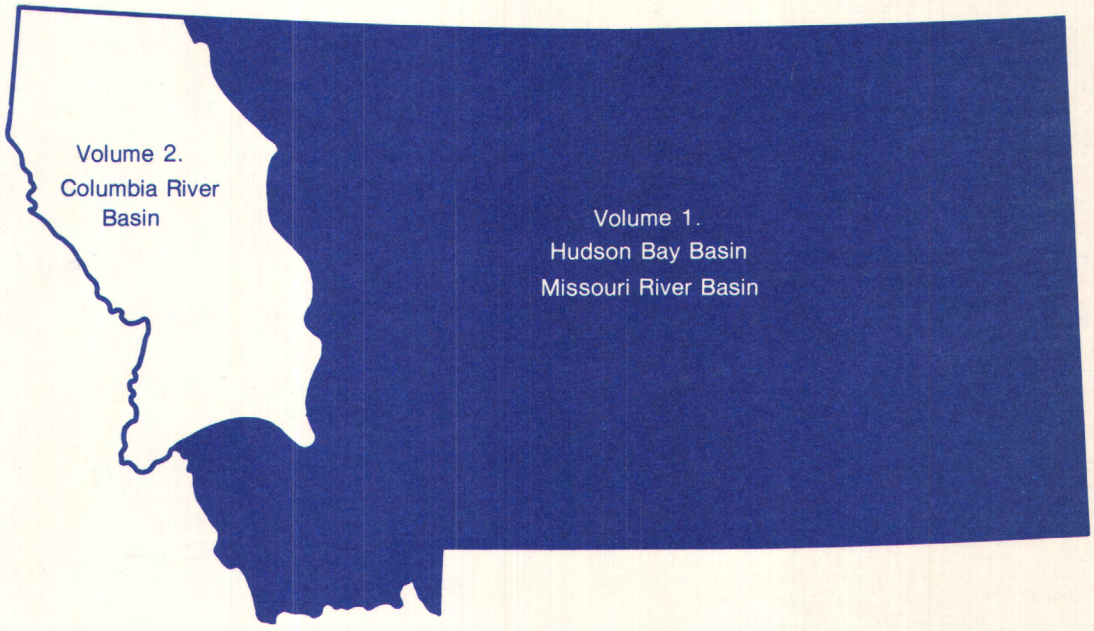
(200)
Ga 3
Montana

Water Resources Data Montana Water Year 1986

Volume 1. Hudson Bay Basin Missouri River Basin

U.S. GEOLOGICAL SURVEY
RESTON, VA.
DEC 14 1987
LIBRARY



U.S. GEOLOGICAL SURVEY WATER DATA REPORT MT-86-1
Prepared in cooperation with the State of Montana
and with other agencies

CALENDAR FOR WATER YEAR 1986

1985

OCTOBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

1986

JANUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

FEBRUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

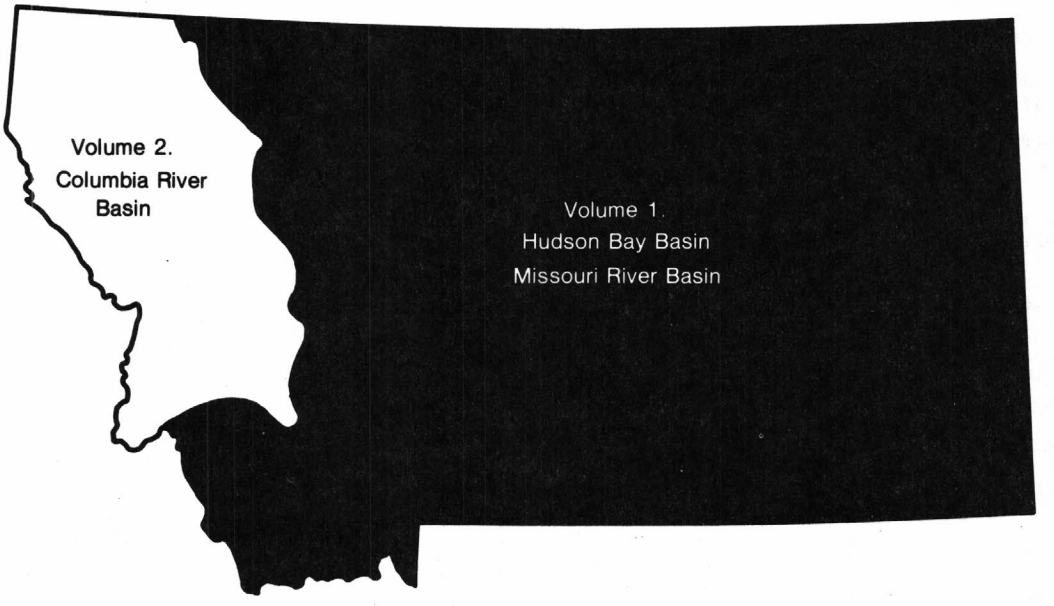
SEPTEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Water Resources Data Montana Water Year 1986

Volume 1. Hudson Bay Basin
Missouri 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-86-1
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

For information on the water program in Montana write to
District Chief, Water Resources Division
U.S. Geological Survey
301 South Park Avenue
Federal Office Building, Room 428
Drawer 10076
Helena, Montana 59626

1987

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:

Donald A. Bischoff, Hydrologic Technician
Bruce M. Bochy, Hydrologic Technician
Tom Brooks, Hydrologist
C. Lee Chambers, Hydrologic Technician
Cynthia J. Diamond, Technical Publications Editor
Jay H. Diamond, Supervisory Hydrologic Technician
James E. Elliott, Hydrologic Technician
James L. Fisher, Hydrologic Technician
Thomas I. Follinglo, Hydrologic Technician
John J. French, Hydrologic Technician
David B. Hanson, Hydrologist
Millard M. Hiner, Supervisory Hydrologic Technician
James A. Hull, Hydrologic Technician
Kurt C. Jenewein, Cartographic Technician
Michael R. Johnson, Hydrologic Technician
Philip L. Karper, Hydrologic Technician
Stephen V. Lynn, Hydrologic Technician
Lawrence A. Merritt, Hydrologist
Norman A. Midtlyng, Hydrologic Technician
Evonne S. Mitton, Computer Assistant
Robert J. Omang, Hydrologist
Charles Parrett, Hydrologist
Marian D. Piatte, Hydrologic Technician
Scott K. Quimby, Hydrologic Technician
Virginia Redstone, Hydrologic Technician
Thomas E. Reed, Hydrologic Technician
Andrew A. Skerda, Hydrologic Technician
Kenneth L. Tangen, Supervisory Hydrologic Technician
Elizabeth A. Weaver, Clerk Typist
Karen S. Midtlyng, Editorial Assistant, 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.

Data for Montana are in two volumes as follows:

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

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-87/271	2.	3. Recipient's Accession No.

4. Title and Subtitle
Water Resources Data, Montana, Water Year 1986
Volume 1. Hudson Bay and Missouri River Basins

5. Report Date
July 1987

6.

7. Author(s)
U.S. Geological Survey

8. Performing Organization Rept. No.
USGS-WDR-MT-86-1

9. Performing Organization Name and Address
U.S. Geological Survey, Water Resources Division
301 South Park Avenue, Drawer 10076
Federal Office Building, Room 428
Helena, MT 59626

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Geological Survey, Water Resources Division
301 South Park Avenue, Drawer 10076
Federal Office Building, Room 428
Helena, MT 59626

13. Type of Report & Period Covered
Annual - Oct. 1, 1985 to Sept. 30, 1986

14.

15. Supplementary Notes
Prepared in cooperation with the State of Montana and with other agencies.

16. Abstract (Limit: 200 words)

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 in wells. Volume 1 of this report contains discharge records for 191 gaging stations; stage only records for 1 lake station; stage/contents for 5 lakes and reservoirs; water quality for 60 stations; water levels for 194 observations wells. Also included are 132 crest-stage partial-record stations and 33 smaller reservoirs. Additional water data were collected at various sites, not part of the systematic data collection programs, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Montana. Specific conductance determinations are also published for discharge measurements made during the year.

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

18. Availability Statement: No restriction on distribution. This report may be purchased from: National Technical Information Service, Springfield, VA 22161	19. Security Class (This Report) Unclassified	21. No. of Pages 451
	20. Security Class (This Page) Unclassified	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

CONTENTS

	Page
Preface	iii
List of surface-water stations, in downstream order, for which records are published	x
Introduction	1
Cooperation	1
General hydrologic setting	2
Hydrologic activity--water year 1986	3
Summary of hydrologic conditions--water year 1986	3
Precipitation and temperature	3
Streamflow	4
Quality of streamflow	10
Ground-water levels	13
Special networks and programs	21
Explanation of the records	21
Station identification numbers	21
Downstream order system	22
Latitude-longitude system	22
Records of stage and water discharge	22
Data collection and computation	23
Data presentation	23
Identifying estimated daily discharge	25
Accuracy of the records	25
Other records available	25
Publications	26
Records of surface-water quality	26
Classification of records	26
Arrangement of records	26
On-site measurements and sample collection	27
Water temperature	27
Sediment	27
Laboratory measurements	27
Data presentation	28
Remark codes	29
Publications	29
Records of ground-water levels	29
Data collection and computation	29
Publications	29
Access to WATSTORE data	30
Definition of terms	30
Publications on Techniques of Water-Resources Investigations	35
Station records, surface water and water quality	41
Smaller reservoirs in Missouri River basin in Montana	367
Discharge at partial-record stations and miscellaneous sites	377
Crest-stage partial-record stations	377
Measurements at miscellaneous sites	393
Supplemental water-quality data for gaging stations and miscellaneous sites	404
Chemical quality of precipitation (national trends network)	425
Index	431

ILLUSTRATIONS

		Page
Figure 1.	Streamflow data for water year 1986 compared to data for water years 1961-85 at long-term streamflow-gaging stations	5
2.	Suspended-sediment discharge for stations in the upper Yellowstone River basin during May through September 1986	12
3.	Long-term hydrograph for an observation well in Powder River County	13
4.	System for numbering wells and miscellaneous sites (latitude and longitude)	22
5-8.	Maps showing location of:	
	5. Surface-water gaging stations, water year 1986	37
	6. Water-quality stations, water year 1986	38
	7. Crest-stage partial-record stations, water year 1986	39
	8. Ground-water observation wells, water year 1986	40
9.	Schematic diagram showing diversions from St. Mary River in Part 5 to Milk River in Part 6	45
10-12.	Schematic diagrams showing diversions and storage in:	
	10. Sun River basin	99
	11. Lodge Creek basin	159
	12. Battle Creek and Frenchman River basins	167

TABLES

		Page
Table 1.	Precipitation and departure from normal, in inches	3
2.	Water content of mountain snowpack, as percent of normal	3
3.	Comparisons of instantaneous peak discharge for water year 1986 with instantaneous peak discharge for period of record at long-term stations	4
4.	Comparison of peak discharge for the September-October 1986 flood period, with previous peak discharge for the period of record	6
5.	Comparisons of minimum daily discharge for water year 1986 with minimum daily discharge for period of record at long-term stations	9
6.	Comparison of percentage of normal storage by month to the average for the base period (water years 1961-80) for major hydroelectric and irrigation reservoirs for water year 1986	10

TABLES--Continued

Page

7. Comparison of minimum and maximum values for selected water-quality constituents and properties for water year 1986 and for the period of NASQAN record at seven stations..... 11
8. Annual suspended-sediment load at selected stations for water year 1986 compared with water year 1985 and period of record..... 12
9. Water levels in observation wells..... 14
10. Water-supply paper numbers and parts for surface-water stations, 1899-1970..... 26
11. Descriptor values for weather conditions..... 28
12. Water-supply paper numbers and parts for water-quality stations, 1947-70..... 29
13. Water-supply paper numbers and parts for ground-water stations for northwestern United States, 1940-74..... 29

Factors for converting inch-pound units to International System units (SI).....inside back cover

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

(Letter after station name designates types of data: (d) discharge, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment, (e) elevations or contents)

HUDSON BAY BASIN — Page

Lake Winnepeg (head of Nelson River):
SASKATCHEWAN RIVER BASIN
Old Man River:
St. Mary River:
Swiftcurrent Creek at Many Glacier (d)..... 41
Lake Sherburne at Sherburne (e)..... 42
Swiftcurrent Creek at Sherburne (d)..... 43
St. Mary River near Babb (d)..... 44
St. Mary Canal at St. Mary Crossing, near Babb (d)..... 46
St. Mary River at international boundary (dcms)..... 47

MISSOURI RIVER BASIN
Red Rock River (head of Missouri River) below Lima Reservoir, near Monida (d)..... 50
Beaverhead River (continuation of Red Rock River):
Clark Canyon Reservoir near Grant (e)..... 51
Beaverhead River at Barretts (d)..... 52
Beaverhead River near Twin Bridges (d)..... 53
RUBY RIVER BASIN
Ruby River above reservoir, near Alder (d)..... 54
Ruby River below reservoir, near Alder (d)..... 55
BIG HOLE RIVER BASIN
Big Hole River:
Big Hole River near Melrose (dt)..... 56
Jefferson River (continuation of Beaverhead River):
BOULDER RIVER BASIN
Boulder River near Boulder (d)..... 60
WILLOW CREEK BASIN
Willow Creek near Harrison (d)..... 61
Jefferson River near Three Forks (d)..... 62
MADISON RIVER BASIN
Firehole River near West Yellowstone (dct)..... 63
Gibbon River near West Yellowstone (dct)..... 68
Madison River near West Yellowstone (dct)..... 73
Madison River below Hebgen Lake, near Grayling (d)..... 78
Madison River at Kirby Ranch, near Cameron (d)..... 79
Jack Creek near Ennis (d)..... 80
Madison River below Ennis Lake, near McAllister (dt)..... 81
GALLATIN RIVER BASIN
Gallatin River near Gallatin Gateway (d)..... 84
East Gallatin River:
Hyalite Creek at Hyalite Ranger Station, near Bozeman (d)..... 85
Gallatin River at Logan (d)..... 86
Missouri River at Toston (dcmts)..... 87
Canyon Ferry Lake near Helena (e)..... 91
Missouri River below Canyon Ferry Dam, near Helena (c)..... 92

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

MISSOURI RIVER BASIN--Continued — Page

PRICKLY PEAR CREEK BASIN
Prickly Pear Creek:
Prickly Pear Creek near Clancy (d) 94
Tenmile Creek near Rimini (d) 95
Missouri River below Holter Dam, near Wolf Creek (d) 96

SMITH RIVER BASIN
Smith River near Fort Logan (d) 97
Missouri River near Ulm (d) 98

SUN RIVER BASIN
Muddy Creek near Vaughn (d) 100
Muddy Creek at Vaughn (d) 101
Sun River near Vaughn (dc) 102
Missouri River near Great Falls (d) 105
Missouri River at Fort Benton (dcms) 106

MARIAS RIVER BASIN
Two Medicine River below South Fork, near Browning (d) 109
Badger Creek below Four Horns Canal, near Browning (d) 110
Cut Bank Creek at Cut Bank (dc) 111
Marias River near Shelby (d) 113
Lake Elwell near Chester (e) 114
Marias River near Chester (dcms) 115
Teton River near Dutton (d) 118
Missouri River at Virgelle (d) 119
Missouri River near Landusky (dcms) 120
Fort Peck Lake:

MUSSELSHELL RIVER BASIN
Musselshell River at Harlowton (d) 125
Musselshell River near Shawmut (d) 126
Halfbreed Creek:
Halfbreed Creek near Klein (d) 127
Musselshell River near Roundup (d) 128
Musselshell River at Musselshell (d) 129
Musselshell River at Mosby (dcms) 130

BIG DRY CREEK BASIN
Big Dry Creek near Van Norman (d) 135
Fort Peck Lake at Fort Peck (e) 136
Missouri River below Fort Peck Dam (dcms) 137

MILK RIVER BASIN
South Fork Milk River near Babb (d) 140
Milk River at western crossing of international boundary (dc) 141
North Fork Milk River above St. Mary Canal, near Browning (d) 143
North Milk River near international boundary (dc) 144
Milk River at Milk River, Alberta (d) 146
Verdigris Coulee near the mouth, near Milk River, Alberta (d) 147
Milk River at eastern crossing of international boundary (dc) 148
Big Sandy Creek:
Big Sandy Creek at reservation boundary, near Rocky Boy (d) 150
Boxelder Creek near Rocky Boy (d) 151
Sage Creek near Whitlash (d) 152

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

MISSOURI RIVER BASIN--Continued — Page

MILK RIVER BASIN--Continued

Big Sandy Creek near Havre (dcs) 153
Milk River at Havre (d) 156
Little Boxelder Creek at mouth, near Havre (d) 157
Clear Creek near Chinook (d) 158
Lodge Creek:
Spangler Ditch near Govenlock, Saskatchewan (d) 160
Middle Creek near Saskatchewan Boundary (d) 161
Middle Creek below Middle Creek Reservoir, near Govenlock, Saskatchewan (d) 162
Middle Creek near Govenlock (d) 163
Middle Creek above Lodge Creek, near Govenlock (d) 164
Lodge Creek below McRae Creek, at international boundary (d) 165
Reservoirs in Lodge Creek basin in Saskatchewan (e) 166
Battle Creek:
Gaff Ditch near Merryflat, Saskatchewan (d) 168
Cypress Lake west inflow canal near West Plains, Saskatchewan (d) 169
Cypress Lake west inflow canal drain near Oxarat, Saskatchewan (d) 170
Cypress Lake west outflow canal near West Plains, Saskatchewan (d) 171
Vidora Ditch near Consul, Saskatchewan (d) 172
Richardson Ditch near Consul, Saskatchewan (d) 173
McKinnon Ditch near Consul, Saskatchewan (d) 174
Nashlyn Canal near Consul, Saskatchewan (d) 175
Battle Creek at international boundary (d) 176
Lyons Creek at international boundary (d) 177
Battle Creek near Chinook (d) 178
Milk River "A" Canal near Harlem (d) 179
Milk River near Harlem (d) 180
Fifteenmile Creek:
Fifteenmile Creek tributary near Harlem (d) 181
Peoples Creek:
Peoples Creek near Hays (d) 182
Little Peoples Creek near Hays (dcs) 183
Willow Coulee near Dodson (d) 185
Peoples Creek near Dodson (dc) 186
Kuhr Coulee tributary near Dodson (d) 188
Milk River near Dodson (d) 189
Belanger Creek (head of Frenchman River):
Belanger Creek diversion canal near Vidora, Saskatchewan (d) 190
Cypress Lake:
Cypress Lake east outflow canal near Vidora, Saskatchewan (d) 191
Frenchman River:
Eastend Reservoir:
Eastend Canal at Eastend, Saskatchewan (d) 192
Frenchman River below Eastend Reservoir, near Eastend, Saskatchewan (d) 193
Huff Lake:
Huff Lake pumping canal near Val Marie, Saskatchewan (d) 194
Huff Lake gravity canal near Val Marie, Saskatchewan (d) 195
Newton Lake:
Newton Lake Main Canal near Val Marie, Saskatchewan (d) 196

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

MISSOURI RIVER BASIN--Continued	Page
MILK RIVER BASIN--Continued	
Frenchman River--Continued	
Frenchman River below Newton Lake, near Val Marie, Saskatchewan (d).	197
Frenchman River at international boundary (d).....	198
Reservoirs in Frenchman River basin in Saskatchewan (e).....	199
Milk River at Juneberg Bridge, near Saco (dc).....	200
Beaver Creek:	
Beaver Creek near Zortman (d).....	203
Little Warm Creek:	
Little Warm Creek at reservation boundary, near Zortman (dc).....	204
Little Warm Creek tributary near Lodge Pole (d).....	206
Big Warm Creek near Zortman (d).....	207
Beaver Creek below Guston Coulee, near Saco (d).....	208
ROCK CREEK BASIN	
Rock Creek below Horse Creek, near international boundary (dcms)....	209
South Creek:	
South Creek tributary near Opheim (d).....	212
South Creek tributary No. 2 near Opheim (d).....	213
South Creek tributary No. 3 near international boundary (d)...	214
Rock Creek below McEachern Creek, near international boundary (d)...	215
Starbuck Coulee near international boundary (d).....	216
Milk River near Vandalia (d).....	217
Willow Creek near Glasgow (d).....	218
Milk River at Nashua (dcms).....	219
Porcupine Creek at Nashua (dc).....	222
Wolf Creek near Wolf Point (d).....	224
Missouri River near Wolf Point (d).....	225
REDWATER RIVER BASIN	
Redwater River at Circle (d).....	226
POPLAR RIVER BASIN	
Poplar River at international boundary (dcs).....	227
East Poplar River at international boundary (dcs).....	231
East Fork Poplar River near Scobey (cs).....	236
Poplar River above West Fork, near Bredette (c).....	239
West Fork Poplar River near Bredette (c).....	240
Poplar River near Poplar (d).....	242
Beaver Creek at international boundary (dcs).....	243
BIG MUDDY CREEK BASIN	
Big Muddy Creek near Antelope (dcs).....	246
Big Muddy Creek diversion canal near Medicine Lake (d).....	249
Lake Creek near Dagmar (d).....	250
Cottonwood Creek near Dagmar (d).....	251
Sand Creek near Dagmar (d).....	252
Big Muddy Creek near mouth, near Culbertson (dc).....	253
Missouri River near Culbertson (dcms).....	255

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

MISSOURI RIVER BASIN--Continued — Page

YELLOWSTONE RIVER BASIN

Yellowstone River:

Yellowstone Lake at Bridge Bay, Yellowstone National Park (e)..... 258

Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park (d)..... 259

Yellowstone River near Tower Junction, Yellowstone National Park (d)... 260

Lamar River near Tower Falls Ranger Station, Yellowstone National Park (ds)..... 261

Gardner River near Mammoth (d)..... 263

Yellowstone River at Corwin Springs (ds)..... 264

Yellowstone River near Livingston (dcms)..... 267

Shields River near Livingston (d)..... 271

Boulder River at Big Timber (d)..... 272

Stillwater River above Nye Creek, near Nye (d)..... 273

East Rosebud Creek (head of Rosebud Creek):

West Rosebud Creek near Roscoe (d)..... 274

Stillwater River near Absarokee (d)..... 275

Clarks Fork Yellowstone River near Belfry (dc)..... 276

Clarks Fork Yellowstone River near Silesia (d)..... 278

Rock Creek:

Rock Creek near Red Lodge (d)..... 279

Red Lodge Creek above Cooney Reservoir, near Boyd (d)..... 280

Willow Creek near Boyd (d)..... 281

Red Lodge Creek below Cooney Reservoir, near Boyd (d)..... 282

Rock Creek at Rockvale (d)..... 283

Yellowstone River at Billings (dcms)..... 284

Pryor Creek at Pryor (d)..... 287

Pryor Creek near Huntley (d)..... 288

Bighorn River at Kane, WY (dc)..... 289

Bighorn Lake:

Shoshone River near Lovell, WY (dc)..... 292

Shoshone River at Kane, WY (cm)..... 294

Bighorn Lake near St. Xavier (e)..... 295

Bighorn River near St. Xavier (d)..... 296

Little Bighorn River below Dayton Gulch, near Burgess Junction, WY (d)..... 297

Dry Fork below Lick Creek, near Burgess Junction, WY (d)..... 298

Elkhorn Creek above Fuller Ranch ditch, near Parkman, WY (d).. 299

West Fork Little Bighorn River near Parkman, WY (d)..... 300

Little Bighorn River at State line, near Wyola (d)..... 301

Spring Creek:

Red Canyon Creek near Parkman, WY (d)..... 302

Pass Creek:

West Pass Creek near Parkman, WY (d)..... 303

East Pass Creek near Dayton, WY (d)..... 304

Twin Creek near Parkman, WY (d)..... 305

Pass Creek near Wyola (d)..... 306

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

MISSOURI RIVER BASIN--Continued Page
YELLOWSTONE RIVER BASIN--Continued
Yellowstone River--Continued
Little Bighorn River below Pass Creek, near Wyola (d)..... 307
Owl Creek near Lodge Grass (d)..... 308
Lodge Grass Creek at State line, near Wyola (d)..... 309
Lodge Grass Creek above Willow Creek Diversion, near Wyola (d) 310
Little Bighorn River near Hardin (d)..... 311
Bighorn River above Tullock Creek, near Bighorn (d)..... 312
Bighorn River at Bighorn (cms)..... 313
Armells Creek near Forsyth (cs)..... 315
Yellowstone River at Forsyth (d)..... 317
Rosebud Creek at reservation boundary, near Kirby (d)..... 318
Rosebud Creek near Colstrip (d)..... 319
Rosebud Creek at mouth, near Rosebud (dcs)..... 320
TONGUE RIVER BASIN
Tongue River:
Tongue River at State line, near Decker (dcm)..... 323
Tongue River at Tongue River Dam, near Decker (dcs)..... 326
Hanging Woman Creek below Horse Creek, near Birney (cs)..... 330
Hanging Woman Creek near Birney (dcs)..... 332
Tongue River at Birney Day School Bridge, near Birney (dcs)..... 336
Tongue River at Miles City (dcms)..... 339
Yellowstone River at Miles City (d)..... 343
POWDER RIVER BASIN
Powder River at Moorhead (dcs)..... 344
Powder River at Broadus (ds)..... 349
Little Powder River above Dry Creek, near Weston, WY (d)..... 352
Mizpah Creek near Mizpah (d)..... 354
Powder River near Locate (dcms)..... 355
O'Fallon Creek near Ismay (d)..... 358
Burns Creek near Savage (dc)..... 359
Yellowstone River near Sidney (dcmts)..... 362
Smaller reservoirs in Missouri River basin in Montana (e)..... 367
LITTLE MISSOURI RIVER BASIN
Little Missouri River at Camp Crook, SD (d)..... 375
Beaver Creek:
Beaver Creek near Trotters, ND (d)..... 376

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, obtain 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 water year 1986 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 191 gaging stations; stage only at 1 lake station; stage and contents at 5 lakes and reservoirs; water quality at 49 gaging stations and 11 water-quality stations; and water levels for 194 observation wells. Also included are data for 132 crest-stage partial-record stations and 33 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. Also, numerous stations in Canada operated for the International Joint Commission under cooperative agreement with the U.S. Department of State are included in the above. In this volume the location of gaging stations are shown in figure 5, water-quality stations are shown in figure 6, and ground-water observation wells are shown in figure 8. 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 1934 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-86-1". These water data reports are for sale, in paper copy or on microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

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 ground-water records since 1964, and for water quality records since 1946. 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

Assistance in the form of funds or services was given by the U.S. Department of State-International Joint Commission, Waterways Treaty Program, in collecting records published in this volume for 34 gaging stations and 4 water-quality stations; by the Corps of Engineers, U.S. Army, for 19 gaging stations and 4 water-quality stations; by the Bureau of Land Management, U.S. Department of the Interior, for 9 gaging stations and 5 water-quality stations; by the U.S Bureau of Reclamation, U.S. Department of the Interior, for 5 gaging stations; and the U.S. Bureau of Indian Affairs, U.S. Department of the Interior, for 24 gaging stations and 7 water-quality stations.

Organizations that supplied data are acknowledged in station descriptions.

Volume 1: Hudson Bay Basin

Missouri River Basin

GENERAL HYDROLOGIC SETTING

The Hudson Bay and upper Missouri River basins in Montana drain about 83 percent of the State and provide slightly less than 50 percent of the State's total streamflow. The Hudson Bay basin comprises less than 1 percent of the drainage area of the combined basins. The major river in the Hudson Bay basin is the St. Mary River, which flows from Montana's Glacier National Park northward into Canada to the Saskatchewan River and then into Hudson Bay. The Missouri River basin in Montana includes drainage of both the Missouri River and the Yellowstone River. The Missouri River, which is formed by the confluence of the Jefferson, Madison, and Gallatin Rivers in southwestern Montana, flows northeastward through the western half of the State and then eastward across northern Montana into North Dakota. Its major tributaries are the Dearborn, Smith, Sun, Teton, Marias, Judith, Musselshell, Milk, Redwater and Poplar Rivers. The Milk River originates in Montana, flows northward into Canada, and then flows southeastward back into Montana. The Poplar River flows from its source in Canada southward into Montana. The Yellowstone River, which originates in Wyoming, drains the south-central and southeastern sections of Montana. It joins the Missouri River just east of the Montana-North Dakota line. The major tributaries to the Yellowstone are the Shields, Boulder, and Stillwater Rivers that originate in Montana and the Clarks Fork Yellowstone, Bighorn, Tongue, and Powder Rivers that originate in Wyoming and flow northward into Montana.

Two major multipurpose reservoirs have been constructed on the Missouri River. Canyon Ferry Lake, which was formed by the U.S. Bureau of Reclamation's Canyon Ferry Dam, is 25 miles long and has a usable capacity of about 2,043,000 acre-feet. Fort Peck Lake was formed by the U.S. Army Corps of Engineers' Fort Peck Dam. It is more than 100 miles long and has a storage capacity of 18,910,000 acre-feet. The Yellowstone River has no dams or storage reservoirs on its mainstem and is the longest free-flowing river in the conterminous United States.

The western and southwestern parts of the upper Missouri River basin are in the Northern Rocky Mountains physiographic province. The northern and eastern parts are in the Great Plains province. Climate and hydrologic conditions differ significantly between the two provinces. The elevation varies from about 10,000 feet at the Continental Divide in Glacier National Park and in the headwaters of the Yellowstone River in Yellowstone National Park to about 1,880 feet where the Missouri and Yellowstone Rivers flow from the State.

Annual precipitation varies considerably throughout the basins, from 100 inches along the Continental Divide in Glacier National Park to about 12 inches in eastern Montana and in some of the intermontane valleys east of the Divide. In mountain areas, much of this precipitation occurs as snow during the winter. Although much of the annual precipitation on the Great Plains also occurs as snow during the winter, intense rainstorms during the summer add substantial quantities of precipitation to the annual totals in a very short time. In areas east of the mountains, generally one-half of the annual precipitation occurs from May through July.

Peak runoff from the basins can result from spring snowmelt, from snowmelt mixed with rain, or from intense rains. In addition, flooding may be caused by backwater from ice jams, as commonly occurs in the lower Yellowstone River basin. The record floods in April 1952 in northeastern Montana are an example of spring snowmelt flooding. Floods in June 1964, June 1975, and May 1981 are examples of those caused by snowmelt-rainfall runoff. The May 1978 flood in the southeastern part of the State is an example of flooding caused by intense rainfall--more than 5 inches in 2 days. Flash floods, although restricted in scope, are at times numerous in the north-central and eastern parts of the State.

Water generally is suitable for most uses throughout the basin except in parts of eastern Montana where, because of large concentrations of dissolved solids and selected constituents, recommended standards for domestic and agricultural uses may be exceeded. Distinctly different water quality occurs in the western mountain region and the eastern plains. In the mountains, where the rocks generally are older (commonly of Precambrian age) and more resistant to weathering, runoff is rapid and the water characteristically is a calcium bicarbonate type. The dissolved-solids concentrations in mountain streams seldom exceed 500 milligrams per liter, even during base-flow conditions. Water from the eastern two-thirds of the State, where Cretaceous and Tertiary rocks are dominant, generally is a sodium sulfate type; dissolved-solids concentrations range from about 500 to 5,000 milligrams per liter. Snowmelt and intense rainstorms sometimes alter this pattern, when rapid runoff results in smaller concentrations of dissolved solids, and calcium and bicarbonate become the dominant ions.

A notable exception to the general classification of water in eastern Montana occurs in the northeastern section of the State, where the runoff and base-flow waters typically are a sodium bicarbonate type. Significant concentrations of boron also are common. Another exception applies to waters in the downstream reaches of the Yellowstone and Missouri Rivers, which originate in the mountain areas. Characteristics of the mountain-type water are present, but gradually diminish as the water moves downstream and mixes with eastern Montana tributaries.

In the Hudson Bay and upper Missouri River basins, water occurs in unconsolidated deposits along streams, in glacial deposits in the north and northeastern parts of the State, and in consolidated rocks underlying most of the area. The unconsolidated deposits generally are the most productive aquifers; along the major streams the alluvium may yield several hundred gallons per minute to wells. These deposits are readily recharged by precipitation, by streams during periods of high flow, and by applied irrigation water. The composition of the glacial deposits determines in large part their potential for production. Where outwash gravels exist, the potential for developing large-yield wells is good; where till is present, yields generally are limited to a few gallons per minute. Many consolidated-rock formations are water bearing, but owing to the complexity of the geology, not all the formations will be found in any given area. Also, the well depth required to penetrate a given formation will vary with location. Well yields generally are only a few gallons per minute; however, several hundred gallons per minute may be obtained from deeply buried, fractured limestones in localized areas.

HYDROLOGIC ACTIVITY--WATER YEAR 1986

During water year 1986, seven streamflow-gaging stations and four water-quality stations were established in the basins to aid in an assessment of the water resources. Eight streamflow-gaging stations and 13 water-quality stations were discontinued at the end of the water year, because sufficient data had been collected to meet users' needs or funding was not available to continue the data collection.

SUMMARY OF HYDROLOGIC CONDITIONS--WATER YEAR 1986

Precipitation and Temperature

Water year 1986 in the Hudson Bay and upper Missouri River basins was characterized by major variations in hydrologic conditions. Precipitation was slightly greater than normal, with departures ranging from 9.5 to 33 percent greater than normal. Data for precipitation and departure from normal precipitation published by the National Weather Service for the basins are listed in table 1. Most National Weather Service stations measure precipitation only in valley locations. Data for mountain precipitation occurring as snow during the winter are published by the U.S. Soil Conservation Service in the report "Montana Water Supply Outlook"; data for 1986 are listed in table 2. Normals for precipitation and snowpack are based on different periods of record. Normal precipitation has a base period of 1951-80 and normal snowpack has a base period of 1961-80. Once sufficient long-term data for snowpack have been collected, the base periods will be the same. Temperatures for the year were near normal, but were markedly less than normal in December and significantly greater than normal in March and June. These factors of precipitation and temperature had a marked effect on streamflow and resulted in substantial fluctuations throughout the year.

Table 1.--*Precipitation and departure from normal, in inches*[1]

Division (number of stations)	October 1985 through March 1986		April through September 1986		Water year 1986	
	Precipitation	Departure from normal, 1951-80	Precipitation	Departure from normal, 1951-80	Precipitation	Departure from normal, 1951-80
Southwestern (26)	5.30	-0.05	11.47	+1.50	16.77	+1.45
North Central (42)	4.30	+1.18	13.07	+3.10	17.37	+4.28
Central (37)	4.36	+ .37	13.27	+2.74	17.63	+3.11
South Central (25)	5.55	+ .52	12.46	+1.76	18.01	+2.28
Northeastern (27)	3.25	+ .62	14.02	+3.52	17.27	+4.14
Southeastern (24)	4.19	+ .77	12.91	+2.60	17.10	+3.37

[1] Data from U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 1986, Climatological data, Montana: v. 88, no. 10 through v. 89, no. 9.

Table 2.--*Water content of mountain snowpack, as percent of normal* [1]

Drainage basin	1986				
	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1
St. Mary	67	75	77	52	46
Missouri	87	86	88	78	67
Yellowstone	114	126	116	106	103

[1] Data from U.S. Department of Agriculture, Soil Conservation Service, 1986. Normal based on 1961-80 period of record.

Although the precipitation data presented in tables 1 and 2 appear to indicate that most of the State had only slightly greater than normal precipitation for water year 1986, most residents of the State will remember the severe flooding. Precipitation was normal for the first few months of the water year in most parts of the State; however, from April through September precipitation increased to greater than normal, especially in September. By May, the snowpack (table 2) was generally less than normal, except in the Yellowstone basin, where it was near normal.

Temperature patterns created the setting for two of the three major flooding periods during water year 1986. In mid-February a major Pacific storm produced large precipitation amounts and cool temperatures. As much as 6 to 14 inches of heavy, wet snow fell throughout north and north-central Montana. On February 25-26, "chinook" winds with gusts more than 50 miles per hour resulted in a rapid melt of the snow cover. Under normal conditions this amount of snow would have melted slowly and most of the snowmelt water would have infiltrated. However, during this period the ground was still frozen and runoff was rapid. These conditions, combined with ice cover in some streams, caused flooding. At the end of May, although snowpack was normal or slightly less than normal, a rapid rise in temperatures into the 80-90 °Fahrenheit range at high elevations melted the snowpack very rapidly, causing some minor flooding.

Streamflow

Streamflow data for water year 1986 are compared to data for water years 1961-85 at four long-term streamflow stations (fig. 1). The extremes in precipitation are reflected in the streamflow records. The drought that occurred in 1985 appears to have been broken by greater than normal precipitation. Floods in February and September produced record monthly mean discharges at two of the four long-term streamflow stations. For example, monthly mean discharge of the Marias River near Shelby, Mont. (station 06099500) for February was the largest for 77 years of record, and for the Redwater River at Circle, Mont. (station 06177500) for September was also the largest for 48 years of record. Compared to the yearly mean discharge for water years 1961-85, the 1986 annual discharge of the Missouri River at Toston, Mont. (station 06054500) was 91 percent of normal, the Marias River near Shelby was 102 percent of normal, the Redwater River at Circle was 491 percent of normal, and the Yellowstone River at Billings, Mont. (station 06214500) was 96 percent of normal. By comparison, streamflows were smaller in water year 1985 at all stations. In water year 1985, the Missouri River was 84 percent of normal, the Marias River was 65 percent of normal, the Redwater River was 5 percent of normal, and the Yellowstone River was 65 percent of normal, based on the long-term averages.

Three separate floodflow periods were recorded during water year 1986: the end of February and into the first week of March, the last week of May and into the first week of June, and the 24th and 25th of September. The February and September floodflows were mostly in the Milk River basin, in north and north-central Montana. May to June floodflows were mainly in the upstream reaches of the Missouri and Yellowstone River basins in southwestern and southern Montana. Instantaneous peak discharges for several representative streamflow-gaging stations in the basin are listed in table 3. The recurrence interval of peak discharge at the selected stations was generally less than 10 years.

Table 3.--*Comparisons of instantaneous peak discharge for water year 1986 with instantaneous peak discharge for period of record at long-term stations*

[<, less than; --, not determined]

Station number	Station name	Drainage area (square miles)	Peak discharge, water year 1986			Peak discharge, period of record	
			Date	Cubic feet per second	Recurrence interval (years)	Date	Cubic feet per second
05014500	Swiftcurrent Creek at Many Glacier, Mont.	30.9	05-29	1,010	<5	06-08-64	6,700
05017500	St. Mary River near Babb, Mont.	278	06-01	4,700	<5	06-09-64	16,500
06025500	Big Hole River near Melrose, Mont.	2,476	06-01	8,810	<5	06-10-72	14,300
06054500	Missouri River at Toston, Mont.	14,669	06-06	23,000	<5	06-06-48	32,000
06062500	Tenmile Creek near Helena, Mont.	32.7	05-28	202	<2	05-22-81	3,290
06089000	Sun River near Vaughn, Mont.	1,854	05-31	4,840	2	06-09-64	53,500
06093200	Badger Creek below Four Horns Canal, near Browning, Mont.	152	05-29	1,330	<2	06-08-64	49,700
06115200	Missouri River near Landusky, Mont.	40,987	09-25	28,200	<2	06-06-53	137,000
06120500	Musselshell River at Harlowton, Mont.	1,125	--	--	--	06-20-75	7,270
06154400	Peoples Creek near Hays, Mont.	220	02-25	1,530	<10	06-08-72	8,460
06174500	Milk River at Nashua, Mont.	22,332	03-08	18,500	10	04-18-52	45,300
06191500	Yellowstone River at Corwin Springs, Mont.	2,623	06-02	21,900	5	06-14,15-18	32,000
06200000	Boulder River at Big Timber, Mont.	523	06-06	5,780	2	05-28-56	9,840
06214500	Yellowstone River at Billings, Mont.	11,795	06-06	45,600	3	06-19-74	69,500
06289000	Little Bighorn River at State line, Mont.	193	06-03	2,030	<25	06-03-44	2,730
06308500	Tongue River at Miles City, Mont.	5,379	09-25	3,620	<2	06-15-62	13,300
06329500	Yellowstone River near Sidney, Mont.	69,103	06-10	59,900	<2	06-02-21	159,000

In north-central Montana, record floodflows occurred during late September on tributary streams of the lower Milk River basin and high flows (5-10 year recurrence interval) occurred on the mainstem Milk River downstream from the town of Chinook. The flooding was caused by large precipitation amounts beginning the evening of September 24th. Intense rainfall of as much as 8 inches fell over the basin during an 18-hour period. Record flooding also occurred in the Porcupine Creek basin, a tributary to the Yellowstone River, from the same storm system. Peak discharges that were determined for streamflow-gaging stations and miscellaneous sites in the area are listed in table 4.

The most significant flooding during September 1986 occurred in the towns of Chinook, Harlem, Malta, and Saco, Mont. The smaller tributaries in the area also caused significant lowland flooding, damaging several roads and bridges and flooding several ranches. Agricultural damage was severe throughout the area. The flooding claimed the life of one person and resulted in damages in excess of $50 million. A four-county area was declared a national disaster area by Presidential proclamation. Twenty-five of the streamflow-gaging stations listed in table 4 had record flood discharges in 1986. Battle Creek at international boundary (station 06149500), with 70 years of record, had a discharge of 9,780 cubic feet per second compared with a previous high of 5,820 cubic feet per second. Peak discharges exceeded the computed 100-year frequency flood at 22 sites.

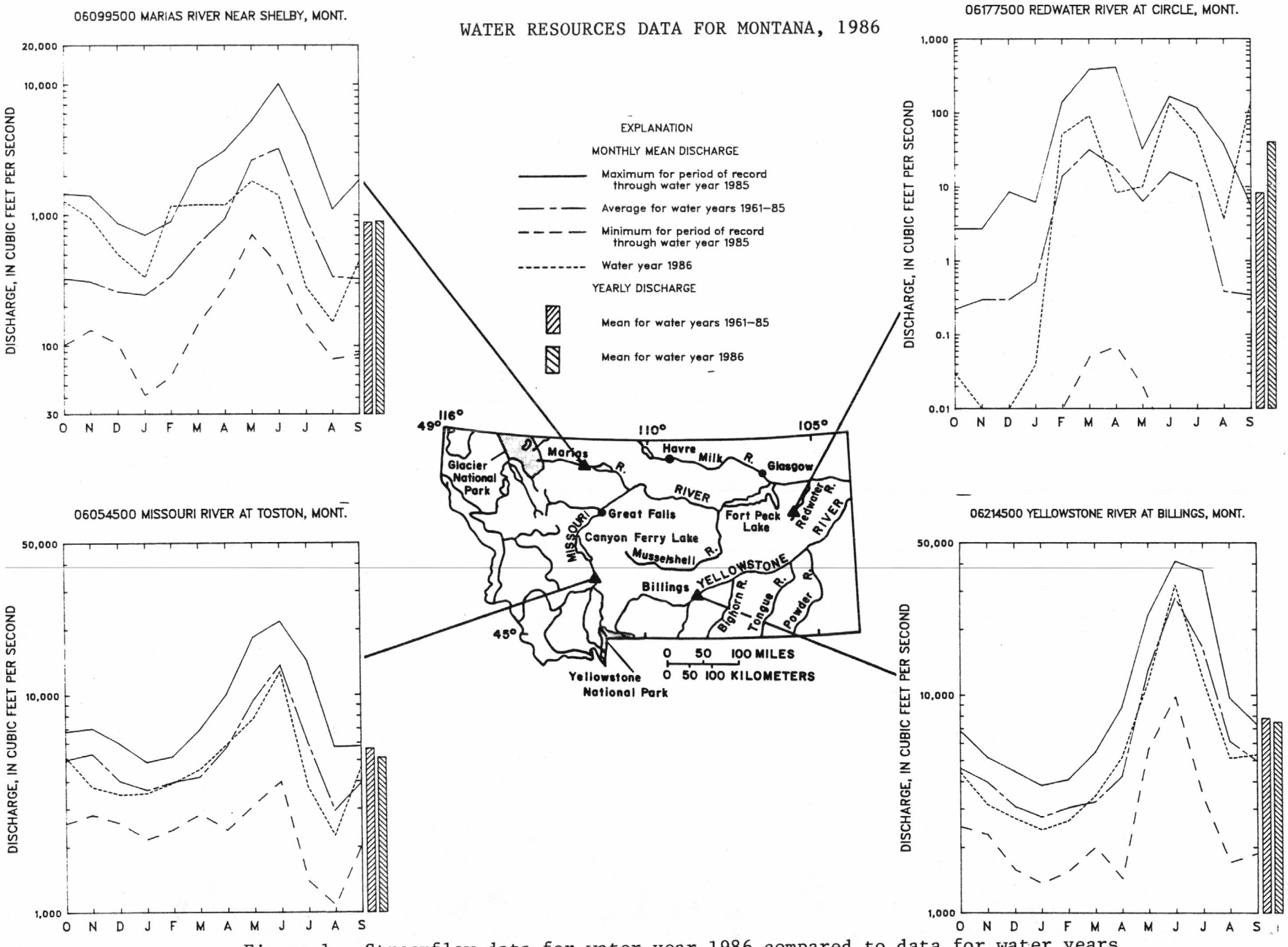


Figure 1.--Streamflow data for water year 1986 compared to data for water years 1961-85 at long-term streamflow-gaging stations.

Table 4.--*Comparison of peak discharge for the September-October 1986 flood period, with previous peak discharge for the period of record*

[<, less than; >, greater than; --, not determined]

Station number	Station name	Drainage area (square miles)	Peak discharge, period of record through 1985				Peak discharge, during flood period September-October 1986			
			Period of record	Date	Gage height (feet)	Cubic feet per second	Date	Gage height (feet)	Cubic feet per second	Recurrence interval (years)
06136400	Spring Coulee tributary near Simpson, Mont.	2.49	1972-86	1972	4.12	35	09-25	--	0	--
06137400	Big Sandy Creek at Reservation Boundary, near Rocky Boy, Mont.	24.7	1982-86	06-04-82	3.83	156	09-25	3.71	126	2
06137570	Boxelder Creek near Rocky Boy, Mont.	48.2	1976-86	03-26-78	6.86	243	09-25	10.56	278	3
06137580	Sage Creek near Whitlash, Mont.	7.26	1977-86	05-02-78	2.41	22	09-25	1.37	18	<2
06138700	South Fork Spring Coulee near Havre, Mont.	6.47	1960-86	03-09-66	4.42	190	09-25	3.52	90	8
06139500	Big Sandy Creek near Havre, Mont.	1,805	1946-67	04-03-52	14.70	5,570	09-25	5.48	216	<2
06140400	Bullock Creek near Havre, Mont.	39.6	1960-75	01-20-71	6.04	700	09-25	3.73	350	7
06140500	Milk River at Havre, Mont.	5,844	1899-22, 1952-86	04-12-99	--	20,000	09-25	4.65	731	<2
06141600	Little Box Elder Creek at mouth, near Havre, Mont.	62.2	1986	--	--	--	09-25	9.09	425	5
06142400	Clear Creek near Chinook, Mont.	135	1984-86	05-22-86	6.12	360	09-25	8.21	571	3
06145500	Lodge Creek below McRae Creek, at international boundary	825	1951-86	06-14-62	14.40	7,760	09-26	16.36	9,890	>100
06147500	Lodge Creek at Chinook, Mont.	1,175	1905-08	06-10-06	16.90	3,000	09-25	--	7,280	35
06149500	Battle Creek at international boundary	997	1917-86	04-15-62	10.56	5,820	09-25	11.57	9,780	>100
06150000	Woodpile Coulee near international boundary	60.2	1927-30, 1950-76	03-30-43	8.60	3,090	09-25	--	5,030	>100
06150500	East Fork Battle Creek near international boundary	89.5	1927-69, 1971-76	07-12-55	11.24	2,300	09-25	11.23	2,780	60
06151000	Lyons Creek at international boundary	66.7	1927-86	07-06-55	8.38	1,200	09-25	6.78	1,400	40
06151500	Battle Creek near Chinook, Mont.	1,539	1905-14, 1917-21, 1952, 1984-86	06-08-06	16.63	10,960	09-25	22.91	19,400	>100
06153400	Fifteenmile Creek tributary near Zurich, Mont.	1.40	1974-86	03-29-78	4.91	70	09-25	18.36	1,250	>100
--------	Thirtymile Creek near Harlem, Mont.	330	--	--	--	--	09-25	--	11,100	>100

Table 4.--*Comparison of peak discharge for the September-October 1986 flood period, with previous peak discharge for the period of record*--Continued

Station number	Station name	Drainage area (square miles)	Peak discharge, period of record through 1985				Peak discharge, during flood period September-October 1986			
			Period of record	Date	Gage height (feet)	Cubic feet per second	Date	Gage height (feet)	Cubic feet per second	Recurrence interval (years)
06154100	Milk River near Harlem, Mont.	9,822	1960-69, 1982-86	08-19-65	5.44	6,600	09-25	26.38	12,300	55
--------	Forgey Creek near Harlem, Mont.	22.6	--	--	--	--	09-25	--	4,100	>100
06154130	Threemile Creek near Harlem, Mont.	46.4	--	--	--	--	09-25	--	2,240	>100
06154140	Fifteenmile Creek tributary, near Harlem, Mont.	2.31	1983-86	07-10-83	1.41	20	09-25	2.70	92	8
06154150	White Bear Creek below Fifteenmile Creek, near Dodson, Mont.	112	--	--	--	--	09-25	--	8,140	>100
06154350	Peoples Creek tributary near Lloyd, Mont.	2.51	1974-86	05-06-75	4.95	15	09-25	4.03	4	<2
06154400	Peoples Creek near Hays, Mont.	220	1967-86	06-08-72	15.03	8,460	09-25	6.99	659	3
06154410	Little Peoples Creek near Hays, Mont.	13.0	1973-86	05-25-74	4.57	576	09-25	12.24	98	3
06154430	Lodge Pole Creek at Lodge Pole, Mont.	19.5	--	--	--	--	09-25	--	450	10
06154490	Willow Coulee near Dodson, Mont.	5.16	1983-86	07-10-83	5.60	1,260	09-25	7.84	2,310	>100
06154500	Peoples Creek near Dodson, Mont.	670	1952-73	06-09-72	11.94	3,940	09-25	15.67	7,590	>100
06154510	Kuhr Coulee tributary near Dodson, Mont.	1.25	1983-86	07-10-83	9.60	310	09-25	15.82	436	>100
06155030	Milk River near Dodson, Mont.	11,192	1982-86	05-25-86	20.07	2,630	09-26	27.79	13,200	60
06155100	Black Coulee near Malta, Mont.	7.03	1956-67	05-03-64	3.16	220	09-25	5.53	2,350	>100
--------	West Alkali Creek near Malta, Mont.	18.0	--	--	--	--	09-25	--	6,190	>100
06155200	Alkali Creek near Malta, Mont.	162	1956-59, 1961-73	03-13-59	3.00	800	09-25	--	22,900	>100
06155300	Disjardin Coulee near Malta, Mont.	4.84	1956-86	04-12-65	5.15	360	09-25	3.83	210	25
06155600	Murray Coulee tributary near Hogeland, Mont.	1.77	1974-86	1974	6.28	403	09-25	5.85	350	15
06156100	Lush Coulee near Whitewater, Mont.	9.58	1972-86	1972	4.69	178	09-25	2.45	69	2
06164000	Frenchman River at international boundary	2,120	1917-86	04-15-52	19.90	22,700	09-26	2.58	91	<2
06164510	Milk River at Juneberg Bridge, near Saco, Mont.	17,670	1977-86	04-03-78	24.20	12,400	10-01	24.45	11,100	8
06164590	Beaver Creek near Zortman, Mont.	10.1	1983-86	05-23-86	2.29	57	09-25	2.04	46	<2

Table 4.--*Comparison of peak discharge for the September-October 1986 flood period, with previous peak discharge for the period of record*--Continued

Station number	Station name	Drainage area (square miles)	Peak discharge, period of record through 1985				Peak discharge, during flood period September-October 1986			
			Period of record	Date	Gage height (feet)	Cubic feet per second	Date	Gage height (feet)	Cubic feet per second	Recurrence interval (years)
06164600	Beaver Creek tributary near Zortman, Mont.	3.89	1972-86	05-18-78	2.94	255	09-25	3.05	280	10
06164615	Little Warm Creek at Reservation Boundary, near Zortman, Mont.	6.31	1983-86	02-24-86	5.84	171	09-25	6.93	300	15
06164623	Little Warm Creek tributary near Lodge Pole, Mont.	2.42	1983-86	02-24-86	3.98	61	09-25	4.83	460	95
06164630	Big Warm Creek near Zortman, Mont.	8.58	1983-86	07-10-83	2.55	42	09-25	6.46	630	40
06164650	Spring Creek near Lodge Pole, Mont.	7.71	--	--	--	--	09-25	--	1,540	>100
06164660	Wild Horse Creek near Lodge Pole, Mont.	52.0	--	--	--	--	09-25	--	5,050	>100
06164665	Wild Horse Creek tributary near Lodge Pole, Mont.	3.10	--	--	--	--	09-25	--	1,840	>100
06164800	Beaver Creek above Dix Creek, near Malta, Mont.	929	1967-69, 1976-82	03-28-78	19.60	7,180	09-26	22.75	26,500	>100
06165200	Beaver Creek tributary No. 2 near Malta, Mont.	1.95	1974-86	1974	2.70	35	09-25	2.36	23	<2
06166000	Beaver Creek below Guston Coulee, near Saco, Mont.	1,208	1981-86	06-01-82	10.46	1,510	09-26	14.68	23,500	>100
06172000	Milk River at Vandalia, Mont.	20,944	1915, 1917-25, 1929-39, 1952, 1970-73, 1982-86	04-16-52	--	45,000	10-03	34.61	16,610	7
06172300	Unger Coulee near Vandalia, Mont.	11.1	1958-86	06-09-72	6.31	4,460	09-25	.99	6	<2
06173300	Willow Creek tributary near Fort Peck, Mont.	.86	1972-86	1972	9.38	940	09-25	8.65	220	5
06174000	Willow Creek near Glasgow, Mont.	538	1954-86	07-14-62	21.70	12,400	09-26	21.88	5,050	90
06174300	Milk River tributary No. 3 near Glasgow, Mont.	1.82	1974-86	07-01-75	7.61	251	09-25	--	0	--
06174500	Milk River at Nashua, Mont.	22,332	1940-86	04-18-52	31.38	45,300	10-08	26.11	13,700	6
--------	Porcupine Creek near Forsyth, Mont.	900	--	--	--	--	09-25	--	27,400	>100
06295050	Little Porcupine Creek near Forsyth, Mont.	614	1958-73, 1975, 1978	03-16-72	11.70	9,350	09-25	13.16	13,000	>100

Despite the severe drought in June and July of 1985, the carryover effect into water year 1986 was not apparent. No stations in the basins recorded any periods of significant low flow in 1986, except the Little Bighorn River at State line (station 06289000), which recorded a 1-day low flow having a recurrence interval of 40 years. Minimum daily discharges for several representative streamflow-gaging stations are listed in table 5.

Table 5.--*Comparisons of minimum daily discharge for water year 1986 with minimum daily discharge for period of record at long-term stations*

[<, less than]

Station number	Station name	Drainage area (square miles)	Minimum discharge, water year 1986			Minimum discharge, period of record	
			Date	Cubic feet per second	Recurrence interval (years)	Date	Cubic feet per second
05014500	Swiftcurrent Creek at Many Glacier, Mont.	30.9	01-02	7.6	15	11-14,16-76	0
05017500	St. Mary River near Babb, Mont.	278	01-16	77	<2	01-05-63	26
06025500	Big Hole River near Melrose, Mont.	2,476	11-12	170	3	08-17-81	49
06054500	Missouri River at Toston, Mont.	14,669	08-12	1,870	<2	04-30-41	562
06061500	Prickly Pear Creek near Clancy, Mont.	192	01-06	20	<2	01-26-58	0.5
06089000	Sun River near Vaughn, Mont.	1,854	08-29	277	<2	05-24-44	20
06099500	Marias River near Shelby, Mont.	3,242	08-30	119	3	08-20-19	10
06115200	Missouri River near Landusky, Mont.	40,987	10-02	6,250	<2	07-08-36	1,120
06120500	Musselshell River at Harlowton, Mont.	1,125	12-02	17	3	([1])	0
06174500	Milk River at Nashua, Mont.	22,332	04-29	42	3	([1])	0
06181000	Poplar River near Poplar, Mont.	3,174	02-20	.3	5	([1])	0
06191500	Yellowstone River at Corwin Springs, Mont.	2,623	11-24	623	3	03-05,09-37	389
06200000	Boulder River at Big Timber, Mont.	523	12-02	60	4	08-26-61	10
06214500	Yellowstone River at Billings, Mont.	11,795	02-12	1,000	4	12-12-32	430
06289000	Little Bighorn River at State line, Mont.	193	02-11	24	40	12-27-54	21
06308500	Tongue River at Miles City, Mont.	5,379	10-16	99	<2	08-13,14-40	0
06329500	Yellowstone River near Sidney, Mont.	69,103	11-26	1,800	3	05-17-61	470

[1]At times.

Contents for the major hydroelectric and irrigation reservoirs generally were about normal, with several exceptions. The percentage of storage by month is compared to the average for the base period (water years 1961-80) in table 6. The effects of the greater-than-normal streamflow are apparent from the increasing reservoir storage during March through May and September.

Table 6.--*Comparison of percentage of normal storage by month to the average for the base period (water years 1961-80) for major hydroelectric and irrigation reservoirs for water year 1986*

Reservoir	Usable capacity (acre-feet)	Percent of normal storage based on period of record (water years 1961-80)											
		Oct. 85	Nov.	Dec.	Jan. 86	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Hydroelectric reservoirs:													
Canyon Ferry Lake	2,043,000	96	91	91	93	95	99	105	100	101	99	97	99
Fort Peck Lake	18,910,000	91	92	91	91	93	95	94	96	94	94	94	99
Irrigation reservoirs:													
Lima Reservoir	84,050	64	66	66	71	71	77	123	116	108	100	73	79
Gibson Reservoir	99,050	224	200	186	162	155	157	155	99	93	60	49	104
Fresno Reservoir	103,000	62	67	66	74	102	115	101	110	99	105	106	100

Quality of Streamflow

The National Stream Quality Accounting Network (NASQAN) was established to assess the quality of the Nation's water through systematic and continuing measurements at specific key locations. Montana has 15 NASQAN stations in the Hudson Bay and upper Missouri River basins.

Statistical summaries for selected water-quality measurements from seven NASQAN stations on the mainstem of the St. Mary, Missouri, and Yellowstone Rivers are given in table 7. The statistical summaries include minimum and maximum values for water year 1986 as well as for the period of NASQAN record. Stations listed for the Missouri and Yellowstone Rivers include the most upstream and most downstream in Montana, as well as one between. The remaining eight NASQAN stations either are on the mainstem of the Missouri and Yellowstone Rivers or are on tributaries.

Dissolved-solids concentration and streamflow generally have an inverse relationship. The smallest concentrations of dissolved solids generally occur during high flows of spring runoff when snowmelt and rainfall are the major sources of water. The largest concentrations occur most often during late summer and fall when base flow from ground-water sources is the dominant component of flow. At six of the seven stations listed in table 7, dissolved-solids concentrations for water year 1986 remained within the ranges of prior record. A sample collected at Missouri River near Landusky, Mont. (station 06115200) on September 25, 1986, had a dissolved-solids concentration of 950 milligrams per liter. This value was more than 40 percent larger than the previous maximum concentration. The sample was collected following an intense rainstorm over much of north-central and northeastern Montana. Rainfall was more than 5 inches in 24 hours at some reporting stations. During the storm, overland runoff flushed salts and other constituents from the surface into tributaries and then to the Missouri River. The water contained unusually large concentrations of dissolved sodium and sulfate, along with phosphorus and organic nitrogen that were adsorbed to suspended particulates.

Concentrations of dissolved phosphorus and percent saturation of dissolved oxygen at the seven stations for water year 1986 either were within or close to their previous ranges. The largest dissolved phosphorus concentrations, as in previous years, occurred at the most downstream stations in the Missouri and Yellowstone Rivers. The largest percent of dissolved-oxygen saturation (117 percent) occurred at the Missouri River at Toston. Upstream from the station, water is aerated as it falls over the Toston irrigation diversion dam. Of the seven stations, the smallest percent of dissolved-oxygen saturation (62 percent) occurred at the Missouri River near Culbertson on March 31.

Concentrations of dissolved arsenic followed the same pattern of previous years. Natural sources from thermal activities in Yellowstone National Park contribute arsenic to headwater tributaries of the Missouri and Yellowstone Rivers. The arsenic concentrations decrease in passage downstream, owing to dilution from tributary inflow and physical-chemical processes that tend to immobilize the element.

Turbidity generally increases downstream. However, where reservoirs are present, turbidity decreases as suspended sediment falls from suspension. At the Missouri River near Landusky on September 25, measured turbidity was 7,500 nephelometric turbidity units, as compared to the previous maximum of 1,100 units for 50 samples. The situation resulted from stream conditions previously described.

Table 7.--*Comparison of minimum and maximum values for selected water-quality constituents and properties for water year 1986 and for the period of NASQAN record at seven stations*

[<, less than]

Station number	Station	Water year 1986			Period of NASQAN[1] record through water year 1985		
		Number of samples	Minimum	Maximum	Number of samples	Minimum	Maximum
	Dissolved solids, in milligrams per liter						
05020500	St. Mary River at international boundary	6	86	119	63	70	195
06054500	Missouri River at Toston, Mont.	4	178	242	127	125	308
06115200	Missouri River near Landusky, Mont.	6	285	950	50	104	672
06185500	Missouri River near Culbertson, Mont.	6	356	460	123	231	593
06192500	Yellowstone River near Livingston, Mont.	6	91	192	49	66	258
06214500	Yellowstone River at Billings, Mont.	4	125	264	102	83	439
06329500	Yellowstone River near Sidney, Mont.	6	305	712	197	158	874
	Dissolved phosphorus, in milligrams per liter						
05020500	St. Mary River at international boundary	6	<.01	.01	64	<.01	.04
06054500	Missouri River at Toston, Mont.	4	.01	.02	68	<.01	.09
06115200	Missouri River near Landusky, Mont.	6	<.01	.02	50	<.01	.39
06185500	Missouri River near Culbertson, Mont.	6	.01	.03	71	<.01	.09
06192500	Yellowstone River near Livingston, Mont.	6	<.01	.03	118	<.01	.09
06214500	Yellowstone River at Billings, Mont.	4	<.01	.02	65	<.01	.14
06329500	Yellowstone River near Sidney, Mont.	5	<.01	.05	71	<.01	.07
	Dissolved oxygen, in percent of saturation						
05020500	St. Mary River at international boundary	6	98	112	88	83	111
06054500	Missouri River at Toston, Mont.	4	102	117	166	89	126
06115200	Missouri River near Landusky, Mont.	6	85	98	124	63	106
06185500	Missouri River near Culbertson, Mont.	6	62	97	160	54	104
06192500	Yellowstone River near Livingston, Mont.	6	95	116	97	73	138
06214500	Yellowstone River at Billings, Mont.	4	84	101	151	78	152
06329500	Yellowstone River near Sidney, Mont.	6	86	98	231	43	109
	Dissolved arsenic, in micrograms per liter						
05020500	St. Mary River at international boundary	3	<1	2	32	<1	<10
06054500	Missouri River at Toston, Mont.	3	23	37	51	8	52
06115200	Missouri River near Landusky, Mont.	3	12	25	36	2	18
06185500	Missouri River near Culbertson, Mont.	3	3	4	45	<1	4
06192500	Yellowstone River near Livingston, Mont.	2	14	20	26	6	27
06214500	Yellowstone River at Billings, Mont.	3	9	12	44	2	14
06329500	Yellowstone River near Sidney, Mont.	3	4	5	43	1	6
	Turbidity, in nephelometric turbidity units						
05020500	St. Mary River at international boundary	6	.5	4	58	.3	85
06054500	Missouri River at Toston, Mont.	4	2.3	15	59	.1	60
06115200	Missouri River near Landusky, Mont.	6	19	7,500	50	1.5	1,100
06185500	Missouri River near Culbertson, Mont.	6	7.5	310	63	.9	370
06192500	Yellowstone River near Livingston, Mont.	6	1.1	6	49	.6	38
06214500	Yellowstone River at Billings, Mont.	4	2.9	13	58	.2	140
06329500	Yellowstone River near Sidney, Mont.	6	4.2	1,300	69	1.0	2,500

[1] National Stream Quality Accounting Network.

Annual suspended-sediment loads at three stations on major streams of eastern Montana are reported in table 8. For each station, the data include the annual suspended-sediment loads for the current (1986) and previous (1985) water years, plus the mean annual loads for the period of record.

Comparison of 1986 annual suspended-sediment loads with those of 1985 indicates a substantial increase at all three stations. The increased sediment loads were a result of greater streamflow, especially during September when high flows from intense rainstorms transported a significant part of the annual sediment load. The annual loads during 1986 were 3 to 4 times greater than during 1985 at the Missouri River near Landusky (station 06115200) and the Yellowstone River near Sidney (station 06329500). The annual sediment load in 1986 was more than 10 times greater than that of 1985 at the Musselshell River near Mosby (station 06130500). As in the 1985 water year, the load transported in 1986 by the Missouri River near Landusky was similar to that of the Yellowstone River near Sidney.

Table 8.--*Annual suspended-sediment load at selected stations for water year 1986 compared with water year 1985 and period of record*

Station number	Station name	1986 water year: Annual suspended-sediment load (tons)	1985 water year: Annual suspended-sediment load (tons)	Period of record: Number of water years	Period of record: Mean annual suspended-sediment load (tons)
06115200	Missouri River near Landusky, Mont.	11,800,000	3,850,000	15	9,970,000
06130500	Musselshell River at Mosby, Mont.	1,180,000	113,000	4	353,000
06329500	Yellowstone River near Sidney, Mont.	12,700,000	3,190,000	14	11,500,000

Annual suspended-sediment loads during water year 1986 were also slightly larger than the mean annual load for the period of record at the Missouri River near Landusky and the Yellowstone River near Sidney. The Musselshell River at Mosby transported significantly more suspended sediment during 1986 than during any of the previous 3 years of record.

Three daily sediment stations were operated on a seasonal basis in the upper Yellowstone River basin to measure the variation of suspended-sediment concentrations in response to streamflow and to determine downstream gains or losses in the suspended load. The three stations were located at Lamar River near Tower Falls Ranger Station, Yellowstone National Park, Wyo. (station 06188000); Yellowstone River at Corwin Springs, Mont. (station 06191500); and Yellowstone River near Livingston, Mont. (station 06192500). Hydrographs of suspended-sediment loads for the three stations during the period of daily sampling are shown in figure 2.

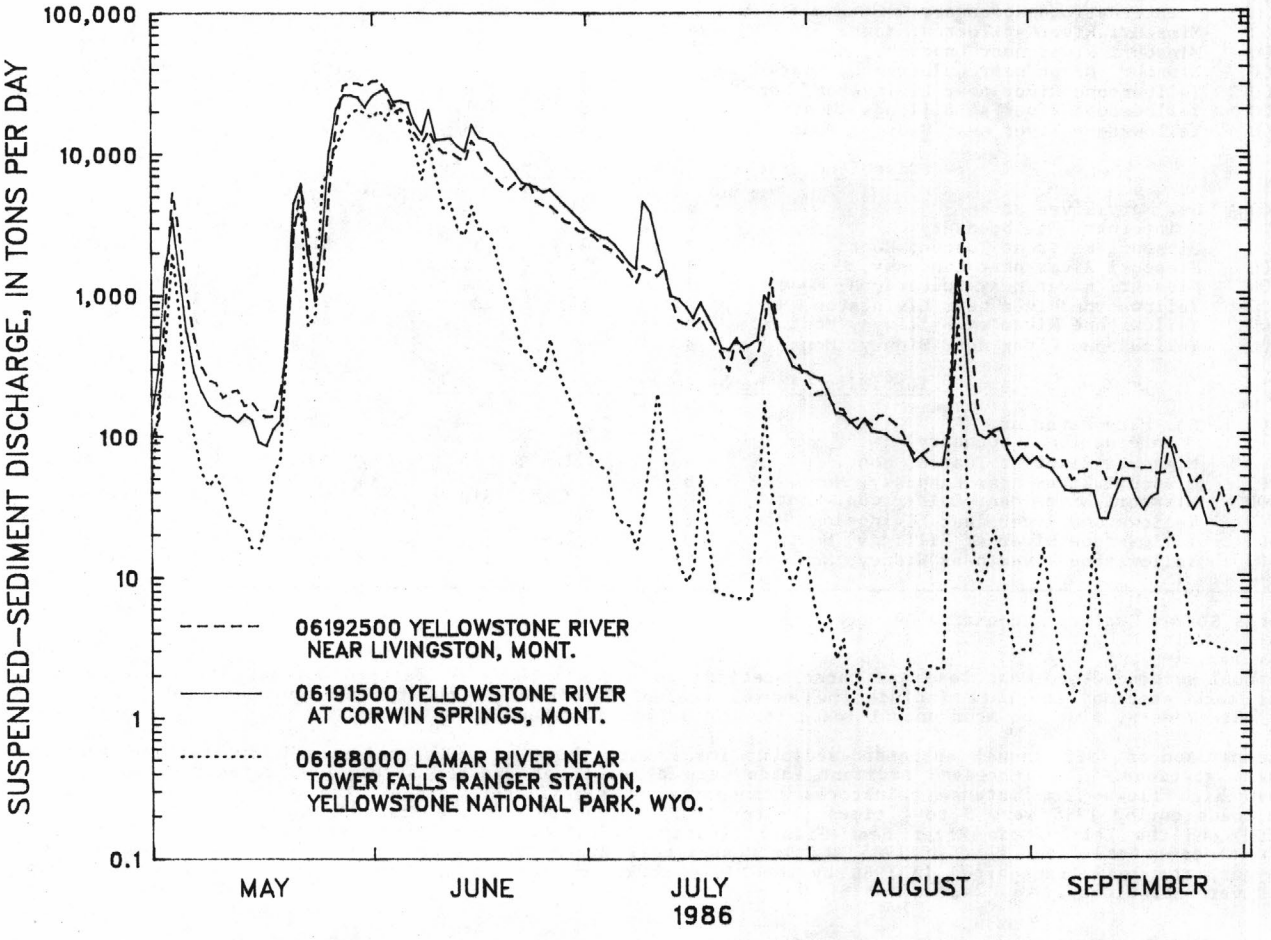


Figure 2.--Suspended-sediment discharge for stations in the upper Yellowstone River basin during May through September 1986.

As a result of greater streamflows in 1986, total sediment loads at all three sites during the seasonal sampling period were about 3 to 4 times larger than in 1985. Part of the increase in total load was due to larger and more sustained sediment peaks during the late May-early June snowmelt runoff season. Intermittent sediment peaks caused by rainfall also occurred throughout the summer, with the largest peak occurring in late August.

Suspended-sediment loads were smallest at the Lamar River station, which accounted for about 50 percent of the load at the Yellowstone River at Corwin Springs in 1986. Daily loads at the upstream Yellowstone River station (Corwin Springs) were slightly larger than at the downstream station (Livingston) on many days during June and July. This apparent loss of suspended load between the two sites may be a result of suspended sediment settling out in reaches of decreased gradient, on vegetated islands, or on the flood plain. Most of the downstream decrease in load is observed during high flows when overbank flow and island submergence occur. Generally, the similarity of streamflow, suspended-sediment concentrations, and loads indicates a relatively stable reach of channel between the two sites.

Ground-Water Levels

Water levels in 194 wells, which are part of a statewide network of 308 observation wells, were measured in water year 1986 in the Hudson Bay and Missouri River basins (table 9). Water levels in most wells in the network are measured annually; however, some water levels are measured more frequently.

The hydrograph (fig. 3) for a 68-foot deep (relatively shallow) observation well in Powder River County (well 04S45E04BDDB01) shows typical water-level fluctuations in a shallow alluvial aquifer of sand and gravel. The water table is unaffected by irrigation recharge or discharge; therefore, the water level changes in response to the natural hydrologic cycle. The hydrograph indicates that recharge to the shallow aquifer was less in water year 1984 than in the other years shown.

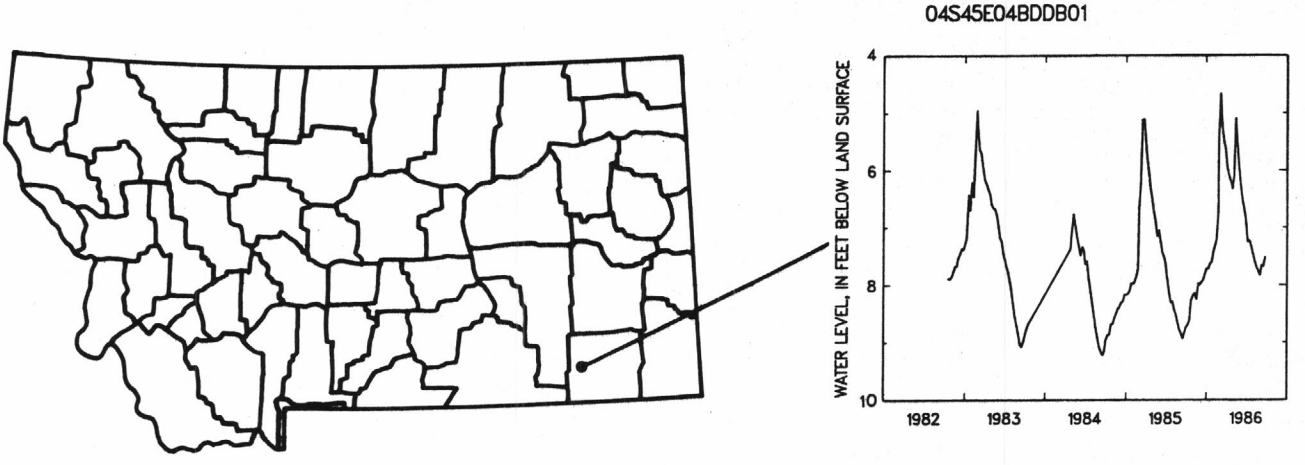


Figure 3.--Long-term hydrograph for an observation well in Powder River County.

Most wells in the statewide network show no significant changes in water level from year to year. Many of the wells in eastern Montana are completed in sandstone or coal aquifers in the Tongue River Member of the Fort Union Formation (Paleocene age); measurements show that water levels in this area remain relatively stable. Water from Tongue River Member aquifers is used primarily for livestock and domestic supply. Significant changes in water levels in these sandstone and coal wells have been recorded only where industrial activity, such as coal mining, has affected the local ground-water levels.

Other wells in the statewide network are completed in shallow alluvial and glacial-drift aquifers. Some of these wells show moderate declines or rises in water levels from year to year as a result of climatic conditions. However, few wells in the network show long-term changes in water levels as a result of human activities.

Table 9.--*Water levels in observation wells*

[Local number--composed of township, range, section, position within a section, and sequential number. Water level--in feet below or above (+) land surface. Water-level data--reported as month, day, year. Depth of well--in feet below land surface. Aquifer--the names were retrieved from the National Water Data Storage and Retrieval System (WATSTORE) and some may not follow current usage of the U.S. Geological Survey]

Local number	Depth of well	Aquifer	Water-level date	Water level
37N47E01ABBB01	53	Pleistocene outwash	11/25/85	20.64
			04/09/86	20.85
			06/20/86	20.83
			09/27/86	20.09
37N47E01ABBB02	83	Tongue River Member of Fort Union Formation	11/25/85	21.13
			04/09/86	21.34
			06/20/86	20.79
			09/27/86	20.49
37N47E12BBBB01	147	Tongue River Member of Fort Union Formation	11/25/85	78.87
			04/09/86	79.01
			06/20/86	78.58
			09/27/86	78.47
37N47E13AADD01	208	Tongue River Member of Fort Union Formation	11/25/85	14.07
			04/09/86	13.69
			06/20/86	14.09
			09/27/86	13.83
37N47E13ADAA01	45	Pleistocene outwash	11/25/85	14.61
			04/09/86	14.19
			06/20/86	14.62
			09/27/86	14.39
37N47E17DABB02	266	Tongue River Member of Fort Union Formation	04/09/86	218.29
			06/20/86	217.75
			09/27/86	217.66
37N47E23AADD02	120	Tongue River Member of Fort Union Formation	11/25/85	81.80
			04/09/86	82.00
			06/20/86	81.85
			09/27/86	81.82
37N48E05AAAA01	218	Fort Union Formation	10/17/85	+.98
			04/09/86	+1.02
			06/20/86	+1.05
			09/27/86	+1.05
37N48E05BABB01	43	Pleistocene outwash	11/25/85	6.26
			04/09/86	5.74
			06/20/86	5.86
			09/27/86	5.87
37N48E23BBDC01	400	Fox Hills-Hell Creek aquifer	11/25/85	60.71
			04/09/86	60.73
			06/20/86	60.52
			09/27/86	60.57
36N09E05DBAD01	1,015	Eagle Sandstone	10/16/85	4.89
35N02E27AABD01	250	Eagle Sandstone	09/29/86	19.42
35N33E19DBA 01	246	Judith River Formation of Montana Group	10/16/85	178.59
33N06W12AAA 02	400	Virgelle Sandstone Member of Eagle Sandstone	09/18/86	29.63
33N06W12AAA 03	250	Two Medicine Formation of Montana Group	09/18/86	29.95
33N48E18DCB 01	325	Hell Creek Formation	10/19/85	171.80
32N11W03DAD 01	12	Pleistocene drift	09/18/86	6.90
32N15E17DDDC01	180	Quaternary alluvium	10/15/85	39.76
			09/22/86	38.80

Table 9.--*Water levels in observation wells*--Continued

Local number	Depth of well	Aquifer	Water-level date	Water level
30N05W33DDB 01	122	Virgelle Sandstone Member of Eagle Sandstone	09/19/86	46.45
30N38E09CADB01	195	Judith River Formation of Montana Group	10/17/85	46.63
29N13E21AABA02	210	Pleistocene alluvium	10/03/85	19.72
			11/06/85	19.52
			01/29/86	19.67
			03/12/86	19.28
			04/22/86	19.12
			05/30/86	19.08
			07/01/86	19.41
			08/12/86	19.02
27N56E34AABC01	118	Tongue River Member of Fort Union Formation	10/05/85	40.58
26N49E13ACAB01	180	Fox Hills-Hell Creek aquifer	10/18/85	43.92
26N54E17DCAA01	240	Tongue River Member of Fort Union Formation	10/05/85	90.90
26N59E22DBDD01	212	Tongue River Member of Fort Union Formation	10/05/85	32.66
25N47E04DAAB01	200	Fox Hills-Hell Creek aquifer	10/18/85	68.66
25N50E24CBDA01	220	Lebo Shale Member of Fort Union Formation	10/18/85	11.50
24N44E20CABD01	300	Fox Hills-Hell Creek aquifer	10/18/85	178.80
24N47E35BBBA01	101	Lebo Shale Member of Fort Union Formation	10/20/85	18.50
24N47E35BBBC01	640	Fox Hills-Hell Creek aquifer	10/20/85	196.01
24N54E29CACB01	190	Tongue River Member of Fort Union Formation	10/05/85	54.12
24N56E25DDAC01	60	Tongue River Member of Fort Union Formation	10/05/85	18.64
23N43E34BABC01	175	Fox Hills-Hell Creek aquifer	10/18/85	104.99
23N51E20BBBD01	175	Fort Union Formation	10/18/85	21.00
22N58E10CCCC01	135	Fort Union Formation	10/05/85	66.67
21N23E13CBBB01	1,630	Eagle Sandstone	10/02/85	+140.22
21N51E10ABCD01	131	Tongue River Member of Fort Union Formation	10/18/85	16.05
21N53E08ADCC01	70	Tongue River Member of Fort Union Formation	10/05/85	26.68
			10/17/85	25.94
21N56E28ADDC01	220	Tongue River Member of Fort Union Formation	10/05/85	87.19
20N47E36ADDD01	220	Tongue River Member of Fort Union Formation	10/17/85	46.70
20N52E17BBBB01	180	Tongue River Member of Fort Union Formation	10/05/85	75.65
20N53E04DAAA01	280	Tongue River Member of Fort Union Formation	10/05/85	142.42
20N53E14BBCC01	206	Tongue River Member of Fort Union Formation	10/05/85	87.86
20N53E20CCCC01	259	Tongue River Member of Fort Union Formation	10/05/85	140.28
20N54E01DCDD01	220	Tongue River Member of Fort Union Formation	10/05/85	41.51
20N56E08DDCD01	223	Tongue River Member of Fort Union Formation	10/04/85	138.68
20N56E08DDCD02	180	Tongue River Member of Fort Union Formation	10/04/85	109.53
19N44E35DDDD01	140	Tongue River Member of Fort Union Formation	10/17/85	39.97
19N53E24CCDC01	220	Tongue River Member of Fort Union Formation	10/05/85	144.05
18N30E19BBBA01	1,003	Judith River Formation of Montana Group	10/02/85	+38.07

Table 9.--*Water levels in observation wells*--Continued

Local number	Depth of well	Aquifer	Water-level date	Water level
18N44E13AAAC01	278	Tongue River Member of Fort Union Formation	10/17/85	96.82
18N50E16CBBB01	161	Lebo Shale Member of Fort Union Formation	10/18/85	46.82
17N47E16DDDD01	242	Tongue River Member of Fort Union Formation	10/17/85	146.09
16N17E25DCAD01	260	First Cat Creek Sandstone of Colorado Group	10/02/85	+22.41
16N44E25BBAB01	1,460	Fox Hills-Hell Creek aquifer	10/17/85	156.84
16N44E25BBAC01	103	Tongue River Member of Fort Union Formation	10/17/85	31.72
16N50E06DDCD01	380	Tongue River Member of Fort Union Formation	10/18/85	291.13
16N51E36DCCC01	202	Tullock Member of Fort Union Formation	10/18/85	152.49
15N19E09BABC01	90	Third Cat Creek Sandstone of Kootenai Formation	10/02/85	37.76
15N46E04BBBC01	160	Tongue River Member of Fort Union Formation	10/17/85	109.37
15N53E12ABAB01	318	Lebo Shale Member of Fort Union Formation	10/06/85	131.87
15N53E12ABAB02	193	Tongue River Member of Fort Union Formation	10/06/85	81.73
15N53E12ABAB03	172	Tongue River Member of Fort Union Formation	10/06/85	79.02
15N55E12ABDC01	675	Fox Hills-Hell Creek aquifer	10/18/85	57.72
14N49E21AAAA01	440	Tullock Member of Fort Union Formation	10/17/85	119.70
13N51E31BCDD01	565	Hell Creek Formation	10/17/85	+.63
13N51E31BCDD02	340	Tullock Member of Fort Union Formation	10/17/85	107.34
13N51E31BDCB01	860	Fox Hills-Hell Creek aquifer	10/17/85	27.63
13N53E18ABAA01	62	Tongue River Member of Fort Union Formation	10/06/85	44.16
13N56E30CCBC01	100	Fox Hills-Hell Creek aquifer	10/06/85	38.54
12N55E20DCCD01	1,185	Fox Hills-Hell Creek aquifer	10/06/85	80.84
12N55E25CDCC01	1,275	Fox Hills-Hell Creek aquifer	10-06/85	42.67
12N55E27BADD01	1,000	Fox Hills-Hell Creek aquifer	10/06/85	+32.76
12N56E23CCDA01	1,449	Fox Hills-Hell Creek aquifer	10/06/85	248.71
12N56E23DCCA01	1,195	Fox Hills-Hell Creek aquifer	10/06/85	277.09
12N56E24CABD01	145	Fox Hills Formation	10/06/85	134.59
12N56E25CBDB01	1,480	Fox Hills-Hell Creek aquifer	10/06/85	308.78
12N56E34DAAC01	1,467	Fox Hills-Hell Creek aquifer	10/06/85	283.11
11N03W30BBBC01	127	Quaternary alluvium	09/23/86	32.49
11N03W30DADA01	44	Quaternary alluvium	09/22/86	.32
11N36E28BACD01	2,745	Third Cat Creek Sandstone of Kootenai Formation	10/16/85	+92.7
11N54E29CACD01	800	Fox Hills-Hell Creek aquifer	10/06/85	+50.1
11N57E21CDBB01	1,230	Fox Hills-Hell Creek aquifer	10/06/85	61.79
11N57E32BBBD01	980	Fox Hills-Hell Creek aquifer	10/06/85	72.19
10N04W02CBAA01	110	Cretaceous bedrock	12/26/85 03/09/86 05/25/86 07/13/86 09/28/86	34.18 33.00 30.30 29.47 29.68

Table 9.--*Water levels in observation wells*--Continued

Local number	Depth of well	Aquifer	Water-level date	Water level
10N04W10DDDA01	23	Quaternary alluvium	09/22/86	2.35
10N03W03BACB01	65	Quaternary alluvium	09/23/86	1.85
10N03W08BBAA01	23	Quaternary alluvium	09/22/86	7.65
10N03W09ACCC01	65	Quaternary alluvium	09/22/86	1.37
10N03W11DDCC01	40	Quaternary alluvium	09/23/86	17.40
10N03W17ACAD01	28	Quaternary alluvium	09/22/86	15.90
10N03W22AAAA01	23	Quaternary alluvium	09/23/86	8.27
10N02W18DDCD01	70	Tertiary sediment	09/23/86	45.01
10N36E06CACA01	195	Judith River Formation of Montana Group	10/16/85	94.87
10N45E28BBBA01	951	Fox Hills-Hell Creek aquifer	10/17/85	223.41
10N45E28BBBA02	362	Tullock Member of Fort Union Formation	10/17/85	111.33
10N45E28BBBB01	762	Hell Creek Formation	10/17/85	222.86
10N55E25CDCD01	1,150	Fox Hills-Hell Creek aquifer	10/06/85	73.45
10N58E19ABBA01	166	Fox Hills-Hell Creek aquifer	10/06/85	124.50
08N31E36DDDD01	1,175	Fox Hills-Hell Creek aquifer	10/16/85	208.73
08N31E36DDDD02	850	Hell Creek Formation	10/16/85	208.85
08N31E36DDDD03	486	Hell Creek Formation	10/16/85	129.80
08N50E18BDBC01	280	Tullock Member of Fort Union Formation	10/17/85	41.85
07N47E24AAD 01	50	Fort Union Formation	10/17/85	33.53
07N50E05CCBD01	700	Fox Hills-Hell Creek aquifer	10/17/85	397.40
07N57E24BBCB01	362	Tongue River Member of Fort Union Formation	10/06/85	217.19
06N44E36CACD01	902	Fox Hills Formation	10/16/85	128.59
06N44E36CACD02	609	Hell Creek Formation	10/16/85	128.79
06N44E36CACD03	316	Hell Creek Formation	10/16/85	140.42
05N01E27CCBB01	215	Tertiary sediment	10/16/85	93.79
05N25E16CCCC01	1,350	Fox Hills Formation	10/16/85	538.94
05N25E16CCCC02	427	Hell Creek Formation	10/16/85	146.93
05N55E23AADB01	1,080	Fox Hills-Hell Creek aquifer	10/06/85	41.46
05N58E14BBBB01	360	Tongue River Member of Fort Union Formation	10/06/85	97.36
04N01E02BBCC01	191	Tertiary sediment	10/16/85	38.95
04N01E10BBCB01	447	Tertiary sediment	10/16/85	115.37
04N01E13BCAC01	209	Tertiary sediment	10/16/85	39.04
04N01E15BCBB01	348	Tertiary sediment	10/16/85	142.15
04N23E14ABBA01	80	Fox Hills-Hell Creek aquifer	11/06/85	27.00
04N23E16BCCC01	1,100	Eagle Sandstone	11/06/85	478.2

Table 9.--*Water levels in observation wells*--Continued

Local number	Depth of well	Aquifer	Water-level date	Water level
02N27E35DBAB01	5,070	Mission Canyon Limestone	05/20/86	+1,016.0
			07/07/86	+1,014.0
			07/18/86	+1,009.0
			08/26/86	+1,012.0
01N04E25DCD 01	101	Quaternary alluvium	10/17/85	11.56
01N26E10ABBA01	193	Eagle Sandstone	11/06/85	28.39
01N54E18DDAC01	8,422	Mission Canyon Limestone	08/25/86	+776.0
01S25E05CD 01	62	Quaternary alluvium	04/02/86	9.13
01S25E17AAAA01	42	Quaternary alluvium	04/02/86	6.44
01S26E08DABA01	24	Quaternary alluvium	04/02/86	13.82
01S33E19DAA 01	25	Pleistocene terrace deposits	11/13/85	17.45
01S33E24BCBC02	26	Quaternary alluvium	11/15/85	9.44
02S23E16DADD01	63	Quaternary alluvium	04/02/86	25.58
03S33E09DCC 01	74	Pleistocene terrace deposits	11/13/85	40.83
			12/20/85	41.40
			01/30/86	44.30
			03/04/86	44.49
			04/18/86	44.88
			06/03/86	45.39
			07/16/86	43.90
			09/05/86	43.58
03S33E16BBBB01	19	Quaternary alluvium	11/13/85	2.38
			12/20/85	2.75
			01/30/86	3.20
			03/04/86	3.35
			04/18/86	3.15
			06/03/86	2.87
			07/16/86	2.50
			09/05/86	2.08
03S33E16BBBB02	46	Quaternary alluvium	11/13/85	31.38
			12/20/85	31.38
			01/30/86	31.39
			03/04/86	31.40
			04/18/86	31.45
			06/03/86	31.44
			07/16/86	31.40
			09/05/86	31.31
03S35E18DABD01	400	Parkman Sandstone of Montana Group	11/14/85	163.59
04S06W16AAAA02	58	Tertiary sediment	08/21/86	25.66
04S06W35BBBB01	170	Tertiary sediment	08/21/86	+17.8
04S32E35AAAA01	39	Quaternary alluvium	11/13/85	13.93
			01/30/86	15.98
			03/04/86	16.01
			04/18/86	16.50
			06/03/86	7.58
			07/16/86	7.86
			09/05/86	10.05
04S45E04BDDB01	68	Quaternary alluvium	10/20/85	[1]8.37
05S07W23ABA 01	20	Tertiary sediment	08/21/86	12.24
05S06W10BCCA01	200	Tertiary sediment	08/21/86	110.01
06S41E08CCAC01	128	Tongue River Member of Fort Union Formation	10/21/85	42.63
			06/01/86	42.02

Table 9.--*Water levels in observation wells*--Continued

Local number	Depth of well	Aquifer	Water-level date	Water level
06S41E17ADDD01	19	Quaternary alluvium	10/21/85	16.04
			06/01/86	14.39
06S41E25CDAC01	144	Tongue River Member of Fort Union Formation	10/21/85	68.02
			06/02/86	68.14
06S41E26BBDD01	23	Quaternary alluvium	10/21/85	19.80
06S41E29ADCA01	393	Tongue River Member of Fort Union Formation	10/21/85	265.89
			10/21/85	265.89
06S41E29ADCA02	322	Tongue River Member of Fort Union Formation	10/21/85	237.51
06S41E34CDAA01	364	Tongue River Member of Fort Union Formation	10/21/85	182.64
06S41E34CDAA02	155	Tongue River Member of Fort Union Formation	10/21/85	93.04
06S42E31DBBA01	68	Quaternary alluvium	10/21/85	31.48
			10/21/85	31.48
			06/02/86	31.75
07S08W03BDC 02	41	Quaternary alluvium	10/03/85	16.29
			11/20/85	17.51
			01/08/86	18.19
			02/19/86	18.24
			04/02/86	18.15
			05/14/86	17.79
			06/24/86	14.03
			08/05/86	13.32
			08/21/86	12.48
07S08W17DDC 02	50	Tertiary sediment	10/03/85	26.62
			11/21/85	28.56
			01/08/86	30.53
			02/19/86	31.55
			04/03/86	32.54
			05/14/86	32.66
			06/26/86	25.33
			08/05/86	25.33
			08/21/86	26.04
07S44E34BAAD01	86	Tongue River Member of Fort Union Formation	10/22/85	54.83
07S44E35DCCA01	213	Tongue River Member of Fort Union Formation	10/22/85	149.80
07S44E35DCCA02	132	Tongue River Member of Fort Union Formation	10/22/85	103.85
07S45E32CADD01	207	Tongue River Member of Fort Union Formation	10/22/85	151.03
07S45E32CADD02	42	Tongue River Member of Fort Union Formation	10/22/85	28.88
07S45E32DCBA02	18	Quaternary alluvium	10/22/85	8.30
07S49E13ABBB01	--	Fox Hills-Hell Creek aquifer	10/21/85	+10.40
08S09W01CCCC01	47	Tertiary sediment	10/02/85	22.62
			08/21/86	19.02
			09/18/86	22.38
08S40E26ACBC01	172	Tongue River Member of Fort Union Formation	05/05/86	52.70
08S42E06ADBA01	398	Tongue River Member of Fort Union Formation	10/21/85	42.83
08S42E14DBAD02	103	Tongue River Member of Fort Union Formation	05/31/86	49.15
08S43E20DABA01	222	Tongue River Member of Fort Union Formation	10/21/85	89.09
			05/07/86	89.07
08S43E21BBDD03	13	Quaternary alluvium	10/21/85	5.36
			05/05/86	4.28
08S43E21BDBB01	223	Tongue River Member of Fort Union Formation	10/21/85	56.21

Table 9.--*Water levels in observation wells*--Continued

Local number	Depth of well	Aquifer	Water-level date	Water level
08S43E21BDBB02	146	Tongue River Member of Fort Union Formation	10/21/85	48.00
08S43E23CACA03	29	Quaternary alluvium	10/21/85	14.63
08S43E23CDAA01	78	Tongue River Member of Fort Union Formation	10/21/85	49.59
08S43E23CDAA02	329	Tongue River Member of Fort Union Formation	10/21/85	166.81
08S43E31BBDA01	131	Tongue River Member of Fort Union Formation	10/21/85	127.23
08S43E31BBDA02	257	Tongue River Member of Fort Union Formation	10/21/85	239.20
08S44E02BACD01	15	Quaternary alluvium	10/22/85	7.23
08S44E03CBBD01	201	Tongue River Member of Fort Union Formation	10/21/85	131.57
08S44E03CBBD02	129	Tongue River Member of Fort Union Formation	10/21/85	73.62
08S44E09DABB01	28	Quaternary alluvium	10/21/85	21.78
08S44E12ACDC01	351	Tongue River Member of Fort Union Formation	10/22/85	187.07
08S44E12ACDC02	252	Tongue River Member of Fort Union Formation	10/22/85	126.20
08S44E12ADBC02	14	Quaternary alluvium	10/22/85	7.54
08S44E19CBBB01	190	Tongue River Member of Fort Union Formation	10/21/85 05/31/86	157.51 157.67
08S44E19CBBB02	130	Tongue River Member of Fort Union Formation	10/21/85	76.77
08S44E19CBCB02	36	Quaternary alluvium	10/21/85	27.09
09S40E09DBAD01	120	Holocene spoil banks	06/02/86	106.81
09S40E20BDAC01	380	Tongue River Member of Fort Union Formation	06/03/86	251.32
09S42E01BCAD02	34	Quaternary alluvium	10/21/85	23.67
09S42E11BDAA01	222	Tongue River Member of Fort Union Formation	10/21/85	143.89
09S43E04ABDD02	26	Quaternary alluvium	10/21/85	13.39
09S43E04CBAB01	186	Tongue River Member of Fort Union Formation	10/21/85	68.62
09S43E07CADB01	165	Tongue River Member of Fort Union Formation	10/21/85 05/06/86	65.57 65.48
09S43E07CADB02	218	Tongue River Member of Fort Union Formation	10/21/85 05/06/86	86.69 86.47
09S43E12ADBB02	41	Quaternary alluvium	05/06/86	14.68
09S43E21BADA01	229	Tongue River Member of Fort Union Formation	10/21/85	99.55
09S43E21BADA02	135	Tongue River Member of Fort Union Formation	10/21/85	50.29
09S43E22ACCA01	129	Tongue River Member of Fort Union Formation	05/07/86	30.04
09S44E07BBCC03	92	Tongue River Member of Fort Union Formation	10/21/85 05/06/86	45.16 44.03

[1]Measured value; continuous water-level data for the period of record are shown in figure 3.

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:

05020500	St. Mary River at international boundary
06054500	Missouri River at Toston, MT
06090800	Missouri River at Fort Benton, MT
06101500	Marias River near Chester, MT
06115200	Missouri River near Landusky, MT
06130500	Musselshell River at Mosby, MT
06132000	Missouri River below Fort Peck Dam
06174500	Milk River at Nashua, MT
06185500	Missouri River near Culbertson, MT
06192500	Yellowstone River near Livingston, MT
06214500	Yellowstone River at Billings, MT
06294700	Bighorn River at Bighorn, MT
06308500	Tongue River at Miles City, MT
06326500	Powder River near Locate, MT
06329500	Yellowstone River near Sidney, MT

The National Trends Network (NTN) is an approximate 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).

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.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for water year 1986 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 5, 6, 7, and 8. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

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 indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention 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.)

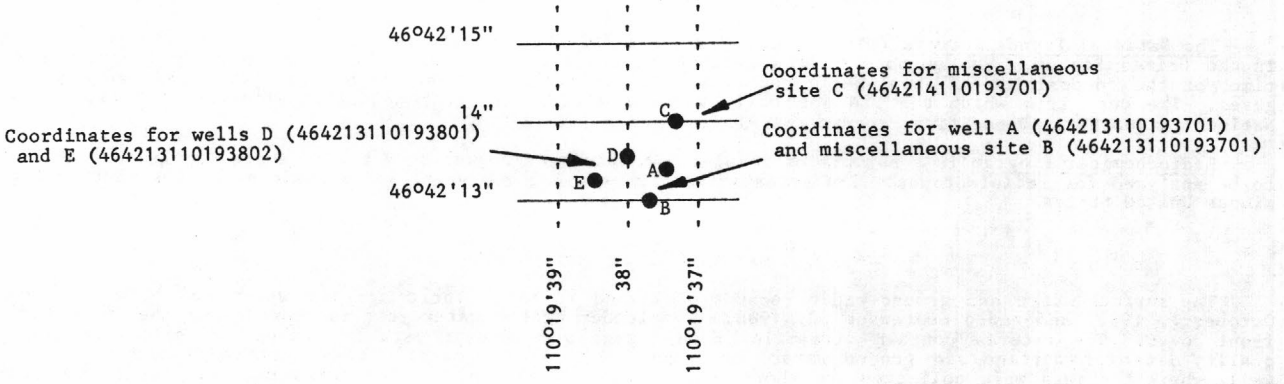


Figure 4.--System for numbering wells and miscellaneous sites (latitude and longitude).

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 ft^3/s; to the nearest tenth between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to 3 significant figures for more than 1,000 ft^3/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 10.--*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 6.

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 11.--*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	REMARK
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)

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

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

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 8.

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

Year	WSP No.	Year	WSP No.	Year	WSP No.
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 [$(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (ft^3/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 ($CaCO_3$).

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

Micrograms per liter (UG/L, µg/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 (µS/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:

Classification	Size (mm)	Method of analysis
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 x 10) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7 x 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 [mg C/(m^2.time)] for periphyton and macrophytes and [mg C/(m^3.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) x discharge (ft^3/s) x 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 planimetered. All areas shown are those for the stage when the planimetered 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 µm 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 µm 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 methodolgy 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 abbreviaton 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."

1-D1. *Water temperature--influential factors, field measurement, and data presentation,* by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

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.

2-E1. *Application of borehole geophysics to water-resources investigations,* by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

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.

3-A2. *Measurement of peak discharge by the slope-area method,* by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. *Measurement of peak discharge at culverts by indirect methods,* by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

3-A4. *Measurement of peak discharge at width contractions by indirect methods,* by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 Pages.

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.

3-A8. *Discharge measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. *Measurement of time of travel and dispersion in streams by dye tracing,* by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.

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.

3-A14. *Use of flumes in measuring discharge,* by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. *Computation of water-surface profiles in open channels,* by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-B1. *Aquifer-test design, observation, and data analysis,* by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

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.

3-C2. *Field methods for measurement of fluvial sediment* by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. *Computation of fluvial-sediment discharge,* by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

4-A1. *Some statistical tools in hydrology,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. *Frequency curves,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

4-B1. *Low-flow investigations,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. *Storage analyses for water supply,* by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. *Regional analyses of streamflow characteristics,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

4-D1. *Computation of rate and volume of stream depletion by wells* by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

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.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples* edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.

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 sedments,* 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.

7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments,* by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water,* by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. *A model for simulation of flow in singular and interconnected channels* by R. W. Schaffrannek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

8-A1. *Methods of measuring water levels in deep wells* by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages

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.

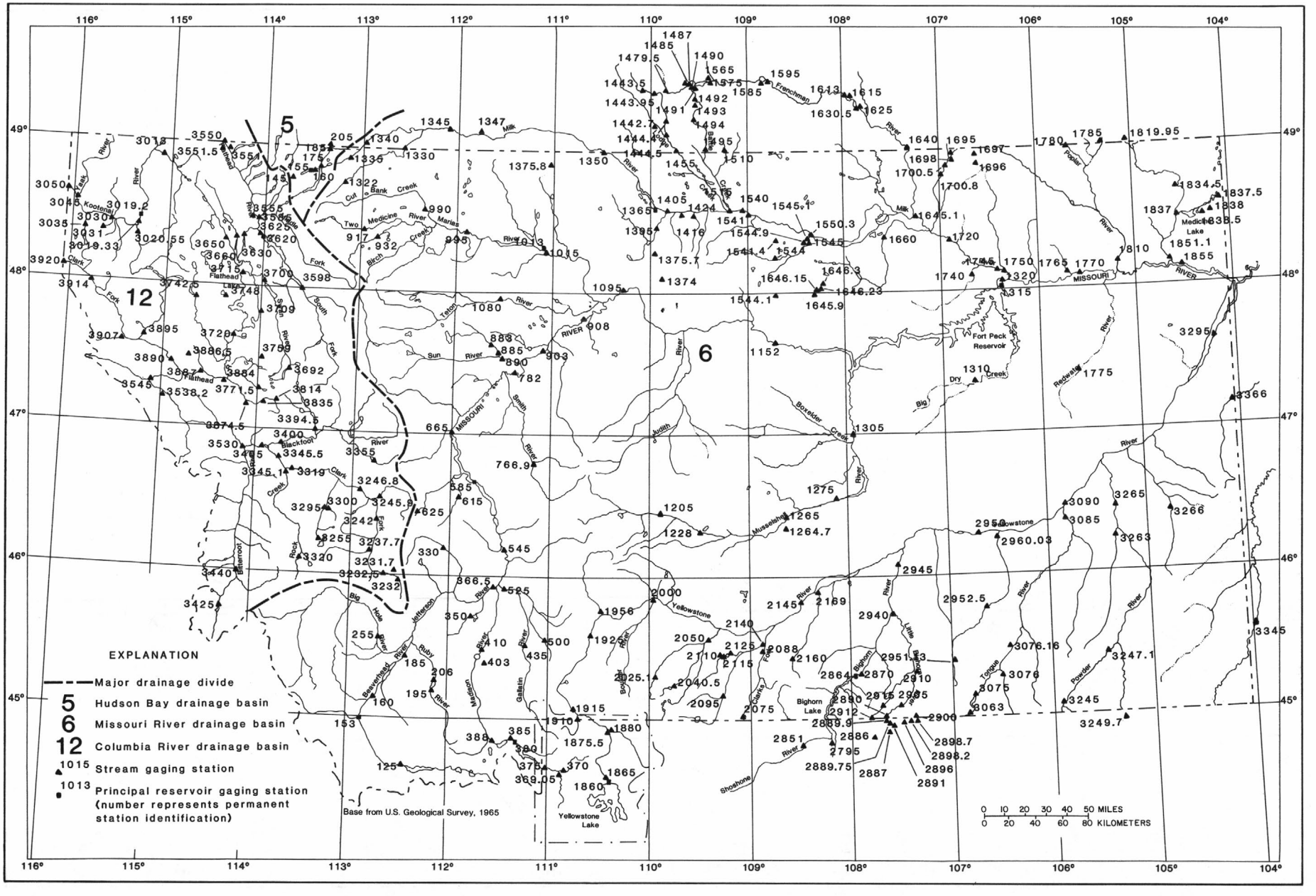


Figure 5. Map showing location of surface-water gaging stations, water year 1986.

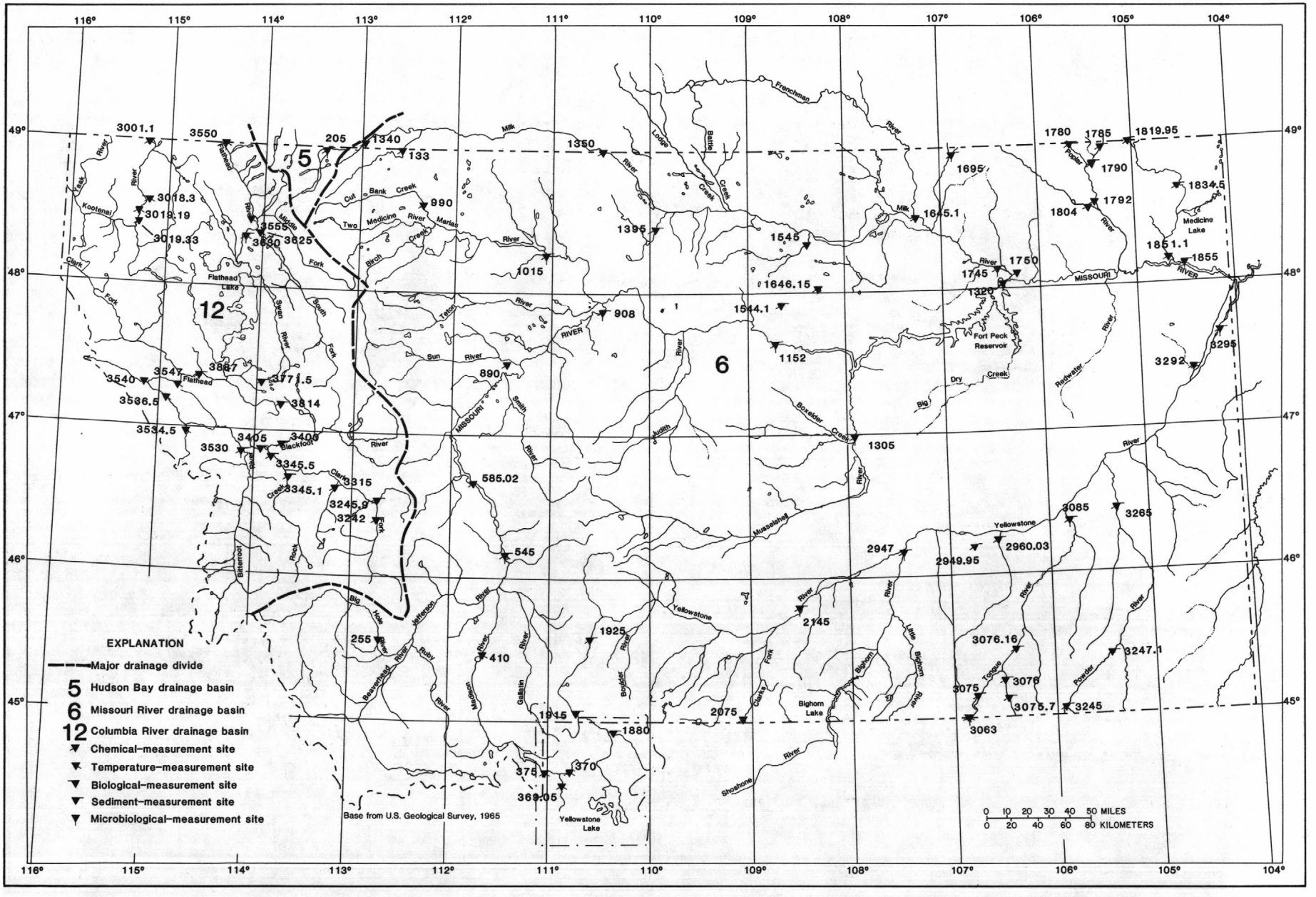


Figure 6. Map showing location of water-quality stations, water year 1986.

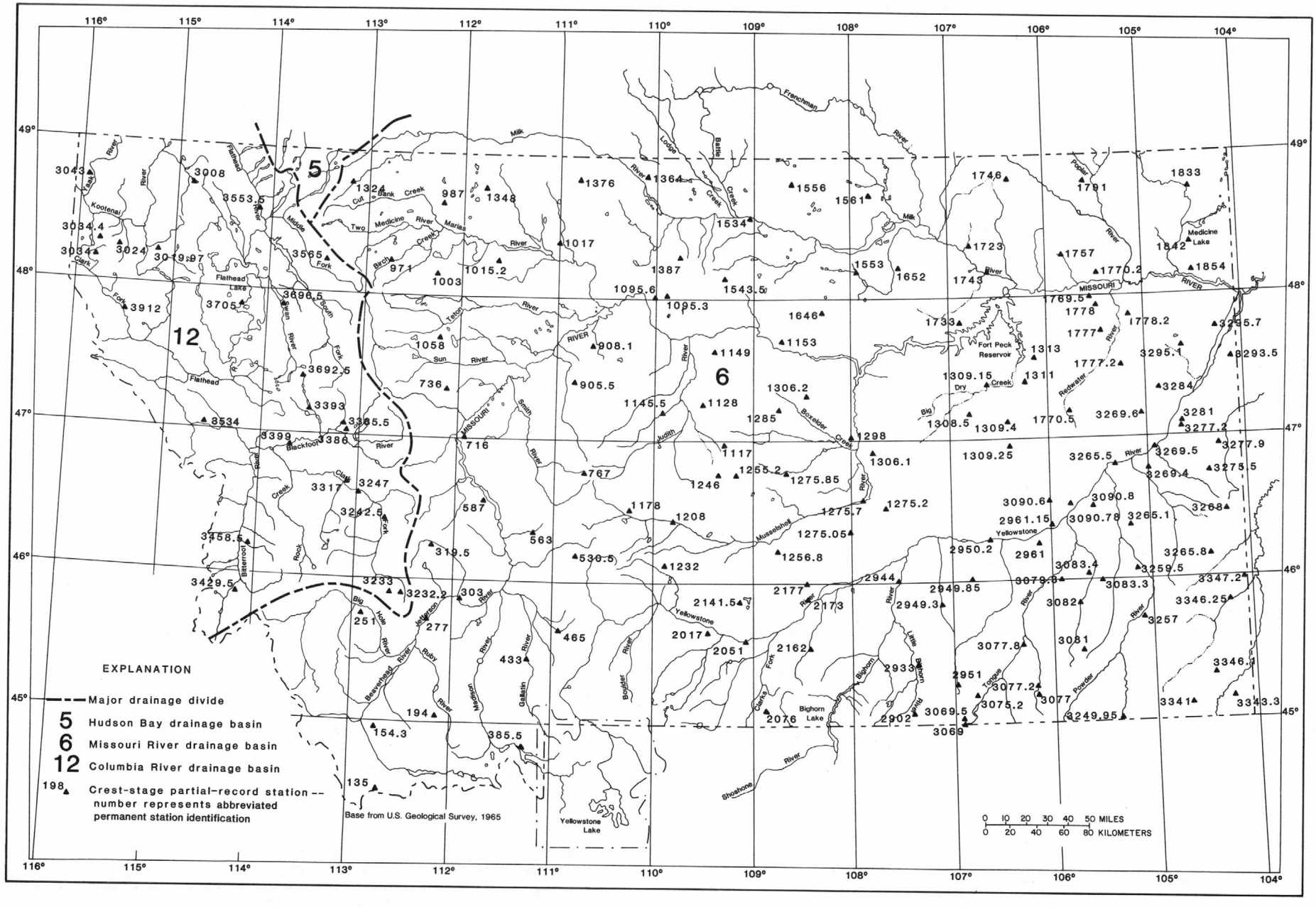


Figure 7. Map showing crest-stage partial-record stations, water year 1986.

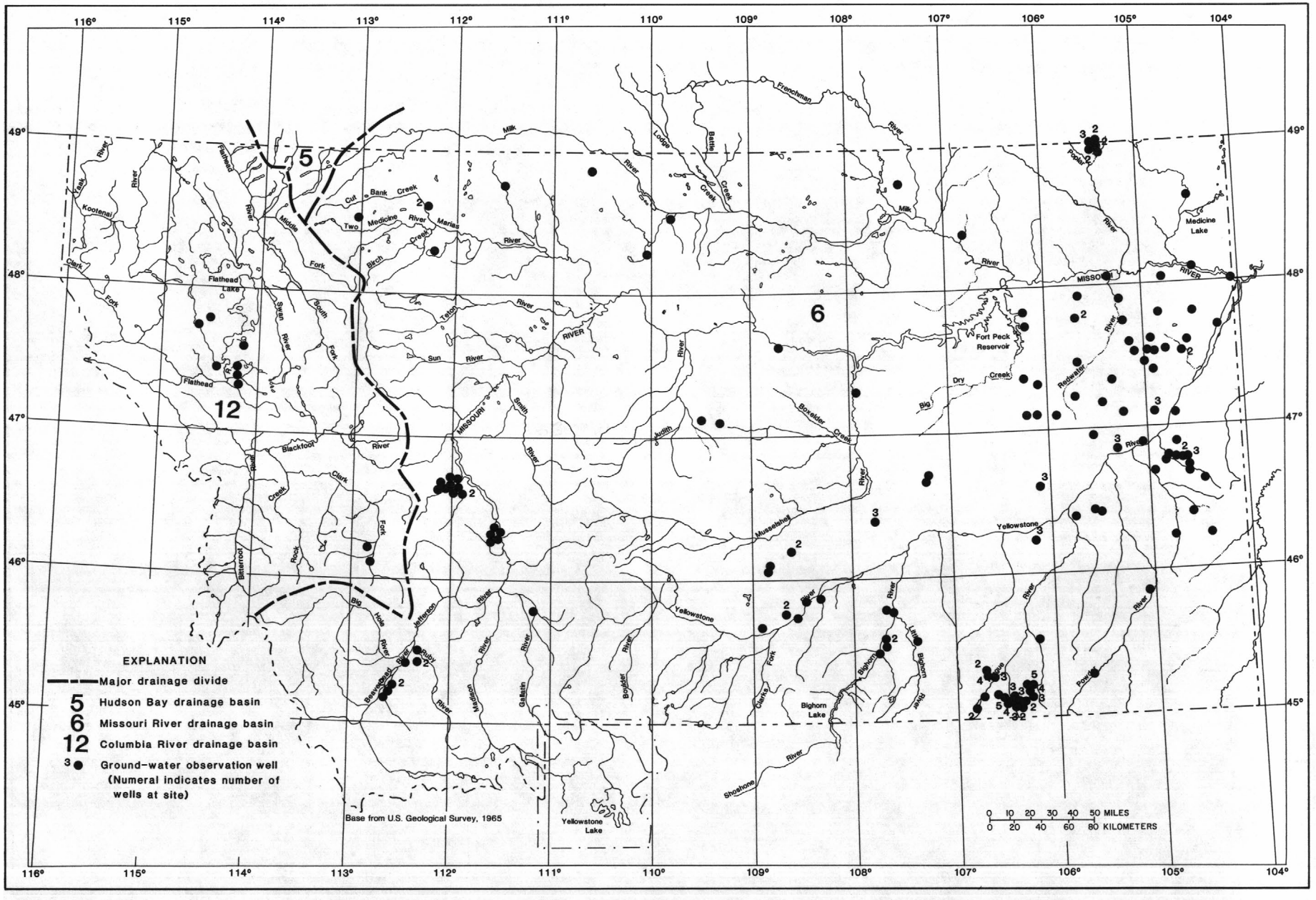


Figure 8. Map showing location of ground-water observation wells, water year 1986.

SASKATCHEWAN RIVER BASIN

05014500 SWIFTCURRENT CREEK AT MANY GLACIER, MT

(Hydrologic bench-mark station)

LOCATION.--Lat 48°47'57", long 113°39'21", in SE¼ sec.11, T.35 N., R.16 W., Glacier County, Hydrologic Unit 10010002, Glacier National Park, on right bank 100 ft upstream from outlet of Swiftcurrent Lake at Many Glacier, and 11 mi southwest of Babb.

DRAINAGE AREA.--30.9 mi^2.

PERIOD OF RECORD.--June 1912 to current year (records incomplete most years prior to 1959). Published as "at" McDermott Lake" 1912-14. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1508: 1918(M), 1943. WDR MT-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,876.78 ft above National Geodetic Vertical Datum of 1929. Prior to May 23, 1916, nonrecording gage on left bank of lake opposite present gage and at present datum, and May 23, 1916, to June 15, 1918, nonrecording gage at present site and datum. Several observations of water temperatures and specific conductance were made during the year and are available in files of Helena district office.

REMARKS.--Estimated daily discharges: Nov. 24 to Dec. 9, July 16 to Sept. 1. Records good except those for estimated discharges, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--30 years, (1917-19, 1958-86), 143 ft^3/s, 62.85 in/yr, 103,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,700 ft^3/s June 8, 1964, gage height, 10.00 ft, from floodmarks, from rating curve extended above 1,100 ft^3/s, on basis of computation of peak flow over dam; no flow Nov. 14-16, 1976 (result of pumping operation).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 680 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 22	0630	706	3.90	May 29	0600	*1,010	*4.61

Minimum daily discharge, 7.6 ft^3/s Jan. 2, 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	104	309	25	9.6	24	161	177	102	874	253	115	75
2	102	309	25	7.6	25	156	148	93	911	228	110	71
3	111	357	27	8.1	24	143	118	116	812	243	105	66
4	109	382	29	9.1	23	123	102	210	638	226	100	64
5	100	548	31	9.1	22	111	95	270	520	205	100	66
6	107	377	35	10	22	102	89	255	478	200	105	63
7	102	269	30	11	20	104	78	217	471	191	100	56
8	91	209	27	9.6	20	143	86	186	414	183	95	50
9	89	160	24	7.6	19	136	104	169	392	177	100	75
10	75	123	21	8.1	19	118	141	161	385	175	95	111
11	76	104	19	9.6	18	104	156	161	410	175	90	121
12	75	91	18	12	18	93	148	159	435	180	85	114
13	71	86	17	13	18	82	126	169	369	180	100	100
14	69	71	16	11	17	75	107	183	325	167	90	91
15	111	66	15	11	19	71	95	172	374	153	85	75
16	222	63	14	10	20	68	91	156	341	140	80	73
17	246	63	13	13	14	64	78	141	305	150	80	72
18	202	53	13	12	13	56	71	133	331	160	75	86
19	175	50	13	40	13	52	71	180	345	160	75	86
20	159	50	13	63	12	47	68	390	278	160	70	80
21	151	49	12	56	11	46	89	579	224	170	70	76
22	167	46	11	50	11	50	237	663	180	160	70	71
23	164	43	11	46	13	47	535	465	180	180	65	68
24	151	40	13	38	33	56	407	346	220	190	65	61
25	300	38	13	33	182	58	284	341	268	170	67	68
26	354	35	14	27	298	53	223	540	277	160	70	93
27	303	33	13	25	227	53	185	783	243	150	65	93
28	315	31	13	24	178	75	167	943	220	140	60	89
29	286	29	12	24	---	127	131	980	279	130	55	89
30	235	27	11	24	---	190	114	967	305	125	60	86
31	340	---	10	24	---	217	---	941	---	120	90	---
TOTAL	5162	4111	558	655.4	1333	2981	4521	11171	11804	5401	2592	2389
MEAN	167	137	18.0	21.1	47.6	96.2	151	360	393	174	83.6	79.6
MAX	354	548	35	63	298	217	535	980	911	253	115	121
MIN	69	27	10	7.6	11	46	68	93	180	120	55	50
CFSM	5.40	4.43	.58	.68	1.54	3.11	4.89	11.7	12.7	5.63	2.71	2.58
IN.	6.21	4.95	.67	.79	1.60	3.59	5.44	13.45	14.21	6.50	3.12	2.88
AC-FT	10240	8150	1110	1300	2640	5910	8970	22160	23410	10710	5140	4740

CAL YR 1985	TOTAL	53352.7	MEAN	146	MAX	1250	MIN	4.0	CFSM	4.72	IN.	64.23	AC-FT	105800
WTR YR 1986	TOTAL	52678.4	MEAN	144	MAX	980	MIN	7.6	CFSM	4.66	IN.	63.42	AC-FT	104500

05015500 LAKE SHERBURNE AT SHERBURNE, MT
(International gaging station)

LOCATION.--Lat 48°49'42", long 113°31'16", in SE¼SE¼SE¼ sec.35, T.36 N., R.15 W., Glacier County, Hydrologic Unit 10010002, Blackfeet Indian Reservation, in gatehouse at dam on Swiftcurrent Creek, 4.5 mi southwest of Babb.

DRAINAGE AREA.--64.1 mi^2.

PERIOD OF RECORD.--May 1915 to September 1923 (fragmentary), May 1924 to September 1925, November 1925 to June 1926 September 1926 to March 1936 (no winter records some years), May 1936 to September 1952 (monthend contents and daily elevations). October 1952 to current year (monthend contents only). Monthend contents for some periods, published in WSP 1308. Published as Sherburne Lake Reservoir at Sherburne 1915, 1917-28, 1931-52, and as Sherburne Lake Reservoir near Babb 1929-30.

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,709.45 ft above National Geodetic Vertical Datum of 1929. Prior to May 7, 1931, nonrecording gage at present site, and May 8, 1931, to Sept. 30, 1974, water-stage recorder at present site, all at datum 9.45 ft lower.

REMARKS.--Reservoir is formed on a natural lake by earthfill dam completed in 1921. Prior to 1919, flashboards on a temporary dam provided limited storage. Storage behind main dam began in 1919. The following capacity figure are from capacity table effective Jan. 1, 1983; see previous reports for superseded figures. Usable capacity, 64,790 acre-ft between gage height 29.3 ft, revised, 9.3 ft, revised, above lowest outlet gage sill, and 88.00 ft, spillway crest. Streambed above gates prevents withdrawal of storage to sill elevation. Dead storage, 3,060 acre-ft below gage height, 29.30 ft, revised. Figures given herein represent usable contents. Water is used for irrigation on Milk River project of U.S. Bureau of Reclamation.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 65,480 acre-ft June 30, 1986, gage height, 88.40 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 65,480 acre-ft June 30, gage height, 88.40 ft; minimum, 4,460 acre-ft Oct. 1, gage height, 36.27 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Gage height (feet)	Contents (acre-feet)	Change in Contents (acre-feet)
Sept. 30	36.31	4,490	--
Oct. 31	53.05	18,970	+14,480
Nov. 30	63.35	30,100	+11,130
Dec. 31	65.29	32,350	+ 2,250
CAL YR 1985			- 1,790
Jan. 31	67.93	35,500	+ 3,150
Feb. 28	72.19	40,920	+ 5,420
Mar. 31	79.21	50,890	+ 9,970
Apr. 30	78.00	49,100	- 1,790
May 31	83.19	56,940	+ 7,840
June 30	88.36	65,410	+ 8,470
July 31	76.48	46,890	-18,520
Aug. 31	51.64	17,570	-29,320
Sept. 30	56.08	22,080	+ 4,510
WTR YR 1986			+17,590

05016000 SWIFTCURRENT CREEK AT SHERBURNE, MT

(International gaging station)

LOCATION.--Lat 48°49'49", long 113°30'59", in NW¼SW¼SW¼ sec.36, T.36 N., R.15 W., Glacier County, Hydrologic Unit 10010002, Blackfeet Indian Reservation, on left bank 1,200 ft downstream from outlet of Lake Sherburne Dam at Sherburne and 4.2 mi southwest of Babb.

DRAINAGE AREA.--64.6 mi^2.

PERIOD OF RECORD.--July 1912 to November 1915 (no winter records), March 1916 to October 1923, May 1924 to September 1981 (no winter records), March 1984 to current year (seasonal records only). Monthly discharge only for some periods, published in WSP 1308, 1728. Published as "at Sherburne Lake" 1912-14.

REVISED RECORDS.--WSP 1388: Drainage area. WSP 1508: 1935.

GAGE.--Water-stage recorder. Datum of gage is 4,730.26 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 10, 1920, nonrecording gages at two sites within 1,000 ft of present site at different datums. Aug. 10, 1920, to May 17, 1921, nonrecording gage at present site and May 18, 1921, to Sept. 30, 1975, water-stage recorder at present site, all at datum 9.45 ft lower. 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.

REMARKS.--Estimated daily discharges: Mar. 1-26 and Oct. 29-31. Records good. Flow regulated by Lake Sherburne (see preceding page).

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

AVERAGE DISCHARGE.--7 years (1916-23), 199 ft^3/s, 144,200 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,420 ft^3/s June 25, 1969, gage height, 7.63 ft; maximum gage height, 7.77 ft July 15, 1981; no flow at times when gates in dam are closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,490 ft^3/s May 29, gage height, 7.04 ft; minimum daily, 0.09 ft^3/s on many days in September and October.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			1.7	173	113	1260	409	617	510	.30		
2			1.6	230	81	1130	416	613	446	.23		
3			1.5	266	81	1060	419	608	256	.16		
4			1.4	265	81	721	376	604	60	.16		
5			1.2	263	81	370	391	600	.12	.17		
6			1.0	263	82	156	379	595	.09	.14		
7			.90	234	82	85	401	591	.09	.10		
8			.80	215	82	86	418	613	.09	.10		
9			.80	215	82	86	502	623	.14	.10		
10			.70	215	82	86	548	619	.09	.11		
11			.70	215	82	86	547	613	.10	.09		
12			.70	214	82	202	546	547	2.4	.10		
13			.60	214	185	282	544	607	3.2	.10		
14			.60	214	268	350	522	601	3.0	.10		
15			.60	215	268	476	494	594	3.0	.10		
16			.50	214	268	456	492	589	2.5	.09		
17			.50	214	269	400	490	584	1.9	.09		
18			.50	214	269	347	487	579	1.9	.10		
19			.50	213	209	359	543	573	1.8	.11		
20			.50	213	235	348	574	567	1.8	51		
21			.60	213	566	368	608	583	1.1	108		
22			.60	260	782	343	654	590	.26	110		
23			.60	540	618	298	651	582	.09	110		
24			.70	628	517	282	648	574	.09	110		
25			.80	436	517	282	644	566	.09	110		
26			1.0	294	518	260	641	558	.10	110		
27			1.2	294	690	244	638	551	.09	110		
28			1.5	294	960	253	634	543	.09	110		
29			1.6	294	1260	287	630	536	.11	110		
30			1.9	247	1340	353	627	525	.13	110		
31			88	---	1250	---	622	518	---	37		
TOTAL			115.80	7979	12000	11316	16495	18063	1296.37	1188.45		
MEAN			3.74	266	387	377	532	583	43.2	38.3		
MAX			88	628	1340	1260	654	623	510	110		
MIN			.50	173	81	85	376	518	.09	.09		
AC-FT			230	15830	23800	22450	32720	35830	2570	2360		

05017500 ST. MARY RIVER NEAR BABB, MT

LOCATION.--Lat 48°50'00", long 113°25'08", in NW¼NW¼SE¼ sec.34, T.36 N., R.14 W., Glacier County, Hydrologic Unit 1001000 on right bank 0.7 mi upstream from outlet of Lower St. Mary Lake and 2.0 mi southeast of Babb.

DRAINAGE AREA.--276 mi^2.

PERIOD OF RECORD (REVISED).--July 1901 to October 1902, May 1910 to September 1925, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "at Main" in 1901-2, and as "below Swiftcurrent Creek, at Babb" 1910-15. Records published as "near Babb" for April 1902 to September 1915, May 1929 to September 1950 at sites about 1.5 mi downstream not equivalent because flow of Swiftcurrent Creek not included 1902-15 and because diversion by St. Mary Canal not included 1929-50.

REVISED RECORDS.--WSP 1308: 1913-14, 1920, 1922-24. WSP 1508: 1902.

GAGE.--Water-stage recorder. Datum of gage is 4,468.13 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1915, water-stage recorder or nonrecording gages at several sites about 3.8 mi downstream at different datums Oct. 1, 1915, to Sept. 30, 1925, water-stage recorder or nonrecording gages at several sites within 1.5 mi downstream at different datums.

REMARKS.--Estimated daily discharges: Feb. 15-23 and Sept. 22-30. Records good. Entire flow of Swiftcurrent Creek below Lake Sherburne is diverted into Lower St. Mary Lake upstream from station. Flow of Swiftcurrent Creek regulated by Lake Sherburne (station number 05015500) since 1919. October 1950 to September 1976, monthly discharge and runoff figures adjusted for change in contents in Lake Sherburne. 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.--52 years (1901-2, 1910-25, 1950-86), 775 ft^3/s, 561,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,500 ft^3/s June 9, 1964, gage height, 12.96 ft, from highwater mark in well, from rating curve extended above 6,100 ft^3/s on basis of slope-area measurement of peak flow; minimum, 26 ft^3/s Jan. 5, 1963, Jan. 8, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,700 ft^3/s June 1, gage height, 6.44 ft; minimum daily, 77 ft^3/s Jan. 16, 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	530	766	217	94	113	330	441	894	4640	1430	1020	766
2	504	741	207	94	113	361	508	792	4620	1440	1000	747
3	498	716	204	94	111	398	594	723	4460	1440	980	693
4	472	710	194	92	111	437	640	753	4190	1410	966	574
5	452	777	187	92	108	432	669	809	3630	1360	959	478
6	447	840	184	90	106	452	680	854	3080	1310	953	404
7	462	854	181	86	106	462	669	873	2640	1260	946	344
8	442	861	175	86	106	483	651	880	2370	1230	932	297
9	442	826	168	84	108	477	640	873	2180	1200	953	314
10	432	767	165	84	108	472	646	854	2020	1230	953	318
11	393	705	162	84	108	462	657	829	1910	1250	946	326
12	379	641	159	84	106	447	675	810	1880	1250	926	326
13	361	595	157	81	104	432	686	804	1940	1260	919	335
14	339	557	151	79	104	417	692	849	1930	1240	919	335
15	330	530	145	78	105	403	692	880	2020	1200	913	330
16	340	504	142	77	105	393	686	893	2030	1150	899	326
17	379	472	139	77	105	379	675	913	1990	1140	893	314
18	408	427	134	79	105	365	657	880	1900	1110	880	322
19	432	384	131	106	100	352	651	867	1860	1090	848	330
20	442	352	126	123	100	335	640	893	1790	1110	848	326
21	452	330	123	126	100	330	617	1100	1710	1110	835	322
22	467	309	118	126	105	326	628	1580	1590	1140	835	320
23	488	293	116	129	120	314	808	1890	1450	1160	829	310
24	504	277	113	131	137	301	1060	1920	1340	1170	816	295
25	541	265	111	129	181	301	1200	1890	1300	1170	797	290
26	599	254	108	126	228	297	1170	1920	1290	1160	791	280
27	662	246	106	121	258	297	1120	2130	1280	1140	778	280
28	727	235	101	121	289	309	1090	2660	1270	1120	766	270
29	766	228	101	118	---	301	1040	3400	1310	1090	759	270
30	791	222	99	118	---	322	1000	4110	1390	1070	747	260
31	791	---	97	116	---	357	---	4500	---	1040	766	---
TOTAL	15272	15684	4521	3125	3550	11744	22582	44023	67010	37480	27372	11102
MEAN	493	523	146	101	127	379	753	1420	2234	1209	883	370
MAX	791	861	217	131	289	483	1200	4500	4640	1440	1020	766
MIN	330	222	97	77	100	297	441	723	1270	1040	747	260
AC-FT	30290	31110	8970	6200	7040	23290	44790	87320	132900	74340	54290	22020

CAL YR 1985	TOTAL	278982	MEAN	764	MAX	3130	MIN	45	AC-FT	553400
WTR YR 1986	TOTAL	263465	MEAN	722	MAX	4640	MIN	77	AC-FT	522600

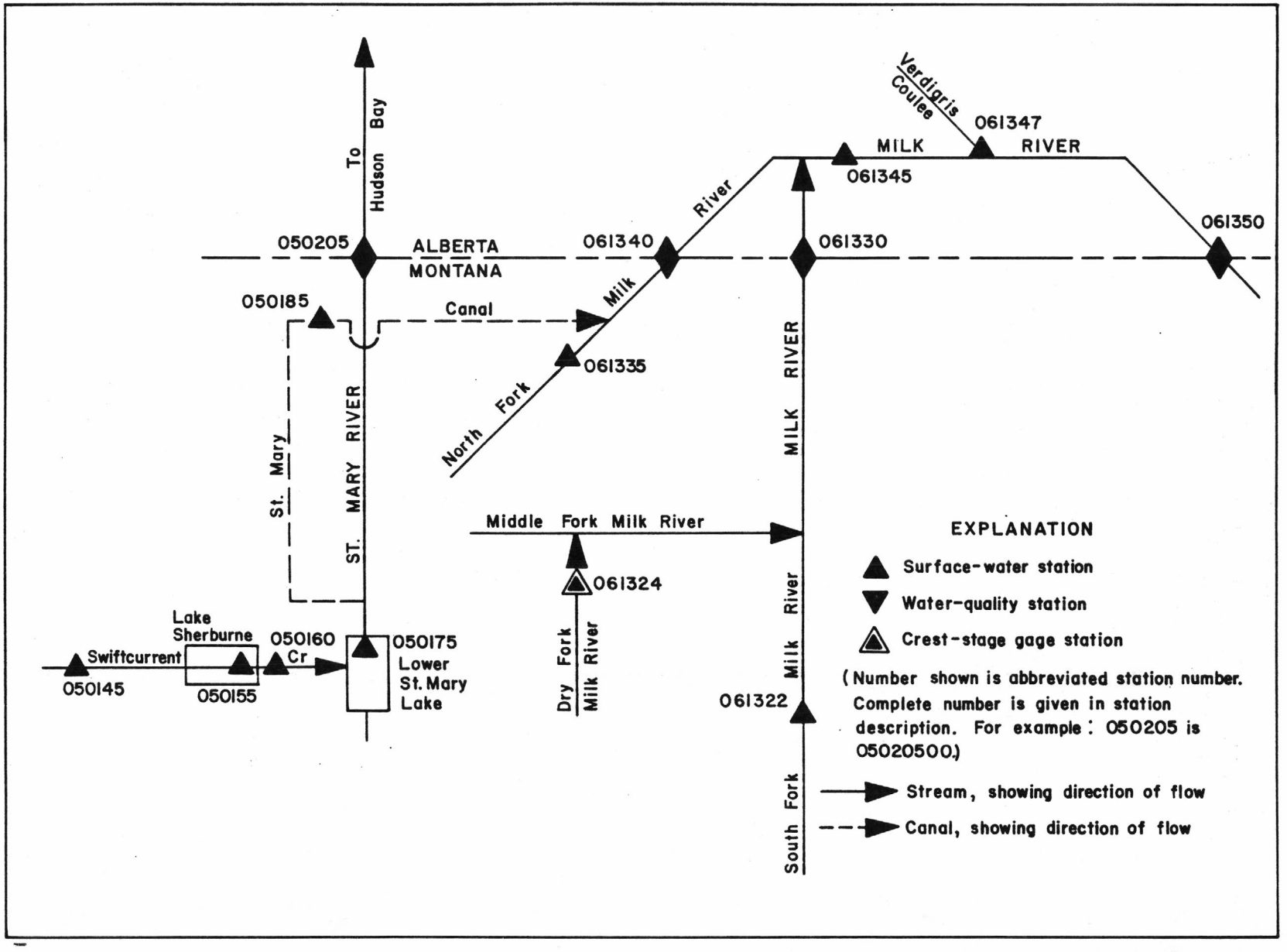


Figure 9. Schematic diagram showing diversions from St. Mary River in Part 5 to Milk River in Part 6.

05018500 ST. MARY CANAL AT ST. MARY CROSSING, NEAR BABB, MT

(International gaging station)

LOCATION.--Lat 48°56'50", long 113°22'28", in NE¼SW¼SW¼ sec.19, T.37 N., R.13 W., Glacier County, Hydrologic Unit 10010002, Blackfeet Indian Reservation, on left bank 50 ft upstream from inlet of St. Mary siphon, 6.6 mi northeast of Babb, and 9 mi downstream from intake.

PERIOD OF RECORD.--July 1918 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1308, 1728.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,450 ft, from topographic map. Prior to June 14, 1951, water-stage recorder at several sites 0.8 mi downstream at different datums.

REMARKS.--No estimated daily discharges this year. Records good. Canal diverts water from left bank of St. Mary River near Babb and discharges into North Fork Milk River. This water flows in the natural channel of Milk River through Canada and then back into Montana where it is used for irrigation in Milk River Valley east of Havre. Some water may be returned to St. Mary River at Kennedy Creek and St. Mary crossings.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 767 ft^3/s June 19, 28, 1936; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	2.7	286	293	643	589	583	.00		
2			.00	38	283	291	642	588	542	.00		
3			.00	150	281	290	643	589	350	.00		
4			.00	229	289	291	643	587	133	.00		
5			.00	239	288	288	640	588	17	.00		
6			.00	256	285	281	638	588	3.3	.00		
7			.00	257	285	276	636	587	.00	.00		
8			.00	255	284	273	636	586	.00	.00		
9			.00	255	284	272	635	588	.00	.00		
10			.00	257	282	269	636	589	.00	.00		
11			.00	258	282	267	637	588	.00	.00		
12			.00	259	284	267	638	478	.00	.00		
13			.00	257	281	267	636	496	.00	.00		
14			.00	256	284	268	636	562	.00	.00		
15			.00	256	283	268	635	572	.00	.00		
16			.00	256	283	329	636	577	.00	.00		
17			.00	255	284	474	636	590	.00	.00		
18			.00	262	283	563	634	589	.00	.00		
19			.00	280	282	622	633	585	.00	.00		
20			.00	280	282	655	634	587	.00	.00		
21			.00	280	287	653	634	585	.00	.00		
22			.00	281	291	649	620	584	.00	.00		
23			.00	284	287	645	595	584	.00	.00		
24			.00	289	289	641	595	584	.00	.00		
25			.00	291	287	638	595	582	.00	.00		
26			.00	291	286	639	595	584	.00	.00		
27			.00	290	288	638	594	583	.00	.00		
28			.00	290	293	640	594	581	.00	.00		
29			.00	289	291	641	594	583	.00	.00		
30			.00	288	291	642	592	582	.00	.00		
31			.00	---	287	---	590	585	---	.00		
TOTAL			.00	7430.7	8852	13230	19345	17920	1628.30	.00		
MEAN			.00	248	286	441	624	578	54.3	.00		
MAX			.00	291	293	655	643	590	583	.00		
MIN			.00	2.7	281	267	590	478	.00	.00		
AC-FT			.00	14740	17560	26240	38370	35540	3230	.00		

05020500 ST. MARY RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°00'12", long 113°18'48", in SW¼ sec.5, T.1, R.25 W., fourth meridian, in Alberta, Hydrologic Unit 10010002, on right bank 0.4 mi north of international boundary, 2.5 mi downstream from Boundary Creek, 7.5 mi southwest of Kimball, Alberta, and 11.5 mi northeast of Babb, MT.

DRAINAGE AREA.--465 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1902 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "near Cardston, Alberta" and "at Cook's Ranch, Alberta" 1902-12 and as "near Kimball, Alberta" 1913-55.

REVISED RECORDS.--WSP 1308: 1902, 1908-12. WSP 1508: 1902, 1908-9. W 1983: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 4,120 ft, from topographic map. Prior to Jan. 1, 1913, non-recording gages at two sites within 0.3 mi of present site at different datums. Jan. 1, 1913, to Oct. 25, 1955, water-stage recorder at several sites about 8 mi downstream from present site at various datums. Oct. 26, 1955, to Mar. 23, 1965, water-stage recorder at site 100 ft upstream at datum 2 ft higher.

REMARKS.--Estimated daily discharges: Nov. 22 to Jan. 31 and Feb. 7-25. Water-discharge records good except those for estimated daily discharges, which are fair. Since 1917, St. Mary Canal has diverted water from the river near Babb, MT, to North Fork Milk River. Some regulation by Lake Sherburne on Swiftcurrent Creek.

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

AVERAGE DISCHARGE.--14 years (1902-16), prior to operation of St. Mary Canal, 1,003 ft^3/s, 726,700 acre-ft/yr; 70 years (1916-86), 687 ft^3/s, 497,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,000 ft^3/s June 5, 1908, gage height, 12.75 ft, from flood-marks, site and datum then in use, from rating curve extended above 6,000 ft^3/s; minimum daily, 16 ft^3/s Nov. 29, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,920 ft^3/s June 1, gage height, 7.64 ft; minimum daily, 110 ft^3/s Jan. 8-14.

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	675	943	260	123	160	531	539	768	4860	935	506	257
2	640	907	250	120	155	552	547	658	4810	934	483	308
3	640	879	240	120	155	568	536	590	4480	942	464	435
4	611	879	230	120	152	595	511	686	4250	900	446	527
5	589	949	220	120	138	584	531	798	3720	873	437	531
6	595	1010	215	115	136	579	531	845	3200	820	437	469
7	595	1030	210	115	135	595	521	852	2740	750	428	416
8	579	1030	205	110	135	628	501	825	2450	707	411	369
9	568	973	205	110	135	611	486	792	2230	677	432	418
10	573	901	210	110	135	595	496	767	2040	707	432	415
11	547	833	205	110	135	579	526	741	1920	719	424	415
12	557	780	200	110	135	563	547	723	1910	725	547	415
13	526	718	195	110	135	547	557	711	1920	713	516	424
14	486	681	190	110	135	526	568	748	1890	695	451	428
15	491	651	185	115	135	506	573	783	1960	660	422	424
16	516	617	180	120	135	496	575	819	1890	626	394	419
17	552	569	175	125	135	476	563	832	1700	610	373	406
18	557	517	170	130	130	462	521	799	1520	583	361	428
19	573	476	165	145	130	450	496	786	1400	551	334	437
20	600	442	160	160	130	439	476	865	1310	562	330	437
21	600	412	155	160	130	434	462	1150	1230	572	312	432
22	617	370	150	160	140	439	481	1590	1100	610	319	424
23	640	350	150	165	250	421	690	1840	986	665	312	406
24	645	335	145	165	900	394	997	1830	887	660	301	394
25	722	320	140	170	1100	403	1130	1790	846	660	281	381
26	767	310	137	170	683	386	1100	1880	839	654	274	381
27	831	295	135	170	498	382	1040	2140	819	637	261	381
28	913	285	132	180	506	399	988	2710	793	615	245	369
29	964	275	130	170	---	421	930	3490	851	583	233	361
30	979	270	130	165	---	439	885	4270	906	559	230	357
31	979	---	125	160	---	486	---	4690	---	531	245	---
TOTAL	20127	19007	5599	4233	6978	15486	19304	42768	61457	21435	11641	12264
MEAN	649	634	181	137	249	500	643	1380	2049	691	376	409
MAX	979	1030	260	180	1100	628	1130	4690	4860	942	547	531
MIN	486	270	125	110	130	382	462	590	793	531	230	257
AC-FT	39920	37700	11110	8400	13840	30720	38290	84830	121900	42520	23090	24330

CAL YR 1985	TOTAL	206069	MEAN	565	MAX	2700	MIN	45	AC-FT	408700
WTR YR 1986	TOTAL	240299	MEAN	658	MAX	4860	MIN	110	AC-FT	476600

05020500 ST. MARY RIVER AT INTERNATIONAL BOUNDARY--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1978 to September 1981.
WATER TEMPERATURE: February 1978 to September 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1978-81): Maximum daily, 317 microsiemens, Mar. 30, 31, 1981; minimum daily, 141 microsiemens, June 14, 1979.
WATER TEMPERATURE (water years 1978-79): Maximum, 21.0°C, Aug.23, 1979; minimum, 0.0°C, on many days during winter.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
17...	1015	565	--	--	205	8.0	3.5	--	--	--	--	--
30...	1200	949	40	1	178	6.0	3.0	651	11.4	99	K2	K13
DEC												
11...	1015	204	100	3	210	-5.0	0.0	660	12.4	98	K4	<1
FEB												
13...	1100	138	--	--	231	-18.0	0.0	--	--	--	--	--
MAR												
19...	0910	441	10	1	218	2.5	2.5	662	13.2	112	<1	<1
MAY												
15...	1045	783	100	71	209	2.5	5.5	655	11.6	107	<1	K3
28...	1830	2920	--	--	171	29.0	15.0	--	--	--	--	--
29...	0750	3430	--	--	169	16.0	11.0	--	--	--	--	--
JUL												
16...	1100	599	80	2	164	16.5	14.0	662	8.9	100	20	110
30...	1835	522	--	--	172	22.0	19.0	--	--	--	--	--
SEP												
17...	1700	394	100	13	168	7.5	10.5	658	9.6	100	K8	K8

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)
OCT											
30...	1200	8.70	4.0	91	0	23	8.2	1.6	0.1	0.5	100
DEC											
11...	1015	8.00	0.5	110	0	27	9.3	2.1	0.1	0.4	130
MAR											
19...	0910	8.10	1.2	110	0	27	9.8	2.7	0.1	0.5	130
MAY											
15...	1045	8.00	2.0	110	4	27	9.9	2.6	0.1	0.4	130
JUL											
16...	1100	8.10	1.5	86	5	22	7.5	1.4	0.1	0.3	95
SEP											
17...	1700	8.00	2.5	88	1	22	8.0	1.5	0.1	0.5	110

05020500 ST. MARY RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
OCT 30...	4	82	13	0.8	<0.1	2.7	111	110	0.15	284	<0.01
DEC 11...	0	105	9.0	0.5	<0.1	3.0	109	120	0.15	60	<0.01
MAR 19...	0	106	8.9	0.6	<0.1	2.8	119	120	0.16	142	<0.01
MAY 15...	0	105	9.6	0.5	<0.1	3.1	116	120	0.16	245	<0.01
JUL 16...	0	82	5.1	0.4	<0.1	2.3	86	86	0.12	139	<0.01
SEP 17...	0	89	5.9	0.3	<0.1	2.6	114	93	0.16	121	<0.01

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 30...	<0.10	0.03	0.03	<0.2	0.01	<0.01	<0.01	11	28	74
DEC 11...	0.11	0.03	0.02	<0.2	0.01	<0.01	<0.01	3	1.7	62
MAR 19...	<0.10	0.02	<0.01	0.3	<0.01	<0.01	0.02	8	9.5	68
MAY 15...	<0.10	0.02	0.03	0.3	0.01	<0.01	<0.01	17	36	80
JUL 16...	<0.10	0.03	0.02	<0.2	0.01	<0.01	<0.01	4	6.5	74
SEP 17...	<0.10	0.01	0.03	0.3	0.01	0.01	<0.01	4	4.3	68

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
OCT 30...	1200	<10	<1	110	<0.5	<1	<1	<3	2	3	<1
MAR 19...	0910	<10	<1	130	<0.5	<1	2	<3	<1	4	<1
JUL 16...	1100	<10	2	110	<0.5	<1	2	<3	2	10	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
OCT 30...	<4	<1	<0.1	<10	5	<1	<1	55	<6	<3
MAR 19...	<4	<1	<0.1	<10	<1	<1	<1	87	<6	5
JUL 16...	5	<1	<0.1	<10	6	<1	<1	55	<6	10

06012500 RED ROCK RIVER BELOW LIMA RESERVOIR, NEAR MONIDA, MT

LOCATION.--Lat 44°39'22", long 112°22'14", in NE¼SE¼SE¼ sec. 31, T.13 S., R.6 W., Beaverhead County, Hydrologic Unit 10020001, on right bank just downstream from Lima Reservoir, 7 mi northwest of Monida, and at mile 2,542.1.

DRAINAGE AREA.--570 mi^2.

PERIOD OF RECORD.--January 1911 to December 1918, April 1919, May 1925 to October 1933, April 1934 to September 1935, May 1936 to October 1938, May 1939 to September 1969, June 1974 to September 1982, April to September 1985. No winter records 1974-1982. Monthly discharge only for some periods, published in WSP 1309. Prior to October 1950, published as "below Red Rock Reservoir".

REVISED RECORDS.--WSP 1309: 1935. WSP 1389: 1912, 1934. WSP 1559: Drainage area.

GAGE.--Water-stage recorder and sharp-crested weir. Elevation of gage is 6,530 ft, estimated from spillway elevation based on Montana Department of Natural Resources and Conservation datum. Prior to Oct. 1, 1978, at datum 1.00 ft higher. See WSP 1709 for history of nonrecording gage changes prior to May 8, 1939.

REMARKS.--No estimated daily discharges this year. Seasonal records good. Flow regulated by Lima Reservoir (station number 06012000). No storage during 1934. Diversions for irrigation of about 10,000 acres upstream from reservoir. 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.--48 years (1912-18, 1926-33, 1935, 1937-38, 1940-69), 143 ft^3/s, 103,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 2,500 ft^3/s May 15, 1933, gage height, 6.40 ft, estimated by damtender, released to prevent failure of dam; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1984 reached a discharge of 1,500 ft^3/s, gage height, 5.15 ft, from floodmarks.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 756 ft^3/s June 3, gage height, 3.82 ft; no flow Oct. 30, Sept. 17-28.

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	50						21	79	656	550	189	420
2	52						21	79	651	550	214	420
3	53						21	80	715	548	368	417
4	53						21	80	750	548	447	414
5	53						21	80	730	548	446	412
6	53						22	80	652	547	446	410
7	53						22	80	632	546	439	408
8	53						22	80	631	545	400	406
9	53						22	80	631	543	399	416
10	53						22	127	630	542	398	421
11	53						22	241	628	541	422	421
12	53						22	271	628	551	439	418
13	53						22	278	627	560	436	417
14	53						23	319	621	488	436	413
15	53						23	345	610	435	434	384
16	53						23	346	593	434	437	75
17	54						23	348	584	363	445	.00
18	54						23	350	584	322	449	.00
19	54						23	350	585	323	447	.00
20	54						23	350	583	288	446	.00
21	53						23	360	584	263	443	.00
22	53						51	401	583	262	440	.00
23	53						77	458	582	261	421	.00
24	53						77	455	583	220	421	.00
25	53						78	453	581	193	420	.00
26	53						78	422	581	193	418	.00
27	53						78	363	582	190	416	.00
28	53						78	363	581	187	421	.00
29	22						78	383	564	188	424	48
30	.00						51	468	551	188	421	131
31	17						---	623	---	189	421	---
TOTAL	1523.00						1111	8792	18493	12106	12803	6451.00
MEAN	49.1						37.0	284	616	391	413	215
MAX	54						78	623	750	560	449	421
MIN	.00						21	79	551	187	189	.00
AC-FT	3020						2200	17440	36680	24010	25390	12800

06015300 CLARK CANYON RESERVOIR NEAR GRANT, MT

LOCATION.--Lat 45°00'06", long 112°51'27", in SE¼SW¼ sec 32, T.9 S., R.10 W., Beaverhead County, Hydrologic Unit 10020001, in shaft house near left end of dam on Beaverhead River, 1.5 mi upstream from Clark Canyon Creek, 10 mi east of Grant, and at mile 2,483.9.

DRAINAGE AREA.--2,321 mi^2.

PERIOD OF RECORD.--May 1964 to current year (monthend contents only). Records of daily elevations are in files of Helena district.

GAGE.--Water-stage recorder in shaft house. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by zoned earthfill dam with concrete control works and spillway completed in October 1964. Storage began Aug. 28, 1964 (uncontrolled storage began June 10, 1964). Usable capacity, 255,600 acre-ft between elevation 5,455.00 ft, invert of outlet works, and 5,560.40 ft, top of flood control. Dead storage, 1,509 acre-ft, revised, below elevation 5,455.00 ft. Normal operating level, 177,500 acre-ft at elevation 5,546.00 ft. Minimum operating level, 1,450 acre-ft at elevation 5,470.60 ft. Figures given herein represent usable contents total contents published in previous water-supply papers and annual reports for May 1964 to September 1975. Water is used for irrigation, flood control, and recreation.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 283,000 acre-ft June 25, 1984, elevation, 5,564.70 ft; minimum since normal operating level was reached, 58,960 acre-ft Oct. 11, 1974, elevation, 5,516.80 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents at 2400, 170,000 acre-ft May 19, elevation, 5,544.83 ft; minimum, 91,800 acre-ft Oct. 1, elevation, 5,527.43 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in Contents (acre-feet)
Sept. 30	5,527.30	91,300	---
Oct. 31	5,531.04	106,000	+ 14,700
Nov. 30	5,534.02	118,700	+ 12,700
Dec. 31	5,536.45	129,500	+ 10,800
CAL YR 1985			- 19,000
Jan. 31	5,538.12	137,200	+ 7,700
Feb. 28	5,539.82	145,300	+ 8,100
Mar. 31	5,542.50	158,300	+ 13,000
Apr. 30	5,543.78	164,700	+ 6,400
May 31	5,544.04	166,000	+ 1,300
June 30	5,541.63	154,000	- 12,000
July 31	5,537.00	132,000	- 22,000
Aug. 31	5,533.86	118,000	- 14,000
Sept. 30	5,538.13	137,300	+ 19,300
WTR YR 1986			+ 46,000

06016000 BEAVERHEAD RIVER AT BARRETTS, MT

LOCATION.--Lat 45°06'59", long 112°44'59", in SE¼SW¼SE¼ sec.19, T.8 S., R.9 W., Beaverhead County, Hydrologic Unit 10020002, on left bank 1.4 mi upstream from Barretts, 2.2 mi downstream from Grasshopper Creek, 8.9 mi southwest of Dillon, and at mile 2,469.2.

DRAINAGE AREA.--2,737 mi^2.

PERIOD OF RECORD.--August 1907 to current year. Monthly discharge only for some periods, published in WSP 1309. Prior to October 1963, published as "at Barratts".

REVISED RECORDS.--WSP 1279: 1908(M), 1910-12(M), 1929(M), 1935-36. WSP 1559: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 5,268.17 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1934, nonrecording gages at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 18-19, 22-27, Nov. 29 to Dec. 2, Dec. 11, 14, Feb. 10-14. Records good. Some regulation by Lima Reservoir (station number 06012000) and nearly complete regulation by Clark Canyon Reservoir (station number 06015300) since August 1964. Diversions for irrigation of about 90,000 acres above 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.--79 years, 441 ft^3/s, 319,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,720 ft^3/s June 20, 1908, gage height, 6.1 ft; minimum recorded, 69 ft^3/s Jan. 30, 1939, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,210 ft^3/s June 2, gage height, 2.70 ft; minimum daily, 173 ft^3/s Nov. 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	196	195	175	176	183	214	235	218	1170	763	906	292
2	205	196	180	177	183	218	232	215	1190	735	882	280
3	204	196	183	178	184	222	224	222	1150	716	879	286
4	202	196	183	178	185	221	220	226	1160	752	858	269
5	204	196	183	177	187	222	217	239	1140	761	832	266
6	205	192	183	178	187	227	217	237	1080	746	829	267
7	212	194	183	178	185	234	219	251	1010	719	828	267
8	211	197	184	178	181	257	220	267	960	744	839	273
9	203	193	185	178	179	247	224	247	897	732	853	278
10	204	173	185	178	176	228	222	239	821	737	851	277
11	216	175	185	178	174	220	225	277	773	772	837	275
12	218	175	185	179	176	214	226	255	806	790	790	274
13	215	179	181	180	178	212	219	238	837	801	720	274
14	212	182	180	179	180	208	215	247	905	800	672	277
15	211	181	182	178	180	204	224	286	942	811	653	280
16	210	182	181	178	180	204	236	311	940	844	611	284
17	211	190	182	179	181	208	229	343	921	872	568	283
18	210	185	183	178	187	201	218	367	916	913	549	289
19	208	180	183	179	187	200	212	427	938	959	554	297
20	207	183	184	180	185	204	209	468	1010	977	542	292
21	206	186	185	180	185	209	212	600	1060	973	496	293
22	205	180	183	180	186	229	216	700	1050	983	477	292
23	205	175	183	180	190	229	243	678	976	996	442	282
24	205	180	183	180	203	223	249	627	910	1040	415	280
25	205	180	183	180	223	214	252	679	924	1040	404	285
26	205	180	183	179	231	209	248	801	931	1040	381	285
27	205	180	181	178	218	216	238	828	897	1040	314	285
28	203	183	178	178	214	230	226	864	868	1010	317	286
29	197	180	177	179	---	243	225	945	869	959	320	291
30	195	180	175	180	---	249	220	1060	837	917	301	297
31	195	---	175	181	---	246	---	1120	---	919	317	---
TOTAL	6390	5544	5636	5539	5288	6862	6772	14482	28888	26861	19237	8456
MEAN	206	185	182	179	189	221	226	467	963	866	621	282
MAX	218	197	185	181	231	257	252	1120	1190	1040	906	297
MIN	195	173	175	176	174	200	209	215	773	716	301	266
AC-FT	12670	11000	11180	10990	10490	13610	13430	28730	57300	53280	38160	16770

CAL YR 1985 TOTAL 163138 MEAN 447 MAX 1170 MIN 173 AC-FT 323600
WTR YR 1986 TOTAL 139955 MEAN 383 MAX 1190 MIN 173 AC-FT 277600

06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MT

LOCATION.--Lat 45°23'01", long 112°27'07", in SW¼NW¼SE¼ sec.22, T.5 S., R.7 W., Madison County, Hydrologic Unit 10020002, on left bank at downstream side of bridge on State Highway 41, 11.5 mi upstream from Ruby River, 12.7 mi southwest of Twin Bridges, 14.5 mi northeast of Dillon, and at mile 2,340.4.

DRAINAGE AREA.--3,619 mi^2.

PERIOD OF RECORD.--August 1935 to current year. Prior to October 1968, published as "at Blaine."

REVISED RECORDS.--WSP 1309: 1938(M), 1945(M). WSP 1559: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,809.15 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 17, 1949, nonrecording gage at bridge 0.5 mi upstream at different datum. Feb. 17, 1949, to June 28, 1951, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 21-26, Nov. 30 to Dec. 2, Dec. 13-14, Feb. 9-15. Records good except those for estimated discharges, which are fair. Flow partly regulated by Lima Reservoir (station number 06012000 and Clark Canyon Reservoir (station number 06015300) since August 1964. Diversions upstream from station for irrigation of about 135,400 acres of which about 5,000 acres are irrigated by imported water from Birch and Willow Creeks and of which about 9,200 acres lies downstream from station including 600 acres in Ruby River drainage. Several observations of water temperature and specific conductance were made this year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--51 years, 433 ft^3/s, 313,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 3,130 ft^3/s June 12, 1944, gage height, 6.76 ft, site and datum then in use; maximum gage height, 7.88 ft June 25, 1984; minimum discharge observed, 7.0 ft^3/s May 25, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 640 ft^3/s Feb. 24, gage height, 5.60 ft; minimum, 60 ft^3/s May 28, gage height, 3.32 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	410	403	140	317	364	438	366	239	112	251	139	499
2	412	403	160	314	360	446	367	215	155	202	131	431
3	417	403	246	325	360	441	360	210	148	189	148	403
4	412	401	308	325	363	444	348	211	163	212	164	394
5	414	398	314	297	361	442	351	243	239	273	153	369
6	420	396	320	338	357	445	347	251	315	305	144	366
7	431	395	326	326	334	466	335	262	312	296	134	374
8	430	400	329	320	333	488	331	277	328	257	120	385
9	416	405	312	334	320	496	332	304	375	246	136	413
10	421	339	287	340	300	470	327	313	320	241	140	400
11	444	333	244	351	280	450	322	331	270	241	130	417
12	462	345	220	343	270	444	329	324	198	226	146	410
13	450	347	230	343	290	438	355	262	169	198	171	434
14	444	346	230	334	310	429	349	225	159	171	166	449
15	436	346	240	335	330	416	357	215	194	150	159	475
16	432	347	259	338	346	408	351	212	176	164	163	487
17	431	348	310	344	354	412	336	217	183	128	126	470
18	431	329	331	342	367	415	323	223	153	108	108	478
19	428	316	334	353	387	404	298	196	108	117	100	493
20	422	336	326	357	358	407	294	138	97	126	135	489
21	415	330	325	341	356	412	294	86	107	124	182	485
22	427	260	329	335	360	405	276	124	167	117	284	478
23	427	180	338	343	391	414	304	181	186	95	306	476
24	421	190	345	339	554	410	320	145	172	93	309	468
25	418	200	332	328	529	367	327	100	143	77	289	474
26	412	230	314	330	510	363	310	93	180	97	307	485
27	413	307	288	336	468	362	308	81	217	122	292	474
28	411	322	271	338	445	365	290	63	263	133	258	470
29	400	290	306	341	---	371	276	72	269	146	262	471
30	401	170	312	344	---	356	271	84	252	145	330	485
31	403	---	301	357	---	365	---	104	---	132	425	---
TOTAL	13111	9815	8927	10408	10357	12989	9754	6001	6130	5382	6057	13402
MEAN	423	327	288	336	370	419	325	194	204	174	195	447
MAX	462	405	345	357	554	496	367	331	375	305	425	499
MIN	400	170	140	297	270	356	271	63	97	77	100	366
AC-FT	26010	19470	17710	20640	20540	25760	19350	11900	12160	10680	12010	26580

CAL YR 1985	TOTAL	139349	MEAN	382	MAX	828	MIN	52	AC-FT	276400
WTR YR 1986	TOTAL	112333	MEAN	308	MAX	554	MIN	63	AC-FT	222800

06019500 RUBY RIVER ABOVE RESERVOIR, NEAR ALDER, MT

LOCATION.--Lat 45°10'31", long 112°08'52", in SW¼SW¼SW¼ sec.31, T.7 S., R.4 W., Madison County, Hydrologic Unit 10020003, on left bank at Puller Hot Springs, 0.4 mi upstream from Cottonwood Creek, 6 mi upstream from Ruby Dam, 10.5 mi south of Alder, and at mile 54.4.

DRAINAGE AREA.--538 mi^2.

PERIOD OF RECORD.--May 1938 to current year. Monthly discharge only for May 1938, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1938(M). WSP 1559: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 5,440.2 ft above National Geodetic Vertical Datum of 1929 (river-profile survey). Prior to Oct. 1, 1938, nonrecording gage at bridge 1,500 ft downstream at datum 5.2 ft lower. Oct. 1, 1938, to Aug. 5, 1955, water-stage recorder at site 500 ft downstream at datum 0.5 ft lower.

REMARKS.--Estimated daily discharges: Nov. 10-12, 18-20, Nov. 22 to Dec. 5, Dec. 10-16, 26-28, 30-31, Jan. 2, 4-5, 25-26, Feb. 5-8, 11-12, 14. Records good except those for estimated daily discharges, which are fair. Diversion for irrigation of about 3,000 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.--48 years, 184 ft^3/s, 133,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,810 ft^3/s May 16, 1984, gage height, 6.24 ft; minimum daily, 35 ft^3/s Jan. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 640 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 4	0930	674	4.02	May 29	1500	*1,270	* 4.95
May 22	0830	785	4.23	June 6	0930	963	4.53

Minimum discharge, 89 ft^3/s Oct. 9, Aug. 16-20, gage height, 2.33 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	117	112	95	103	111	133	149	188	976	160	141	127
2	117	126	100	100	109	131	148	216	921	150	138	122
3	107	131	100	103	109	126	132	350	813	144	136	119
4	109	131	105	100	107	125	132	562	730	155	139	114
5	108	129	105	100	100	121	133	458	812	154	136	114
6	113	124	106	102	98	123	139	357	826	155	133	115
7	118	123	112	101	95	125	152	314	630	151	124	117
8	108	130	114	107	98	138	171	278	564	150	117	118
9	98	122	112	104	101	135	180	260	554	148	116	120
10	105	105	105	104	103	123	185	268	483	146	112	122
11	116	105	100	105	100	121	196	278	438	143	109	122
12	123	110	100	104	100	122	184	262	428	143	108	117
13	112	112	105	104	101	118	173	255	414	135	110	115
14	113	117	105	103	100	113	157	263	384	132	101	128
15	115	115	105	103	105	116	160	258	412	136	97	147
16	114	115	105	103	106	111	157	250	355	136	93	139
17	116	117	107	106	106	122	151	253	317	133	92	127
18	110	115	107	103	115	112	143	271	290	137	94	128
19	106	110	107	104	113	114	139	304	267	144	90	130
20	107	115	107	105	106	112	141	423	235	143	94	132
21	110	115	105	105	104	114	179	631	219	150	110	134
22	126	110	105	101	105	122	253	678	210	147	139	130
23	122	105	105	106	114	118	377	498	200	145	110	124
24	117	105	105	105	184	120	342	451	176	143	105	123
25	120	100	105	100	158	116	275	491	172	140	101	125
26	119	105	105	100	143	114	256	667	179	157	105	114
27	118	110	100	105	136	120	233	865	169	162	102	114
28	113	110	100	105	133	133	218	997	171	156	103	120
29	108	105	102	105	---	150	209	1100	172	149	102	121
30	110	100	100	106	---	160	188	1060	168	146	106	124
31	113	---	100	110	---	167	---	1020	---	139	124	---
TOTAL	3508	3429	3234	3212	3160	3875	5652	14526	12685	4529	3487	3702
MEAN	113	114	104	104	113	125	188	469	423	146	112	123
MAX	126	131	114	110	184	167	377	1100	976	162	141	147
MIN	98	100	95	100	95	111	132	188	168	132	90	114
AC-FT	6960	6800	6410	6370	6270	7690	11210	28810	25160	8980	6920	7340

CAL YR 1985	TOTAL	52908	MEAN	145	MAX	694	MIN	64	AC-FT	104900
WTR YR 1986	TOTAL	64999	MEAN	178	MAX	1100	MIN	90	AC-FT	128900

06020600 RUBY RIVER BELOW RESERVOIR, NEAR ALDER, MT

LOCATION.--Lat 45°14'32", long 112°06'36", in SE¼SE¼NE¼ sec.8, T.7 S., R.4 W., Madison County, Hydrologic Unit 10020003, on right bank 0.2 mi downstream from Ruby Dam, 5.7 mi south of Alder, and at mile 47.8.

DRAINAGE AREA.--596 mi^2.

PERIOD OF RECORD.--November 1962 to current year.

REVISED RECORDS.--1985 (M).

GAGE.--Water-stage recorder. Datum of gage is 5,286.63 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Ruby River Reservoir (station number 06020500). Diversions for irrigation of about 3,500 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.--23 years, 227 ft^3/s, 164,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,010 ft^3/s May 16, 1984, gage height, 8.52 ft, from flood-mark; minimum, 1.4 ft^3/s Dec. 5, 1974, dam closure, result of discharge measurement; minimum daily, 19 ft^3/s Feb. 15-19, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,150 ft^3/s May 31, gage height, 5.72 ft; minimum daily, 26 ft^3/s Oct. 1.

REVISIONS.--The maximum discharge for the 1985 water year has been revised to 545 ft^3/s May 23, 1985, gage height, 4.35 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	26	44	29	57	52	56	58	174	1090	244	354	273
2	27	45	29	57	52	57	58	181	1070	214	356	274
3	27	45	29	57	52	57	58	235	974	286	355	271
4	29	44	31	57	51	57	58	375	864	300	354	270
5	30	44	37	57	52	56	58	471	847	297	354	262
6	32	44	46	58	52	57	58	410	919	289	351	234
7	33	45	52	58	52	57	59	355	799	288	377	234
8	34	45	52	58	53	57	59	310	688	288	389	235
9	35	45	52	57	53	57	58	279	640	289	388	237
10	35	45	52	56	53	57	58	267	593	289	384	222
11	37	45	53	56	53	57	58	269	525	290	384	211
12	38	44	53	56	53	57	59	258	470	291	383	211
13	38	42	53	56	53	57	59	250	394	294	380	208
14	39	40	53	57	53	57	59	236	421	295	378	206
15	39	37	53	52	53	57	60	251	468	297	377	183
16	40	37	53	49	54	57	60	246	481	298	374	151
17	41	37	53	49	55	57	60	237	432	300	371	140
18	41	36	53	49	55	57	60	242	427	303	369	140
19	41	34	53	49	55	57	60	281	395	304	368	140
20	42	32	55	50	56	58	61	328	409	304	365	138
21	42	32	55	49	56	58	61	479	439	303	395	138
22	42	30	55	51	56	58	61	621	440	302	410	138
23	42	30	55	51	56	58	61	593	440	317	406	137
24	43	30	55	51	56	58	62	508	439	331	403	135
25	43	31	56	51	56	58	64	482	441	349	394	123
26	43	31	56	51	56	58	98	566	443	355	388	111
27	43	30	56	51	56	58	153	733	443	354	373	111
28	44	30	57	51	56	58	177	905	442	351	365	111
29	44	29	57	51	---	58	185	1030	422	350	327	112
30	44	29	57	51	---	58	183	1100	405	349	314	105
31	44	---	57	52	---	58	---	1110	---	348	307	---
TOTAL	1178	1132	1557	1655	1510	1777	2283	13782	17260	9469	11493	5461
MEAN	38.0	37.7	50.2	53.4	53.9	57.3	76.1	445	575	305	371	182
MAX	44	45	57	58	56	58	185	1110	1090	355	410	274
MIN	26	29	29	49	51	56	58	174	394	214	307	105
AC-FT	2340	2250	3090	3280	3000	3520	4530	27340	34240	18780	22800	10830

CAL YR 1985	TOTAL	56772	MEAN	156	MAX	598	MIN	20	AC-FT	112600
WTR YR 1986	TOTAL	68557	MEAN	188	MAX	1110	MIN	26	AC-FT	136000

06025500 BIG HOLE RIVER NEAR MELROSE, MT

LOCATION.--Lat 45°31'36", long 112°42'03", in SE¼SE¼SW¼ sec.34, T.3 S., R.9 W., Madison County, Hydrologic Unit 10020004, on left bank 50 ft downstream from bridge, on U.S. Highway 91, 0.1 mi downstream from Rock Creek, 7 mi south of Melrose, and at mile 31.1.

DRAINAGE AREA.--2,476 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 5,032.87 ft above National Geodetic Vertical Datum of 1929. Prior to June 14, 1927, water-stage recorder, and July 17, 1927, to Sept. 30, 1931, nonrecording gage, at site 1.7 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 12-14, Nov. 22 to Feb. 27. Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 136,000 acres upstream from station.

AVERAGE DISCHARGE.--63 years, 1,171 ft^3/s, 848,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,000 ft^3/s June 14, 1927, when Wise River Reservoir dam failed (gage height, 14.0 ft, from floodmark, site and datum then in use), from rating curve extended above 8,000 ft^3/s; maximum discharge unaffected by dam failure, 14,300 ft^3/s June 10, 1972, gage height, 8.04 ft; minimum observed, 49 ft^3/s Aug. 17, 1931, gage height, 0.70 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,810 ft^3/s June 1, gage height, 6.25 ft; minimum, 128 ft^3/s Nov. 12, gage height, 0.85 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	496	577	270	350	360	562	3060	1640	8510	1100	543	512
2	499	579	290	340	350	573	2250	1610	8290	1030	503	540
3	503	595	320	330	340	558	1710	1740	7980	954	475	499
4	517	601	370	330	330	556	1430	2150	7510	976	455	464
5	509	609	360	320	320	571	1510	2540	7710	1310	424	430
6	506	581	350	300	300	594	1620	2530	7300	1570	400	404
7	589	568	350	310	280	641	1840	2320	6720	1400	372	394
8	564	573	340	330	280	748	2110	2280	6740	1200	353	398
9	433	537	320	350	290	820	2130	2340	6440	1270	337	464
10	542	354	300	360	290	821	2110	2250	5510	1320	322	547
11	625	186	270	370	270	861	2150	2370	4430	1280	319	564
12	683	170	260	360	260	827	2050	2380	3760	1190	323	536
13	694	250	290	340	280	814	1760	2070	3300	1080	325	525
14	687	350	310	320	290	781	1600	1850	2890	989	320	577
15	672	412	320	300	320	762	1600	1710	2850	922	305	568
16	693	460	340	310	340	699	1690	1550	2760	885	288	575
17	692	480	370	320	360	694	1610	1410	2470	955	283	609
18	654	406	380	330	350	652	1450	1330	2230	978	281	692
19	622	398	370	340	340	634	1280	1350	2050	943	273	719
20	607	431	360	360	330	612	1190	1560	1850	876	268	712
21	601	418	350	340	330	630	1300	2100	1680	818	264	721
22	611	320	350	320	340	732	1730	2770	1500	775	293	692
23	632	250	360	340	360	787	2680	2960	1340	741	363	674
24	642	270	360	350	450	834	2920	2820	1140	700	375	676
25	653	290	350	330	650	795	2740	2730	1060	657	359	667
26	658	310	340	310	620	752	2390	3120	1050	708	333	656
27	661	340	320	310	580	874	2090	4120	1030	742	315	672
28	656	350	300	320	545	1250	1960	5480	991	709	299	693
29	638	330	330	330	---	2130	1850	6870	1050	662	290	670
30	596	300	360	350	---	3400	1750	7870	1120	618	300	680
31	590	---	350	370	---	3720	---	8270	---	590	376	---
TOTAL	18725	12295	10310	10340	10155	29684	57560	88090	113261	29948	10736	17530
MEAN	604	410	333	334	363	958	1919	2842	3775	966	346	584
MAX	694	609	380	370	650	3720	3060	8270	8510	1570	543	721
MIN	433	170	260	300	260	556	1190	1330	991	590	264	394
AC-FT	37140	24390	20450	20510	20140	58880	114200	174700	224700	59400	21290	34770

CAL YR 1985 TOTAL 293189 MEAN 803 MAX 4220 MIN 170 AC-FT 581500
WTR YR 1986 TOTAL 408634 MEAN 1120 MAX 8510 MIN 170 AC-FT 810500

06025500 BIG HOLE RIVER NEAR MELROSE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956-57, 1960-64, 1977 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: August 1956 to September 1957, August 1960 to September 1964, June 1977 to current year.
SUSPENDED-SEDIMENT DISCHARGE: August 1956 to September 1957, August 1960 to September 1964.

INSTRUMENTATION.--Temperature recorder since June 22, 1977.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 23.0°C July 17, 1961, Aug. 6, 1983, July 20, 1985; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION (water years 1956-57, 1960-64): Maximum daily mean, 200 mg/L, June 29, 1961; minimum daily mean, 1 mg/L, on many days in 1960-64.
SEDIMENT LOAD (water years 1956-57, 1960-64): Maximum daily, 4,300 tons, June 9, 1964; minimum daily, less than 0.5 ton on several days in 1961.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 22.0 Aug. 18; minimum, 0.0°C on many days during winter period.

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					
01...	0945	502	200	4.5	4.0
NOV					
21...	1030	427	196	-10.0	0.0
JAN					
07...	1015	310	209	-9.0	0.0
FEB					
19...	1430	334	185	-2.0	0.0
MAR					
12...	1030	825	140	5.0	2.0
APR					
01...	0930	3070	114	10.5	2.5
MAY					
13...	0945	2080	110	10.5	7.0
28...	0815	5580	79	15.5	12.0
JUN					
02...	1030	8510	73	19.0	15.0
24...	0945	1200	155	20.0	16.0
AUG					
06...	0900	386	210	15.0	14.5
SEP					
30...	0815	686	186	12.0	7.5

06025500 BIG HOLE RIVER NEAR MELROSE, MT--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	6.5	4.0	5.5	4.5	2.5	3.5	.0	.0	.0	.0	.0	.0
2	9.0	5.0	7.0	5.5	4.0	5.0	.0	.0	.0	.0	.0	.0
3	9.0	7.5	8.0	7.0	4.0	5.5	.0	.0	.0	.0	.0	.0
4	9.0	4.5	6.5	6.0	3.5	5.0	.0	.0	.0	.0	.0	.0
5	9.5	5.5	7.5	5.5	3.0	4.0	.0	.0	.0	.0	.0	.0
6	9.0	6.5	8.0	4.5	2.0	3.0	.0	.0	.0	.0	.0	.0
7	7.5	3.0	4.5	3.5	1.5	2.5	.0	.0	.0	.0	.0	.0
8	4.0	1.0	2.5	3.0	2.0	2.5	.0	.0	.0	.0	.0	.0
9	3.0	.0	1.5	1.5	.0	.5	.0	.0	.0	.0	.0	.0
10	4.0	.0	2.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	5.0	1.5	3.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	6.0	3.5	4.5	.5	.0	.0	.0	.0	.0	.0	.0	.0
13	6.0	2.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	6.0	3.0	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	8.5	5.0	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
16	8.0	5.0	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
17	7.5	4.0	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	8.0	4.0	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	8.5	4.0	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	8.5	5.5	7.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	8.0	5.5	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	7.0	4.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	7.0	4.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	7.0	3.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	7.5	5.0	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	7.5	4.5	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	8.0	4.5	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	8.0	5.0	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	5.0	2.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	4.5	2.0	3.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	4.5	2.0	3.5				.0	.0	.0	.0	.0	.0
MONTH	9.5	.0	5.5	7.0	.0	1.0	.0	.0	.0	.0	.0	.0
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	4.0	1.0	2.5	4.5	2.5	3.5	10.5	7.0	8.5
2	.0	.0	.0	5.0	2.0	3.5	5.0	2.5	3.5	12.5	9.5	11.0
3	.0	.0	.0	5.0	1.5	3.0	7.0	2.5	4.5	13.0	10.0	11.5
4	.0	.0	.0	4.5	1.5	3.0	7.5	4.0	5.5	11.5	8.0	10.0
5	.0	.0	.0	5.0	1.5	3.0	9.0	5.0	6.5	8.5	6.5	7.5
6	.0	.0	.0	4.0	2.5	3.5	9.5	6.0	7.5	7.0	6.5	6.5
7	.0	.0	.0	5.0	2.5	4.0	10.0	6.5	8.0	6.5	5.5	6.0
8	.0	.0	.0	3.5	2.0	2.5	9.0	7.0	8.0	5.5	5.0	5.5
9	.0	.0	.0	2.5	1.5	2.0	9.0	6.5	7.5	8.0	5.0	6.0
10	.0	.0	.0	3.0	1.0	2.0	9.0	7.0	8.0	7.5	5.5	6.5
11	.0	.0	.0	3.5	1.5	2.5	7.5	6.0	7.0	8.5	5.5	6.5
12	.0	.0	.0	4.0	1.5	2.5	6.5	3.0	5.5	9.0	5.5	7.0
13	.0	.0	.0	5.0	2.0	3.0	4.0	1.5	2.5	10.0	7.5	8.5
14	.0	.0	.0	3.5	1.5	2.5	6.0	1.5	3.5	9.5	6.0	7.5
15	.0	.0	.0	4.0	1.5	2.5	7.0	4.0	5.5	9.0	6.0	7.0
16	.0	.0	.0	3.5	1.5	2.5	7.5	5.5	6.5	11.0	5.5	8.0
17	.0	.0	.0	5.0	1.5	3.0	7.0	5.0	6.0	11.0	8.0	9.5
18	.0	.0	.0	5.0	1.5	3.0	7.0	4.5	6.0	11.5	8.0	9.5
19	.0	.0	.0	6.0	1.5	3.5	8.0	4.0	6.0	14.0	9.5	11.5
20	.0	.0	.0	7.0	2.0	4.5	10.5	6.0	8.0	14.5	11.5	13.0
21	.0	.0	.0	7.5	3.0	5.0	11.5	7.5	9.5	13.0	11.0	12.0
22	.0	.0	.0	6.0	3.0	4.5	13.0	9.5	11.0	11.0	8.0	9.5
23	.0	.0	.0	5.0	2.0	3.5	12.0	9.0	10.5	10.0	6.5	8.5
24	.0	.0	.0	4.0	2.5	3.5	8.5	7.5	8.0	12.5	8.5	10.5
25	.0	.0	.0	5.5	1.0	3.0	7.5	6.5	7.0	14.5	11.5	13.0
26	1.5	.0	.5	7.0	1.0	4.0	7.5	5.0	6.0	15.5	13.0	14.5
27	2.5	.0	1.5	7.5	3.5	5.5	6.5	5.0	6.0	15.5	13.5	14.5
28	3.5	.5	2.0	6.0	4.5	5.0	8.5	6.0	7.0	14.0	12.0	13.0
29				6.0	4.0	5.0	7.5	6.0	6.5	14.0	13.0	13.5
30				5.0	1.0	3.5	9.0	5.0	6.5	15.0	13.5	14.5
31				4.5	2.0	3.5				15.5	14.0	15.0
MONTH	3.5	.0	.0	7.5	1.0	3.5	13.0	1.5	6.5	15.5	5.0	10.0

06025500 BIG HOLE RIVER NEAR MELROSE, MT--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	15.5	14.0	15.0	20.0	14.0	17.0	20.5	14.5	17.5	16.5	12.5	14.0
2	16.0	14.5	15.0	20.5	15.5	18.0	21.0	15.0	18.0	16.0	13.0	14.5
3	15.5	13.0	14.5	18.5	16.5	17.0	20.0	16.0	18.5	17.5	12.0	14.5
4	14.0	12.0	13.0	16.0	13.0	14.5	21.5	15.5	18.5	18.5	13.0	15.5
5	14.5	13.0	13.5	15.0	11.0	12.5	20.5	15.0	18.0	17.5	13.0	15.0
6	14.0	12.5	13.0	15.5	10.0	12.5	21.0	14.5	18.0	14.0	11.5	12.0
7	14.0	13.0	13.5	18.0	13.0	15.0	21.0	15.0	18.0	14.5	10.0	12.5
8	13.0	11.0	11.5	17.0	14.0	15.5	20.5	16.0	18.5	13.5	12.5	13.0
9	12.0	10.5	11.5	17.5	13.5	15.0	21.5	15.5	18.5	14.0	12.0	12.5
10	15.0	11.0	13.0	16.5	14.5	15.5	20.5	16.0	18.5	12.5	10.0	11.5
11	16.0	13.0	15.0	18.0	13.5	15.5	20.0	16.0	18.0	14.5	9.5	12.0
12	16.5	14.0	15.5	18.0	13.0	15.5	18.5	15.5	17.0	12.5	9.5	11.0
13	16.5	14.0	15.5	19.5	14.0	16.5	19.0	14.0	16.5	12.5	9.5	11.0
14	16.0	14.5	15.0	18.0	14.5	16.5	21.0	14.5	17.5	11.5	10.0	11.0
15	16.5	13.5	15.0	19.0	13.5	16.0	21.0	15.0	18.0	12.0	10.0	11.0
16	17.0	14.5	16.0	19.5	14.5	16.5	20.0	15.0	17.5	13.5	9.0	11.0
17	18.5	15.5	17.0	17.5	12.5	15.0	21.0	16.0	18.5	14.0	10.0	11.5
18	18.0	15.0	16.5	15.5	13.0	14.0	22.0	15.5	18.5	12.5	9.5	11.0
19	17.5	13.5	15.5	18.5	12.5	15.0	19.0	15.5	17.0	11.0	9.5	10.0
20	16.5	13.5	15.0	20.0	14.5	17.0	19.0	14.0	16.5	11.5	9.5	10.0
21	16.5	13.0	14.5	21.0	15.0	18.0	17.0	13.5	15.5	11.0	8.0	9.5
22	17.5	13.0	15.0	20.5	15.5	18.0	18.5	12.0	15.0	12.0	7.5	9.5
23	19.0	14.0	16.5	21.0	15.5	18.5	18.0	14.0	16.0	12.0	7.5	9.5
24	21.0	15.5	18.0	20.5	15.5	18.0	19.5	13.5	16.5	10.0	8.5	9.0
25	19.0	15.5	17.0	18.5	16.0	17.0	19.0	15.0	17.0	9.5	7.0	8.0
26	19.0	14.5	16.5	17.5	14.0	16.0	20.0	14.0	17.0	8.0	7.0	7.5
27	18.5	15.0	16.5	17.5	14.0	15.5	20.5	14.5	17.5	9.5	5.5	7.0
28	19.0	15.5	17.0	19.5	14.0	16.5	20.5	15.0	18.0	9.0	6.0	7.5
29	18.5	15.0	16.5	20.0	14.5	17.5	18.5	15.0	16.5	9.0	6.5	7.5
30	19.0	14.0	16.0	20.0	14.5	17.0	16.0	13.5	15.0	9.5	7.5	8.5
31				20.5	14.0	17.0	14.5	12.5	13.5			
MONTH	21.0	10.5	15.0	21.0	10.0	16.0	22.0	12.0	17.0	18.5	5.5	11.0
YEAR	22.0	.0	7.0									

06033000 BOULDER RIVER NEAR BOULDER, MT

LOCATION.--Lat 46°12'40", long 112°05'27", in SE¼NE¼SW¼ sec. 3, T.5 N., R.4 W., Jefferson County, Hydrologic Unit 10020006, on left bank 40 ft downstream from county bridge, 1.1 mile downstream of Muskrat Creek, 2.0 mi southeast of Boulder, and at mile 44.1.

DRAINAGE AREA.--381 mi^2.

PERIOD OF RECORD.--April 1929 to December 1932, March 1934 to September 1972, October 1984 to September 1985. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1279: 1931.

GAGE.--Water-stage recorder. Elevation of gage is 4,810 ft, by barometer. Prior to Aug. 29, 1946, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 11-14, Nov. 18 to Dec. 16, Feb. 7-15. Records good except those for periods of estimated daily discharges, which are fair. Diversions for irrigation of about 3,500 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.--43 years (1930-32, 1935-72, 1985-86), 121 ft^3/s, 87,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,490 ft^3/s June 9, 1964, gage height, 10.90 ft; no flow July 15-17, 21, 1931.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 22, 1981, reached a discharge of 7,000 ft^3/s, gage height, 12.3 ft from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 420 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 30	0630	480	6.64	May 22	0200	731	7.08
Apr. 23	0600	505	6.69	May 29	0100	*1,100	*7.58
May 4	0530	465	6.61				

Minimum discharge, 20 ft^3/s Feb. 7, Aug. 20-21, gage height, 4.89 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	65	78	33	33	37	82	253	228	802	102	43	53
2	63	79	32	33	38	91	196	267	739	83	38	53
3	73	79	35	33	38	107	157	352	699	79	33	41
4	76	79	37	33	36	129	153	454	666	85	32	36
5	81	79	36	33	37	125	161	421	645	186	30	33
6	82	73	35	33	36	140	174	380	652	185	28	32
7	80	79	35	33	28	137	200	352	543	130	27	32
8	66	68	34	33	29	154	239	335	578	109	25	35
9	71	57	34	33	28	146	257	324	508	115	24	44
10	74	42	33	34	29	128	279	337	436	120	23	48
11	81	28	30	34	27	111	275	352	369	113	23	41
12	83	25	32	34	26	94	246	309	322	106	32	37
13	78	30	33	35	27	84	190	300	288	90	37	40
14	76	38	33	34	29	72	200	314	263	82	33	61
15	82	43	34	34	31	70	221	278	295	71	31	58
16	94	49	34	35	33	65	217	252	245	80	26	54
17	96	51	35	35	34	64	202	247	208	116	24	62
18	90	48	35	35	34	57	176	258	188	92	23	134
19	88	46	35	36	34	55	160	323	162	81	22	138
20	93	45	35	36	32	55	161	435	148	75	21	102
21	98	44	35	36	35	62	226	607	139	69	25	95
22	114	43	35	34	34	78	319	674	131	75	50	85
23	108	42	35	37	35	82	469	562	119	74	45	76
24	96	40	35	37	102	84	394	521	108	64	37	70
25	97	39	34	35	145	72	346	574	101	57	33	71
26	100	38	33	35	170	72	298	729	101	56	30	69
27	96	40	33	36	94	83	283	901	100	61	29	64
28	99	38	33	36	82	159	272	996	99	57	29	64
29	87	36	33	36	---	326	256	1020	161	51	27	70
30	84	34	33	36	---	416	231	958	129	48	27	71
31	85	---	33	37	---	359	---	879	---	49	35	---
TOTAL	2656	1510	1052	1074	1340	3759	7211	14939	9944	2761	942	1869
MEAN	85.7	50.3	33.9	34.6	47.9	121	240	482	331	89.1	30.4	62.3
MAX	114	79	37	37	170	416	469	1020	802	186	50	138
MIN	63	25	30	33	26	55	153	228	99	48	21	32
AC-FT	5270	3000	2090	2130	2660	7460	14300	29630	19720	5480	1870	3710

CAL YR 1985	TOTAL	29384	MEAN	80.5	MAX	604	MIN	10	AC-FT	58280
WTR YR 1986	TOTAL	49057	MEAN	134	MAX	1020	MIN	21	AC-FT	97300

06035000 WILLOW CREEK NEAR HARRISON, MT

LOCATION.--Lat 46°43'23", long 111°44'25", in SE¼SW¼NW¼ sec.28, T.1 S., R.1 W., Madison County, Hydrologic Unit 10020005, on right bank 2.2 mi upstream from Willow Creek Dam, 2.5 mi northeast of Harrison, and at mile 13.6.

DRAINAGE AREA.--83.8 mi^2.

PERIOD OF RECORD.--April 1938 to September 1982, October 1982 to current year (seasonal records only). Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1559: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,750 ft, from topographic map. Prior to Oct. 8, 1946, water-stage recorder at datum 0.22 ft higher, with different concrete control.

