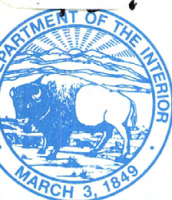
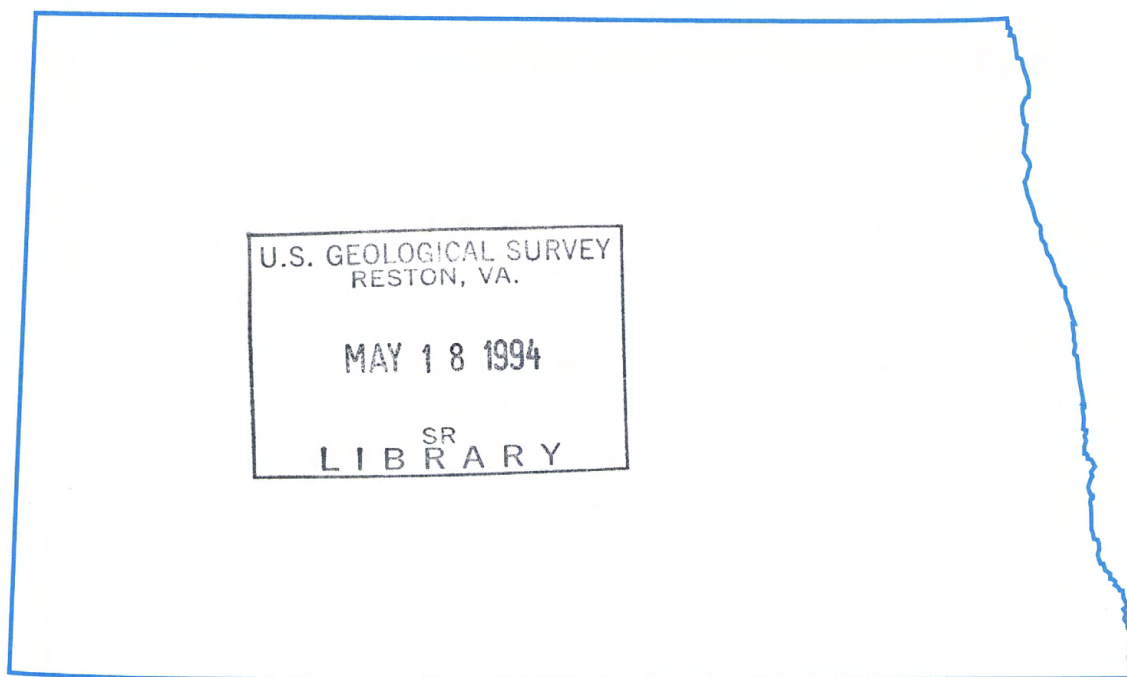


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Water Resources Data North Dakota Water Year 1993



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-93-1
Prepared in cooperation with the State of North Dakota
and with other agencies

CALENDAR FOR WATER YEAR 1993

1992

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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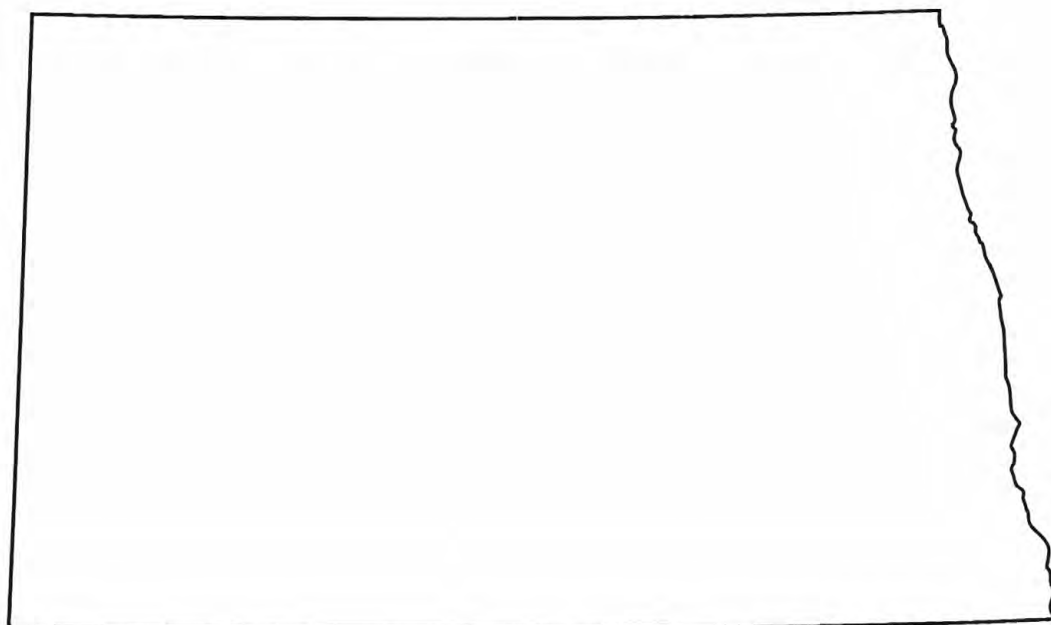
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31																				
APRIL							MAY							JUNE						
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4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
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Water Resources Data North Dakota Water Year 1993

by R.E. Harkness, N.D. Haffield, W.R. Berkas, and S.W. Norbeck



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-93-1
Prepared in cooperation with the State of North Dakota
and with other agencies

DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, SECRETARY

U.S. GEOLOGICAL SURVEY

Gordon P. Eaton, Director

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District Chief, Water Resources Division
U.S. Geological Survey
821 East Interstate Avenue
Bismarck, North Dakota 58501-1199

PREFACE

This volume of the annual hydrologic data report of North Dakota is one of a series of annual reports that documents hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

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

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This report was prepared in cooperation with the State of North Dakota and with other agencies under the supervision of William F. Horak, District Chief, North Dakota.

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16. Abstract (Limit: 200 words) Water-resources data for the 1993 water year for North Dakota consist of records of discharge, stage, and water quality for streams; contents, stage, and water quality for lakes and reservoirs; and water levels and water quality for ground-water wells. This report contains records of water discharge for 108 streamflow-gaging stations; stage only for 20 river-stage stations; contents and/or stage for 15 lake or reservoir stations; annual maximum discharge for 8 crest-stage stations; water levels for 30 ground-water wells and water quality for 102 streamflow-gaging stations, 1 river-stage station, 17 lake or reservoir stations, 6 crest-stage stations, 34 ground-water wells, and several miscellaneous sample sites on streams and lakes. Also included are water-quality data for 2 precipitation-chemistry stations. 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 North Dakota.				
17. Document Analysis. a. Descriptors *North Dakota, *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, Floods, Drought. b. Identifiers/Open-Ended Terms c. COSATI Field/Group				
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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

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[Letter after station name designates type of data: (d) discharge, (e) elevation, gage height, or contents, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment, (r) radiochemical, (p) pesticides]

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RED RIVER OF THE NORTH BASIN		
Red River of the North at Wahpeton (dc)	05051500	44
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Well 471601097371001, Local number 144-055-26BBB.....	429
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Well 461130102122601,	Local number 131-092-05DDD.....	438
Well 460908102282702,	Local number 131-094-20CBC2.....	438
BOWMAN COUNTY		
Well 460705103041101,	Local number 130-099-04BAA.....	438
Well 460856103024401,	Local number 131-099-22DCC1.....	438
DUNN COUNTY		
Well 471514102390401,	Local number 144-095-36AAA.....	438
EMMONS COUNTY		
Well 460144100070202,	Local number 130-075-31DCC2.....	438
Well 460658100340201,	Local number 130-079-04AAA.....	438
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Well 461306100200801,	Local number 132-077-29DDD.....	438
Well 462539100061101,	Local number 134-075-15BBB.....	438
Well 463608100034601,	Local number 136-075-14AAA.....	438
Well 463429100233702,	Local number 136-077-29BBB2.....	438
Well 463748100323001,	Local number 136-078-06BCB.....	438
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DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in North Dakota have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Those stations with an asterisk (*) after the station number are currently operated as crest-stage partial-record stations. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[Letters after station name designate type of data collected: (d) discharge, (e) elevation (stage only)]

Discontinued surface-water discharge or stage-only stations

Station name	Station number	Drainage area (mi ²)	Period of record
RED RIVER OF THE NORTH BASIN			
Bois de Sioux River near Fairmount, ND (d)	05050500	1,540	1919-44
Wild Rice River near Cayuga, ND (d)	05051700	955	1956-79
Wild Rice River near Mantador, ND (d)	05052000	1,540	1944-50
Richland County Drain No. 65 near Great Bend, ND (d)	05052100	38	1981-84
Antelope Creek at Dwight, ND (d)	05052500	294	1944-49
Sheyenne River near Harvey, ND (d)	05055000	534	1946-56
North Fork Sheyenne River near Wellsburg, ND (d)	05055100	693	1957-67
Big Coulee near Maddock, ND (d)	05055200	146	1957-67
Sheyenne River at Sheyenne, ND (d)	05055500	1,790	1929-33, 1940-51
Big Coulee near Fort Totten, ND (d)	05055520	23.2	1966-75
Webster Coulee at Webster, ND (d)	05056225	670	1980-85
Calio Coulee near Starkweather, ND (d)	05056247	130	1986-88
Lake Alice-Irvine Channel near Churchs Ferry, ND (d)	05056255	999	1985-87
Little Coulee at Leeds, ND (d)	05056300	280	1956-67
Maple River near Mapleton, ND (d)	05060000	1,450	1944-75
Cass County Drain 52 near Amenia, ND (d)	05060510	13.5	1981-85
Rush River near Prosper, ND (d)	05060550	170	1981-85
Lower Branch Rush River near Prosper, ND (d)	05060570	35.8	1981-85
Elm River near Kelso, ND (d)	05062200	199	1956-63, 1981-85
Beaver Creek near Hatton, ND (d)	05065000	162	1954-57
Goose River near Portland, ND (d)	05065500	517	1940-75
South Branch Goose River near Portland, ND (d)	05066000	362.0	1940-42
Turtle River at Manvel, ND (d)	05083000	613	1946-70 (d), 1980-82 (gh)
Red River of the North at Oslo, MN (d)	05083500*	31,200	1936-37, 1941-43, 1945-60
Forest River near Minto, ND (d)	05084500	578	1932-44
South Branch Park River near Park River, ND (d)	05088000	214	1940-50
Middle Branch Park River near Union, ND (d)	05089100	15.3	1966-83
Cart Creek at Mountain, ND (d)	05089500	16.9	1954-84
Pembina County Drain No. 20 near Glasston, ND (d)	05092200	80	1972-82
Cypress Creek near Sarles, ND (d)	05098800	71	1961-88
Little South Pembina River near Walhalla, ND (d)	05099400	182	1956-82
Pembina River at Walhalla, ND (d)	05099600	3,350	1940-90
Herzog Creek near Concrete, ND (d)	05100500	18.9	1954-77
Tongue River at Cavalier, ND (d)	05101500	167	1939-52
Tongue River near Pembina, ND (d)	05102000	460	1940-42
Long Creek near Crosby, ND (d)	05113500	2,080	1943-65

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS--Continued

Station name	Station number	Drainage area (mi ²)	Period of record
RED RIVER OF THE NORTH BASIN--Continued			
West Branch Short Creek near Columbus, ND (d)	05113700	167	1978-81
Wintering River near Bergan, ND (d)	05120200	176	1957-78
Souris River near Towner, ND (d)	05121500	13,100	1933-41
Willow Creek at Dunseith, ND (d)	05122500	142	1953-70
Oak Creek at Lake Metigoshe Outlet near Bottineau, ND (d)	05123100	59	1954-81
Egg Creek near Granville, ND (d)	05123600	289	1957-81
Cut Bank Creek at North Lake Outlet near Granville, ND (d)	05123700	534	1957-80
Cut Bank Creek at Upham, ND (d)	05123750	722	1975-80, 1987-91
MISSOURI RIVER BASIN			
Charbonneau Creek near Charboneau, ND (d)	06329597	149	1967-81
Missouri River Stage Gage No. 8 near Trenton, ND (e)	06329680	164,000	1959-79 (gh)
Blacktail Creek near Bonetrail, ND (d)	06330500	30	1956-60
Little Muddy Creek near Williston, ND (d)	06331500	1,010	1904-09, 1932-33, 1946-54
Stony Creek near Williston, ND (d)	06331570	146	1978-81
Missouri River Stage Gage No. 10 near Williston, ND (e)	06331600	165,000	1959-75 (gh)
Missouri River Stage Gage No. 11 near Williston, ND (e)	06331650	165,000	1959-80 (gh)
Tobacco Garden Creek near Watford City, ND (d)	06331680	135	1977-82
Beaver Creek near Ray, ND (d)	06331850	102	1978-82
White Earth River at White Earth, ND (d)	06332000	780	1954-81
Missouri River at Sanish, ND (d)	06332500	166,000	1928-32
Shell Creek near Parshall, ND (d)	06332520	465	1965-81
Little Beaver Creek near Marmarth, ND (d)	06335000	587	1938-79
Deep Creek near Amidon, ND (d)	06335750	250	1978-83
Little Missouri River at Medora, ND (d)	06336000	6,190	1903-09, 1922-24, 1928-34, 1946-50
Missouri River near Elbowwoods, ND (d)	06337500	179,800	1940-54
Missouri River below Garrison Dam, ND (d)	06339000	181,400	1948-69 1970-76 (gh)
Stray Creek near Manning, ND (d)	06339180	30.3	1979-81
Knife River at Marshall, ND (d)	06339300	722	1971-81
Elm Creek near Golden Valley, ND (d)	06339490	82	1967-81
Coyote Creek near Zap, ND (d)	06339550	65.2	1978-83
Spring Creek below Lake Ilo at Dunn Center, ND (d)	06339800	116	1978-81
Spring Creek near Halliday, ND (d)	06339900	260	1978-81
West Branch Otter Creek near Beulah, ND (d)	06340200	26.5	1965-82
Antelope Creek above Hazen, ND (d)	06340520	47.2	1978-86
West Branch Antelope Creek No. 5 near Zap, ND (d)	06340524	4.37	1978-82
West Branch Antelope Creek No. 4 near Zap, ND (d)	06340528	8.46	1977-86
West Branch Antelope Creek No. 2 near Beulah, ND (d)	06340536	28.3	1977-80
West Branch Antelope Creek near Hazen, ND (d)	06340540	37.7	1978-83
Coal Creek near Stanton, ND (d)	06340580	15.8	1978-81

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS--Continued

Station name	Station number	Drainage area (mi ²)	Period of record
MISSOURI RIVER BASIN--Continued			
Alderin Creek near Fort Clark, ND (d)	06340780	21.9	1978-83
Missouri River Tributary No. 2 near Hensler, ND (d)	06340890	9.80	1979-81
Coal Lake Coulee near Hensler, ND (d)	06340905	70.5	1978-89
Buffalo Creek near Washburn, ND (d)	06340930	57.3	1979-83
Turtle Creek near Turtle Lake, ND (d)	06341400	310	1957-76
Square Butte Creek near Hannover, ND (d)	06342040	16.9	1978-81
Square Butte Creek Tributary No. 2 near Center, ND (d)	06342100	13	1965-76
Square Butte Creek Creek above Nelson Lake near Center, ND (d)	06342200	75.8	1978-82
Hagel Creek near Center, ND (d)	06342230	45.6	1978-82
Norwegian Creek near Belfield, ND (d)	06342850	39.8	1979-81
South Branch Heart River near South Heart, ND (d)	06342900	132	1979-83
North Creek near South Heart, ND (d)	06342970	40.8	1979-81
Heart River near South Heart, ND (d)	06343000	311	1946-70, 1978-84
Heart River below Dickinson Dam near Dickinson, ND (d)	06344000	404	1952-72
Heart River at Lehigh, ND (d)	06344500	443	1943-52
Green River Tributary near New Hradec, ND (d)	06344610	22.4	1979-81
Green River near Gladstone, ND (d)	06345000	356	1946-75
Heart River below Heart Butte Dam near Glen Ullin, ND (d)	06346500	1,710	1943-72
Antelope Creek near Carson, ND (d)	06347000	221	1948-75
Wilson Creek near Glen Ullin, ND (d)	06347100	41.4	1965-70
Sweetbriar Creek near Judson, ND (d)	06348500	157	1951-79
Cannonball River at New England, ND (d)	06349900	285	1979-81
Coal Bank Creek near Havelock, ND (d)	06349930	70	1974-83
Cannonball River below Bentley, ND (d)	06351000	1,140	1943-81
Cannonball River near Heil, ND (d)	06351500	1,340	1951-53
Cedar Creek near North Lemmon, ND (d)	06352300	901	1959-63
Cannonball River near New Leipzig, ND (d)	---	1,180	1943-50
Timber Creek near Bentley, ND (d)	06352400	100	1978-81
Cedar Creek near Pretty Rock, ND (d)	06352500	1,340	1943-76
Hay Creek near Morristown, SD (d)	06352525	86	1991-92
Cannonball River near Timmer, ND (d)	06353500	3,670	1903-09, 1911-18, 1922, 1924, 1928-35
Beaver Creek at Linton, ND (d)	06354500	717	1949-89
Buffalo Creek Tributary near Gascoyne, ND (d)	06355310	15.7	1975-87
Big Slough at Hamberg, ND (d)	06467900	60	1957-68, 1970-75
James River at New Rockford, ND (d)	06468000	714	1950-69
Juanita Lake Tributary near Grace City, ND (d)	06468190	94	1986-89
Kelly Creek below Niccum Reservoir near Bordulac, ND (d)	06468300	188	1986-89
James River near Pingree, ND (d)	06468500	1,670	1953-68
Pipestem Creek near Buchanan, ND (d)	06469500	758	1950-74
Pilot Drain at Oakes, ND (d)	06470833	5.10	1972-82

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following stations were discontinued as continuous-record surface-water quality stations prior to the current water year. Daily records of temperature, specific conductance or sediment were collected and published for the record shown for each station.