REMARKS.--Estimated daily discharges: Oct. 7-10, Apr. 1, 13, 14. Seasonal records good except those for estimated daily discharges, which are fair. Diversions for irrigation of about 12,500 acres of which 3,500 acres is in Norwegian Creek drainage. 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.--44 years (1938-82), 40.7 ft^3/s, 29,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 813 ft^3/s Feb. 3, 1963, gage height, 4.24 ft, from floodmarks, from rating curve extended above 300 ft^3/s; minimum, 1.4 ft^3/s Sept. 17, 1956, gage height, 0.39 ft.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 267 ft^3/s June 6, gage height, 2.46 ft; minimum, 2.6 ft^3/s Aug. 5-10, gage height, 0.37 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	30						39	46	197	29	4.7	17
2	32						40	46	221	24	3.6	11
3	36						39	53	240	21	3.2	8.4
4	36						38	65	219	24	3.1	7.3
5	39						37	66	251	31	2.9	6.6
6	40						36	64	250	21	2.8	7.6
7	42						37	76	204	17	2.8	7.4
8	40						40	91	186	14	2.8	8.4
9	35						40	93	163	13	2.7	9.4
10	38						40	88	131	11	3.0	9.0
11	40						40	88	108	11	3.6	10
12	43						39	72	106	15	3.9	11
13	39						35	69	107	13	4.1	12
14	38						35	69	101	11	4.2	18
15	47						45	66	110	11	3.5	24
16	51						55	64	114	13	3.5	25
17	48						54	63	112	17	3.5	29
18	44						46	65	110	18	3.5	30
19	42						41	72	103	17	3.2	31
20	41						40	89	92	12	3.5	30
21	41						41	103	75	9.0	5.1	32
22	51						44	110	64	8.5	6.0	28
23	44						66	112	53	6.8	5.7	26
24	42						60	101	47	5.5	5.6	24
25	41						55	92	43	4.4	5.5	24
26	41						57	90	45	5.8	4.8	23
27	41						56	104	47	6.6	4.2	25
28	38						54	138	43	6.2	4.5	27
29	35						51	158	43	5.2	5.0	27
30	34						48	173	37	5.5	9.0	30
31	33						---	180	---	4.8	15	---
TOTAL	1242						1348	2766	3622	411.3	138.5	578.1
MEAN	40.1						44.9	89.2	121	13.3	4.47	19.3
MAX	51						66	180	251	31	15	32
MIN	30						35	46	37	4.4	2.7	6.6
AC-FT	2460						2670	5490	7180	816	275	1150

06036650 JEFFERSON RIVER NEAR THREE FORKS, MT

LOCATION.--Lat 45°53'52", long 111°35'45", in SW¼SW¼NW¼ sec.27, T.2 N., R.1 E., Broadwater County, Hydrologic Unit 10020005, on left bank 50 ft downstream from bridge on U.S. Highway 10, 2.5 mi northwest of Three Forks, and at mile 2,329.3.

DRAINAGE AREA.--9,532 mi^2.

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 4,076.76 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 11 to Feb. 26. Records good except those for periods of estimated daily record, 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 Ruby River Reservoir (station number 06020500) and Clark Canyon Reservoir (station number 06015300). Diversions for irrigation of about 390,000 acres upstream from station.

AVERAGE DISCHARGE.--8 years, 2,548 ft^3/s, 1,846,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,900 ft^3/s May 24, 1981, gage height recorded, 8,06 ft, 8.21 ft, from floodmark; maximum gage height, 9.39 ft Dec. 10, 1980 (ice jam); minimum discharge, 249 ft^3/s July 30, 31, 1985, gage height, 1.66 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,360 ft^3/s June 2, gage height, 6.87 ft; maximum gage height, 7.36 ft Nov. 15 (ice jam); minimum discharge, 499 ft^3/s Aug. 10, 11, gage height, 2.07 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	1570	1660	850	1200	1600	1910	4870	2760	9150	1560	883	1530
2	1590	1640	800	1200	1600	1890	4290	2610	9310	1570	808	1720
3	1600	1630	900	1200	1600	1900	3500	2500	9230	1540	769	1730
4	1580	1640	1200	1200	1500	1890	2960	2570	9180	1710	749	1660
5	1590	1650	1400	1150	1500	1860	2580	3050	9010	2010	712	1590
6	1610	1660	1350	1100	1400	1880	2630	3490	9110	2210	654	1560
7	1650	1650	1300	1200	1300	1880	2690	3560	9200	2460	611	1580
8	1680	1640	1300	1200	1200	1940	2850	3460	8660	2380	580	1580
9	1760	1640	1300	1250	1200	2080	3120	3410	8530	2080	533	1620
10	1660	1570	1200	1250	1200	2140	3200	3430	8200	1980	504	1660
11	1750	1300	1100	1300	1100	2090	3190	3580	7190	1930	507	1700
12	1900	1000	1000	1300	950	2130	3260	3600	5970	1870	560	1720
13	1930	1100	1000	1250	900	2130	3190	3490	5110	1720	635	1750
14	1930	1200	1050	1250	1000	2120	2870	3080	4450	1580	661	1780
15	1900	1400	1050	1200	1100	2040	2730	2790	4070	1450	665	1830
16	1890	1600	1050	1200	1200	1980	2760	2530	3990	1360	659	1950
17	1890	1700	1100	1300	1400	1920	2830	2320	3780	1340	664	1950
18	1900	1400	1150	1400	1600	1880	2730	2160	3350	1300	664	1970
19	1860	1200	1150	1500	1500	1810	2470	2050	2970	1310	636	2030
20	1810	1100	1200	1450	1500	1780	2290	1980	2630	1290	609	2140
21	1770	1000	1250	1400	1600	1760	2160	2160	2350	1220	619	2130
22	1800	850	1250	1350	1600	1740	2300	2810	2170	1150	697	2120
23	1820	750	1200	1400	1700	1770	2670	3610	2040	1110	777	2080
24	1800	700	1200	1350	2000	1850	3550	3940	1870	1070	914	2030
25	1790	750	1200	1300	2700	1880	3780	3760	1690	989	1050	2010
26	1780	800	1200	1300	2500	1850	3680	3630	1570	965	1060	2020
27	1780	850	1150	1300	2140	1760	3370	4050	1520	1010	1050	2010
28	1770	900	1150	1300	2000	1790	3120	5140	1540	1060	1060	2050
29	1740	950	1100	1400	---	2070	2980	6640	1550	1000	1020	2060
30	1710	900	1150	1400	---	2950	2880	7710	1550	951	1020	2070
31	1670	---	1200	1500	---	4330	---	8690	---	939	1150	---
TOTAL	54480	37830	35500	40100	42590	63000	91500	110560	150940	46114	23480	55630
MEAN	1757	1261	1145	1294	1521	2032	3050	3566	5031	1488	757	1854
MAX	1930	1700	1400	1500	2700	4330	4870	8690	9310	2460	1150	2140
MIN	1570	700	800	1100	900	1740	2160	1980	1520	939	504	1530
AC-FT	108100	75040	70410	79540	84480	125000	181500	219300	299400	91470	46570	110300

CAL YR 1985	TOTAL	588285	MEAN	1612	MAX	5670	MIN	254	AC-FT	1167000
WTR YR 1986	TOTAL	751724	MEAN	2060	MAX	9310	MIN	504	AC-FT	1491000

06036905 FIREHOLE RIVER NEAR WEST YELLOWSTONE, MT

LOCATION.--Lat 44°37'13", long 110°51'44", Yellowstone National Park, Hydrologic Unit 10020007, on right bank 1.6 mi south of Madison Junction, 12 mi east of West Yellowstone, and at mile 1.8.

DRAINAGE AREA.--282 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 7,050 ft, from topographic map.

REMARKS.--Estimated daily discharges: Apr. 25-28. Water-discharge records good except those for estimated daily discharges, which are poor. No regulation or diversions upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,520 ft^3/s May 31, 1986, gage height, 5.48 ft; minimum, 255 ft^3/s Feb. 8, 1986, gage height, 3.03 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,520 ft^3/s May 31, gage height, 5.48 ft; minimum, 255 ft^3/s Feb. 8, gage height, 3.03 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	300	306	309	298	302	326	384	458	1230	435	375	375
2	302	312	317	292	300	322	370	483	1190	423	371	387
3	300	311	317	298	301	316	349	539	1150	421	367	366
4	293	308	312	290	296	314	352	598	1020	416	367	359
5	297	341	307	292	294	310	348	542	1070	405	364	357
6	301	312	307	299	288	311	369	502	996	397	362	351
7	373	311	313	291	279	330	394	487	908	403	360	350
8	341	329	311	291	277	440	422	468	860	399	363	354
9	335	319	304	290	282	384	427	448	977	430	368	358
10	322	316	296	293	284	349	411	480	856	455	365	356
11	327	323	289	292	277	337	454	468	760	455	366	354
12	335	318	303	288	284	329	451	433	789	430	370	349
13	312	312	299	289	300	319	422	425	771	396	362	350
14	312	310	301	287	288	313	382	460	750	387	361	355
15	315	305	301	287	310	308	375	424	827	384	356	354
16	319	302	300	292	287	303	395	414	752	406	355	352
17	317	307	300	296	288	307	365	402	704	467	354	349
18	309	307	301	295	295	297	346	422	679	399	351	376
19	309	291	303	301	306	296	338	464	638	387	355	377
20	313	293	302	309	313	297	343	550	615	382	364	460
21	319	298	296	300	312	305	386	648	585	378	429	405
22	343	296	294	295	314	319	457	690	537	379	430	379
23	329	289	294	306	311	321	496	577	533	411	382	367
24	353	304	294	297	327	334	456	565	528	398	381	375
25	355	310	291	290	358	327	420	649	525	409	414	375
26	350	289	293	292	374	315	400	798	532	582	389	381
27	337	300	293	295	344	336	400	935	501	469	368	374
28	334	313	289	296	331	378	400	1060	480	408	362	367
29	325	327	288	302	---	411	400	1150	463	384	359	362
30	317	311	288	302	---	431	421	1210	453	380	363	371
31	312	---	285	303	---	436	---	1240	---	396	376	---
TOTAL	10006	9270	9297	9148	8522	10421	11933	18989	22679	12871	11509	11045
MEAN	323	309	300	295	304	336	398	613	756	415	371	368
MAX	373	341	317	309	374	440	496	1240	1230	582	430	460
MIN	293	289	285	287	277	296	338	402	453	378	351	349
AC-FT	19850	18390	18440	18150	16900	20670	23670	37660	44980	25530	22830	21910

CAL YR 1985	TOTAL	124300	MEAN	341	MAX	780	MIN	275	AC-FT	246500
WTR YR 1986	TOTAL	145690	MEAN	399	MAX	1240	MIN	277	AC-FT	289000

06036905 FIREHOLE RIVER NEAR WEST YELLOWSTONE, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: August 1983 to current year.
WATER TEMPERATURE: August 1983 to current year.

INSTRUMENTATION.--Water-quality monitor since Aug. 30, 1983.

REMARKS.--No specific conductance record Feb. 19 to Mar. 17, Apr. 17-28, June 8, 9. No temperature record Feb. 6 to July 21.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 560 microsiemens, Nov. 16, Mar. 21, 1986; minimum , 140 microsiemens, Jun. 5, 1986.
WATER TEMPERATURE: Maximum, 27.0°C, July 25, 1984; minimum, 1.0°C, Dec. 24, 1983, Feb. 1, 1985.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum recorded, 560 microsiemens, Nov. 16, Mar. 21; minimum, 140 microsiemens, Jun. 5.
WATER TEMPERATURE: Maximum, 24.5°C, Aug. 1, 4, 18; minimum, 3.5°C, Nov. 26, 27, Dec. 11.

SPECIFIC CONDUCTANCE (UMHOS), 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	448	423	435	506	483	493	513	501	505	532	510	524
2	442	432	438	520	493	505	514	498	505	526	509	517
3	449	439	442	514	496	503	508	460	481	531	509	518
4	451	433	441	517	496	503	498	478	491	528	518	521
5	460	446	451	516	481	498	508	495	501	543	528	533
6	464	457	461	519	483	498	518	505	510	527	518	523
7	474	408	451	522	498	507	525	502	509	525	512	520
8	468	409	440	512	475	494	526	504	514	534	520	527
9	477	453	463	526	506	516	516	500	507	536	521	530
10	491	466	476	525	501	513	525	508	514	531	520	527
11	493	480	486	522	501	514	538	504	521	537	525	531
12	494	474	482	545	508	530	512	493	504	537	522	528
13	501	476	484	544	525	534	516	503	509	539	524	532
14	497	480	487	549	529	539	516	506	511	540	521	532
15	501	488	493	555	533	545	522	510	516	546	526	535
16	503	487	494	560	536	548	526	512	518	529	519	524
17	494	467	474	553	533	543	525	519	522	530	500	514
18	490	463	475	551	521	536	533	516	522	533	522	529
19	491	464	478	537	517	527	535	518	526	553	530	541
20	491	468	477	545	525	533	532	520	526	558	523	541
21	488	464	476	544	514	526	528	520	524	534	519	528
22	486	434	455	530	515	523	533	512	523	543	531	537
23	520	441	475	530	509	519	533	516	524	549	528	540
24	514	476	495	529	499	515	533	519	524	531	526	528
25	476	455	466	505	493	497	532	515	522	536	527	530
26	462	438	451	524	494	508	535	517	527	541	530	536
27	478	449	459	532	509	518	534	519	526	546	534	541
28	478	457	467	518	507	510	529	517	523	548	539	544
29	483	454	466	510	483	497	534	519	527	544	537	540
30	503	468	487	515	483	497	532	519	525	546	527	540
31	506	482	492				528	518	522	546	537	541
MONTH	520	408	468	560	475	516	538	460	515	558	500	531

06036905 FIREHOLE RIVER NEAR WEST YELLOWSTONE, MT--Continued

SPECIFIC CONDUCTANCE (UMHOS) 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	548	527	536				467	429	449	462	409	431
2	540	536	538				475	466	471	435	415	425
3	546	530	539				497	472	483	444	380	393
4	542	535	539				497	481	490	397	350	375
5	543	517	534				507	488	496	416	398	408
6	517	501	508				492	474	484	420	410	415
7	520	500	510				468	446	455	423	414	419
8	532	495	508				462	434	447	425	414	419
9	514	478	496				448	430	440	430	419	425
10	500	485	494				460	442	450	427	416	422
11	514	491	498				463	429	445	414	405	410
12	501	481	492				458	441	450	419	408	413
13	498	465	476				455	423	437	419	403	410
14	487	469	478				484	452	467	407	386	396
15	479	447	460				496	470	481	406	389	396
16	468	457	463				480	469	474	397	389	392
17	462	447	456							390	382	385
18	467	451	457	545	531	537				384	366	370
19				546	524	535				366	342	350
20				555	528	540				338	304	316
21				560	532	544				293	277	281
22				547	531	538				277	261	266
23				544	518	534				286	268	278
24				526	497	513				280	270	275
25				524	489	505				267	239	252
26				527	512	519				237	213	222
27				519	490	511				210	190	199
28				493	443	478				231	175	197
29				454	421	439	467	393	418	173	155	163
30				434	406	423	456	406	427	168	150	157
31				429	390	407				162	148	155
MONTH	548	447	499	560	390	502	507	393	459	462	148	336
		JUNE			JULY			AUGUST			SEPTEMBER	
1	173	153	161	296	283	288	349	341	346	423	417	421
2	168	148	157	309	290	299	374	347	367	416	410	413
3	183	145	164	319	308	314	381	374	377	410	404	408
4	190	169	179	320	306	317	392	379	385	409	403	406
5	189	140	166	329	320	325	398	388	393	410	405	407
6	198	155	175	343	331	337	407	396	402	408	403	406
7	204	177	192	345	334	339	413	403	409	409	404	407
8				352	340	345	420	410	417	424	408	414
9				362	347	354	424	417	420	422	410	415
10	199	148	176	357	347	354	432	426	428	418	406	410
11	184	152	163	366	358	361	436	427	432	416	401	407
12	224	157	186	367	354	360	442	434	439	418	407	411
13	209	167	182	378	365	372	450	442	447	419	404	413
14	232	168	187	384	369	378	461	451	456	415	405	410
15	189	161	172	388	380	384	467	458	464	414	407	410
16	218	183	199	391	384	388	478	467	474	414	405	409
17	232	198	213	391	362	375	486	478	482	412	401	408
18	253	213	232	396	381	391	495	484	490	420	407	412
19	266	227	249	402	388	397	500	494	498	410	398	404
20	271	236	257	411	400	405	506	500	503	441	394	410
21	277	249	259	415	404	409	503	485	498	394	370	377
22	276	262	271	422	408	413	482	470	477	388	371	378
23	283	267	275	429	369	392	483	479	481	394	380	385
24	288	271	279	394	377	383	486	471	479	404	385	394
25	295	272	284	381	338	370	474	456	468	393	378	385
26	298	277	289	335	253	291	457	449	452	393	380	384
27	307	283	295	290	259	275	452	448	450	393	379	385
28	299	288	295	310	292	301	450	444	448	391	382	387
29	305	277	294	324	309	317	444	440	443	396	385	390
30	284	274	280	330	320	326	441	430	436	422	386	401
31				341	327	334	430	424	427			
MONTH	307	140	223	429	253	351	506	341	442	441	370	402
YEAR	560	140	432									

06036905 FIREHOLE RIVER NEAR WEST YELLOWSTONE, MT--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	15.0	10.5	13.0	12.0	10.5	11.0	8.5	6.0	7.5	9.5	7.5	9.0
2	17.5	13.0	15.0	14.0	11.5	13.0	10.5	7.5	9.0	9.5	6.5	8.0
3	15.5	13.5	14.5	15.5	13.0	14.0	10.5	6.5	8.0	9.5	7.0	8.5
4	16.5	11.0	13.5	15.0	12.0	13.5	9.5	5.5	7.5	8.5	5.5	7.0
5	15.5	11.5	13.5	14.0	10.0	12.0	10.0	7.0	8.5	9.0	5.0	7.0
6	16.0	13.5	15.0	11.5	9.0	10.0	11.0	8.0	9.5	10.5	9.0	9.5
7	15.5	7.5	12.5	12.0	10.0	11.0	11.5	9.5	11.0	9.5	7.0	8.5
8	11.5	7.0	9.0	11.5	9.0	10.0	11.5	8.5	10.5	10.0	7.0	8.5
9	13.5	8.5	11.0	11.0	8.5	9.5	9.0	7.0	8.0	10.0	7.5	8.5
10	15.0	8.5	12.0	10.5	7.5	9.0	7.0	4.5	6.0	12.5	9.0	10.5
11	15.0	11.0	13.0	11.5	9.0	10.0	7.0	3.5	5.5	11.5	8.0	10.0
12	13.5	11.0	12.5	12.5	8.5	10.5	7.5	5.5	6.5	10.5	7.5	9.0
13	14.5	9.0	11.5	11.5	9.5	10.5	8.0	5.5	7.0	11.0	7.0	9.0
14	13.5	9.5	12.0	12.5	10.0	11.0	8.5	7.5	8.0	10.5	7.0	8.5
15	16.0	11.5	13.5	11.0	9.0	10.0	9.5	7.5	8.5	9.5	7.0	8.5
16	15.5	11.5	13.5	10.5	8.5	9.5	10.0	7.0	8.5	11.0	9.0	10.0
17	16.0	11.5	14.0	12.0	9.5	10.5	10.0	9.0	9.5	11.0	8.0	9.0
18	16.5	11.5	14.0	10.5	7.5	9.5	11.0	9.5	10.5	12.0	9.0	10.5
19	16.0	11.5	14.0	7.5	5.5	6.5	11.5	10.0	10.5	14.0	11.0	12.5
20	16.5	12.5	14.5	8.5	6.0	7.0	11.5	9.5	10.0	12.5	10.0	11.5
21	15.0	12.5	14.0	7.5	6.5	7.0	10.5	7.5	9.0	10.5	8.5	9.5
22	13.5	9.5	11.0	7.0	5.0	6.0	9.5	7.0	8.5	10.0	7.0	8.5
23	12.0	9.0	10.5	6.0	4.0	5.0	10.5	7.0	9.0	10.5	9.0	10.0
24	13.5	12.0	12.5	8.0	6.0	7.0	11.0	9.0	10.0	10.0	8.0	9.0
25	14.0	12.0	13.0	8.5	4.0	7.0	10.0	7.5	8.5	9.5	6.0	8.0
26	15.5	13.0	14.0	6.5	3.5	4.5	11.0	8.5	9.5	10.5	6.5	10.0
27	16.0	12.0	14.0	6.5	3.5	5.0	10.5	8.5	9.5	11.5	8.0	10.0
28	14.5	12.5	13.0	9.0	6.5	8.0	9.5	6.5	8.0	12.0	10.5	11.5
29	15.0	11.5	13.0	9.0	5.5	7.5	9.5	6.5	8.0	13.5	12.0	12.5
30	14.5	11.0	13.0	7.0	4.5	6.0	9.5	7.0	8.0	13.5	11.5	12.5
31	13.5	11.0	12.5				9.5	6.5	8.0	15.0	12.5	13.5
MONTH	17.5	7.0	13.0	15.5	3.5	9.0	11.5	3.5	8.5	15.0	5.0	9.5
		FEBRUARY			MARCH			APRIL			MAY	
1	13.5	12.0	13.0									
2	12.5	11.5	12.0									
3	12.5	11.0	12.0									
4	12.5	10.5	11.5									
5	10.5	10.0	10.0									
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
MONTH	13.5	10.0	11.5									

06036905 FIREHOLE RIVER NEAR WEST YELLOWSTONE, MT--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
		JUNE			JULY			AUGUST			SEPTEMBER	
1							24.5	19.0	22.0	20.0	17.5	19.0
2							24.0	19.0	22.0	20.0	17.5	18.5
3							24.0	20.0	22.0	21.5	17.0	19.0
4							24.5	19.5	22.0	22.5	17.0	20.0
5							24.0	19.5	22.0	22.5	18.0	20.5
6							24.0	19.0	21.5	21.5	17.5	19.5
7							24.0	19.0	21.5	21.5	17.0	19.0
8							23.5	19.0	21.0	22.0	17.5	19.5
9							23.5	19.0	21.5	20.5	18.0	19.0
10							24.0	19.5	22.0	19.0	17.5	18.5
11							23.0	20.5	21.5	20.5	16.5	18.5
12							23.0	19.5	21.0	21.0	16.5	19.0
13							22.5	19.0	20.5	21.0	17.5	19.0
14							23.5	19.0	21.0	20.5	17.5	19.0
15							23.5	18.5	21.0	20.5	17.0	19.0
16							23.5	19.5	21.5	20.5	16.5	18.5
17							24.0	20.0	22.0	20.0	16.0	18.0
18							24.5	19.5	22.0	18.0	16.5	17.0
19							23.0	20.0	20.5	17.5	15.5	16.5
20							23.5	19.0	21.0	17.0	13.5	15.5
21							22.0	18.0	20.0	17.5	13.5	15.5
22				23.5	22.0	22.5	22.0	17.0	19.0	18.5	14.0	16.5
23				23.0	19.5	21.5	20.5	18.0	19.0	18.5	13.5	16.5
24				24.0	20.0	21.5	23.0	18.5	20.5	17.0	15.5	16.0
25				22.5	20.0	21.0	21.5	19.5	20.5	16.0	13.5	14.5
26				20.5	17.5	18.5	23.0	19.0	21.0	16.0	12.5	14.0
27				20.0	17.5	19.0	24.0	19.0	21.5	15.5	13.5	14.5
28				22.5	17.5	20.0	24.0	19.5	22.0	16.0	14.0	15.0
29				23.0	18.5	20.5	22.0	19.5	21.0	15.0	14.0	14.5
30				21.0	19.0	20.0	22.0	19.5	20.5	16.5	14.5	15.0
31				24.0	18.5	21.0	21.0	18.5	19.5			
MONTH				24.0	17.5	20.5	24.5	17.0	21.0	22.5	12.5	17.5
YEAR	24.5	3.5	13.5									

06037000 GIBBON RIVER NEAR WEST YELLOWSTONE, MT

LOCATION.--Lat 44°38'58", long 110°47'02", Yellowstone National Park, Hydrologic Unit 10020007, on right bank, 0.6 mi downstream from Canyon Creek, 4.0 mi east of Madison Junction, 16.7 mi east of West Yellowstone, and at mile 5.6.

DRAINAGE AREA.--118 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1913 to September 1916 (incomplete record most years), October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 6,940 ft, from topographic map. Nonrecording gage at site 0.1 mi downstream at different datum, 1913-1916.

REMARKS.--Estimated daily discharges: Nov. 23, 30, Dec. 10-12, Feb. 8-12. Water-discharge records good except those for discharges over 300 ft^3/s, which are fair. No regulation or diversions upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 809 ft^3/s May 30, 1986, gage height, 4.53 ft, corrected; minimum observed, 62 ft^3/s Mar. 10-17, 1915.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 809 ft^3/s May 30, gage height, 4.53 ft; minimum daily, 66 ft^3/s Feb. 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	83	82	82	73	79	90	132	184	543	177	130	112
2	83	85	83	74	78	89	125	202	535	176	127	113
3	86	87	87	75	79	86	116	235	576	173	125	103
4	84	87	82	73	78	86	117	251	550	174	124	100
5	84	90	82	74	78	84	117	225	492	166	121	99
6	84	85	82	76	77	82	127	220	470	164	120	98
7	104	83	84	75	72	83	140	208	433	166	118	97
8	95	90	86	72	72	99	146	196	406	164	119	97
9	92	88	81	73	70	98	161	185	430	189	123	99
10	91	84	80	74	70	91	156	188	387	205	125	98
11	95	89	78	74	66	91	164	183	343	212	118	96
12	96	87	80	71	71	88	158	174	311	178	121	94
13	89	87	77	72	78	87	144	166	293	161	118	95
14	88	84	77	71	77	85	131	173	271	153	115	97
15	88	81	78	72	83	84	127	162	293	148	112	98
16	89	80	78	74	78	83	140	158	255	149	110	96
17	89	84	78	77	78	85	124	164	233	160	110	96
18	86	85	78	75	80	80	116	181	222	135	108	103
19	84	78	78	76	79	79	112	205	204	132	108	107
20	85	79	78	79	78	79	115	237	201	140	111	126
21	86	81	74	78	80	80	135	287	210	139	137	112
22	91	80	72	74	82	84	182	323	204	135	141	101
23	88	80	73	79	83	84	220	269	203	141	114	96
24	89	80	74	78	85	87	199	265	201	137	111	96
25	89	85	72	73	95	87	177	300	197	147	116	98
26	89	81	73	74	96	83	167	351	196	164	118	97
27	86	79	73	76	92	90	152	428	195	148	113	98
28	86	82	72	78	91	106	157	507	193	137	107	94
29	84	85	70	78	---	124	154	645	186	133	105	92
30	82	80	71	79	---	138	160	673	180	131	103	95
31	82	---	69	79	---	149	---	588	---	135	114	---
TOTAL	2727	2508	2402	2326	2225	2841	4371	8533	9413	4869	3642	3003
MEAN	88.0	83.6	77.5	75.0	79.5	91.6	146	275	314	157	117	100
MAX	104	90	87	79	96	149	220	673	576	212	141	126
MIN	82	78	69	71	66	79	112	158	180	131	103	92
AC-FT	5410	4970	4760	4610	4410	5640	8670	16930	18670	9660	7220	5960

CAL YR 1985	TOTAL	40889	MEAN	112	MAX	472	MIN	65	AC-FT	81100
WTR YR 1986	TOTAL	48860	MEAN	134	MAX	673	MIN	66	AC-FT	96910

06037000 GIBBON RIVER NEAR WEST YELLOWSTONE, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: September 1983 to current year.
WATER TEMPERATURE: August 1983 to current year.

INSTRUMENTATION.--Water-quality monitor since Aug. 31, 1983.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 538 microsiemens, Sep. 9, 1985; minimum, 77 microsiemens, May 30, 1986.
WATER TEMPERATURE: Maximum, 23.5°C, July 8, 1985; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 517 microsiemens, Feb. 7; minimum, 77 microsiemens, May 30.
WATER TEMPERATURE: Maximum, 21.5°C, Aug. 18, 27, 28; minimum, 0.0°C on many days during winter period.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 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	422	398	407	413	399	409	460	434	446	420	404	412
2	414	401	409	441	402	423	444	430	436	417	401	409
3	415	399	405	440	421	427	442	417	430	407	396	402
4	412	388	394	420	398	409	438	424	428	397	384	389
5	414	398	404	447	409	424	438	423	431	404	389	397
6	424	411	416	427	390	410	447	433	441	402	379	390
7	458	419	440	431	414	423	450	442	446	380	358	365
8	435	415	426	439	408	425	460	445	454	370	364	367
9	436	416	424	456	431	439	458	438	448	386	359	371
10	442	408	422	453	423	434	466	404	439	373	353	363
11	445	417	425	448	422	437	475	451	461	376	359	366
12	434	406	417	443	420	431	467	448	461	376	353	364
13	431	403	415	443	416	424	460	448	456	408	353	384
14	428	406	412	427	408	418	468	454	459	432	389	410
15	428	413	419	447	421	430	467	457	463	448	405	435
16	416	400	410	455	432	445	469	457	465	461	422	442
17	412	391	399	451	430	441	488	466	479	472	414	448
18	397	384	392	455	441	445	473	455	465	495	435	466
19	407	388	394	452	435	445	462	448	454	495	439	477
20	460	405	428	464	431	447	455	445	450	483	450	469
21	422	403	410	459	448	454	456	438	449	476	452	462
22	439	397	418	458	442	450	469	432	449	473	449	461
23	429	394	414	469	430	454	460	434	445	485	438	463
24	425	402	413	457	430	445	450	426	434	476	449	462
25	407	399	403	471	434	457	441	423	430	495	456	471
26	400	385	390	460	443	452	471	431	461	492	452	468
27	398	386	391	463	449	457	482	417	442	475	436	455
28	411	397	403	469	451	462	445	421	432	478	416	445
29	404	392	397	479	461	469	435	415	423	430	402	415
30	419	400	408	483	449	472	430	406	419	420	404	412
31	419	411	416				415	404	409	456	386	414
MONTH	460	384	410	483	390	439	488	404	445	495	353	421

06037000 GIBBON RIVER NEAR WEST YELLOWSTONE, MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 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	470	426	444	431	413	423	383	344	366	329	274	313
2	469	416	452	436	416	426	396	377	388	273	231	257
3	469	444	454	438	415	424	395	374	383	219	160	198
4	484	460	473	448	427	440	396	379	388	162	143	153
5	488	470	480	455	436	446	400	376	387	204	168	189
6	500	470	482	459	439	450	373	344	365	229	203	218
7	517	460	495	461	435	450	345	325	336	242	223	232
8	503	458	483	458	435	445	339	311	329	257	237	246
9	478	452	466	458	431	443	327	304	315	267	247	257
10	480	460	469	428	393	411	320	301	309	284	260	267
11	480	439	453	437	413	428	334	298	320	286	263	272
12	488	454	475	436	417	428	351	313	327	286	271	277
13	484	446	467	454	409	431	353	335	344	296	276	285
14	473	449	461	450	428	441	366	336	344	307	281	290
15	476	452	465	447	430	439	391	347	365	292	273	285
16	483	437	461	477	427	444	371	343	357	289	274	284
17	475	434	455	463	418	441	368	353	362	283	264	275
18	483	456	469	465	382	429	365	352	359	265	251	259
19	493	449	469	469	449	459	373	357	367	252	225	240
20	482	440	467	462	445	453	380	360	371	220	181	205
21	448	420	430	463	431	450	359	314	347	174	160	166
22	426	377	409	456	439	450	304	249	287	169	147	158
23	379	328	366	455	437	447	254	234	244	174	163	169
24	327	291	308	465	437	449	253	229	239	165	155	160
25	365	227	287	461	432	450	291	257	272	154	133	142
26	428	404	419	449	430	440	307	287	297	139	123	130
27	446	419	433	440	415	427	313	296	303	125	110	119
28	440	417	429	429	388	411	334	304	321	113	105	109
29				398	365	385	324	293	311	109	99	104
30				378	346	364	335	314	326	111	77	98
31				355	339	348				90	78	85
MONTH	517	227	444	477	339	431	400	229	334	329	77	208
		JUNE			JULY			AUGUST			SEPTEMBER	
1	127	83	93	225	217	222	289	278	284	333	321	324
2	98	84	90	230	219	225	289	278	284	348	328	335
3	137	99	123	234	221	229	290	280	286	332	326	329
4	140	130	136	238	224	232	290	280	287	338	326	334
5	145	123	140	235	228	232	292	284	288	340	331	337
6	145	122	138	240	226	234	295	285	290	339	330	334
7	147	132	142	243	230	238	294	285	290	340	332	336
8	148	142	146	245	235	240	296	286	292	342	330	338
9	159	143	149	273	238	248	301	290	295	351	336	342
10	151	142	147	263	238	244	365	296	312	343	333	339
11	151	146	149	268	241	248	302	295	298	339	332	336
12	152	148	150	246	237	242	313	295	302	341	330	336
13	158	150	154	250	238	245	311	295	303	342	333	338
14	169	159	165	252	241	247	306	298	302	345	331	339
15	187	162	169	255	246	251	308	296	301	346	336	341
16	175	166	171	258	247	253	308	296	302	344	333	338
17	181	173	177	269	248	254	306	294	302	344	331	339
18	185	174	179	260	247	255	308	297	302	365	332	345
19	184	175	180	260	251	257	308	296	303	343	325	336
20	185	178	182	266	255	262	314	304	308	368	324	344
21	186	178	183	271	261	266	334	295	307	333	326	328
22	190	181	186	273	263	268	335	294	308	337	326	332
23	194	183	190	274	265	270	315	307	312	345	328	337
24	203	191	197	274	264	270	319	312	316	351	334	344
25	210	200	205	293	267	277	329	310	315	350	338	344
26	213	202	210	289	272	279	337	309	316	343	332	338
27	217	206	212	279	273	276	325	315	321	342	332	337
28	218	211	215	283	270	277	327	319	323	344	335	339
29	222	212	217	284	269	279	327	320	324	342	334	339
30	224	214	219	284	273	280	326	322	324	352	339	343
31				289	280	284	333	318	324			
MONTH	224	83	167	293	217	254	365	278	304	368	321	337
YEAR	517	77	349									

06037000 GIBBON RIVER NEAR WEST YELLOWSTONE, MT--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	9.5	5.5	8.0	7.0	5.5	6.5	3.0	1.0	2.0	4.0	3.0	3.5
2	12.5	8.0	10.0	9.5	6.5	8.0	4.5	2.0	3.5	4.0	1.5	3.0
3	11.5	8.5	10.0	10.5	8.0	9.0	5.5	2.0	4.0	4.5	2.5	3.5
4	11.5	5.5	8.5	10.0	6.5	8.0	4.0	1.0	2.5	3.0	.5	1.5
5	11.0	7.0	9.0	9.0	5.5	7.5	4.0	1.0	2.5	3.0	.0	1.0
6	11.0	8.5	10.0	6.5	4.5	5.5	5.5	2.0	4.0	5.5	3.5	4.5
7	10.5	4.0	7.5	7.0	5.0	6.0	6.5	5.0	5.5	4.5	2.5	3.5
8	6.5	3.5	4.5	6.0	4.0	5.0	6.0	3.5	5.0	4.0	1.0	2.5
9	8.0	3.5	5.5	5.0	2.5	4.0	3.5	1.0	2.5	5.0	1.5	3.0
10	9.5	3.0	6.0	4.5	1.0	3.0	1.0	.0	.0	6.0	2.5	4.0
11	10.5	5.5	8.0	5.5	2.5	3.5	.0	.0	.0	5.0	2.0	3.5
12	8.5	6.5	8.0	6.5	2.5	4.0	1.5	.0	.5	4.0	1.0	2.5
13	9.0	4.0	6.5	6.0	4.0	5.0	2.5	.0	1.5	4.5	1.0	2.5
14	8.5	5.0	7.0	6.5	4.0	5.0	3.5	2.0	3.0	4.5	.0	2.5
15	10.0	7.0	8.5	5.0	3.0	4.0	3.5	1.5	2.5	4.0	.5	2.5
16	11.0	7.0	9.0	5.0	2.5	4.0	4.5	3.0	4.0	5.5	4.0	4.5
17	11.0	7.0	8.5	6.0	4.0	5.0	4.5	4.0	4.5	5.0	3.5	4.5
18	11.5	6.5	8.5	5.0	2.5	4.0	5.0	4.0	4.5	6.5	3.5	5.0
19	11.0	6.5	8.5	2.0	.0	1.0	5.5	4.5	5.0	8.0	6.0	7.0
20	11.5	8.0	9.5	2.5	.5	1.5	5.5	4.0	4.5	7.0	4.5	5.5
21	10.5	7.5	9.0	2.5	1.0	1.5	4.5	2.0	3.0	5.0	3.5	4.0
22	9.0	5.5	7.0	1.5	.0	1.0	3.5	1.0	2.5	4.5	1.5	3.0
23	8.0	6.0	7.0	.5	.0	.0	4.5	1.5	3.0	5.5	4.0	4.5
24	9.0	7.5	8.5	2.5	.5	1.5	4.5	2.5	3.5	5.0	2.0	3.5
25	10.5	8.0	9.0	4.0	1.5	2.5	4.0	1.5	2.5	4.0	.5	2.0
26	11.0	9.0	9.5	1.5	.0	.5	5.0	2.5	3.5	4.5	.5	2.5
27	11.0	7.5	9.0	2.0	.0	1.0	5.0	3.0	4.0	5.5	1.5	3.5
28	10.5	8.0	9.0	4.0	1.0	2.5	3.5	.5	2.0	7.0	5.0	6.0
29	10.0	6.5	8.5	3.5	.0	2.0	3.5	.0	2.0	7.5	6.5	7.0
30	9.5	6.5	8.0	1.5	.0	.0	3.5	1.0	2.0	8.0	6.5	7.0
31	9.0	6.5	7.5				3.5	.5	2.0	8.5	7.0	8.0
MONTH	12.5	3.0	8.0	10.5	.0	3.5	6.5	.0	3.0	8.5	.0	4.0
	FEBRUARY			MARCH			APRIL			MAY		
1	8.0	7.0	7.5	10.0	5.0	7.5	9.5	5.5	7.5	14.5	6.0	10.0
2	8.0	7.0	7.5	11.5	6.5	8.5	9.0	7.0	8.5	14.5	8.0	11.0
3	7.0	6.0	6.5	11.0	5.0	7.5	12.0	5.0	8.0	13.0	7.0	10.0
4	7.0	5.0	6.0	10.0	6.0	7.5	11.0	6.5	8.5	9.5	5.5	7.5
5	6.0	4.0	5.0	10.5	5.0	7.5	13.0	6.0	9.5	9.0	4.5	7.0
6	4.5	1.5	3.0	10.5	7.0	8.5	14.0	7.0	10.0	8.0	5.5	7.0
7	3.0	.0	1.0	9.0	8.0	8.5	12.0	6.5	9.5	8.5	6.0	7.0
8	1.0	.0	.0	7.5	5.5	6.5	13.5	7.5	10.0	8.0	5.5	6.5
9	2.0	.0	.5	8.5	5.5	7.0	11.0	8.0	9.5	8.0	6.0	7.0
10	3.0	.0	1.5	7.5	6.0	7.0	11.0	7.0	9.0	7.5	6.5	7.0
11	2.0	.0	.5	10.0	6.5	8.0	11.0	6.0	8.5	8.0	5.5	7.0
12	3.5	.0	2.0	9.0	7.0	8.0	8.5	4.5	7.0	10.0	6.0	8.0
13	3.5	1.0	2.5	8.5	6.0	7.5	7.5	3.5	5.0	9.0	6.5	8.0
14	4.5	2.5	3.5	8.0	4.5	6.0	9.5	3.0	6.0	11.0	5.5	8.0
15	5.0	3.5	4.5	9.0	5.0	7.0	12.5	5.0	8.5	11.0	6.0	9.0
16	5.5	4.0	4.5	9.0	3.0	6.0	9.5	7.5	8.5	13.0	8.0	10.5
17	5.0	3.5	4.0	8.5	5.5	7.0	11.5	6.5	8.5	13.0	7.0	10.0
18	4.5	4.0	4.5	8.5	3.5	6.0	10.0	6.0	8.0	11.5	7.5	10.0
19	5.0	3.5	4.0	9.5	5.5	7.5	10.0	6.0	8.0	14.0	8.0	11.0
20	8.5	4.0	5.5	12.5	5.5	8.5	13.0	8.5	10.5	14.5	8.5	11.5
21	6.5	4.0	5.0	11.5	7.0	8.5	15.0	8.5	11.5	12.0	7.0	9.5
22	5.0	3.0	4.5	11.5	7.0	9.0	13.5	8.5	10.5	9.0	4.5	6.5
23	7.0	4.0	5.5	11.0	7.0	9.0	10.5	7.5	9.0	12.0	4.5	8.5
24	10.0	7.0	8.0	10.5	6.5	8.5	9.0	6.5	7.5	14.0	7.0	11.0
25	10.5	8.5	9.0	9.5	5.0	7.0	8.5	6.5	7.5	15.5	8.0	12.0
26	9.5	7.0	8.5	12.5	5.5	8.5	9.5	6.0	7.5	16.5	8.5	13.0
27	9.5	4.0	7.0	14.0	6.5	10.0	7.5	6.0	7.0	17.0	8.5	13.0
28	10.0	4.0	7.0	14.0	7.5	10.0	11.0	6.5	8.5	17.5	9.0	13.5
29				13.0	7.5	10.0	8.5	3.0	5.0	17.5	9.0	13.5
30				11.5	7.0	9.0	11.5	3.0	7.0	18.0	8.5	13.5
31				11.0	6.0	8.5				16.5	9.5	13.5
MONTH	10.5	.0	4.5	14.0	3.0	8.0	15.0	3.0	8.5	18.0	4.5	9.5

06037000 GIBBON RIVER NEAR WEST YELLOWSTONE, MT--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
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.5	9.5	13.0	19.0	11.5	15.5	20.5	13.0	16.5	16.0	13.0	14.5
2	17.0	10.0	13.5	20.0	13.0	16.5	20.0	13.0	16.5	17.5	13.5	15.0
3	14.5	10.5	12.5	17.0	14.5	15.5	20.0	14.0	16.5	18.0	12.5	15.0
4	18.0	10.0	14.0	18.5	12.0	15.0	19.5	13.5	16.0	20.0	12.5	16.0
5	16.5	12.0	14.5	14.5	9.5	12.0	20.0	13.0	16.5	20.0	14.0	16.5
6	14.5	10.5	12.5	17.5	9.0	13.0	20.0	13.0	16.5	19.0	13.0	15.5
7	15.0	10.5	13.0	17.0	12.5	14.5	20.0	13.0	16.5	18.5	12.5	15.5
8	14.5	11.5	13.0	16.0	11.5	13.5	18.5	13.5	15.5	17.5	13.5	15.0
9	13.5	9.5	11.5	16.0	12.0	14.0	20.0	13.0	16.0	15.5	12.5	14.0
10	16.5	9.5	13.0	15.5	12.0	13.5	20.5	12.5	16.5	14.0	12.0	13.0
11	17.0	11.5	14.5	16.0	13.0	14.0	18.5	15.0	16.5	15.0	11.5	13.0
12	16.0	12.5	14.5	16.5	10.5	14.0	19.5	14.0	16.0	15.0	11.0	13.0
13	17.5	11.5	14.5	18.5	11.5	14.5	18.5	13.0	15.5	15.5	11.0	13.0
14	16.0	12.0	14.5	18.0	12.5	15.5	20.0	13.5	16.5	15.0	12.0	13.5
15	16.5	12.0	14.5	17.0	13.0	15.0	20.5	13.0	16.5	15.0	11.5	13.0
16	18.5	11.5	15.0	15.0	12.5	14.0	20.5	14.0	17.0	14.5	10.5	12.5
17	19.0	13.0	16.0	16.5	10.0	13.0	20.5	15.0	17.5	14.0	10.5	12.5
18	17.5	13.0	15.5	16.5	11.5	13.5	21.5	14.0	17.5	12.5	10.5	11.5
19	18.5	13.0	15.5	19.0	10.5	14.5	17.5	15.0	16.0	12.0	10.0	11.0
20	16.5	12.0	14.5	19.0	13.5	16.0	21.0	13.5	16.5	11.5	9.0	10.0
21	16.0	11.0	13.5	19.5	13.0	16.0	17.5	13.5	15.5	12.5	8.0	10.0
22	17.5	10.0	14.0	18.5	13.0	15.5	19.0	12.0	15.0	13.5	8.0	10.5
23	19.5	12.0	15.5	18.5	13.0	15.5	17.0	13.0	15.0	13.5	8.0	10.5
24	19.0	12.5	16.0	19.0	13.5	16.0	20.5	13.5	16.5	11.5	10.5	11.0
25	19.0	13.5	16.5	16.5	13.5	15.0	18.5	15.5	16.5	10.5	8.5	9.5
26	20.0	13.5	16.5	16.0	12.5	14.0	20.5	14.5	17.0	10.0	7.5	8.5
27	19.0	14.0	16.0	16.0	12.5	14.0	21.5	14.5	17.5	10.0	8.0	9.0
28	17.5	13.0	15.5	18.0	12.0	15.0	21.5	14.5	18.0	9.5	8.5	9.0
29	18.0	13.5	15.5	19.0	12.5	15.5	18.0	14.5	16.5	10.0	8.5	9.0
30	18.0	11.5	14.5	16.5	13.5	14.5	18.5	14.5	16.5	10.5	8.5	9.5
31				19.5	13.0	16.0	17.0	14.0	15.5			
MONTH	20.0	9.5	14.5	20.0	9.0	14.5	21.5	12.0	16.5	20.0	7.5	12.5
YEAR	21.5	.0	9.0									

06037500 MADISON RIVER NEAR WEST YELLOWSTONE, MT

LOCATION.--Lat 44°39'25", long 111°04'03", in NE¼NW¼SW¼, revised, sec.36, T.13 S., R.5 E., Gallatin County, Hydrologic Unit 10020007, Yellowstone National Park, on left bank 0.7 mi downstream of Montana-Wyoming stateline, 1.5 mi east of West Yellowstone, 16.4 mi downstream from Gibbon River, and at mile 132.7.

DRAINAGE AREA.--420 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1913 to December 1917, July 1918 to October 1921, June 1922 to September 1973, August 1983 to September 1986 (discontinued). Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 6,650 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Oct. 20, 1918, nonrecording gage, and Oct. 20, 1918 to June 29, 1930, nonrecording gage or water-stage recorder at sites 2.5 mi upstream at different datums. Supplementary nonrecording gage at site 0.3 mi downstream at different datum used at times during 1927-30.

REMARKS.--Estimated daily discharges: Dec. 11-12. Water-discharge records good. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--61 years (1913-17, 1918-21, 1922-73, 1984-86), 491 ft^3/s, 15.88 in/yr, 355,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,340 ft^3/s May 31, 1986, gage height, 3.56 ft, maximum gage height, about 10.0 ft Jan. 8, 1937 (ice jam); minimum discharge, 100 ft^3/s Feb. 7, 1933, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,070 ft^3/s, revised, and maximums (*)

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 4	0500	1,110	2.68	May 31	0800	*2,340	*3.56
May 22	0800	1,300	2.84				

Minimum discharge, 369 ft^3/s Feb. 8, 9, 11, gage height, 1.90 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	437	445	453	420	433	476	597	715	2150	708	581	570
2	439	452	460	422	428	471	574	783	2130	688	569	598
3	441	456	472	429	433	461	528	883	2050	678	561	558
4	433	450	453	420	425	457	534	1040	1840	674	560	543
5	433	480	448	413	422	450	520	956	1800	660	553	535
6	437	459	447	430	418	450	546	867	1710	651	552	526
7	515	449	454	419	401	464	596	825	1560	645	545	526
8	518	481	453	417	397	604	632	779	1440	650	545	528
9	486	469	443	417	402	580	659	742	1550	679	544	537
10	468	459	429	418	410	519	641	767	1530	759	564	535
11	479	471	420	418	393	500	700	773	1280	758	546	532
12	490	460	430	411	408	487	697	711	1280	744	558	524
13	461	456	446	412	430	472	689	686	1250	668	554	524
14	458	450	436	409	416	462	604	731	1180	635	545	533
15	455	443	435	413	450	455	586	682	1280	620	537	534
16	463	437	434	415	420	445	613	656	1200	620	528	526
17	467	445	436	428	422	454	576	643	1110	715	526	523
18	456	450	433	417	428	438	536	675	1070	653	522	553
19	451	430	435	426	438	433	516	736	1020	624	519	576
20	454	423	432	438	444	431	513	862	984	604	533	684
21	459	437	425	434	443	437	570	1090	940	596	565	645
22	493	432	421	421	452	458	687	1230	885	588	725	580
23	483	423	420	437	451	458	804	1050	858	608	596	557
24	495	439	421	427	461	479	758	988	841	604	585	559
25	512	467	417	414	503	482	706	1110	828	603	591	571
26	502	425	416	416	540	456	680	1350	841	744	620	573
27	484	457	419	420	504	472	633	1590	801	756	571	570
28	475	451	415	421	482	527	642	1830	782	637	552	556
29	466	476	410	429	---	593	645	2000	755	597	542	551
30	455	454	413	434	---	629	641	2100	732	584	545	556
31	452	---	408	432	---	678	---	2140	---	611	569	---
TOTAL	14517	13526	13434	13077	12254	15178	18623	31990	37677	20361	17403	16683
MEAN	468	451	433	422	438	490	621	1032	1256	657	561	556
MAX	518	481	472	438	540	678	804	2140	2150	759	725	684
MIN	433	423	408	409	393	431	513	643	732	584	519	523
AC-FT	28790	26830	26650	25940	24310	30110	36940	63450	74730	40390	34520	33090

CAL YR 1985	TOTAL	185054	MEAN	507	MAX	1240	MIN	370	AC-FT	367100
WTR YR 1986	TOTAL	224723	MEAN	616	MAX	2150	MIN	393	AC-FT	445700

06037500 MADISON RIVER NEAR WEST YELLOWSTONE, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year (discontinued).

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1983 to July 1986 (discontinued).
WATER TEMPERATURE: July 1983 to July 1986 (discontinued).

INSTRUMENTATION.--Water-quality monitor since July 22, 1983. Equipment removed July 22, 1986.

REMARKS.--No temperature records Oct. 24 to Nov. 9 (erratic readings).

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 558 microsiemens, Mar. 24, 25, 1986; minimum , 78 microsiemens, May 30, 1986.
WATER TEMPERATURE: Maximum, 25.5°C, Aug. 6, 9, 1983; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 558 microsiemens, Mar. 24, 25; minimum, 78 microsiemens, May 30.
WATER TEMPERATURE: Maximum, not determined; minimum, 0.0°C on many days during winter period.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 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	484	471	477	496	482	488	495	488	492	497	491	494
2	485	474	479	505	483	498	493	485	489	498	484	491
3	480	473	477	510	487	501	488	470	483	497	490	494
4	476	464	471	494	482	487	487	467	477	499	490	494
5	474	463	471	492	476	486	497	482	489	503	489	498
6	483	472	479	484	472	477	502	494	498	506	495	500
7	481	463	472	492	474	485	499	495	497	503	494	499
8	471	430	446	480	461	472	506	495	501	509	493	502
9	482	463	472	493	467	486	506	493	498	514	503	509
10	487	473	481	502	488	496	502	480	496	509	482	501
11	494	479	487	499	489	495	516	493	501	497	479	485
12	491	475	484	501	494	497	497	484	491	509	487	501
13	485	473	478	503	493	499	500	489	494	516	492	507
14	493	476	482	499	490	495	498	489	493	510	485	499
15	486	476	481	501	491	497	501	495	498	514	478	500
16	486	473	481	508	495	501	501	496	498	505	470	485
17	486	470	479	507	497	503	504	496	500	503	475	491
18	478	467	472	507	500	503	506	496	501	507	487	495
19	481	469	474	505	498	501	503	496	499	516	493	503
20	485	475	479	505	495	501	503	496	498	520	494	506
21	485	469	476	510	497	505	501	495	498	509	481	494
22	485	457	476	500	420	494	501	496	498	510	488	502
23	475	454	462	501	489	495	503	491	498	510	492	501
24	508	477	494	499	480	491	502	494	498	500	483	493
25	494	469	481	483	471	477	499	493	496	502	486	492
26	477	455	467	495	480	485	502	492	498	508	477	495
27	468	461	464	497	486	493	500	495	498	512	501	506
28	477	462	470	499	488	493	498	493	495	510	491	502
29	477	465	472	491	476	483	502	493	498	508	491	499
30	483	468	477	491	449	476	502	497	500	509	474	490
31	494	481	488				499	493	495	487	462	475
MONTH	508	430	476	510	420	492	516	467	496	520	462	497

06037500 MADISON RIVER NEAR WEST YELLOWSTONE, MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 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	506	481	490	474	468	471	456	427	440	420	389	401
2	508	483	497	476	467	472	472	445	458	408	340	359
3	513	484	500	478	472	475	494	461	479	360	299	329
4	512	480	496	481	472	478	501	452	479	325	239	267
5	505	487	497	482	472	479	485	455	474	309	269	281
6	505	480	494	485	469	479	485	449	466	328	305	315
7	509	485	497	486	472	480	475	410	438	350	332	338
8	510	466	492	475	417	443	435	401	423	367	347	356
9	519	476	496	439	419	428	432	380	409	389	364	379
10	501	477	490	447	438	441	426	398	412	394	381	386
11	494	465	481	456	443	450	426	385	408	393	374	382
12	490	475	483	455	445	450	431	411	416	407	388	397
13	490	462	475	456	450	453	427	394	409	411	398	405
14	493	456	478	469	449	458	444	413	429	418	395	406
15	485	461	473	468	457	463	462	429	446	423	400	407
16	487	456	471	493	463	471	462	417	444	425	413	418
17	477	459	471	515	486	499	454	417	446	429	411	416
18	483	438	466	522	490	508	465	455	459	421	394	407
19	477	421	436	532	500	515	467	458	463	400	367	383
20	496	437	472	524	501	512	474	466	471	373	320	343
21	500	456	484	541	494	519	474	438	452	328	260	283
22	482	469	475	551	510	537	447	374	403	274	235	252
23	496	472	486	555	497	525	380	339	356	282	247	265
24	494	476	486	558	533	546	349	330	338	280	264	273
25	480	469	474	558	520	532	368	348	357	279	240	256
26	468	451	457	551	525	539	383	368	376	257	192	213
27	468	457	461	550	514	536	390	383	388	207	157	174
28	471	465	468	529	494	508	409	389	396	182	134	155
29				497	447	462	414	382	394	119	81	90
30				478	420	445	412	371	393	92	78	86
31				459	384	419				92	79	86
MONTH	519	421	480	558	384	484	501	330	424	429	78	307
		JUNE			JULY			AUGUST			SEPTEMBER	
1	92	80	86	225	212	217						
2	92	80	86	253	221	243						
3	94	82	88	259	247	253						
4	101	94	96	259	242	251						
5	102	92	97	251	240	246						
6	106	97	101	254	241	248						
7	112	104	107	256	247	251						
8	115	111	113	255	244	251						
9	123	114	117	254	241	248						
10	121	105	112	248	233	241						
11	128	122	124	253	233	242						
12	129	122	125	244	236	240						
13	127	122	125	257	239	247						
14	161	128	142	254	245	249						
15	179	150	166	262	248	253						
16	171	151	162	367	358	363						
17	180	161	170	365	341	353						
18	195	167	185	363	343	354						
19	199	178	191	367	358	363						
20	196	183	190	376	364	370						
21	205	185	197	381	372	375						
22	199	187	193	382	374	378						
23	202	197	200									
24	206	197	201									
25	206	197	202									
26	206	199	202									
27	207	200	204									
28	210	204	208									
29	216	208	212									
30	216	208	213									
31												
MONTH	216	80	154	382	212	283						
YEAR	558	78	413									

06037500 MADISON RIVER NEAR WEST YELLOWSTONE, MT--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	10.0	7.0	8.5				2.0	.0	1.0	4.0	3.0	3.5
2	12.5	9.0	10.5				4.5	1.5	3.0	4.0	2.0	3.0
3	11.5	9.0	10.5				5.5	2.0	4.0	4.0	3.0	3.5
4	11.5	7.0	9.0				2.5	1.5	2.0	2.5	.0	1.0
5	11.0	8.0	9.5				3.0	1.0	2.0	.0	.0	.0
6	11.5	9.0	10.5				4.5	2.0	3.5	5.0	.0	3.5
7	11.0	6.5	9.0				7.0	5.0	6.0	4.5	.0	3.0
8	6.0	4.0	5.0				6.5	4.0	6.0	3.5	1.5	2.0
9	8.0	4.5	6.0				4.5	1.5	3.0	4.5	2.0	3.0
10	9.0	4.5	6.5	4.5	2.5	3.5	1.5	.0	.0	6.0	3.0	4.5
11	10.0	6.5	8.5	5.5	3.5	4.0	.0	.0	.0	5.0	3.0	4.0
12	10.0	7.0	9.0	6.0	3.0	4.5	.0	.0	.0	3.5	1.5	2.5
13	8.5	5.0	7.0	6.5	4.5	5.5	1.5	.0	1.0	4.0	1.5	2.5
14	8.5	6.5	7.5	7.0	4.5	5.5	3.0	1.5	2.5	3.5	1.0	2.5
15	11.5	7.5	9.0	5.5	3.5	4.5	3.5	2.0	2.5	3.5	1.5	2.0
16	11.0	7.5	9.5	5.0	3.0	4.0	4.0	2.5	3.5	5.5	3.5	5.0
17	11.5	7.5	9.5	6.0	4.0	5.0	5.0	4.0	4.5	5.5	4.0	5.0
18	11.0	7.5	9.0	6.0	2.5	4.5	5.5	4.0	5.0	6.5	4.0	5.5
19	11.0	7.5	9.5	2.0	.5	1.5	6.0	4.0	5.5	9.0	6.5	7.5
20	12.0	8.5	10.0	2.5	.5	1.5	5.5	3.5	4.5	7.5	5.5	7.0
21	10.5	6.0	9.0	2.5	1.5	2.0	4.0	2.5	3.0	5.5	4.0	4.5
22	10.0	4.5	7.0	1.0	.0	.5	2.5	1.5	2.0	4.5	2.5	3.5
23	7.5	4.0	5.5	.0	.0	.0	3.5	1.0	2.0	5.5	4.0	4.5
24				2.0	.0	1.0	4.5	2.5	3.0	5.0	3.0	4.0
25				4.0	1.5	2.5	3.0	1.5	2.0	3.5	1.5	2.5
26				1.5	.0	.5	5.0	2.0	3.5	3.5	1.0	2.0
27				1.5	.0	.5	5.0	3.0	4.0	5.0	1.5	3.5
28				3.0	.5	2.0	2.5	1.0	1.5	7.5	5.0	6.5
29				3.5	1.0	2.5	2.5	.0	1.5	8.5	7.0	7.5
30				1.0	.0	.5	2.5	1.0	2.0	9.0	7.5	8.0
31							3.0	1.0	2.0	9.5	8.0	9.0
MONTH	12.5	4.0	8.5	7.0	.0	2.5	7.0	.0	3.0	9.5	.0	4.0
	FEBRUARY			MARCH			APRIL			MAY		
1	9.5	8.0	8.5	10.0	6.5	8.0	10.0	7.5	9.0	15.5	8.5	12.5
2	9.5	8.0	8.5	11.5	8.0	9.5	11.0	8.5	10.0	17.0	12.5	15.0
3	8.5	7.0	7.5	11.0	7.0	9.0	12.5	6.0	9.0	15.5	12.0	14.0
4	8.0	6.0	7.0	10.5	7.5	8.5	11.5	9.0	10.0	14.0	10.0	11.5
5	6.5	5.0	6.0	10.0	6.5	8.5	13.5	8.0	11.0	11.0	8.5	9.5
6	6.0	1.5	4.0	11.0	8.5	9.5	15.0	9.5	12.0	10.5	9.0	9.5
7	2.0	.0	.5	10.0	9.0	9.5	13.0	10.0	11.5	10.0	9.0	9.5
8	1.5	.0	.0	9.0	6.5	7.5	15.0	11.0	12.5	10.0	8.0	9.0
9	1.0	.0	.5	9.5	6.0	7.5	13.0	11.0	12.0	10.5	8.0	9.0
10	2.5	.0	1.0	8.5	7.5	8.0	12.5	10.0	11.0	10.5	9.5	10.0
11	1.0	.0	.0	10.5	7.5	9.0	13.0	9.0	11.0	10.5	8.0	9.0
12	3.0	.0	1.0	10.5	8.0	9.0	11.5	6.0	9.5	12.5	8.5	10.5
13	3.5	2.0	2.5	10.0	7.0	8.5	9.0	5.0	6.5	12.0	10.0	10.5
14	4.5	2.5	3.5	9.5	6.5	7.5	10.5	4.5	7.5	11.5	8.5	10.0
15	6.0	4.0	4.5	9.5	6.5	7.5	13.0	7.5	10.5	13.0	8.5	11.0
16	5.0	3.5	4.0	9.0	5.0	7.0	12.0	9.5	10.5	15.0	10.5	12.5
17	4.5	3.0	3.5	10.0	7.0	8.5	13.0	8.5	10.5	14.0	10.5	12.5
18	5.0	3.5	4.0	8.5	5.0	7.0	11.5	8.0	10.0	15.0	11.5	13.0
19	5.0	3.5	4.0	10.0	6.0	8.0	12.0	8.0	10.0	17.0	11.5	14.5
20	7.0	4.0	5.5	12.0	7.0	9.5	14.0	10.0	11.5	17.5	13.5	15.5
21	6.5	4.5	5.5	13.0	8.5	10.0	17.0	11.0	14.0	15.0	11.0	13.0
22	5.5	3.5	4.5	12.0	9.0	10.5	15.5	12.5	14.0	12.0	8.5	10.0
23	7.5	5.0	6.5	11.5	8.5	10.0	13.0	10.5	11.5	13.5	7.5	10.5
24	11.0	7.0	9.0	11.5	7.5	9.5	10.5	9.5	10.0	15.5	11.0	13.5
25	12.0	9.0	10.0	9.5	6.0	7.5	10.5	9.5	9.5	16.5	13.0	15.0
26	11.0	8.0	9.5	12.0	6.5	9.5	10.0	8.5	9.5	16.5	13.0	15.0
27	9.5	6.0	8.0	13.5	8.5	11.0	9.5	8.0	8.5	16.0	12.0	14.5
28	9.5	6.0	8.0	14.0	9.5	12.0	13.5	8.0	10.5	16.0	12.0	14.5
29				13.5	10.0	12.0	11.0	5.5	8.5	16.0	11.5	14.5
30				13.0	10.0	11.5	12.5	4.5	8.5	16.0	11.5	14.5
31				11.5	8.5	10.0				16.0	12.0	14.5
MONTH	12.0	.0	5.0	14.0	5.0	9.0	17.0	4.5	10.5	17.5	7.5	12.0

06037500 MADISON RIVER NEAR WEST YELLOWSTONE, MT--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
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	13.0	15.0	23.5	17.5	20.5						
2	17.0	13.5	15.5	24.5	19.0	22.0						
3	17.0	13.5	14.5	22.5	20.5	21.5						
4	17.5	13.0	15.0	23.0	18.0	20.5						
5	17.5	15.5	16.5	20.0	15.0	17.0						
6	15.5	13.5	15.0	21.5	14.5	18.0						
7	16.5	13.5	15.0	23.0	18.0	20.5						
8	15.5	14.5	15.0	22.0	17.5	19.5						
9	15.0	13.0	14.0	21.5	18.0	19.5						
10	17.5	12.0	14.5	21.0	18.0	19.5						
11	19.0	15.5	17.5	21.0	19.0	20.0						
12	19.0	17.0	17.5	22.0	17.5	20.0						
13	19.0	15.5	17.5	23.5	18.0	21.0						
14	19.0	16.5	17.5	25.0	19.0	22.0						
15	18.5	16.0	17.0	22.5	19.5	21.0						
16	20.0	16.0	18.0	20.0	18.0	19.0						
17	21.5	17.0	19.5	20.0	16.0	18.0						
18	20.0	17.5	18.5	19.5	15.5	17.5						
19	20.5	16.5	18.5	22.0	15.5	19.0						
20	20.0	16.0	18.0	23.0	17.5	20.5						
21	19.0	15.5	17.0	23.0	17.5	20.0						
22	20.5	14.5	17.5	22.0	17.0	19.0						
23	22.5	16.5	19.5									
24	22.5	18.0	20.5									
25	23.5	18.5	21.0									
26	23.5	18.5	21.0									
27	23.0	19.0	21.0									
28	22.0	19.0	20.5									
29	23.5	19.0	21.0									
30	22.0	17.5	20.0									
31												
MONTH	23.5	12.0	17.5	25.0	14.5	20.0						
YEAR	25.0	.0	9.0									

06038500 MADISON RIVER BELOW HEBGEN LAKE, NEAR GRAYLING, MT

LOCATION.--Lat 44°52'00", long 111°20'15", NE¼NE¼NE¼ sec.22, T.11 S., R.3 E., Gallatin County, Hydrologic Unit 10020007, Gallatin National Forest, on right bank 1,500 ft downstream from Hebgen Dam, 8 mi northwest of Grayling, 17 mi upstream from West Fork, and at mile 108.8.
DRAINAGE AREA.--905 mi^2.
PERIOD OF RECORD.--June 1909 to current year. Prior to October 1938 adjusted runoff only, published in WSP 1309. Prior to October 1949, published as "below Hebgen Reservoir".
REVISED RECORDS.--WSP 1509: 1948. WSP 1559: Drainage area. WSP 1629: 1943. WSP 1709: 1959. WSP 1729: 1943.
GAGE.--Water-stage recorder. Datum of gage is 6,448.47 ft above National Geodetic Vertical Datum of 1929 (after 1959 earthquake). Prior to July 13, 1943, nonrecording gage in stilling well.
REMARKS.--No estimated daily discharges this year. Records good. Flow completely regulated by Hebgen Lake (station number 06038000). 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 for irrigation of about 1,100 acres upstream from station.
AVERAGE DISCHARGE.--77 years, 1,009 ft^3/s, 15.14 in/yr, 731,000 acre-ft/yr, adjusted for storage.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,200 ft^3/s Aug. 17, 1959, caused by wave over Hebgen Dam during earthquake, gage height, 5.3 ft, from floodmark, from rating curve extended above 3,500 ft^3/s on basis of slope-area measurement of peak flow; maximum observed unaffected by wave over dam, 5,980 ft^3/s June 3, 1943, gage height, 3.69 ft; minimum daily, 5.0 ft^3/s May 9-12, 1960.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,340 ft^3/s June 5, gage height, 3.08 ft; minimum daily, 734 ft^3/s Dec. 5, 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	1360	1360	1300	844	762	767	1000	1260	2140	1530	1170	1350
2	1360	1360	1210	843	762	766	1010	1270	2570	1530	1170	1660
3	1460	1360	1010	842	763	767	1010	1280	3150	1530	1170	1740
4	1820	1360	942	843	762	767	1010	1280	3220	1530	1180	1640
5	1910	1360	734	844	763	768	1010	1300	3280	1540	1190	1640
6	1910	1360	734	845	765	768	1010	1300	3230	1530	1190	1630
7	1910	1360	792	845	765	770	1010	1310	2840	1430	1190	1620
8	1910	1350	842	844	764	771	1010	1390	2860	1390	1190	1620
9	1900	1340	844	843	765	771	1010	1510	2770	1390	1090	1620
10	1890	1340	842	844	765	837	1060	1510	2670	1390	983	1620
11	1890	1340	840	844	765	1010	1200	1520	2520	1390	990	1620
12	1890	1340	841	844	766	1010	1200	1520	2530	1380	993	1610
13	1890	1340	840	843	766	1010	1200	1540	2530	1370	994	1610
14	1880	1340	840	843	764	1010	1200	1540	2530	1370	996	1610
15	1880	1340	840	842	764	1010	1200	1540	2530	1370	1090	1610
16	1880	1340	841	841	768	1010	1200	1550	2530	1370	1050	1610
17	1880	1320	841	843	768	1010	1200	1550	2530	1370	994	1600
18	1880	1310	842	840	767	1010	1210	1550	2530	1370	997	1600
19	1880	1310	840	839	766	1010	1210	1560	2410	1370	1000	1590
20	1870	1310	840	839	767	1010	1210	1560	2360	1370	1090	1590
21	1850	1310	841	819	767	1010	1220	1580	2190	1370	1130	1590
22	1850	1310	840	762	768	1000	1220	1590	1900	1240	1120	1590
23	1850	1310	839	762	764	1000	1220	1590	1240	1170	1120	1590
24	1750	1310	840	762	765	1000	1230	1600	971	1170	1120	1590
25	1620	1310	839	762	773	1000	1230	1610	961	1170	1120	1590
26	1490	1300	841	762	765	1000	1240	1620	1080	1170	1120	1590
27	1490	1300	841	762	766	1000	1250	1630	1500	1170	1160	1590
28	1490	1300	841	762	765	1000	1250	1640	1550	1170	1360	1590
29	1490	1300	844	762	---	1000	1260	1650	1550	1170	1360	1580
30	1450	1300	842	762	---	1000	1260	1670	1540	1170	1350	1580
31	1360	---	843	762	---	1000	---	1820	---	1170	1350	---
TOTAL	53940	39890	26906	25294	21430	28862	34550	46840	68212	41660	35027	48070
MEAN	1740	1330	868	816	765	931	1152	1511	2274	1344	1130	1602
MAX	1910	1360	1300	845	773	1010	1260	1820	3280	1540	1360	1740
MIN	1360	1300	734	762	762	766	1000	1260	961	1170	983	1350
AC-FT	107000	79120	53370	50170	42510	57250	68530	92910	135300	82630	69480	95350
MEAN †	896	899	829	798	782	954	1333	2311	2951	1323	1151	1112
CFSM †	.99	.99	.92	.88	.86	1.05	1.47	2.55	3.26	1.46	1.27	1.23
IN †	1.14	1.11	1.06	1.02	.90	1.22	1.64	2.94	3.64	1.68	1.47	1.37
AC-FT †	55100	53520	50970	49070	43410	58650	79330	142110	175600	81330	70780	66150

OBSERVED

CAL YR 1985	TOTAL	410000	MEAN	1123	MAX	1910	MIN	723	AC-FT	813200
WTR YR 1986	TOTAL	470681	MEAN	1290	MAX	3280	MIN	734	AC-FT	933600

ADJUSTED

CAL YR 1985	TOTAL	392841	MEAN	1076	CFSM	1.19	IN	16.14	AC-FT	779200
WTR YR 1986	TOTAL	466852	MEAN	1280	CFSM	1.41	IN	19.18	AC-FT	926000

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

06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, MT

LOCATION.--Lat 44°53'22", long 111°34'46", in NE¼NE¼SE¼ sec.10, T.11 S., R.1 E., Madison County, Hydrologic Unit 10020007, on upstream side of county bridge 0.2 mi upstream from West Fork Madison River, and 22 mi south of Cameron, and at mile 89.8.

DRAINAGE AREA.--1,065 mi^2.

PERIOD OF RECORD.--September 1959 to September 1963, May 1978 to current season (seasonal records only).

GAGE.--Nonrecording gage. Elevation of gage is 5,860 ft, from topographic map. Aug. 31, 1959, to Oct. 2, 1959, nonrecording gage at present site but at a different datum. Oct. 3, 1959, to September 1963, water-stage recorder at site 75 ft upstream at different datum.

REMARKS.--Seasonal records fair. Flow regulated by Hebgen Lake (station 06038000). Diversions for irrigation of about 1,500 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 5,000 ft^3/s June 6, 1986, gage height, 3.14 ft; minimum daily, 280 ft^3/s May 26, 27, 1960.

EXTREMES FOR CURRENT SEASON.--Maximum discharge observed, 5,000 ft^3/s June 6, gage height, 3.14 ft; minimum observed 1,400 ft^3/s July 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								1600	3580	1940		
2								1600	3660	1910		
3								1600	4080	1920		
4								1600	4410	1980		
5								1600	4750	1920		
6								1600	5000	1990		
7								1600	4160	1840		
8								1600	3950	1740		
9								1740	4050	1600		
10								1760	3710	1760		
11								1760	3540	1760		
12								1640	3400	1760		
13								1740	3400	1740		
14								1760	3470	1580		
15								1600	3540	1590		
16								1640	3590	1610		
17								1600	3360	1630		
18								1600	3520	1640		
19								1640	3380	1630		
20								1820	3050	1640		
21								1890	2790	1580		
22								1920	2630	1570		
23								1920	2250	1430		
24								1920	1610	1430		
25								1920	1470	1430		
26								2060	1480	1400		
27								2380	1740	1460		
28								2580	1920	1440		
29								2690	1990	1430		
30								2840	2080	1430		
31								3010	---	1410		
TOTAL								58230	95560	51190		
MEAN								1878	3185	1651		
MAX								3010	5000	1990		
MIN								1600	1470	1400		
AC-FT								115500	189500	101500		

06040300 JACK CREEK NEAR ENNIS, MT

LOCATION.--Lat 45°21'23", long 111°34'51", in NE¼SE¼ sec.34, T.5 S., R.1 E., Madison County, Hydrologic Unit 10020007, Beaverhead National Forest, on left bank 800 ft upstream from bridge at forest boundary, 8.8 mi east of Ennis, and at mile 6.5.

DRAINAGE AREA.--51.5 mi^2.

PERIOD OF RECORD.--September 1973 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 5,600 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 14, 16-18, 21-23, Dec. 2, 10-13, Jan. 5, 22-23, 25-28, 30, Feb. 7-14. Records good except those periods of estimated daily 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.

AVERAGE DISCHARGE.--13 years, 47.0 ft^3/s, 34,050 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 555 ft^3/s June 14, 1974, gage height, 3.97 ft in gage well, about 4.97 ft, from outside gage; maximum gage height, 5.46 ft Dec. 23, 1983 (backwater from ice); minimum discharge, 5.0 ft^3/s Mar. 7, 1975, gage height, 1.84 ft; minimum gage height, 1.81 ft Mar. 10, 1979, and Nov. 14, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 30	2030	318	3.81	June 5	2230	*391	*3.98

Minimum discharge, 6.3 ft^3/s Mar. 16, gage height, 1.95 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	20	18	15	14	12	14	29	40	240	64	37	26
2	20	18	15	14	12	15	26	50	241	61	36	26
3	22	18	15	14	12	15	25	71	208	64	35	25
4	20	18	15	14	12	15	24	79	187	62	36	25
5	20	18	15	14	11	14	25	68	260	60	34	24
6	20	17	15	14	11	15	28	61	244	57	34	23
7	22	17	15	13	10	16	34	57	201	54	33	23
8	18	17	15	13	10	22	36	52	205	53	33	24
9	15	15	14	13	10	18	36	48	214	53	33	24
10	21	9.2	13	13	10	16	38	47	184	51	32	23
11	22	12	13	13	10	15	40	47	178	52	32	23
12	22	14	13	13	10	15	37	44	169	48	33	23
13	20	15	14	13	10	14	32	47	157	47	33	23
14	19	16	14	13	10	13	33	52	149	46	31	27
15	20	16	14	13	11	14	31	46	150	46	30	29
16	21	16	14	13	11	13	32	44	133	46	29	25
17	20	16	14	13	11	13	32	44	122	45	29	24
18	19	16	14	13	11	13	29	47	112	44	28	24
19	19	16	14	13	11	12	29	57	102	43	27	25
20	19	16	14	13	11	13	30	75	88	42	27	25
21	19	16	14	12	10	14	38	110	81	42	32	24
22	24	15	14	12	10	14	52	110	78	42	32	23
23	21	15	14	12	10	14	73	88	77	41	29	23
24	20	15	14	12	13	15	57	84	77	40	29	23
25	20	15	13	12	16	14	51	97	77	42	27	23
26	19	15	13	12	16	15	45	135	76	42	26	22
27	19	15	13	12	14	18	41	183	78	41	26	23
28	19	15	13	12	13	28	41	219	71	40	25	23
29	18	15	14	12	---	34	40	219	71	40	25	23
30	18	15	14	12	---	36	38	248	68	38	25	23
31	18	---	14	12	---	35	---	239	---	37	29	---
TOTAL	614	469.2	435	398	318	532	1102	2808	4298	1483	947	721
MEAN	19.8	15.6	14.0	12.8	11.4	17.2	36.7	90.6	143	47.8	30.5	24.0
MAX	24	18	15	14	16	36	73	248	260	64	37	29
MIN	15	9.2	13	12	10	12	24	40	68	37	25	22
AC-FT	1220	931	863	789	631	1060	2190	5570	8530	2940	1880	1430

CAL YR 1985	TOTAL	11384.2	MEAN	31.2	MAX	137	MIN	9.2	AC-FT	22580
WTR YR 1986	TOTAL	14125.2	MEAN	38.7	MAX	260	MIN	9.2	AC-FT	28020

06041000 MADISON RIVER BELOW ENNIS LAKE, NEAR MCALLISTER, MT

LOCATION.--Lat 45°29'25", long 111°38'00", in SW¼SE¼NW¼ sec.17, T.4 S., R.1 E., Madison County, Hydrologic Unit 10020007, on right bank 500 ft downstream from Madison powerplant, 1.5 mi downstream from Ennis Lake, 5.7 mi northeast of McAllister, and at mile 38.8.

DRAINAGE AREA.--2,186 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1901 to December 1905, October 1906 to current year. Prior to October 1938 adjusted monthly runoff only, published in WSP 1309. Published as "below Madison Reservoir" 1938-49. Records published as "near Red Bluff" 1890-94 and as "near Norris" 1910 are not equivalent and are published as "near Norris" in WSP 1309.

REVISED RECORDS.--WSP 1559: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,689.03 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to May 7, 1941, nonrecording gage in wooden stilling well at present site at different datum. May 7, 1941, to Jan. 13, 1945, nonrecording gages in concrete stilling well at present site and datum.

REMARKS.--No estimated daily discharges this year. Water-discharge records good. Flow regulated by Hebgen Lake (station number 06038000) and Ennis Lake (station number 06040500). Diversions for irrigation of about 23,000 acres upstream from station.

AVERAGE DISCHARGE.--48 years, 1,782 ft^3/s, 1,291,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,550 ft^3/s June 12, 1970, gage height, 8.01 ft; minimum daily, 210 ft^3/s Aug. 25, 26, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,050 ft^3/s June 6, gage height, 7.11 ft; minimum daily, 950 ft^3/s Dec. 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	1830	2010	1650	1400	1590	1600	1630	1860	5690	2390	1650	1770
2	1660	1980	1660	1430	1590	1570	1580	1860	6210	2350	1650	2090
3	1680	1990	1860	1430	1570	1550	1600	1880	6470	2230	1650	2180
4	2120	2010	1970	1450	1560	1520	1580	1910	6570	2160	1650	2250
5	2400	1970	1860	1390	1530	1500	1540	2040	6710	2230	1650	2200
6	2350	1970	1780	1320	1470	1500	1550	2060	6920	2230	1640	2130
7	2370	1950	1690	1390	1370	1500	1560	2070	6760	2220	1620	2120
8	2410	1950	1620	1400	1290	1490	1570	2180	6420	2180	1610	2120
9	2430	1950	1530	1370	1270	1510	1580	2240	5650	2140	1620	2100
10	2430	1940	1360	1410	1260	1500	1620	2230	5260	2130	1610	2040
11	2450	1890	1190	1450	1240	1480	1650	2220	4900	2090	1510	2050
12	2450	1730	1100	1480	1210	1510	1680	2200	4480	2060	1470	2200
13	2470	1710	1080	1490	1200	1560	1750	2190	4470	2040	1470	2210
14	2470	1840	999	1490	1130	1580	1790	2000	4480	1970	1460	2200
15	2440	2070	950	1280	1110	1600	1790	1940	4500	1940	1450	2310
16	2450	2390	999	1270	1150	1600	1750	1950	4550	1970	1460	2380
17	2410	2300	1180	1520	1240	1600	1840	1970	4470	1980	1450	2330
18	2410	2090	1280	1650	1490	1610	1830	1980	4250	1960	1450	1290
19	2430	1960	1420	1610	1650	1350	1820	1990	4040	1930	1440	1960
20	2410	1900	1540	1650	1590	1330	1790	2030	3780	1930	1460	2110
21	2220	1940	1610	1640	1560	1450	1780	2170	3570	1900	1460	2130
22	2390	1850	1570	1580	1540	1450	1830	2540	3450	1870	1450	2140
23	2610	1570	1540	1490	1530	1490	1830	2810	2930	1800	1460	2130
24	2440	1420	1540	1490	1580	1620	1880	2740	2250	1700	1480	2110
25	2300	1550	1530	1460	1690	1650	1910	2690	1840	1620	1520	2120
26	2290	1590	1490	1380	1750	1640	1920	2730	1660	1620	1590	2110
27	2170	1760	1460	1390	1730	1620	1940	3100	1870	1630	1590	2110
28	2060	1940	1430	1420	1650	1590	1920	3960	2120	1630	1580	2110
29	2060	1910	1430	1440	---	1600	1890	4750	2340	1640	1630	2120
30	2010	1760	1450	1530	---	1610	1880	5370	2430	1650	1700	2110
31	1980	---	1440	1560	---	1600	---	5490	---	1650	1720	---
TOTAL	70600	56890	45208	45260	40540	47780	52280	79150	131040	60840	48150	63230
MEAN	2277	1896	1458	1460	1448	1541	1743	2553	4368	1963	1553	2108
MAX	2610	2390	1970	1650	1750	1650	1940	5490	6920	2390	1720	2380
MIN	1660	1420	950	1270	1110	1330	1540	1860	1660	1620	1440	1290
AC-FT	140000	112800	89670	89770	80410	94770	103700	157000	259900	120700	95510	125400

CAL YR 1985 TOTAL 637608 MEAN 1747 MAX 2940 MIN 950 AC-FT 1265000
WTR YR 1986 TOTAL 740968 MEAN 2030 MAX 6920 MIN 950 AC-FT 1470000

06041000 MADISON RIVER BELOW ENNIS LAKE, NEAR MCALLISTER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-73, 1977 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: June 1977 to current year.

INSTRUMENTATION.--Temperature recorder since June 21, 1977.

REMARKS.--No record Apr. 10-22 due to equipment failure.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 23.0°C, July 29, 1980; minimum, 0.0°C at times during winter months most years.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 21.0°C, July 2; minimum, 0.5°C many days November to February.

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					
15...	1500	2580	294	15.5	5.5
NOV					
20...	1100	1930	302	-6.0	1.0
JAN					
06...	1000	1300	348	1.5	1.0
MAR					
04...	0845	1510	310	9.5	4.0
MAY					
27...	1900	3510	263	30.5	15.5
29...	1020	4380	258	20.0	16.5
JUN					
02...	1500	6620	220	26.0	16.0
JUL					
14...	1400	1900	253	25.0	18.0
AUG					
26...	1210	1440	275	15.0	18.0

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

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

06041000 MADISON RIVER BELOW ENNIS LAKE, NEAR MCALLISTER, MT--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
		FEBRUARY			MARCH			APRIL			MAY	
1	2.0	1.5	1.5	4.0	3.0	3.5	8.5	7.5	8.0	9.5	8.0	8.5
2	1.5	1.5	1.5	4.0	3.5	4.0	7.5	6.5	7.0	11.0	8.5	9.5
3	1.5	1.5	1.5	4.5	4.0	4.0	6.5	6.0	6.5	12.0	11.0	11.0
4	1.5	1.5	1.5	4.5	4.5	4.5	7.0	5.0	6.0	12.0	11.0	11.5
5	1.5	1.5	1.5	5.0	4.5	5.0	7.5	6.5	7.0	11.5	10.5	11.0
6	1.5	1.0	1.5	5.5	5.0	5.5	8.0	7.0	7.5	10.5	9.0	10.0
7	1.5	.5	1.0	5.5	5.0	5.5	9.5	8.0	8.5	9.5	7.5	8.5
8	1.0	.5	1.0	5.5	3.5	4.5	10.0	8.5	9.0	7.0	5.5	6.0
9	1.0	.5	1.0	5.0	4.5	5.0	10.0	9.5	9.5	8.0	5.0	6.5
10	1.0	.5	1.0	4.5	4.0	4.5				8.0	7.0	7.5
11	1.0	.5	1.0	5.0	4.0	4.5				7.5	7.0	7.5
12	1.0	.5	1.0	5.0	4.5	5.0				8.0	7.0	7.5
13	1.0	.5	.5	5.0	4.5	4.5				8.0	7.0	8.0
14	1.0	.5	1.0	5.0	4.0	4.5				8.0	7.0	7.5
15	1.0	.5	1.0	4.5	4.0	4.0				8.0	7.0	7.5
16	1.0	.5	1.0	4.0	3.0	3.5				8.0	7.5	7.5
17	1.0	.5	1.0	3.5	2.5	3.0				9.5	7.0	8.5
18	1.5	1.0	1.0	3.0	2.0	2.5				10.0	9.5	9.5
19	1.0	1.0	1.0	3.0	2.5	3.0				11.0	10.0	10.5
20	1.5	1.0	1.0	3.5	3.0	3.0				11.0	10.5	11.0
21	1.5	.5	1.0	4.5	3.0	3.5				11.5	10.5	11.0
22	1.5	1.0	1.5	5.5	4.0	5.0				11.0	10.5	11.0
23	1.5	1.5	1.5	6.0	5.0	5.5	10.5	10.0	10.0	12.0	10.0	11.0
24	2.0	1.5	2.0	6.0	5.5	6.0	10.0	9.5	10.0	12.0	10.5	11.0
25	2.0	1.5	2.0	6.0	5.0	5.5	10.0	9.5	9.5	13.0	10.5	11.5
26	2.5	2.0	2.0	6.0	5.5	5.5	9.5	9.0	9.0	15.5	10.0	13.5
27	3.0	2.0	2.5	6.5	5.5	6.0	9.0	8.0	8.5	16.5	12.5	15.0
28	3.5	2.5	3.0	7.0	6.5	6.5	8.5	8.0	8.5	17.5	12.5	15.0
29				8.0	7.0	7.5	8.5	7.5	8.0	17.5	15.5	16.5
30				9.5	8.0	8.5	8.0	7.0	7.5	17.5	15.0	16.5
31				9.0	8.0	8.5				17.5	14.0	16.0
MONTH	3.5	.5	1.5	9.5	2.0	5.0	10.5	5.0	8.0	17.5	5.0	10.5
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.0	15.0	16.5	20.5	19.5	19.5	17.5	16.5	17.0	18.5	18.0	18.5
2	17.0	15.0	16.0	21.0	19.5	20.0	19.5	17.5	18.0	18.5	17.0	17.5
3	16.5	14.0	15.5	20.5	19.5	20.0	20.0	18.0	19.0	18.0	17.0	17.5
4	14.5	11.5	13.5	19.5	18.0	18.5	20.0	18.5	19.5	17.5	16.5	17.0
5	14.0	11.5	13.0	17.5	16.5	17.0	20.5	19.0	19.5	17.0	15.5	16.0
6	14.5	13.5	14.0	16.5	15.5	16.5	20.5	20.0	20.5	16.0	13.5	14.5
7	14.5	13.0	13.5	16.5	15.0	15.5	20.5	19.0	19.5	14.0	13.0	13.5
8	13.0	12.5	12.5	17.5	16.0	16.5	20.5	19.5	20.0	14.0	12.5	13.0
9	12.5	12.5	12.5	17.5	16.5	17.0	20.0	19.0	19.0	14.0	13.5	13.5
10	15.5	12.0	13.0	17.5	16.5	17.0	20.5	19.0	19.5	13.5	13.0	13.5
11	16.0	12.5	14.0	17.5	17.0	17.5	20.0	19.5	19.5	13.5	13.0	13.5
12	16.0	14.0	15.0	18.5	17.0	17.5	19.5	18.5	19.0	13.5	12.5	13.0
13	16.5	15.0	16.0	19.5	18.0	18.5	19.0	18.5	18.5	12.5	11.0	11.5
14	16.5	14.0	15.5	18.5	18.0	18.0	19.5	18.0	18.5	11.5	11.5	11.5
15	16.0	15.0	16.0	18.5	18.0	18.0	20.0	19.5	19.5	11.5	10.5	11.0
16	16.5	15.5	16.0	18.0	17.5	17.5	20.0	19.5	20.0	12.0	11.0	11.5
17	16.5	15.5	16.0	18.0	16.5	17.0	20.0	18.5	19.0	12.5	11.5	12.0
18	17.0	16.5	16.5	17.5	16.5	17.0	20.5	20.0	20.0	12.5	10.5	12.0
19	17.5	16.5	16.5	18.0	17.0	17.5	20.5	20.0	20.5	12.0	11.0	11.5
20	18.0	15.5	17.0	18.0	17.0	17.5	20.5	19.5	20.0	10.5	10.0	10.5
21	17.0	16.0	16.5	18.5	17.5	18.0	20.0	18.5	19.0	11.0	10.5	10.5
22	17.0	15.5	16.5	20.5	17.5	18.5	18.5	18.0	18.0	11.0	10.5	10.5
23	17.5	16.0	17.0	20.5	19.5	20.0	19.0	18.5	18.5	10.5	10.0	10.5
24	19.5	17.0	18.0	20.0	19.5	20.0	19.0	18.0	18.5	11.0	10.0	10.5
25	19.5	17.5	18.0	20.5	19.0	19.5	18.5	18.0	18.5	10.5	10.0	10.5
26	18.5	18.0	18.5	19.0	18.5	18.5	19.0	17.5	18.5	10.0	9.5	9.5
27	19.5	18.5	19.0	18.5	18.0	18.0	19.5	18.0	18.5	9.5	8.5	9.0
28	19.5	18.5	19.0	18.5	17.5	18.0	19.5	18.0	18.5	9.0	8.5	9.0
29	19.5	17.5	18.5	18.5	18.0	18.0	19.5	19.0	19.5	8.5	7.5	8.0
30	20.0	18.5	19.0	18.0	17.5	18.0	19.0	18.5	19.0	8.5	7.5	8.0
31				17.5	16.5	17.0	18.5	18.0	18.5			
MONTH	20.0	11.5	16.0	21.0	15.0	18.0	20.5	16.5	19.0	18.5	7.5	12.5
YEAR	21.0	.5	8.5									

06043500 GALLATIN RIVER NEAR GALLATIN GATEWAY, MT

LOCATION.--Lat 45°29'51", long 111°25'12", in SE¼SE¼SE¼ sec.7, T.4 S., R.4 E., Gallatin County, Hydrologic Unit 10020008, on left bank 0.3 mi downstream from Spanish Creek, 7.3 mi south of Gallatin Gateway and at mile 47.7.

DRAINAGE AREA.--825 mi^2.

PERIOD OF RECORD.--August 1889 to September 1894, June 1930 to September 1969, annual maximum, water years 1970-71, October 1971 to September 1981, October 1984 to current year. Monthly discharge only for some periods, published in WSP 1309. Published as West Gallatin River near Bozeman 1889-94.

REVISED RECORDS.--WSP 1389: 1892(M), 1893-94. WSP 1559: Drainage area. WRD MT-85-1 (M).

GAGE.--Water-stage recorder. Datum of gage is 5,167.67 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 20, 1932, nonrecording gages at several different sites and datums within 0.8 mi of present site.

REMARKS.--Estimated daily discharges: Nov. 11-13, Nov. 21 to Dec. 7, Dec. 11-18, Feb. 6-16, July 20-25, 28-30. Records good except those for periods of estimated daily discharges, which are fair. Diversions for irrigation of about 1,400 acres upstream from station. Several observations 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.--56 years (1890-94, 1931-69, 1972-81, 1985-86); 815 ft^3/s, 590,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,100 ft^3/s June 17, 1974, gage height, 7.38 ft; minimum, 117 ft^3/s Jan. 19, 1935, gage height, 0.68 ft, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,900 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 6	0215	*6,830	*6.00	No other peak greater than base discharge.			

Minimum daily discharge, 250 ft^3/s Nov. 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	474	438	280	324	357	364	519	711	5890	1510	711	582
2	484	450	290	325	355	380	498	849	6230	1420	688	555
3	498	445	310	329	362	373	451	1320	5780	1430	676	527
4	462	433	320	319	353	371	445	1840	5270	1520	684	510
5	475	441	330	307	330	367	445	1660	5950	1380	656	499
6	478	415	340	325	330	367	486	1420	5980	1250	638	494
7	504	423	340	323	300	376	566	1280	5090	1170	623	494
8	442	439	327	319	285	423	662	1160	4770	1130	609	490
9	422	415	315	319	290	397	667	1090	4880	1190	605	521
10	437	331	286	324	280	373	664	1050	4280	1220	595	512
11	491	320	290	327	280	367	727	1050	4100	1180	597	492
12	501	320	300	318	290	355	696	960	4200	1110	624	480
13	451	350	310	318	300	346	631	935	4050	1030	642	482
14	462	393	320	321	300	325	569	962	3830	994	611	517
15	462	363	330	326	310	335	586	895	4220	984	576	579
16	465	366	330	331	310	316	601	865	3750	973	562	536
17	468	375	330	338	323	344	575	855	3540	971	554	512
18	450	379	340	331	326	325	545	891	3320	890	543	521
19	447	355	325	337	324	325	518	1020	3130	862	533	586
20	455	322	328	348	314	320	524	1480	2750	795	543	594
21	459	310	324	341	312	326	622	2350	2410	770	599	559
22	521	280	315	319	311	348	849	2520	2160	745	717	525
23	483	270	316	334	314	343	1230	2020	2060	705	591	510
24	469	260	319	342	342	352	1050	1870	2010	705	588	509
25	468	270	320	304	370	341	920	2110	1980	740	553	520
26	470	250	315	307	377	333	852	2830	1970	851	545	516
27	461	270	320	322	352	361	785	3840	1930	859	532	512
28	459	300	319	342	346	415	765	4810	1790	775	518	513
29	450	290	321	350	---	497	755	5130	1760	735	516	503
30	445	280	319	354	---	547	697	5320	1650	730	523	500
31	450	---	313	357	---	597	---	5590	---	740	548	---
TOTAL	14463	10553	9842	10181	9043	11609	19900	60683	110730	31364	18500	15650
MEAN	467	352	317	328	323	374	663	1958	3691	1012	597	522
MAX	521	450	340	357	377	597	1230	5590	6230	1520	717	594
MIN	422	250	280	304	280	316	445	711	1650	705	516	480
AC-FT	28690	20930	19520	20190	17940	23030	39470	120400	219600	62210	36690	31040

CAL YR 1985	TOTAL	249551	MEAN	684	MAX	3220	MIN	250	AC-FT	495000
WTR YR 1986	TOTAL	322518	MEAN	884	MAX	6230	MIN	250	AC-FT	639700

06050000 HYALITE CREEK AT HYALITE RANGER STATION, NEAR BOZEMAN, MT

LOCATION.--Lat 45°33'42", long 111°04'12", in NW¼NW¼SE¼ sec.23, T.3 S., R.5 E., Gallatin County, Hydrologic Unit 10020008, Gallatin National Forest, on right bank 0.8 mi south of former Hyalite Ranger Station, 7.3 mi south of Bozeman, and at mile 20.8.
DRAINAGE AREA.--48.2 mi^2.
PERIOD OF RECORD.--August 1895 to October 1896, calendar year 1897 (discharge measurements only), April 1898 to October 1899, June to October 1900, May to September 1902, calendar year 1903 (discharge measurements only), September to December 1904, September 1934 to current year. Monthly discharge only for some periods, published in WSP 1309. Prior to 1934, published as Middle Creek near Bozeman.
REVISED RECORDS.--WSP 84: 1898-99. WSP 1509: 1902, 1939(M). WSP 1559: Drainage area. WSP 1709: 1953, 1956-57.
GAGE.--Water-stage recorder. Datum of gage is 5,539.6 ft above National Geodetic Vertical Datum of 1929. Prior to September 1934, nonrecording gages at two sites 0.5 mi upstream at different datums. Sept. 13, 1934, to May 13, 1948, water-stage recorder at site 0.3 mi downstream at different datum.
REMARKS.--Estimated daily discharges: Nov. 5, Nov. 9 to Mar. 6. Records good except those for estimated daily discharges, which are poor. Flow regulated by Middle Creek Reservoir (station 06049500) since March 1951. 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.--54 years (1895-96, 1898-99, 1934-86), 67.2 ft^3/s, 18.93 in/yr, 48,690 acre-ft/yr, adjusted for storage in Middle Creek Reservoir.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 956 ft^3/s June 14, 1898, gage height, 2.10 ft, site and datum then in use; maximum gage height, 4.56 ft Dec. 22, 1983 (backwater from ice); minimum daily discharge, 5.0 ft^3/s Jan. 27, 1961.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 472 ft^3/s June 6, gage height, 3.00 ft; maximum gage height, 3.40 ft Feb. 11 (backwater from ice); minimum daily discharge, 9.0 ft^3/s Feb. 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	36	13	10	15	17	37	43	74	285	109	113	71
2	27	14	10	15	16	35	41	96	325	108	116	65
3	29	13	10	14	15	34	38	112	280	92	116	61
4	28	13	11	13	14	34	38	114	247	87	121	60
5	28	13	12	13	12	34	39	104	272	85	121	60
6	29	13	13	13	11	34	42	93	385	80	120	60
7	30	13	13	13	10	35	47	108	365	77	120	58
8	37	13	13	14	9.5	37	52	155	275	75	99	50
9	36	13	12	15	9.5	35	52	153	290	74	97	51
10	35	13	12	15	9.0	35	50	155	284	74	86	51
11	28	13	11	16	9.5	35	49	156	251	80	88	50
12	29	12	11	15	9.5	35	45	153	259	87	89	50
13	28	13	12	14	10	34	40	159	268	81	87	49
14	27	14	13	14	11	34	40	124	249	73	85	45
15	20	13	14	14	12	34	40	82	234	70	69	45
16	21	13	15	15	14	33	42	77	256	67	68	43
17	21	13	15	15	25	31	40	76	271	64	68	42
18	19	12	14	16	18	30	38	75	240	63	68	45
19	18	11	14	16	16	30	36	72	219	63	68	47
20	19	11	14	16	15	30	42	83	219	63	68	45
21	19	11	15	15	16	30	52	96	167	63	74	40
22	20	10	16	14	17	31	63	100	113	70	70	38
23	18	11	16	14	18	31	72	88	127	70	68	38
24	18	12	15	13	60	33	59	82	129	85	68	38
25	18	11	15	13	60	32	56	81	130	86	68	39
26	19	11	14	13	52	32	56	83	148	90	67	38
27	18	12	14	13	47	36	51	100	147	96	67	36
28	18	13	14	14	40	42	56	258	123	98	67	34
29	18	12	14	14	---	48	55	268	112	110	67	34
30	14	11	15	15	---	52	60	187	107	110	67	34
31	14	---	15	16	---	50	---	257	---	109	68	---
TOTAL	739	370	412	445	573.0	1093	1434	3821	6777	2559	2618	1417
MEAN	23.8	12.3	13.3	14.4	20.5	35.3	47.8	123	226	82.5	84.5	47.2
MAX	37	14	16	16	60	52	72	268	385	110	121	71
MIN	14	10	10	13	9.0	30	36	72	107	63	67	34
AC-FT	1470	734	817	883	1140	2170	2840	7580	13440	5080	5190	2810
MEAN †	31.9	28.0	16.5	22.5	22.7	28.9	62.2	148	226	66.8	35.8	41.0
CFSM †	.66	.58	.34	.47	.47	.60	1.29	3.07	4.69	1.39	.74	.85
IN †	.76	.65	.40	.54	.49	.69	1.44	3.54	5.23	1.60	.86	.95
AC-FT †	1,960	1,664	1,017	1,383	1,260	1,780	3,700	9,090	13,450	4,110	2,200	2,440

OBSERVED

CAL YR 1985	TOTAL	16,078	MEAN	44.0	MAX	184	MIN	10	AC-FT	31,890
WTR YR 1986	TOTAL	22,258	MEAN	61.0	MAX	385	MIN	9.0	AC-FT	44,150

ADJUSTED

CAL YR 1985	TOTAL	16,890	MEAN	46.3	CFSM	.96	IN	13.03	AC-FT	33,750
WTR YR 1986	TOTAL	22,208	MEAN	60.8	CFSM	1.26	IN	17.13	AC-FT	44,050

(†) Adjusted for change in contents in Middle Creek Reservoir.

06052500 GALLATIN RIVER AT LOGAN, MT

LOCATION.--Lat 45°53'07", long 111°26'15", in SE¼NW¼NE¼ sec.35, T.2 N., R.2 E., Gallatin County, Hydrologic Unit 10020008, on right bank at former county road bridge site, 0.2 mi upstream from present county bridge, 0.5 mi west of Logan, and at mile 6.3.

DRAINAGE AREA.--1,795 mi^2.

PERIOD OF RECORD.--September 1893 to December 1905, August 1928 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1389: 1898-99, 1903, 1905, 1929(M), 1935-36(M), 1938-39(M), 1941(M). WSP 1559: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,086.42 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 10, 1928, nonrecording gages at several sites within 0.5 mi of present site at various datums. Aug. 10, 1928, to Oct. 7, 1941, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 12-13, 15, Nov. 18 to Dec. 23, Dec. 25 to Jan. 1, Jan. 4-6, 8, 12-15, 26-27, Feb. 7-15, 20, May 20-26, May 31 to June 15. Water-discharge records good except those for estimated daily discharges and those for May 27-30 and June 16 to July 15, which are fair. Some regulation by Middle Creek Reservoir (station number 06049500). Diversions for irrigation of about 110,000 acres upstream from station.

AVERAGE DISCHARGE.--70 years (1894-1905, 1929-86), 1,078 ft^3/s, 781,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 9,840 ft^3/s June 21, 1899, gage height, 6.25 ft, site and datum then in use; maximum gage height, 11.88 ft Feb. 5, 1963, from floodmark (backwater from ice); minimum discharge observed, 130 ft^3/s July 19, 1939, gage height, 2.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, not determined; maximum gage height, 8.06 ft Nov. 26 (backwater from ice); minimum discharge, 370 ft^3/s Aug. 9, gage height, 3.62 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	751	853	620	710	740	972	1020	968	6200	1290	503	700
2	755	848	620	701	718	995	933	956	6700	1160	479	710
3	765	859	640	686	754	981	897	1160	6400	1070	461	686
4	791	847	670	680	754	940	827	1680	6000	1060	467	671
5	762	845	700	660	718	937	793	1950	6300	1210	439	656
6	767	848	730	680	696	895	762	1760	6500	1230	404	685
7	806	862	750	685	650	892	791	1590	5900	1160	387	698
8	926	890	750	690	620	964	810	1540	5600	1070	383	698
9	863	888	720	692	610	1030	820	1520	5800	1010	384	747
10	857	800	680	694	580	941	835	1450	5400	997	397	747
11	924	761	650	694	570	895	907	1490	4800	1000	410	733
12	1020	750	660	690	560	896	946	1460	4900	989	445	718
13	1040	770	680	690	580	890	957	1290	4700	963	497	734
14	971	799	700	680	620	839	893	1300	4400	937	498	767
15	960	790	710	680	670	805	952	1270	4600	894	467	845
16	961	788	720	691	711	783	953	1150	4180	848	444	858
17	966	786	730	709	769	772	935	1080	3690	822	436	875
18	961	780	740	685	846	774	857	1040	3400	776	435	872
19	943	760	750	701	719	734	806	1060	3100	742	415	977
20	894	720	760	720	690	726	745	1300	2800	705	429	1020
21	877	680	750	718	682	716	757	2100	2450	683	460	1040
22	922	640	740	682	675	723	822	2800	2170	658	572	965
23	953	600	740	718	675	723	1080	2600	1940	629	583	913
24	911	580	735	711	1240	715	1310	2400	1690	590	626	906
25	898	600	730	682	1790	737	1120	2300	1500	588	583	932
26	889	550	720	670	1530	711	1210	2700	1430	624	560	932
27	882	600	710	680	1210	702	1200	3400	1430	641	555	932
28	868	650	700	696	1010	731	1170	4260	1390	641	539	954
29	861	640	700	704	---	813	1100	4870	1320	563	534	948
30	864	630	710	711	---	930	1050	5040	1380	522	562	936
31	859	---	710	732	---	1030	---	5600	---	517	648	---
TOTAL	27467	22414	21925	21522	22387	26192	28258	65084	118070	26589	15002	24855
MEAN	886	747	707	694	800	845	942	2099	3936	858	484	829
MAX	1040	890	760	732	1790	1030	1310	5600	6700	1290	648	1040
MIN	751	550	620	660	560	702	745	956	1320	517	383	656
AC-FT	54480	44460	43490	42690	44400	51950	56050	129100	234200	52740	29760	49300

CAL YR 1985	TOTAL	302934	MEAN	830	MAX	3390	MIN	247	AC-FT	600900
WTR YR 1986	TOTAL	419765	MEAN	1150	MAX	6700	MIN	383	AC-FT	832600

06054500 MISSOURI RIVER AT TOSTON, MT

LOCATION.--Lat 46°08'46", long 111°25'11", in NW¼SE¼NW¼ sec.36, T.5 N., R.2 E., Broadwater County, Hydrologic Unit 10030101, on left bank 2.2 mi southeast of Toston, 4.8 mi upstream from Crow Creek, 7.8 mi downstream from Sixteenmile Creek, and at mile 2,296.1.

DRAINAGE AREA.--14,669 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1890 to February 1891, April 1910 to December 1916, April 1941 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,905.68 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 20, 1916, nonrecording gages at site 2.5 mi downstream at different datums.

REMARKS.--Estimated daily discharges: Nov. 24 to Dec. 4, Feb. 13. Water-discharge records good. Some regulation by six reservoirs on tributaries and Clark Canyon Reservoir (station 06015300). Diversions for irrigation of about 555,400 acres of which 12,000 acres lies downstream from station.

AVERAGE DISCHARGE.--51 years (1911-16, 1942-86), 5,436 ft^3/s, 3,938,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,000 ft^3/s June 6, 1948, gage height, 11.77 ft; minimum, 562 ft^3/s Apr. 30, 1941, gage height, 1.68 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,100 ft^3/s June 6, gage height, 10.22 ft; minimum, 1,800 ft^3/s Aug. 12, gage height, 3.20 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	4210	4750	2600	3390	4110	4830	7250	5880	19200	4670	2390	3510
2	4210	4770	2500	3430	4080	4750	7070	5620	20400	4500	2300	3850
3	4090	4730	2700	3430	4110	4680	6280	5640	21400	4290	2190	4320
4	4200	4720	3500	3460	4110	4600	5710	6030	21100	4350	2230	4260
5	4730	4730	4160	3410	3910	4500	5200	6820	20800	5100	2190	4290
6	4880	4690	4100	3260	3790	4440	5060	7290	21700	5240	2100	4150
7	5030	4680	4180	3390	3450	4440	5140	7240	22200	5330	2000	4130
8	5150	4680	4140	3320	3090	4620	5280	7210	20700	5190	1940	4190
9	5260	4710	4040	3450	3140	4830	5530	7330	19900	4790	1890	4320
10	5250	4550	3750	3450	3170	4810	5720	7250	19000	4600	1890	4350
11	5270	4250	3550	3530	2900	4700	5620	7400	17100	4520	1910	4320
12	5580	3660	3120	3510	2500	4700	5990	7480	15100	4410	1870	4260
13	5700	3390	3110	3490	2300	4720	6080	7160	13600	4200	2030	4510
14	5730	3790	3260	3440	2560	4720	5800	6830	12700	4000	2100	4640
15	5600	4060	3190	3490	2820	4620	5710	6230	12100	3720	2060	4820
16	5560	4700	3200	3360	3040	4510	5760	5820	12100	3600	2000	5180
17	5550	4980	3320	3420	3620	4450	5780	5510	11400	3720	1990	5210
18	5530	3890	3390	3620	4100	4400	5710	5260	10600	3540	2030	5060
19	5490	3470	3480	3840	3770	4320	5430	5170	9660	3450	1970	4180
20	5420	3400	3580	4050	3770	3960	5150	5100	8880	3360	1940	5070
21	5320	3150	3670	3870	4000	3960	4950	5650	7440	3250	2030	5240
22	5340	2900	3770	3700	4010	4030	4950	7070	7280	3100	2300	5180
23	5550	2690	3730	3640	3990	4040	5480	8350	6760	2880	2370	5060
24	5720	2200	3730	3650	4880	4160	6570	8370	5710	2800	2550	4990
25	5500	2300	3680	3460	6880	4340	7010	8040	4650	2610	2660	4990
26	5280	2400	3640	3400	7030	4310	7170	7950	4160	2560	2730	5030
27	5250	2500	3550	3390	5960	4210	6960	8800	3980	2610	2760	5000
28	5230	2700	3420	3530	5150	4190	6660	11000	4250	2700	2750	5060
29	4940	2800	3240	3600	---	4450	6470	14200	4430	2600	2720	5100
30	4930	2700	3330	3670	---	5180	6230	16200	4850	2510	2800	5100
31	4770	---	3420	4000	---	6590	---	18100	---	2470	3060	---
TOTAL	160270	112940	108050	109650	110240	141060	177720	242000	383150	116670	69750	139370
MEAN	5170	3765	3485	3537	3937	4550	5924	7806	12770	3764	2250	4646
MAX	5730	4980	4180	4050	7030	6590	7250	18100	22200	5330	3060	5240
MIN	4090	2200	2500	3260	2300	3960	4950	5100	3980	2470	1870	3510
AC-FT	317900	224000	214300	217500	218700	279800	352500	480000	760000	231400	138300	276400

CAL YR 1985	TOTAL	1543150	MEAN	4228	MAX	10900	MIN	1300	AC-FT	3061000
WTR YR 1986	TOTAL	1870870	MEAN	5126	MAX	22200	MIN	1870	AC-FT	3711000

06054500 MISSOURI RIVER AT TOSTON, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-53, 1965, 1972 to current year. Sampling location moved in October 1978, from old bridge on U. S. Highway 287 at Toston, to cableway 2.4 miles upstream.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to September 1981.
WATER TEMPERATURE: May 1949 to June 1953, April 1973 to current year.
SUSPENDED-SEDIMENT DISCHARGE: March 1949 to June 1953.

INSTRUMENTATION.--Temperature recorder since July 6, 1977.

REMARKS.--No record June 6-July 10, 17-30 (recorder stopped), and September 18-30 (erratic values).

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1973-81): Maximum daily, 524 microsiemens, Mar. 4, 1978; mimimum daily, 159 microsiemens, May 28, 1979.
WATER TEMPERATURE: Maximum, 26.0°C July 10, 21, 27, 1985; minimum, 0.0°C on many days during winter.
SEDIMENT CONCENTRATION (water years 1949-53): Maximum daily mean, 670 mg/L, Mar. 22, 25, 1951; minimum daily mean, 5 mg/L, Jul. 12, 1951.
SEDIMENT LOAD (water years 1949-53): Maximum daily, 16,100 tons, May 5, 1952; minimum daily, 51 tons Feb. 1, 1951.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 24.0°C Aug.8, but may have been higher during periods of instrument malfunction; minimum, 0.0°C on many days during winter period.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
08...	1030	4980	--	--	378	E-8.0	3.0	--	--	--	--	--
25...	0945	6460	50	1	350	17.0	8.0	658	10.7	105	K4	110
DEC												
18...	1330	3420	--	--	420	5.0	0.0	--	--	--	--	--
MAR												
06...	1040	4460	--	--	381	7.0	5.5	--	--	--	--	--
11...	1337	4820	--	--	379	15.0	6.5	--	--	--	--	--
18...	0930	4380	75	1	391	5.5	5.0	663	12.0	108	K4	K20
MAY												
08...	0845	7220	100	13	280	4.0	7.5	660	10.6	102	46	120
AUG												
28...	1015	2670	0	0	388	22.0	20.0	663	9.2	117	K7	170

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)	POTA-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)
OCT											
25...	0945	8.30	9.0	140	12	37	11	23	0.9	3.7	160
MAR											
18...	0930	8.20	9.0	150	11	39	12	22	0.8	3.8	170
MAY											
08...	0845	7.80	15	100	5	28	8.4	16	0.7	3.0	120
AUG											
28...	1015	8.10	2.3	150	3	37	13	20	0.7	4.2	170

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 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											
25...	0	127	32	14	1.4	26	228	230	0.31	3980	<0.01
MAR											
18...	0	137	35	13	1.2	25	237	230	0.32	2800	<0.01
MAY											
08...	0	104	27	8.9	0.9	23	178	180	0.24	3470	<0.01
AUG											
28...	0	147	36	9.7	1.0	23	242	230	0.33	1740	<0.01

06054500 MISSOURI RIVER AT TOSTON, MT--Continued
(National Stream Quality Accounting Network)

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, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
25...	<0.10	0.03	0.03	0.3	0.03	<0.01	0.01	25	436	85
MAR										
18...	0.20	0.02	<0.01	0.5	0.04	0.02	0.02	28	331	78
MAY										
08...	<0.10	0.03	0.02	0.5	0.07	0.02	0.02	49	955	85
AUG										
28...	<0.10	<0.01	<0.01	0.5	0.02	<0.01	<0.01	8	58	89

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											
25...	0945	20	37	--	<0.5	<1	<1	5	2	24	<1
MAR											
18...	0930	<10	30	47	<0.5	<1	1	<3	3	30	2
MAY											
08...	0845	60	23	36	<0.5	<1	<1	<3	3	60	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)
OCT										
25...	90	12	<0.1	<10	1	<1	<1	210	<6	6
MAR										
18...	82	9	<0.1	<10	1	<1	<1	250	<6	<3
MAY										
08...	63	5	<0.1	<10	2	<1	<1	160	<6	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	7.5	7.0	7.0	5.5	5.5	5.5	.0	.0	.0	.5	.0	.0
2	8.5	6.5	7.5	7.0	5.5	6.0	.0	.0	.0	.5	.0	.0
3	9.5	8.5	9.0	7.5	7.0	7.0	.5	.0	.0	.5	.0	.0
4	8.5	8.0	8.0	7.5	7.0	7.0	.5	.0	.0	.0	.0	.0
5	9.0	8.0	8.5	7.5	6.0	7.0	.5	.0	.0	.0	.0	.0
6	9.5	8.5	9.0	6.0	5.5	5.5	.5	.0	.0	.5	.0	.0
7	8.5	4.0	6.5	5.5	5.0	5.0	.5	.0	.0	.5	.0	.0
8	4.0	3.5	3.5	5.0	4.0	4.5	.5	.0	.0	.5	.0	.0
9	4.0	3.0	3.5	4.0	2.0	3.5	.5	.0	.0	.5	.0	.0
10	3.5	3.0	3.0	2.0	.5	1.5	.0	.0	.0	.5	.0	.0
11	4.5	3.5	4.0	.5	.5	.5	.0	.0	.0	.5	.0	.0
12	6.5	5.0	6.0	1.0	.5	.5	.0	.0	.0	.5	.0	.0
13	6.5	5.5	6.0	1.0	.5	.5	.0	.0	.0	.5	.0	.0
14	7.0	6.0	6.5	1.0	.5	.5	.0	.0	.0	.5	.0	.0
15	7.5	6.5	7.0	1.0	.5	.5	.0	.0	.0	.5	.0	.0
16	8.0	7.5	7.5	1.0	.5	.5	.5	.0	.0	.5	.0	.5
17	8.0	7.5	7.5	.5	.5	.5	.0	.0	.0	.5	.0	.5
18	8.0	7.5	7.5	.5	.5	.5	.5	.0	.0	.5	.0	.5
19	8.0	7.5	8.0	.5	.5	.5	.5	.0	.0	.5	.0	.5
20	9.0	8.0	8.5	.5	.5	.5	.5	.0	.0	.5	.0	.0
21	9.5	8.5	9.0	.5	.5	.5	.5	.0	.0	.5	.0	.0
22	9.5	8.0	9.0	.5	.5	.5	.5	.0	.0	.5	.0	.0
23	8.0	6.5	7.0	.5	.5	.5	.5	.0	.5	.5	.0	.5
24	7.5	6.5	7.0	.5	.5	.5	.5	.0	.0	.5	.0	.5
25	8.5	7.5	8.0	.5	.5	.5	.5	.0	.0	.5	.0	.0
26	8.5	8.0	8.0	.5	.5	.5	.5	.0	.0	.5	.0	.0
27	8.5	8.0	8.0	.5	.5	.5	.5	.0	.0	.5	.0	.5
28	8.5	8.0	8.5	.5	.5	.5	.0	.0	.0	1.0	.0	.5
29	8.0	6.0	7.0	.5	.0	.0	.5	.0	.0	.5	.0	.5
30	6.0	5.5	5.5	.0	.0	.0	.5	.0	.5	.5	.5	.5
31	6.0	5.5	5.5				.5	.0	.0	.5	.0	.5
MONTH	9.5	3.0	7.0	7.5	.0	2.0	.5	.0	.0	1.0	.0	.0

06054500 MISSOURI RIVER AT TOSTON, MT--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
		FEBRUARY			MARCH			APRIL			MAY	
1	.5	.0	.5	5.0	4.0	4.5	9.0	7.5	8.0	11.5	9.5	10.5
2	1.0	.0	.5	6.5	5.0	6.0	7.5	5.5	6.5	14.0	11.5	12.5
3	.5	.0	.5	6.5	6.0	6.0	7.5	5.0	6.0	15.0	14.0	14.5
4	.5	.0	.5	6.0	5.5	6.0	8.0	7.0	7.5	15.0	13.5	14.5
5	.5	.0	.5	6.0	5.0	5.5	9.5	8.0	8.5	13.5	10.5	11.5
6	.5	.0	.0	7.5	6.0	6.5	11.0	9.5	10.0	10.5	10.0	10.0
7	.5	.0	.0	7.0	7.0	7.0	11.5	10.5	11.0	10.0	8.0	9.0
8	.5	.0	.0	7.0	6.0	6.5	12.0	11.0	11.5	8.0	7.0	7.5
9	.5	.0	.5	6.0	5.0	5.5	12.0	11.5	11.5	8.0	6.5	7.0
10	.5	.0	.0	5.5	5.0	5.0	12.0	11.0	11.5	8.0	8.0	8.0
11	.5	.0	.0	7.0	5.5	6.0	12.0	10.5	11.0	8.5	8.0	8.0
12	.5	.0	.0	7.0	6.5	7.0	11.0	5.5	8.5	9.5	7.5	8.5
13	.5	.0	.0	6.5	6.0	6.5	5.5	3.5	4.5	10.5	9.5	10.0
14	.5	.0	.0	6.0	5.5	6.0	6.0	4.5	5.0	10.5	9.0	9.5
15	.5	.0	.0	7.0	5.5	6.0	8.0	6.5	7.0	9.0	8.5	9.0
16	1.0	.0	.5	6.5	5.5	6.0	9.0	8.5	8.5	11.0	9.0	10.0
17	.5	.0	.0	5.5	5.0	5.5	9.0	8.0	8.5	11.5	10.5	11.0
18	.0	.0	.0	5.0	4.5	5.0	9.0	8.0	8.5	12.0	10.5	11.0
19	.5	.0	.0	6.0	4.5	5.5	8.0	7.5	7.5	14.5	12.0	13.0
20	.5	.0	.0	7.5	6.0	6.5	10.0	8.0	9.0	15.5	14.5	15.0
21	.5	.0	.0	8.5	7.0	8.0	12.0	10.0	11.0	14.5	13.5	14.0
22	.5	.0	.5	8.0	7.0	7.5	13.5	12.0	13.0	13.5	11.0	12.0
23	.5	.0	.5	8.0	7.0	7.5	13.5	12.0	12.5	12.5	10.0	11.0
24	.5	.0	.5	7.5	6.5	7.0	12.0	10.0	11.0	14.0	12.0	13.0
25	.5	.0	.5	6.5	5.0	5.5	10.5	10.0	10.5	16.0	14.0	14.5
26	1.0	.0	.5	6.5	5.5	6.0	10.0	8.5	9.0	17.0	15.5	16.5
27	2.5	1.0	1.5	9.0	6.5	8.0	9.5	8.0	8.5	18.0	16.5	17.5
28	4.0	3.0	3.5	10.0	9.0	9.5	10.0	9.0	9.5	18.5	17.0	18.0
29				10.5	9.5	10.0	10.0	9.0	9.0	18.5	16.5	17.5
30				10.5	10.0	10.5	9.5	8.0	8.5	19.0	16.5	17.5
31				10.0	9.0	9.5				19.0	16.5	17.5
MONTH	4.0	.0	.5	10.5	4.0	6.5	13.5	3.5	9.0	19.0	6.5	12.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.5	16.5	17.5				22.0	20.0	21.0	20.0	18.0	18.5
2	18.5	17.0	18.0				22.5	20.5	21.5	20.0	18.0	19.5
3	18.5	15.5	16.5				23.0	21.0	22.0	18.0	17.0	17.5
4	17.0	14.0	15.0				23.0	21.5	22.0	18.0	17.0	17.5
5	17.0	15.0	16.0				23.5	21.5	22.0	18.0	14.5	17.0
6							22.5	21.0	21.5	14.5	13.0	13.5
7							23.5	21.0	22.0	14.0	13.0	13.5
8							24.0	22.0	22.5	16.0	14.0	15.0
9							23.0	21.0	22.0	15.5	14.0	15.0
10						19.5	23.5	20.5	22.0	15.0	13.0	14.0
11				19.0	18.5	19.0	23.0	21.0	22.0	13.0	12.5	13.0
12				19.0	18.5	18.5	22.0	19.5	20.5	13.0	12.0	12.5
13				20.0	19.0	19.5	21.5	19.0	20.0	12.5	11.5	12.0
14				20.0	19.5	20.0	22.0	19.5	21.0	12.5	11.0	12.0
15				20.0	19.5	19.5	23.0	20.5	21.5	12.0	11.0	11.5
16				20.0	19.0	19.5	22.0	20.5	21.5	12.5	11.5	12.0
17							22.5	20.5	21.0	13.0	11.5	12.5
18							23.5	21.0	22.0			
19							22.5	20.5	22.0			
20							21.0	19.0	20.5			
21							22.0	18.5	20.5			
22							21.5	17.5	19.5			
23							22.0	17.5	19.0			
24							21.0	19.0	19.5			
25							21.0	19.5	20.0			
26							21.0	20.0	20.5			
27							21.5	20.0	21.0			
28							22.0	21.0	21.5			
29							22.5	21.0	21.5			
30							21.5	19.5	20.5			
31				21.5	20.0	20.5	21.0	19.0	20.0			
MONTH	18.5	14.0	16.5	21.5	18.5	19.5	24.0	17.5	21.0	20.0	11.0	14.5
YEAR	24.0	.0	7.5									

06058500 CANYON FERRY LAKE NEAR HELENA, MT

LOCATION.--Lat 46°38'57", long 111°43'39", in SE¼SE¼ sec.4, T.10 N., R.1 W., Lewis and Clark County, Hydrologic Unit 10030101, in block 17 of Canyon Ferry Dam, 15 mi east of Helena, and at mile 2,252.8.

DRAINAGE AREA.--15,904 mi^2.

PERIOD OF RECORD.--April 1953 to current year (monthend contents only). Prior to October 1981, published as Canyon Ferry Reservoir near Helena. Records of monthend contents in Lake Sewell, submerged by present reservoir Apr. 8, 1953, available January 1936 to March 1953. Scattered daily elevations and contents for April to July 1953, published in WSP 1320-B. Daily elevations and contents for May to June 1964, published in WSP 1840-B. Daily elevations and contents on file in Helena district office.

REVISED RECORDS.--WSP 1559: Drainage area.

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by concrete dam; construction began in 1949, completed in 1953. Storage began in March 1953. Usable capacity, 2,043,000 acre-ft between elevation 3,650.00 ft, invert of outlet works, and 3,800.00 ft, controlled spillway elevation. Dead storage, 7,470 acre-ft, below elevation 3,650.00 ft. Minimum operating level, 426,500 acre-ft at elevation 3,728.00 ft for on-site power generation. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, recreation, and supplemental water supply for city of Helena.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 2,043,000 acre-ft July 15-29, 31, 1955, July 2, 5, 6, 8, 1956, July 16, 17, 1962, June 23, 1964, elevation, 3,800.0 ft; minimum since first filling, 1,017,000 acre-ft Apr. 11, 1967, elevation, 3,764.70 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents at 2400, 1,953,000 acre-ft June 24, elevation, 3,797.25 ft; minimum, 1,454,000 acre-ft Feb. 16-23, elevation, 3,781.40 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	3,787.18	1,630,000	---
Oct. 31	3,789.41	1,701,000	+ 71,000
Nov. 30	3,786.81	1,619,000	- 82,000
Dec. 31	3,784.78	1,556,000	- 63,000
CAL YR 1985			+ 8,000
Jan. 31	3,783.04	1,503,000	- 53,000
Feb. 28	3,782.32	1,482,000	- 21,000
Mar. 31	3,782.51	1,487,000	+ 5,000
Apr. 30	3,784.25	1,540,000	+ 53,000
May 31	3,787.76	1,649,000	+109,000
June 30	3,796.72	1,935,000	+286,000
July 31	3,794.08	1,850,000	- 85,000
Aug. 31	3,789.30	1,697,000	-153,000
Sept. 30	3,790.48	1,734,000	+ 37,000
WTR YR 1986			+104,000

06058502 MISSOURI RIVER BELOW CANYON FERRY DAM, NEAR HELENA, MT

LOCATION.--Lat 46°38'58", long 111°43'39", in NW¼SE¼SE¼ sec.4, T.10 N., R.1 W., Lewis and Clark County, Hydrologic Unit 10030101, at penstock of No. 1 generator at Canyon Ferry Dam, 15 mi east of Helena, and at mile 2,242.8.

DRAINAGE AREA.--15,904 mi2.

PERIOD OF RECORD.--Water years 1968 to current year. Prior to October 1971 samples and water temperature were obtained about 200 ft downstream from dam in tailrace pond.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1967 to current year.
WATER TEMPERATURE: October 1967 to September 1979.

REMARKS.--Flow completely regulated. Many diversions for irrigation upstream from station. Unpublished records of once-daily water temperatures are available in files of District office.

COOPERATION.--Records of discharge furnished by Canyon Ferry Project Office, Bureau of Reclamation, Helena, MT.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 442 microsiemens, Mar. 31, Apr. 13, 1978; minimum daily, 241 microsiemens, Dec. 16, 1968.
WATER TEMPERATURE (water years 1968-79): Maximum daily, 20.0°C, Aug.27, 1969; minimum daily, (water years 1968-71) 0.0°C on several days during winter, (water years 1972-79) 1.5°C, Jan. 3, 1972.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 412 microsiemens, Feb. 23, Apr. 13; minimum daily, 297 microsiemens, Aug. 27, Sep. 7.

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)	PH LAB (STAND-ARD UNITS) (00403)	HARD-NESS (MG/L AS CACO3) (00900)
NOV									
20...	1330	5500	2	1	360	-12.0	6.5	8.20	140
DEC									
19...	0950	5160	0	0	375	-10.0	3.5	8.30	150
MAR									
21...	1400	5450	60	1	395	13.0	4.5	8.10	160
JUN									
18...	0750	10100	20	1	360	19.0	9.0	8.10	140
JUL									
10...	1330	5610	50	1	350	18.0	10.0	7.80	130
AUG									
07...	0950	5620	0	0	313	23.0	13.5	7.90	120
SEP									
17...	1315	5060	80	3	311	21.0	15.5	8.00	120

DATE	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)
NOV								
20...	5	36	11	19	0.7	3.9	130	32
DEC								
19...	11	39	12	20	0.7	3.7	136	29
MAR								
21...	7	41	13	23	0.8	3.9	149	37
JUN								
18...	7	39	11	21	0.8	3.7	136	36
JUL								
10...	2	35	10	19	0.8	3.4	127	35
AUG								
07...	4	33	9.5	17	0.7	3.3	118	29
SEP								
17...	3	32	9.2	17	0.7	3.2	115	26

06058502 MISSOURI RIVER BELOW CANYON FERRY DAM, NEAR HELENA, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)
NOV 20...	8.8	1.0	19	210	0.28	3100	0.18	0.03
DEC 19...	12	1.1	20	220	0.30	3040	0.15	0.03
MAR 21...	11	1.3	22	240	0.33	3550	0.21	0.01
JUN 18...	12	1.1	22	230	0.31	6200	0.19	0.03
JUL 10...	10	0.9	21	210	0.29	3190	0.22	0.03
AUG 07...	8.9	1.0	20	190	0.26	2920	0.18	0.04
SEP 17...	9.6	0.8	20	190	0.25	2550	0.13	0.04

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	357	371	373	401	397	404	403	407	387	348	344	301
2	363	373	373	385	395	407	406	410	390	365	341	314
3	374	371	375	389	394	406	409	410	389	366	339	303
4	372	372	377	392	404	404	409	407	388	366	332	304
5	373	372	375	391	389	403	409	407	387	357	341	305
6	375	373	375	392	390	403	408	411	393	357	332	313
7	377	375	374	388	394	406	409	411	388	361	325	297
8	374	371	376	388	394	402	406	411	389	360	337	305
9	370	371	377	389	392	402	408	408	386	360	332	306
10	369	374	378	391	389	405	407	407	387	359	329	306
11	369	373	378	391	392	406	408	405	385	365	319	305
12	375	372	378	393	390	406	407	406	384	347	337	306
13	372	373	378	389	394	405	412	406	383	359	320	306
14	372	371	378	393	396	407	408	408	384	351	326	311
15	376	371	376	393	404	408	406	407	381	357	334	309
16	373	372	378	394	396	405	404	409	382	363	321	307
17	372	371	377	395	404	405	405	406	380	346	315	318
18	371	370	377	393	401	408	405	400	379	344	331	329
19	372	370	379	392	396	405	404	402	381	349	318	332
20	371	370	377	391	397	405	404	399	376	353	317	327
21	368	371	376	402	400	404	403	399	383	348	308	335
22	372	372	385	404	406	403	403	403	372	357	314	333
23	373	372	386	404	412	403	402	400	375	348	306	329
24	373	372	381	406	399	404	402	396	381	355	314	329
25	372	372	382	405	399	404	400	390	378	347	317	336
26	371	372	384	403	406	403	400	391	377	346	302	337
27	371	373	382	403	399	403	399	392	377	358	297	330
28	370	373	384	392	403	406	399	390	373	346	300	328
29	370	372	385	406	---	409	399	389	369	339	318	327
30	370	373	385	390	---	405	398	387	371	347	302	327
31	370	---	391	390	---	409	---	386	---	325	310	---
MEAN	371	372	379	395	398	405	405	402	382	353	322	317

WTR YR 1986 MEAN 375 MAX 412 MIN 297

06061500 PRICKLY PEAR CREEK NEAR CLANCY, MT

LOCATION.--Lat 46°31'09", long 111°56'45", in NE¼SE¼SW¼ sec.23, T.9 N., R.3 W., Jefferson County, Hydrologic Unit 10030101, on right bank 3.5 mi downstream from Lump Gulch Creek, 4 mi northeast of Clancy, 7 mi southeast of Helena, and at mile 24.4.

DRAINAGE AREA.--192 mi^2.

PERIOD OF RECORD.--July 1908 to September 1916, July 1921 to September 1933, October 1945 to October 1953, October 1954 to September 1969, October 1978 to current year. October 1969 to September 1980 record collected by Montana Department of Natural Resources and Conservation. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1086: 1946(m). WSP 1309: 1925, 1927, 1931(M), 1933, 1948(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,067.1 ft above National Geodetic Vertical Datum of 1929. Prior to July 12, 1910, nonrecording gage at site 1.2 mi upstream at different datum. July 12, 1910, to Sept. 30, 1916, and July 28, 1921, to Aug. 12, 1933, nonrecording gage at site 2.2 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 11 to Dec. 18, Dec. 21 to Jan. 12, 14, 15, 22, 23, 25-27, Feb. 6-26. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation 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.--51 years (water years, 1909-16, 1922-33, 1946-53, 1955-69, 1979-86), 50.1 ft^3/s, 36,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,300 ft^3/s May 22, 1981, gage height, 8.82 ft, from rating curve extended above 900 ft^3/s, on basis of culvert computation at gage height 8.82 ft; minimum, 0.5 ft^3/s Jan. 26, 1958, gage height, 0.40 ft, ice jam upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 19, 1975, reached a discharge of 1,200 ft^3/s, gage height, 6.56 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 29	0115	214	2.46	June 6	0415	*220	*2.48

Minimum daily discharge, 20 ft^3/s Jan. 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	28	37	27	25	28	48	59	64	178	51	27	37
2	28	37	26	24	30	48	57	73	179	47	26	32
3	33	36	27	23	29	48	54	90	185	44	26	28
4	35	35	28	22	28	47	55	99	171	53	25	26
5	35	36	29	20	27	48	54	91	182	92	25	25
6	39	36	28	22	26	46	54	81	203	65	25	27
7	37	36	28	23	25	51	55	82	164	55	25	27
8	35	35	27	24	25	65	57	89	159	51	24	28
9	35	32	27	25	24	55	59	93	149	53	23	37
10	36	31	26	26	23	49	60	102	128	56	22	33
11	38	30	25	25	24	48	59	104	116	53	22	30
12	43	29	26	25	26	52	58	91	106	50	26	28
13	40	30	27	27	28	50	51	93	99	45	33	31
14	39	30	27	25	32	46	55	108	93	42	28	41
15	42	31	28	25	35	43	60	93	100	41	25	37
16	47	30	28	24	36	43	65	86	88	45	23	36
17	49	29	27	25	35	43	61	84	80	51	22	41
18	43	31	26	26	34	42	56	87	71	43	22	81
19	41	30	28	29	33	42	53	98	67	40	21	63
20	44	29	27	28	33	42	52	123	65	38	21	54
21	48	29	25	26	35	44	61	146	63	36	25	55
22	59	29	25	24	40	47	68	145	60	35	39	47
23	50	27	25	26	45	44	80	120	57	35	29	42
24	44	27	25	25	54	46	71	110	55	32	27	39
25	42	28	25	24	70	44	68	112	52	32	25	39
26	43	28	25	25	64	43	72	139	52	37	23	38
27	41	28	25	26	55	45	70	169	51	41	23	36
28	42	28	24	25	49	56	70	186	53	36	22	35
29	41	28	24	24	---	68	70	195	75	33	22	35
30	39	28	24	25	---	70	64	193	60	31	23	35
31	38	---	25	27	---	69	---	184	---	28	28	---
TOTAL	1254	930	814	770	993	1532	1828	3530	3161	1391	777	1143
MEAN	40.5	31.0	26.3	24.8	35.5	49.4	60.9	114	105	44.9	25.1	38.1
MAX	59	37	29	29	70	70	80	195	203	92	39	81
MIN	28	27	24	20	23	42	51	64	51	28	21	25
AC-FT	2490	1840	1610	1530	1970	3040	3630	7000	6270	2760	1540	2270

CAL YR 1985	TOTAL	10403.4	MEAN	28.5	MAX	85	MIN	8.8	AC-FT	20640
WTR YR 1986	TOTAL	18123	MEAN	49.7	MAX	203	MIN	20	AC-FT	35950

06062500 TENMILE CREEK NEAR RIMINI, MT

LOCATION.--Lat 46°31'27", long 112°15'22", in NW¼SW¼NE¼ sec.20, T.9 N., R.5 W., Lewis and Clark County, Hydrologic Unit 10030101, Helena National Forest, on left bank at U.S. Forest Service Moose Creek picnic grounds, 500 ft upstream from Moose Creek, 2.5 mi north of Rimini, and at mile 20.4.

DRAINAGE AREA.--32.7 mi^2.

PERIOD OF RECORD.--October 1914 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1917, 1921, 1924-25. WSP 1509: 1915, 1916-17(M), 1920(M), 1927(M), 1928-30, 1947(M), 1948, 1950(M). WSP 1559: Drainage area. WSP 1709: 1959.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,850 ft, from topographic map. Prior to Dec. 17, 1934, water-stage recorder at site 40 ft downstream at different datum and different control.

REMARKS.--Estimated daily discharges: Dec. 10-11, 28, Jan. 5-6. Records good. Flow regulated by Chessman and Scott Reservoirs on tributaries upstream from station, combined capacity, 2,340 acre-ft. Small diversions upstream from station for water supply for city of Helena. Several observations of water temperature and specific conducance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--72 years, 17.9 ft^3/s, 12,970 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,290 ft^3/s May 22, 1981, gage height, 6.20 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 105 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 21	2115	159	3.03	June 3	1245	121	2.83
May 28	2015	*202	*3.23	June 5	2315	109	2.76

Minimum discharge, 0.69 ft^3/s Aug. 8-9, gage height, 1.22 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	10	21	6.7	4.5	2.4	7.9	33	39	118	11	1.1	8.6
2	11	21	6.2	4.7	2.3	8.6	30	49	102	6.7	.98	6.2
3	15	20	6.9	4.5	2.2	10	26	66	106	4.2	.91	4.4
4	14	20	6.6	4.5	1.8	19	26	77	95	12	.90	4.1
5	14	19	6.4	4.4	1.7	19	26	71	89	33	.92	3.9
6	16	16	6.2	4.3	1.4	19	27	66	90	22	.82	4.1
7	12	17	6.2	4.2	1.3	21	29	65	70	15	.79	4.9
8	14	15	6.1	4.2	1.4	21	31	61	70	12	.75	6.1
9	14	12	6.0	4.1	1.3	19	33	61	59	12	.75	5.7
10	15	9.2	6.0	3.7	1.3	17	37	65	48	12	.97	3.9
11	14	13	6.0	3.8	1.1	16	37	63	42	11	.84	3.0
12	15	15	6.0	3.7	1.0	16	35	57	37	10	2.8	2.6
13	14	20	5.8	3.6	1.1	15	35	65	31	7.0	5.2	4.5
14	13	19	5.5	3.6	1.1	15	35	69	28	3.9	3.4	9.6
15	17	17	5.4	3.5	1.3	16	31	62	30	2.0	2.3	6.5
16	21	16	5.3	3.5	1.3	15	33	59	25	5.3	1.6	6.0
17	22	13	5.2	3.5	1.2	15	30	59	20	15	1.1	8.7
18	21	11	5.3	3.4	1.2	14	28	64	18	8.2	.93	22
19	21	12	4.8	3.6	1.2	14	27	79	17	6.8	.85	15
20	24	12	4.4	3.7	1.1	14	31	103	17	6.0	.85	13
21	27	11	4.3	3.7	1.1	15	38	132	16	5.1	2.9	15
22	32	10	4.5	3.2	1.1	16	51	135	14	3.1	5.1	13
23	28	9.7	4.9	3.5	1.1	15	61	115	9.9	2.2	2.4	11
24	26	9.6	4.9	3.3	2.2	16	52	109	7.3	2.0	1.9	10
25	26	9.1	4.8	3.2	5.5	15	49	115	5.4	1.7	1.4	11
26	26	8.2	4.7	3.1	7.2	15	46	131	5.0	1.6	1.3	9.4
27	25	8.2	4.7	3.1	7.2	17	45	158	4.2	2.2	1.4	7.6
28	25	8.1	4.6	3.1	8.1	22	44	183	6.5	2.9	1.1	6.7
29	24	7.7	4.6	3.0	---	29	41	171	21	3.9	.98	6.0
30	23	7.2	4.5	3.2	---	35	38	155	16	4.5	1.8	5.7
31	22	---	4.7	3.0	---	35	---	134	---	4.0	4.2	---
TOTAL	601	407.0	168.2	114.4	62.2	541.5	1085	2838	1217.3	248.3	53.24	238.2
MEAN	19.4	13.6	5.43	3.69	2.22	17.5	36.2	91.5	40.6	8.01	1.72	7.94
MAX	32	21	6.9	4.7	8.1	35	61	183	118	33	5.2	22
MIN	10	7.2	4.3	3.0	1.0	7.9	26	39	4.2	1.6	.75	2.6
AC-FT	1190	807	334	227	123	1070	2150	5630	2410	493	106	472

CAL YR 1985	TOTAL	3619.38	MEAN	9.92	MAX	83	MIN	.25	AC-FT	7180
WTR YR 1986	TOTAL	7574.34	MEAN	20.8	MAX	183	MIN	.75	AC-FT	15020

06066500 MISSOURI RIVER BELOW HOLTER DAM, NEAR WOLF CREEK, MT

LOCATION.--Lat 46°59'41", long 112°00'37", in NE¼SW¼SE¼ sec.5, T.14 N., R.3 W., Lewis and Clark County, Hydrologic Unit 10030102, on left bank 0.4 mi downstream from Holter Dam, 2.8 mi southeast of Wolf Creek, and at mile 2,210.7.

DRAINAGE AREA.--17,149 mi^2.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,464.11 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 10-12. Records good. Flow regulated by nine smaller irrigation reservoirs and powerplants, Clark Canyon Reservoir (station number 06015300), and Canyon Ferry Lake (station number 06058500). Diversions for irrigation of about 594,400 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.--41 years, 5,717 ft^3/s, 4,142,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,800 ft^3/s June 8, 1948, gage height, 11.70 ft; minimum, probably less than 250 ft^3/s during powerplant shutdown July 26, 1968; minimum daily, 747 ft^3/s May 27, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,700 ft^3/s June 9, gage height, 6.70 ft; minimum daily, 3,570 ft^3/s Oct. 1.

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	3570	5520	4980	4980	5030	5120	4880	5440	7470	6220	4870	4670
2	3990	5780	4940	4810	5000	5120	5110	5410	7550	6070	4870	4300
3	4400	5500	4970	4850	4940	5130	5030	5400	7470	5920	4880	4290
4	4420	5330	4890	4930	4870	5120	4900	5530	7870	6030	4890	4280
5	4300	5320	4680	4960	4890	5100	4760	5650	8950	6380	4910	4380
6	4150	5230	4400	4890	5020	5130	4730	5670	9660	6170	4900	4380
7	4160	5150	4260	4890	5670	5110	4850	5610	11400	5660	4880	4340
8	4210	5140	4310	4960	6150	5100	4940	5950	13000	5380	4890	4300
9	4520	5180	4280	4970	6240	5100	5160	6690	14100	5530	4940	4630
10	4490	5130	4400	4960	6250	5130	5740	6950	14500	5770	4910	4900
11	4310	5110	4500	4990	6220	5170	5320	6950	13900	5480	4900	4880
12	4240	5110	4600	5000	6240	5210	5090	6640	12700	5310	4940	4860
13	4250	5300	4660	5000	6260	5220	5060	6420	13100	5290	4960	4790
14	4230	5420	4550	4970	6260	5090	5040	6470	12400	5430	4960	4810
15	4170	5290	4580	4940	6070	5040	5390	6630	11000	5570	4960	4680
16	4120	5240	4810	4930	5360	5060	5540	6640	10600	5500	4900	4780
17	4150	5290	4940	4920	4870	5050	5600	6690	11200	5410	4610	4790
18	4180	5300	4980	4960	4430	5040	5300	6710	10700	5120	4940	5100
19	4200	5240	4910	4950	4360	5050	5070	6560	8380	4920	5140	5040
20	4130	5980	4860	4910	4330	5070	5070	6600	6610	4520	4870	4590
21	4430	6460	4870	4870	4380	5020	5140	6930	6710	4740	4790	4390
22	4740	6430	4870	4890	4410	5000	5840	7200	6540	4790	4930	4160
23	4590	6350	4830	4830	4410	4990	6040	7030	6380	4650	5010	4090
24	4610	6310	4940	4760	4340	5000	5630	6940	6470	4850	5140	4130
25	4770	6290	4860	4830	4460	4990	5220	7030	6470	4870	5210	4110
26	5050	6290	4830	4860	4690	4980	5210	7080	6340	4860	5200	4140
27	5120	5860	4610	5020	4700	4970	5150	7130	6150	4880	5100	4290
28	5100	5000	4610	5020	4850	4860	5440	7190	6100	4880	4920	4270
29	5100	5020	4740	5060	---	4830	5660	7250	6110	4810	5020	4160
30	5110	5020	4900	5070	---	4820	5580	7300	6560	4810	5050	4080
31	5140	---	4910	5070	---	4820	---	7430	---	4860	4900	---
TOTAL	137950	165590	146470	153050	144700	156440	157490	203120	276390	164680	153390	134610
MEAN	4450	5520	4725	4937	5168	5046	5250	6552	9213	5312	4948	4487
MAX	5140	6460	4980	5070	6260	5220	6040	7430	14500	6380	5210	5100
MIN	3570	5000	4260	4760	4330	4820	4730	5400	6100	4520	4610	4080
AC-FT	273600	328400	290500	303600	287000	310300	312400	402900	548200	326600	304200	267000

CAL YR 1985	TOTAL	1626710	MEAN	4457	MAX	7380	MIN	2500	AC-FT	3227000
WTR YR 1986	TOTAL	1993880	MEAN	5463	MAX	14500	MIN	3570	AC-FT	3955000

06076690 SMITH RIVER NEAR FORT LOGAN, MT

LOCATION.--Lat 46°47'45", long 111°10'41", in NE¼SW¼SW¼ sec.13, T.12 N., R.4 E., Meagher County, Hydrologic Unit 10030103, on left bank, 15 ft downstream from ranch bridge, 1.0 mi upstream from Sheep Creek, 9.0 mi north of Fort Logan, and at mile 83.7.

DRAINAGE AREA.--846 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 4,400 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 11 to Mar. 1. Records good except those for estimated daily discharges, which are poor. Flow slightly regulated by Smith River Reservoir (station number 06075000). Diversion for irrigation of about 19,300 acres 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.

AVERAGE DISCHARGE.--9 years, 181 ft^3/s, 131,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,600 ft^3/s May 22, 1981, gage height, 7.80 ft; minimum, 28 ft^3/s July 2, 1985, gage height, 2.36 ft; minimum gage height, 2.12 ft Nov. 11, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	1800	ice jam	*6.05	June 6	2030	*864	4.54

No other peak greater than base discharge.

Minimum discharge, 50 ft^3/s Jan. 13, gage height, 2.53 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	106	118	96	86	92	350	166	228	494	197	115	150
2	109	118	96	84	98	323	164	217	517	193	113	149
3	110	119	98	84	100	287	155	206	560	188	112	141
4	112	120	100	84	98	262	154	212	650	218	116	139
5	110	119	102	84	94	244	156	232	734	427	115	141
6	108	119	104	86	90	220	157	232	833	430	106	144
7	112	119	105	87	88	211	155	231	764	343	100	153
8	85	119	104	88	86	234	153	258	727	302	97	156
9	110	117	100	90	84	235	145	278	772	289	93	180
10	114	88	98	96	82	215	149	293	696	266	94	175
11	126	80	98	100	82	197	143	360	587	250	92	158
12	128	80	98	100	82	206	144	331	505	233	97	151
13	139	86	98	100	82	224	119	276	457	217	116	155
14	139	92	98	100	86	202	136	263	424	199	138	171
15	138	100	98	98	90	186	184	242	427	189	114	172
16	137	110	100	98	92	178	208	240	393	193	104	174
17	128	105	100	98	94	172	217	229	339	239	99	180
18	119	100	100	100	92	167	188	223	290	257	98	211
19	115	100	100	110	92	168	165	234	252	227	97	216
20	113	98	100	108	90	172	153	237	229	199	99	200
21	111	98	99	100	92	174	147	244	203	189	98	193
22	111	98	98	94	100	174	152	292	188	175	125	179
23	117	98	97	92	110	167	195	305	165	161	124	167
24	122	100	96	88	150	165	230	273	149	151	118	159
25	127	98	96	88	450	166	236	248	131	143	111	163
26	121	94	94	88	700	154	276	232	123	165	103	163
27	119	95	93	88	600	155	339	232	130	162	104	162
28	118	95	92	89	450	164	327	284	144	150	107	158
29	115	98	90	90	---	172	268	368	180	140	107	157
30	115	97	88	90	---	178	246	429	203	129	110	155
31	118	---	86	92	---	171	---	453	---	120	129	---
TOTAL	3652	3078	3022	2880	4446	6293	5627	8382	12266	6741	3351	4972
MEAN	118	103	97.5	92.9	159	203	188	270	409	217	108	166
MAX	139	120	105	110	700	350	339	453	833	430	138	216
MIN	85	80	86	84	82	154	119	206	123	120	92	139
AC-FT	7240	6110	5990	5710	8820	12480	11160	16630	24330	13370	6650	9860

CAL YR 1985	TOTAL	37613	MEAN	103	MAX	233	MIN	36	AC-FT	74610
WTR YR 1986	TOTAL	64710	MEAN	177	MAX	833	MIN	80	AC-FT	128400

06078200 MISSOURI RIVER NEAR ULM, MT

LOCATION.--Lat 47°26'06", long 111°23'07", in NE¼NW¼NW¼ sec.5, T.19 N., R.3 E., Cascade County, Hydrologic Unit 10030102, on left bank 5.6 mi east of Ulm, 9.1 mi downstream from Smith River, and at mile 2,140.4.

DRAINAGE AREA.--20,941 mi^2.

PERIOD OF RECORD.--August 1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,313.27 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 20 to Jan. 19, Feb. 8-28. Records good except those for estimated daily discharges, which are poor. Flow regulated by 10 smaller irrigation reservoirs and power plants, Clark Canyon Reservoir (station number 06015300), and Canyon Ferry Lake (station number 06058500). Diversions for irrigation of about 630,400 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.--29 years, 6,901 ft^3/s, 5,000,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,500 ft^3/s May 24, 1981, gage height, 14.99 ft; minimum daily, 1,700 ft^3/s June 17, 1961.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1953 reached a stage of about 17 ft; discharge, 35,000 ft^3/s. Flood in June 1948 reached a stage of about 16 ft; discharge, 32,000 ft^3/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,300 ft^3/s June 11, gage height, 9.74 ft; minimum daily, 4,260 ft^3/s Sept. 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	4320	6490	5600	5400	5330	6630	5890	7170	9490	6820	5160	4870
2	4330	6700	5600	5400	5320	6500	5920	6950	9420	6650	5140	4830
3	4680	7010	5600	5400	5320	6350	6140	6870	9270	6420	5130	4400
4	5240	6780	5400	5400	5280	6260	6110	6930	9030	6260	5130	4290
5	5400	6610	5300	5200	5190	6180	5920	7310	9250	6610	5120	4260
6	5370	6560	5200	5400	5180	6130	5750	7670	10100	7290	5090	4320
7	5370	6470	5200	5400	5180	6120	5680	7730	10800	7240	5070	4370
8	5460	6430	5200	5400	5900	6080	5780	7680	12100	6630	5020	4370
9	5410	6370	5100	5400	7000	6110	5920	7930	13500	6210	5000	4410
10	5620	6320	5100	5400	7000	6150	6100	8590	14700	6250	5020	4680
11	5710	6180	5200	6000	7000	6080	6630	9110	15200	6420	5030	4970
12	5830	6080	5300	5800	7000	6050	6560	9320	14700	6170	5030	4900
13	6130	6040	5400	5600	7000	6090	6430	8940	13400	5940	5040	4910
14	6070	6250	5500	5600	7000	6080	6270	8570	13200	5880	5110	4940
15	5970	6470	5400	5500	7000	5930	6220	8490	12700	5940	5090	5000
16	6050	6440	5200	5500	7000	5830	6530	8570	11300	6120	5030	4910
17	6180	6370	5200	5400	6800	5810	6710	8510	10700	6280	4970	4990
18	6100	6370	5600	5400	6200	5810	6770	8440	11000	6120	4700	5050
19	6000	6330	5600	5400	5600	5770	6510	8370	10600	5910	4800	5380
20	5910	6200	5600	5360	5200	5740	6170	8270	8650	5670	5020	5630
21	5810	6200	5400	5330	5200	5760	6090	8410	6800	5260	4840	5330
22	5990	7000	5400	5240	5200	5640	6120	8880	6670	5310	4750	5120
23	6270	7400	5400	5290	5200	5650	6690	9350	6530	5400	4840	4870
24	6180	7400	5400	5160	5200	5700	7210	9290	6350	5180	4920	4640
25	6160	7400	5400	5050	5800	5670	7170	9020	6390	5300	4990	4680
26	6180	7400	5400	5050	6400	5710	7050	8940	6430	5310	5040	4660
27	6410	7400	5400	5090	6800	5680	7070	8960	6360	5320	5020	4630
28	6520	7200	5000	5200	6800	5630	7050	9100	6220	5280	4930	4740
29	6440	6800	5000	5240	---	5550	7200	9280	6320	5260	4770	4780
30	6470	5700	5200	5290	---	5690	7320	9450	6410	5200	4790	4660
31	6440	---	5400	5320	---	5790	---	9510	---	5160	4900	---
TOTAL	180020	198370	165700	166620	169100	184170	192980	261610	293590	184810	154490	143590
MEAN	5807	6612	5345	5375	6039	5941	6433	8439	9786	5962	4984	4786
MAX	6520	7400	5600	6000	7000	6630	7320	9510	15200	7290	5160	5630
MIN	4320	5700	5000	5050	5180	5550	5680	6870	6220	5160	4700	4260
AC-FT	357100	393500	328700	330500	335400	365300	382800	518900	582300	366600	306400	284800

CAL YR 1985	TOTAL	1948810	MEAN	5339	MAX	8980	MIN	2770	AC-FT	3865000
WTR YR 1986	TOTAL	2295050	MEAN	6288	MAX	15200	MIN	4260	AC-FT	4552000

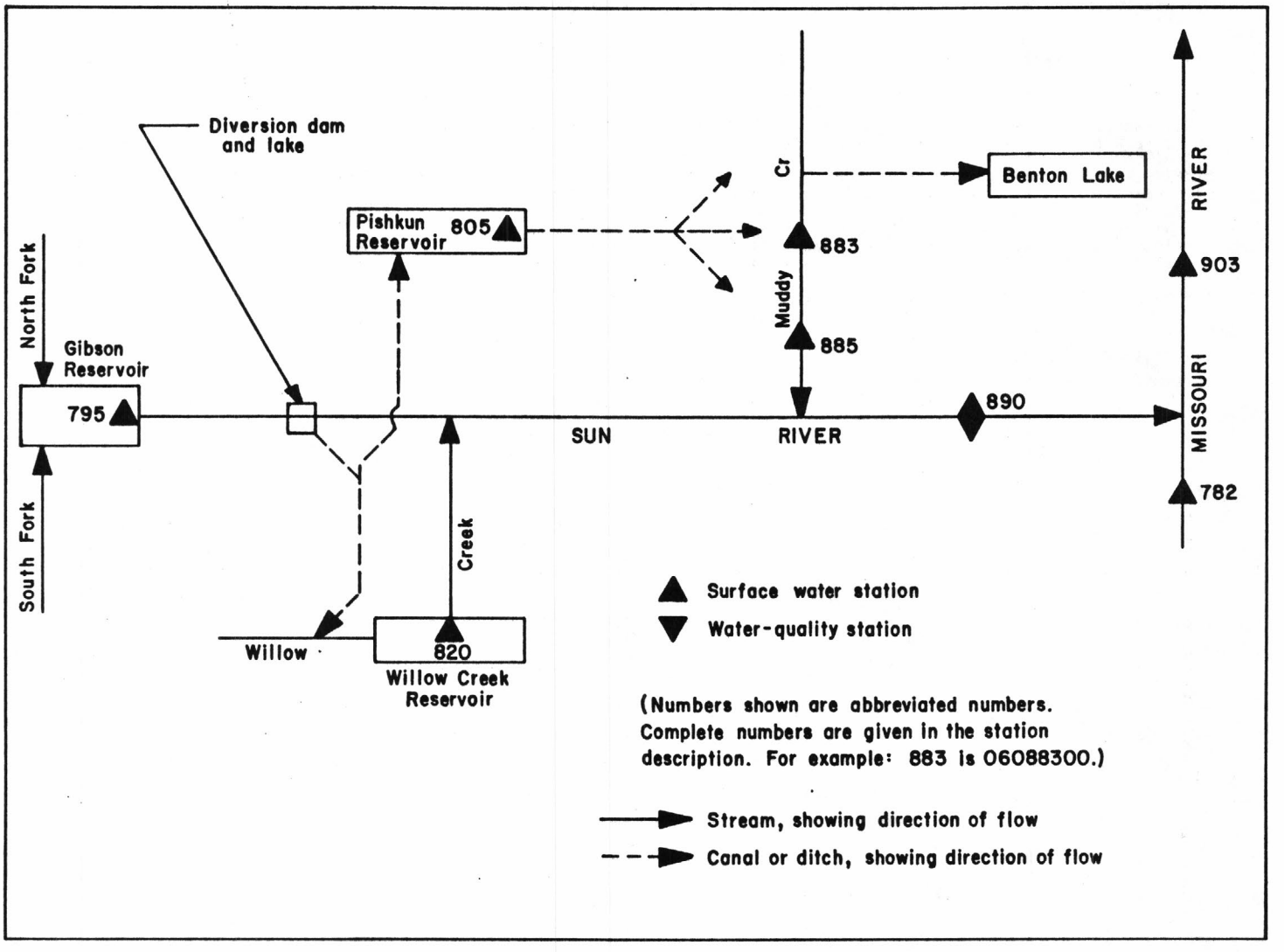


Figure 10. Schematic diagram showing diversions and storage in Sun River basin.

06088300 MUDDY CREEK NEAR VAUGHN, MT

LOCATION.--Lat 47°37'30", long 111°38'05", in NE¼NE¼NW¼ sec.32, T.22 N., R.1 E., Cascade County, Hydrologic Unit 10030104, on left bank 200 ft downstream from bridge on county road 6.2 mi northwest of Vaughn and at mile 14.6.

DRAINAGE AREA.--282 mi^2.

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,441.79 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Oct. 8-9, Nov. 10 to Feb. 26, Apr. 14-20. 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. Natural flow increased by wastage from Greenfields Irrigation Project. Diversions for irrigation of about 400 acres upstream from station. Pumped diversions from Muddy Creek upstream from station in SW¼ sec.2, T.22 N., R.1 W., to supplement water supply for Benton Lake Wildlife Refuge are listed below.

AVERAGE DISCHARGE.--18 years, 115 ft^3/s, 83,320 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,560 ft^3/s May 22, 1981, gage height, 14.72 ft; minimum daily, 8.0 ft^3/s Dec. 8, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 419 ft^3/s July 18, gage height, 4.58 ft; maximum gage height, 7.71 ft Feb. 25 (backwater from ice); minimum daily discharge, 23 ft^3/s Apr. 14-15.

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	118	83	61	54	46	78	33	37	112	225	214	135
2	114	82	60	52	46	65	32	37	126	227	219	110
3	116	81	60	50	45	60	32	37	74	236	212	104
4	110	80	62	49	44	57	32	40	68	265	221	113
5	109	80	63	48	43	56	31	41	73	334	200	120
6	116	78	65	48	42	52	31	37	78	326	187	126
7	97	79	64	49	42	50	30	37	75	265	211	109
8	90	80	62	49	40	51	30	37	82	211	196	86
9	110	68	60	50	39	49	30	56	114	231	209	130
10	130	66	60	52	38	46	30	109	124	250	223	116
11	153	66	58	52	38	45	30	91	122	228	225	105
12	179	68	56	52	38	45	27	89	129	249	199	124
13	154	70	56	50	38	44	24	69	136	291	199	124
14	137	72	56	50	38	45	23	50	151	292	241	90
15	130	74	58	49	38	42	23	46	212	236	215	71
16	117	75	58	48	37	42	25	53	199	243	207	72
17	111	75	60	47	36	43	28	54	157	315	194	76
18	110	74	60	48	36	41	32	71	163	356	203	86
19	108	72	62	49	36	40	34	66	167	345	212	81
20	105	70	62	50	36	39	35	57	192	285	156	77
21	103	68	64	48	40	38	36	49	212	213	146	68
22	101	66	62	45	50	36	35	49	224	188	139	71
23	98	64	60	45	70	36	33	46	231	199	135	84
24	95	65	58	46	100	37	34	45	227	208	132	84
25	94	68	56	46	350	34	35	56	181	256	136	87
26	92	66	54	46	200	36	56	81	188	277	142	81
27	90	65	52	46	127	34	55	119	190	240	106	78
28	88	64	50	45	91	33	48	111	206	295	101	75
29	86	63	50	45	---	33	41	101	226	289	97	77
30	86	62	52	45	---	33	37	117	261	209	98	74
31	84	---	54	46	---	33	---	121	---	202	130	---
TOTAL	3431	2144	1815	1499	1824	1373	1002	2009	4700	7986	5505	2834
MEAN	111	71.5	58.5	48.4	65.1	44.3	33.4	64.8	157	258	178	94.5
MAX	179	83	65	54	350	78	56	121	261	356	241	135
MIN	84	62	50	45	36	33	23	37	68	188	97	68
AC-FT	6810	4250	3600	2970	3620	2720	1990	3980	9320	15840	10920	5620
(†)	0	0	0	0	0	0	0	0	0	0	1610	1770

CAL YR 1985	TOTAL	31053	MEAN	85.1	MAX	332	MIN	12	AC-FT	61590
WTR YR 1986	TOTAL	36122	MEAN	99.0	MAX	356	MIN	23	AC-FT	71650

† Diversions, in acre-feet, to Benton Lake, furnished by U.S. Fish and Wildlife Service.

06088500 MUDDY CREEK AT VAUGHN, MT

LOCATION.--Lat 47°33'42", long 111°32'33", in SE¼SW¼NE¼ sec.24, T.21 N., R.1 E., Cascade County, Hydrologic Unit 10030104, on right bank at Vaughn, and at mile 1.3.

DRAINAGE AREA.--314 mi^2.

PERIOD OF RECORD.--May 1925 to February 1926, April 1934 to September 1968, July 1971 to current year.

REVISED RECORDS.--WSP 856: 1937. WSP 1509: 1934-35, 1941(M). WSP 1559: 1956. WSP 1629: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,337.64 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). May 21, 1925, to Feb. 8, 1926, nonrecording gage at site 500 ft downstream at different datum. Apr. 19, 1925, to Sept. 30, 1955, at present site at datum 1.00 ft higher. May 18, 1955, to Apr. 25, 1960, and Sept. 24, 1962, to Sept. 30, 1968, auxiliary crest-stage gage. Oct. 1, 1955, to Sept. 30, 1968, nonrecording gage at bridge 30 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 10 to Mar. 2 and Apr. 13-21. Water-discharge 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 back of this report. Natural flow increased by wastage from Sun River Canal and by return flow from irrigation. Diversions for irrigation of about 700 acres upstream from station. Pumped diversions from Muddy Creek upstream from station in SW¼ sec. 2, T.22 N., R.1 W., to supplement water supply for Benton Lake Wildlife Refuge are listed below.

AVERAGE DISCHARGE.--49 years (1934-68, 1971-86), 128 ft^3/s, 92,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,600 ft^3/s June 4, 1953, gage height, 17.7 ft, present datum, from floodmarks, from rating curve extended above 3,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 2.0 ft^3/s Mar. 16, 17, 1972, gage height, 1.20 ft, result of ice jams upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1908 reached a stage of about 24 ft, present datum (discharge not determined); flood in June 1932 reached a stage of about 19 ft, present datum (discharge not determined); from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 508 ft^3/s July 18, gage height, 4.90 ft, but may have been higher during period of no gage-height record, Feb. 25-28; minimum daily, 31 ft^3/s Apr. 15-17.

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	128	84	61	56	46	80	36	36	151	306	288	227
2	127	85	60	53	46	70	36	35	168	318	302	175
3	131	83	60	51	45	64	35	36	111	308	286	165
4	123	81	62	49	44	60	36	36	94	340	309	167
5	120	80	63	49	43	58	35	38	101	429	288	177
6	124	77	65	49	42	53	35	36	123	430	259	186
7	120	76	64	50	41	49	35	35	117	376	264	177
8	90	79	62	50	40	51	34	35	116	306	258	141
9	122	76	61	51	39	50	34	37	153	326	253	183
10	135	75	60	52	38	49	33	118	168	355	293	191
11	166	72	58	52	38	48	32	106	155	328	324	175
12	198	70	57	52	37	46	33	111	156	346	294	178
13	173	70	56	51	38	45	32	88	166	385	289	193
14	150	72	57	50	38	45	32	74	183	405	340	163
15	142	74	58	49	38	44	31	63	275	321	296	132
16	131	76	58	48	37	43	31	65	310	319	290	130
17	123	74	59	48	36	44	31	95	256	416	266	143
18	118	72	60	48	36	43	32	127	270	445	269	147
19	116	71	61	49	36	43	33	131	276	455	283	147
20	112	70	62	50	35	41	35	109	304	403	232	134
21	109	68	64	48	40	40	36	110	331	315	217	129
22	105	66	62	46	50	39	36	106	325	235	220	123
23	101	64	61	45	70	40	35	108	331	245	215	140
24	99	65	59	46	100	40	33	98	330	241	213	140
25	98	68	57	47	400	37	34	104	281	288	200	146
26	94	66	56	47	200	39	58	124	278	327	215	139
27	93	65	54	46	150	39	55	151	287	299	176	134
28	91	64	52	45	100	36	44	182	283	362	165	132
29	87	63	50	45	---	37	39	150	296	377	154	133
30	87	62	52	45	---	36	36	173	357	302	151	132
31	85	---	55	46	---	36	---	172	---	262	169	---
TOTAL	3698	2168	1826	1513	1903	1445	1077	2889	6752	10570	7778	4679
MEAN	119	72.3	58.9	48.8	68.0	46.6	35.9	93.2	225	341	251	156
MAX	198	85	65	56	400	80	58	182	357	455	340	227
MIN	85	62	50	45	35	36	31	35	94	235	151	123
AC-FT	7330	4300	3620	3000	3770	2870	2140	5730	13390	20970	15430	9280
(†)	0	0	0	0	0	0	0	0	0	0	1,610	1,770

CAL YR 1985	TOTAL	39627	MEAN	109	MAX	519	MIN	12	AC-FT 78600
WTR YR 1986	TOTAL	46298	MEAN	127	MAX	455	MIN	31	AC-FT 91830

† Diversions, in acre-feet, to Benton Lake, furnished by U.S. Fish and Wildlife Service.

06089000 SUN RIVER NEAR VAUGHN, MT

LOCATION.--Lat 47°31'37", long 111°29'05", in NW¼SE¼SW¼ sec.33, T.21 N., R.2 E., Cascade County, Hydrologic Unit 10030104, on right bank 3.7 mi downstream from Muddy Creek, 3.6 mi southeast of Vaughn, and at mile 13.6.

DRAINAGE AREA.--1,854 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to October 1897 (gage heights and discharge measurements only, published as "near Great Falls"), April 1934 to current year. Monthly discharge only for April 1934, published in WSP 1309.

REVISED RECORDS.--WSP 786: 1934. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,317.12 ft above National Geodetic Vertical Datum of 1929. July 11 to Oct. 30, 1897, nonrecording gage at site 0.8 mi upstream at different datum. Apr. 19 to Aug. 3, 1934, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 8 to Feb. 26. Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by Gibson, Pishkun, Willow Creek, and Nilan Reservoir. Diversion for irrigation of about 110,000 acres upstream from station.

AVERAGE DISCHARGE.--52 years, 713 ft^3/s, 516,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,500 ft^3/s June 9, 1964, 42,200 ft^3/s in main channel, plus 11,300 ft^3/s in bypass channel, gage height, 23.4 ft from floodmark; minimum, 20 ft^3/s Apr. 24, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1964 exceeded the stage of the June 1908 flood by about 3 ft and is the highest since 1908, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,840 ft^3/s May 31, gage height, 7.61 ft; maximum gage height, 8.66 ft Feb. 25 (backwater from ice); minimum daily discharge, 277 ft^3/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	426	1340	310	600	600	834	600	1180	4250	423	470	546
2	416	1350	300	580	610	742	610	1180	3930	399	489	485
3	424	1340	320	560	620	687	806	1180	3120	383	478	448
4	472	1340	400	540	600	665	947	1180	1900	426	522	458
5	497	1320	550	560	540	645	951	1200	1280	529	469	463
6	516	1140	600	600	480	620	949	1190	1370	569	424	493
7	575	960	550	640	460	595	944	1260	1680	531	430	467
8	486	900	480	680	450	617	920	1280	1860	442	425	397
9	545	800	440	700	440	671	909	1190	1760	442	398	508
10	571	720	420	720	430	662	906	1280	1460	460	433	541
11	689	660	410	740	420	652	916	1350	1050	428	490	485
12	818	600	400	700	420	737	984	1400	555	429	484	454
13	751	620	410	680	420	733	928	1310	439	474	511	459
14	676	640	420	660	430	753	950	1180	398	506	573	452
15	654	680	430	660	430	825	1080	1130	504	432	536	409
16	646	700	450	660	420	824	1220	1130	547	440	507	425
17	629	600	470	680	400	835	1230	1020	450	554	457	441
18	615	540	540	700	380	824	1140	978	454	591	447	468
19	604	480	580	800	350	807	972	982	493	583	451	603
20	594	450	600	750	350	808	953	914	455	513	398	586
21	588	430	580	700	370	773	951	887	483	444	373	577
22	619	410	560	640	400	653	1020	946	451	371	370	527
23	808	390	540	640	500	621	1040	2250	452	369	345	501
24	937	380	530	660	700	619	820	2330	428	374	341	474
25	1070	370	520	680	2000	601	974	1950	364	423	321	464
26	1090	360	510	700	1500	599	1240	1960	356	502	331	443
27	1190	350	500	700	1200	583	1260	2490	352	488	307	425
28	1310	340	500	650	898	522	1210	3580	349	555	297	417
29	1310	330	520	600	---	507	1180	4360	365	562	277	406
30	1330	320	540	580	---	508	1180	4580	497	509	283	402
31	1340	---	580	580	---	531	---	4700	---	446	328	---
TOTAL	23196	20860	14960	20340	16818	21053	29790	53547	32052	14597	12965	14224
MEAN	748	695	483	656	601	679	993	1727	1068	471	418	474
MAX	1340	1350	600	800	2000	835	1260	4700	4250	591	573	603
MIN	416	320	300	540	350	507	600	887	349	369	277	397
AC-FT	46010	41380	29670	40340	33360	41760	59090	106200	63580	28950	25720	28210

CAL YR 1985	TOTAL	190988	MEAN	523	MAX	3260	MIN	120	AC-FT	378800
WTR YR 1986	TOTAL	274402	MEAN	752	MAX	4700	MIN	277	AC-FT	544300

06089000 SUN RIVER NEAR VAUGHN, MT--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at county bridge 1.8 mi downstream from gaging station.

PERIOD OF RECORD.--Water years 1969 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1968 to current year.
WATER TEMPERATURE: October 1968 to September 1979.

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 2,610 microsiemens, Apr. 8, 1977; minimum daily, 214 microsiemens, June 8, 1970.
WATER TEMPERATURE (water years 1969-79): Maximum daily, 28.0°C, Aug. 11, 27, 1969, Aug. 16, 1977; minimum daily, 0.0°C on many days during winter.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,400 microsiemens, Oct. 13; minimum daily, 267 microsiemens, Jun. 1.

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)
NOV							
06...	1030	1190	2	1	466	6.0	3.0
JAN							
09...	1200	699	0	0	548	9.0	0.0
FEB							
28...	1230	837	87	3	712	13.0	6.0
MAR							
05...	1055	682	--	--	696	8.0	5.0
APR							
09...	1615	908	--	0	444	24.0	13.0
MAY							
21...	0925	869	14	1	466	18.0	15.5
30...	0915	4480	--	--	289	28.0	15.0
JUN							
05...	1245	1230	--	--	427	23.0	17.0
30...	1200	535	10	1	790	22.0	18.0
AUG							
12...	1430	487	73	1	700	29.5	21.5

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
NOV										
06...	1030	8.30	230	59	53	24	19	0.6	1.2	172
JAN										
09...	1200	8.10	230	52	51	26	25	0.7	1.5	182
FEB										
28...	1230	8.20	280	99	58	34	44	1	2.7	186
APR										
09...	1615	8.20	200	32	48	20	16	0.5	1.3	170
MAY										
21...	0925	8.20	210	39	48	22	21	0.6	1.3	171
JUN										
30...	1200	8.20	310	80	60	40	38	1	2.8	235
AUG										
12...	1430	8.20	310	96	58	41	45	1	2.3	218

06089000 SUN RIVER NEAR VAUGHN, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986--Continued

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)
NOV 06...	77	2.3	0.3	5.4	290	0.39	917	0.46	<0.01
JAN 09...	99	2.4	0.3	5.7	320	0.44	604	0.61	<0.01
FEB 28...	190	6.4	0.3	7.0	450	0.62	1030	1.00	0.01
APR 09...	70	2.1	0.2	4.1	260	0.36	646	0.19	<0.01
MAY 21...	75	2.2	0.2	4.3	280	0.38	649	0.24	0.03
JUN 30...	180	5.3	0.5	5.7	470	0.64	684	1.10	0.02
AUG 12...	150	3.9	0.4	5.8	440	0.59	575	0.67	0.01

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	474		---	834	773	516	859	267	704	738	1020
2	915	472		---	849	754	---	515	271	703	744	808
3	931	471		---	877	738	463	466	290	737	704	769
4	900	472		---	879	729	525	461	370	723	714	---
5	996	477		---	968	713	457	477	389	727	717	730
6	843	509		---	920	691	441	470	470	735	737	705
7	875	573		---	927	679	452	450	350	742	720	710
8	835	491		---	---	692	448	461	342	746	736	709
9	914	490		---	1080	648	456	474	479	759	707	751
10	924	447		675	897	631	448	---	532	743	718	883
11	1250	464		867	985	628	447	483	385	772	702	743
12	---	558		801	---	600	446	592	431	---	686	714
13	1400	508		808	---	604	393	515	670	744	724	742
14	1090	558		758	---	597	435	494	668	725	710	737
15	925	594		819	---	567	509	543	637	747	721	771
16	867	566		970	---	560	555	---	636	772	700	796
17	836	622		902	---	563	612	504	644	791	658	765
18	790	613		863	---	558	644	493	659	768	687	812
19	773	633		940	---	552	652	482	652	734	664	962
20	765	782		882	---	549	600	473	671	736	704	830
21	748	---		1170	---	542	562	474	---	775	720	872
22	740	802		988	---	553	517	473	666	824	732	797
23	627	745		1030	---	563	481	349	648	797	726	774
24	557	858		---	---	565	493	354	636	800	723	777
25	530	867		---	---	554	458	337	651	782	749	778
26	520	---		821	---	550	---	317	694	718	711	780
27	500	763		813	699	551	---	326	682	720	---	780
28	483	770		740	767	571	667	322	695	742	734	757
29	475	---		732	---	575	542	310	701	692	788	745
30	477	---		792	---	570	558	297	702	705	782	742
31	472	---		769	---	551	---	301	---	707	786	---
MEAN	792	599		857	890	612	510	451	548	746	721	785

WATER YEAR 1986 MEAN 667 MAX 1400 MIN 267

06090300 MISSOURI RIVER NEAR GREAT FALLS, MT

LOCATION.--Lat 47°34'55", long 111°03'35", in NW¼NE¼NW¼ sec.14, T.21 N., R.5 E., Cascade County, Hydrologic Unit 10030102, on left bank 100 ft downstream from Morony Dam, 12.6 mi northeast of Great Falls, and at mile 2,105.6.

DRAINAGE AREA.--23,292 mi^2.

PERIOD OF RECORD.--May to July 1953 (in WSP 1320-B), October 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,809.21 ft National Geodetic Vertical Datum of 1929. Prior to July 27, 1977, nonrecording gage at site 700 ft downstream at same datum. October 1971 to July 27, 1977, discharges were obtained from the Montana Power Company at Rainbow Dam 7.05 mi upstream. Prior to October 1971, Foxboro meters were used for determining discharge through powerplant. Water-stage recorder on Morony Reservoir was used for determining head on taintor gates with datum of gage at National Geodetic Vertical Datum of 1929 (level by Montana Power Company).

REMARKS.--Estimated daily discharges: Apr. 12,13. Records fair. 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 regulated by 18 smaller irrigation reservoirs and powerplants upstream, Clark Canyon Reservoir (station number 06015300), and Canyon Ferry Lake (station number 06058500). Diversion for irrigation of about 750,400 acres upstream from station.

AVERAGE DISCHARGE.--30 years, 8,024 ft^3/s, 5,813,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,000 ft^3/s June 10, 1964 (from hydrographic comparison with nearby stations); minimum, about 1.0 ft^3/s Apr. 16, 1962, powerplant shutdown; minimum daily, 1,760 ft^3/s Apr. 16, 1961. Flood of June 10, 1964, is the highest since 1908.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,300 ft^3/s Feb. 26, gage height, 7.01 ft; minimum daily, 4,930 ft^3/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	5230	8450	6590	6510	6550	8830	7690	9470	15200	7970	6450	6160
2	5270	8750	6830	6340	6680	8200	7610	9840	14300	8360	6310	6040
3	5240	9040	6390	6590	6500	8530	7760	9420	13800	7840	6430	6590
4	5520	9000	6500	6220	6580	7770	8000	9370	12400	7870	6580	5490
5	6310	8710	7010	5710	6590	8500	8120	10100	10900	7880	6340	5380
6	6200	8340	7580	5880	6660	7760	7640	10400	11800	8560	6350	5430
7	6220	7910	7450	6400	6150	7720	7880	10200	12000	9220	6220	5440
8	6000	8430	6950	6610	5920	7760	7900	10800	14100	8930	6330	5520
9	6010	8390	6610	6540	5120	6320	7490	10900	15300	8310	7170	5820
10	6500	7960	6400	6830	5600	8260	7760	11100	15900	7180	6840	5800
11	7140	7380	6000	7140	6340	8850	8380	12000	16000	7540	6730	5970
12	7170	7580	6020	7110	5810	7140	8300	12900	15200	7550	5960	6140
13	7640	7710	5930	7380	5930	7000	8200	12300	14400	7270	5970	5970
14	7700	7700	6250	7060	6960	8510	8300	11500	13800	7200	5240	6070
15	7520	8260	6550	6410	7970	7940	8480	10900	13800	7340	5700	6150
16	7490	7910	6440	6610	7540	7970	7360	11200	12600	7210	5620	6090
17	7260	7990	6510	6830	7320	7810	8140	11300	11300	7580	6130	6060
18	7490	7900	6610	6860	6420	7670	8400	11100	11800	7610	6170	6270
19	7370	6580	6830	7090	5320	7610	8820	10900	11700	7440	5910	6330
20	7270	5500	7290	6980	4930	7530	8270	11800	10900	7040	6160	6940
21	6960	6000	7220	6900	4990	7520	7700	10400	8590	6800	5980	7050
22	7170	6160	7110	6570	5690	7290	7740	10900	7970	6350	5930	5920
23	7970	6210	7030	6290	6280	7270	8410	12500	8120	6100	5870	5590
24	7940	6140	6740	6530	6630	7290	9200	13700	7660	6390	5720	5310
25	8010	6910	6910	6270	9100	7610	9620	13000	7550	6340	5840	5190
26	8090	7510	6690	6490	15500	7220	9940	12900	7700	6650	6120	5380
27	8190	6830	6790	5700	12300	6920	9820	13100	7770	6700	6060	5860
28	8700	6390	6480	6380	9570	7310	9350	14000	7700	6770	6130	6950
29	8630	6710	6050	6560	---	7130	9580	15200	7820	6510	5850	6250
30	8440	6430	6160	6530	---	7030	8680	15400	8120	6660	5870	5190
31	8380	---	6350	6530	---	7350	---	15600	---	6480	5990	---
TOTAL	221030	224780	206270	203850	196950	237620	250540	364200	346200	227650	189970	178350
MEAN	7130	7493	6654	6576	7034	7665	8351	11750	11540	7344	6128	5945
MAX	8700	9040	7580	7380	15500	8850	9940	15600	16000	9220	7170	7050
MIN	5230	5500	5930	5700	4930	6320	7360	9370	7550	6100	5240	5190
AC-FT	438400	445900	409100	404300	390700	471300	496900	722400	686700	451500	376800	353800

CAL YR 1985	TOTAL	2331230	MEAN	6387	MAX	9940	MIN	3450	AC-FT	4624000
WTR YR 1986	TOTAL	2847410	MEAN	7801	MAX	16000	MIN	4930	AC-FT	5648000

06090800 MISSOURI RIVER AT FORT BENTON, MT
(National stream quality accounting network station)

LOCATION.--Lat 47°49'03", long 110°39'59", in NW¼SE¼SE¼ sec.23, T.24 N., R.8 E., Chouteau County, Hydrologic Unit 10030102, on left bank at downstream side of Old Fort Benton highway bridge at Fort Benton, 3.8 mi upstream from Shonkin Creek, and at mile 2,073.2.

DRAINAGE AREA.--24,749 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1890 to current year. Records for June 1881 to September 1890, published in WSP 546 and 761, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 746: 1932. WSP 1146: 1891-1907, 1908(M), 1909-18, 1937-38. WSP 1209: 1948(P). WSP 1309: 1929(M). WSP 1629: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 2,614.05 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 11, 1920, nonrecording gages, and Oct. 11, 1920, to Apr. 25, 1924, water-stage recorder, all at present site at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 29 to Jan. 5, Feb. 9-12, 19-23. Water-discharge records good except those for periods of estimated daily discharges, which are fair. Flow regulated by 18 smaller irrigation reservoirs and powerplants, Clark Canyon Reservoir (station number 06015300), and Canyon Ferry Lake (station number 06058500). Diversions for irrigation of about 751,000 acres upstream from station. Extreme diurnal fluctuation caused by powerplant at Morony Dam.

AVERAGE DISCHARGE.--96 years, 7,833 ft^3/s, 5,675,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, about 140,000 ft^3/s June 6, 1908, gage height, 18.5 ft, present datum, from rating curve extended above 63,000 ft^3/s; minimum, 320 ft^3/s July 5, 1936, gage height, -0.50 ft; minimum daily, 627 ft^3/s July 5, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,400 ft^3/s Feb. 26, gage height, 6.05 ft; maximum gage height, 12.41 ft Dec. 2 (backwater from ice); minimum daily discharge, 5,070 ft^3/s Sept. 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	5280	8280	7000	6600	6780	9120	7610	9430	15900	7340	6170	6030
2	5310	8150	7200	6800	6910	8570	7820	9670	14800	7680	5890	6100
3	5400	8690	7000	6800	6800	8470	7610	9140	14600	7300	6320	6550
4	5600	8780	7400	6500	6930	8310	8140	9090	13000	7120	6130	5420
5	6750	8570	7600	6400	6760	8690	8170	9730	11400	7290	6170	5350
6	6790	8270	8000	6320	6910	8070	7780	10700	12600	7670	6220	5370
7	6780	7850	7800	6370	6510	7940	7760	10300	12600	8470	5940	5270
8	6430	7730	7600	6910	6050	7960	8050	10600	14100	8130	6010	5450
9	6410	8070	7200	6800	5500	7110	7550	10700	15800	7870	6200	5510
10	6430	7830	6800	6860	6200	7830	7930	10800	16400	6760	7310	5610
11	6910	7110	6600	7160	6600	9060	8050	12400	16600	6700	6680	5850
12	7200	7050	6400	7310	6200	8150	8800	13300	16100	7040	5990	5670
13	7460	7230	6400	7270	6470	6620	8620	12200	15100	6800	6090	5630
14	7410	7490	6600	7360	7630	8210	8400	11800	13900	6620	5190	5820
15	7360	7640	6800	6850	8100	8000	8610	11100	13900	6660	5470	5800
16	7320	7830	6800	6530	8290	7880	8020	10700	13100	6800	5550	5740
17	7240	7370	6900	6950	7770	7720	8700	11100	11400	7090	5690	5620
18	7340	7400	7100	7050	6930	7750	8720	11000	11400	7170	5890	5840
19	7280	6850	7500	7140	5600	7700	8940	10900	11200	7030	5650	5970
20	7250	5830	7600	7270	5200	7670	8080	11200	10800	6740	5700	6310
21	7010	6510	7400	7090	5400	7580	7970	11200	8350	6450	5870	6360
22	6930	6320	7300	6700	6200	7530	7810	11000	7570	6110	5660	6000
23	7510	6500	7200	6420	6600	7360	8230	13000	7510	5750	5600	5850
24	7850	7090	7200	6820	7020	7410	9120	14200	7380	6040	5750	5420
25	7810	7720	7200	6500	8780	7670	9350	13400	7020	5840	5700	5320
26	7850	8030	7000	6500	15600	7470	10000	12700	7010	6070	5900	5290
27	7830	7940	7000	6230	13700	6900	9740	12900	7300	6310	5960	5170
28	8150	7180	6900	6490	10200	7270	9460	13900	7020	6480	5920	5770
29	8410	7000	6600	6660	---	7230	9530	15200	7220	6070	5980	5890
30	7860	7000	6600	6790	---	7040	9640	15900	7440	6260	5770	5070
31	7980	---	6400	6770	---	7480	---	16000	---	6180	5560	---
TOTAL	219140	225310	219100	210220	207640	241770	254210	365260	348520	211840	183930	171050
MEAN	7069	7510	7068	6781	7416	7799	8474	11780	11620	6834	5933	5702
MAX	8410	8780	8000	7360	15600	9120	10000	16000	16600	8470	7310	6550
MIN	5280	5830	6400	6230	5200	6620	7550	9090	7010	5750	5190	5070
AC-FT	434700	446900	434600	417000	411900	479600	504200	724500	691300	420200	364800	339300

CAL YR 1985 TOTAL 2335470 MEAN 6399 MAX 10500 MIN 3580 AC-FT 4632000
WTR YR 1986 TOTAL 2857990 MEAN 7830 MAX 16600 MIN 5070 AC-FT 5669000

06090800 MISSOURI RIVER AT FORT BENTON, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1969-73, 1980 to current year (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1980 to September 1982.
SUSPENDED-SEDIMENT DISCHARGE: July to September 1980.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (water years 1980-82): Maximum, 25.0°C, Aug. 15-17, 1981; minimum, 0.0°C, on many days during winter.
SEDIMENT CONCENTRATION (water years 1980): Maximum daily mean, 36 mg/L, July 16, 17, 1980; minimum daily mean, 7 mg/L, Sep. 28, 1980.
SEDIMENT LOAD (water years 1980): Maximum daily, 951 tons, July 17, 1980; minimum daily, 76 tons, Sep. 28, 1980.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV												
07...	1200	7980	100	70	408	11.0	6.0	691	11.9	106	K6	K12
JAN												
29...	1300	6830	100	70	470	2.0	1.0	691	13.3	104	K5	K19
MAR												
10...	1630	8210	50	1	452	7.0	6.0	685	12.0	108	--	K12
APR												
21...	1615	8210	--	--	445	22.0	11.0	--	--	--	--	--
MAY												
28...	1400	13400	--	0	371	26.0	18.5	705	9.3	108	K7	43
JUL												
08...	1500	8110	30	1	406	30.0	19.0	704	11.1	130	K7	K1600
AUG												
20...	1230	5610	0	0	399	25.0	18.5	700	10.6	124	K3	230
22...	0800	5820	--	--	404	15.0	17.0	--	--	--	--	--

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)
NOV											
07...	1200	8.50	7.0	180	27	44	16	19	0.6	2.6	170
JAN											
29...	1300	8.10	14	190	33	47	17	23	0.8	3.4	190
MAR											
10...	1630	8.40	13	190	22	47	17	22	0.7	3.2	180
MAY											
28...	1400	8.40	10	150	13	40	13	16	0.6	3.0	160
JUL											
08...	1500	8.70	15	170	0	44	15	21	0.7	3.5	170
AUG											
20...	1230	8.20	5.8	170	28	43	15	21	0.7	3.3	180

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 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)
NOV											
07...	9	143	54	8.2	0.8	14	236	260	0.32	5080	<0.01
JAN											
29...	0	156	71	11	1.0	17	273	280	0.37	5030	<0.01
MAR											
10...	13	159	64	9.1	0.9	17	272	300	0.37	6030	<0.01
MAY											
28...	4	141	43	7.1	0.7	13	221	220	0.3	8000	<0.01
JUL											
08...	22	147	54	8.7	0.8	16	249	290	0.34	5450	<0.01
AUG											
20...	0	145	61	10	0.9	15	252	260	0.34	3820	<0.01

06090800 MISSOURI RIVER AT FORT BENTON, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 07...	0.17	0.04	0.02	0.4	0.03	0.02	0.01	20	431	89
JAN 29...	0.26	0.02	0.02	0.4	0.04	0.03	0.02	8	148	69
MAR 10...	0.28	0.06	0.06	0.5	0.07	0.03	<0.01	45	998	78
MAY 28...	<0.10	0.05	0.03	0.5	0.07	0.01	0.01	76	2750	69
JUL 08...	<0.10	0.03	0.04	0.4	0.04	0.02	<0.01	32	701	86
AUG 20...	<0.10	0.01	<0.01	0.5	0.04	0.01	0.01	23	348	88

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV 07...	1200	10	16	64	<0.5	<1	<1	<3	2	8	<1
MAR 10...	1630	20	17	68	<0.5	<1	<1	<3	5	6	2
JUL 08...	1500	10	19	58	<0.5	1	<1	<3	4	9	<5
AUG 20...	1230	<10	19	54	<0.5	<1	<1	<3	2	8	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV 07...	47	3	<0.1	<10	<1	1	<1	320	<6	<3
MAR 10...	55	17	<0.1	<10	<1	<1	<1	370	<6	11
JUL 08...	62	4	<0.1	<10	1	<1	<1	320	<6	14
AUG 20...	62	4	<0.1	<10	<1	<1	<1	350	<6	9

06091700 TWO MEDICINE RIVER BELOW SOUTH FORK, NEAR BROWNING, MT

LOCATION.--Lat 48°25'36", long 112°59'20", in SE¼SE¼SE¼ sec. 23, T.31 N., R.11 W., Glacier County, Hydrologic Unit 10030201, Blackfeet Indian Reservation, on right bank 93 ft downstream from bridge on Blackfeet Secondary Highway No. 1, 9.7 mi south of Browning, and 12.3 mi northwest of Heart Butte.

DRAINAGE AREA.--250 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 4,180 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 19 to Feb. 25. Records good except those for estimated daily discharges, which are poor. Flow regulated by Lower Two Medicine Lake (station number 06090900). Diversions for irrigation of about 64.0 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, 315 ft^3/s, 228,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,900 ft^3/s May 26, 1980, gage height, 6.69 ft; minimum daily, 10 ft^3/s Jan. 29, 1980, and Jan. 6, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 100,000 ft^3/s June 8, 1964, as determined at Two Medicine River near Browning (station number 06092000) located about 10 mi downstream. Discharge not determined at this site.

EXTREMES FOR CURRENT YEAR.--Maximum discharge not determined but occurred on Feb. 24, gage height, 5.64 ft (backwater from ice); minimum daily, 45 ft^3/s Feb. 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	275	586	110	70	66	722	659	494	1630	279	209	137
2	263	615	115	67	65	704	591	473	1600	258	208	121
3	277	646	125	64	63	679	520	530	1440	256	209	116
4	271	651	145	62	62	646	491	1010	1160	248	215	114
5	277	755	165	63	60	584	469	985	996	258	233	124
6	312	668	180	65	59	526	452	832	879	247	232	123
7	277	591	165	67	57	509	428	763	759	231	231	116
8	295	557	130	68	56	641	462	712	709	240	228	110
9	268	490	100	70	55	536	515	632	647	225	223	156
10	278	397	85	71	54	475	574	595	600	221	223	157
11	279	362	70	72	53	435	574	567	584	228	225	134
12	281	341	70	73	52	411	536	525	579	221	220	127
13	266	348	71	74	51	387	503	530	563	210	195	128
14	267	330	73	73	49	369	472	563	523	220	192	130
15	507	322	74	72	48	353	471	523	508	259	189	130
16	716	326	77	70	47	340	473	515	452	258	185	134
17	682	290	79	68	46	320	437	501	422	257	178	135
18	581	241	82	70	46	301	410	483	402	260	171	199
19	555	220	84	72	45	297	389	556	382	250	138	187
20	557	200	88	72	46	292	392	809	356	247	136	188
21	506	180	88	71	48	317	457	1200	355	246	132	191
22	497	160	86	69	55	339	697	1440	321	243	131	179
23	483	140	83	67	80	311	1000	1110	295	237	129	173
24	473	150	78	65	3000	333	1050	920	290	233	126	170
25	1500	145	75	64	1300	341	876	845	287	229	123	172
26	1160	140	71	67	1070	314	804	1050	289	228	122	145
27	1040	130	68	70	730	366	732	1420	284	223	119	127
28	1060	120	68	67	722	559	678	1740	273	219	117	119
29	887	115	70	63	---	661	589	1880	318	216	115	111
30	760	110	72	63	---	789	538	1930	296	213	113	112
31	686	---	72	66	---	840	---	1830	---	213	146	---
TOTAL	16536	10326	2919	2115	8085	14697	17239	27963	18199	7373	5413	4265
MEAN	533	344	94.2	68.2	289	474	575	902	607	238	175	142
MAX	1500	755	180	74	3000	840	1050	1930	1630	279	233	199
MIN	263	110	68	62	45	292	389	473	273	210	113	110
AC-FT	32800	20480	5790	4200	16040	29150	34190	55460	36100	14620	10740	8460
(†)	45	0	0	0	0	0	0	385	5090	11130	8230	343

CAL YR 1985	TOTAL	138289	MEAN	379	MAX	2290	MIN	11	AC-FT 274300
WTR YR 1986	TOTAL	135130	MEAN	370	MAX	3000	MIN	45	AC-FT 268000

† Flows, in acre-ft, in Two Medicine Canal.

06093200 BADGER CREEK BELOW FOUR HORNS CANAL, NEAR BROWNING, MT

LOCATION.--Lat 48°22'12", long 112°48'07", in NW¼SW¼SE¼ sec.8, T.30 N., R.9 W., Glacier County, Hydrologic Unit 10030201, on left bank, 3.4 mi downstream from point of diversion to Four Horns Canal, 15.5 mi southeast of Browning, and at mile 11.6.

DRAINAGE AREA.--152 mi^2.

PERIOD OF RECORD.--October 1951 to current year. Records since October 1973 equivalent to those published as Badger Creek near Browning (station number 06092500) if diversion to Four Horns Canal is added to flow past station.

GAGE.--Water-stage recorder. Elevation of gage is 4,140 ft, from topographic map. May 1951 to September 1973, water-stage recorder at site 3.4 mi upstream at datum 4,179.26 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 8-14, Nov. 19 to Dec. 20, Dec. 27 to Jan. 6, Feb. 6-24, Apr. 12-15. Records good except those for estimated daily discharges, which are poor. Four Horns Canal diverts water from right bank in NE¼ sec.24, T.30 N., R.10 W., at diversion dam 3.4 mi upstream for irrigation of about 6,000 acres downstream from station. Recorded diversions from Badger Creek upstream from station for the current year are listed in daily table below. 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.--35 years, 223 ft^3/s, 19.91 in/yr, 161,600 acre-ft/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,700 ft^3/s June 8, 1964, gage height, 10.37 ft, from rating curve extended above 2,000 ft^3/s on basis of slope-area measurement of peak flow (site and datum then in use); minimum daily, 6.5 ft^3/s Sept. 17, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,330 ft^3/s May 29, gage height, 6.90 ft; maximum gage height, 9.41 ft Feb. 24 (backwater from ice); minimum daily discharge, 16 ft^3/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	246	354	130	126	104	253	318	250	906	81	25	51
2	242	343	130	124	103	250	296	243	824	70	24	26
3	261	335	135	122	102	244	267	274	745	67	24	20
4	251	347	145	120	100	238	253	445	632	72	24	17
5	249	379	150	122	95	230	244	490	584	78	24	23
6	264	350	145	126	94	222	234	446	553	70	24	23
7	271	330	145	129	92	216	231	404	500	61	24	19
8	259	310	140	127	88	240	248	384	457	55	23	16
9	246	290	135	120	86	230	286	360	409	51	23	50
10	245	270	130	123	84	215	313	351	377	49	24	62
11	243	250	130	117	82	204	316	342	363	47	24	40
12	246	250	130	110	80	199	300	321	351	46	24	31
13	235	260	130	111	80	194	260	313	325	44	29	28
14	232	280	135	109	78	188	240	313	308	42	25	28
15	259	267	135	109	78	184	240	301	298	39	24	24
16	319	252	140	108	76	184	252	297	268	38	23	29
17	332	247	140	107	74	176	218	282	221	38	23	28
18	315	202	145	113	72	169	171	275	193	37	23	69
19	315	190	145	129	70	163	160	317	185	35	22	62
20	324	180	150	123	70	162	154	493	167	37	22	62
21	320	170	152	112	80	164	183	741	160	42	22	60
22	323	165	147	105	100	166	301	747	153	37	22	72
23	322	160	143	112	350	160	464	564	140	35	22	145
24	304	150	141	107	800	161	399	483	130	32	22	166
25	434	145	136	105	529	158	361	514	115	46	22	164
26	524	140	135	100	361	154	341	661	89	73	22	161
27	471	135	135	111	297	155	311	885	83	72	22	156
28	507	135	130	107	264	189	298	1110	78	50	21	150
29	453	130	128	102	---	251	279	1130	126	28	21	148
30	413	130	126	102	---	301	263	1100	97	40	80	149
31	381	---	126	103	---	349	---	988	---	38	126	---
TOTAL	9806	7146	4264	3541	4489	6369	8201	15824	9837	1550	880	2079
MEAN	316	238	138	114	160	205	273	510	328	50.0	28.4	69.3
MAX	524	379	152	129	800	349	464	1130	906	81	126	166
MIN	232	130	126	100	70	154	154	243	78	28	21	16
CFSM	2.08	1.57	.91	.75	1.05	1.35	1.80	3.36	2.16	.33	.19	.46
IN.	2.40	1.75	1.04	.87	1.10	1.56	2.01	3.87	2.41	.38	.22	.51
AC-FT	19450	14170	8460	7020	8900	12630	16270	31390	19510	3070	1750	4120
(†)	0	0	0	0	0	0	570	308	4660	6390	5410	4320

CAL YR 1985	TOTAL	68001	MEAN	186	MAX	898	MIN	21	CFSM	1.22	IN.	16.64	AC-FT	134900
WTR YR 1986	TOTAL	73986	MEAN	203	MAX	1130	MIN	16	CFSM	1.34	IN.	18.11	AC-FT	146800

† Diversions, in acre-feet, by Four Horns Canal.

06099000 CUT BANK CREEK AT CUT BANK, MT

LOCATION.--Lat 48°38'00", long 112°20'46", in SW¼SE¼NE¼ sec.11, T.33 N., R.6 W., Glacier County, Hydrologic Unit 10030202, Blackfeet Indian Reservation, on right bank, 0.1 mi downstream from bridge on U.S. Highway 2, 0.7 mi west of Cut Bank, 0.8 mi downstream from Old Maids Coulee, and at mile 17.7.
DRAINAGE AREA.--1,065 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1905 to October 1919, May to July 1920, May 1922 to October 1924, May 1951 to September 1973, October 1981 to current year. Monthly discharge only for some periods, published in WSP 1309.
REVISED RECORDS.--WSP 1309: 1907-8, 1910-11, 1924-25. WSP 1509: 1911, 1916(M). WSP 1559: 1905(M), 1908(M). WSP 1709: 1959. WSP 1729: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 3,550 ft, from topographic map. Prior to May 12, 1922, non-recording gage at several sites 0.5 mi upstream at various datums. May 12, 1922 to Nov. 1, 1924, nonrecording gage at present site and different datum.
REMARKS.--Estimated daily discharges: Oct. 7-9, Nov. 8 to Feb. 25. Water-discharge records good except those for estimated daily discharges, which are poor. Few minor diversions for irrigation and municipal water supply for city of Cut Bank upstream from station. Natural flow of stream may be affected by return flow from Two Medicine Canal which irrigates lands upstream from station.
AVERAGE DISCHARGE.--43 years (1906-19, 1923-24, 1952-73, 1982-86), 189 ft^3/s, 136,900 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,600 ft^3/s June 9, 1964, gage height, 13.93 ft, 14.2 ft, from floodmarks, from rating curve extended above 12,000 ft^3/s, on basis of slope-area measurement of peak flow; minimum daily, 1.0 ft^3/s Jan. 22-26, 1982.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	0815	not determined	a *13.12	May 31	1230	819	3.89

a backwater from ice.

Minimum discharge, 1.6 ft^3/s Aug. 4, gage height, 0.75 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	161	261	60	39	37	671	275	209	775	158	5.3	28
2	153	238	64	38	36	537	254	194	707	142	5.0	31
3	153	240	68	36	35	452	232	181	665	124	3.6	27
4	156	233	80	35	34	388	204	217	641	107	2.7	29
5	153	238	95	36	34	348	183	382	571	131	3.8	38
6	153	277	100	37	33	321	172	433	507	119	4.8	36
7	150	263	85	38	32	281	164	396	468	107	11	36
8	145	250	70	39	32	280	157	357	449	93	26	36
9	140	210	55	39	31	276	153	318	413	80	29	46
10	170	180	45	40	31	261	158	286	369	67	35	60
11	182	150	40	40	30	240	179	306	329	54	39	68
12	234	130	41	41	29	227	217	272	312	49	45	69
13	241	120	41	41	28	216	223	240	337	54	56	80
14	212	140	42	41	28	205	204	236	314	48	57	93
15	196	155	43	40	27	197	206	264	315	32	56	97
16	197	170	44	39	27	191	220	254	282	28	43	92
17	255	150	46	38	26	193	231	248	266	38	31	85
18	265	130	47	42	26	183	215	230	239	41	28	92
19	240	115	48	45	25	182	191	223	238	33	28	120
20	218	100	50	43	26	184	171	220	231	31	31	147
21	206	90	50	41	28	182	160	348	222	26	29	138
22	202	80	48	39	29	168	159	539	215	20	27	127
23	199	70	46	38	30	174	199	608	192	13	25	110
24	197	80	44	37	200	171	413	488	170	13	29	101
25	193	76	42	36	5000	160	410	385	142	12	27	100
26	291	72	40	38	3300	158	383	347	136	12	32	106
27	350	70	38	40	1500	154	328	424	142	10	24	101
28	308	66	38	38	912	149	281	581	145	7.2	25	101
29	321	64	39	35	---	159	252	702	150	5.7	23	97
30	319	62	40	36	---	197	228	753	173	4.6	17	92
31	288	---	40	37	---	226	---	787	---	7.4	18	---
TOTAL	6648	4480	1629	1202	11606	7731	6822	11428	10115	1666.9	816.2	2383
MEAN	214	149	52.5	38.8	415	249	227	369	337	53.8	26.3	79.4
MAX	350	277	100	45	5000	671	413	787	775	158	57	147
MIN	140	62	38	35	25	149	153	181	136	4.6	2.7	27
AC-FT	13190	8890	3230	2380	23020	15330	13530	22670	20060	3310	1620	4730

CAL YR 1985	TOTAL	54400.9	MEAN	149	MAX	1020	MIN	2.3	AC-FT	107900
WTR YR 1986	TOTAL	66527.1	MEAN	182	MAX	5000	MIN	2.7	AC-FT	132000

06099000 CUT BANK CREEK AT CUT BANK, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1982 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)
NOV 15...	1000	155	--	--	489	-2.0	0.5
JAN 07...	1510	38	--	--	748	8.0	0.0
MAR 04...	1830	390	--	--	505	5.0	4.0
13...	1510	212	--	--	580	--	--
APR 08...	0840	153	--	0	540	7.0	6.0
MAY 20...	0830	201	31	1	825	21.0	11.0
JUN 25...	1710	135	--	--	338	30.0	22.0
30...	1900	164	20	1	303	22.0	22.0
AUG 11...	1800	39	7	1	493	30.0	22.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
APR 08...	0840	8.30	190	21	42	21	42	1	1.3
MAY 20...	0830	8.30	230	59	45	29	96	3	1.6
JUN 30...	1900	8.30	120	0	27	12	15	0.6	1.0
AUG 11...	1800	8.50	160	8	31	19	48	2	2.0

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 DIS-SOLVED (MG/L AS N) (00631)
APR 08...	170	100	5.2	<0.1	0.8	310	0.43	130	<0.10
MAY 20...	173	230	11	0.1	1.7	520	0.7	281	<0.10
JUN 30...	118	38	2.0	0.1	3.0	170	0.23	75	<0.10
AUG 11...	148	96	5.6	0.2	1.5	290	0.4	30	<0.10

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
APR 08...	--	20	--	--	12	--	--	--
MAY 20...	1	40	1	<10	120	4	10	<1
JUN 30...	--	20	--	--	17	--	--	--
AUG 11...	--	70	--	--	44	--	--	--

06099500 MARIAS RIVER NEAR SHELBY, MT

LOCATION.--Lat 48°25'38", long 111°53'20", in SE¼NW¼SE¼ sec.20, T.31 N., R.2 W., Toole County, Hydrologic Unit 10030203, on left bank 20 ft downstream from bridge on old U.S. Highway 91, 5.1 mi south of Shelby, 24 mi downstream from Cut Bank Creek, and at mile 140.6.

DRAINAGE AREA.--3,242 mi^2, of which 518 mi^2 is probably noncontributing.

PERIOD OF RECORD.--April 1902 to December 1904, May 1905 to December 1906, May 1907 to January 1908, April 1911 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1903-4, 1918, 1921, 1933, 1935, 1947. WSP 1509: 1902, 1912(M), 1916, 1943(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 3,087.72 ft National Geodetic Vertical Datum of 1929. Prior to Dec. 23, 1947, nonrecording gage or water-stage recorder at several sites within 1,000 ft of present site at approximately the same datum. Dec. 23, 1947, to Apr. 6, 1976, water-stage recorder at site 150 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Oct. 7-9, Nov. 7 to Feb. 26. Records good except those for the 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 Lower Two Medicine Lake (station number 06090900), Four Horns Reservoir (station number 06093000) Swift Reservoir (station number 06094000), and Lake Frances (station number 06095500), having a combined capacity of 172,630 acre-ft. Diversions for irrigation of about 50,000 acres upstream from station and about 15,000 acres downstream from station.

AVERAGE DISCHARGE.--78 years, (1902-4, 1905-6, 1911-86), 929 ft^3/s, 673,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 241,000 ft^3/s June 9, 1964, largely due to failure of Swift Dam, gage height, 23.64 ft, from floodmark, from rating curve extended above 34,000 ft^3/s on basis of slope-area measurement of peak flow; maximum unaffected by dam failure, 75,700 ft^3/s June 20, 1975, gage height, 18.21 ft; minimum observed, 10 ft^3/s Aug. 20, 1919.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,900 ft^3/s Feb. 25, gage height, 12.58 ft; maximum gage height, 13.71 ft (ice jam); minimum discharge, 114 ft^3/s Aug. 30, gage height, 2.96 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	847	1650	520	410	255	2610	1660	1040	3590	545	182	366
2	820	1490	510	410	260	2320	1440	950	3440	479	186	390
3	818	1490	530	400	260	2070	1300	922	3170	398	170	283
4	841	1490	600	390	255	1840	1160	1030	2910	362	166	223
5	832	1520	670	390	255	1710	1060	1840	2650	389	187	235
6	828	1650	720	380	250	1520	990	2060	2320	418	169	304
7	825	1400	740	380	245	1340	947	1910	2100	394	160	328
8	825	1300	730	390	240	1290	921	1730	1910	346	155	298
9	800	1100	650	390	235	1440	919	1600	1780	303	159	299
10	849	1000	550	390	230	1300	968	1510	1570	288	162	406
11	934	900	500	385	225	1180	1080	1500	1390	251	154	495
12	1070	820	450	380	220	1090	1190	1430	1260	225	157	397
13	1090	760	420	375	215	1030	1170	1280	1260	227	168	354
14	994	800	410	365	210	1010	1090	1180	1220	233	187	357
15	947	860	420	350	205	947	1030	1240	1160	234	175	372
16	1160	900	430	335	200	917	1040	1200	1090	218	168	367
17	1550	900	440	320	195	929	1050	1160	985	228	157	376
18	1600	860	460	305	190	890	985	1110	922	244	143	390
19	1480	820	470	295	190	867	910	1060	891	249	132	547
20	1410	760	480	295	185	858	863	1130	862	278	125	689
21	1400	710	500	300	190	844	838	1610	784	258	126	651
22	1320	670	500	300	200	832	867	2590	748	245	126	645
23	1290	640	490	290	300	846	1190	2860	687	221	125	588
24	1270	610	470	280	500	830	1870	2480	625	205	123	597
25	1230	600	460	275	5000	810	1960	2100	545	201	123	616
26	2280	580	440	270	14200	817	1850	1990	478	206	134	629
27	2260	570	420	265	4790	798	1650	2320	472	208	137	595
28	2140	560	415	265	3140	803	1420	3020	473	231	125	540
29	2150	550	410	260	---	953	1270	3520	483	237	120	512
30	1990	530	410	260	---	1200	1130	3680	544	209	119	488
31	1800	---	410	255	---	1470	---	3690	---	196	156	---
TOTAL	39650	28490	15625	10355	32840	37361	35818	56742	42319	8726	4676	13337
MEAN	1279	950	504	334	1173	1205	1194	1830	1411	281	151	445
MAX	2280	1650	740	410	14200	2610	1960	3690	3590	545	187	689
MIN	800	530	410	255	185	798	838	922	472	196	119	223
AC-FT	78650	56510	30990	20540	65140	74110	71050	112500	83940	17310	9270	26450

CAL YR 1985	TOTAL	287332	MEAN	787	MAX	4170	MIN	64	AC-FT	569900
WTR YR 1986	TOTAL	325939	MEAN	893	MAX	14200	MIN	119	AC-FT	646500

06101300 LAKE ELWELL NEAR CHESTER, MT

LOCATION.--Lat 48°19'06", long 111°05'27", in NW¼ sec.33, T.30 N., R.5 E., Liberty County, Hydrologic Unit 10030203, in control house of river outlet tunnel at Tiber Dam on Marias River, 15 mi southwest of Chester, and at mile 80.4.

DRAINAGE AREA.--4,923 mi^2, of which 518 mi^2 is probably noncontributing.

PERIOD OF RECORD.--October 1955 to current year (monthend contents only). Daily elevations and contents May to June 1964, published in WSP 1840-B. Prior to October 1975, published as Tiber Reservoir near Chester.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Records of daily elevations on file in Helena district office.

REMARKS.--Reservoir is formed by rolled earthfill dam with concrete spillway chute; construction began in September 1952; completed in March 1956. Storage began Oct. 28, 1955. Usable capacity, 1,347,000 acre-ft between elevation 2,870.00 ft, trashrack sill, and 3,012.50 ft, top of flood control. Dead storage, 21,580 acre-ft below elevation, 2,870.00 ft. Prior to Oct. 1, 1963, usable capacity was 1,313,000 acre-ft and dead storage was 24,000 acre-ft at same elevations. Figures given herein represent usable contents. Water is presently used for recreation and flood control.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 1,193,000 acre-ft July 12, 13, 1965, elevation, 3,005.59 ft; minimum observed since normal operation began, 442,100 acre-ft Apr. 1, 1968, elevation, 2,953.81 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 919,800 acre-ft June 18, elevation, 2,991.53 ft; minimum observed, 698,800 acre-ft Feb. 22, elevation, 2,977.51 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,983.94	794,400	---
Oct. 31	2,984.68	806,100	+11,700
Nov. 30	2,981.91	763,200	-42,900
Dec. 31	2,980.42	740,900	-22,300
CAL YR 1985			+58,200
Jan. 31	2,979.00	720,100	-20,800
Feb. 28	2,982.63	774,200	+54,100
Mar. 31	2,983.32	784,800	+10,600
Apr. 30	2,985.12	813,100	+28,300
May 31	2,989.26	880,900	+67,800
June 30	2,991.12	912,600	+31,700
July 31	2,988.82	873,500	-39,100
Aug. 31	2,986.12	829,100	-44,400
Sept. 30	2,984.79	807,800	-21,300
WTR YR 1986			+13,400

06101500 MARIAS RIVER NEAR CHESTER, MT

LOCATION.--Lat 48°18'23", long 111°04'47", in SW¼SW¼SW¼ sec.34, T.30 N., R.5 E., Liberty County, Hydrologic Unit 10030203, on left bank 2.0 mi downstream from Tiber Dam, 4.4 mi upstream from Pondera Coulee, 15 mi southwest of Chester, and at mile 78.3.

DRAINAGE AREA.--4,927 mi^2, of which 518 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1921, October 1945 to September 1947, October 1955 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1629: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,814.03 ft above National Geodetic Vertical Datum of 1929 (U.S. Bureau of Reclamation bench mark). Prior to Oct. 1, 1921, nonrecording gage at bridge 2.5 mi downstream at different datum. Oct. 4, 1945, to Sept. 30, 1946, nonrecording gage at site 3 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Water-discharge records good. Flow completely regulated by Lake Elwell since Oct. 28, 1955 (see preceding page).

AVERAGE DISCHARGE.--33 years (1945-47, 1955-86), 857 ft^3/s, 620,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, occurred about Mar. 20, 1947; minimum, probably less than 0.2 ft^3/s during period of no gage-height record Oct. 29 to Nov. 10, 1955, when gates at dam were closed.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1948 reached a stage of 16 ft, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,140 ft^3/s Nov. 9, gage height, 5.28 ft; minimum daily, 664 ft^3/s Apr. 12.

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	891	1560	891	877	869	1660	982	714	712	953	928	901
2	891	1560	891	877	869	1660	981	693	711	959	928	899
3	892	1560	891	877	869	1660	991	692	840	962	928	898
4	1010	1570	891	877	869	1660	988	695	936	959	925	901
5	1030	1700	891	877	869	1660	986	693	936	957	925	904
6	1030	1890	891	877	867	1660	987	694	936	958	919	903
7	1010	1890	891	877	868	1660	986	698	938	958	916	902
8	1030	2020	891	877	864	1660	899	695	940	961	912	899
9	1030	2130	891	877	865	1660	727	692	940	958	914	899
10	1030	2130	891	877	862	1660	669	695	938	958	914	899
11	1030	2130	891	876	862	1430	669	698	936	958	912	896
12	1030	2130	891	877	862	1080	664	698	940	956	907	894
13	1030	2120	891	875	880	984	669	696	943	951	909	896
14	1030	2120	891	870	918	983	673	694	945	952	905	891
15	1030	2120	890	869	921	982	675	694	948	951	896	895
16	1030	2120	887	869	919	981	672	698	951	951	900	899
17	1030	2110	884	869	919	983	672	698	951	951	905	900
18	1030	2110	884	869	913	981	672	698	948	951	893	899
19	1030	2110	884	869	913	981	672	698	940	951	892	895
20	1030	2110	884	869	913	981	672	699	941	951	903	894
21	1030	1980	884	869	913	981	672	699	943	943	902	894
22	1030	1700	884	869	913	981	672	704	953	943	902	891
23	1030	1590	884	869	913	982	672	705	956	941	899	891
24	1030	1580	884	869	913	981	677	705	952	941	902	891
25	1030	1390	884	869	918	982	678	708	959	938	906	890
26	1030	1000	884	869	933	981	677	711	954	936	906	895
27	1040	896	884	869	952	982	679	709	948	936	906	899
28	1040	891	884	868	1180	981	678	711	954	936	906	899
29	1040	891	883	869	---	981	822	711	960	930	906	892
30	1040	891	881	869	---	981	806	711	952	928	906	895
31	1350	---	877	869	---	983	---	711	---	928	903	---
TOTAL	31834	51999	27500	27040	25326	37762	22939	21717	27801	29406	28175	26901
MEAN	1027	1733	887	872	905	1218	765	701	927	949	909	897
MAX	1350	2130	891	877	1180	1660	991	714	960	962	928	904
MIN	891	891	877	868	862	981	664	692	711	928	892	890
AC-FT	63140	103100	54550	53630	50230	74900	45500	43080	55140	58330	55890	53360

CAL YR 1985	TOTAL	240792	MEAN	660	MAX	2130	MIN	237	AC-FT	477600
WTR YR 1986	TOTAL	358400	MEAN	982	MAX	2130	MIN	664	AC-FT	710900

06101500 MARIAS RIVER NEAR CHESTER, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-72, 1978 to current year (discontinued).

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1964 to September 1972, January 1978 to September 1981.
WATER TEMPERATURE: October 1964 to September 1972, January 1978 to September 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-72, 1978-81): Maximum daily, 791 microsiemens, May 3, 1979; minimum daily, 388 microsiemens, Aug. 17, 18, 21, 1972.
WATER TEMPERATURE (water years 1965-72, 1978-79): Maximum daily, 22.0°C, Aug. 20, 1972; minimum daily, 0.5°C on several days during December 1978 to February 1979.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
NOV											
05...	1230	1500	30	1	561	5.5	8.0	688	13.4	126	<1
JAN											
28...	1400	871	80	71	580	3.0	3.5	691	14.2	118	<1
MAR											
11...	1330	1260	60	1	542	10.0	5.0	683	14.4	126	--
MAY											
28...	2045	697	--	0	583	23.5	9.5	698	12.5	120	<1
JUL											
09...	0830	997	50	1	571	19.0	10.0	697	11.9	116	<1
AUG											
19...	1530	881	20	1	535	22.0	12.0	692	11.2	115	K1

DATE	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)
NOV											
05...	K4	8.90	2.1	230	85	52	24	31	0.9	2.0	150
JAN											
28...	<1	8.30	1.2	240	100	55	24	31	0.9	1.8	160
MAR											
11...	79	8.40	6.7	220	89	51	23	31	0.9	2.2	150
MAY											
28...	K8	8.10	1.7	220	87	52	23	31	0.9	2.3	170
JUL											
09...	K13	8.20	1.2	240	99	56	24	31	0.9	2.1	170
AUG											
19...	K12	8.0	1.4	230	94	54	24	32	0.9	2.1	170

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 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)
NOV											
05...	14	129	160	3.2	0.3	2.2	360	380	0.49	1460	<0.01
JAN											
28...	0	141	150	3.5	0.3	2.4	360	350	0.49	847	<0.01
MAR											
11...	6	134	150	2.9	0.2	2.8	339	350	0.46	1150	<0.01
MAY											
28...	0	140	150	3.5	0.2	2.8	362	350	0.49	681	<0.01
JUL											
09...	0	138	140	3.3	0.2	3.1	365	350	0.5	983	0.01
AUG											
19...	0	140	150	5.2	0.3	3.1	363	360	0.49	863	<0.01

06101500 MARIAS RIVER NEAR CHESTER, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV										
05...	<0.10	0.04	0.05	0.3	0.02	<0.01	<0.01	9	36	60
JAN										
28...	<0.10	0.03	0.04	0.4	0.01	<0.01	<0.01	4	9.4	69
MAR										
11...	0.21	0.05	0.06	<0.2	0.02	<0.01	<0.01	16	54	75
MAY										
28...	0.24	0.07	0.05	0.5	<0.01	<0.01	<0.01	7	13	66
JUL										
09...	0.26	0.02	0.05	0.3	0.01	<0.01	<0.01	5	13	75
AUG										
19...	0.31	0.01	0.02	0.3	0.01	<0.01	<0.01	2	4.8	90

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV											
05...	1230	<10	<1	45	<0.5	<1	<1	<3	3	<3	<1
MAR											
11...	1330	<10	1	57	<0.5	<1	<1	<3	2	13	5
JUL											
09...	0830	<10	<1	49	<0.5	<1	<1	<3	5	5	<5
AUG											
19...	1530	<10	<1	49	<0.5	<1	<1	<3	1	3	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV										
05...	17	3	<0.1	<10	1	1	<1	390	<6	14
MAR										
11...	15	13	<0.1	<10	5	2	<1	400	<6	7
JUL										
09...	18	5	<0.1	<10	1	1	<1	390	<6	12
AUG										
19...	17	2	<0.1	<10	<1	1	<1	400	<6	9

06108000 TETON RIVER NEAR DUTTON, MT

LOCATION.--Lat 47°55'49", long 111°33'07", in SE¼SW¼SW¼ sec.12, T.25 N., R.1 E., Teton County, Hydrologic Unit 10030205, on right bank 150 ft upstream from Kerr Bridge, 0.9 mi downstream from Hunt Coulee, 9.5 mi northeast of Dutton, and at mile 100.9.

DRAINAGE AREA.--1,307 mi^2. Area at site used prior to July 17, 1965, 1,308 mi^2.

PERIOD OF RECORD.--August 1954 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,235 ft, from topographic map. Prior to July 17, 1965, water-stage recorder at site 1,800 ft downstream at datum 1.97 ft lower.

REMARKS.--Estimated daily discharges: Nov. 7 to Feb. 25. Records good except those for estimated daily discharges, which are poor. Water is diverted on left bank in sec.34, T.25 N., R.7 W., for storage in Bynum Reservoir (usable capacity, 75,000 acre-ft). Diversions for irrigation of about 44,000 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.--32 years, 152 ft^3/s, 110,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 71,300 ft^3/s June 9, 1964, gage height, 20.48 ft, present site and datum, from floodmark, from slope-area measurement of peak flow; no flow July 21 to Aug. 1, 1984, and July 18 to Aug. 4, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,290 ft^3/s Feb. 26, gage height, 11.52 ft, recorded, 12.04 ft, from floodmark; minimum, 10 ft^3/s Aug. 22, 23, 29, 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	150	138	45	66	64	631	114	95	119	66	12	27
2	143	141	42	64	66	482	112	86	109	64	12	51
3	140	141	45	62	68	403	107	82	98	52	13	61
4	137	140	50	60	66	351	104	80	96	48	15	44
5	141	140	70	60	64	317	96	79	96	46	16	36
6	153	137	80	64	62	284	101	79	98	42	17	34
7	170	150	74	70	60	264	96	84	95	39	16	33
8	156	140	66	72	60	247	90	87	93	37	15	32
9	133	130	62	80	58	238	86	92	101	37	14	40
10	169	110	60	80	58	228	87	93	110	33	14	44
11	200	90	58	80	58	216	84	107	101	31	12	45
12	386	80	56	78	58	205	93	119	88	28	13	47
13	505	82	54	74	58	201	94	125	79	28	13	48
14	367	90	54	72	60	200	91	116	71	26	13	48
15	287	100	56	70	60	207	99	106	78	23	12	48
16	253	120	58	72	58	205	117	100	72	24	11	53
17	240	110	60	76	56	200	145	98	72	26	12	67
18	211	110	62	80	54	188	164	94	70	26	13	69
19	191	100	64	88	52	189	148	92	67	27	14	104
20	181	90	66	88	50	192	129	90	70	27	14	197
21	172	80	64	74	52	181	115	85	82	25	12	178
22	163	70	62	70	54	170	111	87	77	23	10	153
23	160	66	60	70	60	161	97	88	73	21	11	132
24	157	60	60	72	200	156	82	95	65	21	13	117
25	154	60	58	76	1000	149	80	95	56	18	13	116
26	153	58	56	76	5280	141	100	81	44	18	12	124
27	149	54	56	76	2070	135	106	72	37	17	12	122
28	149	50	56	70	947	128	126	68	34	17	11	113
29	144	47	56	66	---	123	126	77	42	16	11	103
30	142	45	60	64	---	117	109	103	45	16	10	96
31	141	---	64	62	---	116	---	124	---	14	14	---
TOTAL	5997	2929	1834	2232	10853	7025	3209	2879	2338	936	400	2382
MEAN	193	97.6	59.2	72.0	388	227	107	92.9	77.9	30.2	12.9	79.4
MAX	505	150	80	88	5280	631	164	125	119	66	17	197
MIN	133	45	42	60	50	116	80	68	34	14	10	27
AC-FT	11900	5810	3640	4430	21530	13930	6370	5710	4640	1860	793	4720

CAL YR 1985	TOTAL	20144.66	MEAN	55.2	MAX	505	MIN	.00	AC-FT	39960
WTR YR 1986	TOTAL	43014	MEAN	118	MAX	5280	MIN	10	AC-FT	85320

06109500 MISSOURI RIVER AT VIRGELLE, MT

LOCATION.--Lat 48°00'18", long 110°15'25", in SW¼SW¼SE¼ sec.13, T.26 N., R.11 E., Chouteau County, Hydrologic Unit 10040101, on left bank 0.2 mi upstream from Virgelle ferry, 0.6 mi southwest of Virgelle, 1.8 mi downstream from Spring Coulee, and at mile 2,034.2.

DRAINAGE AREA.--34,379 mi^2.

PERIOD OF RECORD.--February 1935 to current year. Prior to October 1953, published as "at Loma."

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,507.50 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1953, water-stage recorder at Loma, 18 mi upstream, at datum 2,543.40 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 12-14, Nov. 21 to Jan. 22, Feb. 13-27, Apr. 12, 13. Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by 23 smaller irrigation reservoirs and powerplants, Clark Canyon Reservoir (station number 06015300), Canyon Ferry Lake (station number 06058500), and Lake Elwell (station number 06101300). Diversions for irrigation of about 850,400 acres upstream from station.

AVERAGE DISCHARGE.--51 years, 8,711 ft^3/s, 6,311,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 122,000 ft^3/s June 5, 1953, gage height, 23.4 ft, from floodmark, from rating curve for former site at Loma extended above 66,000 ft^3/s, adjusted to present site; minimum daily, 638 ft^3/s July 5, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1908 reached a stage about 2 ft higher than that of June 5, 1953, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,800 ft^3/s Feb. 28, gage height, 8.93 ft; maximum gage height, 18.40 ft Feb. 25, backwater from ice, but may have been greater during period of ice affect, Feb. 27; minimum daily discharge, 5,980 ft^3/s Aug. 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	6030	9350	8800	8200	7580	13800	8370	10400	16500	8460	7010	6700
2	6290	9690	8800	8200	7680	12000	8690	10100	16000	8610	6890	6860
3	6220	10300	9000	8200	7710	10800	8510	10100	15500	8670	6930	6710
4	6380	10500	9000	8200	7610	10900	8830	9800	14300	8230	6930	7140
5	7210	10400	9400	8000	7520	9870	9060	9900	13200	8420	7060	6310
6	7880	10200	9600	8000	7580	10200	8830	11200	13100	8640	6960	6230
7	8050	10100	9600	8000	7440	9620	8720	11300	13600	9440	6820	6280
8	7630	9480	9000	8000	7300	9500	8920	10900	14500	9650	6840	6290
9	7520	10200	8600	8600	7230	9140	8540	11300	16100	9340	6980	6540
10	7400	10100	8200	8600	6050	8560	8450	11300	17200	8450	7860	6550
11	7840	9430	8000	8600	6500	10400	8620	12600	17800	7750	7300	6620
12	8360	9000	7800	9000	7250	9900	8600	13700	17700	8160	7250	6840
13	8350	9000	7800	9200	8000	7900	8800	13200	16600	8060	6970	6960
14	8910	9400	7800	9000	8000	8500	9080	12700	15400	7810	6710	6950
15	8860	9580	8200	8800	9400	9130	8890	11900	15200	7860	5980	6850
16	8640	10000	8400	8600	10500	8690	9030	11500	14700	7910	6480	6980
17	8620	9550	8400	8200	11000	8600	9290	11800	13400	8160	6430	7050
18	8580	9580	8600	8400	10000	8550	9250	11700	12600	8300	6830	7230
19	8390	9130	9000	8500	8500	8550	9950	11600	12900	8300	6620	7430
20	8510	8080	9400	8600	7400	8580	9150	11400	12500	8050	6440	7460
21	8350	7200	9400	8600	6800	8430	8770	12700	10900	7740	6780	8040
22	8060	7600	9000	8600	7400	8400	8670	10900	8920	7450	6590	7890
23	8250	7500	9000	8230	8000	8250	8760	12900	8780	6970	6480	7390
24	9100	7800	9000	7910	8000	8190	9370	14500	8830	6870	6600	7160
25	9060	8400	8800	7770	10300	8300	10100	14300	8260	6990	6470	6950
26	8930	9000	8800	7570	21000	8590	10600	13400	8160	7000	6580	6910
27	9020	10000	8600	7870	25000	7880	10400	13300	8310	7340	6780	6720
28	9260	9600	8600	6880	20800	7960	10300	13800	8140	7300	6690	7130
29	9540	9000	8400	7420	---	8150	10100	15300	8430	7220	6760	7760
30	9180	8800	8400	7630	---	8010	10200	16400	8400	7180	6600	6960
31	9300	---	8200	7570	---	8080	---	16500	---	7090	6850	---
TOTAL	253720	277970	269600	254950	267550	283430	274850	382400	385930	247420	210470	208890
MEAN	8185	9266	8697	8224	9555	9143	9162	12340	12860	7981	6789	6963
MAX	9540	10500	9600	9200	25000	13800	10600	16500	17800	9650	7860	8040
MIN	6030	7200	7800	6880	6050	7880	8370	9800	8140	6870	5980	6230
AC-FT	503300	551400	534800	505700	530700	562200	545200	758500	765500	490800	417500	414300

CAL YR 1985 TOTAL 2584090 MEAN 7080 MAX 11000 MIN 3810 AC-FT 5126000
WTR YR 1986 TOTAL 3317180 MEAN 9088 MAX 25000 MIN 5980 AC-FT 6580000

06115200 MISSOURI RIVER NEAR LANDUSKY, MT

LOCATION.--Lat 47°37'51", long 108°41'13", in NW¼NE¼ sec.31, T.22 N., R.24 E., Fergus County, Hydrologic Unit 10040104, Fort Peck Game Range, on right bank 380 ft upstream from bridge on U.S. Highway 191, 0.9 mi upstream from Armells Creek, 20 mi south of Landusky, and at mile 1,921.61.

DRAINAGE AREA.--40,987 mi^2. Area at site used prior to Dec. 13, 1968, 40,763 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1934 to current year. Prior to October 1968, published as "at powerplant ferry, near Zortman."

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,239.96 ft above National Geodetic Vertical Datum of 1929 (State Highway bench mark). Prior to Feb. 7, 1935, nonrecording gage, and Feb. 7, 1935, to Dec. 12, 1968, water-stage recorder, at site 16.5 mi upstream at datum 33.06 ft higher.

REMARKS.--Estimated daily discharges: Nov. 11 to Mar. 8. Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by 24 smaller irrigation reservoirs and powerplants, Clark Canyon Reservoir (station number 06015300), Canyon Ferry Lake (station number 06058500), and Lake Elwell (station number 06101300). Diversions for irrigation of aout 870,400 acres upstream from station.

AVERAGE DISCHARGE.--52 years, 9,468 ft^3/s, 6,860,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137,000 ft^3/s June 6, 1953, gage height, 22.20 ft, from graph based on gage readings, site and datum then in use; maximum gage height, 30.16 ft Mar. 19, 1947 (ice jam), from floodmark, site and datum then in use; maximum gage height, present site and datum, 34.17 ft Mar. 26, 1978, (ice jam), from floodmark; minimum discharge, 1,120 ft^3/s July 8, 1936, gage height, 1.92 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 28,200 ft^3/s Sept. 25, gage height, 21.87 ft; maximum gage height, 28.54 ft Feb. 26 (backwater from ice); minimum daily discharge, 6,250 ft^3/s Oct. 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	6350	9180	9500	9500	10000	18000	8520	10500	18200	8950	7760	7910
2	6250	9230	10000	9500	10000	15000	8770	11000	18300	8950	7630	7410
3	6490	9650	9500	9500	10000	13000	8990	10600	17800	8960	7600	7650
4	6580	10100	10000	9500	10000	12000	8950	11400	17200	9140	7430	7700
5	6620	10400	10000	9500	10000	11400	9140	11700	16200	9390	7690	8180
6	7160	10400	9500	10000	9500	11700	9370	10700	17200	9240	7640	7290
7	8180	10200	9500	9500	9500	11000	9310	11900	15800	9380	7550	7160
8	8170	10100	10000	9000	9500	11000	9040	12700	15800	9940	7620	7160
9	7990	9630	11000	9500	9500	11400	9200	14500	16400	10200	7400	7220
10	7740	10000	10000	9500	9500	11200	9090	15500	18100	9940	7460	7520
11	7950	10000	10000	10000	9000	9920	8720	15600	19300	9410	7930	7510
12	8790	10500	10000	10000	8500	11400	8830	18700	19600	8490	8190	7500
13	9000	10500	9500	10000	9000	11100	9430	17500	19400	8640	7970	7630
14	8930	10000	9000	11000	9500	9610	9670	15700	18200	8780	7470	7730
15	9250	10000	9000	11000	9000	9400	9430	14400	17000	8580	7590	7880
16	9170	10500	9000	11000	9000	10200	9370	13500	16500	8510	6930	7940
17	8890	10500	9500	10000	10000	9720	9750	13000	16200	8790	7110	8630
18	8820	11000	10000	9500	11000	9590	9610	13300	15000	8760	7160	8710
19	8640	11000	9500	9500	10500	9460	9890	13100	13700	8970	7390	10600
20	8710	11000	9500	10000	10500	9400	10300	13000	13600	9010	7410	9800
21	8660	11000	10000	10100	9500	9400	9740	13000	13300	8850	7160	8690
22	8550	10000	10000	10000	8500	9230	9290	18700	11900	8550	7240	8840
23	8240	9000	11000	10000	8000	9130	9240	14900	9940	8260	7330	8810
24	8270	9500	11000	10000	8000	8960	9020	15300	9450	7900	7240	8420
25	8940	9500	10000	10000	9000	8840	9610	16700	9420	7600	7220	20300
26	8990	9500	10000	9500	9500	8830	10300	16200	9020	7780	7280	14200
27	8970	9500	10000	9500	10000	9120	10800	15300	8740	7620	7250	9430
28	9040	10000	10000	9500	13000	8720	10900	15100	8740	7820	7430	8450
29	9080	11000	10000	9500	---	8530	10800	15600	9190	7910	7440	8250
30	9390	10000	10000	9000	---	8710	10500	17000	8970	7930	7470	8840
31	9270	---	10000	9500	---	8590	---	18300	---	7620	7570	---
TOTAL	257080	302890	306000	303600	269000	323560	285580	444400	438170	269870	231560	263360
MEAN	8293	10100	9871	9794	9607	10440	9519	14340	14610	8705	7470	8779
MAX	9390	11000	11000	11000	13000	18000	10900	18700	19600	10200	8190	20300
MIN	6250	9000	9000	9000	8000	8530	8520	10500	8740	7600	6930	7160
AC-FT	509900	600800	607000	602200	533600	641800	566400	881500	869100	535300	459300	522400

CAL YR 1985 TOTAL 2827950 MEAN 7748 MAX 11000 MIN 3830 AC-FT 5609000
WTR YR 1986 TOTAL 3695070 MEAN 10120 MAX 20300 MIN 6250 AC-FT 7329000

06115200 MISSOURI RIVER NEAR LANDUSKY, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1979 to September 1981.
WATER TEMPERATURE: March to September 1979.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to current year

REMARKS.--Unpublished records of once-daily water temperature are available in files of the District office. Prior to July 1972, sampling and record computations were under supervision of Corps of Engineers, U.S. Army. Sediment loads estimated Nov. 12 to Dec. 3. Flow affected by ice during most of winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1979-81): Maximum daily, 1,240 microsiemens, June 20, 1979; minimum daily, 410 microsiemens, July 3, 1980.
WATER TEMPERATURE (water year 1979): Maximum, 24.0°C, on several days during June to August 1979; minimum, 0.5°C, on several days during March 1979.
SEDIMENT CONCENTRATION: Maximum daily mean, 27,400 mg/L, June 22, 1976; minimum daily mean, 2 mg/L, Dec. 21, 1983.
SEDIMENT LOAD : Maximum daily, 1,680,000 tons, June 22, 1976; minimum daily, 33 tons, Dec. 21, 1983.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 23,400 mg/L, Sep. 25; minimum daily mean, 41 mg/L, Feb. 21.
SEDIMENT LOAD: Maximum daily, 1,470,000 tons, Sep. 25; minimum daily, 1,050 tons, Feb. 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)	METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
NOV 05...	1100	10400	60	1	489	5.0	6.0	704	11.0	96
JAN 22...	1500	10300	70	2	640	0.0	0.0	711	11.5	85
MAR 11...	1015	9580	100	2	660	7.0	4.5	701	11.1	94
MAY 29...	1330	15200	0	0	547	29.0	21.0	708	7.5	91
JUL 24...	0915	7470	0	0	482	21.0	23.0	708	7.8	98
SEP 25...	1030	20300	100	63	1300	10.0	11.0	685	9.0	91

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 05...	K60	K20	7.80	56	200	71	49	19	24	0.8
JAN 22...	K8	160	8.40	19	240	86	54	25	45	1
MAR 11...	K81	230	8.20	180	240	81	56	24	48	1
MAY 29...	K130	1300	8.50	95	190	36	46	18	32	1
JUL 24...	<1	190	8.70	32	190	51	45	18	24	0.8
SEP 25...	--	--	7.50	7500	260	82	68	22	190	5

06115200 MISSOURI RIVER NEAR LANDUSKY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)
NOV 05...	2.7	160	0	146	87	7.3	0.7	11	287	280
JAN 22...	3.1	170	11	154	170	8.1	0.7	13	504	430
MAR 11...	3.6	200	0	161	170	8.9	0.8	13	429	420
MAY 29...	3.1	170	11	150	110	8.1	0.7	11	324	330
JUL 24...	3.0	150	10	142	94	9.2	0.8	12	285	300
SEP 25...	6.7	180	0	120	560	7.0	0.9	5.3	950	950

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
NOV 05...	0.39	8060	<0.01	0.14	0.08	0.02	0.4	0.15	0.01	0.01
JAN 22...	0.69	14000	<0.01	0.43	0.10	0.12	0.4	0.08	0.02	0.02
MAR 11...	0.58	11100	<0.01	0.37	--	--	1.0	0.15	0.02	0.01
MAY 29...	0.44	13300	<0.01	<0.10	<0.01	0.03	0.9	0.06	<0.01	<0.01
JUL 24...	0.39	5750	<0.01	<0.10	0.04	<0.01	0.4	0.06	<0.01	<0.01
SEP 25...	1.3	52100	0.02	0.43	0.07	0.03	10	0.48	0.02	0.02

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV 05...	1100	<10	12	52	<0.5	<1	<1	<3	1	4	1
MAR 11...	1015	50	25	48	<0.5	<1	<1	<3	8	54	4
JUL 24...	0915	10	13	50	<0.5	<10	<1	<3	3	<3	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV 05...	42	3	0.2	<10	<1	1	<1	410	<6	<3
MAR 11...	60	8	<0.1	<10	7	2	<1	540	<6	5
JUL 24...	52	<1	<0.1	<10	<1	<1	<1	400	<6	<3

06115200 MISSOURI RIVER NEAR LANDUSKY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
JAN							
22...	1500	0.0	10300	61	1700	--	--
MAR							
11...	1015	4.5	9580	779	20100	36	43
MAY							
29...	1330	21.0	15200	781	32100	21	26
JUL							
24...	0915	23.0	7470	192	3870	--	--
SEP							
24...	1745	10.5	27200	36100	2650000	49	60
25...	1030	11.0	20300	25100	1380000	54	65

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. SIEVE DIAM. % FINER THAN .062 MM (70331)
JAN							
22...	--	--	--	--	--	--	78
MAR							
11...	52	59	95	100	--	--	--
MAY							
29...	32	37	61	93	99	100	--
JUL							
24...	--	--	--	--	--	--	45
SEP							
24...	70	81	97	99	100	--	--
25...	76	86	100	--	--	--	--

DATE	TIME	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
NOV											
05...	1100	36	80	92	99	100	--	--	--	--	--
MAR											
11...	1015	13	41	46	55	62	72	87	96	98	100

06115200 MISSOURI RIVER NEAR LANDUSKY, 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	198	3390	512	12700	340	8720	147	3770	190	5130	3480	169000
2	168	2840	500	12500	350	9450	148	3800	182	4910	3450	140000
3	186	3260	450	11700	340	8720	128	3280	183	4940	3460	121000
4	219	3890	850	23200	343	9260	102	2620	184	4970	3450	112000
5	242	4330	855	24000	337	9100	101	2590	203	5480	3450	106000
6	275	5320	665	18700	323	8280	109	2940	170	4360	3420	108000
7	581	12800	418	11500	283	7260	124	3180	130	3330	3200	95000
8	613	13500	390	10600	196	5290	133	3230	103	2640	4800	143000
9	598	12900	337	8760	117	3470	132	3390	107	2740	2080	64000
10	548	11500	382	10300	66	1780	105	2690	142	3640	1800	54400
11	970	20800	423	11400	65	1760	80	2160	190	4620	1000	26800
12	3660	86900	450	12800	77	2080	74	2000	195	4480	900	27700
13	2610	63400	450	12800	104	2670	99	2670	187	4540	940	28200
14	1530	36900	400	10800	133	3230	121	3590	179	4590	730	18900
15	1080	27000	400	10800	105	2550	127	3770	170	4130	640	16200
16	780	19300	425	12000	63	1530	117	3470	162	3940	650	17900
17	730	17500	425	12000	60	1540	114	3080	151	4080	395	10400
18	900	21400	450	13400	147	3970	126	3230	123	3650	376	9740
19	558	13000	450	13400	254	6520	157	4030	90	2550	270	6900
20	487	11500	450	13400	210	5390	194	5240	57	1620	320	8120
21	430	10100	450	13400	137	3700	180	4910	41	1050	318	8070
22	423	9760	400	10800	86	2320	75	2030	48	1100	226	5630
23	373	8300	350	8500	77	2290	59	1590	65	1400	290	7150
24	362	8080	375	9620	91	2700	59	1590	112	2420	385	9310
25	518	12500	375	9620	113	3050	59	1590	3650	88700	374	8930
26	560	13600	375	9620	130	3510	61	1560	4420	113000	310	7390
27	515	12500	375	9620	137	3700	80	2050	3780	102000	356	8770
28	432	10500	380	10300	138	3730	151	3870	3550	125000	312	7350
29	373	9140	400	11900	133	3590	232	5950	---	---	263	6060
30	348	8820	350	9450	131	3540	226	5490	---	---	260	6110
31	339	8480	---	---	138	3730	219	5620	---	---	238	5520
TOTAL	---	503210	---	369590	---	138430	---	100980	---	515010	---	1363550
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	212	4880	295	8360	680	33400	880	21300	517	10800	576	12300
2	288	6820	290	8610	525	25900	740	17900	400	8240	596	11900
3	355	8620	252	7210	740	35600	635	15400	345	7080	558	11500
4	257	6210	1800	55400	750	34800	720	17800	227	4550	378	7860
5	292	7210	9400	297000	705	30800	2520	63900	335	6960	468	10300
6	282	7130	2540	73400	6210	288000	2190	54600	188	3880	422	8310
7	250	6280	1500	48200	4420	189000	1070	27100	212	4320	350	6770
8	228	5570	1900	65200	3100	132000	1160	31100	253	5210	203	3920
9	217	5390	6120	240000	1220	54000	790	21800	346	6910	213	4150
10	325	7980	7580	317000	1390	67900	500	13400	292	5880	388	7880
11	253	5960	4900	206000	915	47700	450	11400	315	6740	265	5370
12	155	3700	8400	424000	710	37600	420	9630	210	4640	280	5670
13	259	6590	3950	187000	630	33000	480	11200	232	4990	328	6760
14	270	7050	1940	82200	675	33200	470	11100	225	4540	304	6340
15	310	7890	1360	52900	600	27500	370	8570	274	5620	300	6380
16	490	12400	985	35900	635	28300	920	21100	221	4140	395	8470
17	1310	34500	850	29800	930	40700	1260	29900	259	4970	2190	51000
18	810	21000	830	29800	945	38300	720	17000	287	5550	4400	103000
19	620	16600	810	28600	695	25700	860	20800	252	5030	5800	166000
20	560	15600	750	26300	670	24600	290	7050	288	5760	4790	127000
21	345	9070	580	20400	585	21000	195	4660	509	9840	1800	42200
22	208	5220	9480	497000	490	15700	307	7090	419	8190	998	23800
23	235	5860	6920	278000	430	11500	296	6600	320	6330	500	11900
24	120	2920	2460	102000	420	10700	238	5080	251	4910	895	20300
25	397	10300	1550	69900	450	11400	192	3940	252	4910	23400	1470000
26	440	12200	1230	53800	410	9990	233	4890	438	8610	15000	619000
27	280	8160	980	40500	430	10100	201	4140	449	8790	3120	79400
28	655	19300	765	31200	470	11100	227	4790	518	10400	1050	24000
29	545	15900	760	32000	5450	135000	294	6280	360	7230	710	15800
30	310	8790	835	38300	1700	41200	488	10400	232	4680	1290	30800
31	---	---	830	41000	---	---	565	11600	242	4950	---	---
TOTAL	---	295100	---	3426980	---	1505690	---	501520	---	194650	---	2908080

TOTAL LOAD FOR YEAR: 11822790 TONS

06120500 MUSSELSHELL RIVER AT HARLOWTON, MT

LOCATION.--Lat 46°25'48", long 109°50'24", in NE¼ sec.28, T.8 N., R.15 E., Wheatland County, Hydrologic Unit 10040201, on left bank 350 ft downstream from bridge on U.S. Highway 191, 1.0 mi southwest of Harlowton, 6 mi upstream from American Fork, and at mile 327.8.

DRAINAGE AREA.--1,125 mi^2.

PERIOD OF RECORD.--July 1907 to November 1929, March 1930 to December 1932, April to August 1933, February 1934 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1912, 1915(M), 1918, 1925. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,171.46 ft above National Geodetic Vertical Datum of 1929 (levels by Morrison and Maierle, Inc.). Prior to Dec. 8, 1937, nonrecording gages at site 1.2 mi downstream at different datums. Dec. 8, 1937, to Aug. 26, 1955, nonrecording gage at bridge 300 ft upstream at different datums.

REMARKS.--Estimated daily discharges: Oct. 7-10, Nov. 9 to Feb. 27. Records good except those for estimated daily discharges, which are poor. Some regulation by Bair and Martinsdale Reservoirs. 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 for irrigation of about 30,100 acres upstream from station of which about 2,300 acres is flood irrigated.

AVERAGE DISCHARGE.--76 years (water years 1908-29, 1931-32, 1935-86), 164 ft^3/s, 118,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 7,270 ft^3/s June 20, 1975, gage height, 10.01 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge not determined; maximum gage height, 6.68 ft Feb. 24 (backwater from ice); minimum daily discharge, 17 ft^3/s Dec. 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	67	48	21	47	45	256	95	114	412	103	75	155
2	67	48	17	43	40	185	93	112	432	100	70	169
3	68	49	19	38	38	152	89	100	442	108	71	126
4	69	49	24	30	35	130	87	100	621	132	78	107
5	71	49	33	35	32	119	84	147	667	298	73	98
6	70	48	39	44	30	111	78	185	724	385	66	90
7	66	51	42	45	29	103	77	182	570	278	62	84
8	60	53	40	48	27	100	72	207	713	229	59	75
9	60	50	35	52	26	109	64	225	907	200	56	74
10	70	43	30	56	24	106	65	201	739	184	61	69
11	92	43	22	52	23	98	70	195	588	175	71	67
12	105	40	26	45	25	93	74	215	465	158	70	61
13	111	45	25	50	28	91	84	191	368	136	77	74
14	102	50	35	52	30	87	76	176	316	124	97	101
15	91	54	33	47	30	82	91	162	286	124	102	116
16	94	56	36	50	40	80	103	151	251	128	87	115
17	100	50	39	50	38	80	107	125	196	188	83	115
18	96	40	41	56	30	78	95	121	161	176	80	128
19	103	37	43	62	30	74	86	117	136	157	76	131
20	86	34	45	50	35	73	79	112	124	149	76	130
21	64	31	48	35	60	71	76	117	121	137	77	130
22	60	27	47	35	110	68	74	220	110	107	86	118
23	56	32	45	42	150	69	74	407	103	85	79	108
24	54	30	43	45	390	70	88	400	91	78	77	103
25	54	29	45	40	930	67	99	327	77	79	76	105
26	52	25	43	43	1050	65	113	283	79	89	73	106
27	50	26	38	50	800	66	142	278	81	85	73	103
28	50	26	42	50	398	67	130	314	97	76	71	103
29	49	27	45	40	---	68	121	338	102	71	71	102
30	49	24	44	45	---	78	120	382	108	64	76	105
31	49	---	43	49	---	90	---	381	---	71	82	---
TOTAL	2235	1214	1128	1426	4523	2986	2706	6585	10087	4474	2331	3168
MEAN	72.1	40.5	36.4	46.0	162	96.3	90.2	212	336	144	75.2	106
MAX	111	56	48	62	1050	256	142	407	907	385	102	169
MIN	49	24	17	30	23	65	64	100	77	64	56	61
AC-FT	4430	2410	2240	2830	8970	5920	5370	13060	20010	8870	4620	6280

CAL YR 1985	TOTAL	18502.0	MEAN	50.7	MAX	200	MIN	3.7	AC-FT	36700
WTR YR 1986	TOTAL	42863	MEAN	117	MAX	1050	MIN	17	AC-FT	85020

06122800 MUSSELSHELL RIVER NEAR SHAWMUT, MT

LOCATION.--Lat 46°21'02", long 109°33'18", in NE¼NW¼SE¼ sec. 23, T.7 S., R.17 E., Wheatland County, Hydrologic Unit 10040201, on left bank 1.6 mi west of Shawmut, 3.2 mi upstream from county bridge located 0.5 mi south of Shawmut, 4.8 mi downstream from diversion to Deadman's Basin Reservoir, and at mile 304.1.

DRAINAGE AREA.--1,479 mi^2.

PERIOD OF RECORD.--March to September 1986.

GAGE.--Water-stage recorder. Elevation of gage is 3,880 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges this year. Seasonal records good except those above 70 ft^3/s, which are fair. Diversions for irrigation of about 40,000 acres upstream from station of which about 29,000 acres is 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 691 ft^3/s June 9, 1986, gage height, 4.09 ft, from rating curve extended above 36 ft^3/s; minimum 1.1 ft^3/s Apr. 8, 1986.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 691 ft^3/s June 9, gage height, 4.09 ft, from rating curve extended above 36 ft^3/s; minimum, 1.1 ft^3/s Apr. 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							1.3	18	121	15	25	25
2							1.3	17	135	24	27	33
3							1.4	16	142	24	27	29
4							1.4	16	264	25	28	26
5							1.4	18	382	38	31	26
6							1.4	21	522	92	30	25
7							1.4	23	407	78	25	25
8							1.3	26	421	43	18	25
9							1.6	29	659	25	16	24
10							19	17	574	74	17	22
11							24	13	435	118	20	21
12							26	12	277	29	25	20
13							26	12	173	24	35	18
14							12	7.9	106	19	34	22
15							11	6.6	84	19	33	25
16							8.2	6.2	66	30	30	26
17							7.8	6.0	36	34	30	27
18							7.3	5.8	14	40	28	29
19							16	5.5	9.9	38	27	29
20							23	5.3	8.0	36	26	32
21							22	5.2	6.7	36	27	33
22							21	5.1	5.6	34	27	30
23							11	29	7.1	30	26	27
24							21	75	14	28	25	25
25							24	58	12	32	24	25
26							27	34	11	32	24	25
27							23	25	12	34	25	42
28							29	24	12	34	23	106
29							20	32	13	24	22	107
30							19	56	13	22	22	109
31							---	93	---	22	24	---
TOTAL							409.8	717.6	4942.3	1153	801	1038
MEAN							13.7	23.1	165	37.2	25.8	34.6
MAX							29	93	659	118	35	109
MIN							1.3	5.1	5.6	15	16	18

06126470 HALFBREED CREEK NEAR KLEIN, MT

LOCATION.--Lat 46°23'14", long 108°32'29", in SW¼NE¼SW¼ sec.1, T.7 N., R.25 E., Musselshell County, Hydrologic Unit 10040201, on left bank, 800 ft upstream from private road bridge, 1.2 mi south of Klein, 3.2 mi upstream from mouth, and 4.1 mi south of Roundup.

DRAINAGE AREA.--53.2 mi^2.

PERIOD OF RECORD.--October 1977 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 3,330 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 8 to Dec. 16, Dec. 26 to Jan. 8, Jan. 21-25, Feb. 6 to Mar. 4, Apr. 13-15. Records fair except those for estimated daily discharges, which are poor. No known regulation or diversions 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.--9 years, 1.08 ft^3/s, 782 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 634 ft^3/s July 16, 1986, gage height, 8.69 ft, from floodmark, from rating curve extended above 345 ft^3/s based on extension of 1978 slope-area data; no flow Feb. 2-14, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5.0 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Feb. 25	unknown	23	4.79	July 16	1900	*a 630	*8.69

a--From rating curve extended above 345 ft^3/s based on extension of 1978 slope-area data.

Minimum daily discharge, 0.12 ft^3/s Dec. 1.

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	.41	.12	.41	.67	1.1	.64	.72	.41	.46	.46	.71
2	.37	.44	.13	.43	.60	1.0	.64	.62	.37	.46	.41	.81
3	.33	.46	.15	.38	.67	.90	.56	.60	.41	.41	.42	.58
4	.34	.48	.17	.32	.82	.80	.58	.55	.56	.55	.41	.54
5	.34	.46	.20	.28	.79	.76	.61	.70	.52	.82	.41	.50
6	.32	.41	.25	.32	.62	.86	.60	.67	.61	.80	.41	.50
7	.40	.39	.30	.35	.50	.82	.55	.66	.62	.67	.41	.53
8	.41	.35	.25	.40	.45	.86	.59	1.1	1.6	.61	.40	.55
9	.43	.30	.20	.41	.35	.86	.61	2.0	2.4	.61	.41	.53
10	.47	.20	.15	.45	.25	.82	.61	2.1	1.2	.57	.41	.50
11	.50	.20	.15	.51	.20	.86	.88	1.4	.73	.54	.41	.50
12	.49	.25	.20	.50	.25	.77	.79	.94	.62	.47	.41	.50
13	.45	.30	.22	.48	.30	.80	.50	.79	.56	.45	.43	.50
14	.40	.32	.27	.48	.40	.80	.40	.79	.61	.38	.45	.55
15	.37	.32	.30	.43	.50	.77	.90	.78	.59	.43	.42	.61
16	.37	.32	.33	.46	.60	.70	1.5	.74	.48	28	.41	.66
17	.37	.32	.37	.49	.70	.73	1.6	.70	.46	16	.37	.61
18	.35	.30	.39	.46	.60	.73	1.1	.67	.44	1.9	.36	.90
19	.37	.25	.46	.50	.40	.77	.88	.66	.46	.76	.35	1.1
20	.37	.20	.48	.53	.30	.75	.80	.62	.42	.60	.37	.90
21	.37	.18	.54	.48	.40	.73	.79	.59	.47	.55	.37	.74
22	.37	.16	.56	.42	.50	.67	.79	1.1	.46	.52	.40	.73
23	.39	.17	.55	.41	.60	.67	.80	1.0	.42	.50	.41	.71
24	.37	.18	.55	.42	.80	.67	.76	.84	.41	.46	.41	.70
25	.39	.16	.53	.44	2.5	.66	.76	.66	.37	.47	.40	1.1
26	.40	.15	.52	.46	1.5	.65	1.0	.63	.37	.49	.39	.92
27	.39	.17	.45	.48	.90	.67	1.0	.60	.43	.48	.40	.72
28	.41	.17	.38	.58	1.0	.67	.84	.52	.46	.49	.40	.67
29	.38	.16	.40	.50	---	.67	.77	.49	.54	.46	.43	.67
30	.39	.15	.40	.52	---	.64	.81	.46	.55	.46	.47	.67
31	.41	---	.40	.60	---	.64	---	.45	---	.46	.55	---
TOTAL	12.07	8.33	10.37	13.90	18.17	23.80	23.66	25.15	18.55	60.83	12.76	20.21
MEAN	.39	.28	.33	.45	.65	.77	.79	.81	.62	1.96	.41	.67
MAX	.50	.48	.56	.60	2.5	1.1	1.6	2.1	2.4	28	.55	1.1
MIN	.32	.15	.12	.28	.20	.64	.40	.45	.37	.38	.35	.50
AC-FT	24	17	21	28	36	47	47	50	37	121	25	40

CAL YR 1985	TOTAL	131.95	MEAN	.36	MAX	2.4	MIN	.00	AC-FT	262
WTR YR 1986	TOTAL	247.80	MEAN	.68	MAX	28	MIN	.12	AC-FT	492

06126500 MUSSELSHELL RIVER NEAR ROUNDUP, MT

LOCATION.--Lat 46°25'41", long 108°34'19", in NW¼SE¼SE¼ sec.22, T.8 N., R.25 E., Musselshell County, Hydrologic Unit 10040202, on left bank 20 ft downstream from Halfbreed Creek, 0.1 mi upstream from bridge on U.S. Highway 87, 2.0 mi southwest of Roundup, and at mile 211.6.

DRAINAGE AREA.--4,023 mi^2.

PERIOD OF RECORD.--May 1946 to current year. Monthly discharge only for October 1947 to September 1949, published in WSP 1309.

REVISED RECORDS.--WSP 1086: 1946. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,188.15 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 26, 1949, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharge: Nov. 9 to Feb. 26, Apr. 13, 14. Records good except those for estimated daily discharge, which are poor. Some regulation by Bair (station number 06116500), Martinsdale (station number 06119000) and Deadman's Basin (station number 06122500) Reservoirs. Diversions for irrigation of about 59,600 acres upstream from station, of which about 11,000 acres is flood irrigated. 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.--40 years, 228 ft^3/s, 165,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,610 ft^3/s June 18, 1967, gage height, 12.45 ft; maximum gage height, 13.73 ft Mar. 9, 1979 (ice jam); minimum discharge, 0.60 ft^3/s May 12, 1962, gage height, 0.63 ft; minimum gage height, 0.23 ft July 31, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,350 ft^3/s Feb. 27, gage height, 6.21 ft; maximum gage height, 7.33 ft Feb. 26 (ice jam); minimum daily discharge, 10 ft^3/s Dec. 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	21	32	11	36	42	705	43	87	86	243	191	459
2	20	32	10	37	43	430	42	84	181	236	197	331
3	20	32	12	35	44	303	41	79	198	229	197	242
4	20	34	15	32	43	235	39	67	222	241	209	167
5	22	34	18	31	42	185	39	91	256	278	206	150
6	22	33	20	33	40	146	37	102	372	269	183	143
7	26	33	21	36	35	124	35	108	421	289	170	143
8	32	34	19	38	30	113	35	118	768	320	171	141
9	34	33	18	40	28	109	32	155	811	277	164	140
10	33	32	16	42	27	104	28	212	822	206	158	136
11	38	28	15	44	26	100	38	260	717	170	155	126
12	42	28	17	42	27	96	41	231	534	238	169	118
13	50	30	16	42	28	100	46	207	396	194	194	99
14	54	32	19	40	29	94	66	180	308	151	206	90
15	65	34	18	39	30	88	80	152	214	148	208	92
16	64	33	19	39	32	82	85	134	179	215	192	96
17	61	30	22	40	29	78	102	119	155	268	188	99
18	51	26	24	42	25	76	115	111	114	204	194	115
19	40	21	25	43	23	77	107	100	87	197	188	182
20	33	15	27	40	23	71	89	95	66	208	185	185
21	30	14	30	38	25	68	80	87	52	213	182	175
22	29	13	32	36	27	64	71	87	34	206	194	212
23	26	12	34	39	30	61	66	79	99	192	197	172
24	25	13	33	42	40	59	60	88	123	177	204	146
25	25	12	32	40	200	55	57	83	117	165	196	126
26	25	11	30	38	1500	52	55	118	125	171	185	102
27	25	11	29	40	2020	51	62	102	193	187	133	93
28	25	12	30	38	1400	50	68	68	198	198	99	85
29	25	12	31	37	---	48	79	43	224	203	92	86
30	30	12	33	38	---	47	93	31	255	198	112	124
31	35	---	34	40	---	46	---	15	---	196	173	---
TOTAL	1048	728	710	1197	5888	3917	1831	3493	8327	6687	5492	4575
MEAN	33.8	24.3	22.9	38.6	210	126	61.0	113	278	216	177	153
MAX	65	34	34	44	2020	705	115	260	822	320	209	459
MIN	20	11	10	31	23	46	28	15	34	148	92	85
AC-FT	2080	1440	1410	2370	11680	7770	3630	6930	16520	13260	10890	9070

CAL YR 1985	TOTAL	18205.9	MEAN	49.9	MAX	249	MIN	2.6	AC-FT	36110
WTR YR 1986	TOTAL	43893	MEAN	120	MAX	2020	MIN	10	AC-FT	87060

06127500 MUSSELSHELL RIVER AT MUSSELSHELL, MT

LOCATION.--Lat 46°31'23", long 108°06'30", in SE¼SW¼SW¼ sec.20, T.9 N., R.29 E., Musselshell County, Hydrologic Unit 10040202, on left bank 0.9 mi upstream from Hawk Creek, 1 mi west of Musselshell, and at mile 164.5.

DRAINAGE AREA.--4,568 mi^2.

PERIOD OF RECORD.--August 1928 to September 1932 (no records December to February for the water years 1930-31), August 1945 to September 1979, October 1982 to September 1983, October 1983 to current season (seasonal record only). Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,984.72 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 8, 1949, nonrecording gage at site 1 mi downstream at different datums.

REMARKS.--Estimated daily discharges: Apr. 12-14. Records good. Some regulation by Bair (station number 06116500) Martinsdale (station number 06119000), and Deadman's Basin (station number 06122500) Reservoirs. Diversions for irrigation of about 63,300 acres upstream from station, of which about 12,500 acres is flood irrigated. 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.--37 years (1928-29, 1931-32, 1945-79, 1982-83), 215 ft^3/s, 155,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,850 ft^3/s June 19, 1967, gage height, 11.57 ft; maximum gage height, 12.96 ft Mar. 10, 1979 (ice jam); no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 890 ft^3/s June 9, gage height, 4.73 ft; minimum daily, 16 ft^3/s Oct. 3.

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	22						53	89	20	163	133	281
2	18						53	89	31	148	132	331
3	16						51	83	110	152	137	279
4	18						50	78	127	159	141	208
5	18						49	76	146	196	152	153
6	20						47	87	228	205	142	146
7	28						47	101	285	196	119	139
8	35						45	113	467	216	113	142
9	39						43	135	834	214	117	140
10	42						39	164	708	170	109	135
11	41						33	213	770	124	102	134
12	43						30	234	599	103	98	124
13	48						42	206	448	155	105	118
14	56						54	188	340	109	125	105
15	60						78	163	254	88	137	99
16	69						91	144	179	109	140	100
17	66						98	129	148	335	130	105
18	64						109	117	115	210	133	114
19	52						116	110	83	153	132	137
20	49						109	95	62	157	132	198
21	42						98	94	57	165	122	183
22	36						90	93	46	161	118	191
23	31						80	92	28	145	128	208
24	32						72	88	45	131	137	171
25	28						69	92	67	121	146	176
26	29						66	88	65	121	146	134
27	29						68	102	74	136	131	114
28	29						71	90	114	149	91	105
29	29						73	59	121	157	67	99
30	28						87	37	149	156	59	102
31	31						---	26	---	138	84	---
TOTAL	1148						2011	3475	6720	4942	3758	4671
MEAN	37.0						67.0	112	224	159	121	156
MAX	69						116	234	834	335	152	331
MIN	16						30	26	20	88	59	99
AC-FT	2280						3990	6890	13330	9800	7450	9260

06130500 MUSSELSHELL RIVER AT MOSBY, MT
(National stream quality accounting network station)

LOCATION.-Lat 46°59'34", long 107°53'34", in NW¼SW¼NW¼ sec.11, T.14 N., R.30 E., Petroleum County, Hydrologic Unit 10040205, on left bank 300 ft upstream from bridge on State Highway 20, 0.3 mi west of Mosby, 10.9 mi downstream from Flatwillow Creek, and at mile 60.0.

DRAINAGE AREA.--7,846 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May to November 1929, March 1930 to September 1932, February 1934 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1559: 1935-36. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,495.9 ft above National Geodetic Vertical Datum of 1929. Dec. 6, 1962, to Mar. 14, 1966, water-stage recorder at site 900 ft downstream at different datum. Mar. 15, 1966, to Dec. 11, 1973, water-stage recorder and nonrecording gages at site 400 ft downstream at same datum. Dec. 12, 1973, to Oct. 1, 1981, nonrecording gage at site 300 ft downstream at same datum. See WSP 2116 for history of changes prior to 1962.

REMARKS.--Estimated daily discharges: Nov. 10 to Feb. 26. Water-discharge records good except those for Feb. 27 to Apr. 24, May 9 to June 21, July 10, Sept. 26-30, which are fair, and those for estimated daily discharges, which are poor. Some regulation by Bair (station number 06116500), Martinsdale (station number 06119000) and Deadman's Basin (station number 06122500) Reservoirs. Diversions for irrigation of about 103,000 acres upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1931-32, 1935-86), 293 ft^3/s, 212,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft^3/s June 18, 1944, gage height, 14.43 ft; maximum gage height, 15.1 ft Mar. 12, 1979, from floodmark (backwater from ice jam); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,400 ft^3/s Sept. 25, gage height, 14.02 ft; minimum daily discharge, 10 ft^3/s Nov. 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	16	30	14	39	120	1980	91	129	194	53	86	1420
2	16	30	18	38	140	1250	91	134	123	67	70	247
3	17	31	20	35	140	818	79	137	104	71	70	308
4	17	36	22	30	140	607	79	116	125	65	69	248
5	19	35	24	30	120	465	80	256	96	73	69	191
6	18	35	24	30	100	375	80	412	117	130	68	148
7	24	34	26	35	90	313	79	219	126	122	78	122
8	24	28	21	40	80	270	73	394	233	118	74	116
9	32	25	20	45	70	242	64	1490	435	102	65	113
10	35	23	18	60	60	214	58	3030	862	159	58	110
11	38	21	18	80	55	200	52	4780	732	130	68	104
12	62	19	17	100	60	191	47	4280	788	94	62	97
13	76	22	16	120	65	191	54	1850	674	67	65	93
14	56	25	18	150	70	163	80	1240	530	56	69	89
15	54	29	21	140	75	158	95	930	410	57	76	90
16	51	33	21	120	80	155	125	688	333	105	76	82
17	52	35	22	130	70	155	270	549	261	618	88	80
18	59	27	22	130	65	155	290	480	211	254	87	121
19	79	20	22	140	65	152	286	433	178	194	76	476
20	72	16	23	150	60	147	324	384	147	128	68	356
21	64	16	28	120	62	147	266	349	107	109	64	442
22	57	17	30	130	68	155	198	373	93	90	72	286
23	49	15	35	120	80	163	177	378	78	86	70	209
24	43	16	33	140	100	155	182	757	66	85	66	214
25	39	19	30	130	3500	152	149	743	58	79	76	8750
26	35	17	40	120	6000	125	140	484	46	65	74	5510
27	34	15	40	130	3440	110	140	388	47	61	90	1370
28	32	13	38	140	2770	95	138	317	35	53	86	1030
29	30	13	38	130	---	95	140	264	26	71	68	730
30	30	10	39	105	---	82	133	224	21	80	58	468
31	30	---	40	110	---	82	---	192	---	87	631	---
TOTAL	1260	705	798	3017	17745	9562	4060	26400	7256	3529	2797	23620
MEAN	40.6	23.5	25.7	97.3	634	308	135	852	242	114	90.2	787
MAX	79	36	40	150	6000	1980	324	4780	862	618	631	8750
MIN	16	10	14	30	55	82	47	116	21	53	58	80
AC-FT	2500	1400	1580	5980	35200	18970	8050	52360	14390	7000	5550	46850

CAL YR 1985	TOTAL	14041.75	MEAN	38.5	MAX	678	MIN	.00	AC-FT	27850
WTR YR 1986	TOTAL	100749	MEAN	276	MAX	8750	MIN	10	AC-FT	199800

06130500 MUSSELSHELL RIVER AT MOSBY, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to September 1981.
WATER TEMPERATURE: October 1974 to September 1979.
SUSPENDED-SEDIMENT DISCHARGE: October 1982 to current year.

REMARKS.--Unpublished records of once-daily water temperatures are available in files of District office.
Flow affected by ice during most of winter months.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1975-81): Maximum daily, 4,900 microsiemens, Aug. 14, 1977; minimum daily, 678 microsiemens, Mar. 23, 1978.
WATER TEMPERATURE (water years 1975-79): Maximum daily, 26.0°C, Aug. 7, 9, 1978; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 25,800 mg/L, Aug. 3, 1985; minimum daily mean, 11 mg/L Sep. 18, 1983, Nov. 11, 15, 1984.
SEDIMENT LOAD: Maximum daily, 242,000 tons, Sep. 26, 1986; minimum daily, 0 ton, July 22, 23, 27-29, 1985, during period of no flow.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 18,800 mg/L, Jul. 17; minimum daily mean, 48 mg/L, Aug. 15.
SEDIMENT LOAD: Maximum daily, 242,000 tons, Sep. 25; minimum daily, 3.7 tons, Nov. 28.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC												
18...	1130	22	75	1	3350	2.0	0.0	700	8.2	62	K13	100
JAN												
30...	1245	102	--	--	2260	2.0	0.0	--	--	--	--	--
FEB												
27...	1500	4120	--	--	850	8.0	3.0	--	--	--	--	--
MAR												
05...	1445	474	--	--	1180	12.0	7.5	--	--	--	--	--
11...	1300	203	75	1	1940	9.5	7.5	689	10.1	94	<1	200
APR												
24...	1515	170	--	--	2600	9.0	12.0	--	--	--	--	--
JUN												
10...	1130	958	10	1	1340	21.0	18.0	697	6.8	79	520	--
JUL												
23...	1130	87	10	1	1900	28.0	23.0	--	--	--	--	--
AUG												
27...	1500	92	0	0	2100	25.0	22.0	700	8.5	107	110	330

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)
DEC										
18...	1130	7.90	4.7	1000	630	170	150	460	6	5.4
MAR										
11...	1300	8.50	55	610	400	120	74	220	4	6.6
JUN										
10...	1130	8.90	150	440	180	90	52	130	3	5.2
AUG										
27...	1500	8.40	16	--	--	--	--	--	--	6.2

06130500 MUSSELSHELL RIVER AT MOSBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BICARBONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
DEC 18...	510	0	338	1500	43	0.3	6.9	2680	2600	3.6
MAR 11...	240	4	135	830	23	0.4	6.9	1500	1400	2.0
JUN 10...	270	29	199	470	8.4	0.3	6.7	872	950	1.2
AUG 27...	220	7	208	920	20	0.4	1.4	1680	--	2.3

DATE	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
DEC 18...	159	<0.01	0.62	--	--	0.6	0.01	0.02	0.01
MAR 11...	822	0.17	0.33	0.44	0.01	1.2	0.10	0.01	<0.01
JUN 10...	2260	<0.01	<0.10	0.16	0.11	2.7	0.65	<0.01	<0.01
AUG 27...	417	<0.01	<0.10	0.03	0.03	0.7	0.03	<0.01	<0.01

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
DEC 18...	1130	<10	<1	<100	<10	<1	<1	<1	4	60	1
MAR 11...	1300	<10	1	52	<0.5	<1	<1	<3	1	6	<1
JUN 10...	1130	30	1	41	<0.5	1	<1	<3	12	14	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC 18...	80	70	<0.1	1	4	4	<1	2800	<1	20
MAR 11...	75	72	<0.1	<10	5	6	<1	1900	<6	12
JUN 10...	55	3	<0.1	<10	3	1	1	1500	<6	46

06130500 MUSSELSHELL RIVER AT MOSBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	TEMPERATURE (DEG C) (00010)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
NOV							
06...	1500	5.0	35	256	24	--	--
DEC							
18...	1130	0.0	22	172	10	--	--
JAN							
30...	1245	0.0	102	189	52	--	--
FEB							
27...	1500	3.0	4120	8450	94000	43	50
MAR							
05...	1445	7.5	474	596	763	57	71
11...	1300	7.5	203	154	84	--	--
APR							
19...	0830	8.5	276	579	431	--	--
24...	1515	12.0	170	235	108	--	--
JUN							
10...	1130	18.0	958	1330	3440	54	66
JUL							
23...	1130	23.0	87	111	26	--	--
AUG							
27...	1500	22.0	92	58	14	--	--
SEP							
02...	0945	10.0	255	2490	1710	75	87
25...	1045	10.5	9620	14100	366000	56	65

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. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV						
06...	--	--	--	--	--	98
DEC						
18...	--	--	--	--	--	71
JAN						
30...	--	--	--	--	--	98
FEB						
27...	60	69	90	96	100	--
MAR						
05...	--	89	--	--	--	98
11...	--	--	--	--	--	93
APR						
19...	--	--	--	--	--	97
24...	--	--	--	--	--	95
JUN						
10...	75	84	96	98	100	--
JUL						
23...	--	--	--	--	--	99
AUG						
27...	--	--	--	--	--	98
SEP						
02...	96	99	--	--	--	100
25...	74	82	96	99	100	--

DATE	TIME	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	BED MAT. FALL DIAM. % FINER THAN .062 MM (80158)	BED MAT. FALL DIAM. % FINER THAN .125 MM (80159)	BED MAT. FALL DIAM. % FINER THAN .250 MM (80160)	BED MAT. FALL DIAM. % FINER THAN .500 MM (80161)	BED MAT. FALL DIAM. % FINER THAN 1.00 MM (80162)	BED MAT. FALL DIAM. % FINER THAN 2.00 MM (80163)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
APR											
24...	1515	21	52	96	100	--	--	--	--	--	--
JUL											
23...	1130	42	81	90	91	94	94	94	95	96	100
AUG											
27...	1500	25	60	91	99	100	--	--	--	--	--

06130500 MUSSELSHELL RIVER AT MOSBY, 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	285	12	303	25	147	5.6	128	13	180	58	4100	21900
2	233	10	301	24	170	8.3	134	14	192	73	2390	8070
3	348	16	262	22	150	8.1	117	11	204	77	1440	3180
4	324	15	385	37	145	8.6	112	9.1	218	82	870	1430
5	286	15	357	34	154	10	123	10	230	75	622	781
6	270	13	259	24	166	11	128	10	192	52	440	445
7	270	17	177	16	133	9.3	92	8.7	178	43	338	286
8	275	18	147	11	116	6.6	97	10	133	29	308	225
9	290	25	211	14	144	7.8	114	14	87	16	221	144
10	305	29	142	8.8	106	5.2	126	20	82	13	174	101
11	319	33	140	7.9	141	6.9	141	30	103	15	159	86
12	347	58	187	9.6	143	6.6	195	53	132	21	264	136
13	357	73	189	11	151	6.5	213	69	94	16	296	153
14	312	47	168	11	158	7.7	202	82	87	16	265	117
15	296	43	201	16	187	11	192	73	108	22	273	116
16	228	31	137	12	163	9.2	184	60	129	28	258	108
17	232	33	148	14	82	4.9	178	62	124	23	190	80
18	268	43	140	10	125	7.4	231	81	118	21	165	69
19	322	69	110	5.9	68	4.0	214	81	127	22	135	55
20	359	70	94	4.1	103	6.4	195	79	123	20	163	65
21	344	59	93	4.0	93	7.0	177	57	126	21	137	54
22	368	57	95	4.4	100	8.1	160	56	119	22	148	62
23	343	45	93	3.8	112	11	144	47	110	24	140	62
24	290	34	103	4.4	105	9.4	130	49	190	51	153	64
25	288	30	134	6.9	132	11	119	42	10000	94500	128	53
26	307	29	111	5.1	137	15	113	37	9500	154000	105	35
27	315	29	107	4.3	159	17	133	47	9200	85400	124	37
28	282	24	105	3.7	171	18	177	67	6800	50900	94	24
29	333	27	132	4.6	168	17	213	75	---	---	91	23
30	345	28	183	4.9	157	17	191	54	---	---	75	17
31	365	30	---	---	143	15	173	51	---	---	74	16
TOTAL	---	1062	---	363.4	---	296.6	---	1371.8	---	385640	---	37994
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	78	19	141	49	296	155	132	19	98	23	6220	26400
2	73	18	173	63	260	86	115	21	94	18	2280	1690
3	78	17	195	72	219	61	108	21	101	19	1190	990
4	61	13	190	60	212	72	112	20	72	13	278	186
5	79	17	1400	1810	139	36	134	26	85	16	430	222
6	75	16	5720	6940	155	49	321	113	74	14	328	131
7	63	13	2050	1210	308	105	118	39	71	15	179	59
8	57	11	1570	2020	482	303	162	52	78	16	135	42
9	83	14	5770	23200	580	681	302	83	70	12	150	46
10	89	14	6600	54000	1260	2930	560	240	65	10	135	40
11	72	10	7700	99400	1140	2250	578	203	67	12	115	32
12	60	7.6	5730	66200	1070	2280	403	102	67	11	112	29
13	80	12	2530	12600	620	1130	250	45	66	12	88	22
14	84	18	1460	4890	460	658	131	20	54	10	55	13
15	91	23	970	2440	331	366	188	29	48	9.8	49	12
16	117	39	780	1450	218	196	2470	2940	53	11	62	14
17	605	441	590	875	172	121	18800	41800	68	16	80	17
18	709	555	472	612	138	79	3080	2300	57	13	1000	476
19	570	440	374	437	178	86	1280	670	68	14	3810	4900
20	467	409	352	365	220	87	820	283	74	14	1800	1730
21	316	227	370	349	212	61	318	94	72	12	2400	2860
22	259	138	500	504	216	54	208	51	58	11	900	695
23	270	129	515	526	390	82	140	33	61	12	284	160
24	238	117	1450	3490	178	32	160	37	65	12	252	154
25	176	71	1220	2450	163	26	186	40	80	16	8910	242000
26	144	54	572	747	133	17	316	55	98	20	5010	89600
27	142	54	430	450	188	24	212	35	78	19	1700	6290
28	172	64	291	249	135	13	301	43	80	19	960	2670
29	185	70	293	209	132	9.3	155	30	92	17	630	1240
30	153	55	265	160	148	8.4	151	33	58	9.1	295	373
31	---	---	233	121	---	---	120	28	2100	18100	---	---
TOTAL	---	3085.6	---	287948	---	12057.7	---	49505	---	18525.9	---	383093

TOTAL LOAD FOR YEAR: 1180943.0 TONS.

06131000 BIG DRY CREEK NEAR VAN NORMAN, MT

LOCATION.--Lat 47°20'58", long 106°21'26", in NE¼SW¼NW¼ sec.3, T.18 N., R.42 E., Garfield County, Hydrologic Unit 10040105, on left bank 900 ft downstream from Little Dry Creek, 3.2 mi northeast of Van Norman Post Office, 26 mi east of Jordan, and at mile 55.1.

DRAINAGE AREA.--2,554 mi^2.

PERIOD OF RECORD.--October 1939 to July 1969, July 1970 to current year (discharge measurements only, October 1947 to March 1949). Prior to July 1970, published as "Dry Creek near Van Norman".

REVISED RECORDS.--WSP 1309: 1947(M). WSP 1559: 1944(M), 1947. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,330 ft, by barometer. Prior to July 24, 1978, at site 400 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Oct. 10-24 and Oct. 30 to Mar. 1. Records fair except those for estimated daily discharges, which are poor. Few small diversions for irrigation of hay meadows 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.--43 years (1939-47, 1949-68, 1970-86), 54.4 ft^3/s, 39,410 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,600 ft^3/s Mar. 21, 1947, gage height, 13.39 ft; maximum gage height, 15.26 ft Mar. 21, 1947 (ice jam); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	unknown	*unknown	*a 9.06	Sept. 26	0700	7,080	7.59
June 29	0300	4,180	6.11				

a--from floodmarks, backwater from ice.

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	.39	.50	.10	.00	.00	1500	9.8	6.7	6.8	40	2.2	.20
2	.39	.60	.00	.00	.00	859	8.4	6.1	6.0	19	1.9	.21
3	.36	.70	.00	.00	.00	423	8.4	5.2	6.0	10	1.5	.21
4	.41	.70	.00	.00	.00	317	9.5	4.9	6.0	9.9	1.4	.23
5	.32	.80	.00	.00	.00	248	9.3	28	5.4	11	1.4	.43
6	.44	.70	.00	.00	.00	159	9.0	27	6.4	6.1	1.5	.56
7	1.9	.80	.00	.00	.00	134	8.5	24	5.7	6.7	1.4	.57
8	3.9	.70	.00	.00	.00	120	7.7	49	7.8	7.8	1.0	.63
9	5.1	.60	.00	.00	.00	108	7.0	171	32	6.0	.86	.60
10	3.0	.70	.00	.00	.00	87	6.5	260	25	4.4	.86	.53
11	2.0	.80	.00	.00	.00	100	8.9	256	64	3.3	.79	.60
12	1.0	.90	.00	.00	.00	87	7.7	152	56	2.6	.59	.47
13	1.0	1.0	.00	.00	.00	79	10	112	40	2.0	.64	.52
14	1.0	.90	.00	.00	.00	65	15	79	31	1.5	.82	5.1
15	1.0	.80	.00	.00	.10	51	13	58	21	6.2	.52	5.9
16	1.0	.70	.00	.00	.10	43	16	43	15	96	.39	3.0
17	1.0	.60	.00	.00	.10	37	29	36	13	82	.33	5.0
18	1.0	.70	.00	.00	.10	33	21	30	9.6	28	.27	99
19	1.0	.70	.00	.00	.10	29	24	25	7.4	81	.23	168
20	1.0	.70	.00	.00	.10	29	39	21	5.8	82	.19	208
21	1.0	.80	.00	.00	.10	28	44	18	4.4	46	.20	231
22	1.0	.90	.00	.00	.10	24	34	15	4.0	27	.45	193
23	1.0	1.0	.00	.00	1.0	20	19	14	3.6	17	.35	110
24	1.0	.80	.00	.00	5.0	18	12	15	3.2	12	.26	97
25	1.1	.70	.00	.00	20	15	11	13	2.8	8.9	.23	1470
26	1.1	.60	.00	.00	8500	13	11	11	2.2	6.8	.25	5080
27	1.1	.50	.00	.00	5000	13	9.8	9.8	1.4	5.7	.21	2020
28	.88	.40	.00	.00	2500	11	9.5	8.9	1.3	4.9	.19	1050
29	.95	.30	.00	.00	---	15	8.6	8.0	894	3.8	.17	577
30	.70	.20	.00	.00	---	13	7.4	8.1	107	3.2	.19	388
31	.60	---	.00	.00	---	12	---	8.0	---	2.6	.20	---
TOTAL	37.64	20.80	.10	.00	16026.80	4690	434.0	1522.7	1393.8	643.4	21.49	11715.76
MEAN	1.21	.69	.00	.00	572	151	14.5	49.1	46.5	20.8	.69	391
MAX	5.1	1.0	.10	.00	8500	1500	44	260	894	96	2.2	5080
MIN	.32	.20	.00	.00	.00	11	6.5	4.9	1.3	1.5	.17	.20
AC-FT	75	41	.2	.00	31790	9300	861	3020	2760	1280	43	23240

CAL YR 1985	TOTAL	444.95	MEAN	1.22	MAX	23	MIN	.00	AC-FT	883
WTR YR 1986	TOTAL	36506.49	MEAN	100	MAX	8500	MIN	.00	AC-FT	72410

06131500 FORT PECK LAKE AT FORT PECK, MT

LOCATION.--Lat 48°00'26", long 106°23'49", in sec. 14, T.26 N., R.41 E., McCone County, Hydrologic Unit 10040104, in No. 4 emergency gate shaft of Fort Peck Dam on Missouri River at Fort Peck, 2 mi downstream from Bear Creek, 9.5 mi southwest of Nashua, 9.5 mi upstream from Milk River, and at mile 1,771.6.

DRAINAGE AREA.--57,500 mi^2.

PERIOD OF RECORD.--October 1937 to current year. (Monthend contents only, except October 1938 to September 1940, when elevations were included.) Monthend contents for October 1937 to August 1938, published only in WSP 1309. Daily elevations and contents for May to June 1964, published in WSP 1840-B. Prior to October 1970, published as "Fort Peck Reservoir." Daily elevations on file in Helena district office.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929. Prior to May 1, 1941, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam completed in 1939; storage began in 1937. The following capacity figures are from capacity table effective July 1, 1973; see previous reports for superseded figures. Total capacity, 18,910,000 acre-ft between elevation 2,095.00 ft, invert of lower ring gates, and 2,250.00 ft, top of 25 ft gates. Elevation of spillway crest, 2,225.00 ft. Normal operating level, 17,930,000 acre-ft, elevation, 2,246.00 ft. Dead storage, 542,800 acre-ft below elevation 2,095.00 ft. Minimum operating level, 4,283,000 acre-ft, elevation, 2,160.00 ft, for on-site power generation. Figures given herein represent total contents; usable contents published in previous water-supply papers for October 1950 to September 1955. Water is used for navigation, recreation, flood control, and power generation. Elevations materially affected by wind.

COOPERATION.--Elevations and capacity table furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 19,310,000 acre-ft July 15-17, 1975, elevation, 2,251.6 ft; minimum since first filling, 5,061,000 acre-ft Jan. 25, 26, 1956, elevation, 2,167.67 ft, by capacity table used Mar. 1, 1940, to Dec. 31, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum contents at 2400, 15,970,000 acre-ft Sept. 30, elevation, 2,237.43 ft; minimum, 13,440,000 acre-ft Feb. 24, elevation, 2,225.20 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in Contents (acre-feet)
Sept. 30	2,228.75	14,150,000	---
Oct. 31	2,229.34	14,260,000	+110,000
Nov. 30	2,229.30	14,260,000	0
Dec. 31	2,228.30	14,060,000	-200,000
CAL YR 1985			-2,160,000
Jan. 31	2,226.74	13,750,000	-310,000
Feb. 28	2,226.59	13,720,000	-30,000
Mar. 31	2,229.10	14,220,000	+500,000
Apr. 30	2,230.03	14,400,000	+180,000
May 31	2,233.54	15,130,000	+730,000
June 30	2,235.36	15,520,000	+390,000
July 31	2,235.22	15,490,000	-30,000
Aug. 31	2,234.65	15,370,000	-120,000
Sept. 30	2,237.43	15,970,000	+600,000
WTR YR 1986			+1,820,000

06132000 MISSOURI RIVER BELOW FORT PECK DAM, MT
(National stream quality accounting network station)

LOCATION.--Lat 48°02'39", long 106°21'21", in NW¼ sec.6, T.26 N., R.42 E., McCone County, Hydrologic Unit 10060001, on right bank 2 mi upstream from Milk River, 6 mi south of Nashua, 8 mi downstream from Fort Peck Dam, and at mile 1,763.5.

DRAINAGE AREA.--57,556 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1934 to current year.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,018.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Apr. 14, 1938, at site 0.7 mi upstream at different datum; Apr. 14, 1938, to Sept. 30, 1963, at present site at datum 2.00 ft higher, all water-stage recorders. Since Oct. 1, 1, 1969, published discharge is determined by flowmeters at Fort Peck Dam.

REMARKS.--Flow completely regulated by Fort Peck Lake. Diversions for irrigation of about 880,400 acres above station.

COOPERATION.--Records since Oct. 1, 1969, furnished by U.S. Army Corps of Engineers; 2 to 4 discharge measurements are made each year and the records are reviewed by Geological Survey. Records for March 1934 to September 1969 collected and computed by Geological Survey.

AVERAGE DISCHARGE.--5 years (1934-39, prior to Fort Peck Lake reaching operational level), 6,347 ft^3/s, 4,598,000 acre-ft/yr; 43 years (1943-86, after operational level in Fort Peck Lake was reached), 9,982 ft^3/s, 7,232,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,000 ft^3/s including 32,000 ft^3/s inflow from spillway 1 mi downstream from station, Aug. 8, 1946; maximum gage height observed, 12.30 ft Mar. 10, 1936 (ice jam), site and datum then in use; maximum daily reverse flow, 400 ft^3/s Mar. 29, 1943 (backwater from Milk River).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 14,500 ft^3/s Feb. 11; minimum daily, 1,100 ft^3/s Mar. 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	6000	6300	9100	13700	13900	12400	6900	7000	6100	8400	8400	5900
2	6100	6000	8900	13900	13900	10100	6900	7100	5800	8400	7000	6100
3	6200	6100	9100	14000	13900	9200	6900	7200	5800	8500	6900	6000
4	5900	5800	9100	13900	13900	9800	7100	7000	7100	8700	7000	6000
5	5900	6300	9100	14200	13900	8100	7200	6800	8700	8500	6900	6000
6	5900	6400	9100	13700	13900	5800	6700	7000	8500	8600	8000	6100
7	6000	6300	9000	14000	13900	2500	7000	7100	8600	8400	8100	5900
8	6000	6600	9300	14200	13900	1800	6900	6900	8700	8400	7900	6100
9	5800	6300	10000	14100	13900	1100	7000	6900	8700	8200	7800	5800
10	5800	6300	10000	14300	13800	3200	7000	5700	8200	8300	8100	6400
11	5700	6400	11100	14000	14500	3100	6900	5500	8000	8500	8200	6100
12	5900	6400	11200	13400	14200	4000	6900	5900	8200	8600	8000	6300
13	5900	6400	11200	14300	14400	6000	6900	5700	8300	8700	8200	6200
14	5900	6300	12300	13900	14400	6000	7100	5900	8500	8300	8100	6000
15	5900	6200	12200	14000	14200	5800	7300	5700	8300	8400	8100	6300
16	6000	6400	12300	13800	14100	6100	7200	5500	8500	8600	8100	5900
17	5800	6500	12500	14000	14100	6000	7100	5800	8400	8600	8000	5900
18	5900	6500	13300	14200	14100	6000	7100	6300	8600	8500	8000	6100
19	6100	6500	13100	14100	14000	5800	7000	6300	8600	8500	8000	6000
20	6000	6900	13200	14000	14200	5900	7000	6300	8600	8400	8200	6000
21	6200	8800	12800	14000	14200	6100	7100	6200	8600	8500	7000	6200
22	12800	9100	12800	14000	14200	6800	7000	6300	8700	8600	7000	6000
23	12700	9700	12900	14100	14000	6800	7000	6200	8800	8700	7000	6100
24	6300	9200	13800	13900	14000	6700	7000	6100	8600	8600	7100	6000
25	6200	9200	13600	14000	14000	7100	7100	6100	8600	8800	7100	6100
26	6200	9200	13700	14200	12600	6900	7000	6100	8500	8700	7000	6000
27	6000	8900	13600	14200	11400	6900	7300	6100	8600	8600	7000	6000
28	6100	8800	13600	14100	11500	7100	7100	6700	8500	8700	7200	6000
29	6100	8900	13500	14100	---	7000	7000	5900	8400	8600	6600	6000
30	6100	9000	13500	13600	---	7000	7100	6400	8500	8400	6800	5900
31	6200	---	13600	13900	---	7000	---	6100	---	8500	6800	---
TOTAL	199600	217700	362500	433800	387000	194100	210800	195800	246000	264200	233600	181400
MEAN	6439	7257	11690	13990	13820	6261	7027	6316	8200	8523	7535	6047
MAX	12800	9700	13800	14300	14500	12400	7300	7200	8800	8800	8400	6400
MIN	5700	5800	8900	13400	11400	1100	6700	5500	5800	8200	6600	5800
AC-FT	395900	431800	719000	860400	767600	385000	418100	388400	487900	524000	463300	359800

CAL YR 1985	TOTAL	3714500	MEAN	10180	MAX	14600	MIN	5600	AC-FT	7368000
WTR YR 1986	TOTAL	3126500	MEAN	8566	MAX	14500	MIN	1100	AC-FT	6201000

06132000 MISSOURI RIVER BELOW FORT PECK DAM, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to September 1981.
WATER TEMPERATURE: October 1974 to September 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1975-81): Maximum daily, 1,080 microsiemens, Nov. 30, 1976; minimum daily, 520 microsiemens, June 29, 1978.
WATER TEMPERATURE (water years 1975-79): Maximum daily, 14.5°C, on several days during August and September 1976; minimum daily, 0.0°C, on several days during December 1977 to January 1978.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV												
20...	1130	7190	0	0	579	-16.0	2.0	720	10.9	84	K5	K5
JAN												
27...	1030	14200	0	0	580	0.0	2.0	707	12.4	97	<1	<1
APR												
02...	1100	9120	0	0	570	7.0	4.5	705	10.4	87	<1	K6
MAY												
20...	1100	7270	0	0	542	24.0	11.0	705	8.7	85	K3	K10
JUL												
22...	1030	11400	0	0	572	25.0	10.0	709	10.8	103	K2	K17
AUG												
28...	1045	10300	0	0	589	17.0	12.5	712	10.5	106	K26	50

DATE	PH (STAND-ARD UNITS) (00400)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	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 TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	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)
NOV												
20...	8.40	7	1.0	210	53	40	52	19	20	36	1	2.9
JAN												
27...	8.40	3	1.0	210	52	41	52	16	20	37	1	4.5
APR												
02...	7.80	5	0.6	220	51	60	54	20	21	38	1	3.6
MAY												
20...	8.50	10	1.5	210	57	34	52	18	20	37	1	3.6
JUL												
22...	8.30	5	1.6	220	79	34	55	18	21	38	1	3.5
AUG												
28...	8.40	5	1.0	--	--	40	--	18	--	--	--	3.6

DATE	BICAR-BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	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 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)
NOV												
20...	--	--	154	120	11	0.7	8.1	349	350	0.47	6780	<0.01
JAN												
27...	--	--	160	130	10	0.8	8.2	351	360	0.48	13500	<0.01
APR												
02...	210	0	162	130	9.3	0.8	8.0	362	370	0.49	8910	<0.01
MAY												
20...	170	8	160	120	8.5	0.7	7.4	352	350	0.48	6910	<0.01
JUL												
22...	170	4	159	130	8.7	0.7	8.2	339	360	0.46	10400	<0.01
AUG												
28...	170	8	157	140	8.7	0.7	--	400	--	0.54	11100	<0.01

06132000 MISSOURI RIVER BELOW FORT PECK DAM, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV											
20...	<0.10	0.12	0.03	0.6	<0.01	<0.01	<0.01	0.02	7	136	50
JAN											
27...	<0.10	0.04	0.05	0.5	0.01	<0.01	--	0.01	5	192	63
APR											
02...	<0.10	0.02	0.03	0.3	0.01	<0.01	<0.01	<0.01	3	74	64
MAY											
20...	<0.10	0.04	0.05	0.3	0.01	<0.01	0.01	<0.01	31	608	66
JUL											
22...	<0.10	0.04	0.04	0.3	0.02	0.02	0.01	<0.01	4	123	87
AUG											
28...	<0.10	0.02	<0.01	0.2	0.03	<0.01	0.02	<0.01	11	306	72

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV											
20...	1130	<10	5	40	<0.5	1	<1	<3	2	<3	<1
APR											
02...	1100	10	5	40	<0.5	<1	<1	<3	4	<3	1
JUL											
22...	1030	<10	5	39	<0.5	<1	<1	<3	5	<3	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV										
20...	54	4	<0.1	<10	3	1	<1	470	<6	6
APR										
02...	55	6	0.1	<10	14	1	<1	470	<6	6
JUL										
22...	55	3	<0.1	<10	5	<1	<1	480	<6	6

06132200 SOUTH FORK MILK RIVER NEAR BABB, MT

(International gaging station)

LOCATION.--Lat 48°45'14", long 113°10'00", in NE¼NW¼NW¼ sec.34, T.35 N., R.12 W., Glacier County, Hydrologic Unit 10050001, Blackfeet Indian Reservation, on right bank 300 ft upstream from bridge on FAS 464 ("Duck Lake Road"), 14.4 mi southeast of Babb, 15.2 mi northwest of Browning, and at mile 17.3.

DRAINAGE AREA.--70.4 mi^2.

PERIOD OF RECORD.--May 1961 to current season (seasonal records only).

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,731.6 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Feb. 23, 24, and Oct. 28-31. Records good. Many small diversions for irrigation 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.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s June 8, 1964, gage height, 6.61 ft, from rating curve extended above 400 ft^3/s, on basis of slope-area measurement of peak flow at site 3 mi downstream; maximum gage height, 7.17 ft Feb. 24, 1986; no flow Aug. 23, 1973, June 28 to Aug. 14, 1977, Aug. 26 to Sept. 2, 1984.

EXTREMES FOR CURRENT SEASON.--Peak discharges greater than base discharge of 260 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 24	2230	a*1,000	*7.17	No other peaks greater than base discharge.			

a about

Minimum daily discharge, 5.3 ft^3/s Aug. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			129	71	40	53	31	9.4	19	28		
2			109	58	38	51	28	9.0	16	58		
3			88	49	37	50	23	7.9	12	40		
4			83	44	99	49	21	9.9	11	31		
5			64	41	157	62	24	12	15	26		
6			62	41	99	137	25	10	29	24		
7			66	39	83	92	22	8.7	24	21		
8			59	39	70	73	19	8.3	19	22		
9			58	40	61	73	19	8.3	35	24		
10			49	43	55	55	20	7.9	50	25		
11			50	48	50	47	19	7.9	29	24		
12			45	45	47	41	17	7.6	20	23		
13			43	47	44	41	17	7.9	20	21		
14			44	51	50	40	16	8.3	27	19		
15			41	59	60	43	15	7.9	26	19		
16			40	73	81	42	14	6.9	25	17		
17			37	61	80	36	16	6.6	23	17		
18			35	48	64	33	15	6.1	29	16		
19			34	42	54	33	14	5.6	54	16		
20			39	39	50	31	14	5.3	44	15		
21			44	39	67	32	13	5.6	43	15		
22			51	42	83	31	12	5.8	32	15		
23		10	49	47	62	27	13	6.1	23	15		
24		200	43	53	53	25	15	6.6	21	15		
25		581	39	48	49	23	14	6.6	19	14		
26		275	41	50	45	22	14	6.1	19	15		
27		156	42	53	45	21	13	6.1	17	15		
28		131	59	45	57	22	13	5.8	16	15		
29			80	43	61	42	12	5.6	15	15		
30			71	41	58	47	10	5.8	14	14		
31			75	---	54	---	9.9	8.3	---	14		
TOTAL			1769	1439	1953	1374	527.9	229.9	746	648		
MEAN			57.1	48.0	63.0	45.8	17.0	7.42	24.9	20.9		
MAX			129	73	157	137	31	12	54	58		
MIN			34	39	37	21	9.9	5.3	11	14		
AC-FT			3510	2850	3870	2730	1050	456	1480	1290		

06133000 MILK RIVER AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°00'27", long 112°32'42", in NE¼ sec.1, T.1, R.20 W., fourth meridian, in Alberta, Hydrologic Unit Unit 10050001, on left bank 0.8 mi north of international boundary, 22 mi upstream from North Milk River, 23 mi southwest of Milk River, Alberta, and at mile 656.4.

DRAINAGE AREA.--401 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1931 to current season (seasonal records only). Prior to October 1961, published as South Fork Milk River near international boundary.

REVISED RECORDS.--WSP 1389: 1934(M), 1935, 1936(M), 1937, 1942(M), 1947-48(M). W 1983: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,820 ft, from topographic map. Prior to Aug. 9, 1948, and Aug. 9, 1948, to Oct. 31, 1958, water-stage recorders at sites 0.4 mi and 0.5 mi downstream, respectively, at different datums.

REMARKS.--Estimated daily discharges: Feb. 26, Oct. 30, 31. Water-discharge records good. Several diversions for irrigation upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,930 ft^3/s June 9, 1964, gage height, 9.77 ft; maximum gage height, 12.55 ft Mar. 18, 1976 (backwater from ice); no flow at times.

EXTREMES FOR CURRENT SEASON.--Peak discharges greater than base discharge of 430 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	unknown	a*6,000	unknown	No other peak greater than base discharge this year.			

(a) From hydrographic comparisons with nearby stations.

No flow Aug. 2 to Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			381	156	81	59	20	.04	.00	18		
2			349	154	78	52	34	.00	.00	22		
3			283	132	73	47	26	.00	.00	41		
4			226	113	108	40	21	.00	.00	56		
5			209	102	197	45	18	.00	.00	46		
6			160	95	292	59	15	.00	.00	37		
7			153	91	229	101	14	.00	.00	33		
8			142	85	185	115	14	.00	.00	33		
9			139	84	151	81	13	.00	.00	31		
10			132	88	131	75	9.8	.00	.00	32		
11			108	95	118	69	7.7	.00	.00	33		
12			109	103	103	55	6.2	.00	11	34		
13			96	103	92	46	4.9	.00	23	34		
14			94	112	87	40	3.4	.00	20	32		
15			93	105	109	36	2.7	.00	17	30		
16			94	113	123	32	2.6	.00	19	27		
17			94	136	161	30	2.7	.00	24	26		
18			80	127	172	31	1.4	.00	26	25		
19			76	107	140	30	1.1	.00	28	24		
20			81	92	112	37	.85	.00	29	23		
21			96	82	99	26	.60	.00	46	22		
22			109	81	111	24	.42	.00	41	21		
23			121	86	133	23	.39	.00	38	21		
24			120	94	112	23	.25	.00	32	20		
25			101	105	93	20	.14	.00	28	19		
26		3170	84	107	81	19	.14	.00	28	19		
27		1010	88	106	71	17	.39	.00	30	19		
28		475	86	114	65	15	.49	.00	27	19		
29			129	100	61	20	.32	.00	23	19		
30			180	88	67	14	.11	.00	20	19		
31			165	---	64	---	.07	.00	---	19		
TOTAL			4378	3156	3699	1281	221.67	.04	510.00	854		
MEAN			141	105	119	42.7	7.15	.00	17.0	27.5		
MAX			381	156	292	115	34	.04	46	56		
MIN			76	81	61	14	.07	.00	.00	18		
AC-FT			8680	6260	7340	2540	440	.08	1010	1690		

06133000 MILK RIVER AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973, 1984 to current year (discontinued).

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	CLOUD COVER (PER-CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	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)
MAY 28...	1230	67	0	0	29.5	23.0	210	0	49	21	20	0.6
JUL 30...	0920	0.2	30	1	12.0	13.0	70	2	18	6.0	1.0	0
SEP 30...	0950	20	60	1	5.5	4.0	210	0	45	24	28	0.9

DATE	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)	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
MAY 28...	1.7	228	31	1.8	0.1	7.5	270	0.37	49	<0.10	<0.01	2
JUL 30...	0.3	68	4.1	0.3	<0.1	1.7	72	0.1	0.04	<0.10	<0.01	<1
SEP 30...	1.8	213	55	2.5	0.1	4.3	290	0.39	16	<0.10	--	1

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAY 28...	<0.5	30	<1	<10	1	6	<1	4	<0.1	<1	<1	12
JUL 30...	<0.5	<10	<1	<10	1	9	<5	2	<0.1	<1	<1	4
SEP 30...	<0.5	20	<1	<10	1	6	<5	1	<0.1	<1	<1	8

06133500 NORTH FORK MILK RIVER ABOVE ST. MARY CANAL, NEAR BROWNING, MT

(International gaging station)

LOCATION.--Lat 48°58'15", long 113°03'19", in NE¼NW¼NE¼ sec.16, T.37 N., R.11 W., Glacier County, Hydrologic Unit 10050001, Blackfeet Indian Reservation, on left bank 1.7 mi upstream from outlet of canal, 1.9 mi south of International boundary, and 29 mi north of Browning.

DRAINAGE AREA.--60.2 mi^2.

PERIOD OF RECORD.--May 1911 to July 1912 and June to July 1918 (published as "near Browning"), May 1919 to current season (seasonal records only). Monthly discharge only for some periods published in WSP 1309. Records usually obtained at this station only when St. Mary Canal is in operation.

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-discharge recorder. Concrete control since 1936. Elevation of gage is 4,220 ft, from topographic map. Prior to June 20, 1921, nonrecording gages at several sites within 1 mi of present site at different datums.

REMARKS.--Estimated daily discharges: Mar. 1-3 and Oct. 29-31. Records good. Many small diversions for irrigation 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.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s May 8, 1967, gage height, 7.95 ft, from rating curve extended above 130 ft^3/s, on basis of slope-area measurements at gage heights 7.55 ft and 7.95 ft; maximum gage height, 8.24 ft Feb. 24, 1986, backwater from ice and snow; no flow Oct. 29, 1942.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, about 2,500 ft^3/s Feb. 24, gage height, 8.24 ft, backwater from ice and snow; minimum daily, 4.7 ft^3/s July 30.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			22	21	13	11	7.5	5.0	8.1	26		
2			21	18	13	10	6.5	5.0	7.8	16		
3			20	16	13	10	6.3	5.0	7.1	13		
4			20	16	32	10	6.2	5.3	7.5	12		
5			19	15	35	14	7.5	5.3	9.1	11		
6			19	15	27	15	7.5	5.6	11	9.8		
7			18	15	23	12	6.8	5.6	9.1	9.1		
8			20	15	19	11	6.2	5.3	8.4	11		
9			19	16	18	11	6.2	5.6	13	11		
10			16	17	18	11	5.9	5.9	14	11		
11			16	17	17	9.5	5.6	5.9	9.8	12		
12			16	17	16	9.5	5.3	5.9	8.4	11		
13			15	17	15	9.8	5.6	5.9	9.1	10		
14			15	17	15	9.1	5.6	7.8	10	9.6		
15			15	18	18	9.8	5.3	6.5	9.5	9.1		
16			15	18	24	9.5	5.6	5.9	9.1	8.8		
17			15	15	21	9.0	6.2	6.2	8.8	8.8		
18			15	14	17	8.4	6.2	5.9	9.8	8.8		
19			15	14	15	8.8	5.9	5.6	12	8.4		
20			17	14	15	8.1	5.9	5.9	11	8.4		
21			17	15	17	8.1	5.4	6.2	10	8.4		
22			17	17	17	7.8	5.0	5.9	9.1	8.4		
23			16	18	15	7.5	5.0	5.9	8.1	8.4		
24			16	18	14	7.1	5.0	6.2	8.1	8.4		
25			15	15	14	7.1	5.0	6.5	11	8.4		
26			15	17	13	6.8	5.3	6.8	17	8.4		
27			16	17	13	6.8	5.3	6.8	12	8.4		
28			21	15	13	7.1	5.3	7.1	9.8	8.4		
29			24	14	12	8.4	5.0	6.5	9.1	8.4		
30			21	13	12	8.1	4.7	6.8	9.1	8.4		
31			22	---	11	---	5.0	7.1	---	8.2		
TOTAL			548	484	535	281.3	179.8	186.9	295.9	317.0		
MEAN			17.7	16.1	17.3	9.38	5.80	6.03	9.86	10.2		
MAX			24	21	35	15	7.5	7.8	17	26		
MIN			15	13	11	6.8	4.7	5.0	7.1	8.2		
AC-FT			1090	960	1060	558	357	371	587	629		

06134000 NORTH MILK RIVER NEAR INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°01'19", long 112°58'16", in SW¼NE¼ sec.11, T.1, R.23 W., fourth meridian, in Alberta, Hydrologic Unit 10050001, on right bank 0.4 mi upstream from highway bridge, 1.6 mi north of international boundary, 2.8 mi east of Whiskey Gap, Alberta, 11 mi southeast of Kimball, Alberta, and at mile 49.9.

DRAINAGE AREA.--91.8 mi^2. Area at site used Apr. 12, 1930, to Aug. 15, 1962, 97.4 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1909 to October 1912 (seasonal records only), January 1913 to October 1922, March 1923 to current season (seasonal records only). Records for November and December 1912, published in WSP 1309, have been found to be unreliable and should not be used. Published as "near Kimball, Alberta" 1913-16. Prior to February 1962, published as North Fork Milk River near international boundary.

REVISED RECORDS.--WSP 1309: 1909-13, 1915(M), 1920(M), 1937(M). WSP 1559: 1948(M). WSP 1729: 1944(M). W 1983: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 4,112.16 ft above mean sea level (Geodetic Surveys of Canada datum). Prior to May 1913, nonrecording gage at site 2 mi downstream at different datum. May 1, 1913, to Apr. 11, 1930, water-stage recorder 700 ft downstream at different datum. Apr. 12, 1930, to Aug. 15, 1962, water-stage recorder 1,500 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Feb. 26, Oct. 14-16, 30, 31. Water-discharge records good. Since 1917, flow increased during irrigation season by water from St. Mary Canal (station number 05018500). Several small diversions for irrigation upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,950 ft^3/s June 17, 1948, gage height, 6.47 ft, site and datum then in use, from rating curve extended above 1,500 ft^3/s; no flow Mar. 1, 2, 1940.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 2,680 ft^3/s Feb. 24, gage height, 7.23 ft, from floodmarks, from rating curve extended above 1,400 ft^3/s; minimum daily, 8.4 ft^3/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			60	29	275	273	607	537	544	20		
2			52	26	278	276	607	537	540	19		
3			42	21	277	273	607	540	459	14		
4			40	142	314	277	600	537	293	12		
5			37	226	320	300	607	537	156	10		
6			32	240	302	293	593	540	68	9.2		
7			25	250	292	273	593	540	35	8.8		
8			24	253	286	269	593	544	22	10		
9			23	255	284	266	597	544	23	11		
10			20	256	283	261	593	540	24	12		
11			18	258	280	257	590	544	17	12		
12			18	266	282	252	590	537	14	11		
13			17	262	275	255	590	424	9.5	10		
14			17	259	281	256	590	470	9.4	9.5		
15			16	261	286	261	586	519	9.4	9.9		
16			17	265	300	252	586	526	9.1	10		
17			17	258	303	329	593	540	9.0	9.0		
18			15	253	287	456	579	547	9.0	8.9		
19			16	265	280	540	586	540	11	8.8		
20			20	274	280	590	586	544	9.5	8.8		
21			23	275	286	618	583	547	8.8	9.0		
22			24	280	290	614	586	547	9.1	8.6		
23			20	281	285	611	561	551	8.8	8.7		
24			19	284	284	604	547	544	8.5	8.8		
25			17	287	280	600	547	547	9.7	8.9		
26		144	16	293	278	593	547	547	17	8.9		
27		81	18	292	278	604	544	544	11	9.0		
28		74	24	288	279	611	540	544	8.5	8.9		
29			30	278	279	622	537	544	8.4	8.7		
30			27	278	278	611	537	544	8.4	9.5		
31			30	---	275	---	537	544	---	9.2		
TOTAL			774	7155	8857	12297	17939	16590	2369.1	322.1		
MEAN			25.0	239	286	410	579	535	79.0	10.4		
MAX			60	293	320	622	607	551	544	20		
MIN			15	21	275	252	537	424	8.4	8.6		
AC-FT			1540	14190	17570	24390	35580	32910	4700	639		

06134000 NORTH MILK RIVER NEAR INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1973-74, 1981, 1984 to current year (discontinued).

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 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)	PH LAB (STAND-ARD UNITS) (00403)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)
MAY										
28...	1500	281	20	1	--	32.0	21.0	8.60	92	0
JUL										
30...	1245	537	25	1	386	20.0	16.5	8.30	170	0
SEP										
30...	1225	8.2	80	10	--	10.0	8.0	8.40	240	0

DATE	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)	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)
MAY										
28...	23	8.3	2.2	0.1	0.5	92	5.5	0.3	<0.1	2.4
JUL										
30...	29	24	64	2	2.5	195	100	4.0	0.2	3.9
SEP										
30...	57	23	12	0.3	1.8	237	9.6	1.2	0.1	8.6

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)
MAY									
28...	97	0.13	74	<0.10	0.01	<1	<0.5	<10	<1
JUL									
30...	340	0.47	500	<0.10	<0.01	2	<0.5	60	<1
SEP									
30...	260	0.35	5.6	<0.10	--	<1	<0.5	10	<1

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAY									
28...	<10	1	5	2	3	<0.1	<1	<1	9
JUL									
30...	<10	1	6	<5	7	<0.1	2	<1	6
SEP									
30...	20	<1	19	<5	6	<0.1	<1	<1	6

06134500 MILK RIVER AT MILK RIVER, ALBERTA

(International gaging station)

LOCATION.--Lat 49°08'37", long 112°04'44", in NE¼ sec.21, T.2, R.16 W., fourth meridian, in Alberta, Hydrologic Unit 10050002, on right bank 5 ft downstream from highway bridge at Milk River, Alberta, 22 mi downstream from North Milk River, and at mile 613.4.

DRAINAGE AREA.--1,050 mi^2.

PERIOD OF RECORD.--June 1909 to October 1910 (no winter records), April 1911 to current year. Monthly discharge only for June 1909, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1912. WSP 1599: 1916, 1927(M), 1947(M). W 1983: Drainage area. W 1984: 1983 (M).

GAGE.--Water-stage recorder. Datum of gage is 3,402.78 ft above mean sea level (Geodetic Survey of Canada datum). Prior to June 17, 1919, nonrecording gages, and June 17, 1919, to Nov. 2, 1921, water-stage recorder at several sites 300 ft upstream at datum 0.61 ft higher. Nov. 3, 1921, to Aug. 28, 1947, water-stage recorder at site 60 ft upstream at present datum. Aug. 29, 1947, to Nov. 10, 1976, water-stage recorder located 700 ft downstream on left bank at present datum.

REMARKS.--Estimated daily discharges: Oct. 7-11, Oct. 31 to Mar. 25. Records good except those for estimated daily discharge, which are poor. Since 1917, flow increased during irrigation season by water from St. Mary Canal (station number 05018500). Several diversions for irrigation upstream from station.

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

AVERAGE DISCHARGE.--70 years (1916-86), 324 ft^3/s, 234,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,850 ft^3/s Feb. 25, 1986, gage height, 12.46 ft, from floodmarks, from rating curve extended above 8,600 ft^3/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,850 ft^3/s Feb. 25, gage height, 12.46 ft, from floodmarks; minimum daily, 3.6 ft^3/s Dec. 3.

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	97	63	6.1	35	95	770	180	371	321	636	512	558
2	86	60	5.3	30	92	622	181	364	331	632	516	558
3	78	52	3.6	18	81	519	176	367	309	646	516	554
4	70	54	4.0	14	82	431	159	410	304	646	512	491
5	68	51	4.7	13	81	399	147	487	308	646	519	357
6	79	48	6.3	13	71	357	316	611	336	653	519	217
7	88	39	7.8	13	66	276	337	579	360	636	523	137
8	83	38	8.7	13	65	273	350	509	392	629	526	95
9	80	38	7.7	14	58	276	353	463	374	629	530	78
10	80	38	7.8	18	48	226	360	427	338	618	530	63
11	111	39	7.8	23	46	185	364	424	323	614	533	50
12	102	39	8.1	26	46	164	378	392	308	614	540	43
13	104	40	8.5	30	45	159	385	378	293	618	544	40
14	141	39	8.1	33	39	167	378	364	293	611	434	36
15	125	39	8.5	37	30	157	364	392	309	611	459	34
16	110	39	11	40	26	156	378	406	288	618	505	44
17	110	39	13	41	23	150	392	431	273	618	523	40
18	135	39	13	43	23	145	399	480	346	611	533	46
19	123	39	12	57	23	138	381	452	501	593	540	53
20	106	39	12	212	24	131	371	410	583	593	540	55
21	95	40	12	103	25	128	374	388	639	590	540	54
22	84	39	12	87	28	138	367	403	646	583	547	62
23	78	37	12	80	35	158	367	406	646	586	547	64
24	72	30	15	66	48	159	378	406	646	554	547	57
25	70	26	17	65	4870	145	392	381	639	533	551	58
26	68	22	25	72	7700	128	424	360	632	530	554	53
27	72	15	22	85	2540	116	413	343	632	537	551	50
28	106	11	29	92	946	116	406	340	632	519	551	51
29	115	10	37	85	---	111	399	333	653	512	554	54
30	98	8.8	35	87	---	152	378	326	639	512	558	46
31	82	---	35	97	---	193	---	330	---	512	561	---
TOTAL	2916	1110.8	415.0	1642	17256	7245	10247	12733	13294	18440	16415	4098
MEAN	94.1	37.0	13.4	53.0	616	234	342	411	443	595	530	137
MAX	141	63	37	212	7700	770	424	611	653	653	561	558
MIN	68	8.8	3.6	13	23	111	147	326	273	512	434	34
AC-FT	5780	2200	823	3260	34230	14370	20320	25260	26370	36580	32560	8130

CAL YR 1985	TOTAL 124132.09	MEAN	340	MAX	1100	MIN	.35	AC-FT	246200
WTR YR 1986	TOTAL 105811.8	MEAN	290	MAX	7700	MIN	3.6	AC-FT	209900

06134700 VERDIGRIS COULEE NEAR THE MOUTH, NEAR MILK RIVER, ALBERTA

(International gaging station)

LOCATION.--Lat 49°06'39", long 111°45'31", in NW¼ sec.12, T.2, R.14 W., fourth meridian, in Alberta, Hydrologic Unit 10050002, on left bank, 0.6 mi upstream from mouth, 5 mi downstream from culvert on provincial highway 501, and 15 mi east of Milk River, Alberta.

DRAINAGE AREA.--137 mi^2, of which 130 mi^2 is probably noncontributing.

PERIOD OF RECORD.--May 1985 to current season (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 3,040 ft, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 1, 3, 5, 9-11, 17-20, 22, 23, 25, 26, Apr. 3, 4, 12-15, June 20-23, and Oct. 31 to Nov. 30. Records fair. Nearly all flow is the result of interbasin diversion from St. Mary River into Weston Lake 25 miles upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42 ft^3/s Oct. 9, 1985, gage height, 5.61 ft; maximum gage height, 5.70 ft Nov. 6, 1985 (backwater from ice); no flow at times most years.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 38 ft^3/s Mar. 7, gage height, 5.44 ft; maximum gage height, 5.58 ft Apr. 15 (backwater from ice); no flow Nov. 9-30.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			4.1	9.9	15	12	7.9	6.4	9.0	15	1.0	
2			18	10	14	13	5.2	5.5	9.0	17	1.8	
3			23	8.7	14	13	5.7	4.9	11	15	2.5	
4			26	5.3	17	11	6.8	7.4	10	16	3.4	
5			20	1.1	23	12	6.4	7.3	12	16	2.4	
6			13	.25	17	11	8.5	10	11	16	1.8	
7			18	.07	16	11	5.7	7.2	9.7	16	.64	
8			24	.04	15	12	4.9	7.9	10	16	.04	
9			17	2.4	15	12	3.4	9.1	16	16	.00	
10			12	15	16	10	6.3	5.7	14	18	.00	
11			12	16	16	10	7.7	4.6	13	17	.00	
12			12	11	16	9.5	6.8	8.7	13	15	.00	
13			13	16	15	8.1	5.0	13	12	16	.00	
14			14	21	19	6.6	3.7	11	12	15	.00	
15			13	25	23	9.1	2.9	12	12	14	.00	
16			13	20	16	8.8	4.1	11	12	13	.00	
17			17	19	15	7.2	3.3	9.0	13	13	.00	
18			13	19	15	5.4	6.5	10	13	12	.00	
19			16	19	14	5.0	4.1	11	14	11	.00	
20			14	19	14	5.3	3.2	8.7	14	11	.00	
21			14	18	15	5.2	3.7	8.9	13	10	.00	
22			14	17	18	5.3	3.0	9.6	14	10	.00	
23			11	19	19	5.3	5.6	8.2	13	6.4	.00	
24			11	16	13	5.4	6.6	9.1	13	8.1	.00	
25			11	15	2.0	5.5	4.2	9.5	23	9.1	.00	
26			12	15	1.9	6.1	5.3	7.7	24	7.2	.00	
27			11	15	11	3.7	5.0	7.5	15	5.1	.00	
28			11	16	15	3.8	6.5	7.6	15	6.2	.00	
29			10	16	15	5.1	7.2	7.9	15	4.5	.00	
30			10	17	15	8.3	8.3	9.1	14	4.1	.00	
31			11	---	14	---	7.1	11	---	3.3	---	
TOTAL			438.1	401.76	463.9	245.7	170.6	266.5	398.7	372.0	13.58	
MEAN			14.1	13.4	15.0	8.19	5.50	8.60	13.3	12.0	.45	
MAX			26	25	23	13	8.5	13	24	18	3.4	
MIN			4.1	.04	1.9	3.7	2.9	4.6	9.0	3.3	.00	
AC-FT			869	797	920	487	338	529	791	738	27	

06135000 MILK RIVER AT EASTERN CROSSING OF INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 48°59'03", long 110°28'10", in SE¼NE¼NW¼ sec.7, T.37 N., R.10 E., Hill County, Hydrologic Unit 10050002, on right bank 1.1 mi south of international boundary, 6.5 mi upstream from Lost River, 12.5 mi northwest of Simpson, 29.5 mi north of Rudyard, and at mile 484.1.

DRAINAGE AREA.--2,506 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1909 to current season. No winter record. A few winter records were collected and are on file in the Helena district office. Monthly discharge only for April 1912, published in WSP 1309.

REVISED RECORDS.--WSP 1086: 1927, 1935. WSP 1559: 1920(M), 1922(M), 1926, 1928(M), 1929, 1930(M), 1932(M). WSP 1729: 1921-13, 1921-22, 1929(M). W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,659.64 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1970, water-stage recorder or nonrecording gages of several sites within 10.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Mar. 10-28, Sept. 13-23 and Sept. 30 to Oct. 7, Oct. 30, 31. Water-discharge records fair. Since 1917, flow increased during irrigation season by water from St. Mary Canal (station number 05018500). Many diversions for irrigation upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft^3/s Apr. 9, 1965, gage height, 9.53 ft, site and datum then in use, but may have been higher Mar. 28, 1952; maximum gage height, 13.65 ft Mar. 28, 1952 (backwater from ice), site and datum then in use; no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 10,000 ft^3/s Feb. 27, gage height, 11.4 ft, from floodmark, from rating curve extended above 7,000 ft^3/s, on basis of velocity-area study; minimum daily, 45 ft^3/s Oct. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			1440	170	410	358	705	470	593	120		
2			769	174	405	337	631	474	615	110		
3			682	207	400	330	592	462	626	100		
4			650	210	409	324	575	466	638	93		
5			671	199	511	337	572	468	676	85		
6			671	192	551	333	597	460	691	80		
7			558	171	571	328	597	467	579	75		
8			507	150	642	350	597	460	391	71		
9			475	212	819	414	596	466	295	91		
10			450	273	687	425	565	462	262	100		
11			375	293	616	416	552	461	204	93		
12			325	317	561	391	545	477	162	87		
13			300	340	537	338	533	497	140	83		
14			290	352	516	313	525	481	120	85		
15			270	367	508	316	525	514	110	82		
16			270	376	477	297	559	482	100	81		
17			260	390	460	286	560	348	97	79		
18			260	383	496	322	574	379	93	77		
19			250	387	488	268	553	444	90	73		
20			250	391	510	232	546	443	110	71		
21			240	396	560	248	565	456	100	68		
22			230	382	674	404	538	476	95	66		
23			210	378	703	511	543	479	83	62		
24			200	387	592	597	550	491	65	59		
25			190	383	562	617	559	500	789	57		
26			200	384	597	606	559	497	842	56		
27			210	389	525	584	525	508	484	51		
28			200	407	477	573	520	518	285	50		
29			190	420	444	636	507	527	163	49		
30			177	411	416	662	485	531	131	47		
31			170	---	383	---	472	558	---	45		
TOTAL			11940	9491	16507	12153	17322	14722	9629	2346		
MEAN			385	316	532	405	559	475	321	75.7		
MAX			1440	420	819	662	705	558	842	120		
MIN			170	150	383	232	472	348	65	45		
AC-FT			23680	18830	32740	24110	34360	29200	19100	4650		

06135000 MILK RIVER AT EASTERN CROSSING OF INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA

PERIOD OF RECORD.--Water years 1965-66, 1973-74, 1984 to current year (discontinued).

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 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							
28...	1730	2950	--	--	328	13.0	1.0
MAR							
05...	1205	701	--	--	371	9.0	4.5
12...	1425	321	--	--	589	7.0	4.5
20...	0955	250	--	--	674	9.0	5.0
28...	1330	198	--	--	708	19.5	10.5
APR							
03...	1820	222	--	--	718	10.0	9.0
MAY							
14...	1200	511	--	--	461	6.0	7.5
27...	1450	513	0	0	501	26.0	22.0
JUL							
10...	1200	563	--	--	232	--	--
29...	1300	506	50	1	228	22.0	20.0
SEP							
10...	1735	252	90	13	392	18.0	16.0
16...	1650	101	--	--	510	17.0	14.5
22...	1500	96	--	--	706	18.0	12.0
29...	1505	149	--	--	631	14.0	10.5
OCT							
29...	1330	50	--	--	842	8.0	6.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
MAY											
27...	1450	8.30	170	0	41	17	42	1	3.2	173	93
JUL											
29...	1300	8.20	90	0	22	8.5	10	0.5	1.3	92	18
SEP											
10...	1735	7.90	47	0	12	4.2	67	4	1.5	125	70

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)
MAY											
27...	2.7	0.2	4.4	310	0.42	426	<0.10	0.01	<1	<0.5	50
JUL											
29...	0.7	<0.1	2.4	120	0.16	161	<0.10	0.01	<1	<0.5	<10
SEP											
10...	2.2	0.2	4.5	240	0.32	161	0.80	0.02	1	0.5	50

DATE	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAY										
27...	3	<10	2	340	2	4	<0.1	2	<1	23
JUL										
29...	<1	<10	3	12	<5	3	<0.1	3	<1	6
SEP										
10...	<1	<10	4	35	<5	1	<0.1	3	<1	<3

06137400 BIG SANDY CREEK AT RESERVATION BOUNDARY, NEAR ROCKY BOY, MT

LOCATION.--Lat 48°10'21", long 109°49'31", in SE¼NE¼NW¼ sec. 20, T.28 N., R.15 E., Chouteau County, Hydrologic Unit 10050005, on left bank 1.0 mi downstream from Muddy Creek, 6.0 mi south of Rocky Boy Agency, and at mile 90.5.

DRAINAGE AREA.--24.7 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,830 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 10 to Feb. 25. Records good except those for estimated daily discharges which are poor. No known regulation or diversions upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 371 ft^3/s May 23, 1986, gage height, 4.84 ft; minimum, 0.71 ft^3/s Aug. 28, 1984, gage height, 2.23 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 30 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	1100	104	3.58	Sept. 25	1130	75	3.71
May 23	0245	*371	*4.84				

Minimum daily discharge, 4.5 ft^3/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	13	13	6.5	6.6	5.6	13	12	8.1	73	23	11	8.5
2	13	14	6.0	6.5	5.6	12	11	8.1	69	21	10	7.0
3	14	14	7.0	6.4	5.6	12	9.9	8.4	64	21	10	6.5
4	13	13	7.8	6.4	5.6	12	9.8	8.4	62	21	10	6.6
5	13	14	8.2	6.2	5.6	12	9.8	18	61	25	10	11
6	13	13	8.5	6.4	5.5	10	9.8	18	71	21	9.8	8.7
7	14	13	8.5	6.8	5.4	9.2	9.5	17	63	19	9.9	7.3
8	12	12	8.5	7.0	5.2	11	9.4	17	56	18	9.5	7.0
9	12	11	8.0	7.0	5.0	11	9.4	18	53	17	10	13
10	13	8.0	7.6	7.0	5.0	10	9.6	20	49	17	10	12
11	13	8.0	7.4	7.0	5.0	9.5	9.4	33	47	17	9.8	8.3
12	14	9.0	7.2	6.8	4.9	9.3	8.9	38	44	17	10	7.3
13	14	11	7.0	6.8	4.8	9.3	7.4	41	42	16	12	6.9
14	14	12	7.2	6.6	4.8	9.2	7.7	41	40	15	11	5.8
15	15	12	7.5	6.5	4.8	9.1	11	40	39	16	9.6	6.3
16	15	12	7.8	6.4	4.9	9.4	10	36	36	16	8.6	6.9
17	15	11	8.0	6.3	4.8	9.6	9.7	36	35	23	8.2	13
18	15	10	8.0	6.2	4.7	9.0	9.0	36	33	16	8.3	12
19	16	9.0	7.5	6.5	4.6	9.1	8.7	38	31	14	7.9	18
20	15	8.0	7.5	7.0	4.5	9.1	8.7	44	31	14	7.9	13
21	15	7.6	7.4	6.6	4.6	10	8.8	51	30	14	8.3	11
22	15	7.4	7.0	6.5	4.8	11	8.8	177	29	13	8.7	9.3
23	15	7.0	7.0	6.2	5.0	10	9.5	286	28	13	8.1	8.2
24	14	6.5	7.0	6.0	6.0	10	9.1	190	27	13	7.7	8.0
25	14	7.0	7.0	5.8	8.0	10	9.1	176	26	13	7.5	75
26	14	6.5	7.0	5.8	75	9.6	9.1	165	26	12	7.6	44
27	14	6.5	6.8	5.8	27	10	9.1	144	24	12	7.4	30
28	14	6.5	6.8	5.6	12	12	9.1	126	24	12	7.3	25
29	14	6.5	6.8	5.6	---	13	8.8	110	28	11	7.2	21
30	14	6.5	6.8	5.6	---	11	8.1	88	25	11	6.7	19
31	14	---	6.6	5.6	---	12	---	80	---	11	9.6	---
TOTAL	433	295.0	227.9	197.5	244.3	323.4	280.2	2117.0	1266	502	279.6	435.6
MEAN	14.0	9.83	7.35	6.37	8.72	10.4	9.34	68.3	42.2	16.2	9.02	14.5
MAX	16	14	8.5	7.0	75	13	12	286	73	25	12	75
MIN	12	6.5	6.0	5.6	4.5	9.0	7.4	8.1	24	11	6.7	5.8
AC-FT	859	585	452	392	485	641	556	4200	2510	996	555	864

CAL YR 1985	TOTAL	2983.4	MEAN	8.17	MAX	32	MIN	1.5	AC-FT	5920
WTR YR 1986	TOTAL	6601.5	MEAN	18.1	MAX	286	MIN	4.5	AC-FT	13090

06137570 BOXELDER CREEK NEAR ROCKY BOY, MT

LOCATION.--Lat 48°18'07", long 109°50'37", in SW¼SW¼NW¼ sec.6, T.29 N., R.15 E., Hill County, Hydrologic Unit 10050005, on Rocky Boy Indian Reservation, on right bank 1,000 ft upstream from Bonneau Reservoir, 4,000 ft downstream from Wolf Creek, 4.1 mi northwest of Rocky Boy Agency, and a mile 14.0.

DRAINAGE AREA.--48.2 mi^2.

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,225 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 21-23, Nov. 20 to Jan. 14, Feb. 1-5, 8-28 and May 26 to June 12. Records poor. Other than beaver dams 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 miscellanous water-quality data in the back of this report.

AVERAGE DISCHARGE.--11 years, 9.73 ft^3/s, 7,049 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 898 ft^3/s May 23, 1986, gage height, 10.95 ft, from outside highwater mark; minimum, 0.02 ft^3/s, Sept. 15, 1980, Sept. 1, 2, 1984, but may have been less during the period Sept. 9-23, 1980, backwater from beaver dams; minimum gage height, 3.79 ft Sept. 17, 1976, present site and datum and previous control.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 898 ft^3/s May 23, gage height, 10.95 ft, from floodmarks; minimum, 5.0 ft^3/s Sept. 4, 5.

REVISIONS.--The maximum discharge reported for water year 1982 has been revised to 398 ft^3/s June 3, 1982, gage height, 10.36 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	11	13	7.0	7.8	8.2	12	11	9.6	95	28	9.6	13
2	11	13	7.0	7.8	8.0	11	11	9.4	85	26	9.2	6.3
3	11	13	8.0	7.6	8.0	10	11	9.3	75	25	8.8	5.5
4	11	13	8.5	7.6	8.0	9.8	11	9.5	70	26	8.4	5.2
5	11	14	9.0	7.6	8.0	9.4	11	37	66	35	8.3	5.6
6	12	14	9.5	8.0	7.5	9.4	10	44	74	33	8.2	7.3
7	13	13	9.5	8.2	7.2	9.7	9.8	30	70	28	8.1	6.7
8	13	13	9.5	8.4	7.2	10	9.7	23	60	25	8.0	5.9
9	12	12	9.0	8.5	7.0	9.6	9.6	27	55	23	8.0	6.7
10	12	11	8.6	8.5	7.0	9.0	9.7	40	50	22	8.8	9.0
11	14	10	8.4	8.5	7.0	8.6	9.8	102	47	22	8.8	8.8
12	14	10	8.0	8.4	7.0	8.5	9.8	100	44	25	8.7	7.6
13	13	11	8.0	8.2	6.8	8.7	10	81	43	23	10	6.9
14	13	12	8.2	8.0	6.8	9.2	9.9	69	40	21	12	7.6
15	14	12	8.5	7.5	6.8	9.3	11	57	34	20	11	9.2
16	14	12	9.0	7.2	7.0	9.1	12	52	32	21	9.7	11
17	14	12	9.4	7.1	6.8	9.2	12	40	30	31	8.8	12
18	14	11	9.6	7.6	6.5	9.5	11	36	30	26	8.4	19
19	15	10	9.0	10	6.5	9.7	11	35	29	20	8.4	23
20	15	9.0	9.0	9.8	6.5	9.7	11	35	28	19	7.7	26
21	15	8.5	8.8	8.5	6.8	9.7	11	38	28	17	7.4	20
22	15	8.0	8.5	7.2	7.0	9.5	10	253	27	15	8.4	15
23	15	7.5	8.5	7.5	7.5	9.5	11	637	27	13	9.2	13
24	15	7.2	8.5	7.4	10	9.5	11	281	26	14	9.2	12
25	15	7.6	8.5	6.4	20	9.5	11	198	25	13	9.0	149
26	14	7.0	8.4	7.6	35	9.2	11	180	26	12	8.7	99
27	14	7.0	8.2	8.3	25	9.4	11	160	26	11	8.2	45
28	14	7.0	8.0	8.5	14	9.6	10	140	25	11	8.8	41
29	13	7.0	8.0	7.9	---	9.7	9.9	130	27	9.9	9.2	40
30	13	7.0	8.0	8.3	---	9.9	9.8	120	30	9.6	9.9	37
31	13	---	8.0	8.2	---	11	---	110	---	9.6	11	---
TOTAL	413	311.8	264.1	248.1	269.1	297.9	317.0	3092.8	1324	634.1	277.9	673.3
MEAN	13.3	10.4	8.52	8.00	9.61	9.61	10.6	99.8	44.1	20.5	8.96	22.4
MAX	15	14	9.6	10	35	12	12	637	95	35	12	149
MIN	11	7.0	7.0	6.4	6.5	8.5	9.6	9.3	25	9.6	7.4	5.2
AC-FT	819	618	524	492	534	591	629	6130	2630	1260	551	1340

CAL YR 1985	TOTAL	2622.2	MEAN	7.18	MAX	30	MIN	1.4	AC-FT	5200
WTR YR 1986	TOTAL	8123.1	MEAN	22.3	MAX	637	MIN	5.2	AC-FT	16110

06137580 SAGE CREEK NEAR WHITLASH, MT

LOCATION.--Lat 48°53'30", long 111°01'47", in NW¼NW¼SW¼ sec.12, T.36 N., R.5 E., Liberty County, Hydrologic Unit 10050006, on left bank, 0.2 mi downstream from bridge on Black Jack Road, 10 mi southeast of Whitlash.

DRAINAGE AREA.--7.26 mi^2.

PERIOD OF RECORD.--October 1976 to September 1982, October 1984 to current year.

GAGE.--Water-stage recorder, Parshall flume, and V-notch sharp-crested weir. Elevation of gage is 3,900 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 10 to Dec. 2, Dec. 28-30, Jan. 3-8, Jan. 30 to Feb. 2, Feb. 6-24. Records fair except those for estimated daily discharges, which are poor. No known regulation above station. Diversions for irrigation of about 40 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.--8 years, 2.70 ft^3/s 1,960 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 100 ft^3/s Aug. 10, 1982, gage height, 3.04 ft; no flow part of several days during winter periods of 1978, 1980, and 1981, result of siphon action over weir.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 24	1615	57	2.55	May 23	0230	*63	*2.66

Minimum discharge, 0.34 ft^3/s Mar. 17, gage height, 0.12 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	9.0	5.5	1.3	1.3	1.4	2.8	3.4	2.6	13	2.8	.77	.89
2	8.3	5.6	1.3	1.1	1.4	2.2	3.1	2.5	12	2.5	.84	.66
3	7.8	5.2	1.5	.90	1.5	1.9	3.1	2.4	11	2.3	.84	.72
4	7.4	4.9	1.6	.80	1.3	1.9	3.0	4.4	9.8	2.5	.77	.65
5	7.1	4.5	1.7	.80	1.1	1.8	2.9	9.5	9.1	2.7	.71	.98
6	7.7	4.4	1.9	.85	.90	1.3	2.7	9.0	8.2	2.4	.69	1.0
7	6.0	4.1	1.8	.90	.80	2.4	2.6	8.9	9.0	2.0	.84	.75
8	7.0	4.0	1.7	.95	.70	2.2	2.6	9.5	9.6	1.9	.77	.71
9	5.7	3.2	1.4	1.0	.65	1.8	2.6	9.7	7.8	1.8	.75	1.1
10	7.8	2.5	1.3	4.4	.60	1.7	2.6	9.3	6.9	1.8	.80	1.2
11	12	2.0	1.3	2.2	.60	1.6	2.6	10	6.1	1.7	.80	.93
12	12	1.5	1.4	1.5	.65	1.7	2.0	10	5.9	1.6	.84	.82
13	11	1.6	1.3	1.4	.65	1.6	2.7	12	5.6	1.5	1.1	.86
14	11	1.8	1.1	1.4	.65	1.9	3.7	14	5.2	1.4	.96	1.2
15	11	1.9	1.4	1.4	.70	1.7	3.5	13	5.3	1.3	.86	1.0
16	13	2.0	1.4	1.3	.65	1.6	3.6	13	4.6	1.8	.87	1.0
17	13	1.8	1.3	1.1	.60	.64	3.1	13	4.6	1.7	.83	1.6
18	12	1.8	1.3	1.9	.55	2.0	2.8	14	4.5	1.3	.79	1.9
19	12	1.7	1.3	3.2	.50	2.0	2.7	18	4.2	1.3	.79	3.2
20	12	1.7	1.4	1.5	.50	2.3	2.6	21	3.9	1.3	.89	2.5
21	12	1.7	2.7	1.9	.60	6.8	2.6	22	3.7	1.2	.90	2.1
22	12	1.6	2.3	1.3	.75	4.5	2.7	47	3.4	1.1	.85	1.8
23	11	1.6	1.8	1.7	1.0	3.2	3.0	56	3.2	1.3	.74	2.2
24	9.8	1.6	1.5	1.4	20	3.3	3.3	53	3.1	1.3	.68	2.3
25	9.1	1.5	1.5	1.9	15	2.8	3.5	46	2.9	1.2	.75	13
26	8.6	1.5	.98	1.7	4.5	2.8	3.1	35	2.8	1.3	.76	14
27	7.7	1.5	1.0	2.1	2.5	4.2	3.0	29	2.8	1.2	.65	9.2
28	7.3	1.4	.90	1.4	3.0	4.3	2.8	24	2.7	1.0	.55	7.8
29	6.7	1.4	1.1	1.7	---	3.8	2.8	21	5.3	.97	.48	6.8
30	6.5	1.4	1.2	1.6	---	3.7	2.8	17	3.2	.90	.59	6.2
31	6.0	---	1.3	1.5	---	3.8	---	15	---	.84	.79	---
TOTAL	289.5	76.9	44.98	48.10	63.75	80.24	87.5	570.8	179.4	49.91	24.25	89.07
MEAN	9.34	2.56	1.45	1.55	2.28	2.59	2.92	18.4	5.98	1.61	.78	2.97
MAX	13	5.6	2.7	4.4	20	6.8	3.7	56	13	2.8	1.1	14
MIN	5.7	1.4	.90	.80	.50	.64	2.0	2.4	2.7	.84	.48	.65
AC-FT	574	153	89	95	126	159	174	1130	356	99	48	177

CAL YR 1985	TOTAL	1479.06	MEAN	4.05	MAX	31	MIN	.24	AC-FT	2930
WTR YR 1986	TOTAL	1604.40	MEAN	4.40	MAX	56	MIN	.48	AC-FT	3180

06139500 BIG SANDY CREEK NEAR HAVRE, MT

LOCATION.--Lat 48°31'36", long 109°50'27", in SW¼SW¼SW¼ sec.18, T.32 N., R.15 E., Hill County, Hydrologic Unit 10050005, on right bank, 6 mi upstream from mouth, 7.7 mi west southwest of Havre post office, and 22 mi downstream from Sage Creek.

DRAINAGE AREA.--1,805 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1946 to November 1953 (monthly discharge only for February 1946, published in WSP 1309 as "Big Sandy Creek near Assinniboine"), annual maximum, water years 1955-67 (published as "Big Sandy Creek near Assinniboine"), and May 1984 to current year (seasonal records only).

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,510 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 30, 31. Water-discharge records fair. Diversions for irrigation of about 1,000 acres upstream from station.

AVERAGE DISCHARGE.--7 years (water years, 1947-53), 25.2 ft^3/s, 18,240 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,570 ft^3/s Apr. 3, 1952, gage height, 14.70 ft, from floodmarks; no flow at times during most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 30, 1978, reached a stage of 15.15 ft, from floodmarks, discharge, about 6,000 ft^3/s.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 302 ft^3/s May 28, gage height, 5.82 ft; minimum daily discharge, 0.58 ft^3/s Aug. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				22	3.4	257	49	8.3	1.1	102		
2				20	4.2	236	56	8.7	1.1	98		
3				19	5.2	214	50	7.4	.84	89		
4				19	4.1	189	45	7.4	.84	83		
5				17	6.3	176	45	12	.96	77		
6				15	5.8	170	44	12	1.1	71		
7				13	4.7	168	47	12	.75	68		
8				11	9.2	167	47	8.7	.66	65		
9				8.1	29	169	42	7.4	2.0	60		
10				6.2	26	162	37	6.6	1.7	57		
11				5.0	26	153	34	4.7	2.8	52		
12				4.7	43	145	34	5.4	1.7	45		
13				5.0	64	133	32	11	2.0	40		
14				6.6	99	121	30	9.7	7.1	40		
15				6.2	99	109	27	8.7	9.7	40		
16				4.7	94	96	28	8.3	14	40		
17				5.4	93	96	33	6.6	17	40		
18				10	93	94	25	5.8	18	39		
19				11	91	86	25	6.6	26	39		
20				12	88	80	26	5.8	40	39		
21				11	86	73	24	5.8	63	39		
22				16	94	66	21	5.8	55	40		
23				14	100	63	20	5.8	50	39		
24				13	186	62	18	4.3	52	41		
25				12	271	60	16	3.7	130	46		
26				8.3	286	58	15	2.8	135	51		
27				7.4	281	54	13	1.7	157	51		
28				6.2	296	52	12	1.2	162	51		
29				3.7	297	58	10	.75	120	50		
30				3.5	281	51	8.3	.58	103	49		
31				---	271	---	7.8	.75	---	48		
TOTAL				316.0	3336.9	3618	921.1	196.28	1176.35	1689		
MEAN				10.5	108	121	29.7	6.33	39.2	54.5		
MAX				22	297	257	56	12	162	102		
MIN				3.5	3.4	51	7.8	.58	.66	39		
AC-FT				627	6620	7180	1830	389	2330	3350		

06139500 BIG SANDY CREEK NEAR HAVRE, MT--Continued

WATER-QUALITY RECORDS

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

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										
02...	1430	7.1	30	1	683	15.5	10.0	693	11.4	111
MAR										
28...	0940	27	--	--	732	16.5	7.0	--	--	--
APR										
10...	1825	5.8	--	--	954	11.0	15.0	--	--	--
30...	1345	3.0	--	--	1090	12.0	11.0	--	--	--
MAY										
19...	1635	90	--	--	693	27.0	17.0	--	--	--
JUN										
05...	1335	175	--	--	526	23.0	22.5	--	--	--
06...	1045	166	--	--	527	15.5	20.5	--	--	--
17...	1800	91	--	--	570	32.0	27.0	--	--	--
21...	0915	74	--	--	569	15.0	18.0	--	--	--
JUL										
09...	1630	41	50	1	571	29.0	25.0	705	10.5	138
22...	1230	21	--	--	613	27.0	24.0	--	--	--
AUG										
19...	1630	6.7	--	--	610	22.0	24.0	--	--	--
21...	0800	5.8	20	1	875	22.0	15.0	695	7.1	78
SEP										
23...	0925	50	--	--	589	11.0	9.0	--	--	--
26...	1715	154	--	--	440	14.0	10.5	--	--	--

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)
OCT											
02...	1430	8.70	15	190	0	34	25	81	3	7.8	--
JUL											
09...	1630	8.60	1.0	190	0	40	21	58	2	8.8	280
AUG											
21...	0800	8.40	18	200	0	26	32	120	4	11	330

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 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)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)
OCT											
02...	--	280	72	9.1	0.3	18	414	420	0.56	7.9	61
JUL											
09...	15	246	63	5.8	--	5.0	348	370	0.47	39	16
AUG											
21...	3	282	150	19	--	0.4	549	530	0.75	8.6	24

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	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 DIS. (MG/L AS N) (00623)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ANTI-MONY, TOTAL (UG/L AS SB) (01097)
OCT											
02...	449	--	<0.01	--	<0.10	0.6	--	0.02	--	<0.01	--
JUL											
09...	--	<0.01	<0.01	<0.10	<0.10	--	0.06	0.04	0.034	0.022	<1
AUG											
21...	--	<0.01	<0.01	<0.10	<0.10	--	0.04	0.02	0.016	0.003	<1

06139500 BIG SANDY CREEK NEAR HAVRE, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)
OCT 02...	--	--	--	--	--	--	--	--	200	--
JUL 09...	<1	5	4	100	78	<10	<0.5	130	130	<1
AUG 21...	<1	4	4	<100	68	<10	<0.5	270	240	<1

DATE	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)
OCT 02...	--	--	--	2	21	<1	4	0.1	--	--
JUL 09...	<1	<1	<3	6	<3	<5	2	<0.1	4	3
AUG 21...	2	3	<3	2	43	<5	5	0.1	5	3

DATE	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 02...	<1	<1	--	--	5	--	--	22	0.42	92
JUL 09...	<1	<1	<1	<1	17	<0.01	<0.01	14	1.6	83
AUG 21...	<1	<1	<1	<1	7	<0.01	<0.01	26	0.41	97

06140500 MILK RIVER AT HAVRE, MT

LOCATION.--Lat 48°33'50", long 109°41'42", in SE¼NE¼NE¼ sec.6, T.32 N., R.16 E., Hill County, Hydrologic Unit 10050004, on left bank, 1.25 mi upstream from Bullhook Creek and 7th Avenue East highway bridge in Havre, 8.2 mi downstream from Big Sandy Creek, 15.8 mi downstream from Fresno Dam, and at mile 419.2.

DRAINAGE AREA.--5,785 mi^2, of which 670 mi^2 is probably noncontributing.

PERIOD OF RECORD.--May to November 1898, April 1899 to November 1922, March, April 1923, March, April 1952 (gage heights only, in WSP 1260-B), June 1953 (in WSP 1320-B), August 1954 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1899-1900, 1902-4, 1907-8, 1909(M), 1912, 1917(M), 1920(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,465.24 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 4, 1902, nonrecording gage at site 0.75 mi downstream at different datum. Nov. 4, 1902, to Aug. 6, 1980, nonrecording gages 1.25 mi downstream on 7th Avenue East highway bridges, all at datum then in use.

REMARKS.--Estimated daily discharges: Nov. 9 to Mar. 4, Apr. 11-16. Records fair except those for winter period, which are poor. Diversions for irrigation of about 6,000 acres upstream from station. Since 1917, flow increased during irrigation season by water from St. Mary Canal (station number 05018500). Since 1939, flow regulated by Fresno Reservoir (station number 06136500). 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.--17 years (water years, 1900-1916), prior to operation of St. Mary Canal, 273 ft^3/s, 197,800 acre-ft/yr; 38 years (water years, 1917-22, 1955-86), 420 ft^3/s, 304,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 20,000 ft^3/s Apr. 12, 1899, gage height, 19.3 ft, site and datum then in use, from floodmarks, from rating curve extended above 5,200 ft^3/s; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,510 ft^3/s May 25, gage height, 6.30 ft; minimum daily, 30 ft^3/s Nov. 11, 12, 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	405	177	37	45	38	900	325	365	1100	1480	989	806
2	406	92	39	45	40	600	324	377	1010	1280	988	786
3	402	85	40	42	42	380	324	563	949	1240	987	703
4	405	60	42	41	43	290	326	561	881	1240	972	691
5	406	60	44	40	40	205	322	554	852	1240	878	705
6	412	56	44	40	39	160	318	402	843	1230	875	697
7	419	53	45	40	37	212	312	422	839	1230	871	687
8	417	42	45	41	36	136	311	453	831	1180	867	676
9	419	34	44	41	35	118	300	546	871	969	868	614
10	341	32	43	43	33	99	108	625	845	954	860	595
11	331	30	42	43	33	87	58	726	817	954	861	584
12	251	30	40	42	33	83	56	843	803	1050	854	561
13	237	36	39	41	35	81	52	836	762	1070	876	451
14	242	40	41	40	36	81	50	896	734	1060	854	449
15	255	44	46	38	37	78	54	901	723	1060	792	436
16	339	44	47	40	36	81	56	787	695	1070	792	338
17	381	42	47	41	34	82	52	746	639	1120	790	281
18	384	40	47	42	33	78	61	737	686	1250	787	260
19	384	39	47	43	31	76	78	720	862	1260	784	305
20	383	38	48	43	30	71	87	717	834	1250	787	152
21	383	36	48	40	35	71	105	719	1190	1260	788	144
22	382	35	48	38	45	198	149	866	1140	1250	777	140
23	380	35	47	40	60	216	304	956	1120	1210	765	133
24	379	35	46	41	80	247	319	1140	1090	1050	760	130
25	382	35	44	40	120	229	325	1420	873	1030	754	499
26	376	35	44	40	170	204	333	1490	517	1020	741	491
27	382	34	42	40	250	226	343	1430	1480	1020	732	318
28	379	34	42	42	600	263	371	1390	1520	924	724	302
29	377	34	42	41	---	277	392	1320	1520	989	718	269
30	380	35	43	40	---	271	372	1230	1510	998	804	228
31	376	---	45	38	---	273	---	1150	---	993	815	---
TOTAL	11395	1422	1358	1271	2081	6373	6587	25888	28536	34931	25710	13431
MEAN	368	47.4	43.8	41.0	74.3	206	220	835	951	1127	829	448
MAX	419	177	48	45	600	900	392	1490	1520	1480	989	806
MIN	237	30	37	38	30	71	50	365	517	924	718	130
AC-FT	22600	2820	2690	2520	4130	12640	13070	51350	56600	69290	51000	26640

CAL YR 1985	TOTAL	105099	MEAN	288	MAX	1310	MIN	19	AC-FT	208500
WTR YR 1986	TOTAL	158983	MEAN	436	MAX	1520	MIN	30	AC-FT	315300

06141600 LITTLE BOX ELDER CREEK AT MOUTH, NEAR HAVRE, MT

LOCATION.--Lat 48°33'43", long 109°31'53", in SE¼SE¼NW¼ sec.4, T.32 N., R.17 E., Hill County, Hydrologic Unit 10050004, on right bank, attached to downstream pier of railroad bridge (number 423.2) 0.6 mi upstream from Milk River, and 7 mi east of Havre, MT.

DRAINAGE AREA.--95.9 mi^2.

PERIOD OF RECORD.--March to September 1986 (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 2,455 ft, from topographic map.

REMARKS.--Estimated daily discharges: June 28 to July 10. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 425 ft^3/s Sept. 25, 1986, gage height, 9.09 ft; minimum, 1.0 ft^3/s Aug. 7, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 425 ft^3/s Sept. 25, gage height, 9.09 ft; minimum, 1.0 ft^3/s Aug. 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						25	13	9.4	96	20	5.0	2.4
2						25	13	7.5	87	17	4.2	4.1
3						21	11	5.1	77	16	2.1	3.7
4						18	11	4.5	71	18	2.8	3.3
5						17	10	7.8	66	21	3.2	4.0
6						18	9.9	34	68	18	1.5	6.0
7						17	11	30	81	16	1.4	6.4
8						18	9.4	24	72	13	2.9	4.9
9						20	8.9	30	65	12	2.7	5.7
10						17	9.1	46	57	11	3.3	7.2
11						16	9.3	94	50	9.3	4.2	7.7
12						15	9.7	165	42	10	3.8	7.6
13						12	10	132	40	9.8	3.8	6.4
14						12	13	102	39	9.4	4.4	7.1
15						14	12	98	36	8.8	4.7	7.3
16						12	14	103	33	8.2	4.2	7.7
17						12	19	93	31	12	3.6	12
18						15	15	83	29	16	2.9	21
19						15	13	76	25	12	2.1	32
20						14	11	73	25	11	1.8	31
21						7.7	10	79	25	11	2.0	17
22						6.7	10	173	24	10	2.4	13
23						9.7	9.9	284	23	9.0	2.3	11
24						14	9.4	308	19	8.7	2.5	9.6
25						13	11	287	18	8.6	2.2	266
26						14	11	250	18	8.1	2.0	302
27						13	12	213	22	8.2	1.7	144
28						12	11	179	24	7.9	1.7	77
29						8.7	10	150	25	6.9	1.8	56
30						9.8	9.5	128	22	5.8	1.6	49
31						12	---	109	---	5.2	1.4	---
TOTAL						453.6	336.1	3377.3	1310	357.9	86.2	1132.1
MEAN						14.6	11.2	109	43.7	11.5	2.78	37.7
MAX						25	19	308	96	21	5.0	302
MIN						6.7	8.9	4.5	18	5.2	1.4	2.4
IN.						.00	.00	.00	.00	.00	.00	.00
AC-FT						900	667	6700	2600	710	171	2250

06142400 CLEAR CREEK NEAR CHINOOK, MT

LOCATION.--Lat 48°34'44", long 109°23'26", in SE¼NW¼NW¼ sec.33, T.33 N., R.18 E., Blaine County, Hydrologic Unit 10050004, on right bank, 7 mi west of Chinook, and at mile 2.5.

DRAINAGE AREA.--135 mi^2.

PERIOD OF RECORD.--June 1984 to current year (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 2,470 ft, from topographic map.

REMARKS.--Estimated daily discharges: Apr. 14-16, and Oct. 31. Records fair. Diversions for irrigation of about 2,000 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 571 ft^3/s Sept. 25, 1986, gage height, 8.21 ft, from rating curve extended above 312 ft^3/s; no flow at times most years.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 571 ft^3/s Sept. 25, gage height, 8.21 ft, from rating curve extended above 312 ft^3/s; minimum daily, 1.7 ft^3/s Aug. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				7.2	7.5	131	42	6.5	2.2	66		
2				6.7	6.6	122	36	5.9	3.7	63		
3				5.9	7.6	117	31	4.6	4.6	59		
4				6.9	7.2	111	30	4.0	4.6	57		
5				7.2	25	109	35	6.6	5.9	54		
6				6.2	58	114	38	3.7	9.4	51		
7				8.1	53	123	33	3.7	11	48		
8				8.6	45	115	27	3.2	9.4	46		
9				6.9	56	105	24	3.7	11	46		
10				5.2	80	95	21	5.6	13	47		
11				5.6	134	85	21	5.6	14	48		
12				5.7	202	78	23	5.9	12	46		
13				4.9	161	73	21	5.6	10	44		
14				5.9	141	71	17	6.5	11	42		
15				6.1	145	66	15	5.9	14	41		
16				29	155	63	17	6.5	14	41		
17				42	146	60	23	5.2	21	40		
18				33	139	56	36	4.0	37	39		
19				22	132	52	25	3.5	50	38		
20				14	131	50	21	3.2	55	37		
21				11	136	50	17	3.2	40	38		
22				13	308	47	16	3.6	30	37		
23				15	327	45	15	4.0	24	37		
24				13	291	42	11	3.7	21	36		
25				12	261	40	11	2.8	360	35		
26				12	238	39	9.7	2.3	232	34		
27				14	213	39	11	2.5	150	33		
28				12	189	37	9.7	2.3	100	32		
29				11	169	40	8.3	2.1	81	32		
30				8.9	154	45	6.9	1.7	71	32		
31				---	142	---	5.9	1.8	---	31		
TOTAL				359.0	4259.9	2220	657.5	129.4	1421.8	1330		
MEAN				12.0	137	74.0	21.2	4.17	47.4	42.9		
MAX				42	327	131	42	6.6	360	66		
MIN				4.9	6.6	37	5.9	1.7	2.2	31		
AC-FT				712	8450	4400	1300	257	2820	2640		

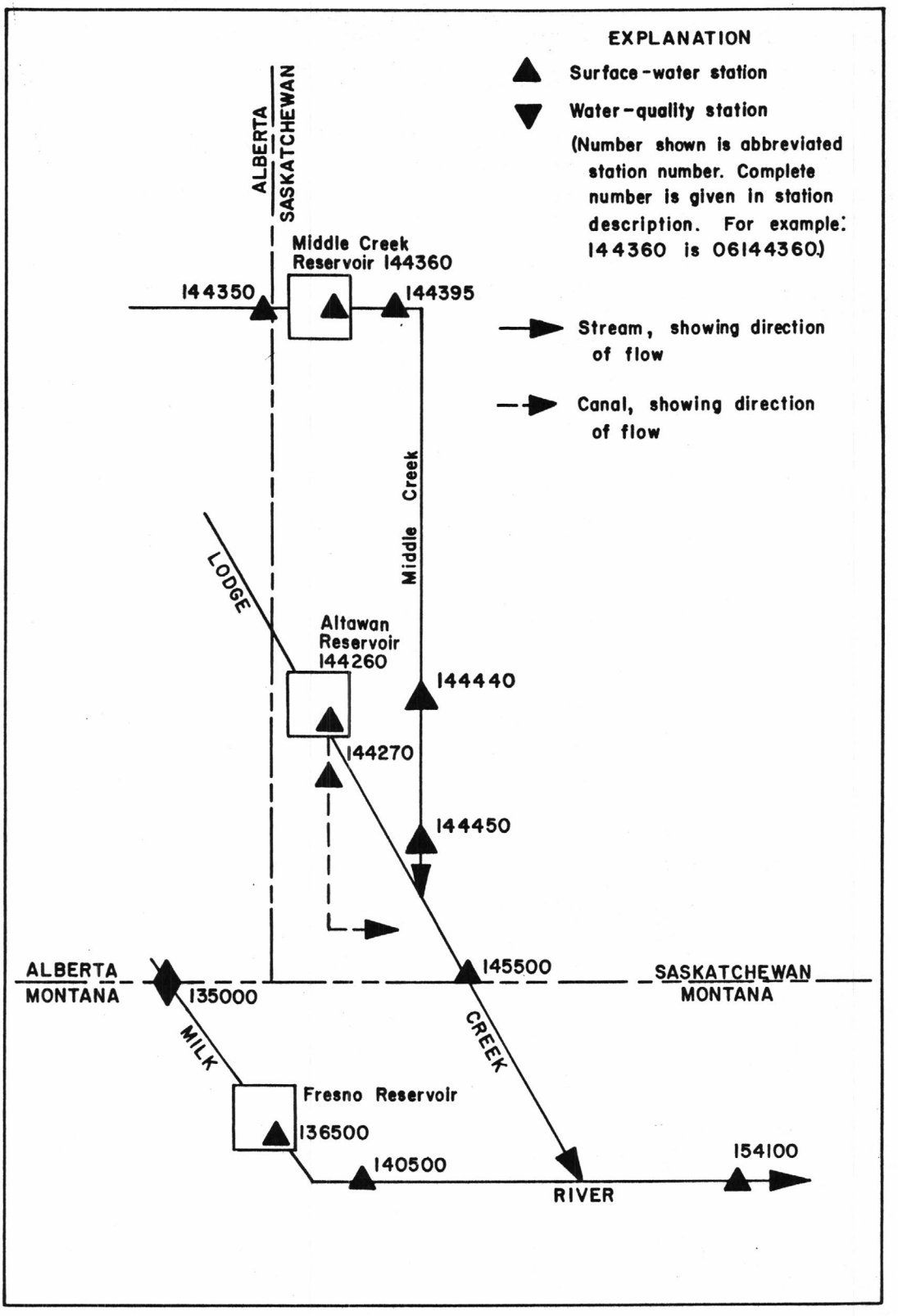


Figure 11. Schematic diagram showing diversions and storage in Lodge Creek basin.

06144270 SPANGLER DITCH NEAR GOVENLOCK, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°09'16", long 109°54'58", in NW¼ sec.26, T.2, R.30 W., third meridian, Hydrologic Unit 10050007, on right bank 0.9 mi south of Altawan Dam, and 6.8 mi southwest of Govenlock.

PERIOD OF RECORD.--March 1966 to current season (seasonal records only). 1915 to 1936, March 1950 to current season, in reports of Department of the Environment, Canada. Estimates of seasonal diversion only in most years prior to March 1950.

GAGE.--Water-stage recorder. Elevation of gage is 2,920 ft, from topographic map. Prior to March 1950, non-recording gages at several sites within 2 mi of present site at different datums. March 1950 to July 8, 1960, water-stage recorder at site 350 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Mar. 3, 4, 11. Records good. Canal diverts water from right bank of Lodge Creek in SW¼ sec.35, T.2, R.30 W., third meridian, for irrigation of 1,320 acres in Spangler irrigation project.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 65 ft^3/s Apr. 22, 1950, July 9, 1985; no flow most of each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	45	.00	25	.00	.00		
2			.00	.00	.00	46	.00	14	.00	.00		
3			1.8	.00	.00	43	.00	.21	.00	.00		
4			8.8	.00	.00	31	.00	.00	.00	.00		
5			26	.00	.00	25	.00	.00	.00	.00		
6			26	.00	.00	9.7	.00	.00	.00	.00		
7			28	.00	.00	.53	.00	.00	.00	.00		
8			23	.00	.00	.42	.00	.00	.00	.00		
9			25	.00	.00	.74	.00	.00	.00	.00		
10			25	.00	.00	.71	.00	.00	.00	.00		
11			25	.00	.00	.00	.00	.00	.00	.00		
12			24	.00	.00	.00	.00	.00	.00	.00		
13			24	.00	.00	.00	.00	.00	.00	.00		
14			25	.00	.00	.00	.00	.00	.00	.00		
15			24	.00	.00	.00	.00	.00	.00	.00		
16			25	.00	.00	.00	.00	.00	.00	.00		
17			25	.00	.00	.00	.00	.00	.00	.00		
18			24	.00	.00	.00	.00	.00	.00	.00		
19			17	.00	.00	.00	.00	.00	.00	.00		
20			1.7	.00	28	.00	.00	.00	.00	.00		
21			.57	.00	48	.00	18	.00	.00	.00		
22			.00	.00	25	.00	27	.00	.00	.00		
23			.00	.00	.74	.00	27	.00	.00	.00		
24			.00	.00	.28	.00	28	.00	.00	.00		
25			.00	.00	.00	.00	28	.00	24	.00		
26			.00	.00	.00	.00	28	.00	28	.00		
27			.00	.00	29	.00	29	.00	.00	.00		
28			.00	.00	43	.00	29	.00	.00	.00		
29			.00	.00	43	.00	28	.00	.00	.00		
30			.00	.00	44	.00	28	.00	.00	.00		
31			.00	---	44	---	28	.00	---	.00		
TOTAL			378.87	.00	305.02	202.10	298.00	39.21	52.00	.00		
MEAN			12.2	.00	9.84	6.74	9.61	1.26	1.73	.00		
MAX			28	.00	48	46	29	25	28	.00		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			751	.00	605	401	591	78	103	.00		

06144350 MIDDLE CREEK NEAR SASKATCHEWAN BOUNDARY

(International gaging station)

LOCATION.--Lat 49°25'30", long 110°03'08", in SW¼ sec.34, T.5, R.1 W., fourth meridian, in Alberta, Hydrologic Unit 10050007, on left bank 2 mi upstream from Middle Creek Reservoir, 2 mi west of Saskatchewan boundary, 18 mi northwest of Govenlock, Saskatchewan, and at mile 65.7.

DRAINAGE AREA.--118 mi^2.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). Prior to March 1982, published as "Middle Creek near Alberta boundary". June 1910 to April 1915, published as "at McKinnon's Ranch" and September 1949 to current season in reports of Department of the Environment, Canada.

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,381.13 ft above mean sea level (Geodetic Survey of Canada datum). Prior to Mar. 1, 1951, nonrecording gages, and Mar. 1, 1951, to July 5, 1961, water-stage recorder, at site 0.3 mi downstream at different datums.

REMARKS.--Estimated daily discharges: Feb. 1-28. Records good. Minor diversions for irrigation upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,980 ft^3/s Apr. 15, 1952, gage height, 10.27 ft, site and datum then in use, from rating curve extended above 600 ft^3/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 565 ft^3/s Sept. 26, gage height, 7.96 ft; minimum daily, 0.14 ft^3/s Aug. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.32	448	11	.71	.92	.57	.25	.32	3.6		
2		.32	385	7.0	.71	.81	.57	.21	.39	2.4		
3		.32	276	4.4	.67	.81	.53	.21	.46	1.9		
4		.28	195	3.0	.71	.78	.49	.18	.64	1.6		
5		.28	168	2.3	.81	.81	.57	.18	.71	1.4		
6		.28	112	1.7	.78	.85	.57	.18	.71	1.7		
7		.32	47	1.3	.78	.95	.49	.18	.71	1.5		
8		.28	46	1.1	.67	.99	.42	.21	.60	1.4		
9		.28	42	1.1	.78	.88	.53	.18	.57	1.3		
10		.28	40	1.1	.81	.78	.57	.18	.64	1.1		
11		.25	24	.99	.81	.74	.53	.14	.64	1.1		
12		.18	18	.99	.78	.67	.49	.14	.57	1.1		
13		.28	10	1.1	.78	.74	.53	.25	.53	1.1		
14		.35	6.2	1.2	.85	.74	.46	.32	.53	1.1		
15		.39	6.3	1.1	.99	.88	.39	.39	.57	1.1		
16		.39	5.5	1.2	.99	.78	.53	.57	.57	1.1		
17		.21	4.6	1.2	.95	.78	.71	1.1	.71	1.3		
18		.28	3.3	1.0	.88	.81	.71	1.1	.74	1.4		
19		.28	2.4	1.1	27	.81	1.0	1.1	.71	1.2		
20		.28	2.9	1.0	37	.74	1.0	1.2	.64	1.1		
21		.32	23	1.1	37	.74	.92	.74	.49	1.1		
22		.39	27	1.1	29	.67	1.1	.49	.46	1.0		
23		.42	22	.99	37	.67	1.1	.46	.39	1.0		
24		.49	20	.95	34	.64	.78	.42	.39	1.1		
25		2.0	10	.92	19	.60	.39	.39	145	1.1		
26		92	21	.88	9.9	.57	.35	.35	396	1.0		
27		289	8.8	.71	4.8	.53	.35	.39	124	1.0		
28		313	4.3	.71	2.6	.57	.25	.35	39	1.0		
29		---	14	.71	1.6	.67	.28	.32	18	1.0		
30		---	22	.67	1.2	.67	.25	.32	7.7	1.0		
31		---	15	---	.95	---	.28	.32	---	1.1		
TOTAL		703.47	2029.3	53.62	255.51	22.60	17.71	12.82	743.39	40.9		
MEAN		25.1	65.5	1.79	8.24	.75	.57	.41	24.8	1.32		
MAX		313	448	11	37	.99	1.1	1.2	396	3.6		
MIN		.18	2.4	.67	.67	.53	.25	.14	.32	1.0		
AC-FT		1400	4030	106	507	45	35	25	1470	81		

06144395 MIDDLE CREEK BELOW MIDDLE CREEK RESERVOIR, NEAR GOVENLOCK, SASKATCHEWAN

(International gaging station)

LOCATION (REVISED).--Lat 49°24'44", long 109°55'06", in SW¼ sec.25, T.5, R.30 W., third meridian, Hydrologic Unit 10050007, on right bank 9.1 mi downstream from Middle Creek Reservoir, 14 mi northwest of Govenlock, and at mile 57.6.

DRAINAGE AREA.--149 mi^2.

PERIOD OF RECORD.--April 1972 to current season (seasonal records only). July 1909 to May 1931, September 1935 to October 1936, and April 1972 to current season in reports of Department of the Environment, Canada. Published as "at Ross Ranch" 1909-20, "at Downes and Robert's Ranch" 1920-23, and "at Wright's Ranch" 1920-31, 1935-36. Discharge measurements only during 1928 season.

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,300 ft, from topographic map. Prior to April 1972, non-recording gages at two sites within 2 mi of present site, at different datums.

REMARKS.--Estimated daily discharges: Feb. 1-26. Records good. Flow completely regulated by Middle Creek Reservoir (station number 06144360). Many diversions for irrigation upstream from station. At high reservoir levels flow may be diverted to Lodge Creek through Middle Creek Reservoir. Diversions for irrigation of 920 acres between Middle Creek Reservoir and station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 77 ft^3/s May 3, 1985; no flow at times most seasons.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	25	.00	11	.00	.00	.00	.00	.00		
2		.00	15	.00	11	.00	.00	.00	.00	.00		
3		.00	8.3	.00	4.0	.00	.00	.00	.00	.00		
4		.00	6.0	.00	.00	.00	.00	.00	.00	.00		
5		.00	4.8	.00	.00	.00	.00	.35	.00	.00		
6		.00	1.7	.00	31	.00	.00	6.7	.00	.00		
7		.00	.74	.00	27	.00	.00	8.8	.00	.00		
8		.00	.11	.00	1.2	.00	.00	7.2	.00	.00		
9		.00	.92	.00	.07	.00	.00	9.1	.00	.00		
10		.00	.88	.00	.00	.00	.00	4.4	.00	.00		
11		.00	.21	.00	.00	.00	.00	3.8	.00	.00		
12		.00	.04	.00	.00	.00	.00	2.8	.00	.00		
13		.00	.00	.00	.00	.00	.00	1.1	.00	.00		
14		.00	.00	.00	.00	.00	.00	.28	.00	.00		
15		.00	.00	.00	.00	.00	.00	.07	.00	.00		
16		.00	.00	.00	.00	.00	.00	.00	.00	.00		
17		.00	.00	.00	.00	.00	.00	.00	.00	.00		
18		.00	.00	.00	.00	.00	.00	.00	.00	.00		
19		.00	.00	.00	.00	.00	.00	.00	.00	.00		
20		.00	.00	.00	.00	.00	.00	.00	.00	.00		
21		.00	.00	.00	.00	.00	.00	.00	.00	.00		
22		.00	.00	.00	.00	.00	.00	.00	.00	.00		
23		.00	.00	.00	.00	.00	.00	.00	.00	.00		
24		.00	.00	.00	.00	.00	.00	.00	.00	.00		
25		.00	.00	.00	.00	.00	.00	.00	36	.00		
26		14	.00	.00	.00	.00	.00	.00	49	.00		
27		25	.00	.00	.00	.00	.00	.00	24	.00		
28		22	.00	7.7	.00	.00	.00	.00	1.4	.00		
29		---	.00	8.4	.00	.00	.00	.00	.11	.00		
30		---	.00	9.6	.00	.00	.00	.00	.04	.00		
31		---	.00	---	.00	---	.00	.00	---	.00		
TOTAL		61.00	63.70	25.70	85.27	.00	.00	44.60	110.55	.00		
MEAN		2.18	2.05	.86	2.75	.00	.00	1.44	3.69	.00		
MAX		25	25	9.6	31	.00	.00	9.1	49	.00		
MIN		.00	.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT		121	126	51	169	.00	.00	88	219	.00		

06144440 MIDDLE CREEK NEAR GOVENLOCK, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°13'42", long 109°48'57", in NW¼ sec.23, T.3, R.29 W., third meridian, Hydrologic Unit 10050007, on left bank 43.9 mi downstream from Middle Creek Reservoir, 0.3 mi northwest of Govenlock, and at mile 22.8.

DRAINAGE AREA.--253 mi^2.

PERIOD OF RECORD.--February to October 1986. March 1968 to current season in reports of Department of the Environment, Canada.

GAGE.--Water-stage recorder. Elevation of gage is 3,010 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 6 and Oct. 31. Records poor. Natural flow of stream affected by Middle Creek Reservoir (station 06144360), several; smaller reservoirs, diversions for irrigation, and return flow from irrigated areas. At high reservoir levels flow may be diverted to Lodge Creek through Middle Creek Reservoir.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,190 ft^3/s Sept. 25, 1986, gage height, 9.81 ft; no flow at times each season.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 1,190 ft^3/s Sept. 25, gage height, 9.81 ft; no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.07	141	2.6	1.0	.25	.07	.00	.00	18		
2		.07	212	2.6	.99	.14	.04	.00	.00	14		
3		.07	85	3.5	2.4	.14	.00	.00	.00	11		
4		.07	42	4.0	5.4	.07	.00	.00	.00	9.1		
5		.07	20	2.8	6.4	.04	.04	.00	.00	7.2		
6		.07	9.2	2.4	5.1	.07	.00	.00	.00	6.0		
7		.07	5.2	2.0	2.9	.07	.00	.00	.00	4.9		
8		.04	6.6	1.8	10	.39	.00	.00	.00	4.1		
9		.04	14	1.8	19	.35	.00	.00	.00	3.6		
10		.04	17	1.8	7.0	.21	.00	.00	.00	3.1		
11		.04	19	1.7	5.4	.18	.00	.00	.00	2.8		
12		.04	12	1.6	7.6	.18	.00	.00	.00	2.5		
13		.04	21	1.6	9.3	.25	.00	.00	.00	2.5		
14		.04	6.3	1.7	3.6	.18	.00	.00	.00	2.3		
15		.04	7.6	1.7	3.0	.21	.00	.00	.00	2.3		
16		.04	6.3	1.9	2.6	.11	.00	.00	.00	2.2		
17		.04	6.2	1.8	2.3	.07	.00	.00	.00	2.1		
18		.04	3.8	1.8	2.0	.11	.00	.00	.00	2.0		
19		.00	5.3	1.7	1.9	.21	.00	.00	.00	2.0		
20		.00	5.0	1.6	1.8	.32	.00	.00	.00	1.9		
21		.00	4.8	1.6	1.7	.28	.00	.00	.00	2.0		
22		.00	5.2	1.4	3.0	.21	.00	.00	.00	2.0		
23		.00	4.5	1.3	2.8	.18	.00	.00	.00	2.0		
24		.00	5.9	1.2	2.3	.14	.00	.00	.00	2.0		
25		12	3.9	1.4	2.3	.11	.00	.00	671	1.9		
26		124	4.2	1.4	1.5	.07	.00	.00	724	1.9		
27		150	4.6	1.4	.92	.11	.00	.00	176	2.0		
28		147	3.7	1.4	.71	.11	.00	.00	72	2.0		
29		---	3.1	1.1	.60	.14	.00	.00	39	1.9		
30		---	2.8	1.0	.49	.11	.00	.00	25	1.9		
31		---	2.6	---	.35	---	.00	.00	---	1.9		
TOTAL		433.93	689.8	55.6	116.36	5.01	.15	.00	1707.00	125.1		
MEAN		15.5	22.3	1.85	3.75	.17	.00	.00	56.9	4.04		
MAX		150	212	4.0	19	.39	.07	.00	724	18		
MIN		.00	2.6	1.0	.35	.04	.00	.00	.00	1.9		
CFSM		.00	.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT		861	1370	110	231	9.9	.3	.00	3390	248		

06144450 MIDDLE CREEK ABOVE LODGE CREEK, NEAR GOVENLOCK, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°06'01", long 109°49'02", in NE¼ sec.4, T.2, R.29 W., third meridian, Hydrologic Unit 10050007, on left bank, 0.7 mi upstream from Lodge Creek, and 9 mi south of Govenlock.

DRAINAGE AREA.--276 mi^2.

PERIOD OF RECORD.--March 1962 to October 1966 and February to October 1986 (seasonal records only). March 1911 to May 1931 and March 1962 to current season in reports of Department of the Environment, Canada. Published as "at Hammond's Ranch" 1911-31.

GAGE.--Water-stage recorder. Elevation of gage is 2,830 ft (from topographic map). Prior to Mar. 1, 1962, nonrecording gage at site 1,000 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Feb. 1-26 and Oct. 31. Records fair. Natural flow of stream affected by Middle Creek Reservoir (station 06144360) several smaller reservoirs, diversions for irrigation, and return flow from irrigated areas. At high reservoir levels flow may be diverted to Lodge Creek through Middle Creek Reservoir.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 738 ft^3/s Sept. 26, 1986, gage height, 13.84 ft; no flow at times each season.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 738 ft^3/s Sept. 26, gage height, 13.84 ft; no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	220	.42	1.8	.25	.04	.00	.00	46		
2		.00	242	.39	1.8	.18	.00	.00	.00	34		
3		.00	264	.35	1.7	.11	.00	.00	.00	30		
4		.00	114	.25	1.5	.04	.00	.00	.00	29		
5		.00	29	.18	1.6	.00	.00	.00	.00	26		
6		.00	5.2	.21	1.1	.00	.00	.00	.00	9.2		
7		.00	2.6	3.0	.78	.00	.00	.00	.00	3.2		
8		.00	1.8	2.2	.71	.00	.00	.00	.00	2.6		
9		.00	2.3	.42	1.1	.14	.00	.00	.00	2.4		
10		.00	2.0	.28	1.6	.39	.00	.00	.00	2.2		
11		.00	2.1	.28	2.6	.28	.00	.00	.00	2.1		
12		.00	2.1	.32	5.5	.11	.00	.00	.00	4.0		
13		.00	2.1	.25	8.6	.07	.00	.00	.00	4.9		
14		.00	11	.21	7.5	.00	.00	.00	.00	5.0		
15		.00	20	.21	6.6	.00	.00	.00	.00	4.8		
16		.00	16	.21	4.8	.00	.00	.00	.00	4.6		
17		.00	8.2	.25	4.0	.00	.04	.00	.00	4.4		
18		.00	4.1	.18	3.8	.00	.00	.00	.00	4.2		
19		.00	4.1	.14	2.8	.04	.00	.00	.71	3.8		
20		.00	3.4	.11	1.6	.00	.00	.00	.35	3.8		
21		.00	2.2	.07	1.3	.00	.00	.00	.25	3.6		
22		.00	1.7	.07	2.5	.00	.00	.00	.07	3.3		
23		.00	1.4	.07	3.6	.00	.00	.00	.00	3.2		
24		.00	1.1	5.2	5.3	.00	.04	.00	.11	3.1		
25		.00	.95	6.1	5.2	.00	.00	.00	311	3.1		
26		1.5	.42	2.4	4.9	.00	.00	.00	689	2.9		
27		18	.53	2.2	2.9	.00	.00	.00	452	2.9		
28		113	.95	2.1	1.1	.00	.00	.00	247	2.8		
29		---	.53	1.9	.78	.00	.00	.00	130	2.6		
30		---	.53	1.8	.60	.04	.00	.00	69	2.6		
31		---	.46	---	.39	---	.00	.00	---	2.6		
TOTAL		132.50	966.77	31.77	90.06	1.65	.12	.00	1899.49	258.9		
MEAN		4.73	31.2	1.06	2.91	.05	.00	.00	63.3	8.35		
MAX		113	264	6.1	8.6	.39	.04	.00	689	46		
MIN		.00	.42	.07	.39	.00	.00	.00	.00	2.1		
CFSM		.02	.10	.00	.01	.00	.00	.00	.21	.03		
AC-FT		263	1920	63	179	3.3	.2	.00	3770	514		

06145500 LODGE CREEK BELOW MCRAE CREEK, AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°00'19", long 109°43'02", in SW¼ sec.5, T.1, R.28 W., third meridian, in Saskatchewan, Hydrologic Unit 10050007, on right bank 0.3 mi downstream from McRae Creek, 0.4 mi north of international boundary, 0.8 mi northeast of Willow Creek Port of Entry, 31 mi north of Havre, MT, and at mile 84.3.

DRAINAGE AREA.--825 mi^2.