Discontinued continuous-record surface-water-quality stations

Station name	Station number	Drainage area (mi ²)	Type of record	Period of record (water years)
Wild Rice River near Cayuga, ND	05051700	955	Temp.	1958
Wild Rice River near Abercrombie, ND	05053000	2,080	Temp. S.C.	1967-81 1968-81
Red River of the North at Fargo, ND	05054000	6,800	Temp. S.C.	1947-49, 1956-73 1965-73
Red River of the North below Fargo, ND	05054020	6,820	Temp., S.C.	1973-82
Sheyenne River above Harvey, ND	05054500	424	Temp.	1954
Sheyenne River near Warwick, ND	05056000	2,070	Temp. S.C.	1951-53, 1955-62, 1964-80 1952-60, 1964-80
Big Coulee near Churchs Ferry, ND	05056400	2,510	Temp., S.C.	1983-89
Channel A near Penn, ND	05056410	---	Temp. S.C.	1983-89, 91 1983-89
Sheyenne River near Cooperstown, ND	05057000	6,470	Temp. S.C.	1967-81 1968-81
Sheyenne River at Lisbon, ND	05058700	8,190	Temp. S.C. Sed.	1956-81 1964-80 1976-79
Sheyenne River near Kindred, ND	05059000	8,800	Temp. S.C. Sed.	1971-81 1976-81 1976-80
Sheyenne River near Horace, ND	05059400	8,800	Temp., S.C.	1976-80
Red River of the North at Grand Forks, ND	05082500	30,100	Temp.	1957-73
Red River of the North at Oslo, MN	05083500	31,200	Temp., S.C.	1974-78
Red River of the North at Drayton, ND	05092000	34,800	Temp.	1957-61, 1965-75
Pembina River at Walhalla, ND	05099600	3,350	Temp. S.C. Sed.	1962-81 1965-81 1962-76
Souris River near Sherwood, ND	05114000	8,940	Sed.	1975-81
Souris River near Foxholm, ND	05116000	9,470	Temp., S.C.	1973-81
Souris River near Verendrye, ND	05120000	11,300	Temp., S.C.	1973-83
Deep River Below Cut Bank Creek near Upham, ND	05123760	1,722	Temp. S.C. Sed.	1974-81, 1989 1974-81 1989
Souris River near Westhope, ND	05124000	16,900	Temp. S.C. Sed.	1955, 1957-64, 1967-68, 1974-81, 1989 1957-64, 1967-68, 1974-81 1956-59, 1989
Missouri River near Williston, ND	06330000	164,500	Temp. S.C.	1952-65 1952-60, 1965
Bear Den Creek near Mandaree, ND	06332515	74	Temp. S.C.	1969-71, 1989-91 1969-71
Little Missouri River at Marmarth, ND	06335500	4,640	Temp., Sed.	1952-54
Little Missouri River at Medora, ND	06336000	6,190	Temp. Sed.	1947-49 1946-51
Little Missouri River near Watford City, ND	06337000	8,310	Temp., S.C. Sed.	1972-81 1947-48, 1972-76
Missouri River Below Garrison Dam, ND	06339000	181,400	Temp.	1952-71
Knife River near Golden Valley, ND	06339500	1,230	Temp. Sed.	1964-65 1946-49, 1964-65
Knife River at Hazen, ND	06340500	2,240	Temp., S.C.	1975-82

Type of record: Temp. (temperature), S.C. (specific conductance), and Sed. (sediment).

WATER RESOURCES DATA - NORTH DAKOTA, 1993

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DISCONTINUED SURFACE-WATER-QUALITY STATIONS

Discontinued continuous-record surface-water-quality stations--Continued

Station name	Station number	Drainage area (mi ²)	Type of record	Period of record (water years)
Missouri River near Hensler, ND	06340900	183,000	Temp.	1967-77
Missouri River at Bismarck, ND	06342500	186,400	Temp. S.C. Sed.	1967-75 1972-75 1972-81
Heart River near Richardton, ND	06345500	1,240	Sed.	1946-52
Heart River near Mandan, ND	06349000	3,310	Temp., S.C. Sed.	1972-76, 1978-82 1972-76
Missouri River near Schmidt, ND	06349700	191,700	Temp.	1967-75
Cannonball River at Regent, ND	06350000	580	Temp., S.C., Sed.	1965-66
Cedar Creek near Pretty Rock, ND	06352500	1,340	Sed.	1946-49
Cannonball River at Breien, ND	06354000	4,100	Temp. S.C. Sed.	1972-82, 1991 1972-82 1972-76
North Fork Grand River at Haley, ND	06355000	509	Temp.	1951-52
Pilot Drain at Oakes, ND	06470833	5.10	Temp., S.C.	1972-80, 1982
James River at North Dakota-South Dakota Stateline	06470878	6,650	Temp., S.C.	1974-88

Type of record: Temp. (temperature), S.C. (specific conductance), and Sed. (sediment).

WATER RESOURCES DATA - NORTH DAKOTA, 1993

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of North Dakota 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 U.S. Geological Survey, the data are published annually in this report series entitled "Water Resources Data - North Dakota."

This report series includes records of discharge, stage, and water quality for streams; contents, stage, and water quality for lakes and reservoirs; and water levels and water quality for ground-water wells. This volume contains records of water discharge for 108 streamflow-gaging stations; stage only for 20 river-stage stations; contents and/or stage for 15 lake or reservoir stations; annual maximum discharge for 8 crest-stage stations; water levels for 30 ground-water wells; and water quality for 102 streamflow-gaging stations, 1 river-stage stations, 17 lake or reservoir stations, 6 crest-stage stations, 34 ground-water wells, and several miscellaneous sample sites on streams and lakes. Locations of these stations and wells are shown in figures 1, 2, and 3 except for the miscellaneous water-quality sites. Data are included for 6 water-quality monitor sites on streams and for 2 precipitation-chemistry stations. 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 North Dakota.

This series of annual reports for North Dakota began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for North Dakota were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 5 and 6." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and ground-water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 810, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the U.S. Geological Survey for all States. These official Survey reports have 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 ND-92-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. Beginning with the 1990 water year, all water data also will be available on Compact Disc-Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

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 telephoning (701) 250-4601. A limited number of CD-ROM discs will be available for sale by the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225.

COOPERATION

The U.S. Geological Survey and agencies of the State of North Dakota have had cooperative agreements for the collection of streamflow records since 1903, ground-water levels since 1937, and water-quality records since 1946. Organizations that assisted in collecting the data in this report through cooperative agreement with the Survey are: North Dakota State Water Commission, David A. Sprynczynatyk, Chief Engineer; Lower Heart River Water Resources District, W. S. Russell, Chairman; City of Minot, George M. Christensen, Mayor; City of Dickinson, Henry Schank, Mayor; Three Affiliated Tribes of the Fort Berthold Indian Reservation, W. D. Wilkinson, Tribal Chairman.

Assistance with funds or services was given by the U.S. Army Corps of Engineers for 22 streamflow-gaging stations, 18 river-stage stations, 5 reservoir stations, 25 ground-water wells, and water quality for 3 streamflow-gaging stations; the U.S. Bureau of Reclamation for 2 streamflow-gaging stations, 1 river-stage station, and water quality for 8 streamflow-gaging stations and for 2 lake or reservoir stations; the International Joint Commission of the U.S. State Department for 7 streamflow-gaging stations and 1 reservoir station; the U.S. Fish and Wildlife Service for 8 streamflow-gaging stations, water quality for 4 streamflow-gaging stations and water quality for 1 lake station; the U.S. Bureau of Indian Affairs for 1 streamflow-gaging station and water-quality for 1 streamflow-gaging station; and other U.S. Department of the Interior agencies concerned with the Missouri River basin for 7 streamflow-gaging stations, 2 river-stage stations, 3 reservoir stations, and water quality for 6 streamflow-gaging stations, 1 river-stage station, and 1 reservoir station.

Certain stations are maintained under agreement with Canada and the records are obtained and compiled in a manner equally acceptable to both countries. Most of these are designated as "international gaging stations."

Organizations that provided data are acknowledged in station descriptions.

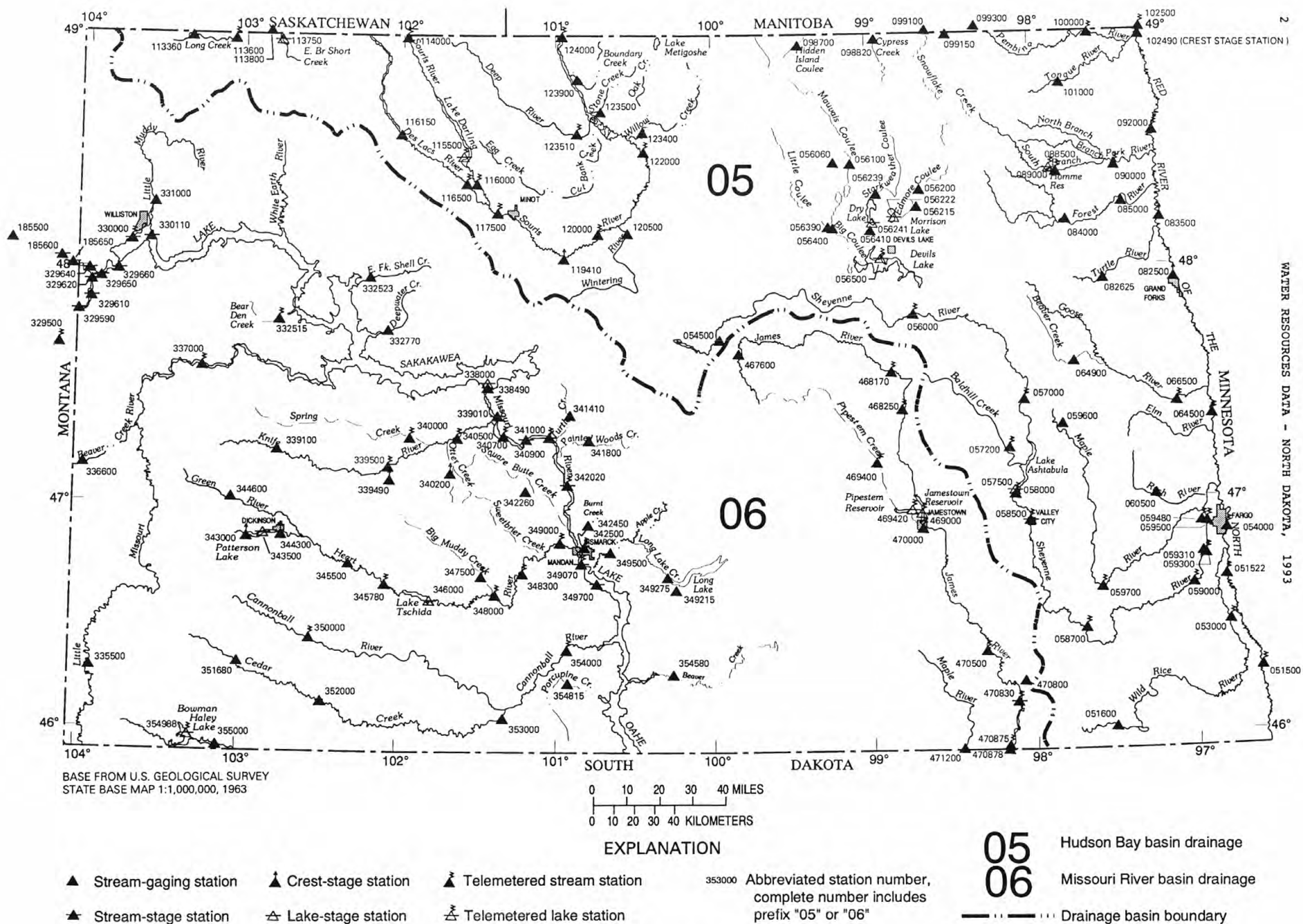


Figure 1.--Location of active surface-water gaging stations.