PERIOD OF RECORD.--October 1951 to current season (seasonal records only). Prior to October 1951, records were collected on both McRae Coulee (1927-51) and Lodge Creek above McRae Coulee (1910-51). Summations are equivalent to records at this site. Prior to March 1965, published as "below McRae Coulee."

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,731.0 ft above mean sea level (International Boundary Survey datum).

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 17 and Oct. 31. Records good. Natural flow affected by numerous storage reservoirs, diversions for irrigation of about 3,000 acres, and return flow from irrigation area. 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.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,890 ft^3/s Sept. 25, 1986, gage height, 16.36 ft, from rating curve extended above 4,100 ft^3/s on basis of slope-area measurement of peak flow; no flow at times each season.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 9,890 ft^3/s Sept. 25, gage height, 16.36 ft, from rating curve extended above 4,100 ft^3/s on basis of slope-area measurement of peak flow; no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	862	35	4.1	8.6	.32	.00	.00	249		
2		.00	1360	31	4.1	6.3	.21	.00	.00	184		
3		.00	1250	29	4.0	5.2	.14	.00	.00	153		
4		.00	833	24	4.2	4.6	.07	.00	.00	148		
5		.00	434	21	5.1	3.9	.07	.00	.00	138		
6		.00	314	18	4.9	4.0	.04	1.0	.00	114		
7		.00	226	16	4.8	5.7	.04	.71	.00	85		
8		.00	145	17	5.5	8.3	.04	.46	.00	68		
9		.00	124	14	5.9	8.9	.04	.21	.00	53		
10		.00	110	11	5.8	7.3	.00	.14	.00	43		
11		.00	77	9.5	17	4.8	.00	.07	.00	38		
12		.00	63	9.9	101	3.7	.00	.07	.00	30		
13		.00	51	11	26	3.2	.00	.04	.00	26		
14		.00	41	9.0	22	2.4	.00	.04	.00	25		
15		.00	55	8.3	18	2.0	.00	.04	.00	24		
16		.00	69	6.7	18	1.6	.00	.00	.00	22		
17		.00	49	6.0	20	1.4	58	.00	.00	22		
18		.00	28	5.8	14	1.3	11	.00	.00	20		
19		.00	22	5.5	13	2.2	3.5	.00	.04	19		
20		.00	19	6.0	40	4.3	1.5	.00	1.2	17		
21		.00	18	6.0	77	3.8	.88	.00	1.2	16		
22		.00	63	5.5	121	2.5	.57	.00	.60	15		
23		.00	94	4.6	155	1.7	.49	.00	.32	15		
24		.00	118	4.0	144	1.1	.35	.00	.18	14		
25		.00	107	5.3	162	.78	.21	.00	4940	13		
26		1.7	81	13	136	.57	.14	.00	7770	12		
27		98	56	7.5	104	.42	.07	.00	4800	12		
28		438	44	5.3	63	.25	.07	.00	1670	11		
29		---	38	4.7	34	.32	.04	.00	770	11		
30		---	32	4.3	21	.39	.04	.00	381	12		
31		---	29	---	13	---	.00	.00	---	11		
TOTAL		537.70	6812	353.9	1367.4	101.53	77.83	2.78	20334.54	1620		
MEAN		19.2	220	11.8	44.1	3.38	2.51	.09	678	52.3		
MAX		438	1360	35	162	8.9	58	1.0	7770	249		
MIN		.00	18	4.0	4.0	.25	.00	.00	.00	11		
AC-FT		1070	13510	702	2710	201	154	5.5	40330	3210		

RESERVOIRS IN LODGE CREEK BASIN IN SASKATCHEWAN

(International gaging stations)

06144260 ALTAWAN RESERVOIR.--Lat 49°10'00", long 109°55'00", in SW¼ sec.35, T.2, R.30 W., third meridian, Hydrologic Unit 10050007, at dam on Lodge Creek, 6.3 mi southwest of Govenlock, and at mile 113.5. DRAINAGE AREA, 373 mi^2. PERIOD OF RECORD, February 1966 to current season (seasonal records only). February 1960 to current season in reports of Department of the Environment, Canada. Water-stage recorder. Datum of gage is at mean sea level (Geodetic Survey of Canada datum). Prior to July 7, 1967, nonrecording gage in gate well read every ten days during irrigation season.

Reservoir is formed by earthfill dam with concrete spillway and control works as well as an emergency earthen spillway, completed in 1959. The following capacity figures are from revised capacity table put into use Jan. 1, 1983. Usable capacity is 5,440 acre-ft between elevation 2,918.0 ft, bottom of outlet works, and 2,952.0 ft, maximum design level. No dead storage. Water is used for irrigation. This is one of a number of stations which are maintained jointly by Canada and the United States. REVISED RECORDS, W 1983: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, 8,300 acre-ft Sept. 26, 1986, elevation, 2,958.10 ft; no contents Mar. 1, 1960, Oct. 6-31, 1984, Mar. 1-18, and Oct. 3-31, 1985.

EXTREMES FOR CURRENT SEASON: Maximum contents, 8,300 acre-ft Sept. 26, elevation, 2,958.10 ft; minimum, 37 acre-ft Feb. 3, elevation, 2,923.76 ft.

06144360 MIDDLE CREEK RESERVOIR.--Lat 49°24'22", long 109°59'02", in NE¼ sec.21, T.5, R.30 W., third meridian, Hydrologic Unit 10050007, at dam on Middle Creek, 0.7 mi east of Alberta-Saskatchewan boundary, 6.3 mi west of Battle Creek, 15 mi northwest of Govenlock, and at mile 66.7, revised. DRAINAGE AREA, 143 mi^2. PERIOD OF RECORD, February 1966 to current season. Occasional nonrecording gage readings in 1937 and 1939-51, March 1952 to current season in reports of Department of the Environment, Canada. Seasonal records only. Water-stage recorder. Datum of gage is at mean sea level (Geodetic Survey of Canada datum). Prior to July 7, 1967, nonrecording gage in gate well read every ten days during irrigation season.

Reservoir is formed by earthfill dam with concrete control works and sod spillway at elevation 3,383.0 ft on Middle Creek and at Ducks Unlimited outlet, constructed in 1937. Usable capacity, 13,080 acre-ft between elevation 3,368.60 ft, bottom of outlet works on Middle Creek, and 3,383.0 ft, natural spillway. Invert of outlet pipe at Ducks Unlimited outlet is at elevation 3,372.04 ft. No dead storage. Water is used for irrigation and to maintain levels of Orleans Lakes. Water may be released to Lodge Creek via Ducks Unlimited outlet, Simms Lake and Walburger Coulee. Spillway does not return water to Middle Creek, may return to Lodge Creek via Walburger Coulee. This is one of a number of stations which are maintained jointly by Canada and the United States. REVISED RECORDS, W 1984: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 23,080 acre-ft Apr. 13, 1952, elevation, 3,387.92 ft; no contents at various times.

EXTREMES FOR CURRENT SEASON: Maximum contents, 4,950 acre-ft Apr. 1, elevation, 3,375.85 ft; no contents Feb. 1-27.

Monthend contents, in acre-ft, October 1985 to October 1986

Date	Altawan Reservoir	Middle Creek Reservoir
Oct. 31	0	0
Nov. 30	-	-
Dec. 31	-	-
Jan. 31	-	-
Feb. 28	5,420	1,050
Mar. 31	5,760	4,910
Apr. 30	5,510	3,660
May 31	5,470	3,760
June 30	5,030	3,730
July 31	4,040	3,260
Aug. 31	3,690	2,630
Sept. 30	4,670	4,500
Oct. 31	4,350	4,430

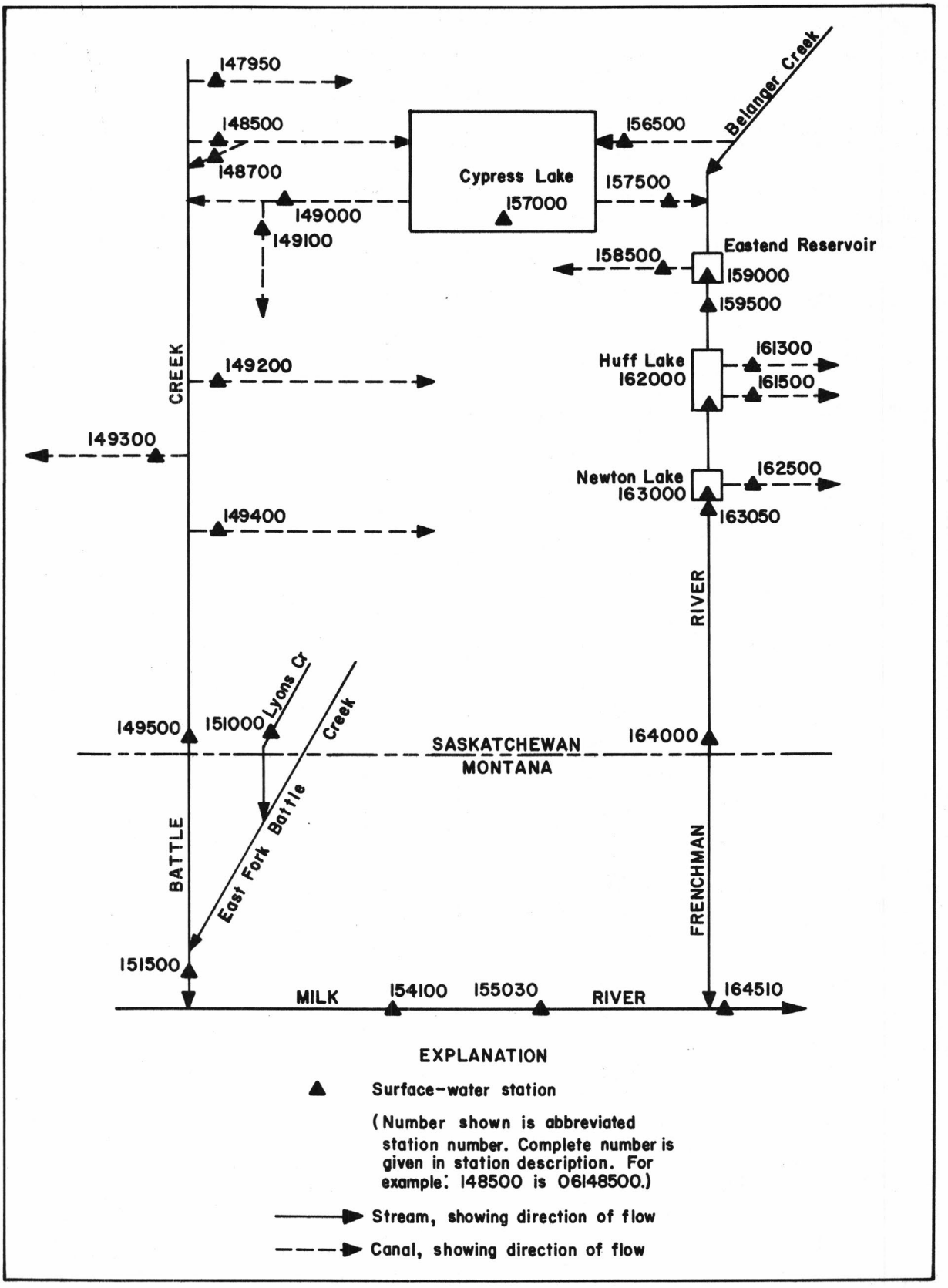


Figure 12. Schematic diagram showing diversions and storage in Battle Creek and Frenchman River basins.

06147950 GAFF DITCH NEAR MERRYFLAT, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°26'05", long 109°50'07", in NW¼ sec.34, T.5, R.29 W., third meridian, Hydrologic Unit 10050008, on left bank about 200 ft downstream from headgates, and 4 mi southwest of Merryflat.

PERIOD OF RECORD.--March 1972 to current season (seasonal record only). March 1964 to current season in reports of Department of the Environment, Canada.

GAGE.--Water-stage recorder. Elevation of gage is 3,350 ft, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 1-18 and Apr. 12, 13. Records fair. Water is diverted from left bank of Battle Creek in NW¼ sec.34, T.5. R.29 W., third meridian, for irrigation of about 890 acres along Battle Creek.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s Apr. 22, 1971; no flows at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.42	10	13	14	1.1	.11	.00	.00		
2			.25	15	13	14	1.1	.07	.00	.00		
3			.21	15	12	14	.88	.00	.00	.00		
4			.21	14	13	16	.74	.00	.00	.00		
5			.18	14	12	16	.67	.00	.00	.00		
6			.14	14	5.3	16	.64	.07	.00	.00		
7			.14	15	4.4	17	.67	.04	.04	.00		
8			.11	16	3.7	18	.67	.18	.07	.00		
9			.11	15	13	19	.71	.07	.07	.00		
10			.07	16	13	18	.74	.00	.00	.00		
11			.07	16	9.7	17	.67	.00	.00	.00		
12			.04	16	1.4	16	.71	.00	.00	.00		
13			.04	7.8	1.2	15	.74	.00	.00	.00		
14			.04	1.1	.71	14	.78	.00	.00	.00		
15			.07	.88	.57	15	.78	.00	.00	.00		
16			.07	.78	.60	16	.74	.00	.00	.00		
17			.07	.53	.60	16	.92	.00	.00	.00		
18			.11	.14	.60	15	1.1	.00	.00	.00		
19			.11	9.0	.64	15	.99	.00	.00	.00		
20			.11	14	.57	15	.88	.00	.00	.00		
21			.11	14	.57	13	.81	.00	.00	.00		
22			.14	14	.53	12	.78	.00	.00	.00		
23			.11	15	.57	11	.88	.00	.00	.00		
24			.14	16	.53	7.2	.88	.00	.00	.00		
25			.11	16	.49	5.4	.78	.00	.00	.00		
26			.14	16	.49	1.5	.57	.00	.14	.00		
27			.14	16	.42	1.4	.39	.00	.14	.00		
28			.11	15	.42	1.1	.25	.00	.07	.00		
29			.11	15	4.6	1.2	.14	.00	.04	.00		
30			.14	14	6.7	1.4	.07	.00	.00	.00		
31			.11	---	11	---	.07	.00	---	.00		
TOTAL			3.93	361.23	145.31	371.2	21.85	.54	.57	.00		
MEAN			.13	12.0	4.69	12.4	.70	.02	.02	.00		
MAX			.42	16	13	19	1.1	.18	.14	.00		
MIN			.04	.14	.42	1.1	.07	.00	.00	.00		
AC-FT			7.8	716	288	736	43	1.1	1.1	.00		

06148500 CYPRESS LAKE WEST INFLOW CANAL NEAR WEST PLAINS, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°28'18", long 109°37'08", in SE¼ sec.18, T.6, R.27 W., third meridian, Hydrologic Unit 10050008, on left bank 2.5 mi downstream from canal headgates, 5.5 mi northeast of West Plains, and 13 mi northwest of Consul.

PERIOD OF RECORD.--March 1939 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 3,210 ft, from topographic map. Prior to Oct. 16, 1956, at site 2.3 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 22, Apr. 13-18, and Sept. 26. Records fair. Canal diverts water from Battle Creek in NW¼ sec.1, T.6, R.28 W., third meridian, for storage in Cypress Lake. Part or all of flow may be returned to Battle Creek via wasteway and drain canal 0.4 mi downstream.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 884 ft^3/s Apr. 27, 1965; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	413	.18	12	27	1.4	.35	.00	101		
2		.00	339	.14	12	31	1.1	.35	.00	90		
3		.00	264	.14	12	29	.81	.35	.00	82		
4		.00	189	.11	12	24	.64	.39	.00	78		
5		.00	198	.07	16	21	.53	.39	.00	73		
6		.00	152	.07	25	13	.49	.35	.00	70		
7		.00	210	.04	57	.78	.42	.32	.00	67		
8		.00	144	.00	50	.42	.39	.32	.00	66		
9		.00	103	.00	50	.28	.39	.32	.00	64		
10		.00	111	.00	44	19	.39	.32	.00	63		
11		.00	108	16	44	26	.42	.32	.00	61		
12		.00	102	19	52	17	.39	.28	.00	60		
13		.00	76	23	58	4.9	.35	.28	.00	54		
14		.00	81	23	55	4.9	.35	.25	.00	48		
15		.00	75	26	55	5.2	.35	.21	.00	46		
16		.00	64	28	60	4.8	49	.18	.00	44		
17		.00	56	31	66	5.0	36	.18	.00	29		
18		.00	48	26	70	6.5	36	.14	.00	.78		
19		.00	28	26	77	14	34	.07	.49	.49		
20		.00	8.4	23	81	15	34	.00	25	.35		
21		.00	5.4	16	104	15	22	.00	25	.32		
22		.00	4.6	14	107	16	1.9	.00	32	.28		
23		.00	2.1	12	142	15	1.1	.00	20	.25		
24		.00	1.6	13	153	10	.99	.00	22	.21		
25		71	1.2	14	121	10	.71	.00	466	.11		
26		281	.88	14	92	11	.67	.00	396	.04		
27		341	2.5	13	77	11	.67	.00	367	.04		
28		392	3.4	15	65	7.2	.57	.00	202	.04		
29		---	2.6	14	57	7.2	.42	.00	139	.00		
30		---	.42	13	45	3.5	.32	.00	117	.04		
31		---	.25	---	37	---	.32	.00	---	.00		
TOTAL		1085.00	2794.35	379.75	1908	374.68	227.09	5.37	1811.49	1098.95		
MEAN		38.8	90.1	12.7	61.5	12.5	7.33	.17	60.4	35.4		
MAX		392	413	31	153	31	49	.39	466	101		
MIN		.00	.25	.00	12	.28	.32	.00	.00	.00		
AC-FT		2150	5540	753	3780	743	450	11	3590	2180		

06148700 CYPRESS LAKE WEST INFLOW CANAL DRAIN NEAR OXARAT, SASKATCHEWAN

(International gaging station)

LOCATION.-Lat 49°28'25", long 109°36'38", in NW¼ sec.17, T.6, R.27 W., third meridian, Hydrologic Unit 10050008, on left bank about 500 ft downstream from drain gate on Cypress Lake west inflow canal, 0.5 mi upstream from Battle Creek, and 4 mi northwest of Oxarat.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). March 1955 to current season in reports of Department of the Environment, Canada.

GAGE.--Water-stage recorder. Elevation of gage is 3,200 ft, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 18. Records poor. Drain used as an emergency bypass to return diverted water to Battle Creek. It may also be used to return stored water from Cypress Lake when lake stage is high.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 450 ft^3/s Apr. 20, 1955; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.04	.00	.00	17	.39	.04	.00	.14		
2			.04	.00	.00	.25	.35	.04	.00	.11		
3			.04	.00	.04	.14	.28	.04	.00	.07		
4			.04	.00	.04	.14	.28	.07	.00	.04		
5			.00	.00	.07	.14	.25	.07	.00	.04		
6			.00	.00	.07	.14	.21	.07	.00	.04		
7			.00	.00	.07	.11	.18	.07	.00	.04		
8			.04	.00	.07	.11	.18	.07	.00	.04		
9			.07	.00	.07	.11	.14	.07	.00	.04		
10			.04	.00	.07	.32	.11	.07	.00	.04		
11			.04	.00	.07	.46	.11	.07	.00	.04		
12			.04	.00	.07	.39	.11	.07	.00	.04		
13			.00	.00	.07	.35	.07	.07	.00	.04		
14			.00	.00	.07	.35	.07	.07	.00	.04		
15			.00	.00	.07	.39	.07	.07	.00	.04		
16			.00	.00	.07	.39	.92	.07	.00	.04		
17			.00	.00	.07	.42	.11	.07	.00	.04		
18			.00	.00	.07	.42	.07	.07	.00	.04		
19			.00	.00	10	.49	.07	.04	.11	.04		
20			.00	.00	27	.46	.07	.07	.25	.04		
21			.00	.00	44	.49	.04	.04	.18	.04		
22			.00	.00	67	.49	.04	.00	.14	.04		
23			.00	.00	41	.53	.04	.00	.07	.04		
24			.00	.00	42	.49	.00	.00	.11	.04		
25			.00	.00	41	.53	.00	.00	.99	.04		
26			.00	.00	40	.57	.00	.00	.21	.04		
27			.00	.00	39	.57	.00	.00	.14	.04		
28			.00	.00	49	.57	.00	.00	.14	.04		
29			.00	.00	62	.60	.00	.00	.18	.04		
30			.00	.00	29	.49	.00	.00	.18	.04		
31			.00	---	29	---	.04	.00	---	.04		
TOTAL			.39	.00	521.06	27.91	4.20	1.32	2.70	1.44		
MEAN			.01	.00	16.8	.93	.14	.04	.09	.05		
MAX			.07	.00	67	17	.92	.07	.99	.14		
MIN			.00	.00	.00	.11	.00	.00	.00	.04		
AC-FT			.8	.00	1030	55	8.3	2.6	5.4	2.9		

06149000 CYPRESS LAKE WEST OUTFLOW CANAL NEAR WEST PLAINS, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°28'14", long 109°35'18", in SW¼ sec.16, T.6, R.27 W., third meridian, Hydrologic Unit 10050008, on left bank 1.1 mi downstream from Cypress Lake West Dam, 6 mi northeast of West Plains, and 13 mi north of Consul.

PERIOD OF RECORD.--March 1940 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 3,180 ft, from topographic map. Prior to Sept. 18, 1952, at site 1 mi upstream and 300 ft downstream from Cypress Lake West Dam at different datum.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 11 and Apr. 26. Records fair. Canal diverts water from Cypress Lake in NW¼ sec.15, T.6, R.27 W., third meridian, for irrigation of 5,500 acres in Battle Creek basin in Saskatchewan. Water may be delivered to Battle Creek or diverted into Vidora Ditch at gate structure near lower end of canal.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 304 ft^3/s May 4, 1951; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	.00	3.0	.21	115	3.2	.00	.00	.67		
2		.00	13	2.4	.18	92	.85	.00	.00	.57		
3		.00	34	3.2	.14	81	.71	.00	.00	.42		
4		.00	18	2.9	.25	90	.85	.00	.00	.28		
5		.00	12	2.8	.21	78	.92	.00	.00	.21		
6		.00	7.7	1.9	.18	77	.99	.00	.00	.14		
7		.00	11	.07	.21	86	1.1	.00	.00	.07		
8		.00	3.2	.04	.18	89	.95	.00	.00	.07		
9		.00	2.5	.04	.25	80	1.0	.00	.00	.04		
10		.00	.18	.04	.18	77	.99	.00	.00	.04		
11		.00	.11	.00	.18	66	.99	.00	.00	.04		
12		.00	.07	.00	.11	69	.99	.00	.00	.04		
13		.00	.07	.00	.46	70	.99	.00	.00	.04		
14		.00	.07	.00	1.6	64	.99	.00	.00	.04		
15		.00	.04	.00	1.5	55	1.0	.00	.07	.04		
16		.00	.07	.00	1.1	63	3.9	.00	.11	.04		
17		.00	5.0	.00	.07	60	5.0	.00	.25	.04		
18		.00	11	.00	.00	61	4.1	.00	.25	.04		
19		.00	10	.00	31	54	3.0	.00	.39	.04		
20		.00	5.3	.00	81	53	.78	.00	.39	.04		
21		.00	.18	.00	79	41	.49	.00	.32	.04		
22		.00	.18	.00	75	29	.28	.00	.21	.04		
23		.00	.11	.00	83	30	.18	.00	.18	.04		
24		.00	.11	.00	103	30	.18	.00	.25	.04		
25		.00	.35	.00	119	30	.14	.00	13	.07		
26		.00	3.1	.04	124	30	.07	.00	32	.04		
27		.00	3.2	.35	119	29	.07	.00	14	.04		
28		.00	3.7	.28	117	17	.04	.00	2.5	.04		
29		---	3.2	.21	116	3.5	.00	.00	1.6	.04		
30		---	3.1	.21	118	3.2	.00	.00	.92	.07		
31		---	3.1	---	123	---	.00	.00	---	.04		
TOTAL		.00	153.64	17.48	1295.01	1722.7	34.75	.00	66.44	3.41		
MEAN		.00	4.96	.58	41.8	57.4	1.12	.00	2.21	.11		
MAX		.00	34	3.2	124	115	5.0	.00	32	.67		
MIN		.00	.00	.00	.00	3.2	.00	.00	.00	.04		
AC-FT		.00	305	35	2570	3420	69	.00	132	6.8		

06149100 VIDORA DITCH NEAR CONSUL, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°27'27", long 109°35'30", in SW¼ sec.9, T.6, R.27 W., third meridian, Hydrologic Unit 10050008, on left bank 0.5 mi downstream from headgate near lower end of Cypress Lake west outflow canal, 12 mi north of Consul.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). March 1952 to current season in reports of Department of the Environment, Canada.

GAGE.--Water-stage recorder. Elevation of gage is 3,200 ft, from topographic map. Prior to Aug. 1, 1963, at datum 1.0 ft higher.

REMARKS.--No estimated daily discharges this year. Records fair. Canal diverts water from Cypress Lake west outflow canal in NE¼ sec.8, T.6, R.27 W., third meridian, for irrigation of about 2,140 acres in the Battle Creek basin. Water may be delivered either to this canal or returned to Battle Creek from Cypress Lake.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 97 ft^3/s June 12, 13, 1975; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	52	.00	.00	.00	.00		
2			.00	.00	.00	38	.00	.00	.00	.00		
3			.00	.00	.00	33	.00	.00	.00	.00		
4			.00	.00	.00	42	.00	.00	.00	.00		
5			.00	.00	.00	36	.00	.00	.00	.00		
6			.00	.00	.00	36	.00	.00	.00	.00		
7			.00	.00	.00	40	.00	.00	.00	.00		
8			.00	.00	.00	42	.00	.00	.00	.00		
9			.00	.00	.00	39	.00	.00	.00	.00		
10			.00	.00	.00	41	.00	.00	.00	.00		
11			.00	.00	.00	38	.00	.00	.00	.00		
12			.00	.00	.00	39	.00	.00	.00	.00		
13			.00	.00	.14	40	.00	.00	.00	.00		
14			.00	.00	.07	37	.00	.00	.00	.00		
15			.00	.00	.07	36	.00	.00	.00	.00		
16			.00	.00	.04	39	.00	.00	.00	.00		
17			.00	.00	.00	37	.00	.00	.00	.00		
18			.00	.00	.00	37	.00	.00	.00	.00		
19			.00	.00	.07	32	.00	.00	.00	.00		
20			.00	.00	.18	31	.00	.00	.00	.00		
21			.00	.00	.07	27	.00	.00	.00	.00		
22			.00	.00	7.2	19	.00	.00	.00	.00		
23			.00	.00	.35	19	.00	.00	.00	.00		
24			.00	.00	.25	19	.00	.00	.00	.00		
25			.00	.00	.21	20	.00	.00	.00	.00		
26			.00	.00	.18	20	.00	.00	.00	.00		
27			.00	.00	.11	20	.00	.00	.00	.00		
28			.00	.00	14	11	.00	.00	.00	.00		
29			.00	.00	44	.39	.00	.00	.00	.00		
30			.00	.00	48	.18	.00	.00	.00	.00		
31			.00	---	57	---	.00	.00	---	.00		
TOTAL			.00	.00	171.94	920.57	.00	.00	.00	.00		
MEAN			.00	.00	5.55	30.7	.00	.00	.00	.00		
MAX			.00	.00	57	52	.00	.00	.00	.00		
MIN			.00	.00	.00	.18	.00	.00	.00	.00		
AC-FT			.00	.00	341	1830	.00	.00	.00	.00		

06149200 RICHARDSON DITCH NEAR CONSUL, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°21'50", long 109°32'12", near center of south line of sec.11, T.5, R.27 W., third meridian, Hydrologic Unit 10050008, on left bank 420 ft downstream from headgate, 4.8 mi north of Consul.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). 1910-12, 1914, 1916-20, 1922-33, 1935, July 1946 to current season in reports of Department of the Environment, Canada. Estimates of seasonal diversion only in most seasons prior to 1946.

GAGE.--Water-stage recorder. Prior to June 26, 1949, nonrecording gages at different sites and datums. June 26, 1949, to Aug. 28, 1963, water-stage recorder at present site at datum 1.00 ft higher.

REMARKS.--No estimated daily discharges this year. Records good. Ditch diverts from left bank of Battle Creek in SW¼ sec.11, T.5, R.27 W., third meridian, for irrigation of about 1,330 acres along Battle Creek.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 72 ft^3/s June 15, 1974; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	14	.00	.00	.00	.00		
2			.00	.00	.00	17	.00	.00	.00	.00		
3			.00	.00	.00	12	.00	.00	.00	.00		
4			.00	.00	.00	.07	.00	.00	.00	.00		
5			.00	.00	.00	.00	.00	.00	.00	.00		
6			.00	.00	.00	.00	.00	.00	.00	.00		
7			.00	.00	.00	.00	.00	.00	.00	.00		
8			.00	.00	.00	.00	.00	.00	.00	.00		
9			.00	.00	.00	.00	.00	.00	.00	.00		
10			.00	.00	.00	.00	.00	.00	.00	.00		
11			.00	.00	.00	.00	.00	.00	.00	.00		
12			.00	.00	.00	.00	.00	.00	.00	.00		
13			.00	.00	.00	.00	.00	.00	.00	.00		
14			.00	.00	.00	.00	.00	.00	.00	.00		
15			.00	.00	.00	.00	.00	.00	.00	.00		
16			.00	.00	.00	.00	.00	.00	.00	.00		
17			.00	.00	.00	.00	.00	.00	.00	.00		
18			.00	.00	.00	.00	.00	.00	.00	.00		
19			.00	.00	.00	.00	.00	.00	.00	.00		
20			.00	.00	23	.00	.00	.00	.00	.00		
21			.00	.00	42	.00	.00	.00	.00	.00		
22			.00	.00	50	.00	.00	.00	.00	.00		
23			.00	.00	49	.00	.00	.00	.00	.00		
24			.00	.00	49	.00	.00	.00	.00	.00		
25			.00	.00	51	.00	.00	.00	.00	.00		
26			.00	.00	51	.00	.00	.00	.00	.00		
27			.00	.00	50	.00	.00	.00	.00	.00		
28			.00	.00	50	.00	.00	.00	.00	.00		
29			.00	.00	48	.00	.00	.00	.00	.00		
30			.00	.00	18	.00	.00	.00	.00	.00		
31			.00	---	5.8	---	.00	.00	---	.00		
TOTAL			.00	.00	486.80	43.07	.00	.00	.00	.00		
MEAN			.00	.00	15.7	1.44	.00	.00	.00	.00		
MAX			.00	.00	51	17	.00	.00	.00	.00		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			.00	.00	966	85	.00	.00	.00	.00		

06149300 MCKINNON DITCH NEAR CONSUL, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°20'00", long 109°29'40", in NW¼ sec.30, T.4, R.26 W., third meridian, Hydrologic Unit 10050008, on right bank 1.0 mi downstream from headgate on Battle Creek, and 2.7 mi northeast of Consul.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). 1911-26, 1929-31, and March 1938 to current season in reports of Department of the Environment, Canada. Estimates of seasonal diversions only in many years prior to 1947.

GAGE.--Water-stage recorder. Prior to September 1949, nonrecording gages at various sites and datums. Sept. 4, 1949, to Aug. 29, 1963, water-stage recorder at present site at datum 1.00 ft higher.

REMARKS.--No estimated daily discharges this year. Records good. Ditch diverts from right bank of Battle Creek in NE¼ sec.30, T.4, R.26 W., third meridian, for irrigation of about 1,320 acres along Battle Creek.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 68 ft^3/s June 18, 1975; no flow most of each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	21	.00	.00	.00	.00		
2			.00	.00	.00	18	.00	.00	.00	.00		
3			.00	.00	.00	17	.00	.00	.00	.00		
4			.00	.00	.00	17	.00	.00	.00	.00		
5			.00	.00	.00	7.8	.00	.00	.00	.00		
6			.00	.00	.00	.00	.00	.00	.00	.00		
7			.00	.00	.00	.00	.00	.00	.00	.00		
8			.00	.00	.00	.00	.00	.00	.00	.00		
9			.00	.00	.00	.00	.00	.00	.00	.00		
10			.00	.00	.00	.00	.00	.00	.00	.00		
11			.00	.00	.00	.00	.00	.00	.00	.00		
12			.00	.00	.00	.00	.00	.00	.00	.00		
13			.00	.00	.00	.00	.00	.00	.00	.00		
14			.00	.00	.00	.00	.00	.00	.00	.00		
15			.00	.00	.00	.00	.00	.00	.00	.00		
16			.00	.00	.00	.00	.00	.00	.00	.00		
17			.00	.00	.00	.00	.00	.00	.00	.00		
18			.00	.00	.00	.00	.00	.00	.00	.00		
19			.00	.00	.00	.00	.00	.00	.00	.00		
20			.00	.00	24	.00	.00	.00	.00	.00		
21			.00	.00	45	.00	.00	.00	.00	.00		
22			.00	.00	44	.00	.00	.00	.00	.00		
23			.00	.00	42	.00	.00	.00	.00	.00		
24			.00	.00	43	.00	.00	.00	.00	.00		
25			.00	.00	45	.00	.00	.00	.00	.00		
26			.00	.00	46	.00	.00	.00	.00	.00		
27			.00	.00	46	.00	.00	.00	.00	.00		
28			.00	.00	46	.00	.00	.00	.00	.00		
29			.00	.00	44	.00	.00	.00	.00	.00		
30			.00	.00	34	.00	.00	.00	.00	.00		
31			.00	---	24	---	.00	.00	---	.00		
TOTAL			.00	.00	483.00	80.80	.00	.00	.00	.00		
MEAN			.00	.00	15.6	2.69	.00	.00	.00	.00		
MAX			.00	.00	46	21	.00	.00	.00	.00		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			.00	.00	958	160	.00	.00	.00	.00		

06149400 NASHLYN CANAL NEAR CONSUL, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°13'57", long 109°33'27", in NE¼ sec.22, T.3, T.27 W., third meridian, Hydrologic Unit 10050008, on left bank 0.8 mi downstream from headgate on Battle Creek, and 5.9 mi south of Consul.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). 1912, 1914-35, 1938 to current season in reports of Department of the Environment, Canada. Prior to March 1950, estimates of seasonal diversions only in many seasons. Prior to Mar. 1, 1971, published as "Stirling and Nash Ditch".

GAGE.--Water-stage recorder. Prior to Sept. 21, 1949, water-stage recorder at present site or nonrecording gages at site 0.5 mi downstream at different datums.

REMARKS.--No estimated daily discharges this year. Records good. Ditch diverts water from left bank of Battle Creek in SW¼ sec.27, T.3, R.27 W., third meridian, for irrigation of about 1,880 acres along Battle Creek.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 85 ft^3/s Apr. 14, 1952; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			2.4	13	.00	27	.00	.00	.00	.00		
2			27	13	.00	19	.00	.00	.00	.00		
3			41	13	.00	12	.00	.00	.00	.00		
4			41	11	.00	1.3	.00	.00	.00	.00		
5			46	2.2	.00	.00	.00	.00	.00	.00		
6			46	1.4	.00	.00	.00	.00	.00	.00		
7			47	17	.00	.00	.00	.00	.00	.00		
8			38	20	.00	.00	.00	.00	.00	.00		
9			42	13	.00	.00	.00	.00	.00	.00		
10			42	3.2	.00	.00	.00	.00	.00	.00		
11			39	1.6	.00	.00	.00	.00	.00	.00		
12			31	.95	.00	.00	.00	.00	.00	.00		
13			25	.64	.00	.00	.00	.00	.00	.00		
14			19	.25	.00	.00	.00	.00	.00	.00		
15			19	.00	.00	.00	.00	.00	.00	.00		
16			16	.00	.00	.00	.00	.00	.00	.00		
17			15	.00	.00	.00	.00	.00	.00	.00		
18			16	.00	.00	.00	.00	.00	.00	.00		
19			14	.00	.00	.00	.00	.00	.00	.00		
20			13	.00	.00	.00	.00	.00	.00	.00		
21			22	.00	.00	.00	.00	.00	.00	.00		
22			33	.00	.00	.00	.00	.00	.00	.00		
23			37	.00	.00	.00	.00	.00	.00	.00		
24			36	.00	.00	.00	.00	.00	.00	.00		
25			32	.00	.00	.00	.00	.00	40	.00		
26			32	.00	1.5	.00	.00	.00	26	.00		
27			14	.00	25	.00	.00	.00	1.3	.00		
28			13	.00	32	.00	.00	.00	.53	.00		
29			13	.00	32	.00	.00	.00	.00	.00		
30			13	.00	32	.00	.00	.00	.00	.00		
31			13	---	32	---	.00	.00	---	.00		
TOTAL			837.4	110.24	154.50	59.30	.00	.00	67.83	.00		
MEAN			27.0	3.67	4.98	1.98	.00	.00	2.26	.00		
MAX			47	20	32	27	.00	.00	40	.00		
MIN			2.4	.00	.00	.00	.00	.00	.00	.00		
AC-FT			1660	219	306	118	.00	.00	135	.00		

06149500 BATTLE CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°00'07", long 109°25'18", in SE¼ sec.4, T.1, R.26 W., third meridian, Hydrologic Unit 10050008, on left bank 600 ft north of international boundary, in Saskatchewan, 8 mi upstream from Woodpile Coulee, 30 mi north of Chinook, MT, and at mile 69.8.

DRAINAGE AREA.--997 mi^2, of which 378 mi^2 is probably noncontributing.

PERIOD OF RECORD.--April 1917 to current season (seasonal records only most seasons). Monthly discharge only for March 1918 and March 1928, published in WSP 1309.

REVISED RECORDS.--WSP 1389: 1935(M), 1936, 1937-38(M). WSP 1729: 1924, 1926, 1932 (montlhy discharge only). W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,729.8 ft above mean sea level (International Boundary Survey datum, adjustment of 1928).

REMARKS.--Estimated daily discharge: Feb. 25 to Mar. 7 and Oct. 31. Records good. Natural flow of stream affected by storage reservoirs, diversions for irrigation of about 9,500 acres, and return flow from irrigated areas. Water may be diverted into or from Frenchman River basin through Cypress Lake. 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.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,780 ft^3/s Sept. 25, 1986, gage height, 11.57 ft, from rating curve extended above 4,400 ft^3/s on basis of slope-area measurement of peak flow; no flow at times most seasons.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 9,780 ft^3/s Sept. 25, gage height, 11.57 ft, from rating curve extended above 4,400 ft^3/s on basis of slope-area measurement of peak flow; no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			1240	54	5.0	34	15	9.0	1.6	232		
2			763	65	4.7	32	13	8.4	1.4	191		
3			685	65	4.1	37	10	7.9	1.6	161		
4			491	59	4.3	35	9.4	7.6	2.3	136		
5			410	47	5.8	31	11	7.2	2.2	115		
6			353	43	5.8	38	13	6.3	2.3	95		
7			76	42	5.8	40	15	5.5	2.6	79		
8			71	33	5.4	32	14	4.9	2.6	62		
9			143	22	7.6	40	13	4.8	3.7	50		
10			265	19	8.8	41	11	4.4	5.4	43		
11			195	19	12	52	9.0	4.4	10	35		
12			87	26	19	63	8.0	4.1	9.0	29		
13			66	24	16	57	7.3	4.1	8.9	25		
14			46	20	9.3	42	7.3	3.5	9.3	25		
15			46	23	8.2	34	9.9	3.2	10	23		
16			91	22	7.2	34	8.7	3.1	10	20		
17			58	16	6.5	38	11	3.2	13	19		
18			30	14	6.1	37	9.3	3.0	16	17		
19			26	12	5.8	33	7.9	2.9	19	16		
20			27	11	5.6	36	36	2.6	22	16		
21			26	9.6	4.9	40	48	2.4	29	15		
22			38	8.3	7.5	40	25	2.3	28	24		
23			40	7.8	18	39	18	2.1	30	42		
24			41	7.5	21	33	15	2.2	27	41		
25		24	48	7.0	66	23	11	2.3	4130	41		
26		79	54	6.7	59	16	9.6	2.2	2290	41		
27		306	53	6.6	54	15	7.3	2.0	1650	41		
28		392	55	6.0	44	13	6.3	1.9	848	40		
29		---	68	5.5	31	15	5.7	1.9	456	40		
30		---	66	5.2	29	16	10	1.6	313	38		
31		---	61	---	29	---	10	1.7	---	37		
TOTAL			5719	706.2	516.4	1036	404.7	122.7	9953.9	1789		
MEAN			184	23.5	16.7	34.5	13.1	3.96	332	57.7		
MAX			1240	65	66	63	48	9.0	4130	232		
MIN			26	5.2	4.1	13	5.7	1.6	1.4	15		
AC-FT			11340	1400	1020	2050	803	243	19740	3550		

06151000 LYONS CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°00'17", long 109°13'48", in SW¼ sec.1, T.1, R.25 W., third meridian, Hydrologic Unit 10050008, on right bank 0.3 mi north of international boundary, 8 mi south of Arena, Saskatchewan, 28 mi north of Chinook, MT, and at mile 20.5.

DRAINAGE AREA.--66.7 mi^2.

PERIOD OF RECORD.--March 1927 to current season (seasonal records only in most seasons). Monthly discharge only for February, March 1934, published in WSP 1309. Prior to March 1962, published as Lyons Coulee at international boundary.

REVISED RECORDS.--WSP 1389: 1929(M), 1936, 1937(M), 1939, 1940-41(M), 1946(M). WSP 1629: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,800 ft, from international boundary map. Prior to Oct. 19, 1935, nonrecording gages at site 0.5 mi south of international boundary at different datum. Oct. 19, 1935, to Oct. 31, 1940, nonrecording gage at site 1.2 mi north of international boundary at different datum. Nov. 1, 1940, to Aug. 4, 1958, nonrecording gages at sites within 300 ft of present site at present datum.

REMARKS.--Estimated daily discharge: Feb. 25-28 and Oct. 31. Records good. Natural flow of stream affected by small stockwater and irrigation dams upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,400 ft^3/s Sept. 25, 1986, gage height, 6.78 ft, from rating curve extended above 300 ft^3/s on basis of slope-area measurement of peak flow; no flow most of each season.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 1,400 ft^3/s Sept. 25, gage height, 6.78 ft, from rating curve extended above 300 ft^3/s on basis of slope-area measurement of peak flow; no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			56	.00	.00	.35	.00	.00	.00	75		
2			69	.00	.00	.07	.00	.00	.00	60		
3			49	.00	.00	.00	.00	.00	.00	51		
4			65	.00	.00	.00	.00	.00	.00	45		
5			88	.00	.00	.00	.00	.00	.00	36		
6			73	.00	.00	.00	.00	.00	.00	24		
7			77	.00	.00	.00	.00	.00	.00	12		
8			111	.00	.00	.00	.00	.00	.00	7.1		
9			131	.00	.00	.00	.00	.00	.00	4.8		
10			179	.00	.00	.00	.00	.00	.00	3.3		
11			165	.00	.00	.00	.00	.00	.00	2.5		
12			122	.00	17	.00	.00	.00	.00	1.9		
13			112	.00	5.2	.00	.00	.00	.00	1.6		
14			83	.00	2.8	.00	.00	.00	.00	1.1		
15			66	.00	2.2	.00	.00	.00	.00	.95		
16			52	.00	1.4	.00	.00	.00	.00	.85		
17			37	.00	.99	.00	.00	.00	.00	.71		
18			18	.00	.99	.00	.00	.00	.00	.60		
19			9.9	.00	.64	.00	.00	.00	.00	.53		
20			6.7	.00	.35	.00	.00	.00	.00	.46		
21			6.4	.00	.25	.00	.00	.00	.00	.42		
22			3.8	.00	35	.00	.00	.00	.00	.32		
23			2.2	.00	38	.00	.00	.00	.00	.28		
24			1.2	.00	27	.00	.00	.00	.00	.25		
25		.00	.71	.00	13	.00	.00	.00	664	.21		
26		.71	.39	.00	6.9	.00	.00	.00	438	.21		
27		14	.21	.00	4.0	.00	.00	.00	249	.21		
28		15	.04	.00	2.4	.00	.00	.00	183	.18		
29		---	.00	.00	1.6	.00	.00	.00	122	.14		
30		---	.00	.00	.92	.00	.00	.00	98	.14		
31		---	.00	---	.64	---	.00	.00	---	.14		
TOTAL			1584.55	.00	161.28	.42	.00	.00	1754.00	331.90		
MEAN			51.1	.00	5.20	.01	.00	.00	58.5	10.7		
MAX			179	.00	38	.35	.00	.00	664	75		
MIN			.00	.00	.00	.00	.00	.00	.00	.14		
AC-FT			3140	.00	320	.8	.00	.00	3480	658		

06151500 BATTLE CREEK NEAR CHINOOK, MT

LOCATION.--Lat 48°39'05", long 109°13'50", in NW¼SW¼SE¼ sec.3, T.33 N., R.19 E., Blaine County, Hydrologic Unit 10050008, on right bank, 4 mi north of Chinook, and at mile 14.

DRAINAGE AREA.--1,539 mi^2.

PERIOD OF RECORD.--April 1905 to September 1921 (monthly discharge only, published in WSP 1309), June 1984 to current year (seasonal records only). Published as North Fork Milk River near Chinook prior to 1913.

GAGE.--Water-stage recorder. Elevation of gage is 2,410 ft above National Geodetic Vertical Datum of 1929, from topographic map. Apr. 22, 1905 to Apr. 8, 1918, chain gage 100 ft downstream, and Apr. 9, 1918 to Sept. 30, 1921, chain gage on bridge 600 ft downstream at same datum but different from present datum.

REMARKS.--Estimated daily discharges: Sept. 26 to Oct. 3; Oct. 31. Records fair. Diversions for irrigation of about 11,000 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,400 ft^3/s Sept. 26, 1986, gage height, 22.91 ft, from rating curve extended above 900 ft^3/s, on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 19,400 ft^3/s Sept. 26, gage height, 22.91 ft, from rating curve extended above 900 ft^3/s, on basis of slope-area measurement of peak flow; minimum daily, 0.40 ft^3/s Aug. 31, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				65	4.5	41	14	5.2	.43	800		
2				69	3.8	35	12	4.5	.59	600		
3				59	3.8	36	11	3.8	.59	450		
4				60	3.5	29	10	2.7	.59	371		
5				61	4.5	33	19	3.5	1.4	312		
6				56	5.2	32	20	3.8	1.3	261		
7				49	6.3	33	18	2.6	1.1	225		
8				44	4.8	40	25	1.8	.60	188		
9				43	7.6	41	33	1.6	.40	159		
10				39	9.6	31	28	1.6	.59	132		
11				33	13	33	26	1.6	1.0	109		
12				33	96	36	28	1.3	1.3	97		
13				32	365	39	26	1.3	1.4	88		
14				29	141	49	25	1.8	1.6	83		
15				31	76	49	25	2.2	1.7	76		
16				28	52	39	24	2.5	3.5	73		
17				30	39	35	19	2.2	6.8	71		
18				28	32	32	6.9	1.4	8.6	68		
19				26	26	33	6.3	.83	10	65		
20				22	21	34	9.6	.69	14	64		
21				21	17	32	19	.82	16	59		
22				18	131	30	18	.78	17	58		
23				14	905	32	35	1.1	19	52		
24				11	402	33	37	1.3	24	56		
25				10	214	34	24	1.1	2560	64		
26				7.8	149	33	17	1.3	12000	63		
27				6.3	122	29	15	1.3	5900	63		
28				6.3	97	23	11	.96	3500	61		
29				5.2	81	19	9.1	.70	2000	59		
30				4.8	62	16	8.1	.49	1200	59		
31				---	48	---	6.3	.40	---	58		
TOTAL				941.4	3142.6	1011	585.3	57.17	27293.49	4944		
MEAN				31.4	101	33.7	18.9	1.84	910	159		
MAX				69	905	49	37	5.2	12000	800		
MIN				4.8	3.5	16	6.3	.40	.40	52		
AC-FT				1870	6230	2010	1160	113	54140	9810		

06154000 MILK RIVER "A" CANAL, NEAR HARLEM, MT

LOCATION.--Lat 48°29'10", long 108°45'56", in SE¼NW¼SE¼ sec. 32, T.32 N., R.23 E., Blaine County, Hydrologic Unit 10050004, on left bank at Fork Belknap Agency, Fort Belknap Indian Reservation, 40 feet downstream from headgate on Milk River, and 4.0 miles south of Harlem.

PERIOD OF RECORD.--July 1905 to September 1910 (gage heights and discharge measurements only), Apr. 13, 1911, to May 24, 1920, staff gage at site 0.75 mi downstream below wasteway at different datum. May 25, to July 31, 1920 staff gage 500 feet below headgate at different datum, June to September 1986 (seasonal records only). Seasonal records only collected 1910-1920. Miscellaneous measurements obtained 1914, 1921, 1934, 1958. Prior to Apr. 30, 1986 published at Agency Ditch near Harlem.

GAGE.--Water-stage recorder and electromagnetic flow meter. Datum of gage is 2,330.045 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Indian Affairs).

REMARKS.--Estimated daily discharges: July 22, 26. Records poor. Canal diverts water from right bank of Milk River in SE¼NW¼SE¼ sec.32, T.32 N., R.23 E., for irrigation of about 10,000 acres on the Fort Belknap Indian Reservation.

EXTREMES FOR PERIOD OF RECORD.--1905, 1910-20: Maximum discharge, 128 ft^3/s May 28, 1916.

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	32	49	45
2									1.4	43	48	44
3									.00	51	49	43
4									.00	55	49	43
5									.00	55	48	44
6									19	54	46	44
7									20	57	43	45
8									20	67	48	33
9									20	67	46	19
10									20	65	47	20
11									14	65	46	19
12									1.3	64	50	15
13									.98	64	54	24
14									.75	61	53	32
15									.50	54	53	31
16									19	50	52	31
17									28	40	53	10
18									40	40	54	
19									73	31	52	
20									90	28	48	
21									90	46	45	
22									90	55	48	
23									90	51	46	
24								.00	90	22	46	
25								.00	89	32	46	
26								.00	84	50	45	
27								.00	50	51	45	
28								.00	34	50	44	
29								.00	39	50	41	
30								.00	30	50	43	
31								.00	---	70	43	
TOTAL									1116.93	1570	1480	
MEAN									37.2	50.6	47.7	
MAX									90	70	54	
MIN									.00	22	41	

06154100 MILK RIVER NEAR HARLEM, MT

LOCATION.--Lat 48°29'22", long 108°45'28", in NE¼SE¼NE¼ sec.32, T.32 N., R.23 E., Blaine County, Hydrologic Unit 10050004, Fort Belknap Indian Reservation, on right bank 30 ft downstream from U.S. Highway 2 bridge, 0.6 mi northeast of unincorporated community of Fort Belknap Agency, 3.5 mi southeast of Harlem, and at mile 332.2.

DRAINAGE AREA.--9,822 mi^2.

PERIOD OF RECORD.--October 1959 to September 1969, October 1982 to current year. Gage heights only for period Apr. 3-25, 1952, published as "at Fort Belknap" in 1260-B.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,319.48 ft above National Geodetic Vertical Datum of 1929. Apr. 3-25, 1952, nonrecording gage on old bridge 200 ft downstream at different datum. Nov. 1, 1959, to Mar. 12, 1968, nonrecording gage or water-stage recorder at several sites within 0.5 mi of present site at different datum.

REMARKS.--Estimated daily discharges: Nov. 11 to Mar. 7. Records fair except those for estimated daily discharges, which are poor. Flow increased during irrigation season by water from St. Mary Canal (station number 05018500). Flow mainly regulated by Fresno Reservoir (station number 06136500) since 1939. Diversions for irrigation of about 60,000 acres of which about 13,000 acres lie 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.--14 years (1960-69, 1983-86), 373 ft^3/s, 270,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,900 ft^3/s Sept. 29, 1986, gage height, 25.73 ft; minimum daily, 0.44 ft^3/s July 24, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1952 reached a stage of about 23.5 ft, present site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,900 ft^3/s Sept. 29, gage height, 25.73 ft; minimum daily, 80 ft^3/s Dec. 1, 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	426	420	80	93	110	1500	445	366	1580	888	508	500
2	428	419	80	92	110	2300	444	300	1430	872	531	562
3	429	373	84	91	112	2500	484	259	1250	800	529	536
4	421	237	86	90	114	2400	479	240	1080	670	523	515
5	417	187	88	90	114	2200	474	413	1010	665	524	470
6	423	184	95	90	110	1900	483	528	937	690	517	487
7	441	173	100	92	106	1600	465	531	906	715	484	502
8	455	170	100	94	100	1280	440	436	906	658	482	509
9	458	121	98	96	95	1070	431	536	919	633	498	529
10	455	105	94	98	90	1210	429	700	873	565	497	556
11	458	100	92	100	88	1640	408	913	843	444	495	519
12	421	95	90	103	85	1510	308	1410	779	408	496	506
13	404	90	90	106	86	1100	204	2120	720	430	483	503
14	385	95	92	110	88	848	178	1880	678	473	459	500
15	359	100	94	112	89	707	162	1450	637	485	477	453
16	342	110	96	114	90	611	165	1340	559	482	452	459
17	343	110	100	116	90	541	186	1260	495	485	414	494
18	375	108	102	118	89	486	192	1160	401	555	420	475
19	422	102	104	120	88	447	197	1080	257	594	416	471
20	438	98	106	120	86	375	187	1020	243	667	390	557
21	441	96	108	118	90	337	174	989	380	666	389	589
22	444	94	110	116	95	294	174	1260	414	688	404	442
23	444	92	108	114	100	261	171	2320	578	678	437	344
24	436	90	106	112	110	318	168	3000	507	701	430	333
25	440	88	104	112	150	409	265	2600	449	651	428	2450
26	435	86	102	110	200	409	356	2430	503	549	421	5560
27	432	84	100	110	600	390	353	2360	384	529	401	6380
28	429	82	98	110	1000	365	362	2210	247	540	387	8300
29	428	81	96	110	---	371	367	2050	669	532	396	12900
30	423	81	94	110	---	391	354	1870	846	445	403	10000
31	419	---	94	110	---	447	---	1740	---	483	435	---
TOTAL	13071	4271	2991	3277	4285	30217	9505	40771	21480	18641	14126	57401
MEAN	422	142	96.5	106	153	975	317	1315	716	601	456	1913
MAX	458	420	110	120	1000	2500	484	3000	1580	888	531	12900
MIN	342	81	80	90	85	261	162	240	243	408	387	333
AC-FT	25930	8470	5930	6500	8500	59940	18850	80870	42610	36970	28020	113900

CAL YR 1985	TOTAL	76855.3	MEAN	211	MAX	711	MIN	3.0	AC-FT	152400
WTR YR 1986	TOTAL	220036	MEAN	603	MAX	12900	MIN	80	AC-FT	436400

06154140 FIFTEENMILE CREEK TRIBUTARY NEAR HARLEM, MT

LOCATION.--Lat 48°19'29", long 108°42'49", in SW¼NW¼SW¼ sec.26, T.30 N., R.23 E., Blaine County, Hydrologic Unit 10050004, just downstream of culvert on State Highway 66, 1.7 mi upstream of mouth, and 15.5 mi south of Harlem.

DRAINAGE AREA.--2.31 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,650 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 15 to Dec. 16, Feb. 10-27. Records fair. No known regulation or diversion upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 180 ft^3/s Feb. 25, 1986, gage height, 3.61 ft; no flow most days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 180 ft^3/s Feb. 25, gage height, 3.61 ft; no flow most 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	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.00	.00
10	.00	.00	.00	1.0	.00	.00	.00	.75	.00	.00	.00	.00
11	.72	.00	.00	5.0	.00	.00	.00	.52	.00	.00	.00	.00
12	.01	.00	.00	2.0	.00	.00	.00	2.6	.00	.00	.00	.00
13	.00	.00	.00	.90	.00	.00	.00	.24	.00	.00	.00	.00
14	.00	.00	.00	.20	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.62
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	5.8	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	4.0	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.05
25	.00	.00	.00	.00	90	.00	.00	.00	.00	.00	.00	46
26	.00	.00	.00	.00	30	.00	.00	.00	.00	.00	.00	2.8
27	.00	.00	.00	.00	4.0	.00	.00	.00	.00	.00	.00	.02
28	.00	.00	.00	.00	1.2	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.73	.00	.00	9.10	125.20	.00	.00	15.88	.00	.00	.00	49.49
MEAN	.02	.00	.00	.29	4.47	.00	.00	.51	.00	.00	.00	1.65
MAX	.72	.00	.00	5.0	90	.00	.00	5.8	.00	.00	.00	46
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1.4	.00	.00	18	248	.00	.00	31	.00	.00	.00	98

CAL YR 1985	TOTAL	7.58	MEAN	.02	MAX	1.0	MIN	.00	AC-FT	15
WTR YR 1986	TOTAL	200.40	MEAN	.55	MAX	90	MIN	.00	AC-FT	397

06154400 PEOPLES CREEK NEAR HAYS, MT

LOCATION.--Lat 48°13'25", long 108°42'48", in SW¼ sec.35, T.29 N., R.23 E., Blaine County, Hydrologic Unit 1005009, on right bank 45 ft downstream from bridge on State Highway 66, 2.5 mi downstream from Myrtle Creek, 16.4 mi north of Hays, and at mile 47.2.

DRAINAGE AREA.--220 mi^2.

PERIOD OF RECORD.--December 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,714.10 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 7 to Feb. 25, Apr. 13-15. Records good except those for estimated daily discharges, which are poor. Some storage in numerous stock and beaver ponds and diversions for irrigation of about 1,300 acres upstream of station. 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.

AVERAGE DISCHARGE.--19 years (water years 1968-86), 16.4 ft^3/s, 11,880 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,460 ft^3/s June 8, 1972, gage height, 15.03 ft, from floodmark, from rating curve extended above 490 ft^3/s on basis of slope-area measurement of peak flow; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	unknown	*1,530	*a9.02	May 22	1000	520	6.73
May 12	1100	246	5.67	Sept. 25	1430	730	7.17

a--from floodmark.

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	4.0	6.0	3.0	4.5	5.0	73	18	14	73	19	2.7	.00
2	4.2	8.0	2.5	5.0	4.5	62	19	14	67	19	2.3	.00
3	4.0	8.7	3.0	4.5	5.0	52	19	13	60	16	2.1	.00
4	4.1	8.6	3.5	4.0	5.5	41	19	13	55	13	2.7	.00
5	4.2	9.0	4.0	4.5	5.5	35	19	23	51	13	2.3	.16
6	3.9	9.3	4.5	5.0	5.5	32	18	31	51	14	2.1	2.1
7	3.8	8.5	5.0	7.0	5.0	31	16	43	56	13	1.7	4.6
8	2.8	7.0	4.0	8.0	5.0	32	14	46	65	13	.96	6.3
9	4.0	6.0	3.0	10	4.5	29	15	50	69	12	.80	8.8
10	4.0	7.0	2.5	9.0	4.0	29	15	70	58	9.9	.33	9.2
11	4.4	8.0	2.0	10	3.5	26	15	139	49	9.2	.00	8.9
12	4.7	9.0	1.5	9.0	3.5	22	16	229	43	8.3	.00	11
13	7.2	12	1.5	9.5	4.0	21	17	178	39	7.7	.00	10
14	7.0	11	1.6	9.5	4.5	21	18	123	36	7.4	.00	11
15	7.0	11	1.8	10	5.0	20	19	105	34	6.6	.00	12
16	6.2	12	1.8	11	6.0	20	20	106	35	6.3	.00	14
17	6.1	12	2.0	12	6.0	20	23	109	35	5.2	.00	17
18	5.9	10	2.5	14	5.5	20	27	103	31	5.2	.00	20
19	6.0	9.0	3.0	15	5.0	19	26	98	28	5.8	.00	29
20	5.9	8.0	2.8	13	5.0	19	22	88	25	8.5	.00	40
21	5.3	8.0	2.8	10	6.0	18	20	87	23	7.1	.00	37
22	5.4	6.0	3.0	9.0	8.0	17	19	305	20	6.1	1.7	30
23	5.2	4.5	2.8	9.0	10	20	17	187	20	5.2	2.0	21
24	5.2	5.0	3.0	8.0	50	20	16	173	19	5.8	1.3	19
25	4.9	5.5	2.8	6.0	600	19	16	158	18	5.1	1.1	408
26	4.9	5.0	3.5	5.0	419	19	16	129	16	5.8	.94	383
27	5.2	4.5	3.5	4.7	197	19	15	107	16	6.9	.49	302
28	5.4	4.0	3.0	5.5	94	18	15	98	15	6.9	.17	161
29	5.4	3.5	2.5	5.5	---	18	15	91	16	5.8	.41	93
30	5.6	3.5	3.0	5.0	---	18	14	85	16	4.0	.32	70
31	5.7	---	3.5	5.5	---	18	---	78	---	3.4	.00	---
TOTAL	157.6	229.6	88.9	247.7	1481.5	828	538	3093	1139	274.2	26.42	1728.06
MEAN	5.08	7.65	2.87	7.99	52.9	26.7	17.9	99.8	38.0	8.85	.85	57.6
MAX	7.2	12	5.0	15	600	73	27	305	73	19	2.7	408
MIN	2.8	3.5	1.5	4.0	3.5	17	14	13	15	3.4	.00	.00
AC-FT	313	455	176	491	2940	1640	1070	6130	2260	544	52	3430

CAL YR 1985	TOTAL	1487.63	MEAN	4.08	MAX	29	MIN	.00	AC-FT	2950
WTR YR 1986	TOTAL	9831.98	MEAN	26.9	MAX	600	MIN	.00	AC-FT	19500

06154410 LITTLE PEOPLES CREEK NEAR HAYS, MT

LOCATION.--Lat 47°57'59", long 108°39'37", in SE¼SE¼NW¼ sec.32, T.26 N., R.24 E., Blaine County, Hydrologic Unit 10050009, on right bank 0.5 mi upstream from entrance to Mission Canyon, 2 mi southeast of Hays, and at mile 23.1.

DRAINAGE AREA.--13.0 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR MT-81-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,760 ft, from topographic map. August 1972 to June 24, 1976, gage at present site at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 5 to Dec. 16, July 16-22. Water-discharge records poor. No known regulation or diversion upstream from station.

AVERAGE DISCHARGE.--14 years, 4.87 ft^3/s, 3,530 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 576 ft^3/s May 25, 1974, gage height, 4.57 ft, from floodmark, at site and datum then in use, from rating curve extended above 44 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.92 ft^3/s Mar. 21, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 22	2000	51	12.23	May 24	0300	59	12.35
May 23	1300	*116	*12.94	Sept. 25	1200	98	12.24

Minimum discharge, 1.55 ft^3/s Aug. 25.

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	3.5	4.9	4.0	3.5	3.8	3.6	5.1	6.4	16	13	3.2	2.2
2	3.5	4.6	4.0	3.6	3.8	3.6	5.1	6.4	17	13	3.2	2.2
3	3.5	4.6	4.0	3.6	3.8	3.6	5.1	6.4	17	13	3.2	2.3
4	3.8	4.6	4.0	3.6	3.7	3.5	5.1	6.6	16	13	3.2	2.3
5	3.7	4.5	4.0	3.6	3.6	4.0	5.1	7.7	17	14	3.2	2.3
6	3.6	4.5	4.5	3.6	3.5	4.4	5.1	11	18	13	3.2	2.3
7	3.6	4.5	4.5	3.5	3.5	4.9	5.1	12	18	13	3.2	2.2
8	3.6	4.5	5.0	3.5	3.5	5.3	5.1	13	17	13	3.0	2.3
9	3.6	4.5	4.5	3.5	3.5	5.7	4.9	13	17	13	2.6	2.3
10	3.6	4.5	4.0	3.5	3.5	5.9	4.9	13	17	13	2.7	2.4
11	3.5	4.5	4.0	3.5	3.3	5.9	4.9	19	16	13	2.6	2.6
12	3.6	4.5	3.5	3.5	3.3	5.9	4.9	18	16	12	2.6	2.6
13	3.6	4.5	3.5	3.6	3.5	5.7	4.9	23	16	12	2.3	2.4
14	4.0	4.0	3.5	3.6	3.5	5.7	4.9	29	16	12	2.4	2.4
15	4.9	4.0	3.5	3.6	3.5	5.7	4.9	8.0	16	11	2.4	2.4
16	6.4	4.0	3.5	3.6	3.5	5.5	4.9	11	15	10	2.4	2.5
17	7.2	4.0	3.3	3.5	3.5	5.5	4.9	9.9	15	9.0	2.4	2.7
18	7.0	4.0	3.3	3.5	3.5	5.5	4.7	7.7	15	8.0	2.4	2.4
19	6.8	4.0	3.4	3.5	3.3	5.4	4.7	6.6	14	7.0	2.3	2.6
20	6.8	4.0	3.5	3.5	3.3	5.3	4.7	6.8	14	6.0	2.2	2.7
21	7.2	4.5	3.5	3.3	3.3	5.5	5.3	7.9	13	5.0	2.2	2.7
22	7.0	4.5	3.5	3.3	3.3	5.7	6.4	24	13	4.5	2.0	2.6
23	6.8	4.5	3.6	3.5	3.3	5.3	6.6	46	13	4.0	1.9	2.6
24	6.6	4.5	3.5	3.5	3.5	5.3	6.6	26	13	3.5	1.9	2.7
25	6.6	4.5	3.5	3.5	3.6	5.3	6.6	10	13	3.6	1.9	30
26	6.1	4.5	3.5	3.3	3.6	5.3	6.6	7.5	13	3.3	2.2	20
27	5.8	4.5	3.5	3.3	3.6	5.3	6.6	7.9	13	3.2	2.0	19
28	5.7	4.5	3.5	3.6	3.6	5.3	6.6	9.1	13	3.2	2.0	16
29	5.5	4.5	3.5	3.6	---	5.1	6.4	11	14	3.2	2.0	14
30	5.5	4.5	3.5	3.8	---	5.1	6.4	13	13	3.2	2.0	13
31	5.3	---	3.5	3.8	---	5.1	---	14	---	3.1	2.2	---
TOTAL	157.9	132.2	116.1	109.4	98.2	158.9	163.1	410.9	454	270.8	77.0	170.7
MEAN	5.09	4.41	3.75	3.53	3.51	5.13	5.44	13.3	15.1	8.74	2.48	5.69
MAX	7.2	4.9	5.0	3.8	3.8	5.9	6.6	46	18	14	3.2	30
MIN	3.5	4.0	3.3	3.3	3.3	3.5	4.7	6.4	13	3.1	1.9	2.2
AC-FT	313	262	230	217	195	315	324	815	901	537	153	339

CAL YR 1985	TOTAL	1183.93	MEAN	3.24	MAX	13	MIN	.92	AC-FT	2350
WTR YR 1986	TOTAL	2319.2	MEAN	6.35	MAX	46	MIN	1.9	AC-FT	4600

06154410 LITTLE PEOPLES CREEK NEAR HAYS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1977 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)
NOV 04...	1545	4.5	80	1	470	10.0	8.0
DEC 17...	--	3.2	--	--	470	2.0	4.5
JAN 28...	--	3.4	--	--	510	3.0	6.0
MAR 26...	1400	5.3	25	1	448	10.0	8.0
APR 22...	--	6.7	--	--	400	23.0	8.0
JUN 02...	1345	18	0	0	405	29.0	14.0
JUL 23...	1400	4.2	0	0	460	27.0	15.0
SEP 24...	--	2.9	--	--	450	15.0	10.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
NOV 04...	1545	8.30	260	44	68	21	4.4	0.1	1.8
MAR 26...	1400	7.30	240	100	65	20	4.4	0.1	1.8
JUN 02...	1345	8.20	200	7	54	16	4.3	0.1	2.1
JUL 23...	1400	8.30	240	21	63	21	3.5	0.1	1.9

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 DIS-SOLVED (MG/L AS N) (00631)
NOV 04...	212	30	0.8	0.4	12	270	0.36	3.2	<0.10
MAR 26...	140	22	0.7	0.4	11	210	0.28	3.0	<0.10
JUN 02...	194	30	0.6	0.3	12	240	0.32	11	<0.10
JUL 23...	223	30	0.9	0.3	11	270	0.36	3.0	<0.10

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
NOV 04...	--	20	--	--	4	--	--	--	--
MAR 26...	6	20	<1	<10	<3	1	<1	<0.1	<1
JUN 02...	--	20	--	--	28	--	--	--	--
JUL 23...	--	20	--	--	5	--	--	--	--

06154490 WILLOW COULEE NEAR DODSON, MT

LOCATION.--Lat 48°19'31", long 108°24'52", in SW¼NE¼SE¼ sec.25, T.30 N., R.25 E., Blaine County, Hydrologic Unit 10050009, just below culvert on county road 1.1 mi upstream of mouth and 9.5 mi southwest of Dodson.

DRAINAGE AREA.--5.16 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,450 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-9, Oct. 16 to June 24, Sept. 25-30. Records fair except those for estimated daily discharges, which are poor. No known diversion for irrigation upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,310 ft^3/s Sept. 25, 1986, gage height, 7.84 ft, from floodmark by computation of peak flow through culvert and over road; no flow periods most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,310 ft^3/s Sept. 25, gage height, 7.84 ft, from floodmarks, by computation of peak flow through culvert and over road; no flow most 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	35	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	25	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	15	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	10	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	7.0	.00	55	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	5.0	.00	2.5	4.0	.00	.00	.00
7	.00	.00	.00	.00	.00	3.5	.00	1.0	.40	.00	.00	.00
8	.00	.00	.00	.00	.00	2.7	.00	.50	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	2.2	.00	100	.00	.00	.00	.00
10	.15	.00	.00	.00	.00	1.7	.00	20	.00	.00	.00	.00
11	13	.00	.00	.10	.00	1.3	.00	75	.00	.00	.00	.00
12	9.4	.00	.00	.20	.00	1.0	.00	30	.00	.00	.00	.00
13	2.3	.00	.00	.10	.00	.80	.00	7.0	.00	.00	.00	.00
14	.57	.00	.00	.00	.00	.60	.00	1.0	.00	.00	.00	.00
15	.13	.00	.00	.00	.00	.50	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.10	.00	.30	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.40	.00	.24	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	1.0	.00	.18	.00	.00	.00	.00	.00	15
20	.00	.00	.00	.80	.00	.12	.00	.00	.00	.00	.00	3.2
21	.00	.00	.00	.20	.00	.06	.00	1.0	.00	.00	.00	1.2
22	.00	.00	.00	.04	.00	.00	.00	60	.00	.00	.00	.02
23	.00	.00	.00	.02	.00	.00	.00	5.0	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00	.01
25	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00	775
26	.00	.00	.00	.00	10	.00	.00	.00	.00	.00	.00	20
27	.00	.00	.00	.00	150	.00	.00	.00	.00	.00	.00	7.0
28	.00	.00	.00	.00	50	.00	.00	.00	.00	.00	.00	2.0
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.70
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.20
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	25.55	.00	.00	2.96	210.10	112.60	.00	358.50	4.40	.00	.00	824.33
MEAN	.82	.00	.00	.09	7.50	3.63	.00	11.6	.15	.00	.00	27.5
MAX	13	.00	.00	1.0	150	35	.00	100	4.0	.00	.00	775
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	51	.00	.00	5.9	417	223	.00	711	8.7	.00	.00	1640

CAL YR 1985	TOTAL	163.36	MEAN	.45	MAX	22	MIN	.00	AC-FT	324
WTR YR 1986	TOTAL	1538.44	MEAN	4.21	MAX	775	MIN	.00	AC-FT	3050

06154500 PEOPLES CREEK NEAR DODSON, MT

LOCATION.--Lat 48°20'34", long 108°21'32", in SE¼SE¼NW¼ sec.21, T.30 N., R.26 E., Phillips County, Hydrologic Unit 10050009, on right bank 0.8 mi upstream of Indian Service diversions, 6.5 mi southwest of Dodson, and at mile 7.

DRAINAGE AREA.--670 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1918 to November 1921 (fragmentary), June 1951 to September 1973, October 1981 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,310 ft, by barometer. Prior to June 1951, nonrecording gage at site 2 mi downstream at different datum. June 1, 1951, to Aug. 11, 1956, water-stage recorder at site 300 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Oct. 8-11 and Nov. 8 to Feb. 27. Water-discharge records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 3,300 acres upstream from station.

AVERAGE DISCHARGE.--27 years (1951-73, 1982-86) 33.8 ft^3/s, 24,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,590 ft^3/s Sept. 25, 1986, gage height, 15.67 ft, from floodmark; maximum gage height, 17.05 ft Mar. 29, 1952 (backwater from ice), from floodmark in gage house; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	0015	--	a 12.56	June 29	2330	1,290	8.26
May 12	0030	2,120	9.76	Sept. 25	1045	*7,590	*15.67
May 22	1915	1,680	9.00				

a--backwater from ice.

Minimum discharge, 0.45 ft^3/s Sept. 1-4, gage height, 3.00 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	11	13	1.0	2.5	8.0	601	39	23	255	213	10	.53
2	10	14	.90	3.0	9.0	456	39	23	221	100	9.3	.54
3	9.9	15	1.0	2.5	10	344	37	23	190	69	9.1	.58
4	9.1	21	1.3	2.0	12	240	37	23	173	55	8.8	.60
5	8.7	21	1.5	2.0	10	182	38	173	166	54	8.3	1.1
6	9.4	21	2.0	2.5	9.0	137	37	174	154	53	8.1	2.0
7	11	21	2.5	3.5	7.0	107	35	113	168	54	7.2	2.5
8	11	15	1.8	4.5	6.0	121	33	94	173	49	8.6	3.5
9	12	11	1.5	5.5	5.0	112	31	389	172	44	8.0	8.6
10	16	9.0	1.5	5.0	5.0	98	30	718	161	54	7.0	12
11	29	9.0	1.2	6.0	4.0	94	30	768	140	62	6.5	13
12	79	7.0	1.0	5.5	3.5	82	30	1920	117	46	6.4	12
13	44	8.0	1.0	6.0	4.0	76	25	1230	103	36	6.3	13
14	33	8.0	1.5	6.0	3.5	71	23	839	95	31	6.0	15
15	33	8.0	2.0	6.5	4.0	67	32	739	91	29	5.2	16
16	29	6.0	2.0	7.0	5.0	64	35	695	84	27	4.2	18
17	24	4.5	2.0	7.5	5.0	62	36	619	81	26	3.6	22
18	20	3.0	2.5	7.5	5.0	58	49	531	75	24	3.5	37
19	19	2.0	2.5	8.0	4.5	56	47	472	68	23	3.1	85
20	18	1.5	2.3	7.5	4.5	54	43	447	63	25	2.2	105
21	17	1.5	2.3	7.0	5.0	53	37	442	59	27	2.3	96
22	16	1.5	2.5	6.5	9.0	50	34	992	54	26	2.9	60
23	15	1.2	2.5	7.0	35	48	31	1420	50	23	8.3	44
24	13	1.4	2.0	7.0	70	50	28	1110	48	22	6.8	35
25	14	1.5	1.5	6.5	500	47	27	970	44	22	4.0	5070
26	13	1.2	2.0	6.5	2000	45	26	763	40	18	2.6	4200
27	12	1.2	2.0	6.7	1100	44	26	594	38	15	2.2	1810
28	12	1.2	1.5	8.0	853	44	25	482	34	15	1.7	1170
29	13	1.0	1.5	8.0	---	42	25	404	242	15	1.2	868
30	13	1.0	1.5	8.0	---	40	24	347	529	14	.94	693
31	13	---	2.0	8.0	---	40	---	297	---	12	.62	---
TOTAL	587.1	230.7	54.30	179.7	4696.0	3585	989	17834	3888	1283	164.96	14413.95
MEAN	18.9	7.69	1.75	5.80	168	116	33.0	575	130	41.4	5.32	480
MAX	79	21	2.5	8.0	2000	601	49	1920	529	213	10	5070
MIN	8.7	1.0	.90	2.0	3.5	40	23	23	34	12	.62	.53
AC-FT	1160	458	108	356	9310	7110	1960	35370	7710	2540	327	28590

CAL YR 1985	TOTAL	3405.89	MEAN	9.33	MAX	85	MIN	.00	AC-FT	6760
WTR YR 1986	TOTAL	47905.71	MEAN	131	MAX	5070	MIN	.53	AC-FT	95020

06154500 PEOPLES CREEK NEAR DODSON, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1982 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 WATER (DEG C) (00010)
NOV 06...	1000	22	10	1	1020	2.5	3.0
JAN 27...	1310	6.7	--	--	1100	8.0	0.0
FEB 27...	1350	1090	--	--	265	7.0	0.5
MAR 05...	0930	186	50	1	475	3.0	3.0
APR 23...	1000	31	100	2	1080	8.5	10.0
JUN 03...	1030	193	100	2	700	22.0	21.0
AUG 05...	1205	8.3	--	--	740	30.0	21.5

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
NOV 06...	1000	8.30	370	110	78	43	82	2	7.3	264
MAR 05...	0930	7.80	140	35	33	15	41	2	6.1	109
APR 23...	1000	8.10	390	150	83	45	95	2	7.2	247
JUN 03...	1030	8.30	270	42	64	27	44	1	5.9	229

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
NOV 06...	270	11	0.50	8.0	660	0.90	39	<0.100	220	8
MAR 05...	120	3.6	0.20	9.6	290	0.40	148	<0.100	80	310
APR 23...	330	7.8	0.50	7.8	720	0.99	61	<0.100	200	11
JUN 03...	140	3.7	0.40	10	430	0.59	225	<0.100	130	34

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
APR 23...	1000	7	<1	<10	3	10	<0.1	<1

06154510 KUHR COULEE TRIBUTARY NEAR DODSON, MT

LOCATION.--Lat 48°20'21", long 108°23'17", in SW¼NW¼SW¼ sec. 20, T.30 N., R.26 E., Phillips County, at culvert ir county road 0.5 mi upstream of Kuhr Coulee and 8.5 mi southwest of Dodson.

DRAINAGE AREA.--1.25 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,430 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 19, 20, Feb. 25 to Mar. 2, 18, May 12 to June 2, 5-24, Sept. 25. Records poor. No known diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 436 ft^3/s Sept. 25, 1986, gage height, 15.82 ft, from floodmark, based on rating curve developed on basis of culvert computation of peak flow; no flow most days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 436 ft^3/s Sept. 25, gage height, 15.82 ft, from floodmark, based or rating curve developed on basis of culvert computation of peak flow; no flow most 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	1.0	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	14	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.52	1.0	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	25	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	5.3	.00	.00	.00	.00
11	3.3	.00	.00	.00	.00	.00	.00	19	.00	.00	.00	.00
12	.48	.00	.00	.00	.00	.00	.00	10	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	1.0	.00	.00	.00	.00	.00	.00	.00	.92
20	.00	.00	.00	.50	.00	.00	.00	.00	.00	.00	.00	.50
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.36
22	.00	.00	.00	.00	.00	.00	.00	15	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12
25	.00	.00	.00	.00	20	.00	.00	.00	.00	.00	.00	200
26	.00	.00	.00	.00	30	.00	.00	.00	.00	.00	.00	1.8
27	.00	.00	.00	.00	15	.00	.00	.00	.00	.00	.00	.19
28	.00	.00	.00	.00	5.0	.00	.00	.00	.00	.00	.00	.10
29	.00	.00	.00	.00	---	.00	.00	.00	.07	.00	.00	.08
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.05
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	3.78	.00	.00	1.50	70.00	1.10	.00	90.82	1.17	.00	.00	204.12
MEAN	.12	.00	.00	.05	2.50	.03	.00	2.93	.04	.00	.00	6.80
MAX	3.3	.00	.00	1.0	30	1.0	.00	25	1.0	.00	.00	200
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	7.5	.00	.00	3.0	139	2.2	.00	180	2.3	.00	.00	405

CAL YR 1985	TOTAL	25.05	MEAN	.07	MAX	11	MIN	.00	AC-FT	50
WTR YR 1986	TOTAL	372.49	MEAN	1.02	MAX	200	MIN	.00	AC-FT	739

06155030 MILK RIVER NEAR DODSON, MT

LOCATION.--Lat 48°24'11", long 108°17'35", in NE¼SE¼NW¼ sec.36, T.31 N., R.26 E., Phillips County, Hydrologic Unit 10050004, on left bank 30 ft downstream from U.S. Highway 2 bridge, 0.95 mi downstream from Dodson Dam, 1.9 mi west of Dodson, and at mile 273.2.

DRAINAGE AREA.--11,192 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,250 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 11 to Mar. 10, and May 11-15. Records good except those for estimated daily discharges, which are poor. Numerous diversions for irrigation 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, 13,200 ft^3/s Sept. 26, 1986, gage height, 29.79 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,200 ft^3/s Sept. 26, gage height, 29.79 ft; minimum daily, 10 ft^3/s Mar. 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	28	24	20	40	150	5500	15	103	1910	360	45	29
2	15	25	20	45	140	5000	17	112	1780	596	45	30
3	13	25	25	40	150	4700	20	107	1570	471	47	33
4	14	25	35	35	160	4300	23	83	772	362	51	38
5	14	24	35	30	140	4200	32	111	496	318	54	35
6	14	21	40	35	110	4100	43	298	806	272	61	43
7	14	150	45	40	100	4000	52	543	844	274	69	47
8	14	212	35	45	90	2500	105	567	810	283	72	51
9	15	180	30	60	80	1500	313	638	815	228	64	65
10	17	173	35	60	70	750	143	1170	814	161	57	86
11	18	100	25	70	60	700	79	1300	805	100	54	120
12	19	70	20	60	50	700	57	1500	721	51	52	124
13	20	80	20	60	60	650	48	1700	626	35	50	104
14	22	80	25	60	60	650	35	2000	533	30	47	103
15	21	80	30	60	65	600	27	2300	469	30	39	109
16	20	90	30	80	80	578	24	2500	386	31	24	124
17	20	100	35	100	80	479	21	2170	305	32	25	116
18	19	90	35	130	75	436	19	1990	201	33	24	129
19	19	70	40	170	70	403	18	1840	130	36	24	172
20	19	50	35	160	60	375	19	1670	83	49	24	191
21	19	45	35	150	65	268	22	1540	68	104	24	233
22	20	35	40	130	70	129	24	1540	63	130	23	270
23	21	25	40	140	90	125	25	2640	48	139	23	209
24	22	25	35	150	110	121	25	3560	28	126	24	108
25	23	30	30	140	150	115	25	3760	43	131	24	3690
26	22	25	40	140	1000	88	27	3570	76	127	24	11500
27	23	20	40	140	5400	33	32	3180	70	85	26	10200
28	24	20	40	180	6000	10	55	2830	50	60	28	8620
29	25	20	40	180	---	12	75	2560	26	54	29	7800
30	24	20	45	160	---	13	105	2290	33	53	29	7430
31	25	---	40	150	---	14	---	2070	---	49	29	---
TOTAL	603	1934	1040	3040	14735	43049	1525	52242	15381	4810	1211	51809
MEAN	19.5	64.5	33.5	98.1	526	1389	50.8	1685	513	155	39.1	1727
MAX	28	212	45	180	6000	5500	313	3760	1910	596	72	11500
MIN	13	20	20	30	50	10	15	83	26	30	23	29
AC-FT	1200	3840	2060	6030	29230	85390	3020	103600	30510	9540	2400	102800

CAL YR 1985 TOTAL 14746.38 MEAN 40.4 MAX 261 MIN .00 AC-FT 29250
WTR YR 1986 TOTAL 191379 MEAN 524 MAX 11500 MIN 10 AC-FT 379600

06156500 BELANGER CREEK DIVERSION CANAL NEAR VIDORA, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°29'39", long 109°21'54", in NW¼ sec.19, T.6, R.25 W., third meridian, Hydrologic Unit 10050013, on left bank 0.3 mi downstream from diversion weir and 12 mi north of Vidora.

PERIOD OF RECORD.--March 1946 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 3,200 ft, from Cypress Lake elevation.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 10 and Apr. 14, 15. Records good. Canal diverts water from right bank of Belanger Creek in SW¼ sec.30, T.6, R.25 W., third meridian, for storage in Cypress Lake.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 598 ft^3/s May 7, 1975; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	99	6.8	.00	9.3	.00	.00	.00	6.4		
2		.00	143	4.2	.00	9.3	.00	.00	.00	7.2		
3		.00	114	2.6	.00	10	.00	.00	.00	5.8		
4		.00	77	1.9	.00	9.9	.00	.00	.00	5.0		
5		.00	84	1.5	.00	5.3	.00	.00	.00	4.7		
6		.00	53	.81	.00	2.4	.00	.00	.00	4.4		
7		.00	52	.42	.00	3.1	.00	.00	.00	4.3		
8		.00	30	.25	.00	4.9	.00	.00	.00	4.6		
9		.00	46	.46	.00	14	.00	.00	.00	4.4		
10		.00	32	1.5	.04	14	.00	.00	.00	4.0		
11		.00	26	7.5	5.2	12	.00	.00	.00	3.8		
12		.00	20	7.8	26	9.9	.00	.00	.00	2.1		
13		.00	19	15	29	9.3	.00	.00	.00	.18		
14		.00	14	8.2	17	8.2	.00	.00	.00	.04		
15		.00	18	7.8	10	12	.00	.00	.00	.00		
16		.00	16	4.9	10	8.5	.00	.00	.00	.00		
17		.00	15	.25	14	5.4	.00	.00	.00	.00		
18		.00	13	.00	23	.42	.00	.00	.00	.00		
19		.00	12	.00	21	.18	.00	.00	.00	.00		
20		.00	13	.00	8.3	.00	.00	.00	.00	.00		
21		.00	18	.00	3.4	.00	.00	.00	.00	.00		
22		.00	24	.00	18	.00	.00	.00	.00	.00		
23		.00	26	.00	65	.00	.00	.00	.00	.00		
24		.00	20	.00	98	.00	.00	.00	.00	.00		
25		.18	10	.00	52	.00	.00	.00	61	.00		
26		77	7.8	.00	19	.00	.00	.00	132	.00		
27		144	9.8	.00	13	.00	.00	.00	118	.00		
28		67	15	.00	17	.00	.00	.00	47	.00		
29		---	22	.00	14	.00	.00	.00	21	.00		
30		---	19	.00	12	.00	.00	.00	9.4	.00		
31		---	12	---	9.6	---	.00	.00	---	.00		
TOTAL		288.18	1079.6	71.89	484.54	148.10	.00	.00	388.40	56.92		
MEAN		10.3	34.8	2.40	15.6	4.94	.00	.00	12.9	1.84		
MAX		144	143	15	98	14	.00	.00	132	7.2		
MIN		.00	7.8	.00	.00	.00	.00	.00	.00	.00		
AC-FT		572	2140	143	961	294	.00	.00	770	113		

06157500 CYPRESS LAKE EAST OUTFLOW CANAL NEAR VIDORA, SASKATCHEWAN

(International gaging station)

LOCATION (REVISED).--Lat 49°29'12", long 109°21'08", in SE¼ sec.19, T.6, R.25 W., third meridian, Hydrologic Unit 10050013, on right bank 500 ft upstream from Belanger Creek, and 12.3 mi north of Vidora.

PERIOD OF RECORD.--April to October 1940, April 1943 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 3,180 ft, from topographic map. Prior to Sept. 26, 1946, at datum 2.24 ft higher and Sept. 26, 1946, to May 18, 1950, at datum 1.54 ft higher.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 22, and Oct. 11-31. Records poor. Canal diverts water from Cypress Lake for irrigation in Frenchman River basin in Saskatchewan.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 202 ft^3/s Apr. 19, 1952; no flow at times most seasons.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.00	13	4.1	.67	.32	14	.14	.00	1.2		
2		.00	11	8.5	.71	.25	13	.11	.00	1.1		
3		.00	5.9	7.7	.74	.18	12	.07	.00	1.1		
4		.00	14	8.4	.78	.18	11	.04	.00	.99		
5		.00	6.9	9.3	.99	.21	9.9	.04	.00	.95		
6		.00	13	9.2	.95	.21	7.6	.18	.00	.85		
7		.00	6.4	8.8	.95	.35	5.4	.18	.11	.81		
8		.00	3.6	8.1	.88	.35	3.7	.18	.21	.95		
9		.00	3.8	7.0	1.2	.35	2.9	.14	.28	.99		
10		.00	3.5	6.1	1.3	.25	2.8	.11	.46	.92		
11		.00	5.0	5.9	1.6	.21	2.4	.04	.60	1.3		
12		.00	2.8	4.2	1.8	.18	3.4	.04	.71	1.2		
13		.00	1.4	2.8	1.8	.14	2.3	.00	.74	1.2		
14		.00	1.2	2.8	1.6	.11	1.9	.00	.81	1.2		
15		.00	1.2	2.6	1.4	.18	1.3	.00	.92	1.1		
16		.00	1.3	2.3	1.5	.18	.88	.00	1.0	1.1		
17		.00	1.2	2.0	1.3	.14	11	.00	1.1	1.1		
18		.00	1.1	1.5	1.2	.28	6.2	.00	1.2	1.0		
19		.00	1.1	1.1	1.1	.39	3.2	.00	1.3	.99		
20		.00	1.1	.92	1.1	.39	1.3	.00	1.3	.95		
21		.00	1.1	.92	1.0	2.9	.78	.00	1.1	.92		
22		.00	1.3	.92	2.3	4.2	.46	.00	1.0	.88		
23		.00	.67	.85	2.4	6.1	.39	.00	.95	.85		
24		.00	.64	.78	2.0	21	.35	.00	.81	.81		
25		1.8	.64	.78	1.4	20	.18	.00	6.0	.78		
26		20	.57	.81	.99	16	.11	.00	7.9	.74		
27		50	.74	.81	.78	14	.14	.00	5.4	.71		
28		18	1.1	.81	.64	13	.18	.00	4.0	.67		
29		---	3.5	.74	.49	16	.21	.00	2.7	.64		
30		---	4.9	.67	.39	16	.25	.00	1.6	.60		
31		---	3.9	---	.32	---	.18	.00	---	.57		
TOTAL		89.80	117.56	111.41	36.28	134.05	119.41	1.27	42.20	29.17		
MEAN		3.21	3.79	3.71	1.17	4.47	3.85	.04	1.41	.94		
MAX		50	14	9.3	2.4	21	14	.18	7.9	1.3		
MIN		.00	.57	.67	.32	.11	.11	.00	.00	.57		
AC-FT		178	233	221	72	266	237	2.5	84	58		

06158500 EASTEND CANAL AT EASTEND, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°30'21", long 108°50'54", in NW¼ sec.25, T.6, R.22 W., third meridian, Hydrologic Unit 10050013, on left bank 600 ft downstream from headgate, 1.5 mi west of Eastend.

PERIOD OF RECORD.--March 1937 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,998.58 ft above mean sea level (Geodetic Survey of Canada datum). Prior to June 1973, at sites within 1 mi, at different datums.

REMARKS.--No estimated daily discharges this year. Records good. Canal diverts water from Eastend Reservoir in NW¼ sec.25, T.6, R.22 W., third meridian, on right bank for irrigation of about 3,100 acres in the Frenchman River basin in Saskatchewan.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 86 ft^3/s June 4, 1986; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	52	.00	.00	.00	.00	.00		
2			.00	.00	62	50	.00	.00	.00	.00		
3			.00	.00	67	81	.00	.00	.00	.00		
4			.00	.00	69	86	.00	.00	.00	.00		
5			.00	.00	33	85	.00	.00	.00	.00		
6			.00	.00	28	85	.00	.00	.00	.00		
7			.00	.00	8.1	85	.00	.00	.00	.00		
8			.00	.00	.00	83	.00	.00	.00	.00		
9			.00	.00	.00	85	.00	.00	.00	.00		
10			.00	.00	.00	85	.00	.00	.00	.00		
11			.00	.00	.00	85	.00	.00	.00	.00		
12			.00	.00	.00	85	.00	.00	.00	.00		
13			.00	.00	.00	82	.00	.00	.00	.00		
14			.00	.00	.00	80	44	.00	.00	.00		
15			.00	.00	.00	71	69	.00	.00	.00		
16			.00	.00	.00	48	74	.00	.00	.00		
17			.00	.00	.00	32	75	.00	.00	.00		
18			.00	.00	.00	16	73	.00	.00	.00		
19			.00	.00	.00	5.0	72	.00	.00	.00		
20			.00	.00	.00	24	71	.00	.00	.00		
21			.00	.00	.00	13	71	.00	.00	.00		
22			.00	.00	.00	12	72	.00	.00	.00		
23			.00	.00	.00	9.1	64	.00	.00	.00		
24			.00	.00	.00	.00	50	.00	.00	.00		
25			.00	.00	.00	.00	32	.00	.00	.00		
26			.00	.00	.00	.00	18	.00	.00	.00		
27			.00	.00	.00	.00	15	.00	.00	.00		
28			.00	29	.00	.00	12	.00	.00	.00		
29			.00	47	.00	.00	.11	.00	.00	.00		
30			.00	50	.00	.00	.00	.00	.00	.00		
31			.00	---	.00	---	.00	.00	---	.00		
TOTAL			.00	126.00	319.10	1287.10	812.11	.00	.00	.00		
MEAN			.00	4.20	10.3	42.9	26.2	.00	.00	.00		
MAX			.00	50	69	86	75	.00	.00	.00		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			.00	250	633	2550	1610	.00	.00	.00		

06159500 FRENCHMAN RIVER BELOW EASTEND RESERVOIR, NEAR EASTEND, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°30'54", long 108°50'16", in SE¼ sec.36, T.6, R.22 W., third meridian, Hydrologic Unit 10050013, on left bank 0.8 mi west of Eastend, 1.7 mi downstream from Eastend Reservoir, and at mile 298.8.

DRAINAGE AREA.--619 mi^2.

PERIOD OF RECORD.--April 1909 to October 1916, March 1918 to May 1931, September 1935, March to July 1936, and April 1939 to current season (seasonal records only). Monthly discharge only for some periods, published in WSP 1309. Published as "at East End" 1909-16. Records prior to April 1939, not equivalent owing to diversion in Eastend Canal since 1937.

REVISED RECORDS.--WSP 1729: 1919, 1941 (monthly figures only). W 1983: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,960 ft, from topographic map. Prior to July 1941, non-recording gages at several sites within 1.5 mi of present site at various datums.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 1. Records fair except those for estimated daily discharges, which are poor. Natural flow of stream affected by storage reservoirs, diversions for irrigation, and return flow from irrigated areas. Water may be diverted into or from Battle Creek basin through Cypress Lake.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft^3/s Apr. 16, 1952, gage height, 19.10 ft, from flood-mark in gage house; no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 1,500 ft^3/s Feb. 27, gage height, 13.46 ft, backwater from ice; minimum daily, 0.71 ft^3/s Feb. 1-24 and June 22.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		.71	1170	84	3.5	4.9	3.2	5.0	4.3	32		
2		.71	1010	79	3.5	4.6	2.6	5.5	4.1	28		
3		.71	685	60	3.5	4.8	1.9	5.4	4.6	25		
4		.71	438	48	3.5	4.1	1.7	5.9	4.9	23		
5		.71	420	49	3.7	4.0	1.7	5.8	5.5	21		
6		.71	333	43	3.3	4.1	1.3	5.7	5.3	19		
7		.71	106	24	3.2	3.7	1.2	5.8	5.6	18		
8		.71	70	10	3.5	3.1	1.2	5.7	5.7	19		
9		.71	119	10	3.9	2.6	1.4	5.4	6.8	19		
10		.71	142	29	3.7	2.3	1.7	6.7	6.9	20		
11		.71	165	45	50	2.0	1.7	6.5	6.6	20		
12		.71	161	43	225	1.8	1.7	6.3	6.1	19		
13		.71	131	42	227	1.7	1.8	6.8	6.4	17		
14		.71	108	42	178	1.5	1.8	6.7	6.8	17		
15		.71	94	42	145	1.8	1.7	6.6	6.7	17		
16		.71	93	43	99	1.3	1.8	7.5	7.0	23		
17		.71	91	42	85	.95	2.0	7.4	7.4	27		
18		.71	90	42	72	.85	1.5	7.1	7.5	30		
19		.71	67	42	60	.78	1.8	5.9	9.0	32		
20		.71	51	30	61	.74	1.8	5.1	8.3	32		
21		.71	47	14	28	.74	1.6	4.9	8.2	32		
22		.71	63	13	110	.71	1.4	4.8	8.3	32		
23		.71	83	11	163	1.4	1.4	5.6	9.8	32		
24		.71	83	10	161	3.9	1.1	5.5	21	33		
25		26	83	11	123	3.4	.99	5.5	96	32		
26		246	83	13	60	2.7	.92	4.9	353	33		
27		1110	82	13	44	2.8	.85	4.6	213	34		
28		1440	81	4.5	7.0	3.0	.78	4.3	90	34		
29		---	59	3.6	6.0	3.6	1.5	4.5	54	34		
30		---	43	3.6	5.7	3.5	5.0	4.8	36	34		
31		---	67	---	5.3	---	4.9	5.0	---	35		
TOTAL		2839.04	6318	945.7	1950.3	77.37	55.94	177.2	1014.8	823		
MEAN		101	204	31.5	62.9	2.58	1.80	5.72	33.8	26.5		
MAX		1440	1170	84	227	4.9	5.0	7.5	353	35		
MIN		.71	43	3.6	3.2	.71	.78	4.3	4.1	17		
AC-FT		5630	12530	1880	3870	153	111	351	2010	1630		

06161300 HUFF LAKE PUMPING CANAL NEAR VAL MARIE, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°22'20", long 107°53'05", in NW¼ sec.7, T.5, R.14 W., third meridian, Hydrologic Unit 10050013, on right bank 50 ft downstream from pump discharge outlet, and 11 mi northwest of Val Marie.

PERIOD OF RECORD.--March 1963 to current season (seasonal records only). Published as Val Marie West Pumping Canal near Val Marie, Saskatchewan, March 1963 to October 1980. July 1950 to current season in reports of Department of the Environment, Canada.

GAGE.--Water-stage recorder. Prior to 1956 and subsequent to 1960, records obtained from occasional discharge measurements and records of pump operation.

REMARKS.--No estimated daily discharges this year. Records fair. Canal diverts water from Huff Lake for irrigation of about 2,100 acres in the Frenchman River basin in Saskatchewan.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s May 30 to June 2, 7-10, 1975, May 5, 6, 7, 9, 1977; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	24	.00	19	.00	.00		
2			.00	.00	.00	24	.00	12	.00	.00		
3			.00	.00	.00	15	.00	10	.00	.00		
4			.00	.00	.00	21	.00	2.5	.00	.00		
5			.00	.00	.00	23	.00	.00	.00	.00		
6			.00	.00	.00	21	.00	.00	.00	.00		
7			.00	.00	.00	22	.00	.00	.00	.00		
8			.00	.00	.00	22	.00	.00	.00	.00		
9			.00	.00	.00	22	.00	.00	.00	.00		
10			.00	.00	.00	21	.00	.00	.00	.00		
11			.00	.00	.00	21	.00	.00	.00	.00		
12			.00	.00	.00	21	.00	.00	.00	.00		
13			.00	.00	.00	21	.00	.00	.00	.00		
14			.00	.00	.00	20	.67	.00	.00	.00		
15			.00	.00	.00	19	16	.00	.00	.00		
16			.00	.00	.00	20	18	.00	.00	.00		
17			.00	.00	.00	18	19	.00	.00	.00		
18			.00	.00	.00	18	18	.00	.00	.00		
19			.00	.00	.00	19	19	.00	.00	.00		
20			.00	.00	.00	13	18	.00	.00	.00		
21			.00	.00	.00	10	18	.00	.00	.00		
22			.00	.00	.00	5.0	10	.00	.00	.00		
23			.00	.00	.00	6.5	10	.00	.00	.00		
24			.00	.00	.00	10	10	.00	.00	.00		
25			.00	.00	.00	10	10	.00	2.6	.00		
26			.00	.00	.00	4.1	5.9	.00	.00	.00		
27			.00	.00	.00	.00	10	.00	.00	.00		
28			.00	.00	.00	.00	10	.00	.00	.00		
29			.00	.00	6.1	.00	16	.00	.00	.00		
30			.00	.00	19	.00	8.9	.00	.00	.00		
31			.00	---	24	---	17	.00	---	.00		
TOTAL			.00	.00	49.10	450.60	234.47	43.50	2.60	.00		
MEAN			.00	.00	1.58	15.0	7.56	1.40	.09	.00		
MAX			.00	.00	24	24	19	19	2.6	.00		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			.00	.00	97	894	465	86	5.2	.00		

06161500 HUFF LAKE GRAVITY CANAL NEAR VAL MARIE, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°22'10", long 107°53'06", in SW¼ sec.7, T.5, R.14 W., third meridian, Hydrologic Unit 10050013, on right bank at outlet of Huff Lake, and 11 mi northwest of Val Marie.

PERIOD OF RECORD.--March 1946 to current season (seasonal records only). Published as Val Marie West Gravity Canal near Val Marie, Saskatchewan, March 1946 to October 1980. Monthly figures only prior to March 1947, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,662.88 ft above mean sea level (Geodetic Survey of Canada datum). Prior to Sept. 27, 1949, at site 0.5 mi downstream at different datum.

REMARKS.--No estimated daily discharges this year. Records fair. Canal diverts water from Huff Lake for irrigation of about 1,900 acres in the Frenchman River basin in Saskatchewan. Since 1962, records have been based on gate openings in Huff Lake Dam.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 55 ft^3/s July 14, 1972; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	16	.00	9.5	.00	.00		
2			.00	.00	.00	20	.00	8.9	.00	.00		
3			.00	.00	.00	20	.00	8.2	.00	.00		
4			.00	.00	.00	23	.00	7.9	.00	.00		
5			.00	.00	.00	28	.00	7.8	.00	.00		
6			.00	.00	.00	32	.00	2.3	.00	.00		
7			.00	.00	.00	36	.00	.00	.00	.00		
8			.00	.00	.00	35	.00	.00	.00	.00		
9			.00	.00	.00	30	.00	2.1	.00	.00		
10			.00	.00	.00	28	.00	4.2	.00	.00		
11			.00	.00	.00	32	.00	4.2	.00	.00		
12			.00	.00	.00	26	.00	4.1	.00	.00		
13			.00	.00	.00	26	.00	4.1	.00	.00		
14			.00	.00	.00	25	9.9	4.1	.00	.00		
15			.00	.00	.00	20	9.8	3.9	.00	.00		
16			.00	.00	.00	24	9.0	3.9	.00	.00		
17			.00	.00	.00	28	12	3.9	.00	.00		
18			.00	.00	.00	33	16	3.9	.00	.00		
19			.00	.00	.00	35	21	3.7	.00	.00		
20			.00	.00	.00	33	18	3.7	.00	.00		
21			.00	.00	.00	32	16	3.7	.00	.00		
22			.00	.00	.00	30	14	3.5	.00	.00		
23			.00	.00	.00	23	13	3.5	.00	.00		
24			.00	.00	.00	14	13	3.5	.00	.00		
25			.00	.00	.00	14	11	.74	.00	.00		
26			.00	.00	.00	8.2	12	.00	.00	.00		
27			.00	.00	.00	5.3	15	.00	.00	.00		
28			.00	.00	.00	4.9	17	.00	.00	.00		
29			.00	.00	.00	2.6	17	.00	.00	1.8		
30			.00	.00	11	.00	12	.00	.00	.00		
31			.00	---	22	---	5.8	.00	---	.04		
TOTAL			.00	.00	33.00	684.00	241.50	105.34	.00	1.84		
MEAN			.00	.00	1.06	22.8	7.79	3.40	.00	.06		
MAX			.00	.00	22	36	21	9.5	.00	1.8		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			.00	.00	65	1360	479	209	.00	3.6		

06162500 NEWTON LAKE MAIN CANAL NEAR VAL MARIE, SASKATCHEWAN

(International gaging station)

LOCATION.--Lat 49°18'18", long 107°48'05", in NE¼ sec.15, T.4, R.14 W., third meridian, Hydrologic Unit 10050013, on right bank about 500 ft downstream from Newton Lake, and 5.4 mi northwest of Val Marie.

PERIOD OF RECORD.--April 1937 to current season (seasonal records only). Published as Val Marie Main Canal near Val Marie, Saskatchewan, March 1962 to October 1980. Prior to April 1947 monthly discharge only, published in WSP 1309. Prior to March 1962, published as Val Marie Canal near Val Marie.

GAGE.--Water-stage recorder. Datum of gage is 2,622.03 ft above mean sea level (Geodetic Surveys of Canada datum). Prior to May 21, 1963, at several sites within 2 mi of present site at different datums.

REMARKS.--No estimated daily discharges this year. Records good. Canal diverts water from Newton Lake for irrigation of about 4,700 acres in the Frenchman River basin in Saskatchewan.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 122 ft^3/s May 26, 27, 1976; no flow at times each season.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			.00	.00	.00	91	.00	34	.00	.00		
2			.00	.00	.00	104	.00	17	.00	.00		
3			.00	.00	.00	107	.00	14	.00	.00		
4			.00	.00	.00	107	.00	12	.00	.00		
5			.00	.00	.00	107	.00	.00	.00	.00		
6			.00	.00	.00	105	.00	.00	.00	.00		
7			.00	.00	.00	104	.00	.00	.00	.00		
8			.00	.00	.00	100	.00	.00	.00	.00		
9			.00	.00	.00	89	33	.00	.00	.00		
10			.00	.00	.00	78	49	.00	.00	.00		
11			.00	.00	.00	72	48	.00	.00	.00		
12			.00	.00	.00	71	38	.00	.00	.00		
13			.00	.00	.00	70	40	.00	.00	.00		
14			.00	.00	.00	69	52	.00	.00	.00		
15			.00	.00	.00	65	54	.00	.00	.00		
16			.00	.00	.00	60	61	.00	.00	.00		
17			.00	.00	.00	50	67	.00	.00	.00		
18			.00	.00	.00	40	64	.00	.00	.00		
19			.00	.00	.00	37	59	.00	.00	.00		
20			.00	.00	.00	32	52	.00	.00	.00		
21			.00	.00	.00	21	50	.00	.00	.00		
22			.00	.00	.00	13	53	.00	.00	.00		
23			.00	.00	.00	13	53	.00	.00	.00		
24			.00	.00	.00	14	53	.00	.00	.00		
25			.00	.00	.00	21	58	.00	.00	.00		
26			.00	.00	.00	18	60	.00	.00	.00		
27			.00	.00	.00	6.1	65	.00	.00	.00		
28			.00	.00	19	.00	59	.00	.00	.00		
29			.00	.00	73	.00	66	.00	.00	.00		
30			.00	.00	81	.00	66	.00	.00	.00		
31			.00	---	83	---	45	.00	---	.00		
TOTAL			.00	.00	256.00	1664.10	1245.00	77.00	.00	.00		
MEAN			.00	.00	8.26	55.5	40.2	2.48	.00	.00		
MAX			.00	.00	83	107	67	34	.00	.00		
MIN			.00	.00	.00	.00	.00	.00	.00	.00		
AC-FT			.00	.00	508	3300	2470	153	.00	.00		

06163050 FRENCHMAN RIVER BELOW NEWTON LAKE, NEAR VAL MARIE, SASKATCHEWAN

(International gaging station)

LOCATION (REVISED).--Lat 49°18'07", long 107°48'20", in NE¼ sec.15, T.4, R.14 W., third meridian, Hydrologic Unit 10050013, on left bank about 200 ft downstream from spillway for Newton Lake, about 5.4 mi northwest of Val Marie, and at mile 156.1.

DRAINAGE AREA.--1,349 mi^2, of which 210 mi^2 probably is noncontributing.

PERIOD OF RECORD.--May 1976 to current season. Seasonal records only. Published as Frenchman River below Val Marie Reservoir, near Val Marie, Saskatchewan, May 1976 to October 1979. June to October 1939, July to October 1965, and May 1966 to current season in reports of Department of the Environment, Canada.

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,606.11 ft above mean sea level (Geodetic Survey of Canada datum).

REMARKS.--Estimated daily discharges: Oct. 2 to Nov. 4. Records fair. Natural flow of stream affected by storage reservoirs, diversions for irrigation, and return flow from irrigated areas. Water may be diverted into or from Battle Creek basin through Cypress Lake.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,350 ft^3/s Apr. 19, 1979, gage height, 12.87 ft; no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 2,050 ft^3/s Mar. 4, gage height, 12.04 ft; minimum daily, 1.1 ft^3/s Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			15	45	22	8.1	4.8	3.3	2.2	1.5	6.7	
2			20	25	13	8.5	4.7	3.0	2.2	1.5	6.7	
3			946	23	8.2	7.7	4.7	2.7	2.3	1.5	25	
4			1850	23	8.2	7.2	4.6	3.0	2.2	1.5	54	
5			1540	23	7.3	6.6	4.9	3.0	2.1	1.5	54	
6			950	25	32	6.3	4.6	3.1	2.0	1.5		
7			371	43	67	6.1	4.6	2.9	1.9	1.5		
8			396	44	67	5.9	4.5	3.0	1.9	1.5		
9			427	44	89	5.5	4.5	2.9	1.9	1.5		
10			427	44	135	5.4	4.5	2.7	2.0	22		
11			385	44	134	5.4	4.6	2.6	2.0	35		
12			271	44	132	5.0	4.6	2.6	1.9	35		
13			218	44	131	5.2	4.6	2.7	1.6	35		
14			217	44	130	5.4	4.4	2.8	1.7	35		
15			216	44	129	5.4	4.2	2.9	1.5	35		
16			214	44	127	5.4	4.1	3.0	1.5	35		
17			202	44	100	5.4	4.1	3.1	1.4	35		
18			153	44	87	5.9	3.9	3.1	1.6	35		
19			100	44	87	5.6	3.7	3.2	1.4	35		
20			100	44	87	5.5	3.5	3.1	1.4	35		
21			98	44	88	5.4	3.5	3.0	1.4	35		
22			90	44	115	5.2	3.4	2.9	1.3	35		
23			64	44	154	5.2	3.4	2.8	1.2	35		
24			23	44	154	5.2	3.3	2.6	1.3	35		
25			26	31	154	5.3	3.2	2.5	1.1	35		
26			54	23	164	5.3	3.2	2.5	1.3	35		
27			53	23	182	5.2	3.4	2.2	1.4	20		
28			66	23	138	5.2	3.4	2.2	1.3	6.7		
29			76	23	105	5.1	3.4	2.2	1.1	6.7		
30			75	22	92	4.9	3.6	2.2	1.1	6.7		
31			75	---	7.7	---	3.5	2.2	---	6.7		
TOTAL			9718	1100	2946.4	173.5	125.4	86.0	49.2	642.3		
MEAN			313	36.7	95.0	5.78	4.05	2.77	1.64	20.7		
MAX			1850	45	182	8.5	4.9	3.3	2.3	35		
MIN			15	22	7.3	4.9	3.2	2.2	1.1	1.5		
AC-FT			19280	2180	5840	344	249	171	98	1270		

06164000 FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 49°00'00", long 107°18'06", in SE¼ sec.5, T.1, R.10 W., third meridian, in Saskatchewan, Hydrologic Unit 10050013, on left bank 50 ft north of international boundary, 22 mi northeast of Whitewater, MT, and at mile 76.4.

DRAINAGE AREA.--2,120 mi^2, of which 343 mi^2 probably is noncontributing.

PERIOD OF RECORD.--April 1917 to current season (seasonal records only for most seasons).

REVISED RECORDS.--WSP 1389: 1938(M), 1939-41, 1942(M), 1943, 1950(M). W 1983: Drainage area.

GAGE.--Water-stage recorder and concrete control since August 1949. Altitude of gage is 2,420 ft, from topographic map. Prior to June 23, 1937, water-stage recorder at site 0.5 mi upstream at different datum. June 23, 1937, to October 1952, water-stage recorder at site 100 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Feb. 26 to Mar. 7 and Nov. 8-13. Records good. Natural flow of stream affected by several storage reservoirs, diversions for irrigation o about 14,500 acres, and return flow from irrigated areas. Water may be diverted into or from Battle Creek basin through Cypress Lake. 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.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,700 ft^3/s Apr. 15, 1952, gage height, 19.90 ft, from floodmark, from rating curve extended above 2,300 ft^3/s on basis of slope-area measurement of peak flow; no flow at times most seasons.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 1,990 ft^3/s Mar. 9, gage height, 11.61 ft; no flow Sept. 7-14.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			381	95	26	106	14	17	.07	11	9.8	
2			738	91	26	55	11	16	.04	118	8.6	
3			936	68	26	38	8.8	12	.04	205	8.1	
4			1140	48	25	43	6.4	12	.04	63	7.2	
5			1270	38	100	46	6.3	9.8	.04	31	7.0	
6			1400	34	268	47	4.3	8.3	.04	17	7.8	
7			1480	33	148	51	3.7	6.8	.00	13	39	
8			1750	31	59	52	3.6	5.0	.00	11	38	
9			1910	42	254	52	3.7	4.1	.00	9.3	25	
10			1710	63	381	61	4.0	4.3	.00	7.8	21	
11			1360	55	388	55	7.3	4.0	.00	5.9	18	
12			1090	51	280	48	4.0	3.9	.00	5.1	15	
13			901	53	236	43	4.4	3.8	.00	2.6	14	
14			816	53	243	33	3.5	3.7	.00	4.2		
15			770	52	203	36	3.0	3.3	.07	24		
16			597	50	162	33	4.9	3.1	.21	31		
17			484	52	143	33	8.2	2.8	.25	31		
18			403	52	132	26	7.5	2.6	.32	31		
19			328	51	112	24	39	2.3	.67	31		
20			237	49	97	24	43	1.8	7.5	31		
21			158	49	95	23	37	1.6	12	31		
22			166	48	124	19	30	1.1	7.3	31		
23			250	48	129	17	25	.74	13	31		
24			201	48	123	15	22	.49	8.1	31		
25			160	47	135	18	22	.42	28	31		
26		43	105	45	134	11	19	.35	67	31		
27		154	81	32	132	9.9	16	.32	69	31		
28		263	88	25	136	9.1	15	.18	27	31		
29		---	82	24	157	12	15	.11	12	30		
30		---	109	26	136	11	18	.07	6.9	27		
31		---	115	---	112	---	15	.07	---	15		
TOTAL			21216	1453	4722	1051.0	424.6	132.05	259.59	1002.9		
MEAN			684	48.4	152	35.0	13.7	4.26	8.65	32.4		
MAX			1910	95	388	106	43	17	69	205		
MIN			81	24	25	9.1	3.0	.07	.00	2.6		
AC-FT			42080	2880	9370	2080	842	262	515	1990		

RESERVOIRS IN FRENCHMAN RIVER BASIN IN SASKATCHEWAN

(International gaging stations)

06157000 CYPRESS LAKE.--Lat 49°27'30", long 109°30'25", in SE¼ sec.12, T.6, R.27 W., third meridian, Hydrologic Unit 10050013, on south shore, and 12 mi north of Consul. DRAINAGE AREA, 107 mi². PERIOD OF RECORD, February 1939 to current season (seasonal records only). Records prior to October 1946, published only in WSP 1309. March to May 1952 daily elevations and contents, published in WSP 1260-B. Water-stage recorder. Datum of gage is at mean sea level (Geodetic Survey of Canada datum; subtract 33.67 ft to obtain Reclamation Service datum). Prior to 1969 season, at Reclamation Service datum. Prior to 1940, nonrecording gage on natural lake at "South" station. February 1940 to Apr. 28, 1955, elevation obtained from average of nonrecording gage readings at west and east dams. Apr. 29, 1955, to Aug. 21, 1984, gage located at east dam.

This is an offstream reservoir formed by two earthfill dams on a natural lake of the same name which was, at one time, the head of the Frenchman River. There are concrete control works at both dams. The following capacity figures are from capacity table effective February 1970; see previous reports for superseded figures. Usable capacity, 79,400 acre-ft between elevation 3,187.0 ft, bottom of west outlet works, and 3,201.9 ft, maximum design level. Dead storage, 24,300 acre-ft. Water is diverted from Battle Creek on west, 12 mi northwest of Consul, and from Belanger Creek, head of Frenchman River, on the east, 12 mi north of Vidora. Water is released to the same streams for irrigation. Figures given herein represent total contents. This is one of a number of stations which are maintained jointly by Canada and the United States. REVISED RECORDS, W 1983: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, 117,300 acre-ft Apr. 21, 1955, elevation, 3,203.36 ft; minimum observed since first filling, 21,100 acre-ft Sept. 5, 1985, elevation, 3,186.27 ft.

EXTREMES FOR CURRENT SEASON: Maximum contents, 38,200 acre-ft Oct. 17, elevation, 3,189.88 ft; minimum 21,900 acre-ft Feb. 1-11, elevation, 3,186.46 ft.

06159000 EASTEND RESERVOIR.--Lat 49°30'26", long 108°51'08", in NW¼ sec.25, T.6, R.22 W., third meridian Hydrologic Unit 10050013, at dam on Frenchman River, 1.6 mi west of Eastend, and at mile 300.5. DRAINAGE AREA, 619 mi². PERIOD OF RECORD, February 1937 to current season (seasonal records only). Prior to 1958, published as East End Reservoir at East End. Nonrecording gages read about once a day during irrigation season and twice a day during high stages February 1937 to July 1979. Water-stage recorder. Datum of gage is at mean sea level (Geodetic Survey of Canada datum).

Reservoir is formed by earthfill dam completed in 1939, breached during flood in 1952 and rebuilt the same year with a concrete spillway and control works. The following capacity figures are from revised capacity table put into use Jan. 1, 1983. Usable capacity, 1,690 acre-ft between elevation 2,993.5 ft, bottom of outlet works, and 3,012.0 ft, maximum design level. No dead storage. Water is used for irrigation. This is one of a number of stations which are maintained jointly by Canada and the United States. REVISED RECORDS (SEASONS), WSP 1309: 1948(M). WSP 1729: Drainage area. WSP 2116: 1937-65. W 1983: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, about 3,700 acre-ft Apr. 15, 1952, elevation, about 3,015 ft, dam overtopped; no contents at various times.

EXTREMES FOR CURRENT SEASON: Maximum contents, 2,360 acre-ft May 12, elevation, 3,013.65 ft; minimum observed, 77 acre-ft Feb. 4, elevation, 3,003.53 ft.

06162000 HUFF LAKE.--Lat 49°22'16", long 107°53'07", in SW¼ sec.7, T.5, R.14 W., third meridian, Hydrologic Unit 10050013, near dam on Frenchman River, 11 mi northwest of Val Marie, and at mile 169.7. DRAINAGE AREA, 1,274 mi². PERIOD OF RECORD, February 1940 to current season (seasonal records only). February 1940 to October 1979, published as Val Marie West Reservoir. Records prior to October 1946, published only in WSP 1309. April to May 1952 daily elevations and contents, published in WSP 1260-B. Water-stage recorder. Datum of gage is at mean sea level (Geodetic Survey of Canada datum). May 1952 to May 1954, reference point on control structure. May 1954 to May 10, 1966, nonrecording gages. May 11, 1966, to Oct. 31, 1979, recording gage on riparian gatewell.

Reservoir is formed by earthfill dam with concrete control works completed in 1939. The following capacity figures are from revised capacity table put into use Jan. 1, 1983. Usable capacity, 3,620 acre-ft between elevation 2,663.2 ft, bottom of outlet works, and 2,676.5 ft, maximum design level. Dead storage, 10 acre-ft. Water is used for irrigation. This is one of a number of stations which are maintained jointly by Canada and the United States. REVISED RECORDS (SEASONS), WSP 1309: 1947-50.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, 4,360 acre-ft May 20, 1967, elevation, 2,677.83 ft; no contents Feb. 28, Mar. 31, 1950, Oct. 22-31, 1984, Mar. 1-7 and Aug. 6 to Sept. 14, 1985.

EXTREMES FOR CURRENT SEASON: Maximum contents, 4,170 acre-ft May 24, elevation, 2,677.36 ft; minimum, 302 acre-ft Sept. 4, elevation, 2,666.92 ft.

06163000 NEWTON LAKE.--Lat 49°18'12", long 107°48'20", in NE¼ sec.15, T.4, R.14 W., third meridian, Hydrologic Unit 10050013, at dam on Frenchman River, 5.4 mi northwest of Val Marie, and at mile 156.2. DRAINAGE AREA, 1,349 mi². PERIOD OF RECORD, February 1937 to current season (seasonal records only). February 1937 to October 1979, published as Val Marie Reservoir. Water-stage recorder. Datum of gage is at mean sea level (Geodetic Survey of Canada datum). Prior to May 11, 1966, nonrecording gages.

Reservoir is formed by earthfill dam with concrete control works; construction began in 1936; storage began in 1937; construction completed in 1938. The following capacity figures are from revised capacity table put into use Jan. 1, 1983. Usable capacity, 9,950 acre-ft between elevation 2,616.1 ft, bottom of outlet works, and 2,635.4 ft maximum design level. No dead storage. Water is used for irrigation. This is one of a number of stations which are maintained jointly by Canada and the United States. REVISED RECORDS (SEASONS), WSP 2116: 1937-65. WSP 1729: 1949.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 18,920 acre-ft Apr. 19, 1952, elevation, 2,638.80 ft; no contents at times.

EXTREMES FOR CURRENT SEASON: Maximum contents, 11,900 acre-ft May 25, elevation, 2,636.70 ft; minimum observed, 443 acre-ft Feb. 26, elevation 2,623,81 ft.

Monthend contents, in acre-feet, October 1985 to October 1986

Date	Cypress Lake	Eastend Reservoir	Huff Lake	Newton Lake
Oct. 31	21,600	143	536	464
Nov. 30	-	-	-	-
Dec. 31	-	-	-	-
Jan. 31	-	-	-	-
Feb. 28	26,700	296	2,510	3,810
Mar. 31	34,200	1,920	3,620	11,100
Apr. 30	34,500	2,160	3,590	11,000
May 31	35,900	2,220	3,720	11,400
June 30	32,800	859	1,170	8,670
July 31	31,500	270	530	5,760
Aug. 31	29,500	182	312	5,000
Sept. 30	36,100	81	1,920	5,400
Oct. 31	38,000	79	3,700	4,650

06164510 MILK RIVER AT JUNEBERG BRIDGE, NEAR SACO, MT

LOCATION.--Lat 48°30'32", long 107°13'02", in NE¼NE¼ sec.30, T.32 N., R.35 E., Phillips County, Hydrologic Unit 10050014, on left bank 25 ft upstream from Juneberg bridge on Phillips County road, 1.5 mi downstream from Frenchman River, 6.9 mi northeast of Saco, and at mile 152.3.

DRAINAGE AREA.--17,670 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 2,130 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 17 to Mar. 7. Water-discharge records fair except those for estimated daily discharges, which are poor. Flow increased during irrigation season by water from St. Mary Canal which diverts from the St. Mary River near Babb (station number 05017500). Flow regulated by Fresno Reservoir (station number 06136500), two reservoirs in Lodge Creek basin in Saskatchewan (station numbers 06144260 and 06144360 and four reservoirs in Frenchman River basin in Saskatchewan. There are many small dams for the diversion of irrigation canals upstream.

AVERAGE DISCHARGE.--9 years, 467 ft^3/s, 338,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft^3/s Apr. 3, 1978, gage height, 24.20 ft; maximum gage height, 26.70 ft Mar. 4, 1986 (backwater from ice jam); minimum daily discharge, 2.1 ft^3/s Aug. 20, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,900 ft^3/s Sept. 30, gage height, 24.26 ft; maximum gage height, 26.70 ft Mar. 4 (ice jam); minimum daily discharge, 25 ft^3/s Nov. 26 to Dec. 5, 13, 14.

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	48	53	25	65	160	8000	201	67	2760	419	216	158
2	52	53	25	70	150	9000	211	83	2420	318	207	175
3	53	53	25	70	150	10000	208	129	2190	288	207	190
4	54	54	25	65	160	10500	167	137	1970	634	213	193
5	55	55	25	55	170	10000	169	175	1720	813	218	192
6	56	53	30	60	160	9000	154	227	1330	721	236	185
7	58	51	40	70	150	8000	142	809	752	626	239	192
8	54	51	35	80	130	6700	134	755	856	529	212	200
9	48	50	35	90	110	5820	125	852	1060	449	178	217
10	50	221	35	100	90	5270	129	1250	1030	427	176	236
11	52	313	35	120	80	4660	145	2100	995	395	187	246
12	63	197	30	110	70	3670	317	2690	970	347	190	236
13	57	166	25	100	65	2610	302	4500	968	286	193	240
14	52	147	25	95	60	2320	219	5420	913	232	189	254
15	86	134	30	90	60	2500	180	5400	825	241	165	268
16	94	121	40	100	60	2170	171	5150	719	223	163	282
17	78	90	45	120	65	1740	169	4610	636	203	169	300
18	69	90	50	140	60	1430	158	3770	517	187	159	292
19	66	90	55	160	55	1210	150	3040	420	176	136	283
20	69	80	60	180	50	1110	143	2580	357	182	142	283
21	65	70	65	200	50	965	139	2340	302	210	159	329
22	59	60	70	180	50	829	139	2080	262	164	179	341
23	51	50	75	170	55	734	136	2240	224	179	191	330
24	51	40	70	180	80	615	100	2310	204	236	192	339
25	52	30	60	190	200	539	101	2950	336	269	176	422
26	50	25	65	180	2000	481	117	4020	316	288	160	1710
27	50	25	60	190	6000	422	116	4360	220	304	154	6880
28	52	25	50	200	7000	356	108	4280	229	324	157	9230
29	60	25	55	190	---	309	77	3930	295	316	156	10400
30	55	25	60	180	---	263	71	3520	351	288	157	10900
31	54	---	65	170	---	220	---	3130	---	239	155	---
TOTAL	1813	2497	1390	3970	17490	111443	4698	78904	26147	10513	5631	45503
MEAN	58.5	83.2	44.8	128	625	3595	157	2545	872	339	182	1517
MAX	94	313	75	200	7000	10500	317	5420	2760	813	239	10900
MIN	48	25	25	55	50	220	71	67	204	164	136	158
AC-FT	3600	4950	2760	7870	34690	221000	9320	156500	51860	20850	11170	90260

CAL YR 1985	TOTAL	32498	MEAN	89.0	MAX	389	MIN	19	AC-FT	64460
WTR YR 1986	TOTAL	309999	MEAN	849	MAX	10900	MIN	25	AC-FT	614900

06164510 MILK RIVER AT JUNEBERG BRIDGE, NEAR SACO, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1977 to current year.
WATER TEMPERATURE: October 1977 to September 1979.

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 2,220 microsiemens, Jan. 7, 8, 1978; minimum daily, 263 microsiemens, Mar. 17, 1982.
WATER TEMPERATURE (water years 1978-79): Maximum daily, 26.5°C, July 20, 22, Aug. 2, 1979; 0.0°C on many days during winter.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,730 microsiemens, Oct. 30; minimum daily, 248 microsiemens, Feb. 27.

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)
NOV 06...	1430	53	0	0	1300	7.0	5.0
DEC 18...	1000	53	100	2	1130	-2.0	0.0
JAN 29...	0945	181	100	2	1210	-2.0	0.0
FEB 27...	1725	6940	--	--	202	1.0	0.5
MAR 05...	1245	10300	--	--	232	11.5	2.5
12...	1345	3700	100	2	272	4.0	3.0
APR 24...	1345	105	100	51	1260	9.0	12.0
JUN 04...	1015	2000	30	1	612	20.0	22.0
JUL 25...	1015	260	10	1	982	24.5	23.0
AUG 27...	1000	149	0	0	915	20.0	18.0
SEP 29...	1230	10500	40	1	318	9.0	11.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
NOV 06...	1430	8.20	320	68	70	35	160	4	5.2	251
DEC 18...	1000	7.70	330	15	74	36	130	3	6.5	318
JAN 29...	0945	7.90	240	0	52	27	180	5	7.0	274
MAR 12...	1345	7.40	75	1	17	8.0	24	1	6.3	74
APR 24...	1345	8.10	330	67	76	35	150	4	7.2	267
JUN 04...	1015	8.00	180	0	41	19	58	2	6.9	187
JUL 25...	1015	8.20	260	6	59	28	110	3	6.4	257
AUG 27...	1000	8.20	250	5	56	27	110	3	5.5	246
SEP 29...	1230	7.90	78	3	20	6.8	31	2	4.3	75

06164510 MILK RIVER AT JUNEBERG BRIDGE, NEAR SACO, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)
NOV 06...	390	28	0.4	7.2	850	1.2	121	<0.10	<0.01
DEC 18...	300	24	0.3	12	770	1.1	111	0.29	0.03
JAN 29...	350	16	0.3	10	810	1.1	394	0.53	0.08
MAR 12...	60	3.5	0.2	7.0	170	0.23	1700	0.27	0.05
APR 24...	410	22	0.3	6.2	870	1.2	246	<0.10	0.02
JUN 04...	120	6.4	0.3	9.2	370	0.51	2010	0.14	0.03
JUL 25...	250	12	0.2	6.5	630	0.85	440	<0.10	0.01
AUG 27...	210	11	0.2	6.0	570	0.78	231	<0.10	0.04
SEP 29...	72	3.3	0.1	5.1	190	0.26	5320	0.10	--

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM at 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1230	1430	1120	1220	877	304	734	1420	636	942	953	960
2	1180	1310	1170	1210	847	282	719	1430	---	1060	950	952
3	1110	1320	1180	1220	876	264	679	1430	626	1080	920	---
4	1160	1350	1220	1210	900	266	724	1260	635	---	920	963
5	1210	1360	1240	1220	883	284	770	1270	634	1030	910	981
6	1250	1290	1200	---	897	289	822	1240	657	930	887	985
7	1260	1330	1180	1230	928	295	875	1170	685	867	886	982
8	1260	1360	1180	1230	976	306	881	1170	699	865	904	972
9	1250	1330	1190	1240	1010	332	940	1700	732	---	918	969
10	1210	1330	1200	1240	1000	337	999	1030	771	841	965	955
11	1240	1310	1190	1240	1020	350	966	1020	732	835	---	937
12	1250	1350	1170	1220	1030	308	1010	778	718	847	948	962
13	1280	1320	1160	1180	1040	301	1040	675	729	861	946	978
14	1270	1270	1180	1210	1070	337	1010	611	734	881	942	923
15	1270	1270	---	1180	1100	392	1040	577	735	894	945	894
16	1290	1250	1200	1170	1120	401	1020	579	756	936	967	877
17	1290	1230	1200	1040	1130	363	1030	645	779	888	989	875
18	1290	1100	1210	1190	1130	381	1040	725	807	880	987	868
19	1300	912	1200	1600	1140	401	1060	734	821	873	990	863
20	1370	790	1200	1100	1170	392	1070	704	829	922	981	869
21	1430	781	1200	1130	1180	421	1080	693	834	912	980	858
22	1430	825	1200	1130	---	478	1100	686	886	921	965	828
23	1450	887	1200	1090	1200	476	1140	739	861	919	979	807
24	1490	881	1210	868	1190	520	1290	725	908	966	955	810
25	1550	905	1220	869	1200	493	1320	722	914	1020	950	---
26	1550	945	1220	896	1130	512	1270	620	804	1040	940	813
27	1580	999	1220	915	248	552	1220	580	814	1060	939	326
28	1610	1010	1220	1170	280	591	---	703	819	1070	946	299
29	1600	1030	1220	1240	---	649	1270	666	851	1040	964	319
30	1730	1060	1230	980	---	680	1380	655	885	1030	986	298
31	1630	---	1230	914	---	690	---	644	---	1000	969	---
MEAN	1360	1150	1200	1150	984	408	1020	890	769	945	949	826

06164590 BEAVER CREEK NEAR ZORTMAN, MT

LOCATION.--Lat 47°56'19", long 108°23'26", in NE¼SE¼NE¼ sec.8, T.25 N., R.26 E., Phillips County, Hydrologic Unit 10050014, on right bank, at Baker Creek School, 3.3 mi southeast of Blaine-Phillips County line, 4.7 mi east of Fort Belknap Indian Reservation boundary, and 6 mi northeast of Zortman.

DRAINAGE AREA.--10.1 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,320 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 9 to Jan. 27, Feb. 6-25, June 29 to July 15, and Aug. 25 to Sept. 24. Records fair except those for estimated daily discharges, which are poor. No known diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57.0 ft^3/s May 23, 1986, gage height, 2.29 ft; maximum gage height, 3.38 ft Dec. 31, 1983 (backwater from ice); no flow many days 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 57.0 ft^3/s May 23, gage height, 2.29 ft; minimum daily, 0.05 ft^3/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	.17	.59	.05	.90	1.5	.52	1.3	.95	10	4.5	2.5	.55
2	.22	.88	.05	1.0	1.2	.44	1.2	1.1	9.6	4.5	2.4	.55
3	.20	1.1	.10	.90	1.1	.40	1.1	1.2	8.8	4.5	2.3	.50
4	.20	1.2	.10	.80	1.5	.44	1.2	2.5	7.9	6.0	2.3	.50
5	.21	1.2	.10	.70	.74	.40	1.3	10	7.3	9.0	2.0	.60
6	.30	1.2	.20	.60	.50	.39	1.3	2.6	7.0	7.0	1.8	.55
7	.46	1.3	.20	.70	.35	.48	1.1	1.4	6.8	5.0	1.9	.50
8	.30	1.1	.10	.80	.30	.69	1.1	3.5	6.3	4.5	1.3	.45
9	.16	1.0	.10	.90	.30	.63	1.1	3.3	6.0	4.5	1.5	.45
10	.34	.90	.10	1.0	.25	.58	1.0	6.4	6.1	5.0	1.6	.45
11	1.3	.80	.10	1.5	.20	.57	1.2	6.5	6.1	4.5	1.2	.40
12	3.6	.70	.05	1.5	.10	.57	1.3	6.9	5.9	4.5	1.3	.40
13	.85	.60	.05	1.0	.10	.59	1.6	1.2	5.6	4.0	1.3	.40
14	.65	.50	.10	.90	.10	.72	1.5	9.6	5.6	4.0	1.1	.45
15	.54	.45	.25	.80	.20	.69	.96	15	5.8	4.0	1.1	.50
16	.28	.50	.50	.70	.20	.90	1.5	21	6.0	3.7	.93	.45
17	.17	.40	1.0	.80	.20	.79	2.7	20	6.0	3.7	1.1	.40
18	.26	.30	1.0	.80	.10	.94	2.0	22	6.2	3.8	.92	.50
19	.20	.20	1.0	.80	.10	1.0	1.6	16	5.9	4.2	.80	.70
20	.28	.10	1.0	.80	.05	1.1	1.4	14	5.8	4.5	.62	.80
21	.51	.05	1.5	.75	.05	1.1	1.3	19	5.8	4.1	.62	.70
22	.48	.05	1.5	.70	.10	1.0	1.3	15	5.9	3.1	1.0	.60
23	.53	.05	1.5	.70	.20	1.1	1.3	37	5.7	2.7	.80	.55
24	.54	.05	1.0	.70	.90	1.3	.95	26	5.5	2.5	.62	.50
25	.74	.05	1.0	.80	1.5	1.4	.99	19	5.2	2.6	.60	18
26	.52	.05	1.5	.90	2.3	1.3	.88	23	5.4	2.8	.60	23
27	.78	.05	1.5	.90	1.4	1.4	.94	21	5.3	2.9	.60	14
28	.99	.05	1.5	.85	1.0	1.4	1.0	18	5.0	2.8	.55	10
29	.84	.05	1.0	.77	---	1.4	1.1	16	5.0	2.5	.55	7.6
30	.69	.05	1.0	2.2	---	1.3	1.0	14	5.0	2.6	.55	6.6
31	.65	---	.80	1.2	---	1.4	---	12	---	2.5	.55	---
TOTAL	17.96	15.52	19.95	28.37	16.54	26.94	38.22	385.15	188.5	126.5	37.01	91.65
MEAN	.58	.52	.64	.92	.59	.87	1.27	12.4	6.28	4.08	1.19	3.05
MAX	3.6	1.3	1.5	2.2	2.3	1.4	2.7	37	10	9.0	2.5	23
MIN	.16	.05	.05	.60	.05	.39	.88	.95	5.0	2.5	.55	.40
AC-FT	36	31	40	56	33	53	76	764	374	251	73	182

CAL YR 1985	TOTAL	155.66	MEAN	.43	MAX	4.1	MIN	.00	AC-FT	309
WTR YR 1986	TOTAL	992.31	MEAN	2.72	MAX	37	MIN	.05	AC-FT	1970

06164615 LITTLE WARM CREEK AT RESERVATION BOUNDARY, NEAR ZORTMAN, MT

LOCATION.--Lat 47°59'04", long 108°21'15", in SE¼SW¼SW¼ sec.27, T.26 N., R.26 E., Phillips County, Hydrologic Unit 10050014, 0.2 mi upstream from Fort Belknap Indian Reservation boundary, 2.5 mi northwest of U.S. Highway 191, and 15 mi northeast of Zortman.

DRAINAGE AREA.--6.31 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,070 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 11 to Feb. 24 and May 27 to July 15. Water-discharge records fair except those for estimated daily discharges, which are poor. Diversions for irrigation upstream from station can, at times, dry up stream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 300 ft^3/s Sept. 25, 1986, gage height, 6.93 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 300 ft^3/s Sept. 25, gage height, 6.93 ft; minimum daily, 0.11 ft^3/s Aug. 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	1.6	2.2	1.2	2.3	1.8	3.3	2.8	2.3	5.0	4.8	3.1	2.8
2	1.9	2.5	1.0	2.2	1.7	3.2	3.0	2.3	5.0	4.3	2.0	2.8
3	2.1	2.6	1.1	2.1	1.6	3.1	2.9	2.3	5.0	5.0	1.6	3.2
4	2.3	2.5	1.4	2.0	1.5	3.0	3.0	3.1	5.0	5.6	2.7	3.3
5	2.2	2.5	1.6	1.8	1.4	3.0	3.1	24	5.0	5.0	1.7	4.9
6	2.4	2.4	1.9	1.8	1.3	2.9	3.2	4.0	5.6	4.5	.38	3.1
7	2.7	2.3	2.0	1.7	1.3	3.0	3.6	2.1	6.4	4.3	.53	3.3
8	2.4	2.3	2.0	1.8	1.4	3.3	3.7	11	5.6	4.3	.55	3.3
9	2.3	2.3	1.9	2.0	1.4	3.2	3.6	14	4.8	4.3	.96	4.1
10	2.9	2.2	1.8	2.3	1.4	3.2	3.4	50	4.5	4.2	2.3	4.7
11	4.1	2.2	1.5	2.5	1.4	3.2	3.3	91	4.4	4.2	1.4	4.6
12	10	1.5	1.6	2.3	1.4	3.2	3.3	57	4.3	4.2	.14	4.5
13	3.7	2.2	1.7	2.0	1.4	3.2	3.4	12	4.1	4.1	.67	4.9
14	3.2	2.3	1.9	2.0	1.4	3.3	3.1	9.0	4.0	4.1	1.9	5.5
15	3.2	2.3	2.2	2.0	1.4	3.2	3.1	7.8	4.0	4.0	1.9	4.2
16	2.8	2.4	2.2	2.0	1.4	3.2	3.5	7.5	4.0	4.0	2.2	5.4
17	2.6	2.2	2.3	2.0	1.3	3.2	5.9	7.0	4.0	3.8	1.9	7.2
18	2.4	2.1	2.3	2.0	1.3	3.2	3.9	7.0	3.9	3.7	.11	6.0
19	2.3	2.0	2.3	2.0	1.3	3.2	3.0	6.8	3.9	3.7	.15	16
20	2.3	1.9	2.5	2.0	1.2	3.2	2.9	6.5	3.9	3.6	.22	6.6
21	2.2	1.9	3.5	2.0	1.3	3.2	2.7	6.8	4.0	3.6	.31	3.4
22	2.2	1.8	4.5	2.0	1.4	3.2	2.6	33	4.0	3.6	.35	2.6
23	2.2	1.8	4.0	2.0	4.0	3.1	2.5	11	4.0	3.5	1.1	2.5
24	2.2	1.8	3.5	2.0	20	3.1	2.4	7.8	3.9	3.4	1.4	19
25	2.2	1.7	3.5	2.0	35	3.1	2.4	6.8	3.8	3.3	2.0	137
26	2.2	1.6	3.6	1.9	6.0	3.2	2.4	6.2	3.8	3.3	2.5	10
27	2.3	1.6	3.7	1.9	3.5	3.2	2.4	6.2	4.0	3.3	2.9	4.9
28	2.2	1.6	3.0	1.9	3.2	3.2	2.3	6.0	4.5	3.2	2.9	4.4
29	2.1	1.5	2.5	1.9	---	3.1	2.3	5.6	5.8	3.1	2.8	4.3
30	2.1	1.4	2.3	1.9	---	3.0	2.3	5.4	5.0	3.2	3.0	4.3
31	2.0	---	2.3	1.9	---	2.9	---	5.2	---	3.1	3.1	---
TOTAL	83.3	61.6	72.8	62.2	102.7	97.6	92.0	426.7	135.2	122.3	48.77	292.8
MEAN	2.69	2.05	2.35	2.01	3.67	3.15	3.07	13.8	4.51	3.95	1.57	9.76
MAX	10	2.6	4.5	2.5	35	3.3	5.9	91	6.4	5.6	3.1	137
MIN	1.6	1.4	1.0	1.7	1.2	2.9	2.3	2.1	3.8	3.1	.11	2.5
AC-FT	165	122	144	123	204	194	182	846	268	243	97	581

CAL YR 1985	TOTAL	682.11	MEAN	1.87	MAX	10	MIN	.09	AC-FT	1350
WTR YR 1986	TOTAL	1597.97	MEAN	4.38	MAX	137	MIN	.11	AC-FT	3170

06164615 LITTLE WARM CREEK AT RESERVATION BOUNDRY, NEAR ZORTMAN, 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 WATER (DEG C) (00010)
NOV 04...	1130	2.6	70	1	2200	9.0	8.0
JAN 28...	1315	1.9	--	--	2350	3.5	--
MAR 26...	1630	3.3	25	1	2050	12.0	9.0
APR 22...	1215	2.8	--	--	1450	23.0	--
JUL 23...	1645	3.4	20	1	1810	29.0	24.0
SEP 24...	1130	2.5	100	2	1780	14.0	12.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
NOV 04...	1130	8.00	1200	1100	300	120	72	0.9	12
MAR 26...	1630	7.90	1100	960	270	110	67	0.9	11
JUL 23...	1645	8.20	950	780	240	84	56	0.8	9.6
SEP 24...	1130	7.90	1000	830	260	87	63	0.9	12

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 DIS-SOLVED (MG/L AS N) (00631)
NOV 04...	173	1000	62	1.5	14	1700	2.3	12	<0.100
MAR 26...	163	930	48	1.5	17	1600	2.1	14	<0.100
JUL 23...	169	860	42	1.4	13	1400	1.9	13	<0.100
SEP 24...	182	950	45	1.3	14	1500	2.1	11	<0.100

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
NOV 04...	--	390	--	--	30	--	--	--	--
MAR 26...	3	370	1	<10	30	2	90	<0.1	<1
JUL 23...	--	320	--	--	11	--	--	--	--
SEP 24...	--	330	--	--	12	--	--	--	--

06164623 LITTLE WARM CREEK TRIBUTARY NEAR LODGE POLE, MT

LOCATION.--Lat 47°59'43", long 108°19'09", in SW¼SE¼NW¼ sec.24, T.26 N., R.26 E., Phillips County, Hydrologic Unit 10050014, at culvert on county road 0.3 mi northeast of Little Warm Creek, 1.3 mi east of Fort Belknap Indian Reservation boundary, 2.3 mi northeast of State Highway 191, and 10 mi southeast of Lodge Pole.

DRAINAGE AREA.--2.42 mi^2.

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

REVISED RECORDS.--WDR MT-86-1: 1983-85(M).

GAGE.--Water-stage recorder. Elevation of gage is 2,910 ft, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 24-29, Jan. 9-12, Sept. 16-30. Records fair except those for period of estimated daily discharges, which are poor. No known diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 460 ft^3/s Sept. 25, 1986, gage height, 4.83 ft, from floodmarks, on basis of culvert computations and flow-over-road measurement of peak flow; no flow most days.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 460 ft^3/s Sept. 25, gage height, 4.83 ft, from floodmarks, on basis of culvert computations and flow-over-road measurement of peak flow; no flow most days.

REVISIONS.--The maximum discharges for some water years have been revised, as shown in the following table. They supersede figures published in previous reports for water years 1983-85.

Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1983	July 10, 1983	56	3.13
1984	Aug. 2, 1984	56	3.12
1985	Aug. 16, 1985	91	3.70

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	.20	.00	.00	.00	.02	.00	.00
2	.00	.00	.00	.00	.00	.14	.00	.00	.00	.01	.00	.00
3	.00	.00	.00	.00	.00	.09	.00	.00	.00	.01	.00	.00
4	.00	.00	.00	.00	.00	.05	.00	3.9	.00	.07	.00	.00
5	.00	.00	.00	.00	.00	.01	.00	23	.00	2.7	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.65	.00	.28	.00	.00
7	.00	.00	.00	.00	.00	.01	.00	.37	.00	.03	.00	.00
8	.00	.00	.00	.00	.00	.04	.00	11	.00	.01	.00	.00
9	.00	.00	.00	.10	.00	.02	.00	3.8	.00	.00	.00	.00
10	.29	.00	.00	.50	.00	.01	.00	29	.00	.00	.00	.00
11	17	.00	.00	.10	.00	.15	.00	15	.00	.00	.00	.00
12	11	.00	.00	.00	.00	.07	.00	11	.00	.00	.00	.00
13	1.7	.00	.00	.00	.00	.04	.00	.32	.00	.00	.00	.00
14	1.3	.00	.00	.00	.00	.02	.00	.14	.00	.00	.00	.00
15	1.1	.00	.00	.00	.00	.01	.00	.05	.00	.00	.00	.00
16	.67	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00
17	.42	.00	.00	.00	.00	.00	2.3	.03	.00	.00	.00	.00
18	.01	.00	.00	.00	.00	.00	.14	.02	.00	.00	.00	1.0
19	.00	.00	.00	.00	.00	.00	.06	.01	.00	.00	.00	20
20	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	2.0
21	.00	.00	5.7	.00	.00	.00	.01	.01	.00	.00	.00	.50
22	.00	.00	4.4	.00	.00	.00	.00	14	.00	.00	.00	.00
23	.00	.00	1.8	.00	.00	.00	.00	.39	.00	.00	.00	.00
24	.00	.00	.50	.00	35	.00	.00	.18	.00	.00	.00	.00
25	.00	.00	.20	.00	5.8	.00	.00	.05	.00	.00	.00	100
26	.00	.00	.02	.00	1.3	.00	.00	.01	.00	.00	.00	10
27	.00	.00	.02	.00	.30	.00	.00	.00	.00	.00	.00	2.0
28	.00	.00	.10	.00	.18	.00	.00	.00	.00	.00	.00	.30
29	.00	.00	.04	.00	---	.00	.00	.00	.62	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.37	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	33.49	.00	12.78	.70	42.58	.86	2.53	112.98	.99	3.13	.00	135.80
MEAN	1.08	.00	.41	.02	1.52	.03	.08	3.64	.03	.10	.00	4.53
MAX	17	.00	5.7	.50	35	.20	2.3	29	.62	2.7	.00	100
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	66	.00	25	1.4	84	1.7	5.0	224	2.0	6.2	.00	269

CAL YR 1985	TOTAL	76.02	MEAN	.21	MAX	17	MIN	.00	AC-FT	151
WTR YR 1986	TOTAL	345.84	MEAN	.95	MAX	100	MIN	.00	AC-FT	686

06164630 BIG WARM CREEK NEAR ZORTMAN, MT

LOCATION (REVISED).--Lat 48°00'52", long 108°27'02", in NE¼NW¼NW¼ sec.13, T.26 N., R.25 E., Blaine County, Hydrologic Unit 10050014, on left bank, 0.75 mi west of Blaine-Phillips County line, 4 mi east of Lodgepole, and 8.5 mi northeast of Zortman.

DRAINAGE AREA.--8.58 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,660 ft, from topographic map.

REMARKS.--No estimated daily discharges this year. Records fair. Numerous diversions for irrigation upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 630 ft^3/s Sept. 25, 1986, gage height, 6.49 ft; minimum daily, 3.2 ft^3/s Sept. 9, 1983, Oct. 3, 4, 29, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 630 ft^3/s Sept. 25, gage height, 6.49 ft; minimum daily, 3.2 ft^3/s Oct. 3, 4, 29.

REVISIONS.--Previously published location information has been in error. This station has been in the above location since its inception.

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	3.6	3.8	4.7	6.0	4.5	4.7	8.3	5.5	9.1	7.2	6.9	5.7
2	3.5	3.8	5.1	5.4	4.1	4.3	8.2	5.4	8.8	7.3	7.0	5.4
3	3.2	3.9	5.4	5.4	4.1	4.1	8.2	5.4	8.8	7.4	6.9	5.6
4	3.2	4.1	5.1	5.2	3.9	4.0	8.7	10	8.3	7.4	6.8	5.7
5	3.6	4.7	4.4	4.7	3.6	5.8	7.1	29	8.2	9.6	6.5	6.3
6	4.1	4.2	3.4	4.4	3.5	6.2	6.9	17	8.8	7.5	6.3	6.7
7	4.8	3.9	3.9	4.5	3.5	6.3	7.4	13	9.9	6.9	6.5	6.6
8	4.7	4.0	5.4	5.0	3.8	6.4	6.8	19	9.3	6.7	6.1	6.9
9	4.4	5.3	4.9	5.3	3.9	6.5	7.1	17	9.3	6.7	6.0	7.1
10	4.8	5.2	4.6	6.5	3.8	6.3	7.4	27	8.1	6.6	6.0	6.8
11	6.8	5.1	4.8	6.6	3.9	5.8	7.2	41	7.6	6.4	5.7	6.6
12	7.3	5.0	4.7	5.4	3.8	5.9	7.4	34	7.3	6.2	5.7	6.6
13	6.5	5.0	5.1	5.4	3.9	6.3	7.2	19	7.1	6.1	5.6	6.8
14	6.6	4.9	5.6	5.2	4.1	6.4	7.3	18	6.9	6.2	5.5	7.0
15	6.3	4.7	5.3	5.1	4.4	6.6	7.0	18	6.8	6.3	5.5	6.9
16	5.0	5.2	5.5	5.1	4.4	6.5	7.7	16	6.5	6.6	5.5	6.8
17	4.6	5.0	5.4	5.0	4.5	6.3	13	16	6.7	6.4	5.5	8.0
18	3.8	4.7	5.9	5.1	4.6	6.2	12	14	6.9	7.2	5.9	7.9
19	4.2	4.5	6.0	5.1	4.5	6.3	9.1	13	6.7	7.9	5.9	22
20	4.2	4.3	6.9	5.1	5.1	6.3	8.5	12	6.6	8.0	5.8	11
21	4.4	4.5	12	5.2	5.4	6.7	7.8	12	6.6	7.9	6.4	8.8
22	4.2	4.5	10	5.4	5.4	6.7	6.5	21	6.5	7.8	6.2	8.0
23	4.2	5.1	9.0	5.4	5.7	6.8	5.9	17	6.6	7.8	6.0	7.8
24	4.0	4.6	8.7	5.5	16	7.1	6.1	14	7.0	7.8	5.5	10
25	4.1	4.7	9.1	5.6	11	7.2	6.8	13	6.9	7.7	5.6	323
26	3.8	6.0	9.5	5.5	6.7	7.4	6.0	12	6.9	7.9	5.5	23
27	3.6	5.6	8.8	5.7	5.1	6.6	5.9	12	6.9	7.6	5.5	18
28	3.7	5.6	6.4	5.5	4.9	7.3	5.5	11	7.0	7.6	5.6	16
29	3.2	5.2	6.2	5.4	---	7.7	5.4	11	12	7.4	5.5	15
30	4.1	5.0	6.0	5.6	---	8.1	5.5	10	7.9	7.2	5.6	14
31	3.9	---	5.9	4.4	---	8.2	---	9.7	---	6.8	5.8	---
TOTAL	138.4	142.1	193.7	164.7	142.1	197.0	223.9	492.0	232.0	224.1	184.8	596.0
MEAN	4.46	4.74	6.25	5.31	5.07	6.35	7.46	15.9	7.73	7.23	5.96	19.9
MAX	7.3	6.0	12	6.6	16	8.2	13	41	12	9.6	7.0	323
MIN	3.2	3.8	3.4	4.4	3.5	4.0	5.4	5.4	6.5	6.1	5.5	5.4
AC-FT	275	282	384	327	282	391	444	976	460	445	367	1180

CAL YR 1985	TOTAL	1905.3	MEAN	5.22	MAX	12	MIN	3.2	AC-FT	3780
WTR YR 1986	TOTAL	2930.8	MEAN	8.03	MAX	323	MIN	3.2	AC-FT	5810

06166000 BEAVER CREEK BELOW GUSTON COULEE, NEAR SACO, MT

LOCATION.--Lat 48°21'25", long 107°34'48", in SE¼SW¼NW¼ sec.16, T.30 N., R.32 E., Phillips County, Hydrologic Unit 10050014, on right bank, 25 ft upstream from bridge on county road, 13 mi southwest of Saco, 22.5 river miles downstream from Guston Coulee, and at mile 61.1.

DRAINAGE AREA.--1,208 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1981 to current year (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 2,215 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-9, Mar. 1-10. Water-discharge records fair except those for estimated daily discharges, which are poor. Some regulation by numerous small reservoirs on tributary streams. Diversions for irrigation upstream from gage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,500 ft^3/s Sept. 26, 1986, gage height, 14.68 ft, from slope-area determination of peak flow; no flow at times each year.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 23,500 ft^3/s Sept. 26, gage height, 14.68 ft, from slope-area determination of peak flow; 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	.90	1.1				900	6.1	4.0	124	7.6	.80	8.7
2	1.0	1.4				800	6.4	3.0	97	41	.53	8.7
3	1.1	1.7				750	4.5	2.5	82	169	.42	8.2
4	1.2	1.5				700	3.0	2.5	63	187	.36	4.1
5	1.3	1.7				690	2.7	4.4	50	136	.52	3.3
6	1.4	1.3				500	2.0	22	44	159	3.9	4.8
7	1.5	1.2				400	1.7	709	42	175	1.2	6.4
8	1.6	1.4				300	1.0	1140	36	220	.38	7.7
9	1.7					200	.05	1160	33	247	.16	9.8
10	1.9					150	.00	1080	30	173	.30	12
11	2.1					130	.00	1260	21	104	2.5	11
12	1.9					119	.00	1470	16	74	9.6	6.9
13	1.9					100	.00	1540	23	50	19	3.7
14	1.9					86	.00	1890	23	38	21	2.5
15	72					71	.00	2140	24	31	21	2.5
16	161					61	.00	1920	21	23	20	4.4
17	154					50	.00	1540	16	6.5	16	6.7
18	152					42	.13	1320	13	3.7	15	7.3
19	114					35	.26	752	11	1.6	19	9.7
20	55					34	13	403	9.2	.70	14	12
21	26					31	58	292	7.7	2.5	11	59
22	15					30	39	246	6.1	11	9.8	489
23	9.9					27	28	189	4.9	17	9.8	687
24	7.4					25	21	241	5.7	23	10	747
25	5.1					22	22	477	4.0	19	10	849
26	3.6					17	22	526	3.3	13	8.2	6560
27	3.0					14	16	437	2.3	7.8	8.2	11900
28	2.5					13	11	533	2.3	5.3	9.2	6710
29	1.5					13	7.8	466	3.0	3.3	7.7	4450
30	1.4					8.8	5.7	305	3.3	2.0	7.3	3010
31	1.3					7.7	---	188	---	1.2	7.3	---
TOTAL	806.10					6326.5	271.34	22262.4	820.8	1952.20	264.17	35601.4
MEAN	26.0					204	9.04	718	27.4	63.0	8.52	1187
MAX	161					900	58	2140	124	247	21	11900
MIN	.90					7.7	.00	2.5	2.3	.70	.16	2.5
AC-FT	1600					12550	538	44160	1630	3870	524	70620

06169500 ROCK CREEK BELOW HORSE CREEK, NEAR INTERNATIONAL BOUNDARY

(Hydrologic bench-mark station)

LOCATION (REVISED).--Lat 48°58'10", long 106°50'21", in NE¼NW¼ sec.15, T.37 N., R.37 E., Valley County, Hydrologic Unit 10050015, on right bank 2 mi south of international boundary, 3 mi downstream from Horse Creek, 21 mi northwest of Opheim, MT, and at mile 82.0.
DRAINAGE AREA.--328 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1916 to October 1926, September 1956 to current year (seasonal records only prior to October 1978). Monthly discharge only for some periods, published in WSP 1309. Published as Rock Creek near Barnard, Mt. 1916-17. Prior to September 1956, records were collected at both Horse Creek (1914-56) and Rock Creek above Horse Creek (1914-56). Summations are equivalent to records at this site.
REVISED RECORDS.--WSP 1509: 1925(M), WSP 1729: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 2,530 ft, from topographic map. March 1916 to October 1926, nonrecording gages at several sites within 500 ft upstream at different datum.
REMARKS.--Estimated daily discharges: Oct. 6-12, Nov. 7 to Mar. 13. Water-discharge records good except those for estimated daily discharges, which are poor. Several small diversions for irrigation upstream from station.
AVERAGE DISCHARGE.--8 years (1979-86), 16.6 ft^3/s, 12,030 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,420 ft^3/s Apr. 7, 1969, gage height, 12.03 ft; maximum gage height, 13.40 ft Mar. 29, 1978 (backwater from ice); no flow at times most years.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 15, 1952, reached a stage of 12.6 ft, from floodmarks, discharge, 5,110 ft^3/s, by slope-area measurement of peak flow.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 5	unknown	*1,000	*a8.65	July 10	1945	261	4.75
May 10	0015	423	5.40				

a Backwater from ice
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	1.3	1.7	.25	.45	.65	100	35	4.8	3.0	1.1	.24	.00
2	1.3	1.8	.25	.45	.60	500	26	4.5	2.8	1.5	.18	.00
3	1.3	1.8	.30	.40	.55	800	20	4.2	2.4	1.7	.17	.01
4	1.2	1.9	.35	.35	.60	650	17	3.8	2.3	1.3	.14	.01
5	1.1	2.0	.35	.30	.60	1000	14	7.2	2.1	1.4	.15	.11
6	1.1	2.0	.40	.35	.50	850	11	48	2.1	1.1	.14	.10
7	1.1	1.7	.40	.40	.45	350	10	112	2.2	.98	.14	.08
8	1.0	1.5	.35	.45	.40	200	10	62	2.3	.98	.11	.06
9	1.0	1.2	.30	.50	.30	300	9.3	183	2.7	1.9	.08	.72
10	1.1	.95	.30	.45	.25	450	8.4	292	2.6	68	.09	1.1
11	1.5	.90	.25	.40	.30	500	7.7	92	6.5	111	.09	1.5
12	2.0	.80	.25	.45	.30	450	7.7	56	4.4	36	.09	5.5
13	3.3	.70	.20	.40	.35	350	8.9	39	3.1	23	.10	3.2
14	5.4	.80	.25	.40	.30	460	6.3	28	2.3	9.2	.11	2.1
15	5.3	.85	.30	.45	.35	352	6.3	20	2.1	5.2	.08	1.9
16	5.0	.90	.40	.50	.40	242	5.9	16	1.8	3.6	.06	1.7
17	4.4	.80	.35	.60	.40	173	7.2	14	1.5	2.2	.05	2.4
18	3.8	.65	.30	.50	.35	112	8.6	11	1.4	1.6	.04	5.7
19	3.4	.60	.45	.45	.30	70	9.8	9.9	1.4	1.3	.02	4.4
20	3.1	.60	.55	.40	.25	57	11	8.7	1.1	1.1	.00	7.4
21	2.9	.50	.60	.35	.30	62	9.1	7.9	1.1	.94	.00	82
22	2.6	.40	.60	.40	.30	198	7.8	6.8	.99	.78	.01	88
23	2.3	.30	.50	.45	.40	162	7.1	6.5	.97	.71	.00	31
24	2.1	.35	.45	.45	.40	99	6.5	6.1	.87	.65	.00	13
25	2.1	.35	.50	.45	.50	94	6.2	5.7	.76	.59	.00	8.5
26	2.1	.30	.45	.40	1.0	70	6.0	5.4	.65	.52	.00	23
27	2.1	.30	.45	.50	5.0	47	6.0	5.4	.56	.48	.01	49
28	2.0	.30	.40	.55	10	48	5.9	5.3	.55	.44	.00	24
29	1.8	.30	.40	.50	---	67	5.3	4.8	.95	.39	.00	12
30	1.8	.30	.40	.55	---	60	5.0	4.2	1.0	.34	.00	7.0
31	1.7	---	.45	.60	---	46	---	3.6	---	.29	.00	---
TOTAL	72.2	27.55	11.75	13.85	26.10	8919	305.0	1077.8	58.50	280.29	2.10	375.49
MEAN	2.33	.92	.38	.45	.93	288	10.2	34.8	1.95	9.04	.07	12.5
MAX	5.4	2.0	.60	.60	10	1000	35	292	6.5	111	.24	88
MIN	1.0	.30	.20	.30	.25	46	5.0	3.6	.55	.29	.00	.00
AC-FT	143	55	23	27	52	17690	605	2140	116	556	4.2	745

CAL YR 1985	TOTAL	2109.78	MEAN	5.78	MAX	230	MIN	.00	AC-FT	4180
WTR YR 1986	TOTAL	11169.63	MEAN	30.6	MAX	1000	MIN	.00	AC-FT	22150

06169500 ROCK CREEK BELOW HORSE CREEK, NEAR INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-65, 1977 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 WATER (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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV												
12...	1130	0.85	0	0	1340	-13.0	0.0	702	9.7	72	52	K20
JAN												
28...	1145	0.53	--	--	1420	-12.0	0.0	--	--	--	--	--
MAR												
04...	1320	652	--	--	143	9.0	0.5	--	--	--	--	--
10...	1340	439	--	--	131	2.0	0.5	--	--	--	--	--
14...	1350	456	--	--	118	2.0	1.0	--	--	--	--	--
18...	1400	113	75	1	220	1.0	1.0	700	9.3	71	K78	220
APR												
24...	1100	6.9	--	--	1000	10.0	10.5	--	--	--	--	--
JUN												
04...	1230	2.2	0	0	1620	22.0	19.5	700	6.6	79	--	K7
JUL												
14...	1150	9.0	--	--	362	24.5	21.5	--	--	--	--	--
AUG												
27...	1100	0.01	0	0	1220	19.0	18.0	706	7.6	87	K35	58
SEP												
24...	1215	13	--	--	550	--	--	--	--	--	--	--

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)
NOV											
12...	1130	8.70	16	240	0	38	36	220	6	7.8	630
MAR											
18...	1400	7.80	130	--	--	--	--	--	--	--	120
JUN											
04...	1230	8.60	--	--	--	--	--	--	--	--	500
AUG											
27...	1100	8.70	0.80	--	--	--	--	--	--	8.1	330

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 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)
NOV											
12...	20	538	190	5.3	0.40	5.8	846	860	1.2	1.9	<0.010
MAR											
18...	0	93	36	1.9	0.10	--	--	--	--	--	--
JUN											
04...	25	--	--	--	--	--	--	--	--	--	<0.010
AUG											
27...	37	344	180	5.0	0.40	--	740	--	1.0	.02	--

06169500 ROCK CREEK BELOW HORSE CREEK, NEAR INTERNATIONAL BOUNDARY--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, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 12...	<0.100	0.050	0.050	0.60	0.030	0.010	0.010	52	0.12	99
MAR 18...	--	0.020	--	1.4	0.160	--	--	169	52	98
JUN 04...	<0.100	0.050	0.080	0.90	0.060	0.010	<0.010	63	0.38	96
AUG 27...	--	--	--	--	--	--	--	30	0.00	99

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 12...	1130	20	3	62	<0.5	<1	1	<3	8	11	<1
MAR 18...	1400	--	--	--	--	--	--	--	--	--	--

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 12...	140	10	0.6	<10	3	<1	<1	430	<6	3
MAR 18...	--	--	0.7	--	--	--	--	--	--	--

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L) (80020)
MAR 18...	1400	1.6	7.3	5.4	4.6	4.3	3.8	0.04	0.72

06169600 SOUTH CREEK TRIBUTARY NEAR OPHEIM, MT

LOCATION.--REVISED.--Lat 48°52'31", long 106°38'17", in NW¼SE¼ sec.17, T.36 N., R.39 E., Valley County, Hydrologic Unit 10050015, at culvert on county road 0.8 mi upstream of South Creek, 2.1 mi east of Wagon Reservoir, and 10.5 mi west of Opheim.

DRAINAGE AREA.--2.15 mi^2.

PERIOD OR RECORD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,730 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 27 to Mar. 17. Records fair except those for estimated discharges, which are poor. No known diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 56 ft^3/s Aug. 28, 1985, gage height, 5.96 ft, on basis of indirect culvert computation; no flow most days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 43 ft^3/s May 12, gage height, 5.34 ft, from crest-stage gage; no flow most 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	.50	.01	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	2.0	.01	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	5.0	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	7.5	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	10	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	5.0	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	3.5	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	1.0	.00	.00	.00	2.7	.00	.00
9	.00	.00	.00	.00	.00	2.5	.00	4.5	.00	.21	.00	.00
10	.00	.00	.00	.00	.00	5.0	.00	.21	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	6.0	.00	2.9	.00	.00	.00	.00
12	.66	.00	.00	.00	.00	3.5	.00	7.8	.00	.00	.00	.00
13	.16	.00	.00	.00	.00	2.5	.00	.01	.00	.00	.00	.00
14	.02	.00	.00	.00	.00	2.0	.00	.01	.00	.00	.00	.00
15	.02	.00	.00	.00	.00	1.0	.00	.01	.00	.00	.00	.00
16	.02	.00	.00	.00	.00	.70	.00	.00	.00	.00	.00	.00
17	.01	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	2.4	.00	.00	.00	.00	.00	.07
22	.00	.00	.00	.00	.00	2.6	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.90	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	1.8	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.54	.00	.00	.00	.00	.00	1.9
26	.00	.00	.00	.00	.00	.31	.00	.00	.00	.00	.00	.87
27	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00	.00	.01
28	.00	.00	.00	.00	.05	1.5	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.89	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.14	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.05	---	.00	---	.00	.00	---
TOTAL	.89	.00	.00	.00	.05	70.65	.02	15.44	.00	2.91	.00	2.85
MEAN	.03	.00	.00	.00	.00	2.28	.00	.50	.00	.09	.00	.09
MAX	.66	.00	.00	.00	.05	10	.01	7.8	.00	2.7	.00	1.9
MIN	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00
AC-FT	1.8	.00	.00	.00	.1	140	.04	31	.00	5.8	.00	5.7

CAL YR 1985	TOTAL	52.01	MEAN	.14	MAX	6.5	MIN	.00	AC-FT	103
WTR YR 1986	TOTAL	92.81	MEAN	.25	MAX	10	MIN	.00	AC-FT	184

06169700 SOUTH CREEK TRIBUTARY NO. 2 NEAR OPHEIM, MT

LOCATION.--Lat 48°53'19", long 106°39'35", in NW¼SE¼ sec.7, T.36 N., R.39 E., Valley County, Hydrologic Unit 10050015, just upstream of county road, 1.4 mi northeast of Wagon Reservoir, 1.6 mi upstream of South Creek, and 12 mi west of Opheim.

DRAINAGE AREA.--1.62 mi^2.

PERIOD OF RECROD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,680 ft, from topographic map.

REMARKS.--Estimated daily discharge: Nov. 10, 11, Feb. 28 to Mar. 20, June 6 to July 13, Sept. 1-23, 26-30. Records good except those for periods of flow, which are poor. No known diversions for irrigation 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, 459 ft^3/s Aug. 28, 1985, gage height, 5.17 ft, rating then in use; maximum gage height, 6.81 ft Sept. 25, 1986; no flow most days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 124 ft^3/s May 11, gage height, 2.45 ft, rating then in use; maximum gage height, 6.81 ft Sept. 25; no flow most 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	1.0	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	3.5	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	10	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	15	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	20	.00	.52	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	2.0	.00	.03	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.70	.00	1.3	.00	10	.00	.00
9	.00	.00	.00	.00	.00	3.0	.00	27	.00	.50	.00	.00
10	.00	.00	.00	.00	.00	9.0	.00	22	.00	.00	.00	.00
11	5.2	.00	.00	.00	.00	7.0	.00	31	.00	.00	.00	.00
12	4.1	.00	.00	.00	.00	5.0	.00	8.9	.00	.00	.00	.00
13	.31	.00	.00	.00	.00	4.0	.00	.08	.00	.00	.00	.00
14	.03	.00	.00	.00	.00	3.0	.00	.00	.00	.00	.00	.00
15	.39	.00	.00	.00	.00	4.0	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	2.0	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	4.3	.00	.00	.00	.00	.00	.50
22	.00	.00	.00	.00	.00	1.2	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	6.9
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.5
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10
28	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	10.03	.00	.00	.00	.10	97.50	.00	90.83	.00	10.50	.00	10.00
MEAN	.32	.00	.00	.00	.00	3.15	.00	2.93	.00	.34	.00	.33
MAX	5.2	.00	.00	.00	.10	20	.00	31	.00	10	.00	6.9
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	20	.00	.00	.00	.2	193	.00	180	.00	21	.00	20

CAL YR 1985	TOTAL	98.66	MEAN	.27	MAX	31	MIN	.00	AC-FT	196		
WTR YR 1986	TOTAL	218.96	MEAN	.60	MAX	31	MIN	.00	AC-FT	434		

06169800 SOUTH CREEK TRIBUTARY NO.3 NEAR INTERNATIONAL BOUNDARY

LOCATION.--Lat 48°56'24", long 106°48'58", in NE¼SW¼ sec.23, T.37 N., R.37 E., Valley County, Hydrologic Unit 10050015, at upstream end of culvert on county road, 2.2 mi upstream of mouth, 3.7 mi south of international boundary, and 20 mi west of Opheim.

DRAINAGE AREA.--0.32 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,590 ft, from topographic map.

REMARKS.--Estimated daily discharge: Mar. 3-16, May 5, 8, 9, 11, 12, July 9, Sept. 20, 21. Records poor. No known diversions for irrigation upstream of station. No observations of specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7.5 ft^3/s May 8, 1986, gage height, 1.55 ft, from highwater mark; no flow most days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 7.5 ft^3/s May 8, gage height, 1.55 ft, from highwater mark; no flow most 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	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.10	.00	.53	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.54	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.14	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.30	.00	.19	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.20	.00	.26	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.15	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.69
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.16
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	1.00	.00	2.88	.00	.14	.00	.85
MEAN	.00	.00	.00	.00	.00	.03	.00	.09	.00	.00	.00	.03
MAX	.00	.00	.00	.00	.00	.30	.00	1.3	.00	.14	.00	.69
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	2.0	.00	5.7	.00	.3	.00	1.7

CAL YR 1985	TOTAL	.20	MEAN	.00	MAX	.20	MIN	.00	AC-FT	.4
WTR YR 1986	TOTAL	4.87	MEAN	.01	MAX	1.3	MIN	.00	AC-FT	9.7

06170050 ROCK CREEK BELOW McEACHERN CREEK, NEAR INTERNATIONAL BOUNDARY

LOCATION.--Lat 48°52'53", long 106°53'54", in SE¼SE¼NE¼ sec.17, T.36 N., R.37 E., Valley County, Hydrologic Unit 10050015, on left bank 300 ft north of county road, 1 mi east of old townsite of Thoeny, 3.2 mi downstream of McEachern Creek, 8 mi south of international boundary, and 23 mi west of Opheim.

DRAINAGE AREA.--650 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,460 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 2 to Mar. 13. Records good except those for estimated daily discharges, which are poor. Numerous diversions for irrigation 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 daily discharge, 2,000 ft^3/s Mar. 5, 1986, backwater from ice; no flow on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2,000 ft^3/s Mar. 5, backwater from ice; 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	.16	1.3	.20	.00	.60	150	52	7.8	4.8	2.7	1.4	.00
2	.31	1.5	.10	.00	.55	600	44	7.2	4.7	2.6	1.4	.00
3	.49	1.4	.05	.00	.50	1500	37	7.4	3.6	2.1	1.3	.00
4	.53	1.6	.00	.00	.55	1250	33	7.7	3.1	2.2	1.2	.00
5	.45	1.9	.00	.00	.55	2000	27	15	2.7	3.7	1.1	.00
6	.58	1.7	.00	.00	.45	1600	21	57	2.7	3.5	1.1	.04
7	.72	1.9	.00	.00	.40	700	17	145	3.3	3.3	1.2	.00
8	.62	1.7	.00	.00	.35	500	15	124	3.3	2.7	1.0	.00
9	.76	1.7	.00	.00	.25	700	15	276	3.5	2.2	.83	.11
10	.81	1.6	.00	.05	.20	900	13	638	3.3	3.1	.68	.22
11	1.0	1.3	.00	.20	.25	1000	12	305	3.5	158	.61	.31
12	1.2	1.2	.00	.30	.25	900	11	326	3.7	73	.68	.22
13	1.2	1.1	.00	.25	.30	700	11	285	5.5	40	.83	.42
14	1.2	1.1	.00	.25	.25	775	11	138	4.1	18	.49	4.1
15	2.9	1.0	.00	.30	.30	597	10	95	3.5	12	.48	4.1
16	4.0	1.0	.00	.35	.35	396	11	74	2.9	7.3	.42	3.5
17	3.5	1.1	.00	.45	.35	272	11	63	2.6	5.1	.18	3.1
18	3.3	1.0	.00	.40	.30	201	11	51	2.4	4.4	.26	2.7
19	2.7	1.0	.00	.35	.25	133	12	41	2.7	3.5	.22	6.5
20	2.4	.90	.00	.30	.20	95	13	31	2.2	3.5	.11	6.7
21	2.5	.81	.00	.25	.25	97	14	25	2.4	3.3	.04	25
22	2.2	.81	.00	.30	.25	205	12	22	2.1	2.7	.07	181
23	2.0	.67	.00	.35	.30	268	11	19	1.7	2.7	.04	67
24	1.9	.58	.00	.40	.30	175	10	18	1.6	2.2	.04	24
25	1.6	.62	.00	.40	.70	140	8.7	16	1.5	2.2	.00	15
26	1.5	.67	.00	.35	2.0	128	8.3	13	1.5	1.8	.00	13
27	1.6	.62	.00	.40	10	80	8.9	12	1.4	2.1	.00	74
28	1.6	.49	.00	.50	30	64	9.1	10	1.5	1.8	.00	55
29	1.2	.38	.00	.45	---	84	8.9	10	2.1	1.8	.00	21
30	1.3	.27	.00	.50	---	94	8.7	8.4	2.9	1.5	.00	13
31	1.5	---	.00	.55	---	72	---	7.2	---	1.4	.00	---
TOTAL	47.73	32.92	.35	7.65	51.00	16376	486.6	2854.7	86.8	376.4	15.68	520.02
MEAN	1.54	1.10	.01	.25	1.82	528	16.2	92.1	2.89	12.1	.51	17.3
MAX	4.0	1.9	.20	.55	30	2000	52	638	5.5	158	1.4	181
MIN	.16	.27	.00	.00	.20	64	8.3	7.2	1.4	1.4	.00	.00
AC-FT	95	65	.7	15	101	32480	965	5660	172	747	31	1030

CAL YR 1985	TOTAL	2645.18	MEAN	7.25	MAX	350	MIN	.00	AC-FT	5250		
WTR YR 1986	TOTAL	20855.85	MEAN	57.1	MAX	2000	MIN	.00	AC-FT	41370		

06170080 STARBUCK COULEE NEAR INTERNATIONAL BOUNDARY

LOCATION.--Lat 48°51'39", long 106°53'56", in SW¼SE¼SE¼ sec.20, T.36 N., R.37 E., Valley County, at the upstream end of culvert on old road, 0.4 mi upstream of mouth, 1.6 mi south of county road, and 22 mi west of Opheim.

DRAINAGE AREA.--4.16 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 2,460 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 21 to Mar. 20. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75 ft^3/s Aug. 28, 1985, gage height, 4.65 ft; maximum gage height, 4.67 ft Mar. 5, 1986, backwater from ice; no flow most days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 33 ft^3/s May 9, gage height, 3.33 ft; maximum gage height, 4.67 ft Mar. 5, backwater from ice; no flow most 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	.50	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	2.0	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	4.0	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	14	.00	10	.00	.25	.00	.00
6	.00	.00	.00	.00	.00	.30	.00	2.3	.00	.05	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.32	.00	.01	.00	.00
8	.00	.00	.00	.00	.00	.15	.00	1.1	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	3.0	.00	20	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	6.5	.00	3.3	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	15	.00	1.4	.00	.07	.00	.00
12	.75	.00	.00	.00	.00	3.5	.00	8.4	.00	.03	.10	.00
13	.25	.00	.00	.00	.00	5.0	.00	.45	.00	.01	.00	.00
14	.00	.00	.00	.00	.00	2.0	.00	.28	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	2.5	.00	.11	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	1.5	.00	.06	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.60	.00	.05	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.30	.00	.03	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.20	.00	.00	.00	.00	.00	.20
20	.00	.00	.00	.00	.00	.50	.00	.00	.00	.00	.00	5.0
21	.00	.00	.00	.00	.00	2.6	.00	.00	.00	.00	.00	3.8
22	.00	.00	.00	.00	.00	2.1	.00	.00	.00	.00	.00	.34
23	.00	.00	.00	.00	.00	.64	.00	.00	.00	.00	.00	.13
24	.00	.00	.00	.00	.00	.83	.00	.00	.00	.00	.00	.09
25	.00	.00	.00	.00	.00	.47	.00	.00	.00	.00	.00	.22
26	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00	.64
27	.00	.00	.00	.00	.00	.32	.00	.00	.00	.00	.00	.13
28	.00	.00	.00	.00	.10	.45	.00	.00	.00	.00	.00	.08
29	.00	.00	.00	.00	---	.26	.00	.00	.00	.00	.00	.05
30	.00	.00	.00	.00	---	.08	.00	.00	.00	.00	.00	.03
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	1.00	.00	.00	.00	.10	70.37	.00	47.80	.00	.42	.10	10.71
MEAN	.03	.00	.00	.00	.00	2.27	.00	1.54	.00	.01	.00	.36
MAX	.75	.00	.00	.00	.10	15	.00	20	.00	.25	.10	5.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	2.0	.00	.00	.00	.2	140	.00	95	.00	.8	.2	21

CAL YR 1985	TOTAL	40.03	MEAN	.11	MAX	9.6	MIN	.00	AC-FT	79		
WTR YR 1986	TOTAL	130.50	MEAN	.36	MAX	20	MIN	.00	AC-FT	259		

06172000 MILK RIVER NEAR VANDALIA, MT

LOCATION.--Lat 48°22'21", long 106°58'25", in SW¼SW¼NE¼ sec.7, T.30 N., R.37 E., Valley County, Hydrologic Unit 10050012, on right bank, just downstream of Vandalia Dam, 3.0 mi upstream of Long Coulee, 3.2 mi northwest of Vandalia, and at mile 117.3

DRAINAGE AREA.--20,926 mi^2. Area at site used October 1969 to September 1973, 20,944 mi^2.

PERIOD OF RECORD.--October 1914 to September 1925, August 1928 to September 1939, October 1969 to September 1973, October 1982 to current year. April to May 1952 scattered daily elevations, published in WSP 1260-B. Monthly discharge only for some periods, published in WSP 1309. Published as "at Vandalia" October 1969 to September 1973.

REVISED RECORDS.--WSP 1309: 1920(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,090.00 ft, from topographic map. October 1969 to September 1973, nonrecording gage 7.1 mi downstream at datum 5.00 ft lower.

REMARKS.--Estimated daily discharges: Nov. 16 to Mar. 4, Aug. 5-10, Sept. 22-30. Records fair except those for estimated daily discharges, which are poor. Since 1917, flow increased during irrigation season by water from St. Mary Canal which diverts from the St. Mary River near Babb. Flow regulated by Fresno and Nelson Reservoirs, five reservoirs in Lodge Creek basin in Saskatchewan, and four reservoirs in Frenchman River basin in Saskatchewan. Water is diverted at Vandalia Dam by canal, capacity about 300 ft^3/s, for irrigation downstream. Diversions upstream from station for irrigation of about 126,000 acres of which about 18,000 acres lies 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.--30 years (1914-25, 1928-39, 1969-73, 1983-86), 654 ft^3/s, 473,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 27,200 ft^3/s Apr. 1, 1925, gage height, 35.35 ft; maximum gage height, 36.47 ft Mar. 25, 1939; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 17, 1952, reached an observed stage of 38.67 ft, furnished by the U.S. Army Corps of Engineers; discharge, about 45,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 19,200 ft^3/s Mar. 4, gage height, 35.16 ft; no flow Apr. 29 to May 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	126	63	30	70	150	3000	459	.00	3050	251	130	41
2	174	65	30	70	150	6000	386	.00	2590	315	21	91
3	161	61	30	80	150	10000	333	.00	2020	293	64	175
4	226	64	30	80	150	13000	324	.00	1870	315	136	163
5	238	68	30	80	150	15400	292	.03	1670	632	100	121
6	232	65	30	70	150	15000	264	303	1400	855	75	79
7	223	63	35	70	150	13900	243	1510	919	883	60	52
8	216	60	40	75	150	12000	224	1550	519	734	45	47
9	216	44	45	80	150	10300	218	2480	625	520	35	68
10	121	133	40	90	150	9360	213	4050	873	460	28	138
11	69	196	40	120	150	8600	208	4940	800	424	22	160
12	72	340	40	150	150	8260	216	5440	683	320	21	162
13	74	324	40	170	150	6960	294	6160	683	251	20	105
14	80	273	35	170	150	5110	315	6680	679	122	20	83
15	135	215	35	160	150	4620	314	6550	621	67	20	85
16	130	150	40	150	150	4180	306	6210	511	51	20	144
17	145	130	45	150	150	3290	279	5960	360	41	19	270
18	143	110	50	150	150	2490	246	5550	348	35	20	284
19	146	100	55	160	150	1850	231	5070	395	34	19	295
20	169	100	60	170	150	1430	220	4650	310	35	18	230
21	249	100	65	180	150	1220	85	3800	190	47	18	118
22	274	90	70	190	150	1080	1.1	4040	105	61	15	800
23	251	80	75	200	150	1100	1.5	4210	52	42	13	1100
24	254	70	80	200	150	1120	1.5	3760	23	42	12	1500
25	238	60	80	200	400	953	.64	3300	12	82	15	2300
26	158	50	75	190	600	795	.40	3790	28	89	19	3000
27	97	40	70	180	1000	681	.40	4270	36	99	19	4000
28	85	30	70	170	1500	594	.22	4390	20	133	16	6000
29	68	30	65	160	---	520	.00	4400	51	164	21	8000
30	68	30	60	150	---	492	.00	3750	140	289	29	10000
31	69	---	65	150	---	478	---	3720	---	267	35	---
TOTAL	4907	3204	1555	4285	7100	163783	5675.76	110533.03	21583	7953	1105	39611
MEAN	158	107	50.2	138	254	5283	189	3566	719	257	35.6	1320
MAX	274	340	80	200	1500	15400	459	6680	3050	883	136	10000
MIN	68	30	30	70	150	478	.00	.00	12	34	12	41
AC-FT	9730	6360	3080	8500	14080	324900	11260	219200	42810	15770	2190	78570

CAL YR 1985 TOTAL 19326.86 MEAN 53.0 MAX 414 MIN .20 AC-FT 38330
WTR YR 1986 TOTAL 371294.79 MEAN 1017 MAX 15400 MIN .00 AC-FT 736500

06174000 WILLOW CREEK NEAR GLASGOW, MT

LOCATION.--Lat 48°06'52", long 106°40'15", in SW¼NW¼NE¼ sec.10, T.27 N., R.39 E., Valley County, Hydrologic Unit 10050012, on right bank 5.8 mi south of Glasgow, and at mile 12.6.

DRAINAGE AREA.--538 mi^2.

PERIOD OF RECORD.--October 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,085.63 ft National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REVISED RECORDS.--WSP 1729: Drainage area. WSP 1916: 1960.

REMARKS.--Estimated daily discharge: Oct. 29 to Mar. 3, 8, 9, Apr. 29 to May 11, May 25 to June 10, July 1-4, 7-16, July 18 to Sept. 28. Records poor. There are more than 270 storage and detention reservoirs upstream. Water-spreader irrigtion of about 5,000 acres of hay or pasture lands to extent of available flow. Several observation 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.--33 years, 56.5 ft^3/s, 40,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft^3/s July 14, 1962, gage height, 21.70 ft; maximum gage height, 23.0 ft June 21, 1974; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,050 ft^3/s, date unknown but probably occurred Sept. 26, gage height, 21.88 ft, from highwater mark; 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	.00	.00	.00	.00	2000	2.9	4.0	9.0	10	1.0	.00
2	.00	.00	.00	.00	.00	2000	2.0	3.0	7.0	15	.50	.00
3	.00	.00	.00	.00	.00	2000	2.6	2.0	5.0	25	.20	.00
4	.00	.00	.00	.00	.00	2030	1.5	1.0	4.0	40	.00	.00
5	.00	.00	.00	.00	.00	2050	.74	6.0	3.0	52	.00	.00
6	.00	.00	.00	.00	.00	1910	1.2	15	2.5	243	.00	.00
7	.00	.00	.00	.00	.00	1090	.61	50	2.0	230	.00	.00
8	.00	.00	.00	.00	.00	658	.25	130	1.0	110	.00	.00
9	.00	.00	.00	.00	.00	783	.22	400	.50	76	.00	.00
10	.00	.00	.00	.00	.00	649	.18	1300	.25	55	.00	.00
11	.00	.00	.00	.00	.00	582	.20	1200	60	42	.00	.00
12	.00	.00	.00	.00	.00	361	.19	1010	18	36	.00	.00
13	.09	.00	.00	.00	.00	193	.22	890	6.1	30	.00	.00
14	21	.00	.00	.00	.00	142	.22	732	3.4	26	.00	.00
15	171	.00	.00	.00	.00	97	.22	626	3.8	23	.00	.00
16	144	.00	.00	.00	.00	73	.39	535	3.6	19	.00	.00
17	101	.00	.00	.00	.00	58	9.2	414	4.0	16	.00	.00
18	74	.00	.00	.00	.00	42	235	242	1.7	15	.00	10
19	45	.00	.00	.00	.00	34	326	175	2.9	13	.00	100
20	28	.00	.00	.00	.00	27	135	133	3.3	11	.00	500
21	18	.00	.00	.00	.00	27	70	98	3.8	9.0	.00	1000
22	13	.00	.00	.00	.00	32	46	73	2.9	8.0	.00	800
23	9.6	.00	.00	.00	.00	24	32	54	2.4	7.0	.00	700
24	7.4	.00	.00	.00	.00	18	23	44	2.0	6.0	.00	600
25	5.7	.00	.00	.00	10	14	17	50	1.2	5.0	.00	500
26	4.5	.00	.00	.00	50	12	13	40	.73	4.0	.00	4500
27	3.3	.00	.00	.00	350	10	9.9	30	.45	3.5	.00	3500
28	2.6	.00	.00	.00	2000	5.7	8.8	25	.29	3.0	.00	3000
29	.00	.00	.00	.00	---	5.0	6.5	20	5.8	2.5	.00	2340
30	.00	.00	.00	.00	---	3.8	5.0	15	8.1	2.0	.00	2110
31	.00	---	.00	.00	---	3.3	---	12	---	1.5	.00	---
TOTAL	648.19	.00	.00	.00	2410.00	16933.8	950.04	8329.0	168.72	1138.5	1.70	19660.00
MEAN	20.9	.00	.00	.00	86.1	546	31.7	269	5.62	36.7	.05	655
MAX	171	.00	.00	.00	2000	2050	326	1300	60	243	1.0	4500
MIN	.00	.00	.00	.00	.00	3.3	.18	1.0	.25	1.5	.00	.00
AC-FT	1290	.00	.00	.00	4780	33590	1880	16520	335	2260	3.4	39000

CAL YR 1985	TOTAL	2591.73	MEAN	7.10	MAX	171	MIN	.00	AC-FT	5140
WTR YR 1986	TOTAL	50239.95	MEAN	138	MAX	4500	MIN	.00	AC-FT	99650

06174500 MILK RIVER AT NASHUA, MT
(National Stream Quality Accounting Network)

LOCATION.--Lat 48°07'47", long 106°21'50", in NE¼NE¼ sec.1, T.27 N., R.41 E., Valley County, Hydrologic Unit 10050012, on right bank at downstream side of former highway bridge site, 0.6 mi southwest of Nashua, 2.0 mi upstream from Porcupine Creek, and at mile 22.7.

DRAINAGE AREA.--22,332 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,027.75 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 19 to Mar. 7. Water-discharge records good except those for estimated daily discharges, which are poor. Flow increased during irrigation season by water from St. Mary Canal which diverts from the St. Mary River near Babb. Flow regulated by Fresno Reservoir (station number 06136500), two reservoirs in Lodge Creek basin in Saskatchewan, and four reservoirs in Frenchman River basin in Saskatchewan. Diversions for irrigation of about 140,000 acres upstream from station.