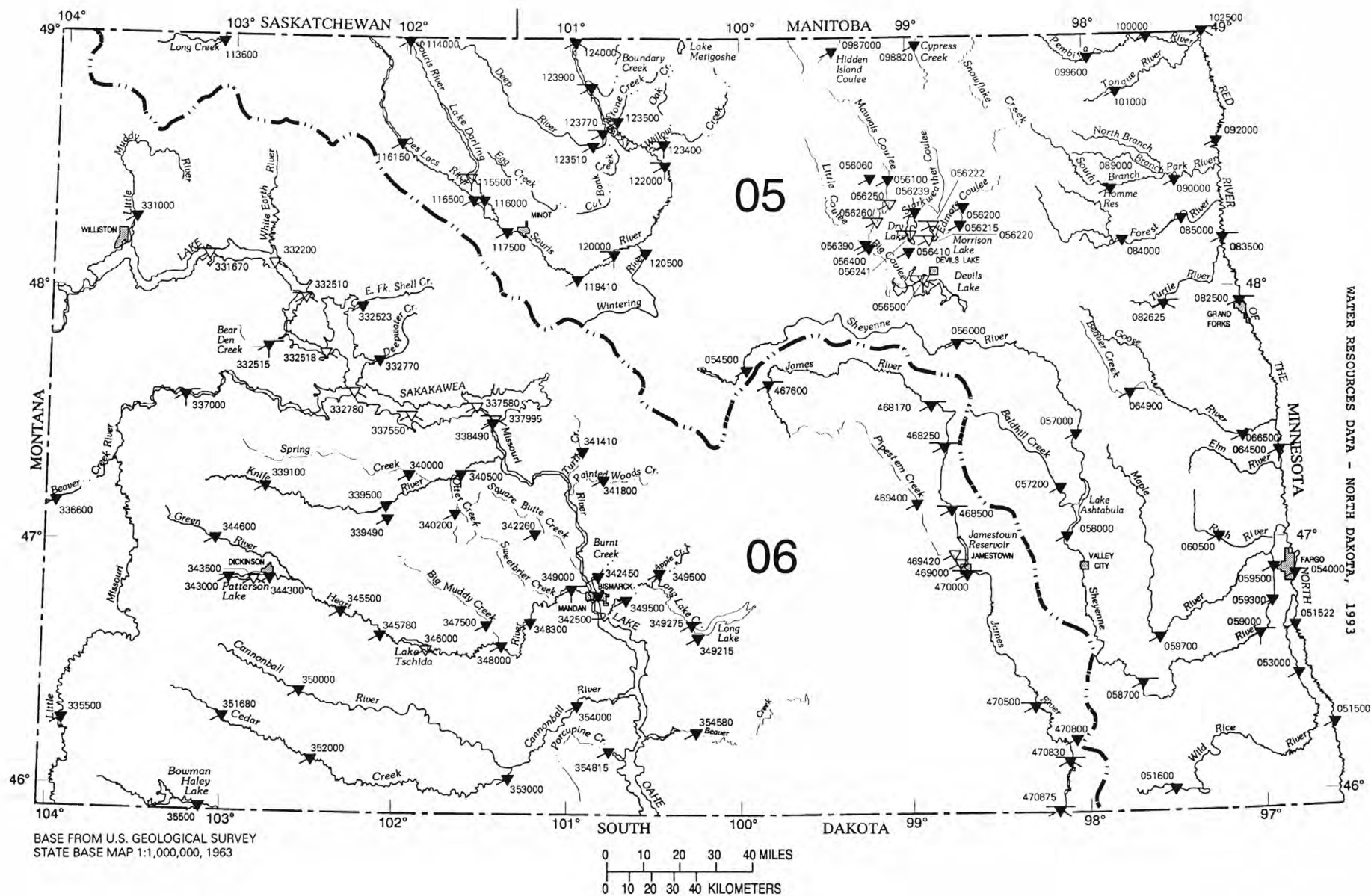
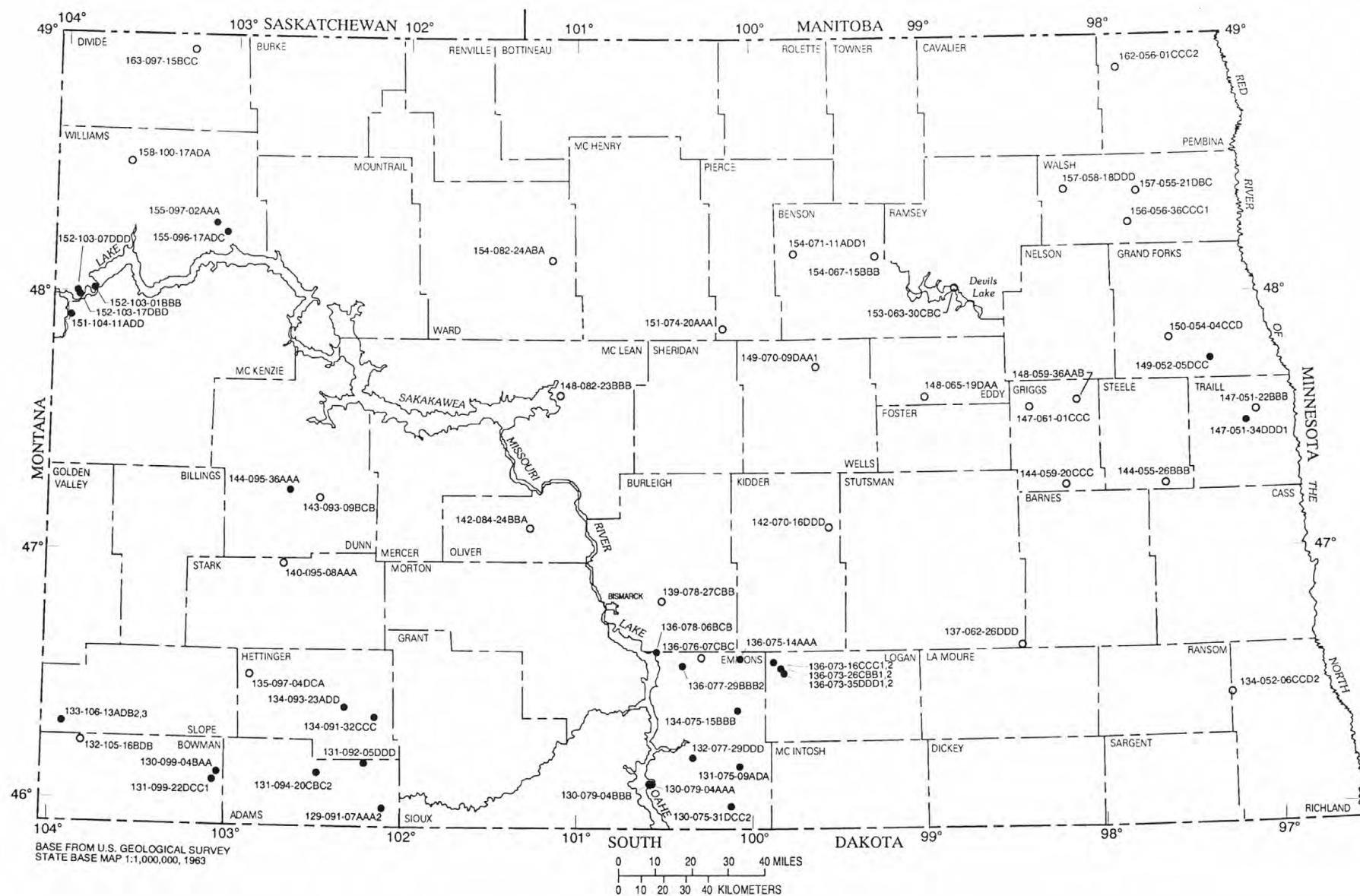


Figure 2.--Location of active surface-water-quality stations.



EXPLANATION

129-067-29AAD Well for which water-quality analyses
are given, number is local well number

136-076-07CBC Well for which water-level measurements
are given, number is local well number

Figure 3.-- Location of selected ground-water observation wells.

SUMMARY OF HYDROLOGIC CONDITIONS

Climate

In North Dakota, normal annual precipitation ranges from about 14 inches in the northwestern part of the State to about 22 inches in the southeastern part of the State (Owenby, J.R., and Ezell, D.S., 1992, Monthly station normals of temperature, precipitation, and heating and cooling degree days, 1961-90, North Dakota: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service, National Climatic Data Center, Asheville, North Carolina, Climatology of the United States, No. 81). Three-fourths of this precipitation occurs during April through September. Greatest normal monthly precipitation for the entire State generally occurs during June. Normal, as used in reference to meteorological data in this report, is an average value for the reference period 1961 through 1990. Meteorological data were obtained from publications of the National Climatic Data Center (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, 1992, 1993, Climatological data, North Dakota: Asheville, North Carolina, v. 101, no. 10-12, v. 102, no. 1-6 and from Grant Goodge, National Climatic Data Center, Asheville, North Carolina, written commun., 1994).

North Dakota is divided into nine climatological divisions (fig. 4). Precipitation during water year 1993 ranged from about 1.5 inches greater than normal in the southwest division to about 9.2 inches greater than normal in the central division.

A comparison of monthly precipitation for water year 1993 to normal monthly precipitation for 1961-90 for the nine climatological divisions in North Dakota is shown in figure 4. The data shown in figure 4 are averages of the monthly precipitation for reporting stations within each climatological division.

The statewide monthly average precipitation during the usually dry fall and winter months of October through March ranged from near normal to 0.2 inch less than normal, except for October when precipitation averaged 0.8 inch (about 75 percent) less than normal and November when precipitation averaged 0.6 inch (about 114 percent) greater than normal. Statewide precipitation for October through March averaged 0.7 inch (about 19 percent) less than normal.

Statewide precipitation during April averaged about 1.0 inch (about 36 percent less than normal). Statewide precipitation during May averaged about 2.8 inches (about 19 percent greater than normal). Precipitation during May for the northwest and southwest climatological divisions averaged 0.5 and 1.0 inch less than normal, respectively. Average precipitation for the remaining climatological divisions ranged from normal to 2.1 inches greater than normal. The greatest average precipitation for May was about 4.3 inches (about 100 percent greater than normal) in the central climatological division.

Statewide precipitation during June averaged about 5.1 inches (about 61 percent greater than normal). Average precipitation ranged from about 4.1 inches (about 27 percent greater than normal) in the west-central climatological division to about 6.1 inches (about 82 percent greater than normal) in the central climatological division.

Statewide precipitation during July averaged about 8.0 inches (about 215 percent greater than normal). As shown in figure 4, precipitation during July was much greater than for any other month in all nine climatological divisions and greatly exceeded the normal maximum monthly precipitation, which usually occurs in June.

The National Weather Service Bismarck field office described the July precipitation in the Monthly Report of River and Flood Conditions (Charlene Prindiville, National Weather Service, written commun., 1993) as follows:

The most significant torrential rains fell on July 15-16 covering most of the southern half of the state. These rains were the result of a low pressure system that was nearly stationary over Wyoming on the morning of the 15th. * * * The key feature was a warm front lying east/west along the ND/SD border. * * * During the day of the 15th and into the early morning of the 16th, southerly winds ahead of the Wyoming low pressure system lifted the warm and very moist air from the south up and over the cooler air to the north of the front. * * * This caused lengthy periods of heavy rain in an east to west band along Interstate 94 from Hebron [about 60 miles west of Bismarck] to Fargo. * * *

This weather pattern produced large, and in many areas unprecedented 24 hour rainfall totals of 4 to 7 inches. * * *

During the period from July 22-27 severe but more localized thunderstorms struck North Dakota. These storms produced 6 inches of rainfall with some areas reporting up to 10 inches. * * *

July rainfall amounts were greater than 200% of normal nearly everywhere in the state and ranged up to an astounding 400%-500% of normal over large areas and equaled over 600% of normal at Bismarck * * *. * * * Bismarck had 13.75 inches * * *. This amount exceeded the old total July precipitation record set back in 1935 by 8.29 inches and in addition it was the wettest month ever at Bismarck since instrument weather records have been taken.

Statewide precipitation during August averaged about 2.6 inches (about 23 percent greater than normal). Average precipitation ranged from about 1.0 inch (about 33 percent less than normal) in the southwest climatological division to about 4.5 inches (about 86 percent greater than normal) in the northeast climatological division.

Precipitation was less than normal in all nine climatological divisions during September. Average precipitation ranged from 0.2 inch (about 87 percent less than normal) in the central climatological division to 0.7 inch (about 63 percent less than normal) in the southeast climatological division.

The average monthly temperature statewide for October through February ranged from 1° to 4°F (degrees Fahrenheit) below normal. At the end of February, the majority of the State had 3 to 6 inches of snow cover. The northeast and southeast climatological divisions had the greatest amount of snow with 8 to 15 inches. The northwest division had the least amount of snow with 1 to 3 inches.

Snowmelt started during the first week in March when daytime high temperatures reached 40° to 50°F. Below freezing daytime high temperatures and below zero nighttime low temperatures slowed melting in mid-March. Snowmelt resumed in late March with the return of above freezing temperatures, greater than 70°F at some locations. Average statewide temperature for March was about 2°F above normal. Statewide temperatures during April and May averaged near normal (42°F for April and 55°F for May). Average monthly temperatures statewide for June through September ranged from 2° to 7°F below normal.

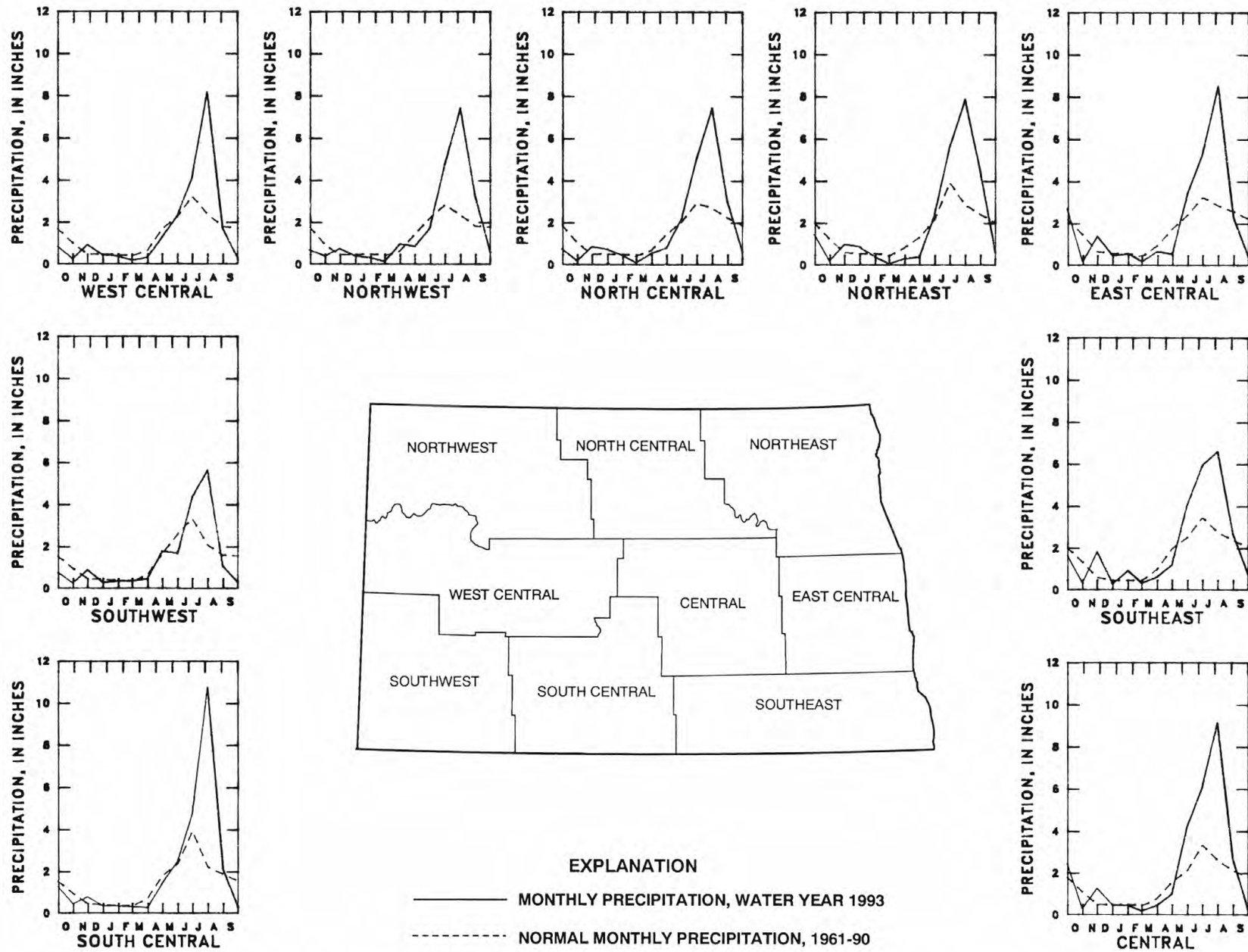


Figure 4.--Comparison, by climatological division, of monthly precipitation, water year 1993, to normal monthly precipitation, 1961-90.

The Palmer Drought Severity Index on selected dates for the nine climatological divisions in North Dakota is shown in tables 1a-f (M. T. Roletto and C. M. Prindiville, National Weather Service, written commun., 1989-94). "The Palmer Drought [Severity] Index is widely used as a measure of the severity of drought. Positive values indicate a moisture excess, values near zero indicate normal conditions, and values less than zero indicate drier than normal. An index of less than -3 is termed a severe drought, and an index of less than -4 is the worst condition, termed extreme drought." (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, U.S. drought 1988 -- A climate assessment: NOAA Climate Office, Rockville, Md., 1988, p. 2).

The severity of the drought at the beginning of the 1993 water year was less than at the beginning of the 1989-91 water years and greater than at the beginning of the 1988 or 1992 water years. Comparison of index values at the beginning and end of each water year (table 1a-f) indicates that, although conditions may have improved somewhat during the summer months of each year when precipitation normally is greater, once the drought started in 1988 there was little difference between index values at the beginning and end of each water year until the 1991 water year. Conditions improved slightly during the 1992 water year and the three eastern climatological divisions were out of the drought at year end (table 1e, 09/26/92). However, it was not until after the cool, wet summer of 1993 that all nine climatological divisions had near normal to extreme moist spells (table 1f, 09/25/93). Five of the nine divisions had extreme moist spells at the end of the 1993 water year.

Streamflow

The largest mean monthly discharge of North Dakota rivers generally is coincident with snowmelt runoff. Because the springtime temperatures normally are greater in the southwestern part of the State than in the northeastern part, snowmelt runoff usually begins first on the Missouri River tributaries in southwestern North Dakota and progresses from southwest to northeast across the State. Hydrographs of mean monthly discharge (fig. 5) for the period of record for selected streams verify this trend. For example, the largest mean monthly discharge for Bear Den Creek near Mandaree, which is in the west-central climatological division, normally occurs in March; whereas, the largest mean monthly discharge for the remaining streamflow-gaging stations normally occurs in April. Mean monthly discharge for March is almost as large as mean monthly discharge for April for Cedar Creek near Haynes in the southwest climatological division, further substantiating the general trend of snowmelt progressing in time from southwest to northeast in North Dakota.