AVERAGE DISCHARGE.--47 years, 694 ft^3/s, 502,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,300 ft^3/s Apr. 18, 1952, gage height, 31.38 ft; no flow July 14, 15, July 17 to Aug. 1, Aug. 15 to Sept. 6, 1984, and May 16-19, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,500 ft^3/s Mar. 8, gage height, 30.09 ft; minimum daily, 42 ft^3/s Apr. 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	78	140	110	140	1000	517	61	4260	157	346	141
2	93	72	130	120	140	2000	499	127	4010	179	419	149
3	97	69	130	130	140	4000	486	97	3630	268	386	154
4	130	68	120	130	140	6600	446	111	3150	332	259	146
5	158	69	110	140	150	9000	385	164	2660	376	143	173
6	139	67	110	150	150	12000	321	183	2300	413	116	255
7	171	66	130	170	150	15000	291	279	2050	653	129	266
8	187	63	140	160	150	18400	270	939	1800	961	152	230
9	185	59	150	150	150	18000	237	1820	1390	1030	188	213
10	181	51	140	150	140	16500	212	2700	872	897	228	200
11	173	60	130	140	150	14700	203	4050	660	658	233	196
12	168	65	120	140	160	12600	182	5110	854	561	209	209
13	134	58	120	150	180	11100	187	5550	902	557	172	282
14	93	58	130	170	180	9850	185	5920	790	528	162	309
15	76	94	140	170	180	9040	212	6270	744	446	144	280
16	123	182	130	160	200	8330	269	6530	765	366	130	237
17	192	179	120	180	200	7470	293	6690	752	283	126	222
18	193	173	110	200	200	6380	291	6750	668	252	121	243
19	183	160	120	190	200	5190	392	6670	565	227	116	358
20	163	170	130	180	220	4040	576	6470	485	219	126	503
21	148	180	140	180	240	3050	428	6120	482	187	143	702
22	136	180	130	180	250	2320	297	5630	460	152	135	1290
23	145	180	120	190	270	1850	242	5010	363	140	134	1670
24	179	180	110	200	290	1560	159	4630	280	170	134	1790
25	192	180	110	190	310	1410	93	4470	210	182	140	2210
26	197	170	110	190	310	1360	65	4240	153	169	140	2710
27	202	160	120	180	350	1220	52	3920	105	178	149	4900
28	183	150	120	170	500	1010	46	3900	87	210	144	6270
29	139	150	110	160	---	809	42	4120	79	259	138	6970
30	104	140	100	150	---	663	43	4320	120	293	141	7350
31	86	---	100	140	---	568	---	4420	---	314	142	---
TOTAL	4639	3531	3820	5020	5840	207020	7921	117271	35646	11617	5445	40628
MEAN	150	118	123	162	209	6678	264	3783	1188	375	176	1354
MAX	202	182	150	200	500	18400	576	6750	4260	1030	419	7350
MIN	76	51	100	110	140	568	42	61	79	140	116	141
AC-FT	9200	7000	7580	9960	11580	410600	15710	232600	70700	23040	10800	80590

CAL YR 1985	TOTAL	32640.60	MEAN	89.4	MAX	966	MIN	.00	AC-FT	64740
WTR YR 1986	TOTAL	448398	MEAN	1228	MAX	18400	MIN	42	AC-FT	889400

06174500 MILK RIVER AT NASHUA, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-53, 1960 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1974 to September 1981.
WATER TEMPERATURE: January 1974 to September 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1974-81): Maximum daily, 2,540 microsiemens, Dec.12, 1977; minimum daily, 246 microsiemens, Apr. 14, 1974.
WATER TEMPERATURE (water years 1974-79): Maximum, 27.0°C, July 20, 21, 1974; minimum, 0.0°C on many days during winter.

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 WATER (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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV												
18...	1200	175	100	76	1910	-26.0	0.5	720	11.6	86	K22	K14
JAN												
21...	1500	177	100	2	1480	-5.0	0.0	717	8.3	61	K30	K17
MAR												
12...	--	12700	--	--	249	3.0	3.0	--	--	--	--	--
18...	1300	6410	100	2	275	3.0	5.0	716	9.5	79	K15	280
MAY												
02...	0915	135	--	--	1300	14.0	12.0	--	--	--	--	--
27...	1200	3910	0	0	620	25.0	17.0	715	7.0	77	250	K100
JUL												
28...	1200	204	0	0	1190	26.0	23.0	712	7.7	97	K26	67
SEP												
23...	1300	1690	5	1	700	20.0	12.5	706	8.4	85	--	--

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)
NOV											
18...	1200	8.10	10	450	70	96	52	270	6	6.6	470
JAN											
21...	1500	7.70	5.4	360	42	80	40	170	4	5.9	390
MAR											
18...	1300	7.76	520	76	16	18	7.4	27	1	5.6	74
MAY											
27...	1200	8.14	250	160	39	38	17	66	2	6.7	150
JUL											
28...	1200	8.30	39	320	68	72	33	140	4	8.3	290
SEP											
23...	1300	7.80	5000	130	37	31	12	100	4	6.1	120

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 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)
NOV											
18...	0	378	550	38	0.40	8.3	1320	1300	1.8	624	<0.010
JAN											
21...	0	335	360	30	0.40	12	911	890	1.2	435	0.010
MAR											
18...	0	67	72	4.1	0.20	9.3	248	180	0.34	4290	0.010
MAY											
27...	0	137	140	7.0	0.20	9.2	357	360	0.49	3770	0.010
JUL											
28...	5	260	330	26	0.40	5.6	806	770	1.1	444	0.010
SEP											
23...	0	108	230	7.6	0.40	7.3	547	450	0.74	2500	--

06174500 MILK RIVER AT NASHUA, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 18...	<0.100	0.140	0.120	0.80	0.090	0.030	0.010	82	39	43
JAN 21...	0.730	0.120	0.140	0.70	0.050	0.040	0.030	48	23	99
MAR 18...	0.280	0.350	0.140	1.9	0.580	0.040	0.020	742	12800	99
MAY 27...	0.140	0.090	0.080	1.3	0.410	0.030	0.030	533	5630	97
JUL 28...	<0.100	0.040	0.030	0.80	0.130	0.050	<0.010	102	56	77
SEP 23...	--	--	--	--	--	--	--	7740	35300	99

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV 18...	1200	10	2	72	<0.5	<1	<1	<3	7	8	<1
MAR 18...	1300	250	8	30	<0.5	<1	<1	<3	6	420	1
JUL 28...	1200	10	3	58	<0.5	<1	<1	<3	4	6	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV 18...	120	85	<0.1	<10	3	<1	<1	910	<6	5
MAR 18...	23	26	0.1	<10	4	<1	<1	140	<6	12
JUL 28...	89	10	<0.1	<10	4	<1	<1	680	<6	3

06175000 PORCUPINE CREEK AT NASHUA, MT

LOCATION.--Lat 48°08'09", long 106°20'52", in SW¼NE¼SE¼ sec.31, T.28 N., R.42 E., Valley County, Hydrologic Unit 10050016, on right bank, 30 ft downstream from U.S. Highway 2 bridge, 0.1 mi downstream from Fort Peck Indian Reservation boundary, 0.3 m east of Nashua, and at mile 3.9.

DRAINAGE AREA.--725 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1908 to September 1924 (no winter records 1912-13, 15-16, 22-24), October 1981 to current year. Flows are equivalent if overflow channel just upstream from the present location is gaged.

GAGE.--Water-stage recorder. Elevation of gage is 2,060 ft, from topographic map. July 12, 1908, to Sept. 30, 1924 nonrecording gage 0.5 mi upstream at different datum.

REMARKS.--Estimated daily discharge: Mar. 1-11, and June 13 to Sept. 30. Water-discharge records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 430 acres upstream from station.

AVERAGE DISCHARGE.--13 years (1909-11, 1913-14, 1916-21, 1982-86), 25.6 ft^3/s, 18,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,600 ft^3/s Apr. 13, 1982, gage height, 15.95 ft; maximum gage height, 18.0 ft Apr. 11, 1916, from floodmark, at previous site and datum; no flow each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 24, 1939, computed as 35,000 ft^3/s by U.S. Indian Service (now Bureau of Indian Affairs), caused by failure of Middle Fork dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge about 3,000 ft^3/s Mar. 6, gage height, 15.39 ft (observed, backwater from ice); 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	.00	46	6.8	1.3	.00	.00	.00
2	.00	.00	.00	.00	.00	25	39	7.0	.64	.00	.00	.00
3	.00	.00	.00	.00	.00	100	33	7.0	.01	.00	.00	.00
4	.00	.00	.00	.00	.00	600	30	7.0	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	2500	28	8.6	1.3	2.5	.00	.00
6	.00	.00	.00	.00	.00	3000	25	10	1.7	5.5	.00	.00
7	.00	.00	.00	.00	.00	2500	23	10	1.7	2.5	.00	.00
8	.00	.00	.00	.00	.00	2000	20	13	1.0	.00	.00	.00
9	.00	.00	.00	.00	.00	1800	19	73	1.0	.00	.00	.00
10	.00	.00	.00	.00	.00	1600	19	142	.64	.00	.00	.00
11	.00	.00	.00	.00	.00	1400	18	97	.01	.00	.00	.00
12	.00	.00	.00	.00	.00	1250	17	67	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	959	16	100	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	562	16	64	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	412	15	46	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	297	14	38	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	194	15	38	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	140	14	33	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	115	13	28	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	100	13	21	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	92	13	17	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	116	14	14	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	136	13	13	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	124	12	12	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	114	11	9.9	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	110	11	8.4	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	92	9.9	7.2	.00	.00	.00	1.3
28	.00	.00	.00	.00	.00	86	9.5	5.3	.00	.00	.00	4.5
29	.00	.00	.00	.00	---	86	8.6	3.9	.00	.00	.00	.00
30	.00	.00	.00	.00	---	77	7.8	3.2	.00	.00	.00	2.1
31	.00	---	.00	.00	---	56	---	2.3	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	20643.00	542.8	912.6	9.30	10.50	.00	7.90
MEAN	.00	.00	.00	.00	.00	666	18.1	29.4	.31	.34	.00	.26
MAX	.00	.00	.00	.00	.00	3000	46	142	1.7	5.5	.00	4.5
MIN	.00	.00	.00	.00	.00	.00	7.8	2.3	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	40950	1080	1810	18	21	.00	16

CAL YR 1985	TOTAL	1650.60	MEAN	4.52	MAX	175	MIN	.00	AC-FT	3270
WTR YR 1986	TOTAL	22126.10	MEAN	60.6	MAX	3000	MIN	.00	AC-FT	43890

06175000 PORCUPINE CREEK AT NASHUA, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1982 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)	PH LAB (STAND-ARD UNITS) (00403)	HARD-NESS (MG/L AS CACO3) (00900)
MAR									
25...	1140	113	--	--	700	9.0	6.0	--	--
APR									
01...	1100	48	30	1	868	5.0	8.0	8.30	200
22...	1100	14	80	1	1330	20.0	14.5	8.30	280
JUN									
05...	1230	1.7	100	2	1620	25.0	21.0	8.20	380

DATE	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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
MAR									
25...	--	--	--	--	--	--	--	--	--
APR									
01...	1	44	22	110	3	5.3	199	240	11
22...	17	65	29	160	4	5.7	265	350	15
JUN									
05...	81	85	41	230	5	7.3	300	510	12

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
MAR								
25...	--	--	--	--	--	--	--	--
APR								
01...	0.4	9.8	560	0.76	72	<0.10	140	39
22...	0.5	8.4	790	1.1	30	0.10	220	<3
JUN								
05...	0.6	7.3	1100	1.5	4.8	<0.10	340	8

06176500 WOLF CREEK NEAR WOLF POINT, MT

LOCATION.--Lat 48°05'47", long 105°40'41", in NE¼SE¼NW¼ sec.17, T.27 N., R.47 E., Roosevelt County, Hydrologic Unit 10060001, on right bank 0.5 mi north of U.S. Highway 2, 1.5 mi west of Wolf Point, and at mile 2.3.

DRAINAGE AREA.--251 mi^2.

PERIOD OF RECORD.--August 1908 to July 1914 (no winter records 1909, 1913-14), March 1950 to September 1953, water years 1954, 1956-1973 (annual maximums), October 1981 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,000 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 31, 1914, nonrecording gage at site 0.8 mi upstream at different datum. Aug. 1, 1914, to Sept. 30, 1953, water-stage recorder at same site and datum. May 1955 to September 1973, crest-stage gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1, 2, Oct. 12 to Nov. 20, Dec. 5 to Mar. 12, and Sept. 18-30. Records poor. Minor diversion for irrigation upstream from station.

AVERAGE DISCHARGE.--11 years (1910-12, 1951-53, 1982-86), 9.37 ft^3/s, 6,790 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,780 ft^3/s Apr. 4 or 5, 1954, gage height, 12.9 ft, on basis of contracted-opening measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1938 reached a stage of about 12 ft, at previous site and datum, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge and gage height not determined; no flow most 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	500	10	6.7	1.9	.00	.00	.00
2	.00	.00	.00	.00	.00	400	8.9	6.4	1.5	.00	.00	.00
3	.00	.00	.00	.00	.00	350	9.3	6.4	.81	.00	.00	.00
4	.00	.00	.00	.00	.00	300	9.3	6.4	.69	.00	.00	.00
5	.00	.00	.00	.00	.00	250	11	8.4	.55	.00	.00	.00
6	.00	.00	.00	.00	.00	200	11	14	.26	.00	.00	.00
7	.00	.00	.00	.00	.00	150	14	14	.22	.00	.00	.00
8	.00	.00	.00	.00	.00	100	12	14	.22	.00	.00	.00
9	.00	.00	.00	.00	.00	70	11	17	.27	.00	.00	.00
10	.00	.00	.00	.00	.00	50	9.5	19	.10	.00	.00	.00
11	.00	.00	.00	.00	.00	40	7.9	18	10	.00	.00	.00
12	.00	.00	.00	.00	.00	30	7.6	15	5.8	.00	.00	.00
13	.00	.00	.00	.00	.00	23	7.6	13	3.6	.00	.00	.00
14	.00	.00	.00	.00	.00	21	7.1	9.0	2.6	.00	.00	.00
15	.00	.00	.00	.00	.00	18	7.3	6.3	1.8	.00	.00	.00
16	.00	.00	.00	.00	.00	14	7.0	5.6	.86	.00	.00	.00
17	.00	.00	.00	.00	.00	14	8.3	5.1	.61	.00	.00	.00
18	.00	.00	.00	.00	.00	16	8.4	4.9	.39	.00	.00	.00
19	.00	.00	.00	.00	.00	14	8.3	4.7	.11	.00	.00	.00
20	.00	.00	.00	.00	.00	10	7.6	4.1	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	11	7.3	3.5	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	9.3	7.7	2.9	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	8.6	6.3	3.2	.00	.00	.00	.00
24	.00	.00	.00	.00	.50	8.3	6.7	3.5	.00	.00	.00	.20
25	.00	.00	.00	.00	10	7.8	6.8	3.5	.00	.00	.00	1.0
26	.00	.00	.00	.00	100	7.3	6.7	3.5	.00	.00	.00	1.0
27	.00	.00	.00	.00	800	7.3	6.6	3.2	.00	.00	.00	1.0
28	.00	.00	.00	.00	650	11	6.7	3.0	.00	.00	.00	1.0
29	.00	.00	.00	.00	---	13	6.7	2.9	.00	.00	.00	1.0
30	.00	.00	.00	.00	---	14	6.6	2.4	.00	.00	.00	.98
31	.00	---	.00	.00	---	12	---	2.3	---	.00	.00	---
TOTAL	.00	.00	.00	.00	1560.50	2679.6	251.2	231.9	32.29	.00	.00	6.18
MEAN	.00	.00	.00	.00	55.7	86.4	8.37	7.48	1.08	.00	.00	.21
MAX	.00	.00	.00	.00	800	500	14	19	10	.00	.00	1.0
MIN	.00	.00	.00	.00	.00	7.3	6.3	2.3	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	3100	5310	498	460	64	.00	.00	12

CAL YR 1985	TOTAL	309.60	MEAN	.85	MAX	11	MIN	.00	AC-FT	614
WTR YR 1986	TOTAL	4761.67	MEAN	13.0	MAX	800	MIN	.00	AC-FT	9440

06177000 MISSOURI RIVER NEAR WOLF POINT, MT

LOCATION.--Lat 48°04'00", long 105°31'55", in SW¼NW¼ sec.28, T.27 N., R.48 E., McCone County, Hydrologic Unit 10060001, on right bank 500 ft downstream from bridge on State Highway 13, 5 mi southeast of Wolf Point, 7.8 mi downstream from Wolf Creek, and at mile 1,701.4.

DRAINAGE AREA.--82,290 mi^2.

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

REVISED RECORDS.--WSP 1146: 1931. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,958.57 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 13, 1930, nonrecording gages at Wolf Point ferry landing 5.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 11, 12, Nov. 18 to Feb. 28, and Sept. 11-30. Records good except those for estimated daily discharges, which are fair. Flow partly regulated by Fort Peck Lake and many other reservoirs upstream from station. Diversion for irrigation of about 1,010,400 acres upstream from station.

AVERAGE DISCHARGE.--11 years (1928-39, prior to Fort Peck Lake reaching operational level), 7,219 ft^3/s, 5,230,000 acre-ft/yr; 43 years (1943-86, after operational level was reached), 10,640 ft^3/s, 7,709,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft^3/s Mar. 25, 1939, gage height, 14.4 ft, ice present, from rating curve extended above 39,000 ft^3/s; maximum gage height, 15.64 ft Mar. 27, 1960 (backwater from ice); minimum daily discharge, 320 ft^3/s Dec. 10, 1941.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 14, 1908, reached a stage of about 20 ft, present site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,900 ft^3/s Mar. 10, gage height, 6.90 ft; maximum gage height, 10.87 ft Feb. 27 (backwater from ice); minimum daily discharge, 5,570 ft^3/s Oct. 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	5690	6110	9100	13600	13800	13600	8020	6840	10400	8400	8440	7170
2	5570	6100	9200	13700	14000	13900	7860	6830	10100	8330	8440	7030
3	5800	6200	9200	13800	14000	15400	7770	6940	9730	8060	8160	6590
4	5740	5960	9000	14000	14000	15400	7690	7110	9360	8320	7450	6770
5	6060	5980	9200	14100	14000	17600	7650	7270	9330	8560	7500	6730
6	5850	5930	9200	14000	14000	19000	7560	8010	10200	8730	7300	6720
7	5850	6220	9200	14300	14100	19300	7720	7420	10300	8460	7580	6710
8	6390	6300	9200	13900	14100	19400	7340	7360	9810	8640	8170	6490
9	6260	6440	9100	14200	14100	20600	7460	8040	9710	8830	8180	6900
10	6090	6480	9400	14400	14100	21700	7320	9230	9540	9120	8090	6830
11	5830	6450	10100	14300	14100	21000	7350	9110	8990	8960	8120	6300
12	6080	6450	10100	14500	13900	20000	7300	9350	8500	8940	8370	6600
13	5950	6530	11200	14100	14700	18400	7420	10600	8440	8800	8360	6300
14	6100	6350	11300	13500	14400	18100	7520	11300	8640	8860	8390	6500
15	6120	6370	11300	14500	14600	17500	7340	11800	8740	8650	8490	6500
16	6120	6290	12400	14100	14600	15900	7240	12100	8560	8520	8420	6300
17	6050	6300	12300	14200	14400	15000	7550	12400	8820	8620	8450	6600
18	6230	6600	12400	14000	14300	14200	7860	12600	8880	8490	8220	6150
19	5850	6700	12600	14200	14300	12800	7420	13200	8860	8290	8230	6100
20	6020	6700	13400	14400	14300	11600	7390	13300	8840	8310	8180	6350
21	6160	6700	13200	14300	14200	10500	7450	13000	8450	8260	8170	6350
22	6130	7100	13300	14200	14400	9500	7440	12700	8650	8130	8300	6500
23	9680	9000	12900	14200	14500	9230	7460	12300	8650	8260	7300	6900
24	13100	9300	12900	14200	14500	8970	7280	11500	8640	8310	7310	7300
25	9760	9900	13000	14300	14300	8830	7040	10800	8720	8310	7340	7750
26	6900	9400	13900	14100	14300	8330	7040	10600	8380	8340	7410	7800
27	6630	9400	13700	14200	14300	8770	7040	10400	8260	8710	7380	8300
28	6360	9400	13800	14400	12900	8410	7140	10100	8100	8420	7460	8700
29	6430	9100	13700	14400	---	7960	7040	10100	8250	8380	7340	10900
30	6160	9000	13700	14300	---	8540	6890	10200	8210	8360	7330	12300
31	6150	---	13600	14300	---	7880	---	10100	---	8490	7350	---
TOTAL	203110	214760	356600	438700	397200	437320	222600	312610	270060	263860	245230	214440
MEAN	6552	7159	11500	14150	14190	14110	7420	10080	9002	8512	7911	7148
MAX	13100	9900	13900	14500	14700	21700	8020	13300	10400	9120	8490	12300
MIN	5570	5930	9000	13500	12900	7880	6890	6830	8100	8060	7300	6100
AC-FT	402900	426000	707300	870200	787800	867400	441500	620100	535700	523400	486400	425300

CAL YR 1985	TOTAL	3669830	MEAN	10050	MAX	15400	MIN	5530	AC-FT	7279000
WTR YR 1986	TOTAL	3576490	MEAN	9799	MAX	21700	MIN	5570	AC-FT	7094000

06177500 REDWATER RIVER AT CIRCLE, MT

LOCATION.--Lat 47°24'51", long 105°34'30", in SW¼SW¼ sec.11, T.19 N., R.48 E., McCone County, Hydrologic Unit 10060002, on left bank at Circle, 1 mi upstream from Horse Creek, and at mile 110.2.

DRAINAGE AREA.--547 mi^2.

PERIOD OF RECORD.--April to November 1929, March to November 1930, July 1931 to December 1932, March to June 1933, February to November 1934, April 1935 to December 1936, April 1937 to June 1972, October 1974 to current year. Monthly discharge only for some periods, published in WSP 1309. Prior to October 1967, published as Redwater Creek at Circle.

REVISED RECORDS.--WSP 1006: 1929-30, 1932-33, 1935-39. WSP 1509: 1929, 1934. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Sharp-crested weir since Sept. 24, 1938. Datum of gage is 2,394.32 ft National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 1, 1941, and Mar. 23, 1943, to Feb. 16, 1948, nonrecording gage at site 0.3 mi upstream at same datum. June 1, 1941, to Mar. 22, 1943, nonrecording gage at site 200 ft upstream at datum 2.8 ft lower. Feb. 26, 1948, to May 7, 1950, nonrecording gage at site 200 ft upstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 17 to Mar. 1. Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 1,200 acres upstream from station.

AVERAGE DISCHARGE.--48 years (1931-32, 1935-36, 1937-71, 1975-86), 13.4 ft^3/s, 9,710 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,960 ft^3/s June 29, 1986, gage height, 12.85 ft, from floodmarks, rating curve extended above 3,500 ft^3/s; no flow at time most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 80 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 28	----	a 600	ice jam	July 17	1215	427	8.52
June 9	0715	2,060	10.66	July 28	0930	92	5.69
June 19	1115	184	6.81	Sept. 25	0745	5,040	12.21
June 29	1800	*6,960	*12.85				

a--about

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	.01	.06	550	6.3	4.2	2.3	165	7.3	1.8
2	.00	.00	.00	.02	.05	608	5.9	4.0	2.1	72	6.5	2.0
3	.01	.00	.00	.01	.06	271	5.6	3.7	1.8	40	6.0	2.1
4	.02	.00	.00	.01	.05	325	5.2	3.7	1.7	31	5.6	2.2
5	.01	.00	.01	.01	.04	371	4.7	4.3	1.6	46	5.4	2.5
6	.01	.00	.02	.01	.03	203	4.6	6.1	1.6	31	5.5	3.1
7	.20	.00	.02	.01	.02	66	4.4	9.2	1.7	29	5.1	3.1
8	.18	.00	.02	.01	.01	57	4.2	14	2.0	24	4.7	2.9
9	.06	.01	.01	.02	.01	49	4.6	32	753	21	4.5	2.7
10	.05	.01	.01	.02	.01	40	5.8	40	141	19	4.5	2.5
11	.05	.01	.01	.04	.01	35	4.6	35	58	18	4.4	2.4
12	.07	.01	.01	.06	.01	32	5.7	29	32	15	4.3	2.2
13	.06	.01	.01	.05	.01	28	6.7	24	25	10	4.4	2.2
14	.05	.01	.01	.05	.01	26	7.3	18	19	7.7	4.4	2.4
15	.05	.01	.01	.04	.01	24	6.2	12	14	8.6	4.0	3.0
16	.06	.01	.02	.03	.01	21	6.2	8.1	9.4	15	3.5	2.9
17	.06	.01	.02	.04	.01	20	12	6.7	7.2	235	3.1	3.1
18	.05	.01	.02	.05	.01	18	25	6.0	6.4	232	2.9	3.8
19	.02	.01	.02	.06	.01	16	25	5.5	83	140	2.7	20
20	.00	.01	.02	.05	.01	13	23	5.1	46	70	2.4	27
21	.00	.00	.02	.04	.01	12	17	4.7	28	44	2.2	20
22	.00	.00	.02	.04	.01	10	12	4.4	18	33	2.3	15
23	.00	.00	.02	.05	.01	11	8.4	4.4	10	29	2.2	17
24	.00	.00	.01	.05	.10	11	6.7	4.3	7.2	25	2.1	11
25	.00	.00	.01	.06	.70	8.3	6.0	4.3	6.4	22	2.1	2890
26	.00	.00	.02	.07	300	6.8	5.5	4.1	5.6	19	2.3	642
27	.00	.00	.02	.08	550	6.2	5.2	3.9	4.9	18	2.2	228
28	.00	.00	.01	.09	600	5.8	4.9	3.7	4.4	54	2.0	119
29	.00	.00	.01	.08	---	5.6	4.5	3.4	2040	28	1.9	75
30	.00	.00	.01	.07	---	5.5	4.4	3.0	678	18	1.8	63
31	.00	---	.01	.06	---	6.4	---	2.7	---	11	1.9	---
TOTAL	1.01	.12	.40	1.29	1451.27	2861.6	247.6	313.5	4011.3	1530.3	114.2	4173.9
MEAN	.03	.00	.01	.04	51.8	92.3	8.25	10.1	134	49.4	3.68	139
MAX	.20	.01	.02	.09	600	608	25	40	2040	235	7.3	2890
MIN	.00	.00	.00	.01	.01	5.5	4.2	2.7	1.6	7.7	1.8	1.8
AC-FT	2.0	.2	.8	2.6	2880	5680	491	622	7960	3040	227	8280

CAL YR 1985	TOTAL	238.83	MEAN	.65	MAX	15	MIN	.00	AC-FT	474
WTR YR 1986	TOTAL	14706.49	MEAN	40.3	MAX	2890	MIN	.00	AC-FT	29170

06178000 POPLAR RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 48°59'25", long 105°41'46", in NE¼NE¼SE¼ sec.6, T.37 N., R.46 E., Daniels County, Hydrologic Unit 10060003, on left bank 0.7 mi south of international boundary, 1.5 mi upstream from Coal Creek, 18.5 mi northwest of Scobey, Mt, and at mile 135.7.

DRAINAGE AREA.--358 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1931 to current season (seasonal records only for most seasons). Published as Middle Fork Poplar River at international boundary, March 1931 to November 1975.

REVISED RECORDS.--WSP 1389: 1931, 1935-37(M), 1939-40, 1942(M), 1943, 1948(M), 1950(M). WSP 1729: Drainage area. W 1984: Drainage area.

GAGE.--Water-stage recorder and concrete control since September 1977. Elevation of gage is 2,460 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 1-3. Water-discharge records good except those below 1.0 ft^3/s, which are poor. A few small diversions for irrigation upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,700 ft^3/s Apr. 6, 1954, gage height, 10.25 ft, from floodmark, from rating curve extended above 2,500 ft^3/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, about 2,500 ft^3/s Feb. 26, gage height, 7.18 ft, from highwater mark; minimum daily, 0.06 ft^3/s Aug. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			900	20	7.9	4.6	.59	.09	.28	4.9		
2			700	20	7.1	4.0	.79	.10	.16	7.5		
3			600	20	6.5	4.9	.72	.10	.12	8.6		
4			577	19	6.3	4.6	.70	.10	.10	9.1		
5			587	18	14	3.8	3.4	.12	.12	8.5		
6			390	18	40	3.2	4.7	.13	.11	8.6		
7			192	16	52	2.6	2.1	.09	.13	7.5		
8			175	14	37	2.5	1.6	.09	.13	8.7		
9			182	13	41	3.7	1.4	.08	.13	9.6		
10			145	12	69	2.7	4.0	.08	.23	9.7		
11			151	11	63	2.1	19	.09	.24	8.9		
12			116	9.8	88	1.5	9.6	.09	.19	8.5		
13			88	9.4	52	1.1	5.0	.09	.15	7.5		
14			79	12	37	3.1	2.7	.08	.15	9.4		
15			67	8.8	29	6.8	2.1	.07	.15	7.7		
16			60	9.3	25	3.2	1.9	.08	.15	6.5		
17			52	11	21	2.4	1.4	.08	.15	6.3		
18			44	12	18	2.0	.87	.07	.15	6.2		
19			36	12	16	2.2	.50	.06	.34	6.0		
20			30	12	15	2.2	.37	.06	.57	5.8		
21			28	11	13	1.8	.30	.07	.83	5.9		
22			27	11	12	1.6	.23	.09	2.4	6.0		
23			24	11	12	1.3	.20	.07	3.5	5.9		
24			23	11	12	1.0	.19	.07	2.9	5.7		
25			25	12	12	.77	.14	.08	5.3	5.7		
26			22	12	11	.59	.14	.08	8.2	5.8		
27			25	12	9.7	.49	.15	.07	7.4	5.8		
28			25	11	8.6	.45	.13	.07	7.0	5.7		
29			22	10	7.1	.65	.13	.07	6.2	5.7		
30			21	8.9	6.3	.71	.11	.09	5.3	7.1		
31			20	---	5.3	---	.10	.25	---	6.1		
TOTAL			5433	387.2	753.8	72.56	65.26	2.76	52.78	220.9		
MEAN			175	12.9	24.3	2.42	2.11	.09	1.76	7.13		
MAX			900	20	88	6.8	19	.25	8.2	9.7		
MIN			20	8.8	5.3	.45	.10	.06	.10	4.9		
AC-FT			10780	768	1500	144	129	5.5	105	438		

06178000 POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964, 1976 to current year.

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 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)
MAR										
07...	1340	178	--	--	2520	-2.0	5.0	--	--	--
25...	1130	26	50	1	738	2.0	4.5	696	8.0	68
APR										
16...	1300	9.9	100	3	1030	2.0	3.0	692	12.4	102
MAY										
15...	1200	29	99	3	1080	9.0	11.0	692	7.8	78
JUN										
18...	1030	2.0	0	0	1150	25.0	22.0	697	7.7	97
JUL										
15...	1630	1.9	0	0	1220	29.0	26.5	696	12.2	167
AUG										
19...	0945	0.08	0	0	1730	25.0	18.0	698	7.5	87
SEP										
16...	1300	0.15	100	3	1410	9.0	8.0	701	8.0	74
OCT										
14...	1600	11	0	0	1500	16.0	8.0	708	11.0	101
NOV										
12...	1500	5.0	0	0	1400	-15.0	0.0	719	14.0	102

DATE	TIME	PH (STAND-ARD UNITS) (00400)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	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)
MAR											
25...	1130	8.54	60	1.5	240	0	43	31	78	2	7.8
APR											
16...	1300	8.40	30	3.1	300	0	52	42	140	4	6.7
MAY											
15...	1200	8.70	60	4.2	360	0	51	57	140	3	9.9
JUN											
18...	1030	8.72	45	2.2	220	0	22	41	170	5	7.6
JUL											
15...	1630	8.98	30	40	200	0	23	35	200	6	8.2
AUG											
19...	0945	8.86	30	17	230	0	19	44	330	10	8.0
SEP											
16...	1300	8.43	20	4.8	360	0	50	56	280	7	8.8
OCT											
14...	1600	8.40	65	9.0	320	0	48	48	240	6	9.8
NOV											
12...	1500	8.30	9	2.7	430	0	69	63	190	4	9.0

06178000 POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986

DATE	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L) (00530)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
MAR 25...	326	94	3.8	0.3	11	460	0.63	32	--	<0.01	<0.10
APR 16...	434	160	5.4	0.4	10	680	0.92	18	--	<0.01	<0.10
MAY 15...	494	200	5.5	0.3	11	770	1.0	60	--	<0.01	<0.10
JUN 18...	459	160	6.0	0.4	0.8	680	0.93	3.6	--	<0.01	<0.10
JUL 15...	460	220	6.3	0.4	3.9	770	1.1	3.9	--	0.01	<0.10
AUG 19...	583	410	17	0.6	0.2	1200	1.6	0.25	18	<0.01	<0.10
SEP 16...	556	380	11	0.4	7.8	1100	1.5	0.46	--	<0.01	<0.10
OCT 14...	535	290	8.7	0.4	12	980	1.3	29	--	0.01	<0.10
NOV 12...	617	230	8.0	0.5	15	960	1.3	13	--	<0.01	<0.10

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR 25...	0.02	0.58	0.6	0.05	0.02	9.5	440	130	10	0.69	61
APR 16...	0.05	0.45	0.5	0.04	0.02	--	700	34	14	0.37	85
MAY 15...	0.19	1.1	1.3	0.06	0.03	--	810	150	103	8.1	61
JUN 18...	0.07	0.93	1.0	0.04	0.01	--	1200	32	21	0.11	71
JUL 15...	0.08	1.0	1.1	0.12	0.07	--	1400	79	25	0.13	82
AUG 19...	<0.01	--	1.0	--	0.03	12	1900	16	53	0.01	80
SEP 16...	<0.01	--	0.8	0.03	0.02	--	1800	13	--	--	--
OCT 14...	0.04	1.4	1.4	<0.20	0.04	--	1400	84	191	5.7	95
NOV 12...	0.03	0.47	0.5	0.02	<0.01	--	1200	25	16	0.22	78

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)
MAR 25...	1130	10	2	2	<10	<0.5	<1	<1	<10
AUG 19...	0945	<10	--	4	--	<0.5	--	<1	--

06178000 POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986

DATE	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
MAR 25...	<10	6	2	280	2	1	20	13
AUG 19...	<10	--	2	--	--	<5	--	5

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
MAR 25...	<0.1	<0.1	1	1	<1	<1	<10	5
AUG 19...	--	<0.1	--	<1	--	<1	--	7

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 48°59'58", long 105°24'32", in SW¼SW¼ sec.3, T.1, R.26 W., second meridian, in Saskatchewan Hydrologic Unit 10060003, on left bank 10 ft north of international boundary, 400 ft southwest of Canadian East Poplar Port of Entry, 14 mi north of Scobey, Mt, and at mile 21.9.

DRAINAGE AREA.--541 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1931 to current year (seasonal records only in most seasons prior to October 1974). Prior to March 1962, published as East Fork Poplar River at international boundary.

REVISED RECORDS.--WSP 1389: 1932, 1939, 1942-43, 1947. W 1983: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,410.92 ft National Geodetic Vertical Datum of 1929 (International Boundary Survey datum). Prior to Oct. 5, 1953, water-stage recorder at site 80 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Feb. 7-23. Water-discharge records fair. Since September 1975 flow regulated by Morrison Dam at Cookson Reservoir 3 miles upstream. Several diversions for irrigation upstream from station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,020 ft^3/s Apr. 23, 1975, gage height, 12.01 ft; maximum gage height, 12.8 ft Mar. 25, 1943, from floodmark (backwater from ice); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 244 ft^3/s Mar. 2, gage height, 6.88 ft; maximum gage height, 7.15 ft Mar. 1 (backwater from ice); minimum daily discharge, 2.0 ft^3/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	2.8	3.0	2.5	2.8	2.9	150	7.6	7.9	5.6	3.2	2.9	2.4
2	3.0	3.1	2.5	2.9	2.9	230	14	7.0	4.1	2.9	2.8	2.4
3	3.3	3.0	2.4	2.9	2.9	230	8.5	7.2	4.0	2.9	2.9	2.8
4	3.3	3.0	2.6	2.9	3.0	231	5.8	7.7	3.7	3.1	2.9	2.8
5	2.9	3.3	2.6	2.7	2.9	219	5.4	28	3.3	5.3	2.9	2.7
6	2.9	3.0	2.7	2.8	2.9	202	7.0	18	3.0	4.9	2.9	2.7
7	3.2	3.0	2.8	2.8	2.7	155	7.2	7.9	3.2	3.9	2.9	2.6
8	3.2	2.9	2.9	2.8	2.5	75	5.5	7.5	3.2	3.3	2.8	2.5
9	3.2	2.8	2.8	2.9	2.4	71	4.5	13	4.2	3.0	2.8	2.7
10	3.2	2.7	2.8	2.9	2.2	70	4.3	12	4.5	3.3	2.8	3.0
11	3.2	2.7	2.6	3.1	2.1	73	13	9.0	3.8	3.6	2.8	3.0
12	3.4	2.8	2.6	3.0	2.1	70	6.0	18	5.8	3.4	2.6	2.9
13	3.4	2.9	2.3	3.0	2.1	66	5.6	12	5.0	3.2	2.5	2.6
14	3.5	2.9	2.6	3.0	2.1	63	12	13	3.7	3.0	2.5	2.6
15	3.4	2.9	2.6	3.0	2.2	58	5.9	15	3.3	2.9	2.5	2.6
16	3.4	2.9	2.7	3.0	2.3	56	4.6	22	2.6	2.8	2.3	2.8
17	3.3	2.8	2.7	3.0	2.3	51	4.9	9.0	2.6	2.9	2.2	2.8
18	3.2	2.7	2.7	3.0	2.2	54	8.3	8.4	2.7	2.8	2.3	2.7
19	3.1	2.7	2.8	3.1	2.1	43	11	7.8	4.2	2.8	2.3	2.9
20	3.1	2.5	2.8	3.1	2.0	39	6.5	7.4	4.0	2.9	2.3	3.1
21	3.0	2.6	2.9	2.9	2.1	36	4.7	7.0	3.5	2.7	2.3	3.5
22	3.0	2.6	2.9	2.9	2.2	43	4.1	8.6	3.2	2.6	2.4	3.0
23	3.0	2.4	3.0	2.9	2.4	26	8.7	10	3.0	2.6	2.3	2.8
24	2.9	2.3	2.8	2.9	2.9	24	6.2	8.9	2.8	2.6	2.4	2.6
25	3.1	2.4	2.8	2.9	3.7	39	4.5	7.6	2.7	2.6	2.3	4.0
26	3.2	2.4	3.3	2.9	46	17	4.2	7.1	2.8	2.6	2.4	4.1
27	2.9	2.3	3.0	2.8	19	16	4.0	6.9	2.7	2.6	2.4	3.5
28	3.2	2.2	2.9	2.9	28	15	4.0	7.0	2.6	2.7	2.4	3.1
29	2.8	2.2	2.9	2.8	---	24	4.7	6.9	2.8	2.7	2.4	2.8
30	3.0	2.3	2.9	2.9	---	14	9.6	6.9	3.1	2.8	2.5	2.7
31	3.1	---	2.8	2.9	---	18	---	7.9	---	3.1	2.5	---
TOTAL	97.2	81.3	85.2	90.4	155.1	2478	202.3	322.6	105.7	95.7	79.2	86.7
MEAN	3.14	2.71	2.75	2.92	5.54	79.9	6.74	10.4	3.52	3.09	2.55	2.89
MAX	3.5	3.3	3.3	3.1	46	231	14	28	5.8	5.3	2.9	4.1
MIN	2.8	2.2	2.3	2.7	2.0	14	4.0	6.9	2.6	2.6	2.2	2.4
AC-FT	193	161	169	179	308	4920	401	640	210	190	157	172

CAL YR 1985	TOTAL	1219.0	MEAN	3.34	MAX	13	MIN	1.8	AC-FT	2420
WTR YR 1986	TOTAL	3879.4	MEAN	10.6	MAX	231	MIN	2.0	AC-FT	7690

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-65, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1982 to current year.
WATER TEMPERATURE: June 1975 to September 1983.

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily observed, 1,780 microsiemens Nov. 25, 1985; minimum daily observed, 654 microsiemens Apr. 16, 1982.
WATER TEMPERATURE (water years 1975-83): Maximum, 29.5°C, July 6, 1975, July 25, 26, 1978; minimum, 0.0°C on many days during winters most years.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily observed, 1,780 microsiemens Nov. 25, minimum daily, 1,130 microsiemens Mar. 22, 23, 26, 30.

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 WATER (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										
17...	1400	2.6	0	0	1500	11.5	7.0	696	7.0	63
NOV										
18...	1300	2.3	100	3	1600	-15.0	0.0	706	6.7	50
DEC										
17...	1120	3.4	100	71	1540	-20.0	0.0	709	3.8	28
JAN										
14...	1330	3.1	0	0	1500	3.5	0.0	699	5.7	43
FEB										
18...	1145	5.3	100	71	1480	-19.0	0.0	695	5.7	43
MAR										
07...	1130	190	--	--	1100	-3.0	5.5	--	--	--
24...	1515	22	75	1	1120	12.0	8.0	692	8.5	79
APR										
16...	1030	4.2	100	3	1160	2.0	3.0	698	11.0	90
MAY										
15...	1000	12	95	3	1210	6.0	8.0	695	9.3	87
JUN										
17...	1430	2.4	0	0	1220	28.0	21.5	701	8.3	103
JUL										
08...	1130	3.1	0	0	1320	24.0	20.5	705	8.9	107
08...	1145	3.1	0	0	1320	24.0	20.5	705	8.9	107
08...	1200	3.1	0	0	1320	24.0	20.5	705	8.9	107
16...	1010	2.7	--	--	1450	23.0	21.5	--	--	--
AUG										
18...	1430	2.3	0	0	1350	29.0	21.0	700	7.5	92
SEP										
17...	1000	3.2	90	2	1450	7.5	8.5	704	7.8	73

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	PH (STAND-ARD UNITS) (00400)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT												
17...	1400	8.30	10	20	410	0	77	52	200	4	8.0	498
NOV												
18...	1300	7.60	7	2.0	420	0	86	49	200	4	7.6	588
DEC												
17...	1120	7.50	5	16	420	0	88	49	200	4	6.7	508
JAN												
14...	1330	7.70	7	2.0	400	0	82	48	190	4	7.2	567
FEB												
18...	1145	7.60	12	2.0	420	0	86	50	200	4	7.6	475
MAR												
24...	1515	8.63	30	5.3	270	0	39	43	160	4	16	422
APR												
16...	1030	8.30	15	6.0	290	0	44	44	170	4	12	426
MAY												
15...	1000	8.70	20	3.2	310	0	46	48	170	4	13	417
JUN												
17...	1430	8.60	25	4.2	280	0	41	44	180	5	10	450
JUL												
08...	1130	8.40	30	4.5	340	0	59	48	170	4	8.1	463
08...	1145	8.40	30	3.5	350	0	60	48	170	4	8.2	467
08...	1200	8.40	30	2.5	350	0	60	48	170	4	8.2	463
AUG												
18...	1430	8.30	15	--	350	0	57	51	210	5	8.2	485
SEP												
17...	1000	8.10	15	2.5	380	0	70	49	200	5	7.8	495

DATE	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, NITRATE TOTAL (MG/L AS N) (00620)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
OCT											
17...	300	6.6	0.30	10	950	1.3	6.7	0.080	--	0.020	0.100
NOV											
18...	280	6.1	0.40	15	1000	1.4	6.2	0.090	--	0.010	0.100
DEC											
17...	290	5.5	0.30	16	980	1.3	9.0	0.190	0.150	0.010	0.200
JAN											
14...	300	6.3	0.30	16	990	1.3	8.2	0.190	--	0.010	0.200
FEB											
18...	290	6.1	0.40	15	940	1.3	13	--	--	<0.010	0.200
MAR											
24...	230	6.2	0.30	2.1	750	1.0	44	0.190	--	0.010	0.200
APR											
16...	240	6.1	0.30	3.9	780	1.1	8.8	--	--	<0.010	0.100
MAY											
15...	250	5.8	0.20	3.1	790	1.1	27	--	--	0.010	<0.100
JUN											
17...	240	5.1	0.30	5.0	800	1.1	5.2	--	--	<0.010	<0.100
JUL											
08...	250	4.9	0.40	8.5	830	1.1	6.9	--	--	<0.010	<0.100
08...	250	4.8	0.30	8.5	830	1.1	7.0	--	--	<0.010	<0.100
08...	250	4.8	0.30	8.5	830	1.1	6.9	--	--	<0.010	<0.100
AUG											
18...	290	6.1	0.30	9.4	920	1.3	5.7	--	--	<0.010	<0.100
SEP											
17...	280	6.2	0.30	13	930	1.3	8.0	0.090	--	0.010	0.100

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
17...	0.270	0.53	0.80	0.010	0.010	--	1800	5	36	0.25	80
NOV											
18...	0.820	0.18	1.0	0.020	0.030	--	1900	9	61	0.38	52
DEC											
17...	0.880	0.42	1.3	0.010	0.030	--	1700	18	76	0.70	55
JAN											
14...	0.770	0.33	1.1	0.010	<0.010	--	1800	14	76	0.63	38
FEB											
18...	0.750	0.25	1.0	0.020	0.020	--	1800	14	51	0.73	53
MAR											
24...	<0.010	--	1.2	0.050	0.010	10	1200	16	42	2.5	83
APR											
16...	0.180	0.82	1.0	0.040	0.020	--	1300	31	35	0.40	91
MAY											
15...	0.060	0.84	0.90	0.030	<0.010	--	1300	13	87	2.9	70
JUN											
17...	0.040	0.96	1.0	0.030	<0.010	--	1600	13	32	0.21	97
JUL											
08...	0.100	0.60	0.70	0.030	<0.010	9.0	1700	16	--	--	--
08...	0.070	0.53	0.60	0.030	<0.010	8.9	1700	12	--	--	--
08...	0.080	0.62	0.70	0.030	<0.010	9.6	1700	12	27	0.23	96
AUG											
18...	0.030	0.57	0.60	0.030	<0.010	--	2000	14	23	0.14	85
SEP											
17...	0.040	0.46	0.50	0.020	0.010	5.0	1900	14	38	0.33	69

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)
MAR									
24...	1515	10	3	3	<10	<0.5	<1	<1	<10
JUL									
08...	1130	<10	--	5	--	--	--	--	<10
08...	1145	<10	--	5	--	--	--	--	<10
08...	1200	<10	--	5	--	--	--	--	<10
SEP									
17...	1000	20	--	2	--	<0.5	--	<1	--

DATE	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	NESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
MAR								
24...	<10	4	2	510	2	1	50	19
JUL								
08...	--	3	--	--	<5	--	--	22
08...	--	4	--	--	<5	--	--	20
08...	--	2	--	--	<5	--	--	20
SEP								
17...	<10	--	2	--	--	<5	--	12

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
MAR								
24...	<0.10	<0.1	2	<1	<1	<1	30	8
JUL								
08...	--	--	3	--	--	<1	20	--
08...	--	--	2	--	--	<1	10	--
08...	--	--	2	--	--	<1	10	--
SEP								
17...	--	<0.1	--	3	--	<1	--	31

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1400	1400	1560	1390	1290	1170	1150	1280	1270	1390	1420	1390
2	1410	1420	1520	1320	1340	1230	1170	1250	1280	1390	1410	1370
3	1400	1400	1520	1360	1360	1200	1240	1290	1290	1410	1410	1390
4	1390	1400	1440	1380	1370	1220	1190	1300	1300	1400	1400	1400
5	1390	1410	1470	1400	1380	1180	1200	1280	1320	1370	1380	1380
6	1400	1430	1470	1340	1400	1160	1250	1330	1420	1370	1400	1370
7	1430	1440	1440	1380	1390	1160	1330	1390	1390	1320	1400	1340
8	1410	1490	1430	1340	1450	1160	1300	1340	1420	1400	1390	1400
9	1400	1550	1420	1410	1400	1150	1250	1360	1400	1390	1400	1430
10	1410	1620	1410	1400	1500	1160	1290	1480	1380	1390	1420	1420
11	1430	1680	1450	1380	1520	1150	1320	1390	1350	1400	1430	1380
12	1410	1660	1490	1390	1480	1150	1230	1450	1340	1420	1400	1370
13	1420	1620	1530	1430	1480	1150	1180	1400	1320	1420	1410	1380
14	1400	1590	1560	1450	1480	1150	1260	1330	1340	1410	1420	1450
15	1420	1560	1520	1440	1500	1140	1220	1260	1270	1410	1410	1450
16	1460	1530	1510	1450	1470	1140	1210	1200	1260	1410	1410	1400
17	1460	1470	1460	1440	1460	1140	1230	1180	1280	1430	1410	1400
18	1470	1560	1450	1450	1460	1140	1350	1210	1320	1420	1390	1400
19	1470	1600	1470	1440	1470	1140	1440	1270	1340	1440	1400	1400
20	1480	1640	1470	1440	1490	1140	1210	1270	1390	1430	1400	1450
21	1500	1700	1450	1440	1470	1140	1230	1290	1380	1430	1420	1490
22	1500	1750	1450	1490	1470	1130	1220	1300	1390	1440	1430	1460
23	1500	1750	1450	1490	1480	1130	1290	1270	1370	1440	1420	1440
24	1470	1770	1440	1490	1480	1150	1400	1280	1380	1420	1420	1440
25	1470	1780	1470	1490	1440	1150	1250	1260	1380	1420	1480	1430
26	1470	1770	1500	1480	---	1130	1240	1270	1390	1430	1480	1400
27	1470	1760	1480	1500	---	1160	1290	1280	1390	1440	1440	1380
28	1480	1750	1470	1500	---	1170	1360	1280	1400	1430	1420	1380
29	1470	1750	1520	1480	---	1160	1440	1280	1400	1430	1410	1380
30	1460	1740	1530	1480	---	1130	1400	1280	1400	1430	1410	1460
31	1460	---	1520	1500	---	1190	---	1280	---	1430	1410	---
MEAN	1440	1600	1480	1430	---	1160	1270	1300	1350	1410	1410	1410

WTR YR 1986 MEAN 1390 MAX 1780 MIN 1130

06179000 EAST FORK POPLAR RIVER NEAR SCOBEY, MT

LOCATION.--Lat 48°51'08", long 105°25'15", in NE¼NW¼ sec.27, T.36 N., R.48 E., Daniels County, Hydrologic Unit 10060003, at bridge on State Highway 13, 2.5 mi upstream from mouth, and 4 mi north of Scobey.

DRAINAGE AREA.--722 mi2.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1975 to September 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (water years 1976-79): Maximum, 27.5°C July 15, 1978, July 19, 1979; minimum, 0.0°C on many days during winter.

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)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	TUR-BID-ITY (NTU) (00076)
OCT											
17...	1600	4.5	0	0	1380	8.80	12.0	7.5	699	30	9.0
NOV											
18...	1500	2.1	100	3	1940	8.40	-15.0	0.0	707	20	2.7
JAN											
14...	1500	1.5	0	0	--	7.50	3.0	0.0	700	10	2.5
MAR											
25...	0830	33	10	1	1000	8.84	1.5	4.0	698	40	10
APR											
16...	0900	12	100	3	1280	8.63	1.0	2.0	700	15	4.8
MAY											
14...	1500	20	65	1	1280	8.76	8.5	13.0	693	30	4.0
JUN											
18...	0800	3.7	0	0	1260	8.94	20.0	21.0	700	40	4.1
JUL											
16...	0900	4.1	0	0	1300	8.90	21.0	20.0	700	20	5.0
AUG											
19...	0800	1.4	0	0	1480	9.20	20.0	18.0	700	40	--
SEP											
17...	0800	3.6	90	3	1640	8.80	7.0	9.0	704	30	2.2

DATE	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	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)
OCT										
17...	11.7	107	300	0	34	52	220	6	7.4	478
NOV										
18...	10.5	78	380	0	49	63	270	6	9.5	598
JAN										
14...	--	--	490	0	92	62	250	5	8.7	678
MAR										
25...	9.9	83	240	0	35	37	140	4	15	369
APR										
16...	9.3	74	300	0	42	48	200	5	12	480
MAY										
14...	9.2	97	290	0	40	46	210	5	10	470
JUN										
18...	6.0	74	240	0	19	46	200	6	13	465
JUL										
16...	6.5	78	250	0	21	47	180	5	10	428
AUG										
19...	5.8	67	280	0	16	58	270	7	9.6	528
SEP										
17...	8.0	75	310	0	23	61	280	7	9.9	542

06179000 EAST FORK POPLAR RIVER NEAR SCOBEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	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, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT										
17...	320	12	0.3	3.0	940	1.3	11	<0.01	<0.10	0.08
NOV										
18...	360	11	0.4	2.6	1100	1.5	6.4	<0.01	<0.10	0.04
JAN										
14...	350	9.0	0.4	2.0	1200	1.6	4.9	<0.01	<0.10	0.82
MAR										
25...	210	5.6	0.3	2.5	670	0.91	60	<0.01	<0.10	0.03
APR										
16...	280	7.3	0.3	2.4	880	1.2	29	<0.01	<0.10	0.05
MAY										
14...	280	6.4	0.2	3.6	880	1.2	48	<0.01	<0.10	0.06
JUN										
18...	230	6.5	0.3	0.9	800	1.1	7.9	<0.01	<0.10	0.02
JUL										
16...	220	6.5	0.3	1.9	740	1.0	8.3	<0.01	<0.10	0.07
AUG										
19...	330	8.1	0.3	1.9	1000	1.4	3.7	<0.01	<0.10	0.01
SEP										
17...	370	9.1	0.3	1.4	1100	1.5	11	<0.01	<0.10	0.01

DATE	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)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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										
17...	0.52	0.6	0.02	0.01	--	1800	13	64	0.78	68
NOV										
18...	0.56	0.6	0.02	0.01	--	2200	18	--	--	--
JAN										
14...	<0.1	0.8	0.01	<0.01	--	1900	33	72	0.29	51
MAR										
25...	1.3	1.3	0.06	0.02	11	970	28	28	2.5	84
APR										
16...	0.85	0.9	0.05	0.01	--	1300	37	26	0.84	93
MAY										
14...	0.94	1.0	0.05	0.01	--	1400	33	115	6.3	--
JUN										
18...	1.1	1.1	0.05	<0.01	--	1600	38	9	0.09	92
JUL										
16...	1.1	1.2	0.05	0.02	--	1500	34	10	0.11	53
AUG										
19...	1.2	1.2	0.04	0.01	--	2300	92	17	0.06	22
SEP										
17...	0.99	1.0	0.03	<0.01	12	2300	34	32	0.31	28

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)
MAR									
25...	0830	20	3	3	<10	<0.5	1	<1	<10
SEP									
17...	0800	20	--	3	--	3	--	<1	--

06179000 EAST FORK POPLAR RIVER NEAR SCOBEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
MAR 25...	<10	6	6	540	1	1	40	8
SEP 17...	<10	--	2	--	--	<5	--	3

DATE	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
MAR 25...	0.1	<0.1	3	2	<1	<1	50	8
SEP 17...	--	<0.1	--	2	--	<1	--	4

06179200 POPLAR RIVER ABOVE WEST FORK, NEAR BREDETTE, MT

WATER-QUALITY RECORDS

LOCATION.--Lat 48°33'05", long 105°21'55", in NW¼SW¼SW¼ sec.4, T.32 N., R.49 E., Roosevelt County, Hydrologic Unit 10060004, on county road bridge, 3.8 mi upstream from mouth, and 4.4 mi northwest of Bredette.

DRAINAGE AREA.--1,745 mi2.

PERIOD OF RECORD.--Water years 1976-81, 1985 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)
OCT 17...	1030	22	--	0	1410	10.0	6.0
NOV 18...	1100	6.3	--	70	2000	-15.0	0.0
MAR 24...	1100	143	0	0	875	14.5	6.0
APR 15...	1300	50	0	0	1110	2.0	2.5
MAY 14...	1135	161	--	0	1220	11.0	11.5
JUN 17...	1100	63	0	0	1300	28.0	19.0
JUL 15...	1020	52	--	0	825	22.0	21.5
AUG 18...	1130	8.6	0	0	1460	24.0	17.5
SEP 16...	1000	9.1	--	40	1190	10.0	9.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
MAR 24...	1100	8.40	210	0	34	31	120	4	9.3
APR 15...	1300	8.50	270	0	43	40	180	5	7.7
JUN 17...	1100	8.30	240	0	31	40	210	6	9.4
AUG 18...	1130	8.80	240	0	22	45	280	8	9.7

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 DIS-SOLVED (MG/L AS N) (00631)
MAR 24...	326	160	7.2	0.3	7.6	570	0.77	218	<0.10
APR 15...	450	200	9.6	0.4	7.6	760	1.0	102	<0.10
JUN 17...	443	270	9.1	0.4	3.4	840	1.1	142	<0.10
AUG 18...	504	310	16	0.4	0.6	990	1.3	23	<0.10

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
MAR 24...	--	670	--	--	48	--	--	--	--
APR 15...	2	900	<1	<10	9	<1	8	<0.1	<1
JUN 17...	--	1200	--	--	37	--	--	--	--
AUG 18...	--	1600	--	--	15	--	--	--	--

06180400 WEST FORK POPLAR RIVER NEAR BREDETTE, MT

LOCATION.--Lat 48°33'01", long 105°25'42", in SW¼SW¼ sec.1, t.32 N., R.48 E., Roosevelt County, Hydrologic Unit 10060004, at bridge on State Highway 13, 5.9 mi upstream from mouth, and 6.6 mi northwest of Bredette.

DRAINAGE AREA.--1,010 mi2.

PERIOD OF RECORD.--Water year 1976 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)
OCT 17...	1120	19	--	0	1020	11.0	7.0
NOV 18...	1140	4.8	--	70	1480	-15.0	0.0
MAR 24...	1245	91	0	0	658	16.0	7.0
APR 15...	1140	24	--	0	885	1.0	2.5
MAY 14...	1030	105	--	0	1000	10.0	13.0
JUN 17...	0930	6.5	0	0	1980	27.0	20.0
JUL 15...	0915	89	--	0	720	22.0	21.0
AUG 18...	1045	4.5	0	0	1280	22.0	18.5
SEP 16...	1035	8.9	--	40	1220	10.0	9.0

DATE	TIME	PH LAB (STAND-ARD UNITS) (00403)	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)
MAR 24...	1245	8.40	100	0	21	12	110	5	5.2
APR 15...	1140	8.40	120	0	23	15	190	8	4.0
JUN 17...	0930	8.60	98	0	16	14	230	10	4.1
AUG 18...	1045	8.90	88	0	12	14	270	13	4.4

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 DIS-SOLVED (MG/L AS N) (00631)
MAR 24...	292	89	4.2	0.4	10	430	0.58	105	0.11
APR 15...	441	120	6.2	0.4	8.4	630	0.86	41	<0.10
JUN 17...	467	160	10	0.4	4.6	720	0.98	13	<0.10
AUG 18...	509	150	8.0	0.4	2.4	770	1.0	9.3	<0.10

06180400 WEST FORK POPLAR RIVER NEAR BREDETTE, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
MAR 24...	--	270	--	--	140	--	--	--	--
APR 15...	2	370	<1	<10	21	1	17	<0.1	<1
JUN 17...	--	540	--	--	79	--	--	--	--
AUG 18...	--	710	--	--	28	--	--	--	--

06181000 POPLAR RIVER NEAR POPLAR, MT

LOCATION.--Lat 48°10'15", long 105°10'42", in NE¼NE¼ sec.19, T.28 N., R.51 E., Roosevelt County, Hydrologic Unit 10060003, on right bank 4 mi north of Poplar, and at mile 11.

DRAINAGE AREA.--3,174 mi^2.

PERIOD OF RECORD.--August 1908 to October 1924, August 1947 to September 1969, June 1975 to September 1979, October 1981 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1176. 1948. WSP 1389: 1911. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,970 ft, from topographic map. Prior to May 1, 1911, nonrecord ing gage at site 4.2 mi upstream at different datum. May 1, 1911, to Oct. 4, 1913, nonrecording gage at site 14 mi upstream at different datum. Oct. 5, 1913, to Oct. 31, 1924, nonrecording gage at site 2.2 mi upstream at different datum. Aug. 10, 1947, to Sept. 30, 1969, water-stage recorder at present site and datum.

REMARKS.--Estimated daily discharges: Oct. 7-11 and Nov. 8 to Mar. 8. Records good except those for estimate daily discharges, which are poor. Diversions for irrigation of about 5,500 acres upstream from station. Flow partially regulated by Coronach Dam, on the East Fork Poplar River, 2 mi north of international boundary. 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 (1908-24, 1947-69, 1975-79, 1982-86), 134 ft^3/s, 97,080 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,400 ft^3/s Apr. 6, 1954, gage height, 17.86 ft, from floodmark, from slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 10, 1946, reached a stage of 18.1 ft, from floodmark, discharge, 40,000 ft^3/s, from slope-area measurement of peak flow made at site 20 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s, and maximums (*):

Date	Time	Discharge	Gage height	Date	Time	Discharge	Gage height
Mar. 1	1830	ice jam	*15.20	Mar. 3	---	* 6,000	ice jam

Minimum daily discharge, 0.30 ft^3/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	12	26	2.0	1.0	2.5	4000	173	69	59	23	26	7.5
2	15	30	1.5	1.0	2.5	4500	167	67	55	23	23	6.6
3	17	35	2.0	.80	2.5	5000	161	64	51	22	22	7.1
4	22	35	2.0	.60	2.5	4500	151	64	48	20	19	7.1
5	24	34	2.0	.40	2.0	4000	143	64	45	20	17	8.0
6	24	35	2.0	.40	2.0	3500	135	82	43	20	17	10
7	16	34	2.0	.40	1.5	2500	127	95	43	20	15	12
8	15	18	1.5	.80	1.5	2000	117	103	45	20	14	12
9	14	14	1.5	1.0	1.0	1470	111	115	55	81	14	11
10	16	15	1.0	1.0	.80	1400	105	219	63	74	14	11
11	18	14	1.0	2.0	.60	1310	103	251	45	66	12	12
12	20	13	.80	2.5	.60	1320	97	248	39	64	12	15
13	23	12	.60	2.5	.80	1320	98	232	38	271	17	17
14	27	13	.40	2.0	.60	1120	206	241	35	313	19	18
15	31	14	.80	2.0	1.0	867	106	268	34	249	17	20
16	31	15	.60	2.5	2.0	768	109	257	32	209	14	19
17	32	14	.40	3.0	1.5	671	113	224	30	187	12	18
18	33	13	.80	3.0	1.0	566	111	199	51	204	11	19
19	35	11	1.0	2.5	.60	486	101	172	64	218	11	31
20	36	10	1.5	3.0	.30	427	97	153	48	193	10	66
21	36	9.0	1.5	2.5	1.0	385	93	135	39	136	9.5	59
22	36	8.0	2.0	2.5	2.0	341	89	127	33	102	11	66
23	34	7.0	2.0	2.5	3.0	308	86	131	56	82	11	56
24	34	6.0	2.0	2.5	5.0	285	86	117	46	70	10	58
25	33	5.0	1.5	2.5	10	278	86	107	38	59	10	70
26	32	4.0	1.0	2.5	15	261	82	97	32	53	9.5	141
27	31	3.0	.80	2.5	200	241	77	81	29	46	9.0	135
28	28	3.0	.60	2.5	3000	223	74	77	25	40	9.0	153
29	28	3.5	.80	2.5	---	208	70	77	24	35	8.2	128
30	28	3.0	1.0	2.5	---	196	69	72	24	32	8.0	125
31	26	---	1.0	2.5	---	185	---	67	---	28	8.0	---
TOTAL	807	456.5	39.60	59.90	3263.80	44636	3343	4275	1269	2980	419.2	1318.3
MEAN	26.0	15.2	1.28	1.93	117	1440	111	138	42.3	96.1	13.5	43.9
MAX	36	35	2.0	3.0	3000	5000	206	268	64	313	26	153
MIN	12	3.0	.40	.40	.30	185	69	64	24	20	8.0	6.6
AC-FT	1600	905	79	119	6470	88540	6630	8480	2520	5910	831	2610

CAL YR 1985	TOTAL	11110.35	MEAN	30.4	MAX	550	MIN	.25	AC-FT	22040
WTR YR 1986	TOTAL	62867.30	MEAN	172	MAX	5000	MIN	.30	AC-FT	124700

06181995 BEAVER CREEK AT INTERNATIONAL BOUNDARY

(International gaging station)

LOCATION.--Lat 48°59'59", long 105°02'06", in SE¼ sec.5, T.1, R.23 W., second meridian, in Saskatchewan, Hydrologic Unit 10060006, on left bank 300 ft north of international boundary, 6 mi east of Canadian Big Beaver Port of Entry, 8 mi upstream from mouth, and 9 mi southeast of Big Beaver, Saskatchewan.

DRAINAGE AREA.--149 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1977 to current year (seasonal records after November 1982). April 1949 to October 1952, seasonal records collected 0.8 mi downstream (station number 06182000 Beaver Creek near international boundary). Records probably are equivalent.

REVISED RECORDS.--W 1983: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,250 ft, from topographic map. April 1949 to October 1952, nonrecording gage 0.8 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 2 and Nov. 8 to Nov. 30. Water-discharge records fair.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,020 ft^3/s Apr. 7, 1952, gage height, 13.3 ft, from floodmark, from rating curve extended above 320 ft^3/s, on basis of slope-area measurements of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 978 ft^3/s Feb. 26, gage height, 7.06 ft (backwater from ice); minimum daily, 0.74 ft^3/s Sept. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		1.2	195	2.8	1.8	1.1	1.5	1.3	.74	1.7	1.4	
2		1.2	180	2.5	1.7	1.1	1.4	1.3	.78	2.0	1.4	
3		1.2	151	2.5	1.7	1.2	1.3	1.3	.85	1.8	1.4	
4		1.2	149	2.4	1.7	1.2	1.5	1.2	.85	1.7	1.3	
5		1.2	124	2.4	2.4	1.2	2.9	1.2	.88	1.7	1.2	
6		1.2	71	2.3	2.7	1.2	1.9	1.2	.92	1.7	1.1	
7		1.2	49	2.2	2.4	1.3	1.6	1.1	.92	1.7	1.0	
8		1.2	31	2.1	4.0	1.5	1.6	1.1	.99	1.9	1.1	
9		1.2	39	2.0	6.6	2.2	1.6	1.1	1.1	1.8	1.1	
10		1.2	54	1.8	8.3	1.7	1.6	1.1	1.3	1.8	1.1	
11		1.2	169	1.8	10	1.5	1.7	1.1	1.3	1.7	1.1	
12		1.2	113	1.8	7.4	1.4	1.7	1.1	1.2	1.7	1.2	
13		1.2	47	1.8	7.7	1.4	1.6	1.1	1.2	1.7	1.1	
14		1.2	26	1.9	6.7	1.4	1.5	1.1	1.2	1.6	.92	
15		1.2	17	1.8	4.8	1.5	1.4	1.1	1.3	1.6	.88	
16		1.3	12	1.8	3.9	1.5	1.4	1.0	1.3	1.6	.85	
17		1.3	10	2.0	3.4	1.4	48	1.1	1.3	1.5	.81	
18		1.3	8.9	1.9	2.9	1.3	62	.99	1.4	1.6	.85	
19		1.3	7.3	1.8	2.5	1.6	19	.95	1.8	1.6	.88	
20		1.3	6.9	1.8	2.3	1.5	9.7	.92	1.8	1.5	.92	
21		1.3	5.7	1.9	1.9	1.4	6.5	.88	1.8	1.5	.95	
22		1.3	5.1	1.8	1.8	1.4	4.6	.92	1.5	1.5	.95	
23		1.3	4.4	1.8	1.9	1.3	3.5	.92	1.4	1.5	.95	
24		1.3	4.1	1.8	1.8	1.3	2.9	.88	1.4	1.4	.99	
25		92	4.0	1.8	1.6	1.3	2.3	.88	2.5	1.4	1.1	
26		788	3.7	1.8	1.5	1.3	2.1	.85	2.4	1.4	1.0	
27		579	3.5	1.7	1.4	1.3	1.8	.88	2.0	1.4	1.0	
28		308	3.4	1.7	1.3	1.3	1.7	.85	1.9	1.4	1.1	
29		---	3.2	1.6	1.3	1.4	1.6	.81	1.7	1.4	1.1	
30		---	3.0	1.7	1.2	1.6	1.4	.78	1.7	1.4	1.2	
31		---	3.0	---	1.2	---	1.4	.78	---	1.4	---	
TOTAL		1796.7	1503.2	59.0	101.8	41.8	194.7	31.79	41.43	49.6	31.95	
MEAN		64.2	48.5	1.97	3.28	1.39	6.28	1.03	1.38	1.60	1.06	
MAX		788	195	2.8	10	2.2	62	1.3	2.5	2.0	1.4	
MIN		1.2	3.0	1.6	1.2	1.1	1.3	.78	.74	1.4	.81	
AC-FT		3560	2980	117	202	83	386	63	82	98	63	

06181995 BEAVER CREEK AT INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1977 to current year.

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 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)	PH (STAND-ARD UNITS) (00400)
APR											
17...	1100	2.0	0	0	1330	5.0	8.0	700	10.6	98	8.20
JUL											
16...	1200	1.5	0	0	1620	21.0	20.0	702	8.8	106	8.30
SEP											
17...	1200	1.3	90	2	1650	9.0	10.0	708	9.8	94	8.10
NOV											
13...	1230	1.4	70	2	1900	-10.0	0.0	705	10.2	76	8.00

DATE	COLOR (PLAT-INUM-COBALT UNITS) (00080)	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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
APR										
17...	40	8.9	220	0	47	26	260	8	6.7	491
JUL										
16...	10	3.0	190	0	34	26	290	9	7.2	510
SEP										
17...	20	6.6	230	0	45	29	300	9	7.1	508
NOV										
13...	8	3.6	300	0	62	36	350	9	7.9	661

DATE	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, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
APR										
17...	310	5.6	0.2	6.6	960	1.3	5.2	<0.01	<0.10	0.08
JUL										
16...	350	5.7	0.2	6.0	1000	1.4	4.2	<0.01	<0.10	0.05
SEP										
17...	370	6.2	0.2	7.9	1100	1.5	3.8	<0.01	<0.10	<0.01
NOV										
13...	430	7.7	0.2	13	1300	1.8	4.9	<0.01	<0.10	0.15

DATE	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)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)
APR										
17...	0.72	0.8	0.07	0.01	35	1100	9	47	0.25	80
JUL										
16...	0.65	0.7	0.02	0.01	--	1500	22	28	0.11	90
SEP										
17...	--	0.4	0.03	0.01	5.6	1500	10	56	0.2	95
NOV										
13...	0.55	0.7	0.03	0.01	--	1700	18	19	0.07	48

06181995 BEAVER CREEK AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
APR 17...	1100	2	1	<10	<0.5	<1	<1	<10	<10	7	2	1100
SEP 17...	1200	--	1	--	<0.5	--	<1	--	70	--	2	--

DATE	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
APR 17...	7	<1	150	68	<0.1	<0.1	7	3	<1	<1	20	<3
SEP 17...	--	<5	--	48	--	<0.1	--	3	--	<1	--	6

06183450 BIG MUDDY CREEK NEAR ANTELOPE, MT

LOCATION.--Lat 48°40'22", long 104°30'42", in SW¼SW¼NW¼ sec.27, T.34 N., R.55 E., Sheridan County, Hydrologic Unit 10060006, on right bank, 3 mi southwest of Antelope, and 7 mi south of Plentywood, MT.

DRAINAGE AREA.--967 mi^2. Prior to 1981, drainage area published as 1,171 mi^2.

WATER DISCHARGE RECORDS

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

REVISED RECORDS.--WDR MT-81-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,000 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 20 to Mar. 9. Water-discharge records good except those for estimated daily discharges, which are poor. Several known diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--8 years, 37.2 ft^3/s, 26,950 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,890 ft^3/s Apr. 14, 1982, gage height, 17.37 ft; no flow on many days during 1984, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,200 ft^3/s Mar. 1; maximum gage height, 13.00 ft Mar. 1 (ice jam); minimum daily discharge, 0.17 ft^3/s Aug. 15, 16.

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	10	5.2	.60	.45	1.3	1200	22	14	12	.55	6.3	.25
2	9.8	4.5	.30	.45	1.5	1000	29	12	11	.45	2.4	.25
3	8.2	4.7	.35	.40	1.4	800	24	12	9.1	.48	1.2	.25
4	1.4	4.8	.40	.40	1.3	600	14	12	7.5	.59	.67	.24
5	.59	4.4	.40	.35	1.3	450	20	14	4.3	3.2	.53	.24
6	.55	5.4	.45	.35	1.0	300	20	18	3.1	.80	.48	.36
7	.90	5.3	.45	.60	.80	200	24	17	1.7	.51	.42	.43
8	2.9	5.8	.40	1.0	.70	180	12	19	1.0	.48	.32	.36
9	3.9	5.6	.40	2.0	.60	170	18	29	.81	.51	.28	.37
10	7.1	4.8	.35	1.9	.50	158	24	64	.65	.59	.27	.41
11	10	5.0	.30	1.9	.55	151	23	74	.58	.52	.26	.43
12	9.0	5.3	.25	1.8	.55	116	24	113	.47	4.3	.23	.45
13	8.2	5.7	.20	1.7	.60	114	19	103	.30	16	.23	.45
14	9.8	5.9	.40	1.6	.60	174	19	75	.28	5.7	.24	.47
15	14	9.3	.35	1.5	.65	178	18	58	2.4	4.8	.17	.46
16	15	11	.30	1.6	.70	87	18	50	25	6.9	.17	.42
17	21	10	.45	1.7	.60	75	20	41	19	20	.18	.41
18	20	8.2	.60	1.9	.55	70	21	38	13	32	.18	.44
19	17	7.1	.65	2.0	.50	59	21	35	11	25	.21	.85
20	13	5.0	.70	1.9	.40	44	23	31	31	18	.21	2.9
21	12	4.0	.75	1.7	.45	39	23	27	23	16	.23	8.9
22	11	4.5	.50	1.5	.50	39	23	24	14	12	.24	25
23	9.9	3.5	.55	1.3	1.0	35	24	25	8.6	15	.23	23
24	9.3	3.5	.55	1.4	5.0	28	23	23	4.5	54	.25	23
25	8.3	4.0	.60	1.6	40	28	23	22	2.4	42	.27	39
26	7.4	3.0	.65	1.3	80	48	21	21	2.6	32	.27	62
27	7.1	2.5	.50	1.0	350	41	19	19	5.1	23	.26	70
28	7.0	2.0	.35	1.5	900	22	17	18	2.0	19	.24	99
29	6.5	1.5	.35	1.2	---	18	16	16	2.5	17	.25	71
30	5.0	1.0	.40	1.1	---	42	15	14	2.4	15	.25	57
31	5.0	---	.45	1.2	---	34	---	14	---	11	.25	---
TOTAL	270.84	152.5	13.95	40.30	1393.05	6500	617	1052	221.29	397.38	17.69	488.34
MEAN	8.74	5.08	.45	1.30	49.8	210	20.6	33.9	7.38	12.8	.57	16.3
MAX	21	11	.75	2.0	900	1200	29	113	31	54	6.3	99
MIN	.55	1.0	.20	.35	.40	18	12	12	.28	.45	.17	.24
AC-FT	537	302	28	80	2760	12890	1220	2090	439	788	35	969

CAL YR 1985	TOTAL	4409.60	MEAN	12.1	MAX	251	MIN	.00	AC-FT	8750
WTR YR 1986	TOTAL	11164.34	MEAN	30.6	MAX	1200	MIN	.17	AC-FT	22140

06183450 BIG MUDDY CREEK NEAR ANTELOPE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1979 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 WATER (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										
14...	1600	5.8	0	0	3120	-3.0	0.0	720	10.9	80
DEC										
18...	1030	0.62	100	3	3490	-20.0	0.0	718	0.8	6
JAN										
15...	1030	1.4	0	0	4520	0.0	0.0	709	3.2	24
FEB										
28...	1125	940	--	--	400	1.0	0.5	--	--	--
MAR										
07...	0840	195	--	--	384	-13.0	0.5	--	--	--
12...	1000	114	100	3	471	-1.0	0.5	710	9.5	71
25...	--	23	--	--	886	-2.5	5.0	--	--	--
APR										
22...	1000	23	0	0	2080	16.0	11.5	704	8.6	86
JUN										
06...	0930	3.6	100	61	2150	13.0	17.5	708	8.0	91
JUL										
17...	0900	13	95	3	2440	23.0	22.5	709	4.8	60
AUG										
25...	1315	0.27	0	0	1990	27.0	20.0	715	7.6	90
SEP										
17...	1430	0.40	85	1	2990	11.0	10.0	714	7.0	67

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
NOV										
14...	1600	8.50	490	0	60	82	510	10	9.5	728
DEC										
18...	1030	7.90	1200	54	120	210	1100	14	19	1110
JAN										
15...	1030	7.80	890	0	110	150	860	13	18	1320
MAR										
12...	1000	8.00	110	0	23	13	48	2	9.2	143
APR										
22...	1000	8.60	610	47	130	70	370	7	8.3	566
JUN										
06...	0930	9.40	380	0	22	80	360	8	6.3	474
JUL										
17...	0900	9.60	340	0	20	70	480	11	7.1	540
AUG										
25...	1315	8.70	380	0	45	66	370	8	13	565
SEP										
17...	1430	9.00	380	0	35	70	430	10	12	638

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
NOV										
14...	770	41	0.40	1.4	1900	2.6	30	<0.100	0.060	1.2
DEC										
18...	290	400	0.50	10	2800	3.8	4.7	<0.100	2.60	3.9
JAN										
15...	1400	150	0.50	15	3500	4.8	13	<0.100	2.90	1.2
MAR										
12...	85	4.4	0.20	9.0	280	0.38	86	0.400	0.370	1.5
APR										
22...	560	20	0.40	0.9	1500	2.0	93	<0.100	0.070	0.93
JUN										
06...	640	18	0.30	0.5	1400	1.9	14	<0.100	0.040	1.3
JUL										
17...	760	26	0.30	0.7	1700	2.3	59	<0.100	0.060	1.7
AUG										
25...	530	20	0.30	0.4	1400	1.9	1.0	<0.100	0.050	2.9
SEP										
17...	640	26	0.40	0.7	1600	2.2	1.7	<0.100	0.030	3.3

06183450 BIG MUDDY CREEK NEAR ANTELOPE, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C) (00689)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 14...	1.3	0.090	--	--	1500	40	101	1.6	99
DEC 18...	6.5	0.370	--	--	2000	110	286	0.48	99
JAN 15...	4.1	0.400	--	--	2200	100	249	0.95	99
MAR 12...	1.9	0.180	21	1.3	210	240	126	39	95
APR 22...	1.0	0.090	17	0.4	990	30	52	3.2	87
JUN 06...	1.3	0.050	21	--	1200	10	19	0.18	85
JUL 17...	1.8	0.230	--	--	1400	30	9	0.32	67
AUG 25...	2.9	0.380	23	2.0	1100	30	124	0.09	80
SEP 17...	3.3	0.420	--	--	1200	100	38	0.04	95

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)
MAR 12...	1000	3	2	<10	<0.5	<1	<1	10	<10	9	5	3500
AUG 25...	1315	--	10	--	<10	--	<1	--	<10	--	2	--

DATE	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
MAR 12...	4	3	130	42	0.10	0.3	5	5	<1	<1	20	31
AUG 25...	--	<5	--	50	--	0.2	--	4	--	<1	--	10

06183700 BIG MUDDY CREEK DIVERSION CANAL NEAR MEDICINE LAKE, MT.

LOCATION.--Lat 48°30'34", long 104°32'55", in SE¼NW¼SE¼ sec.22, T.32 N., R.55 E., Sheridan County, Hydrologic Unit 10060006, on right bank, on dike road about 75 ft downstream from canal headgate and 2.2 miles northwest of Medicine Lake.

PERIOD OF RECORD.--August 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,940 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 17 to Mar. 5. Records fair except those for estimated daily discharges, which are poor. Canal diverts water into Medicine Lake at the Medicine Lake National Wildlife Refuge. At times stage-discharge relationship is severely affected by backwater from Medicine Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,300 ft^3/s Mar. 2, 1986; maximum gage height observed, 9.24 ft Mar. 3, 1986; no flow on many days in 1986.

EXTREMES FOR CURRENT YEAR.-- Maximum daily discharge, 1,300 ft^3/s Mar. 2; maximum gage height observed, 9.24 ft Mar. 3; 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	2.7	5.5	.20	.20	.20	1000	29	16	1.7	2.1	7.4	.21
2	1.8	4.0	.20	.20	.20	1300	23	18	1.0	3.1	7.3	.12
3	1.1	5.7	.20	.20	.40	900	20	14	.77	2.3	6.7	.00
4	2.2	5.7	.20	.20	.60	800	21	22	.55	2.8	5.6	.00
5	4.4	3.6	.20	.10	.60	600	17	9.1	.74	2.2	5.0	.06
6	4.2	4.4	.30	.10	.40	528	13	11	.18	2.7	3.6	.03
7	7.8	5.3	.30	.10	.20	342	14	15	.31	4.5	3.3	.05
8	6.4	4.8	.20	.20	.20	257	16	17	.74	5.0	3.1	.12
9	6.0	5.0	.20	.40	.20	263	16	13	.42	9.8	2.2	.23
10	5.0	4.8	.20	.60	.10	136	16	17	.55	5.9	3.1	.11
11	5.7	5.0	.20	.60	.00	83	12	18	.60	6.1	2.5	.00
12	6.0	5.7	.10	.60	.00	74	18	18	.49	5.1	1.9	.00
13	7.4	5.3	.10	.40	.00	58	19	32	.41	6.4	1.4	.19
14	7.4	5.5	.20	.20	.00	54	16	26	.65	8.1	1.5	.25
15	9.2	5.7	.20	.20	.00	85	18	14	.89	9.1	1.3	.41
16	8.9	5.5	.20	.20	.00	79	20	12	1.3	14	1.0	.10
17	8.7	5.0	.30	.40	.00	43	18	13	1.4	13	1.5	.04
18	8.5	4.5	.30	.60	.00	35	17	12	1.2	12	.89	.21
19	12	4.0	.30	1.2	.00	37	14	11	.70	13	.59	.54
20	11	3.5	.30	1.0	.00	32	19	14	1.4	19	.55	.56
21	11	3.0	.40	.60	.00	44	23	23	1.0	18	1.3	.18
22	8.7	2.5	.40	.60	.00	29	21	10	1.1	21	.53	.17
23	6.4	2.0	.40	.40	.00	35	14	7.0	2.3	13	.99	.32
24	6.0	2.0	.20	.40	.05	33	23	5.5	2.6	12	.38	2.4
25	7.2	1.5	.20	.40	.10	18	25	5.3	2.2	13	.47	3.3
26	6.4	1.0	.20	.20	2.0	28	20	5.1	1.8	22	.31	3.0
27	7.0	.50	.20	.20	30	29	18	4.7	2.4	21	.41	4.7
28	5.7	.50	.20	.60	620	29	14	3.4	2.0	17	.38	8.0
29	6.0	.20	.10	.60	---	18	13	2.6	4.7	13	.28	9.8
30	6.2	.20	.20	.40	---	23	9.2	2.2	2.1	9.2	.17	3.3
31	5.3	---	.20	.20	---	18	---	1.4	---	7.5	.19	---
TOTAL	202.3	111.90	7.10	12.30	655.25	7010	536.2	392.3	38.20	312.9	65.84	38.40
MEAN	6.53	3.73	.23	.40	23.4	226	17.9	12.7	1.27	10.1	2.12	1.28
MAX	12	5.7	.40	1.2	620	1300	29	32	4.7	22	7.4	9.8
MIN	1.1	.20	.10	.10	.00	18	9.2	1.4	.18	2.1	.17	.00
AC-FT	401	222	14	24	1300	13900	1060	778	76	621	131	76

WTR YR 1986 TOTAL 9382.69 MEAN 25.7 MAX 1300 MIN .00 AC-FT 18610

06183750 LAKE CREEK NEAR DAGMAR, MT

LOCATION.--Lat 48°33'51", long 104°10'38", in SE¼SE¼SW¼ sec. 31, T.33 N., R.58 E., Sheridan, County, Hydrologic Unit 10060006, on left bank, at downstream end of dike, just north of Medicine Lake National Wildlife Refuge, and 1.7 miles southeast of Dagmar.

DRAINAGE AREA.--101 mi^2.

PERIOD OF RECORD.--September 1985 to September 1986. Seasonal records only.

GAGE.--Water-stage recorder. Elevation of gage is 1,979.00 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 25 to Mar. 10, Apr. 1-15, June 1 to July 10. Records fair except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47 ft^3/s Mar. 26, 1986, gage height, 1.91 ft; no flow most days.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 47 ft^3/s Mar. 26, gage height, 1.91 ft; no flow most days.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	.00	1.5	1.6	1.5	.00	.00	.00	.00	.00	
2	.00	.00	.00	1.5	1.5	1.0	.00	.00	.00	.00	.00	
3	.00	.00	.00	1.4	1.6	.70	.00	.00	.00	.00	.00	
4	.00	.00	.00	1.4	1.6	.30	.00	.00	.00	.00	.00	
5	.00	.00	5.0	1.4	2.7	.02	.00	.00	.00	.00	.00	
6	.00	.00	10	1.3	5.1	.00	.00	.00	.00	.00	.00	
7	.00	.00	5.0	1.3	3.4	.00	.00	.00	.00	.00	.00	
8	.00	.00	10	1.3	3.2	.00	.00	.00	.00	.00	.00	
9	.00	.00	20	1.2	7.0	.00	.00	.00	.00	.00	.00	
10	.00	.00	17	1.2	9.9	.00	.00	.00	.00	.00	.00	
11	.00	.00	15	1.1	7.4	.00	.00	.00	.00	.00	.00	
12	.00	.00	13	1.1	6.3	.00	.00	.00	.00	.00	.00	
13	.00	.00	12	1.0	5.2	.00	.00	.00	.00	.00	.00	
14	.00	.00	11	1.0	4.1	.00	.00	.00	.00	.00		
15	.00	.00	8.8	1.0	3.4	.00	.00	.00	.00	.00		
16	.00	.00	7.3	1.5	2.9	.00	.00	.00	.00	.00		
17	.00	.00	5.8	3.7	2.5	.00	.00	.00	.00	.00		
18	.00	.00	5.2	3.8	2.2	.00	.00	.00	.00	.00		
19	.00	.00	4.0	2.9	2.1	.00	.00	.00	.00	.00		
20	.00	.00	3.6	2.4	2.1	.00	.00	.00	.00	.00		
21	.00	.00	3.1	2.2	2.2	.00	.00	.00	.00	.00		
22	.00	.00	3.1	2.1	4.6	.00	.00	.00	.00	.00		
23	.00	.00	2.1	2.2	4.1	.00	.00	.00	.00	.00		
24	.00	.00	2.0	2.2	3.1	.00	.00	.00	.00	.00		
25	.00	.00	2.1	2.0	2.5	.00	.00	.00	.00	.00		
26	.00	.00	24	2.2	2.5	.00	.00	.00	.00	.00		
27	.00	.00	31	2.2	2.2	.00	.00	.00	.00	.00		
28	.00	.00	5.9	2.1	1.8	.00	.00	.00	.00	.00		
29	.00	---	2.5	2.0	1.8	.00	.00	.00	.00	.00		
30	.00	---	1.9	1.7	1.7	.00	.00	.00	.00	.00		
31	.00	---	1.7	---	1.7	---	.00	.00	---	.00		
TOTAL	.00	.00	232.10	53.9	104.0	3.52	.00	.00	.00	.00		
MEAN	.00	.00	7.49	1.80	3.35	.12	.00	.00	.00	.00		
MAX	.00	.00	31	3.8	9.9	1.5	.00	.00	.00	.00		
MIN	.00	.00	.00	1.0	1.5	.00	.00	.00	.00	.00		
CFSM	.00	.00	.07	.02	.03	.00	.00	.00	.00	.00		
AC-FT	.00	.00	460	107	206	7.0	.00	.00	.00	.00		

06183800 COTTONWOOD CREEK NEAR DAGMAR, MT

LOCATION.--Lat 48°30'35", long 104°10'23", in SE¼NE¼SE¼ sec.21, T.32 N., R.58 E., Sheridan County, Hydrologic Unit 10060006, on right bank, at bridge on county road 1.2 mi southeast of Medicine Lake National Wildlife Refuge, and 5.3 mi south of Dagmar.

DRAINAGE AREA.--126 mi^2.

PERIOD OF RECORD.--October 1985 to September 1986. Seasonal records only.

GAGE.--Water-stage recorder. Elevation of gage is 1,975.00 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 26 to Mar. 8. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge and gage height not determined; maximum gage height, 4.46 ft Feb. 27, 1986; no flow most days each year.

EXTREMES FOR CURRENT SEASON.--Maximum discharge and gage height not determined; maximum gage height, 4.46 ft Feb. 27; no flow most days each year.

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1986 TO DECEMBER 1986
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			190	1.0	.58	.01	.00	.00	.00	.00	.00	
2			150	1.1	.54	.01	.00	.00	.00	.00	.00	
3			165	1.1	.37	.01	.00	.00	.00	.00	.00	
4			120	.96	.27	.00	.00	.00	.00	.00	.00	
5			70	1.1	.50	.00	.00	.00	.00	.00	.00	
6			16	.90	.79	.00	.00	.00	.00	.00	.00	
7			10	.96	1.9	.00	.00	.00	.00	.00	.00	
8			9.3	.96	2.0	.00	.00	.00	.00	.00	.00	
9			9.3	.96	4.5	.00	.00	.00	.00	.00	.00	
10			6.3	.85	20	.00	.00	.00	.00	.00	.00	
11			4.7	1.3	7.3	.00	.00	.00	.00	.00	.00	
12			4.1	1.4	4.3	.00	.00	.00	.00	.00	.00	
13			3.6	2.0	2.8	.00	.00	.00	.00	.00	.00	
14			3.0	2.0	1.9	.00	.00	.00	.00	.00		
15			2.3	1.6	1.1	.00	.00	.00	.00	.00		
16			1.7	2.0	.86	.00	.00	.00	.00	.00		
17			1.4	6.3	.66	.00	.00	.00	.00	.00		
18			1.7	6.5	.47	.00	.00	.00	.00	.00		
19			1.7	3.5	.37	.00	.00	.00	.00	.00		
20			1.4	2.5	.29	.00	.00	.00	.00	.00		
21			1.2	1.9	.23	.00	.00	.00	.00	.00		
22			.97	1.3	.13	.00	.00	.00	.00	.00		
23			1.1	1.0	.17	.00	.00	.00	.00	.00		
24			1.1	1.1	.17	.00	.00	.00	.00	.00		
25			.90	1.4	.46	.00	.00	.00	.00	.00		
26		10	.96	1.1	.54	.00	.00	.00	.00	.00		
27		100	.90	1.1	.28	.00	.00	.00	.00	.00		
28		160	.80	.90	.10	.00	.00	.00	.00	.00		
29			.85	.75	.06	.00	.00	.00	.00	.00		
30			.90	.62	.03	.00	.00	.00	.00	.00		
31			.80	---	.01	---	.00	.00	---	.00		
TOTAL			781.98	50.16	53.68	.03	.00	.00	.00	.00		
MEAN			25.2	1.67	1.73	.00	.00	.00	.00	.00		
MAX			190	6.5	20	.01	.00	.00	.00	.00		
MIN			.80	.62	.01	.00	.00	.00	.00	.00		
CFSM			.20	.01	.01	.00	.00	.00	.00	.00		
AC-FT			1550	99	106	.06	.00	.00	.00	.00		

06183850 SAND CREEK NEAR DAGMAR, MT

LOCATION.--Lat 48°29'38", long 104°16'23", in SE¼NW¼NW¼ sec.26, T.32 N., R.57 E., Sheridan County, Hydrologic Unit 10060006, at Medicine Lake National Wildlife Refuge boundary, on right bank at downstream end of culvert on county road, 1.0 mi upstream from mouth, and 7 mi southwest of Dagmar.

DRAINAGE AREA.--122 mi^2.

PERIOD OF RECORD.--August 1985 to October 1986 (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 1,945 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 25 to Mar. 3, Mar. 6-9. Records good except those for estimated daily discharges, which are poor. No known diversions for irrigation 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 daily discharge, 35 ft^3/s Mar. 1, 1986; maximum gage height, 3.68 ft Mar. 1, 1986 (backwater from ice); no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 35 ft^3/s Mar. 1; maximum gage height, 3.68 ft Mar. 1 (backwater from ice); 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	35	.88	1.4	1.5	.00	.00	.00
2	.00	.00	.00		.00	25	.79	1.1	.40	.00	.00	.00
3	.00	.00	.00		.00	30	.75	.48	.00	.00	.00	.00
4	.00	.00	.00		.00	21	.67	.00	.00	.00	.00	.00
5	.00	.00	.00		.00	19	.60	.00	.00	.00	.00	.00
6	.00	.00	.00		.00	12	.51	.41	.00	.00	.00	.00
7	.00	.00	.00		.00	8.0	.10	.64	.00	.00	.00	.00
8	.00	.00	.00		.00	9.0	.00	2.2	.00	.00	.00	.00
9	.00	.00	.00		.00	11	.00	3.5	.00	.00	.00	.00
10	.00	.00	.00		.00	12	.00	6.8	.00	.00	.00	.00
11	.00	.00	.00		.00	11	.00	9.0	.00	.00	.00	.00
12	.00	.00	.00		.00	10	.00	5.1	.00	.00	.00	.00
13	.00	.00	.00		.00	11	.00	3.8	.00	.00	.00	.00
14	.00	.00	.00		.00	8.2	.00	3.3	.00	.00	.00	.00
15	.00	.00	.00		.00	9.4	.00	2.8	.34	.00	.00	.00
16	.00	.00	.00		.00	10	.00	2.6	.00	.00	.00	.00
17	.00	.00	.00		.00	7.7	7.8	2.2	.00	.00	.00	.00
18	.00	.00	.00		.00	8.9	4.9	2.0	.00	.00	.00	.00
19	.00	.00	.00		.00	6.8	7.0	1.5	.00	.00	.00	.00
20	.00	.00	.00		.00	6.5	4.8	1.4	.00	.00	.00	.00
21	.00	.00	.00		.00	6.8	3.7	1.2	.00	.00	.00	.00
22	.00	.00	.00		.00	7.4	3.0	.65	.00	.00	.00	.00
23	.00	.00	.00		.00	6.7	2.8	1.5	.00	.00	.00	.00
24	.00	.00	.00		.00	6.3	2.5	2.0	.00	.00	.00	.00
25	.00	.00	.00		.00	5.8	2.3	1.7	.00	.00	.00	.00
26	.00	.00	.00		.50	5.1	2.1	2.5	.00	.00	.00	.00
27	.00	.00	.00		10	4.5	1.8	3.3	.00	.00	.00	.00
28	.00	.00	.00		30	3.6	2.0	2.8	.00	.00	.00	.00
29	.00	.00	.00		---	1.9	1.8	2.8	.00	.00	.00	.00
30	.00	.00	.00		---	1.1	1.5	2.7	.00	.00	.00	.00
31	.00	---	.00		---	.97	---	2.1	---	.00	.00	---
TOTAL	.00	.00	.00		40.50	321.67	52.30	73.48	2.24	.00	.00	.00
MEAN	.00	.00	.00		1.45	10.4	1.74	2.37	.07	.00	.00	.00
MAX	.00	.00	.00		30	35	7.8	9.0	1.5	.00	.00	.00
MIN	.00	.00	.00		.00	.97	.00	.00	.00	.00	.00	.00
CFSM	.00	.00	.00		.01	.09	.01	.02	.00	.00	.00	.00
AC-FT	.00	.00	.00		80	638	104	146	4.4	.00	.00	.00

06185110 BIG MUDDY CREEK NEAR MOUTH, NEAR CULBERTSON, MT

LOCATION.--Lat 48°09'52", long 104°37'45", in NE¼NW¼SW¼ sec.21, T.28 N., R.55 E., Roosevelt County, Hydrologic Unit 10060006, Fort Peck Indian Reservation, on right bank 30 ft downstream from U.S. Highway 2 bridge and 5.3 mi northwest of Culbertson.

DRAINAGE AREA.--2,684 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--November 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,896.52 ft above National Geodetic Vertical Datum of 1980 (unadjusted).

REMARKS.--Estimated daily discharges: Nov. 26 to Mar. 13, June 12, 19-23, 26, July 1-4. Water-discharge records poor. Flows are subject to extreme regulation by diversions and dams at Medicine Lake National Wildlife Refuge about 40 mi upstream.

AVERAGE DISCHARGE.--5 years (1982-1986), 41.1 ft^3/s, 29,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,860 ft^3/s Apr. 16, 1982, gage height, 10.40 ft; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum discharge and gage height undetermined; maximum gage height was caused by backwater from ice; 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	.05	.43	.00	.00	.00	100	39	11	6.5	.00	.00	18
2	.11	.20	.00	.00	.00	300	36	9.3	6.3	.00	.00	13
3	.08	.58	.00	.00	.00	800	151	6.9	3.7	.00	.00	9.1
4	.04	.48	.00	.00	.00	700	115	7.6	2.8	.00	.00	4.2
5	.47	.09	.00	.00	.00	500	97	7.8	2.7	.11	.00	2.7
6	.38	.00	.00	.00	.00	400	74	14	1.3	.17	.00	2.6
7	.77	.00	.00	.00	.00	350	57	16	1.4	.38	.00	2.7
8	2.4	.00	.00	.00	.00	300	50	17	6.2	.24	.03	2.7
9	1.5	.00	.00	.00	.00	350	44	22	2.8	.00	.04	2.3
10	1.3	.00	.00	.00	.00	550	38	41	1.9	.00	.08	2.3
11	.73	.00	.00	.00	.00	500	35	51	1.2	.00	.28	2.2
12	.48	.00	.00	.00	.00	450	29	43	.80	.00	.24	2.1
13	.48	.00	.00	.00	.00	400	51	38	.27	.00	.33	2.2
14	.33	.00	.00	.00	.00	363	57	36	.52	.00	.33	1.8
15	.71	.00	.00	.00	.00	287	21	36	.12	.00	.38	1.4
16	.92	.00	.00	.00	.00	239	15	35	.37	.00	.28	.73
17	.54	.00	.00	.00	.00	173	32	44	.38	.00	.48	.48
18	.53	.00	.00	.00	.00	143	49	45	.17	.00	.53	.71
19	.59	.00	.00	.00	.00	146	48	44	.00	.00	.25	1.9
20	.48	.00	.00	.00	.00	93	99	49	.00	.00	.20	1.4
21	.65	.00	.00	.00	.00	77	119	57	.00	.00	.64	.93
22	.39	.00	.00	.00	.00	76	85	47	.00	.00	.65	.66
23	.20	.00	.00	.00	.00	90	46	51	.00	.00	.39	.48
24	.33	.00	.00	.00	.00	60	26	45	.00	.00	.28	.71
25	27	.00	.00	.00	.00	66	22	34	.00	.00	.14	1.8
26	31	.00	.00	.00	.00	121	20	26	.00	.00	.28	.80
27	3.6	.00	.00	.00	.00	55	17	18	.00	.00	6.3	1.3
28	.44	.00	.00	.00	2.0	45	14	12	.00	.00	21	2.8
29	.59	.00	.00	.00	---	49	15	11	.00	.00	24	2.8
30	.59	.00	.00	.00	---	54	10	9.3	.00	.00	24	13
31	.34	---	.00	.00	---	39	---	7.6	---	.00	21	---
TOTAL	78.02	1.78	.00	.00	2.00	7876	1511	891.5	39.43	.90	102.13	99.80
MEAN	2.52	.06	.00	.00	.07	254	50.4	28.8	1.31	.03	3.29	3.33
MAX	31	.58	.00	.00	2.0	800	151	57	6.5	.38	24	18
MIN	.04	.00	.00	.00	.00	39	10	6.9	.00	.00	.00	.48
AC-FT	155	3.5	.00	.00	4.0	15620	3000	1770	78	1.8	203	198

CAL YR 1985	TOTAL	468.96	MEAN	1.28	MAX	39	MIN	.00	AC-FT	930
WTR YR 1986	TOTAL	10602.56	MEAN	29.0	MAX	800	MIN	.00	AC-FT	21030

06185110 BIG MUDDY CREEK NEAR MOUTH, NEAR CULBERTSON, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1982 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)	PH LAB (STAND-ARD UNITS) (00403)	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)
MAR											
11...	1140	122	--	--	662	3.0	2.0	--	--	--	--
31...	1100	35	20	1	1220	8.5	10.5	8.10	290	0	39
APR											
29...	1400	16	--	0	1830	15.0	13.0	8.30	410	0	50
JUN											
02...	1230	6.0	0	0	2330	32.0	24.5	8.40	520	0	60

DATE	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)	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)
MAR											
11...	--	--	--	--	--	--	--	--	--	--	--
31...	46	180	5	11	327	360	15	0.2	11	860	1.2
APR											
29...	70	270	6	13	448	530	19	0.3	6.6	1200	1.7
JUN											
02...	90	370	7	12	556	730	21	0.3	6.4	1600	2.2

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
MAR											
11...	--	--	--	--	--	--	--	--	--	--	--
31...	82	<0.10	--	280	--	--	62	--	--	--	--
APR											
29...	53	<0.10	6	440	<1	<10	52	<1	37	<0.1	<1
JUN											
02...	26	<0.10	--	610	--	--	30	--	--	--	--

06185500 MISSOURI RIVER NEAR CULBERTSON, MT

(National Stream Quality Accounting Network Station)

LOCATION.--Lat 48°07'30", long 104°28'20", in SE¼NW¼ sec.3, T.27 N., R.56 E., Richland County, Hydrologic Unit 10060005, on right bank at downstream side of bridge on State Highway 16, 2.5 mi southeast of Culbertson, 10 mi downstream from Big Muddy Creek, and at mile 1,620.76.

DRAINAGE AREA.--91,557 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1941 to December 1951, April 1958 to current year.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,883.4 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). July 1 to Nov. 6, 1941, water-stage recorder at site 400 ft upstream at datum 0.11 ft. Nov. 7, 1941, to Aug. 17, 1950, water-stage recorder at site 580 ft downstream at present datum. Aug. 18, 1950, to Dec. 31, 1951, nonrecording gage on bridge at present datum. Apr. 1, 1958, to Nov. 1, 1967, water-stage recorder at site 580 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 14 to Mar. 12. Water-discharge records good except those for estimated daily discharges, which are poor. Flow partly regulated by Fort Peck Lake (station number 06131500) and many other reservoirs upstream from station. Diversions for irrigation of about 1,030,400 acres upstream from station.

AVERAGE DISCHARGE.--36 years (1943-51, 1958-86, after operational level at Fort Peck Lake was reached), 10,940 ft^3/s, 7,926,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,200 ft^3/s Mar. 26, 1943, gage height, 14.80 ft, from rating curve extended above 30,000 ft^3/s; maximum gage height observed, 19.66 ft Apr. 14, 1979 (backwater from ice jam); minimum daily discharge, 575 ft^3/s Nov. 22, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22,000 ft^3/s Mar. 10; maximum gage height, 14.52 ft Mar. 12 (backwater from ice); minimum daily discharge, 5,500 ft^3/s Nov. 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	6290	6570	9500	14000	14000	14500	8390	7200	9540	8350	8200	7250
2	6120	6560	9500	14000	14500	15000	8170	7120	9820	9950	8210	7250
3	6210	6520	9500	14000	14500	16000	8110	7090	9720	9020	8270	7240
4	6040	6550	9500	14500	14500	17000	8040	7070	9430	8410	8170	6830
5	6140	6350	9500	14500	14500	19000	7950	7380	9100	8530	7620	6630
6	6240	6290	9500	14000	14500	20000	7850	7630	8920	8510	7390	6830
7	6430	6210	9500	14500	14500	20000	7780	8030	9290	8800	7270	6780
8	6470	6340	9500	14500	14500	20000	7850	8270	10000	8740	7160	6790
9	6600	6490	9500	14500	14500	21000	7650	8050	9810	8650	7590	6740
10	6840	6730	9500	14500	14500	22000	7570	8300	9500	8750	7910	6710
11	6740	5810	10500	14500	14500	21500	7560	9150	9360	8960	7900	7030
12	6590	6070	10500	14500	14000	21500	7480	9710	8960	9070	7810	6700
13	6520	6160	11500	14500	14500	15100	7550	9610	8490	8970	8120	6750
14	6570	6500	11500	14000	14500	13200	7590	10000	8260	8950	8270	6960
15	6620	6500	11500	14000	14500	12700	7740	11000	8290	9040	8210	7040
16	6750	6500	12500	14500	14500	12600	7720	11600	8390	9030	8210	6970
17	6720	6500	12500	14500	14500	12400	7620	12100	8440	9050	8180	6890
18	6670	6000	12500	14500	14500	12400	7750	12300	8350	9190	8170	7140
19	6750	6000	13000	14500	14500	12600	8030	12300	8520	9940	8150	7180
20	6630	5500	13500	14500	14500	12200	7960	12500	8470	9110	7980	7310
21	6560	6000	13500	14500	14500	11500	7780	12600	8710	8790	8020	7640
22	6670	8000	13500	14500	14500	10300	7720	12600	8420	8620	8090	7660
23	6740	9500	13500	14500	14500	9470	7710	12500	8320	8540	8210	7460
24	7370	10000	13500	14500	14500	9230	7620	12200	8350	8390	7600	7500
25	11100	10000	13500	14500	14500	9140	7600	11600	8410	8410	7260	8000
26	11500	9500	14000	14500	14500	9250	7400	10800	8460	8420	7200	8380
27	8580	9500	13500	14500	14500	8890	7320	10300	8320	8380	7210	9450
28	7230	9500	14000	14500	14000	9090	7260	10000	8080	8400	7310	10600
29	6920	9500	14000	14500	---	8880	7240	9760	8020	8510	7300	10100
30	6800	9500	14000	14500	---	8430	7290	9540	8070	8270	7340	11100
31	6680	---	13500	14500	---	8690	---	9800	---	8120	7320	---
TOTAL	216090	217150	365000	446500	404500	433570	231300	308110	263820	271870	241650	226910
MEAN	6971	7238	11770	14400	14450	13990	7710	9939	8794	8770	7795	7564
MAX	11500	10000	14000	14500	14500	22000	8390	12600	10000	9950	8270	11100
MIN	6040	5500	9500	14000	14000	8430	7240	7070	8020	8120	7160	6630
AC-FT	428600	430700	724000	885600	802300	860000	458800	611100	523300	539300	479300	450100

CAL YR 1985	TOTAL	3743490	MEAN	10260	MAX	15000	MIN	5500	AC-FT	7425000
WTR YR 1986	TOTAL	3626470	MEAN	9936	MAX	22000	MIN	5500	AC-FT	7193000

06185500 MISSOURI RIVER NEAR CULBERTSON, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946, 1965 to current year (discontinued).

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1965 to September 1981.
WATER TEMPERATURE: July 1965 to September 1979.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-81): Maximum daily, 941 microsiemens, Jan. 10, 1980; minimum daily, 338 microsiemens, Mar.30, 1967.
WATER TEMPERATURE (water years 1965-79): Maximum daily, 24.5°C, July 17, 1966; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION (water years 1972-76): Maximum daily mean, 2,940 mg/L, Aug. 15, 1974; minimum daily mean, 30 mg/L, Jan 13, 1975.
SEDIMENT LOAD (water years 1972-76): Maximum daily, 147,000 tons, June 5, 1975; minimum daily, 421 tons, Jan. 13, 1975.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	CLOUD COVER (PERCENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE, AIR (DEG C) (00020)	TEMPERATURE (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
NOV 19...	1300	E6000	--	80	1	575	-14.0	0.0	726	12.2	88
JAN 24...	1000	E14500	--	100	2	581	-5.0	0.0	716	12.4	90
MAR 31...	1300	8690	--	20	1	600	9.5	9.0	720	6.8	62
MAY 28...	1400	--	10200	0	0	605	28.0	19.0	720	8.2	94
JUL 29...	1400	8510	--	0	0	590	31.0	20.0	712	8.2	97
SEP 30...	1430	11100	--	0	0	672	16.0	12.5	710	9.4	95

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	PH (STANDARD UNITS) (00400)	TURBIDITY (NTU) (00076)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS, NONCARBONATE (MG/L CACO3) (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
NOV 19...	K1	<1	8.4	7.5	220	49	53	21	41	1	3.2
JAN 24...	<1	K6	8.3	14	220	62	52	21	39	1	3.5
MAR 31...	K22	140	8.3	68	210	60	49	21	47	1	4.4
MAY 28...	K11	K20	8.3	60	190	44	46	19	55	2	5.5
JUL 29...	K31	66	8.4	32	220	63	54	21	41	1	3.7
SEP 30...	K40	74	7.6	310	210	49	50	21	68	2	4.9

DATE	BICARBONATE FET-FLD (MG/L AS HCO3) (00440)	CARBONATE FET-FLD (MG/L AS CO3) (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)
NOV 19...	210	0	158	140	11	0.7	8.1	377	380	0.51	E6110
JAN 24...	190	0	160	130	9.2	0.7	8.0	356	360	0.48	E13900
MAR 31...	180	1	162	130	9.0	0.7	8.1	377	360	0.51	8850
MAY 28...	--	--	149	160	8.8	0.5	7.9	398	390	0.54	11000
JUL 29...	190	5	162	140	8.8	0.7	7.7	374	380	0.51	8590
SEP 30...	200	0	154	180	9.4	0.6	7.5	460	440	0.63	13800

06185500 MISSOURI RIVER NEAR CULBERTSON, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
NOV 19...	<0.01	<0.10	0.05	0.05	0.45	0.5	0.05	0.01	0.01	20	4
JAN 24...	<0.01	<0.10	0.03	0.03	0.27	0.3	0.05	0.02	0.02	--	--
MAR 31...	<0.01	<0.10	0.05	0.04	0.45	0.5	0.07	0.02	<0.01	20	4
MAY 28...	<0.01	0.12	0.09	0.03	0.81	0.9	0.25	0.02	0.02	--	--
JUL 29...	<0.01	<0.10	<0.01	0.02	--	0.3	0.05	0.02	0.01	20	3
SEP 30...	<0.01	0.12	0.04	0.03	0.86	0.9	0.28	0.03	0.02	--	--

DATE	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
NOV 19...	40	<0.5	<1	<1	<3	3	3	<1	55	4	<0.1
JAN 24...	--	--	--	--	--	--	--	--	--	--	--
MAR 31...	39	<0.5	<1	<1	<3	3	24	1	51	4	<0.1
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
JUL 29...	40	<0.5	<1	<1	<3	1	<3	<5	55	2	0.1
SEP 30...	--	--	--	--	--	--	--	--	--	--	--

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 19...	<10	2	1	<1	490	<6	10	--	--	--
JAN 24...	--	--	--	--	--	--	--	99	E3880	21
MAR 31...	440	<1	1	<1	<6	<6	8	284	6660	--
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUL 29...	<10	<1	1	<1	470	<6	6	--	--	--
SEP 30...	--	--	--	--	--	--	--	639	19200	87

06186000 YELLOWSTONE LAKE AT BRIDGE BAY, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°32'00", long 110°26'20", Yellowstone National Park, Hydrologic Unit 10070001, at marina at Bridge Bay, 3.7 mi southwest of lake outlet.

DRAINAGE AREA.--1,006 mi^2.

PERIOD OF RECORD.--October 1921 to current year, gage heights only. Prior to October 1966, published as Yellowstone Lake at Lake Hotel.

REVISED RECORDS.--WSP 1916: Drainage area.

GAGE.--Nonrecording gage usually read once weekly except during summer months, when it is read once daily. Datum of gage is 7,729.45 ft National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1966, nonrecording gages at Lake Hotel dock at same datum.

REMARKS.--No regulation. Beginning Oct. 1, 1982, gage-height data supplied by National Park Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.34 ft June 28, 30, 1974; minimum observed, -0.1 ft Dec. 7, 8, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 7.01 ft June 19; minimum observed, 1.67 ft Nov. 7.

GAGE HEIGHT (FEET) WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.02	---							---	6.74	4.94	
2	---	---							---	6.65	4.88	
3	1.97	---							---	6.57	4.84	
4	1.98	---							---	6.50	4.68	
5	---	---							---	6.43	4.72	
6	---	---							---	6.38	4.66	
7	---	1.67							---	6.30	4.58	
8	---	---							---	6.21	4.56	
9	---	---							---	6.22	4.45	
10	---	---							6.17	6.08	4.44	
11	---	---							6.28	5.98	4.34	
12	---	---							6.28	5.96	4.33	
13	---	---							---	5.92	4.29	
14	---	---							6.55	5.86	4.24	
15	1.86	---							6.72	5.79	4.22	
16	---	---							6.73	5.72	4.16	
17	---	---							6.84	5.74	3.94	
18	---	---							6.86	5.60	4.00	
19	---	---							7.01	5.58	3.94	
20	1.83	---							6.98	5.57	3.92	
21	---	---							6.98	5.46	3.82	
22	---	---							6.96	---	3.94	
23	---	---							6.94	5.38	3.86	
24	---	---							6.92	---	3.82	
25	---	---							6.90	5.28	3.82	
26	---	---							6.89	5.22	3.75	
27	1.75	---							6.86	5.25	3.74	
28	---	---							6.80	5.20	3.71	
29	---	---							6.73	5.16	3.65	
30	---	---							6.76	5.05	3.66	
31	---	---							---	5.01	---	
MEAN	---	---							---	---	---	
MAX	---	---							---	---	---	
MIN	---	---							---	---	---	

06186500 YELLOWSTONE RIVER AT YELLOWSTONE LAKE OUTLET, YELLOWSTONE NATIONAL PARK

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

DRAINAGE AREA.--1,006 mi^2.

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

REVISED RECORDS.--WSP 1309: See PERIOD OF RECORD. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 7,729.58 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 2, 1928, nonrecording gage at site 450 ft upstream at datum 1.07 ft higher.

REMARKS.--Estimated daily discharges: Nov. 8 to Feb. 25. Records good except those for estimated daily discharges, which are fair. No artificial regulation. 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.--59 years (1927-82, 1984-86), 1,334 ft^3/s, 18.01 in/yr, 966,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,170 ft^3/s June 28, 1974, gage height, 8.20 ft; minimum daily, 130 ft^3/s Mar. 1-31, 1934, but may have been less during periods of ice effect; minimum gage height, 1.45 ft Dec. 17, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,370 ft^3/s June 20, gage height, 7.85 ft; minimum daily, 410 ft^3/s Jan. 13-19.

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	759	627	450	430	500	702	677	818	2410	6740	3540	1900
2	749	623	460	430	520	699	668	817	2760	6610	3460	1870
3	736	619	470	430	530	693	670	820	3130	6480	3370	1840
4	726	617	480	420	540	690	665	842	3500	6350	3290	1800
5	719	621	490	420	530	682	666	878	3880	6190	3220	1760
6	714	614	500	420	520	677	665	886	4340	6010	3130	1710
7	727	604	500	430	500	682	662	897	4730	5840	3050	1690
8	725	600	500	420	480	722	674	907	5060	5690	2980	1670
9	728	580	500	420	460	737	683	924	5370	5550	2900	1650
10	719	580	490	420	450	740	686	940	5630	5420	2850	1610
11	718	580	480	420	450	742	697	949	5820	5320	2770	1590
12	712	580	470	420	450	743	701	950	6000	5260	2710	1560
13	706	560	470	410	450	736	726	948	6180	5160	2650	1520
14	702	560	470	410	470	731	729	955	6340	5040	2590	1500
15	693	560	490	410	480	728	727	944	6570	4940	2530	1480
16	685	550	490	410	500	727	732	937	6760	4850	2460	1460
17	676	540	490	410	500	721	738	939	6940	4780	2400	1430
18	670	530	490	410	520	722	739	933	7130	4660	2350	1440
19	666	520	490	410	540	712	737	934	7290	4550	2290	1440
20	661	500	480	420	560	707	734	947	7360	4440	2250	1450
21	661	500	480	420	560	707	736	981	7350	4330	2240	1440
22	668	480	480	420	580	699	737	1060	7310	4250	2220	1420
23	668	470	480	420	600	691	748	1110	7240	4170	2190	1390
24	666	460	460	440	620	693	756	1150	7180	4080	2150	1370
25	663	450	450	430	680	704	773	1190	7140	4030	2110	1360
26	660	440	450	430	728	696	788	1260	7100	4040	2090	1340
27	652	440	450	440	716	689	797	1370	7050	3980	2070	1320
28	653	450	450	450	709	686	813	1540	7000	3900	2030	1300
29	642	450	450	450	---	685	824	1730	6950	3800	1990	1280
30	643	450	450	470	---	680	828	1940	6870	3710	1960	1270
31	635	---	440	490	---	675	---	2190	---	3630	1940	---
TOTAL	21402	16155	14700	13230	15143	21898	21776	33686	178390	153800	79780	45860
MEAN	690	539	474	427	541	706	726	1087	5946	4961	2574	1529
MAX	759	627	500	490	728	743	828	2190	7360	6740	3540	1900
MIN	635	440	440	410	450	675	662	817	2410	3630	1940	1270
CFSM	.69	.54	.47	.42	.54	.70	.72	1.08	5.91	4.93	2.56	1.52
IN.	.79	.60	.54	.49	.56	.81	.81	1.25	6.60	5.69	2.95	1.70
AC-FT	42450	32040	29160	26240	30040	43430	43190	66820	353800	305100	158200	90960

CAL YR 1985	TOTAL	417039	MEAN	1143	MAX	3470	MIN	440	CFSM	1.14	IN.	15.42	AC-FT	827200
WTR YR 1986	TOTAL	615820	MEAN	1687	MAX	7360	MIN	410	CFSM	1.68	IN.	22.77	AC-FT	1221000

06187550 YELLOWSTONE RIVER AT TOWER JUNCTION, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°55'14", long 110°24'14", Yellowstone National Park, Hydrologic Unit 10070001, on left bank below bridge 0.7 mi east of Tower Junction on Cooke City highway, 0.8 mi upstream from Lamar River, 15 mi east of Mammoth, WY, and at mile 578.9.

DRAINAGE AREA.--1,342 mi^2.

PERIOD OF RECORD.--October 1983 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 6,010 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 24-28, Dec. 1-3, 11-14, Feb. 8-13, Sept. 9-30. Records fair except those for estimated daily discharges, which are poor. Natural storage in Yellowstone Lake 37.7 river miles upstream. No upstream regulation or diversions.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft^3/s June 19, 1986, gage height, 9.80 ft; minimum, 465 ft^3/s Nov. 23, 1985, gage height, 2.80 ft, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,800 ft^3/s June 19, gage height, 9.80 ft; minimum, 465 ft^3/s Nov. 23, gage height, 2.80 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	1040	881	555	622	784	1030	1060	1290	6540	9070	4940	2610
2	1040	887	540	594	803	1030	1030	1480	6830	8780	4830	2570
3	1040	877	560	610	808	1010	971	1860	7060	8660	4690	2500
4	998	870	597	598	798	1010	999	2270	7350	8520	4570	2450
5	995	891	613	594	799	999	994	2010	7780	8250	4480	2380
6	992	868	632	614	770	1010	1010	1780	8260	8020	4380	2280
7	1050	863	659	606	695	1020	1060	1670	8370	7830	4250	2230
8	1010	872	675	602	670	1060	1100	1560	8610	7580	4160	2210
9	1000	881	656	610	660	1060	1150	1530	9450	7510	4060	2220
10	1000	866	628	610	650	1060	1130	1550	9420	7410	3960	2200
11	1010	879	610	610	650	1060	1170	1550	9480	7270	3870	2200
12	1010	854	600	606	660	1050	1150	1510	9590	7030	3790	2190
13	978	860	610	610	680	1050	1120	1500	9730	6900	3690	2150
14	981	850	620	602	714	1020	1090	1530	9900	6780	3590	2120
15	981	844	631	602	750	1020	1090	1500	10500	6640	3530	2100
16	971	843	630	602	765	990	1110	1480	10400	6570	3420	2080
17	963	845	634	602	782	1010	1090	1520	10500	6530	3330	2080
18	945	835	626	598	802	956	1060	1610	10600	6300	3240	2080
19	935	795	630	610	824	996	1060	1780	10600	6170	3170	2050
20	933	806	638	630	868	995	1070	2220	10500	6030	3090	2000
21	927	777	630	622	916	997	1100	2770	10500	5890	3190	1950
22	948	719	630	626	932	1010	1270	2880	10300	5770	3180	1920
23	947	586	630	646	955	999	1490	2430	10100	5710	3010	1900
24	947	540	634	646	1000	1000	1460	2520	9950	5600	2970	1890
25	949	500	630	638	1080	1000	1340	3010	9900	5610	2930	1860
26	950	505	630	650	1090	989	1300	3620	9850	5670	2890	1830
27	932	510	630	663	1040	1010	1250	4180	9710	5580	2840	1820
28	917	520	622	671	1020	1040	1270	4740	9550	5440	2770	1800
29	914	560	622	693	---	1070	1280	5270	9400	5290	2710	1800
30	897	562	622	728	---	1100	1270	5690	9200	5160	2700	1800
31	900	---	618	765	---	1130	---	6020	---	5090	2730	---
TOTAL	30100	22946	19242	19480	22965	31781	34544	76330	279930	208660	110960	63270
MEAN	971	765	621	628	820	1025	1151	2462	9331	6731	3579	2109
MAX	1050	891	675	765	1090	1130	1490	6020	10600	9070	4940	2610
MIN	897	500	540	594	650	956	971	1290	6540	5090	2700	1800
CFSM	.72	.57	.46	.47	.61	.76	.86	1.83	6.95	5.02	2.67	1.57
IN.	.83	.64	.53	.54	.64	.88	.96	2.12	7.76	5.78	3.08	1.75
AC-FT	59700	45510	38170	38640	45550	63040	68520	151400	555200	413900	220100	125500

CAL YR 1985	TOTAL	595580	MEAN	1632	MAX	5000	MIN	500	CFSM	1.22	IN.	16.51	AC-FT	1181000
WTR YR 1986	TOTAL	920208	MEAN	2521	MAX	10600	MIN	500	CFSM	1.88	IN.	25.51	AC-FT	1825000

06188000 LAMAR RIVER NEAR TOWER FALLS RANGER STATION, YNP

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

DRAINAGE AREA.--660 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1922, April 1923 to September 1969, May 1985 to current year (seasonal records only). Monthly discharges only for some periods, published in WSP 1309.

GAGE.--Nonrecording gage and crest-stage gage. Elevation of gage is 6,000 ft above National Vertical Datum of 1929, from topographic map. Prior to Sept. 16, 1925, nonrecording gage and Sept. 16, 1925 to July 29, 1927, water-stage recorder at same site at datum 1.00 ft higher. July 29, 1925 to Sept. 30, 1969, water-stage recorder at same site and datum.

REMARKS.--Estimated daily discharges: May 25. Seasonal water-discharge records fair. No regulation or diversions. 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.

COOPERATION.--Gage-height record was collected in cooperation with National Park Service.

AVERAGE DISCHARGE.--46 years (1924-69), 829 ft^3/s, 600,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s May 25, 1928, gage height, 9.75 ft; minimum observed, 40 ft^3/s (discharge measurement) Mar. 16, 1945, but may have been less during period of no gage-height record in winter.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,500 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 4	unknown	*11,000	*9.03	June 15	unknown	7,190	7.42
June 9	unknown	8,670	8.09				

Minimum discharge observed, 208 ft^3/s Sept. 17, gage height, 1.44 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								781	8970	1890	591	270
2								1220	9030	1650	545	293
3								1710	9000	1500	507	256
4								2570	9080	1460	501	245
5								2130	8440	1360	475	234
6								1620	8390	1120	440	224
7								1410	7260	1070	420	217
8								1190	6620	994	406	217
9								1080	7700	1090	383	282
10								986	6430	1220	369	256
11								925	5660	1350	351	238
12								873	5990	1130	356	217
13								816	5570	995	356	211
14								774	5300	917	339	214
15								747	6290	851	318	234
16								721	5680	741	301	217
17								774	5530	823	286	214
18								901	5060	781	278	245
19								1080	4360	740	270	350
20								1740	4010	695	274	401
21								2740	3430	682	330	406
22								3300	2870	651	596	365
23								2340	2750	645	379	330
24								2210	2700	638	318	297
25								3710	2700	682	305	313
26								4840	2810	924	330	301
27								5800	2650	851	313	290
28								6880	2400	748	270	278
29								7580	2300	695	263	270
30								8110	2040	645	259	256
31								7980	---	626	278	---
TOTAL								79538	161020	30164	11407	8141
MEAN								2566	5367	973	368	271
MAX								8110	9080	1890	596	406
MIN								721	2040	626	259	211
CFSM								3.89	8.13	1.47	.56	.41
AC-FT								157800	319400	59830	22630	16150

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

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1985 to current year (discontinued).

PERIOD OF DAILY RECORD.--
SUSPENDED-SEDIMENT DISCHARGE: May 1985 to September 1986, seasonal records only (discontinued).

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATION: Maximum daily mean, 967 mg/L, June 4, 1986; minimum daily mean, 1 mg/L, Aug. 7, 9, 14, 1986.
SEDIMENT LOAD: Maximum daily, 23,700 tons, June 4, 1986; minimum daily, 0.9 tons Aug. 14, 1986.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 967 mg/L June 4; minimum daily mean, 1 mg/L Aug. 7, 9, 14.
SEDIMENT LOAD: Maximum daily, 23,700 tons, June 4; minimum daily, 0.9 tons Aug. 14.

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)	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)
APR								
08...	--	866	132	12.0	5.0	--	--	--
30...	1330	671	158	10.5	1.0	13	24	69
MAY								
21...	1445	2540	100	20.0	7.0	151	1040	53
27...	1700	5080	82	20.5	7.5	382	5240	56
JUN								
03...	1630	8120	69	15.0	6.0	390	8550	55
JUL								
23...	1550	631	138	20.0	15.0	7	12	88
SEP								
02...	1530	374	180	16.5	13.0	12	12	90

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	---		19	40	750	18200	16	82	8	13	4	2.9
2	---		57	188	848	20700	16	71	4	5.9	10	7.9
3	---		102	471	713	17300	15	61	3	4.1	23	16
4	---		289	2010	967	23700	14	55	4	5.4	10	6.6
5	---		119	684	757	17300	8	29	2	2.6	5	3.2
6	---		38	166	752	17000	8	24	3	3.6	3	1.8
7	---		26	99	572	11200	8	23	1	1.1	2	1.2
8	---		17	55	371	6630	6	16	2	2.2	3	1.8
9	---		15	44	571	11900	11	32	1	1.0	5	3.8
10	---		20	53	403	7000	25	82	2	2.0	24	17
11	---		16	40	271	4140	56	204	2	1.9	8	5.1
12	---		11	26	282	4560	25	76	2	1.9	5	2.9
13	---		11	24	200	3010	8	21	2	1.9	3	1.7
14	---		11	23	185	2650	5	12	1	.92	2	1.2
15	---		8	16	253	4300	4	9.2	3	2.6	3	1.9
16	---		8	16	193	2960	6	12	2	1.6	2	1.2
17	---		12	25	191	2850	24	53	2	1.5	2	1.2
18	---		22	54	176	2400	9	19	3	2.3	2	1.3
19	---		24	70	126	1480	4	8.0	3	2.2	12	11
20	---		97	456	93	1010	4	7.5	3	2.2	16	17
21	---		423	3130	72	667	4	7.4	216	192	18	20
22	---		480	4280	53	411	4	7.0	768	1240	12	12
23	---		95	600	52	386	4	7.0	92	94	8	7.1
24	---		125	746	43	313	4	6.9	21	18	4	3.2
25	---		599	6000	39	284	17	31	10	8.2	4	3.4
26	---		622	8130	65	493	70	175	12	11	4	3.3
27	---		744	11700	42	301	17	39	25	21	4	3.1
28	---		832	15500	34	220	10	20	21	15	4	3.0
29	---		963	19700	27	168	6	11	7	5.0	4	2.9
30	14		959	21000	22	121	5	8.7	4	2.8	4	2.8
31	---		902	19400	---	---	8	14	4	3.0	---	---
TOTAL	---		---	114746	---	183654	---	1223.7	---	1669.92	---	167.5

TOTAL LOAD FOR PERIOD: 301461.12 TONS.

06191000 GARDNER RIVER NEAR MAMMOTH, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°59'35", long 110°41'25", Yellowstone National Park, Hydrologic Unit 10070001, on left bank at Wyoming-Montana state line, 400 ft upstream from highway bridge, 0.5 mi downstream from Hot River (formerly Boiling River), 1.5 mi north of Mammoth, and at mile 2.9.

DRAINAGE AREA.--202 mi^2.

PERIOD OF RECORD.--October 1938 to September 1972, April 1984 to current year. Prior to October 1959, published as Gardiner River near Mammoth.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 5,620 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 28 to Dec. 4, Feb. 8-15. Records good except those for flows below 100 ft^3/s, which are fair, and those for estimated daily discharges, which are poor. No regulation or diversion upstream of station.

AVERAGE DISCHARGE.--36 years (1938-72, 1985-86), 219 ft^3/s, 14.72 in/yr, 158,700 acre ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,080 ft^3/s June 4, 1956, gage height, 4.46 ft; maximum gage height, 4.78 ft June 16, 1962 (backwater from logs and debris); minimum discharge, 35 ft^3/s Mar. 28, 1942, gage height, 1.08 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 2	0330	*1,740	*4.65	No other peak greater than base discharge.			

Minimum discharge, 49 ft^3/s Feb. 7, gage height, 1.83 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	130	119	75	103	101	113	153	209	1550	376	191	155
2	130	124	80	103	101	113	150	293	1630	355	187	157
3	134	124	90	103	103	110	142	432	1580	348	186	149
4	131	121	100	98	102	109	141	456	1470	359	182	146
5	133	126	108	90	97	107	142	381	1470	328	176	144
6	131	115	111	117	95	108	157	328	1480	306	172	144
7	152	118	111	105	69	113	183	302	1300	295	169	143
8	130	123	110	100	68	135	209	275	1170	292	168	143
9	134	114	96	104	68	126	227	260	1250	342	167	146
10	132	97	73	103	65	118	229	260	1110	334	166	148
11	138	106	81	103	68	116	245	253	1020	306	164	149
12	142	107	105	97	70	113	236	240	1090	283	166	147
13	132	124	105	100	75	110	193	238	1030	265	166	148
14	134	117	107	96	80	107	192	253	976	253	162	153
15	133	106	103	101	90	107	187	239	1110	246	156	153
16	134	111	110	102	95	104	189	244	996	253	153	149
17	134	116	113	100	82	107	177	257	929	262	152	150
18	131	109	110	101	85	104	168	270	870	240	151	158
19	129	96	107	104	83	105	163	299	791	231	150	162
20	130	99	107	103	86	106	165	385	711	224	153	184
21	130	106	105	100	91	109	203	551	642	223	173	170
22	137	93	104	98	92	111	286	650	582	219	185	158
23	130	91	105	100	94	111	354	520	549	214	163	152
24	132	105	104	98	107	115	294	492	527	216	158	151
25	136	105	102	85	118	108	265	574	513	234	162	156
26	137	104	104	83	123	108	242	739	505	230	162	158
27	133	104	101	106	120	116	219	913	475	231	158	158
28	129	90	98	108	115	131	216	1130	448	217	152	156
29	125	85	103	101	---	144	213	1310	439	207	150	154
30	124	80	103	101	---	157	204	1350	407	207	150	155
31	123	---	100	101	---	165	---	1460	---	198	153	---
TOTAL	4110	3235	3131	3114	2543	3606	6144	15563	28620	8294	5103	4596
MEAN	133	108	101	100	90.8	116	205	502	954	268	165	153
MAX	152	126	113	117	123	165	354	1460	1630	376	191	184
MIN	123	80	73	83	65	104	141	209	407	198	150	143
CFSM	.66	.53	.50	.50	.45	.57	1.01	2.49	4.72	1.33	.82	.76
IN.	.76	.60	.58	.57	.47	.66	1.13	2.87	5.27	1.53	.94	.85
AC-FT	8150	6420	6210	6180	5040	7150	12190	30870	56770	16450	10120	9120

CAL YR 1985	TOTAL	66352	MEAN	182	MAX	1050	MIN	73	CFSM	.90	IN.	12.22	AC-FT	131600
WTR YR 1986	TOTAL	88059	MEAN	241	MAX	1630	MIN	65	CFSM	1.19	IN.	16.22	AC-FT	174700

06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MT

LOCATION.--Lat 45°06'43", long 110°47'37", in NW¼SE¼NW¼ sec.30, T.8 S., R.8 E., Park County, Hydrologic Unit 10070002, on left bank 20 ft downstream from county road bridge at Corwin Springs, 1.3 mi upstream from Mulherin Creek, 7 mi northwest of Gardiner, and at mile 549.7.

DRAINAGE AREA.--2,623 mi^2.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 5,079.09 ft above National Geodetic Vertical Datum of 1929. Aug. 12, 1889, to Nov. 4, 1893, nonrecording gages at site 2 mi upstream at different datums. Sept. 2, 1910, to Apr. 19, 1935, nonrecording gages on bridge at present datum.

REMARKS.--Estimated daily discharges: Nov. 20 to Dec. 4, Dec. 11-16, Feb. 9-15. Water-discharge records good except for periods of estimated record, which are poor. Natural storage in Yellowstone Lake. Diversions for irrigation of about 960 acres of which 40 acres lies downstream from station.

AVERAGE DISCHARGE.--80 years, (1890-93, 1911-86) 3,123 ft^3/s, 16.17 in/yr, 2,263,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 32,000 ft^3/s June 14, 15, 1918, gage height, 11.5 ft, from rating curve extended above 18,000 ft^3/s; minimum observed, 389 ft^3/s Feb. 23, Mar. 5, 9, 1937, gage height, 0.05 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 12,000 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 2	0230	21,900	9.00	No other peak greater than base discharge.			

Minimum discharge, 623 ft^3/s Nov. 24, gage height, 0.65 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	1530	1280	720	844	1010	1300	1910	2370	20200	9970	4960	2880
2	1560	1290	720	828	1030	1310	1840	2830	20300	9600	4770	2850
3	1560	1300	800	830	1050	1280	1660	4120	20200	9340	4670	2760
4	1470	1280	860	824	1040	1280	1640	5890	19800	9180	4560	2640
5	1440	1280	883	805	1010	1260	1630	5290	20300	8800	4450	2590
6	1440	1250	892	842	1000	1290	1710	4370	20400	8310	4330	2500
7	1530	1230	920	823	882	1300	1960	3880	18300	8000	4200	2440
8	1490	1270	939	813	858	1400	2320	3490	17400	7800	4120	2420
9	1410	1220	911	814	850	1410	2580	3230	19200	7820	4050	2460
10	1410	1120	859	817	840	1370	2480	3090	17400	7990	3950	2410
11	1470	1130	820	826	840	1360	2510	3000	16700	7970	3860	2330
12	1500	1200	760	812	840	1350	2440	2850	17500	7620	3790	2280
13	1410	1210	770	807	870	1340	2290	2740	16900	7140	3770	2230
14	1420	1200	800	804	900	1280	2090	2790	16500	6880	3650	2200
15	1420	1150	840	799	930	1300	2060	2670	18300	6690	3570	2210
16	1400	1130	880	806	951	1220	2080	2590	17400	6590	3460	2150
17	1410	1170	881	819	961	1300	2030	2610	16900	6840	3380	2110
18	1380	1160	877	799	998	1210	1910	2760	16400	6360	3310	2160
19	1350	1040	869	815	1000	1240	1850	3000	15300	6170	3240	2320
20	1360	980	874	838	1040	1230	1820	4080	14500	5940	3210	2450
21	1350	900	869	841	1100	1230	1910	6490	13600	5790	3220	2470
22	1370	840	854	821	1130	1280	2490	7880	12500	5670	3910	2320
23	1380	800	854	847	1150	1280	3620	6080	12200	5540	3310	2210
24	1370	760	867	859	1220	1300	3520	5620	12100	5520	3190	2160
25	1390	740	857	832	1330	1300	3050	6780	11900	5600	3090	2160
26	1400	700	843	827	1400	1280	2790	9610	11900	5980	3150	2160
27	1390	710	864	862	1350	1330	2560	12500	11500	5820	3030	2120
28	1350	740	845	887	1310	1410	2490	15100	11100	5520	2950	2060
29	1350	750	879	894	---	1600	2440	16600	10900	5350	2880	2030
30	1320	730	850	936	---	1820	2340	17400	10500	5220	2850	2000
31	1320	---	848	979	---	2050	---	18100	---	5110	2970	---
TOTAL	43950	31560	26305	25950	28890	41910	68020	189810	478100	216130	113850	70080
MEAN	1418	1052	849	837	1032	1352	2267	6123	15940	6972	3673	2336
MAX	1560	1300	939	979	1400	2050	3620	18100	20400	9970	4960	2880
MIN	1320	700	720	799	840	1210	1630	2370	10500	5110	2850	2000
CFSM	.54	.40	.32	.32	.39	.52	.86	2.33	6.08	2.66	1.40	.89
IN.	.62	.45	.37	.37	.41	.59	.96	2.69	6.78	3.07	1.61	.99
AC-FT	87170	62600	52180	51470	57300	83130	134900	376500	948300	428700	225800	139000

CAL YR 1985	TOTAL	955735	MEAN	2618	MAX	13400	MIN	700	CFSM	.00	IN.	13.55	AC-FT	1896000
WTR YR 1986	TOTAL	1334555	MEAN	3656	MAX	20400	MIN	700	CFSM	1.39	IN.	18.93	AC-FT	2647000

06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1969-74, 1977-1981, 1984 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1984 to September 1985.
WATER TEMPERATURE: June 1977 to September 1981, March 1984 to September 1985.
SUSPENDED-SEDIMENT DISCHARGE: May 1985 to September 1986, seasonal.

REMARKS: Unpublished records of once-daily water temperatures are available in files of District office.
Sediment records are seasonal.

EXTREMES FOR PERIOD OF DAILY RECORDS.--
SPECIFIC CONDUCTANCE (water years 1984-85): Maximum, 311 microsiemens, Feb. 5, 1985; minimum, 71 microsiemens, June 21, 22, 1984.
WATER TEMPERATURE (water years 1977-81, 1984-85): Maximum, 21.5°C, July 22, 23, 1977; minimum, 0.0°C on many days during winter most years.
SEDIMENT CONCENTRATION: Maximum daily mean, 645 mg/L, May 28, 1986: minimum daily mean, 4 mg/L several days in September 1985 and 1986.
SEDIMENT LOAD: Maximum daily, 29,200 tons, June 3, 1986; minimum daily, 22 tons, Sep. 28-30, 1986.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 645 mg/L, May 28; minimum daily mean, 4 mg/L, Sept. 11, 12, 26-30.
SEDIMENT LOAD: Maximum daily, 29,200 tons, June 3; minimum daily, 22 tons, Sept. 28-30.

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							
04...	0845	1480	0	0	214	E-8.0	7.0
DEC							
17...	1715	877	100	3	300	-3.0	2.0
FEB							
06...	0900	1030	--	--	277	-6.0	1.0
MAY							
01...	1015	2400	--	--	217	4.5	5.0
28...	0900	15900	--	--	81	15.0	9.0
JUN							
04...	0830	20900	--	--	84	20.0	7.0
JUL							
22...	1515	5680	--	--	130	25.0	17.0
SEP							
03...	2030	2680	--	--	169	13.0	15.5

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
MAY							
01...	1015	5.0	2400	23	149	--	--
28...	0900	9.0	15900	835	35800	13	19
JUN							
04...	0830	7.0	20900	483	27300	--	--
JUL							
22...	1515	17.0	5680	30	460	--	--
SEP							
03...	2030	15.5	2680	10	72	--	--

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. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAY						
01...	--	--	--	--	--	78
28...	41	74	83	93	100	--
JUN						
04...	--	--	--	--	--	64
JUL						
22...	--	--	--	--	--	66
SEP						
03...	--	--	--	--	--	72

06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, 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	25	129	23	147	474	25900	113	3040	21	281	8	62
2	21	104	40	306	512	28100	108	2800	20	258	9	69
3	17	76	146	1620	536	29200	103	2600	20	252	8	60
4	18	80	224	3560	436	23300	102	2530	16	197	8	57
5	13	57	99	1410	442	24200	96	2280	12	144	7	49
6	16	74	46	543	420	23100	88	1970	12	140	6	40
7	21	111	27	283	333	16500	78	1680	11	125	6	40
8	44	276	22	207	294	13800	72	1520	10	111	6	39
9	51	355	19	166	397	20600	220	4650	12	131	6	40
10	31	208	18	150	268	12600	178	3840	10	107	6	39
11	35	237	17	138	286	12900	110	2370	10	104	4	25
12	25	165	18	139	277	13100	74	1520	10	102	4	25
13	20	124	17	126	248	11300	51	983	9	92	6	36
14	17	96	19	143	233	10400	50	929	9	89	8	48
15	18	100	18	130	328	16200	45	813	9	87	8	48
16	20	112	13	91	278	13100	38	676	7	65	6	35
17	19	104	12	85	277	12600	48	886	8	73	5	28
18	16	83	15	112	267	11800	41	704	7	63	6	35
19	13	65	16	130	239	9870	34	566	7	61	6	38
20	12	59	52	573	223	8730	26	417	7	61	14	93
21	14	72	262	4590	204	7490	26	406	14	122	12	80
22	35	235	292	6210	186	6280	32	490	131	1380	8	50
23	114	1110	116	1900	183	6030	28	419	81	724	6	36
24	58	551	61	926	179	5850	30	447	17	146	5	29
25	26	214	131	2400	166	5330	32	484	12	100	6	35
26	18	136	404	10500	175	5620	61	985	11	94	4	23
27	19	131	628	21200	159	4940	54	849	13	106	4	23
28	20	134	645	26300	146	4380	34	507	14	112	4	22
29	10	66	589	26400	134	3940	28	404	10	78	4	22
30	9	57	538	25300	123	3490	22	310	8	62	4	22
31	---	---	436	21300	---	---	21	290	9	72	---	---
TOTAL	---	5321	---	157085	---	390650	---	42365	---	5539	---	1248

TOTAL LOAD FOR PERIOD: 602208 TONS.

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MT
(National stream quality accounting network station)

LOCATION.--Lat 45°35'50", long 110°33'55", in NE¼NW¼NW¼ sec. 12, T.3 S., R.9 E., Park County, Hydrologic Unit 10070002, on right bank 50 ft downstream from bridge on Montana Secondary Highway 540, 2 mi downstream from Suce Creek, 4 mi south of Livingston, and at mile 501.4.

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

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 4,542.49 ft above National Geodetic Vertical Datum of 1929. May 2, 1897, to Dec. 31, 1905, nonrecording gage on highway bridge at different datum. Aug. 23, 1928, to Sept. 30, 1932, and Mar. 14, 1938, to Feb. 3, 1951, nonrecording gage on highway bridge at present datum.

REMARKS.--Estimated daily discharges: Nov. 18 to Dec. 15 and Feb. 9-19. Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 24,200 acres of which about 2,000 acres is below station.

AVERAGE DISCHARGE.--61 years, 3,769 ft^3/s, 2,731,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,300 ft^3/s June 17, 1974, gage height, 9.21 ft; maximum gage height, 9.34 ft June 20, 1943; minimum daily discharge, 590 ft^3/s Jan. 22, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 13,500 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 6	1115	*24,000	*8.10	No other peak greater than base discharge.			

Minimum discharge, 945 ft^3/s Nov. 23, gage height, 0.81 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	2060	1870	1000	1310	1510	1690	2420	2820	21400	10500	5340	3170
2	2090	1840	1000	1340	1500	1700	2300	2950	22600	10100	5150	3140
3	2120	1850	1050	1330	1510	1700	2180	3930	22700	9810	5030	3100
4	2110	1830	1150	1310	1500	1680	2060	5700	22200	9740	4950	3040
5	2030	1810	1200	1210	1470	1680	2060	5880	22500	9400	4800	3030
6	2040	1840	1250	1230	1470	1680	2060	5010	23000	8820	4680	2970
7	2080	1780	1300	1340	1390	1710	2230	4400	21400	8430	4580	2910
8	2140	1810	1300	1270	1270	1780	2540	4020	19800	8190	4470	2880
9	2010	1820	1300	1270	1200	1860	2870	3710	20600	8120	4410	2890
10	2000	1730	1250	1300	1180	1810	2940	3540	20200	8430	4330	2900
11	2020	1700	1150	1330	1180	1790	2910	3470	18700	8230	4260	2820
12	2070	1760	1050	1300	1200	1770	2930	3330	19100	8210	4230	2780
13	2070	1690	1100	1280	1230	1760	2840	3190	19000	7610	4190	2740
14	1980	1730	1150	1250	1260	1720	2610	3170	18300	7330	4090	2740
15	2000	1710	1250	1260	1300	1680	2550	3130	19500	7130	3990	2750
16	2000	1650	1370	1290	1350	1680	2520	3030	19300	6980	3890	2680
17	2000	1680	1420	1340	1380	1660	2570	2990	18600	7200	3810	2620
18	1990	1650	1410	1330	1380	1670	2440	3030	18100	7020	3720	2640
19	1950	1550	1410	1380	1400	1610	2340	3200	17000	6740	3650	2750
20	1940	1500	1420	1400	1430	1640	2310	3750	16100	6490	3610	2860
21	1940	1480	1400	1370	1450	1640	2330	5760	14900	6270	3590	2910
22	1950	1400	1380	1280	1500	1660	2600	7810	13700	6200	4020	2830
23	1970	1200	1370	1310	1520	1700	3590	6980	13000	6010	3830	2720
24	1950	1100	1360	1350	1600	1700	4020	6060	12600	5880	3560	2680
25	1940	1000	1350	1300	1690	1740	3660	6620	12400	5850	3450	2640
26	1960	960	1320	1190	1780	1710	3380	8800	12500	6110	3430	2650
27	1960	950	1310	1300	1770	1710	3130	11600	12100	6210	3370	2640
28	1940	1000	1250	1400	1710	1780	2980	14500	11800	5900	3280	2620
29	1920	1050	1260	1390	---	1930	2930	17000	11500	5710	3200	2570
30	1900	1000	1310	1450	---	2140	2860	18400	11100	5590	3160	2560
31	1870	---	1260	1510	---	2380	---	19500	---	5430	3170	---
TOTAL	62000	45940	39100	40920	40130	54360	81160	197280	525700	229640	125240	84230
MEAN	2000	1531	1261	1320	1433	1754	2705	6364	17520	7408	4040	2808
MAX	2140	1870	1420	1510	1780	2380	4020	19500	23000	10500	5340	3170
MIN	1870	950	1000	1190	1180	1610	2060	2820	11100	5430	3160	2560
AC-FT	123000	91120	77550	81160	79600	107800	161000	391300	1043000	455500	248400	167100

CAL YR 1985	TOTAL	1093240	MEAN	2995	MAX	14000	MIN	950	AC-FT	2168000
WTR YR 1986	TOTAL	1525700	MEAN	4180	MAX	23000	MIN	950	AC-FT	3026000

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1969 to september 1981.
WATER TEMPERATURE: October 1969 to September 1983.
SUSPENDED-SEDIMENT DISCHARGE: May 1985 to current year (seasonal).

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.
Sediment records are seasonal.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1969-81): Maximum daily, 398 microsiemens, Apr. 3, 1970; minimum daily, 73 microsiemens Jun. 14, 1979.
WATER TEMPERATURE (water years 1969-83): Maximum, 23.0°C, Jul. 9, 1976; minimum, 0.0°C on many days during winter.
SEDIMENT CONCENTRATION: Maximum daily mean, 790 mg/L, May 28, 1986; minimum daily mean, 4 mg/L on several days in August 1985 and September 1986.
SEDIMENT LOAD: Maximum daily, 33,700 tons, Jun. 2, 1986; minimum daily, 28 tons on several days in August and September of 1985 and 1986.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 790 mg/L, May 28; minimum daily mean, 4 mg/L, Sep. 27, 29.
SEDIMENT LOAD: Maximum daily 33,700 tons, Jun. 2; minimum daily, 28 tons, Sep. 29.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
24...	1330	1950	10	1	245	15.0	7.5	646	11.8	116	K12	K1
NOV												
05...	1615	1810	--	--	250	5.0	7.5	--	--	--	--	--
DEC												
17...	1430	1370	100	3	290	4.5	2.0	653	11.7	99	K8	K6
FEB												
03...	1440	1460	--	--	280	3.5	4.0	--	--	--	--	--
MAR												
17...	1315	1680	--	--	255	1.0	4.5	--	--	--	--	--
19...	0845	1580	100	2	260	5.5	4.5	650	10.5	95	K9	K18
APR												
28...	1530	3100	--	--	195	12.0	9.5	--	--	--	--	--
MAY												
07...	1320	4390	100	68	148	4.0	5.5	641	10.6	100	K9	K8
JUN												
04...	1315	22800	--	--	83	20.0	10.0	--	--	--	--	--
JUL												
15...	1045	7120	20	1	140	19.0	15.5	645	8.7	103	K13	27
22...	1100	6180	--	--	149	16.5	15.0	--	--	--	--	--
AUG												
29...	0910	3210	5	1	185	18.0	16.0	646	8.0	96	K9	120
SEP												
04...	1200	3080	--	--	196	21.0	15.5	--	--	--	--	--

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)
OCT										
24...	1330	8.50	2.0	81	3	21	6.9	17	0.9	3.9
DEC										
17...	1430	7.70	1.1	90	2	23	8.0	20	0.9	5.0
MAR										
19...	0845	7.70	2.7	79	3	20	7.0	19	1	4.5
MAY										
07...	1320	7.50	6.0	51	0	13	4.5	8.9	0.6	2.5
JUL										
15...	1045	7.60	5.5	44	0	11	4.0	11	0.7	2.4
AUG										
29...	0910	7.50	2.2	55	0	14	4.9	13	0.8	3.1

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BICARBONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
OCT 24...	83	6	76	24	9.1	0.6	23	148	160	0.2
DEC 17...	110	0	87	30	11	0.8	27	192	180	0.26
MAR 19...	93	0	75	26	9.8	0.8	24	163	160	0.22
MAY 07...	67	0	57	17	4.1	0.3	19	111	100	0.15
JUL 15...	55	0	48	14	5.3	0.5	17	91	93	0.12
AUG 29...	75	0	63	17	6.3	0.7	18	119	110	0.16

DATE	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
OCT 24...	779	<0.01	<0.10	0.03	0.03	0.3	0.01	<0.01	<0.01
DEC 17...	710	<0.01	0.29	0.10	0.11	0.4	0.02	0.01	0.02
MAR 19...	695	<0.01	0.20	0.01	0.01	0.4	0.03	0.01	0.01
MAY 07...	1320	<0.01	<0.10	0.03	0.05	0.5	0.05	0.03	0.02
JUL 15...	1750	<0.01	<0.10	0.04	0.04	0.4	0.04	0.02	0.02
AUG 29...	1030	<0.01	<0.10	<0.01	<0.01	0.2	0.02	<0.01	<0.01

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
OCT 24...	1330	40	20	40	<0.5	<1	<1	6	3	19	1
MAR 19...	0845	70	--	32	<0.5	<1	2	<3	1	30	<1
JUL 15...	1045	50	14	20	<0.5	<1	<1	<3	5	27	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
OCT 24...	78	<1	<0.1	<10	1	<1	<1	130	<6	8
MAR 19...	93	6	<0.1	<10	<1	<1	<1	140	<6	9
JUL 15...	45	2	<0.1	<10	3	<1	<1	75	<6	7

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	TEMPERATURE (DEG C) (00010)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
24...	1330	7.5	1950	8	42	58
DEC						
17...	1430	2.0	1370	5	18	67
MAR						
19...	0845	4.5	1580	16	68	67
MAY						
01...	1200	--	2880	15	117	67
07...	1320	5.5	4390	34	403	65
JUN						
04...	1315	10.0	22800	342	21100	67
09...	1215	9.0	20600	265	14700	61
JUL						
15...	1045	15.5	7120	33	634	60
22...	1100	15.0	6180	27	451	67
AUG						
29...	0910	16.0	3210	10	87	76
SEP						
04...	1200	15.5	3080	8	67	58

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)
		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER
1	---	---	13	99	576	33300	97	2750	16	231	10	86
2	---	---	17	135	553	33700	97	2650	14	195	10	85
3	---	---	80	849	453	27800	88	2330	15	204	9	75
4	---	---	348	5360	326	19500	82	2160	14	187	8	66
5	---	---	169	2680	348	21100	79	2010	12	156	8	65
6	---	---	79	1070	302	18800	73	1740	12	152	8	64
7	---	---	42	499	244	14100	65	1480	10	124	6	47
8	---	---	29	315	221	11800	55	1220	11	133	7	54
9	---	---	25	250	266	14800	74	1620	11	131	7	55
10	---	---	25	239	214	11700	65	1480	10	117	8	63
11	---	---	20	187	202	10200	61	1360	12	138	8	61
12	---	---	23	207	200	10300	71	1570	12	137	6	45
13	---	---	25	215	186	9540	44	904	11	124	6	44
14	---	---	19	163	177	8750	33	653	10	110	9	67
15	---	---	21	177	238	12500	32	616	8	86	8	59
16	---	---	18	147	192	10000	32	603	7	74	8	58
17	---	---	17	137	159	7980	36	700	7	72	8	57
18	---	---	17	139	146	7140	29	550	8	80	8	57
19	---	---	24	207	133	6100	25	455	9	89	7	52
20	---	---	41	415	127	5520	22	386	9	88	7	54
21	---	---	176	2740	155	6240	17	288	11	107	12	94
22	---	---	287	6050	151	5590	29	485	42	456	9	69
23	---	---	138	2600	185	6490	22	357	300	3100	8	59
24	---	---	55	900	139	4730	20	318	49	471	6	43
25	---	---	65	1160	128	4290	23	363	16	149	7	50
26	---	---	242	5750	128	4320	37	610	12	111	5	36
27	---	---	517	16200	118	3860	79	1320	11	100	4	29
28	---	---	790	30900	106	3380	32	510	10	89	6	42
29	---	---	712	32700	103	3200	28	432	10	86	4	28
30	14	108	636	31600	95	2850	25	377	10	85	5	35
31	---	---	572	30100	---	---	21	308	10	86	---	---
TOTAL	---	108	---	174190	---	339580	---	32605	---	7468	---	1699

TOTAL LOAD FOR PERIOD: 555650 TONS.

06195600 SHIELDS RIVER NEAR LIVINGSTON, MT

LOCATION.--Lat 45°44'18", long 110°28'45", in NE¼SE¼NW¼ sec.22, T.1 S., R.10 E., Park County, Hydrologic Unit 10070003, on right bank 900 ft northeast of U.S. Highway 89, 0.2 mi downstream from private road bridge, 2.0 mi upstream from mouth, and 6.5 mi northeast of Livingston.

DRAINAGE AREA.--852 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 4,420 ft, from topographic map. Oct. 1, 1978, to Aug. 12, 1980, water-stage recorder at site 0.2 mi upstream at datum 7.89 ft higher.

REMARKS.--Estimated daily discharges: Nov. 10 to Dec. 20, Feb. 8-20. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 32,000 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.--8 years, 327 ft^3/s, 236,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,600 ft^3/s June 20, 1979, gage height, 6.80 ft, previous datum; minimum, 39 ft^3/s July 27-29, 1985, gage height, 1.63 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,260 ft^3/s Feb. 26, gage height, 4.23 ft; minimum, 43 ft^3/s Dec. 28, gage height, 1.68 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	136	80	123	95	368	339	389	916	244	131	162
2	165	138	90	112	94	365	302	374	888	246	126	175
3	163	140	100	113	96	322	285	398	872	242	124	173
4	163	141	110	84	92	295	265	504	909	277	121	177
5	158	137	120	75	83	269	256	605	874	365	112	174
6	163	136	120	113	83	268	254	601	922	427	103	167
7	173	135	110	107	68	254	260	560	905	374	95	159
8	160	136	110	112	62	290	266	534	940	350	87	161
9	152	133	100	118	62	304	305	560	941	336	81	178
10	154	105	95	112	60	263	309	566	803	326	76	176
11	170	90	90	105	60	243	361	570	682	324	69	177
12	183	100	90	90	65	230	372	571	601	329	77	167
13	179	110	90	88	70	224	341	537	544	302	100	169
14	172	120	95	85	75	209	347	570	471	281	101	184
15	169	130	95	97	80	194	393	556	450	271	100	213
16	182	130	100	95	85	181	399	531	431	266	105	214
17	183	120	100	94	90	187	411	518	352	275	108	195
18	181	120	100	91	85	175	384	494	317	238	103	192
19	177	110	110	96	80	177	336	495	298	218	101	201
20	172	100	120	95	85	172	321	560	275	209	104	218
21	164	95	126	89	88	175	325	695	259	202	104	214
22	160	90	127	78	88	190	362	935	239	202	124	206
23	163	90	129	91	88	198	448	978	224	191	129	193
24	161	85	122	91	256	198	497	835	204	173	135	187
25	155	80	112	87	533	196	455	720	191	147	129	196
26	152	80	113	84	1020	187	458	714	178	161	127	200
27	148	85	88	94	693	192	467	781	189	157	124	197
28	148	90	79	93	423	211	465	873	184	138	123	195
29	142	90	101	92	---	256	448	919	217	132	139	197
30	139	85	116	87	---	316	414	892	254	132	146	200
31	137	---	104	95	---	362	---	872	---	134	154	---
TOTAL	5053	3337	3242	2986	4759	7471	10845	19707	15530	7669	3458	5617
MEAN	163	111	105	96.3	170	241	362	636	518	247	112	187
MAX	183	141	129	123	1020	368	497	978	941	427	154	218
MIN	137	80	79	75	60	172	254	374	178	132	69	159
AC-FT	10020	6620	6430	5920	9440	14820	21510	39090	30800	15210	6860	11140

CAL YR 1985	TOTAL	58374	MEAN	160	MAX	839	MIN	40	AC-FT	115800
WTR YR 1986	TOTAL	89674	MEAN	246	MAX	1020	MIN	60	AC-FT	177900

06200000 BOULDER RIVER AT BIG TIMBER, MT

LOCATION.--Lat 45°50'03", long 109°56'17", in SE¼NE¼SE¼ sec.14, T.1 N., R.14 E., Sweet Grass County, Hydrologic Unit 10070002, on left bank 150 ft upstream from Old Boulder Bridge, 1 mi east of Big Timber, and at mile 1.6.

DRAINAGE AREA.--523 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 4,056.39 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Nov. 8 to Jan. 8, Jan. 12-26, Feb. 6-24. Records good except those for periods of estimated daily discharges, which are poor. Diversions for irrigation of about 13,300 acres, of which about 250 acres is downstream 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.

AVERAGE DISCHARGE.--37 years, 602 ft^3/s, 436,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,840 ft^3/s May 28, 1956, gage height, 7.84 ft; maximum gage height, 8.25 ft July 8, 1975; minimum discharge, 10 ft^3/s about Aug. 26 or 27, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 6	0730	*5,780	*6.52	No other peak greater than base discharge.			

Minimum daily discharge, 60 ft^3/s Dec. 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	248	212	66	140	136	142	212	304	3980	1040	198	126
2	253	208	60	130	135	138	200	310	4470	927	170	113
3	249	208	80	130	133	136	196	439	4140	889	157	105
4	249	201	110	115	130	134	187	780	4180	1020	155	99
5	237	204	160	100	125	133	183	858	4550	909	140	104
6	234	203	200	140	120	132	179	719	4810	718	133	137
7	254	194	200	130	95	131	187	649	3630	609	124	139
8	239	190	190	140	80	143	218	583	3250	596	117	153
9	218	170	160	149	85	157	248	533	3230	627	109	169
10	246	130	140	151	90	149	255	482	2820	747	104	177
11	288	100	120	150	80	143	273	469	2670	768	96	173
12	289	90	125	135	70	146	294	433	2890	770	94	177
13	278	120	110	135	75	142	293	409	2770	594	110	182
14	264	160	130	135	100	138	276	410	2780	505	103	188
15	256	190	145	130	115	133	265	378	3070	488	96	198
16	256	200	155	130	150	133	256	351	2930	468	92	198
17	260	180	165	135	150	136	260	332	2800	489	93	186
18	252	140	170	125	125	137	244	322	2720	408	90	183
19	244	120	175	115	100	131	233	326	2500	359	88	201
20	239	100	175	95	100	128	221	423	2300	321	85	237
21	244	90	170	95	110	127	220	752	1830	291	84	240
22	247	80	160	100	120	129	249	1300	1460	278	113	219
23	244	74	160	120	135	135	389	1080	1350	264	110	206
24	232	70	155	120	180	136	444	840	1400	254	102	206
25	224	80	150	105	222	144	401	836	1420	231	107	235
26	225	68	140	115	189	140	424	1290	1440	243	101	231
27	226	70	115	155	168	135	374	2010	1430	268	93	227
28	223	74	140	141	149	137	351	2840	1350	257	90	224
29	223	78	160	135	---	151	342	3080	1330	240	87	222
30	221	72	130	133	---	179	329	3170	1280	258	87	219
31	216	---	125	138	---	202	---	3420	---	243	94	---
TOTAL	7578	4076	4441	3967	3467	4377	8203	30128	80780	16079	3422	5474
MEAN	244	136	143	128	124	141	273	972	2693	519	110	182
MAX	289	212	200	155	222	202	444	3420	4810	1040	198	240
MIN	216	68	60	95	70	127	179	304	1280	231	84	99
AC-FT	15030	8080	8810	7870	6880	8680	16270	59760	160200	31890	6790	10860

CAL YR 1985	TOTAL	138428	MEAN	379	MAX	3780	MIN	60	AC-FT	274600
WTR YR 1986	TOTAL	171992	MEAN	471	MAX	4810	MIN	60	AC-FT	341100

06202510 STILLWATER RIVER ABOVE NYE CREEK, NEAR NYE, MT

LOCATION.--45°23'46", long 109°52'14", in SW¼NE¼SW¼ sec.15, T.5 S., R.15 E., Stillwater County, Hydrologic Unit 10007005, at private bridge 200 ft above Nye Creek, 1.0 mi below Mountain View Creek, 4.3 mi southwest of Nye, and at mile 41.3.

DRAINAGE AREA.--193 mi^2.

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

GAGE.--Nonrecording gage and crest-stage gage. Elevation of gage is 4,880 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 13-19, Nov. 11 to Dec. 18, Jan. 3-5, Jan. 21, Feb. 8-21. Records fair except those for estimated daily discharges, which are poor. There are no known diversions or regulation upstream from gage. 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.--6 years, 377 ft^3/s, 273,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,400 ft^3/s July 10, 1983, gage height, 7.60 ft; minimum observed, 23 ft^3/s Mar. 6, 1981, Nov. 23, 1984, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,140 ft^3/s June 5, gage height, 6.55 ft; minimum observed, 44 ft^3/s Jan. 9, 13, 16.

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	162	113	54	70	63	80	128	175	3030	1170	431	181
2	171	116	50	66	65	80	123	194	3360	1100	358	165
3	168	126	54	64	68	70	128	207	3290	1120	357	165
4	168	121	60	60	63	72	134	210	3320	1190	334	165
5	162	121	70	58	65	68	133	229	3460	758	325	165
6	159	101	80	56	68	65	137	255	3410	663	304	165
7	159	92	86	51	63	61	156	236	2860	690	291	158
8	153	92	77	53	60	68	165	229	2770	683	271	148
9	156	90	66	44	56	68	171	316	2510	662	271	156
10	153	86	64	50	58	68	187	271	2070	690	251	148
11	162	84	54	45	52	72	201	204	2010	724	259	148
12	168	80	64	48	56	70	193	178	2140	637	291	148
13	160	82	60	44	60	63	184	197	2010	591	271	148
14	150	86	66	50	58	58	184	197	2020	560	255	148
15	160	90	70	51	60	61	178	191	2160	579	259	148
16	170	100	72	44	62	58	168	191	2510	572	240	134
17	160	92	75	45	60	58	162	197	2580	560	251	148
18	150	85	78	45	62	54	142	197	2550	530	232	165
19	130	80	80	51	60	58	129	207	2240	502	197	194
20	122	85	76	53	62	59	142	290	1960	485	201	194
21	121	74	65	50	66	58	142	632	1770	474	204	184
22	121	66	78	54	70	68	196	855	1340	479	204	162
23	121	62	74	59	74	68	278	569	1280	485	201	160
24	118	66	76	61	78	66	321	519	1380	502	201	151
25	123	64	70	58	80	72	275	603	1440	485	181	145
26	126	56	72	63	86	66	233	1100	1490	479	207	145
27	128	58	66	59	116	72	225	1440	1540	479	214	145
28	123	62	72	65	84	80	214	2060	1390	479	197	145
29	126	60	74	65	---	104	207	2340	1390	507	197	145
30	123	58	76	66	---	97	194	2340	1260	463	187	134
31	118	---	68	61	---	108	---	2770	---	452	181	---
TOTAL	4491	2548	2147	1709	1875	2170	5430	19599	66540	19750	7823	4707
MEAN	145	84.9	69.3	55.1	67.0	70.0	181	632	2218	637	252	157
MAX	171	126	86	70	116	108	321	2770	3460	1190	431	194
MIN	118	56	50	44	52	54	123	175	1260	452	181	134
CFSM	.75	.44	.36	.29	.35	.36	.94	3.27	11.5	3.30	1.31	.81
IN.	.87	.49	.41	.33	.36	.42	1.05	3.78	12.83	3.81	1.51	.91
AC-FT	8910	5050	4260	3390	3720	4300	10770	38870	132000	39170	15520	9340

CAL YR 1985	TOTAL	120005	MEAN	329	MAX	3550	MIN	42	CFSM	1.70	IN.	23.13	AC-FT	238000
WTR YR 1986	TOTAL	138789	MEAN	380	MAX	3460	MIN	44	CFSM	1.97	IN.	26.75	AC-FT	275300

06204050 WEST ROSEBUD CREEK NEAR ROSCOE, MT

LOCATION.--Lat 45°14'35", long 109°43'50", in NE¼ sec.10, T.7 S., R.16 E., Stillwater County, Hydrologic Unit 10070005, on left bank at Mystic Lake powerplant, 2.0 mi downstream from Mystic Lake, 13.5 mi southwest of Roscoe, and at mile 26.8.

DRAINAGE AREA.--52.1 mi^2.

PERIOD OF RECORD.--September 1965 to current year.

GAGE.--Water-stage recorder and rectangular weir. Datum of gage is 6,535.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Mystic Lake (station number 06204000). 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.--21 years, 128 ft^3/s, 33.36 in/yr, 92,740 acre-ft/yr, adjusted for change in contents in Mystic Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft^3/s July 6, 1975, gage height, 4.71 ft; minimum daily, 2.5 ft^3/s Apr. 3, 4, 6, 7, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 608 ft^3/s June 27, gage height, 2.62 ft; minimum daily, 22 ft^3/s Apr. 15, 18, 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	86	181	178	39	42	42	26	31	188	433	265	150
2	87	181	178	39	40	41	29	30	191	383	249	150
3	88	180	125	42	41	41	35	30	197	400	236	149
4	88	180	81	41	40	41	41	34	196	505	229	149
5	87	180	84	38	39	41	43	34	205	528	222	149
6	87	180	66	41	41	41	42	68	218	403	209	150
7	88	180	55	40	42	41	43	86	216	302	200	148
8	88	180	57	39	41	43	43	104	211	253	200	138
9	87	180	56	39	41	44	27	115	225	234	199	149
10	87	180	56	42	41	38	24	113	214	242	198	123
11	88	180	54	41	40	35	25	117	212	263	198	139
12	87	179	54	39	40	36	24	117	211	281	182	128
13	87	179	55	40	41	36	25	115	211	282	165	128
14	85	179	56	40	41	48	24	114	212	271	166	127
15	85	169	56	40	39	73	22	80	216	263	165	129
16	87	178	56	40	41	79	24	42	217	271	166	128
17	87	178	54	41	41	79	25	39	214	304	166	125
18	86	178	54	39	40	79	22	44	218	307	157	124
19	85	178	54	39	39	75	23	47	219	293	147	114
20	85	170	49	41	40	63	25	43	218	269	146	129
21	135	179	43	41	43	63	24	45	233	256	148	132
22	183	179	40	43	44	65	26	52	246	251	150	128
23	183	178	40	40	41	66	29	84	271	252	141	99
24	183	178	40	38	40	47	26	117	346	257	148	59
25	181	178	40	38	40	41	28	118	438	266	153	71
26	182	178	41	41	42	39	31	120	526	274	151	98
27	181	178	41	42	41	41	29	125	549	287	153	97
28	181	178	41	40	41	35	22	132	548	283	154	95
29	182	178	41	38	---	26	32	138	543	273	151	97
30	181	178	40	38	---	26	32	171	523	275	150	97
31	182	---	39	40	---	27	---	187	---	275	151	---
TOTAL	3689	5352	1924	1239	1142	1492	871	2692	8432	9436	5515	3699
MEAN	119	178	62.1	40.0	40.8	48.1	29.0	86.8	281	304	178	123
MAX	183	181	178	43	44	79	43	187	549	528	265	150
MIN	85	169	39	38	39	26	22	30	188	234	141	59
CFSM	2.28	3.42	1.19	.77	.78	.92	.56	1.67	5.39	5.83	3.42	2.36
IN.	2.63	3.82	1.37	.88	.82	1.07	.62	1.92	6.02	6.74	3.94	2.64
AC-FT	7320	10620	3820	2460	2270	2960	1730	5340	16720	18720	10940	7340
MEAN †	48.6	36.0	23.4	19.8	22.7	16.1	43.9	128	568	303	173	93.6
CFSM †	.93	.69	.45	.38	.44	.31	.84	2.46	10.90	5.82	3.32	1.80
IN †	1.08	.77	.52	.44	.45	.36	.94	2.84	12.17	6.71	3.82	2.00
AC-FT †	2,990	2,140	1,440	1,220	1,260	990	2,610	7,900	33,810	18,640	10,610	5,570

OBSERVED

CAL YR 1985	TOTAL	37,081	MEAN	102	MAX	198	MIN	17	AC-FT	73,550
WTR YR 1986	TOTAL	45,483	MEAN	125	MAX	549	MIN	22	AC-FT	90,220

ADJUSTED

CAL YR 1985	TOTAL	36,340	MEAN	996	CFSM	1.91	IN	25.94	AC-FT	72,080
WTR YR 1986	TOTAL	44,961	MEAN	123	CFSM	2.36	IN	32.10	AC-FT	89,160

† Adjusted for change in contents of Mystic Lake.

06205000 STILLWATER RIVER NEAR ABSAROKEE, MT

LOCATION.--Lat 45°33'04", long 109°23'12", in NE¼NE¼NW¼ sec.28, T.3 S., R.19 E., Stillwater County, Hydrologic Unit 10070005, on right bank 3 mi downstream from Rosebud Creek, 3.5 mi northeast of Absarokee, 9 mi southwest of Columbus, and at mile 9.4.

DRAINAGE AREA.--975 mi^2.

PERIOD OF RECORD.--July 1910 to September 1914 (no winter records), March 1935 to current year.

REVISED RECORDS.--WSP 1309: 1911(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,873.8 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1914, nonrecording gage, and Mar. 26, 1935, to Sept. 30, 1942, nonrecording gage, at bridge 2 mi upstream at different datums.

REMARKS.--Estimated daily discharges: Nov. 8 to Jan. 9, Jan. 22, 23, Feb. 5-24, July 3-23. Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Mystic Lake (station number 06204000). Diversions for irrigation of about 24,300 acres, of which 400 acres lies downstream from station. 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.--51 years (1935-86), 964 ft^3/s, 698,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s June 15, 1967, gage height, 7.17 ft; minimum observed, 58 ft^3/s Apr. 2, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 6	0600	*5,520	*5.16	June 16	0900	4,860	4.88

Minimum daily discharge, 90 ft^3/s Feb. 12.

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	603	502	180	230	227	299	291	450	4070	2420	1110	736
2	587	495	180	210	220	294	278	440	4380	2150	1030	708
3	607	494	300	210	215	284	267	506	4590	2100	958	648
4	590	487	400	180	213	273	262	708	4950	2200	915	637
5	565	485	440	130	190	268	255	817	5130	2000	825	649
6	547	480	420	220	170	259	259	743	5190	1800	757	678
7	583	469	330	200	140	253	264	797	4650	1600	709	665
8	538	440	280	260	120	279	270	781	4200	1400	685	649
9	543	400	250	250	110	316	296	773	4590	1500	669	657
10	538	350	230	253	105	292	309	775	3890	1800	669	619
11	572	300	200	256	95	274	319	898	3440	1850	647	599
12	572	280	300	231	90	267	338	791	3750	1900	663	581
13	539	330	400	229	110	268	355	729	3640	1700	674	598
14	515	450	450	218	120	255	329	723	3610	1500	631	625
15	501	450	450	222	130	247	347	698	4340	1450	581	634
16	492	440	450	221	160	266	334	628	4440	1400	541	611
17	494	420	350	242	160	291	337	582	4200	1500	552	667
18	481	380	260	216	130	289	303	558	4110	1450	547	751
19	471	310	260	253	110	287	289	556	3700	1400	536	725
20	464	260	260	262	120	276	281	600	3480	1350	541	744
21	463	220	270	215	140	271	272	804	3010	1300	547	708
22	527	230	280	160	170	275	289	1160	2550	1250	585	665
23	549	220	280	220	220	270	385	1140	2190	1200	616	626
24	541	200	270	230	380	270	493	1060	2290	1150	595	591
25	538	220	260	171	802	253	494	1090	2520	1140	574	579
26	530	210	250	181	562	243	622	1400	2810	1240	569	591
27	529	190	200	272	375	237	528	2150	2960	1280	558	586
28	519	200	200	246	314	239	527	3080	2940	1240	511	571
29	511	200	270	217	---	249	537	3480	2910	1200	486	561
30	514	190	240	220	---	271	486	3600	2850	1220	495	571
31	505	---	210	227	---	284	---	3720	---	1180	541	---
TOTAL	16528	10302	9120	6852	5898	8399	10616	36237	111380	47870	20317	19230
MEAN	533	343	294	221	211	271	354	1169	3713	1544	655	641
MAX	607	502	450	272	802	316	622	3720	5190	2420	1110	751
MIN	463	190	180	130	90	237	255	440	2190	1140	486	561
AC-FT	32780	20430	18090	13590	11700	16660	21060	71880	220900	94950	40300	38140

CAL YR 1985	TOTAL	234370	MEAN	642	MAX	5710	MIN	150	AC-FT	464900
WTR YR 1986	TOTAL	302749	MEAN	829	MAX	5190	MIN	90	AC-FT	600500

06207500 CLARKS FORK YELLOWSTONE RIVER NEAR BELFRY, MT

LOCATION.--Lat 45°00'37", long 109°03'53", in NW¼SW¼NW¼ sec.32, T.9 S., R.22 E., Carbon County, Hydrologic Unit 10070006, on left bank 0.2 mi upstream from county road bridge and Big Sand Coulee, 0.8 mi north of Wyoming-Montana State line, 9.5 mi southwest of Belfry, and at mile 71.2.

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

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1921 to current year. Monthly discharge only for some period, published in WSP 1309. Published as Clarks Fork at Chance prior to October 1956 and as Clarks Fork Yellowstone River at Chance October 1956 to September 1968.

REVISED RECORDS.--WSP 1309: 1922 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,986.24 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 15, 1934, nonrecording gage, and Nov. 15, 1934, to July 26, 1951, water-stage recorder at bridge 0.4 mi downstream of different datum. July 27, 1951, to Sept. 30, 1953, water-stage recorder at present site at datum 0.98 ft higher.

REMARKS.--Estimated daily discharges: Nov. 10 to Jan. 7, Feb. 9-26, July 23 to Aug. 11, Sept. 21-23. Water-discharge records good except those for July 23 to Aug. 11 and Sept. 21-23, which are fair, and Nov. 10 to Jan. 7 and Feb. 9-26, which are poor. Diversions for irrigation of about 11,100 acres upstream from station.

AVERAGE DISCHARGE.--65 years, 948 ft^3/s, 686,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft^3/s June 9, 1981, gage height, 9.97 ft; minimum observed, 32 ft^3/s Apr. 26, 1961, result of discharge measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,400 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 4	0830	*9,350	*7.79	June 16	0500	7,290	6.78

Minimum daily discharge, 110 ft^3/s Dec. 1.

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	308	249	110	180	225	340	550	534	7610	2790	1000	331
2	279	251	130	190	222	348	476	655	8080	2530	900	334
3	271	288	200	190	218	348	430	998	8350	2520	840	369
4	280	290	250	180	218	326	379	1420	8710	2620	800	328
5	250	285	280	190	209	331	372	1470	8720	2610	740	304
6	250	292	280	200	199	318	416	1230	8870	2130	680	288
7	258	270	270	210	198	308	532	1050	7340	1710	620	280
8	292	292	250	211	172	316	695	917	6290	1470	600	275
9	255	282	240	224	160	335	745	786	6780	1420	580	330
10	262	260	190	226	150	307	685	694	5590	1600	580	320
11	267	210	150	243	140	285	665	649	5050	2060	560	329
12	283	240	180	227	130	277	648	581	5620	2080	529	275
13	283	270	160	218	150	268	622	514	5780	1750	521	263
14	254	310	200	215	180	262	546	518	5450	1540	495	259
15	256	300	260	208	200	251	543	491	6250	1520	460	301
16	247	310	230	216	300	245	541	442	6640	1500	417	306
17	252	330	230	235	250	252	508	401	6330	1710	383	286
18	249	280	230	218	220	252	437	381	6110	1590	377	292
19	240	240	230	246	200	236	400	428	5340	1410	362	479
20	278	200	220	241	200	234	379	692	4800	1260	346	458
21	282	180	210	226	220	233	381	1370	4220	1210	339	450
22	268	170	220	198	260	234	610	2070	3430	1170	608	440
23	264	160	220	217	300	252	1090	1780	3100	1100	493	430
24	259	180	215	224	350	261	1040	1510	3290	940	467	427
25	260	180	210	202	400	285	835	1600	3620	960	420	423
26	268	150	200	196	400	279	803	2380	3820	1150	453	406
27	272	160	180	217	355	261	724	3540	3880	1400	423	396
28	267	170	170	233	339	291	639	4760	3640	1250	374	396
29	262	180	160	220	---	383	596	5430	3440	1100	334	381
30	257	160	180	221	---	524	556	6000	3230	1000	331	371
31	248	---	190	225	---	623	---	6380	---	950	331	---
TOTAL	8221	7139	6445	6647	6565	9465	17843	51671	169380	50050	16363	10527
MEAN	265	238	208	214	234	305	595	1667	5646	1615	528	351
MAX	308	330	280	246	400	623	1090	6380	8870	2790	1000	479
MIN	240	150	110	180	130	233	372	381	3100	940	331	259
AC-FT	16310	14160	12780	13180	13020	18770	35390	102500	336000	99270	32460	20880

CAL YR 1985	TOTAL	221819	MEAN	608	MAX	6270	MIN	110	AC-FT	440000
WTR YR 1986	TOTAL	360316	MEAN	987	MAX	8870	MIN	110	AC-FT	714700

06207500 CLARKS FORK YELLOWSTONE RIVER NEAR BELFRY, MT--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at bridge on county road, 0.2 mi downstream from discharge station, just upstream from Big Sand Coulee, and at mile 71.0.

PERIOD OF RECORD.--Water years 1966 to current year (discontinued). Prior to October 1968 published as "at Chance".

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1965 to September 1969.
WATER TEMPERATURE: October 1965 to September 1969.
SUSPENDED-SEDIMENT DISCHARGE: March to September 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1966-69): Maximum daily, 409 microsiemens, Oct, 24, 1966; minimum daily, 73 microsiemens June 6, 8, 1969.
WATER TEMPERATURE (water years 1966-69): Maximum, 22.0 °C, Aug. 23, 24, 1969; 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							
16...	1100	241	40	1	295	12.5	8.0
DEC							
05...	1230	278	--	--	300	1.5	1.0
JAN							
08...	1145	210	100	2	330	0.5	0.5
APR							
09...	1100	730	--	--	190	15.0	9.5
MAY							
15...	1100	492	--	--	205	12.0	8.5
29...	1115	5600	--	--	85	27.0	8.5
JUN							
02...	1410	7920	--	--	85	32.0	9.0
JUL							
02...	1200	2590	--	--	100	--	15.5
AUG							
12...	1200	513	--	--	230	20.0	16.5
SEP							
24...	1130	415	--	--	250	10.0	9.5

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
16...	1100	8.30	140	23	39	11	9.5	0.4	1.3	120
16...	1100	8.30	140	23	39	11	9.5	0.4	1.3	120
JAN										
08...	1145	8.60	150	34	42	12	9.4	0.3	0.9	120
MAY										
29...	1115	8.30	54	0	17	2.7	4.0	0.2	0.4	57

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)
OCT									
16...	36	1.3	0.1	7.5	180	0.24	116	--	0.01
JAN									
08...	43	0.5	0.1	8.7	190	0.26	107	0.20	0.05
MAY									
29...	3.4	0.8	0.0	6.8	69	0.09	1050	0.00	0.73

DATE	TIME	DICAMBA (MED-IBEN) (BAN-VEL D) TOTAL (UG/L) (82052)	PICLO-RAM (TOR-DON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)
JUN							
02...	1410	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

06208800 CLARKS FORK YELLOWSTONE RIVER NEAR SILESIA, MT

LOCATION.--Lat 45°30'48", long 108°49'42", in NW¼SE¼ sec.1, T.4 S., R.23 E., Carbon County, Hydrologic Unit 10070006 on left bank 0.5 mi downstream from Whitehorse Canal intake, 1 mi upstream from Rock Creek, 3 mi south of Silesia, and at mile 16.3.
DRAINAGE AREA.--2,093 mi^2.
PERIOD OF RECORD.--October 1969 to November 1986 (discontinued). Records for July 1921 to September 1969 (published as Clarks Fork Yellowstone River at Edgar) at site 5.8 mi upstream not equivalent because of diversion into Whitehorse Canal during irrigation season.
GAGE.--Water-stage recorder. Datum of gage is 3,405.79 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Corps of Army Engineers).
REMARKS.--Estimated daily discharges: Nov. 9 to Jan. 27, Feb. 7-25 and May 29 to June 25. Records good except those for Nov. 9 to Jan. 27, Feb. 7-25, which are poor, and May 29 to June 25, which are fair. Diversion for irrigation of about 45,900 acres of which about 2,180 acres lies downstream from station. In addition about 56,200 acres of land upstream from station are irrigated by diversions from the adjoining Rock Creek basin.
AVERAGE DISCHARGE.--17 years, 1,142 ft^3/s, 827,400 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,500 ft^3/s June 10, 1981, gage height, 8.36 ft, from rating curve extended above 7.40 ft; minimum, 56 ft^3/s Apr. 25, 1981, gage height, 0.53 ft.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 4	unknown	*8,780	*7.20	June 16	unknown	unknown	unknown

Minimum daily discharge, 210 ft^3/s Dec. 1.

Discharges, in cubic feet per second, October to November 1986

DAY	OCT	NOV	DAY	OCT	NOV	DAY	OCT	NOV	DAY	OCT	NOV	DAY	OCT	NOV
1	845	550	8	859	560	15	755	800	22	618	651	29	553	560
2	850	557	9	837	500	16	727	739	23	616	630	30	559	553
3	870	541	10	801	250	17	754	761	24	606	599	31	562	
4	846	532	11	799	420	18	728	748	25	594	593			
5	852	555	12	759	300	19	717	720	26	576	585			
6	839	649	13	746	370	20	694	703	27	566	555			
7	843	660	14	736	520	21	666	711	28	557	559			

	OCT	NOV
TOTAL	22327	17431
MEAN	720	581
MAX	870	800
MIN	553	250
AC-FT	44290	34570

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	708	580	210	370	459	539	705	726	6400	2850	984	592
2	708	565	230	350	445	528	610	720	7000	2480	916	683
3	691	558	300	330	442	533	571	843	7600	2300	866	657
4	683	558	350	310	447	522	533	1170	7800	2450	845	563
5	683	558	400	360	435	502	494	1400	8200	2540	774	513
6	642	558	400	420	411	494	497	1300	8400	2200	701	528
7	667	587	370	450	380	479	533	1190	7000	1770	670	558
8	642	558	350	430	350	469	636	1140	6000	1430	654	564
9	642	540	350	420	350	489	761	1140	6200	1270	605	571
10	634	500	330	450	330	486	780	1090	5200	1420	637	688
11	619	450	290	460	250	455	743	960	4800	1560	638	654
12	634	400	330	520	260	437	733	853	5000	2190	598	635
13	659	480	350	500	290	443	715	783	5400	1810	573	621
14	642	520	400	540	310	432	683	716	5200	1550	548	672
15	634	540	450	500	340	412	625	708	5800	1400	491	741
16	611	520	500	480	450	397	631	639	6400	1420	447	801
17	595	450	520	460	430	404	652	595	6200	1460	410	779
18	619	380	540	450	400	422	595	587	5800	1530	393	781
19	619	330	540	480	350	412	564	587	5200	1480	313	820
20	634	290	520	520	370	394	546	611	4700	1320	301	970
21	642	280	480	450	450	388	533	869	4000	1230	304	945
22	634	250	450	450	500	382	541	1260	3400	1120	310	1000
23	634	250	470	460	600	380	792	1360	3000	1030	529	937
24	619	270	470	460	700	392	1130	1220	3100	919	505	897
25	619	270	450	460	800	394	1090	1160	3400	954	502	929
26	587	250	440	490	792	422	1050	1370	3660	1190	472	898
27	587	250	400	500	770	412	1030	2070	3670	1330	465	866
28	587	240	340	446	566	399	910	3050	3600	1200	454	845
29	565	270	370	458	---	429	831	4500	3420	1050	434	844
30	587	240	360	438	---	522	791	5200	3240	981	458	825
31	587	---	350	453	---	639	---	5800	---	945	520	---
TOTAL	19614	12492	12310	13865	12677	14008	21305	45617	158790	48379	17317	22377
MEAN	633	416	397	447	453	452	710	1472	5293	1561	559	746
MAX	708	587	540	540	800	639	1130	5800	8400	2850	984	1000
MIN	565	240	210	310	250	380	494	587	3000	919	301	513
AC-FT	38900	24780	24420	27500	25140	27780	42260	90480	315000	95960	34350	44380

CAL YR 1985	TOTAL	257614	MEAN	706	MAX	5830	MIN	178	AC-FT	511000
WTR YR 1986	TOTAL	398751	MEAN	1092	MAX	8400	MIN	210	AC-FT	790900

06209500 ROCK CREEK NEAR RED LODGE, MT

LOCATION.--Lat 45°07'15", long 109°17'45", in NW¼NW¼ sec.20, T.8 S., R.20 E., Carbon County, Hydrologic Unit 10070006, on left bank 10 ft downstream from bridge, 3.2 mi upstream from West Fork, 4.5 mi southwest of Red Lodge, and at mile 46.0.

DRAINAGE AREA.--124 mi^2.

PERIOD OF RECORD.--April to December 1932, May 1934 to September 1982, May 1985 to September 1986 (discontinued). Monthly discharge only for May 1934, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 6,099.42 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1937, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 10 to Apr. 5. Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Glacier Lake. No 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.--49 years (water years 1935-82, 1986), 174 ft^3/s, 126,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,110 ft^3/s June 4, 1957, gage height 4.78 ft, from rating curve extended above 1,300 ft^3/s; maximum gage height observed, 4.80 ft June 16, 1937; minimum discharge observed, 14 ft^3/s Nov. 29, 1954, result of discharge measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 660 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
June 3	2400	*1,220	*3.99	June 28	0400	762	3.37
June 15	2200	960	3.67				

Minimum daily discharge, 22 ft^3/s Feb. 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	82	57	30	31	31	29	42	56	866	563	281	244
2	82	58	37	29	30	28	42	68	870	546	264	231
3	82	57	41	27	30	28	40	85	968	586	258	218
4	78	56	40	24	30	29	40	95	1090	616	268	211
5	78	56	45	25	30	29	44	90	1100	604	257	206
6	77	51	43	26	28	28	47	86	1060	470	249	203
7	78	55	42	25	24	28	43	82	884	403	243	194
8	71	55	41	28	24	28	44	75	765	376	238	191
9	77	50	40	29	24	29	46	71	743	378	235	210
10	74	40	37	28	23	28	48	70	611	396	227	199
11	75	40	35	28	22	28	49	68	582	400	225	179
12	76	42	40	27	27	28	46	65	691	392	219	131
13	71	45	41	28	32	28	45	65	707	354	215	126
14	71	47	42	29	34	29	50	63	746	352	215	129
15	71	50	42	30	37	28	43	61	856	378	248	133
16	70	48	43	30	39	29	43	61	883	394	248	125
17	68	45	44	30	35	29	42	60	856	444	248	122
18	67	43	45	29	30	29	40	62	825	388	247	130
19	65	43	44	30	27	29	40	72	771	352	247	131
20	65	41	45	29	27	30	44	111	739	331	244	127
21	64	41	47	28	28	33	49	184	639	327	250	121
22	63	38	50	27	29	35	65	200	496	333	278	116
23	61	35	48	28	29	35	71	173	488	324	254	110
24	62	38	45	27	32	37	65	169	548	340	244	108
25	63	37	45	26	34	35	67	219	633	343	245	103
26	62	36	42	28	32	37	60	310	689	342	245	99
27	61	36	35	31	30	40	59	403	694	313	235	98
28	60	37	34	33	28	45	58	547	713	304	228	96
29	59	36	32	32	---	48	55	628	709	306	226	92
30	59	33	32	31	---	45	54	660	650	309	226	91
31	59	---	30	31	---	42	---	714	---	291	231	---
TOTAL	2151	1346	1257	884	826	1003	1481	5673	22872	12255	7538	4474
MEAN	69.4	44.9	40.5	28.5	29.5	32.4	49.4	183	762	395	243	149
MAX	82	58	50	33	39	48	71	714	1100	616	281	244
MIN	59	33	30	24	22	28	40	56	488	291	215	91

WTR YR 1986 TOTAL 61760 MEAN 169 MAX 1100 MIN 22 AC-FT 122500

06211000 RED LODGE CREEK ABOVE COONEY RESERVOIR, NEAR BOYD, MT

LOCATION.--Lat 45°26'16", long 109°15'11", in NE¼SE¼SE¼ sec.33, T.4 S., R.20 E., Carbon County, Hydrologic Unit 10070006, on right bank 0.6 mi upstream from Cooney Reservoir, 9.5 mi west of Boyd, and at mile 15.0.

DRAINAGE AREA.--143 mi^2.

PERIOD OF RECORD.--May 1937 to current year (no winter records most years).

REVISED RECORDS.--WSP 1729: Drainage area. WSP 2116: 1937(M), 1942(M), 1943(P), 1944(M), 1948(M), 1952(M), 1957(P), 1962(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 4,248.0 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Apr. 11-14. Seasonal records good except those for estimated daily discharges, which are poor. Some return flow from lands irrigated by water diverted from Rock Creek and East Rosebud Creek basins. Diversions for irrigation of about 5,100 acres upstream from station. 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, 2,260 ft^3/s June 15, 1967, gage height, 7.00 ft, from rating curve extended above 1,700 ft^3/s on basis of contracted-opening measurement of peak flow; no flow on many days in 1949.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 502 ft^3/s June 9, gage height, 3.41 ft; minimum daily discharge, 24 ft^3/s Apr. 13.

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						49	74	83	97	49	82
2	50						46	69	89	96	48	94
3	53						44	70	114	98	46	74
4	54						43	69	179	103	47	68
5	49						42	72	165	109	37	67
6	48						40	68	168	96	30	78
7	46						39	89	154	89	28	80
8	45						38	103	165	85	28	73
9	46						38	115	335	80	27	76
10	46						36	238	341	81	27	73
11	53						35	254	261	84	27	67
12	55						29	177	238	87	31	61
13	54						24	149	225	79	37	62
14	50						34	149	205	77	34	70
15	46						54	139	198	68	34	80
16	45						50	131	186	98	35	74
17	44						54	126	163	133	38	72
18	44						45	120	152	87	44	101
19	42						39	119	152	84	43	84
20	41						38	117	139	83	44	64
21	40						38	116	126	75	44	61
22	39						38	119	115	74	51	55
23	38						37	116	111	69	48	51
24	38						37	111	105	70	51	49
25	38						40	106	108	62	48	49
26	38						66	102	101	54	49	45
27	39						76	95	95	57	52	45
28	38						103	94	91	51	49	44
29	37						101	105	97	49	49	42
30	36						80	106	100	50	49	41
31	36						---	99	---	51	55	---
TOTAL	1377						1433	3617	4761	2476	1279	1982
MEAN	44.4						47.8	117	159	79.9	41.3	66.1
MAX	55						103	254	341	133	55	101
MIN	36						24	68	83	49	27	41
AC-FT	2730						2840	7170	9440	4910	2540	3930

06211500 WILLOW CREEK NEAR BOYD, MT

LOCATION.--Lat 45°25'20", long 109°13'47", in SW¼SW¼SW¼ sec.2, T.5 S., R.20 E., Carbon County, Hydrologic Unit 10070006, on left bank 0.5 mi upstream from Cooney Reservoir, 8 mi west of Boyd, and at mile 2.1.

DRAINAGE AREA.--53.3 mi^2.

PERIOD OF RECORD.--June 1937 to current year (no winter records most years).

REVISED RECORDS.--WSP 1729: Drainage area. WSP 2116: 1957, 1962.

GAGE.--Water-stage recorder. Elevation of gage is 4,260 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Apr. 23, 1948, at site 0.5 mi downstream at different datum.

REMARKS.--No estimated daily discharges this year. Records good. Diversions for irrigation of about 1,800 acres upstream from station. Some return flow from lands irrigated by water diverted from Rock Creek basin. 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,720 ft^3/s June 15, 1967, gage height, 7.08 ft, from rating curve extended above 400 ft^3/s on basis of slope-area measurement of peak flow; maximum gage height, 7.24 ft May 29, 1942 (backwater from Cooney Reservoir), site and datum then in use; no flow May 29, 30, 1969.

EXTREMES FOR CURRENT SEASON.--Peak discharges greater than base discharge of 150 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 10	1800	*488	*4.41	June 10	0030	334	3.89
June 5	2230	324	3.85				

Minimum discharge, 9.9 ft^3/s Apr. 14.

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	44	20	46				26	36	14	84	50	40
2	49	19	46				23	35	15	66	47	47
3	53	19	46				22	31	13	56	44	33
4	48	19	48				22	28	34	72	44	30
5	53	18					22	28	66	81	37	27
6	51	17					23	25	87	73	36	47
7	41	18					23	32	51	83	35	47
8	35	18					22	40	47	87	39	47
9	35	18					22	50	182	81	32	57
10	34	23					21	216	176	88	38	54
11	38	28					23	142	96	78	41	55
12	41	25					24	87	85	93	43	55
13	37	28					21	61	100	83	51	53
14	33	29					20	60	108	79	44	56
15	30	30					27	51	103	80	38	61
16	31	29					29	45	98	103	40	56
17	30	29					28	42	89	109	33	61
18	28	25					24	42	63	95	33	81
19	27	32					22	40	59	93	33	79
20	25	35					21	37	58	71	34	67
21	25	37					21	35	64	64	35	61
22	24	42					20	34	58	73	41	55
23	24	43					20	33	59	79	37	50
24	22	44				28	20	32	59	78	36	48
25	22	45				35	20	28	60	70	31	51
26	22	45				29	32	26	78	68	31	45
27	22	45				29	43	23	78	67	34	43
28	21	45				33	53	28	91	63	32	42
29	21	46				39	54	28	97	59	30	39
30	21	46				30	38	23	98	68	35	39
31	21	---				28	---	16	---	59	37	---
TOTAL	1008	917					786	1434	2286	2403	1171	1526
MEAN	32.5	30.6					26.2	46.3	76.2	77.5	37.8	50.9
MAX	53	46					54	216	182	109	51	81
MIN	21	17					20	16	13	56	30	27
AC-FT	2000	1820					1560	2840	4530	4770	2320	3030

06212500 RED LODGE CREEK BELOW COONEY RESERVOIR, NEAR BOYD, MT

LOCATION.--Lat 45°26'59", long 109°11'06", in NE¼NW¼NW¼ sec.31, T.4 S., R.21 E., Carbon County, Hydrologic Unit 10070006, on right bank 250 ft upstream from Cottonwood Creek, 1.5 mi downstream from Cooney Dam, 6 mi west of Boyd, and at mile 10.5.

DRAINAGE AREA.--210 mi^2.

PERIOD OF RECORD.--September 1937 to current year.

REVISED RECORDS.--WSP 1309: 1942(M), 1944(M). WSP 2116: 1957(M).

GAGE.--Water-stage recorder. Datum of gage is 4,139.12 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 9-11, Nov. 20 to Dec. 3, Dec. 11, Feb. 11-13. Records fair except those for estimated daily discharges, which are poor. Some return flow from lands irrigated by water diverted from Rock Creek and East Rosebud Creek basins. Flow completely regulated by Cooney Reservoir (station number 06212000). Diversions for irrigation of about 6,900 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.--49 years, 102 ft^3/s, 73,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,470 ft^3/s June 15, 1967, gage height, 10.17 ft; no flow Oct. 6, 7, 1948, Oct. 7, 8, 12, 16, 17, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 464 ft^3/s June 13, 14, gage height, 4.17 ft; minimum daily, 0.08 ft^3/s Apr. 6, when gates at Cooney Dam were closed.

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	9.2	14	9.0	15	13	16	28	28	83	218	168	163
2	11	14	10	15	13	15	26	28	83	216	132	161
3	12	15	11	15	13	16	26	26	84	215	131	136
4	11	15	14	14	13	13	23	37	85	217	135	134
5	11	15	13	14	13	14	.31	69	108	216	153	135
6	11	16	14	14	13	14	.08	69	222	183	174	136
7	12	17	14	14	13	13	20	110	218	156	214	136
8	11	17	14	14	13	13	37	161	217	156	254	125
9	13	15	14	14	13	13	37	218	297	154	276	114
10	14	13	14	14	13	15	35	186	390	173	274	114
11	16	13	12	14	10	13	33	185	392	200	272	114
12	15	15	14	14	10	13	32	346	418	214	259	114
13	15	15	14	14	10	13	33	397	451	211	229	115
14	14	15	14	14	12	14	33	403	456	210	217	114
15	14	15	14	14	12	13	32	399	403	209	218	116
16	15	16	13	14	12	13	31	397	368	220	209	115
17	14	16	13	13	12	14	30	330	364	214	205	114
18	14	16	13	13	12	15	30	190	342	211	205	118
19	14	15	14	13	12	18	29	172	263	211	206	113
20	14	14	14	13	12	20	30	172	171	210	198	111
21	13	12	14	13	12	21	29	172	147	209	191	111
22	13	11	14	13	12	20	30	162	138	209	193	109
23	13	11	13	13	12	22	30	138	137	210	193	109
24	13	13	13	13	14	26	30	101	137	210	194	53
25	13	13	13	13	46	28	29	83	136	211	194	12
26	15	12	13	13	52	32	31	83	136	214	192	11
27	14	11	14	12	27	32	31	83	139	215	179	11
28	14	13	14	13	18	31	40	83	140	216	163	11
29	14	12	14	13	---	30	33	83	155	216	145	11
30	15	10	15	13	---	29	29	83	178	217	144	11
31	14	---	15	13	---	26	---	83	---	218	145	---
TOTAL	411.2	419	414.0	421	437	585	857.39	5077	6858	6359	6062	2947
MEAN	13.3	14.0	13.4	13.6	15.6	18.9	28.6	164	229	205	196	98.2
MAX	16	17	15	15	52	32	40	403	456	220	276	163
MIN	9.2	10	9.0	12	10	13	.08	26	83	154	131	11
AC-FT	816	831	821	835	867	1160	1700	10070	13600	12610	12020	5850

CAL YR 1985	TOTAL	19005.5	MEAN	52.1	MAX	192	MIN	7.0	AC-FT	37700
WTR YR 1986	TOTAL	30847.59	MEAN	84.5	MAX	456	MIN	.08	AC-FT	61190

06214000 ROCK CREEK AT ROCKVALE, MT

LOCATION.--Lat 45°31'05", long 108°51'42", in NW¼SW¼NW¼ sec.2, T.4 S., R.23 E., Carbon County, Hydrologic Unit 10070006, on left bank just downstream from bridge on U.S. Highway 310, 0.3 mi southwest of Rockvale, and at mile 2.7.

DRAINAGE AREA.--569 mi^2.

PERIOD OF RECORD.--October 1920 to September 1922 (no winter record 1922), April 1932 to March 1933, February 1934 to September 1940, October 1984 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WDR MT-85-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,470 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Sept. 30, 1940, nonrecording gage in same vicinity at different datum. Flow is equivalent.

REMARKS.--Estimated daily discharges: Nov. 11-13, Nov. 18 to Jan. 15, Feb. 9-26. Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Cooney Reservoir. Diversions for irrigation of about 57,500 acres of which about 1,500 acres is downstream from station and about 2,500 acres is in the Clarks Fork Yellowstone River basin. Some return flow through Red Lodge Creek from lands irrigated by water diverted from East Rosebud Creek basin. 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.--9 years (water years 1921, 1935-40, 1985-86), 133 ft^3/s, 96,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,310 ft^3/s June 8, 1932, gage height, 8.10 ft, site and datum then in use; no flow July 14-16, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,060 ft^3/s June 6, gage height, 4.42 ft; maximum gage height, 4.65 ft Dec. 16 (backwater from fill caused by construction); minimum daily discharge, 3.4 ft^3/s Aug. 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	135	118	53	105	115	160	102	187	197	226	97	111
2	157	126	45	100	112	152	94	157	399	182	53	152
3	155	123	100	95	109	156	92	136	648	157	43	98
4	142	122	180	80	103	148	92	132	819	211	21	92
5	134	113	250	90	101	144	75	129	850	305	6.0	94
6	131	110	250	100	101	146	64	159	983	244	3.9	115
7	168	105	220	95	88	127	57	236	824	142	3.4	134
8	190	115	170	105	71	144	71	324	698	125	10	122
9	206	130	100	120	65	164	68	458	796	108	59	144
10	214	122	70	130	60	147	66	566	866	116	83	152
11	231	110	65	125	50	133	67	596	750	134	80	149
12	218	105	75	120	55	130	66	578	745	161	67	140
13	205	130	80	140	62	162	91	578	786	138	68	138
14	192	155	100	130	70	143	134	570	791	102	56	152
15	185	150	110	125	80	126	163	546	822	87	48	184
16	174	141	140	115	130	118	158	517	829	110	47	183
17	151	140	150	122	120	123	152	492	767	184	42	183
18	147	120	170	117	90	123	125	312	711	185	41	257
19	135	100	170	114	70	127	116	261	618	182	37	316
20	124	80	180	113	75	129	108	229	488	182	30	285
21	124	70	160	100	80	133	96	236	403	177	21	282
22	122	60	140	95	90	130	81	285	295	165	35	261
23	117	70	140	103	105	124	71	283	168	163	57	254
24	112	80	150	121	200	125	77	197	90	157	83	259
25	126	70	125	96	350	125	81	142	73	146	77	221
26	140	55	105	92	280	112	203	143	111	168	86	193
27	135	54	85	118	225	103	231	133	147	186	70	193
28	146	60	85	120	169	106	268	79	201	162	44	202
29	141	65	100	114	---	110	262	76	273	138	42	206
30	116	60	100	110	---	106	221	73	265	130	56	203
31	115	---	100	104	---	105	---	53	---	106	72	---
TOTAL	4788	3059	3968	3414	3226	4081	3552	8863	16413	4979	1538.3	5475
MEAN	154	102	128	110	115	132	118	286	547	161	49.6	183
MAX	231	155	250	140	350	164	268	596	983	305	97	316
MIN	112	54	45	80	50	103	57	53	73	87	3.4	92
AC-FT	9500	6070	7870	6770	6400	8090	7050	17580	32560	9880	3050	10860

CAL YR 1985	TOTAL	29341.7	MEAN	80.4	MAX	250	MIN	1.8	AC-FT	58200
WTR YR 1986	TOTAL	63356.3	MEAN	174	MAX	983	MIN	3.4	AC-FT	125700

06214500 YELLOWSTONE RIVER AT BILLINGS, MT
(National stream quality accounting network)

LOCATION.--Lat 45°47'48", long 108°28'12", in NE¼NE¼ sec.34, T.1 N., R.26 E., Yellowstone County, Hydrologic Unit 10070007, on left bank 30 ft downstream from bridge on U.S. Highway 87, 1 mi northeast of Billings, 10 mi upstream from Pryor Creek, and at mile 360.6.

DRAINAGE AREA.--11,795 mi^2. Area at site used Jan. 10, 1963, to Dec. 2, 1967, 11,783 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1904 to December 1905 (gage heights only January to March, December 1905), August 1928 to current year. Monthly discharge only for some periods, published in WSP 1309. Published as "near Billings" 1904-5.

REVISED RECORDS.--WDR MT 1968: 1967 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,081.36 ft above National Geodetic Vertical Datum of 1929. May 1904 to December 1905, nonrecording gage at bridge 30 ft upstream at different datum. Aug. 24, 1928, to June 30, 1932, nonrecording gage at bridge 30 ft upstream at datum 2.0 ft higher. July 1, 1932, to Oct. 12, 1937, water-stage recorder at old diversion dam 3 mi upstream at different datum. Oct. 13, 1937, to Jan. 9, 1963, water-stage recorder at present site at datum 2.0 ft higher. Jan. 10, 1963, to Dec. 2, 1967, water-stage recorder at city of Billings Water Department intake, 1.8 mi upstream at datum 3,096.09 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 19 to Dec. 5. Water-discharge records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 350,000 acres upstream from station.

AVERAGE DISCHARGE.--58 years (1928-86), 7,064 ft^3/s, 5,118,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,500 ft^3/s June 19, 1974, gage height, 14.60 ft; maximum gage height, 14.76 ft June 16, 1967, present datum, from floodmark; minimum discharge, 430 ft^3/s Dec. 12, 1932.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 45,600 ft^3/s June 6, gage height, 11.83 ft; minimum, 1,000 ft^3/s Feb. 12.

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	4510	4050	1500	2460	2930	4650	4410	6020	34100	19200	7460	4820
2	4530	4040	1600	2490	2950	4000	4620	5720	38200	17600	7170	5420
3	4560	3990	1800	2470	2950	3840	4220	5780	40400	16500	6850	5180
4	4580	3980	2200	2450	2910	3750	4080	7340	41500	16800	6660	4890
5	4570	3950	2700	2220	2780	3630	3780	10400	42400	17600	6310	4710
6	4440	3900	3370	2170	2620	3530	3640	11100	44100	16800	5910	4770
7	4470	3950	3620	2050	2280	3440	3460	10100	44800	15000	5660	4980
8	4770	3930	3430	2210	1930	3460	3600	9190	40500	13600	5510	4970
9	4750	3990	3240	2280	1440	3640	4160	9230	38200	12900	5380	5090
10	4650	3950	3040	2310	1290	3780	4790	8900	39300	12500	5460	5180
11	4590	3620	2690	2590	1180	3620	5210	9290	36000	13000	5450	5160
12	4710	3400	2430	2650	1150	3480	5190	8640	33600	13500	5180	5030
13	4720	3420	2240	2620	1100	3580	5520	8100	34700	13000	5360	4920
14	4630	3600	2240	2510	1270	3510	5710	7700	34000	11500	5240	5080
15	4470	3840	2750	2410	1470	3360	5470	7640	33500	10700	4950	5300
16	4390	3920	2830	2330	1730	3240	5410	7340	36100	10900	4810	5500
17	4360	3900	2830	2500	1920	3310	5450	6930	35300	11400	4620	5470
18	4340	3650	2970	2610	2120	3340	5330	6560	33700	11400	4460	5550
19	4320	3400	3090	2640	1840	3300	4830	6330	32300	10900	4180	5800
20	4250	3300	3130	2750	1450	3160	4350	6300	29800	10200	3990	5910
21	4200	3000	3080	2820	1500	3110	4140	7070	27600	9560	3940	6190
22	4190	2500	3060	2340	2040	3070	4040	10900	25000	8910	4010	6180
23	4240	1800	3000	2120	2780	3040	4400	14900	22100	8630	4370	5940
24	4310	1500	3000	2250	3260	3170	6390	13600	20800	8280	5210	5720
25	4250	1600	2950	2340	4040	3160	7330	11700	20600	8070	4850	5590
26	4220	1700	2790	2000	8520	3210	7870	12100	20700	8360	4570	5430
27	4180	1600	2710	1960	7130	3210	7610	16300	21200	9080	4400	5360
28	4210	1500	2510	2400	5740	3120	6900	21800	20900	9000	4340	5310
29	4170	1600	2370	2510	---	3180	6640	26900	20500	8370	4180	5250
30	4100	1400	2510	2560	---	3420	6370	30400	20300	8010	4180	5190
31	4130	---	2530	2570	---	3920	---	32200	---	7740	4280	---
TOTAL	136810	93980	84210	74590	74320	107230	154920	356480	962200	369010	158940	159890
MEAN	4413	3133	2716	2406	2654	3459	5164	11500	32070	11900	5127	5330
MAX	4770	4050	3620	2820	8520	4650	7870	32200	44800	19200	7460	6190
MIN	4100	1400	1500	1960	1100	3040	3460	5720	20300	7740	3940	4710
AC-FT	271400	186400	167000	147900	147400	212700	307300	707100	1909000	731900	315300	317100

CAL YR 1985 TOTAL 1854150 MEAN 5080 MAX 27400 MIN 1400 AC-FT 3678000
WTR YR 1986 TOTAL 2732580 MEAN 7487 MAX 44800 MIN 1100 AC-FT 5420000

06214500 YELLOWSTONE RIVER AT BILLINGS, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946, 1950-58, 1963 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1965 to September 1981.
WATER TEMPERATURE: December 1950 to September 1958, July 1963 to September 1979.
SUSPENDED-SEDIMENT DISCHARGE: October 1976 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-81): Maximum daily, 720 microsiemens, Jan. 12, 1980; minimum daily, 111 microsiemens, June 9, 1973.
WATER TEMPERATURE (water years 1951-58, 1963-79): Maximum, 26.5°C, July 24, 1955; minimum, 0.0°C, on many days during winter.
SEDIMENT CONCENTRATION (water years 1977-81): Maximum daily mean, 4,260 mg/L, May 18, 1978; minimum daily mean, 1 mg/L, Oct. 27, 30, 1976, Jan. 11, 12, 1978.
SEDIMENT LOAD (water years 1977-81): Maximum daily, 493,000 tons, May 19, 1978; minimum daily, 11 tons, Jan. 12, 1978.

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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV												
13...	0930	3420	50	1	434	-4.5	0.0	687	12.8	97	K6	--
JAN												
13...	1215	2640	--	--	428	10.0	1.5	--	--	--	--	--
23...	1200	1990	--	--	458	2.0	2.0	--	--	--	--	--
FEB												
04...	1100	2930	--	--	408	1.5	0.5	--	--	--	--	--
27...	1440	6860	--	--	435	--	1.0	--	--	--	--	--
MAR												
12...	1050	3480	90	2	402	5.0	6.5	679	11.0	101	K8	64
28...	1015	3130	--	--	396	15.0	9.5	--	--	--	--	--
APR												
22...	0920	4030	--	--	401	--	12.5	--	--	--	--	--
MAY												
08...	0930	9200	--	--	280	0.5	6.5	--	--	--	--	--
20...	1130	6330	--	--	344	24.5	15.5	--	--	--	--	--
30...	1040	30600	--	--	155	19.0	14.5	--	--	--	--	--
JUN												
02...	0925	37400	--	--	138	19.0	14.0	--	--	--	--	--
JUL												
10...	0955	12400	90	2	211	19.5	17.0	684	8.3	96	K90	100
SEP												
08...	1240	4960	--	--	463	22.0	14.5	--	--	--	--	--
09...	0830	5090	50	1	372	15.5	13.5	679	7.8	84	56	300

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)
NOV											
13...	0930	8.20	2.9	160	25	41	14	26	0.9	3.1	170
MAR											
12...	1050	8.30	13	150	29	38	13	27	1	0.8	130
JUL											
10...	0955	7.70	4.0	81	6	21	6.8	13	0.7	2.1	97
SEP											
09...	0830	7.70	4.2	--	--	--	--	--	--	2.9	130

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 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)
NOV											
13...	0	126	70	7.0	0.5	17	264	260	0.36	2440	<0.01
MAR											
12...	8	118	75	7.3	0.5	14	251	260	0.34	2360	0.01
JUL											
10...	0	75	28	3.7	0.4	13	125	140	0.17	4190	<0.01
SEP											
09...	0	120	62	6.0	0.5	--	240	--	0.33	3300	<0.01

06214500 YELLOWSTONE RIVER AT BILLINGS, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 13...	0.25	0.04	0.04	0.2	0.02	<0.01	<0.01	14	129	61
MAR 12...	0.21	0.04	0.07	0.2	0.03	0.01	<0.01	38	357	66
JUL 10...	<0.10	0.03	0.13	0.3	0.06	0.02	0.01	413	13800	60
SEP 09...	0.16	0.01	0.01	0.3	0.04	0.02	0.01	32	440	78

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV 13...	0930	30	12	51	<0.5	1	2	<3	5	20	2
MAR 12...	1050	40	12	50	<0.5	<1	<1	<3	2	17	4
JUL 10...	0955	30	9	34	<0.5	<1	<1	<3	4	12	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV 13...	52	17	0.6	<10	3	<1	<1	360	<6	20
MAR 12...	52	10	0.2	<10	2	<1	<1	360	<6	6
JUL 10...	33	3	<0.1	<10	1	<1	<1	180	<6	9

DATE	TIME	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DISSOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DISSOLVED, EXTRACTION (UG/L) (80020)
JUL 10...	0955	3.6	0.8	2.6	1.8	2.2	1.7	0.04	0.65

06216000 PRYOR CREEK AT PRYOR, MT

LOCATION.--Lat 45°26'06", long 108°32'01", in NE¼NW¼NE¼ sec.5, T.5 S., R.26 E., Big Horn County, Hydrologic Unit 10070008, on left bank 60 ft upstream from county bridge, 0.5 mi north of Pryor, 1.4 mi downstream from Lost Creek, and at mile 82.7.

DRAINAGE AREA.--117 mi^2.

PERIOD OF RECORD.--June 1921 to September 1924 (no winter records), October 1966 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,007.35 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 14, 1966, nonrecording gage at approximately same site at different datum.

REMARKS.--Estimated daily discharges: Nov. 19 to Dec. 2, Dec. 11-13, Feb. 8-22. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 1,100 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.--20 years (water years 1967-86), 38.3 ft^3/s, 27,750 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,280 ft^3/s May 19, 1978, gage height, 8.88 ft, from floodmark, from rating curve extended above 410 ft^3/s on basis of contracted-opening measurement of peak flow; minimum observed, 3.4 ft^3/s June 24, 1921, gage height, 0.86 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 92 ft^3/s May 10, gage height, 3.65 ft; minimum, 10 ft^3/s July 29, 31, Aug. 1-3, 5, 14-17.

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	31	30	20	26	27	31	26	29	21	15	10	21
2	31	30	20	26	27	30	26	29	20	15	11	19
3	32	29	27	27	28	29	26	29	20	15	11	16
4	31	29	28	27	30	29	25	28	23	14	11	24
5	32	29	28	28	28	29	25	29	23	12	11	25
6	32	29	28	28	28	28	25	28	22	12	12	26
7	32	30	28	28	26	28	24	30	21	12	12	26
8	32	30	28	28	25	29	24	33	22	13	12	26
9	32	30	28	29	24	29	24	37	24	12	12	28
10	32	30	26	29	23	28	25	43	25	13	13	28
11	33	29	24	30	22	28	27	59	26	15	12	28
12	33	29	25	29	23	28	26	36	25	16	11	27
13	33	29	26	29	25	28	24	33	26	15	11	28
14	32	29	27	28	27	30	27	35	26	15	11	31
15	31	29	27	28	28	29	29	32	27	15	11	31
16	31	29	27	28	30	27	31	32	25	14	11	31
17	31	30	27	30	29	28	40	31	24	14	12	30
18	31	28	27	29	27	30	32	31	16	12	17	30
19	31	26	28	29	26	29	29	30	16	12	17	31
20	31	24	28	29	26	30	28	30	16	13	20	30
21	31	22	28	29	27	30	29	27	16	12	21	30
22	30	21	28	28	28	29	27	27	16	12	21	29
23	30	22	28	28	28	28	27	30	16	13	20	29
24	30	23	27	28	36	27	27	30	15	13	19	30
25	30	22	27	27	45	26	27	30	15	12	19	31
26	30	21	28	27	39	26	33	30	15	12	18	29
27	29	20	27	27	32	26	35	29	13	12	16	29
28	29	21	27	28	31	26	31	28	14	11	16	29
29	29	22	26	27	---	26	27	23	15	11	15	29
30	30	21	26	27	---	25	28	21	16	11	16	29
31	30	---	26	27	---	26	---	21	---	11	19	---
TOTAL	962	793	825	868	795	872	834	960	599	404	448	830
MEAN	31.0	26.4	26.6	28.0	28.4	28.1	27.8	31.0	20.0	13.0	14.5	27.7
MAX	33	30	28	30	45	31	40	59	27	16	21	31
MIN	29	20	20	26	22	25	24	21	13	11	10	16
AC-FT	1910	1570	1640	1720	1580	1730	1650	1900	1190	801	889	1650

CAL YR 1985	TOTAL	9865	MEAN	27.0	MAX	73	MIN	11	AC-FT	19570
WTR YR 1986	TOTAL	9190	MEAN	25.2	MAX	59	MIN	10	AC-FT	18230

06216900 PRYOR CREEK NEAR HUNTLEY, MT

LOCATION.--Lat 45°49'19", long 108°17'23", in NE¼SE¼NW¼ sec.19, T.1 N., R.28 E., Yellowstone County, Hydrologic Unit 10070008, on left bank 250 ft upstream from county bridge on Indian Creek road, 1.9 mi downstream from Indian Creek, 4.9 mi south of Huntley, and at mile 11.2.

DRAINAGE AREA.--582 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,140 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 8 to Feb. 25. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 3,200 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.--8 years, 78.1 ft^3/s, 56,600 acre-ft/yr. The figure published in the 1985 report was in error; the correct figure is 7 years, 81.9 ft^3/s, 59,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,410 ft^3/s May 17, 1981, gage height, 3.46 ft, but was known to be higher during ice jamming Mar. 12, 1979; maximum gage height, 7.54 ft Mar. 12, 1979 (ice jam); minimum discharge, 0.62 ft^3/s Aug. 10, 1986.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1978, reached a discharge of 18,200 ft^3/s from slope-area measurement of peak flow at site 10.5 mi downstream. Floodmarks at this site not recovered.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	1915	*942	*3.43	May 12	0200	500	2.59

Minimum discharge, 0.62 ft^3/s Aug. 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	54	47	16	52	60	143	52	68	50	15	8.3	12
2	52	49	14	52	56	110	53	67	49	11	9.6	23
3	50	50	17	48	52	93	53	67	45	8.0	11	28
4	53	51	29	41	48	80	52	64	43	6.9	10	21
5	59	49	33	44	45	76	53	62	53	6.5	10	18
6	52	48	34	49	39	70	53	58	66	3.4	7.4	21
7	50	48	33	46	35	64	52	60	57	4.2	6.2	33
8	54	46	32	50	30	62	51	69	53	6.3	2.6	34
9	55	40	30	54	25	62	51	142	57	11	.97	36
10	66	35	25	56	22	63	51	279	138	11	1.8	36
11	74	30	21	62	20	63	53	335	86	8.1	2.1	37
12	75	35	24	51	23	59	55	320	66	7.4	1.6	36
13	65	40	28	56	26	58	65	138	58	6.2	.98	36
14	60	45	33	54	30	61	61	107	53	13	1.7	37
15	56	50	35	50	30	66	67	97	51	16	2.1	39
16	52	50	37	54	45	63	122	90	60	14	1.4	42
17	51	45	39	58	43	58	162	82	51	14	5.3	42
18	50	35	38	56	25	60	182	79	46	15	7.1	42
19	50	28	40	64	25	76	104	77	43	12	4.3	43
20	50	21	43	56	30	92	77	76	35	14	3.4	43
21	50	18	45	40	50	89	68	75	33	12	5.8	44
22	50	17	49	30	70	85	66	73	35	10	9.2	42
23	49	19	54	35	90	71	63	72	34	10	12	42
24	47	21	47	50	200	63	60	72	34	9.0	21	40
25	48	20	48	45	420	58	61	76	30	8.6	20	41
26	49	18	50	48	518	56	65	76	28	8.6	14	42
27	48	17	43	58	562	54	130	77	20	9.5	14	46
28	49	18	45	60	206	54	136	72	19	9.9	14	42
29	49	19	49	48	---	54	96	67	15	10	12	40
30	46	20	52	50	---	53	77	65	14	9.7	13	39
31	46	---	50	57	---	53	---	54	---	11	10	---
TOTAL	1659	1029	1133	1574	2825	2169	2291	3116	1422	311.3	242.85	1077
MEAN	53.5	34.3	36.5	50.8	101	70.0	76.4	101	47.4	10.0	7.83	35.9
MAX	75	51	54	64	562	143	182	335	138	16	21	46
MIN	46	17	14	30	20	53	51	54	14	3.4	.97	12
AC-FT	3290	2040	2250	3120	5600	4300	4540	6180	2820	617	482	2140

CAL YR 1985	TOTAL	23470.7	MEAN	64.3	MAX	749	MIN	2.4	AC-FT	46550
WTR YR 1986	TOTAL	18849.15	MEAN	51.6	MAX	562	MIN	.97	AC-FT	37390

06279500 BIGHORN RIVER AT KANE, WY

LOCATION.--Lat 44°45'31", long 108°10'51", in NW¼NE¼SW¼ sec.9, T.55 N., R.94 W., Big Horn County, Hydrologic Unit 10080010, on right bank 180 ft upstream from Bighorn Canyon National Recreation Area boundary, 0.5 mi upstream from normal high-water line of Bighorn Lake at elevation 3,660 ft, 1.3 mi upstream from Five Springs Creek, and 5.9 mi south of Kane.

DRAINAGE AREA.--15,765 mi^2 . Area at sites used prior to May 17, 1956, 15,846 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1309: 1929(M). WSP 1509: 1929. WSP 1709: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,660 ft above National Geodetic Vertical Datum of 1929, from topographic map. Aug. 29, 1928, to Apr. 25, 1932, nonrecording gage, and Apr. 25, 1932, to May 16, 1956, water-stage recorder at site 12.5 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 13 to Feb. 21, Feb. 26-28. Water-discharge records fair except those for estimated daily discharges, which are poor. Some regulation by Boysen Reservoir (station 06258900) since October 1951. Diversions for irrigation of about 376,000 acres upstream from station. U.S. Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--58 years, 2,287 ft^3/s, 1,657,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,200 ft^3/s, June 16, 1935, gage height, 11.10 ft, site and datum then in use; minimum daily, 179 ft^3/s, July 22, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1923, 14.8 ft, Sept. 30, 1923, site and datum in use April 1932 to May 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,800 ft^3/s, June 9, gage height, 7.08 ft; minimum daily, 911 ft^3/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	1250	1200	1350	1430	1460	3770	2670	2110	4980	3570	2710	1740
2	1250	1200	1380	1440	1460	2870	2690	2030	5730	4250	2630	2230
3	1230	1200	1390	1440	1440	2490	2750	1990	5980	4890	2010	2290
4	1200	1210	1400	1440	1480	2310	2640	2140	6360	4820	1780	1950
5	1200	1210	1420	1440	1500	2400	2480	2810	7580	4930	1440	1850
6	1240	1210	1420	1440	1500	2470	2580	3050	6890	5030	1080	1840
7	1260	1210	1420	1440	1500	2540	2550	2750	7000	4940	965	1970
8	1250	1210	1420	1440	1500	2320	2490	3060	7990	4840	937	2140
9	1250	1220	1420	1440	1460	2250	2470	3530	10900	4810	911	2140
10	1260	1200	1420	1440	1480	2160	2480	3340	10300	4890	973	2280
11	1270	1180	1430	1440	1470	2080	2540	2970	9290	4990	1060	2430
12	1250	1170	1430	1440	1470	2290	2500	2790	9830	5170	1050	2310
13	1250	1190	1430	1440	1480	2970	2440	2640	10400	5350	1000	2280
14	1220	1190	1430	1440	1480	3510	2580	2520	10700	5160	1000	2310
15	1200	1190	1430	1440	1470	3460	2510	2490	10300	4910	1170	2330
16	1200	1200	1430	1450	1470	3440	2650	2420	9170	4400	1220	2310
17	1190	1200	1430	1450	1500	3420	2570	2340	8670	4030	1230	2290
18	1220	1200	1430	1450	1560	3440	2590	2300	8460	3980	1400	2270
19	1270	1200	1430	1450	1700	3440	2510	2240	8680	3950	1350	2290
20	1280	1200	1430	1450	1750	2700	2380	2210	8840	3990	1260	2350
21	1280	1200	1420	1450	2000	2720	2430	2230	8950	4030	1270	2340
22	1280	1210	1420	1450	2330	2610	2190	2590	7520	3980	1360	2330
23	1280	1220	1420	1450	2430	2620	2130	3140	6850	3980	1400	2290
24	1260	1240	1420	1450	2770	2610	2240	2930	6260	3890	1420	2280
25	1250	1260	1420	1450	3520	2750	2460	2580	4610	3690	1480	2820
26	1240	1270	1430	1470	4710	2650	2580	2490	3680	3760	1460	2950
27	1220	1280	1430	1420	4600	2600	2790	2730	3460	3260	1500	2470
28	1230	1300	1430	1460	4350	2670	2490	3140	3470	3340	1470	2450
29	1230	1310	1430	1460	---	2650	2290	3650	3540	3230	1440	2460
30	1210	1330	1430	1460	---	2550	2150	4290	3530	2840	1470	2420
31	1200	---	1430	1460	---	2710	---	4590	---	2760	1550	---
TOTAL	38420	36610	44020	44820	56840	85470	74820	86090	219920	131660	42996	68410
MEAN	1239	1220	1420	1446	2030	2757	2494	2777	7331	4247	1387	2280
MAX	1280	1330	1430	1470	4710	3770	2790	4590	10900	5350	2710	2950
MIN	1190	1170	1350	1420	1440	2080	2130	1990	3460	2760	911	1740
AC-FT	76210	72620	87310	88900	112700	169500	148400	170800	436200	261100	85280	135700

CAL YR 1985 TOTAL 510257 MEAN 1398 MAX 3050 MIN 686 AC-FT 1012000
WTR YR 1986 TOTAL 930076 MEAN 2548 MAX 10900 MIN 911 AC-FT 1845000

06279500 BIGHORN RIVER AT KANE, WY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
OCT 1985											
15...	1100	1180	1060	8.0	380	95	34	90	2	4.1	200
DEC											
05...	1300	1350	1070	0.0	370	94	33	97	2	4.3	210
JAN 1986											
08...	1200	1440	1040	0.0	370	89	35	98	2	4.0	200
FEB											
26...	1630	E4710	942	3.0	210	58	16	85	3	5.6	150
APR											
02...	1300	2790	914	6.0	300	75	27	80	2	3.7	180
MAY											
15...	1110	2560	861	10.0	270	70	24	83	2	3.0	160
JUN											
06...	1520	6850	467	15.5	150	40	12	38	1	2.0	120

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT 1985											
15...	360	15	0.4	7.5	730	0.99	2310	0.40	0.08	146	465
DEC											
05...	330	19	0.4	8.2	710	0.97	2590	0.60	0.30	128	467
JAN 1986											
08...	320	19	0.5	7.6	690	0.94	2690	0.50	0.08	208	809
FEB											
26...	230	10	0.7	4.9	500	0.68	--	2.40	0.26	3490	--
APR											
02...	270	14	0.4	7.0	590	0.8	4410	0.30	0.12	234	1760
MAY											
15...	270	12	0.2	7.1	570	0.77	3910	0.30	0.23	310	2140
JUN											
06...	120	5.7	0.1	6.2	300	0.4	5470	0.20	0.62	1430	26400

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)
OCT							
15...	1100	1180	1090	8.2	8.0	684	10.5
JAN							
08...	1200	1440	920	8.2	0.0	689	13.6
APR							
02...	1300	2790	940	8.1	6.0	673	11.2
MAY							
15...	1110	2560	980	8.2	10.0	662	10.1
JUL							
16...	1000	4720	565	8.0	20.0	660	7.8

06279500 BIGHORN RIVER AT KANE, WY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
OCT							
15...	--	530	0.40	0.11	0.49	0.6	0.08
JAN							
08...	103	130	--	--	--	0.6	0.08
APR							
02...	--	130	0.20	0.15	0.95	1.1	0.12
MAY							
15...	103	150	0.30	0.06	0.54	0.6	0.23
JUL							
16...	100	93	0.40	0.15	0.75	0.9	0.08

PESTICIDE ANALYSIS, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DICAMBA (MED-IBEN) (BAN-VEL D) TOTAL (UG/L)	PICLO-RAM (TOR-DON) (AMDON) TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
MAY									
15...	1110	2560	10.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN									
06...	1520	6850	15.5	0.04	0.01	0.26	<0.01	<0.01	<0.01
JUL									
16...	1000	4720	20.0	0.03	0.02	0.05	<0.01	<0.01	<0.01
AUG									
25...	1030	1410	20.0	0.02	0.02	0.04	<0.01	<0.01	<0.01
SEP									
30...	1100	2420	11.0	0.01	0.01	0.02	<0.01	<0.01	<0.01

06285100 SHOSHONE RIVER NEAR LOVELL, WY

LOCATION.--Lat 44°50'20", long 108°26'00", in NW¼NW¼ sec.16, T.56 N., R.96 W., Big Horn County, Hydrologic Unit 10080014, on right bank 30 ft upstream from bridge on U.S. Highway 310 and 1.5 mi west of Lovell.

DRAINAGE AREA.--2,350 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,850 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Oct. 1, 1976, at datum 2.00 ft higher. Oct. 1, 1976 to Sept. 30, 1980, at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 5 to Mar. 1. Water-discharge records fair except those for estimated daily discharges, which are poor. Flow regulated by Buffalo Bill Reservoir. (See station 06281500.) Natural flow of stream affected by storage reservoirs, power development, diversions upstream from station for irrigation of about 143,000 acres, of which about 8,000 acres are downstream from station, and return flow from irrigated areas.

AVERAGE DISCHARGE.--20 years, 997 ft^3/s, 722,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft^3/s, June 10, 1981, gage height, 9.16 ft, present datum; maximum gage height, 10.09 ft, Feb. 3, 1972 (backwater from ice), present datum; minimum daily discharge, 27 ft^3/s, May 31, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,700 ft^3/s, June 18, gage height, 6.65 ft; minimum daily, 285 ft^3/s, Dec. 1.

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	876	302	285	440	600	600	525	1640	1270	3950	1040	1370
2	915	302	291	450	600	590	528	1620	1300	3450	1110	1680
3	905	302	294	500	595	566	525	1510	1890	3140	1200	1340
4	905	302	295	500	595	516	524	1450	1880	3030	1210	1250
5	900	302	290	500	595	497	518	1580	1930	3100	1120	1010
6	880	302	295	520	565	453	472	1410	2460	2810	1060	982
7	880	300	300	550	540	435	456	1270	2530	2290	1080	1040
8	860	300	300	550	520	454	499	1320	2680	2190	1110	1050
9	800	300	302	550	500	472	495	1500	3650	2260	1070	1010
10	680	300	316	560	480	433	387	2360	3190	2430	1150	975
11	600	300	315	570	465	448	354	2440	3030	2550	1190	889
12	560	300	320	575	460	467	542	2320	3310	2720	1190	833
13	560	300	325	575	450	485	739	2270	4350	2680	1180	743
14	560	298	330	575	470	472	666	2220	4710	2720	1140	739
15	540	295	340	575	500	407	892	2170	4120	2670	1100	837
16	519	295	350	573	560	345	818	2130	5530	2720	1040	809
17	510	295	390	573	620	354	898	2070	6730	2640	1030	776
18	460	295	400	573	680	366	825	2050	7230	2630	1070	717
19	355	294	400	573	720	358	978	1980	7330	2690	1000	667
20	320	293	400	575	700	360	901	1910	6760	2670	955	631
21	317	293	400	580	720	356	864	1900	6300	2700	967	648
22	312	293	410	585	800	340	693	1860	5680	2550	1000	645
23	310	293	470	585	900	327	967	1900	5080	2200	1050	632
24	310	292	520	585	1100	338	1010	1480	4730	1960	1130	662
25	310	292	490	585	1250	333	1550	1430	4620	1800	1160	662
26	308	292	450	580	1200	327	1800	1420	4660	1410	1570	600
27	306	292	440	500	1100	339	1860	1360	4700	1400	1550	598
28	304	292	440	470	700	361	1830	1290	4740	1390	1580	612
29	302	291	440	400	---	450	1820	1220	4640	1340	1540	649
30	302	290	430	500	---	499	1750	1170	4390	1390	1290	645
31	302	---	430	600	---	526	---	1310	---	1460	1200	---
TOTAL	16968	8897	11458	16827	18985	13274	26686	53560	125420	74940	36082	25701
MEAN	547	297	370	543	678	428	890	1728	4181	2417	1164	857
MAX	915	302	520	600	1250	600	1860	2440	7330	3950	1580	1680
MIN	302	290	285	400	450	327	354	1170	1270	1340	955	598
AC-FT	33660	17650	22730	33380	37660	26330	52930	106200	248800	148600	71570	50980

CAL YR 1985	TOTAL	182703	MEAN	501	MAX	1210	MIN	34	AC-FT	362400
WTR YR 1986	TOTAL	428798	MEAN	1175	MAX	7330	MIN	285	AC-FT	850500

06285100 SHOSHONE RIVER NEAR LOVELL, WY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1966 to September 1983.
WATER TEMPERATURES: October 1966 to September 1983.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
OCT											
16...	1300	519	1010	8.0	330	84	30	95	2	4.0	191
JAN											
16...	1500	572	959	0.0	370	96	31	74	2	5.1	240
APR											
02...	1400	534	863	8.0	300	74	28	66	2	4.3	190
JUL											
22...	1510	2530	346	13.0	110	29	8.8	27	1	1.6	99

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT										
16...	310	15	0.7	12	670	0.9	932	1.20	<0.01	<0.01
JAN										
16...	260	14	0.5	13	640	0.87	985	0.90	0.30	--
APR										
02...	220	13	0.5	11	530	0.72	765	0.40	0.08	--
JUL										
22...	72	2.5	0.2	15	220	0.29	1470	0.50	0.06	0.05

06286200 SHOSHONE RIVER AT KANE, WY

LOCATION.--Lat 44°51'31", long 108°19'52", in NE¼SE¼SE¼ sec.6, T.56 N., R.95 W., Big Horn County, Hydrologic Unit 10080014, at bridge on county road, 3.4 mi northeast of Lovell, 6.5 mi west of Kane, 6.6 mi upstream from high-water line of Bighorn Lake at elevation 3,640 ft, and 7.8 mi upstream from former discharge station.

DRAINAGE AREA.--2,989 mi^2, at former discharge station.

PERIOD OF RECORD.--Water years 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)
OCT 1985							
16...	1030	636	1170	8.3	8.0	678	10.8
FEB 1986							
26...	0800	1280	1000	8.3	2.5	670	12.7
APR							
02...	1500	550	940	8.0	8.5	668	11.7
JUL							
22...	1640	2540	370	8.2	13.0	659	9.5

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
OCT 1985							
16...	103	130	1.20	0.10	0.5	0.6	0.10
FEB 1986							
26...	106	510	0.80	0.35	6.5	6.8	4.20
APR							
02...	115	K50	0.40	0.06	0.44	0.5	0.04
JUL							
22...	105	270	0.50	0.09	0.51	0.6	0.11

K-Results based on colony count outside the acceptable range (non-ideal colony count).

06286400 BIGHORN LAKE NEAR ST. XAVIER, MT

LOCATION.--Lat 45°18'27", long 107°57'26", in SW¼SE¼ sec.18, T.6 S., R.31 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi upstream from Grapevine Creek, 15.5 mi southeast of St. Xavier, and at mile 86.6.

DRAINAGE AREA.--19,626 mi^2.

PERIOD OF RECORD.--November 1965 to current year (monthend contents only). Prior to October 1969, published as "Yellowtail Reservoir." Records of daily elevations and contents on file in Helena district office.

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,356,000 acre-ft between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spillway crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation, 3,547.00 ft. Dead storage, 16,010 acre-ft, revised, below elevation 3,296.50 ft. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,346,000 acre-ft July 6, 1967, elevation, 3,656.43 ft; minimum since first filling, 660,700 acre-ft Mar. 11, 1970, elevation 3,584.45 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,064,000 acre-ft July 22, elevation, 3,640.77 ft; minimum, 669,800 acre-ft Apr. 25, elevation, 3,588.87 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	3,614.94	*820,200	---
Oct. 31	3,616.16	828,900	+8,700
Nov. 30	3,609.41	783,500	-45,400
Dec. 31	3,599.59	726,300	-57,200
CAL YR 1985			-209,300
Jan. 31	3,593.48	693,500	-32,800
Feb. 28	3,593.90	695,800	+ 2,300
Mar. 31	3,589.81	674,500	-21,300
Apr. 30	3,589.72	674,100	- 400
May 31	3,602.12	740,400	+66,300
June 30	3,638.74	1,038,000	+297,600
July 31	3,639.19	1,044,000	+ 6,000
Aug. 31	3,637.61	1,025,000	-19,000
Sept. 30	3,637.60	1,025,000	0
WTR YR 1986			+204,800

*From revised capacity table dated February 18, 1986.

06287000 BIGHORN RIVER NEAR ST. XAVIER, MT

LOCATION.--Lat 45°19'00", long 107°55'05", in NW¼NW¼NE¼ sec.16, T.6 S., R.31 E., Big Horn County, Hydrologic Unit 10080015, on right bank 800 ft downstream from Yellowtail afterbay dam, 1,500 ft downstream from Lime Kiln Creek 14 mi southwest of St. Xavier, and at mile 83.9.

DRAINAGE AREA.--19,667 mi^2. Area at site used prior to Apr. 16, 1963, 19,626 mi^2.

PERIOD OF RECORD.--October 1934 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,158.38 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 16, 1963, and June 13, 1964, to Mar. 31, 1965, water-stage recorder at site 1.2 mi upstream at different datum. Apr. 1, 1965, to July 31, 1966, water-stage recorder at site 1,300 ft downstream at present datum.

REMARKS.--No estimated daily discharges during year. Records good. Figures of discharge given herein are sum of river flow and flow of Bighorn Canal. Some regulation by 14 reservoirs in Wyoming with combined capacity of 1,400,000 acre-ft and complete regulation by Bighorn Lake (see preceding page) since Nov. 3, 1965. Diversions for irrigation of about 375,000 acres upstream from station. 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.--52 years, 3,593 ft^3/s, 2,603,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,400 ft^3/s June 16, 1935; minimum observed, 49 ft^3/s Mar. 29, 1966, result of discharge measurement (dam closure); minimum daily, 112 ft^3/s Apr. 2, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,790 ft^3/s June 11; minimum daily, 1,070 ft^3/s Oct. 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	2190	2160	2870	2860	2380	3170	3340	4260	4090	6600	5200	3240
2	2190	2140	2890	2850	2380	3160	3350	4240	4090	7090	4270	3230
3	2180	2140	2890	2860	2380	3650	3330	3850	4080	7100	4170	3230
4	2180	2140	2880	2850	2520	4120	3340	3850	4050	7090	3300	3230
5	2190	2140	2890	2840	2520	4110	3340	3610	4650	7070	3270	3230
6	2190	2140	2890	2840	2520	4360	3330	3180	4620	7070	3280	3170
7	2160	2140	2890	2830	2520	4530	3350	3450	5250	7060	3290	3190
8	2180	2140	2880	2830	2520	4530	3350	3460	5240	7050	3280	3300
9	2180	2130	2880	2640	2530	4550	3360	3460	5250	7040	3290	3330
10	2180	2130	2880	2630	2540	4110	3650	3860	5820	7050	3270	3630
11	2180	2130	2880	2610	2530	3880	3650	3860	7020	7050	3270	3650
12	2180	2130	2880	2610	2550	3650	3650	3850	7500	7060	3280	3650
13	2180	2130	2880	2620	2560	3360	3650	4550	7490	7050	3270	3670
14	2180	2150	2880	2620	2560	3360	3650	4150	7510	7020	3280	3680
15	2180	2180	2880	2620	2570	3370	3650	4160	7500	6540	3270	3700
16	1890	2180	2880	2620	2570	3380	3660	4150	7480	6520	3260	3710
17	1070	2180	2870	2610	2580	3380	3960	4170	7500	6690	3260	3720
18	2140	2180	2880	2400	2580	3370	3930	4180	7730	6680	3260	3730
19	2160	2180	2870	2390	2580	3770	3920	4170	7740	6700	3240	3750
20	2160	2180	2890	2390	2590	4120	3940	4140	7730	6700	3240	3760
21	2160	2580	2910	2390	2590	4130	4210	4130	7730	6690	3270	3780
22	2170	2880	2890	2390	2600	3750	4230	4120	7720	6680	3270	3800
23	2170	2880	2880	2380	2600	3750	4230	4140	7720	6680	3260	3810
24	2170	2880	2870	2370	2610	3750	4240	4140	7700	6680	3260	3830
25	2170	2880	2880	2370	2610	3340	4250	4140	6680	6690	3250	3840
26	2170	2880	2880	2370	2610	3340	4250	4140	6630	6170	3250	3850
27	2170	2870	2870	2380	2610	3340	4240	4130	6640	6160	3240	3870
28	2170	2870	2860	2370	2930	3330	4260	4100	6630	6160	3240	3880
29	2140	2870	2870	2360	---	3340	4250	4110	6620	6150	3250	3890
30	2160	2870	2860	2360	---	3330	4250	4100	6600	6140	3240	3900
31	2160	---	2870	2360	---	3330	---	4090	---	6150	3230	---
TOTAL	65950	71480	89270	79620	71640	114660	113810	123940	193010	208580	105010	108250
MEAN	2127	2383	2880	2568	2559	3699	3794	3998	6434	6728	3387	3608
MAX	2190	2880	2910	2860	2930	4550	4260	4550	7740	7100	5200	3900
MIN	1070	2130	2860	2360	2380	3160	3330	3180	4050	6140	3230	3170
AC-FT	130800	141800	177100	157900	142100	227400	225700	245800	382800	413700	208300	214700

CAL YR 1985	TOTAL	930630	MEAN	2550	MAX	3410	MIN	1070	AC-FT	1846000
WTR YR 1986	TOTAL	1345220	MEAN	3686	MAX	7740	MIN	1070	AC-FT	2668000

06288600 LITTLE BIGHORN RIVER BELOW DAYTON GULCH, NEAR BURGESS JUNCTION, WY

LOCATION.--Lat 44°50'23", long 107°45'18", in SW¼SE¼SW¼ sec.12, T.56 N., R.91 W., Sheridan County, Hydrologic Unit 10080016, Big Horn National Forest, on left bank 150 ft downstream from Dayton Gulch, and 12 mi northwest of Burgess Junction.

DRAINAGE AREA.--15.9 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 8,240 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1, 4, 5, 7-14, 18, 19, 22-24, 29, 30, Nov. 1, 2, 5-15, 18, Dec. 18, 19, 24, Jan. 21, Mar. 14-19, Apr. 1-3, 13-15, and May 1, 6, 12, 17. Records good except those for estimated daily discharges, which are poor. No diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 373 ft^3/s, June 2, 1986, gage height, 3.63 ft; minimum daily, 2.3 ft^3/s, Mar. 27, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 373 ft^3/s, June 2, gage height, 3.63 ft; minimum daily, 2.7 ft^3/s, Apr. 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	6.4	4.6	3.8	3.5	3.0	2.9	2.9	6.4	230	35	14	15
2	6.4	5.1	3.7	3.3	3.0	2.9	2.7	11	286	33	14	12
3	6.3	5.4	3.8	3.3	3.1	2.8	3.1	18	277	31	14	9.5
4	6.3	5.2	3.8	3.2	3.2	2.9	3.0	32	319	31	14	8.8
5	6.5	5.0	4.1	3.3	3.0	2.8	3.2	30	286	29	13	8.5
6	6.7	4.7	4.1	3.4	3.3	2.8	3.6	22	265	27	13	8.5
7	6.4	4.8	3.9	3.3	3.2	2.8	3.9	18	211	27	12	8.6
8	6.0	4.7	3.9	3.3	3.0	2.8	4.1	16	195	26	12	8.5
9	6.2	4.5	3.9	3.2	3.0	2.8	4.6	15	195	28	12	8.9
10	6.1	3.7	3.8	3.1	3.0	2.7	4.1	14	157	26	11	9.5
11	5.8	4.1	3.8	3.2	2.8	2.7	3.8	13	141	30	11	9.0
12	5.5	4.2	3.9	3.1	2.9	2.7	3.6	12	133	25	11	8.5
13	5.3	4.3	3.9	3.3	3.0	2.7	3.4	12	121	23	11	8.3
14	5.5	4.4	3.9	3.3	3.0	2.7	3.3	12	112	22	11	8.3
15	5.5	4.5	3.9	3.3	2.9	2.7	3.4	11	104	22	11	8.0
16	5.5	4.6	3.9	3.2	3.0	2.7	3.6	11	94	21	10	7.9
17	6.0	4.7	3.9	3.1	3.0	2.7	3.8	10	86	20	10	7.9
18	6.0	4.7	3.9	3.1	2.8	2.7	3.5	11	80	20	9.8	8.1
19	6.3	4.6	3.8	3.4	2.8	2.7	3.4	15	74	19	9.7	9.4
20	6.4	4.4	3.8	3.2	3.2	2.7	3.5	26	73	19	9.6	10
21	6.0	4.5	4.0	3.1	2.8	2.7	4.2	48	64	19	9.6	8.7
22	6.0	4.7	3.8	3.2	2.8	2.7	5.7	56	59	18	9.6	8.2
23	5.7	4.5	3.8	3.3	2.8	2.7	7.4	43	55	17	9.3	8.0
24	5.7	4.4	3.7	3.1	2.8	2.8	7.9	39	52	17	9.0	8.2
25	5.7	4.3	3.8	3.0	2.9	2.7	7.6	49	48	16	8.9	8.1
26	5.9	4.3	3.8	3.0	3.0	2.7	7.0	70	46	17	8.8	9.4
27	5.4	4.2	3.5	3.1	2.8	3.1	6.2	96	43	16	8.6	9.2
28	5.5	4.1	3.5	3.1	2.9	3.4	6.1	125	42	16	8.5	9.0
29	6.0	4.1	3.5	3.1	---	3.6	6.0	153	39	15	8.6	8.9
30	5.6	3.9	3.5	3.1	---	3.5	5.8	171	36	15	9.7	9.1
31	5.5	---	3.3	3.1	---	3.3	---	193	---	15	9.8	---
TOTAL	184.1	135.2	117.7	99.3	83.0	88.4	134.4	1358.4	3923	695	333.5	270.0
MEAN	5.94	4.51	3.80	3.20	2.96	2.85	4.48	43.8	131	22.4	10.8	9.00
MAX	6.7	5.4	4.1	3.5	3.3	3.6	7.9	193	319	35	14	15
MIN	5.3	3.7	3.3	3.0	2.8	2.7	2.7	6.4	36	15	8.5	7.9
AC-FT	365	268	233	197	165	175	267	2690	7780	1380	661	536

CAL YR 1985 TOTAL 4133.8 MEAN 11.3 MAX 81 MIN 2.3 AC-FT 8200
WTR YR 1986 TOTAL 7422.0 MEAN 20.3 MAX 319 MIN 2.7 AC-FT 14720

06288700 DRY FORK BELOW LICK CREEK, NEAR BURGESS JUNCTION, WY

LOCATION.--Lat 44°53'06", long 107°36'48", in SW¼NW¼SE¼ sec.28, T.57 N., R.89 W., Sheridan County, Hydrologic Unit 10080016, Bighorn National Forest, on left bank 15 ft downstream from Lick Creek, 5.2 mi upstream from mouth, and 9 mi northwest of Burgess Junction.

DRAINAGE AREA.--54.1 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 6,100 ft above National Geodetic Vertical Datum of 1929, from topographic map. Supplementary gage on right bank 15 ft downstream at datum 0.49 ft higher.

REMARKS.--No estimated daily discharges. Records good. No diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 429 ft^3/s, May 31, 1984, gage height, 3.23 ft; minimum daily, 14 ft^3/s, Apr. 26, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 296 ft^3/s, June 4, gage height, 2.23 ft, supplementary gage datum; minimum daily, 16 ft^3/s, Mar. 16.

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	23	22	24	23	20	18	22	36	193	86	45	38
2	25	24	24	23	20	19	22	42	218	82	44	34
3	25	24	23	23	20	18	20	58	226	81	44	33
4	23	23	21	18	20	18	21	82	276	81	43	33
5	23	22	21	18	20	19	20	91	263	78	42	32
6	24	21	21	20	20	19	21	71	253	74	42	33
7	23	23	21	21	18	19	23	62	234	72	41	32
8	21	24	21	22	19	19	25	56	229	70	41	32
9	22	21	21	22	20	18	25	52	256	71	41	32
10	23	17	21	22	19	18	25	51	244	68	40	34
11	24	18	20	22	19	18	25	49	231	69	40	32
12	24	20	21	22	19	18	24	47	217	65	39	31
13	22	23	22	22	20	18	24	45	205	62	39	30
14	23	22	22	21	20	17	23	47	194	61	38	30
15	23	22	22	21	20	17	24	45	185	60	38	30
16	23	23	22	21	20	16	25	44	173	60	37	29
17	23	25	22	21	19	18	26	43	163	58	37	29
18	23	24	22	21	19	17	24	44	154	57	36	30
19	23	20	22	21	19	18	24	49	147	55	36	30
20	23	20	22	21	19	17	24	63	141	54	36	30
21	24	20	22	21	19	17	25	90	131	54	36	29
22	24	19	22	21	19	17	31	106	123	53	35	29
23	22	19	22	21	18	17	44	87	117	52	35	29
24	23	20	22	21	18	19	41	79	113	51	35	32
25	24	23	22	21	19	19	39	85	109	51	34	32
26	24	23	22	20	19	18	38	99	105	50	34	30
27	24	24	22	20	18	19	35	118	101	49	34	29
28	24	24	22	20	18	21	34	139	96	48	34	30
29	23	24	22	20	---	22	35	153	94	47	34	29
30	23	24	23	20	---	23	35	164	90	47	34	29
31	24	---	23	20	---	23	---	176	---	46	34	---
TOTAL	722	658	679	650	538	574	824	2373	5281	1912	1178	932
MEAN	23.3	21.9	21.9	21.0	19.2	18.5	27.5	76.5	176	61.7	38.0	31.1
MAX	25	25	24	23	20	23	44	176	276	86	45	38
MIN	21	17	20	18	18	16	20	36	90	46	34	29
AC-FT	1430	1310	1350	1290	1070	1140	1630	4710	10470	3790	2340	1850

CAL YR 1985	TOTAL	10706	MEAN	29.3	MAX	79	MIN	17	AC-FT	21240
WTR YR 1986	TOTAL	16321	MEAN	44.7	MAX	276	MIN	16	AC-FT	32370

06288975 ELKHORN CREEK ABOVE FULLER RANCH DITCH, NEAR PARKMAN, WY

LOCATION.--Lat 44°59'01", long 107°36'53", in SE¼NE¼SW¼ sec.21, T.58 N., R.89 W., Sheridan County, Hydrologic Unit 10080016, on right bank 68 ft upstream from Fuller Ranch Ditch, 1.5 mi upstream from mouth, and 15 mi west of Parkman.

DRAINAGE AREA.--4.58 mi^2.

PERIOD OF RECORD.--October 1982 to current year (no winter records during 1985).

GAGE.--Water-stage recorder. Elevation of gage is 4,840 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 11-15, 23-25, 28-30, Dec. 1-5, 27-29, Jan. 1, 2, 4-6, 21-23, 26-28, Feb. 4, 5, 7-22, Mar. 7-24. Records good except those for November to March, which are poor. No diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 82 ft^3/s, May 15, 1984, gage height, 2.40 ft, from floodmarks; maximum gage height, 3.19 ft, Apr. 28, 1984 (backwater from ice); minimum daily discharge, 0.82 ft^3/s, Nov. 24, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23 ft^3/s, June 10, gage height, 1.59 ft; minimum daily, 0.82 ft^3/s, Nov. 24.

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	1.3	1.3	.92	1.2	1.2	1.3	2.2	3.3	9.2	3.3	1.9	1.9
2	1.3	1.3	.92	1.2	1.2	1.3	2.2	3.3	9.5	3.3	1.9	1.9
3	1.3	1.3	1.1	1.2	1.2	1.3	2.1	3.9	10	3.3	1.9	1.7
4	1.4	1.3	1.2	1.2	1.2	1.3	1.9	5.1	14	3.3	1.9	1.7
5	1.3	1.3	1.2	1.2	1.2	1.3	1.8	6.7	12	3.0	1.8	1.7
6	1.3	1.3	1.2	1.2	1.2	1.3	1.8	6.5	10	2.8	1.8	1.7
7	1.3	1.3	1.2	1.2	1.2	1.3	1.8	5.5	8.6	2.8	1.8	1.6
8	1.3	1.3	1.2	1.2	1.2	1.4	1.8	4.9	7.8	2.7	1.8	1.6
9	1.3	1.3	1.2	1.2	1.1	1.5	1.8	4.5	12	2.7	1.8	1.6
10	1.3	1.3	1.1	1.2	.96	1.5	1.9	4.3	21	2.7	1.8	1.9
11	1.3	1.1	.95	1.2	.94	1.5	2.1	4.3	14	2.7	1.8	1.7
12	1.3	1.0	1.1	1.2	.92	1.5	2.2	4.1	12	2.6	1.9	1.6
13	1.3	1.1	1.1	1.2	.94	1.4	2.1	4.1	9.5	2.6	1.9	1.6
14	1.3	1.2	1.1	1.2	1.0	1.3	1.9	4.7	8.3	2.6	1.9	1.6
15	1.3	1.3	1.1	1.2	1.0	1.3	1.9	4.7	7.7	2.6	1.9	1.6
16	1.3	1.3	1.1	1.2	1.1	1.3	2.1	4.7	7.0	2.4	1.9	1.6
17	1.3	1.3	1.1	1.2	1.1	1.2	2.2	4.5	6.5	2.4	1.9	1.5
18	1.3	1.1	1.1	1.2	1.1	1.2	2.2	4.5	6.0	2.4	1.9	1.5
19	1.3	1.1	1.1	1.2	1.1	1.3	2.2	4.5	5.5	2.4	1.9	1.5
20	1.3	1.0	1.1	1.2	.96	1.4	2.3	5.1	5.3	2.3	1.8	1.5
21	1.3	.95	1.1	1.2	1.1	1.6	2.3	7.0	4.9	2.3	1.8	1.5
22	1.3	.88	1.1	1.2	1.2	1.8	2.4	9.5	4.5	2.3	1.8	1.5
23	1.3	.84	1.1	1.2	1.2	1.7	3.3	8.6	4.5	2.3	1.8	1.5
24	1.3	.82	1.1	1.2	1.3	1.7	3.3	7.0	4.1	2.3	1.8	1.6
25	1.3	.86	1.1	1.1	1.5	1.6	3.3	6.0	3.9	2.3	1.8	1.7
26	1.3	.88	1.1	.98	1.5	1.5	3.3	5.8	3.9	2.2	1.8	1.6
27	1.3	.88	1.1	1.1	1.3	1.5	3.2	6.5	3.8	2.1	1.7	1.6
28	1.3	.88	1.0	1.2	1.3	1.6	3.3	7.7	3.6	2.1	1.6	1.6
29	1.3	.88	1.1	1.2	---	1.8	3.3	8.9	3.6	2.1	1.6	1.5
30	1.3	.90	1.2	1.2	---	1.9	3.1	9.2	3.6	2.1	1.6	1.5
31	1.3	---	1.2	1.2	---	2.1	---	9.5	---	1.9	1.6	---
TOTAL	40.4	33.27	34.29	36.78	32.22	45.7	71.3	178.9	236.3	78.9	56.1	48.6
MEAN	1.30	1.11	1.11	1.19	1.15	1.47	2.38	5.77	7.88	2.55	1.81	1.62
MAX	1.4	1.3	1.2	1.2	1.5	2.1	3.3	9.5	21	3.3	1.9	1.9
MIN	1.3	.82	.92	.98	.92	1.2	1.8	3.3	3.6	1.9	1.6	1.5
AC-FT	80	66	68	73	64	91	141	355	469	156	111	96

WTR YR 1986 TOTAL 892.76 MEAN 2.45 MAX 21 MIN .82 AC-FT 1770

06288990 WEST FORK LITTLE BIGHORN RIVER NEAR PARKMAN, WY

LOCATION.--Lat 44°59'54", long 107°37'58", in SW¼NW¼SE¼ sec.17, T.58 N., R.89 W., Sheridan County, Hydrologic Unit 10080016, on right bank 0.3 mi upstream from mouth and 16 mi west of Parkman.

DRAINAGE AREA.--38.2 mi^2.

PERIOD OF RECORD.--October 1969 to September 1972, October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,430 ft above National Geodetic Vertical Datum of 1929, from topographic map. October 1969 to September 1972, at site 0.2 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 10-15, 18-24, 27-30, Dec. 1-4, 11-17, 27-31, Jan. 3 to Feb. 25, and Apr. 14. Records good except those for estimated daily discharges, which are poor. No diverions upstream from station.

AVERAGE DISCHARGE.--7 years (water years 1970-72, 1983-86), 29.0 ft^3/s, 21,010 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.-- Maximum discharge observed, 395 ft^3/s, June 10, 1970, gage height, 2.65 ft, site and datum then in use; maximum gage height recorded, 3.09 ft (backwater from ice, site and datum then in use) from recorded range in stage, during period Dec. 26, 1971 to Jan. 11, 1972, but may have been higher during periods of no gage-height record; minimum daily discharge, 6.0 ft^3/s, Jan. 5, 1970, Feb. 8, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 210 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 4	1830	*213	*2.80	No other peak greater than base discharge.			

Minimum daily discharge, 7.6 ft^3/s, Nov. 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	12	12	9.8	9.6	10	11	12	20	162	28	18	17
2	12	12	10	9.8	10	10	12	21	194	27	17	16
3	12	12	11	9.8	10	10	11	28	193	26	17	15
4	11	12	11	9.8	10	10	11	45	209	25	17	15
5	11	12	11	10	10	10	11	61	206	25	17	15
6	11	11	11	10	10	10	11	51	197	23	17	15
7	11	12	11	10	10	10	11	44	185	23	16	15
8	10	12	11	10	9.4	11	12	39	161	21	16	15
9	11	11	11	10	9.4	11	13	36	147	22	16	15
10	11	9.6	10	10	9.6	10	13	33	138	21	16	15
11	12	9.4	9.6	10	9.6	10	14	32	127	21	16	15
12	11	9.8	9.8	10	9.8	9.8	13	30	115	21	16	14
13	11	10	10	10	9.8	11	13	29	106	21	16	14
14	12	10	10	10	10	10	12	29	97	20	16	14
15	12	11	10	10	10	9.7	13	28	90	20	16	14
16	12	11	10	10	10	9.7	13	28	81	20	16	14
17	12	11	10	10	10	10	14	27	73	20	16	15
18	12	10	10	10	10	9.7	13	27	67	19	15	15
19	12	8.3	10	10	10	10	13	27	62	19	15	15
20	12	7.6	11	10	10	9.8	13	32	57	19	15	15
21	12	7.9	10	10	10	10	13	47	52	19	15	14
22	12	8.3	10	10	10	10	14	70	46	19	15	14
23	12	8.9	10	10	9.8	10	21	64	42	19	15	14
24	12	8.7	10	10	10	10	22	54	39	19	15	15
25	12	8.7	10	10	11	11	21	51	37	18	15	16
26	12	8.8	10	9.5	11	10	21	60	34	18	15	15
27	12	9.4	9.8	9.8	11	10	20	76	33	18	15	15
28	12	10	9.4	9.8	10	11	20	92	31	18	15	14
29	12	11	9.6	10	---	12	20	121	31	18	15	14
30	12	10	9.6	10	---	12	20	152	29	18	15	14
31	12	---	9.6	10	---	13	---	154	---	18	15	---
TOTAL	362	305.4	315.2	308.1	280.4	321.7	440	1608	3041	643	489	443
MEAN	11.7	10.2	10.2	9.94	10.0	10.4	14.7	51.9	101	20.7	15.8	14.8
MAX	12	12	11	10	11	13	22	154	209	28	18	17
MIN	10	7.6	9.4	9.5	9.4	9.7	11	20	29	18	15	14
AC-FT	718	606	625	611	556	638	873	3190	6030	1280	970	879

CAL YR 1985	TOTAL	5148.3	MEAN	14.1	MAX	49	MIN	7.6	AC-FT	10210
WTR YR 1986	TOTAL	8556.8	MEAN	23.4	MAX	209	MIN	7.6	AC-FT	16970

06289000 LITTLE BIGHORN RIVER AT STATE LINE, NEAR WYOLA, MT

LOCATION.--Lat 45°00'25", long 107°36'52", in SW¼NW¼ sec.36, T.9 S., R.33 E., Bighorn County, Hydrologic Unit 10080016, on right bank 20 ft downstream from county bridge, 0.5 mi north of Wyoming-Montana State line, 1 mi downstream from West Fork, 13 mi southwest of Wyola, and at mile 115.2.

DRAINAGE AREA.--193 mi^2.

PERIOD OF RECORD.--March 1939 to current year. Prior to October 1940, published as Little Horn River at State Line, near Wyola.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 4,350 ft above National Geodetic Vertial Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges this year. Records good. 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 for irrigation of 163 acres upstream from station.

AVERAGE DISCHARGE.--47 years, 154 ft^3/s, 111,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,730 ft^3/s June 3, 1944, gage height, 4.87 ft, from rating curve extended above 1,400 ft^3/s; maximum gage height recorded, 5.93 ft June 9, 1944 (log jam); minimum discharge, 21 ft^3/s Dec. 27, 1954, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 510 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 3	2030	*1,650	*4.21	No other peak greater than base discharge.			

Minimum discharge, 24 ft^3/s Feb. 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	71	64	52	57	53	54	65	116	920	241	118	88
2	74	70	51	56	53	54	66	146	1100	232	113	88
3	75	68	65	57	54	53	62	209	1150	225	112	88
4	68	65	67	47	56	54	63	288	1320	224	113	89
5	68	68	67	51	53	55	62	313	1160	222	110	90
6	70	59	66	62	52	54	64	248	1030	207	109	91
7	72	70	62	56	37	54	72	217	844	202	107	90
8	62	70	60	57	37	56	81	198	781	196	105	89
9	67	64	59	56	32	56	86	185	818	200	108	91
10	68	46	55	56	33	54	86	175	716	197	105	97
11	71	38	42	56	29	54	85	172	655	203	104	90
12	72	41	55	54	38	55	79	163	627	192	106	87
13	65	51	59	54	47	56	80	158	596	180	104	86
14	69	59	63	54	54	53	76	162	559	174	101	86
15	69	71	59	56	60	53	75	154	535	168	97	87
16	69	72	59	55	66	52	78	150	493	163	100	85
17	69	69	59	56	66	55	84	145	461	159	103	86
18	66	58	58	55	61	54	77	148	435	153	101	83
19	67	40	59	56	54	55	76	168	414	149	98	84
20	68	38	58	57	52	53	76	229	400	147	99	86
21	69	38	58	55	54	53	84	327	376	145	100	81
22	74	34	58	53	53	54	115	392	346	142	101	79
23	68	37	58	56	53	54	158	320	324	138	95	78
24	70	45	57	55	57	56	143	290	308	136	94	81
25	70	51	57	54	59	58	131	312	293	135	93	95
26	70	50	57	51	59	55	132	382	282	134	93	83
27	69	53	56	57	55	56	119	442	275	132	91	80
28	69	57	56	56	53	60	116	513	268	124	90	82
29	68	57	57	54	---	67	117	601	260	121	89	78
30	67	55	57	53	---	69	115	715	251	121	89	79
31	71	---	56	53	---	72	---	782	---	118	88	---
TOTAL	2145	1658	1802	1705	1430	1738	2723	8820	17997	5280	3136	2577
MEAN	69.2	55.3	58.1	55.0	51.1	56.1	90.8	285	600	170	101	85.9
MAX	75	72	67	62	66	72	158	782	1320	241	118	97
MIN	62	34	42	47	29	52	62	116	251	118	88	78
AC-FT	4250	3290	3570	3380	2840	3450	5400	17490	35700	10470	6220	5110

CAL YR 1985	TOTAL	34686	MEAN	95.0	MAX	376	MIN	34	AC-FT	68800
WTR YR 1986	TOTAL	51011	MEAN	140	MAX	1320	MIN	29	AC-FT	101200

06289100 RED CANYON CREEK NEAR PARKMAN, WY

LOCATION.--Lat 44°58'42", long 107°35'09", in NW¼NE¼NE¼ sec.27, T.58 N., R.89 W., Sheridan County, Hydrologic Unit 10080016, on right bank 0.2 mi upstream from bridge on county road, 1.7 mi upstream from Fuller Ranch, 2.1 mi upstream from the Wyoming-Montana State line, 2.5 mi upstream from mouth (Powers Upper Ditch), and 13 mi west of Parkman.

DRAINAGE AREA.--3.20 mi^2.

PERIOD OF RECORD.--October 1982 to current year (no winter records during 1985).

GAGE.--Water-stage recorder. Elevation of gage is 4,810 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 10-14, 20-30, Dec. 1-4, 31, Jan. 1, 2, 4, 22, 25, 26, Feb. 5-15, 18-22, and Mar. 17-19. Records good except those November to February, which are poor. No diversions upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90 ft^3/s, May 15, 1984, gage height, 2.45 ft, from flood-marks; minimum daily, 0.14 ft^3/s, Dec. 19, 28-31, 1985, and Jan. 1-7, 16, 17, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15 ft^3/s, June 9, gage height, 1.59 ft; minimum daily, 0.14 ft^3/s, Dec. 19, 28-31, Jan. 1-7, 16, 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	.36	.36	.22	.14	.17	.57	3.5	3.3	4.5	1.2	.71	.45
2	.47	.35	.22	.14	.17	.57	3.1	3.2	4.5	1.1	.64	.47
3	.57	.35	.23	.14	.17	.57	2.9	3.5	4.9	1.1	.64	.35
4	.41	.35	.23	.14	.17	.58	2.7	4.8	7.4	1.1	.64	.35
5	.35	.35	.23	.14	.17	.64	2.7	5.9	5.3	1.1	.57	.31
6	.38	.35	.23	.14	.17	.64	2.3	4.5	4.2	.96	.57	.35
7	.40	.35	.23	.14	.17	.64	2.3	3.7	3.5	.96	.51	.35
8	.35	.35	.23	.16	.16	.69	2.5	3.5	3.5	.96	.51	.35
9	.31	.27	.23	.20	.16	.71	2.7	3.3	9.8	1.1	.40	.35
10	.31	.25	.20	.17	.15	.71	2.9	3.3	12	1.1	.40	.51
11	.31	.23	.17	.19	.15	.71	3.1	3.3	8.6	1.1	.40	.40
12	.35	.24	.17	.15	.16	.71	3.1	3.3	7.4	.96	.40	.33
13	.36	.26	.17	.17	.16	.71	3.1	3.5	6.3	.87	.37	.31
14	.35	.29	.17	.17	.19	.66	2.7	3.7	5.3	.78	.35	.31
15	.37	.31	.17	.15	.21	.64	2.5	3.7	5.1	.78	.35	.31
16	.40	.32	.17	.14	.23	.60	2.7	3.7	4.2	.78	.35	.31
17	.40	.33	.18	.14	.20	.58	2.7	3.5	3.7	.84	.35	.31
18	.40	.29	.18	.15	.18	.54	2.7	3.3	3.5	.87	.35	.31
19	.40	.29	.14	.19	.17	.58	2.7	3.3	3.3	.87	.31	.31
20	.40	.28	.16	.27	.19	.61	2.7	3.5	2.9	.87	.31	.31
21	.40	.21	.17	.17	.20	.68	2.7	4.8	2.7	.87	.31	.31
22	.42	.18	.17	.17	.21	.83	3.1	6.6	2.5	.87	.31	.27
23	.45	.19	.17	.17	.21	.87	4.2	4.5	2.1	.87	.28	.27
24	.40	.19	.17	.17	.56	1.0	4.2	3.7	2.0	.87	.27	.29
25	.40	.20	.17	.16	.98	1.2	4.2	3.3	2.0	.87	.27	.40
26	.40	.19	.17	.16	.87	1.2	4.0	3.3	1.8	.87	.27	.40
27	.40	.20	.15	.16	.64	1.3	3.2	4.0	1.5	.87	.27	.31
28	.40	.20	.14	.20	.55	1.8	3.1	4.5	1.4	.78	.27	.35
29	.40	.21	.14	.15	---	2.5	3.1	4.8	1.4	.78	.27	.35
30	.40	.21	.14	.17	---	3.1	3.3	4.8	1.3	.78	.27	.35
31	.40	---	.14	.17	---	3.5	---	4.8	---	.71	.31	---
TOTAL	12.12	8.15	5.66	5.08	7.72	30.64	90.7	122.9	128.6	28.54	12.23	10.35
MEAN	.39	.27	.18	.16	.28	.99	3.02	3.96	4.29	.92	.39	.34
MAX	.57	.36	.23	.27	.98	3.5	4.2	6.6	12	1.2	.71	.51
MIN	.31	.18	.14	.14	.15	.54	2.3	3.2	1.3	.71	.27	.27
AC-FT	24	16	11	10	15	61	180	244	255	57	24	21

WTR YR 1986 TOTAL 462.69 MEAN 1.27 MAX 12 MIN .14 AC-FT 918

06289600 WEST PASS CREEK NEAR PARKMAN, WY

LOCATION.--Lat 44°59'16", long 107°28'56", in NE¼NE¼SE¼ sec.21, T.58 N., R.88 W., Sheridan County, Hydrologic Unit 10080016, on right bank, anchored to concrete headwall of culvert on county road and 7.6 mi northwest of Parkman. Prior to Mar. 27, 1986, at site 300 ft upstream.

DRAINAGE AREA.--15.4 mi^2.

PERIOD OF RECORD.--October 1982 to current year (no winter records since 1985).

GAGE.--Water-stage recorder. Elevation of gage is 4,550 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Apr. 2, 1985, at site 100 ft north (on abandoned channel) at datum 3.28 ft lower. Apr. 2, 1985 to Mar. 27, 1986, at site 300 ft upstream at datum 1.95 ft higher.

REMARKS.--No estimated daily discharges. Records good. Natural flow of stream affected by diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 195 ft^3/s, May 16, 1984, gage height, 4.62 ft, site and datum then in use; maximum gage height, 4.76 ft, Apr. 28, 1984 (backwater from ice and snow), site and datum then in use; minimum daily discharge, 3.8 ft^3/s., Aug. 26, 27, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 45 ft^3/s, June 4, gage height, 1.73 ft; minimum daily during period of operation, 5.0 ft^3/s, Aug. 16, 19, 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						7.8	10	16	25	14	9.0	6.9
2						7.5	11	17	25	13	8.9	6.7
3						7.4	11	20	28	13	8.8	6.0
4						7.5	11	21	33	13	8.6	6.0
5						7.8	11	23	28	13	8.3	6.1
6						7.4	11	21	27	13	8.2	6.9
7						7.4	11	22	25	12	8.2	6.2
8						7.5	11	22	26	12	7.6	6.1
9						7.4	11	22	36	12	7.6	6.2
10						7.4	12	23	35	12	7.8	7.6
11						7.6	13	21	31	12	7.4	6.1
12						7.4	12	19	29	12	6.8	5.8
13						7.5	12	18	28	11	5.3	5.9
14						7.2	12	19	26	11	5.3	6.1
15						6.9	12	18	24	11	5.1	6.1
16						6.6	13	17	22	11	5.0	6.1
17						6.8	14	16	21	11	5.1	6.8
18						6.6	13	16	20	11	5.1	6.3
19						7.0	13	16	19	10	5.0	6.3
20						7.1	13	16	18	10	5.0	6.2
21						8.7	13	19	18	11	5.2	5.9
22						10	14	23	17	9.9	5.1	5.8
23						8.0	16	21	16	9.7	5.1	5.6
24						7.6	17	20	16	9.9	5.1	6.1
25						7.1	17	19	15	9.9	5.1	6.5
26						6.7	20	20	15	9.8	5.1	5.6
27						6.7	18	22	15	9.7	5.1	5.9
28						7.5	17	23	15	9.4	5.3	9.0
29						8.5	17	24	14	9.2	5.5	8.0
30						9.3	17	25	14	9.2	5.5	7.9
31						10	---	25	---	9.1	5.9	---
TOTAL						235.9	403	624	681	343.8	196.1	192.7
MEAN						7.61	13.4	20.1	22.7	11.1	6.33	6.42
MAX						10	20	25	36	14	9.0	9.0
MIN						6.6	10	16	14	9.1	5.0	5.6
AC-FT						468	799	1240	1350	682	389	382

06289820 EAST PASS CREEK NEAR DAYTON, WY

LOCATION.--Lat 44°59'23", long 107°25'20", in SE¼SE¼NE¼ sec.24, T.58 N., R.88 W., Sheridan County, Hydrologic Unit 10080016, on left bank 0.3 mi downstream from bridge on county road, 5.0 mi northwest of Parkman, and 11.2 mi northwest of Dayton.

DRAINAGE AREA.--21.7 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 4,410 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 10-15, 18-30, Dec. 1-3, 11-14, 27-31, Jan. 4-6, 21-23, 26, and Feb. 3-22. Records good except those for estimated daily discharges, which are poor. Several small reservoirs upstream from station, combined capacity, 415 acre-ft, for irrigation. Diversions for irrigation of about 2,900 acres upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 197 ft^3/s, May 16, 1984, gage height, 3.14 ft; maximum gage height, 3.47 ft, Dec. 18, 1984 (backwater from ice); minimum daily discharge, 3.6 ft^3/s, Aug. 18, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 104 ft^3/s, June 9, gage height, 2.42 ft; minimum daily, 5.6 ft^3/s, Sept. 12.

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	9.5	6.8	7.8	7.5	7.9	11	11	12	48	18	7.5	9.3
2	9.5	6.7	8.2	7.6	7.8	11	11	12	52	16	7.3	8.4
3	11	6.8	8.4	7.5	7.6	11	11	14	55	15	7.3	7.3
4	9.9	6.9	8.2	7.2	7.6	10	11	18	71	15	7.3	5.7
5	8.8	6.9	8.3	6.8	7.4	11	11	23	66	15	7.9	7.8
6	8.4	6.6	8.2	8.0	7.4	10	9.9	22	58	15	7.5	6.8
7	8.5	6.6	8.2	7.9	6.8	10	9.9	22	50	14	6.2	5.9
8	8.3	6.7	8.1	7.9	6.8	10	10	21	48	13	6.1	5.7
9	8.2	6.6	8.1	8.1	6.6	10	11	20	72	13	6.7	6.3
10	8.2	6.1	7.8	8.2	6.6	9.6	11	20	100	13	6.3	7.9
11	8.0	5.8	7.4	8.9	6.8	9.6	11	20	91	13	6.4	6.4
12	8.2	5.8	7.1	8.5	6.8	9.3	11	19	76	13	6.4	5.6
13	8.0	6.4	7.4	8.1	7.4	9.4	11	19	63	12	6.5	5.7
14	7.7	7.1	7.6	7.9	7.6	9.0	11	19	54	11	6.2	7.8
15	7.5	7.5	8.0	7.8	7.8	8.4	10	18	48	9.3	6.3	9.4
16	7.4	7.8	7.8	7.8	8.5	8.0	10	18	43	9.8	6.6	8.9
17	7.7	7.9	8.0	8.1	8.7	8.2	11	16	39	11	6.7	8.6
18	7.7	7.2	8.0	8.1	7.9	8.7	11	16	36	10	6.5	8.7
19	7.4	6.5	8.2	8.8	6.0	8.3	11	17	34	10	8.5	8.4
20	7.2	6.2	8.5	8.5	7.4	8.4	11	20	32	11	9.8	8.5
21	6.9	6.1	8.3	8.4	8.1	9.0	11	29	30	10	9.9	8.9
22	6.7	6.0	8.3	8.0	8.4	11	11	44	28	10	9.4	8.5
23	6.9	6.3	8.4	8.0	8.7	10	14	40	26	9.8	7.4	8.5
24	6.6	7.1	8.1	8.1	20	9.8	15	34	23	13	6.3	8.5
25	6.6	7.5	8.1	8.1	23	9.9	14	30	23	12	7.4	8.9
26	7.1	7.4	8.0	8.0	17	9.6	15	31	22	9.9	9.1	9.1
27	6.7	7.8	7.8	8.0	13	9.7	14	37	21	9.6	9.1	10
28	6.9	7.8	7.4	8.3	12	9.8	13	43	21	9.2	8.6	10
29	6.5	8.1	7.4	8.2	---	10	13	46	20	8.1	7.0	10
30	6.6	8.0	7.4	8.0	---	10	13	48	19	7.5	6.2	9.6
31	6.9	---	7.4	7.9	---	12	---	48	---	7.6	7.1	---
TOTAL	241.5	207.0	245.9	248.2	257.6	301.7	347.8	796	1369	363.8	227.5	241.1
MEAN	7.79	6.90	7.93	8.01	9.20	9.73	11.6	25.7	45.6	11.7	7.34	8.04
MAX	11	8.1	8.5	8.9	23	12	15	48	100	18	9.9	10
MIN	6.5	5.8	7.1	6.8	6.0	8.0	9.9	12	19	7.5	6.1	5.6
AC-FT	479	411	488	492	511	598	690	1580	2720	722	451	478

CAL YR 1985	TOTAL	3128.1	MEAN	8.57	MAX	23	MIN	3.6	AC-FT	6200
WTR YR 1986	TOTAL	4847.1	MEAN	13.3	MAX	100	MIN	5.6	AC-FT	9610

06289870 TWIN CREEK NEAR PARKMAN, WY

LOCATION.--Lat 44°59'37", long 107°21'18", in SE¼NW¼NW¼ sec.22, T.58 N., R.87 W., Sheridan County, Hydrologic Unit 10080016, on right bank 0.5 mi downstream from bridge on county road, 0.7 mi northwest of intersection of county road and U.S. Highway 87, and 2.8 mi north of Parkman.

DRAINAGE AREA.--27.0 mi^2.

PERIOD OF RECORD.--October 1982 to current year (no winter records since 1985).

REVISED RECORDS.--WDR WY-86: 1984(M).

GAGE.--Water-stage recorder. Elevation of gage is 4,120 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Natural flow of stream affected by diversions for irrigation upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 377 ft^3/s, Feb. 24, 1986, gage height, 7.44 ft (affected by backwater from trash and snow), from floodmark, from rating curve extended above 160 ft^3/s on basis of culvert measurement of peak flow; minimum daily, 0.23 ft^3/s, Aug. 8, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 377 ft^3/s, Feb. 24, gage height, 7.44 ft (affected by backwater from trash and snow), from floodmark, from rating curve extended above 160 ft^3/s on basis of culvert measurement of peak flow; minimum daily during period of operation, 0.46 ft^3/s, Aug. 22.

REVISIONS.--The maximum discharge for calendar and water year 1984 has been revised to 337 ft^3/s, May 10, 1984, gage height, 5.91 ft; revised daily discharges, in cubic feet per second, for high-water period in May 1984, revised monthly, and revised yearly are given below. These figures supersede those published in the report for 1984.

May 4 155
5 160
May 6 144
7 139
May 8 176
9 214
May 10 211

MONTH/YEAR	TOTAL	MEAN	MAX	AC-FT
May 1984	2478	79.9	214	4920
Water Year 1984	5025.90	13.7	214	9970

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						10	5.1	6.1	3.9	1.6	.71	.73
2						8.7	2.9	5.5	3.6	1.2	.71	.70
3						7.5	2.9	5.2	4.0	.93	.71	.84
4						5.5	3.0	5.1	25	1.6	.59	.78
5						6.6	3.0	6.1	15	.85	.56	.76
6						5.1	2.8	6.5	8.0	1.1	.56	.79
7						3.8	2.6	8.1	4.6	.77	.56	.78
8						3.4	2.5	17	3.5	.70	.52	.81
9						3.3	2.5	26	5.5	.67	.48	.88
10						3.0	2.5	30	12	1.9	.48	2.3
11						2.9	2.8	33	6.8	1.5	.48	1.6
12						2.6	2.9	20	4.2	1.4	.48	.77
13						2.6	3.1	12	3.1	1.2	.50	.53
14						2.5	2.9	12	2.6	1.2	.47	1.4
15						2.4	3.6	12	3.0	1.4	.47	1.1
16						2.5	5.5	10	2.3	1.7	.58	1.7
17						2.6	7.9	9.4	3.1	2.4	.53	2.3
18						2.7	8.6	8.6	2.5	2.3	.55	2.2
19						3.2	7.0	8.0	1.9	2.4	.52	1.8
20						4.4	5.7	7.4	1.1	2.2	.50	1.6
21						8.9	5.0	6.9	1.1	1.1	.47	1.5
22						16	4.7	7.1	2.0	2.4	.46	1.4
23						19	4.5	9.0	1.8	1.9	.49	1.3
24						14	4.7	7.9	.76	1.4	.54	1.4
25						11	5.3	6.9	1.7	.88	.52	1.8
26					61	8.1	7.3	6.0	1.2	.90	.52	1.6
27					29	7.0	13	4.4	2.1	.77	.51	1.5
28					15	6.4	11	3.6	1.3	.72	.49	1.8
29						6.0	8.7	3.9	1.8	.69	.49	1.6
30						5.4	7.0	2.6	2.7	.72	.59	1.1
31						5.5	---	4.0	---	.69	.65	---
TOTAL						192.6	151.0	310.3	132.16	41.19	16.69	39.37
MEAN						6.21	5.03	10.0	4.41	1.33	.54	1.31
MAX						19	13	33	25	2.4	.71	2.3
MIN						2.4	2.5	2.6	.76	.67	.46	.53
AC-FT						382	300	615	262	82	33	78

06290000 PASS CREEK NEAR WYOLA, MT

LOCATION.--Lat 45°03'23", long 107°21'19", in NE¼NE¼SE¼ sec.13, T.9 S., R.35 E., Big Horn County, Hydrologic Unit 10080016, on right bank 125 ft downstream from bridge on U.S. Highway 87, 2.0 mi downstream of Twin Creek, 5.5 mi south of Wyola, and at mile 10.2.

DRAINAGE AREA.--111 mi^2. Drainage area at site used prior to Sept. 30, 1956, 119 mi^2.

PERIOD OF RECORD.--June 1935 to September 1956 (no winter records prior to 1939), October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,920 ft above National Geodetic Vertical Datum of 1929, from topographic map. Dec. 21, 1950, to Sept. 30, 1956, water-stage recorder, and June 4, 1935, to Dec. 20, 1950, nonrecording gage at site 0.3 mi upstream at different datum. Flow is equivalent.

REMARKS.--Estimated daily discharges: Nov. 10-12, Nov. 17 to Feb. 27. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 2,500 acres 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.

AVERAGE DISCHARGE.--22 years (water years 1939-56, 1983-86), 36.6 ft^3/s, 26,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 1,150 ft^3/s June 4, 1944, gage height, 4.82 ft, from rating curve extended above 400 ft^3/s; maximum gage height observed, 6.22 ft Mar. 25, 1943 (ice jam); no flow Aug. 3, 9, 10, 1935.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	unknown	a *850	*b 6.79	June 4	1045	242	4.07
May 11	0315	120	3.26	June 10	0415	205	3.85

a about
b backwater from ice

Minimum discharge, 5.0 ft^3/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	18	14	5.6	21	28	35	36	42	76	33	13	12
2	21	15	5.2	22	27	35	34	41	82	31	11	17
3	23	14	7.0	20	25	37	33	43	92	28	11	14
4	25	15	14	15	25	33	33	47	206	29	11	13
5	19	15	13	12	23	37	34	57	139	30	11	12
6	19	14	13	15	21	34	32	57	112	27	11	12
7	18	15	13	16	18	31	31	58	93	27	9.8	13
8	18	15	12	15	16	32	30	72	85	25	9.9	11
9	18	14	12	22	12	32	31	90	134	21	9.7	11
10	17	10	10	23	11	31	33	100	188	24	11	16
11	17	9.0	7.0	22	10	30	34	105	151	26	10	14
12	17	12	10	22	11	30	35	75	126	25	11	11
13	17	14	11	21	15	30	34	63	108	24	11	8.5
14	17	15	13	19	16	30	32	60	93	24	9.9	9.0
15	16	15	13	17	19	28	36	58	86	22	8.4	15
16	16	15	14	21	28	27	36	52	77	21	7.6	16
17	15	15	16	25	26	28	44	49	70	23	7.6	18
18	15	13	18	27	19	30	43	50	64	22	7.8	18
19	15	7.0	18	33	16	32	39	46	60	23	7.8	17
20	15	7.0	18	25	17	33	37	48	58	22	9.9	17
21	15	6.0	18	17	25	45	36	53	54	20	9.6	17
22	15	6.0	20	20	50	64	36	65	51	19	10	17
23	14	6.0	20	22	54	60	38	75	48	19	9.2	16
24	14	7.0	18	23	150	51	43	65	45	18	7.7	17
25	14	7.0	19	21	520	45	47	59	43	21	8.5	20
26	14	5.2	21	17	150	39	50	56	41	19	9.4	17
27	14	5.4	18	25	50	36	60	59	39	18	8.7	18
28	14	5.8	16	28	41	35	53	63	39	17	6.7	22
29	14	6.5	17	19	---	34	47	69	38	14	6.0	21
30	14	6.0	19	21	---	33	44	70	36	13	5.3	20
31	14	---	20	25	---	36	---	73	---	12	6.7	---
TOTAL	512	323.9	448.8	651	1423	1113	1151	1920	2534	697	287.2	459.5
MEAN	16.5	10.8	14.5	21.0	50.8	35.9	38.4	61.9	84.5	22.5	9.26	15.3
MAX	25	15	21	33	520	64	60	105	206	33	13	22
MIN	14	5.2	5.2	12	10	27	30	41	36	12	5.3	8.5
AC-FT	1020	642	890	1290	2820	2210	2280	3810	5030	1380	570	911

CAL YR 1985	TOTAL	7647.2	MEAN	21.0	MAX	171	MIN	1.6	AC-FT	15170
WTR YR 1986	TOTAL	11520.4	MEAN	31.6	MAX	520	MIN	5.2	AC-FT	22850

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MT

LOCATION.--Lat 45°10'38", long 107°23'36", in W½SW¼ sec.35, T.7 S., R.35 E., Big Horn County, Hydrologic Unit 10080016, on right bank 3.5 mi north of Wyola, 6 mi downstream from Pass Creek, and at mile 92.3.

DRAINAGE AREA.--428 mi^2.

PERIOD OF RECORD.--March 1939 to December 1958, August 1959 to September 1975, October 1976 to current year. Prior to October 1940, published as Little Horn River below Pass Creek, near Wyola.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,600 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 10-15, Nov. 18 to Jan. 9, Jan. 19-27, Feb. 7-25. 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 for irrigation of about 8,300 acres upstream from station.

AVERAGE DISCHARGE.--45 years, 213 ft^3/s, 154,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,010 ft^3/s May 19, 1978, gage height, 10.02 ft, from rating curve extended above 2,800 ft^3/s on basis of slope-area measurement of peak flow; minimum, 12 ft^3/s Aug. 5, 7, 8, 1961, gage height, 0.89 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 24	----	unknown	*7.46	June 4	1230	*1,790	5.72

Minimum daily discharge, 35 ft^3/s Dec. 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	122	105	40	90	97	157	122	163	800	268	105	118
2	126	104	35	90	100	147	119	169	915	250	103	142
3	144	103	56	90	98	138	119	206	1040	230	103	128
4	136	101	70	70	105	128	118	275	1620	223	102	120
5	124	101	90	70	94	143	116	365	1380	216	100	118
6	121	99	100	80	94	129	112	311	1310	218	94	127
7	121	102	100	84	90	119	113	286	1150	198	89	127
8	119	108	90	90	64	119	117	302	1090	195	84	119
9	116	107	70	90	60	118	122	332	1130	188	86	123
10	118	90	64	94	58	116	125	340	1160	192	88	132
11	117	50	50	100	54	107	132	328	970	190	86	124
12	117	60	56	97	70	103	131	262	870	192	86	115
13	117	90	64	95	80	115	132	225	811	184	87	111
14	113	100	80	92	110	115	126	210	744	174	84	112
15	112	100	80	91	120	109	135	208	702	167	83	117
16	111	103	90	90	100	106	138	192	659	163	83	121
17	110	104	90	95	90	108	161	187	601	165	83	128
18	109	90	100	95	80	113	148	183	553	160	82	126
19	108	70	100	95	74	120	136	181	519	157	79	131
20	108	50	110	90	74	128	132	197	496	149	82	133
21	108	40	120	80	90	145	131	262	475	145	87	128
22	109	40	110	90	110	159	140	380	447	139	87	123
23	109	45	90	100	150	149	171	381	409	133	83	119
24	105	50	70	96	350	133	189	327	385	130	83	121
25	106	56	80	85	830	126	192	322	366	137	86	147
26	104	49	95	80	523	118	199	375	351	135	91	131
27	104	49	95	110	248	112	213	448	331	120	99	124
28	105	52	90	93	177	111	189	541	325	115	108	137
29	104	56	90	95	---	112	176	633	307	105	105	135
30	104	45	90	92	---	115	169	672	286	104	105	128
31	107	---	90	94	---	122	---	718	---	106	106	---
TOTAL	3534	2319	2555	2803	4190	3840	4323	9981	22202	5248	2829	3765
MEAN	114	77.3	82.4	90.4	150	124	144	322	740	169	91.3	126
MAX	144	108	120	110	830	159	213	718	1620	268	108	147
MIN	104	40	35	70	54	103	112	163	286	104	79	111
AC-FT	7010	4600	5070	5560	8310	7620	8570	19800	44040	10410	5610	7470

CAL YR 1985 TOTAL 44929 MEAN 123 MAX 461 MIN 35 AC-FT 89120
WTR YR 1986 TOTAL 67589 MEAN 185 MAX 1620 MIN 35 AC-FT 134100

06291000 OWL CREEK NEAR LODGE GRASS, MT

LOCATION.--Lat 45°16'05", long 107°18'03", in NW¼NE¼SE¼, sec.33, T.6 S., R.36 E., Big Horn County, Hydrologic Unit 10080016, on right bank 1.4 mi downstream from Sioux Pass Creek, 5.0 mi southeast of Lodge Grass, and at mile 7.0.

DRAINAGE AREA.--163 mi^2.

PERIOD OF RECORD.--April 1939 to September 1945, October 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft, from topographic map. April 1939 to September 1945, recording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 12. Records good except those for estimated daily discharges, which are poor. Numerous diversions for irrigation 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.--13 years (water years 1940-45, 1980-86), 10.9 ft^3/s, 7,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,020 ft^3/s June 18, 1944, gage height, 14.18 ft; maximum gage height, 14.50 ft Mar. 18, 1944 (ice jam); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	2015	a*360	b*10.13	June 5	0015	138	5.73
Mar. 22	1730	60	3.66	June 10	0730	172	6.40
May 11	1715	109	5.00				

a about.
b backwater from ice.

Minimum discharge, 0.85 ft^3/s Aug. 18, 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	4.7	5.0	2.6	7.0	8.0	100	17	12	8.9	8.4	2.6	3.5
2	4.4	5.6	2.4	7.4	7.8	105	14	11	8.7	7.6	2.4	3.4
3	4.5	5.2	3.5	7.0	7.4	110	13	10	9.2	8.3	1.6	5.7
4	5.2	4.8	6.0	5.0	7.4	80	13	10	46	12	2.1	3.6
5	7.2	4.7	5.6	4.0	7.0	90	13	12	83	8.9	2.1	2.9
6	5.3	4.5	5.6	5.2	6.0	86	13	14	45	6.7	1.6	2.6
7	4.5	4.4	5.6	5.2	5.6	40	12	13	34	6.4	1.9	2.6
8	4.6	4.0	5.4	4.8	5.4	35	11	13	35	6.4	1.8	2.4
9	5.0	3.5	5.2	5.0	4.0	30	11	23	70	5.6	1.5	2.5
10	5.3	3.3	4.5	6.0	3.0	29	11	47	114	3.2	1.2	2.9
11	5.5	3.5	3.5	6.0	2.5	27	12	97	42	5.3	1.6	3.3
12	5.2	4.0	4.0	7.0	2.7	26	12	76	23	4.8	1.2	3.6
13	5.3	4.5	4.0	7.0	4.0	24	13	41	18	6.5	1.5	3.0
14	5.2	4.8	4.5	6.4	4.5	23	13	31	16	5.0	2.5	2.5
15	4.9	5.1	4.0	5.0	5.6	20	15	28	15	3.3	2.6	2.8
16	4.4	5.7	4.5	6.0	7.0	18	22	23	13	2.5	1.6	3.0
17	3.9	6.0	4.5	6.6	6.6	17	29	19	12	2.6	1.6	4.6
18	3.9	6.0	6.0	7.0	5.2	21	30	17	11	2.5	1.1	4.2
19	3.7	4.5	6.0	8.0	4.0	21	19	16	10	2.0	1.7	4.2
20	3.7	4.0	6.4	7.0	3.7	22	15	15	9.5	2.3	2.0	4.5
21	3.9	3.0	6.4	5.6	4.0	34	14	13	11	2.2	1.9	4.3
22	4.6	2.8	6.8	6.0	6.0	45	13	13	11	2.0	1.6	3.8
23	4.3	2.7	6.8	6.2	9.0	38	12	13	9.9	3.4	1.4	3.3
24	4.3	2.9	6.4	6.0	15	29	12	13	9.4	3.3	1.1	3.1
25	4.4	3.2	6.4	5.2	35	29	14	13	9.1	3.2	1.6	3.7
26	3.8	2.5	7.0	4.9	200	24	14	12	8.9	3.2	1.7	4.3
27	4.1	2.7	6.0	6.0	250	17	17	11	8.4	3.1	1.3	4.5
28	4.3	3.0	5.6	7.0	130	17	20	10	8.6	3.0	1.1	4.5
29	4.1	3.2	6.0	7.4	---	17	16	9.7	8.9	2.8	1.2	5.9
30	4.2	2.9	6.6	6.4	---	17	13	9.3	9.7	2.6	1.7	7.2
31	4.6	---	6.6	6.6	---	17	---	9.2	---	2.6	2.0	---
TOTAL	143.0	122.0	164.4	189.9	756.4	1208	453	654.2	718.2	141.7	52.8	112.4
MEAN	4.61	4.07	5.30	6.13	27.0	39.0	15.1	21.1	23.9	4.57	1.70	3.75
MAX	7.2	6.0	7.0	8.0	250	110	30	97	114	12	2.6	7.2
MIN	3.7	2.5	2.4	4.0	2.5	17	11	9.2	8.4	2.0	1.1	2.4
AC-FT	284	242	326	377	1500	2400	899	1300	1420	281	105	223

CAL YR 1985	TOTAL	3671.92	MEAN	10.1	MAX	187	MIN	.24	AC-FT	7280
WTR YR 1986	TOTAL	4716.0	MEAN	12.9	MAX	250	MIN	1.1	AC-FT	9350

06291200 LODGE GRASS CREEK AT STATE LINE, NEAR WYOLA, MT

LOCATION.--Lat 45°00'21", long 107°46'27", in NW¼NW¼SE¼ sec.34, T.9 S., R.32 E., Big Horn County, Hydrologic Unit 10080016, on left bank 4.2 mi upstream from North Fork Lodge Grass Creek, 25 mi southwest of Wyola, 32 mi southwest of Lodge Grass, and at mile 58.4.

DRAINAGE AREA.--16.7 mi^2.

PERIOD OF RECORD.--October 1982 to current year (no winter record in water year 1986).

GAGE.--Water-stage recorder. Elevation of gage is 6,060 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 8-10, Mar. 18, 19, Apr. 14, 30, and May 1-3. Records good except those for May 20 to June 10, which are fair. No diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 349 ft^3/s, June 4, 1986, gage height, 2.84 ft; minimum daily, 2.0 ft^3/s, Dec. 11, 1982, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 349 ft^3/s, June 4, gage height, 2.84 ft; minimum daily during period of operation, 4.5 ft^3/s, Mar. 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	6.7						7.3	23	174	33	13	13
2	7.0						7.0	36	209	30	13	10
3	6.7						6.4	52	210	29	12	9.3
4	6.1						7.0	51	240	29	12	8.8
5	6.4						7.0	46	196	28	12	8.7
6	6.4						7.6	40	223	27	12	8.7
7	6.7						8.3	36	172	26	12	8.7
8	6.6						9.9	30	173	25	12	8.7
9	6.2						11	27	143	25	11	9.7
10	6.4						11	26	127	24	12	9.2
11	6.4						11	26	114	23	11	8.7
12	6.3						10	25	107	23	11	8.5
13	6.1						11	24	99	22	11	8.3
14	5.8					4.7	9.4	24	88	21	11	8.5
15	6.1					5.3	9.9	23	79	21	10	8.3
16	5.8					5.3	10	23	75	19	10	8.2
17	5.8					5.0	9.9	23	79	19	10	8.6
18	5.5					4.8	9.5	23	81	18	10	8.3
19	5.3					4.5	9.5	26	75	18	9.9	8.3
20	5.3					4.8	9.5	38	66	17	9.9	8.5
21	5.3					4.8	13	57	59	17	9.9	8.0
22	5.8					4.8	17	63	51	17	9.8	8.0
23	5.0					4.8	20	46	50	15	9.5	7.7
24	5.5					5.0	18	35	46	16	9.5	8.3
25	5.5					5.0	17	37	43	15	9.3	9.7
26	5.3					5.0	17	51	40	15	9.3	8.3
27	5.3					5.3	17	71	38	15	9.1	7.9
28	5.3					6.1	16	106	36	14	9.0	8.3
29	5.0					7.0	15	112	35	14	8.8	8.1
30	5.0					7.3	15	127	34	14	8.7	8.1
31	5.0					7.6	---	142	---	13	9.0	---
TOTAL	181.6						347.2	1469	3162	642	326.7	261.4
MEAN	5.86						11.6	47.4	105	20.7	10.5	8.71
MAX	7.0						20	142	240	33	13	13
MIN	5.0						6.4	23	34	13	8.7	7.7
AC-FT	360						689	2910	6270	1270	648	518

06291500 LODGE GRASS CREEK ABOVE WILLOW CREEK DIVERSION, NEAR WYOLA, MT

LOCATION.--Lat 45°07'39", long 107°36'01", in SE¼NE¼NE¼ sec.24, T.8 S., R.33 E., Big Horn County, Hydrologic Unit 10080016, on left bank 0.2 mi upstream from Willow Creek diversion canal, 1.1 mi downstream from Spring Creek, 10 mi west of Wyola, 17 mi southwest of Lodge Grass, and at mile 43.0.

DRAINAGE AREA.--80.7 mi^2.

PERIOD OF RECORD.--March 1939 to September 1974, October 1982 to current year.

REVISED RECORDS.--WSP 1559: 1944-47. WSP 1629: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 4,170 ft, from topographic map. March 1939 to September 1974 recording gage 0.1 mi upstream at different datum. Flows are equivalent.

REMARKS.--Estimated daily discharges: Nov. 18 to Dec. 15, Dec. 27-29, Jan. 4-6, 25, 26, Feb. 7-24. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 400 acres 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.

AVERAGE DISCHARGE.--39 years (1939-74, 1983-86), 49.7 ft^3/s, 36,010 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,130 ft^3/s June 9, 1964, gage height, 6.14 ft, from rating curve extended above 600 ft^3/s; minimum daily, 3.0 ft^3/s Jan. 17, 18, 25, 30, 31, 1950, Jan. 15, 16, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 270 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 24	1545	ice jam	*5.09	June 4	1500	*559	4.78

Minimum daily discharge, 5.0 ft^3/s Nov. 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	18	16	5.5	13	13	16	17	33	261	70	28	22
2	20	16	10	13	13	15	17	35	310	66	27	26
3	23	17	21	11	13	15	17	39	361	61	27	22
4	20	17	17	10	13	14	17	58	519	61	27	21
5	17	17	15	8.5	13	15	17	85	450	61	26	20
6	17	17	17	10	12	14	16	84	476	56	25	23
7	17	16	14	11	11	13	16	81	417	55	25	23
8	17	16	10	12	11	13	16	87	358	51	25	21
9	16	17	8.0	13	7.5	14	18	86	334	47	24	21
10	17	15	7.0	14	7.5	13	19	97	306	49	25	23
11	17	15	6.0	16	6.5	13	22	74	282	48	25	21
12	17	12	7.0	15	7.0	15	22	61	265	47	25	20
13	18	10	10	13	10	19	22	56	251	42	26	20
14	17	9.9	13	11	12	16	22	57	231	41	26	20
15	17	9.9	12	10	12	15	25	55	219	40	24	21
16	16	11	13	9.9	19	14	27	53	203	40	23	21
17	16	13	13	11	18	15	31	52	185	38	23	25
18	16	13	13	11	11	15	25	50	172	36	21	23
19	16	11	14	13	11	16	23	51	158	36	21	23
20	16	9.0	15	14	13	21	22	58	145	35	21	23
21	17	8.0	17	16	15	34	23	80	133	36	21	23
22	16	7.0	17	22	20	28	24	121	118	33	22	21
23	16	6.0	16	14	30	20	30	124	108	31	21	21
24	16	6.5	15	11	74	18	38	106	101	31	21	19
25	16	7.0	14	10	59	17	44	96	97	33	19	23
26	16	5.0	14	9.0	29	16	47	104	92	32	20	21
27	16	6.0	14	11	20	15	44	127	86	31	20	20
28	15	7.0	13	14	17	15	38	157	84	30	19	22
29	15	7.0	13	14	---	14	36	190	79	29	18	21
30	16	6.0	13	13	---	15	36	216	74	29	18	20
31	16	---	14	13	---	17	---	227	---	28	19	---
TOTAL	523	343.3	400.5	386.4	497.5	510	771	2800	6875	1323	712	650
MEAN	16.9	11.4	12.9	12.5	17.8	16.5	25.7	90.3	229	42.7	23.0	21.7
MAX	23	17	21	22	74	34	47	227	519	70	28	26
MIN	15	5.0	5.5	8.5	6.5	13	16	33	74	28	18	19
AC-FT	1040	681	794	766	987	1010	1530	5550	13640	2620	1410	1290

CAL YR 1985	TOTAL	9656.8	MEAN	26.5	MAX	116	MIN	5.0	AC-FT	19150
WTR YR 1986	TOTAL	15791.7	MEAN	43.3	MAX	519	MIN	5.0	AC-FT	31320

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MT

LOCATION.--Lat 45°44'09", long 107°33'24", in SE¼NE¼NE¼ sec.19, T.1 S., R.34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream of terminal wasteway of Agency Canal, 0.6 mi upstream from mouth, and 2.3 mi east of Hardin.
DRAINAGE AREA.--1,294 mi^2.
PERIOD OF RECORD.--June 1953 to current year.
GAGE.--Water-stage recorder. Datum of gage is 2,882.29 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953, to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963, to Nov. 6, 1963, non-recording gage at site 0.4 mi downstream. All at different datums. Nov. 7, 1963, to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present datum. Aug. 15, 1976, to Sept. 30, 1979, water-stage recorders were located on each bank downstream of Sarpy Road bridge and were used depending on control conditions.
REMARKS.--Estimated daily discharges: Nov. 9 to Mar. 1. Records good except those for period of estimated record, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. Figures of discharge given herein include flow of terminal wasteway of Agency Canal. 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.--33 years, 310 ft^3/s, 224,600 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s May 19, 1978, gage height, 11.20 ft, used gage height obtained at bridge on Sarpy Road; maximum gage height, 11.78 ft Mar. 20, 1960, site and datum then in use (backwater from ice); minimum discharge observed, 0.20 ft^3/s Aug. 7, 1961, result of discharge measurement.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	0830	ice jam	*6.71	June 6	0430	*2,450	4.99
May 11	0930	1,270	3.95				

Minimum daily discharge, 40 ft^3/s Dec. 2.

Revisions.--Revised daily discharges, in cubic feet per second, for Sept. 1-7, 1978, are given below. These figures supersede those published in the 1978 report.

Sept. 1.....196 Sept. 3.....191 Sept. 5.....178 Sept. 7.....158
Sept. 2.....195 Sept 4.....179 Sept. 6.....169

	TOTAL	MEAN	MAX	MIN	AC-FT
September 1978	8009	267	503	154	15890
Water Year 1978	227544	623	15800	100	451300

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	142	130	45	110	160	904	192	275	983	272	98	178
2	139	136	40	120	170	836	197	262	1030	254	96	206
3	142	133	50	90	170	732	193	251	1100	222	98	218
4	151	132	70	74	160	589	194	261	1520	209	86	196
5	167	129	90	74	150	481	190	333	1920	207	76	173
6	155	126	110	80	140	417	188	438	2420	206	68	165
7	148	127	110	90	130	374	185	478	2250	195	60	163
8	148	131	120	90	80	304	179	454	2170	178	53	167
9	147	131	110	110	64	265	179	534	1920	160	51	162
10	140	111	100	110	64	255	181	833	1800	153	50	154
11	141	91	70	120	60	243	188	1150	1940	147	57	160
12	143	61	70	130	70	226	196	1100	1690	144	61	152
13	146	61	64	100	80	209	207	799	1410	146	63	141
14	147	63	90	120	110	202	212	598	1250	152	66	142
15	141	71	110	140	120	205	211	505	1120	147	74	142
16	139	80	130	130	130	198	210	468	997	140	82	140
17	137	90	140	130	120	191	243	442	908	126	83	148
18	134	80	140	140	100	196	282	408	812	137	79	155
19	133	64	140	150	90	209	295	393	723	136	76	152
20	132	50	150	160	80	214	256	381	660	127	76	155
21	131	45	160	140	90	226	230	371	598	131	73	154
22	131	45	160	120	110	252	220	418	545	142	84	153
23	129	50	140	110	150	276	215	542	499	130	94	148
24	131	60	110	120	300	294	231	664	447	130	98	144
25	129	60	80	130	562	252	265	624	391	143	96	155
26	127	60	100	120	810	225	305	580	358	127	101	162
27	128	52	110	130	905	216	315	595	334	149	104	163
28	126	52	110	160	954	199	336	668	313	153	111	155
29	125	58	100	150	---	189	337	786	305	115	116	162
30	125	60	100	130	---	186	298	839	296	118	122	169
31	129	---	100	130	---	189	---	911	---	109	139	---
TOTAL	4283	2539	3219	3708	6129	9754	6930	17361	32709	4905	2591	4834
MEAN	138	84.6	104	120	219	315	231	560	1090	158	83.6	161
MAX	167	136	160	160	954	904	337	1150	2420	272	139	218
MIN	125	45	40	74	60	186	179	251	296	109	50	140
AC-FT	8500	5040	6380	7350	12160	19350	13750	34440	64880	9730	5140	9590

CAL YR 1985 TOTAL 60855 MEAN 167 MAX 1510 MIN 38 AC-FT 120700
WTR YR 1986 TOTAL 98962 MEAN 271 MAX 2420 MIN 40 AC-FT 196300

06294500 BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MT

LOCATION.--Lat 46°07'29", long 107°28'06", in SE¼SE¼NE¼ sec.3, T.4 N., R.34 E., Treasure County, Hydrologic Unit 10080015, on right bank, 1.9 mi upstream from Tullock Creek, 3.0 mi upstream from mouth, 3.6 mi southwest of Bighorn, and 4.5 mi southeast of Custer.

DRAINAGE AREA.--22,414 mi^2. Area at site used Oct. 7, 1955, to Sept. 30, 1981, 22,885 mi^2.

PERIOD OF RECORD.--October 1981 to current year. Previously published as "06294700 Bighorn River at Bighorn, MT" 1956-81, and as "near Custer" 1945-55. Flows are equivalent at all sites.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft above National Geodetic Vertical Datum of 1929, from topographic map. May 11 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945, to Oct. 6, 1955, water-stage recorder 1.7 mi upstream at different datum. Oct. 7, 1955, to Sept. 30, 1981, at site 2.3 mi downstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 19 to Dec. 18 and Feb. 12 to Mar. 2. Records good except those for estimated daily discharges, which are poor. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,356,000 acre-ft). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft. Diversion for irrigation of about 445,200 acres upstream from station. 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.--41 years (water years 1945-81, 1982-86) 3,929 ft^3/s, 2,847,000 acre-ft/yr, unadjusted.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 59,200 ft^3/s May 20, 1978, gage height, 14.15 ft; maximum gage height recorded, 14.21 ft Apr. 2, 1965 (ice jam); minimum discharge, about 275 ft^3/s Nov. 15, 1959, result of freezeup; minimum daily, 400 ft^3/s Apr. 4, 1967.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft^3/s July 4, 1983, gage height, 5.66 ft, maximum gage height, 8.65 ft Jan. 13, 1985 (ice jam); minimum daily discharge, 1,220 ft^3/s Oct. 18, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,470 ft^3/s June 12, gage height, 5.07 ft; maximum gage height, 7.84 ft Feb. 25, backwater from ice; minimum daily discharge, 1,220 ft^3/s Oct. 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	2180	2200	3000	2990	2620	3500	3860	5100	5070	6650	5720	3340
2	2170	2200	3000	2990	2630	4000	3870	5060	5070	6680	4860	3270
3	2170	2200	3000	2980	2640	4380	3880	4970	4980	6980	4200	3280
4	2230	2200	3000	2970	2740	4810	3880	4600	5160	6970	4070	3300
5	2190	2200	3000	2990	2790	5100	3870	4740	5700	6970	3340	3280
6	2190	2200	3000	2960	2760	4990	3860	4370	6620	6950	3170	3270
7	2210	2200	3000	2940	2750	5320	3860	4220	6590	6940	3120	3240
8	2280	2200	3000	2930	2850	5320	3860	4440	7220	6880	3110	3280
9	2330	2200	3000	2920	2960	5260	3860	4740	7180	6760	3100	3430
10	2280	2200	3000	2780	2840	5270	3910	5920	7340	6790	3100	3460
11	2280	2200	3000	2810	2810	4650	4240	6390	8080	6800	3080	3730
12	2220	2200	3000	2800	2800	4540	4220	5890	9050	6840	3020	3740
13	2220	2200	3000	2790	2900	4150	4290	5530	9030	6880	3060	3760
14	2210	2200	3000	2770	2900	3930	4270	5740	8950	6900	3030	3830
15	2210	2200	3000	2770	2900	3920	4260	5190	8840	6750	2990	3860
16	2250	2200	3000	2760	2900	3920	4310	5080	8820	6370	3000	3870
17	1860	2200	3000	2770	2900	3910	4750	5090	8700	6390	2980	3890
18	1220	2200	3000	2750	2900	3980	5260	5080	8610	6510	2960	4000
19	2200	2200	2940	2610	2900	4010	4910	5030	8680	6560	3000	3990
20	2200	2200	2980	2610	2900	4490	4730	5010	8570	6580	3020	3970
21	2200	2500	3010	2600	2900	4900	4710	4790	8450	6590	2950	3990
22	2200	2700	3030	2570	2900	4870	4980	4980	8460	6540	2920	4000
23	2200	3000	3050	2530	2900	4490	4970	5020	8380	6500	2900	4060
24	2200	3000	3050	2560	2900	4480	4990	5200	8250	6500	2930	4070
25	2200	3000	3030	2600	2900	4370	5050	5180	7890	6530	2940	4240
26	2200	3000	3040	2600	2900	3940	5170	5110	6960	6430	2930	4130
27	2200	3000	3030	2600	2900	3930	5290	5090	6850	6080	2940	4150
28	2200	3000	3020	2600	2900	3910	5390	5110	6780	6060	2960	4160
29	2200	3000	3000	2610	---	3880	5260	5100	6820	5980	2990	4200
30	2200	3000	3000	2610	---	3870	5160	5180	6740	5940	3030	4200
31	2200	---	2980	2620	---	3880	---	5070	---	5900	3140	---
TOTAL	67300	73200	93160	85390	79590	135970	134920	158020	223840	204200	100560	112990
MEAN	2171	2440	3005	2755	2843	4386	4497	5097	7461	6587	3244	3766
MAX	2330	3000	3050	2990	2960	5320	5390	6390	9050	6980	5720	4240
MIN	1220	2200	2940	2530	2620	3500	3860	4220	4980	5900	2900	3240
AC-FT	133500	145200	184800	169400	157900	269700	267600	313400	444000	405000	199500	224100

CAL YR 1985	TOTAL	943730	MEAN	2586	MAX	4510	MIN	1220	AC-FT	1872000
WTR YR 1986	TOTAL	1469140	MEAN	4025	MAX	9050	MIN	1220	AC-FT	2914000

06294700 BIGHORN RIVER AT BIGHORN, MT
(National Stream Quality Accounting Network)

LOCATION.--Lat 46°08'50", long 107°28'00", in NE¼NE¼NE¼ sec.33, T.5 N., R.34 E., Treasure County, Hydrologic Unit 10080015, on right bank 150 ft downstream from bridge on old U.S. Highway 10, 0.3 mi downstream from bridge on Interstate Highway 94, 0.7 mi upstream from mouth, 1.3 mi southwest of Bighorn, and 4.4 mi east of Custer.

DRAINAGE AREA.--22,885 mi2. Area at site used prior to Oct. 7, 1955, 22,410 mi2.

PERIOD OF RECORD.--Water years 1946 to current year. Prior to October 1948, published as near Custer.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1964 to September 1981.
WATER TEMPERATURE: April 1949 to September 1951, October 1953 to September 1981.
SUSPENDED-SEDIMENT DISCHARGE: July 1947 to September 1954, October 1955 to September 1958, October 1959 to June 1972.

REMARKS.--Water-discharge records for Bighorn River above Tullock Creek near Bighorn (station 06294500) are used, flows are equivalent at these two sites.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-81): Maximum daily, 1,460 microsiemens, May 24, 1978; minimum daily, 460 microsiemens, Mar. 13, 1966.
WATER TEMPERATURE (water years 1949-51, 1954-81): Maximum observed, 30.0°C, July 17, 18, 1953; minimum observed, 0.0°C, on many days during winters.
SEDIMENT CONCENTRATION (water years 1947-54, 1955-58, 1959-72): Maximum daily mean, 23,200 mg/L, May 24, 1952; minimum daily mean, 8 mg/L, Oct. 31, 1967.
SEDIMENT LOAD (water years 1947-54, 1955-58, 1959-72): Maximum daily, 727,000 tons, May 24, 1952; minimum daily, 46 tons, Oct. 31, 1967.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	CLOUD COVER (PERCENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
DEC 17...	0950	3000	--	100	61	873	-3.0	0.0	695	13.2	99
FEB 18...	0945	2900	--	100	76	935	-20.0	0.0	684	13.0	99
APR 21...	1150	4710	--	0	0	1020	21.0	9.0	692	10.2	98
JUN 24...	1245	--	8280	0	0	881	31.0	17.5	691	8.6	100
AUG 11...	1215	--	3010	0	0	612	26.0	21.0	693	8.0	99

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	PH (STANDARD UNITS) (00400)	TURBIDITY (NTU) (00076)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
DEC 17...	K13	500	8.40	22	360	200	91	32	92	2	3.6
FEB 18...	K5	430	8.80	5.1	370	170	91	35	99	2	4.2
APR 21...	K63	380	8.60	32	370	160	94	34	110	3	4.3
JUN 24...	K110	K160	8.40	34	290	110	74	25	73	2	3.7
AUG 11...	K130	450	8.40	14	190	43	50	17	50	2	2.9

06294700 BIGHORN RIVER AT BIGHORN, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BICARBONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)
DEC 17...	180	12	182	340	14	0.50	7.2	692	700	0.94	5610
FEB 18...	180	32	193	390	15	0.50	8.2	769	800	1.0	6020
APR 21...	210	25	212	350	13	0.50	8.2	790	770	1.1	10000
JUN 24...	180	18	171	270	12	0.40	7.0	583	590	0.79	13000
AUG 11...	180	3	129	180	7.1	0.30	8.4	377	410	0.51	3060

DATE	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC 17...	0.010	0.530	0.150	--	1.2	0.070	0.020	<0.010	198	1600	75
FEB 18...	<0.010	0.580	0.100	0.110	0.50	0.010	0.010	0.010	72	564	74
APR 21...	<0.010	0.600	0.150	0.180	0.60	0.050	0.010	<0.010	120	1530	99
JUN 24...	<0.010	0.420	0.230	0.230	0.90	0.040	0.020	<0.010	186	4160	84
AUG 11...	<0.010	0.190	--	0.150	0.50	0.050	<0.010	0.020	--	--	74

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
DEC 17...	0950	10	1	74	<0.5	<1	<1	<3	2	7	<1
FEB 18...	0945	50	1	66	<0.5	<1	20	<3	12	4	5
JUN 24...	1245	40	2	73	<0.5	<1	<1	<3	53	4	6

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC 17...	42	12	<0.1	<10	1	3	<1	960	<6	7
FEB 18...	43	13	<0.1	<10	6	3	<1	1100	<6	17
JUN 24...	36	63	0.4	<10	6	1	<1	750	<6	53

06294995 ARMELLS CREEK NEAR FORSYTH, MT

LOCATION.--Lat 46°14'59", long 106°48'22", in SE¼NW¼NE¼ sec.26 T.6 N., R.39 E., Rosebud County, Hydrologic Unit 10100001, on right bank 300 ft upstream from bridge on Interstate Highway I-94, 2.2 mi upstream from mouth, and 6 mi southwest of Forsyth.

DRAINAGE AREA.--370 mi2.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1982 to September 1983.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1983): Maximum daily observered, 5,680 microsiemens, Dec. 16, 1982; minimum daily observed, 1,270 microsiemens, Jan. 11, 1983.

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 WATER (DEG C) (00010)	METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
MAR										
13...	1400	4.8	40	1	5400	9.5	11.0	687	11.6	119
MAY										
01...	1300	3.7	20	1	5700	15.5	15.5	698	10.4	116
SEP										
04...	1300	8.9	50	1	6650	22.5	20.0	696	8.7	107

DATE	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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
MAR										
13...	8.40	1100	920	80	220	700	9	10	182	2500
MAY										
01...	8.60	1700	1200	210	280	800	9	11	455	2600
SEP										
04...	8.70	1100	670	130	190	1200	16	17	436	3400

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
MAR									
13...	47	0.30	5.5	3700	5.0	48	<0.100	0.230	0.67
MAY									
01...	45	0.30	3.8	4200	5.7	42	<0.100	0.150	0.75
SEP									
04...	52	0.60	3.8	5300	7.1	126	<0.100	<0.010	--

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)
MAR									
13...	0.90	0.030	--	--	500	40	127	1.6	58
MAY									
01...	0.90	0.030	12	0.1	670	20	98	0.98	64
SEP									
04...	1.0	0.640	--	--	690	40	79	1.9	68

06294995 ARMELLS CREEK NEAR FORSYTH, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)
MAY												
01...	1300	1	<10	<10	<1	<1	10	<10	6	2	240	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAY											
01...	1	80	50	<0.10	<0.1	9	3	<1	<1	20	10

06295000 YELLOWSTONE RIVER AT FORSYTH, MT

LOCATION.--Lat 46°15'58", long 106°41'24", in NE¼NW¼NW¼ sec.23, T.6 N., R.40 E., Rosebud County, Hydrologic Unit 10100001, on right bank 0.3 mi downstream from U.S. Highway 12 bridge, at intake for Forsyth water supply, at Forsyth, and at mile 238.2.

DRAINAGE AREA.--40,339 mi^2.

PERIOD OF RECORD.--July 16, 1921, to September 30, 1923 (no winter records), October 1977 to current year. Miscellaneous discharge measurements were made in 1974 to 1976 and are available in files of Helena district office.

GAGE.--Water-stage recorder. Datum of gage is 2,504.62 ft above National Geodetic Vertical Datum of 1929, from nearby elevation determined by City of Forsyth. July 1921 to March 1922, nonrecording gage on discontinued highway bridge 10 ft downstream from gage at different datum. March 1922 to September 1923, nonrecording gage on discontinued highway bridge 10 ft downstream from gage at datum 2 ft higher.

REMARKS.--Estimated daily discharges: Nov. 11, 12, Nov. 16 to Mar. 2. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 838,000 acres upstream from station. Flow regulated to some extent by Bighorn Lake, usable capacity, 1,356,000 acre-ft, on Bighorn River. Small diversion dam about 4,200 ft downstream from station. 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 (1978-86), 11,450 ft^3/s, 8,296,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 106,000 ft^3/s May 21, 1978, gage height, 14.53 ft; minimum daily, 1,400 ft^3/s Nov. 23, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1918 reached a stage of about 20 ft, datum used in 1921, information from local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 52,600 ft^3/s June 8, gage height, 8.96 ft; minimum daily, 3,000 ft^3/s Dec. 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	7210	6570	3300	5700	5400	12000	7370	11000	35200	25200	13200	10100
2	7070	6580	3000	5700	5400	11000	7780	10700	37200	23900	12500	9280
3	6900	6510	4000	5700	5600	9790	8140	10300	41100	22500	11700	9060
4	6930	6520	5800	5200	5600	9400	8020	9910	44100	21900	10800	8880
5	6970	6430	6000	4500	5700	9310	7760	11200	46000	22200	10200	8570
6	7040	6390	6200	5000	5700	9270	7550	14000	48100	23200	9340	8410
7	7130	6350	6400	5600	5700	8950	7240	14800	50600	22300	8810	8380
8	7010	6350	6500	5600	5500	9080	7120	14500	52300	20400	8450	8490
9	7170	6410	6800	5200	5400	8920	7140	15400	48100	18900	8310	8550
10	7270	6490	6600	5500	4500	8930	7430	16200	45100	18400	8240	8670
11	7270	6400	6500	5300	3800	9050	8230	18200	46900	18400	8230	8850
12	7060	6400	6300	5400	3500	8370	8860	17400	44000	18800	8150	9000
13	7090	6070	6000	5600	3500	8220	8950	16100	42300	19200	8010	8880
14	7110	5850	5800	5600	3800	7670	9240	15100	43200	19100	8380	8930
15	7110	5910	5000	5600	4500	7640	9160	13900	42300	17800	8190	9110
16	7030	6000	5000	5400	4800	7440	8940	12900	41800	16600	7840	9280
17	6870	6200	6200	5400	5000	7320	8970	12600	44500	16400	7650	9610
18	6400	6400	6400	5400	5200	7300	9660	11900	43400	17200	7520	9980
19	6010	6400	6400	5500	5200	7420	9650	11500	41600	17100	7250	10300
20	6710	4000	6300	5500	5400	7580	9070	11000	40200	16900	7100	10400
21	6720	4000	6400	5500	5000	7940	8670	10600	37000	16300	7030	10300
22	6750	4000	6400	5200	4500	8100	8530	10800	34700	15700	6930	10500
23	6690	3800	6400	5000	5000	7850	8550	12700	31600	14900	6950	10700
24	6680	3800	6300	4600	5600	7590	8640	18500	28700	14500	7170	10700
25	6780	3700	6200	4500	6000	7560	10100	17900	26900	14100	7950	16000
26	6810	4000	6200	4600	8000	7400	11800	16100	26000	13900	7530	21800
27	6750	4000	6200	4500	10000	7100	12500	16000	25900	13900	7330	15800
28	6710	3700	6000	4000	14000	7100	12600	19500	26200	14300	7170	12300
29	6670	4000	6000	4300	---	7060	11900	25000	26000	14400	7210	11200
30	6650	3700	5800	4700	---	6910	11400	30200	25600	13800	7120	10100
31	6560	---	5600	5300	---	6990	---	33300	---	13400	7480	---
TOTAL	213130	162930	182000	160600	157300	256260	270970	479210	1166600	555600	259740	312130
MEAN	6875	5431	5871	5181	5618	8266	9032	15460	38890	17920	8379	10400
MAX	7270	6580	6800	5700	14000	12000	12600	33300	52300	25200	13200	21800
MIN	6010	3700	3000	4000	3500	6910	7120	9910	25600	13400	6930	8380
AC-FT	422700	323200	361000	318600	312000	508300	537500	950500	2314000	1102000	515200	619100

CAL YR 1985 TOTAL 2830560 MEAN 7755 MAX 29100 MIN 3000 AC-FT 5614000
WTR YR 1986 TOTAL 4176470 MEAN 11440 MAX 52300 MIN 3000 AC-FT 8284000

06295113 ROSEBUD CREEK AT RESERVATION BOUNDARY, NEAR KIRBY, MT

LOCATION.--Lat 45°21'40", long 106°59'23", in NE¼NE¼SW¼ sec.36, T.5 S., R.38 E., Bighorn County, Hydrologic Unit 10100003, on right bank, 0.2 mi upstream from Dry Creek, 0.5 mi north of reservation boundary, 1.9 mi downstream from Cache Creek, 2.0 mi north of Kirby, and at mile 179.6.

DRAINAGE AREA.-- 123 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,780 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 2. Records poor. Numerous small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--7 years (1980-86), 7.24 ft^3/s, 5,250 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 127 ft^3/s Apr. 16, 1985, gage height, 5.71 ft; maximum gage height observed, 6.30 ft Feb. 21, 1980 (backwater from ice); minimum daily discharge, 0.10 ft^3/s Dec. 24, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 231 ft^3/s was measured May 9, 1978, at site 1.9 mi upstream from present site. Flow was known to be higher during flood of May 19-21, 1978, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge not determined but occurred Feb. 27, gage height, 6.50 ft (backwater from ice); minimum, 1.2 ft^3/s Sept. 5, 6, gage height, 1.95 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	2.3	3.5	1.8	3.3	8.0	60	16	11	9.4	7.5	2.4	4.5
2	1.9	3.5	1.5	3.5	7.8	50	16	11	9.0	7.0	2.4	2.6
3	2.4	3.6	2.0	3.3	7.4	33	15	10	9.9	6.8	2.2	2.1
4	2.8	3.6	2.5	3.0	7.4	34	14	9.6	36	6.2	2.7	1.8
5	2.4	3.8	2.7	2.5	7.0	35	14	11	40	5.8	2.0	1.5
6	2.1	3.7	3.5	3.0	6.0	32	13	12	31	5.5	1.9	1.4
7	2.2	3.7	3.2	3.3	5.0	31	13	12	24	5.1	2.1	1.6
8	2.4	3.6	3.0	3.5	4.0	26	12	14	26	5.2	2.1	1.7
9	2.4	3.4	2.7	4.0	3.0	22	12	17	37	5.1	2.0	1.7
10	2.4	3.0	2.4	4.5	2.4	23	12	19	61	5.2	2.1	2.0
11	2.4	2.6	2.0	4.7	2.1	23	12	22	51	5.2	2.1	2.1
12	2.5	2.7	2.2	4.3	2.0	22	12	21	30	5.1	2.4	2.0
13	2.8	2.8	2.4	4.5	2.5	20	13	24	23	4.7	2.6	1.8
14	2.6	3.0	2.7	4.0	3.0	19	13	31	20	4.5	2.8	2.1
15	2.7	3.2	3.0	3.9	3.5	18	13	28	19	4.2	2.6	2.5
16	2.5	3.4	3.5	4.0	4.5	17	13	24	17	5.0	3.0	2.6
17	2.6	3.2	3.9	4.3	5.0	17	14	22	15	4.5	2.0	2.9
18	2.9	3.1	4.0	4.8	5.4	18	14	20	13	4.4	1.8	3.2
19	2.6	2.9	4.2	5.4	4.5	17	15	18	12	3.7	2.0	3.5
20	2.6	2.6	4.4	4.5	4.0	18	15	17	11	3.5	2.2	3.2
21	2.7	2.3	4.5	4.0	3.7	18	14	17	11	3.4	2.3	3.1
22	2.7	2.0	4.3	3.5	4.0	18	13	16	11	3.5	2.2	3.0
23	2.8	1.7	4.1	3.7	6.0	18	12	15	11	3.3	2.2	2.7
24	2.9	1.8	3.9	3.9	10	17	12	15	11	3.1	2.1	2.6
25	3.0	1.9	4.1	3.8	30	17	12	15	9.9	3.8	2.1	7.2
26	3.1	1.7	3.9	4.0	50	17	12	14	9.1	3.7	2.0	5.4
27	3.0	1.9	3.7	4.7	80	17	13	13	8.4	3.1	2.1	4.1
28	3.1	2.0	3.4	6.0	70	16	13	12	8.1	3.0	2.1	4.4
29	3.1	1.9	3.0	6.4	---	15	13	11	8.2	2.7	2.0	5.2
30	3.0	1.9	3.1	6.8	---	16	12	10	7.9	2.4	2.1	4.7
31	3.2	---	3.2	7.6	---	16	---	9.8	---	2.5	2.2	---
TOTAL	82.1	84.0	98.8	132.7	348.2	720	397	501.4	589.9	138.7	68.8	89.2
MEAN	2.65	2.80	3.19	4.28	12.4	23.2	13.2	16.2	19.7	4.47	2.22	2.97
MAX	3.2	3.8	4.5	7.6	80	60	16	31	61	7.5	3.0	7.2
MIN	1.9	1.7	1.5	2.5	2.0	15	12	9.6	7.9	2.4	1.8	1.4
AC-FT	163	167	196	263	691	1430	787	995	1170	275	136	177

CAL YR 1985	TOTAL	2524.36	MEAN	6.92	MAX	112	MIN	.86	AC-FT	5010
WTR YR 1986	TOTAL	3250.8	MEAN	8.91	MAX	80	MIN	1.4	AC-FT	6450

06295250 ROSEBUD CREEK NEAR COLSTRIP, MT

LOCATION.--Lat 45°46'03", long 106°34'10", in SE¼SW¼NE¼ sec.8, T.1 S., R.42 E., Rosebud County, Hydrologic Unit 10100003, on left bank 10 ft downstream from bridge on FAS Route 315, 1.5 mi downstream from Lee Coulee, 8.4 mi southeast of Colstrip, and at mile 85.6.

DRAINAGE AREA.--799 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,000 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 19 to Mar. 1. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 800 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.--12 years, 37.5 ft^3/s, 27,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 605 ft^3/s May 21, 1978, gage height, 9.03 ft; no flow many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge not determined but occurred Feb. 28, gage height, 6.78 ft (backwater from ice); minimum daily, 3.5 ft^3/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	4.9	6.7	4.0	10	13	200	26	28	25	13	6.2	5.0
2	4.7	7.4	5.0	10	13	180	27	28	23	13	6.1	5.8
3	4.5	7.2	7.0	9.0	13	174	25	27	21	12	6.1	6.5
4	4.8	7.0	8.0	8.0	12	153	25	28	20	11	6.0	6.5
5	4.8	7.1	8.3	8.5	12	138	26	27	19	11	5.9	6.6
6	4.9	6.6	8.5	9.0	11	117	25	29	19	10	5.6	6.5
7	4.9	6.7	7.0	10	10	93	25	30	19	10	5.1	6.0
8	5.1	7.1	7.0	11	9.0	88	23	34	21	10	4.9	7.1
9	4.8	7.3	7.0	12	8.0	77	22	44	35	9.9	4.7	7.0
10	4.9	6.2	6.5	12	7.0	66	21	49	40	10	4.7	6.7
11	6.1	7.4	6.0	12	7.5	59	21	54	38	9.9	5.6	6.3
12	6.1	7.5	5.0	12	8.0	53	20	57	34	9.9	5.7	6.0
13	6.0	7.7	6.0	12	8.0	46	20	54	34	9.6	4.9	5.5
14	6.1	7.4	7.0	12	8.5	45	20	57	38	9.3	4.4	6.2
15	6.2	8.2	8.0	12	10	43	20	57	51	9.0	4.2	6.2
16	6.2	8.0	8.3	12	12	41	21	53	45	9.0	4.3	6.6
17	6.0	8.1	8.5	12	10	39	23	49	36	8.7	4.2	7.7
18	5.9	7.6	8.5	12	10	38	23	52	32	8.9	4.1	8.5
19	6.0	7.0	9.0	11	12	38	22	49	27	8.4	3.7	9.3
20	6.1	6.0	9.0	10	15	37	22	46	25	8.4	3.6	9.0
21	6.3	5.0	9.0	10	18	37	22	43	23	8.0	3.7	8.1
22	6.0	4.5	9.0	11	20	37	23	41	21	7.8	4.0	7.8
23	5.9	5.0	9.0	11	25	36	23	38	20	7.8	4.6	7.8
24	5.5	6.0	8.0	11	30	35	24	37	18	7.3	4.7	8.2
25	5.7	5.4	9.0	10	150	33	24	36	17	7.3	4.7	13
26	6.0	5.4	10	11	140	31	24	34	16	7.5	4.7	14
27	6.2	5.6	10	13	200	30	27	32	15	7.5	4.4	14
28	6.5	5.6	10	13	300	29	30	30	15	7.1	4.1	12
29	6.9	5.6	9.5	14	---	29	29	29	14	6.3	4.1	11
30	6.4	5.0	9.0	14	---	27	28	28	14	5.5	3.5	10
31	6.4	---	9.5	13	---	27	---	26	---	5.6	3.7	---
TOTAL	176.8	197.3	245.6	347.5	1092.0	2076	711	1226	775	278.7	146.2	240.9
MEAN	5.70	6.58	7.92	11.2	39.0	67.0	23.7	39.5	25.8	8.99	4.72	8.03
MAX	6.9	8.2	10	14	300	200	30	57	51	13	6.2	14
MIN	4.5	4.5	4.0	8.0	7.0	27	20	26	14	5.5	3.5	5.0
AC-FT	351	391	487	689	2170	4120	1410	2430	1540	553	290	478

CAL YR 1985	TOTAL	4757.40	MEAN	13.0	MAX	73	MIN	.00	AC-FT	9440
WTR YR 1986	TOTAL	7513.0	MEAN	20.6	MAX	300	MIN	3.5	AC-FT	14900

06296003 ROSEBUD CREEK AT MOUTH, NEAR ROSEBUD, MT

LOCATION.--Lat 46°15'53", long 106°28'30", in SW¼NW¼NE¼ sec.21, T.6 N., R.42 E., Rosebud County, Hydrologic Unit 10100003, on left bank 0.4 mi upstream from bridge on Interstate Highway 94, 0.8 mi upstream from mouth, and 1.6 mi southwest of Rosebud.

DRAINAGE AREA.--1,302 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 2,480 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 07 to Feb. 27, Apr. 13-15. Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 2,000 acres upstream from station.

AVERAGE DISCHARGE.--12 years, 41.8 ft^3/s, 30,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,620 ft^3/s May 19, 1978, gage height, 6.78 ft, from rating curve extended above 1,500 ft^3/s; no flow several days in August and September 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	0245	unknown	Ice jam	June 9	1600	291	2.77
May 6	0530	210	2.35	Sept. 2	0530	232	2.47
May 11	1215	404	3.27	Sept. 25	2130	*1,310	*6.07

Minimum discharge, 0.60 ft^3/s, Aug. 25-27, 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	1.3	2.7	2.1	4.5	10	99	33	30	29	16	1.9	64
2	1.2	2.8	2.0	4.5	9.0	126	33	26	27	5.5	1.8	154
3	1.1	3.1	3.0	4.0	9.0	137	30	23	22	2.0	.84	30
4	.98	3.6	4.5	3.5	8.0	151	30	19	22	5.3	.75	9.3
5	.95	3.8	4.0	3.0	7.5	151	30	23	11	5.8	.77	4.2
6	.95	3.7	4.0	3.5	7.0	134	30	140	14	7.0	1.9	3.4
7	.95	3.5	3.5	3.8	6.5	122	27	50	12	2.0	2.0	3.7
8	.95	3.2	3.5	4.0	5.0	111	27	156	30	4.8	1.9	4.9
9	.95	3.0	3.5	4.0	4.5	101	23	259	235	5.7	2.0	4.9
10	.95	2.7	3.0	4.0	5.0	86	19	315	82	14	1.3	4.5
11	12	2.7	3.0	4.5	5.0	80	16	354	27	13	.72	4.2
12	11	3.0	2.8	4.0	5.0	72	15	144	23	12	.78	6.7
13	5.3	4.5	2.5	4.0	6.0	65	14	77	35	10	.82	4.1
14	3.7	4.5	3.0	4.0	7.0	57	13	68	32	10	.85	4.8
15	2.7	4.5	3.5	4.5	8.0	55	23	61	25	9.8	.84	5.1
16	2.3	4.5	3.5	4.8	8.5	49	36	57	28	7.4	.74	4.9
17	1.8	4.0	3.7	5.0	8.5	45	42	56	29	5.5	.71	4.9
18	1.6	3.5	4.0	5.4	6.0	44	34	54	37	2.4	.91	5.9
19	1.6	3.0	4.0	5.4	4.5	43	26	52	41	6.1	1.4	73
20	2.0	2.5	4.0	5.0	5.0	43	17	48	34	4.3	.70	57
21	2.2	2.5	4.1	5.0	7.0	42	16	44	26	8.5	1.0	19
22	2.4	2.5	4.3	4.5	10	40	5.5	46	24	7.3	.99	10
23	2.4	2.2	4.5	4.0	30	40	3.8	45	22	6.4	.75	8.5
24	2.3	2.5	4.0	4.5	100	40	7.9	40	17	6.2	.70	8.3
25	2.2	2.5	3.5	5.0	350	39	11	37	7.5	4.7	.68	406
26	2.2	2.5	4.2	5.0	200	38	20	33	6.7	3.9	.63	604
27	2.5	2.4	4.0	5.0	150	38	84	35	7.5	2.2	.65	284
28	2.9	2.3	3.8	6.0	101	37	52	37	5.4	1.8	.68	55
29	2.6	2.3	3.5	9.5	---	36	30	36	4.2	3.9	.68	30
30	2.2	2.2	3.8	11	---	34	29	26	50	2.3	.68	21
31	2.6	---	4.0	10	---	34	---	32	---	2.8	6.7	---
TOTAL	80.78	92.7	110.8	154.9	1083.0	2189	777.2	2423	965.3	198.6	37.77	1899.3
MEAN	2.61	3.09	3.57	5.00	38.7	70.6	25.9	78.2	32.2	6.41	1.22	63.3
MAX	12	4.5	4.5	11	350	151	84	354	235	16	6.7	604
MIN	.95	2.2	2.0	3.0	4.5	34	3.8	19	4.2	1.8	.63	3.4
AC-FT	160	184	220	307	2150	4340	1540	4810	1910	394	75	3770

CAL YR 1985	TOTAL	3064.03	MEAN	8.39	MAX	86	MIN	.42	AC-FT	6080
WTR YR 1986	TOTAL	10012.35	MEAN	27.4	MAX	604	MIN	.63	AC-FT	19860

06296003 ROSEBUD CREEK AT MOUTH, NEAR ROSEBUD, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year (discontinued).

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1978 to September 1981, October 1982 to September 1983.
WATER TEMPERATURE: October 1978 to September 1979.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1979-81, 1983): Maximum daily, 2,890 microsiemens, Oct. 18, 1980; minimum daily, 332 microsiemens, Mar 9, 1979.
WATER TEMPERATURE (water year 1979): Maximum daily, 27.5°C, Aug. 5, 1979; minimum daily, 0.0°C on many days during winter.

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 WATER (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										
22...	1325	2.5	--	--	1240	13.0	9.0	--	--	--
NOV										
13...	1545	4.6	--	--	2500	1.0	0.5	--	--	--
DEC										
17...	0925	3.7	--	--	2550	2.0	0.0	--	--	--
JAN										
29...	1015	9.6	100	2	1650	2.0	0.5	702	11.5	87
MAR										
12...	1705	67	--	--	1030	11.0	7.5	--	--	--
13...	1130	65	20	1	1100	8.0	6.0	690	10.5	94
APR										
28...	1345	47	50	1	1480	14.0	12.0	695	9.3	95
MAY										
08...	1233	209	--	--	705	10.5	7.5	--	--	--
JUN										
16...	1430	30	--	--	1420	28.0	25.0	--	--	--
JUL										
28...	1245	1.4	0	0	2230	26.5	24.5	699	9.0	119
SEP										
15...	1340	5.3	--	--	2330	9.0	10.5	--	--	--
26...	1140	717	--	--	410	14.0	10.5	--	--	--
29...	1230	28	--	--	1360	16.0	11.0	--	--	--

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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
JAN										
29...	1015	8.40	680	240	91	110	140	2	10	443
MAR										
13...	1130	8.50	450	200	59	73	77	2	9.8	249
APR										
28...	1345	8.30	520	180	68	85	130	3	9.0	338
JUL										
28...	1245	8.40	600	150	60	110	300	5	13	453

06296003 ROSEBUD CREEK AT MOUTH, NEAR ROSEBUD, MT--Continued

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
JAN 29...	490	27	0.60	15	1100	1.6	30	0.200	0.170	0.53
MAR 13...	360	5.7	0.40	9.5	740	1.0	131	0.300	0.380	1.1
APR 28...	470	13	0.50	6.5	980	1.3	125	0.200	0.090	1.9
JUL 28...	800	14	0.70	8.6	1600	2.1	6.0	<0.100	<0.010	--

DATE	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)
JAN 29...	0.70	0.090	--	--	210	16	209	5.4	99
MAR 13...	1.5	0.200	10	2.0	140	61	256	45	99
APR 28...	2.0	0.580	--	--	180	22	1670	212	99
JUL 28...	0.90	0.050	9.2	0.6	360	10	80	0.30	97

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
MAR 13...	1130	2	1	<10	<0.5	1	<1	10	<10	10	4	6000
JUL 28...	1245	--	1	--	<10	--	<1	--	<10	--	3	--

DATE	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAR 13...	3	<1	190	19	<0.10	<0.1	11	2	1	1	40	15
JUL 28...	--	<5	--	70	--	0.1	--	4	--	<1	--	10

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT

LOCATION.--Lat 45°00'32", long 106°50'08", in NW¼NW¼NE¼ sec.33, T.9 S., R.40 E., Big Horn County, Hydrologic Unit 10090101, on left bank 1 mi north of Wyoming-Montana State line, 1.4 mi southeast of Decker, 1.6 mi upstream from Badger Creek, and at mile 200.9.

DRAINAGE AREA.--1,477 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1960 to current year. Records published as "near Decker" May 1928 to September 1938, not equivalent owing to intervening drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,429.14 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Nov. 8 to Feb. 27. Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by many small reservoirs in Wyoming, combined capacity, about 15,000 acre-ft. Diversions for irrigation of about 64,300 acres upstream from station.

AVERAGE DISCHARGE.--26 years, 486 ft^3/s, 352,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft^3/s May 19, 1978, gage height, 14.25 ft; minimum, 3.0 ft^3/s Aug. 23, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	1730	ice jam	*9.71	June 10	0900	3,610	7.55
June 5	0230	*3,670	7.60				

Minimum daily discharge, 80 ft^3/s Dec. 1.

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	238	199	80	150	190	608	283	407	1550	508	148	217
2	249	195	90	140	200	503	269	414	1800	460	150	333
3	280	194	110	130	200	437	270	547	2060	425	150	318
4	289	199	120	110	190	396	267	758	2840	394	150	284
5	257	191	110	100	180	389	256	940	3400	383	153	265
6	242	188	120	110	170	397	243	804	2780	369	147	261
7	251	179	120	120	160	358	237	668	2530	340	133	319
8	248	170	110	130	150	332	246	642	2390	320	139	342
9	233	150	110	130	140	315	267	669	3110	290	136	322
10	233	130	100	140	120	306	302	651	3400	263	153	359
11	234	120	90	150	100	290	314	619	2690	261	161	459
12	242	130	100	150	90	271	315	610	2350	285	150	402
13	246	140	100	160	100	260	302	563	2250	292	152	351
14	225	150	110	160	110	257	319	527	2110	264	150	336
15	224	160	110	170	120	248	297	523	1970	237	162	323
16	231	170	120	170	140	238	302	474	1840	216	149	317
17	219	180	130	180	150	234	320	442	1660	207	146	309
18	217	170	140	180	140	254	331	424	1500	202	145	303
19	212	160	150	190	130	255	308	442	1330	189	140	323
20	211	140	160	170	120	269	292	487	1210	189	135	329
21	214	120	170	150	130	289	283	607	1170	198	127	320
22	218	110	180	130	150	304	297	767	1100	199	131	307
23	219	100	190	140	200	311	445	895	987	191	138	300
24	214	110	190	150	300	297	555	791	871	169	143	295
25	207	120	200	160	1000	281	481	730	759	154	151	322
26	208	110	190	150	2000	272	493	798	684	154	145	360
27	204	100	170	160	1400	257	545	927	622	167	151	337
28	203	110	160	170	867	248	493	1060	583	165	148	314
29	196	110	150	160	---	248	450	1190	560	154	151	308
30	194	100	140	170	---	260	429	1300	536	143	156	301
31	195	---	140	180	---	273	---	1380	---	140	166	---
TOTAL	7053	4405	4160	4660	8947	9657	10211	22056	52642	7928	4556	9636
MEAN	228	147	134	150	320	312	340	711	1755	256	147	321
MAX	289	199	200	190	2000	608	555	1380	3400	508	166	459
MIN	194	100	80	100	90	234	237	407	536	140	127	217
AC-FT	13990	8740	8250	9240	17750	19150	20250	43750	104400	15730	9040	19110

CAL YR 1985	TOTAL	79187	MEAN	217	MAX	803	MIN	60	AC-FT	157100
WTR YR 1986	TOTAL	145911	MEAN	400	MAX	3400	MIN	80	AC-FT	289400

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1965 to September 1976, November 1980 to current year.
WATER TEMPERATURE: October 1965 to September 1976.

REMARKS.--Unpublished records of once-daily water temperature are available in files of Montana District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,490 microsiemens, Aug. 12, 1966, Jan. 11, 1972; minimum daily, 192 microsiemens, June 7, 1976.
WATER TEMPERATURE (water years 1966-76): Maximum, 30.5°C, July 16, 1966; minimum, 0.0°C on many days during winter.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 1010 microsiemens, Nov. 24, Mar. 8, 9, 24; minimum daily, 226 microsiemens, Jun. 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 (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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT											
16...	1215	240	--	--	862	19.0	8.0	--	--	--	--
NOV											
04...	1420	207	50	1	798	15.0	7.0	673	12.8	120	K6
DEC											
18...	1110	141	100	2	733	8.0	0.0	681	10.4	80	34
JAN											
28...	1500	172	--	--	830	9.5	0.0	--	--	--	--
MAR											
06...	0845	412	--	--	991	13.0	4.5	--	--	--	--
APR											
15...	0840	292	--	--	628	2.0	4.5	--	--	--	--
MAY											
30...	0930	1190	0	0	259	17.0	14.5	678	7.9	87	130
JUN											
03...	0905	1840	--	--	197	24.0	15.0	--	--	--	--
05...	1325	3410	--	--	248	22.5	14.5	--	--	--	--
11...	0905	2760	--	--	271	14.5	13.0	--	--	--	--
25...	0800	779	0	0	--	25.0	19.0	--	--	--	--
JUL											
16...	0830	222	0	0	644	23.5	20.0	670	7.0	88	K110
AUG											
11...	1430	166	--	--	785	31.0	23.5	--	--	--	--
SEP											
22...	1325	311	50	1	702	15.5	12.5	--	--	--	--

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
NOV											
04...	1420	8.50	350	100	68	44	32	0.8	3.0	250	180
DEC											
18...	1110	8.40	360	110	71	45	29	0.7	2.0	250	160
MAY											
30...	0930	7.90	120	22	29	12	11	0.4	1.4	100	42
JUL											
16...	0830	8.00	--	--	--	--	--	--	--	--	--

DATE	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)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	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)
NOV											
04...	3.7	0.2	4.2	490	0.66	271	<0.10	--	0.05	0.45	0.5
DEC											
18...	3.3	0.3	8.8	470	0.64	179	0.40	0.60	0.21	0.39	0.6
MAY											
30...	3.6	0.1	6.5	170	0.23	532	<0.10	0.10	0.07	0.73	0.8
JUL											
16...	--	--	--	--	--	--	<0.10	--	0.05	0.45	0.5

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986--Continued

DATE	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)
NOV										
04...	0.06	<1	55	<1	<1	<3	1	--	<1	<1
DEC										
18...	0.08	<1	76	2	<1	170	2	--	<1	<1
MAY										
30...	0.14	<1	39	<1	<1	23	<1	0.1	<1	<1
JUL										
16...	0.05	<1	62	<1	<1	6	<5	<0.1	<1	<1

DATE	TIME	DICAMBA (MED-IBEN) (BAN-VEL D) TOTAL (UG/L) (82052)	PICLO-RAM (TOR-DON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)
JUN							
25...	0800	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
JUL							
16...	0830	0.01	0.02	0.02	<0.01	<0.01	<0.01
SEP							
22...	1325	0.01	0.04	0.01	<0.01	<0.01	<0.01

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	823	792	832	846	790	770	809	497	274	442	806	791
2	816	797	826	838	806	762	749	502	258	512	815	822
3	812	796	820	820	803	861	750	475	226	514	814	761
4	770	789	816	818	797	915	754	392	244	514	788	759
5	754	789	824	846	789	989	768	335	280	512	815	729
6	766	806	821	879	804	990	780	347	288	574	813	716
7	769	794	806	826	808	985	802	373	296	566	822	721
8	781	795	804	807	864	1010	798	360	265	575	810	672
9	780	790	799	793	896	1010	770	428	250	555	837	663
10	794	784	789	781	897	1000	716	456	296	577	840	658
11	800	812	784	769	927	1000	670	502	287	573	827	664
12	804	903	816	766	946	1000	651	487	306	630	805	667
13	772	949	849	760	963	1000	649	501	277	625	825	683
14	771	909	842	779	960	1000	627	473	280	675	833	689
15	792	927	808	789	932	998	649	482	278	655	829	705
16	806	906	788	797	900	967	681	496	274	647	812	695
17	810	817	766	793	862	995	668	509	284	671	828	695
18	798	811	763	775	839	961	689	529	291	665	869	708
19	793	840	762	747	806	967	680	533	315	704	874	709
20	791	860	763	777	827	960	679	513	310	712	881	706
21	793	948	778	731	865	990	685	440	329	726	874	704
22	794	980	775	757	866	960	633	366	328	706	874	715
23	792	1000	768	802	857	966	631	311	351	714	867	716
24	770	1010	774	802	837	1010	471	378	381	712	892	719
25	768	991	798	813	444	1000	434	378	373	765	891	715
26	764	937	815	795	369	995	446	366	387	787	877	687
27	761	910	852	820	463	949	487	337	401	785	889	682
28	780	901	854	824	563	972	466	330	412	773	884	665
29	782	881	855	813	---	930	488	300	425	776	943	673
30	797	855	868	781	---	908	494	299	434	785	857	670
31	771	---	865	788	---	860	---	261	---	823	833	---
MEAN	786	869	809	798	803	957	652	418	313	653	846	705

WTR YR 1986 MEAN 718 MAX 1010 MIN 226

06307500 TONGUE RIVER AT TONGUE RIVER DAM, NEAR DECKER, MT

LOCATION.--Lat 45°08'29", long 106°46'15", in SW¼SE¼SE¼ sec.12, T.8 S., R.40 E., Big Horn County, Hydrologic Unit 10090101, on left bank 0.5 mi downstream from Tongue River Dam, 4 mi upstream from Post Creek, 8 mi northeast of Decker, 16 mi southeast of Kirby, and at mile 188.4.

DRAINAGE AREA.--1,770 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,344.40 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--No estimated daily discharges this year. Water-discharge records good. Flow regulated by Tongue River Reservoir (station number 06307000) and many small reservoirs, combined capacity, about 15,000 acre-ft. Diversion for irrigation of about 64,800 acres upstream from station.

AVERAGE DISCHARGE.--47 years, 457 ft^3/s, 331,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft^3/s May 20, 1978, gage height, 10.00 ft, from floodmark in gage well; no flow part of each day Nov. 12, 13, 1969, when gates at dam were closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,650 ft^3/s June 5, 7, gage height, 4.81 ft; minimum daily, 82 ft^3/s Oct. 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	142	244	196	191	188	211	371	335	492	605	504	437
2	142	244	196	191	188	211	371	339	488	606	500	417
3	145	244	196	191	188	210	371	339	498	559	500	368
4	147	221	192	192	188	210	371	342	758	525	498	298
5	147	191	191	193	188	210	371	348	2110	527	496	251
6	149	191	191	192	188	209	371	401	2610	529	496	253
7	149	196	191	191	188	229	371	474	2590	529	493	252
8	151	204	191	192	188	278	371	481	2570	479	492	253
9	151	204	191	191	188	279	370	486	2570	433	490	253
10	152	204	191	191	188	279	371	490	2580	512	488	251
11	155	204	191	191	188	281	371	491	2580	591	488	251
12	156	202	191	191	188	281	371	491	2590	587	488	253
13	158	201	191	191	188	281	371	490	2590	586	488	253
14	158	201	192	191	188	281	371	492	2410	583	485	253
15	160	201	193	191	188	281	397	490	2300	581	479	251
16	161	201	192	191	189	281	446	488	1870	578	479	250
17	161	201	191	191	188	282	439	490	1620	581	477	250
18	161	201	191	191	188	281	424	491	1220	583	475	250
19	161	201	191	191	188	282	356	491	925	582	475	250
20	160	201	191	191	188	282	324	492	927	582	470	249
21	161	200	191	191	188	282	321	492	1040	580	466	247
22	161	199	191	191	188	284	321	495	1130	578	464	248
23	161	199	191	191	186	284	324	499	1130	472	463	247
24	161	199	192	191	186	317	325	503	1130	514	462	246
25	161	199	191	191	188	375	327	504	1130	513	458	246
26	161	199	191	191	203	375	328	507	1120	509	454	246
27	161	199	191	191	207	375	328	505	1010	509	452	246
28	161	197	191	189	209	375	331	503	823	508	450	246
29	82	196	191	188	---	375	333	500	737	506	448	246
30	171	196	191	188	---	375	334	497	663	505	445	246
31	245	---	191	188	---	374	---	495	---	505	439	---
TOTAL	4852	6140	5942	5915	5316	8930	10851	14441	46211	16837	14762	8007
MEAN	157	205	192	191	190	288	362	466	1540	543	476	267
MAX	245	244	196	193	209	375	446	507	2610	606	504	437
MIN	82	191	191	188	186	209	321	335	488	433	439	246
AC-FT	9620	12180	11790	11730	10540	17710	21520	28640	91660	33400	29280	15880

CAL YR 1985	TOTAL	87402.5	MEAN	239	MAX	889	MIN	9.5	AC-FT	173400
WTR YR 1986	TOTAL	148204	MEAN	406	MAX	2610	MIN	82	AC-FT	294000

06307500 TONGUE RIVER AT TONGUE RIVER DAM, NEAR DECKER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1980 to current year.

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily (water years 1981-82, 1984-86), 932 microsiemens, Mar. 12, 14, 1981; minimum daily, 230 microsiemens, July 1, 1983.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 888 microsiemens Dec. 4, 15; minimum daily, 293 microsiemens June 14.

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 WATER (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										
16...	0915	161	0	0	865	23.0	7.0	673	10.8	101
NOV										
05...	1125	195	100	51	823	4.0	7.0	677	11.5	107
DEC										
18...	1505	187	100	2	880	2.5	2.0	682	12.6	102
JAN										
28...	0920	183	80	1	846	5.0	2.0	675	12.7	104
MAR										
06...	1045	204	100	2	780	4.5	2.0	683	12.5	101
APR										
14...	1250	376	0	0	749	2.0	8.5	685	10.9	104
JUN										
03...	1235	486	50	1	518	31.5	16.0	675	9.4	108
10...	0930	2580	--	--	325	17.0	18.0	--	--	--
JUL										
15...	0920	582	60	1	339	26.0	20.5	676	7.6	96
AUG										
12...	0910	488	0	0	455	23.0	22.0	677	7.8	101
SEP										
23...	0910	246	--	--	695	7.0	14.0	--	--	--

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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
16...	0915	8.40	360	150	65	48	40	0.9	4.2	213
NOV										
05...	1125	8.40	370	150	69	48	38	0.9	3.8	219
DEC										
18...	1505	8.00	410	150	80	51	37	0.8	3.8	258
JAN										
28...	0920	8.20	410	140	80	51	38	0.8	3.8	270
MAR										
06...	1045	8.30	350	120	67	44	39	0.9	5.2	225
APR										
14...	1250	8.30	320	130	59	42	41	1	5.5	189
JUN										
03...	1235	8.20	220	68	45	27	24	0.7	2.9	156
JUL										
15...	0920	8.10	150	33	34	17	13	0.5	2.0	122
AUG										
12...	0910	7.80	200	52	41	24	20	0.6	2.6	149

06307500 TONGUE RIVER AT TONGUE RIVER DAM, NEAR DECKER, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
OCT 16...	230	4.4	0.30	2.0	520	0.71	227	<0.100	0.040	0.56
NOV 05...	210	3.8	0.30	0.5	500	0.69	266	<0.100	0.050	0.55
DEC 18...	210	4.3	0.30	6.1	550	0.74	276	0.200	0.150	0.35
JAN 28...	200	5.0	0.30	8.9	550	0.75	271	0.300	0.120	0.38
MAR 06...	200	4.5	0.20	8.5	500	0.68	277	0.400	0.320	0.58
APR 14...	210	4.7	0.30	5.3	480	0.65	489	<0.100	0.090	0.71
JUN 03...	120	3.4	0.20	5.8	320	0.44	422	<0.100	0.130	0.37
JUL 15...	61	1.5	0.20	5.5	210	0.28	326	<0.100	0.130	0.47
AUG 12...	96	2.2	0.20	2.4	280	0.38	366	<0.100	0.080	0.52

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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 16...	0.60	0.020	--	--	110	8	21	9.1	92
NOV 05...	0.60	0.030	--	--	100	<3	40	21	83
DEC 18...	0.50	0.030	--	--	90	7	54	27	44
JAN 28...	0.50	0.050	4.1	0.3	90	7	30	15	68
MAR 06...	0.90	0.140	6.3	0.6	70	32	42	23	87
APR 14...	0.80	0.060	7.0	1.0	70	24	21	21	91
JUN 03...	0.50	0.040	7.0	0.2	50	10	5	6.6	85
JUL 15...	0.60	0.040	--	--	30	39	213	335	74
AUG 12...	0.60	0.040	--	--	50	11	13	17	55

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
JAN 28...	0920	--	1	--	<0.5	--	<1	--	<10	--	1	--
JUN 03...	1235	1	<1	10	<0.5	<1	<1	<10	<10	8	4	140

DATE	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
JAN 28...	--	2	--	51	--	<0.1	--	1	--	<1	--	15
JUN 03...	2	1	60	38	<0.10	<0.1	3	2	<1	<1	10	7

06307500 TONGUE RIVER AT TONGUE RIVER DAM, NEAR DECKER, MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	833	787	871	840	850	719	720	756	543	313	415	607
2	810	792	877	826	855	744	715	776	553	320	424	582
3	846	784	883	839	841	746	716	761	538	317	436	628
4	809	788	888	825	844	774	713	762	521	320	434	632
5	829	787	885	842	834	777	711	725	502	332	444	633
6	822	791	881	845	846	790	727	725	439	326	451	681
7	840	784	884	847	845	821	746	732	430	327	460	676
8	823	775	881	830	843	806	767	724	408	321	465	672
9	826	777	860	846	840	809	745	699	355	329	462	702
10	813	777	865	844	841	824	754	694	353	347	472	694
11	815	778	863	830	854	833	762	674	314	347	476	697
12	830	778	882	838	834	855	765	679	308	346	475	709
13	805	779	861	831	836	867	748	678	314	347	491	692
14	814	781	869	854	840	872	754	663	293	357	498	687
15	803	776	888	853	846	878	756	649	315	364	506	698
16	804	779	865	825	846	884	757	631	301	365	509	709
17	800	778	868	850	849	881	760	624	306	381	536	699
18	806	782	864	835	852	870	770	606	294	376	537	700
19	810	784	871	845	853	852	770	623	307	385	543	699
20	814	792	869	839	856	846	771	616	301	381	553	690
21	812	805	867	847	854	855	773	621	300	385	553	702
22	802	815	863	834	859	856	773	598	307	383	552	675
23	799	818	880	844	862	816	772	580	305	393	553	668
24	796	816	864	845	865	792	775	576	300	391	562	689
25	797	824	878	846	865	788	770	560	302	399	577	683
26	793	831	870	835	842	712	771	561	302	405	594	665
27	801	840	868	826	800	719	767	564	315	397	601	656
28	789	849	866	838	745	741	763	552	315	402	610	683
29	807	848	865	841	---	743	750	550	315	401	608	692
30	816	861	843	828	---	723	745	550	317	407	618	696
31	809	---	835	842	---	739	---	546	---	403	611	---
MEAN	812	799	870	839	843	804	753	647	359	363	517	677

WTR YR 1986 MEAN 689 MAX 888 MIN 293

06307570 HANGING WOMAN CREEK BELOW HORSE CREEK, NEAR BIRNEY, MT

LOCATION.--Lat 45°08'02", long 106°29'00", on section line 17-20, T.8 S., R.43 E., Big Horn County, Hydrologic Unit 10090101, at county road bridge, 0.6 mi downstream from Horse Creek, 0.8 mi upstream from Circle Bar Draw, and 13.2 mi southeast of Birney.

DRAINAGE AREA.--321 mi2.

PERIOD OF RECORD.--Water years 1978-83, January to September 1986.

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 WATER (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)
JAN 29...	0910	0.23	50	1	4180	-2.0	0.0	677	7.2	56
FEB 28...	1230	109	5	1	473	7.5	0.0	677	11.6	89
APR 15...	1100	0.86	5	1	4550	8.0	8.0	679	11.4	110
JUN 10...	1310	0.78	50	1	4850	19.5	21.0	680	7.2	92
JUL 15...	1355	0.26	100	2	3800	25.5	24.5	673	7.1	98
AUG 12...	1320	0.21	50	1	5270	28.0	23.0	675	7.6	102
SEP 23...	1140	0.42	0	0	5700	13.5	14.0	670	7.8	88

DATE	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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
JAN 29...	--	1200	670	160	200	600	8	13	552	2000
FEB 28...	7.90	120	60	20	17	52	2	8.6	60	170
APR 15...	8.30	1100	730	70	220	680	9	12	352	2200
JUN 10...	8.10	1500	1000	180	250	760	9	15	452	2600
JUL 15...	8.10	1200	660	140	200	540	7	16	509	1800
AUG 12...	8.20	1100	0	130	200	620	8	18	--	2100
SEP 23...	8.20	1600	0	170	280	920	10	17	--	3100

DATE	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)	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)
JAN 29...	19	0.80	14	3300	4.5	2.1	0.200	0.220	0.58	0.80
FEB 28...	2.8	<0.10	4.0	310	0.42	91	0.200	0.600	1.8	2.4
APR 15...	17	0.80	9.4	3400	4.7	7.9	<0.100	0.200	0.60	0.80
JUN 10...	19	0.70	4.5	4100	5.6	8.6	<0.100	0.100	0.80	0.90
JUL 15...	4.0	0.80	8.3	3000	4.1	2.1	<0.100	0.230	0.77	1.0
AUG 12...	19	0.80	10	--	--	--	<0.100	0.070	0.83	0.90
SEP 23...	22	0.60	6.3	--	--	--	<0.100	0.050	1.2	1.2

06307570 HANGING WOMAN CREEK BELOW HORSE CREEK, NEAR BIRNEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)
JAN 29...	0.020	--	--	--	310	20	155	0.10	25
FEB 28...	0.520	19	19	--	20	190	--	--	--
APR 15...	0.040	--	--	0.8	280	40	57	0.13	54
JUN 10...	0.050	--	--	--	340	30	70	0.15	82
JUL 15...	0.050	--	--	--	320	30	134	0.09	58
AUG 12...	0.080	--	10	0.8	410	70	50	0.03	76
SEP 23...	0.140	--	--	--	320	40	60	0.07	79

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
FEB 28...	1230	2	1	<10	<0.5	<1	<1	<10	<10	10	3	3500
AUG 12...	1320	--	3	--	<10	--	<1	--	<10	--	3	--

DATE	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
FEB 28...	4	6	170	75	<0.10	<0.1	6	<1	<1	<1	60	17
AUG 12...	--	<5	--	130	--	<0.1	--	3	--	1	--	20

06307600 HANGING WOMAN CREEK NEAR BIRNEY, MT

LOCATION.--Lat 45°17'57", long 106°30'28", in N½NW¼SE¼ sec.19, T.6 S., R.43 E., Rosebud County, Hydrologic Unit 10090101, on right bank 0.5 mi downstream from bridge on Birney-Otter road, 1.2 mi south of Birney, 1.2 mi downstream from East Fork, and at mile 3.3.

DRAINAGE AREA.--470 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1973 to September 1984, October 1985 to current year.

REVISED RECORDS.--WDR MT-82-1: 1980 (M).

GAGE.--Water-stage recorder. Elevation of gage is 3,150 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 3. Water-discharge records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 1,240 acres upstream from station.

AVERAGE DISCHARGE.--12 years, 4.14 ft^3/s, 3,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,060 ft^3/s May 19, 1978, gage height, 11.56 ft, from rating curve extended above 360 ft^3/s on basis of slope-area measurement of peak flow; no flow most days August and September 1981 and July, August and September 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	0130	*a530	*b7.17	No other peak greater than base discharge.			

a about

b backwater from ice

Minimum discharge, 0.25 ft^3/s Oct. 3, 17, and 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	.33	.63	.40	1.0	1.0	40	4.7	1.6	2.4	1.8	.58	1.1
2	.33	.65	.35	1.0	1.0	8.0	4.6	1.7	2.3	1.6	.55	.95
3	.30	.70	.45	.90	.90	4.5	4.7	2.2	2.2	1.3	.52	.88
4	.31	.69	1.0	.90	.80	3.1	5.0	2.3	2.7	1.3	.54	.76
5	.34	.69	1.0	.80	.80	2.4	4.7	2.2	2.4	1.3	.48	.63
6	.36	.69	.90	.90	.70	4.8	4.7	2.3	3.6	1.2	.44	.66
7	.40	.75	1.0	1.0	.70	13	4.4	2.4	3.3	1.2	.48	.64
8	.49	.80	.90	1.0	.70	14	4.3	2.8	5.9	1.4	.45	.62
9	.51	.80	.90	1.0	.70	22	4.1	3.3	3.4	1.3	.44	.70
10	.51	.75	.80	1.0	.70	19	4.1	3.1	2.3	1.3	.49	.93
11	.51	.70	.50	.90	.60	16	4.1	2.7	1.5	1.2	.46	.85
12	.49	.70	.50	.90	.60	13	4.2	3.4	1.5	1.2	.50	.76
13	.54	.75	.60	.90	.70	11	4.3	3.9	1.3	1.1	.58	.74
14	.51	.75	.80	1.0	.70	10	4.4	4.0	2.1	1.1	.63	.66
15	.50	.75	1.0	1.0	.70	9.5	4.3	3.3	2.0	1.1	.56	.74
16	.46	.70	.90	1.0	.80	3.0	4.1	2.4	1.8	1.1	.47	.75
17	.42	.70	1.0	1.0	.80	2.8	4.1	2.4	1.7	1.1	.44	.76
18	.44	.65	.90	1.0	.80	3.9	3.9	2.3	1.5	1.0	.41	.74
19	.48	.65	1.0	1.0	.70	3.0	3.9	2.2	1.4	.98	.37	.94
20	.49	.50	1.0	1.0	.70	3.0	3.9	2.7	1.7	.97	.37	1.2
21	.54	.40	1.0	.90	.80	4.2	3.9	3.2	2.4	.98	.37	3.2
22	.57	.40	1.0	.80	.90	8.8	3.7	3.3	1.8	.94	.41	2.3
23	.57	.40	.90	.90	1.0	7.0	2.6	3.3	2.0	.92	.34	1.8
24	.51	.40	.90	1.0	1.5	6.9	1.8	3.1	2.6	.86	.32	2.0
25	.56	.45	.80	1.0	7.0	6.2	2.0	3.1	2.6	.93	.33	3.2
26	.55	.40	.90	.90	150	6.6	2.3	3.0	2.4	.86	.32	1.8
27	.61	.45	.90	.90	340	5.8	2.1	3.0	2.2	.80	.35	1.4
28	.59	.45	.90	.90	100	5.6	1.9	2.9	2.1	.72	.37	2.1
29	.56	.45	1.0	.95	---	5.2	1.8	2.7	2.1	.68	.41	2.0
30	.61	.45	1.0	.95	---	5.2	1.8	2.7	1.9	.61	.40	1.7
31	.67	---	.90	.95	---	4.9	---	2.5	---	.60	.59	---
TOTAL	15.06	18.25	26.10	29.35	616.30	272.4	110.4	86.0	69.1	33.45	13.97	37.51
MEAN	.49	.61	.84	.95	22.0	8.79	3.68	2.77	2.30	1.08	.45	1.25
MAX	.67	.80	1.0	1.0	340	40	5.0	4.0	5.9	1.8	.63	3.2
MIN	.30	.40	.35	.80	.60	2.4	1.8	1.6	1.3	.60	.32	.62
AC-FT	30	36	52	58	1220	540	219	171	137	66	28	74

WTR YR 1986 TOTAL 1327.89 MEAN 3.64 MAX 340 MIN .30 AC-FT 2630

06307600 HANGING WOMAN CREEK NEAR BIRNEY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1980 to July 1983, October 1985 to September 1986.

REMARKS.--Unpublished records of once-daily temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 3,780 microsiemens, July 3, 1986; minimum daily, 263 microsiemens, Feb. 27, 1986.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 3,780 microsiemens, July 3; minimum daily, 263 microsiemens, Feb. 27.

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 WATER (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										
15...	1305	0.50	60	1	2910	20.0	8.5	680	11.6	112
NOV										
06...	0925	0.67	25	1	2720	3.0	3.0	682	10.5	88
DEC										
19...	1005	1.0	100	2	2790	2.5	0.0	685	10.6	82
JAN										
29...	1225	0.95	100	2	2910	1.0	0.0	682	10.8	83
FEB										
27...	1510	360	5	1	245	17.5	0.5	691	10.5	80
28...	0850	154	--	--	426	0.0	--	--	--	--
MAR										
05...	1340	2.4	5	1	1810	13.0	6.5	685	8.2	75
APR										
16...	0915	4.2	40	1	3370	10.5	9.5	676	9.6	96
MAY										
09...	1050	3.3	--	--	2990	2.0	5.0	--	--	--
JUN										
11...	1230	1.6	0	0	2880	25.0	22.0	683	9.4	121
JUL										
16...	1310	1.1	10	0	3500	26.5	25.5	677	7.7	108
AUG										
13...	1000	0.54	--	--	3580	20.5	20.0	--	--	--
SEP										
24...	1405	1.7	--	--	3400	19.0	14.0	--	--	--

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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
15...	1305	8.20	780	260	100	130	380	6	16	528
NOV										
06...	0925	8.40	830	310	120	130	370	6	14	528
DEC										
19...	1005	7.90	850	320	95	150	390	6	14	536
JAN										
29...	1225	--	1100	570	230	130	380	5	14	542
FEB										
27...	1510	7.90	85	35	16	11	29	1	6.2	50
MAR										
05...	1340	8.10	510	170	74	80	220	4	14	347
APR										
16...	0915	8.20	850	510	60	170	450	7	15	343
JUN										
11...	1230	8.20	880	480	140	130	340	5	17	402
JUL										
16...	1310	8.20	1000	530	120	180	470	6	19	513

06307600 HANGING WOMAN CREEK NEAR BIRNEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
OCT 15...	990	24	1.1	13	2000	2.7	2.7	<0.100	0.070	0.43
NOV 06...	990	28	1.1	14	2000	2.7	3.6	<0.100	0.060	0.54
DEC 19...	1100	7.8	1.1	19	2100	2.9	5.7	<0.100	0.190	0.31
JAN 29...	1200	50	1.0	16	2300	3.2	6.0	<0.100	0.070	0.43
FEB 27...	98	4.0	<0.10	3.0	200	0.27	192	0.200	0.350	1.4
MAR 05...	640	9.3	0.70	13	1300	1.7	8.2	0.200	0.400	1.0
APR 16...	1400	16	1.0	13	2300	3.2	26	<0.100	0.250	0.75
JUN 11...	1200	14	0.80	8.8	2100	2.8	9.0	<0.100	0.130	0.57
JUL 16...	1500	140	1.0	6.4	2700	3.7	8.2	<0.100	0.080	0.62

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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 15...	0.50	0.010	--	--	300	40	52	0.07	64
NOV 06...	0.60	0.020	--	--	290	30	77	0.14	72
DEC 19...	0.50	0.010	--	--	250	50	122	0.33	29
JAN 29...	0.50	0.010	--	--	270	<10	117	0.30	44
FEB 27...	1.7	0.210	13	--	30	210	650	632	96
MAR 05...	1.4	0.110	9.6	1.1	160	59	93	0.60	83
APR 16...	1.0	0.050	--	0.7	280	30	114	1.3	48
JUN 11...	0.70	0.050	--	--	280	40	--	--	--
JUL 16...	0.70	0.040	8.0	0.8	340	30	81	0.24	70

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
FEB 27...	1510	4	1	<10	<0.5	<1	<1	20	<10	21	3	13000
JUL 16...	1310	--	3	--	<10	--	<1	--	<10	--	1	--

DATE	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
FEB 27...	11	4	470	61	<0.10	<0.1	14	<1	1	<1	100	6
JUL 16...	--	<5	--	40	--	<0.1	--	2	--	<1	--	10

06307600 HANGING WOMAN CREEK NEAR BIRNEY, MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2570	2630	3230	2760	2670	612	3290	3120	3350	3690	3480	3180
2	2560	2640	3230	2760	2670	764	3310	3160	3360	3720	3500	3180
3	2580	2640	3220	2770	2660	1080	3310	3130	3360	3780	3520	3180
4	2590	2650	3100	2850	2610	1370	3290	3180	3270	3750	3520	3150
5	2600	2670	3100	2860	2590	1760	3280	3180	3260	3750	3520	3180
6	2580	2670	3090	2890	2590	1960	3290	3190	3210	3710	3540	3210
7	2600	2640	2930	2890	2600	2310	3290	3120	3220	3700	3520	3240
8	2540	2590	3250	2860	2590	2460	3280	3040	3060	3650	3500	3260
9	2560	2600	2940	2830	2730	2540	3310	2940	3080	3660	3520	3200
10	2520	2610	2910	2840	2740	2640	3300	2940	2790	3610	3520	3150
11	2490	2700	2900	2830	2760	2730	3330	2980	2940	3620	3530	3090
12	2560	2760	2910	2860	2870	2770	3310	3010	2980	3620	3520	3090
13	2490	2750	2850	2880	2830	2840	3300	3170	3070	3490	3520	3110
14	2580	2820	2920	2880	2810	2900	3290	3180	3040	3500	3450	3160
15	2610	2830	2920	2870	2800	2940	3280	3320	3090	3500	3460	3180
16	2600	2810	2860	2890	2810	2970	3270	3300	3040	3500	3470	3220
17	2620	2840	2800	2870	2850	2940	3270	3220	3130	3500	3480	3200
18	2620	3190	2800	2840	2870	3000	3290	3180	3190	3470	3480	3210
19	2620	3070	2780	2830	2880	3110	3310	3210	3200	3480	3500	3120
20	2580	3020	2780	2780	2860	3100	3310	3180	3190	3480	3470	3100
21	2560	3030	2790	2780	2860	3120	3290	3210	3180	3480	3470	3080
22	2560	3030	2740	2840	2830	3140	3290	3270	3200	3470	3490	3300
23	2570	3100	2790	2850	2820	3210	3310	3290	3340	3490	3520	3260
24	2580	3110	2730	2760	2720	3230	3310	3330	3370	3470	3540	3290
25	2590	3290	2710	2780	2600	3260	3140	3310	3260	3460	3520	3140
26	2590	3280	2700	2840	967	3280	3060	3320	3260	3460	3500	2960
27	2590	3220	2740	2850	263	3290	3050	3330	3330	3460	3510	3090
28	2610	3220	2740	2840	452	3300	3070	3330	3420	3470	3480	3090
29	2650	3220	2780	2790	---	3310	3080	3370	3540	3470	3470	2980
30	2650	3220	2790	2790	---	3320	3080	3360	3620	3470	3460	3080
31	2610	---	2810	2740	---	3320	---	3340	---	3480	3430	---
MEAN	2580	2900	2900	2830	2510	2660	3250	3200	3210	3560	3500	3160

WTR YR 1986 MEAN 3020 MAX 3780 MIN 263

06307616 TONGUE RIVER AT BIRNEY DAY SCHOOL BRIDGE, NEAR BIRNEY, MT

LOCATION.--Lat 45°24'42", long 106°27'26", in SE¼SW¼SW¼ sec.8, T.5 S., R.43 E., Rosebud County, Hydrologic Unit 10090102, on left bank, 60 ft upstream from Bureau of Indian Affairs bridge, 0.2 mi east of Birney Day School, 5.5 mi downstream from Cook Creek, 6.5 mi northeast of Birney, and at mile 144.3.

DRAINAGE AREA.--2,621 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 3,060 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 9 to Mar. 7. Water-discharge records good except those for Nov. 16-22 and Feb. 14 to Mar. 3, which are poor. Flow regulated by Tongue River Reservoir (station number 06307000), and many small reservoirs in Wyoming (combined capacity, about 15,000 acre-ft. Numerous diversions for irrigation upstream from station.