Although many inferences can be made about hydrologic conditions of the State by using precipitation data (fig. 4) and streamflow data (fig. 5), sound hydrologic judgment should be used. Variability of rainfall intensity and distribution should be considered when making conclusions about hydrologic response to rainfall, especially for small basins. Problems may occur because different reporting periods are used for the normal monthly precipitation data and the mean monthly discharge data in the two figures. Normal monthly precipitation is computed using a 30-year reference period from 1961 to 1990, but mean monthly discharges are computed using data for the period of record at each streamflow-gaging station--1967-93 (27 years), in the case of Bear Den Creek near Mandaree.

At the beginning of the 1993 water year, the drought, which had persisted since 1988, had ended in the three eastern climatological divisions, but was still extreme in the southwest and west-central divisions, severe in the northwest and north-central divisions, moderate in the central division, and mild in the south-central division. The dry winter yielded little potential for flooding due to snowmelt runoff except in the upper Red River of the North Basin in the southeast corner of the State.

Runoff started in early March in southwestern North Dakota. Spring peaks occurred on Cedar Creek near Haynes and Bear Den Creek near Mandaree prior to the cold spell in mid-March. Runoff also had started on the Des Lacs River at Foxholm and Apple Creek near Menoken, but was slowed by the cold spell in mid-March. Spring peaks occurred on these two streams and on the remaining streams shown in figure 5 in late March or early April.

Cool, wet weather in June increased soil-moisture levels prior to the precipitation that occurred July 15-16 and July 22-27. The July precipitation caused summer flooding of unprecedented magnitude over a wide area. The areas with the most severe flooding were in the upper James River, Sheyenne River, and Devils Lake Basins. Water levels in flood-control reservoirs on the Sheyenne and James Rivers rose rapidly, and large, controlled releases were made to prevent more serious flooding that could have occurred if the reservoirs had overflowed. Flooding also occurred in the Heart River Basin and on several smaller streams tributary to the Missouri River. Urban flooding affected Bismarck, Jamestown, Valley City, Fargo, and several smaller communities.

The wide distribution of flooding during the summer of 1993 may be inferred from the hydrographs shown in figure 5. Monthly mean discharges for July and August greatly exceeded the maximum mean monthly discharge, which usually occurs in March or April at most of the streamflow-gaging stations (fig. 5). Cedar Creek near Haynes is an exception because its drainage area lies outside of the area of greatest precipitation (the south-west climatological division had the least amount of precipitation of all nine climatological divisions during July and August). The Des Lacs River at Foxholm also is an exception. Lakes and reservoirs upstream from the Des Lacs River at Foxholm station were at very low levels because of the 1988-92 drought and storage of water in these lakes and reservoirs masked the runoff effect.

Selected streamflow statistics for the nine streamflow-gaging stations shown in figure 5 are summarized in table 2. Annual mean discharges for water years 1988-93 for each streamflow-gaging station are ranked against similar data for the period of record. The smallest annual mean discharge for each streamflow-gaging station is given a rank of 1. Table 2 has been included in previous reports to substantiate the extreme deficiency in streamflow caused by the 1988-92 drought; however, table 2 is included in this report to substantiate the end of the drought.

The mean discharge for 1993 at the nine streamflow-gaging stations listed in table 2 is greater than the mean discharge at each station for water years 1988-92, except for the Des Lacs River at Foxholm where the 1993 mean discharge did not exceed the 1989 mean discharge. However, as previously noted, the runoff above the Des Lacs River at Foxholm was masked by upstream reservoir storage. Mean discharge for 1993 for Cedar Creek near Haynes was less than the mean discharge for the period of record, and mean discharge for 1993 for Bear Den Creek near Mandaree was about the same as the median discharge for the period of record. Mean discharges for 1993 at the other six stations exceeded their respective median discharges for the period of record; in fact, the 1993 mean discharge for the James River near Grace City was the largest mean discharge during the 25-year period of record.

The Devils Lake Basin is a 3,810 square-mile closed basin adjacent to the headwaters of the Sheyenne River. Less-than-normal runoff in the Devils Lake Basin during water years 1988-92 resulted in decreasing water levels in Devils Lake. Since reaching a record high water level (of this century) of 1,428.8 feet above sea level on August 2, 1987, the water level in Devils Lake had fallen 6.4 feet, to an elevation of 1,422.4 feet, on October 31, 1992. Spring runoff increased the water level to 1,423.2 feet on May 9, 1993. No significant

Table 1.--Palmer Drought Severity Index on selected dates for water years 1988-93 for the nine National Weather Service climatological divisions in North Dakota (M. T. Roletto and C. M. Prindiville, National Weather Service, written commun., 1989-94)
 [Below -4.0, extreme drought; -3.9 to -3.0, severe drought; -2.9 to -2.0, moderate drought; -1.9 to -1.0, mild drought; -0.9 to -0.5, incipient drought; -0.4 to +0.4, near normal; +0.5 to +0.9, incipient moist spell; +1.0 to +1.9, moist spell; +2.0 to +2.9, unusual moist spell; +3.0 to +3.9, very moist spell; +4.0 and above, extreme moist spell]

Table 1a.--Water year 1988

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/03/87	01/01/88	04/02/88	07/02/88	09/24/88
Northwest	+1.5	-2.7	-2.5	-5.6	-6.2
North central	+2.4	-1.6	-1.1	-4.2	-5.7
Northeast	+2.4	-1.2	+0.3	-4.2	-5.4
West central	+1.3	-1.8	-1.7	-5.3	-7.0
Central	+2.1	-1.4	-1.5	-4.5	-5.8
East central	+3.5	+1.9	+1.7	-3.8	-4.0
Southwest	+2.4	-1.2	-1.1	-4.1	-6.2
South central	+3.8	-1.4	-1.4	-4.3	-5.6
Southeast	-2.3	-2.4	-2.8	-6.3	-5.9

Table 1b.--Water year 1989

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/01/88	12/31/88	04/01/89	07/01/89	09/30/89
Northwest	-5.9	-4.2	-3.0	-3.3	-5.5
North central	-5.3	-3.4	-3.0	-2.2	-4.3
Northeast	-5.4	-4.5	-3.8	-3.6	-5.3
West central	-6.8	-5.4	-4.5	-4.7	-5.8
Central	-5.6	-4.4	-3.9	-5.1	-3.4
East central	-3.9	-2.8	-1.8	-3.2	-2.4
Southwest	-6.0	-4.5	-4.5	-4.4	-4.8
South central	-5.4	-3.6	-3.3	-4.2	-2.9
Southeast	-5.5	-3.6	-2.5	-3.4	-1.5

Table 1c.--Water year 1990

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/07/89	12/30/89	03/31/90	06/30/90	09/29/90
Northwest	-5.4	-3.1	-3.1	-3.8	-4.2
North central	-4.3	-4.3	-2.7	-0.7	-3.3
Northeast	-5.3	-5.4	-3.1	-2.4	-4.8
West central	-5.7	-4.1	-4.5	-3.7	-6.4
Central	-3.3	-3.2	-3.1	-2.9	-4.5
East central	-2.3	-3.3	-1.4	-1.4	-3.5
Southwest	-4.8	-2.8	-2.2	-2.4	-5.9
South central	-2.8	-3.3	-3.5	-3.6	-5.4
Southeast	-1.6	-3.0	-2.5	-3.8	-3.7

Table 1.--Palmer Drought Severity Index on selected dates for water years 1988-93 for the nine National Weather Service climatological divisions in North Dakota (M. T. Roletto and C. M. Prindiville, National Weather Service, written commun., 1989-94)--Continued

Table 1d.--Water year 1991

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/06/90	12/29/90	03/30/91	06/29/91	09/28/91
Northwest	-4.3	-3.4	-3.4	-2.3	-0.9
North central	-3.4	-2.8	-3.6	-3.3	-1.1
Northeast	-5.0	-4.8	-5.2	-2.8	+0.1
West central	-6.4	-4.8	-4.7	-4.2	-3.2
Central	-4.7	-3.6	-3.8	-3.4	-2.3
East central	-3.8	-3.1	-3.5	-2.7	-2.5
Southwest	-6.0	-4.7	-4.6	-3.8	-3.6
South central	-5.5	-4.6	-4.7	-2.9	-4.1
Southeast	-4.1	-3.6	-3.6	+1.5	+0.4

Table 1e.--Water year 1992

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/05/91	12/28/91	03/28/92	06/27/92	09/26/92
Northwest	-0.8	+0.7	-0.2	-2.8	-2.8
North central	-0.7	+1.2	+0.5	-2.8	-3.5
Northeast	+0.2	+2.5	+2.5	-0.5	+0.6
West central	-3.0	-1.3	-1.1	-3.9	-3.7
Central	-2.3	0.0	-0.4	-4.1	-2.1
East central	-2.8	-1.8	0.0	0.0	+1.7
Southwest	-3.5	-2.1	-2.9	-5.1	-3.5
South central	-4.3	-2.1	-0.7	-3.0	-1.0
Southeast	+0.1	-0.2	+0.8	+0.6	+0.9

Table 1f.--Water year 1993

National Weather Service climatological division	Palmer Drought Severity Index by date of computation				
	10/03/92	12/26/92	03/27/93	06/26/93	09/25/93
Northwest	-3.0	-2.0	-2.0	-1.1	+5.0
North central	-3.7	-2.4	-2.3	-1.0	+3.4
Northeast	+0.1	+0.5	-1.3	+1.3	+5.2
West central	-4.1	-3.2	-3.3	-2.4	+3.1
Central	-2.6	-0.8	-1.4	+0.8	+5.0
East central	+1.2	+1.6	+1.3	+1.2	+3.3
Southwest	-4.0	-2.5	-2.6	-3.1	+0.5
South central	-1.4	-0.5	-1.5	-1.2	+5.7
Southeast	+0.2	+0.7	+0.1	+2.6	+4.9

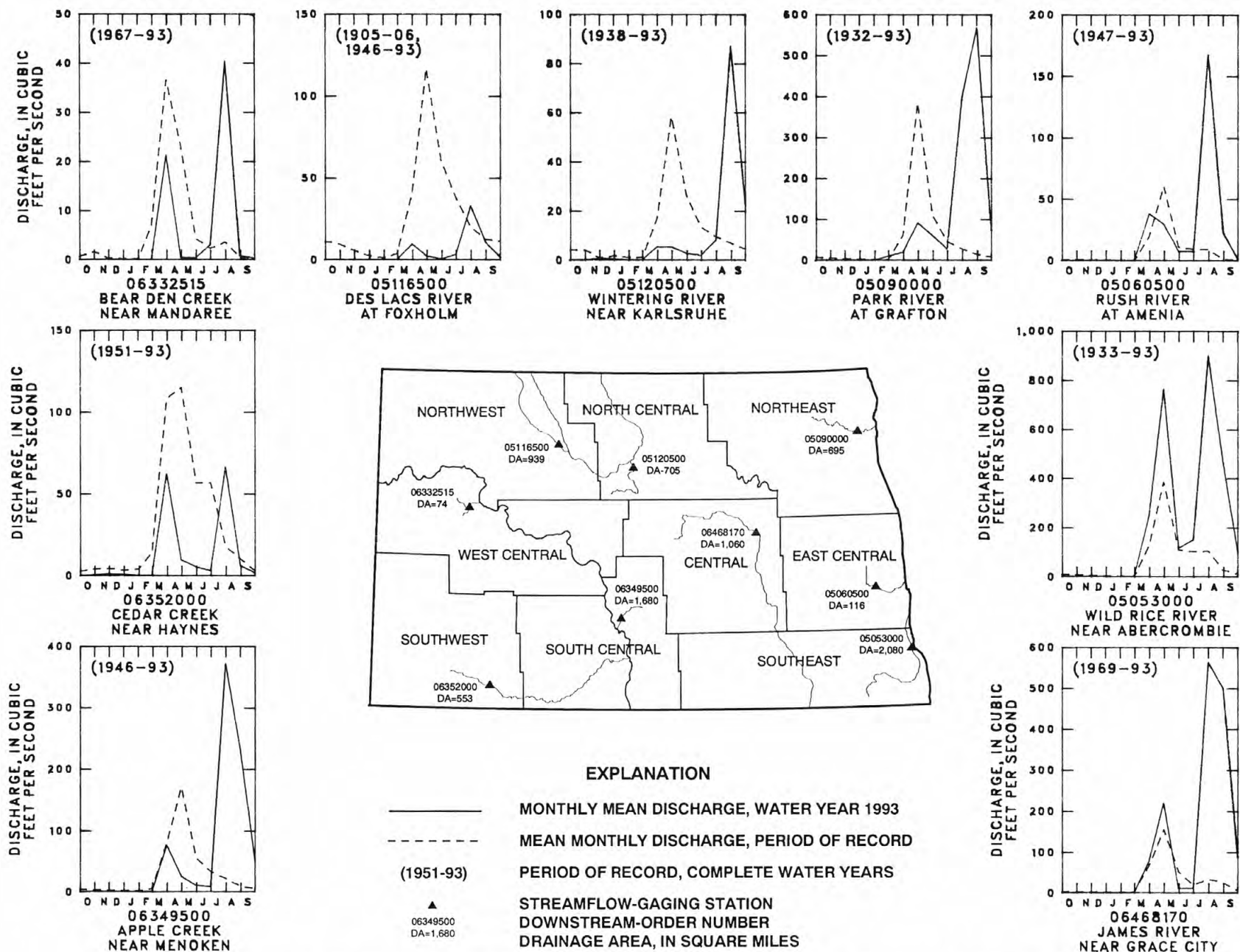


Figure 5.--Comparison of monthly mean discharge during water year 1993 to mean monthly discharge for the period of record.

Table 2.--Period-of-record mean annual and median annual discharges; water years 1988-93 mean discharges; and ranking of water years 1988-93 data versus record low mean discharges for period of record at selected streamflow-gaging stations.

[ft³/s, cubic feet per second]

Streamflow-gaging station	Period of record			Mean discharge (ft ³ /s)						Ranking of mean from lowest annual mean discharge for period of record					
	Number of years	Mean annual discharge (ft ³ /s)	Median annual discharge (ft ³ /s)	Mean discharge (ft ³ /s)						Ranking of mean from lowest annual mean discharge for period of record					
				1988	1989	1990	1991	1992	1993	1988	1989	1990	1991	1992	1993
Apple Creek near Menoken	48	32.4	18	4.92	2.77	0.31	0.64	6.97	65.6	9	5	1	4	12	43
Cedar Creek near Haynes	43	33.2	19	3.98	9.99	6.77	3.61	3.23	13.3	5	13	9	4	3	18
Bear Den Creek near Mandaree	27	6.68	5.7	.27	2.25	.62	.34	1.39	5.69	1	11	4	2	8	15
Des Lacs River at Foxholm	50	26.8	15	.93	9.34	1.48	.44	.83	5.19	4	19	6	1	3	12
Wintering River near Karlsruhe	56	12.3	10	3.31	3.69	2.45	1.39	1.36	11.4	13	15	7	2	1	30
Park River at Grafton	62	55.2	42	5.13	3.96	1.38	2.22	56.4	106	10	8	1	3	37	55
Rush River at Amenia	47	9.36	5.9	1.13	9.16	3.04	2.03	4.56	23.1	4	29	13	9	20	44
Wild Rice River near Abercrombie	61	73.7	36	3.99	158	2.70	11.3	38.3	231	4	52	2	10	32	58
James River near Grace City	25	30.8	18	5.01	1.29	2.11	.22	14.3	124	6	4	5	2	10	25

change in the water level occurred until mid-July. The water level in Devils Lake had risen to 1,424.5 feet by the end of July, primarily due to direct precipitation on the lake surface. Actual surface runoff to the lake is very slow because of the flat slopes of the tributary streams and retardation caused by flow through the chain of lakes upstream from Devils Lake. However, by the end of the 1993 water year, Devils Lake had risen to 1,427.1 feet, 4.7 feet higher than the October minimum, and the lake was still rising at a rate of 0.02 foot per day.

Chemical Quality of Streamflow

The chemical quality of streamflow at any particular site is dependent upon many factors, including source of streamflow, composition of rocks over which water flows, location, and time of year; therefore, the quality of streamflow varies considerably across the State. The chemical quality of streamflow also is dependent on the volume of streamflow. During periods of low flow, most of the flow is derived from ground-water inflow, which is mineralized, and the resulting streamflow has large dissolved-solids concentrations. During periods of high flow, most of the flow is derived from snowmelt or precipitation runoff, which is less mineralized, and the resulting streamflow has small dissolved-solids concentrations.

Five stations from around the State were selected to show the variability in stream-water quality among the different river drainages. Specific conductance, an indicator of dissolved solids in water, is used to show the water-quality variability among these stations and among months at a given station. The mean, maximum, and minimum specific conductance for the period of record and the specific conductances measured during the 1993 water year for each station are shown in table 3.