AVERAGE DISCARGE.--7 years, 399 ft^3/s, 289,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,520 ft^3/s June 14, 1984, gage height, 6.43 ft, from rating curve extended above 2,700 ft^3/s; minimum daily, 52 ft^3/s Mar. 27, 1982.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,670 ft^3/s June 8, gage height, 5.20 ft; minimum daily, 100 ft^3/s Nov. 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	165	230	205	200	230	500	376	313	443	598	442	517
2	166	232	205	200	230	350	377	313	450	578	437	421
3	170	235	205	200	220	240	376	313	445	574	442	388
4	170	235	200	200	210	240	378	314	556	512	442	348
5	166	216	200	210	200	250	374	324	966	500	444	278
6	167	185	200	200	200	250	372	321	2400	481	439	242
7	169	186	200	200	200	280	372	389	2400	490	436	237
8	171	196	200	200	200	293	371	452	2500	497	440	237
9	168	190	200	200	200	318	372	461	2450	424	451	241
10	169	190	200	200	200	313	372	444	2480	419	456	245
11	169	180	200	210	200	312	372	438	2500	540	465	232
12	171	200	200	210	200	308	371	438	2510	574	458	236
13	174	200	200	210	200	307	375	441	2520	568	441	244
14	170	200	200	200	210	304	371	445	2490	570	445	245
15	170	210	210	200	220	301	368	444	2240	572	440	247
16	170	170	200	210	220	298	406	444	2180	571	435	246
17	170	140	200	210	220	297	438	444	1610	569	431	251
18	171	120	200	210	220	304	419	441	1570	567	430	248
19	173	100	205	210	230	299	407	442	990	564	427	260
20	174	110	200	200	250	295	325	441	933	563	423	249
21	173	150	200	200	260	294	310	424	938	568	415	250
22	176	190	200	200	280	295	304	426	1090	562	412	250
23	175	210	200	210	310	294	303	425	1120	552	405	249
24	174	210	200	210	350	294	305	426	1120	427	405	259
25	175	210	200	210	500	339	307	429	1110	461	406	289
26	176	210	200	210	800	379	317	430	1100	460	407	252
27	177	210	200	210	1000	378	316	428	1090	461	402	251
28	178	210	200	220	800	376	306	431	901	468	399	251
29	176	210	200	220	---	378	308	434	734	450	410	255
30	139	210	200	230	---	377	313	435	714	446	403	252
31	131	---	200	230	---	378	---	435	---	445	425	---
TOTAL	5243	5745	6230	6430	8560	9841	10681	12785	44550	16031	13313	8170
MEAN	169	192	201	207	306	317	356	412	1485	517	429	272
MAX	178	235	210	230	1000	500	438	461	2520	598	465	517
MIN	131	100	200	200	200	240	303	313	443	419	399	232
AC-FT	10400	11400	12360	12750	16980	19520	21190	25360	88360	31800	26410	16210

CAL YR 1985	TOTAL	85828	MEAN	235	MAX	866	MIN	69	AC-FT	170200
WTR YR 1986	TOTAL	147579	MEAN	404	MAX	2520	MIN	100	AC-FT	292700

06307616 TONGUE RIVER AT BIRNEY DAY SCHOOL BRIDGE, NEAR BIRNEY, MT--Continued

WATER-QUALITY RECORD

PERIOD OF RECORD.--Water years 1980 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 WATER (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										
15...	1120	170	70	1	923	22.0	9.0	683	10.4	101
NOV										
06...	1235	186	50	1	810	9.0	6.0	684	11.1	100
DEC										
19...	1350	208	100	2	860	0.5	0.0	685	10.6	81
JAN										
31...	1055	232	80	2	825	4.5	0.0	680	13.0	100
MAR										
05...	1010	246	20	1	740	8.0	0.5	687	12.1	93
APR										
16...	1310	438	80	1	785	15.0	9.5	676	9.6	95
JUN										
06...	1040	2470	50	1	479	19.5	18.5	680	6.3	76
09...	1300	2480	--	--	402	16.5	17.5	--	--	--
JUL										
18...	1020	570	30	1	392	26.0	22.5	686	7.0	90
AUG										
13...	1155	434	50	1	498	19.0	20.0	685	7.6	93

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
OCT										
15...	1120	8.30	360	140	63	49	46	1	4.5	222
NOV										
06...	1235	8.40	370	140	66	50	44	1	4.1	228
DEC										
19...	1350	8.00	400	130	77	51	41	0.9	3.8	268
JAN										
31...	1055	--	390	130	72	50	43	1	3.8	255
MAR										
05...	1010	8.40	320	99	61	41	41	1	4.6	222
APR										
16...	1310	8.60	330	130	59	44	49	1	5.6	197
JUN										
06...	1040	8.00	210	0	42	25	23	0.7	2.8	141
JUL										
18...	1020	8.10	170	36	37	19	17	0.6	2.3	135
AUG										
13...	1155	8.10	210	49	42	25	23	0.7	3.0	159

06307616 TONGUE RIVER AT BIRNEY DAY SCHOOL BRIDGE, NEAR BIRNEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
OCT										
15...	240	4.6	0.30	2.0	540	0.74	249	<0.100	0.040	0.46
NOV										
06...	220	4.0	0.30	1.0	530	0.72	264	<0.100	0.040	0.36
DEC										
19...	220	4.2	0.30	5.2	560	0.77	316	0.200	0.360	0.34
JAN										
31...	210	4.9	0.30	5.4	540	0.74	340	0.100	0.040	0.36
MAR										
05...	180	4.5	0.20	7.0	470	0.64	314	0.300	0.150	0.65
APR										
16...	230	4.4	0.30	2.3	510	0.70	606	<0.100	0.090	1.0
JUN										
06...	110	2.3	0.20	6.4	300	0.40	1980	<0.100	0.210	1.4
JUL										
18...	77	1.4	0.20	3.6	240	0.32	367	<0.100	0.040	0.46
AUG										
13...	100	2.2	0.30	2.2	290	0.40	343	<0.100	<0.010	--

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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									
15...	0.50	<0.010	--	--	110	15	18	8.3	64
NOV									
06...	0.40	0.010	--	--	100	<3	38	19	73
DEC									
19...	0.70	0.010	--	--	90	22	47	26	33
JAN									
31...	0.40	0.010	--	--	80	17	29	18	50
MAR									
05...	0.80	0.090	7.0	1.6	70	27	76	50	84
APR									
16...	1.1	0.080	7.2	1.3	80	11	36	43	99
JUN									
06...	1.6	0.670	6.5	5.0	50	31	780	5200	78
JUL									
18...	0.50	0.050	--	--	40	15	64	98	71
AUG									
13...	0.50	0.030	4.8	--	50	6	27	32	83

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	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)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)
JUN								
06...	1040	2	1	<0.5	<1	--	1	--
AUG								
13...	1155	--	1	<0.5	<1	<10	2	<5

DATE	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
JUN							
06...	9	<0.10	<0.1	3	<1	--	--
AUG							
13...	5	--	<0.1	1	--	<1	9

06308500 TONGUE RIVER AT MILES CITY, MT
(National stream quality accounting network station)

LOCATION.--Lat 46°20'44", long 105°48'10", in NE¼NE¼SE¼ sec.23, T.7 N., R.47 E., Custer County, Hydrologic Unit 10090102, on right bank 4 mi south of Miles City and at mile 8.1.

DRAINAGE AREA.--5,379 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,375.76 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). April 1938 to April 1942, nonrecording gage at site 8 mi upstream at different datum. April 1946 to Sept. 30, 1963, at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 23 to Feb. 27. Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulation by Tongue River Reservoir (station 06307000), and many small reservoirs in Wyoming (combined capacity about 15,000 acre-ft). Diversions for irrigation of about 100,800 acres upstream from station.

AVERAGE DISCHARGE.--43 years (1938-41, 1946-86), 436 ft^3/s, 315,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft^3/s June 15, 1962, gage height, 12.33 ft, present datum, from rating curve extended above 8,220 ft^3/s on basis of float measurement; maximum gage height, 13.27 ft Mar. 19, 1960, Feb. 15, 1971 (ice jam), present datum; no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,620 ft^3/s Sept. 25, gage height, 6.57 ft; maximum gage height, 9.74 ft Feb. 26 (ice jam); minimum daily discharge, 99 ft^3/s Oct. 16.

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	110	320	210	200	230	2120	409	352	247	658	225	1360
2	116	320	190	210	220	1750	409	348	247	571	222	1260
3	112	310	210	190	210	1180	409	348	231	472	212	541
4	108	290	220	180	190	969	406	348	221	412	222	420
5	108	240	230	170	180	913	406	403	226	405	219	376
6	116	220	230	170	170	744	406	535	276	387	211	345
7	125	210	230	180	170	550	406	438	601	356	190	320
8	130	220	220	190	170	487	398	867	1850	341	181	278
9	118	210	210	200	160	462	398	2670	2470	329	183	252
10	114	190	200	200	140	443	395	2270	2440	301	191	240
11	116	180	200	210	150	436	398	905	2290	273	214	240
12	105	160	190	190	150	426	399	694	2270	247	225	240
13	108	180	170	200	160	413	398	593	2260	259	227	239
14	101	210	190	190	170	404	402	481	2270	299	257	231
15	103	220	200	170	180	398	402	432	2320	294	227	231
16	99	230	200	190	200	395	402	419	2290	278	218	231
17	114	240	210	200	180	387	413	428	2090	283	209	231
18	132	230	200	200	170	388	413	427	1940	275	223	231
19	193	210	210	200	170	387	424	424	1550	283	217	276
20	193	210	220	190	150	384	428	421	1430	281	212	316
21	198	160	230	180	160	384	428	404	1030	291	203	261
22	207	160	240	160	170	380	413	396	938	288	208	238
23	220	170	240	150	250	369	366	395	899	290	212	225
24	240	190	220	160	400	363	360	389	976	279	212	220
25	260	230	200	180	1000	366	362	380	960	267	212	1910
26	270	220	180	190	1700	359	366	368	952	264	212	1610
27	260	200	180	190	2500	352	398	356	896	224	208	527
28	260	170	180	170	2340	395	384	322	885	234	207	367
29	270	180	180	190	---	402	369	299	867	233	207	315
30	280	210	190	200	---	402	360	284	793	233	198	293
31	310	---	200	210	---	402	---	260	---	234	254	---
TOTAL	5196	6490	6380	5810	12040	17810	11927	17656	38715	9841	6618	13824
MEAN	168	216	206	187	430	575	398	570	1291	317	213	461
MAX	310	320	240	210	2500	2120	428	2670	2470	658	257	1910
MIN	99	160	170	150	140	352	360	260	221	224	181	220
AC-FT	10310	12870	12650	11520	23880	35330	23660	35020	76790	19520	13130	27420

CAL YR 1985	TOTAL	74325	MEAN	204	MAX	928	MIN	26	AC-FT	147400
WTR YR 1986	TOTAL	152307	MEAN	417	MAX	2670	MIN	99	AC-FT	302100

06308500 TONGUE RIVER AT MILES CITY, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946 to current year. October 1977 to December 1985 samples collected at private ranch bridge 11 mi upstream from gaging station.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1965 to September 1981.
WATER TEMPERATURE: April 1949 to September 1983.
SUSPENDED-SEDIMENT DISCHARGE: April 1946 to September 1951. October 1977 to December 1985 (discontinued).

REMARKS.--Flow affected by ice during most of winter months. Unpublished records of once-daily water temperature for October to December 1985 are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-81): Maximum daily, 1,520 microsiemens, May 24, 1981; minimum daily, 215 microsiemens, Feb. 16, 1971.
WATER TEMPERATURE (water years 1949-83): Maximum recorded, 31.0°C July 14, 1983; minimum 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 18,900 mg/L, Aug. 13, 1946; minimum daily mean, 1 mg/L, Aug. 14, 15, 1947.
SEDIMENT LOAD: Maximum daily, 122,000 tons, June 5, 1948; minimum daily, <0.1 ton on many days in August and September 1949.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 210 mg/L, Nov. 7; minimum daily mean, 43 mg/L, Nov. 1.
SEDIMENT LOAD: Maximum daily, 119 tons, Nov. 9; minimum daily, 24 tons, Oct. 16.

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 WATER (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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
03...	1420	116	--	--	978	9.5	10.0	--	--	--	--	--
DEC												
02...	1300	191	100	2	865	-30.0	0.0	699	13.2	99	K47	K140
JAN												
21...	1330	172	--	--	2480	-5.0	0.0	--	--	--	--	--
MAR												
14...	1040	401	--	--	1500	10.0	1.0	--	--	--	--	--
26...	0855	360	50	1	1020	6.0	6.0	710	11.2	97	K7	47
APR												
30...	1050	361	--	--	949	9.0	11.0	--	--	--	--	--
MAY												
13...	1330	609	--	--	872	26.0	14.5	--	--	--	--	--
JUN												
13...	0840	2200	--	--	370	14.5	20.0	--	--	--	--	--
18...	0800	2060	0	0	322	24.5	24.0	698	6.8	89	--	190
JUL												
30...	0835	215	--	--	650	17.5	19.5	--	--	--	--	--
SEP												
17...	0930	238	90	2	848	13.0	13.5	703	7.7	80	35	680

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)
DEC										
02...	1300	8.40	35	340	68	60	46	50	1	5.2
MAR										
26...	0855	8.50	0.60	400	160	71	55	80	2	6.3
JUN										
18...	0800	7.40	35	140	32	30	15	14	0.5	2.4
SEP										
17...	0930	8.20	17	--	--	--	--	--	--	5.0

06308500 TONGUE RIVER AT MILES CITY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BICARBONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
DEC										
02...	280	29	176	280	5.4	0.30	5.4	--	650	0.88
MAR										
26...	280	15	253	330	5.9	0.30	1.1	705	720	0.96
JUN										
18...	130	0	108	60	0.30	0.20	8.5	192	200	0.26
SEP										
17...	270	0	212	230	4.7	0.30	--	556	--	0.76

DATE	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
DEC									
02...	334	<0.010	<0.100	0.130	0.120	0.40	0.020	<0.010	0.010
MAR									
26...	685	<0.010	<0.100	0.110	0.090	0.60	0.020	<0.010	<0.010
JUN									
18...	1070	<0.010	0.200	0.140	0.050	1.1	0.280	0.020	<0.010
SEP									
17...	357	<0.010	<0.100	<0.010	--	0.50	0.150	0.010	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
DEC											
02...	1300	10	<1	79	<0.5	2	<1	<3	2	3	<1
MAR											
26...	0855	20	<1	74	<0.5	<1	<1	<3	2	11	1
JUN											
18...	0800	20	<1	46	<0.5	<1	<1	<3	2	5	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC										
02...	36	6	<0.1	<10	4	<1	<1	790	<6	16
MAR										
26...	31	6	<0.1	<10	1	<1	<1	750	<6	11
JUN										
18...	12	1	<0.1	<10	1	<1	<1	230	<6	<3

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
02...	1315	13.0	112	119	36	98
DEC						
02...	1300	0.0	191	123	63	49
MAR						
26...	0855	6.0	360	30	29	85
JUN						
18...	0800	24.0	2060	466	2590	79
SEP						
17...	0930	13.5	238	58	37	94

06308500 TONGUE RIVER AT MILES CITY, 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	168	50	43	37	79	45						
2	139	44	47	41	81	42						
3	125	38	50	42	104	59						
4	110	32	56	44	110	65						
5	137	40	88	57	---	---						
6	140	44	92	55	---	---						
7	95	32	73	41	---	---						
8	92	32	65	39	---	---						
9	128	41	210	119	---	---						
10	155	48	148	76	---	---						
11	197	62	91	44	---	---						
12	175	50	93	40	---	---						
13	126	37	104	51	---	---						
14	103	28	107	61	---	---						
15	98	27	86	51	---	---						
16	89	24	93	58	---	---						
17	98	30	109	71	---	---						
18	92	33	102	63	---	---						
19	72	38	130	74	---	---						
20	70	36	170	96	---	---						
21	70	37	112	48	---	---						
22	58	32	73	32	---	---						
23	57	34	61	28	---	---						
24	65	42	73	37	---	---						
25	53	37	68	42	---	---						
26	53	39	61	36	---	---						
27	51	36	73	39	---	---						
28	72	51	69	32	---	---						
29	80	58	77	37	---	---						
30	88	67	87	49	---	---						
31	81	68	---	---	---	---						
TOTAL	---	1267	---	1540	---	211						

06309000 YELLOWSTONE RIVER AT MILES CITY, MT

LOCATION.--Lat 46°25'18", long 105°51'38", in NE¼SW¼NW¼ sec.28, T.8 N., R.47 E., Custer County, Hydrologic Unit 10100001, on left bank at upstream side of bridge on State Highway 22 at Miles City, 0.8 mi downstream from Tongue River, and at mile 184.2.

DRAINAGE AREA.--48,253 mi^2.

PERIOD OF RECORD.--September 1922 to September 1923, August 1928 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,333.3 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to May 6, 1929, nonrecording gages at pumping plant 1.2 mi downstream at different datums. May 6, 1929, to Sept. 30, 1931, nonrecording gage, and Oct. 1, 1931, to Nov. 10, 1937, water-stage recorder 300 ft upstream from present site at same datum. Nov. 11, 1937, to Sept. 30, 1946, water-stage recorder at pumping plant 1.2 mi downstream at different datum. Oct. 1, 1946, to Mar. 15, 1979, water-stage recorder at site 300 ft upstream at present datum. Mar. 16, 1979, to Sept. 21, 1979, nonrecording gage at present site and datum. Sept. 22, 1979, recording gage established at same site and datum.

REMARKS.--Estimated dialy discharges: Nov. 17 to Mar. 03. Water-discharge records good except those for estimated daily discharges, which are poor. Some regulation by reservoirs on tributary streams. Diversions for irrigation of about 1,100,000 acres upstream from station (does not include flood irrigation).

AVERAGE DISCHARGE.--59 years (1922-23, 1928-86), 11,600 ft^3/s, 8,404,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 102,000 ft^3/s May 22, 1978, gage height, 16.50 ft, result of discharge measurement; maximum gage height, 21.7 ft Mar. 20, 1944 (ice jam, from floodmark, at site 300 ft upstream at present datum); minimum discharge, 996 ft^3/s Dec. 14, 1932.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 52,200 ft^3/s June 9, gage height, 10.94 ft; minimum daily, 2,800 ft^3/s Dec. 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	7580	6800	3500	6000	5600	15000	7940	13100	34900	26900	15100	16100
2	7480	6850	2800	6000	5600	14000	8440	12600	36200	26100	14800	13700
3	7290	6730	4000	6000	5700	13000	8860	12100	38900	24600	13300	11200
4	7290	6780	6200	5600	5900	12100	9030	11700	42300	22400	12000	10300
5	7360	6750	6600	4200	6000	11700	8760	12200	43600	22300	11300	9820
6	7430	6670	6800	5400	6000	11300	8620	15300	45400	22300	10000	9500
7	7530	6640	7000	6000	5900	10400	8320	17300	47600	22300	9410	9320
8	7530	6590	7000	6000	5700	10200	8120	17600	50900	22400	8820	9340
9	7460	6640	7000	5600	5600	10100	7970	20400	51400	21600	8580	9400
10	7700	6500	7000	5800	4800	9920	8180	21100	46900	20600	8500	9520
11	7660	6470	6800	5600	4000	10000	8670	21500	46400	20300	8380	9540
12	7540	6580	6600	5800	3300	9680	9680	20800	46700	20600	8430	9870
13	7460	6470	6400	5800	3300	9140	10100	19500	43500	20900	8290	9760
14	7550	6100	6000	5800	4000	8750	10300	18000	43500	21200	8500	9780
15	7540	5980	4800	5800	4800	8460	10500	17300	43800	20200	8630	9900
16	7510	6200	4900	5200	5000	8280	10300	15800	42600	19100	8200	10100
17	7290	6300	5500	5600	5300	8130	10200	15400	43600	18300	7910	10500
18	7080	6500	6700	5600	5400	8080	10600	14900	44900	18800	7870	11000
19	6310	5900	6600	5700	5500	8130	11300	14400	42600	19100	7630	12400
20	6810	4300	6600	5700	5500	8160	10900	13700	41200	19100	7400	13100
21	7100	4200	6600	5600	5200	8470	10200	13100	38600	18500	7250	12500
22	7090	4200	6600	5500	4300	8780	9830	12800	36300	17900	7280	12500
23	7020	4000	6600	5300	4800	8750	9780	15000	33900	17300	7200	12300
24	6930	3900	6600	5000	6000	8330	9740	19400	31200	16800	7330	12300
25	6970	3800	6600	5000	7000	8210	10400	21000	29100	16400	8090	25500
26	7070	4100	6500	5000	9000	8130	13200	19200	28200	16100	8110	32300
27	7000	4100	6400	4800	12000	7820	14300	18200	27400	16000	7800	26700
28	6970	3900	6300	4700	17000	7790	15100	19800	27800	16000	7590	17400
29	6920	4100	6200	4800	---	7820	14500	24300	27900	16300	7570	14300
30	6890	3800	6000	5300	---	7740	13600	29300	27500	15900	7570	12500
31	6840	---	5900	5500	---	7720	---	32900	---	15400	7910	---
TOTAL	224200	167850	189100	169700	168200	294090	307440	549700	1184800	611700	276750	392450
MEAN	7232	5595	6100	5474	6007	9487	10250	17730	39490	19730	8927	13080
MAX	7700	6850	7000	6000	17000	15000	15100	32900	51400	26900	15100	32300
MIN	6310	3800	2800	4200	3300	7720	7940	11700	27400	15400	7200	9320
AC-FT	444700	332900	375100	336600	333600	583300	609800	1090000	2350000	1213000	548900	778400

CAL YR 1985 TOTAL 3005920 MEAN 8235 MAX 28000 MIN 2800 AC-FT 5962000
WTR YR 1986 TOTAL 4535980 MEAN 12430 MAX 51400 MIN 2800 AC-FT 8997000

06324500 POWDER RIVER AT MOORHEAD, MT

LOCATION.--Lat 45°04'04", long 105°52'10", in NW¼SE¼NW¼ sec.8, T.9 S., R.48 E., Powder River County, Hydrologic Unit 10090207, on left bank 500 ft downstream from discontinued post office at Moorhead, 6.2 mi upstream from Buffalo Creek, and at mile 184.8.

DRAINAGE AREA.--8,088 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1929 to September 1972, October 1974 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1932(M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,334.6 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Aug. 28, 1931, nonrecording gage at site 0.3 mi upstream at different datum. Aug. 28, 1931, to Mar. 21, 1956, water-stage recorder at site 1.2 mi upstream at different datum. Mar. 22 to July 24, 1956, nonrecording gage at site 0.3 mi downstream at different datum. July 25 to Sept. 12, 1956, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 22 to Mar. 23. Water-discharge records good except those for period of estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 66,300 acres upstream from station.

AVERAGE DISCHARGE.--55 years, 457 ft^3/s, 331,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,000 ft^3/s May 20, 1978, gage height, 15.24 ft; maximum gage height, 17.7 ft Mar. 21, 1956, site and datum then in use (ice jam); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 30, 1923, reached a stage of 19 ft, site and datum used 1931-56, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 9	--	*4,540	*5.65	No other peak greater than base discharge.			

Minimum discharge, 57 ft^3/s Aug. 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	280	175	80	140	230	800	278	578	608	304	109	787
2	281	178	70	150	240	700	281	524	695	349	102	328
3	309	180	80	140	230	1000	304	499	1050	312	116	398
4	317	180	100	130	230	1500	370	473	1250	228	116	417
5	294	180	120	120	220	1100	386	477	2250	192	113	317
6	267	180	130	120	220	1000	366	604	1850	183	102	295
7	263	180	130	130	210	1200	331	972	1550	184	100	293
8	253	170	120	130	190	1250	307	1100	1350	207	94	300
9	263	150	120	140	160	1020	300	1380	3400	161	91	324
10	254	130	115	140	140	837	296	1500	3600	119	85	388
11	258	110	100	150	110	712	446	1310	2500	90	93	502
12	261	120	100	140	100	616	440	914	1710	97	98	510
13	240	130	90	140	110	540	466	716	1600	118	110	1200
14	251	120	100	130	120	474	481	671	1410	151	113	800
15	258	100	110	120	130	437	477	699	1210	169	114	545
16	255	110	110	130	150	395	453	679	1160	167	101	394
17	251	120	120	140	160	405	432	632	1150	164	109	332
18	242	110	120	150	150	399	491	600	1100	119	83	328
19	241	100	130	160	130	384	496	541	951	96	80	698
20	225	90	140	150	120	394	457	531	817	91	67	957
21	211	80	150	140	140	395	505	494	760	96	60	483
22	196	90	160	130	180	387	429	457	800	102	69	383
23	187	80	160	140	250	368	385	455	769	76	93	325
24	179	90	150	160	400	359	368	460	696	121	89	316
25	177	100	140	180	700	360	395	632	604	155	90	603
26	176	90	150	170	600	332	654	601	474	152	87	491
27	171	80	140	180	800	316	815	514	400	152	101	490
28	170	80	130	190	1100	322	809	458	352	158	116	345
29	173	85	120	210	---	312	721	427	322	150	116	360
30	171	90	120	220	---	294	632	539	306	141	114	353
31	173	---	130	220	---	285	---	599	---	113	158	---
TOTAL	7247	3678	3735	4690	7520	18893	13571	21036	36694	4917	3089	14262
MEAN	234	123	120	151	269	609	452	679	1223	159	99.6	475
MAX	317	180	160	220	1100	1500	815	1500	3600	349	158	1200
MIN	170	80	70	120	100	285	278	427	306	76	60	293
AC-FT	14370	7300	7410	9300	14920	37470	26920	41720	72780	9750	6130	28290

CAL YR 1985	TOTAL	70950.5	MEAN	194	MAX	1050	MIN	8.0	AC-FT	140700
WTR YR 1986	TOTAL	139332	MEAN	382	MAX	3600	MIN	60	AC-FT	276400

06324500 POWDER RIVER AT MOORHEAD, MT--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at bridge on county road, 1.2 mi upstream from gaging station.

PERIOD OF RECORD.--Water years 1951-53, 1956-57, 1969-72, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July to September 1986.
WATER TEMPERATURE: February 1951 to September 1953, October 1955 to September 1957, October 1974 to September 1977, March 1978 to September 1981 (seasonal records only).
SUSPENDED-SEDIMENT DISCHARGE: October 1974 to September 1977, March 1978 to current year (seasonal records only).

REMARKS.--Flow regulated by reservoirs and diversions for irrigation upstream from station. Unpublished records of once-daily water temperature are available in files of Montana District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 3,130 microsiemens, Sep. 4, 1986; minimum daily, 1,200 microsiemens, Sep. 1, 1986.
WATER TEMPERATURE (water years 1951-53, 1955-57, 1975-81): Maximum daily, 33.0°C, July 13, 1981; minimum daily, 0.0°C on many days during winter.
SEDIMENT CONCENTRATION: Maximum daily mean, 53,500 mg/L, May 27, 1980; minimum daily mean, 5 mg/L, Sept. 15, 1975.
SEDIMENT LOAD: Maximum daily, 2,230,000 tons, May 20, 1978; minimum daily, 0.24 ton, Sept. 15, 1975.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 3,130 microsiemens, Sep. 4, minimum daily, 1,200 microsiemens, Sep. 1.
SEDIMENT CONCENTRATION: Maximum daily mean, 34,800 mg/L, Sep. 14; minimum daily mean, 40 mg/L, Aug. 6.
SEDIMENT LOAD: Maximum daily, 179,000 tons, June 10; minimum daily, 11 tons, Aug. 6, 7, 10.

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										
23...	1115	187	--	--	2750	8.5	5.0	--	--	--
DEC										
10...	1030	115	--	--	2850	-11.0	0.0	--	--	--
JAN										
30...	0950	219	--	--	2540	2.5	0.0	--	--	--
APR										
17...	1145	430	100	2	1850	--	10.0	--	--	--
JUN										
05...	1020	2050	30	1	1500	22.0	18.5	--	--	--
JUL										
17...	1430	167	0	0	2020	26.5	26.5	--	--	--
AUG										
14...	1130	117	20	1	1870	23.0	21.0	677	8.2	105
SEP										
25...	1040	909	20	1	1460	12.0	11.0	661	6.6	69

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
JUL										
17...	1430	--	480	290	100	55	250	5	6.5	190
AUG										
14...	1130	8.30	560	370	120	63	190	4	7.5	194
SEP										
25...	1040	8.20	390	240	94	37	160	4	5.9	149

DATE	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 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)
JUL									
17...	650	170	0.4	3.8	1300	1.8	609	<0.10	<0.01
AUG									
14...	620	110	0.3	3.6	1200	1.7	389	<0.10	<0.01
SEP									
25...	490	84	0.4	6.2	970	1.3	2370	0.31	--

06324500 POWDER RIVER AT MOORHEAD, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	DICAMBA (MEDIBEN) (BANVEL D) TOTAL (UG/L) (82052)	PICLORAM (TORDON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)
JUN							
05...	1020	0.01	0.25	<0.01	<0.01	<0.01	<0.01
SEP							
25...	1040	<0.01	0.08	<0.01	<0.01	<0.01	<0.01

DATE	TIME	TEMPERATURE (DEG C) (00010)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
APR							
17...	1145	10.0	430	3450	4010	49	60
27...	1510	12.0	813	10400	22800	34	41
JUN							
05...	1020	18.5	2050	18300	101000	39	49
09...	1930	16.0	4330	22000	257000	35	44
JUL							
17...	1430	26.5	167	231	104	--	--
AUG							
14...	1130	21.0	117	52	16	--	--
SEP							
25...	1040	11.0	909	7840	19200	38	48

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. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR							
17...	74	84	93	98	100	--	--
27...	55	67	90	98	100	--	--
JUN							
05...	60	72	93	100	--	--	--
09...	55	66	91	98	100	--	--
JUL							
17...	--	--	--	--	--	--	97
AUG							
14...	--	--	--	--	--	--	92
SEP							
25...	59	70	88	96	99	100	--

06324500 POWDER RIVER AT MOORHEAD, MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1										1470	2490	1200
2										1380	2340	1570
3										1370	2160	2200
4										1590	2090	3130
5										1730	2090	2220
6										2210	2170	1810
7										2360	2040	1840
8										2030	2050	2310
9										2290	2050	2180
10										2380	2160	1740
11										2770	2130	1510
12										3030	1930	---
13										2530	1840	2860
14										2010	1880	3120
15										1850	1900	2430
16										2080	1860	2170
17										1880	1900	2070
18										2620	1780	1940
19										2710	1840	1570
20										2720	1850	1930
21										2540	1910	1600
22										2540	1840	1540
23										2840	1710	1980
24										2310	1720	1890
25										2730	1620	1600
26										2230	1610	1690
27										2000	1640	2060
28										2000	1590	1920
29										2550	1550	1890
30										2470	1480	2220
31										2420	1480	---
MEAN										2250	1890	2010

	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	
1						2000	4320
2						1480	2800
3						1650	4450
4						2060	8340
5						2640	7840
6						2200	5940
7						3180	10300
8						3890	13100
9						5700	15700
10						5590	12600
11						4500	8650
12						3670	6100
13						3120	4550
14						2630	3370
15						2300	2710
16						2070	2210
17						1910	2090
18						1850	1990
19						1760	1820
20						1730	1840
21						1790	1910
22						1840	1920
23						1690	1680
24						1570	1520
25						1530	1490
26						1400	1250
27						1250	1070
28						1230	1070
29						1100	927
30						1030	818
31						1080	831
TOTAL						---	135206

06324500 POWDER RIVER AT MOORHEAD, 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	1090	818	4090	6380	1730	2840	479	393	162	48	10000	28000
2	1030	781	3250	4600	2160	5130	390	367	660	182	2080	1840
3	1130	928	3200	4310	6390	18100	318	268	422	132	1500	1610
4	1920	1920	3110	3970	9610	43300	290	179	167	52	9800	11000
5	1640	1710	3220	4150	18500	112000	231	120	73	22	6550	5610
6	1490	1470	4490	7320	8700	43500	307	152	40	11	3590	2860
7	1300	1160	6410	16800	8800	36800	375	186	42	11	3160	2500
8	1120	928	7700	22900	4800	17500	280	156	50	13	6520	5280
9	1070	867	11200	41700	17400	160000	1720	748	56	14	4280	3740
10	1600	1280	12600	51000	18400	179000	2730	877	48	11	3400	3560
11	3870	4660	12900	45600	10000	67500	1410	343	49	12	3090	4190
12	3600	4280	9900	24400	6700	30900	1100	288	47	12	3390	4670
13	6120	7700	6860	13300	6500	28100	780	249	58	17	21600	70600
14	6930	9000	5140	9310	4980	19000	347	141	81	25	34800	75200
15	4650	5990	5240	9890	3700	12100	259	118	104	32	23000	33800
16	3730	4560	4470	8190	2760	8640	281	127	100	27	15200	16200
17	3470	4050	3420	5840	2190	6800	300	133	105	31	9800	8780
18	3210	4260	3010	4880	2030	6030	289	93	96	22	7100	6290
19	3140	4210	2750	4020	1640	4210	233	60	74	16	11300	31500
20	3270	4030	2520	3610	1270	2800	204	50	68	12	20500	58900
21	3420	4660	2330	3110	1160	2380	168	44	74	12	6500	8480
22	2890	3350	2710	3340	1070	2310	124	34	77	14	2270	2350
23	2370	2460	3190	3920	870	1810	81	17	77	19	1440	1260
24	2440	2420	3120	3880	950	1790	132	43	85	20	1590	1360
25	2370	2530	4990	8510	1210	1970	538	225	84	20	4640	8030
26	6340	12100	3330	5400	990	1270	392	161	84	20	2280	3020
27	10600	23300	1840	2550	880	950	209	86	93	25	3400	4500
28	9100	19900	1480	1830	1210	1150	126	54	79	25	2510	2340
29	7250	14100	1350	1560	1060	922	448	181	76	24	2520	2450
30	5290	9030	1900	2770	665	549	401	153	86	26	2270	2160
31	---	---	2470	3990	---	---	158	48	850	363	---	---
TOTAL	---	158452	---	333030	---	819351	---	6094	---	1270	---	412080

TOTAL LOAD FOR PERIOD: 1865483 TONS.

06324710 POWDER RIVER AT BROADUS, MT

LOCATION.--Lat 45°25'37", long 105°24'05", in NE¼NE¼SE¼ sec.3, T.5 S., R.51 E., Powder River County, Hydrologic Unit 10090207, on right bank 100 ft upstream from bridge on U.S. Highway 212, 0.4 mi downstream from Doyle Creek, 1.0 mi south of Broadus, 7.0 mi upstream from Little Powder River, and at mile 162.0.

DRAINAGE AREA.--8,748 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year. Station operated seasonally March 1982 to current year.

REVISED RECORDS.--WDR MT-78-1: 1976(M), 1977(M).

GAGE.--Nonrecording gage. Datum of gage is 3,016.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 1, 2, 17. Water-discharge records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-feet. Diversions for irrigation of about 70,000 acres upstream from station.

AVERAGE DISCHARGE.--6 years (1976-1981), 488 ft^3/s, 353,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,000 ft^3/s May 21, 1978, gage height, 12.96 ft; minimum daily, 6.6 ft^3/s July 19, 1977, July 10, 1985.

EXTREMES FOR CURRENT SEASON.--Peak discharges greater than base discharge of 4,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 10	1000	*4,370	*5.12

No other peak greater than base discharge.

Minimum discharge, 41 ft^3/s July 23.

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						2100	331	596	629	349	99	323
2						1900	320	549	580	343	88	377
3						1660	334	505	842	372	87	320
4						1080	365	476	954	328	85	357
5						1110	431	449	1720	250	94	377
6						1140	444	453	2000	199	90	338
7						981	436	657	1470	189	69	327
8						1510	393	998	1300	170	62	327
9						1170	338	1170	2080	189	72	353
10						1040	361	1440	3790	155	65	385
11						844	357	1420	2730	121	50	397
12						706	475	1100	1830	71	45	458
13						652	509	813	1330	51	53	462
14						570	534	659	1200	80	67	901
15						514	539	624	1030	96	83	604
16						476	524	624	924	141	86	463
17						485	476	618	904	136	78	385
18						478	467	602	882	138	70	373
19						453	514	570	760	99	98	402
20						444	534	529	692	71	82	797
21						462	500	514	650	55	78	614
22						440	534	472	650	52	68	459
23						427	462	449	661	52	61	397
24						423	418	453	620	66	68	365
25						402	383	449	574	45	93	700
26						397	423	628	491	102	95	658
27						385	765	578	441	124	99	560
28						365	863	529	390	122	95	514
29						377	780	458	365	138	108	436
30						373	682	458	357	131	116	436
31						342	---	585	---	128	111	---
TOTAL						23706	14492	20425	32846	4563	2515	13865
MEAN						765	483	659	1095	147	81.1	462
MAX						2100	863	1440	3790	372	116	901
MIN						342	320	449	357	45	45	320
AC-FT						47020	28740	40510	65150	9050	4990	27500

06324710 POWDER RIVER AT BROADUS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: March 1976 to September 1979.
SUSPENDED-SEDIMENT DISCHARGE: October 1975 to September 1978, March 1979 to current year (seasonal record only).

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (water years 1976-79): Maximum daily observed, 34.0°C, July 12, 1976; minimum daily, 0.0°C on many days during winter.
SEDIMENT CONCENTRATION: Maximum daily mean, 44,100 mg/L July 29, 1977; minimum daily mean, 16 mg/L Sept. 27, 1981.
SEDIMENT LOAD: Maximum daily, 1,570,000 tons May 21, 1978; minimum daily, 1.1 tons Sept. 27, 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 35,600 mg/L, Sep. 15; minimum daily mean, 55 mg/L Aug. 24.
SEDIMENT LOAD: Maximum daily, 246,000 tons, June 10; minimum daily, 9.2 tons Aug. 23.

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)
APR							
17...	0805	470	100	2	2170	--	9.0
JUN							
04...	1450	1000	50	1	1460	18.0	23.0
11...	1730	2460	--	--	1070	29.0	20.0
JUL							
17...	0755	133	100	2	2250	17.5	21.5
AUG							
14...	0815	57	0	0	2440	17.0	16.5

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
MAR							
04...	1325	5.0	1110	5080	15200	26	32
APR							
17...	0805	9.0	470	4510	5720	51	62
27...	1850	11.0	903	6160	15000	30	38
28...	0620	8.0	811	7450	16300	38	46
JUN							
04...	1450	23.0	1000	7560	20400	26	33
JUL							
17...	0755	21.5	133	420	151	--	--
AUG							
14...	0815	16.5	57	43	6.6	--	--
SEP							
26...	0910	10.5	701	6660	12600	35	44

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. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR							
04...	38	45	62	82	98	100	--
APR							
17...	73	80	86	93	100	--	--
27...	54	74	96	100	--	--	--
28...	61	78	94	98	100	--	--
JUN							
04...	41	55	86	96	100	--	--
JUL							
17...	--	--	--	--	--	--	82
AUG							
14...	--	--	--	--	--	--	86
SEP							
26...	56	72	86	94	100	--	--

06324710 POWDER RIVER AT BROADUS, 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											6620	37500
2											4670	24000
3											6100	27300
4											5680	16600
5											4880	14600
6											6160	19000
7											5520	14600
8											7500	30600
9											5520	17400
10											4900	13800
11											4980	11300
12											3640	6940
13											2760	4860
14											2700	4160
15											2520	3500
16											1920	2470
17											1650	2160
18											1600	2060
19											1580	1930
20											1570	1880
21											1630	2030
22											1550	1840
23											1510	1740
24											1470	1680
25											1390	1510
26											1370	1470
27											1260	1310
28											1140	1120
29											1190	1210
30											1150	1160
31											1120	1030
TOTAL											---	272760

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	1000	894	4740	7630	2340	3970	1630	1540	89	24	7470	15900
2	920	795	3810	5650	1980	3100	1080	1000	123	29	13200	14900
3	910	821	3230	4400	4550	12100	950	954	88	21	6300	5440
4	1150	1130	2630	3380	6590	17000	695	615	68	16	3590	3460
5	1400	1630	2370	2870	16300	91100	475	321	103	26	4730	4810
6	1570	1880	2480	3030	15200	82100	340	183	93	23	8200	7480
7	1620	1910	4780	8480	8000	31800	290	148	76	14	6490	5730
8	1780	1890	5870	15800	6380	22400	260	119	70	12	4030	3560
9	1230	1120	6300	19900	11300	71500	288	147	94	18	3280	3130
10	990	965	8180	31800	24000	246000	240	100	83	15	6490	6750
11	1200	1160	10500	40300	17800	131000	296	97	75	10	5370	5760
12	2360	3030	10600	31500	8000	39500	599	115	78	9.5	4080	5050
13	2940	4040	8700	19100	6230	22400	574	79	91	13	3800	4740
14	3970	5720	6450	11500	5960	19300	662	143	66	12	18600	45200
15	7000	10200	5150	8680	4610	12800	637	165	88	20	35600	58100
16	6200	8770	4680	7880	3780	9430	641	244	96	22	27000	33800
17	4320	5550	4120	6870	2750	6710	414	152	80	17	19500	20300
18	3410	4300	3130	5090	2260	5380	336	125	68	13	13400	13500
19	3190	4430	2580	3970	1870	3840	286	76	123	33	12100	13100
20	2910	4200	2320	3310	1600	2990	163	31	87	19	24700	63400
21	2930	3960	2510	3480	1390	2440	128	19	82	17	25200	41800
22	3490	5030	2120	2700	1390	2440	135	19	67	12	13300	16500
23	3100	3870	1700	2060	1360	2430	98	14	56	9.2	5800	6220
24	2570	2900	1830	2240	1190	1990	110	20	55	10	2950	2910
25	1920	1990	1640	1990	1000	1550	85	10	88	22	4500	9200
26	1900	2170	3210	5440	1070	1420	191	53	74	19	6280	11200
27	5300	10900	2560	4000	1190	1420	179	60	66	18	4770	7210
28	7910	18400	1940	2770	1100	1160	162	53	56	14	3500	4860
29	7520	15800	1400	1730	1010	995	156	58	80	23	3370	3970
30	6020	11100	1360	1680	1650	1590	125	44	103	32	3190	3760
31	---	---	1970	3110	---	---	116	40	130	39	---	---
TOTAL	---	140555	---	272340	---	851855	---	6744	---	581.7	---	441740

TOTAL LOAD FOR PERIOD: 1986575.7 TONS.

06324970 LITTLE POWDER RIVER ABOVE DRY CREEK, NEAR WESTON, WY

LOCATION.--Lat 44°55'37", long 105°21'10", in NW¼SW¼SW¼ sec.13, T.57 N., R.71 W., Campbell County, Hydrologic Unit 10090208, on left bank 3.1 mi upstream from Dry Creek, 5.0 mi south of the Wyoming-Montana State line, and 20 mi north of Weston.

DRAINAGE AREA.--1,235 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR WY-77-1: Drainage area. WDR WY-78-1: 1976(M).

GAGE.--Water-stage recorder. Elevation of gage is 3,410 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 25-27, Feb. 6, 26-28, and Mar. 1-5, 28, 29. Water-discharge records fair except those for estimated daily discharges, which are poor. Diversion upstream from station for irrigation of about 80 acres downstream from station. Flow occasionally affected by contributions from mine dewatering.

AVERAGE DISCHARGE.--14 years, 22.6 ft^3/s, 16,340 acre-ft/yr.

EXTREMES FOR PERIOD OR RECORD.--Maximum discharge, 5,300 ft^3/s, May 19, 1978, gage height, 11.62 ft; maximum gage height, 11.63 ft, Mar. 20, 1978 (backwater from ice); no flow at times some years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 130 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	1100	unknown	a6.75	June 5	0630	265	4.99
May 12	0330	778	7.14	Sept. 26	1130	*836	*7.27

a Backwater from ice and temporary road construction.

No flow Oct. 1-4.

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	.00	1.6	.62	1.4	3.3	148	25	16	6.7	2.4	.30	2.4
2	.00	6.4	.63	1.5	4.0	118	19	14	6.5	2.0	.23	2.3
3	.00	1.0	.67	1.5	4.1	92	18	11	6.4	1.7	.15	23
4	.00	2.0	.67	1.5	4.1	75	19	9.5	14	2.4	.21	49
5	.10	6.8	.73	1.3	4.3	61	19	9.6	176	2.1	.25	22
6	.23	1.5	.81	1.3	4.0	49	19	8.9	93	2.0	.21	15
7	.31	2.1	.90	1.4	3.6	35	33	12	47	1.9	.17	9.5
8	.45	3.3	.97	1.4	3.8	27	20	14	25	1.8	.19	7.2
9	.69	3.9	1.1	1.5	2.8	24	18	110	36	1.8	.13	6.0
10	.66	11	1.1	1.5	2.2	21	13	243	57	1.6	.12	6.2
11	.88	7.2	.96	1.6	1.9	17	11	526	24	1.5	.12	77
12	.99	5.7	1.0	1.6	1.4	14	8.9	612	18	2.6	.12	98
13	1.0	3.9	1.0	1.5	1.3	11	8.1	263	16	1.8	.14	28
14	1.4	1.3	.99	1.4	1.5	9.3	8.0	177	18	1.6	.15	9.2
15	1.8	1.2	.97	1.4	1.8	8.4	7.9	139	15	1.6	.14	6.7
16	1.4	1.2	.95	1.4	2.0	7.8	7.8	101	10	1.4	.22	5.3
17	1.5	1.4	.90	1.5	2.3	7.7	7.7	75	7.6	1.1	.18	4.4
18	.36	1.1	1.0	1.6	2.3	7.9	7.6	55	6.5	.68	.24	4.8
19	.35	1.1	1.2	1.7	2.4	7.7	7.7	31	5.7	.92	.27	5.5
20	.31	1.0	1.3	1.8	2.1	7.5	7.4	23	5.1	1.1	.41	5.0
21	.38	.78	1.3	1.6	2.4	7.4	7.4	19	4.9	1.1	.42	4.3
22	.43	.79	1.4	1.9	2.3	10	7.1	16	4.5	1.1	.42	4.0
23	.27	.73	1.4	2.1	2.6	15	7.2	15	4.2	1.0	.55	4.0
24	.22	.62	1.4	2.1	3.7	8.8	7.2	13	3.6	.99	.71	5.1
25	.31	.57	1.5	2.2	5.3	8.2	7.1	13	3.2	1.2	.81	148
26	.54	.56	1.5	2.2	74	7.0	7.6	12	2.7	1.2	.91	651
27	.52	.54	1.4	2.2	148	6.4	11	10	2.5	1.1	1.0	342
28	.62	.52	1.6	2.2	183	4.5	13	9.6	2.3	1.1	1.2	153
29	.64	.54	1.4	2.4	---	5.3	34	9.7	2.3	.83	1.4	93
30	.66	.59	1.4	2.6	---	5.6	16	8.2	2.4	.56	1.8	33
31	1.0	---	1.4	2.8	---	26	---	7.4	---	.42	1.8	---
TOTAL	18.02	70.94	34.17	54.1	476.5	852.5	402.7	2582.9	626.1	44.60	14.97	1823.9
MEAN	.58	2.36	1.10	1.75	17.0	27.5	13.4	83.3	20.9	1.44	.48	60.8
MAX	1.8	11	1.6	2.8	183	148	34	612	176	2.6	1.8	651
MIN	.00	.52	.62	1.3	1.3	4.5	7.1	7.4	2.3	.42	.12	2.3
AC-FT	36	141	68	107	945	1690	799	5120	1240	88	30	3620

CAL YR 1985	TOTAL	3390.76	MEAN	9.29	MAX	222	MIN	.00	AC-FT	6730
WTR YR 1986	TOTAL	7001.40	MEAN	19.2	MAX	651	MIN	.00	AC-FT	13890

06324970 LITTLE POWDER RIVER ABOVE DRY CREEK, NEAR WESTON, WY--Continued

PERIOD OF RECORD.--Water years 1975 to 1982, October 1985 to September 1986.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
OCT											
21...	1815	0.44	4100	10.0	1000	170	150	660	9	20	304
DEC											
03...	1000	0.68	4850	0.5	1300	250	160	780	10	21	578
JAN											
28...	1400	2.3	3700	0.5	750	120	110	590	10	20	469
FEB											
20...	1430	2.3	3750	0.0	990	200	120	460	7	19	480
APR											
08...	0930	21	3530	11.0	800	160	97	580	9	17	380
MAY											
06...	1715	8.5	2860	14.0	740	140	95	460	8	17	310
12...	1140	600	702	7.0	150	32	16	82	3	6.0	93
JUN											
12...	1045	19	1720	19.5	560	120	63	220	4	14	240
JUL											
17...	1020	1.2	3790	22.0	890	160	120	620	9	22	300
AUG											
19...	0930	0.3	3780	22.0	1000	170	140	630	9	25	320

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
OCT										
21...	2000	22	0.7	5.7	3370	3200	4.6	4.0	<0.10	--
DEC										
03...	2300	89	0.9	13	3990	4000	5.4	7.3	0.00	--
JAN										
28...	1600	90	0.8	12	2950	2800	4.0	18	0.12	--
FEB										
20...	1600	61	0.7	13	2890	2800	3.9	18	0.12	--
APR										
08...	1600	63	0.5	5.7	--	2800	3.7	156	0.00	0.09
MAY										
06...	1300	20	0.2	6.6	--	2200	3.0	51	0.00	0.11
12...	210	4.3	0.2	6.4	--	410	0.56	669	0.20	0.61
JUN										
12...	750	19	0.2	9.6	--	1300	1.8	69	0.00	0.10
JUL										
17...	1900	28	0.6	2.4	--	3000	4.1	9.8	0.00	0.04
AUG										
19...	1900	23	0.6	5.3	3200	3100	4.4	2.6	<0.10	--

06326300 MIZPAH CREEK NEAR MIZPAH, MT

LOCATION.--Lat 46°15'39", long 105°17'34", in NW¼NE¼SW¼ sec.24, T.6 N., R.51 E., Custer County, Hydrologic Unit 10090210, on left bank 20 ft downstream from county bridge, 1.0 mi upstream from mouth, and 1.6 mi northwest of Mizpah.

DRAINAGE AREA.--797 mi^2.

PERIOD OF RECORD.--October 1974 to September 1986 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 2,490 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 9 to Feb. 18 and Feb. 20-27. Records fair except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--12 years, 16.3 ft^3/s, 11,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,270 ft^3/s Sept. 25, 1986, gage height, 9.59 ft, from rating curve extended above 1,200 ft^3/s; maximum gage height, 10.64 ft Mar. 20, 1978, backwater from ice; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	----	ice jam	9.40	Sept. 1	1545	1,830	8.84
May 9	1330	1,530	8.27	Sept. 19	1200	336	4.82
June 9	0315	743	6.35	Sept. 25	1500	*2,270	*9.59

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	1.2	.03	.00	.06	.16	445	.13	3.7	.31	.00	.00	964
2	.78	.04	.00	.14	.12	381	.03	1.4	.18	.31	.00	463
3	.53	.03	.00	.10	.10	196	.03	.63	.12	.88	.00	73
4	.35	.03	.06	.02	.10	212	.00	.32	.11	.32	.00	19
5	.24	.02	.04	.00	.08	234	.03	83	.07	.16	.00	8.1
6	.15	.01	.04	.00	.04	121	.00	81	.98	.09	.00	8.5
7	.14	.00	.04	.00	.02	58	.00	62	19	.08	.00	1.6
8	.18	.00	.04	.00	.00	39	.00	345	23	.10	.00	.38
9	5.5	.00	.04	.00	.00	36	.00	1060	525	.09	.00	.14
10	4.3	.00	.02	.00	.00	31	.00	500	354	.07	.00	.10
11	3.7	.00	.00	.00	.00	26	.00	130	83	.05	.00	.03
12	2.1	.00	.00	.00	.00	22	.00	59	38	.08	.00	.00
13	.84	.00	.00	.00	.00	19	.00	35	22	.09	.00	.51
14	.60	.00	.00	.00	.00	16	.00	25	15	.10	.01	.55
15	.35	.00	.00	.00	.00	14	.00	21	11	.16	.00	1.1
16	.26	.06	.04	.00	.00	12	1.5	17	7.6	.14	.00	.78
17	.19	.00	.10	.02	.00	10	1.3	13	5.5	.10	.00	.87
18	.14	.00	.06	.10	.00	10	.76	10	3.9	.08	.00	.93
19	.11	.00	.06	4.0	.00	11	.31	8.6	2.1	.05	.00	203
20	.09	.00	.08	3.5	.00	11	.13	6.7	1.1	.06	.00	167
21	.06	.00	.08	2.0	.04	8.3	.05	5.2	.74	.07	.00	52
22	.12	.00	.12	1.5	.10	6.8	.03	3.8	.51	.05	.00	24
23	.14	.00	.10	3.5	.40	5.5	.00	3.9	.25	.04	.00	16
24	.10	.00	.08	3.0	1.0	4.4	.00	3.4	.12	.04	.00	11
25	.11	.00	.06	2.0	20	3.4	.00	2.7	.04	.07	.00	1400
26	.13	.00	.15	1.0	850	2.1	.00	2.1	.01	.03	.00	1210
27	.09	.00	.10	.30	1030	1.3	9.1	1.7	.00	.03	.00	159
28	.08	.00	.06	.20	528	1.1	11	1.3	.00	.03	.00	90
29	.05	.00	.04	.20	---	.76	11	.85	.00	.02	.00	67
30	.06	.00	.02	.18	---	.39	9.1	.62	.00	.01	.00	44
31	.05	---	.04	.16	---	.24	---	.42	---	.01	.01	---
TOTAL	22.74	.22	1.47	21.98	2430.16	1938.29	44.50	2488.34	1113.64	3.41	.02	4985.59
MEAN	.73	.01	.05	.71	86.8	62.5	1.48	80.3	37.1	.11	.00	166
MAX	5.5	.06	.15	4.0	1030	445	11	1060	525	.88	.01	1400
MIN	.05	.00	.00	.00	.00	.24	.00	.32	.00	.00	.00	.00
AC-FT	45	.4	2.9	44	4820	3840	88	4940	2210	6.8	.04	9890

CAL YR 1985	TOTAL	2136.43	MEAN	5.85	MAX	337	MIN	.00	AC-FT	4240
WTR YR 1986	TOTAL	13050.36	MEAN	35.8	MAX	1400	MIN	.00	AC-FT	25890

06326500 POWDER RIVER NEAR LOCATE, MT
(National stream quality accounting network station)

LOCATION.--Lat 46°26'56", long 105°18'44", in NW¼SW¼ sec.14, T.8 N., R.51 E., Custer County, Hydrologic Unit 10090209, on left bank 1.5 mi downstream from bridge on old U.S. Highway 12 at present site of Locate, 1.5 mi upstream from Locate Creek, 5 mi west of former site of Locate, 25 mi east of Miles City, and at mile 27.9.
DRAINAGE AREA.--13,194 mi^2. Drainage area of site 1.5 mi upstream, 13,189 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1938 to current year.
REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area.
GAGE.--Water-stage recorder. Datum of gage is 2,384.79 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11 1947, to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different datum. Oct. 1, 1965, to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966, to Mar. 21, 1978, water-stage recorder at present site and datum. Mar. 22, 1978, to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different datum, Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and datum, and Aug. 21, 1981, to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different datum. Effective Oct. 1, 1981, recording and nonrecording gages will be maintained at both the upstream and present gage locations and each site will be employed depending on the water-stage control conditions and/or the capability of recording useful gage-height data.
REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 2. Water-discharge records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station.
AVERAGE DISCHARGE.--48 years, 604 ft^3/s, 438,000 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 31,000 ft^3/s Feb. 19, 1943; maximum gage height, 12.27 ft Mar. 16, 1978 (backwater from ice); no flow Jan. 16 to Feb. 12, Feb. 22-24, 1950, July 27, Sept. 21-27, Oct. 1, 1960, Sept. 4-8, 1961.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	unknown	(a)	(b) *6.76	May 9	1745	*4,830	(b) 6.24

(a) backwater from ice
(b) observed

Minimum discharge, 29 ft^3/s Aug. 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	174	209	70	150	230	1900	440	822	343	401	111	655
2	184	213	60	160	230	2100	406	712	463	348	120	930
3	209	217	75	150	240	1750	396	622	539	333	120	334
4	233	213	100	140	250	1770	385	559	513	315	111	358
5	233	209	120	130	240	4510	396	644	1010	343	90	301
6	237	221	140	120	220	2670	429	765	908	369	88	329
7	271	213	140	130	210	1690	452	581	1820	320	76	364
8	303	200	130	140	190	1130	488	1270	1750	297	71	343
9	280	170	130	150	160	1140	488	3670	2920	231	65	310
10	275	150	130	160	140	1200	429	3630	1980	202	62	306
11	266	120	120	170	110	1260	406	2540	3200	181	49	320
12	275	110	110	160	110	1160	374	1930	2700	162	43	353
13	258	120	100	150	120	1050	364	1560	2220	162	47	418
14	245	110	120	140	140	873	487	1380	1740	131	56	458
15	253	110	130	130	160	806	476	1230	1630	93	38	780
16	262	120	130	130	170	727	526	874	1440	88	33	856
17	266	130	130	140	190	637	553	806	1320	69	30	705
18	262	120	120	150	160	594	526	727	1190	74	35	527
19	266	100	140	160	130	622	526	704	1160	69	56	733
20	275	90	150	150	120	580	513	673	1150	103	56	666
21	249	80	160	140	140	566	526	567	1150	103	45	594
22	271	90	170	130	180	526	539	506	1050	114	37	948
23	266	80	160	140	250	566	500	488	840	83	56	667
24	253	90	150	150	400	580	553	488	814	69	51	567
25	249	100	140	160	1200	513	513	429	822	56	45	2520
26	233	100	150	150	3000	526	500	396	742	53	43	3080
27	233	90	140	180	2300	513	440	348	673	42	42	1300
28	225	80	130	240	1500	500	494	463	580	69	38	1060
29	213	70	120	240	---	464	854	440	526	60	35	1140
30	209	80	130	230	---	464	907	418	458	85	43	951
31	206	---	140	230	---	418	---	385	---	111	53	---
TOTAL	7634	4005	3935	4900	12490	33805	14886	30627	37651	5136	1845	22873
MEAN	246	134	127	158	446	1090	496	988	1255	166	59.5	762
MAX	303	221	170	240	3000	4510	907	3670	3200	401	120	3080
MIN	174	70	60	120	110	418	364	348	343	42	30	301
AC-FT	15140	7940	7810	9720	24770	67050	29530	60750	74680	10190	3660	45370

CAL YR 1985	TOTAL	95950.5	MEAN	263	MAX	4300	MIN	1.5	AC-FT	190300
WTR YR 1986	TOTAL	179787	MEAN	493	MAX	4510	MIN	30	AC-FT	356600

06326500 POWDER RIVER NEAR LOCATE, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946, 1948-63, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to September 1981.
WATER TEMPERATURE: March 1951 to July 1963, October 1974 to September 1979.
SUSPENDED-SEDIMENT DISCHARGE: March 1950 to September 1953, October 1974 to September 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1975-81): Maximum daily, 4,000 microsiemens, Aug. 1, 1977; minimum daily, 615 microsiemens, July 8, 1975.
WATER TEMPERATURE (water years 1951-63, 1975-79): Maximum, 30.0°C, July 26, 1959; minimum, 0.0°C, on many days during winter periods.
SEDIMENT CONCENTRATION (water years 1950-53, 1975-84): Maximum daily mean, 60,000 mg/L, Aug. 6, 1953; minimum daily mean, 17 mg/L, Dec, 3, 1974.
SEDIMENT LOAD (water years 1950-53, 1975-84): Maximum daily, 1,020,000 tons, May 26, 1952; minimum daily, less than 1 ton on several days during September 1950.

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 WATER (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)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
01...	1000	160	--	--	3100	3.0	3.0	--	--	--	--	--
DEC												
03...	1210	74	100	2	3160	-10.0	0.0	705	13.2	99	K170	25000
JAN												
22...	1240	131	0	0	2110	-5.0	0.0	705	13.2	98	K400	3100
MAR												
25...	1125	566	50	1	2530	11.5	9.0	702	10.0	95	<1	200
APR												
29...	1100	867	80	1	2330	11.0	11.0	696	8.9	89	--	670
MAY												
13...	1050	1690	--	--	1520	15.0	12.5	--	--	--	--	--
JUN												
17...	0945	1290	20	1	1140	23.5	22.5	700	6.4	81	K450	2600
JUL												
29...	1130	56	--	--	2830	30.5	22.5	--	--	--	--	--
SEP												
16...	1045	855	50	1	1820	15.0	10.5	703	7.2	70	2300	7100

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											
03...	1210	8.30	86	890	610	190	100	460	7	8.3	350
JAN											
22...	1240	8.00	190	560	210	120	63	380	7	6.2	420
MAR											
25...	1125	8.30	530	620	380	140	65	340	6	7.7	310
APR											
29...	1100	8.30	1000	--	--	--	--	--	--	6.9	300
JUN											
17...	0945	7.80	16000	310	190	78	27	130	3	4.9	150
SEP											
16...	1045	8.00	2500	--	--	--	--	--	--	7.4	230

06326500 POWDER RIVER NEAR LOCATE, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
DEC											
03...	0	310	1100	280	0.40	11	2410	2300	3.3	482	<0.010
JAN											
22...	0	362	740	250	0.50	11	1880	1800	2.6	665	0.010
MAR											
25...	0	248	900	170	0.60	8.9	1400	1800	1.9	2140	<0.010
APR											
29...	0	246	760	150	0.50	8.3	1620	--	2.2	3790	<0.010
JUN											
17...	0	135	390	44	0.50	9.3	786	760	1.1	2740	<0.010
SEP											
16...	0	197	660	98	0.40	--	1360	--	1.8	3140	<0.010

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC										
03...	0.250	0.370	0.210	0.90	0.050	0.010	0.020	304	61	99
JAN										
22...	--	0.320	0.260	0.90	0.130	0.040	0.050	416	147	96
MAR										
25...	0.330	0.250	0.250	2.1	0.500	0.030	0.020	2020	3090	71
APR										
29...	0.380	0.120	0.150	2.9	0.680	0.020	0.010	4210	9860	87
JUN										
17...	0.360	0.050	0.040	6.5	3.20	0.010	<0.010	5160	18000	85
SEP										
16...	0.500	0.290	0.250	0.90	3.40	0.010	<0.010	9270	21400	80

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
DEC											
03...	1210	<10	<1	<100	<10	<1	<1	1	2	20	<1
MAR											
25...	1125	30	1	<100	<10	<1	<1	1	3	40	1
JUN											
17...	0945	30	2	44	<0.5	<1	<1	<3	4	20	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC										
03...	100	20	0.1	1	3	2	<1	2200	4	<10
MAR										
25...	100	<10	<0.1	1	<1	2	<1	1600	3	10
JUN										
17...	40	2	0.1	<10	2	2	<1	790	<7	4

06326600 O'FALLON CREEK NEAR ISMAY, MT

LOCATION.--Lat 46°25'17", long 104°45'40", in NE¼SE¼ sec. 30, T.8 N., R.56 E., Fallon County, Hydrologic Unit 10100005, on left bank, about 350 ft upstream of U.S. Highway 12, 1 mi east of road to Ismay, 6.5 mi southeast of Ismay, 11.5 mi west of Plevna, and at mile 58.3.

DRAINAGE AREA.--669 mi^2.

PERIOD OF RECORD.--October 1977 to current year. Crest-stage partial-record data collected July 1962 to September 1977.

GAGE.--Water-stage recorder. Elevation of gage is 2,590 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 12 to Feb. 26 and Mar. 5 to Apr. 28. 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 back of this report.

AVERAGE DISCHARGE.--9 years, 20.9 ft^3/s, 15,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,100 ft^3/s Mar. 22, 1978, gage height, 9.35 ft; maximum gage height, 9.60 ft Feb. 26, 1986, backwater from ice; no flow on many days most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge 1963-77, 4,700 ft^3/s July 3, 1976, extension of crest-stage gage rating above 3,860 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Feb. 26	0130	ice jam	*9.60	May 9	2245	1,100	6.43
Feb. 27	0300	a*2,470	8.87				

a about

No flow Oct. 1, 3, Nov. 5, 6, Dec. 2, Aug. 31.

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	.01	.08	2.0	1.9	623	13	11	6.8	2.4	.24	.01
2	.01	.01	.00	2.0	1.7	613	12	9.8	5.9	2.0	.27	.04
3	.00	.03	.08	1.8	1.5	431	11	8.5	5.3	1.6	.26	.06
4	.01	.01	.14	1.6	1.7	323	10	7.1	5.1	1.2	.24	.04
5	.01	.00	.12	1.0	1.5	250	9.5	6.5	4.7	.86	.22	.04
6	.01	.00	.10	1.0	1.3	200	9.0	6.5	4.4	.84	.19	.04
7	.01	.02	.10	1.2	1.3	150	8.5	35	4.5	.83	.14	.04
8	.02	.23	.10	1.4	1.0	120	8.0	77	4.9	.95	.12	.05
9	.01	.25	.10	1.5	.80	100	7.5	742	13	.81	.09	.19
10	.01	.19	.10	1.7	.60	80	6.5	750	13	.68	.08	.23
11	.11	.10	.08	2.0	.35	70	6.0	288	5.4	.65	.08	.23
12	2.8	.06	.06	2.3	.50	70	6.0	113	4.7	.71	.09	.23
13	2.2	.08	.02	2.0	.60	65	6.5	66	4.1	.69	.06	.24
14	1.0	.10	.10	1.7	.60	60	7.0	47	3.9	.64	.08	.31
15	.46	.10	.25	1.4	.70	55	8.0	37	3.9	6.0	.06	.38
16	.16	.12	.45	1.8	1.0	50	9.0	29	3.6	2.1	.05	.45
17	.11	.12	.70	2.0	.90	50	8.0	23	3.0	.91	.05	.52
18	.08	.10	.80	2.1	.80	40	7.0	20	2.7	1.2	.07	3.3
19	.05	.06	.90	2.2	.70	45	5.0	17	2.3	.86	.06	3.0
20	.05	.02	1.0	2.2	.60	45	4.0	16	2.3	.64	.01	7.6
21	.05	.02	1.2	1.9	.70	35	5.0	14	2.0	.63	.01	3.5
22	.04	.04	1.4	1.7	.90	30	6.0	12	1.9	.77	.01	2.7
23	.04	.02	1.7	1.8	3.0	28	8.0	12	2.1	.58	.01	3.0
24	.03	.04	1.4	2.2	10	25	9.0	12	2.1	.57	.01	5.5
25	.02	.10	1.5	2.1	550	25	10	11	2.6	.47	.01	23
26	.01	.06	2.0	1.7	1600	23	11	11	2.3	.41	.01	40
27	.01	.04	1.7	1.8	1540	22	12	9.8	2.2	.41	.01	32
28	.01	.02	1.5	2.1	835	20	14	9.2	1.8	.39	.01	24
29	.01	.06	1.2	2.0	---	18	16	8.8	1.3	.32	.01	11
30	.01	.14	1.4	2.0	---	17	17	8.2	2.2	.27	.01	6.8
31	.01	---	1.7	2.0	---	15	---	7.6	---	.27	.00	---
TOTAL	7.35	2.15	21.98	56.2	4559.65	3698	269.5	2425.0	124.0	31.66	2.56	168.50
MEAN	.24	.07	.71	1.81	163	119	8.98	78.2	4.13	1.02	.08	5.62
MAX	2.8	.25	2.0	2.3	1600	623	17	750	13	6.0	.27	40
MIN	.00	.00	.00	1.0	.35	15	4.0	6.5	1.3	.27	.00	.01
AC-FT	15	4.3	44	111	9040	7330	535	4810	246	63	5.1	334

CAL YR 1985	TOTAL	1590.68	MEAN	4.36	MAX	190	MIN	.00	AC-FT 3160
WTR YR 1986	TOTAL	11366.55	MEAN	31.1	MAX	1600	MIN	.00	AC-FT 22550

06329200 BURNS CREEK NEAR SAVAGE, MT

LOCATION.--Lat 47°22'20", long 104°25'46", in NE¼SE¼SE¼ sec.27, T.19 N., R.57 E., Richland County, Hydrologic Unit 10100004, on right bank 1,000 ft upstream from bridge on State Highway 16, 7 mi southwest of Savage, and at mile 2.1.

DRAINAGE AREA.--233 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1957 to September 1967, September 1975 to September 1984, October 1985 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 2,000 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1,2, Oct. 28 to Feb. 26. Water discharge records good except those for estimated daily discharges, which are poor. Minor diversions for irrigation upstream.

AVERAGE DISCHARGE.--20 years (1958-67, 1976-84, 1986), 6.96 ft^3/s, 5,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,100 ft^3/s Mar. 20, 1960, gage height, 5.31 ft, from flood-marks, from rating curve extended above 500 ft^3/s on basis of slope-area measurement of peak flow; maximum gage height, 6.52 ft Feb. 26, 1986 (backwater from ice); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft^3/s and maximums (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	1300	*a 2000	*6.52	July 17	0030	411	4.06
May 10	1245	43	2.86	Sept. 19	0745	35	2.79
June 29	1245	1160	4.88	Sept. 25	0515	203	3.58
July 6	1815	30	2.71				

a - about, backwater from ice.

Minimum daily discharge, 0.20 ft^3/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	.70	.80	.70	.40	1.2	217	3.1	3.6	2.0	32	2.2	1.1
2	.70	1.0	.70	.60	1.2	157	3.0	3.1	2.0	28	2.1	1.1
3	1.2	1.1	.60	.70	1.1	97	3.6	2.9	1.9	23	1.9	1.3
4	1.6	1.2	.50	.90	1.2	72	3.1	2.8	1.9	20	1.9	1.3
5	1.2	1.1	.50	.90	1.4	65	3.1	3.4	1.9	16	1.9	1.4
6	1.1	1.0	.50	1.0	1.4	49	2.9	4.4	4.3	18	1.9	1.5
7	4.2	1.0	.60	.90	1.4	29	2.6	4.6	2.9	24	1.8	1.1
8	3.8	.90	.80	.70	1.4	27	2.4	5.8	2.8	23	1.9	.99
9	2.7	.70	1.0	.60	1.4	29	2.4	24	6.0	18	1.7	1.0
10	2.7	.80	1.0	.50	1.4	24	2.4	40	3.1	15	1.6	1.3
11	3.6	1.0	.70	.30	1.6	19	2.8	36	2.4	12	1.6	1.4
12	3.9	1.0	.60	.40	2.0	17	2.7	28	1.7	12	1.7	1.2
13	3.8	1.1	.60	.60	1.8	17	3.1	20	1.6	9.8	4.3	1.2
14	3.5	1.0	.60	.50	2.0	16	3.8	19	1.5	7.2	2.0	1.5
15	3.3	.80	.70	.40	2.1	14	4.3	16	1.4	6.6	1.9	1.9
16	2.9	.80	.70	.40	2.3	14	5.5	12	1.3	9.4	1.6	1.9
17	2.6	.50	.50	1.0	2.5	13	10	9.8	1.3	100	1.3	2.4
18	2.2	.60	.20	1.8	2.1	13	12	8.6	1.3	19	1.3	4.3
19	2.0	.60	.50	1.2	2.2	11	12	7.4	1.1	10	1.3	24
20	2.2	.60	.70	1.2	2.4	9.4	12	5.8	.99	7.8	1.2	10
21	2.7	.60	.80	1.2	2.4	8.4	10	4.7	1.1	6.8	1.1	4.7
22	2.7	.80	.70	1.2	2.4	7.9	8.7	4.5	.99	5.0	1.2	3.4
23	2.7	1.0	.70	1.9	2.3	7.0	7.2	6.2	.80	4.3	1.2	2.8
24	2.6	1.4	.60	2.1	3.0	6.6	5.6	6.6	.79	3.4	1.2	3.0
25	2.2	1.2	.60	2.0	50	6.3	6.6	5.2	.66	3.0	1.0	80
26	2.2	1.1	.60	2.1	1500	5.3	7.8	4.7	.70	2.7	.99	45
27	2.2	1.0	.60	2.0	1000	4.6	6.4	3.7	.66	2.9	1.0	18
28	2.1	1.0	.50	1.8	295	4.6	5.4	3.4	.70	2.7	.99	17
29	2.0	.90	.40	1.6	---	4.2	5.1	3.0	279	2.6	.99	33
30	1.5	.80	.30	1.2	---	3.7	4.4	2.5	40	2.4	.99	26
31	1.2	---	.30	1.2	---	3.7	---	2.4	---	2.3	1.0	---
TOTAL	74.00	27.40	18.80	33.30	2889.2	971.7	164.0	304.1	368.79	448.9	48.76	294.79
MEAN	2.39	.91	.61	1.07	103	31.3	5.47	9.81	12.3	14.5	1.57	9.83
MAX	4.2	1.4	1.0	2.1	1500	217	12	40	279	100	4.3	80
MIN	.70	.50	.20	.30	1.1	3.7	2.4	2.4	.66	2.3	.99	.99
AC-FT	147	54	37	66	5730	1930	325	603	731	890	97	585

WTR YR 1986 TOTAL 5643.74 MEAN 15.5 MAX 1500 MIN .20 AC-FT 11190

06329200 BURNS CREEK NEAR SAVAGE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-79, 1984, October 1985 to September 1986 (discontinued).

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 WATER (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...	--	0.75	--	--	1640	17.0	13.0	--	--	--
NOV										
20...	1400	0.62	0	0	2040	-16.0	0.0	725	11.6	84
DEC										
23...	1500	0.74	100	71	1720	0.0	0.0	719	12.0	88
JAN										
23...	1600	1.9	100	2	1700	-5.0	0.0	710	12.0	89
MAR										
26...	1200	5.0	40	1	2100	10.5	6.5	722	10.6	92
APR										
30...	0930	4.8	0	0	2420	5.0	8.5	715	9.8	90
MAY										
30...	1000	2.7	0	0	2270	25.0	21.0	716	7.2	87
JUL										
31...	1000	2.2	0	0	1730	20.0	19.0	720	7.6	87
AUG										
27...	1100	0.99	0	0	1650	15.0	18.0	724	8.6	96
SEP										
24...	1600	2.9	70	1	1520	20.0	15.5	698	10.6	117

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)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
NOV										
20...	1400	8.40	740	160	130	100	290	5	7.0	578
DEC										
23...	1500	8.20	490	81	69	77	220	4	6.7	408
JAN										
23...	1600	8.40	510	0	70	81	210	4	7.2	537
MAR										
26...	1200	8.30	740	250	100	120	250	4	8.7	490
APR										
30...	0930	8.60	830	290	100	140	320	5	8.6	533
MAY										
30...	1000	8.45	740	230	80	130	290	5	10	503
JUL										
31...	1000	8.40	520	59	57	92	240	5	9.0	462
AUG										
27...	1100	8.40	440	13	41	83	220	5	8.2	431
SEP										
24...	1600	8.40	480	52	64	78	190	4	7.3	429

06329200 BURNS CREEK NEAR SAVAGE, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	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)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)
NOV										
20...	630	11	0.60	14	1500	2.1	2.6	<0.100	0.050	0.45
DEC										
23...	470	7.5	0.60	15	1100	1.5	2.2	<0.100	0.130	0.27
JAN										
23...	480	7.5	0.50	14	1200	1.6	6.1	<0.100	0.060	0.54
MAR										
26...	780	11	0.50	10	1600	2.1	21	<0.100	0.010	0.59
APR										
30...	870	8.1	0.50	8.5	1800	2.4	23	<0.100	0.030	0.57
MAY										
30...	840	7.8	0.50	6.8	1700	2.3	12	<0.100	0.030	0.57
JUL										
31...	580	7.5	0.50	9.4	1300	1.7	7.6	<0.100	<0.010	--
AUG										
27...	490	7.7	0.60	7.9	1100	1.5	3.0	<0.100	0.040	0.26
SEP										
24...	430	7.3	0.50	13	1000	1.4	8.2	<0.100	<0.010	--

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)
NOV									
20...	0.50	<0.010	--	--	420	30	37	0.06	45
DEC									
23...	0.40	<0.010	--	--	300	26	99	0.20	68
JAN									
23...	0.60	0.030	--	--	280	60	122	0.63	64
MAR									
26...	0.60	0.020	8.1	0.2	320	30	61	0.82	79
APR									
30...	0.60	0.020	9.9	0.1	390	50	67	0.86	61
MAY									
30...	0.60	0.010	10	0.2	430	20	--	--	--
JUL									
31...	0.50	0.140	--	--	460	11	81	0.48	75
AUG									
27...	0.30	0.020	--	--	420	9	69	0.18	89
SEP									
24...	0.30	0.030	3.5	0.3	370	9	102	0.80	95

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	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)
MAR												
26...	1200	3	2	<10	<10	<1	1	<10	<10	4	2	380
SEP												
24...	1600	--	1	--	<0.5	--	<1	--	<10	--	1	--

DATE	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)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAR												
26...	2	1	40	30	<0.10	<0.1	1	1	<1	<1	20	<10
SEP												
24...	--	<5	--	6	--	<0.1	--	2	--	<1	--	14

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT

LOCATION.--Lat 47°40'42", long 104°09'22", in SW¼NE¼SW¼ sec.9, T.22 N., R.59 E., Richland County, Hydrologic Unit 10100004, on left bank at Montana-Dakota Utilities Company powerplant, 0.2 mi downstream from bridge on State Highway 23, 2.5 mi south of Sidney, 3.0 mi downstream from Fox Creek, and at mile 29.2.
DRAINAGE AREA.--69,103 mi^2. Area at site 4.5 mi upstream, 68,812 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1910 to September 1931 (published as "at Intake"), October 1933 to current year. If monthly figures of diversions to Lower Yellowstone Canal at Intake are added to records at this site, records equivalent to those published as Yellowstone River at Glendive (1898-1910, 1931-34) can be obtained. Monthly discharge only for some periods, published in WSP 1309. Monthly figures of diversions into Lower Yellowstone Canal prior to 1951 published in WSP 1309, 1951-60 published in WSP 1729, 1961-65 published in WSP 1916, 1966-70 published in WSP 2116, and 1971 to current year are published in annual reports.
GAGE.--Water-stage recorder. Datum of gage is 1,881.3 ft National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Jan. 1, 1911, to Sept. 30, 1931, nonrecording gage at site 32 miles upstream at different datum. Apr. 9, 1934, water-stage recorder at two sites within 500 ft of highway bridge 0.2 mi upstream and May 17, 1945, to Apr. 3, 1952, nonrecording gage on same bridge at datum 1.36 ft higher. Apr. 4, 1952, to Nov. 19, 1967, water-stage recorder at site 4.5 mi upstream at different datum.
REMARKS.--Estimated daily discharges: Nov. 17 to Mar. 13. Water-discharge records good except those for estimated daily discharges, which are poor. Some regulation on tributary streams. Diversion for irrigation of about 1,250,000 acres upstream from station. Lower Yellowstone Project Main Canal diverts from left bank in NW¼ sec.36, T.18 N., R.56 E., at Lower Yellowstone diversion dam at Intake about 36.6 mi upstream for irrigation of about 52,000 acres of which about one-third lies upstream from station (see table below).
AVERAGE DISCHARGE.--74 years, 13,010 ft^3/s, 9,426,000 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 159,000 ft^3/s June 2, 1921, gage height, 12.6 ft, site and datum then in use; maximum gage height observed, 21.85 ft Mar. 22, 1947, site and datum then in use (backwater from ice); minimum discharge, 470 ft^3/s May 17, 1961, gage height, 2.73 ft, site and datum then in use.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 59,900 ft^3/s June 10, gage height, 14.87 ft; maximum gage height observed, 19.60 ft Feb. 27, result of ice jam; minimum daily discharge, 1,800 ft^3/s Nov. 26, 27.

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	7560	6940	3500	5000	5000	45000	8280	13600	32100	28200	13000	6690
2	7580	6900	4000	6000	5000	35000	8010	12900	34700	26800	12700	8920
3	7610	6880	4000	7000	5000	30700	8550	12400	36500	25800	12400	14900
4	7680	6880	4000	7000	4500	24000	8960	12100	39300	24200	11800	11300
5	7520	6810	3500	7500	4500	20100	9320	11700	43200	23000	10900	9970
6	7490	6770	4000	8000	4000	20700	9330	11900	46000	22400	10100	9470
7	7790	6780	5000	7500	4000	17700	9020	13300	47800	23000	9430	8940
8	7930	6750	6000	7000	4000	15900	8810	16200	51400	23600	8630	8710
9	7960	6730	7000	6500	4000	13700	8570	19700	55900	22300	8100	8610
10	7870	6700	8000	6000	4000	12700	8420	26900	58800	20500	7610	8590
11	7970	6820	7000	5500	4000	12500	8320	27300	54100	19300	7500	8600
12	8120	6260	6000	6000	4000	12200	8590	24800	52700	18800	7400	8640
13	8020	6040	5000	7000	4500	12400	9370	23100	53700	18700	7510	8780
14	7800	5700	6000	6500	4500	11300	10200	20900	49300	19000	7380	9010
15	7760	5700	7000	6000	4500	10900	10300	18800	47800	19600	7260	9140
16	7750	5350	6500	6000	4500	10100	10700	17400	48300	19000	7430	9330
17	7700	4500	6000	7500	5000	9740	11200	15700	47000	27100	7430	9840
18	7610	3500	5500	7000	5000	9360	11000	14600	47300	19200	7120	10100
19	7380	2500	6500	6500	5500	9230	10900	14100	49000	17400	6980	11700
20	7060	2000	7000	5500	6000	9110	11300	13300	46400	17800	6840	12400
21	6410	2500	6500	6000	6000	9200	11400	12700	44500	17700	6540	12700
22	6940	3000	6500	6500	6000	9300	10800	12000	41600	17100	6340	12200
23	7230	2500	6000	7000	6500	9490	10400	11600	38400	16300	6370	11800
24	7230	2200	5500	7500	7000	9630	10100	12000	35300	15400	6380	11900
25	7170	1900	6000	7500	7500	9410	10200	15700	32200	14600	6290	15100
26	7070	1800	6000	7000	10000	9130	10200	19500	29400	14200	6280	23700
27	7070	1800	6500	7000	25000	9050	11400	18300	28100	14000	6890	37800
28	7120	2000	6000	6500	35000	8950	13300	16400	26600	14400	6830	32400
29	7070	2500	5500	6000	---	8560	13900	16500	31000	13800	6640	21000
30	7050	3000	5500	5500	---	8570	13900	21000	32100	13700	6500	15600
31	7000	---	5500	5500	---	8410	---	27300	---	13600	6510	---
TOTAL	231520	139710	177000	203000	194500	442040	304750	523700	1280500	600500	249090	387840
MEAN	7468	4657	5710	6548	6946	14260	10160	16890	42680	19370	8035	12930
MAX	8120	6940	8000	8000	35000	45000	13900	27300	58800	28200	13000	37800
MIN	6410	1800	3500	5000	4000	8410	8010	11600	26600	13600	6280	6690
AC-FT	459200	277100	351100	402700	385800	876800	604500	1039000	2540000	1191000	494100	769300
(†)	0	0	0	0	0	0	0	67200	72800	75300	81200	51600

CAL YR 1985 TOTAL 2865070 MEAN 7850 MAX 28700 MIN 1800 AC-FT 5683000
WTR YR 1986 TOTAL 4734150 MEAN 12970 MAX 58800 MIN 1800 AC-FT 9390000

† Diversions, in acre-feet, by Lower Yellowstone Canal, furnished by the Bureau of Reclamation.

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1964 to September 1981.
WATER TEMPERATURE: January 1951 to September 1985.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1981, October 1982 to current year.

REMARKS.--Unpublished records of once-daily water temperature are available in files of District office. Prior to July 1972, sediment sampling and record computation under supervision of U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-81): Maximum daily, 1,220 microsiemens, Apr. 6, 1979; minimum daily, 261 microsiemens, June 4, 1966.
WATER TEMPERATURE (water years 1951-85): Maximum, 29.0°C July 23, 1960; minimum, 0.0°C on many days during winter.
SEDIMENT CONCENTRATION: Maximum daily mean, 26,800 mg/L May 8, 1975; minimum daily mean, 8 mg/L Jan. 9, 1973.
SEDIMENT LOAD: Maximum daily, 3,030,000 tons May 8, 1975; minimum daily, 67 tons Nov. 25, 1986.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 8,050 mg/L, Sep. 27; minimum daily mean, 13 mg/L, Nov. 25.
SEDIMENT LOAD: Maximum daily, 822,000 tons, Sep. 27; minimum daily, 67 tons, Nov. 25.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	CLOUD COVER (PERCENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE, AIR (DEG C) (00020)	TEMPERATURE (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
NOV											
20...	1000	2000	--	--	0	844	-12.0	0.0	729	12.0	86
JAN											
23...	1400	--	6830	100	2	845	-3.0	0.0	712	12.0	88
MAR											
26...	1600	--	9110	40	1	1010	15.0	7.5	720	10.6	94
MAY											
29...	1100	--	16100	--	--	565	28.0	21.0	720	8.2	98
JUL											
30...	1000	--	13700	100	2	537	25.0	22.0	720	7.9	96
SEP											
25...	1100	--	13900	80	2	650	18.0	15.0	688	8.2	90

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	PH (STANDARD UNITS) (00400)	TURBIDITY (NTU) (00076)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM ADSORPTION RATIO (00931)
NOV										
20...	K6	60	8.40	4.2	290	100	68	29	77	2
JAN										
23...	K20	910	8.50	61	270	110	65	27	80	2
MAR										
26...	K2	110	8.50	57	340	140	78	34	110	3
MAY										
29...	K25	K13	8.40	60	170	51	42	16	46	2
JUL										
30...	130	130	8.50	80	150	33	37	14	41	2
SEP										
25...	>600	>1000	8.40	1300	210	78	50	21	70	2

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CARBONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)
NOV 20...	3.6	220	4	178	250	17	0.5	11	571	570
JAN 23...	3.6	180	5	173	250	18	0.5	9.1	564	550
MAR 26...	4.5	210	12	194	340	24	0.5	8.0	712	730
MAY 29...	2.9	140	2	149	140	9.2	0.3	11	360	340
JUL 30...	2.8	130	5	117	130	6.3	0.4	9.3	305	320
SEP 25...	4.2	150	4	139	210	11	0.4	9.9	470	460

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
NOV 20...	0.78	3080	<0.01	0.45	0.07	0.07	0.6	0.02	<0.01	0.01
JAN 23...	0.77	10400	0.01	0.53	0.15	0.11	0.6	0.06	0.05	0.03
MAR 26...	0.97	17500	0.02	0.30	0.05	0.05	0.6	0.06	<0.01	0.02
MAY 29...	0.49	15600	<0.01	0.19	0.05	0.02	0.6	0.19	0.01	<0.01
JUL 30...	0.41	11300	<0.01	<0.10	0.03	<0.01	0.8	0.28	0.01	<0.01
SEP 25...	0.64	17600	--	--	--	--	--	--	--	--

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV 20...	1000	<10	5	59	<0.5	1	<1	<3	3	<3	2
MAR 26...	1600	<10	4	55	<0.5	<1	<1	<3	2	6	<1
JUL 30...	1000	30	5	48	<0.5	<1	<1	<3	2	23	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
NOV 20...	51	12	<0.1	<10	1	2	<1	730	<6	9
MAR 26...	57	10	<0.1	<10	<1	2	<1	850	<6	7
JUL 30...	32	2	0.1	<10	<1	1	<1	380	<6	7

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
NOV								
20...	1000	0.0	2000	--	17	92	--	--
MAR								
04...	1300	3.0	--	22700	1790	110000	49	56
26...	1600	7.5	--	9110	175	4300	--	--
APR								
19...	1500	10.0	--	10900	422	12400	60	73
MAY								
29...	1100	21.0	--	16100	247	10700	--	--
JUN								
09...	1230	18.5	--	53400	1610	232000	29	37
JUL								
30...	1000	22.0	--	13700	263	9730	--	--
SEP								
20...	1430	13.0	--	12200	3590	118000	62	74
25...	1100	15.0	--	13900	2380	89300	52	64
26...	1600	14.0	--	28100	8770	665000	44	51

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. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV							
20...	--	--	--	--	--	--	76
MAR							
04...	63	69	86	95	100	--	--
26...	--	--	--	--	--	--	89
APR							
19...	--	92	94	96	100	--	--
MAY							
29...	--	--	--	--	--	--	67
JUN							
09...	47	56	84	95	100	--	--
JUL							
30...	--	--	--	--	--	--	79
SEP							
20...	86	93	98	99	100	--	--
25...	76	86	94	97	100	--	--
26...	60	68	89	94	99	100	--

DATE	TIME	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
MAR											
26...	1600	28	71	82	86	88	90	93	95	97	100
MAY											
29...	1100	58	91	99	100	--	--	--	--	--	--
JUN											
09...	1230	3	5	11	71	96	99	100	--	--	--
JUL											
30...	1000	36	85	98	100	--	--	--	--	--	--

06329500 YELLOWSTONE RIVER NEAR SIDNEY, 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	222	4530	46	862	93	879	45	607	140	1890	2180	265000
2	163	3340	40	745	90	972	43	697	145	1960	2380	225000
3	112	2300	39	724	83	896	44	832	145	1960	2330	193000
4	192	3980	39	724	76	821	45	850	146	1770	1890	122000
5	560	11400	41	754	78	737	43	871	149	1810	1970	107000
6	262	5300	45	823	79	853	40	864	147	1590	1950	109000
7	220	4630	46	842	75	1010	39	790	183	1980	2000	95600
8	355	7600	40	729	80	1300	45	850	171	1850	1300	55800
9	322	6920	43	781	98	1850	55	965	115	1240	822	30400
10	284	6030	60	1090	115	2480	70	1130	91	983	598	20500
11	340	7320	187	3440	123	2320	71	1050	58	626	490	16500
12	470	10300	822	13900	144	2330	59	956	47	508	455	15000
13	410	8880	758	12400	133	1800	58	1100	41	498	450	15100
14	308	6490	252	3880	102	1650	73	1280	40	486	418	12800
15	260	5450	80	1230	80	1510	75	1220	31	377	360	10600
16	220	4600	47	679	63	1110	65	1050	41	498	307	8370
17	181	3760	42	510	46	745	63	1280	70	945	269	7070
18	154	3160	36	340	40	594	70	1320	78	1050	230	5810
19	137	2730	30	202	45	790	71	1250	80	1190	188	4690
20	117	2230	44	238	53	1000	60	891	75	1220	147	3620
21	94	1630	77	520	64	1120	78	1260	57	923	140	3480
22	147	2750	137	1110	75	1320	114	2000	50	810	136	3410
23	101	1970	95	641	80	1300	120	2270	63	1110	121	3100
24	87	1700	50	297	76	1130	115	2330	80	1510	88	2290
25	76	1470	13	67	59	956	100	2030	87	1760	108	2740
26	64	1220	26	126	49	794	79	1490	580	15700	165	4070
27	68	1300	54	262	46	807	74	1400	2300	155000	165	4030
28	70	1350	74	400	45	729	82	1440	2470	233000	142	3430
29	61	1160	85	574	40	594	84	1360	---	---	121	2800
30	54	1030	92	745	39	579	78	1160	---	---	108	2500
31	49	926	---	---	41	609	107	1590	---	---	95	2160
TOTAL	---	127456	---	49635	---	35585	---	38183	---	434244	---	1356870
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	77	1720	519	19100	1490	129000	570	43400	130	4560	51	921
2	66	1430	539	18800	1620	152000	438	31700	121	4150	1080	41600
3	65	1500	522	17500	1340	132000	362	25200	119	3980	5920	238000
4	65	1570	478	15600	1380	146000	285	18600	109	3470	4590	140000
5	68	1710	399	12600	1740	203000	315	19600	98	2880	2440	65700
6	72	1810	515	16500	1610	200000	370	22400	95	2590	1000	25600
7	67	1630	1320	47400	1410	182000	325	20200	100	2550	355	8570
8	54	1280	1560	68200	1420	197000	260	16600	93	2170	210	4940
9	46	1060	2200	117000	1630	246000	258	15500	80	1750	230	5350
10	46	1050	7450	541000	1930	306000	208	11500	78	1600	262	6080
11	58	1300	6230	459000	1470	215000	205	10700	78	1580	242	5620
12	73	1690	3130	210000	1340	191000	250	12700	77	1540	162	3780
13	73	1850	1750	109000	1370	199000	255	12900	74	1500	178	4220
14	84	2310	1350	76200	1600	213000	240	12300	68	1350	198	4820
15	110	3060	1240	62900	1160	150000	210	11100	62	1220	178	4390
16	164	4740	1120	52600	795	104000	180	9230	66	1320	180	4530
17	285	8620	970	41100	800	102000	5010	411000	73	1460	224	5950
18	375	11100	780	30700	720	92000	2140	115000	69	1330	482	13100
19	417	12300	560	21300	690	91300	338	15900	63	1190	2230	70400
20	418	12800	460	16500	650	81400	266	12800	59	1090	3670	123000
21	404	12400	380	13000	600	72100	244	11700	58	1020	3610	124000
22	384	11200	305	9880	640	71900	230	10600	57	976	2500	82400
23	362	10200	270	8460	605	62700	212	9330	55	946	1800	57300
24	304	8290	280	9070	595	56700	188	7820	52	896	1330	42700
25	202	5560	440	18700	580	50400	167	6580	50	849	2160	88100
26	182	5010	670	35300	520	41300	156	5980	54	916	7210	508000
27	200	6160	640	31600	470	35700	155	5860	73	1360	8050	822000
28	263	9440	420	18600	385	27700	217	8440	65	1200	5000	437000
29	345	12900	258	11500	2240	201000	225	8380	50	896	3300	187000
30	437	16400	460	26100	1930	167000	228	8430	46	807	1890	79600
31	---	---	1030	75900	---	---	166	6100	49	861	---	---
TOTAL	---	172090	---	2211110	---	4118200	---	937550	---	54007	---	3204671

TOTAL LOAD FOR YEAR: 12739601 TONS.

Smaller Reservoirs in Missouri River Basin in Montana

06012000 LIMA RESERVOIR.--Lat 44°39'16", long 112°21'54", in SW¼ sec.32, T.13 S., R.6 W., Beaverhead County, Hydrologic Unit 10020001, at Lima Dam on Red Rock River, 7 mi northwest of Monida, and at mile 2,542.2. DRAINAGE AREA, 570 mi^2. PERIOD OF RECORD, April 1940 to current year. Records prior to October 1950, published only in WSP 1309, and those for April 1955, published only in WSP 1729. Records of daily elevations available in files of Helena district office. Nonrecording gage read twice daily. 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 1902. Usable capacity, 84,050 acre-ft between elevation 6,537.30 ft, bottom of tunnel, and 6,582.7 ft, spillway crest. No dead storage. Figures given herein represent usable contents. Water is used for irrigation, flood control, and recreation. Records furnished by Water Users Irrigation Co.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 85,870 acre-ft May 27, 28, June 14, 15, 1984, elevation, 6,582.98 ft; no usable storage Sept. 20-26, 1979.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 78,180 acre-ft May 23, elevation, 6,581.78 ft; minimum observed, 14,630 acre-ft Oct. 1, elevation, 6,562.58 ft.

06020500 RUBY RIVER RESERVOIR.--Lat 45°14'21", long 112°06'35", in NE¼NE¼SE¼ sec.8, T.7 S., R.4 W., Madison County, Hydrologic Unit 10020003, at dam on Ruby River, 6 mi south of Alder, and at mile 47.9. DRAINAGE AREA, 596 mi^2 (1,544 km^2). PERIOD OF RECORD, July 1938 to April 1950, September 1954, May 1955, September to November 1955, and February to September 1960 (total contents), October 1960 to current year (usable contents). Records prior to October 1939, published only in WSP 1309, and those for September 1954, published only in WSP 1729. Elevations are determined by measuring from reference points in the middle and at or near the end of the month. 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, 38,850 acre-ft between elevation 5,300.0 ft, bottom of tunnel, and 5,392.0 ft, spillway crest. Dead storage, 100 ft below elevation 5,300.0 ft. 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 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 46,040 acre-ft Aug. 25, 1975, elevation, 5,399.0 ft; no storage at times in 1938, 1955, 1961.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 41,320 acre-ft May 30, elevation, 5,394.5 ft; minimum contents, 8,160 acre-ft Oct. 1 (interpolated).

06036000 WILLOW CREEK RESERVOIR.--Lat 45°42'51", long 111°41'57", in NW¼NW¼NW¼ sec.35, T.1 S., R.1 W., Madison County, Hydrologic Unit 10020005, at dam on Willow Creek, 4 mi east of Harrison, and at mile 11.5. DRAINAGE AREA, 153 mi^2. PERIOD OF RECORD, February 1938 to March 1958 (total contents), April 1958 to current year (usable contents). Records prior to October 1939, published only in WSP 1309 and November, December 1951, published only in WSP 1729. Prior to October 1949, published as Harrison Lake near Harrison. Elevations determined by measuring from reference marks in the middle and at or near the end of the month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Montana Department of Natural Resources and Conservation).
Reservoir is formed by earth and rockfill dam with concrete spillway completed in 1938. Usable capacity, 17,730 acre-ft between elevation 4,666.5 ft, tunnel inlet, and 4,736.0 ft, spillway crest. Dead storage, 270 acre-ft below elevation 4,666.5 ft. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Montana Department of Natural Resources and Conservation. REVISED RECORDS, WSP 1629: 1958. WSP 1729: 1948(M), 1951-52, 1956-57.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 19,230 acre-ft June 30, 1963, elevation, 4,736.7 ft; minimum observed, 2,270 acre-ft Nov. 15, 1970, elevation, 4,705.0 ft.

EXTREMES FOR CURRENT YEAR: Only one observation made during year.

06038000 HEBGEN LAKE.--Lat 44°51'51", long 111°20'09", in SW¼NW¼ sec.23, T.11 S., R.3 E., Gallatin County, Hydrologic Unit 10020007, at Hebgen Dam on Madison River, 18 mi northwest of West Yellowstone, and at mile 103. DRAINAGE AREA, 904 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1939, published only in WSP 1309. Figures of contents published in WSP 1629, 1709, and 1729 have been found to be in error and should not be used. Prior to Oct. 1, 1949, published as Hebgen Reservoir near West Yellowstone. Records of daily elevations since October 1955 on file in Helena district office. Nonrecording gage read about twice daily. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.). Prior to earthquake of Aug. 17, 1959, datum of gage was 9.74 ft higher, also at National Geodetic Vertical Datum of 1929. Reservoir is formed by earthfill dam with concrete core and spillway completed in 1915, repaired in 1960 following severe earthquake of Aug. 17, 1959, which lowered dam 9.74 ft and deformed reservoir area. Subsequent usable capacity, 377,500 acre-ft between elevation 6,473.00 ft, bottom of outlet tower, and 6,534.87 ft, spillway crest. Dead storage, 7,340 acre-ft below elevation 6,473.00 ft. Prior to Aug. 17, 1959, usable capacity, 344,700 acre-ft between 6,483.11 ft, bottom of outlet tower, and 6,544.61 ft, spillway crest. Dead storage, 7,340 acre-ft below elevation 6,473.00 ft. Observations of reservoir level prior and subsequent to earthquake indicate smaller increases in capacity than indicated by new capacity table. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by The Montana Power Co. REVISED RECORDS, WSP 1916: 1959-60.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 378,800 acre-ft, on many days in 1962-64, 1970, 1972, 1974-76, 1978, 1980-86, elevation, 6,534.87 ft; minimum monthend, 670 acre-ft Dec. 31, 1936 (by capacity table used prior to August 1959).

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 378,800 acre-ft June 27 to July 5 and Aug. 27 to Sept. 1, elevation, 6,534.87 ft; minimum observed, 276,200 acre-ft Jan. 21 to Feb. 4, elevation, 6,526.19 ft.

Smaller reservoirs in Missouri River basin in Montana--Continued

06040500 ENNIS LAKE.--Lat 45°28'12", long 111°38'15", in NW¼SW¼ sec.20, T.4 S., R.1 E., Madison County, Hydrologic Unit 10020007, at Madison Dam on Madison River, 5 mi northeast of McAllister, and at mile 40.3. DRAINAGE AREA, 2,181 mi^2. PERIOD OF RECORD, January 1936 to September 1975 (total contents), October 1975 to current year (usable contents). Records prior to October 1939, published only in WSP 1309. Prior to 1949, published as Madison Reservoir near McAllister. Records of daily elevations since October 1955 on file in Helena district office. Nonrecording gage read about twice daily. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.).

Reservoir is formed by timber crib dam completed in 1900. Usable capacity, 41,020 acre-ft between elevation 4,826.5 ft, bottom of penstock, and 4,841.5 ft, top of flashboards. Dead storage, 1,040 acre-ft below elevation 4,826.5 ft. Not normally drawn below 4,831.0 ft, 6,810 acre-ft. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by The Montana Power Co.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 40,830 acre-ft June 20, 1968, elevation, 4,841.45; minimum observed, 2,600 acre-ft Mar. 31, 1937, elevation, 4,828.8 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 38,650 acre-ft Sept. 1, elevation, 4,841.15 ft; minimum observed, 27,620 acre-ft Dec. 14, elevation, 4,838.15 ft.

06049500 MIDDLE CREEK RESERVOIR.--Lat 45°29'18", long 110°58'42", in NW¼SW¼ sec.15, T.4 S., R.6 E., Gallatin County, Hydrologic Unit 10020008, at dam on Hyalite Creek, 14 mi south of Bozeman, and at mile 28.9. DRAINAGE AREA, 27.4 mi^2. PERIOD OF RECORD, April 1951 to current year. Nonrecording gage read in the middle and at or near the end of month. Altitude of lake at full pond is about 6,700 ft, from topographic map.

Reservoir is formed by earthfill dam with conduit control works completed in 1951. Storage began in March 1951. Usable capacity, 8,030 acre-ft between gage height 125 ft, bottom of outlet, and 200.75 ft, spillway crest. Dead storage, 209 acre-ft below gage height 125 ft. Figures given herein represent usable contents. Water is used for irrigation and municipal purposes. Records furnished by Montana Department of Natural Resources and Conservation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 8,480 acre-ft July 10, 1983, gage height, 202.8 ft, from capacity table then in use; minimum observed, 120 acre-ft Oct. 18, 1965, gage height, 129.0 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 8,270 acre-ft July 1, elevation, 6,712.8 ft; minimum observed, 3,840 acre-ft Sept. 15, elevation, 6,685.5 ft.

06058600 HELENA VALLEY RESERVOIR.--Lat 46°38'17", long 111°52'56", in NW¼NW¼SE¼ sec.8, T.10 N., R.2 W., Lewis and Clark County, Hydrologic Unit 10030101, at dam 5.8 mi east of Helena. PERIOD OF RECORD, September 1960 to current year. Nonrecording gage read one or more times per month. U.S. Geological Survey began publishing data October 1983. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

This is an offstream reservoir formed by an earthfill dam and dike completed in 1958. Closure and first fill of reservoir in March 1959. Stored water is diverted from Missouri River at Canyon Ferry Dam in W½SE¼SE¼ sec.4, T.10 N., R.1 W., 17 mi east of Helena. Usable capacity, 5,900 acre-ft between elevation 3,805.0 ft, invert of City of Helena municipal outlet, and 3,820.07 ft, top of active conservation pool (maximum normal water-surface elevation). Dead storage, 1,260 acre-ft, below elevation 3,787.75 ft, and inactive storage, 3,290 acre-ft, below elevation 3,805.0 ft. Figures given herin represent usable contents. Water is used for irrigation and municipal use by the City of Helena. Records furnished by U.S. Bureau of Reclamation. Capacity table effective Jan. 1, 1961.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 9,470 acre-ft June 2, 1975, elevation, 3,820.60 ft; no usable contents observed October and November 1977, result of construction work.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 8,690 acre-ft May 11, elevation, 3,819.1 ft; minimum observed, 3,120 acre-ft Apr. 7, elevation, 3,804.4 ft.

06064500 LAKE HELENA.--Lat 46°45'58", long 111°53'10", in SE¼SW¼ sec. 29, T.12 N., R.2 W., Lewis and Clark County, Hydrologic Unit 10030101, at Hauser Dam on Missouri River, 13 mi northeast of Helena, and at mile 2,239.1. DRAINAGE AREA, 610 mi^2 above dam and control works on Prickly Pear Creek. PERIOD OF RECORD, May 1945 to current year. April to July 1953 scattered daily elevation and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Records of daily elevations since October 1955 on file in Helena district office. Nonrecording gage at Hauser Dam read hourly. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.).

Gage heights collected at Hauser Dam are effective on Lake Helena at control dam. Prior to April 1945, contents of Lake Helena included with records of Hauser Lake. Since that date, a dam and control works has separated the two lakes to allow independent regulation of Lake Helena, if needed. Usable capacity, 10,450 acre-ft between elevation 3,624.00 ft, bottom of control works, and 3,635.00 ft, top of flashboards. No dead storage. Figures given herein represent usable contents. Water is used for recreation, wildlife, and power production through Hauser Dam. Records furnished by The Montana Power Co.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 11,790 acre-ft Aug. 2, 1960, Dec. 10, 1962, July 19, 20, Sept. 4, 1963, Aug. 15, 1968, Apr. 6, 1973, June 26, 1980, elevation, 3,635.60 ft; no storage Mar. 29 to Apr. 7, 1958, Feb. 12, 20, 1962, May 4-10, 1979.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 11,340 acre-ft on many days, elevation, 3,635.40 ft; minimum observed, 10,030 acre-ft Sept. 2, 3, elevation, 3,634.80 ft.

Smaller reservoirs in Missouri River basin in Montana--Continued

06065000 HAUSER LAKE.--Lat 46°45'58", long 111°53'10", in SE¼SW¼ sec.29, T.12 N., R.2 W., Lewis and Clark County, Hydrologic Unit 10030101, at Hauser Dam on Missouri River, 1.6 mi downstream from Prickly Pear Creek, 13 mi northeast of Helena, and at mile 2,226.4. DRAINAGE AREA, 16,876 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1939, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Monthend contents prior to May 1945 include contents of Lake Helena, excluded thereafter. Records of daily elevations since October 1955 on file in Helena district office. Nonrecording gage read hourly. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.).

Reservoir is formed by concrete dam completed in 1907; separated from Lake Helena in April 1945. Usable contents, 51,420 acre-ft between elevation 3,617.00 ft, bottom of tunnel, and 3,635.00 ft top of flashboards. Dead storage, 46,810 acre-ft below elevation 3,617.00 ft. Prior to Nov. 28, 1949, usable capacity, 52,090 acre-ft at elevation 3,635.00 ft, decrease caused by construction of Canyon Ferry Dam in backwater of Hauser Dam. Not normally drawn below 3,621.00 ft, 8,870 acre-ft. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by The Montana Power Co. REVISED RECORDS, WSP 1729: 1949-57.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed since May 1945, 53,630 acre-ft Aug. 2, 1960, Dec. 10, 1961, July 19, 20, Sept. 4, 1963, Aug. 15, 1968, Apr. 6, 1973, June 26, 1980, elevation, 3,635.60 ft; no storage Jan. 31, Feb. 29, 1936.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 52,890 acre-ft on many days, elevation, 3,635.40 ft; minimum observed, 50,680 acre-ft Sept. 2, 3, elevation, 3,634.80 ft.

06066000 HOLTER LAKE.--Lat 46°59'28", long 112°00'17", on line between SE¼ sec.5 and NE¼ sec.8, T.14 N., R.3 W., Lewis and Clark County, Hydrologic Unit 10030101, at Holter Dam on Missouri River, 3.3 mi east of Wolf Creek, and at mile 2,211.1. DRAINAGE AREA, 17,149 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1939, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Records of daily elevations since October 1955 on file in Helena district office. Prior to 1950, published as Holter Reservoir near Wolf Creek. Nonrecording gage read three times daily. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.).

Reservoir is formed by concrete dam completed in 1918. Usable capacity, 81,920 acre-ft between elevation 3,543.00 ft, bottom of tunnel, and 3,564.00 ft, top of flashboards. Dead storage, 158,500 acre-ft below elevation 3,543.00 ft. Not normally drawn below 3,548.00 ft, 16,660 acre-ft. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by The Montana Power Co.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 85,250 acre-ft June 19, 1970, elevation, 3,564.70 ft; no storage Feb. 29, Dec. 31, 1936.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 81,870 acre-ft Sept. 18, elevation, 3,563.99 ft; minimum observed, 65,130 acre-ft Nov. 30, elevation, 3,560.36 ft.

06075000 SMITH RIVER RESERVOIR.--Lat 46°37'27", long 110°44'48", near center of south line of sec.17, T.10 N., R.8 W., Meagher County, Hydrologic Unit 10030103, at dam on Smith River, 9 mi northeast of White Sulphur Springs, and at mile 22.8. DRAINAGE AREA, 72.3 mi^2. PERIOD OF RECORD, April 1938 to September 1950 (scattered records 1947-50) and April to October 1959 (total contents), November 1959 to current year (usable contents). Records for some periods published only in WSP 1309 and for April 1959, published only in WSP 1729. Elevations determined by measuring from reference marks at or near middle and end of month. 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 1936. Usable capacity, 10,650 acre-ft between elevation, 5,415.0 ft, bottom of outlet, and 5,486.0 ft, spillway crest. Dead storage, 52 acre-ft below elevation 5,415.0 ft. 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 1729: 1960.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 11,650 acre-ft June 1, 1978, elevation, 5,489.1 ft; minimum observed, 90 acre-ft Sept. 12, 1973, elevation, 5,423.9 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 10,480 acre-ft May 2, elevation, 5,485.3 ft; minimum observed, 2,220 acre-ft Oct. 15, elevation, 5,451.1 ft.

06079500 GIBSON RESERVOIR.--Lat 47°36'09", long 112°45'39", in NE¼NW¼SE¼ sec.4, T.21 N., R.9 W., Teton County, Hydrologic Unit 10030104, at Gibson Dam on Sun River, 19 mi northwest of Augusta, and at mile 100.8. DRAINAGE AREA, 575 mi^2. PERIOD OF RECORD, January 1930 to current year. Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Nonrecording gage read daily. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

Reservoir is formed by concrete dam with glory-hole spillway completed in 1929. Usable capacity, 99,050 acre-ft, between elevation 4,557.5 ft, bottom of outlet, and 4,724.0 ft, top of glory-hole, by capacity table effective Aug. 1, 1975; see previous reports for superseded figures. Dead storage, 11 acre-ft, below elevation 4,557.5 ft. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, 116,300 acre-ft June 8, 1964, elevation, 4,732.23 ft, from floodmark, of which 11,600 acre-ft was uncontrolled storage, by capacity table used Oct. 1, 1965, to July 30, 1975; minimum observed, 11 acre-ft Oct. 13, 1936, elevation, 4,560.9 ft, by capacity table used prior to 1939.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 99,050 acre-ft June 13, elevation, 4,724.0 ft; minimum observed, 15,750 acre-ft Aug. 28, elevation, 4,631.8 ft.

Smaller reservoirs in Missouri River basin in Montana--Continued

06080500 PISHKUN RESERVOIR.--Lat 47°40'36", long 112°29'48", in W½ sec.10, T.22 N., R.7 W., Teton County, Hydrologic Unit 10030104, at dam 14 mi northwest of Augusta, and at mile 97.3. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. Nonrecording gage read one or more times a month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). This is an offstream reservoir formed by two earthfill dams completed in 1919. Stored water is diverted from Sun River in sec.36, T.22 N., R.9 W., 18 mi northwest of Augusta. Usable capacity, 30,420 acre-ft, between elevation 4,342.0 ft, bottom of outlet, and 4,370.0 ft, maximum pool. Dead storage, 16,250 acre-ft, below elevation 4,342.0 ft. Prior to 1940, usable capacity varied from 3,600 to 21,750 acre-ft. Figures given herein represent usable contents. Water is used for irrigation, recreation, and wildlife. Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 32,700 acre-ft July 4-6, 1953, elevation 4,371.4 ft; no storage October 1939 to March 1940, Oct. 31, 1967.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 30,270 acre-ft May 21, elevation, 4,369.9 ft; minimum observed, 5,800 acre-ft Sept. 12, 30, elevation, 4,349.3 ft.

06082000 WILLOW CREEK RESERVOIR.--Lat 47°32'48", long 112°25'45", in SW¼NW¼ sec.30, T.21 N., R.6 W., Lewis and Clark County, Hydrologic Unit 10030104, at dam on Willow Creek, 4 mi northwest of Augusta, and at mile 2.8. PERIOD OF RECORD, January 1936 to September 1960 (total contents), October 1960 to current year (usable contents) Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. Nonrecording gage read one or more times a month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).
Reservoir is formed by earthfill dam completed in 1911. Usable capacity, 32,230 acre-ft between elevation 4,085.28 ft, bottom of outlet, and 4,142.0 ft, maximum pool. Dead storage, 67 acre-ft below elevation 4,085.28 ft. Prior to 1941, total capacity was 16,700 acre-ft. Supplemental water diverted from Sun River in sec.36, T.22 N., R.9 W., 18 mi northwest of Augusta. Figures given herein represent usable contents. Water is used for irrigation, recreation, and wildlife. Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 35,230 acre-ft June 22, 1975, elevation, 4,144.0 ft; no storage July 31, Aug. 31, 1940.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 32,090 acre-ft June 16, elevation, 4,141.9 ft; minimum observed, 15,300 acre-ft Oct. 1, elevation, 4,128.6 ft.

06083000 NILAN RESERVOIR.--Lat 47°29'06", long 112°32'24", in S½NE¼ sec.18, T.20 N., R.7 W., Lewis and Clark County, Hydrologic Unit 10030104, at north dam, lat 47°28'18", long 112°30'54", in SE¼NE¼ sec. 20, T.20 N., R.7 W., at east dam, 6 mi west of Augusta. PERIOD OF RECORD, December 1951 to current year. April to July 1953 scattered daily contents, published in WSP 1320-B. Records for November 1958 to March 1959, published only in WSP 1729. Nonrecording gage read at middle and end of month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Montana Department of Natural Resources and Conservation).
This is an offstream reservoir formed by two earthfill dams completed in 1951. Usable capacity, 10,090 acre-ft between elevation 4,402.0 ft, bottom of outlet, and 4,442.5 ft, spillway crest. Dead storage, 900 acre-ft below elevation 4,402.0 ft, not including contents of old lake. Stored water is diverted from Smith Creek in NE¼ sec.4, T.19 N., R.8 W., and from Ford Creek in SW¼ sec.26, T.20 N., R.8 W., at points 12 mi and 10 mi, respectively, southwest of Augusta. Figures given herein represent total 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 May 31, 1963, elevation, 4,448.5 ft; no contents observed Sept. 8, 1984.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 10,090 acre-ft June 3, elevation, 4,442.5 ft; minimum observed, 1,700 acre-ft Oct. 2, elevation, 4,418.0 ft.

06090900 LOWER TWO MEDICINE LAKE.--Lat 48°29'39", long 113°15'49", in NE¼ sec.34, T.32 N., R.13 W., Glacier County, Hydrologic Unit 10030201, at dam on Two Medicine River, 4 mi northwest of East Glacier. DRAINAGE AREA, 50.2 mi^2. PERIOD OF RECORD, September 1938 to June 1964 (dam destroyed), December 1967 to current year. Figures of no storage prior to April 1961 may be in error and should be used with caution. Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 occasional elevations and contents, published in WSP 1840-B. Prior to 1942, published as Two Medicine Lake near East Glacier. Nonrecording gage read at or near end of month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation) and is 8.22 ft higher than datum for destroyed dam (levels by Bureau of Indian Affairs).
Reservoir is formed by earthfill dam with concrete spillway and control works; construction began in September 1965, completed in November 1967. Storage began Dec. 1, 1967. Former dam 250 ft upstream completed in 1913 and destroyed by flood of June 8, 1964. Usable capacity at new dam, 11,880 acre-ft between elevation 4,861.0 ft, bottom of outlet, and 4,882.0 ft, spillway crest. Dead storage, about 2,000 acre-ft near upper end of reservoir below elevation 4,861.0 ft. Prior to June 8, 1964, at site and datum then in use, usable capacity was 16,620 acre-ft between elevation 4,848.00 ft elevation of natural outlet, and 4,878.0 ft, spillway crest. Dead storage was unknown. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Bureau of Indian Affairs. REVISED RECORDS, WSP 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 20,930 acre-ft June 8, 1964, elevation, 4,883.8 ft, datum and capacity table then in use, dam overtopped; no storage at times in some years.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 12,490 acre-ft June 30, elevations, 4,883.0 ft; no contents observed Sept. 30.

Smaller reservoirs in Missouri River basin in Montana--Continued

06093000 FOUR HORNS LAKE.--Lat 48°20'33", long 112°41'48", in SW¼NW¼SE¼ sec.19, T.30 N., R.8 W., Glacier County, Hydrologic Unit 10030201, at dam 7 mi northeast of Heart Butte. PERIOD OF RECORD, September 1938 to current year. Records prior to October 1940, published only in WSP 1309 and those for December 1958 to August 1959, published only in WSP 1729. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. Prior to 1950, published as Four Horns Reservoir near Heart Butte. Nonrecording gage read at or near end of month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Bureau of Indian Affairs). This is an offstream reservoir formed by earthfill dam completed in 1932.

Stored water is diverted from Badger Creek in NE¼ sec.24, T.30 N., R.10 W., 5 mi north of Heart Butte. Usable capacity, 19,250 acre-ft between elevation 4,081.0 ft, gage sill, and 4,115.0 ft, maximum design level. No dead storage. 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, 16,320 acre-ft Aug. 5, 1958, elevation, 4,111.6 ft, from capacity table then in use; minimum observed, 2,840 acre-ft July 31, 1949, elevation, 4,090.0 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 13,540 acre-ft Oct. 31, elevation, 4,110.4 ft; minimum observed, 7,980 acre-ft June 30, elevation, 4,101.6 ft.

06094000 SWIFT RESERVOIR.--Lat 48°09'53", long 112°52'20", in NE¼ sec.27, T.28 N., R.10 W., Pondera County, Hydrologic Unit 10030201, at Swift Dam on Birch Creek, 17 mi west of Dupuyer, and at mile 60.5. DRAINAGE AREA, 75.3 mi^2. PERIOD OF RECORD, January 1936 to June 1964 (dam destroyed), June 1967 to current year. Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. April to June 1964 scattered daily elevations and contents, published in WSP 1840-B. Prior to 1950, published as Birch Creek Reservoir near Dupuyer. Nonrecording gage read monthly. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation) and is 63.7 ft lower than datum for destroyed dam (levels by Pondera County Canal and Reservoir Co.).

Reservoir is formed by concrete arch dam; construction began in 1965; completed in 1967. Storage began June 22, 1967. Former dam, in same location, was built about 1915 and destroyed by flood of June 8, 1964. Usable capacity at new dam, 29,980 acre-ft between elevation 4,748.0 ft, bottom of outlet, and 4,883.5 ft, spillway crest. Dead storage, 35 acre-ft below elevation 4,808.2 ft, bottom of outlet, and 4,947.0 ft, spillway crest. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Pondera County Canal and Reservoir Co. REVISED RECORDS, WSP 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 34,300 acre-ft June 8, 1964, elevation, 4,956.3 ft, datum then in use; minimum observed, 20 acre-ft Sept. 30, 1952, elevation, 4,810.0 ft, datum then in use.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 27,860 acre-ft May 31, elevation, 4,878.7 ft; minimum, 6,040 acre-ft Aug. 31, elevation, 4,814.8 ft.

06095500 LAKE FRANCES.--Lat 48°15'48", long 112°12'24", in NE¼NE¼ sec.23, T.29 N., R.5 W., Pondera County, Hydrologic Unit 10030203, at dam 3 mi southeast of Valier. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. Nonrecording gage read at or near end of month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Pondera County Canal and Reservoir Co.).

This is an offstream reservoir formed by earthfill dam completed about 1931. Stored water is diverted from Birch Creek in sec.28, T.29 N., R.8 W., and Dupuyer Creek in sec.28, T.29 N., R.6 W., at points 20 mi and 6 mi, respectively, west of dam. Usable capacity, 111,900 acre-ft between elevation 3,787.40 ft, outlet sill, and 3,816.00 ft, maximum design level. Dead storage is estimated at 5,000 acre-ft below elevation 3,787.40 ft. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Pondera County Canal and Reservoir Co.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 111,400 acre-ft June 4, 1953, elevation, 3,815.92 ft; minimum observed, 4,560 acre-ft Jan. 31, 1938, elevation, 3,789.36 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 105,300 acre-ft May 31, elevation, 3,814.78 ft; minimum observed, 33,170 acre-ft Oct. 1 (interpolated).

06110500 ACKLEY LAKE.--Lat 46°57'19", long 109°55'55", in SE¼ sec.22, T.14 N., R.14 E., Judith Basin County, Hydrologic Unit 10040103, at dam 4 mi southwest of Hobson. PERIOD OF RECORD, June 1938 to September 1960 (total contents), October 1960 to current year (usable contents). Records prior to October 1939, published only in WSP 1309. Nonrecording gage read usually at or near middle and end of month.

This is an offstream reservoir formed by earthfill dam with concrete conduits completed in 1938. Water is diverted from Judith River near center of east line of sec.14, T.14 N., R.13 E., 7.5 mi west of Hobson. Usable capacity, 5,820 acre-ft between gage height 45.0 ft, bottom of outlet, and 82.67 ft, spillway crest. Dead storage, 325 acre-ft below gage height 45.0 ft. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 6,150 acre-ft Sept. 1, 1975, elevation, 2,984.0 ft; minimum observed, 784 acre-ft Aug. 25, 1984, elevation, 2,954.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 5,830 acre-ft May 7, June 19, elevation, 2,982.7 ft; minimum observed, 1,580 acre-ft Oct. 21, elevation, 2,961.0 ft.

Smaller reservoirs in Missouri River Basin in Montana--Continued

06116500 BAIR RESERVOIR.--Lat 46°34'47", long 110°33'24", in SE¼SE¼SW¼ sec.35, T.10 N., R.9 E., Meagher County, Hydrologic Unit 10040201, at dam on North Fork Musselshell River, 1 mi northwest of Delpine, 14 mi northwest of Martinsdale, and at mile 24.7. DRAINAGE AREA, 48.6 mi^2. PERIOD OF RECORD, November 1939 to September 1960 (total contents), winter records incomplete some years during 1951-59, October 1960 to current year (usable contents). Records for November 1939, published only WSP 1309. Prior to October 1969, published as "Durand Reservoir." Nonrecording gage read at or near middle and end of month. 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 1939. Usable capacity, 7,000 acre-ft between elevation 5,253.2 ft, bottom of inlet, and 5,325.0 ft, spillway crest. Dead storage, 24 acre-ft below elevation 5,253.2 ft. Supplemental water can be diverted from Checkerboard Creek in S½ sec.5, T.9 N., R.9 E., but seldom used. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation. REVISED RECORDS, WSP 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 7,390 acre-ft July 1, 1979, elevation, 5,326.3 ft; no storage July 31, 1961, September, October 1984, and July to October 1985.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 7,090 acre-ft July 1, elevation, 5,325.3 ft; no contents observed Oct. 1.

06119000 MARTINSDALE RESERVOIR.--Lat 46°27'17", long 110°16'02", in NE¼NW¼SE¼ sec.18, T.8 N., R.12 E., Wheatland County, Hydrologic Unit 10040201, at north dam 2 mi east of Martinsdale, lat 46°26'33", long 110°15'30", in NE¼ sec.20, T.8 N., R.12 E., at south dam 3 mi southeast of Martinsdale. PERIOD OF RECORD, November 1939 to September 1960 (total contents), winter records incomplete for some years during 1951-59, October 1960 to current year (usable contents). Records for November 1939, published only in WSP 1309. Nonrecording gage read at or near middle and end of month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Montana Department of Natural Resources and Conservation).

This is an offstream reservoir formed by two earthfill dams with concrete conduit and spillway completed in 1939. Stored water is diverted from South Fork Musselshell River in N½ sec.15, T.8 N., R.11 E., at a point 1 mi west of Martinsdale. Usable capacity, 23,110 acre-ft between elevation 4,714.67 ft, bottom of outlet, and 4,779.0 ft, spillway crest. Dead storage, 73 acre-ft below elevation 4,714.67 ft. South Fork Musselshell River flow above diversion is supplemented at times with return flow from lands irrigated by water diverted from North Fork Musselshell River. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 23,910 acre-ft June 15, 1980, elevation, 4,779.84 ft; no storage July 31, Aug. 31, Sept. 30, Oct. 31, 1961.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 22,260 acre-ft June 15, elevation, 4,778.1 ft; minimum observed, 169 acre-ft Oct. 15, elevation, 4,721.7 ft.

06122500 DEADMAN'S BASIN RESERVOIR.--Lat 46°20'24", long 109°24'35", in NE¼ sec.25, T.7 N., R.18 E., Wheatland County, Hydrologic Unit 10040201, at dam 6 mi east of Shawmut. PERIOD OF RECORD, June 1941 to June 1955 (some contents may be total), July 1955 to current year (usable contents), incomplete 1942, 1951-59. Nonrecording gage read at or near middle and end of month. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Montana Department of Natural Resources and Conservation).

This is an offstream reservoir formed by earthfill dam completed in 1941. Stored water is diverted from Musselshell River in NW¼ sec.8, T.7 N., R.17 E., 6 mi northwest of Shawmut. Usable capacity, 72,220 acre-ft between elevation 3,872.0 ft, bottom of outlet, and 3,921.0 ft, maximum design level. Prior to 1958, usable capacity was 52,500 acre-ft at elevation 3,911.0 ft. Dead storage, 4,600 acre-ft below elevation 3,872.0 ft. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 73,240 acre-ft June 7, 1978, elevation, 3,921.5 ft; minimum observed, 3,290 acre-ft Oct. 31, 1961, elevation, 3,867.3 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 58,410 acre-ft July 2, elevation, 3,914.1 ft; minimum observed, 15,610 acre-ft Oct. 1, elevation, 3,887.9 ft.

06136500 FRESNO RESERVOIR.--Lat 48°36'04", long 109°56'45", in SE¼ sec.19, T.33 N., R.14 E., Hill County, Hydrologic Unit 10050002, at dam on Milk River, 13 mi west of Havre and at mile 437.3. DRAINAGE AREA, 3,766 mi^2 of which 670 mi^2 is probably noncontributing. PERIOD OF RECORD, January 1940 to current year. Records prior to September 1940, published only in WSP 1309. March to May, 1952 daily elevations and contents, published in WSP 1260-B. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. Records of daily contents in files of Helena district office. Nonrecording gage read daily. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

Reservoir is formed by earthfill dam with concrete spillway completed in 1939. Usable capacity, 103,000 acre-ft, between elevation 2,530.00 ft, invert of tunnel inlet, and 2,575.00 ft, spillway crest, from revised capacity table effective Feb. 1, 1983. Elevation of maximum water surface is 2,592.93 ft, 224,700 acre-ft. Crest of dam is 2,596.10 ft. There are no gates in the spillway. Dead storage, 544 acre-ft, revised, below elevation 2,530.00 ft. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by U.S. Bureau of Reclamation. REVISED RECORDS, WSP 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 154,000 acre-ft Apr. 3, 1952, elevation, 2,579.35 ft, of which 26,800 acre-ft was uncontrolled storage, capacity table then in use; no storage Feb. 18 to Mar. 6, 1950.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 107,100 acre-ft May 24, 25, elevation, 2,575.85 ft; minimum observed, 39,150 acre-ft Jan. 12, elevation, 2,556.46 ft.

Smaller reservoirs in Missouri River Basin in Montana--Continued

06155000 NELSON RESERVOIR.--Lat 48°31'42", long 107°31'00", in SE¼ sec.14, T.32 N., R.32 E., Phillips County, Hydrologic Unit 10050004, at dam 10 mi northwest of Saco. PERIOD OF RECORD, March 1928 to current year. Records prior to October 1940, published only in WSP 1309. Nonrecording gage read on first and last day of month and more often during high stages. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

This is an offstream reservoir formed by earthfill dam completed in 1922. Stored water is diverted from Milk River at Dodson Dam in SE¼ sec.26, T.31 N., R.26 E., 6 mi west of Dodson. Usable capacity, 60,570 acre-ft, between elevation 2,200 ft, gage sill, and 2,221.6 ft, top of active conservation pool. Dead storage, 18,650 acre-ft below elevation 2,200.0 ft. Reservoir has never been operated to maximum capacity which is 66,800 acre-ft at elevation 2,223.0 ft, maximum design level. Figures given herein represent usable contents. Water is used for irrigation, recreation, and wildlife. Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 60,570 acre-ft July 12-14, 1965, elevation, 2,221.6 ft; minimum observed, 842 acre-ft Aug. 31, 1984, elevation, 2,200.5 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 60,150 acre-ft May 1-13, elevation, 2,221.5 ft; minimum observed, 14,300 acre-ft Oct. 1, elevation, 2,207.3 ft.

06204000 MYSTIC LAKE.--Lat 45°13'30", long 109°45'36", in sec.9, T.7 S., R.16 E., (unsurveyed), Stillwater County, Hydrologic Unit 10070005, at dam on West Rosebud Creek, 15 mi southwest of Roscoe, 25 mi southwest of Absarokee, and at mile 28.8. DRAINAGE AREA, 46.9 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to September 1939, published only in WSP 1309. Record of daily elevations since October 1965 available in files of Helena district office. Water-stage recorder. Prior to October 1965, only monthend figures furnished. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.).

Reservoir is formed by thin-section reinforced concrete arch dam completed in 1925. Usable capacity, 21,000 acre-ft between elevation 7,612.00 ft, minimum operating level, and 7,673.50 ft, top of 3.5 ft stop logs. No dead storage. Figures given herein represent usable contents. Water is used for power development and recreation. Records furnished by The Montana Power Co. REVISED RECORDS, WSP 1916: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 21,130 acre-ft July 10, 1983, elevation, 7,673.80 ft; no storage most days Mar. 23 to May 5, 1981, Apr. 10 to May 19, 1982, May 4, 5, 1983, May 14, 1984, and Mar. 23, 26, 27, 1986.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 20,820 acre-ft June 29, elevation, 7,673.09 ft; no storage Mar. 23, 26, 27.

06212000 COONEY RESERVOIR.--Lat 45°26'47", long 109°11'57", in N½NE¼ sec.36, T.4 S., R.20 E., Carbon County, Hydrologic Unit 10070006, at dam on Red Lodge Creek, 1 mi upstream from Cottonwood Creek, 6.6 mi west of Boyd, and at mile 12.0. DRAINAGE AREA, 206 mi^2. PERIOD OF RECORD, May 1937 to September 1960 (total contents), incomplete 1954-60, October 1960 to current year (usable contents). Records prior to October 1939, published only in WSP 1309. Nonrecording gage read at or near middle and end of month. Datum of gage is at National Geodetic Vertical Datum of 1929.

Reservoir is formed by earthfill dam with concrete spillway completed in 1936. Usable capacity, 27,400 acre-ft between elevation 4,175.0 ft, bottom of tunnel, and 4,250.0 ft, top of 4 ft flashboards. Dead storage, 90 acre-ft below elevation 4,175.0 ft. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation. REVISED RECORDS, WSP 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 26,990 acre-ft June 15, 1967, elevation, 4,249.5 ft; no contents observed Sept. 30, 1960, Oct. 31, 1981 through Feb. 28, 1982.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 26,390 acre-ft June 15, 30, elevation, 4,249.0 ft; minimum observed, 10,980 acre-ft Oct. 15, elevation, 4,225.6 ft.

06307000 TONGUE RIVER RESERVOIR.--Lat 45°07'48", long 106°46'13", in SE¼SE¼NE¼ sec.13, T.8 W., R.40 E., Big Horn County, Hydrologic Unit 10090101, at dam on Tongue River, 4 mi upstream from Post Creek, 7 mi northeast of Decker, and at mile 189.1. DRAINAGE AREA, 1,770 mi^2. PERIOD OF RECORD, December 1938 to current year. Records prior to September 1939, published only in WSP 1309 and those for January, February 1956, published only in WSP 1729. Nonrecording gage read daily but only weekly readings supplied. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

Reservoir is formed by earthfill dam with concrete spillway completed in May 1939. Usable capacity, 68,040 acre-ft between elevation 3,374.4 ft, bottom of outlet, and 3,424.4 ft, spillway crest. Prior to October 1947, usable contents was 73,950 acre-ft at same elevations, due to sedimentation study. Dead storage, 1,400 acre-ft below elevation, 3,374.4 ft. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation. REVISED RECORDS, WSP 1309: 1947-50. WSP 1729: 1951, drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 77,040 acre-ft May 26, 1978, elevation, 3,426.8 ft, from extension of rating curve; no storage October 1939 to February 1940.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 60,420 acre-ft June 24, elevation, 3,422.1 ft; minimum observed, 12,000 acre-ft Oct. 1, elevation, 3,396.1 ft.

Smaller reservoirs in Missouri River basin in Montana--Continued

Monthend contents, in acre-feet, water year October 1985 to September 1986

Date	Lima Reservoir	Ruby River Reservoir	Willow Creek Reservoir	Hebgen Lake	Ennis Lake	Middle Creek Reservoir	Helena Valley Reservoir
Sept. 30	14,710	7,960		357,200	35,060	b4,040	b5,880
Oct. 31	18,880	a13,140		305,300	35,430	b4,530	5,310
Nov. 30	b21,910	18,410		279,700	31,200	a5,460	5,090
Dec. 31	b23,080	a22,540		277,300	29,860	b5,660	4,380
Jan. 31	a24,220	a26,330	No	276,200	30,080	b6,160	3,970
Feb. 28	a25,720	b29,650	data	277,100	30,110	a6,280	3,290
Mar. 31	a33,660	34,010	avail-	278,500	31,380	5,890	3,260
Apr. 30	67,160	40,140	able	289,300	33,130	6,750	8,290
May 31	75,180	a41,260		338,500	35,690	b8,260	6,950
June 30	64,650	35,750		378,800	37,620	b8,270	4,950
July 31	50,360	a27,110		377,500	37,310	b7,300	6,950
Aug. 31	29,640	a12,130		378,800	38,080	b4,310	6,360
Sept. 30	23,630	11,370		349,600	37,310	b3,940	6,910

Date	Lake Helena	Hauser Lake	Holter Lake	Smith River Reservoir	Gibson Reservoir	Pishkun Reservoir	Willow Creek Reservoir
Sept. 30	10,890	52,150	81,110	c 3,480	43,870	19,810	15,100
Oct. 31	11,110	52,520	81,200	c 2,500	66,800	19,040	17,580
Nov. 30	11,110	52,520	65,130	b 2,660	69,430	18,910	17,810
Dec. 31	10,890	52,150	81,250	b 3,480	70,990	18,910	19,350
Jan. 31	10,890	52,150	80,780	b 4,120	66,050	18,390	20,410
Feb. 28	10,890	52,150	78,470	b 5,520	68,110	18,130	22,530
Mar. 31	10,890	52,150	80,590	b 7,350	72,570	18,000	26,200
Apr. 30	10,890	52,150	80,540	a10,300	78,610	21,880	31,220
May 31	10,890	52,150	79,790	b 9,220	88,750	29,530	31,360
June 30	10,890	52,150	81,020	b 8,780	89,250	17,490	28,110
July 31	10,890	52,150	80,920	b 7,960	39,190	17,870	25,120
Aug. 31	11,110	52,520	80,490	b 5,350	16,690	13,950	24,570
Sept. 30	10,890	52,150	80,830	b 5,990	30,270	5,800	24,980

Date	Nilan Reservoir	Lower Two Medicine Lake	Four Horns Lake	Swift Reservoir	Lake Frances	Ackley Lake	Bair Reservoir
Sept. 30	a1,670	11,880	13,460	8,180	32,480	a1,380	0
Oct. 31	b4,430	11,880	13,540	10,880	53,820	---	c 200
Nov. 30	a6,100	---	---	14,460	62,890	---	c 350
Dec. 31	b7,540	---	---	18,920	63,070	---	c 500
Jan. 31	a8,590	---	---	21,870	62,890	---	b1,290
Feb. 28	a9,370	---	---	25,020	66,940	---	b1,960
Mar. 31	b9,790	---	---	9,920	94,540	c3,100	b3,340
Apr. 30	10,030	12,260	11,250	13,970	103,800	a5,310	a4,220
May 31	a10,090	12,190	8,640	27,860	105,300	a5,830	b5,580
June 30	a8,880	12,490	7,980	26,540	96,040	a5,710	b7,090
July 31	a7,760	12,040	8,360	12,170	75,320	a5,130	b7,060
Aug. 31	a5,680	3,970	10,230	6,040	69,340	a4,230	b5,840
Sept. 30	a5,320	0	10,360	10,020	74,380	a4,430	b5,670

Date	Martinsdale Reservoir	Deadman's Basin Reservoir	Fresno Reservoir	Nelson Reservoir	Mystic Lake	Cooney Reservoir	Tongue River Reservoir
Sept. 30	b 173	b15,610	50,840	14,300	19,670	9,260	12,500
Oct. 31	b 827	b21,240	40,520	b31,490	15,340	13,030	17,300
Nov. 30	b 2,610	b23,890	41,790	33,190	6,860	a14,440	17,900
Dec. 31	b 3,540	b26,450	40,010	30,290	4,480	a15,040	12,500
Jan. 31	b 4,670	b29,660	42,830	29,990	3,240	a15,870	12,400
Feb. 28	b 5,080	b34,810	59,250	33,190	2,230	b18,400	24,260
Mar. 31	b 9,850	b38,940	99,970	49,450	260	22,040	30,180
Apr. 30	a15,740	b44,410	104,800	59,720	1,140	b24,550	28,250
May 31	b21,510	a53,470	105,800	58,440	3,700	b24,790	40,660
June 30	b21,130	a58,350	95,340	50,250	20,790	26,390	56,400
July 31	b16,960	b45,130	74,290	45,940	20,710	b22,340	35,800
Aug. 31	b12,720	a33,610	62,720	46,710	20,380	b15,790	13,900
Sept. 30	b11,930	a35,260	68,000	54,280	18,610	a16,390	16,100

a Interpolated.
b Figure of contents for first day of following month.
c Estimated.

06334500 LITTLE MISSOURI RIVER AT CAMP CROOK, SD

LOCATION.--Lat 45°32'49", long 103°58'23", in SW¼ sec.2, T.18 N., R.1 E., Harding County, Hydrologic Unit 10110201, on left bank 15 ft upstream from bridge on State Highway 20 at east edge of Camp Crook.

DRAINAGE AREA.--1,970 mi^2, approximately.

PERIOD OF RECORD.--September 1903 to November 1906, May 1956 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1904. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,108.98 ft above National Geodetic Vertical Datum of 1929. Sept. 2, 1903, to Nov. 30, 1906, nonrecording gage at site 0.5 mi upstream at different datum. May 1956 to Oct. 8, 1957, nonrecording gage at site 15 ft downstream, and Oct. 9, 1957, to Sept. 30, 1976, water-stage recorder at present site both at datum 2.00 ft higher.

REMARKS.--Records good except those for period of estimated record, which is poor. Estimated daily discharges during water year: Nov. 7 to Mar. 3. Small diversions upstream from station for irrigation. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--33 years, 135 ft^3/s, 97,810 acre-ft/yr; median of yearly mean discharges, 120 ft^3/s, 86,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,420 ft^3/s Mar. 24, 1978, gage height, 16.90 ft, present datum; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1952 reached a stage of about 18 ft, present datum, from local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	0315	2,970	11.47	May 10	1615	*5,430	*14.73
Apr. 30	2100	1,090	7.07	Sept. 26	1000	1,890	9.16

Minimum daily discharge, 1.5 ft^3/s, Nov. 30.

CORRECTIONS.--Published acre-feet for October of 1984 and 1985 water years is in error. Correct figures are as follows: October 1983, 236; October 1984, 659.

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	2.5	3.1	1.7	2.6	4.0	800	134	837	71	48	12	8.0
2	2.5	3.1	2.0	2.5	3.6	1000	112	623	67	47	11	17
3	2.7	3.5	2.5	2.4	3.6	1300	106	410	66	42	10	26
4	5.0	3.6	2.7	2.3	3.6	1870	106	254	64	36	19	10
5	10	3.1	2.8	2.2	3.6	2260	190	211	64	31	18	9.0
6	4.8	2.6	2.8	2.2	3.3	2600	616	209	64	28	15	29
7	3.4	2.5	2.8	2.4	3.0	2280	721	248	65	27	13	55
8	4.2	2.4	2.7	2.5	2.5	1850	512	444	65	26	12	38
9	3.4	2.4	2.5	2.6	2.5	1470	339	2090	74	25	11	36
10	4.6	2.4	2.3	2.7	2.3	1380	241	4870	123	26	10	29
11	4.0	2.3	2.2	2.8	2.2	1270	189	4070	437	29	9.9	36
12	3.6	2.3	2.2	2.8	3.7	1290	144	3130	692	27	9.8	36
13	3.5	2.1	2.2	2.9	4.2	1330	121	2340	540	35	8.9	35
14	3.5	1.9	2.3	3.0	4.6	1160	86	1920	450	30	7.9	138
15	3.3	1.9	2.4	3.0	4.8	790	85	1560	390	26	6.8	178
16	2.8	2.0	2.5	3.1	5.0	561	80	1240	340	25	6.7	128
17	2.6	2.0	2.6	3.2	5.0	487	80	827	280	23	6.3	77
18	2.5	1.9	2.7	3.3	4.6	434	83	607	230	20	6.3	58
19	2.5	1.9	2.7	3.4	4.6	340	188	453	197	19	6.3	56
20	2.5	1.8	2.8	3.5	4.8	300	183	339	137	19	5.5	67
21	2.5	1.7	2.8	3.5	5.0	291	176	252	126	19	5.3	52
22	2.5	1.7	2.7	3.5	5.2	398	141	198	98	20	6.1	86
23	2.5	1.7	2.6	3.6	5.4	503	108	164	81	19	6.2	151
24	2.1	1.7	2.5	3.6	5.5	455	87	146	73	17	6.6	83
25	3.3	1.7	2.6	3.6	5.6	311	72	125	68	16	6.3	315
26	3.7	1.7	2.6	4.0	8.0	278	65	108	63	15	6.1	1470
27	3.9	1.6	2.5	4.0	100	282	192	97	58	17	5.9	1380
28	3.5	1.6	2.4	4.0	500	245	729	89	54	14	5.9	1020
29	2.5	1.6	2.5	3.6	---	197	887	82	52	13	5.7	822
30	2.5	1.5	2.7	3.6	---	192	977	78	51	12	4.8	814
31	2.7	---	2.7	3.6	---	155	---	75	---	12	4.7	---
TOTAL	105.6	65.3	78.0	96.0	710.2	28079	7750	28096	5140	763	269.0	7259.0
MEAN	3.41	2.18	2.52	3.10	25.4	906	258	906	171	24.6	8.68	242
MAX	10	3.6	2.8	4.0	500	2600	977	4870	692	48	19	1470
MIN	2.1	1.5	1.7	2.2	2.2	155	65	75	51	12	4.7	8.0
AC-FT	209	130	155	190	1410	55690	15370	55730	10200	1510	534	14400

CAL YR 1985 TOTAL 21548.58 MEAN 59.0 MAX 3500 MIN .20 AC-FT 42740
WTR YR 1986 TOTAL 78411.1 MEAN 215 MAX 4870 MIN 1.5 AC-FT 155500

06336600 BEAVER CREEK NEAR TROTTERS, ND

LOCATION.--Lat 47°09'47", long 103°59'32", in SW¼SW¼NE¼ sec.33, T.143 N., R.105 W., Golden Valley County, Hydrologic Unit 10110204, on left bank 100 ft upstream from bridge on county road, 2.4 mi east of Montana-North Dakota State line, 13 mi southwest of Trotters, 17 mi north of Beach, 20 mi upstream from Elk Creek, and at mile 27.

DRAINAGE AREA.--616 mi^2, revised.

PERIOD OF RECORD.--October 1977 to current year (seasonal records only since 1984).

REVISED RECORDS.--1977: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,370 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 7, June 21-28, and July 17-28. Records fair.

AVERAGE DISCHARGE.--6 years (water years 1978-83), 33.3 ft^3/s, 24,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s Mar. 29, 1978, gage height, 18.61 ft; maximum gage height, 19.27 ft Mar. 22, 1978, ice jam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,250 ft^3/s Mar. 2, gage height, 17,22 ft, backwater from ice; 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	1450	30	17	9.0	27	2.2	.19
2					.00	2050	28	16	8.2	18	2.3	.22
3					.00	1830	27	15	7.5	15	2.0	.38
4					.00	1700	26	16	7.4	12	2.0	.23
5					.00	1450	25	15	6.6	11	1.7	.29
6					.00	1200	24	15	6.7	8.9	1.5	.42
7					.00	900	22	15	6.4	7.6	1.5	.43
8					.00	473	20	16	6.4	7.4	2.0	.38
9					.00	310	19	20	7.4	6.5	1.6	.40
10					.00	242	18	28	7.3	6.2	1.2	.42
11					.00	200	18	32	6.6	5.7	.98	.49
12					.00	172	17	78	6.2	5.2	.97	.26
13					.00	152	17	117	5.7	4.5	.95	.26
14					.00	135	17	72	5.2	3.9	.89	.50
15					.00	125	17	48	4.9	3.6	.86	.92
16					.00	112	20	36	4.6	4.5	.64	.98
17					.00	94	19	30	4.3	18	.67	.89
18					.00	83	20	26	4.4	14	.63	1.1
19					.00	77	20	23	4.0	11	.34	2.7
20					.00	70	19	20	4.9	8.5	.32	2.4
21					.00	63	19	18	4.2	7.4	.21	2.0
22					.00	57	19	16	3.8	6.0	.27	1.2
23					.00	51	18	16	3.1	5.0	.36	1.1
24					20	46	17	16	3.1	4.0	.25	1.5
25					100	42	19	15	2.9	3.5	.12	11
26					900	38	19	16	2.9	3.2	.19	26
27					1500	38	18	14	3.1	3.0	.19	33
28					1400	39	17	12	5.6	2.8	.21	20
29					---	36	16	11	804	2.6	.18	18
30					---	35	18	11	200	2.6	.19	14
31					---	33	---	9.9	---	2.3	.18	---
TOTAL					3920.00	13303	603	809.9	1156.4	240.9	27.60	141.66
MEAN					140	429	20.1	26.1	38.5	7.77	.89	4.72
MAX					1500	2050	30	117	804	27	2.3	33
MIN					.00	33	16	9.9	2.9	2.3	.12	.19
AC-FT					7780	26390	1200	1610	2290	478	55	281

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	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
Part 6		BIG SHEEP CREEK BASIN					
06013500	Big Sheep Creek below Muddy Creek, near Dell	Lat 44°39'19", long 112°46'41", SW¼NW¼SE¼ sec.35, T.13 S., R.10 W., Beaverhead County, Hydrologic Unit 10020001, on left bank 2.2 mi downstream from Muddy Creek, 6.5 mi southwest of Dell, and at mi 8.5.	278	† 1936 †1946-53 1960-76 †1977-79 1980-86	6-05-86	4.69	220
		CLARK CANYON BASIN					
06015430	Clark Canyon near Dillon	Lat 45°00'56", long 112°50'10", in SE¼SW¼ sec.28, T.9 S., R.10 W., Beaverhead County, Hydrologic Unit 10020002, at culvert in county road, 0.3 mi south of Interstate Highway 15 and junction with access road, 1.6 mi north of Interstate Highway 15 and junction to Clark Canyon Dam, 17.0 mi southwest of Dillon.	18.0	1969 1974-86	5-27-86	1.83	31
		RUBY RIVER BASIN					
06019400	Sweetwater Creek near Alder	Lat 45°04'39", long 112°13'32", in NW¼SW¼ sec.4, T.9 S., R.4 W., Madison County, Hydrologic Unit 10020003, at bridge on county road 0.6 mi upstream from small reservoir, 3.5 mi upstream from Belmont Park Ranch, 6.0 mi southwest of Ruby River bridge, 12.5 mi southwest of Ruby Reservoir dam, 18 mi south of Alder.	81.5	1974-86	2-24-86	a 2.20	b 40

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		BIG HOLE RIVER BASIN					
06025100	Quartz Hill Gulch near Wise River	Lat 45°46'35", long 112°51'41", in NE¼SE¼ sec.5, T.1 S., R.10 W., Beaverhead County, Hydrologic Unit 10020004, 210 ft upstream from State Highway 43, 0.3 mi west of Dewey, 4.2 mi east of Wise River.	14.3	1974-86	2-24-86	1.04	2
		FISH CREEK BASIN					
06027700	Fish Creek near Silver Star	Lat 45°46'18", long 112°14'56", in NW¼ sec.8, T.1 S., R.5 W., Silver Bow County, Hydrologic Unit 10020005, at bridge in county road, 6 mi north of Silver Star.	38.9	1959-86	6-03-86	1.25	125
		TRIBUTARY BETWEEN FISH CREEK AND BOULDER RIVER					
06030300	Jefferson River tributary No. 2 near Whitehall	Lat 45°52'48", long 111°58'28", SE¼ sec.33, T.2 N., R.3 W., Jefferson County, Hydrologic Unit 10020005, at culvert in State Highway 281, 6 mi east of Whitehall.	4.50	1958-86	9-17-86	-1.22	7
		BOULDER RIVER BASIN					
06031950	Cataract Creek near Basin	Lat 46°17'10", long 112°14'33", in NW¼SW¼ sec.9, T.6 N., R.5 W., Jefferson County, Hydrologic Unit 10020006, on bridge on county road 200 ft upstream from Big Limber Gulch, and 2.1 mi northeast of Basin.	30.6	1973-86	5-28-86	2.61	245
		MADISON RIVER BASIN					
06038550	Cabin Creek near West Yellowstone	Lat 44°52'19", long 111°20'29", in NW¼SE¼ sec.15, T.11 W., R.3 E., Gallatin County, Hydrologic Unit 10020007, at U.S. Forest Service Cabin Creek Campground on U.S. Highway 287, 12.8 mi west of U.S Highway 191, 19 mi northwest of West Yellowstone.	30.3	1974-86	5-28-86	2.48	520
		GALLATIN RIVER BASIN					
06043300	Logger Creek near Gallatin Gateway	Lat 45°27'17", long 111°14'38", in SW¼ sec.28, T.4 S., R.4 E., Gallatin County, Hydrologic Unit 10020008, at culvert in U.S. Highway 191, 10 mi south of Gallatin Gateway.	2.48	1959-86	5-30-86	.81	28
06046500	Rocky Creek near Bozeman	Lat 45°39'17", long 110°56'33", in NE¼ sec.23, T.2 S., R.6 E., Gallatin County, Hydrologic Unit 10020008, 5 mi east of Bozeman.	50.5	†1951-53 1956-57 1959-86	5-29-86	1.44	250
		SIXTEENMILE CREEK BASIN					
06053050	Lost Creek near Ringling	Lat 46°45'38", long 110°47'08", in SE¼SE¼ sec.24, T.6 N., R.7 E., Meagher County, Hydrologic Unit 10030101, on bridge on U.S. Highway 89, 1 mi southeast of Ringling.	9.59	1974-86	2-24-86	a 3.98	b 80

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		DEEP CREEK BASIN					
06056300	Cabin Creek near Townsend	Lat 46°20'00", long 111°13'05", in NW¼ sec.27, T.7 N., R.4 E., Broadwater County, Hydrologic Unit 10030101, at bridge 100 ft upstream from mouth, 14.5 mi east of Townsend.	11.8	1960-86	9-07-86	2.33	7
		SPOKANE CREEK BASIN					
06058700	Mitchell Gulch near East Helena	Lat 46°34'20", long 111°49'21", in NW¼ sec.2, T.9 N., R.2 W., Lewis and Clark County, Hydrologic Unit 10030101, at culvert in U.S. Highway 12, 4.7 mi east of East Helena.	8.09	1959-86	2-25-86	1.76	195
		WEGNER CREEK BASIN					
06071600	Wegner Creek at Craig	Lat 47°04'35", long 111°57'17", in NW¼ sec.11, T.15 N., R.3 W., Lewis and Clark County, Hydrologic Unit 10030102, at bridge on U.S. Highway 91, 0.9 mi east of Craig.	35.7	1960-86	5-20-86	c	b 20
		DEARBORN RIVER BASIN					
06073600	Black Rock Creek near Augusta	Lat 47°17'28", long 112°09'46", in NE¼NW¼ sec. 30, T.18 N., R.4 W., Lewis and Clark County, Hydrologic Unit 10030102, at culvert 0.1 mi north of Bowmans Corner in U.S. Highway 287, 17.5 mi southeast of Augusta.	5.54	1974-86	2-26-86	8.66	550
		SMITH RIVER BASIN					
06076700	Sheep Creek near Neihart	Lat 46°47'59", long 110°42'10", in SE¼ sec.15, T.12 N., R.8 E., Meagher County, Hydrologic Unit 10030103, at culvert in U.S. Highway 89, 10 mi south of Neihart.	5.23	1960-86	6-02-86	1.34	56
		BELT CREEK BASIN					
06090550	Little Otter Creek near Raynesford	Lat 47°15'05", long 110°43'50", in SW¼NW¼ sec.8, T.17 N., R.8 E., Judith Basin County, Hydrologic Unit 10030105, at culvert in Secondary Highway 427, 1.0 mi south of Raynesford.	39.5	1974-86	2-24-86	3.51	35
		SHONKIN CREEK BASIN					
06090810	Ninemile Coulee near Fort Benton	Lat 47°42'01", long 110°42'12", in SE¼SE¼ sec.34, T.23 N., R.8 E., Chouteau County, Hydrologic Unit 10030102, at culverts in county road, 8.4 mi south of Missouri River bridge at Fort Benton, and 8.5 mi south of Fort Benton.	16.9	1972-86	2-26-86	3.54	47

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		MARIAS RIVER BASIN					
06097100	Blacktail Creek near Heart Butte	Lat 48°14'56", long 112°47'19", in NW¼NW¼ sec.28, T.29 N., R.9 W., Pondera County, Hydrologic Unit 10030201, at bridge on county road, 3.3 mi southeast of Heart Butte, 16.7 mi northwest of Dupuyer.	16.4	1975-86	2-24-86	3.48	390
06098700	Powell Coulee near Browning	Lat 48°45'01", long 112°45'21", in SE¼NE¼ sec.34, T.35 N., R.9 W., Glacier County, Hydrologic Unit 10030202, at culvert in Secondary Highway 444, 10.5 mi north of U.S. Highway 2, 18 mi northeast of Browning.	12.7	1974-86	2-25-86	9.40	370
06100300	Lone Man Coulee near Valier	Lat 48°14'10", long 112°13'49", in SE¼ sec.27, T.29 N., R.5 W., Pondera County, Hydrologic Unit 10030203, at culvert in county road, 5 mi south of Valier.	14.1	1960-86	1980 1981 1982 2-26-86	-- -- -- 8.96	d 85 d 275 d 145 826
06101520	Favot Coulee tributary near Ledger	Lat 48°15'47", long 111°42'09", in SE¼SW¼ sec.14, T.29 N., R.1 W., Pondera County, Hydrologic Unit 10030203, at culvert in Highway 366, 0.3 mi east of Higgins School, 5.5 mi east of Ledger.	.86	1974-86	2-24-86	5.22	80
06101700	Fey Coulee tributary near Chester	Lat 48°27'31", long 111°04'47", near center of east line of sec.9, T.31 N., R.5 E., Liberty County, Hydrologic Unit 10030203, at culvert in county road, 3.5 mi south of Tiber Siding on Great Northern Railway and U.S. Highway 2, 6.5 mi southwest of Chester.	2.47	1963-86	2-24-86	5.60	540
06105800	Bruce Coulee tributary near Choteau	Lat 47°44'07", long 112°15'05", near center of sec.21, T.23 N., R.5 W., Teton County, Hydrologic Unit 10030205, at bridge on county road 1.2 mi west of State Highway 287 and 6 mi southwest of Choteau.	1.70	1963-86	9-18-86	2.73	284
		LITTLE SANDY CREEK BASIN					
06109530	Little Sandy Creek tributary near Virgelle	Lat 48°05'15", long 109°56'34", in NW¼NW¼ sec.21, T.27 N., R.14 E., Chouteau County, Hydrologic Unit 10040101, at culvert in county road, 11 mi east of Highway 236, 10 mi southeast of Big Sandy.	.80	1972 1974-86	2-25-86	2.13	6
		ALKALI COULEE BASIN					
06109560	Alkali Coulee tributary near Virgelle	Lat 48°03'19", long 110°05'21", in SW¼NW¼ sec.32, T.27 N., R.13 E., Chouteau County, Hydrologic Unit 10040101, at culvert on county road, 2.1 mi south of Highway 236, 9.1 mi southeast of of Big Sandy.	.96	1972-86	9-25-86	3.13	37
		JUDITH RIVER BASIN					
06111700	Mill Creek near Lewistown	Lat 46°59'44", long 109°26'49", in NE¼ sec.9, T.14 N., R.18 E., Fergus County, Hydrologic Unit 10040103, at culverts in county road, 5 mi south of Lewistown.	3.53	1960-86	5-05-86	.71	9

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		JUDITH RIVER BASIN--Continued					
06112800	Bull Creek tributary near Hilger	Lat 47°15'10", long 109°21'51", in NW¼NE¼ sec.12, T.17 N., R.18 E., Fergus County, Hydrologic Unit 10040103, at culvert in county road, 0.4 mi west of Hilger.	.99	1974-86	9-09-86	2.32	10
06114550	Wolf Creek tributary near Coffee Creek	Lat 47°17'56", long 110°07'57", in NE¼NE¼ sec.25, T.18 N., R.12 E., Judith Basin County, Hydrologic Unit 10040103, at culverts in county road, 1.8 mi east of Highway 230, 4 mi southwest of Coffee Creek.	1.73	1974-86	2-24-86	3.54	23
		DOG CREEK BASIN					
06114900	Taffy Creek tributary near Winifred	Lat 47°39'06", long 109°15'33", in SW¼NW¼ sec.26, T.22 N., R.19 E., Fergus County, Hydrologic Unit 10040101, at culvert in county road, 8.5 mi northeast of Winifred.	2.95	1974-86	9-25-86	4.23	94
		DUVAL CREEK BASIN					
06115300	Duval Creek near Landusky	Lat 47°45'17", long 108°42'23", in center of sec.13, T.23 N., R.23 E., Phillips County, Hydrologic Unit 10040104, at culvert in U.S. Highway 191, 10.0 road mi north of Fred Robinson Bridge over the Missouri River, 11 mi southwest of Landusky.	3.31	1963-86	9-25-86	13.34	760
		MUSSELSHELL RIVER BASIN					
06117800	Big Coulee near Martinsdale	Lat 46°33'00", long 110°18'52", in SW¼SW¼ sec.11, T.9 N., R.11 E., Meagher County, Hydrologic Unit 10040201, at culvert in county road, 4.3 mi north of U.S. Highway 12 and turnoff to Martinsdale, 6.5 mi north of Martinsdale.	2.86	1972 1974-86	3-02-86	a 5.84	140
06120800	Antelope Creek tributary No. 2 near Harlowton	Lat 46°27'47", long 109°49'29", in SE¼ sec.10, T.8 N., R.15 E., Wheatland County, Hydrologic Unit 10040201, at E.S. Bacon ranch, 1.5 mi north of Harlowton.	21.2	1956-86	7-05-86	2.05	220
06123200	Spring Creek tributary near Harlowton	Lat 46°11'35", long 109°54'10", in NW¼NW¼ sec.18, T.5 N., R.15 E., Sweet Grass County, Hydrologic Unit 10040201, at culverts in U.S. Highway 191, 17 mi south of Harlowton.	2.10	1973-86	9-25-86	4.66	136
06124600	East Fork Roberts Creek tributary near Judith Gap	Lat 46°40'51", long 109°40'24", in SE¼SW¼ sec.26, T.11 N., R.16 E., Wheatland County, Hydrologic Unit 10040201, at culvert in Secondary Highway 248, 3.5 mi east of Judith Gap.	.74	1974-86	7-17-86	1.89	10
06125520	Swimming Woman Creek tributary near Living Springs	Lat 46°36'24", long 109°21'33", in SW¼SW¼ sec.20, T.10 N., R.19 E., Golden Valley County, Hydrologic Unit 10040201, at culvert in county road, 2.3 mi east of county line, 12.5 mi northeast of Hedgesville, 19.5 mi east of Judith Gap.	1.73	1974-86	8-31-86	9.95	403

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		MUSSELSHELL RIVER BASIN--Continued					
06125680	Big Coulee Creek tributary near Cushman	Lat 46°14'50", long 109°01'58", in SE¼SE¼ sec.24, T.6 N., R.21 E., Golden Valley County, Hydrologic Unit 10040201, at culvert in county road, 3.0 mi south of Cushman, 5.5 mi southwest of Lavina.	1.23	1974-86	6-06-86	10.35	460
06127505	Fishel Creek near Musselshell	Lat 46°27'25", long 108°06'36", in NW¼SW¼ sec.9, T.8 N., R.29 E., Musselshell County, Hydrologic Unit 10040202, at culvert in county road, 2.5 mi southwest of Hawk Creek road, 4.5 mi southwest of Musselshell.	16.5	1974-86	2-25-86	3.06	30
06127520	Home Creek near Sumatra	Lat 46°38'14", long 107°37'12", in SE¼NW¼ sec.7, T.10 N., R.33 E., Rosebud County, Hydrologic Unit 10040202, 100 ft upstream from U.S. Highway 12, 3.7 mi northwest of Sumatra.	1.98	1973-86	6-08-86	3.23	92
06127570	Butts Coulee near Melstone	Lat 46°38'49", long 107°49'15", in center of E½ sec.9, T.10 N., R.31 E., Musselshell County, Hydrologic Unit 10040202, at culvert in county road, 2.8 mi north of U.S. Highway 12, 4 mi northeast of Melstone.	6.71	1963-86	5-09-86	5.43	165
06127585	Little Wall Creek tributary near Flatwillow	Lat 46°45'36", long 108°36'24", in SE¼NW¼ sec.32, T.12 N., R.25 E., Petroleum County, Hydrologic Unit 10040202, at culvert in U.S. Highway 87, 1.7 mi north of junction with Highway 244, 20.5 mi southeast of Grass Range.	3.95	1974-86	2-26-86	a 5.42	b 10
06128500	South Fork Bear Creek tributary near Roy	Lat 47°13'44", long 108°47'54", in SW¼ sec.16, T.17 N., R.23 E., Fergus County, Hydrologic Unit 10040204, at culvert in State Highway 19, 1.7 mi north of South Fork Bear Creek, 8.7 road mi south of U.S. Highway 191, 10.5 mi southeast of Roy, and 14 mi north of Grass Range.	5.40	1962-86	6-06-86	5.28	190
06129800	Gorman Coulee tributary near Cat Creek	Lat 47°00'45", long 108°05'33", in SE¼SW¼ sec.31, T.15 N., R.29 E., Petroleum County, Hydrologic Unit 10040204, at culvert in State Highway 20, 6 mi southwest of Cat Creek.	.81	1955-86	9-25-86	.31	11
06130610	Bair Coulee near Mosby	Lat 47°03'15", long 107°36'43", in NE¼NE¼ sec.23, T.15 N., R.32 E., Garfield County, Hydrologic Unit 10040205, at bridge on U.S. Highway 200, 6.8 mi southwest of Sand Springs, 9.0 mi northeast of Mosby.	1.79	1974-86	9-25-86	2.29	57
06130620	Blood Creek tributary near Valentine	Lat 47°20'12", long 108°27'48", in SW¼NW¼ sec.7, T.18 N., R.26 E., Fergus County, Hydrologic Unit 10040205, at culvert in county road 3.0 mi northeast of Valentine, 16 mi east of State Highway 19, 23 mi east of Roy.	1.97	1974-86	9-25-86	2.05	9

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		BIG DRY CREEK					
06130850	Second Creek tributary No. 2 near Jordan	Lat 47°12'23", long 106°48'56", in NE¼ sec.25, T.17 N., R.38 E., Garfield County, Hydrologic Unit 10040105, at culvert in State Highway 22, 9.5 mi southeast of Jordan.	2.08	1958-86	2-25-86	2.36	99
06130915	Russian Coulee near Jordan	Lat 47°19'58", long 106°42'39", in NE¼SW¼ sec.11, T.18 N., R.39 E., Garfield County, Hydrologic Unit 10040105, at bridge on U.S. Highway 200, 9.4 mi east of Jordan.	3.45	1974-86	2-25-86	5.83	200
06130925	Thompson Creek tributary near Cohagen	Lat 46°57'05", long 106°27'38", in NW¼SW¼ sec.19, T.14 N., R.42 E., Garfield County, Hydrologic Unit 10040106, 100 ft downstream from bridge, 1.3 mi northeast of Thompson Creek, 10.5 mi southeast of Cohagen, 11 mi northeast of county line, 14.1 mi northeast Rock Springs.	1.23	1974-86	2-25-86	3.73	112
06130940	Spring Creek tributary near Van Norman	Lat 47°14'58", long 106°18'21", in NW¼NE¼ sec.12, T.17 N., R.42 E., Garfield County, Hydrologic Unit 10040106, at culvert in county road, 7.2 mi south of State Highway 200, 8 mi southeast of Van Norman, 20.6 mi northeast of Cohagen.	1.39	1974-86	2-25-86	7.34	120
		TIMBER CREEK BASIN					
06131100	Terry Coulee (formerly published as Timber Creek tributary near Van Norman)	Lat 47°23'32", long 106°10'15", in SE¼NE¼ sec.24, T.19 N., R.43 E., McCone County, Hydrologic Unit 10040104, at culvert in State Highway 24, 4.7 mi north of State Highway 200, 12 mi east of Van Norman.	.48	1974-86	6-29-86	5.80	158
		MCGUIRE CREEK BASIN					
06131300	McGuire Creek tributary near Van Norman	Lat 47°36'22", long 106°09'12", in NE¼SE¼ sec.2, T.21 N., R.43 E., McCone County, Hydrologic Unit 10040104, at culvert in State Highway 24, 0.7 mi south of McGuire Creek, 19 mi north of State Highway 200, 20.5 mi northeast of Van Norman.	.79	1974-86	2-25-86	4.76	150
		MILK RIVER BASIN					
06132400	Dry Fork Milk River near Babb	Lat 48°49'50", long 113°12'02", in SE¼ sec.32, T.36 N., R.12 W., Glacier County, Hydrologic Unit 10050001, at bridge on State Highway 464, 11 mi east of Babb.	17.9	1962-86	2-24-86	a 7.45	2,640
06134800	Van Cleeve Coulee tributary near Sunburst	Lat 48°53'05", long 111°49'20", on north line of NE¼ sec.14, T.36 N., R.2 W., Toole County, Hydrologic Unit 10030203, at culvert in county road, 3.7 road mi east of Interchange on Interstate 15 at Sunburst.	10.8	1963-86	2-24-86	2.46	136

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		MILK RIVER BASIN--Continued					
06136400	Spring Coulee tributary near Simpson	Lat 48°56'36", long 110°12'51", in SW¼SW¼ sec.24, T.37 N., R.12 E., Hill County, Hydrologic Unit 10050002, at culvert in Highway 232, 1.3 mi northwest of Simpson, 0.7 mi north of mile post 39, 38 mi northwest of Havre.	2.49	1972 1974-86	3-02-86	2.76	20
06137600	Sage Creek tributary No. 2 near Joplin	Lat 48°54'38", long 110°46'20", in NE¼NE¼ sec.2, T.36 N., R.7 E., Liberty County, Hydrologic Unit 10050006, at culvert in Highway 224, 0.7 mi north of Sage Creek, 5.9 mi north of end of pavement, 25.2 mi north of Joplin.	2.21	1974-86	2-24-86	2.85	42
06138700	South Fork Spring Coulee near Havre	Lat 48°24'33", long 109°49'44", in NE¼ sec.31, T.31 N., R.15 E., Hill County, Hydrologic Unit 10050005, at culvert in county road, 12 mi southwest of Havre.	6.47	1960-86	2-24-86	3.67	100
06153400	Fifteenmile Creek tributary near Zurich	Lat 48°38'36", long 109°02'50", in SE¼SE¼ sec.1, T.33 N., R.21 E., Blaine County, Hydrologic Unit 10050004, at culvert in county road, 4.3 mi north of U.S. Highway 2, 4.3 mi north of Zurich.	1.40	1974-86	9-25-86	18.36	1,250
06154350	Peoples Creek tributary near Lloyd	Lat 48°11'33", long 109°18'25", in SW¼SE¼ sec.8, T.28 N., R.19 E., Blaine County, Hydrologic Unit 10050009, at culvert in county road, 1.6 mi south of Peoples Creek, 8 mi south of of Lloyd, 9 mi southwest of Cleveland.	2.51	1965-66 1974-86	2-25-86	6.20	32
06155300	Disjardin Coulee near Malta	Lat 48°16'33", long 107°57'49", in SE¼NW¼ sec.16, T.29 N., R.29 E., Phillips County, Hydrologic Unit 10050004, at bridge on U.S. Highway 191, 8 mi southwest of Malta.	4.84	1956-86	6-29-86	3.88	220
06155600	Murphy Coulee tributary near Hogeland	Lat 48°47'16", long 108°44'50", in SW¼SE¼ sec.17, T.35 N., R.23 E., Blaine County, Hydrologic Unit 10050010, at culverts in county road, 6.5 mi southwest of Hogeland, 13.6 mi north of State Highway 241, 18.4 northeast of Harlem.	1.77	1974-86	2-25-86	5.85	350
06156100	Lush Coulee near Whitewater	Lat 48°41'10", long 107°41'25", in SE¼SE¼ sec.20, T.34 N., R.31 E., Phillips County, Hydrologic Unit 10050011, at culverts in county road, 3 mi north of State Highway 242, 6 mi southwest of Whitewater.	9.58	1974-86	2-25-86	12.36	335
06164600	Beaver Creek tributary near Zortman	Lat 47°55'38", long 108°21'07", in NE¼NE¼ sec.15, T.25 N., R.26 E., Phillips County, Hydrologic Unit 10050014, at bridge on State Highway 191, 0.3 mi northeast of turnoff to Zortman, 8 mi east of Zortman.	3.89	1974-86	9-25-86	3.05	280

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		MILK RIVER BASIN--Continued					
06165200	Beaver Creek tributary No. 2 near Malta	Lat 48°14'34", long 107°32'58", in SW¼NE¼ sec.27, T.29 N., R.32 E., Phillips County, Hydrologic Unit 10050014, at culvert in county road, 11 mi south of Bowdoin, 17 mi southeast of Malta, and 18 mi southwest of Saco.	1.95	1974-86	5-22-86	2.91	43
06172300	Unger Coulee near Vandalia	Lat 48°22'11", long 106°47'37", in SW¼ sec.9, T.30 N., R.38 E., Valley County, Hydrologic Unit 10050012, at bridge on U.S. Highway 2, 4.5 mi northeast of Vandalia.	11.1	1958-86	2-25-86	2.58	170
06173300	Willow Creek tributary near Fort Peck	Lat 47°53'36", long 106°53'22", in SE¼NE¼ sec.25, T.25 N., R.37 E., Valley County, Hydrologic Unit 10050012, at culvert in county road, 6.8 mi west of Pines Recreation area turnoff, 19.8 mi southwest of State Highway 24, 21.5 mi southwest of Fort Peck.	.86	1972 1974-86	9-24-86	8.65	220
06174300	Milk River tributary No. 3 near Glasgow	Lat 48°12'17", long 106°33'05", in SW¼SW¼ sec.3, T.28 N., R.40 E., Valley County, Hydrologic Unit 10050012, at upstream end of culvert in county road, 1.4 mi east of State Highway 247, 4 mi northwest of Glasgow.	1.82	1974-86	3-08-86	3.28	50
06174600	Snow Coulee at Opheim	Lat 48°50'27", long 106°24'47", in SE¼SE¼ sec.25, T.36 N., R.40 E., Valley County, Hydrologic Unit 10050016, at culvert in FAS Route 247, 1 mi south of Opheim.	3.11	1972 1974-86	3-05-86	a 4.79	b 65
		WOLF CREEK BASIN					
06175700	East Fork Wolf Creek near Lustre	Lat 48°24'58", long 105°47'51", in SE¼ sec.30, T.31 N., R.46 E., Valley County, Hydrologic Unit 10060001, at culverts in county road, 4 mi east of Lustre.	9.61	1956-86	2-28-86	5.12	209
		TRIBUTARY BETWEEN WOLF CREEK AND TULE CREEK					
06176950	Missouri River tributary No. 6 near Wolf Point	Lat 48°03'23", long 105°33'22", in NW¼NW¼ sec.32, T.27 N., R.48 E., McCone County, Hydrologic Unit 10060001, on the left bank at upstream end of culvert in county road, 1.2 mi west of State Highway 13, 5 mi southwest of Wolf Point.	.53	1973-86	2-25-86	4.45	23
		TULE CREEK BASIN					
06177020	Tule Creek tributary near Wolf Point	Lat 48°14'40", long 105°29'31", in SE¼SE¼ sec. 21, T.29 N., R.48 E., Roosevelt County, Hydrologic Unit 10060001, on the right bank at upstream end of culvert in county road 0.2 mi east of State Highway 13, 8.6 mi north of U.S. Highway 2, 12 mi northeast of Wolf Point.	1.91	1974-86	2-28-86	a 5.80	b 59
		REDWATER RIVER BASIN					
06177050	East Fork Duck Creek near Brockway	Lat 47°11'14", long 105°47'09", in sec.31, T.17 N., R.47 E., McCone County, Hydrologic Unit 10060002, at bridge on county road, 8 mi south of Brockway.	12.4	1955-86	7-05-86	2.46	275

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		REDWATER RIVER BASIN--Continued					
06177700	Cow Creek tributary near Vida	Lat 47°42'07", long 105°29'20", in SW¼NW¼SW¼ sec. 31, T.23 N., R.49 E., McCone County Hydrologic Unit 10060002, at bridge on State Highway 13, 8.8 mi south of Vida, and 20 mi northeast of Circle.	1.71	1963-86	2-26-86	4.37	950
06177720	West Fork Sullivan Creek near Richey	Lat 47°31'47", long 105°13'43", in NW¼NW¼ sec.4, T.20 N., R.51 E., Dawson County, Hydrologic Unit 10060002, at culvert in county road, 2.5 mi south of Highway 200, 11 mi southwest of Richey, 19 mi northeast of Circle.	13.8	1974-86	6-29-86	7.75	313
06177800	Wolf Creek tributary near Vida	Lat 47°54'49", long 105°29'53", in SE¼ sec.15, T.25 N., R.48 E., McCone County, Hydrologic Unit 10060002, at bridge on State Highway 13, 5.5 mi north of Vida, and 11.1 mi south of Missouri River bridge near Wolf Point.	.91	1962-86	2-25-86	1.99	51
06177820	Horse Creek tributary near Richey	Lat 47°52'28", long 104°56'10", in SE¼NE¼ sec.36, T.25 N., R.52 E., Richland County, Hydrologic Unit 10060002, at culvert in county road, 14.5 mi northwest of Enid, 15.3 mi north of Highway 200, and 17 mi northeast of Richey.	.63	1974-86	2-25-86	5.07	102
		POPLAR RIVER BASIN					
06179100	Butte Creek tributary near Four Buttes	Lat 48°48'33", long 105°35'08", in SE¼SE¼ sec.5, T.35 N., R.47 E., Daniels County, Hydrologic Unit 10060003, attached to wooden post on left bank at upstream end of culvert in FAS Route 248, 1 mi east of Four Buttes.	1.60	1972 1974-86	2-28-86	a 5.40	b 72
		BIG MUDDY CREEK BASIN					
06183300	Spring Creek near Plentywood	Lat 48°48'45", long 104°28'16", in SE¼ sec.1, T.35 N., R.55 E., Sheridan County, Hydrologic Unit 10060006, at culvert in county road, 5 mi northeast of Plentywood.	7.05	1955-86	3-08-86	a 2.73	b 20
06184200	Lost Creek tributary near Homestead	Lat 48°24'09", long 104°29'49", in NW¼NW¼ sec.31, T.31 N., R.56 E., Sheridan County, Hydrologic Unit 10060006, at upstream side of culvert in State Highway 16, 2.3 mi southeast of Homestead, 4.6 mi north of Froid.	1.90	1974-86	3-08-86	a 5.66	b 41
		TRIBUTARY BETWEEN BIG MUDDY CREEK AND YELLOWSTONE RIVER					
06185400	Missouri River tributary No. 5 at Culbertson	Lat 48°09'31", long 104°30'55", in SE¼ sec.20, T.28 N., R.56 E., Roosevelt County, Hydrologic Unit 10060005, at culvert in State Highway 16, at Culbertson Rodeo grounds, 0.7 mi north of U.S. Highway 2.	3.67	1963-86	6-28-86	a 2.32	b 78

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN					
06201700	Hump Creek near Reed Point	Lat 45°42'33", long 109°35'35", in NE¼ sec.35, T.1 S., R.17 E., Sweet Grass County, Hydrologic Unit 10070004, at bridge on Interstate Highway 90 and U.S. Highway 10, 2 mi west of Reed Point.	7.61	1960-86	7-16-86	1.66	24
06205100	Allen Creek near Park City	Lat 45°35'43", long 109°03'22", in NE¼ sec.7, T.3 S., R.22 E., Stillwater County, Hydrologic Unit 10070004, about 200 ft upstream from Cove ditch flume, 7 mi west of Park City.	7.17	1961-86	4-28-86	2.17	130
06207600	Jack Creek tributary near Belfry	Lat 45°09'44", long 108°49'24", in SE¼SE¼ sec.6, T.8 S., R.24 E., Carbon County, Hydrologic Unit 10070006, on railroad bridge 100 ft upstream from U.S. Highway 310, 9 mi east of Belfry, 11.5 mi northwest of Warren.	.85	1975-86	2-25-86	a 2.66	b 4
06214150	Mills Creek at Rapelje	Lat 45°58'03", long 109°15'17", in SE¼NE¼ sec.32, T.3 N., R.20 E., Stillwater County, Hydrologic Unit 10070004, at culvert in Secondary Highway 306, 0.4 mi south of Rapelje.	3.32	1974-86	--	--	e
06216200	West Wets Creek near Billings	Lat 45°37'38", long 108°24'14", in SW¼ sec.28,T.2 S.,R.27 E., Yellowstone County, Hydrologic Unit 10070008, at bridge on county road, 19 mi southeast of Billings.	8.80	1955-86	5-09-86	1.28	43
06217300	Twelvemile Creek near Shepherd	Lat 45°55'16", long 108°27'44", in NW¼SW¼ sec.14, T.2 N., R.26 E., Yellowstone County, Hydrologic Unit 10070007, at culverts in U.S. Highway 87, 5.6 mi north of junction with old Highway 10, 6.0 mi west of Shepherd.	9.05	1973-86	2-25-86	1.57	73
06217700	Crooked Creek tributary near Shepherd	Lat 46°04'23", long 108°30'09", in SW¼ sec.21, T.4 N., R.26 E., Yellowstone County, Hydrologic Unit 10070007, at bridge on county road, 1.7 mi west of U.S. Highway 87 between Billings and Roundup, 12 mi northwest of Shepherd, 20 mi north of Billings.	7.21	1962-86	7-16-86	2.31	350
06290200	Little Bighorn River tributary near Wyola	Lat 45°08'18", long 107°23'08", in SE¼NW¼ sec.14, T.8 S., R.35 E., Big Horn County, Hydrologic Unit 10080016 at left bank along side of private road, 0.3 mi east of U.S. Highway 87, 0.8 mi northeast of Wyola (discontinued).	4.43	1973-86	2-25-86	a 3.42	b 60
06293300	Long Otter Creek near Lodge Grass	Lat 45°26'15", long 107°23'42", near center of line between NE¼ and NW¼ of SE¼ sec.28, T.4 S., R.35 E., Big Horn County, Hydrologic Unit 10080016, at culvert in U.S. Highway 87, 10 mi north of Lodge Grass.	11.7	1973-86	2-25-86	3.74	49
06294400	Andresen Coulee near Custer	Lat 46°03'53", long 107°32'30", in center of W½ sec.30, T.4 N., R.34 E., Yellowstone County, Hydrologic Unit 10080015, at culvert in State Highway 47, 4.5 mi south of Custer, and 5.3 road mi south of Highways 10 and 312.	2.35	1963-86	8-13-86	a .82	b 4

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued					
06294930	Sarpy Creek tributary near Colstrip	Lat 45°54'54", long 107°07'57", in in SW¼SW¼ sec.16, T.2 N., R.37 E., Treasure County, Hydrologic Unit 10100001, at culvert in county road, 0.1 mi north of Treasure and Big Horn county line, 25 mi west of Colstrip.	4.44	1972-86	2-25-86	3.04	21
06294985	East Fork Armells Creek tributary near Colstrip	Lat 46°04'01", long 106°42'39", in SE¼SE¼ sec.26, T.4 N., R.40 E., Rosebud County, Hydrologic Unit 10100001, at bridge on State Highway 315, 13 mi north of Colstrip.	1.87	1973-86	9-25-86	2.62	160
06295020	Short Creek near Forsyth	Lat 46°17'44", long 106°40'05", in NW¼ sec.12, T.6 N., R.40 E., Rosebud County, Hydrologic Unit 10100001, at bridge on county road, 2 mi north of Forsyth, 2.4 mi northeast of U.S. Highway 12.	3.23	1962-86	6-29-86	6.28	425
06295100	Rosebud Creek near Kirby	Lat 45°14'45", long 106°58'02", in NW¼NE¼SW¼ sec.9, T.7 S., R.39 E., Big Horn County, Hydrologic Unit 10100003, upstream from culvert on private road to Helvey Ranch, 5.0 mi upstream from Indian Creek, and 7.0 mi south of Kirby Post Office.	35.5	1959-74 † 1982-85 1986	6-08-86	4.65	185
06296100	Snell Creek near Hathaway	Lat 46°17'29", long 106°08'38", in NE¼SE¼NW¼ sec.7, T.6 N., R.45 E., Custer County, Hydrologic Unit 10100001, at old U.S. Highway 10 bridge 2.5 mi northeast of Hathaway, and at mile 1.4.	10.5	1963-77 † 1982-85 1986	9-25-86	1.98	140
06296115	Reservation Creek near Miles City	Lat 46°22'38", long 105°58'21", in SE¼NE¼ sec.9, T.7 N., R.46 E., Custer County, Hydrologic Unit 10100001, at culvert in county road No. 446, 6.5 mi southwest Miles City.	6.29	1973-86	9-25-86	6.26	450
06306900	Spring Creek near Decker	Lat 45°05'09", long 106°50'12", in SW¼NW¼SE¼ sec. 33, T.8 S., R.40 E., Big Horn County, Hydrologic Unit 10090101, at culverts in county road, 5 mi north of Decker at site of water-quality station (discontinued).	34.7	1958-86	6-04-86	1.01	46
06306950	South Fork Leaf Rock Creek near Kirby	Lat 45°11'16", long 106°54'50", in SW¼NE¼SE¼ sec.35, T.7 S., R.39 E., Bighorn County, Hydrologic Unit 10090101, just upstream of culvert on county road, 10 mi south of Kirby, 12 mi north of Decker, and at mile 4.6.	4.53	1958 1960-81 † 1982-85 1986	2-25-86	a 8.05	b 135
06307520	Canyon Creek near Birney	Lat 45°14'28", long 106°40'32", in SW¼ sec.11, T.7 S., R.41 E., Rosebud County, Hydrologic Unit 10090101, at county bridge 11 mi southwest of Birney.	50.2	1972-86	2-25-86	2.13	145

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued					
06307700	Cow Creek near Fort Howes Ranger Station, near Otter	Lat 45°17'20", long 106°09'14", in in SW¼NW¼ sec.30, T.6 S., R.46 E., Powder River County, Hydrologic Unit 10090102, at bridge on county road, 0.8 mi south of Fort Howes Ranger Station, and 6.6 mi north of Otter Creek Post Office.	8.37	1972-86	2-25-86	a 1.89	b 20
06307720	Brian Creek near Ashland	Lat 45°24'37", long 106°09'07", in SW¼SW¼ sec.11, T.5 S., R.45 E., Powder River County, Hydrologic Unit 10090102, at culvert in county road, 8.1 mi north of Fort Howes Ranger Station 13.5 mi south of Ashland.	8.03	1973-86	2-01-86	2.12	32
06307780	Stebbins Creek at mouth, near Ashland	Lat 45°38'27", long 106°17'34", in NW¼ sec.27, T.2 S., R.44 E., Rosebud County, Hydrologic Unit 10090102, at bridge on county road along west side of Tongue River, 3.5 mi northwest of Ashland, and 3.6 mi north of U.S. Highway 212.	19.9	1963-86	6-08-86	6.10	150
06307930	Jack Creek near Volborg	Lat 46°04'55", long 105°51'08", in NE¼NW¼ sec.26, T.4 N., R.47 E., Custer County, Hydrologic Unit 10090102, at bridge on State Highway 332, 19 mi northwest of Volborg.	5.47	1973-86	9-25-86	4.02	240
06308100	Sixmile Creek tributary near Epsie	Lat 45°31'27", long 105°45'10", in SW¼SW¼ sec.36, T.3 S., R.48 E., Powder River County, Hydrologic Unit 10090102, at culvert in U.S. Highway 212, 5.2 mi northwest of Epsie.	.80	1973-86	9-25-86	5.07	196
06308200	Basin Creek tributary near Volborg	Lat 45°53'11", long 105°41'12", in NW¼ sec.31, T.2 N., R.49 E., Custer County, Hydrologic Unit 10090102, at culvert in county road, 3.5 mi north of Volborg.	.14	1955-86	2-25-86	.29	4
06308330	Deer Creek tributary near Volborg	Lat 46°02'04", long 105°31'15", in extreme southwest corner of sec.4, T.3 N., R.50 E., Custer County, Hydrologic Unit 10090102, at culvert in county road, 3 mi east of U.S. Highway 312, 16 mi northeast of Volborg.	1.65	1973-86	9-25-86	5.37	118
06308340	LaGrange Creek near Volborg	Lat 46°06'17", long 105°33'20", in NE¼NW¼ sec.18, T.4 N., R.50 E., Custer County, Hydrologic Unit 10090102, at culvert near mile post 27 in U.S. Highway 312, 19 mi north of Volborg.	3.66	1973-86	9-25-86	3.40	78
06309060	North Sunday Creek tributary No. 2 near Angela	Lat 46°34'00", long 106°03'51", in NE¼ sec.4, T.9 N., R.45 E., Custer County, Hydrologic Unit 10100001, at culvert in State Highway 22, 13 mi southeast of Angela, 14.1 mi northwest of Yellowstone River bridge at Miles City, 15 mi northwest of Miles City.	.22	1962-86	9-25-86	4.25	64

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued					
06309078	Tree Creek near Kinsey	Lat 46°33'17", long 105°47'48", in NE¼NW¼ sec.10, T.9 N., R.47 E., Custer County, Hydrologic Unit 10100001, at culvert in county road, 5.3 mi north of road to Kinsey, 6.5 mi west of Kinsey, and 10.9 mi northeast Miles City.	4.13	1972 1974-86	7-26-86	8.50	1,250
06309080	Deep Creek near Kinsey	Lat 46°33'25", long 105°37'12", in SE¼SE¼ sec.1, T.9 N., R.48 E., Custer County, Hydrologic Unit 10100001, at culvert in Interstate Highway 94 and U.S. Highway 10, 2 mi southeast of Kinsey, 3.1 mi southwest of Shirley railroad station, and 13 mi northeast of Miles City.	11.5	1962-86	2-25-86	5.55	440
06324995	Badger Creek at Biddle	Lat 45°05'46", long 105°20'17", in SW¼NW¼ sec.34, T.8 S., R.52 E., Powder River County, Hydrologic Unit 10090208, at culvert in State Highway 59, 0.2 mi south of Biddle.	6.06	1972-86	9-25-86	2.38	56
06325700	Deep Creek near Powderville	Lat 45°48'46", long 105°03'51", in NE¼NE¼ sec.25, T.1 N., R.53 E., Custer County, Hydrologic Unit 10090209, at culvert in county road, 2 mi north of Custer-Powder River county line, and 4.5 mi north of Powderville.	3.00	1973-86	9-25-86	2.95	12
06325950	Cut Coulee near Mizpah	Lat 46°08'38", long 105°10'05", in NE¼SW¼ sec.36, T.5 N., R.52 E., Custer County, Hydrologic Unit 10090209, at culvert in county road, 8.5 mi southeast of Mizpah.	2.23	1973-86	5-09-86	11.54	420
06326510	Locate Creek tributary near Locate	Lat 46°25'52", long 105°10'51", in SW¼SE¼ sec.23, T.8 N., R.52 E., Custer County, Hydrologic Unit 10090209, at culvert in U.S. Highway 12, 5.5 mi east of Locate, 6.4 mi east of Locate, and 6.5 mi east of Powder River bridge.	.91	1973-86	6-09-86	1.44	8
06326550	Cherry Creek tributary near Terry	Lat 46°51'18", long 105°20'26", in NE¼SW¼ sec.25, T.13 N., R.50 E., Prairie County, Hydrologic Unit 10100004, at bridge on abandoned part of State Highway 253, 4.8 mi north of Terry.	2.52	1973-86	2-25-86	a 4.24	b 80
06326580	Lame Jones Creek tributary near Willard	Lat 46°11'40", long 104°33'05", in SE¼SE¼ sec.11, T.5 N., R.57 E., Fallon County, Hydrologic Unit 10100005, at culvert in county road, 1.1 mi east of Lame Jones School, 8.8 mi west of Willard.	.51	1974-86	2-25-86	1.54	2
06326800	Pennel Creek near Baker	Lat 46°29'57", long 104°14'17", in center of south edge of sec.36, T.9 N., R.59 E., Fallon County, Hydrologic Unit 10100005, at culvert in State Highway 7, 7.8 mi north of Highway 12 in Baker, and 8 mi north of Baker.	1.00	1962-86	5-09-86	2.14	17

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued					
06326940	Spring Creek tributary near Fallon	Lat 46°48'06", long 104°59'25", in NE¼NE¼ sec.13, T.12 N., R.53 E., Prairie County, Hydrologic Unit 10100004, at culvert in county road, 6.8 mi southeast of Fallon.	3.10	1972-86	7-17-86	3.44	54
06326950	Yellowstone River tributary No. 5 near Marsh	Lat 46°57'11", long 104°53'53", in SW¼ sec.21, T.14 N., R.54 E., Dawson County, Hydrologic Unit 10100004, at culvert in Interstate Highway 94 and U.S. Highway 10, 2.4 mi northeast of Cracker Box Creek, 2.5 mi 2.5 mi southwest of Clear Creek, 5 mi northeast of Marsh.	.87	1962-86	7-17-86	2.40	46
06326960	Timber Fork Creek tributary near Lindsay	Lat 47°10'55", long 105°10'16", in SW¼SW¼ sec.36, T.17 N., R.51 E., Dawson County, Hydrologic Unit 10100004, at culvert in county road, 3.3 mi southwest of Lindsay.	1.13	1974-86	2-25-86	4.89	101
06327550	South Fork Horse Creek tributary near Wibaux	Lat 46°48'09", long 104°22'55", in SW¼SE¼ sec.11, T.12 N., R.58 E., Wibaux County, Hydrologic Unit 10100004, at culvert in county road, 7.5 mi west of State Highway 7, 16.0 mi southwest of Wibaux.	1.34	1973-86	2-25-86	4.24	110
06327720	Griffith Creek tributary near Glendive	Lat 47°06'20", long 104°35'48", in NE¼NW¼ sec.35, T.16 N., R.56 E., Dawson County, Hydrologic Unit 10100004, at culvert in Interstate Highway 94, 5 mi east of Glendive.	3.48	1965 1974-86	7-17-86	11.20	660
06327790	Krug Creek tributary No. 2 near Wibaux	Lat 47°00'23", long 104°18'13", in NW¼NW¼ sec.6, T.14 N., R.59 E., Wibaux County, Hydrologic Unit 10100004, at culvert in county road at Interstate Highway 94 interchange, 5.5 mi west of Wibaux.	.44	1974-86	2-26-86	4.58	77
06328100	Yellowstone River tributary No. 6 near Glendive	Lat 47°09'26", long 104°39'14", in NW¼SW¼ sec.8, T.16 N., R.56 E., Dawson County, Hydrologic Unit 10100004, at bridge on county road to Belle Prairie, 3 mi northeast of Glendive.	2.93	1974-86	7-17-86	3.58	190
06328400	Thirteenmile Creek tributary near Bloomfield	Lat 47°24'46", long 104°49'58", in SE¼SE¼ sec.9 T.19 N., R.54 E., Dawson County, Hydrologic Unit 10100004, at culvert in county road, 3.9 mi east of Bloomfield.	.67	1972 1974-86	6-29-86	3.88	85
06329350	Alkali Creek tributary near Sidney	Lat 47°30'34, long 104°07'03", in SW¼NE¼ sec.7, T.20 N., R.60 E., Richland County, Hydrologic Unit 10100004, at culvert in county road, 7.7 mi south of O'Brien Creek, 12.8 mi south of State Highway 23, 14.8 mi southeast of junction to State Highway 23 and State Highway 16, 14.2 mi southeast of Sidney.	.49	1974-86	7-17-86	11.60	305

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued					
06329510	Fox Creek tributary near Lambert	Lat 47°38'58", long 104°36'52", in NW¼SW¼ sec.24, T.22 N., R.55 E., Richland County, Hydrologic Unit 10100004, at bridge on county road, 2.2 mi south of Lambert.	5.17	1972 1974-86	2-26-86	4.56	42
06329570	First Hay Creek near Sidney	Lat 47°50'08", long 104°16'16", in SE¼ sec.16, T.24 N., R.58 E., Richland County, Hydrologic Unit 10100004, at bridge on State Highway 16, 4.1 road mi north of "Dryland Crop and Soils Research Station" sign, 10 mi northwest of Sidney.	29.1	1963-86	2-25-86	2.56	395
		LITTLE MISSOURI RIVER BASIN					
06334100	Wolf Creek near Hammond	Lat 45°09'53", long 104°45'20", in SE¼ sec.5, T.8 S., R.57 E., Carter County, Hydrologic Unit 10110201, at culvert in U.S. Highway 212, 8 mi southeast of Hammond.	9.09	1955-86	5-09-86	3.45	175
06334330	Little Missouri River tributary near Albion	Lat 45°12'42", long 104°15'41", in SW¼NW¼ sec.21, T.7 S., R.61 E., Carter County, Hydrologic Unit 10110201, at culvert in FAS Route 270, 1.8 mi north of Albion.	1.49	1972-86	3-17-86	1.60	2
06334610	Hawks Nest Creek tributary near Albion	Lat 45°23'20", long 104°28'38", in SE¼ sec.19, T.5 S., R.59 E., Carter County, Hydrologic Unit 10110202 at culvert in State Highway 323, 17 mi northwest of Albion.	.92	1973-86	7-11-86	3.90	33
06334625	Coal Creek near Mill Iron	Lat 45°54'15", long 104°21'42", in NW¼SW¼ sec.26, T.2 N., R.59 E., Carter County, Hydrologic Unit 10110202, at culvert in county road, 8 mi northwest of Mill Iron, 8.5 mi east of State Highway 7, 9.0 mi east of Ekalaka.	.64	1974-86	2-25-86	a 2.79	b 2
06334720	Soda Creek tributary near Webster	Lat 46°00'34", long 104°05'30", in NE¼ sec.23, T.3 N., R.61 E., Fallon County, Hydrologic Unit 10110202, at culvert in county road, 0.3 mi south of Soda Creek and 8 mi southeast of Webster.	2.22	1962-86	2-25-86	7.67	250

† Operated as a continuous-record station.
a Backwater.
b Estimate.
c Peak discharge did not reach bottom of gage.
d Revised.
e No evidence of flow during year.