Specific conductance is used as an indicator of the suitability of water for irrigation and other uses. The U.S. Salinity Laboratory (U.S. Salinity Laboratory Staff, 1954, Diagnosis and improvement of saline and alkali soils: U.S. Department of Agriculture Handbook 60, 160 p.) has developed an index using specific conductance as an indicator of salinity hazard for irrigation water. The salinity hazard and corresponding specific conductance are as follow:

Salinity hazard	Specific conductance (microsiemens per centimeter at 25 degrees Celsius)
Low	less than 250
Medium	250 - 750
High	750 - 2,250
Very high	2,250 - 5,000

The Red River of the North drains all of eastern North Dakota, much of northwestern Minnesota, and a small part of northeastern South Dakota. Water from the Red River of the North at Grand Forks had the smallest specific-conductance values for most months during 1993 of the five stations listed in table 3. These small values are due partly to more precipitation occurring in the Red River of the North Basin than in other parts of North Dakota. A new maximum specific-conductance value of 750 microsiemens per centimeter was measured for May, and a new minimum value of 266 microsiemens per centimeter was measured for August. The smallest specific-conductance values were due to snowmelt runoff in April and precipitation runoff in August. The salinity hazard of stream water for irrigation use was medium during the irrigation season (April through October) for months when measurements were made.

The Souris River upstream of Sherwood drains about 9,000 square miles of southeastern Saskatchewan, Canada, and a small area of northwestern North Dakota. Water from the Souris River near Sherwood had larger specific-conductance values than water from the Red River of the North throughout the year, and larger specific-conductance values than all the stations in March. A new maximum specific-conductance value of 3,500 microsiemens per centimeter was measured for March. Usually specific-conductance values decrease in March due to snowmelt runoff, but the stream channel was dry prior to snowmelt runoff, and the initial flush of water in March was of poor quality. The salinity hazard of stream water for irrigation use was high during the irrigation season (April through October) for months when measurements were made.

The Little Missouri River drains parts of southwestern North Dakota, northwestern South Dakota, northeastern Wyoming, and southeastern Montana. A new minimum specific-conductance value of 695 microsiemens per centimeter was measured for July. Large specific-conductance values were measured during low flow, and small specific-conductance values were measured during snowmelt runoff in March and during precipitation runoff in July. The salinity hazard of stream water for irrigation use was high during the irrigation season (April through October), except during part of July when precipitation runoff reduced the salinity hazard to medium.

The Cannonball River drains part of southwestern North Dakota and northwestern South Dakota. A new minimum specific-conductance value of 440 microsiemens per centimeter was measured for July. Measured specific conductances were large during low-flow conditions, small during snowmelt runoff in March, and small during precipitation runoff in July. The salinity hazard of stream water for irrigation use was high during the irrigation season (April through October), except in July when precipitation runoff reduced the salinity hazard to medium.

The James River drains east-central North Dakota. Two reservoirs, Jamestown and Pipestem, are used to regulate flow in the James River Basin. These reservoirs are filled by snowmelt runoff, so releases from the reservoirs during the summer typically have specific-conductance values similar to those measured during periods of snowmelt runoff. Water from the James River at LaMoure generally had lower specific-conductance values than water from the Souris, the Little Missouri, and Cannonball Rivers, but higher specific-conductance values than water from the Red River of the North from October through February and similar values for the remainder of the year. New maximum monthly specific-conductance values of 1,210, 2,590, and 1,780 microsiemens per centimeter were measured during October, January, and February, respectively. Large specific-conductance values were measured during low flow, and small specific-conductance values were measured during snowmelt runoff in April and during releases from Jamestown and Pipestem Reservoirs from July through September. The salinity hazard of stream water for irrigation use was high in May and medium in April, July, and September.

Ground-Water Levels

Water levels measured during water years 1987-93 for well 134-052-06CCD2 completed in the Sheyenne Delta aquifer in Richland County are shown in figure 6. Water levels measured during the same period for well 140-095-08AAA completed in the Sentinel Butte aquifer in Stark County are shown in figure 7. The highest monthly water level, the mean of monthly water levels, and the lowest monthly water level for each of the two wells for the period of record prior to water year 1988 also are shown. Water-level fluctuations in both wells (figs. 6 and 7) follow the typical pattern of rises during the wet spring months and declines during the rest of the year for all 7 water years; however, the water-level rise in the Sentinel Butte well during 1990-92 was very small.

Table 3.--Statistical summary of specific-conductance measurements for the period of record and listing of specific-conductance measurements for water year 1993
 [Specific-conductance values are in microsiemens per centimeter at 25 degrees Celsius; --, indicates no data]

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Water year 1993	Period of record
05082500 Red River of the North at Grand Forks (period of record, water years 1949, 1956-93)														
Mean	517	598	634	601	575	496	460	564	547	499	507	501	562	527
Maximum	700	925	985	1,040	900	910	747	*750	699	675	659	674	760	1,040
Minimum	399	440	468	275	400	305	200	325	348	280	*266	340	266	200
Number of values	66	39	50	48	43	75	159	90	73	74	60	49	14	826
Measured values for water year 1993	--	645	583	561	585	760	370 498	*750	655	--	458 *266 600 659	652	--	--
05114000 Souris River near Sherwood (period of record, water years 1970, 1972-93)														
Mean	1,210	1,380	1,630	1,760	1,700	1,290	783	919	1,060	1,090	1,040	1,090	1,740	1,180
Maximum	2,240	2,460	2,230	2,770	2,550	*3,500	2,510	2,460	1,470	1,640	1,700	1,350	3,500	*3,500
Minimum	710	925	1,250	1,280	540	200	277	345	520	540	128	755	1,000	128
Number of values	31	27	14	22	23	37	55	24	30	26	31	18	9	338
Measured values for water year 1993	--	1,700	--	--	--	1,950 *3,500 2,250	1,150 1,400	1,290	1,440	--	1,000	--	--	--
06337000 Little Missouri River near Watford City (period of record, water years 1972-93)														
Mean	2,060	2,120	2,880	2,430	1,160	985	1,480	1,690	1,610	1,700	1,670	1,770	1,480	1,720
Maximum	3,100	4,000	5,000	3,350	2,030	1,760	2,700	3,100	2,780	3,000	2,520	2,390	2,600	5,000
Minimum	720	740	1,730	1,500	640	400	515	780	750	*695	682	900	633	400
Number of values	21	18	10	9	7	27	21	19	22	18	22	13	6	207
Measured values for water year 1993	2,600	2,420	--	--	--	633	--	1,170	--	*695	1,340	--	--	--
06354000 Cannonball River at Breien (period of record, water years 1950, 1971-93)														
Mean	1,690	2,120	2,580	2,470	1,820	834	1,150	1,760	1,480	1,470	1,440	1,630	1,200	1,610
Maximum	2,400	3,070	3,290	3,800	4,860	3,100	2,260	2,930	3,020	3,000	2,800	2,300	2,580	4,860
Minimum	903	1,600	284	680	190	190	300	481	288	*440	500	730	360	190
Number of values	21	22	19	26	29	46	39	25	27	24	24	24	13	326
Measured values for water year 1993	--	1,770	--	2,580	1,960	360 380 508 510	1,370	--	1,360 1,470	*440	1,440	1,450	--	--
06470500 James River at LaMoure (period of record, water years 1957-93)														
Mean	852	945	1,150	1,490	1,340	626	531	811	807	768	811	861	1,110	873
Maximum	*1,210	1,300	1,550	*2,590	*1,780	1,350	940	1,210	1,180	1,280	1,180	1,210	2,590	*2,590
Minimum	480	540	890	340	700	185	160	500	170	170	485	480	335	160
Number of values	32	22	11	31	18	35	44	28	26	23	24	28	8	322
Measured values for water year 1993	*1,210	1,060	--	*2,590	*1,780	--	488	810	--	335	--	640	--	--

* - New extreme value, maximum or minimum, occurred during water year 1993.

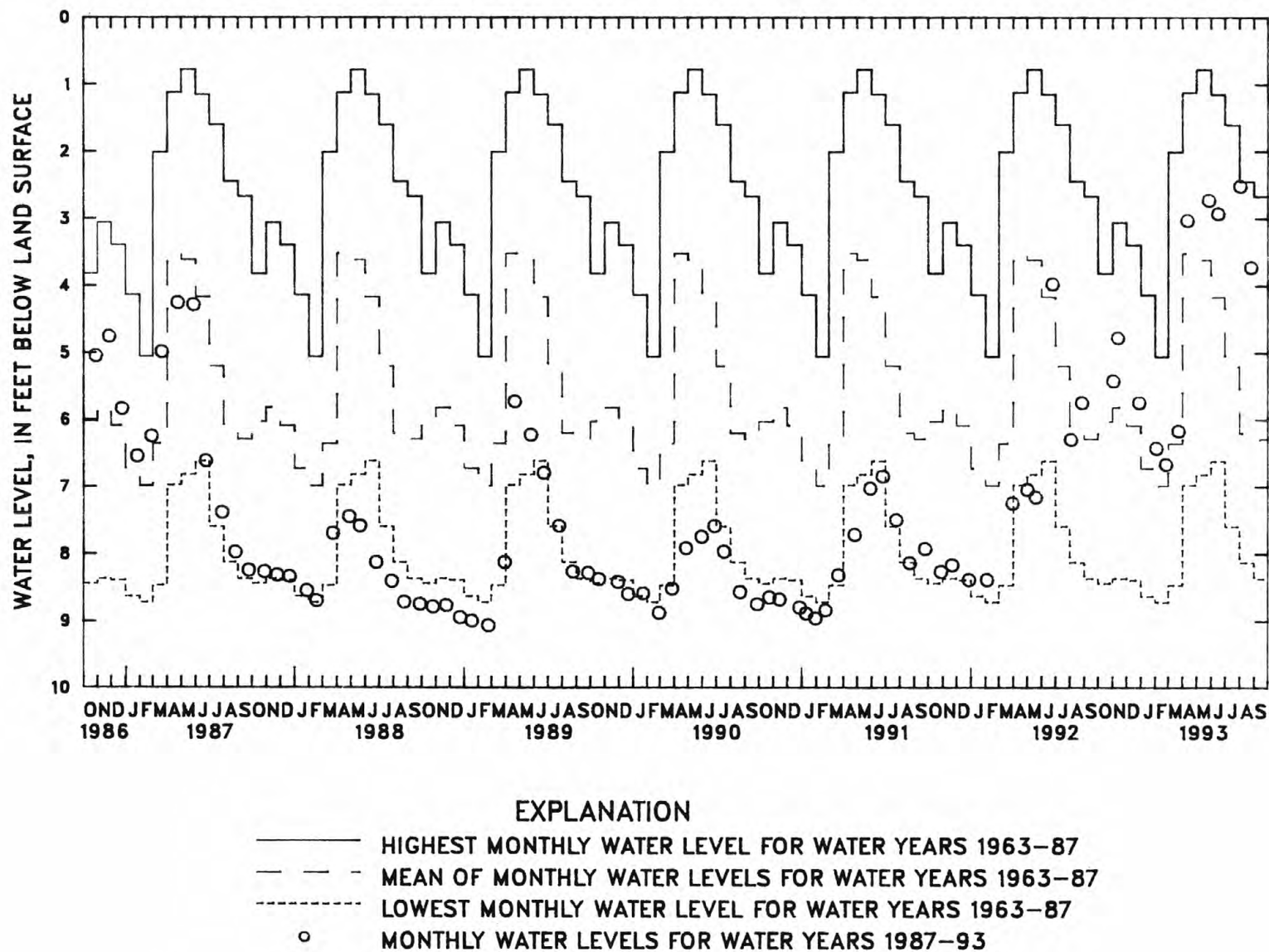
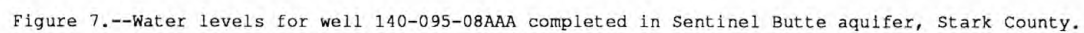


Figure 6.--Water levels for well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County.



The Richland County well is located in an area where no significant ground-water pumping occurs (D. P. Ripley, North Dakota State Water Commission, oral commun., 1990); fluctuations in the water level mainly are a result of climatic conditions. Water levels in the Richland County well were near normal (fig. 6) until June 1987. However, lack of precipitation, especially during April and June 1987, probably caused the near record low water levels by the end of the 1987 water year. The ensuing drought conditions during the spring of 1988 resulted in very little recovery in water level. From April 1988 through February 1989 new record low monthly water levels were measured.

The Richland County well is in the southeast climatological division where flooding occurred during April 1989. The water-level recovery was about 3 feet from the all-time record low set in February 1989 to the maximum in April 1989, but as the drought continued, the water level again declined to a near record low by the end of the 1989 water year. The continued drought conditions in the 1990 water year resulted in monthly water levels similar to those measured during the 1988 water year. Greater-than-normal precipitation in April, May, and June 1991 resulted in a greater recovery of water level than during the 1990 water year. Above normal temperatures and greater-than-normal precipitation during March 1992 in the southeast climatological division resulted in an earlier than usual recovery of the water level. Subsequent greater-than-normal precipitation in June raised the water level above the mean of the monthly water level for the first time since 1987. Continued moist conditions in the southeast climatological division through spring 1993 resulted in a normal seasonal recovery of the water level in the Richland County well. The water level remained high throughout the remainder of the 1993 water year due to greater-than-normal July precipitation.

Water from the Sentinel Butte aquifer generally is used for livestock watering and domestic supplies (Trapp, Henry, Jr., and Croft, M.G., 1975, *Geology and ground-water resources of Hettinger and Stark Counties, North Dakota*: North Dakota State Water Commission, County Ground-Water Studies 16, Part I, 51 p.). Generally low yield and large dissolved-solids concentrations make water from the Sentinel Butte aquifer unsuitable for irrigation. Thus, changes in water levels in the Stark County well generally reflect climatic conditions rather than pumping-induced stresses.

The water level in the Stark County well remained above or near normal through March of 1988 (fig. 7). The extreme deficiency in precipitation in April 1988, when most locations in the southwest climatological division reported either no precipitation or only a trace for the month, contributed to the rapid decline in water level from April through September 1988. The continued drought conditions resulted in record low or near record low water levels from September 1988 through February 1989. Although the water level increased from March through June 1989, it remained more than a foot below normal and declined to a new record low for September at the end of the 1989 water year.

In the 36 months following the 1989 water year, average precipitation in the southwest climatological division was above normal during only 10 months. This precipitation did little more than slow the water-level decline in the Stark County well. New record low water levels were measured each month during the 1991 and 1992 water years and during the first 5 months of the 1993 water year. A new all-time record low water level (22.64 feet below land surface) for the 25-year period of record was measured February 25, 1993.

The water level in the Stark County well had a normal seasonal recovery of about 1 foot during the spring of 1993, and greater-than-normal July precipitation resulted in another water-level rise of about 2 feet. By the end of the 1993 water year, the water level in the Stark County well had recovered to the highest level since 1989.

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 national or regional water-quality planning and management. The 500 or so sites in NASQAN generally are 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, (2) to aid in the description of the areal variability of water quality in the Nation's rivers, (3) to detect changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) to provide 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).

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, diverse, and geographically distributed part of the Nation's ground- and surface-water resources, and to identify, describe, and explain the major natural and human factors that affect these observed conditions and trends.

Assessment activities have begun in more than one-third of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. Part of the Red River of the North study unit lies within North Dakota. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest. In addition to data published in this report, data for the Red River of the North Basin are available from the Minnesota District office of the U.S. Geological Survey.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radiolotopes. 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 the 1993 water year that began October 1, 1992, and ended September 30, 1993. 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 1, 2, and 3. 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 stream site 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. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in North Dakota, for water-quality stations where streamflow or water level are not collected on a regular basis.

Downstream Order System

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

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 06342500, which appears just to the left of the station name, includes the two-digit part number "06" plus the six-digit downstream-order number "342500." The part number designates the major river basin; for example, part "06" is the Missouri River 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 fig. 8).

Local Well Numbers

In order to compare data for wells in other publications in North Dakota, such as the county ground-water studies, the wells in this report also are numbered according to a system based on the location in the public-land classification of the U.S. Bureau of Land Management. The system is illustrated in figure 9. The first number denotes the township north of a base line, the second number denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre tract). For example, well 139-049-15ADC is in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T. 139 N., R. 049 W. Consecutive terminal numbers are added if more than one well is recorded within a 10-acre tract.

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. Locations of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figure 1.

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.

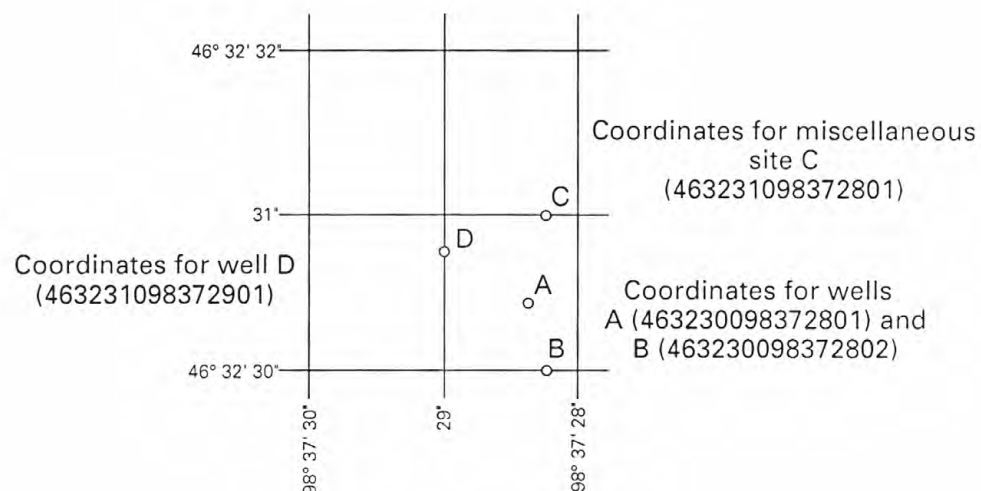


Figure 8.--System for numbering wells and miscellaneous sites
(latitude and longitude).

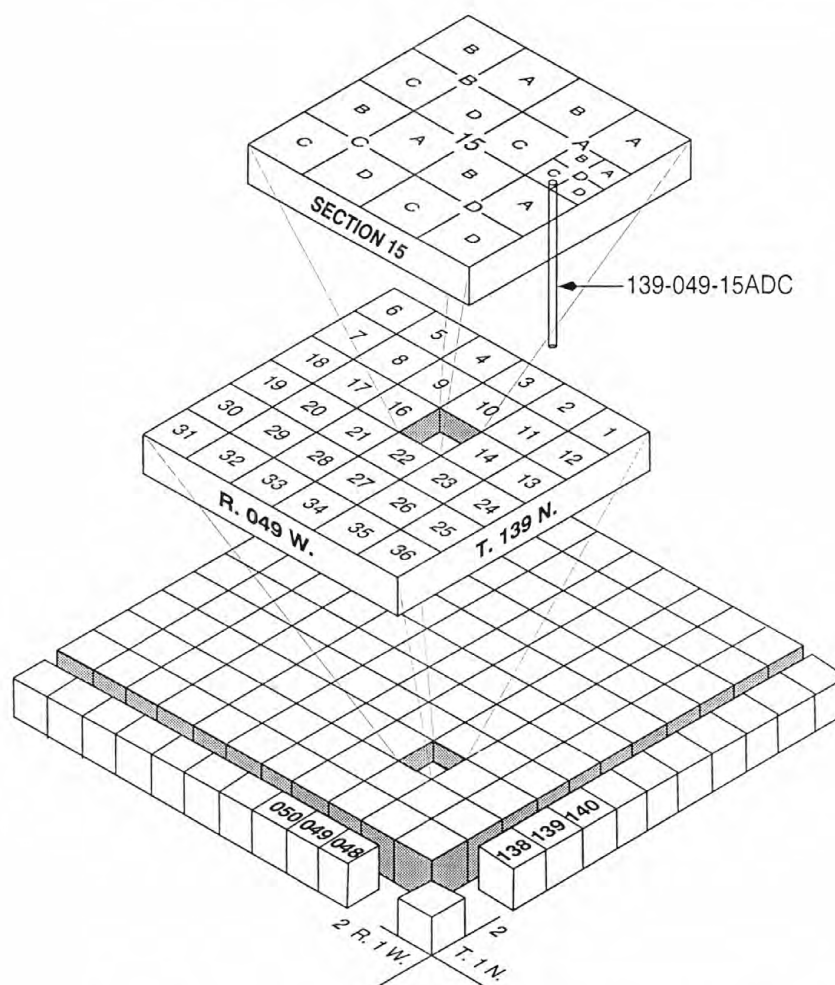


Figure 9.--System for numbering wells and miscellaneous sites
(township and range).

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage, with digital recorders that punch stage values on paper tapes at selected time intervals, with electronic data loggers that store data on an electronic chip, or with satellite data platforms that store data electronically and transmit the data periodically via satellite to a computer based data processing facility. Measurements of discharge are made with current meters using methods adopted by the U.S. 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.

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

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1991 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences.

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

Station manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments 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 gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few 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.

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 records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that flow at it can reasonably be considered equivalent to flow at the present station.

REVISED RECORDS.--Because of new information, published records occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. 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 sea level (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 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 paragraph 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, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

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

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.

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 District Office (address 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 for a discontinued station 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.

Headings for AVERAGE DISCHARGE, EXTREMES FOR PERIOD OF RECORD, and EXTREMES FOR CURRENT YEAR have been deleted and the information contained in these paragraphs, except for the listing of secondary instantaneous peak discharges in the EXTREMES FOR CURRENT YEAR paragraph, is now presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate. No changes have been made to the data presentations of lake contents.

Data table of daily mean values

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

Statistics of monthly mean data

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

Summary statistics

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

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

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily mean values of discharge for the year. At some stations the annual total discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

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

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

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

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

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

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the District Office. (See address on back of title page of this report.)

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

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

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

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

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

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

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

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

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

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 cubic foot per second; to the nearest tenth between 1.0 and 10 cubic feet per second; to whole numbers between 10 and 1,000 cubic feet per second; and to three significant figures for more than 1,000 cubic feet per second. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

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 North Dakota District office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. An example of a computer listing of annual peak discharges for the Knife River at Hazen, N.Dak., gaging station (06340500) is shown in figure 10. An example of the computer generated Log-Pearson Type III annual peak-flow frequency analysis for these data, following the U.S. Water Resources Council guidelines in Bulletin 17B, is shown in tabular form by figure 11 and shown graphically by figure 12.

WATER RESOURCES DATA - NORTH DAKOTA, 1993

STATION		06340500		KNIFE RIVER AT HAZEN, ND				
AGENCY: USGS		STATION LOCATOR		DRAINAGE AREA:		2240.00		SQ MI
STATE: 38		LAT. LONG.		CONTRIBUTING				
COUNTY: 057		471706 1013726		DRAINAGE		2240.00		SQ MI
DISTRICT: 38				GAGE DATUM:		1712.35 (NGVD)		
				BASE DISCHARGE:		1500.00		CFS

WATER YEAR	DATE	PEAK DISCHARGE (CFS)	DISC CODES	GAGE HEIGHT (FT)	GH CODES	MAX GAGE HEIGHT (FT)	DATE	GH CODES
1930	02/21/30	3070.00		23.20	1			
1931	09/22/31	1450.00		11.60				
1932	06/14/32	1300.00		11.10				
1933	03/17/33	2200.00		14.50				
1938	07/05/38	7540.00		23.00				
1939	03/24/39	9300.00		24.47				
1940	07/29/40	1150.00		10.92				
1941	06/09/41	4110.00		20.23				
1942	06/07/42	3120.00		17.10				
1943	03/26/43	26500.00		26.30				
1944	04/03/44	8010.00		23.39				
1945	03/15/45	8690.00		23.99				
1946	03/03/46	3500.00		19.30	1			
1947	06/25/47	6000.00		21.70	2	21.95	03/25/47	1
1948	03/24/48	7070.00		23.62	1			
1949	04/06/49	7760.00		23.30	2	24.10	04/03/49	1
1950	04/17/50	22700.00		25.93				
1951	03/30/51	9000.00		25.36	1			
1952	04/07/52	20200.00		25.83				
1953	06/14/53	3440.00		17.31				
1954	04/08/54	3880.00		18.06				
1955	03/13/55	1400.00	2	11.35				
1956	03/21/56	6630.00		23.76	1			
1957	03/01/57	1590.00		12.49	1			
1958	03/28/58	3500.00	2	19.82	1			
1959	03/24/59	4930.00		20.14				
1960	03/27/60	7230.00		23.13	1			
1961	03/03/61	488.00		9.62	12	9.72	03/02/61	1
1962	05/31/62	3860.00		17.48				
1963	06/10/63	1050.00		9.63				
1964	06/18/64	5170.00		20.17				
1965	04/15/65	3330.00		15.99				
1966	06/24/66	35300.00		27.01				
1967	03/25/67	7980.00		23.88				
1968	03/06/68	1800.00		18.37	1			
1969	04/07/69	11800.00		24.75				
1970	05/11/70	8180.00		23.83				
1971	03/17/71	4320.00		18.79	1			
1972	03/15/72	19000.00		26.17	1			
1973	03/02/73	3900.00		21.44	1			
1974	03/03/74	1350.00		14.28	1			
1975	05/01/75	6600.00		22.60	2	23.37	04/24/75	1
1976	03/19/76	3000.00		18.00	1			
1977	06/19/77	1200.00		9.75	2	11.69	03/11/77	1
1978	03/27/78	11000.00		25.10	1			
1979	04/18/79	5440.00		20.26				
1980	06/15/80	1620.00		10.58				
1981	02/18/81	900.00		9.92	1			
1982	03/31/82	10500.00		25.14	1			
1983	03/13/83	5300.00		23.00	1			
1984	03/21/84	2500.00		14.50	1			
1985	05/13/85	1540.00		10.10				
1986	03/04/86	8800.00		24.00				
1987	03/23/87	8550.00		23.80				
1988	03/24/88	450.00		7.47	1			
1989	03/11/89	1000.00		11.90				
1990	08/25/90	1940.00		10.84				
1991	03/14/91	100.00		3.48		5.24	03/05/91	1
1992	03/01/92	370.00		6.56	1	7.85	02/28/92	1
1993	07/23/93	5100.00		19.52				

Figure 10.--Example of computer printout of annual peak discharges
for the period of record on the Knife River at Hazen

GM J407 VER 3.7
REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 2/25/94 AT 1135 SEQ 1.0001

OPTIONS IN EFFECT -- PLOT BCPU LGPT NODB PPOS NORS EXPR CLIM

STATION - 06340500 /USGS KNIFE RIVER AT HAZEN, ND 1930-1993 06340500 /USGS

I N P U T D A T A S U M M A R Y

-- YEARS OF RECORD --	HISTORIC	HISTORIC	GENERALIZED	STD. ERROR OF	SKEW	GAGE BASE	USER-SET OUTLIER CRITERIA	
SYSTEMATIC	HISTORIC	PEAKS	SKEW	GENERAL. SKEW	OPTION	DISCHARGE	HIGH OUTLIER	LOW OUTLIER
60	0	0	-0.400	--	WRC WEIGHTED	0.0	--	--

***** NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *****
***** USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *****

WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE. 0.0
WCF198I-LOW OUTLIERS BELOW FLOOD BASE WERE DROPPED. 1 157.7
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 69367.9

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE DISCHARGE	FLOOD BASE EXCEEDANCE PROBABILITY	LOGARITHMIC MEAN	LOGARITHMIC STANDARD DEVIATION	LOGARITHMIC SKEW
SYSTEMATIC RECORD	0.0	1.0000	3.5675	0.4828	-0.615
W R C ESTIMATE	157.7	0.9833	3.5834	0.4460	-0.265

ANNUAL FREQUENCY CURVE ORDINATES -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	W R C ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR W R C ESTIMATES	
				LOWER	UPPER
0.9950	--	111.9	--	--	--
0.9900	--	170.8	--	--	--
0.9500	657.3	499.3	624.9	443.8	896.0
0.9000	1001.6	842.9	965.2	716.7	1314.3
0.8000	1640.5	1521.1	1611.4	1243.8	2079.1
0.5000	4010.0	4137.1	4010.0	3219.0	5006.0
0.2000	9191.8	9580.5	9328.8	7241.6	12156.5
0.1000	13831.4	13991.4	14231.8	10590.5	19186.2
0.0400	20993.3	20072.2	21972.2	15492.1	30812.9
0.0200	27214.9	24778.0	29075.3	19574.8	41484.8
0.0100	34145.4	29517.0	37108.3	23985.4	53866.0
0.0050	41797.4	34245.7	46584.9	28725.7	68037.6
0.0020	53039.1	40424.3	59819.9	35497.9	89653.6

Figure 11.--Example of computer printout for annual peak flow frequency analysis for the Knife River at Hazen.

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 2/25/94 AT 1135 SEQ 1.0001

STATION - 06340500 /USGS KNIFE RIVER AT HAZEN, ND 1930-1993 06340500 /USGS

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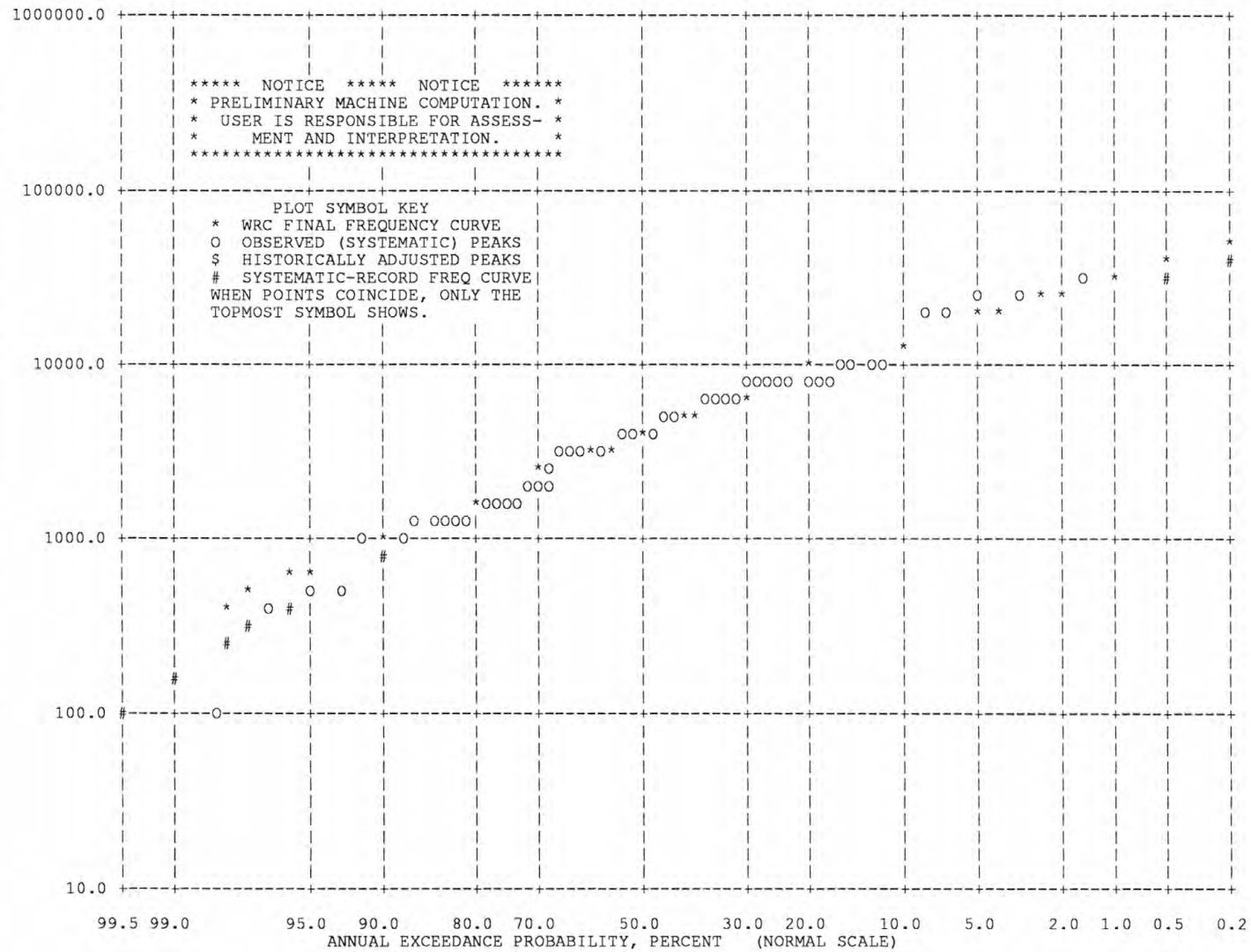


Figure 12.--Example of computer printout for peak flow frequency curve for the Knife River at Hazen.