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)
GRASSHOPPER CREEK BASIN						
Grasshopper Creek 06015500	Red Rock River	Lat 45°06'40", long 112°48'00", in E½SW¼NW¼ sec.26, T.8 S., R.10 W., Beaverhead County, Hydrologic Unit 10020002, 1.75 mi upstream from Beaverhead River, 11 mi south west of Dillon, and at site of former gaging station.	348	1921-33 1939-40 1945-53 1955-73 1975 1982	11-13-85 05-28-86	28.9 140
BEAVERHEAD RIVER BASIN						
Beaverhead River 06017000	Missouri River	Lat 45°13'06", long 112 39'15", on south line of sec. 13, T.7 S., R.9 W., Beaverhead County, Hydrologic Unit 10020002, on right bank at old county bridge site on road to Jackson, at Dillon, and at site of former gaging station.	2890	1907 1950-52 1963-71 1984-85	04-10-86 05-20-86	241 76.7
Blacktail Deer Creek at Dillon 06017600	Beaverhead River	Lat 45°11'32", long 112 39'08", in SE¼NE¼SW¼ sec. 25, T.7 S., R.9 W., Beaverhead County, Hydrologic Unit 10020002, 50 ft downstream from U.S. Highway 91 and 1.0 mi southwest of Dillon.		1972 1984	11-13-85 05-28-86	21.9 48.8
Ruby River 06023000	Beaverhead River	Lat 45°30'28", long 112°19'48", in SE¼NE¼NW¼ sec.10, T.4 S., R.6 W., Madison County, Hydrologic Unit 10020003, on right bank 300 ft upstream from mouth, 2.6 mi south of Twin Bridges, and at site of former gaging station.	935	1940-43 1946-65 1972 1980-82 1985	11-14-85 01-15-86 03-13-86 04-14-86 05-13-86 05-27-86 06-17-86 07-02-86 07-23-86 08-13-86 09-16-86	163 165 195 169 208 163 313 180 111 120 322
JEFFERSON RIVER BASIN						
Big Hole River below Jerry Creek, near Wise River 4547081125450	Jefferson River	Lat 45°47'08", long 112°54'50", in NE¼NW¼NW¼ sec.1, T.1 S., R.11 W., on Beaverhead-Silver Bow County line, Hydrologic Unit 10020004, 0.1 mi downstream from Jerry Creek and 1.7 mi east of Wise River.			07-16-86	832
Big Hole River 06026400	Jefferson River	Lat 45°32'50", long 112°21'59", in SW¼NW¼SE¼ sec.29, T.3 S., R.6 W., Madison County, Hydrologic Unit 10020004, on left bank 0.4 mi upstream of bridge on secondary Highway 361, 0.4 mi above Rochester Creek, 1.8 mi west of Twin Bridges, at mile 2.8, and at site of former gaging station.	2760	1909 1980-82 1985	11-13-85 01-16-86 03-13-86 04-15-86 05-13-86 05-28-86 06-17-86 07-01-86 07-23-86 08-13-86 09-16-86	380 321 922 1920 2510 4330 2310 839 564 128 514
Big Pipestone Creek at Whitehall 06028700	Jefferson River	Lat 45°51'49", long 112 05'48", in SE¼NE¼SE¼ sec.4, T.1 N., R.4 W., Jefferson County, Hydrologic Unit 10020005, at culvert on county road, 0.1 mi south of Whitehall, and at mi 1.8.			11-14-85 05-27-86	8.37 10.2

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		JEFFERSON RIVER BASIN--Continued				
Boulder River near Cardwell 06033900	Jefferson River	Lat 45°52'14", long 111 56'30", in NW¼SE¼NW¼ sec.2, T.1 N., R.3 E., Jefferson County, Hydrologic Unit 10020006, at bridge on Interstate Highway 15, 0.5 mi upstream from mouth, and 0.8 mi northeast of Cardwell.			11-14-85 01-16-86 03-13-86 04-15-86 05-13-86 05-27-86 06-17-86 07-02-86 07-23-86 08-14-86 09-16-86	79.1 72.5 167 238 285 646 190 77.0 64.5 27.9 84.6
South Boulder River near Cardwell 06034300	Jefferson River	Lat 45°48'10", long 111°55'26", in SE¼SW¼NW¼ sec. 25, T.1 N., R.3 W., Madison County, Hydrologic Unit 10020005, 100 ft upstream from bridge on State Highway 359 and 3.5 mi south of Cardwell.		1972	11-14-85 01-16-86 03-13-86 04-15-86 05-13-86 05-27-86 06-17-86 07-02-86 07-23-86 08-12-86 09-16-86	25.7 15.9 22.5 24.4 47.2 120 116 42.5 13.0 5.20 6.17
Willow Creek near Willow Creek 06036500	Jefferson River	Lat 45°45'00", long 111°39'30", in SW¼NW¼ sec.18, T.1 S., R.1 E., at highway bridge 4 mi downstream from Willow Creek Reservoir, 5.5 mi south of town of Willow Creek, and at mile 6.0.	165	1919-32 1946-53 1955-56	11-14-85 05-29-86	8.74 153
		MADISON RIVER BASIN				
Madison River ab Hebgen Lake, near West Yellowstone 06037600	Missouri River	Lat 44°43'00", long 111°06'05", in SW¼SE¼NE¼ sec.10, T.13 S., R.5 E., Gallatin County, Hydrologic Unit 10020007, at bridge on U.S. Highway 191 and 3.6 mi north of West Yellowstone.		1974-75	03-12-86	566
West Fork Madison River near Cameron 06039200	Madison River	Lat 44°53'15", long 111°34'55", near center of SE¼ sec.10, T.11 S., R.1 E., 0.25 mi upstream from mouth and 22 mi southeast of Cameron.	220	1959 1961 1965-67 1972-73	11-13-85 01-15-86 03-12-86 04-16-86 05-14-86 05-28-86 06-16-86 07-01-86 07-22-86 08-12-86 09-17-86	61.4 57.0 60.9 78.2 123 818 257 121 83.6 68.2 68.2
Meadow Creek near McAllister 06040400	Madison River	Lat 45°26'30", long 111°42'38", in SE¼NE¼SW¼ sec.34, T.4 S., R.1 W., Madison County, Hydrologic Unit 10020007, just upstream from mouth, 0.2 mi south of Madison Lake Camp, and 1.0 mi east of McAllister.			11-13-85 05-28-86	47.9 32.5
Hot Springs Creek near Norris 06041300	Madison River	Lat 45°35'07", long 111°35'38", in NE¼SW¼SW¼ sec.10, T.3 S., R.1 E., Madison County, Hydrologic Unit 10020007, just upstream of mouth, 0.1 mi south of State Highway 84, and 4.8 mi northeast of Norris.			11-14-85 05-29-86	5.95 20.5
Cherry Creek near Norris 06041700	Madison River	Lat 45°37'20", long 111°32'50", in NE¼SE¼NW¼ sec.36, T.2 S., R.1 E., Madison County, Hydrologic Unit 10020007, at bridge on State Highway 84, 7.8 mi northeast of Norris, and at mile 0.1.			11-14-85 05-29-86	19.7 237

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		MADISON RIVER BASIN--Continued				
Madison River at Three Forks 06042600	Missouri River	Lat 45°54'05", long 111°31'29", in SE¼NE¼NW¼ sec.30, T.2 N., R.2 E., Gallatin County, Hydrologic Unit 10020007, at bridge on old U.S. Highway 10, 1.5 mi east of Three Forks, and at mile 3.0.		1976-77	03-11-86	1670
					04-17-86	2020
					05-14-86	2370
					05-29-86	4720
					06-17-86	4580
					06-30-86	2550
					07-22-86	1730
					08-14-86	1370
					09-17-86	2400
		SIXTEEN MILE CREEK BASIN				
Sixteen Mile Creek nr Toston 06053400	Missouri River	Lat 46°07'02", long 111°21'41", in NE¼SE¼NW¼ sec.9, T.4 N, R.3 E. Broadwater County, Hydrologic Unit 10030101, at bridge on county road, 5.3 mi southeast of Toston, and at mile 2.6.			11-15-85	30.3
					05-30-86	144
		CROW CREEK BASIN				
Crow Creek 06055500	Missouri River	Lat 46°16'05", long 111°41'30", near west edge of SE¼ sec.14, T.6 N., R.1 W., Broadwater County, Hydrologic Unit 10030101, Helena National Forest on left bank 1.5 mi upstream from Slim Sam Creek, 6 mi northwest of Radersburg, and at site of former gaging station.	78.0	1901-03 1910-11 1919-29 1966-73 1975 1981 1985	11-15-85	20.0
					05-30-86	364
		MARIAS RIVER BASIN				
Two Medicine River 06093600	Marias River	Lat 48°28'20", long 112°21'25", in NW¼SW¼SW¼ sec.2, T.31 N., R.6 W., Glacier County, Hydrologic Unit 10030201, 8.5 river miles upstream from Birch Creek and the eastern boundary of Blackfoot Indian Reservation and 11.5 mi south of Cut Bank.		1982-85	10-17-85	1320
					12-18-85	458
					01-16-86	192
					02-13-86	144
					03-13-86	669
					04-16-86	780
					05-15-86	876
					06-17-86	728
					07-16-86	98.0
					08-13-86	60.5
					09-18-86	297
Blacktail Creek 06097200	Birch Creek	Lat 48°21'11", long 112°33'22", in NE¼NE¼NE¼ sec.19, T.30 N., R.7 W., Pondera County, Hydrologic Unit 10030201, 12.0 mi north of Dupuyer at bridge on State Highway 89, and 2.3 mi upstream from Birch Creek.		1964 1982-85	10-15-85	22.4
					11-14-85	8.31
					12-17-85	6.74
					01-16-86	9.36
					02-13-86	8.64
					03-13-86	25.6
					04-15-86	20.7
					05-14-86	1.04
					06-17-86	6.44
					07-16-86	8.93
					08-13-86	6.88
					09-18-86	80.3
Big Rock Coulee 06098900	Cut Bank Creek	Lat 48°30'06", long 112°22'34", in NE¼NE¼NW¼ sec.15, T.34 N., R.6 W., Glacier County, Hydrologic Unit 10030202, 1.5 mi upstream from mouth, 2.5 mi west of Santa Rita, and 4.9 mi northwest of Cut Bank.		1982-85	10-15-85	3.48
					11-13-85	1.25
					12-17-85	0
					01-15-86	2.52
					02-13-86	.58
					03-12-86	3.78
					04-15-86	1.12
					05-15-86	2.25
					06-17-86	.34
					07-16-86	0
					08-13-86	.22
					09-18-86	.72

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		MARIAS RIVER BASIN--Continued				
Spring Creek 06099100	Cut Bank Creek	Lat 48°34'53", long 112°22'35", in SW¼SE¼SW¼ sec.26, T.33 N., R.6 W., Glacier County, Hydrologic Unit 10030202, 4.5 mi south of Cut Bank on Highway 358 and approximately 4 river miles upstream from junction with Cut Bank Creek and boundary of Blackfeet Indian Reservation.		1982-85	10-15-85	7.14
					11-13-85	7.78
					12-17-85	1.84
					01-15-86	4.72
					02-13-86	1.27
					03-13-86	3.80
					04-15-86	6.04
					05-15-86	3.16
					06-17-86	1.20
					07-16-86	3.40
					08-13-86	8.22
					09-18-86	7.99
		MILK RIVER BASIN				
Lonesome Lake Coulee 06137520	Big Sandy Creek	Lat 48°15'12", long 110°05'08", in SE¼NE¼SE¼ sec.19, T.29 N., R.13 E., Chouteau County, Hydrologic Unit 10050005, just upstream from culvert in county road, 400 ft upstream from Rocky Boys Indian Reservation, 0.8 mi upstream from mouth, 5.1 mi north of Big Sandy, and 5.7 mi southwest of Box Elder.		1982-85	10-14-85	0
					11-12-85	0
					12-16-85	0
					01-14-86	0
					02-13-86	0
					02-25-86	99.2
					03-13-86	0
					04-14-86	0
					05-13-86	0
					06-16-86	0
					07-15-86	0
					08-11-86	0
					09-16-86	0
Duck Creek 06137540	Milk River	Lat 48°14'37", long 109°50'42", in SW¼SW¼NW¼ sec.30, T.29 N., R.15 E., Hill County, Hydrologic Unit 10050005, Rocky Boys Indian Reservation, on left bank 5.5 mi southwest of Rocky Boy Agency, and 10.1 mi southeast of Box Elder.		1982-85	10-14-85	.92
					11-13-85	.70
					12-17-85	.72
					01-14-86	.66
					02-13-86	.25
					03-12-86	.98
					04-14-86	1.22
					05-13-86	5.94
					06-16-86	3.93
					07-15-86	1.90
					08-11-86	.66
					09-16-86	.75
Camp Creek 06137550	Duck Creek	Lat 48°14'54", long 109°57'18", in SE¼SE¼SE¼ sec.19, T.29 N., R.14 E., Chouteau County, Hydrologic Unit 10050005, Rocky Boys Indian Reservation, on right bank 5.5 mi southeast of Box Elder.	7.20	1982-85	10-14-85	0
					11-12-85	0
					12-17-85	0
					01-14-86	0
					02-13-86	0
					03-12-86	.28
					04-14-86	.23
					05-13-86	1.78
					06-16-86	.76
					07-15-86	.01
					08-12-86	.01
					09-16-86	.01
Boxelder Creek 06137575	Milk River	Lat 48°18'38", long 110°01'09", in SW¼ sec.35, T.30 N., R.13 E., Hill County, Hydrologic Unit 10050005, Rocky Boys Indian Reservation, upstream side of bridge 0.7 mi southwest of Box Elder.	67.1	1982-85	10-14-85	4.28
					11-12-85	7.22
					12-16-85	7.72
					01-14-86	6.03
					02-13-86	9.88
					03-13-86	9.28
					04-14-86	1.14
					05-13-86	86.6
					06-16-86	62.7
					07-15-86	9.85
					08-11-86	6.88
					09-17-86	9.34
Sage Creek 06138300	Milk River	Lat 48°23'34", long 110°02'43", in SE¼ sec.33, T.31 N., R.13 E., Hill County, Hydrologic Unit 10050006, at culvert in county road 2.9 mi west of Box Elder.	985	1982-85	10-14-85	0
					11-12-85	0
					12-17-85	0
					01-14-86	0
					02-13-86	0
					02-25-86	23.9
					03-13-86	0
					04-14-86	0
					06-16-86	0
					07-15-86	0
					08-11-86	0
					09-17-86	0

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		MILK RIVER BASIN--Continued				
Big Sandy Creek 06138570	Milk River	Lat 48 24'33", long 109 56'36", in SW¼ sec.29, T.31 N., R.14 E., Hill County, Hydrologic Unit 10050005, Rocky Boys Indian Reservation, on right bank upstream from bridge on county road, 2.6 mi upstream from Gravel Coulee, and 3.3 mi southwest of Laredo.	1640	1982-85	10-14-85	13.0
					11-12-85	27.9
					12-17-85	10.9
					01-14-86	9.72
					02-13-86	12.5
					03-13-86	39.4
					04-14-86	5.97
					05-13-86	111
					06-16-86	89.4
					07-16-86	26.0
					08-11-86	8.03
					09-16-86	17.2
Beaver Creek 06139900	Milk River	Lat 48°13'18", long 109°39'03", in SE¼ sec.33, T.29 N., R.16 E., Hill County, Hydrologic Unit 10050004, on left bank, 0.1 mi downstream from Rocky Boys Indian Reservation boundary, and 6.5 mi southeast of Rocky Boy.	16.1	1907 1982-85	10-14-85	19.5
					11-13-85	10.4
					12-17-85	6.59
					01-14-86	4.47
					02-13-86	3.40
					03-12-86	7.10
					04-14-86	13.8
					05-13-86	47.4
					06-16-86	21.3
					07-15-86	6.50
					08-11-86	4.30
					09-17-86	10.2
Ft. Belknap Canal 06142500	---	Lat 48°36'08", long 109°24'11", in SE¼NW¼SE¼ sec.20, T.33 N., R.18 E., Blaine County, Hydrolgic Unit 10050004, just below headgates of canal on Milk River, 1 mi north of Lohman, and 8 mi west of Chinook.		1903-21	04-29-86	62.2
					04-29-86	60.7
					04-29-86	129
					04-29-86	126
					04-30-86	118
					05-01-86	90.1
					05-12-86	91.6
					05-21-86	36.9
					06-26-86	40.8
					07-07-86	254
					07-09-86	243
					07-29-86	291
					07-31-86	265
					08-06-86	227
					08-26-86	205
					08-29-86	189
					09-16-86	153
Ft. Belknap Canal 06142550	---	Lat 48°36'20", long 109°15'10", in SW¼SW¼NE¼ sec.21, T.33 N., R.19 E., Blaine County, Hydrologic Unit 10050004, at St. Gabriel Cemetery 1 mi north of Chinook.			04-29-86	90.4
					04-30-86	132
					05-01-85	87.5
					05-13-86	92.4
					05-21-86	39.4
					06-26-86	178
					07-08-86	173
					07-29-86	201
					07-31-86	188
					08-07-86	174
					08-26-86	136
					08-28-86	110
					08-29-86	103
					09-16-86	157
Ft. Belknap Canal 06142600	---	Lat 48°35'55", long 109°09'58", in SE¼SE¼SW¼ sec.19, T.33 N., R.20 E., Blaine County, Hydrologic Unit 10050004, 0.1 mi upstream from Battle Creek crossing and 3 mi northeast of Chinook.			05-01-86	27.7
					05-13-86	39.7
					05-21-86	21.1
					06-25-86	127
					07-08-86	113
					07-29-86	135
					07-31-86	122
					08-07-86	121
					08-28-86	59.4
					09-16-86	111

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		MILK RIVER BASIN--Continued				
Paradise Valley Canal 06144000	---	Lat 48°33'52", long 109°10'00", in NW¼SE¼NW¼ sec.5, T.32 N., R.20 E., Blaine County, Hydrologic Unit 10050004, 0.1 mi upstream from Sixmile Coulee, 1 mi downstream from headgates, and 3.5 mi southeast of Chinook.		1906-08 1920-21	05-13-86 05-22-86 06-26-86 07-07-86 07-30-86 08-28-86 09-17-86	30.4 32.5 139 172 127 114 0
Harlem Canal 06153500	---	Lat 48°34'17", long 108°59'50", in NE¼SW¼SW¼ sec.33, T.33 N., R.21 E., Blaine County, Hydrologic Unit 10050004, about 500 ft downstream from headgates and 1.5 mi southeast of Zurich.		1904-21	06-24-86 07-08-86 07-30-86 08-07-86 08-27-86 09-17-86	58.7 98.0 66.8 42.3 42.4 0
Snake Creek 4830501085627	---	Lat 48°30'50", long 108°56'27", in SW¼NW¼SW¼ sec.24, T.32 N., R.21 E., Blaine County, Hydrologic Unit 10050004, 3 mi above mouth and 10 mi southwest of Harlem.			03-23-86	8.39
Threemile Creek 06154130	Milk River	Lat 48°26'02", long 108°36'42", in SE¼NW¼NE¼ sec.21, T.31 N., R.24 E., Blaine County, Hydrologic Unit 10050004, Fort Belknap Indian Reservation, at culvert in U.S. Highway 2, 3 mi upstream from mouth, and 10 mi southeast of Harlem.		1982-85	10-16-85 11-13-85 12-17-85 01-16-86 04-16-86 05-14-86 06-17-86 07-22-86 08-25-86 09-24-86 09-30-86	0 0 0 0 0 0 0 0 0 0 1.0
White Bear Creek 06154150	Milk River	Lat 48°22'23", long 108°32'19", in SW¼SW¼NW¼ sec.7, T.30 N., R.25 E., Philips County, Hydrologic Unit 10050004, Fort Belknap Indian Reservation, 1 mi downstream from Fifteenmile Creek, and 14 mi west of Dodson.		1910 1982-85	10-16-85 11-13-85 12-17-85 01-16-86 03-19-86 04-16-86 05-14-86 06-17-86 07-22-86 08-25-86 09-24-86 09-30-86	5.03 0 0 0 5.35 2.05 62.6 .47 0 0 2.49 44.0
Peoples Creek 06154390	Milk River	Lat 48°15'49", long 108°52'12", in SW¼SE¼SE¼ sec.16, T.29 N., R.22 E., Blaine County, Hydrologic Unit 10050009, at bridge on county road 0.7 mi upstream from St. Johns Coulee, and 13 mi east of Cleveland.		1965-66 1982-85	10-16-85 11-13-85 01-16-86 02-27-86 03-18-86 04-16-86 05-15-86 06-17-86 07-21-86 08-25-86 09-23-86 09-30-86	14.2 5.57 9.88 155 15.8 15.9 77.1 42.6 3.87 .30 12.6 74.0
Lodge Pole Creek 06154430	South Fork Peoples Creek	Lat 48°01'52", long 108°31'55", in SE¼SE¼SW¼ sec.5, T.26 N., R.25 E., Blaine County, Hydrologic Unit 10050009, Fort Belknap Indian Reservation, at culvert in county road south of Lodge Pole 8 mi northeast of Hays.		1972-74 1978 1982-85	10-16-85 11-04-85 12-16-85 02-27-86 04-17-86 06-16-86 07-23-86 08-25-86 09-24-86	.40 0 .95 1.67 0 5.00 2.02 .69 .98

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		MILK RIVER BASIN--Continued				
Dodson South Canal 06154900	---	Lat 48°24'11", long 108°18'07" in NE¼SE¼NE¼ sec.35, T.31 N., R.26 E., Philips County, Hydrologic Unit 10050004, just north of U.S. Highway 2 bridge, 0.7 mi downstream from headgate, and 2.4 mi west of Dodson.		1918-19	04-28-86	190
					05-06-86	236
					06-11-86	288
					06-16-86	389
					07-08-86	448
					07-22-86	384
					08-26-86	263
					09-23-86	386
Nelson South Canal 06155002	---	Lat 48°31'44", long 107°31'01", in SE¼NW¼SW¼ sec.13, T.32 N., R.32 E., Phillips County, Hydrologic Unit 10050004, just below headgate, 0.1 mi east of Nelson Reservoir, and 9.5 mi northwest of Saco.			04-28-86	44.0
					06-11-86	206
					06-18-86	242
					07-25-86	256
					08-27-86	70.4
					09-23-86	3.92
Dodson North Canal 06155005	---	Lat 48°24'44", long 108°18'27", in SE¼NW¼SE¼ sec.26, T.31 N., R.26 E., Phillips County, Hydrologic Unit 10050004, 0.1 mi downstream from headgate, 0.1 mi below Dodson Dam, and 2.8 mi northwest of Dodson.		1918-19	04-28-86	0
					05-06-86	92.3
					06-11-86	91.8
					06-17-86	107
					07-08-86	128
					07-22-86	180
					08-26-86	103
					09-23-86	3.55
Milk River at Malta 06155500	Missouri River	Lat 48°22'00", long 107°52'00", in NW¼ sec.17, T.30 N., R.30 E., at the old highway bridge at Malta.	11762	1902-22	09-26-86	14800
					09-27-86	14500
Spring Coulee 06164650	Beaver Creek	Lat 48°07'07", long 108°16'57", in SW¼SW¼SW¼ sec.5, T.27 N., R.27 E., Phillips County, Hydrologic Unit 10050014, at bridge on county road 13 mi northeast of Lodge Pole.		1982-85	10-16-85	0
					11-13-85	0
					12-16-85	0
					01-16-86	0
					03-10-86	0
					04-17-86	0
					05-15-86	0
					06-16-86	0
					07-21-86	0
					08-25-86	0
					09-24-86	0
					09-30-86	1.50
Wild Horse Creek 06164660	Beaver Creek	Lat 48°09'32", long 108°16'10", in NW¼SW¼NE¼ sec.29, T.28 N., R.27 E., Phillips County, Hydrololgic Unit 10050014, at bridge on county road 15 mi northeast of Lodgepole.		1982-85	10-16-85	0
					11-13-85	0
					12-16-85	0
					01-16-86	0
					03-10-86	0
					04-17-86	0
					05-15-86	0
					06-16-86	0
					07-21-86	0
					08-25-86	0
					09-24-86	0
					09-30-86	1.00
Wild Horse Creek tributary 06164665	Wild Horse Creek	Lat 48°09'32", long 108°16'10", in SW¼NW¼NE¼ sec.29, T.28 N, R.27 E., Phillips County, Hydrologic Unit 10050014, at bridge on county road 0.7 mi upstream from mouth and 15 mi north of Lodge Pole.		1982-85	10-16-85	0
					11-13-85	0
					12-16-85	0
					01-16-86	0
					03-10-86	1.09
					04-17-86	0
					05-15-86	0
					06-16-86	0
					07-21-86	0
					08-25-86	0
					09-24-86	0
					09-30-86	3.00

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		MILK RIVER BASIN--Continued				
Vandalia South Canal 06171990	---	Lat 48°22'20", long 106°58'24", in SW¼SW¼NW¼ sec.7, T.30 N., R.37 E., Valley County, Hydrologic Unit 10050012, just downstream from headgate, just south of Vandalia Dam, and 3.2 mi northwest of Vandalia.			05-07-86 05-07-86 05-07-86 06-26-86 07-28-86 08-28-86 09-22-86	291 49.3 20.2 239 217 164 68.9
Middle Fork Porcupine Creek 06174550	Porcupine Creek	Lat 48°40'07", long 106°26'23", in NE¼NE¼NE¼ sec.36, T.34 N., R.40 E., Valley County, Hydrologic Unit 10050016, downstream from first bridge on county road, 2.5 mi east of Baylor and State Highway 247.		1982-85	03-05-86 04-25-86 05-19-86 06-16-86 07-14-86	399 2.02 2.73 0 0
West Fork Porcupine 06174700	Porcupine Creek	Lat 48°33'36", long 106°32'13", in NW¼NW¼NW¼ sec.4, T.32 N., R.40 E., Valley County, Hydrologic Unit 10050016, Fort Peck Indian Reservation, at bridge on Highway 247, 8 mi south of Baylor, and 22 mi 22 mi south of Ophiem.		1982-85	03-05-86 04-25-86 05-14-86 06-16-86 07-14-86	2.27 .20 .40 0 0
Little Porcupine Creek 06175505	Missouri River	Lat 48°03'52", long 106°02'34", in NE¼SW¼SE¼ sec.28, T.27 N., R.44 E., Valley County, Hydrologic Unit 10050016, Fort Peck Indian Reservation, at bridge on U.S. Highway 2, at Frazer, and 2 mi upstream from mouth.		1982-85	03-10-86 04-15-86 05-13-86 06-12-86	93.7 0 24.9 0
		MISSOURI RIVER BASIN				
Oswego Creek 06175530	Missouri River	Lat 48°03'50", long 105°52'35", in SW¼NE¼SW¼ sec.26, T.27 N., R.45 E., Valley County, Hydrologic Unit 10060001, Fort Peck Indian Reservation, at bridge on U.S. Highway 2 0.3 mi north of Oswego.		1972 1982-85	03-13-86 04-15-86 05-13-86 06-12-86	.78 0 0 0
Flynn Creek 06175545	Missouri River	Lat 48°04'15", long 105°49'30", in SE¼NE¼NE¼ sec.30, T.27 N., R.46 E., McCone County, Hydrologic Unit 10060001, Fort Peck Indian Reservation, at bridge on Highway 2 3 mi east of Oswego.		1982-85	03-13-86 04-15-86 05-13-86 06-12-86	2.82 0 0 0
Tule Creek 06177025	Missouri River	Lat 48°07'49", long 105°25'05", in SW¼SW¼SE¼ sec.32, T.28 N., R.49 E., Roosevelt County, Hydrologic Unit 10060001, Fort Peck Indian Reservation, at bridge on old U.S. Highway 2 10 mi west of Poplar and 10.5 mi east of Wolf Point.		1982-85	03-13-86 04-17-86 05-13-86 06-17-86 07-15-86	12.2 .50 10.6 0 0
		POPLAR RIVER BASIN				
East Fork Poplar River 06179000	Poplar River	Lat 48°51'08", long 105°25'15", in NE¼NW¼ sec.27, T.36 N., R.48 E., Daniels County, Hydrologic Unit 10060003, on right bank at downstream side of bridge on State Highway 13, 2.5 mi upstream from mouth, 4 mi north of Scobey, and at site of former gaging station.	722	1935-39 1975-85	10-17-85 11-18-85 01-14-86 02-18-86 03-25-86 04-16-86 05-14-86 06-18-86 07-16-86 08-19-86 09-17-86	4.48 2.09 1.50 0 33.3 12.0 20.2 3.66 4.11 1.37 3.60

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		POPLAR RIVER BASIN--Continued				
Poplar River 06179200	Missouri River	Lat 48°33'05", long 105°21'55", in NW¼SW¼SW¼ sec.4, T.32 N., R.49 E., Roosevelt County, Hydrologic Unit 10060004, on county road bridge 3.8 mi upstream from mouth, and 4.4 mi north west of Bredette, at site of water-quality station.	1740	1976-85	10-17-85	22.3
					11-18-85	6.30
					12-16-85	0
					01-14-86	1.50
					02-18-86	1.00
					03-24-86	143
					04-15-86	49.9
					05-14-86	161
					06-17-86	62.6
					07-15-86	52.2
					08-18-86	8.61
					09-16-86	9.07
Police Creek 06180300	West Fork Poplar River	Lat 48°35'32", long 105°30'32", in NE¼NE¼NW¼ sec.25, T.33 N., R.47 E., Roosevelt County, Hydrologic Unit 10060000, Fort Peck Indian Reservation, 15 mi southwest of Scobey.		1982-85	03-24-86	.30
					05-13-86	0
					06-17-86	0
West Fork Poplar River 06180400	Poplar River	Lat 48°33'01", long 105°25'42", in SW¼SW¼ sec.1, T.32 N., R.48 E., Roosevelt County, Hydrologic Unit 10060004, at bridge on State Highway 13, 5.9 mi upstream from mouth, 6.6 mi northwest of Bredette, and at site of water-quality station.	1010	1974 1976-85	10-17-85	19.1
					11-08-85	4.76
					12-16-85	0
					01-14-86	0
					02-18-86	0
					03-24-86	90.6
					04-15-86	24.4
					05-14-86	105
					06-17-86	6.54
					07-15-86	88.6
					08-18-86	4.51
					09-16-86	8.94
Boxelder Creek 06181020	Poplar River	Lat 48°06'58", long 105°13'11", in SW¼SE¼SE¼ sec.2, T.27 N., R.50 E., Roosevelt County, Hydrologic Unit 10060003, Fort Peck Indian Reservation, at culvert in county road 0.2 mi north of U.S. Highway 2, and 2 mi west of Poplar.		1982-85	03-13-86	16.6
					04-17-86	0
					05-13-86	1.81
					06-12-86	0
		BIG MUDDY CREEK BASIN				
Wolf Creek 06183900	Big Muddy Creek	Lat 49°36'26", long 104°48'29", in NW¼NW¼NE¼ sec.20, T.33 N., R.53 E., Sheridan County, Hydrologic Unit 10060006, Fort Peck Indian Reservation, on county road bridge 15 mi west of Reserve.		1982-85	03-13-86	2.47
					04-15-86	.43
					05-14-86	2.56
					06-17-86	.20
					07-15-86	0
Smoke Creek 06184400	Big Muddy Creek	Lat 48°33'47", long 105°04'18", in NW¼NW¼NE¼ sec.3, T.32 N., R.51 E., Roosevelt County, Hydrologic Unit 10060006, Fort Peck Indian Reservation, on county road bridge 1 mi north of Pleasant Prairie, and 18 mi south of Flaxville.		1982-85	03-05-86	18.8
					04-15-86	.10
					05-15-86	.45
					06-17-86	0
					07-15-86	0
		YELLOWSTONE RIVER BASIN				
Mammouth Springs at Mammouth 06190410	Gardner River	Lat 44°58'11", long 110°41'33", unsurveyed, Hydrologic Unit 10070001, Yellowstone National Park, 100 ft downstream from south most bridge in Park Service residential area and about 1 mi upstream of mouth.		1967	09-04-86	2.83

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued				
Hot River 06190540	Gardner River	Lat 44°59'10", long 110°41'15", unsurveyed, Hydrologic Unit 100700001, 50 ft downstream from outfall, 0.8 mi northeast of post office at Mammoth, Yellowstone National Park.		1938-44 1966-67	09-04-86	21.1
La Duke Hot Springs 4505351104625	Yellowstone River	Lat 45°05'35", long 110°46'25", in NW¼SE¼SW¼ sec.32, T.9 S, R.8 E., Park County, Hydrologic Unit 10020008, at downstream end of concrete culvert under U.S. Highway 89 about 4.5 mi north of Gardiner.		1972 1975-76	09-04-86	.08
Emigrant Spring Creek 4519591104543	Yellowstone River	Lat 45°19'59", long 110°45'43", in SE¼SNE¼NE¼ sec.8, T.6 S., R.8 E., Park County, near creek mouth, 0.4 mi west of old Highway 89, 2.5 mi west of Chico, and 3 mi south of Emigrant.		1985	02-11-86	4.31
South McDonald Spring Creek 4529291103540	Yellowstone River	Lat 45°29'29", long 110°35'40", in SE¼SW¼NE¼ sec.15, T.4 S., R.9 E., Park County, just upstream from mouth, 1 mi west of old Highway 89, and 9 mi northeast of Pray.		1985	02-11-86	9.11
Middle McDonald Spring Creek 4529451103459	Yellowstone River	Lat 45°29'45", long 110°34'59", in SW¼SE¼SW¼ sec.11, T.4 S., R.9 E., Park County, Hydrologic Unit 100700002, just upstream from mouth, 0.5 mi west of old Highway 89, 9.5 mi northeast of Pray.		1985	02-11-86	5.87
Armstrong Creek 4533111103524	Trail Creek	Lat 45°33'11", long 110°35'24", in SE¼NE¼NE¼ sec.27, T.3 S., R.9 E., Park County, below small dam 0.4 mi east of Highway 89 and 7.8 mi south of Livingston.		1985	02-11-86	81.3
Little Rocky Creek 4523311094525	Stillwater River	Lat 45°23'31", long 109°45'25", in SE¼SE¼SW¼ sec.16, T.5 S., R.16 E., Stillwater County, Hydrologic Unit 10070005, at U.S. Forest Service bridge, 3.2 mi southwest of Dean, and 4.5 mi southeast of Nye.	19.5	1985	10-16-85 11-13-85 12-11-85 01-14-86 02-12-86 03-17-86 04-14-86	1.95 1.67 1.12 .88 .51 .84 .94
West Rosebud Creek 4516391093826	Rosebud Creek	Lat 45°16'39", long 109°38'26", in SE¼SE¼SW¼ sec.28, T.6 S., R.17 E., Stillwater County, Hydrologic Unit 10070005, at Pine Grove Campground 3.0 mi downstream from Emerald Lake and 8.5 mi southwest of Roscoe.	79.9	1985	10-16-85 11-15-85 12-11-85 01-14-86 02-12-86 03-17-86 04-14-86	98.5 179 66.0 46.0 48.0 86.0 39.0
West Rosebud Creek 4523541093216	Rosebud Creek	Lat 45°23'54" long 109°32'16", in NE¼NW¼SW¼ sec.17, T.5 S., R.18 E., Stillwater County, Hydrologic Unit 10070005, at bridge on county road 4.0 mi south of Fishtail.	135	1985	10-16-85 11-15-85 12-11-85 01-14-86 02-12-86 03-17-86 04-14-86	116 219 65.9 83.0 48.0 109 52.0
West Fishtail Creek 4522581094054	West Rosebud Creek	Lat 45°22'58", long 109°40'54", in SE¼NW¼SW¼ sec.19, T.5 S., R.17 E., Stillwater County, Hydrologic Unit 10070005, 200 ft upstream from mouth, 2.0 mi south of Dean, and 8.5 mi southeast of Nye.	15.1	1985	10-16-85 11-13-85 12-11-85 01-14-86 02-12-86 03-17-86 04-14-86	6.69 4.95 3.30 2.90 1.50 2.00 3.60

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		YELLOWSTONE RIVER BASIN--Continued				
East Fishtail Creek 4522561094051	West Rosebud Creek	Lat 45°22'56", long 109°40'51", in SE¼NW¼SW¼ sec.19, T.5 S., R.17 E., Stillwater County, Hydrologic Unit 10070005, 300 ft upstream from mouth, 2.0 mi south of Dean and 8.5 mi southeast of Nye.	11.0	1985	10-16-85 11-13-85 12-11-85 01-14-86 02-12-86 03-17-86 04-14-86	5.93 6.10 2.99 3.40 3.90 3.00 4.90
Butcher Creek 4517251092841	East Rosebud Creek	Lat 45°17'25', long 109°28'41", in SE¼SE¼NW¼ sec.23, T.6 S., R.18 E., Carbon County, Hydrologic Unit 10070005, at culvert on county road just below confluence of East and West Forks and 2.5 mi west of Luther.	9.69	1960-62 1985	10-16-85 11-13-85 12-12-85 01-15-86 02-13-86 03-18-86 04-15-86	2.17 1.30 1.32 1.10 1.40 2.90 4.50
Dry Creek 4512161090010	Clarks Fork Yellowstone River	Lat 45°12'16", long 109°00'10", in SE¼ sec.26, T.7 S., R.22 E., Carbon County, at mouth, 3.5 mi northeast of Belfry.		1971	10-17-85 11-14-85 12-12-85 01-15-86 02-12-86 03-18-86 04-15-86	12 2.69 2.32 2.22 3.22 5.00 5.19
Clear Creek 4522261090844	Rock Creek	Lat 45°22'26", long 109°08'44", in NW¼SW¼NW¼ sec.28, T.5 S., R.21 E., Carbon County, Hydrologic Unit 10070006, at culvert on county road 1.5 mi northeast of Roberts.		1972 1985	10-17-85 11-14-85 12-12-85 01-15-86 02-13-86 03-18-86 04-15-86	39.1 21.7 14.1 10.1 8.55 15.4 12.6
Sage Creek 4513041083416	Shoshone River	Lat 45°13'04", long 108°34'16", in NW¼NW¼ sec.19, T.7 S., R.26 E., Carbon County, Hydrologic Unit 10080010, at U.S. Forest Service and Crow Indian Reservation boundaries, 11.5 mi north of Warren.	32.7	1985	10-17-85 11-14-85 12-12-85 01-15-86 03-18-86 04-15-86	8.60 3.10 8.10 8.00 7.90 8.50
Armells Creek 06294995	Yellowstone River	Lat 46°14'59", long 106°48'22", in SE¼NW¼NE¼ sec.26, T.6 N., R.39 E., Rosebud County, Hydrologic Unit 10100001, on right bank 300 ft upstream from bridge on Interstate Highway I-94, 2.2 mi upstream from mouth, 6 mi southwest of Forsyth, and at site of former gaging station.	370	1974-85	03-13-86 05-01-86 09-04-86	4.75 3.68 8.86
Cow Creek 06295380	Rosebud Creek	Lat 45°51'51", long 106°27'02", in NW¼SW¼SE¼ sec.1, T.1 N., R.42 E., Rosebud County, Hydrologic Unit 10100003, at private road ford, 0.2 mi downstream from confluence with South Fork, 4.2 mi upstream from mouth, 8.4 mi southeast of Colstrip, and at site of current water-quality station.	27.2	1980-85	10-22-85	0
Hanging Woman Creek 06307570	Tongue River	Lat 45°08'02", long 106°29'00", in SW¼SE¼SE¼ sec.17, T.8 S., R.43 E., Big Horn County, Hydrologic Unit 10090101, on county road bridge, 0.6 mi downstream from Horse Creek, 0.8 mi upstream from Circle Bar Draw, 13.2 mi southeast of Birney, and at site of water-quality stations.	321	1977-83	01-29-86 02-28-86 04-15-86 06-10-86 07-15-86 08-12-86 09-23-86	.23 109 .86 .78 .26 .21 .42

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
05016000 SWIFTCURRENT CREEK AT SHERBURNE, MT (LAT 48 49 49 LONG 113 30 59)					
OCT , 1985					
17...	1300	E1.0	246	6.0	2.0
MAY , 1986					
14...	1520	260	137	2.0	5.5
29...	1600	1250	137	32.0	8.5
JUL , 1986					
15...	1800	487	124	19.0	15.0
SEP					
17...	1405	1.9	135	7.0	10.0
06012500 RED ROCK RIVER BELOW LIMA RESERVOIR, NEAR MONIDA, MT (LAT 44 39 20 LONG 112 22 05)					
OCT , 1985					
02...	1430	50	340	12.5	6.0
NOV					
12...	1500	--	373	-10.0	.5
APR , 1986					
01...	1515	21	563	2.5	3.5
MAY , 1986					
13...	1530	279	457	13.5	6.0
JUN					
25...	1130	578	447	22.5	17.0
AUG					
05...	0800	452	420	12.0	17.0
06016000 BEAVERHEAD RIVER AT BARRETTS, MT (LAT 45 06 59 LONG 112 44 59)					
OCT , 1985					
02...	0930	201	564	6.0	7.0
JAN , 1986					
08...	0900	--	615	-3.0	.5
FEB					
19...	1800	--	584	-2.5	4.0
APR , 1986					
02...	0900	241	496	2.5	4.0
JUN					
25...	1630	960	582	24.0	16.0
AUG					
05...	1145	813	571	24.0	17.0
SEP					
30...	1545	284	534	12.0	11.0
06017000 BEAVERHEAD RIVER AT DILLON, MT (LAT 45 13 06 LONG 112 39 15)					
APR , 1986					
10...	1000	241	534	13.5	9.0
MAY , 1986					
20...	1715	77	557	22.0	14.5
06018500 BEAVERHEAD RIVER NEAR TWIN BRIDGES, MT (LAT 45 23 01 LONG 112 27 07)					
OCT , 1985					
04...	0845	414	679	.0	6.5
NOV					
20...	1500	373	685	-4.5	.0
JAN , 1986					
07...	1515	322	688	-1.5	.5
FEB					
19...	0930	373	673	-1.0	3.0
APR , 1986					
02...	1245	355	631	7.0	6.5
JUN					
24...	1545	167	718	28.0	21.5
AUG					
05...	1545	150	722	29.0	20.5
06019500 RUBY RIVER ABOVE RESERVOIR, NEAR ALDER, MT (LAT 45 10 31 LONG 112 08 52)					
OCT , 1985					
03...	0930	106	706	7.5	8.5
NOV					
20...	1100	--	664	-5.5	.0
JAN , 1986					
08...	1330	118	659	5.0	1.0
FEB					
20...	1015	--	656	-3.0	3.0
APR					
03...	1330	124	611	7.0	8.5
MAY , 1986					
15...	0945	262	550	5.0	7.5
21...	1300	685	330	16.0	10.0
29...	0845	1220	337	15.5	10.0
JUN					
26...	1000	186	577	21.5	14.0
AUG					
04...	1315	143	640	25.0	19.5
06020600 RUBY RIVER BELOW RESERVOIR, NEAR ALDER, MT (LAT 45 14 32 LONG 112 06 36)					
OCT , 1985					
03...	1300	29	671	10.5	8.0
NOV					
20...	1245	32	676	-5.5	3.0
JAN , 1986					
08...	1545	--	705	3.0	3.0
FEB					
20...	1100	55	706	-1.5	3.0
APR					
03...	1615	59	647	9.0	4.5
MAY , 1986					
15...	1215	265	611	7.5	8.5
21...	1615	498	563	10.5	9.5
29...	1145	1020	496	24.0	14.0
JUN					
26...	1230	443	552	28.5	10.0
AUG					
04...	1100	355	546	23.5	17.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
454708112545001 BIG HOLE RIVER BELOW JERRY CREEK, NEAR WISE RIVER, MT (LAT 45 47 08 LONG 112 54 50)					
JUL , 1986					
16...	1000	832	160	13.0	12.5
06033000 BOULDER RIVER NEAR BOULDER, MT (LAT 46 12 40 LONG 112 05 27)					
NOV , 1985					
22...	1045	43	171	-20.0	.0
JAN , 1986					
06...	0845	33	178	-8.0	.5
FEB					
20...	1515	--	184	4.5	3.0
MAR					
31...	0830	333	106	6.0	1.5
MAY					
20...	0845	430	94	11.0	7.0
MAY , 1986					
22...	1815	630	71	7.0	7.0
27...	1215	876	72	24.0	10.0
JUN					
23...	0900	122	123	13.0	11.5
AUG					
04...	0830	--	182	17.5	12.0
SEP					
29...	0930	66	170	11.5	4.5
06035000 WILLOW CREEK NEAR HARRISON, MT (LAT 45 43 23 LONG 111 44 25)					
OCT , 1985					
15...	1130	44	232	11.5	5.0
NOV					
01...	1000	36	209	2.5	2.0
MAR , 1986					
26...	1000	--	198	9.0	4.0
APR					
03...	1015	38	181	6.0	3.5
APR , 1986					
15...	1550	44	140	9.0	8.5
JUL					
14...	1000	12	279	17.0	12.0
AUG					
26...	1000	5.7	402	25.0	11.5
06036650 JEFFERSON RIVER NEAR THREE FORKS, MT (LAT 45 53 52 LONG 111 35 45)					
OCT , 1985					
18...	1050	1830	449	4.5	7.0
DEC					
06...	1100	1320	470	-8.0	.0
MAR , 1986					
03...	0945	1960	410	6.0	5.0
MAY , 1986					
30...	1700	7810	177	33.0	19.0
JUN					
04...	1800	9360	190	26.0	16.0
JUL					
16...	1500	1350	390	30.0	20.5
AUG					
28...	1630	1010	546	30.0	20.0
06037600 MADISON RIVER ABOVE HEBGEN LAKE, NEAR WEST YELLOWSTONE, MT (LAT 44 43 00 LONG 111 06 05)					
MAR , 1986					
12...	1030	566	457	5.0	9.0
06038500 MADISON RIVER BELOW HEBGEN LAKE, NEAR GRAYLING, MT (LAT 44 52 00 LONG 111 20 15)					
OCT , 1985					
16...	0915	1910	262	-1.0	7.0
NOV					
21...	1225	1310	287	-7.0	2.0
MAR , 1986					
04...	1445	769	360	6.5	3.0
JUN , 1986					
03...	1800	3160	265	16.5	8.0
10...	1100	2740	258	12.0	8.0
JUL					
15...	1215	1350	217	25.0	15.0
AUG					
27...	1230	1060	220	26.5	17.0
06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, MT (LAT 44 53 22 LONG 111 34 46)					
APR , 1986					
16...	1530	1360	311	5.0	4.0
MAY					
28...	1055	2500	258	22.5	5.5
JUN					
02...	2045	3730	242	23.0	7.0
03...	1400	4350	211	14.5	9.0
JUN , 1986					
26...	1100	1350	288	22.0	15.0
JUL					
15...	0945	1620	223	25.0	13.0
AUG					
27...	1015	1130	226	20.0	14.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06040300 JACK CREEK NEAR ENNIS, MT (LAT 45 21 23 LONG 111 34 51)					
OCT , 1985					
15...	1810	21	218	12.0	5.0
NOV					
20...	1425	16	230	-7.0	.0
JAN , 1986					
06...	1500	15	225	-2.0	.0
MAR					
03...	1615	15	225	11.5	2.0
APR					
03...	1235	25	208	6.0	4.0
16...	1250	33	193	8.0	3.5
MAY , 1986					
27...	1300	169	141	25.5	9.5
29...	1330	189	125	21.5	9.5
JUN					
10...	1545	180	137	21.0	11.0
17...	1200	120	152	34.0	10.0
26...	1310	74	169	23.5	11.0
JUL					
14...	1550	46	188	27.0	12.0
AUG					
26...	1630	27	210	25.0	15.0
06043500 GALLATIN RIVER NEAR GALLATIN GATEWAY, MT (LAT 45 29 51 LONG 111 25 12)					
OCT , 1985					
17...	1120	476	302	6.5	4.5
JAN , 1986					
07...	1530	355	338	-1.0	.5
MAR					
05...	1445	335	291	13.0	5.0
MAY , 1986					
30...	1030	5340	111	24.5	5.5
JUN					
04...	1000	5290	123	20.0	5.0
JUL					
16...	0945	942	192	19.5	12.0
AUG					
28...	1110	497	277	30.0	12.0
06050000 HYALITE CREEK AT HYALITE RANGER STATION, NEAR BOZEMAN, MT (LAT 45 33 42 LONG 111 04 12)					
OCT , 1985					
17...	1440	21	169	5.0	3.0
NOV					
22...	0935	10	196	-21.0	.0
JAN , 1986					
08...	1045	14	188	3.0	.0
MAR					
06...	0915	33	128	8.0	3.0
APR					
18...	0815	37	146	.0	1.0
MAY , 1986					
29...	1955	268	94	22.0	6.0
JUN					
04...	1245	225	96	22.0	8.0
JUL					
16...	1830	66	103	18.0	13.5
AUG					
28...	0850	66	105	9.0	9.0
06052500 GALLATIN RIVER AT LOGAN, MT (LAT 45 53 07 LONG 111 26 15)					
OCT , 1985					
17...	1655	953	372	14.0	9.0
JAN , 1986					
08...	1500	749	412	-3.0	.0
MAR					
06...	1300	881	387	15.5	7.0
MAY , 1986					
30...	1150	5260	196	28.5	12.0
JUL					
16...	1210	857	359	18.0	10.5
AUG					
28...	1345	537	400	21.0	17.5
06061500 PRICKLY PEAR CREEK NEAR CLANCY, MT (LAT 46 31 09 LONG 111 56 45)					
OCT , 1985					
04...	1135	34	281	1.0	4.0
NOV					
05...	1150	36	252	4.0	4.5
DEC					
17...	1020	27	286	5.5	1.0
JAN , 1986					
27...	1515	30	300	6.0	.5
MAR					
04...	1500	45	289	16.0	5.5
APR					
17...	1530	59	257	13.0	9.0
MAY , 1986					
05...	1150	91	193	11.0	7.0
28...	1130	178	132	26.0	10.5
JUN					
11...	1030	120	167	19.0	11.0
JUL					
15...	1200	41	242	17.5	14.5
AUG					
20...	1140	22	302	17.0	13.5
06062500 TENMILE CREEK NEAR RIMINI, MT (LAT 46 31 27 LONG 112 15 22)					
OCT , 1985					
04...	1500	14	95	6.0	5.5
NOV					
04...	1500	17	81	15.5	5.5
DEC					
16...	1230	5.5	102	3.5	1.0
JAN , 1986					
28...	1500	3.2	110	5.0	1.0
MAR					
13...	1515	16	134	6.5	3.5
MAY , 1986					
05...	1430	72	54	13.5	5.0
27...	1315	149	42	22.0	8.5
JUN					
11...	1300	41	58	20.5	13.5
JUL					
15...	1445	2.0	121	24.0	20.0
AUG					
21...	0945	.74	162	13.5	12.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06066500 MISSOURI RIVER BELOW HOLTER DAM, NEAR WOLF CREEK, MT (LAT 46 59 41 LONG 112 00 37)					
NOV , 1985					
07...	1450	5130	371	5.0	7.5
JAN , 1986					
10...	1200	4860	389	--	--
MAR					
05...	--	5240	393	15.5	2.5
11...	0915	5100	400	3.5	2.0
APR					
10...	1140	6140	400	25.5	7.0
MAY , 1986					
22...	1015	7200	398	11.0	7.0
JUL					
03...	0745	6240	372	18.0	15.0
AUG					
14...	1005	4970	351	24.0	18.5
06076690 SMITH RIVER NEAR FORT LOGAN, MT (LAT 46 47 45 LONG 111 10 41)					
OCT , 1985					
10...	1130	116	528	3.0	.5
NOV					
26...	1330	96	530	-22.5	.0
JAN , 1986					
09...	0845	91	499	-2.0	.5
FEB					
25...	0830	396	253	--	--
MAR , 1986					
14...	1330	200	512	7.0	4.0
APR					
24...	0900	240	442	2.0	6.0
JUL					
15...	1910	186	469	18.5	20.0
AUG					
28...	1010	101	490	23.0	18.0
06078200 MISSOURI RIVER NEAR ULM, MT (LAT 47 26 06 LONG 111 23 07)					
OCT , 1985					
24...	1250	5890	379	17.5	7.0
APR , 1986					
10...	1230	6060	388	--	--
06088300 MUDDY CREEK NEAR VAUGHN, MT (LAT 47 37 30 LONG 111 38 05)					
NOV , 1985					
06...	1550	79	1020	6.0	3.5
JAN , 1986					
08...	1325	49	1110	8.5	.0
MAR					
04...	1130	54	1680	14.0	5.0
APR					
09...	1825	30	1300	24.0	14.0
MAY , 1986					
21...	1550	51	1090	28.5	19.0
JUL					
10...	1130	261	655	22.0	15.0
AUG					
13...	1340	196	673	24.0	18.5
06088500 MUDDY CREEK AT VAUGHN, MT (LAT 47 33 42 LONG 111 32 33)					
OCT , 1985					
02...	1405	128	1060	13.5	7.5
NOV					
06...	1335	80	1060	6.5	3.5
JAN , 1986					
08...	1530	50	1160	9.5	.0
MAR					
04...	1330	60	1710	16.5	7.5
11...	0930	48	1620	4.0	3.5
APR					
09...	1620	31	1350	24.5	15.5
MAY , 1986					
21...	1350	110	751	22.5	17.5
JUN					
05...	0915	99	790	17.0	23.0
30...	1500	334	686	22.0	18.0
AUG					
13...	1535	292	689	24.5	18.5
SEP					
11...	1415	180	707	18.0	14.5
06090300 MISSOURI RIVER NEAR GREAT FALLS, MT (LAT 47 34 55 LONG 111 03 35)					
NOV , 1985					
07...	1145	7550	434	4.0	6.0
JAN , 1986					
09...	1655	6260	431	9.0	1.0
MAR					
13...	1700	8580	430	7.0	5.0
APR , 1986					
09...	1025	8200	421	24.0	10.0
JUL					
02...	1245	8600	420	31.0	19.0
AUG					
13...	1030	6350	415	21.5	19.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06091700 TWO MEDICINE RIVER BELOW SOUTH FORK, NEAR BROWNING, MT (LAT 48 25 36 LONG 112 59 20)					
JAN , 1986					
06...	1315	65	234	1.5	.0
MAR					
05...	1330	565	175	9.0	5.0
12...	0915	409	204	5.0	2.0
APR					
07...	1725	428	206	19.0	9.0
MAY					
19...	1640	512	161	26.5	9.5
30...	1155	1900	115	29.0	13.0
JUN , 1986					
03...	1250	1450	103	19.0	11.0
25...	1120	298	131	27.0	16.0
AUG					
11...	1510	226	125	29.0	22.0
SEP					
30...	1430	115	211	13.0	8.0
06091800 TWO MEDICINE CANAL NEAR BROWNING, MT (LAT 48 28 41 LONG 112 48 47)					
JUN , 1986					
17...	1100	53	1810	29.0	15.0
AUG , 1986					
14...	0945	152	138	23.0	16.5
06092600 FOUR HORNS CANAL NEAR BROWNING, MT (LAT 48 20 50 LONG 112 50 17)					
APR , 1986					
15...	1330	2.6	441	7.0	10.0
22...	1300	18	391	21.0	9.0
MAY					
14...	1635	1.9	408	5.0	8.0
JUN					
18...	0830	90	400	18.0	11.0
JUL , 1986					
16...	1745	114	521	19.0	18.0
AUG					
13...	1745	102	561	24.0	17.0
SEP					
18...	--	110	495	9.0	6.5
06093200 BADGER CREEK BELOW FOUR HORNS CANAL, NEAR BROWNING, MT (LAT 48 22 12 LONG 112 48 07)					
NOV , 1985					
14...	1330	282	448	2.0	1.0
JAN , 1986					
06...	1450	134	548	1.5	.0
MAR					
05...	1015	230	484	11.0	3.0
12...	1220	200	495	6.5	5.0
14...	0915	188	500	1.0	2.0
APR					
07...	1445	238	457	21.0	8.5
MAY					
19...	1405	326	388	24.0	9.5
MAY , 1986					
30...	1540	918	268	31.0	12.0
JUN					
03...	--	714	288	--	--
18...	0950	200	410	21.0	13.0
25...	1400	100	462	26.0	16.0
AUG					
11...	1320	23	568	28.5	18.5
SEP					
30...	1130	147	553	13.5	6.5
06093600 TWO MEDICINE RIVER NEAR CUT BANK, MT (LAT 48 28 20 LONG 112 21 25)					
OCT , 1985					
17...	1045	1320	288	9.0	4.5
DEC					
18...	1100	458	410	5.0	.0
JAN , 1986					
16...	1330	192	468	3.5	.0
FEB					
13...	1200	144	544	-20.0	.0
MAR					
13...	1340	669	329	10.5	5.0
APR					
16...	0730	780	309	4.0	7.5
MAY , 1986					
15...	1200	876	283	3.0	4.5
JUN					
17...	1415	728	260	35.0	20.0
JUL					
16...	1345	98	459	23.0	18.5
AUG					
13...	1300	61	420	24.0	18.5
SEP					
18...	1200	297	363	5.0	8.0
06097200 BLACKTAIL CREEK NEAR DUPUYER, MT (LAT 48 21 11 LONG 112 33 22)					
OCT , 1985					
15...	1045	22	633	10.0	5.0
NOV					
14...	1505	8.3	667	4.0	.0
DEC					
17...	1325	6.7	692	3.5	.0
JAN , 1986					
16...	0950	9.4	700	1.5	.0
FEB					
13...	1540	8.6	697	-18.0	.0
MAR					
13...	1050	26	617	2.0	3.0
APR , 1986					
15...	1600	21	605	10.0	7.0
MAY					
14...	1500	1.0	838	5.0	7.0
JUN					
17...	1340	6.4	560	35.0	20.0
JUL					
16...	1500	8.9	631	20.0	18.0
AUG					
13...	1730	6.9	679	27.0	19.0
SEP					
18...	1630	80	492	9.5	7.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06098900 BIG ROCK COULEE NEAR SANTA RITA, MT (LAT 48 42 35 LONG 112 22 34)											
OCT , 1985						MAY , 1986					
15...	1405	3.5	3220	14.0	5.0	15...	0835	2.3	4890	-2.0	3.0
NOV						JUN					
13...	1330	1.3	4340	-4.0	.5	17...	0820	.34	1900	23.0	18.0
JAN , 1986						JUL					
15...	1250	2.5	3880	3.5	.5	16...	1115	.01	2210	19.0	18.5
FEB						AUG					
13...	0915	.58	3130	-18.0	.0	13...	0945	.22	1910	17.0	19.0
MAR						SEP					
12...	1700	3.8	2370	8.0	5.0	18...	0945	.72	3980	6.0	9.0
APR											
15...	1035	1.1	3520	5.5	1.5						
06099100 SPRING CREEK NEAR CUT BANK, MT (LAT 48 34 53 LONG 112 22 35)											
OCT , 1985						APR , 1986					
15...	1310	7.1	1720	14.0	7.0	15...	1150	6.0	2760	8.0	2.5
NOV						MAY					
13...	1430	7.8	2450	-4.0	.0	15...	0955	3.2	2480	1.0	3.5
DEC						JUN					
17...	1000	1.8	2140	3.0	.0	17...	0930	1.2	1580	25.0	18.0
JAN , 1986						JUL					
15...	1400	4.7	2360	2.5	.0	16...	1250	3.4	734	24.0	16.5
FEB						AUG					
13...	1000	1.3	2330	-18.0	.0	13...	1130	8.2	690	21.0	17.0
MAR						SEP					
13...	0755	3.8	2010	2.0	3.0	18...	1105	8.0	1620	6.0	7.5
06099500 MARIAS RIVER NEAR SHELBY, MT (LAT 48 25 38 LONG 111 53 20)											
OCT , 1985						APR , 1986					
01...	1200	842	440	15.0	6.0	08...	1240	926	405	20.0	9.5
NOV						JUN					
05...	1350	1450	316	5.5	4.5	11...	1400	1340	302	28.0	19.0
DEC						26...	1025	468	443	19.0	20.0
04...	1245	603	507	1.0	.0	JUL					
JAN , 1986						16...	0930	223	596	15.0	19.5
07...	1340	372	604	5.5	.0	AUG					
27...	1400	262	700	9.0	.0	12...	0840	152	686	18.0	20.0
FEB						27...	1400	143	632	29.0	23.5
25...	0820	1330	607	11.0	.5	SEP					
MAR						18...	0815	374	553	6.0	9.5
04...	1630	1820	434	10.0	6.0						
11...	1530	1160	448	9.5	5.5						
06108000 TETON RIVER NEAR DUTTON, MT (LAT 47 55 49 LONG 111 33 07)											
JAN , 1986						MAY , 1986					
08...	1105	75	855	6.0	.0	20...	1745	90	1090	28.5	20.5
FEB						JUN					
27...	1535	1690	582	17.5	3.0	26...	1450	44	1300	29.0	24.0
28...	0950	986	681	9.0	2.5	AUG					
MAR						12...	1135	14	1950	22.0	20.5
11...	1130	213	1500	5.5	5.0						
APR											
08...	1605	86	2320	21.5	13.5						
06109500 MISSOURI RIVER AT VIRGELLE, MT (LAT 48 00 18 LONG 110 15 25)											
NOV , 1985						MAY , 1986					
06...	1630	10200	351	6.0	6.5	30...	1500	15400	388	30.0	21.0
MAR , 1986						AUG					
03...	1530	11100	509	22.0	5.0	21...	1900	6740	439	22.0	18.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06120500 MUSSELSHELL RIVER AT HARLOWTON, MT (LAT 46 25 48 LONG 109 50 24)					
NOV , 1985					
07...	1241	52	615	2.0	4.0
DEC					
16...	1300	36	1100	2.0	.0
JAN , 1986					
27...	1130	49	990	4.5	1.5
MAR					
05...	1515	118	845	10.0	5.0
APR , 1986					
15...	1202	89	845	6.0	8.5
MAY					
28...	1340	303	525	23.0	18.0
JUL					
25...	0858	80	965	22.0	18.5
SEP					
02...	1304	164	880	21.0	16.5
06122800 MUSSELSHELL RIVER NEAR SHAWMUT, MT (LAT 46 21 02 LONG 109 33 18)					
MAR , 1986					
19...	1540	2.6	705	8.5	9.0
APR					
15...	1030	12	1080	6.5	11.0
MAY					
28...	1030	22	745	18.0	17.0
JUL , 1986					
25...	1507	32	1020	28.0	20.5
SEP					
02...	1042	36	995	20.0	15.0
06126470 HALFBREED CREEK NEAR KLEIN, MT (LAT 46 23 15 LONG 108 32 15)					
NOV , 1985					
07...	0900	.42	1800	3.5	3.0
DEC					
17...	1555	.43	1850	.5	2.0
JAN , 1986					
29...	1625	.49	1750	1.0	1.5
MAR					
12...	0920	.72	1800	7.0	5.0
APR , 1986					
23...	--	.95	1830	11.0	15.0
JUN					
12...	1340	.63	1600	20.0	20.5
JUL					
22...	1115	.56	1740	23.0	17.0
SEP					
02...	1530	.81	1870	18.0	20.0
06126500 MUSSELSHELL RIVER NEAR ROUNDUP, MT (LAT 46 25 41 LONG 108 34 19)					
NOV , 1985					
07...	1035	33	2200	1.0	3.0
DEC					
17...	1450	22	2450	7.0	.0
JAN , 1986					
29...	1525	37	2500	.0	.0
FEB					
28...	1200	1420	630	16.5	3.5
APR , 1986					
23...	1555	62	2900	15.0	15.5
JUN					
12...	1130	530	1100	14.5	19.0
JUL					
24...	1525	172	1280	30.0	25.0
SEP					
02...	1435	323	1400	19.5	19.0
06127500 MUSSELSHELL RIVER AT MUSSELSHELL, MT (LAT 46 31 21 LONG 108 06 29)					
NOV , 1985					
07...	1505	32	2300	7.0	4.5
MAR , 1986					
12...	1200	112	2150	8.0	7.5
APR					
30...	1200	87	2700	9.0	9.0
JUN , 1986					
09...	1625	862	1060	19.0	18.0
JUL					
22...	1420	170	1420	33.0	24.0
SEP					
02...	1155	315	2130	21.0	18.5
06131000 BIG DRY CREEK NEAR VAN NORMAN, MT (LAT 47 20 58 LONG 106 21 26)					
NOV , 1985					
12...	1100	.87	4200	-10.0	.0
FEB , 1986					
26...	1650	7400	284	7.0	.5
MAR					
04...	1230	275	300	10.0	4.5
17...	1330	37	755	3.0	4.0
APR					
24...	1010	12	2060	5.0	9.5
MAY , 1986					
15...	1105	59	1090	5.0	8.0
JUN					
03...	1040	5.5	2580	29.0	21.0
30...	1105	104	1010	21.0	20.0
SEP					
22...	1050	213	600	14.0	11.0
06132200 SOUTH FORK MILK RIVER NEAR BABB, MT (LAT 48 45 20 LONG 113 10 00)					
OCT , 1985					
16...	1200	53	381	12.5	4.0
29...	1145	41	392	4.0	2.0
MAR , 1986					
03...	1315	81	293	18.0	1.0
18...	1235	31	373	7.0	2.0
MAY					
15...	1625	60	376	10.0	6.0
JUN , 1986					
25...	1300	23	395	23.0	20.0
JUL					
15...	1335	14	400	21.5	17.0
SEP					
18...	1200	25	416	3.0	6.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06133500 NORTH FORK MILK RIVER ABOVE ST. MARY CANAL, NEAR BROWNING, MT (LAT 48 58 15 LONG 113 03 19)											
OCT , 1985						JUL , 1986					
30...	1545	9.0	454	5.0	4.0	30...	1550	4.7	386	22.0	20.0
MAR , 1986						SEP					
04...	1030	19	424	12.0	3.0	30...	1420	8.7	458	12.0	8.5
06137400 BIG SANDY CREEK AT RESERVATION BOUNDARY, NEAR ROCKY BOY, MT (LAT 48 10 21 LONG 109 49 31)											
OCT , 1985						MAY , 1986					
03...	1030	14	308	3.5	5.5	24...	1215	200	222	12.0	7.0
NOV						29...	1820	104	262	24.0	15.0
06...	1115	13	312	3.0	3.0	JUN					
JAN , 1986						12...	1000	46	302	14.0	10.0
30...	0930	5.6	350	4.0	.0	JUL					
MAR						01...	1730	24	324	27.0	17.0
12...	1100	7.6	320	9.0	1.5	AUG					
APR						12...	1010	10	359	20.0	15.0
23...	0930	9.0	333	6.0	8.0	SEP					
MAY						17...	0900	11	344	7.0	9.0
22...	1540	195	190	6.5	4.5						
06137540 DUCK CREEK NEAR BOX ELDER, MT (LAT 48 14 37 LONG 109 50 42)											
OCT , 1985						APR , 1986					
14...	1445	.92	679	7.0	4.5	14...	1430	1.2	669	4.0	4.0
NOV						MAY					
13...	0840	.70	732	-8.5	.0	13...	1445	5.9	569	18.0	10.0
DEC						JUN					
17...	1215	.72	708	2.5	.0	16...	1410	3.8	570	30.0	17.0
JAN , 1986						JUL					
14...	1520	.66	657	5.0	1.0	15...	1000	1.9	810	24.0	17.5
FEB						AUG					
13...	1400	.25	845	-10.0	.0	11...	1920	.66	688	30.0	21.0
MAR						SEP					
12...	1700	.98	695	6.5	5.0	16...	1505	.75	748	15.5	11.5
06137550 CAMP CREEK NEAR BOX ELDER, MT (LAT 48 14 51 LONG 109 57 18)											
MAR , 1986						JUN , 1986					
12...	1815	.28	1590	5.0	7.0	16...	1505	.76	989	31.0	20.0
APR						AUG					
14...	1600	.23	1570	5.0	7.0	12...	1330	.01	1640	20.0	17.0
MAY						SEP					
13...	1645	1.8	1200	12.0	13.0	16...	1332	.01	1750	15.5	12.0
06137570 BOXELDER CREEK NEAR ROCKY BOY, MT (LAT 48 18 07 LONG 109 50 37)											
OCT , 1985						MAY , 1986					
03...	1300	11	461	6.0	6.5	29...	1630	128	405	26.0	19.0
NOV						JUN					
06...	0900	14	480	-2.0	2.0	06...	1230	73	439	19.0	16.5
DEC						12...	1330	44	466	24.0	17.0
18...	1430	9.5	490	3.0	.0	JUL					
JAN , 1986						01...	1600	29	492	31.0	21.0
30...	1200	8.5	520	2.0	.0	AUG					
MAR						12...	1230	8.4	548	24.0	17.0
12...	1530	8.8	465	10.0	4.0	SEP					
APR						16...	1815	11	554	14.5	13.0
22...	1730	10	495	20.0	16.0						
06137575 BOXELDER CREEK AT BOX ELDER, MT (LAT 48 18 38 LONG 110 01 09)											
OCT , 1985						APR , 1986					
14...	1100	4.3	646	5.5	5.0	14...	1515	1.1	672	4.0	7.0
NOV						MAY					
12...	1515	7.1	626	-5.0	.0	13...	1600	87	504	18.0	16.0
DEC						JUN					
16...	1730	7.7	595	-1.0	.0	16...	1610	63	480	35.0	19.0
JAN , 1986						JUL					
14...	1230	6.0	535	3.5	.0	15...	1650	9.9	536	31.0	20.0
FEB						AUG					
13...	1600	11	654	-10.0	.0	11...	1430	6.9	596	30.0	17.0
MAR						SEP					
13...	1100	9.3	550	5.5	4.0	12...	1105	9.3	598	10.0	11.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06137580 SAGE CREEK NEAR WHITLASH, MT (LAT 48 53 29 LONG 111 01 49)					
OCT , 1985					
01...	1645	8.7	318	7.0	8.5
NOV					
04...	1510	4.7	349	9.0	7.0
DEC					
16...	1410	1.3	407	--	1.0
JAN , 1986					
28...	0900	1.6	455	2.0	.0
MAR					
04...	0930	1.8	439	14.0	3.0
APR , 1986					
22...	0900	2.9	404	11.0	8.0
MAY					
29...	1015	21	304	26.0	11.0
JUL					
01...	1015	3.0	412	23.0	12.0
AUG					
12...	1845	.75	436	21.0	17.0
SEP					
23...	0915	2.1	438	14.5	7.0
06138570 BIG SANDY CREEK ABOVE GRAVEL COULEE, NEAR LAREDO, MT (LAT 48 24 33 LONG 109 56 36)					
OCT , 1985					
14...	1220	13	1130	9.0	5.5
NOV					
12...	1410	28	659	-4.0	.0
DEC					
17...	1500	11	718	2.0	.0
JAN , 1986					
14...	1150	9.7	674	2.5	.0
FEB					
13...	0845	13	857	1.0	.0
MAR					
13...	0945	39	532	3.0	4.0
APR , 1986					
14...	1215	6.0	1010	-1.0	2.0
MAY					
13...	1215	111	545	15.0	8.0
JUN					
16...	1135	89	550	27.0	21.5
JUL					
16...	0610	26	583	14.5	19.0
AUG					
11...	1630	8.0	737	31.0	22.0
SEP					
16...	1630	17	704	15.5	14.5
06139900 BEAVER CREEK AT RESERVATION BOUNDARY, NEAR ROCKY BOY, MT (LAT 48 13 18 LONG 109 39 03)					
OCT , 1985					
14...	1345	20	251	4.5	4.0
NOV					
13...	0920	10	270	-1.0	.5
DEC					
17...	0930	6.6	279	2.0	1.0
JAN , 1986					
14...	1415	4.5	282	3.5	2.0
FEB					
13...	1245	3.4	297	-10.0	1.0
MAR					
12...	1330	7.1	258	9.0	4.0
APR , 1986					
14...	1330	14	246	5.0	1.0
MAY					
13...	1350	46	208	15.0	8.5
JUN					
16...	1300	21	259	23.5	14.0
JUL					
15...	1515	6.5	285	32.0	17.0
AUG					
11...	1800	4.3	304	23.0	17.0
SEP					
17...	1305	10	277	9.5	8.5
06140500 MILK RIVER AT HAVRE, MT (LAT 48 33 23 LONG 109 40 14)					
NOV , 1985					
06...	1030	59	570	5.0	2.5
DEC					
12...	1330	41	664	-20.0	.0
JAN , 1986					
30...	1340	39	710	.0	.0
MAR					
01...	1615	766	267	13.5	.0
05...	1545	220	383	13.0	2.5
APR					
04...	1005	318	439	10.5	7.0
MAY , 1986					
14...	0945	879	458	4.0	8.0
24...	0845	1070	468	11.0	10.0
JUN					
11...	2000	808	486	26.0	21.0
JUL					
15...	1800	867	472	30.0	21.0
AUG					
21...	1430	794	370	24.5	18.0
SEP					
17...	1715	280	434	12.0	13.0
06141600 LITTLE BOX ELDER CREEK AT MOUTH, NEAR HAVRE, MT (LAT 48 33 43 LONG 109 31 53)					
FEB , 1986					
25...	1405	246	503	12.0	.5
27...	1730	51	559	8.0	2.0
MAR					
01...	1750	23	721	7.0	4.5
26...	0915	13	715	2.0	4.5
APR					
11...	1015	9.4	796	4.0	9.5
30...	1030	9.8	773	10.5	7.0
MAY					
12...	1500	184	1080	18.0	9.0
JUN					
26...	--	18	664	23.0	23.0
JUL , 1986					
10...	--	11	742	25.0	18.5
23...	--	8.9	741	20.0	18.5
29...	--	7.1	724	29.5	18.0
AUG					
07...	1710	1.3	896	31.0	21.0
26...	--	2.2	950	22.5	16.0
SEP					
17...	--	13	812	10.5	10.5
26...	1100	307	713	12.0	8.0
29...	1755	51	730	15.5	9.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06142400 CLEAR CREEK NEAR CHINOOK, MT (LAT 48 34 44 LONG 109 23 26)											
MAR , 1986						JUN , 1986					
27...	1030	13	728	16.5	7.0	20...	1630	48	587	--	20.0
APR						JUL					
11...	0855	5.7	872	2.0	8.5	23...	0840	16	657	20.0	19.0
28...	1515	11	821	17.0	12.0	AUG					
MAY						22...	1005	4.2	742	21.0	13.0
12...	1645	202	681	15.0	11.0	SEP					
19...	1820	142	760	24.0	16.0	23...	1535	22	700	21.0	12.0
22...	0950	312	546	9.0	10.5	26...	1145	222	652	16.0	8.5
JUN											
05...	1710	112	543	23.5	20.0						
06151500 BATTLE CREEK NEAR CHINOOK, MT (LAT 48 39 00 LONG 109 14 00)											
MAR , 1986						JUL , 1986					
25...	1600	56	315	9.0	6.0	23...	1015	50	983	23.0	20.0
APR						AUG					
29...	1630	5.9	951	14.5	11.0	22...	0855	.78	1320	14.0	14.0
MAY						SEP					
13...	1645	291	304	22.0	10.5	11...	0855	1.0	1530	10.0	12.0
23...	1545	902	322	12.0	8.0	24...	1510	22	927	20.0	13.0
JUN											
20...	1810	33	809	22.0	22.0						
483050108562701 SNAKE CREEK THREE MILES ABOVE MOUTH, NEAR HARLEM, MT (LAT 48 30 50 LONG 108 56 27)											
MAR , 1986											
23...	1605	8.4	1360	10.0	7.0						
06154100 MILK RIVER NEAR HARLEM, MT (LAT 48 29 22 LONG 108 45 28)											
NOV , 1985						MAY , 1986					
05...	1455	178	605	2.0	5.0	23...	1800	2760	727	15.0	12.0
DEC						JUN					
12...	1130	89	841	-25.0	.0	25...	1200	452	608	23.0	24.0
JAN , 1986						JUL					
30...	1045	108	906	-4.0	.0	30...	1540	418	575	21.0	30.0
MAR						AUG					
12...	1845	1440	249	3.5	3.5	27...	1815	397	498	26.5	19.0
26...	1700	399	594	17.0	7.5	SEP					
APR						26...	1015	5410	368	14.0	10.0
24...	1800	201	905	6.0	10.0	26...	1730	5920	389	17.5	10.0
30...	1615	370	583	12.0	11.0	27...	1130	6300	355	14.0	10.0
06154140 FIFTEENMILE CREEK TRIBUTARY NEAR HARLEM, MT (LAT 48 19 29 LONG 108 42 49)											
FEB , 1986						FEB , 1986					
26...	1705	20	55	6.0	1.5	27...	0930	4.0	40	2.0	.5
06154150 WHITE BEAR CREEK BELOW FIFTEENMILE CREEK, NEAR DODSON, MT (LAT 48 22 23 LONG 108 32 19)											
OCT , 1985											
16...	1510	5.0	490	14.0	7.0						
06154390 PEOPLES CREEK NEAR CLEVELAND, MT (LAT 48 15 49 LONG 108 52 12)											
OCT , 1985						JUN , 1986					
16...	1400	14	665	14.0	6.5	17...	1045	43	710	21.5	26.0
JAN , 1986						JUL					
16...	0935	9.9	710	.0	.0	21...	1535	3.9	515	28.0	24.0
MAR						AUG					
18...	1305	16	820	5.0	5.0	25...	1140	.30	640	23.0	21.5
APR											
16...	1100	16	940	5.0	5.0						

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06154400 PEOPLES CREEK NEAR HAYS, MT (LAT 48 13 25 LONG 108 42 48)					
JAN , 1986					
16...	--	11	750	2.0	.0
27...	--	4.7	550	.0	.0
FEB					
27...	1030	197	310	4.0	2.0
MAR					
04...	1420	41	710	9.0	8.0
18...	1145	20	900	5.0	5.0
APR , 1986					
16...	1305	19	920	6.0	5.5
MAY					
15...	1120	105	735	2.0	5.0
JUL					
22...	--	6.1	420	31.0	25.0
SEP					
26...	--	357	330	11.0	11.0
06154430 LODGE POLE CREEK AT LODGE POLE, MT (LAT 48 01 52 LONG 108 31 55)					
OCT , 1985					
16...	1155	.40	560	12.0	6.0
06154490 WILLOW COULEE NEAR DODSON, MT (LAT 48 19 31 LONG 108 24 52)					
MAR , 1986					
04...	1640	11	65	8.0	3.0
06155030 MILK RIVER NEAR DODSON, MT (LAT 48 24 11 LONG 108 17 35)					
OCT , 1985					
17...	--	20	510	7.0	6.5
NOV					
06...	--	21	500	3.0	4.0
DEC					
16...	--	32	622	-5.0	.0
JAN , 1986					
27...	--	143	768	6.5	.0
FEB					
27...	1030	5400	239	3.5	.5
MAR					
04...	0945	4300	269	17.0	1.5
07...	1000	4030	250	-8.0	.5
MAR , 1986					
10...	1400	746	300	8.0	1.0
APR					
17...	0930	20	670	7.0	7.0
JUL					
22...	0905	131	695	17.0	22.0
SEP					
26...	--	12900	237	18.0	10.0
27...	--	10400	247	11.0	10.0
06164590 BEAVER CREEK NEAR ZORTMAN, MT (LAT 47 56 19 LONG 108 23 26)					
NOV , 1985					
05...	0820	1.0	640	1.0	7.0
JAN , 1986					
28...	0820	.91	600	2.0	.0
MAR					
26...	1110	1.3	580	4.0	3.5
APR , 1986					
22...	1340	1.4	578	23.0	14.0
MAY					
29...	1640	16	442	30.0	16.0
JUL					
23...	0940	2.7	512	22.0	17.0
06164623 LITTLE WARM CREEK TRIBUTARY NEAR LODGE POLE, MT (LAT 47 59 43 LONG 108 19 09)					
OCT , 1985					
16...	--	.54	250	11.0	6.5
06164630 BIG WARM CREEK NEAR ZORTMAN, MT (LAT 48 04 37 LONG 108 16 54)					
JAN , 1986					
28...	--	5.9	2000	3.0	8.5
MAR					
26...	1225	7.4	1900	6.0	10.0
APR					
22...	1440	6.0	1900	23.0	12.0
JUL , 1986					
23...	1055	7.8	1630	23.0	22.0
SEP					
24...	1405	7.7	1680	15.0	15.0
06164665 WILD HORSE CREEK TRIBUTARY NEAR LODGE POLE, MT (LAT 48 09 32 LONG 108 16 10)					
MAR , 1986					
10...	1545	1.1	140	2.0	2.0
06166000 BEAVER CREEK BELOW GUSTON COULEE, NEAR SACO, MT (LAT 48 21 44 LONG 107 34 23)					
OCT , 1985					
17...	1325	147	720	11.0	7.0
24...	1025	7.9	535	8.0	6.0
NOV					
06...	1235	1.4	570	5.0	4.0
MAR , 1986					
05...	1245	686	420	7.0	2.0
11...	1530	131	450	3.0	2.0
27...	1005	15	695	15.0	7.0
APR , 1986					
23...	1205	29	1020	7.0	13.0
MAY					
16...	1130	1960	440	10.0	6.0
AUG					
26...	1535	9.4	612	24.0	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06169600 SOUTH CREEK TRIBUTARY NEAR OPHEIM, MT (LAT 48 52 34 LONG 106 38 16)					
MAR , 1986					
04...	1500	7.5	100	4.0	.5
10...	1445	5.0	111	3.0	.5
06169700 SOUTH CREEK TRIBUTARY NO. 2 NEAR OPHEIM, MT (LAT 48 53 19 LONG 106 39 35)					
MAR , 1986					
04...	1430	15	140	4.0	.5
10...	1410	9.2	140	3.0	.5
06170050 ROCK CREEK BELOW MCEACHERN CREEK, NEAR INTERNATIONAL BOUNDARY (LAT 48 52 53 LONG 106 53 54)					
NOV , 1985					
12...	--	1.4	1620	-10.0	.0
JAN , 1986					
28...	--	.52	1400	-10.0	.0
MAR					
04...	1130	1270	123	8.5	--
06...	1520	1540	106	-8.0	.5
14...	1200	859	112	3.0	1.5
APR					
01...	1045	52	440	9.0	8.0
24...	1245	10	975	11.0	1.0
06170080 STARBUCK COULEE NEAR INTERNATIONAL BOUNDARY (LAT 48 51 39 LONG 106 53 56)					
MAR , 1986					
04...	1015	10	171	4.0	.5
14...	1025	1.5	80	1.0	1.0
18...	1050	.20	120	.0	1.0
06172000 MILK RIVER NEAR VANDALIA, MT (LAT 48 22 21 LONG 106 58 25)					
NOV , 1985					
07...	1140	66	1650	1.0	3.0
MAR , 1986					
04...	1345	12400	222	15.0	1.5
05...	0930	15800	220	--	1.5
06174000 WILLOW CREEK NEAR GLASGOW, MT (LAT 48 06 52 LONG 106 40 15)					
OCT , 1985					
22...	1130	13	710	9.5	7.5
28...	1300	3.0	700	11.0	6.5
APR , 1986					
01...	1245	3.8	550	10.0	10.0
22...	0800	48	790	15.0	12.0
06174550 MIDDLE FORK PORCUPINE CREEK NEAR BAYLOR, MT (LAT 48 36 26 LONG 106 26 48)					
MAR , 1986					
05...	1000	399	126	3.0	.5
APR					
25...	1030	2.0	990	5.5	7.0
06174700 WEST FORK PORCUPINE CREEK NEAR BAYLOR, MT (LAT 48 33 36 LONG 106 32 13)					
MAR , 1986					
05...	1055	227	17	8.0	.5
APR					
25...	1130	.20	1000	4.0	7.5
06175505 LITTLE PORCUPINE CREEK BELOW DIVERSION, AT FRAZER, MT (LAT 48 03 52 LONG 106 02 34)					
MAR , 1986					
13...	1600	94	332	10.0	5.0
06175530 OSWEGO CREEK AT OSWEGO, MT (LAT 48 03 50 LONG 105 52 35)					
MAR , 1986					
13...	1510	.78	699	10.0	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)
MAY , 1986					
12...	1435	.99	468	13.5	11.5
MAY , 1986					
12...	1255	5.2	450	13.0	11.5
MAY , 1986					
12...	1100	307	330	10.0	9.0
JUN					
04...	1025	3.2	1000	21.0	19.0
JUL					
14...	0950	21	420	21.0	18.5
SEP					
24...	--	28	495	--	--
SEP , 1986					
24...	--	.10	185	14.0	11.0
APR , 1986					
24...	1150	1.6	1200	--	12.0
AUG					
11...	0950	22	825	21.0	20.0
APR , 1986					
29...	1430	6.5	750	14.5	12.0
JUN					
10...	1100	.24	750	--	--
MAY , 1986					
19...	1405	2.7	1060	25.0	21.0
MAY , 1986					
14...	1445	.40	1100	25.0	21.5
MAY , 1986					
13...	1325	25	1030	18.0	14.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06175545 FLYNN CREEK NEAR OSWEGO, MT (LAT 48 04 15 LONG 105 49 30)					
MAR , 1986					
13...	1530	2.8	300	10.0	7.0
06176500 WOLF CREEK NEAR WOLF POINT, MT (LAT 48 06 00 LONG 105 41 00)					
MAR , 1986					
05...	--	240	371	9.0	4.5
13...	1440	24	928	11.0	6.0
APR					
22...	1340	6.9	1160	25.0	14.5
06177000 MISSOURI RIVER NEAR WOLF POINT, MT (LAT 48 04 00 LONG 105 31 55)					
NOV , 1985					
15...	1215	6220	577	-2.0	1.0
MAY , 1986					
02...	1120	6660	582	--	--
06177025 TULE CREEK NEAR POPLAR, MT (LAT 48 07 49 LONG 105 25 05)					
MAR , 1986					
13...	1330	12	1180	10.5	5.0
06177500 REDWATER RIVER AT CIRCLE, MT (LAT 47 24 56 LONG 105 34 50)					
NOV , 1985					
13...	1245	.02	4250	.0	.0
MAR , 1986					
24...	1430	11	2890	18.0	8.5
MAY					
01...	1000	4.3	4300	10.0	10.0
06181000 POPLAR RIVER NEAR POPLAR, MT (LAT 48 10 15 LONG 105 10 33)					
OCT , 1985					
01...	--	8.8	1900	9.0	5.0
NOV					
21...	--	8.8	2270	-13.0	.0
DEC					
18...	--	.80	3360	-4.0	.0
JAN , 1986					
28...	--	2.5	2780	3.0	.0
06181020 BOX ELDER CREEK AT POPLAR, MT (LAT 48 06 58 LONG 105 13 11)					
MAR , 1986					
13...	1300	17	335	10.5	5.5
06183700 BIG MUDDY CREEK DIVERSION CANAL, NEAR MEDICINE LAKE, MT (LAT 48 30 34 LONG 104 32 55)					
NOV , 1985					
14...	1245	5.6	2190	-4.0	.0
JAN , 1986					
15...	1210	.23	4410	1.0	.0
FEB					
28...	1615	633	391	.0	.5
MAR					
03...	1720	856	252	2.0	.5
06183800 COTTONWOOD CREEK NEAR DAGMAR, MT (LAT 48 30 35 LONG 104 10 23)					
FEB , 1986					
28...	1320	163	318	2.0	.5
MAR					
03...	1345	165	242	9.0	2.0
06...	1600	16	321	-10.0	.5
11...	1420	4.6	608	2.0	2.5
26...	0950	1.0	990	1.0	4.5
MAY , 1986					
13...	1400	13	1390	17.0	12.5
JUN , 1986					
06...	1045	9600	610	19.0	16.0
MAY , 1986					
13...	1045	11	1400	15.0	13.0
JUN , 1986					
04...	1300	1.9	5000	24.0	22.0
AUG					
04...	1130	5.9	2730	31.0	22.0
SEP					
24...	1100	9.3	3900	20.0	13.0
MAR , 1986					
05...	--	4110	294	6.0	1.0
APR					
29...	1030	72	1400	10.0	10.0
JUN					
02...	1435	52	1540	33.0	26.0
JUL					
29...	1030	37	1420	28.0	20.5
MAY , 1986					
13...	1005	1.8	475	15.0	12.5
MAR , 1986					
12...	1310	76	475	2.0	1.0
26...	1200	30	858	2.0	3.0
APR					
22...	--	20	1690	24.0	14.0
JUL					
17...	1140	12	2230	25.0	23.0
APR , 1986					
21...	1345	2.1	2620	16.5	9.0
JUN					
05...	1440	<.01	2780	26.0	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06183850 SAND CREEK NEAR DAGMAR, MT (LAT 48 30 19 LONG 104 16 41)					
FEB , 1986					
28...	--	30	225	3.0	.5
MAR					
03...	1510	30	462	5.0	3.0
06...	1510	9.5	508	-5.0	.5
11...	1335	13	612	4.5	2.5
MAR , 1986					
26...	1045	5.2	985	1.0	2.5
APR					
21...	1220	3.8	2200	15.5	9.5
06183900 WOLF CREEK NEAR RESERVE, MT (LAT 48 36 26 LONG 104 48 05)					
MAR , 1986					
13...	1125	2.5	1180	4.0	1.0
MAY , 1986					
14...	1245	2.6	2340	15.0	13.0
06184400 SMOKE CREEK NEAR FLAXVILLE, MT (LAT 48 33 47 LONG 105 04 18)					
MAY , 1986					
15...	1425	.45	2430	--	--
06186500 YELLOWSTONE RIVER AT YELLOWSTONE LAKE OUTLET, YELLOWSTONE NATIONAL PARK (LAT 44 34 03 LONG 110 22 48)					
OCT , 1985					
01...	1000	762	95	-8.0	6.0
NOV					
04...	1330	618	97	4.0	6.0
DEC					
17...	1030	--	118	-3.0	.5
FEB , 1986					
04...	1135	543	108	-2.5	.0
MAR					
18...	1245	726	100	-1.0	1.5
APR , 1986					
30...	1720	834	92	3.5	4.0
JUN					
09...	1700	5440	76	16.0	10.0
23...	1500	7310	95	28.0	10.5
JUL					
23...	1145	4120	92	20.0	14.0
SEP					
03...	1630	1860	95	21.0	15.5
06187550 YELLOWSTONE RIVER AT TOWER JUNCTION, YELLOWSTONE NATIONAL PARK (LAT 44 55 13 LONG 110 24 14)					
OCT , 1985					
02...	1000	1090	173	10.5	8.5
NOV					
05...	0815	904	198	.5	7.5
DEC					
16...	1500	--	270	.5	4.0
MAR , 1986					
19...	0945	993	217	3.0	4.0
APR					
30...	1000	1270	181	8.5	5.0
06191000 GARDNER RIVER NEAR MAMMOTH, YELLOWSTONE NATIONAL PARK (LAT 44 59 35 LONG 110 41 25)					
NOV , 1985					
04...	1300	119	606	5.0	10.5
DEC					
16...	1200	116	642	1.5	9.0
FEB , 1986					
05...	1735	104	758	.0	11.0
06...	0800	98	772	-7.0	9.0
MAR					
19...	1500	95	724	9.0	16.0
20...	0845	102	758	1.0	11.5
APR					
29...	1620	216	554	4.5	9.5
MAY , 1986					
21...	2030	618	254	8.5	10.0
27...	1030	950	186	15.5	10.5
JUN					
03...	2030	1540	191	13.0	11.0
09...	2030	1260	228	11.0	12.0
JUL					
22...	--	219	420	22.0	20.0
SEP					
02...	1215	158	593	16.5	17.5
451959110454301 EMIGRANT SPRING CREEK, NEAR EMIGRANT, MT (LAT 45 19 59 LONG 110 45 43)					
FEB , 1986					
11...	1450	4.3	286	--	--
452929110354001 SOUTH MCDONALD SPRING CREEK, NEAR PRAY, MT (LAT 45 29 29 LONG 110 35 40)					
FEB , 1986					
11...	1330	9.1	265	--	--
452949110345101 NORTH MCDONALD SPRING CREEK, NEAR PRAY, MT (LAT 45 29 49 LONG 110 34 51)					
FEB , 1986					
11...	1130	2.2	255	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
453311110352401 ARMSTRONG SPRING CREEK NEAR LIVINGSTON, MT (LAT 45 33 11 LONG 110 35 24)											
FEB , 1986											
11...	1050	81	302	--	--						
06195600 SHIELDS RIVER NEAR LIVINGSTON, MT (LAT 45 44 01 LONG 110 28 22)											
OCT , 1985						APR , 1986					
09...	1030	154	433	-10.0	1.5	28...	1230	459	340	9.0	8.5
NOV						MAY					
06...	1330	136	426	7.5	4.0	22...	1130	--	255	4.0	8.5
DEC						JUN					
18...	0810	102	412	2.0	.0	11...	0830	707	358	13.0	10.0
FEB , 1986						JUL					
03...	1135	116	418	2.5	1.5	22...	0730	202	476	14.0	15.0
06...	1230	84	427	-.5	.0	SEP					
MAR						02...	0835	176	551	18.0	13.0
17...	1115	188	420	1.5	3.0						
06200000 BOULDER RIVER AT BIG TIMBER, MT (LAT 45 50 03 LONG 109 56 17)											
NOV , 1985						APR , 1986					
06...	1409	203	202	--	--	15...	1525	268	185	10.5	6.5
DEC						JUN					
16...	1620	153	248	3.5	.0	04...	1012	4900	70	--	--
JAN , 1986						JUL					
27...	1400	155	260	16.0	1.5	24...	1558	260	198	25.5	16.5
MAR						SEP					
05...	1244	132	270	10.0	7.0	02...	1518	112	245	22.0	19.0
06202510 STILLWATER RIVER ABOVE NYE CREEK, NEAR NYE, MT (LAT 45 23 46 LONG 109 52 14)											
OCT , 1985						JUN , 1986					
02...	1410	169	150	13.0	9.0	03...	1430	2610	60	15.0	6.0
MAR , 1986						JUL					
10...	1420	74	200	8.5	7.0	09...	1500	656	60	19.0	11.0
MAY						AUG					
14...	1415	197	170	11.0	9.0	14...	1140	242	210	20.0	15.0
452331109452501 LITTLE ROCKY CREEK ABOVE FOREST SERVICE BOUNDARY, NEAR NYE, MT (LAT 45 23 31 LONG 109 45 25)											
OCT , 1985						FEB , 1986					
16...	1115	2.0	149	--	3.0	12...	--	.51	193	--	.0
NOV						MAR					
13...	1405	1.7	164	--	.0	17...	--	.84	185	--	.0
DEC						APR					
11...	--	1.1	532	--	.0	14...	1225	.94	185	--	1.0
JAN , 1986											
14...	1210	.88	187	--	.0						
06204050 WEST ROSEBUD CREEK NEAR ROSCOE, MT (LAT 45 14 35 LONG 109 43 50)											
OCT , 1985						JUL , 1986					
02...	1100	85	40	5.0	7.0	09...	1150	251	30	17.0	11.0
MAR , 1986						AUG					
10...	1105	35	48	2.0	2.5	14...	1530	161	35	21.5	12.5
MAY											
14...	1055	114	50	3.0	2.5						
451639109382601 WEST ROSEBUD CREEK AT PINE GROVE CAMPGROUND, NEAR ROSCOE, MT (LAT 45 16 39 LONG 109 38 26)											
OCT , 1985						FEB , 1986					
16...	--	99	36	--	5.0	12...	--	48	59	--	.0
NOV						MAR					
15...	--	179	47	--	1.0	17...	--	86	42	--	1.0
DEC						APR					
11...	--	66	61	--	.0	14...	--	39	41	--	6.0
JAN , 1986											
14...	--	46	49	--	.0						

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
452354109321601 WEST ROSEBUD CREEK BELOW INGERSOLL CREEK, NEAR FISHTAIL, MT (LAT 45 23 54 LONG 109 32 16)											
OCT , 1985						FEB , 1986					
16...	1430	116	77	--	7.0	12...	--	48	91	--	.0
NOV						MAR					
15...	--	219	56	--	.0	17...	1530	109	85	--	1.0
DEC						APR					
11...	--	66	79	--	.0	14...	1600	52	93	--	7.0
JAN , 1986											
14...	--	83	78	--	.0						
452258109405401 WEST FISHTAIL CREEK AT MOUTH, NEAR NYE, MT (LAT 45 22 58 LONG 109 40 54)											
OCT , 1985						FEB , 1986					
16...	--	6.7	55	--	5.0	12...	--	1.5	69	--	.0
NOV						MAR					
13...	--	5.0	51	--	.0	17...	--	2.0	80	--	.0
DEC						APR					
11...	--	3.3	70	--	.0	14...	--	3.6	76	--	6.0
JAN , 1986											
14...	--	2.9	72	--	.0						
452256109405101 EAST FISHTAIL CREEK AT MOUTH, NEAR NYE, MT (LAT 45 22 56 LONG 109 40 51)											
OCT , 1985						FEB , 1986					
16...	--	5.9	103	--	4.0	12...	--	3.9	123	--	.0
NOV						MAR					
13...	--	6.1	118	--	.0	17...	--	3.0	132	--	.0
DEC						APR					
11...	--	3.0	117	--	.0	14...	--	4.9	120	--	1.0
JAN , 1986											
14...	--	3.4	119	--	.0						
451725109284101 BUTCHER CREEK BELOW THE FORKS, NEAR LUTHER, MT (LAT 45 17 25 LONG 109 28 41)											
OCT , 1985						FEB , 1986					
16...	1350	2.2	327	--	8.0	13...	--	1.4	397	--	.0
NOV						MAR					
13...	--	1.3	363	--	.0	18...	1520	2.9	366	--	2.0
DEC						APR					
12...	--	1.3	363	--	--	15...	1520	4.5	361	--	8.0
JAN , 1986											
15...	--	1.1	388	--	.0						
06205000 STILLWATER RIVER NEAR ABSAROKEE, MT (LAT 45 33 04 LONG 109 23 12)											
NOV , 1985						APR , 1986					
06...	1050	488	65	4.0	3.0	16...	0937	334	162	8.0	6.5
DEC						MAY					
17...	0915	302	158	4.5	.5	29...	1325	3580	60	29.0	10.5
JAN , 1986						JUL					
28...	0903	248	170	6.0	1.5	24...	1202	1130	112	21.0	16.5
MAR						SEP					
05...	0921	262	182	4.0	3.0	03...	0913	628	190	19.0	14.0
451216109001001 DRY CREEK AT MOUTH, NEAR BELFRY, MT (LAT 45 12 16 LONG 109 00 10)											
NOV , 1985						FEB , 1986					
14...	1040	2.7	2090	--	.0	12...	1550	3.2	1810	--	.0
DEC						MAR					
12...	1045	2.3	1990	--	.0	18...	1050	5.0	1640	--	2.0
JAN , 1986						APR					
15...	1010	2.2	1910	--	.0	15...	1035	5.2	1790	--	5.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06208800 CLARKS FORK YELLOWSTONE RIVER, NEAR SILESIA, MT (LAT 45 30 48 LONG 108 49 41)					
OCT , 1985					
01...	1520	708	708	16.0	8.0
15...	1530	622	710	20.0	10.5
JAN , 1986					
07...	1445	391	810	3.0	1.0
MAR					
03...	1515	539	750	17.0	9.0
MAY					
15...	1600	710	530	14.0	14.0
29...	1645	5350	140	22.0	14.0
JUN , 1986					
02...	1730	7630	120	29.0	10.0
27...	1030	3560	180	26.0	15.0
JUL					
10...	1115	1400	370	19.5	15.5
AUG					
15...	1115	500	690	24.0	18.0
SEP					
25...	1030	920	615	15.0	11.0
06209500 ROCK CREEK NEAR RED LODGE, MT (LAT 45 07 15 LONG 109 17 45)					
OCT , 1985					
16...	1700	66	61	--	6.0
NOV					
14...	1600	48	85	--	.0
DEC					
12...	1255	40	81	--	.0
MAY , 1986					
28...	--	468	69	--	9.0
JUN , 1986					
06...	1105	1040	30	16.0	5.0
24...	1430	513	40	27.0	11.0
AUG					
12...	1535	216	45	21.0	11.5
SEP					
24...	1430	105	50	10.0	9.0
452226109084401 CLEAR CREEK AT MOUTH, NEAR ROBERTS, MT (LAT 45 22 26 LONG 109 08 44)					
OCT , 1985					
17...	1100	39	264	--	5.0
NOV					
14...	1330	22	338	--	.0
DEC					
12...	1345	14	376	--	.0
JAN , 1986					
15...	1300	10	386	--	.0
FEB , 1986					
13...	0800	8.6	416	--	.0
MAR					
18...	1215	15	425	--	3.0
APR					
15...	1205	13	421	--	9.0
06211000 RED LODGE CREEK ABOVE COONEY RESERVOIR, NEAR BOYD, MT (LAT 45 26 16 LONG 109 15 11)					
OCT , 1985					
17...	1515	42	385	11.0	9.5
MAR , 1986					
24...	1510	48	400	14.0	10.0
APR					
10...	1400	34	390	16.0	15.0
MAY					
12...	1510	168	360	15.0	10.0
JUN , 1986					
05...	1350	155	250	26.0	17.0
25...	1455	110	300	19.5	19.5
AUG					
13...	1455	38	320	25.0	19.0
SEP					
23...	1505	51	400	19.0	15.0
06211500 WILLOW CREEK NEAR BOYD, MT (LAT 45 25 20 LONG 109 13 47)					
OCT , 1985					
17...	1145	31	280	11.5	6.5
MAR , 1986					
24...	1330	30	390	14.0	9.0
APR					
10...	1145	21	355	16.0	13.5
MAY					
12...	1330	82	400	14.0	9.0
16...	0935	47	400	10.0	10.0
JUN , 1986					
25...	1245	63	280	19.0	19.5
AUG					
13...	1310	53	285	22.0	18.5
SEP					
23...	1335	51	340	19.0	15.0
06212500 RED LODGE CREEK BELOW COONEY RESERVOIR, NEAR BOYD, MT (LAT 45 26 59 LONG 109 11 06)					
OCT , 1985					
17...	1000	14	330	3.0	5.5
DEC					
04...	1210	14	380	-3.0	3.5
JAN , 1986					
09...	1300	14	380	5.5	4.0
MAR					
04...	1015	14	390	8.0	3.5
APR					
10...	1030	36	350	9.0	9.0
MAY , 1986					
13...	1510	404	360	15.0	9.0
JUN					
25...	1020	134	330	27.0	15.5
AUG					
13...	1035	233	305	17.0	19.0
SEP					
23...	1020	110	320	5.0	13.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06214000 ROCK CREEK AT ROCKVALE, MT (LAT 45 31 00 LONG 108 52 00)											
OCT , 1985						MAY , 1986					
16...	1530	178	278	18.5	10.0	13...	1145	586	325	17.0	10.0
DEC						30...	0910	85	240	19.0	14.0
04...	1605	194	280	-3.0	.0	JUN					
JAN , 1986						05...	1130	909	115	21.0	12.5
08...	1530	114	300	4.5	.5	24...	1000	98	265	23.0	17.0
MAR						AUG					
03...	1700	146	325	14.5	8.0	15...	0945	53	395	23.0	18.0
APR						SEP					
09...	1505	71	380	19.0	16.0	24...	1625	276	300	10.0	11.5
06216000 PRYOR CREEK AT PRYOR, MT (LAT 45 26 06 LONG 108 32 01)											
OCT , 1985						MAY , 1986					
15...	1200	30	500	11.0	9.0	16...	1130	32	510	8.0	11.0
DEC						JUN					
03...	1140	28	500	-2.0	--	27...	1355	13	490	19.5	17.0
JAN , 1986						AUG					
07...	1140	28	520	2.0	2.0	11...	1530	12	510	29.0	18.0
FEB						SEP					
25...	1335	43	490	17.0	8.0	25...	1340	32	480	14.0	12.0
APR											
08...	1130	24	490	11.0	11.5						
24...	1545	28	475	5.5	9.5						
06216900 PRYOR CREEK NEAR HUNTLEY, MT (LAT 45 49 19 LONG 108 17 23)											
OCT , 1985						APR , 1986					
02...	1303	49	880	15.5	8.0	21...	1408	69	1180	20.5	13.5
NOV						MAY					
15...	1213	53	900	3.0	.0	09...	1456	151	1150	3.0	6.0
DEC						JUN					
17...	1420	39	1020	5.0	.0	05...	1240	43	1160	25.5	24.5
JAN , 1986						JUL					
28...	1336	61	940	10.0	1.5	17...	1245	14	1440	--	--
MAR						SEP					
04...	1436	80	1060	10.0	4.0	10...	0920	36	890	12.0	15.0
451304108341601 SAGE CREEK AT FOREST SERVICE BOUNDARY, NEAR WARREN, MT (LAT 45 13 04 LONG 108 34 16)											
OCT , 1985						JAN , 1986					
17...	--	8.6	490	--	4.0	15...	--	8.0	470	--	.0
NOV						MAR					
14...	--	3.1	478	--	1.0	18...	--	7.9	472	--	.0
DEC						APR					
12...	--	8.1	472	--	.0	15...	--	8.5	492	--	2.0
06287000 BIGHORN RIVER NEAR ST. XAVIER, MT (LAT 45 19 00 LONG 107 55 05)											
OCT , 1985						MAR , 1986					
17...	1230	332	438	17.0	11.0	04...	1045	4150	1020	15.0	4.0
NOV						JUN					
13...	0953	2140	495	-4.0	7.5	03...	1205	3640	1030	--	--
DEC						JUL					
20...	0940	2910	1020	4.5	6.0	16...	1345	6020	604	26.5	16.5
JAN , 1986						SEP					
30...	1312	2360	1020	--	--	05...	1012	2840	580	21.0	18.0
06289000 LITTLE BIGHORN RIVER AT STATE LINE, NEAR WYOLA, MT (LAT 45 00 25 LONG 107 36 52)											
OCT , 1985						APR , 1986					
01...	0912	68	340	3.0	2.0	16...	1539	74	335	7.0	6.5
NOV						MAY					
14...	0934	54	262	2.5	1.5	30...	0755	650	245	14.5	4.5
DEC						JUL					
19...	0900	61	340	1.0	3.0	15...	1459	168	315	23.5	12.5
JAN , 1986						SEP					
29...	1321	54	335	--	--	04...	1507	90	330	22.5	12.5
MAR											
03...	1506	53	330	15.0	1.5						

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06290000 PASS CREEK NEAR WYOLA, MT (LAT 45 03 00 LONG 107 21 00)					
NOV , 1985					
14...	1206	15	442	6.0	.0
DEC					
18...	1400	19	630	9.5	.0
JAN , 1986					
29...	1455	20	655	.5	.0
FEB					
25...	1540	527	455	10.0	.5
MAR					
03...	1405	37	725	14.5	3.0
APR , 1986					
17...	0900	43	725	6.5	6.5
MAY					
08...	1714	76	678	.5	6.5
JUN					
02...	1112	84	485	25.5	16.5
JUL					
15...	1315	21	520	26.5	20.0
AUG					
27...	1548	9.1	565	28.0	22.0
06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MT (LAT 45 10 38 LONG 107 23 36)					
OCT , 1985					
01...	1145	126	645	19.0	5.0
NOV					
13...	1435	84	370	-2.0	.0
DEC					
18...	1210	101	640	9.0	.0
JAN , 1986					
29...	1139	92	680	1.5	1.5
FEB					
25...	1028	810	500	7.5	1.0
MAR , 1986					
03...	1245	141	730	10.5	5.0
APR					
17...	1027	171	730	8.0	7.0
JUN					
02...	1317	1050	335	22.0	6.5
JUL					
15...	0940	172	472	23.0	18.5
SEP					
04...	1328	124	540	--	17.0
06291000 OWL CREEK NEAR LODGE GRASS, MT (LAT 45 15 58 LONG 107 18 00)					
OCT , 1985					
01...	1557	4.9	975	17.5	5.5
NOV					
14...	1403	5.0	1150	2.0	.0
DEC					
18...	1035	6.2	1060	9.0	.0
JAN , 1986					
29...	0940	7.5	1090	1.5	.0
FEB					
26...	1458	219	395	10.5	.5
MAR					
10...	1118	33	775	7.5	1.0
APR , 1986					
17...	1146	27	935	12.5	7.5
MAY					
09...	0858	20	960	2.0	4.5
JUN					
02...	1450	8.5	960	29.5	17.5
JUL					
15...	1000	3.1	930	20.0	18.5
AUG					
27...	1052	1.1	1170	25.5	17.0
06291500 LODGE GRASS CREEK ABOVE WILLOW CREEK DIVERSION, NEAR WYOLA, MT (LAT 45 07 39 LONG 107 36 01)					
OCT , 1985					
01...	1412	18	590	15.5	9.0
NOV					
14...	1553	9.9	540	.5	1.5
DEC					
19...	1242	15	638	3.0	2.0
JAN , 1986					
30...	0947	13	655	2.0	3.0
MAR					
03...	1055	15	865	7.5	3.5
APR , 1986					
17...	1338	30	580	9.5	6.5
MAY					
30...	1215	244	365	25.5	5.5
JUL					
16...	0924	41	418	18.5	12.0
AUG					
27...	1323	21	495	17.5	16.5
06294000 LITTLE BIGHORN RIVER, NEAR HARDIN, MT (LAT 45 44 09 LONG 107 33 24)					
OCT , 1985					
02...	0957	145	750	15.0	8.5
NOV					
15...	0938	68	712	-9.0	.0
JAN , 1986					
30...	1518	134	835	4.5	.5
MAR					
04...	0814	561	790	2.0	1.0
APR					
18...	0835	255	985	7.5	8.5
JUN , 1986					
03...	0740	1080	415	20.0	20.0
25...	1030	392	530	30.0	23.0
JUL					
17...	0957	104	715	20.0	22.5
SEP					
04...	1030	176	725	--	20.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06294500 BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MT (LAT 46 07 32 LONG 107 28 02)											
OCT , 1985						APR , 1986					
18...	1045	1180	1070	10.5	10.0	21...	1150	--	1020	21.0	9.0
18...	1610	769	1090	16.5	14.0	JUN					
DEC						24...	1245	8280	881	31.0	17.5
17...	0950	--	873	-3.0	.0	AUG					
FEB , 1986						11...	1215	3010	612	26.0	21.0
18...	0945	--	935	-10.0	.0						
MAR											
20...	1110	4440	920	14.0	4.0						
06295000 YELLOWSTONE RIVER AT FORSYTH, MT (LAT 46 15 53 LONG 106 41 43)											
MAR , 1986						JUN , 1986					
26...	1020	7560	755	8.0	7.0	02...	1415	35800	158	24.0	15.0
APR						AUG					
22...	0955	8740	652	21.0	12.0	12...	0950	7980	669	25.0	21.0
06295113 ROSEBUD CREEK AT RESERVATION BOUNDARY, NEAR KIRBY, MT (LAT 45 21 39 LONG 106 59 10)											
OCT , 1985						APR , 1986					
17...	0950	2.4	1100	17.0	6.5	15...	1520	13	965	--	8.5
NOV						JUN					
05...	1535	4.0	990	3.0	5.0	04...	0945	23	795	13.5	18.0
DEC						JUL					
17...	1100	3.7	1030	--	.0	14...	1110	4.6	911	24.0	17.0
JAN , 1986						AUG					
27...	1305	4.3	952	10.0	.0	11...	1015	2.1	975	27.5	17.0
MAR						SEP					
07...	1030	32	836	7.0	2.5	22...	1030	3.1	990	8.0	8.0
06295250 ROSEBUD CREEK NEAR COLSTRIP, MT (LAT 45 46 03 LONG 106 34 10)											
NOV , 1985						MAY , 1986					
14...	1050	7.7	1700	4.0	.5	01...	1030	28	1500	13.0	10.0
DEC						JUN					
16...	1435	8.3	1610	3.0	.0	16...	1140	45	909	26.0	21.0
JAN , 1986						AUG					
28...	1455	14	1430	5.0	.5	14...	0910	4.3	1570	24.0	18.0
MAR						SEP					
13...	0940	46	1320	4.0	3.5	19...	0855	9.6	1570	7.5	10.5
06309000 YELLOWSTONE RIVER AT MILES CITY, MT (LAT 46 25 16 LONG 105 51 51)											
MAR , 1986						JUL , 1986					
26...	1300	8150	890	14.5	8.5	08...	1250	23000	550	28.0	20.0
APR						AUG					
22...	1300	9550	665	22.0	12.0	12...	1335	8440	695	26.0	21.5
JUN											
04...	1200	44100	135	22.0	15.5						
06326300 MIZPAH CREEK NEAR MIZPAH, MT (LAT 46 15 39 LONG 105 17 34)											
OCT , 1985						MAY , 1986					
03...	0900	.51	790	7.0	9.0	01...	0900	4.0	1680	7.0	8.5
DEC						09...	0940	1200	569	8.0	5.5
04...	0950	.06	3680	-8.0	.0	10...	0920	628	520	7.5	5.0
JAN , 1986						12...	1350	56	1140	8.5	14.0
23...	1005	3.6	543	-10.0	.0	JUN					
FEB						19...	0830	2.1	1020	21.0	24.0
27...	0940	1030	162	14.0	1.0	JUL					
28...	0915	525	300	12.0	1.0	31...	1055	.01	4030	24.0	22.5
MAR						SEP					
03...	1550	155	958	15.0	1.0	17...	1440	.65	1280	16.5	15.5
27...	0840	1.8	1240	10.0	7.0						

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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)
06326600 O'FALLON CREEK NEAR ISMAY, MT (LAT 46 25 17 LONG 104 45 40)					
OCT , 1985					
01...	1330	.01	3630	14.0	17.0
DEC					
03...	0930	.10	4090	-10.0	.0
JAN , 1986					
22...	0940	1.7	753	-5.0	.0
FEB					
26...	1025	958	242	12.0	.5
27...	1250	1320	155	15.0	1.0
APR					
29...	1600	16	3100	18.0	14.5
MAY , 1986					
09...	1355	818	642	6.0	5.5
10...	1245	700	858	15.5	7.0
12...	1610	98	1060	15.5	14.5
JUN					
17...	1500	3.1	2580	28.5	29.0
JUL					
29...	0905	.31	3330	24.0	22.5
SEP					
18...	0900	2.9	4500	10.0	11.0

PRICKLY PEAR CREEK BASIN

462905112035401 MC BEATH RESIDENCE NEAR CLANCY, MT
(National trends network)

LOCATION.--Lat 46°29'05", long 112°03'54", in NE¼NW¼NE¼ sec.2, T.8 N., R.4 W., Jefferson County, at National Forest boundary fence at private residence on Lump Gulch Road, 5.1 mi west of Clancy and 10 mi south of Helena.

PERIOD OF RECORD.--Water years 1981-1982, 1984 to current year. Prior to October 1984, published as 462905112034001

EQUIPMENT.--The sample collector is an Aerochem Metrics Model 301 precipitation collector. An automatic sensor detects occurrences of precipitation, activating a motor which removes a cover from the wetfall collection vessel. When precipitation ceases the cycle is reversed. The sampling vessel is polyethylene and has a collection diameter of 28.6 cm and a capacity of 13 liters. Precipitation is measured using a Belfort Universal rain gage, series 5-780 with a event recorder.*

REMARKS.--Because laboratory quality assurance may not have been completed, data contained in the tables are considered preliminary and are subject to updating.

RAINFALL, ACCUMULATED (INCHES) WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.07	.00	.00	.00	.00	.04	.00	.00	.00
2	.03	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00	.00
3	.79	.00	.08	.16	.00	.00	.00	.00	.30	.01	.00	.00
4	.00	.08	.00	.00	.05	.00	.00	.08	.16	.95	.00	.00
5	.00	.00	.00	.00	.02	.00	.00	.00	.17	.00	.00	.00
6	.54	.03	.00	.00	.02	.00	.00	.02	.01	.00	.00	.00
7	.80	.23	.00	.00	.00	.04	.00	.16	.09	.13	.00	.00
8	.00	.00	.13	.00	.01	.09	.00	.37	.05	.04	.00	.22
9	.00	.03	.03	.00	.07	.05	.00	.22	.00	.04	.00	.15
10	.00	.02	.00	.00	.05	.03	.00	.47	.00	.02	.00	.00
11	.00	.10	.02	.00	.00	.35	.05	.07	.00	.02	.07	.00
12	.02	.00	.13	.00	.20	.02	.35	.00	.00	.00	.50	.15
13	.00	.00	.00	.00	.00	.04	.08	.09	.00	.00	.04	.56
14	.00	.00	.00	.00	.21	.00	.00	.00	.20	.00	.00	.02
15	.00	.00	.00	.00	.19	.00	.00	.00	.00	.05	.00	.13
16	.02	.01	.00	.02	.15	.06	.09	.00	.03	.29	.00	.05
17	.00	.31	.00	.20	.20	.10	.00	.00	.00	.00	.00	.87
18	.00	.06	.00	.00	.06	.00	.00	.00	.00	.00	.00	.33
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06
20	.00	.00	.00	.16	.00	.00	.00	.20	.00	.00	.00	.18
21	.06	.03	.00	.00	.01	.00	.00	.03	.00	.00	.63	.01
22	.02	.05	.00	.00	.02	.00	.02	.00	.00	.01	.00	.00
23	.00	.00	.00	.00	.02	.00	.01	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.17	.00	.00	.00	.00	.03
25	.00	.07	.00	.00	.00	.00	.26	.00	.03	.05	.00	.00
26	.00	.02	.00	.00	.06	.00	.12	.00	.00	.15	.00	.00
27	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06
28	.00	.05	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00
29	.00	.11	.00	.00	---	.00	.03	.00	.02	.00	.00	.00
30	.00	.05	.00	.00	---	.01	.00	.00	.00	.00	.07	.02
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.36	---
TOTAL	2.28	1.28	.39	.61	1.34	.79	1.41	1.71	1.35	1.76	1.67	2.84
MEAN	.07	.04	.01	.02	.05	.03	.05	.06	.04	.06	.05	.09
MAX	.80	.31	.13	.20	.21	.35	.35	.47	.30	.95	.63	.87
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

WTR YR 1986 TOTAL 17.43 MEAN .05 MAX .95 MIN .00

*The use of the brand name in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

CHEMICAL QUALITY OF PRECIPITATION

PRICKLY PEAR CREEK BASIN

462905112035401 - MC BEATH RESIDENCE NEAR CLANCY, MT--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

WEEKLY COMPOSITE

DATE	PRECIP-ITATION INCHES (46529)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4) (00653)
SEP 1985 SEP 24-OCT 01	0.44	4.1	5.23	0.127	0.021	0.041	0.021	0.33	0.09	0.29	0.12	<0.003
OCT 01-08	2.16	5.1	5.03	0.033	0.009	0.013	0.009	0.28	<0.03	<0.03	<0.02	<0.003
OCT 08-15	0.02	--	--	--	--	--	--	--	--	--	--	--
OCT 15-22	0.09	5.2	5.05	0.130	0.028	0.033	0.015	0.48	0.09	0.40	<0.02	<0.003
OCT 22-29	0.01	--	--	--	--	--	--	--	--	--	--	--
OCT 29-NOV 05	0.08	3.7	5.13	0.065	0.036	0.052	0.005	0.10	0.11	<0.03	<0.02	<0.003
NOV 05-12	0.41	2.9	5.14	0.054	0.015	0.035	0.005	0.16	0.04	<0.03	<0.02	<0.003
NOV 12-19	0.38	4.5	5.02	0.029	0.010	0.019	<0.003	0.11	<0.03	<0.03	<0.02	<0.003
NOV 19-26	0.15	8	4.72	--	--	--	--	--	--	--	--	--
NOV 26-DEC 03	0.26	7.3	4.82	0.150	0.037	0.053	0.025	0.31	0.16	<0.03	<0.02	<0.003
DEC 03-10	0.24	8.8	4.74	0.092	0.024	0.041	0.032	0.49	0.10	0.04	<0.02	<0.003
DEC 10-17	0.15	9.4	4.65	0.052	0.042	0.061	0.023	0.69	0.12	0.12	<0.02	<0.003
DEC 17-24	0.0	--	--	--	--	--	--	--	--	--	--	--
DEC 24-31	0.0	--	--	--	--	--	--	--	--	--	--	--
DEC 31 JAN 07	0.23	3.9	5.11	0.064	0.013	0.028	0.015	0.12	<0.03	<0.03	<0.02	<0.003
JAN 1986 07-14	0.0	--	--	--	--	--	--	--	--	--	--	--
JAN 14-21	0.38	4.5	5.07	0.015	0.006	0.015	0.004	0.36	<0.03	<0.03	<0.02	<0.010
JAN 21-28	0.0	--	--	--	--	--	--	--	--	--	--	--
JAN 28-FEB 04	0.0	--	--	--	--	--	--	--	--	--	--	--
EB 04-11	0.22	7.2	4.82	0.096	0.038	0.025	0.007	0.53	0.07	0.81	0.07	0.010
FEB 11-18	1.01	4.8	4.89	0.018	0.004	0.020	0.004	0.18	<0.03	0.34	<0.02	<0.010
FEB 18-25	0.05	--	--	0.241	0.083	0.149	0.047	0.56	0.21	1.00	0.06	0.010
FEB 25-MAR 04	0.06	6.6	4.86	0.081	0.043	0.252	0.014	0.27	0.11	0.27	0.02	<0.010
MAR 04-11	0.21	11.5	4.59	0.112	0.040	0.036	0.010	1.30	0.06	0.49	0.06	<0.010
MAR 11-18	0.57	4.2	4.99	0.034	0.007	0.013	0.008	0.31	0.04	0.24	0.05	<0.010
MAR 18-25	0.0	--	--	--	--	--	--	--	--	--	--	--
MAR 25-APR 01	0.01	--	--	--	--	--	--	--	--	--	--	--

PRICKLY PEAR CREEK BASIN

462905112035401 - MC BEATH RESIDENCE NEAR CLANCY, MT--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

WEEKLY COMPOSITE

DATE	PRECIP-ITATION INCHES (46529)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4) (00653)
APR 01-08	0.23	8.4	5.76	0.358	0.051	0.063	0.026	0.87	0.08	1.22	0.59	<0.010
APR 08-15	0.48	3.8	5.45	0.106	0.019	0.018	0.010	0.29	<0.03	0.41	0.09	<0.010
APR 15-22	0.09	5.5	4.97	0.099	0.031	0.030	0.005	0.57	0.08	0.40	0.10	<0.010
APR 22-29	0.58	5.6	4.92	0.058	0.009	0.041	0.005	0.52	0.07	<0.03	<0.02	0.010
APR 29-MAY 06	0.11	8	5.74	0.688	0.070	0.115	0.028	0.69	0.24	0.84	0.12	<0.010
MAY 06-13	1.31	5.3	4.86	0.047	0.007	0.038	<0.003	0.41	0.05	<0.03	<0.02	<0.010
MAY 13-20	0.09	8.2	4.76	0.139	0.041	0.033	0.021	0.60	0.04	0.27	<0.02	<0.010
MAY 20-27	0.23	11	6.30	0.672	0.075	0.268	0.071	1.30	0.30	1.53	0.60	0.02
MAY 27-JUN 03	0.04	--	--	1.982	0.256	0.161	0.692	4.42	0.25	0.47	<0.02	0.010
JUN 03-10	0.78	6.9	5.03	0.208	0.033	0.036	0.033	0.68	0.05	0.69	0.16	<0.010
JUN 10-17	0.23	6.7	4.72	0.108	0.026	0.022	0.050	0.24	0.04	0.10	<0.02	<0.010
JUN 17-24	0.0	--	--	--	--	--	--	--	--	--	--	--
JUN 24-JUL 01	0.30	12.3	5.10	0.505	0.066	0.069	0.085	1.51	0.22	1.55	0.51	<0.010
JUL 01-08	1.09	5.7	4.81	0.07	0.013	0.026	0.051	0.22	0.04	<0.03	<0.02	<0.010
JUL 08-15	0.12	7.1	4.93	0.117	0.036	0.051	0.015	0.33	0.11	0.61	<0.02	<0.010
JUL 15-22	0.34	12	4.63	0.310	0.043	0.109	0.069	1.49	0.15	0.94	0.13	<0.010
JUL 22-29	0.21	12.1	4.60	0.229	0.031	0.100	0.064	1.29	0.14	0.92	<0.02	<0.010
JUL 29-AUG 05	0.0	--	--	--	--	--	--	--	--	--	--	--
AUG 05-12	0.14	37.8	4.22	0.516	0.088	0.102	0.317	1.81	0.28	2.86	1.30	<0.010
AUG 12-19	0.47	7.1	5.25	0.159	0.027	0.035	0.109	0.60	0.06	1.08	0.51	<0.010
AUG 19-26	0.63	11.7	4.54	0.049	0.007	0.020	0.022	0.37	<0.03	0.39	0.08	<0.010
AUG 26-SEP 02	0.43	12.3	4.49	0.085	0.008	0.025	0.006	0.94	0.04	0.40	0.06	<0.010
SEP 02-09	0.37	13.1	4.51	0.065	0.007	0.025	0.012	0.73	0.06	0.16	<0.02	<0.010
SEP 09-16	0.86	11.5	4.52	0.096	0.015	0.068	0.023	0.71	0.08	0.75	0.15	<0.010
SEP 16-23	1.5	5.8	4.84	0.026	0.005	0.022	0.005	0.30	<0.03	0.28	0.05	<0.010
SEP 23-30	0.10	14.4	4.53	0.261	0.030	0.367	0.025	1.04	0.15	1.15	0.20	<0.010
SEP 30-OCT 07	0.01	--	--	--	--	--	--	--	--	--	--	--

MILK RIVER BASIN

482958109475101 NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT
(National trends network)

LOCATION.--Lat 48°29'58", long 109°47'51", in NE¼SW¼SW¼ sec.28, T.32 N., R.15 E., Hill County, at Northern Montana Agricultural Research Center Experiment Station, 3/4 mile south of U.S. Highway 87, 5.7 miles southwest of Havre.

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

EQUIPMENT.--The sample collector is an Aerochem Metrics Model 301 precipitation collector. An automatic sensor detects occurrences of precipitation, activating a motor which removes a cover from the wetfall collection vessel. When precipitation ceases the cycle is reversed. The sampling vessel is polyethylene and has a collection diameter of 28.6 cm and a capacity of 13 liters. Precipitation is measured using a Belfort Universal rain gage, series 5-780 with a event recorder.*

REMARKS.--Because laboratory quality assurance may not have been completed, data contained in the tables are considered preliminary and are subject to updating.

RAINFALL, ACCUMULATED (INCHES) WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.02	.00	.00	.00	.00	.00	.13	.00	.00	.00
3	.00	.00	.00	.07	.02	.00	.00	.05	.00	.24	.00	.09
4	.00	.09	.00	.00	.00	.00	.00	.32	.21	.05	.00	.16
5	.00	.10	.00	.00	.43	.00	.00	.66	.00	.09	.04	.38
6	.43	.00	.00	.00	.07	.07	.00	.04	.33	.00	.00	.00
7	.40	.00	.02	.00	.00	.04	.00	.00	.00	.00	.00	.00
8	.10	.04	.00	.00	.00	.00	.00	.13	.27	.02	.05	.10
9	.00	.05	.00	.00	.00	.00	.00	.85	.00	.00	.19	.58
10	.00	.00	.00	.00	.00	.00	.13	.27	.00	.00	.00	.03
11	.00	.01	.07	.00	.00	.00	.00	1.23	.00	.00	.00	.00
12	.00	.00	.00	.00	.05	.00	.19	.00	.00	.00	.07	.16
13	.00	.00	.00	.00	.00	.02	.08	.10	.00	.00	.70	.05
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.04
15	.00	.00	.00	.00	.10	.00	.00	.08	.04	.00	.00	.00
16	.00	.01	.00	.01	.11	.00	.00	.00	.00	1.50	.00	.00
17	.00	.30	.00	.00	.09	.06	.00	.00	.04	.14	.00	.57
18	.00	.14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.55
19	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.79
20	.00	.00	.00	.00	.00	.00	.00	.00	.02	.14	.00	.05
21	.00	.05	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00
22	.00	.02	.00	.00	.00	.00	.08	1.06	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.01	.14	.00	.04	.00	.00
24	.00	.10	.00	.02	.00	.00	.03	.00	.00	.00	.00	.50
25	.00	.08	.00	.00	.00	.00	.00	.00	.11	.09	.00	1.93
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12
27	.00	.03	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.15	.00	.00	.00
29	.00	.02	.00	.04	---	.00	.00	.00	.23	.00	.01	.00
30	.00	.02	.00	.23	---	.05	.00	.00	.00	.00	.01	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.29	---
TOTAL	.93	1.09	.12	.37	.87	.24	.53	5.35	1.53	2.33	1.36	6.10
MEAN	.03	.04	.00	.01	.03	.01	.02	.17	.05	.08	.04	.20
MAX	.43	.30	.07	.23	.43	.07	.19	1.23	.33	1.50	.70	1.93
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

WTR YR 1986 TOTAL 20.55 MEAN .06 MAX 1.93 MIN .00

*The use of the brand name in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

MILK RIVER BASIN

482958109475101 - NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

WEEKLY COMPOSITE

DATE	PRECIP-ITATION INCHES (46529)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4) (00653)
OCT 1985 01-08	0.93	10	4.82	0.072	0.017	0.023	0.015	0.52	0.04	0.06	<0.02	<0.003
OCT 08-15	0.0	--	--	--	--	--	--	--	--	--	--	--
OCT 15-22	0.0	--	--	--	--	--	--	--	--	--	--	--
OCT 22-29	0.0	--	--	--	--	--	--	--	--	--	--	--
OCT 29-NOV 05	0.19	4.9	5.74	0.110	0.024	0.020	0.018	0.38	0.05	0.58	0.16	<0.003
NOV 05-12	0.10	--	--	--	--	--	--	--	--	--	--	--
NOV 12-19	0.48	6.1	4.66	0.157	0.073	0.057	0.015	0.85	0.12	0.39	<0.02	<0.003
NOV 19-26	0.25	--	--	--	--	--	--	--	--	--	--	--
NOV 26-DEC 03	0.10	--	--	--	--	--	--	--	--	--	--	--
DEC 03-10	0.02	--	--	--	--	--	--	--	--	--	--	--
DEC 10-17	0.07	--	--	--	--	--	--	--	--	--	--	--
DEC 17-24	0.0	--	--	--	--	--	--	--	--	--	--	--
DEC 24-31	0.0	--	--	--	--	--	--	--	--	--	--	--
DEC 31 JAN 07	0.07	--	--	--	--	--	--	--	--	--	--	--
JAN 1986 07-14	0.0	--	--	--	--	--	--	--	--	--	--	--
JAN 14-21	0.01	--	--	--	--	--	--	--	--	--	--	--
JAN 21-28	0.02	--	--	0.393	0.085	0.142	0.041	0.73	0.19	0.82	0.16	0.020
JAN 28-FEB 04	0.29	3.8	4.80	0.060	0.020	0.024	0.012	0.26	0.06	0.27	<0.02	<0.010
FEB 04-11	0.50	4.3	5.44	0.041	0.013	0.022	0.011	0.16	<0.03	0.48	0.10	<0.010
FEB 11-18	0.35	5.4	4.95	0.098	0.023	0.032	0.022	0.26	0.08	0.25	<0.02	<0.010
FEB 18-25	0.0	--	--	--	--	--	--	--	--	--	--	--
FEB 25-MAR 04	0.0	--	--	--	--	--	--	--	--	--	--	--
MAR 04-11	0.11	11.6	6.31	0.296	0.042	0.060	0.040	1.14	0.15	0.60	0.80	<0.010
MAR 11-18	0.08	9.6	5.33	0.154	0.090	0.053	0.021	1.13	0.11	0.87	0.85	<0.010
MAR 18-25	0.0	--	--	--	--	--	--	--	--	--	--	--
MAR 25-APR 01	0.05	8.9	5.83	0.495	0.100	0.068	0.048	0.50	0.10	1.17	0.36	<0.010

MILK RIVER BASIN

482958109475101 - NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

WEEKLY COMPOSITE

DATE	PRECIP-ITATION INCHES (46529)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	PHOS-PHATE, DIS-SOLVED (MG/L AS PO4) (00653)
APR 01-08	0.0	--	--	--	--	--	--	--	--	--	--	--
APR 08-15	0.40	13.7	6.26	0.646	0.157	0.225	0.073	1.63	0.17	1.33	0.72	<0.010
APR 15-22	0.0	--	--	--	--	--	--	--	--	--	--	--
APR 22-29	0.13	15.5	5.68	0.732	0.127	0.136	0.069	1.31	0.14	1.62	0.77	0.010
APR 29-MAY 06	1.07	7.2	5.43	0.233	0.039	0.122	0.034	0.81	0.05	0.56	0.11	<0.010
MAY 06-13	2.48	8.1	5.00	0.028	0.009	0.049	<0.003	0.56	0.06	0.33	0.18	<0.010
MAY 13-20	0.18	7.4	5.71	0.410	0.083	0.046	0.042	1.34	0.04	0.11	<0.02	0.030
MAY 20-27	1.62	4.8	5.23	0.065	0.012	0.047	<0.003	0.47	0.05	0.34	0.10	<0.010
MAY 27-JUN 03	0.13	16.2	6.02	0.739	0.156	0.167	0.307	1.46	0.26	1.52	0.25	0.150
JUN 03-10	0.81	6.7	5.35	0.094	0.023	0.017	0.038	0.66	<0.03	0.68	<0.02	<0.010
JUN 10-17	0.04	--	--	0.229	0.093	0.190	0.027	0.58	0.11	0.56	<0.02	0.020
JUN 17-24	0.06	--	--	3.35	0.535	0.465	0.554	3.21	0.71	4.6	0.21	0.020
JUN 24-JUL 01	0.49	6.2	5.24	0.239	0.041	0.073	0.079	0.57	0.11	<0.03	<0.02	<0.010
JUL 01-08	0.38	11.1	4.81	0.281	0.053	0.058	0.047	0.88	0.10	1.35	0.31	<0.010
JUL 08-15	0.03	--	--	1.221	0.262	0.250	0.218	3.78	0.43	4.15	1.53	<0.010
JUL 15-22	1.78	3.9	5.28	0.078	0.018	0.045	0.014	0.34	0.05	0.17	<0.02	<0.010
JUL 22-29	0.14	13.1	5.09	0.449	0.084	0.065	0.070	1.49	0.12	1.68	0.22	<0.010
JUL 29-AUG 05	0.02	--	--	--	--	--	--	--	--	--	--	--
AUG 05-12	0.26	6.8	5.23	0.406	0.075	0.146	0.071	0.91	0.09	0.53	<0.02	<0.010
AUG 12-19	0.77	8.9	4.88	0.203	0.045	0.021	0.041	0.87	0.04	1.04	0.33	<0.010
AUG 19-26	0.0	--	--	--	--	--	--	--	--	--	--	--
AUG 26-SEP 02	0.31	6.7	5.17	0.172	0.037	0.059	0.046	0.52	0.04	0.75	0.10	<0.010
SEP 02-16	1.59	6.3	5.04	0.068	0.014	0.034	0.026	0.59	0.04	0.56	<0.02	<0.010
SEP 16-23	1.96	4.3	5.28	0.013	0.003	0.014	0.003	0.29	<0.03	0.26	0.04	<0.010
SEP 23-OCT 01	2.55	2.3	5.85	0.017	0.005	0.009	<0.003	0.12	<0.03	0.17	0.06	<0.010
OCT 01-07	0.04	--	--	--	--	--	--	--	--	--	--	--

Page

Absarokee, Stillwater River near.....275,419
Access to Watstore data..... 30
Accuracy of the records..... 25
Ackley Lake near Hobson.....371,374
Acre-foot (acre-ft, AC-FT), definition of..... 30
Alder, Ruby River above reservoir, near.....54,404
  Ruby River below reservoir, near.....55,404
  Ruby River Reservoir near.....367,374
Algae, definition of..... 30
Alkali Coulee tributary near Virgelle..... 380
Alkali Creek tributary near Sidney..... 391
Allen Creek near Park City..... 387
Altawan Reservoir near Govenlock, Saskatchewan.... 166
Andresen Coulee near Custer..... 387
Annual maximum discharge at crest-stage partial-record stations.....377-392
Antelope, Big Muddy Creek near.....246-248
Antelope Creek tributary No. 2 near Harlowton..... 381
Aquifer, definition of..... 30
Armells Creek, near Forsyth.....315-316,403
  tributary near Colstrip..... 388
Armstrong Creek near Livingston.....402,418
Arrangement of records..... 26
Artesian, definition of..... 30
Augusta, Gibson Reservoir near.....369,374
  Nilan Reservoir near.....370,374
  Pishkun Reservoir near.....370,374
  Willow Creek Reservoir near.....370,374

Babb, St. Mary Canal at St. Mary Crossing, near... 46
  St. Mary River near..... 44
  South Fork Milk River near.....140,410
Bacteria, definition of..... 30
  Fecal coliform, definition of..... 30
  Fecal streptococcal, definition of..... 30
  Non-ideal colony count..... 30
  Total coliform, definition of..... 30
Badger Creek (tributary to Little Powder River) at Biddle..... 390
Badger Creek (tributary to Two Medicine River) below Four Horns Canal, near Browning.....110,408
Bair Coulee near Mosby..... 382
Bair Reservoir near Delpine.....372,374
Barretts, Beaverhead River at.....52,404
Basin Creek tributary near Volborg..... 389
Battle Creek, at international boundary..... 176
  near Chinook.....178,413
Battle Creek basin, schematic diagram of..... 167
Battle Creek (town of), Saskatchewan, Middle Creek Reservoir near..... 166
Baylor, Porcupine Creek, Middle Fork, near.....400,415
  Porcupine Creek, West Fork, near.....400,415
Bear Creek (tributary to Box Elder Creek), South Fork, tributary near Roy..... 382
Beaver Creek (tribuatry to Missouri River) at mouth, near York..... 374
Beaver Creek at international boundary.....243-245
Beaver Creek (tributary to Little Missouri River) near Trotters, ND..... 376
Beaver Creek (tributary to Milk River) at reservation boundary, near Rocky Boy.....397,412
  below Guston Coulee, near Saco.....208,414
  near Zortman.....203,414
  tributary near Zortman..... 384
  tributary No. 2 near Malta..... 385
Beaverhead River, at Barretts.....52,404
  at Dillon.....393,404
  near Twin Bridges.....53,404
Beaverhead River basin, discharge measurements at miscellaneous sites..... 393
  supplemental water-quality data for gaging stations and miscellaneous sites.....404-424
Bed material, definition of..... 30
Belanger Creek diversion canal near Vidora, Saskatchewan..... 190
Belfry, Clarks Fork Yellowstone River near.....276-277
  Dry Creek near.....403,419
Belt Creek basin, crest-stage partial-record stations in..... 379
Big Coulee (tributary to Musselshell River) near Martinsdale..... 381
Big Coulee (tributary to Musselshell River) tributary near Cushman..... 382
Big Dry Creek near Van Norman.....135,410
Big Dry Creek basin, crest-stage partial record stations in..... 383
  gaging stations in..... 135
Big Hole River below Jerry Creek, near Wise River 405
  near Melrose..... 56-59
  near Twin Bridges..... 393
  near Wise River..... 393

Page

Big Hole River basin, crest-stage partial-record stations in..... 378
  gaging stations records in..... 56-59
Big Muddy Creek, near Antelope.....246-248
  near mouth, near Culbertson.....253-254
Big Muddy Creek basin, crest-stage partial-record stations in..... 386
  discharge measurements at miscellaneous sites in 401
  gaging station records in.....243-254
Big Muddy Creek diversion canal, near Medicine Lake.....249,416
Big Pipestone Creek at Whitehall..... 393
Big Rock Coulee near Santa Rita.....395,409
Big Sandy, Lonesome Lake Coulee near..... 396
Big Sandy Creek, above Gravel Coulee, near Laredo.....397,412
  at reservation boundary, near Rocky Boy.....150,411
  near Havre.....153-155
Big Sheep Creek below Muddy Creek, near Dell..... 377
Big Timber, Boulder River at.....272,418
Big Warm Creek near Zortman.....207,414
Bighorn Lake near St. Xavier..... 295
Bighorn, Bighorn River above Tullock Creek, near.312,423
  Bighorn River at.....313-314
Bighorn River, above Tullock Creek, near Bighorn.312,423
  at Bighorn.....313-314
  at Kane, WY.....289-291
  near St. Xavier.....296,421
Billings, Yellowstone River at.....284-286
Birney, Hanging Woman Creek below Horse Creek, near.....330-331,403
  Hanging Woman Creek near.....332-335
  Tongue River at Birney Day School bridge, near.336-338
Black Rock Creek near Augusta..... 379
Blacktail Creek near Dupuyer.....395,408
  near Heart Butte..... 380
Blacktail Deer Creek near Dillon..... 393
Blood Creek tributary near Valentine..... 382
Bottom material, see bed material..... 30
Boulder River (tributary to Jefferson River), near Boulder.....60,405
  near Cardwell..... 394
  South, near Cardwell..... 394
Boulder River (tributary to Yellowstone River), at Big Timber.....272,418
Box Elder, Boxelder Creek at..... 396
  Camp Creek near.....396,411
  Duck Creek near.....396,411
  Sage Creek near..... 396
Boxelder Creek (tributary to Big Sandy Creek) near Rocky Boy.....151,411
Boxelder Creek (tributary to Poplar River) at Box Elder.....396,411
  at Poplar.....401,416
Boyd, Cooney Reservoir near.....373,374
  Red Lodge Creek above Cooney Reservoir, near...280,420
  Red Lodge Creek below Cooney Reservoir, near...282,420
  Willow Creek near.....281,420
Bozeman, Hyalite Creek at Hyalite Ranger Station, near.....85,406
  Middle Creek Reservoir near.....368,374
Bredette, Poplar River above West Fork..... 239
  West Fork Poplar River near.....240-241,401
Brian Creek near Ashland..... 389
Broadus, Powder River at.....349-351
Browning, Badger Creek below Four Horns Canal near.....110,408
  Four Horns Canal near..... 408
  North Fork Milk River above St. Mary Canal near.....143,411
  Two Medicine Canal near..... 408
  Two Medicine River below South Fork, near.....109,408
Bruce Coulee tributary near Choteau..... 380
Bull Creek (tributary to Warm Springs Creek) tributary near Hilger..... 381
Burgess Junction, WY, Dry Fork below Lick Creek, near..... 298
Burgess Junction, WY, Little Bighorn River below Dayton Gulch, near..... 297
Burns Creek near Savage.....359-361
Butcher Creek below the forks, near Luther.....403,419
Butte Creek tributary near Four Buttes..... 386
Butts Coulee near Melstone..... 382

Cabin Creek (tributary to Deep Creek) near Townsend..... 379
Cabin Creek (tributary to Madison River) near West Yellowstone..... 378
Cameron, Madison River at Kirby Ranch, near.....79,405
  West Fork near 394
Camp Creek near Box Elder.....396,411

Page

Camp Crook, SD, Little Missouri River at..... 375
Canyon Creek (tributary to Tongue River) near Birney..... 388
Canyon Ferry Lake near Helena..... 91
Cardwell, Boulder River near..... 394
  Boulder River, South, near..... 394
Cataract Creek near Basin..... 378
Cfs-day, definition of..... 31
Chemical oxygen demand (COD), definition of..... 30
Chemical quality of precipitation.....425-430
Cherry Creek near Norris..... 394
  tributary near Terry..... 390
Chester, Lake Elwell near..... 114
  Marias River near.....115-117
Chico, Emigrant Spring Creek near..... 402
Chinook, Battle Creek near.....178,413
  Clear Creek near.....158,413
  Fort Belknap Canal, at St. Gabriel Cemetery, near..... 397
  Fort Belknap Canal near..... 397
  Paradise Valley Canal near..... 398
Chlorophyll, definition of..... 30
Circle, Redwater River at.....226,416
Clancy, Prickly Pear Creek near.....94,406
Clark Canyon near Dillon..... 377
Clark Canyon Reservoir near Grant..... 51
Clarks Fork Yellowstone River, near Belfry.....276-277
  near Silesia.....278,420
Classification of records..... 26
Clear Creek (tributary to Rock Creek) at mouth, near Roberts..... 420
  near Belfry..... 403
  near Chinook.....158,413
Cleveland, Peoples Creek near.....398,413
Coal Creek near Mill Iron..... 392
COD (chemical oxygen demand), definition of..... 30
Coliform, fecal bacteria, definition of..... 30
  total bacteria, definition of..... 30
Color unit, definition of..... 30
Colstrip, Cow Creek near 403
  Rosebud Creek near.....319,423
Consul, Saskatchewan, Cypress Lake near..... 199
  McKinnon Ditch near..... 174
  Nashlyn Canal near..... 175
  Richardson Ditch near..... 173
  Vidora Ditch near..... 172
Contents, definition of..... 31
Control, definition of..... 31
Control structure, definition of..... 31
Cooney Reservoir near Boyd.....373,374
Cooperation..... 1
Corwin Springs, Yellowstone River at.....264-266
Cottonwood Creek near Dagmar.....251,416
Cow Creek (tributary to Redwater River) near Vida..... 386
  tributary near Vida..... 386
Cow Creek (tributary to Rosebud Creek) near Colstrip..... 403
Cow Creek (tributary to Otter Creek) near Fort Howes Ranger Station, near Otter..... 389
Crest-stage partial-record stations, discharge at.....377-403
Crooked Creek (tributary to Yellowstone River) tributary near Shepherd..... 387
Crow Creek near Radersburg..... 395
Cubic feet per second per square mile ($ft^3/s/mi^2$), definition of..... 31
Cubic foot per second, (FT^3/s, ft^3/s), definition of..... 31
Cubic-foot-per-second day (cfs-day)..... 31
Culbertson, Big Muddy Creek near mouth, near.....253-254
  Missouri River near.....255-257
Cut Bank, Cut Bank Creek at.....111-112
  Spring Creek near.....396,409
  Two Medicine River near.....395,408
Cut Bank Creek at Cut Bank.....111-112
Cut Coulee near Mizpah..... 390
Cypress Lake east outflow canal near Vidora, Saskatchewan..... 191
  near Consul, Saskatchewan..... 199
  west inflow canal drain near Oxarat, Saskatchewan..... 170
  west inflow canal near West Plains, Saskatchewan..... 169
  west outflow canal near West Plains, Saskatchewan..... 171

Dagmar, Cottonwood Creek near.....251,416
  Lake Creek near..... 250
  Sand Creek near.....252,417
Data collection and computation..... 23,29
Data presentation..... 23,28

Page

Dayton, WY, East Pass Creek near..... 304
Deadman's Basin Reservoir near Shawmut.....372,374
Dean, Little Rocky Creek near..... 402
Decker, Spring Creek near..... 388
  Tongue River at State line, near.....323-325
  Tongue River at Tongue River Dam, near.....326-329
  Tongue River Reservoir near.....373,374
Deep Creek (tributary to Yellowstone River) near Kinsey..... 390
  near Powderville..... 390
Deer Creek (tributary to Pumpkin Creek) tributary near Volborg..... 389
Definition of terms..... 30-34
Delpine, Bair Reservoir near.....372,374
Descriptor values for weather conditions..... 28
Dillon, Beaverhead River at.....393,404
  Blacktail Deer Creek at..... 393
  Grasshopper Creek near..... 393
Discharge, definition of..... 31
  instantaneous, definition of..... 31
  mean, definition of..... 31
Discharge at partial-record stations and miscellaneous sites.....377-403
Discharge measurements made at miscellaneous sites during water year 1986.....393-403
Disjardin Coulee near Malta..... 384
Dissolved, definition of..... 31
Dissolved-solids concentration, definition of..... 31
Diversity index..... 31
Dodson, Dodson South Canal near..... 399
  Kuhr Coulee tributary near..... 188
  Milk River near.....189,414
  Peoples Creek near.....186-187
  White Bear Creek below Fifteenmile Creek near..398,413
  Willow Coulee near.....185,414
Downstream order system..... 22
Drainage area, definition of..... 31
Drainage basin, definition of..... 31
Dry Creek near Belfry.....403,419
Dry Fork below Lick Creek near Burgess Junction, WY..... 298
Dry Fork Milk River near Babb..... 383
Duck Creek, near Box Elder.....396,411
Duck Creek (tributary to Redwater River)
  East Fork near Brockway..... 385
Dupuyer, Blacktail Creek near.....395,408
  Swift Reservoir near.....371,374
Dutton, Teton River near.....118,409
Duval Creek near Landusky..... 381

East Fishtail Creek at mouth, near Nye.....403,419
East Glacier, Lower Two Medicine Lake near.....370,374
East Pass Creek near Dayton, WY..... 304
East Poplar River at international boundary.....231-235
Eastend, Saskatchewan, Eastend Canal at..... 192
  Eastend Reservoir at..... 199
  Frenchman River below Eastend Reservoir, near..... 193
Elkhorn Creek above Fuller Ranch ditch, near Parkman, WY..... 299
Elwell, Lake, near Chester..... 114
Emigrant, Big Spring Creek near..... 417
  Emigrant Spring Creek near..... 417
Emigrant Spring Creek near Chico..... 402
  near Emigrant..... 417
Ennis, Jack Creek near.....80,406
Ennis Lake near McAllister.....368,374
Explanation of the records..... 21-29
  records of ground-water levels..... 29
  records of stage and water discharge..... 22-26
  records of surface-water quality..... 26-29

Favot Coulee tributary near Ledger..... 380
Fecal coliform, definition of..... 30
Fecal streptococcal bacteria, definition of..... 30
Fey Coulee tributary near Chester..... 380
Fifteenmile Creek tributary near Harlem.....181,413
  tributary near Zurich..... 384
Firehole River near West Yellowstone..... 63-67
First Hay Creek near Sidney..... 392
Fish Creek (tributary to Jefferson River) near Silver Star..... 378
Fishel Creek near Musselshell..... 382
Fishtail, West Rosebud Creek below Ingersoll Creek, near.....402,419
Flaxville, Smoke Creek near.....401,417
Flynn Creek near Oswego.....400,416
Forsyth, Armells Creek near.....315-316,403
  Yellowstone River at.....317,423
Fort Belknap Canal at St. Gabriel Cemetery, near Chinook..... 397
  near Chinook..... 397

Page

Fort Belknap Canal, near Lohman..... 397
Fort Benton, Missouri River at.....106-108
Fort Logan, Smith River near.....97,407
Fort Peck Dam, Missouri River below.....137-139
Fort Peck Lake at Fort Peck..... 136
Four Horns Canal near Browning..... 408
Four Horns Lake near Heart Butte.....371,374
Fox Creek tributary near Lambert..... 392
Frances, Lake, at Valier.....371,374
Frazer, Little Porcupine Creek at.....400,415
Frenchman River, at international boundary..... 198
  below Eastend Reservoir, near Eastend, Saskatchewan..... 193
Frenchman River, below Newton Lake, near Val Marie, Saskatchewan..... 197
Frenchman River basin, Saskatchewan, reservoirs in..... 199
  schematic diagram of..... 167
Fresno Reservoir near Havre.....372,374

Gaff Ditch near Merryflat, Saskatchewan..... 168
Gage height (G.H.), definition of..... 31
Gaging station, definition of..... 31
Gallatin River, at Logan.....86,406
  near Gallatin Gateway..... 84,406
Gallatin River basin, crest-stage partial-record stations in..... 378
  gaging stations records in..... 84-86
Gardiner, La Duke Hot Springs near..... 402
Gardner River near Mammoth, Yellowstone National Park.....263,417
General hydrologic setting..... 2
Gibbon River near West Yellowstone..... 68-72
Gibson Reservoir near Augusta.....369,374
Glasgow, Willow Creek near.....218,415
Gorman Coulee tributary near Cat Creek..... 382
Govenlock, Saskatchewan, Altawan Reservoir near... 166
  Middle Creek above Lodge Creek, near..... 164
  Middle Creek below Middle Creek Reservoir, near. 162
  Middle Creek near..... 163
  Spangler Ditch near..... 160
Grant, Clark Canyon Reservoir near..... 51
Grasshopper Creek near Dillon..... 393
Grayling, Madison River below Hebgen Lake, near...78,405
Great Falls, Missouri River near.....105,407
Griffith Creek tributary near Glendive..... 391
Ground-water levels, hydrologic conditions of..... 13
  records of..... 29

Halfbreed Creek near Klein.....127,410
Hanging Woman Creek below Horse Creek, near Birney.....330-331,403
  near Birney.....332-335
Hardin, Little Bighorn River near.....311,422
Hardness, definition of..... 31
Harlem, Fifteenmile Creek tributary near.....181,413
  Milk River near.....180,413
  Milk River "A" Canal near..... 179
  Snake Creek near.....398,413
  Threemile Creek near..... 398
Harlem Canal near Zurich..... 398
Harlowton, Musselshell River at.....125,410
Harrison, Willow Creek near.....61,405
  Willow Creek Reservoir near.....367,374
Hathaway, Snell Creek near..... 388
Hauser Lake near Helena.....369,374
Havre, Big Sandy Creek near.....153-155
  Fresno Reservoir near.....372-374
  Little Box Elder Creek at mouth, near.....157,412
  Milk River at.....156,412
Hawks Nest Creek tributary near Albion..... 392
Hays, Little Peoples Creek near.....183-184
  Peoples Creek near.....182,414
Heart Butte, Four Horns Lake near.....371,374
Hebgen Lake near West Yellowstone.....367,374
Helena, Canyon Ferry Lake near..... 91
  Hauser Lake near.....369,374
  Helena Valley Reservoir, near.....368,374
  Lake Helena near.....368,374
  Missouri River below Canyon Ferry Dam near..... 92-93
Helena, Lake, near Helena.....368,374
Helena Valley Reservoir near Helena.....368,374
Hobson, Ackley Lake near.....371,374
Holter Lake near Wolf Creek.....369,374
Home Creek near Sumatra..... 382
Horse Creek (tributary to Redwater River) tributary near Richey..... 386
Horse Creek, South Fork, tributary near Wibaux.... 391
Hot River at Mammoth..... 402
Hot Springs Creek near Norris..... 394
Huff Lake near Val Marie, Saskatchewan..... 199

Page

Huff Lake gravity canal, near Val Marie, Saskatchewan..... 195
Huff Lake pumping canal, near Val Marie, Saskatchewan..... 194
Hump Creek near Reed Point..... 387
Huntley, Pryor Creek near.....288,421
Hyalite Creek at Hyalite Ranger Station, near Bozeman.....85,406
Hydrologic activity -- water year 1986..... 3
Hydrologic bench-mark network, definition of..... 21,31
Hydrologic unit, definition of..... 31

Identifying estimated daily discharge..... 25
Instantaneous discharge, definition of..... 31
Introduction..... 1
Ismay, O'Fallon Creek near.....358,424

Jack Creek (tributary to Madison River) near Ennis.....80,406
Jack Creek (tributary to Tongue River) near Volborg..... 389
Jack Creek tributary (tributary to Clarks Fork Yellowstone River) near Belfry..... 387
Jefferson River near Three Forks.....62,405
  tributary No. 2 near Whitehall..... 378
Judith River basin, crest-stage partial-record stations in.....380-381

Kane, WY, Bighorn River at.....289-291
  Shoshone River at..... 294
Kirby, Rosebud Creek at reservation boundary, near.....318,423
  Rosebud Creek near..... 388
  South Fork Leaf Rock Creek near..... 388
Klein, Halfbreed Creek near..... 127
Krug Creek tributary No. 2 near Wibaux..... 391
Kuhr Coulee Tributary near Dodson..... 188

Laboratory measurements..... 27
La Duke Hot Springs near Gardiner..... 402
LaGrange Creek near Volborg..... 389
Lake Creek near Dagmar..... 250
Lakes and Reservoirs:
  Ackley Lake near Hobson.....371,374
  Altawan Reservoir near Govenlock, Saskatchewan.. 166
  Bair Reservoir near Delpine.....372,374
  Bighorn Lake near St. Xavier..... 295
  Canyon Ferry Lake near Helena..... 91
  Clark Canyon Reservoir near Grant..... 51
  Cooney Reservoir near Boyd.....373,374
  Cypress Lake near Consul, Saskatchewan..... 199
  Deadman's Basin Reservoir near Shawmut.....372,374
  Eastend Reservoir at Eastend, Saskatchewan..... 199
  Elwell, Lake, near Chester..... 114
  Ennis Lake near McAllister.....368,374
  Fort Peck Lake at Fort Peck..... 136
  Four Horns Lake near Heart Butte.....371,374
  Frances, Lake, near Valier.....371,374
  Fresno Reservoir near Havre.....372,374
  Gibson Reservoir near Augusta.....369,374
  Hauser Lake near Helena.....369,374
  Hebgen Lake near West Yellowstone.....367,374
  Helena, Lake, near Helena.....368,374
  Helena Valley Reservoir near Helena.....368,374
  Holter Lake near Wolf Creek.....369,374
  Huff Lake near Val Marie, Saskatchewan..... 199
  Lima Reservoir near Monida.....367,374
  Lower Two Medicine Lake near East Glacier.....370,374
  Martinsdale Reservoir near Martinsdale.....372,374
  Middle Creek Reservoir, near Battle Creek, Saskatchewan..... 166
    near Bozeman.....368,374
  Mystic Lake near Roscoe.....373,374
  Nelson Reservoir near Saco.....373,374
  Newton Lake near Val Marie, Saskatchewan..... 199
  Nilan Reservoir near Augusta.....370,374
  Pishkun Reservoir near Augusta.....370,374
  Ruby River Reservoir near Alder.....367,374
  Sherburne, Lake, at Sherburne..... 42
  Smith River Reservoir near White Sulphur Springs.....369,374
  Swift Reservoir near Dupuyer.....371,374
  Tongue River Reservoir near Decker.....373,374
  Willow Creek Reservoir near Augusta..... 370
    near Harrison.....367,374
  Yellowstone Lake at Bridge Bay, Yellowstone National Park..... 258
Lamar River near Tower Falls ranger station, Yellowstone National Park.....261-262
  schematic diagram of..... 12
Lame Jones Creek tributary near Willard..... 390

Page
Lame Jones Creek tributary near Willard..... 390
Land-surface datum (lsd), definition of..... 31
Landusky, Missouri River near.....120-124
Laredo, Big Sandy Creek, above Gravel Coulee, near.....397,412
Latitude and longitude system..... 22
Leaf Rock Creek, South Fork, near Kirby..... 388
Less than (<), definition of..... 31
Lewistown, Mill Creek near..... 380
Lima Reservoir near Monida.....367,374
Little Bighorn River, at State line, near Wyola..301,421
below Pass Creek, near Wyola.....307,422
below Dayton Gulch near Burgess Junction, WY.... 297
near Hardin.....311,422
tributary near Wyola..... 387
West Fork, near Parkman, WY..... 300
Little Box Elder Creek at mouth, near Havre.....157,412
Little Missouri River at Camp Crook, SD..... 375
tributary near Albion..... 392
Little Missouri River basin, crest-stage partial-record stations in..... 392
gaging station records in.....375-376
Little Otter Creek near Raynesford..... 379
Little Peoples Creek near Hayes.....183-184
Little Porcupine Creek below diversion, at Frazer.....400,415
Little Powder River above Dry Creek, near Weston, WY.....352-353
Little Rocky Creek above Forest Service boundary, near Nye.....402,418
Little Sandy Creek tributary near Virgelle..... 380
Little Wall Creek tributary near Flatwillow..... 382
Little Warm Creek at reservation boundary, near Zortman.....204-205
tributary near Lodge Pole..... 206
Livingston, Armstrong Creek near.....402,418
Shields River near.....271,418
Yellowstone River near.....267-270
Locate, Powder River near.....355-357
Locate Creek tributary near Locate..... 390
Lodge Creek below McRae Creek, at international boundary..... 165
Lodge Creek basin, Saskatchewan, reservoirs in.... 166
schematic diagram of..... 159
Lodge Grass, Owl Creek near.....308,422
Lodge Grass Creek above Willow Creek diversion, near Wyola.....310,422
at State line, near Wyola..... 309
Lodge Pole, Little Warm Creek tributary near.....206,414
Lodge Pole Creek at.....398,414
Spring Coulee near..... 399
Wild Horse Creek tributary near.....399,414
Logan, Gallatin River at.....86,406
Logger Creek near Gallatin Gateway..... 378
Lohman, Fort Belknap Canal near..... 397
Lone Man Coulee near Valier..... 380
Lonesome Lake Coulee near Big Sandy..... 396
Long Otter Creek near Lodge Grass..... 387
Lost Creek (tributary to Sixteenmile Creek) near Ringling..... 378
Lost Creek tributary (tributary to Big Muddy Creek) near Homestead..... 386
Lovell, WY, Shoshone River near.....292-293
Lower Two Medicine Lake near East Glacier.....370,374
Lush Coulee near Whitewater..... 384
Luther, Butcher Creek below the forks, near.....403,419
Lyons Creek at international boundary..... 177

McAllister, Ennis Lake near.....368,374
Madison River below Ennis Lake, near..... 81-83
Meadow Creek near..... 394
McBeath Residence near Clancy.....425-427
McDonald Spring Creek, Middle, near Pray..... 402
North, near Pray..... 417
South, near Pray.....402,417
McGuire Creek tributary near Van Norman..... 383
McKinnon Ditch near Consul, Saskatchewan..... 174
Madison River, above Hebgen Lake, near West Yellowstone.....394,405
at Kirby Ranch, near Cameron..... 79,405
at Three Forks..... 395
below Ennis Lake, near McAllister..... 81-83
below Hebgen Lake, near Grayling.....78,405
near West Yellowstone..... 73-77
West Fork, near Cameron..... 394
Madison River basin, crest-stage partial-record stations in..... 378
Madison River basin, gaging stations records in... 63-83
Malta, Milk River at..... 399
Mammoth, Gardner River near..... 417
Hot River at..... 402
Mammoth, Mammoth Hot Springs at..... 401
Many Glacier, Swiftcurrent Creek at..... 41
Maps of Montana..... 37-40
Marias River, near Chester.....115-117
near Shelby.....113,409
Marias River basin, crest-stage partial-record stations in..... 380
discharge measurements at miscellaneous sites in.....395-396
gaging-station records in.....109-118
Martinsdale Reservoir near Martinsdale.....372,374
Meadow Creek near McAllister..... 394
Mean concentration, definition of..... 33
Mean discharge, definition of..... 31
Measuring point (MP), definition of..... 31
Medicine Lake, Big Muddy Creek diversion canal near.....249,416
Melrose, Big Hole River near..... 56-59
Merryflat, Saskatchewan, Gaff Ditch near..... 168
Micrograms, per gram (µg/g), definition of..... 32
per liter (UG/L, µg/L), definition of..... 32
Microsiemens, per centimeter at 25°C (US/CM)..... 32
Middle Creek above Lodge Creek, near Govenlock, Saskatchewan..... 164
below Middle Creek Reservoir, near Govenlock, Saskatchewan..... 162
near Govenlock, Saskatchewan..... 163
near Saskatchewan boundary..... 161
Middle Creek Reservoir (Gallatin River basin) near Bozeman.....368,374
Middle Creek Reservoir (Lodge Creek Basin) near Battle Creek, Saskatchewan..... 166
Miles City, Tongue River at.....339-342
Yellowstone River at.....343,423
Milk River, Alberta, Milk River at..... 146
Verdigris Coulee near the mouth, near..... 147
Milk River, at eastern crossing of international boundary.....148-149
at Havre.....156,412
at Juneberg Bridge, near Saco.....200-202
at Malta..... 399
at Milk River, Alberta..... 146
at Nashua.....219-221
at western crossing of international boundary..141-142
near Dodson.....189,414
near Harlem.....180,413
near Vandalia.....217,415
North Fork, above St. Mary Canal, near Browning.....143,411
South Fork, near Babb.....140,410
tributary No. 3 near Glasgow..... 385
Milk River "A" Canal near Harlem..... 179
Milk River basin, crest-stage partial-record stations in.....383-385
discharge measurements at miscellaneous sites in.....396-400
gaging-station records in.....140-223
schematic diagram of..... 45
Mill Creek near Lewistown..... 380
Milligrams of carbon per area per unit time ($mg\ C/m^2$. time) for phytoplankton, definition of..... 33
Milligrams per liter (MG/L, mg/L), definition of.. 32
Mills Creek near Rapelje..... 387
Miscellaneous sites, discharge measurement at....393-403
water-quality records at.....404-424
Missouri River, at Fort Benton.....106-108
at Toston..... 87-90
at Virgelle.....119,409
below Canyon Ferry Dam, near Helena..... 92-93
below Fort Peck Dam.....137-139
below Holter Dam, near Wolf Creek.....96,407
near Culbertson.....255-257
near Great Falls.....105,407
near Landusky.....120-124
near Ulm..... 98,407
near Wolf Point.....225,416
tributary No. 5 at Culbertson..... 386
tributary No. 6 near Wolf Point..... 385
Missouri River basin, crest-stage partial-record stations in.....377-392
discharge at partial-record stations and miscellaneous sites.....377-424
gaging-station records in..... 50-257
measurements at miscellaneous sites.....404-424
Mitchell Gulch near East Helena..... 379
Mizpah Creek near Mizpah.....354,423
Monida, Lima Reservoir near.....367,374
Red Rock River below Lima reservoir near..... 50,404
Moorhead, Powder River at.....344-348
Mosby, Musselshell River at.....130-134

Page

Muddy Creek (tributary to Sun River), at Vaughn..101,407
near Vaughn.....100,407
Murphy Coulee tributary near Hogeland..... 384
Musselshell River, at Harlowton.....125,410
at Mosby.....130-134
at Musselshell.....129,410
near Roundup.....128,410
near Shawmut.....126,410
Musselshell River basin, crest-stage partial-record stations in.....381-382
gaging station records in.....125-134
Mystic Lake near Roscoe.....373,374

Nashlyn Canal near Consul, Saskatchewan..... 175
Nashua, Milk River at.....219-221
Porcupine Creek at.....222-223
NASQAN (National stream-quality accounting network), definition of..... 32
National Geodetic Vertical Datum of 1929 (NGVD), definition of..... 32
National Stream-Quality Accounting Network (NASQAN), definition of..... 21,32
National Trends Network..... 21,32
Nelson Reservoir near Saco.....373,374
Nelson South Canal near Saco..... 399
Newton Lake near Val Marie, Saskatchewan..... 199
Newton Lake Main Canal, near Val Marie, Saskatchewan..... 196
NGVD (National Geodetic Vertical Datum of 1929), definition of..... 32
Nilan Reservoir near Augusta.....370,374
Ninemile Coulee near Fort Benton..... 379
Non-ideal colony count, definition of..... 30
Norris, Cherry Creek near..... 394
Hot Springs Creek near..... 394
North Milk River near international boundary.....144-145
North Sunday Creek tributary No. 2 near Angela.... 389
Northern Montana Agricultural Research Center near Havre.....428-430
Numbering system for wells and miscellaneous sites..... 22
Nye, East Fishtail Creek at mouth, near.....403,419
Little Rocky Creek above Forest Service boundary, near.....402,418
Stillwater River above Nye Creek, near.....273,418
West Fishtail Creek, at mouth, near.....402,419

O'Fallon Creek near Ismay.....358,424
On-site measurement and sample collection..... 27
Opheim, South Creek tributary near.....212,414
South Creek tributary No.2 near.....213,415
Organism, definition of..... 32
Organisim count/area, definition of..... 32
Organisim count/volume, definition of..... 32
Total organisim count, definition of..... 32
Oswego, Flynn Creek near.....400,416
Oswego Creek at.....400,415
Oswego Creek at Oswego.....400,415
Other records available..... 25
Owl Creek near Lodge Grass.....308,422
Oxarat, Saskatchewan, Cypress Lake west inflow canal drain, near..... 170

Paradise Valley Canal near Chinook..... 398
Parameter code, definition of..... 32
Parkman, WY, Elkhorn Creek above Fuller Ranch ditch, near..... 299
Little Bighorn River, West Fork, near..... 300
Red Canyon Creek near..... 302
Twin Creek near..... 305
West Pass Creek near..... 303
Partial-record station, definition of..... 32
Partial-record stations.....377-403
annual maximum discharge at.....377-392
Particle size, definition of..... 32
Particle-size classification, definition of..... 32
Pass Creek near Wyola.....306,422
Pennel Creek near Baker..... 390
Peoples Creek, near Cleveland.....398,413
near Dodson.....186-187
near Hays.....182,414
tributary near Lloyd..... 384
Percent composition, definition of..... 32
Pesticides, definition of..... 32
pH, definition of..... 33
Picocurie, definition of..... 33
Pishkun Reservoir near Augusta.....370,374
Police Creek below Cottonwood Creek, near Scobey.. 401
Poplar, Box Elder Creek at.....401,416
Poplar River near.....242,416
Poplar, Tule Creek near.....400,416

Page

Poplar River, above West Fork, near Bredette.....239,400
at international boundary.....227-230
near Bredette..... 401
near Poplar.....242,416
East Fork, near Scobey.....236-238,400
West Fork, near Bredette.....240-241,401
Poplar River basin, crest-stage partial-record station in..... 386
discharge measurement at miscellaneous sites in in.....400-401
gaging-station records in.....227-242
Porcupine Creek at Nashua.....222-223
Middle Fork, near Baylor.....400,415
West Fork, near Baylor.....400,415
Powder River, at Broadus.....349-351
at Moorhead.....344-348
near Locate.....355-357
Powell Coulee near Browning..... 380
Pray, McDonald Spring Creek, Middle, near..... 402
McDonald Spring Creek, North, near..... 417
McDonald Spring Creek, South, near.....402,417
Precipitation and temperature..... 3
Prickly Pear Creek near Clancy.....94,406
Prickly Pear Creek basin, gaging station records in..... 94-95
Primary productivity, definition of..... 33
Pryor Creek, at Pryor.....287,421
near Huntley.....288,421
Publications..... 26,29
Publications on techniques of water-resources investigations..... 35

Quality of streamflow..... 10-13
Quartz Hill Gulch near Wise River..... 378

Radersburg, Crow Creek near..... 395
Radiochemical program, definition of..... 21,33
Records, explanation of..... 21
ground-water levels..... 29
data collection and computation..... 29
publications..... 29
stage and water discharge..... 22-26
accuracy of the records..... 25
data collection and computation..... 23
data presentation..... 23-25
identifying estimated daily discharge..... 25
other records available..... 25
publications..... 26
surface-water quality..... 26-29
arrangement or records..... 26
classification of records..... 26
data presentation..... 28
laboratory measurements..... 27
on-site measurements and sample collection.... 27
publications..... 29
remarks codes..... 29
sediment..... 27
water temperature..... 27
Recoverable from bottom material, definition of... 33
Red Canyon Creek near Parkman, WY..... 302
Red Lodge, Rock Creek near.....279,420
Red Lodge Creek, above Cooney Reservoir, near Boyd.....280,420
below Cooney Reservoir, near Boyd.....282,420
Red Rock River, below Lima Reservoir, near Monida.50,404
Redwater River at Circle.....226,416
Redwater River basin, crest-stage partial-record stations in.....385-386
gaging station records in..... 226
Remark codes..... 29
Reservation Creek near Miles City..... 388
Reserve, Wolf Creek near.....401,417
Reservoirs, See Lakes and Reservoirs.....
Return period, definition of..... 33
Richardson Ditch near Consul, Saskatchewan..... 173
Rimini, Tenmile Creek near.....95,406
Roberts, Clear Creek at mouth, near..... 420
Roberts Creek, East Fork, tributary near Judith Gap..... 381
Rock Creek (tributary to Clarks Fork Yellowstone River) at Rockvale.....283,421
near Red Lodge.....279,420
Rock Creek (tributary to Milk River) below Horse Creek near international boundary.....209-211
below McEachern Creek, near international boundary.....215,415
Rockvale, Rock Creek at.....283,421
Rocky Boy, Beaver Creek at reservation boundary, near..... 412
Big Sandy Creek at reservation boundary, near..150,396
boundary, near.....150,396,411
Boxelder Creek near.....151,411

Page

Rocky Creek near Bozeman..... 378
Roscoe, Mystic Lake near.....373,374
West Rosebud Creek at Pine Grove campground, near..... 418
West Rosebud Creek near.....274,402,418
Rosebud, Rosebud Creek at mouth near.....320-322
Rosebud Creek (tributary to Yellowstone River) at mouth, near Rosebud.....320-322
at reservation boundary, near Kirby.....318,423
near Colstrip.....319,423
near Kirby..... 388
Roundup, Musselshell River near.....128,410
Ruby River, above reservoir, near Alder..... 54,404
below reservoir, near Alder..... 55,404
near Twin Bridges..... 393
Reservoir near Alder.....367,374
Ruby River basin, crest-stage partial-record stations in..... 377
gaging-station records in..... 54-55,404
Runoff in inches (IN., in.), definition of..... 33
Russian Coulee near Jordan..... 383

Saco, Beaver Creek, below Guston Coulee, near....208,414
Milk River at Juneberg Bridge, near.....200-202
Nelson Reservoir near.....373-374
Nelson South Canal near..... 399
Sage Creek (tributary to Big Sandy Creek) near Box Elder..... 396
near Whitlash.....152,412
tributary No. 2 near Joplin..... 384
Sage Creek (tributary to Shoshone River) at Forest Service boundary near Warren.....403,421
St. Mary Canal, at St. Mary Crossing, near Babb... 46
St. Mary River, at international boundary..... 47-49
near Babb..... 44
St. Mary and upper Milk River basins, schematic diagram of..... 45
St. Xavier, Bighorn Lake near..... 295
Bighorn River near.....296,421
Sand Creek near Dagmar.....252,417
Santa Rita, Big Rock Coulee near.....395,409
SAR, definition of..... 33
Sarpy Creek, tributary near Colstrip..... 388
Saskatchewan River basin, gaging-stations records in..... 41-49
reservoir in..... 42
Savage, Burns Creek near.....359-361
Scobey, East Fork Poplar River near.....236-238,400
Police Creek below Cottonwood Creek, near..... 401
Second Creek tributary No. 2 near Jordan..... 383
Sediment..... 27
definition of..... 33
mean concentration, definition of..... 33
suspended sediment, definition of..... 33
suspended-sediment concentration, definition of. 33
suspended-sediment discharge, definition of..... 33
suspended sediment load, definition of..... 33
Shawmut, Deadman's Basin Reservoir near.....372,374
Musselshell River near..... 126
Sheep Creek near Neihart..... 379
Shelby, Marias River near.....113,409
Sherburne, Lake Sherburne at..... 41
Swiftcurrent Creek at.....41,404
Shields River, near Livingston.....271,418
Short Creek near Forsyth..... 388
Shoshone River near Kane, WY..... 294
near Lovell, WY.....292-293
Sidney, Yellowstone River near.....362-366
Silesia, Clarks Fork Yellowstone River near.....278,420
Sixmile Creek tributary near Epsie..... 389
Sixteenmile Creek near Toston..... 395
Smith River near Fort Logan.....97,407
Reservoir near White Sulphur Springs.....369,374
Smith River basin, crest-stage partial-record stations in..... 379
gaging-station records in..... 97
Smoke Creek near Flaxville.....401,417
Snake Creek near Harlem.....398,413
Snell Creek near Hathaway..... 388
Snow Coulee at Opheim..... 385
Soda Creek tributary near Webster..... 392
Sodium-adsorption-ratio (SAR), definition of..... 33
Solute, definition of..... 33
South Creek, tributary near Opheim.....212,415
tributary No. 2, near Opheim.....213,415
tributary No. 3, near international boundary.... 214
Spangler Ditch near Govenlock, Saskatchewan..... 160
Special networks and programs..... 21
Specific conductance, definition of..... 33
Spring Coulee (tributary to Big Sandy Creek), South Fork, near Havre..... 384
tributary near Simpson..... 384

Page

Spring Coulee (tributary to Big Warm Creek), near Lodge Pole..... 399
Spring Creek (tributary to Box Elder Creek) near Plentywood..... 386
Spring Creek (tributary to Cut Bank Creek), near Cut Bank.....396,409
Spring Creek (tributary to Fish Creek) tributary near Harlowton..... 381
Spring Creek (tributary to Little Dry Creek) tributary near Van Norman..... 383
Spring Creek (tributary to Tongue River) near Decker..... 388
Spring Creek tributary (tributary to Cabin Creek) near Fallon..... 391
Stage and water-discharge records, explanation of..... 22-26
Stage-discharge relation, definition of..... 33
Starbuck Coulee near international boundary.....216,415
Station identification numbers..... 21
Station records, surface water and water quality.. 41
Stebbins Creek at mouth, near Ashland..... 389
Stillwater River, above Nye Creek, near Nye.....273,418
near Absarokee.....275,419
Streamflow, definition of..... 33
Streamflow, hydrologic conditions of..... 4-10
quality of..... 10-13
Sullivan Creek (tributary to Redwater River), West Fork, near Richey..... 386
Summary of hydrologic conditions--water year 1986..... 3-20
Sun River near Vaughn.....102-104
Sun River basin, gaging station records in.....100-104
schematic diagram of..... 99
Surface area, definition of..... 33
Surface-water quality records, explanation of..... 26-29
Surficial bed material, definition of..... 33
Suspended, definition of..... 34
Suspended, total, definition of..... 34
determination of..... 34
Suspended, recoverable, definition of..... 34
determination of..... 34
Suspended sediment, definition of..... 33
Suspended-sediment concentration, definition of... 33
Suspended-sediment discharge, definition of..... 33
Suspended-sediment load, definition of..... 33
Sweetwater Creek near Alder..... 377
Swift Reservoir near Dupuyer.....371,374
Swiftcurrent Creek, at Many Glacier..... 41
at Sherburne.....43,404
Swimming Woman Creek tributary near Living Springs..... 381

Taffy Creek tributary near Winifred..... 381
Tenmile Creek near Rimini.....95,406
Terms, definition of..... 30
Terry Coulee near Van Norman..... 383
Teton River near Dutton.....118,409
Thermograph, definition of..... 34
Thirteenmile Creek tributary near Bloomfield..... 391
Thompson Creek tributary near Cohagen..... 383
Three Forks, Jefferson River near.....62,405
Madison River at..... 395
Threemile Creek near Harlem..... 398
Timber Creek tributary near Van Norman (see Terry Coulee)..... 383
Timber Fork Creek tributary near Lindsay..... 391
Time-weighted average, definition of..... 34
Tongue River, at Birney Day School Bridge, near Birney.....336-338
at Miles City.....339-342
at State line near Decker.....323-325
at Tongue River Dam, near Decker.....326-329
Tongue River Reservoir near Decker.....373,374
Tons per acre-foot, definition of..... 34
Tons per day, definition of..... 34
Toston, Missouri River at..... 87-90
Sixteenmile Creek near..... 395
Total, definition of..... 34
Total, recoverable, definition of..... 34
Total, suspended, definition of..... 34
Total coliform bacteria, definition of..... 30
Total discharge, definition of..... 34
Total in bottom material, definition of..... 34
Total load, definition of..... 34
Tower Junction, Yellowstone River at.....260,417
Tree Creek near Kinsey..... 390
Trotters, ND, Beaver Creek near..... 376
Tule Creek near Poplar.....400,416
Tule Creek tributary near Wolf Point..... 385
Turbidity, definition of..... 34
Twelvemile Creek near Shepherd..... 387
Twin Bridges, Beaverhead River near.....53,404

Page

Twin Bridges, Big Hole River near..... 393
  Ruby River near..... 393
Twin Creek near Parkman, WY..... 305
Two Medicine Canal near Browning..... 408
Two Medicine River below South Fork, near
    Browning.....109,408
  near Cut Bank.....395,408

Ulm, Missouri River near.....98,407
Unger Creek near Vandalia..... 385

Val Marie, Frenchman River below Newton
    Lake, near..... 197
  Huff Lake near..... 199
  Huff Lake gravity canal near..... 194
  Huff Lake pumping canal near..... 194
  Newton Lake near..... 199
  Newton Lake Main Canal near..... 196
Valier, Lake Frances near.....371,374
Van Cleeve Coulee tributary near Sunburst..... 383
Van Norman, Big Dry Creek near.....135,410
Vandalia, Milk River near.....217,415
  South Canal near..... 400
  Vandalia South Canal near..... 400
Vaughn, Muddy Creek at.....101,407
  Muddy Creek near.....101,407
  Sun River near.....102-104
Verdigris Coulee near the mouth, near Milk River,
    Alberta..... 147
Vida, Cow Creek tributary near..... 386
Vidora, Saskatchewan, Belanger Creek diversion
    canal near..... 190
  Cypress Lake east outflow canal near..... 191
Vidora Ditch near Consul, Saskatchewan 172
Virgelle, Missouri River at.....119,409

Warren, Sage Creek at Forest Service boundary,
    near.....403,421
Water-supply papers, definition of..... 34
Water temperature..... 27
Water year, definition of..... 34
WDR (Water data report), definition of..... 34
Wegner Creek at Craig..... 379
Weighted average, definition of..... 34
West Fishtail Creek, at mouth, near Nye.....402,419
West Pass Creek near Parkman, WY..... 303
West Plains, Saskatchewan, Cypress Lake
    west inflow canal near..... 169
  Cypress Lake west outflow canal near..... 171
West Rosebud Creek, at Pine Grove Campground,
    near Roscoe.....402,418
  below Ingersoll Creek, near Fishtail.....402,419
  near Roscoe..... 274,418
West Wets Creek near Billings..... 387
West Yellowstone, Firehole River near..... 63-67
  Gibbon River near..... 68-72
  Hebgen Lake near.....367,374
  Madison River above Hebgen Lake, near.....394,405
  Madison River near..... 73-77
Weston, WY, Little Powder River above Dry Creek,
    near.....352-353
White Bear Creek below Fifteenmile Creek,
    near Dodson.....398,413
White Sulphur Springs, Smith River Reservoir
    near.....369,374
Whitehall, Big Pipestone Creek at..... 393
Whitlash, Sage Creek near.....152,412
Wild Horse Creek near Lodge Pole..... 399
  tributary near Lodge Pole..... 399
Willow Coulee near Dodson.....185,414
Willow Creek (tributary to Jefferson River)
    near Harrison.....61,405
Willow Creek near Willow Creek..... 394

Page

Willow Creek (tributary to Milk River) near
    Glasgow.....218,415
  tributary near Fort Peck..... 385
Willow Creek (tributary to Red Lodge Creek)
    near Boyd.....281,420
Willow Creek Reservoir (Sun River basin)
    near Augusta.....370,374
Willow Creek Reservoir (Willow Creek basin)
    near Harrison.....367,374
Wise River, Big Hole River below Jerry Creek,
    near..... 393
Wolf Creek, Holter Lake near.....369,374
  Missouri River below Holter Dam, near.....96,407
Wolf Creek (Big Muddy Creek basin)
    near Reserve.....401,417
Wolf Creek (Judith River basin) tributary near
    Coffee Creek (town of)..... 381
Wolf Creek (Little Missouri River basin) near
    Hammond..... 175
Wolf Creek (Redwater River basin) tributary
    near Vida..... 386
Wolf Creek (Wolf Creek basin), East Fork,
    near Lustre..... 385
Wolf Creek (tributary to Missouri River)
    near Wolf Point.....224,416
Wolf Creek basin, crest-stage partial-record
    stations in..... 385
Wolf Point, Missouri River near.....225-416
  Wolf Creek near.....224,416
WSP, definition of..... 34
Wyola, Little Bighorn River at State line
    near.....301,412
  Little Bighorn River below Pass Creek, near....307,422
  Lodge Grass Creek above Willow Creek
      diversion, near.....310,422
    at State line, near..... 309
  Pass Creek near.....306,422

Yellowstone Lake at Bridge Bay, Yellowstone
    National Park..... 258
Yellowstone National Park:
  Firehole River near West Yellowstone..... 63-67
  Gardner River near Mammoth..... 263
  Gibbon River near West Yellowstone..... 68-72
  Lamar River near Tower Falls Ranger station....261-262
  Yellowstone Lake at Bridge Bay..... 258
  Yellowstone River, at Tower Junction.....260,417
    at Yellowstone Lake outlet.....259,417
Yellowstone River, at Billings.....284-286
  at Corwin Springs.....264-266
    schematic diagram of..... 12
  at Forsyth.....317,423
  at Miles City.....343,423
  at Tower Junction.....260,417
  at Yellowstone Lake Outlet, Yellowstone
      National Park.....259,417
  near Livingston.....267-270
    schematic diagram of..... 12
  near Sidney.....362-366
  tributary No. 5 near Marsh..... 391
  tributary No. 6 near Glendive..... 391
Yellowstone River basin, crest-stage partial-
    record stations in.....387-392
  discharge measurements at miscellaneous
      sites in.....401-403
  gaging station records in.....258-366

Zortman, Beaver Creek near.....203,414
  Big Warm Creek near.....207,414
  Little Warm Creek at reservation boundary,
      near.....204-205
Zurich, Harlem Canal near..... 398

October 1, 1978

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
	Length	
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)
	Area	
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)
	Volume	
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)
	Flow	
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)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

POSTAGE AND FE
USGS LIBRARY - RESTON
3 1818 00453131 3
U.S.MAIL

U.S. DEPARTMENT OF THE INTERIOR
Geological Survey
Federal Office Building, Drawer 10076
Helena, MT 59626

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

SPECIAL 4TH CLASS BOOK RATE