Current flow data at U.S. Geological Survey gaging stations are available upon request, usually within less than one month following retrieval of the recorded data from the field site. After primary analysis the data are available in a computer format that shows hourly water level fluctuations, adjustments required for accurate computation of daily flows, and other details of the record analysis (see fig. 13). In this "primary computation" form, the data are considered provisional and subject to revision until published.

Many other statistics and data formats are available upon request. The information generally is available on a timely basis at no charge to the user; however, large requests or those specifically tailored to individual data-user's needs may be provided at a nominal fee. 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.

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 one or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a 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, a series of discrete values punched at short intervals on a paper tape, or electronically stored data from a data logger or satellite data platform. 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 2.

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.

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, specific conductance, pH, and dissolved oxygen, need to be made on-site 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 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS OF 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 U.S. Geological Survey North Dakota 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. Some 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. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals depends on flow conditions and other factors which must be evaluated by the collector.

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 U.S. Geological Survey North Dakota 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. 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, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are published with the water-quality records for each surface-water station in this report.

06340500
 KNIFE RIVER AT HAZEN, ND
 OUTPUT PARAMETER 00060 STORE STATISTIC(S) 00003
 PROVISIONAL DATA FOR WATER YEAR ENDING SEPT. 30, 1993

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
 PRIMARY COMPUTATIONS OF GAGE HEIGHT AND DISCHARGE
 DATE PROCESSED: 02-25-1994 @ 10:37 BY HARKNESS
 INPUT DD: FROM DCP

STATE 38 DIST 380
 RATINGS USED --
 STNRD 17.0 09/30/90 (2400)

TEST DIFF:***** PUNCH INTERVAL: 90 MIN

DATE -----	MAX GH	MIN GH	MEAN GH	MEAN DISCH	SHIFT ADJ	DATUM CORR	STAGE, IN HUNDREDTHS OF FEET, AT INDICATED HOURS															
	/DISCH <TIME>	/DISCH <TIME>					0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200				
06/08/93	2.41 92 <2400>	1.62 29 <0000>	1.82	42	-0.14W	0.01	162 178	163 178	164 179	167 186	170 189	172 190	173 190	173 192	175 194	176 198	177 234	178 241				
06/09/93	4.40 368 <2400>	2.41 92 <0000>	3.57	242	-0.12W	0.01	249 354	256 371	284 389	305 405	316 417	321 426	323 431	324 433	324 435	326 436	331 439	339 440				
06/10/93	4.51 387 <0600>	4.12 321 <2300>	4.41	370	-0.09W	0.01	443 449	445 448	447 446	449 444	450 440	451 437	451 427	451 426	451 426	451 422	451 412	450 412				
06/11/93	4.12 321 <0000>	3.45 217 <2300>	3.74	261	-0.12W	0.01	408 370	398 368	397 366	397 364	393 361	390 358	386 355	384 353	381 351	379 349	376 345	373 345				
06/12/93	3.45 217 <0000>	3.11 171 <2400>	3.33	201	-0.13W	0.01	343 337	342 334	342 333	341 330	341 327	341 325	341 322	341 320	341 317	341 315	339 312	338 311				
06/13/93	3.11 171 <0000>	2.79 133 <2300>	2.96	153	-0.14W	0.01	310 297	308 295	307 290	306 289	306 289	304 289	302 283	302 282	301 282	301 280	299 279	298 279				
06/14/93	2.79 133 <0000>	2.54 106 <2400>	2.64	116	-0.14W	0.01	276 261	275 261	274 260	273 259	271 258	270 257	269 256	268 256	266 256	264 255	261 255	261 254				
06/15/93	2.54 106 <0000>	2.33 84 <2300>	2.44	96	-0.14W	0.01	254 243	253 243	252 242	251 242	250 240	249 239	248 237	247 237	247 237	247 236	245 233	244 233				
06/16/93	2.33 84 <0000>	2.18 70 <2100>	2.25	76	-0.14W	0.01	233 224	232 223	231 222	230 222	230 221	229 220	228 219	227 219	227 218	226 218	225 218	225 218				
06/17/93	2.18 70 <0000>	2.09 61 <2300>	2.15	67	-0.14W	0.01	218 216	218 216	218 214	218 214	218 214	218 213	218 213	218 212	218 211	218 210	217 209	217 209				
06/18/93	2.09 61 <0000>	1.98 52 <2300>	2.04	57	-0.14W	0.02	209 203	208 203	207 202	207 202	207 201	207 201	206 200	206 200	206 199	205 199	204 198	204 198				
PERIOD	4.51 387	1.62 29					TIME CORRECTION 0.0															

NOTE. SYMBOLS USED ABOVE HAVE THE FOLLOWING MEANINGS --
 W - SHIFT VARIES BY TIME AND VALUE - V SHIFT

Figure 13.--Example of "primary computation" computer printout for the Knife River at Hazen.

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. 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

Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter ($\mu\text{g/L}$) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's to 100's of nanograms per liter (ng/L). Present data above the $\mu\text{g/L}$ level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey will begin using new trace-element protocols in the near future.

Samples for biochemical-oxygen demand (BOD) and samples for indicator bacteria are analyzed locally. Sediment samples are analyzed in the U.S. Geological Survey laboratory in Iowa City, Iowa or Rolla, Mo. All other samples are analyzed in the U.S. Geological Survey laboratory in Arvada, Colo., or the North Dakota State Water Commission laboratory in Bismarck, N.Dak. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the U.S. 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, and dissolved oxygen 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 recorder, 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 U.S. 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.

When the water-quality data for this report was prepared for publication, not all of the parameter values requested from the analyzing laboratories were available. As these data values are received the computer files will be updated, but no attempt to publish these data will be made.

As part of the quality assurance procedures for the samples analyzed at the North Dakota State Water Commission laboratory, about 5 percent of the samples include a "split" sample which is sent to the U.S. Geological Survey laboratory in Arvada. The "split" samples analyzed in Arvada are not included in this report, but can be obtained upon request from the U.S. Geological Survey North Dakota District office.

Records of Ground-Water Levels

Only water-level data from a network of selected observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the most important aquifers. Locations of the observation wells in this selected network in North Dakota are shown in figure 3.

The complete statewide network included about 750 wells during 1993. About one-half of these wells were measured annually and the others at a variety of frequencies. Thirty-eight wells were equipped with continuous water-level recorders.

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.

Tables of water-level data are presented by counties arranged in alphabetical order. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, an alphanumeric number, derived from the township-range location of the well.

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. 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.

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels measured during the water year. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic-unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and/or screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

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

DATUM.--This entry describes both the measuring point and the land-surface elevation at the well. The measuring point is described physically (such as top of collar, notch in top of casing, plug in pump base and so on), and in relation to land surface (such as 1.3 feet above land-surface datum). The elevation of the land-surface datum is described in feet above (or below) sea level; it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet below land-surface datum and all taped measurements of water levels are listed. For wells equipped with recorders, only abbreviated tables are published; only water-level lows are listed for every fifth day and at the end of the month (EOM). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Taped measurements are not published for wells equipped with continuous recorders. Missing records are indicated by dashes in place of the water level.

Availability of Data

All water-level measurements and recorder data are stored in computer as well as office files and are available in a tabular listing similar to those published in this report. However, ground-water data usually are more easily analyzed when displayed graphically. Examples of computer-generated hydrographs for water levels in three wells published in this report are presented in figures 14a-16.

The hydrograph for well 139-078-27CBB in the McKenzie aquifer in Burleigh County is shown in figures 14a and 14b, and the reported water use for irrigation from the McKenzie aquifer (J. A. Paczkowski, North Dakota State Water Commission, oral commun., 1994) is shown in table 4. Very little fluctuation in water level occurred from 1963 until about 1972 (fig. 14a), and water-use data for the McKenzie aquifer (table 4) indicate that irrigation was insignificant until about 1972. Only annual water-level measurements at the end of the year were made during 1972-74 and the effect of irrigation withdrawals on the aquifer during the irrigation season cannot be detected on the hydrograph. Beginning in 1975, the frequency of water-level measurements was increased, and the annual declines in water level during the irrigation season and the recovery during the winter and spring can be seen in figure 14a and figure 14b. The largest annual decline in the water level, more than 7 feet, during the period of record for this well occurred during 1977. This decline corresponds to the largest reported water use for irrigation from the McKenzie aquifer (table 4).

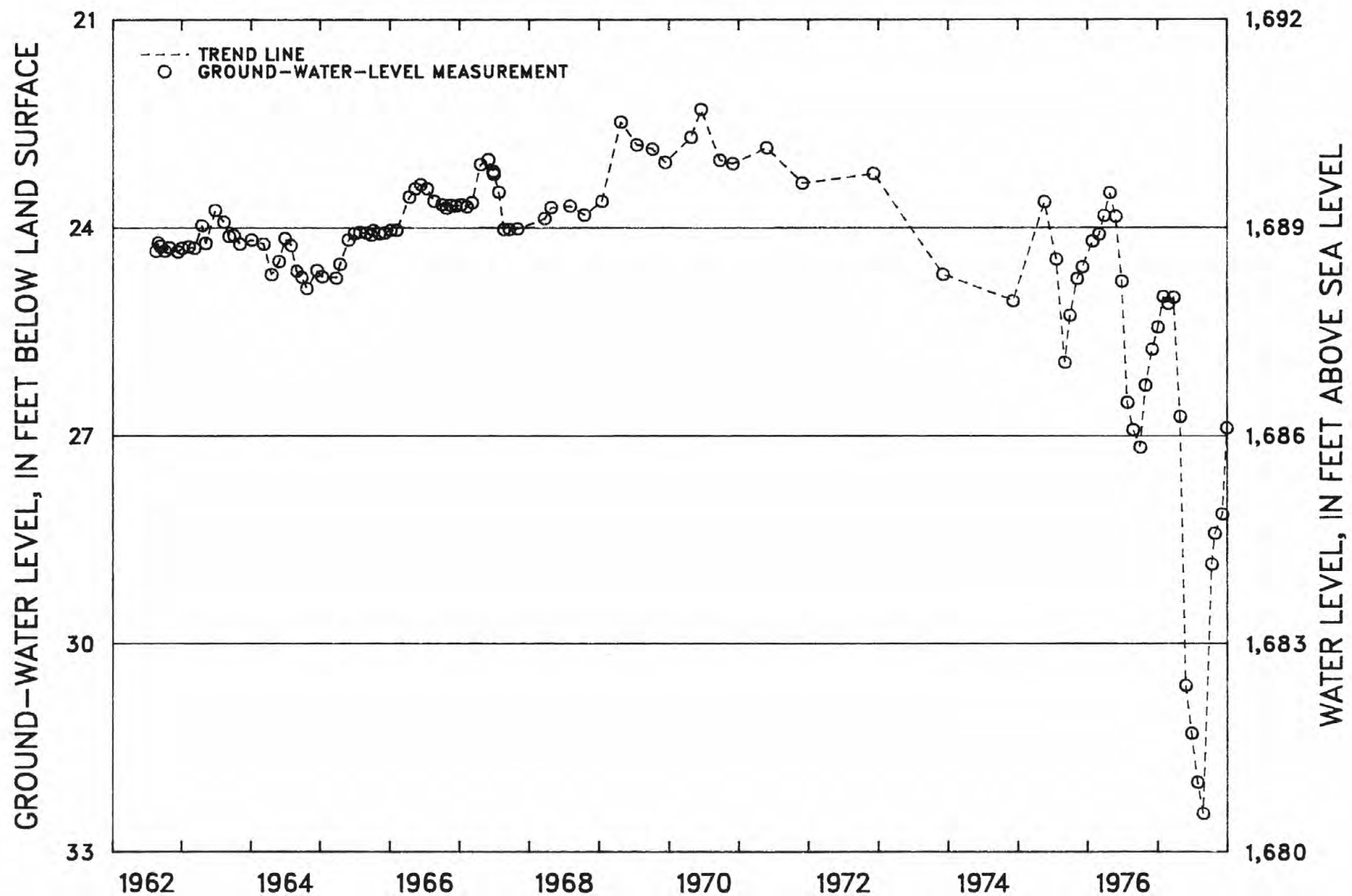


Figure 14a.--Water levels for well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1962-77.

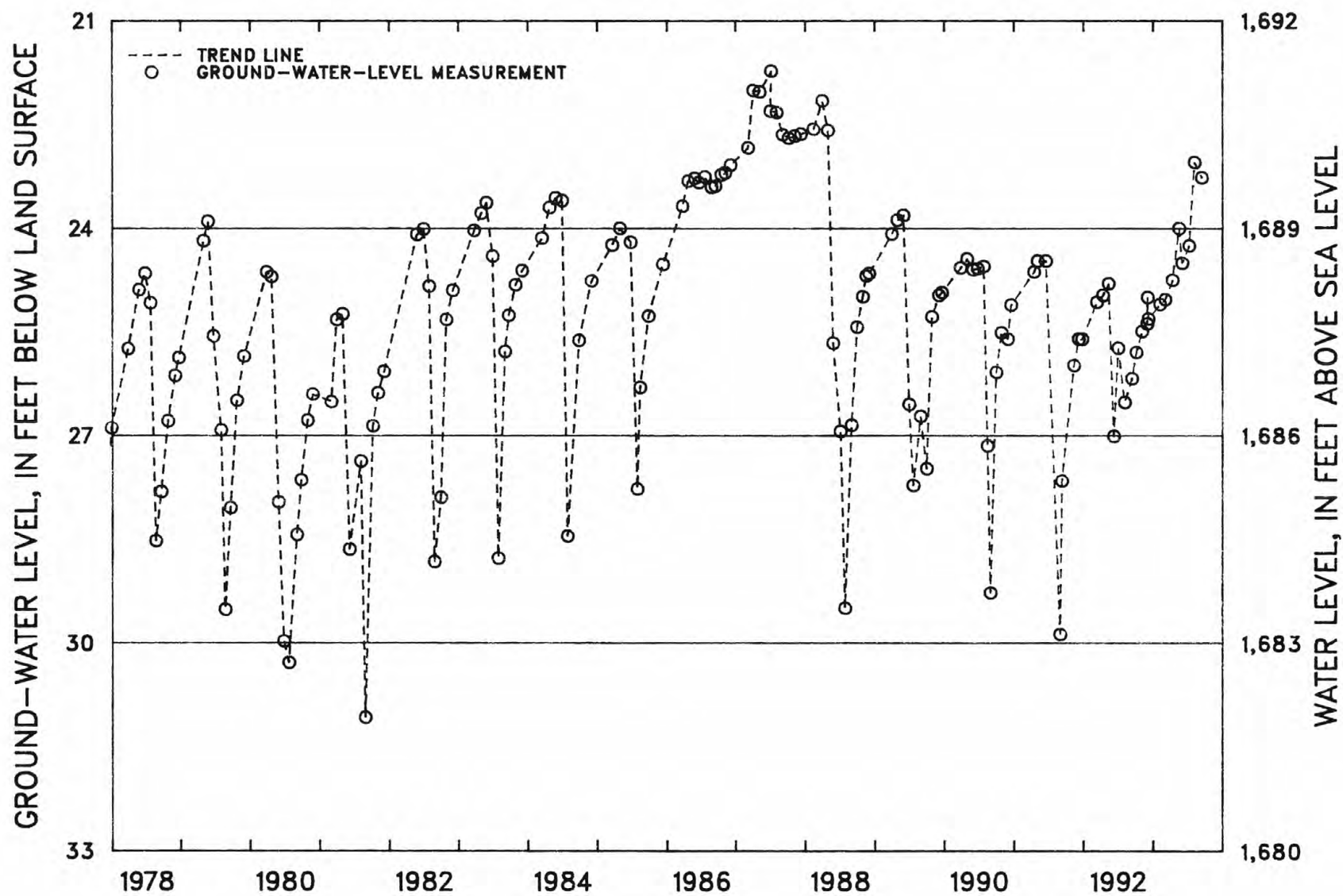


Figure 14b.--Water levels for well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1978-93.

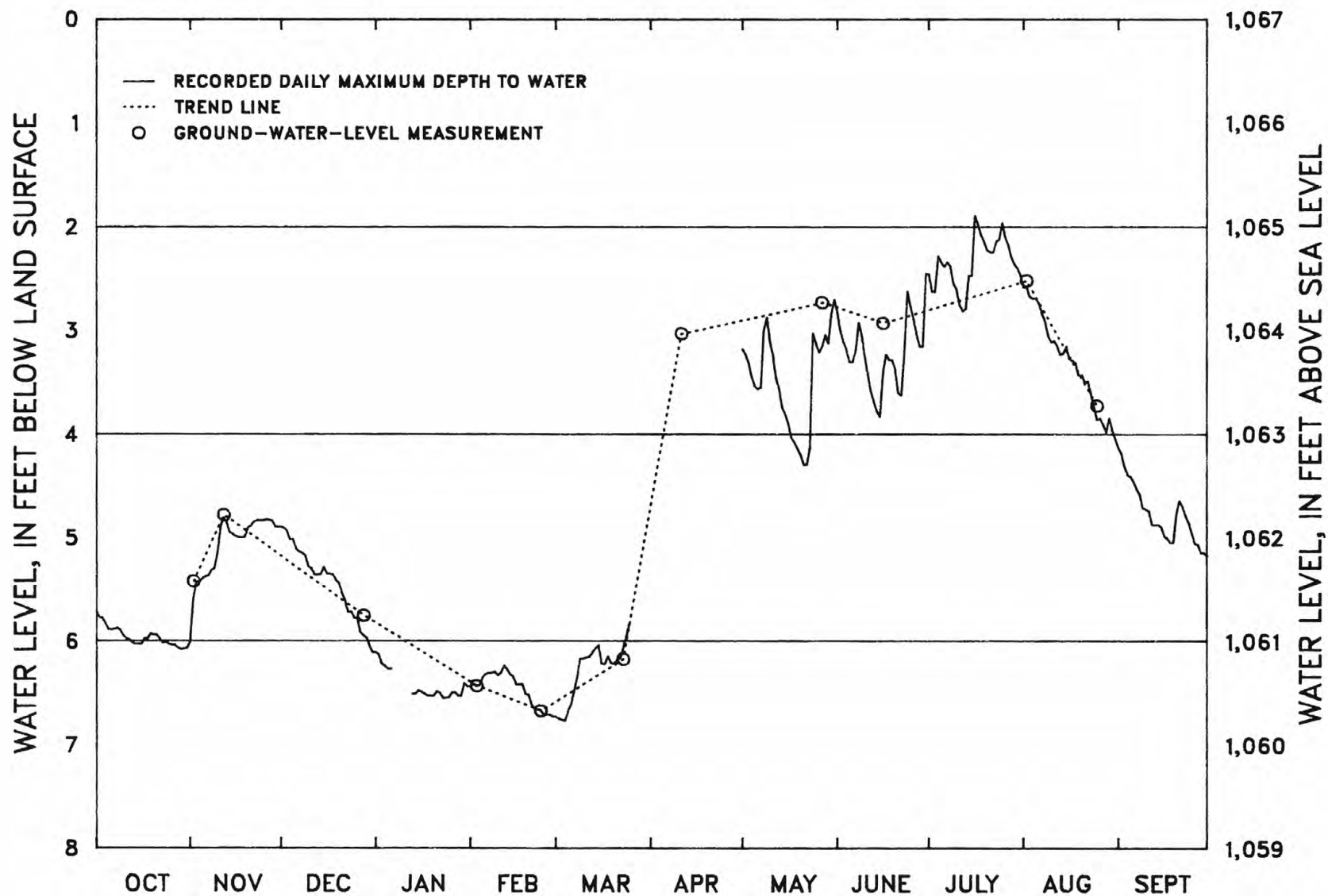


Figure 15.--Water levels for recorder well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County, water year 1993.

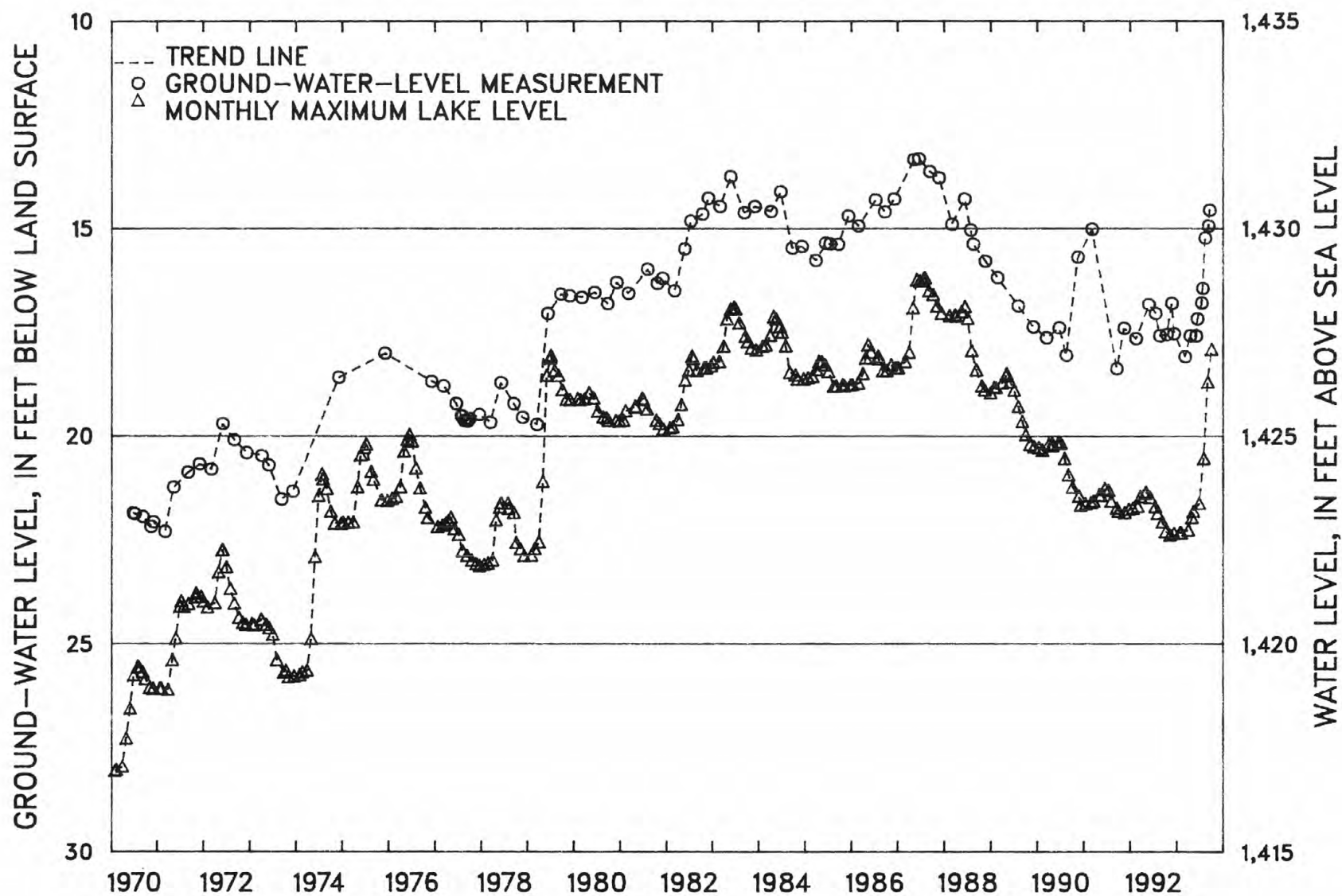


Figure 16.--Water levels for well 153-063-30CBC completed in Spiritwood aquifer, Benson County, and monthly maximum water levels for Devils Lake, 1970-93.

Table 4.--Reported water use, by year, for irrigation from the McKenzie aquifer, in acre-feet

Year	Water use	Year	Water use	Year	Water use	Year	Water use
1969	0	1976	338	1983	486	1990	302
1970	75	1977	781	1984	624	1991	342
1971	150	1978	183	1985	477	1992	283
1972	436	1979	314	1986	20	1993	0
1973	416	1980	475	1987	118		
1974	400	1981	230	1988	600		
1975	182	1982	348	1989	412		

Due to above normal precipitation during the 1986 irrigation season, reported water use for irrigation from the McKenzie aquifer (table 4) was the lowest since 1969. Reported water use also was less in 1987 than any year since 1970. The section of hydrograph for the 1986 through 1987 period for well 139-078-27CBB (see fig. 14b) does not show the decline in water level, during the irrigation season, that has become typical in recent years of larger withdrawals. Due to the drought of 1988, irrigation withdrawals increased to about 600 acre-feet in the McKenzie aquifer. With this increase in ground-water withdrawal from the aquifer, well 139-078-27CBB again experienced a significant decline during the 1988 irrigation season and a subsequent water-level recovery. Although the drought continued in 1989, it was not as severe as during 1988, reported water was not as great, and there was less drawdown. During the 1990 and 1991 water years, the continued drought resulted in lower water levels following the typical post-irrigation recovery than has been recorded in the last ten years. During the 1992 water year, the drought in the recharge area of the McKenzie Aquifer was less severe than recent years, 1988-91, and the decline in water level during the irrigation season was the least since the drought started. There was no reported water use for irrigation during the 1993 water year, probably due to the above normal precipitation and below normal temperatures during the summer months. The water levels rose to the highest levels since the beginning of the drought in 1988, and there was no dip in the hydrograph typical of years with large withdrawals for irrigation.

The 1993 water year hydrograph of water levels in well 134-052-06CCD2 completed in the Sheyenne Delta aquifer in Richland County and equipped with a continuous recorder is shown in figure 15. The recorded daily maximum depth to water and the periodic water-level measurements are shown. The periodic measurements were made with a steel tape. A dotted line was drawn between the periodic measurements to illustrate the definition of changes indicated by periodic taped measurements as compared to definition of changes in water level that is provided when continuous recorder data are available. Although the general trend in water-level changes is provided by the periodic measurements (fig. 15), the water level in this well may fluctuate more than 3 feet between measurements.

Ground-water data are recorded and stored as water levels in feet below land surface. Because the elevation of land surface is determined for all well sites, it is possible to relate water level below land surface to elevation above sea level. Both vertical scales are used on the hydrographs, water level below land surface on the left margin and water-level elevation above sea level on the right margin (figs. 14a-16). Gage datum at lake and reservoir sites also can be directly related to sea level; therefore, both ground-water and surface-water elevation data can be plotted on one hydrograph to show the relationship that exists between the ground-water level, and the level of water in nearby lakes and reservoirs. The hydrographs for well 153-063-30CBC in Benson County and Devils Lake are shown in figure 16. Such comparison hydrographs are useful tools for analysis of ground-water/surface-water relationships.

Records of Ground-Water Quality

Records of ground-water quality in this report differ from other types of records in that, for most sampling sites, they consist of only one set of measurements for the water year. Changes in quality of ground water ordinarily occur slowly; therefore, for general purposes, one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the changes.

Data Collection and Computation

Ground-water quality data published in this report were obtained by analysis of samples collected when routine maintenance was performed on wells in specific areas. Routine well maintenance is scheduled for about one third of the well network each year and a smaller subset of wells is sampled. Consequently, a number of chemical analyses are presented for some counties but none are presented for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality statewide. Such a view can be attained only by considering records for this year in context with similar records obtained for these and other counties in earlier years.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey Techniques of Water-Resources Investigations" manuals listed at the end of the introductory text. The values in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casing.

Data Presentation

The records of ground-water quality are published in a section titled QUALITY OF GROUND WATER immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County and are identified by well number. The prime identification number for wells sampled is the 15-digit number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the well number, depth of well, date of sampling, and other pertinent data are given in the table containing the chemical analyses of the ground water. The REMARK codes listed for surface-water-quality records are also applicable to ground-water-quality records.

ACCESS TO WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other Federal agencies to develop and manage our water resources. As part of the Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and retrieval of water data collected through its activities. The National Water Data Storage and Retrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

- * Station Header File - Contains descriptive information on more than 440,000 sites throughout the United States and its territories where the U.S. Geological Survey collects or has collected data.
- * Daily Values File - Contains more than 220 million daily values of stream flows, stages, reservoir contents, water temperatures, specific conductances, sediment concentrations, sediment discharges, and ground-water levels.
- * Peak Flow File - Contains approximately 500,000 maximum (peak) streamflow and gage-height values at surface-water sites.
- * Water Quality File - Contains approximately 2 million analyses of water samples that describe the chemical, physical, biological, and radio-chemical characteristics of both surface and ground water.
- * Ground-Water Site Inventory Data Base - Contains inventory data for more than 900,000 wells, springs, and other sources of ground water. The data includes site location, geohydrologic characteristics, well-construction history, and one-time field measurements such as water temperature.

In 1976, the U.S. Geological Survey opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the Survey is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requester will be expected to pay all computer costs he/she incurs. Direct access may be obtained by contacting:

U.S. Geological Survey
National Water Data Exchange
421 USGS National Center
Reston, VA 22092

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or 5-1/4 inch floppy disk; and, as noted in the introduction, on CD-ROM discs. Beginning with the 1991 water year, all water-data reports will also be available on CD-ROM discs. All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division's District offices. (See address on the back of the title page.) A limited number of CD-ROM discs will be available for sale by the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225.

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.

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.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded 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.

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

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

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

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.

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.

Crest-stage gage is a device for obtaining the elevation of the flood crest of a stream.

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

Cubic foot per second-day (ft³/s) 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 2,445 cubic meters.

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

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.

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

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

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

Dissolved refers to that material in a representative water sample which passes through a 0.45 μ m membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations 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.

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

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

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

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

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

Hydrologic 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.

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

Micrograms per liter (MG/L, μ g/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

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.

Normal as related to meteorological data published by the National Weather Service are computed as the average value of a meteorological element over a time period. Effective January 1, 1993, the averaging period is 1961 to 1990.

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

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

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

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

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

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

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

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

pH indicates the degree of acidity or alkalinity of water and is expressed in terms of pH units. The pH value of a solution is the negative logarithm of the concentration of hydrogen ions, in moles per liter. A pH of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively less than 7.0 denote increasing acidity and those progressively greater than 7.0 denote increasing alkalinity. The pH of most natural surface waters ranges between 6 and 8.

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

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.

Sea level refers to the National Geodetic Vertical Datum of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

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.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

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).

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 is the height of a water surface above an established datum plane; also gage height.

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. Geological Survey topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimeted. All areas shown are those for the stage when the planimeted map was made.

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 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 concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water 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, 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.

Water year in U.S. Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1985, is called the "1985 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

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

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

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

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

- 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-D2. *Applications of seismic-refraction techniques to hydrologic studies*, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 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.
- 2-E2. *Borehole geophysics applied to ground-water investigations*, by W. S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.
- 2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W. E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 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 in streams by dye tracing*, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 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-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 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-A16. *Measurement of discharge using tracers*, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
- 3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
- 3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F. A. Kilpatrick, R. E. Rathbun, N. Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.
- 3-A19. *Levels of streamflow gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 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 programmed 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-B4. *Regression modeling of ground-water flow*, by R. L. Cooley and R. L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 Pages.
- 3-B4. *Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems*, by R. L. Cooley. USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.
- 3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.
- 3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.
- 3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow*, by E. J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 90 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. J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 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 the determination of organic substances in water and fluvial sediments*, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.
- 5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 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 sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.
- 6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S.A. Leake and D.E. Prudic: U.S.G.S.--TWRI Book 6, Chapter A2. 1991. 68 pages.
- 6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L. J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.
- 6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R. L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.
- 6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details*, by L. J. Torak: USGS--TWRI Book 6, Chapter A5. 1993. 243 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. Schaffranek, 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.

SURFACE-WATER-DISCHARGE AND SURFACE-WATER-QUALITY RECORDS

Remark Codes

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

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

Dissolved Trace-Element Concentrations

NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter ($\mu\text{g/L}$) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Present data above the $\mu\text{g/L}$ level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes. However, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey will begin using new trace-element protocols in water year 1994.

RED RIVER OF THE NORTH BASIN

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05051500 RED RIVER OF THE NORTH AT WAHPETON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 19...	0940	232	512	--	1.0	0.5	--	--	--	--	--
JAN 07...	0905	201	507	--	1.0	1.0	--	--	--	--	--
FEB 16...	1600	221	555	--	-2.0	0.0	--	--	--	--	--
23...	1200	242	667	--	-15.0	0.5	--	--	--	--	--
APR 03...	1610	4190	499	--	6.0	4.5	--	--	--	--	--
06...	1300	2420	570	7.6	3.0	5.5	260	151	56	28	14
13...	0800	1650	780	--	3.0	4.5	--	--	--	--	--
MAY 26...	1230	1220	908	--	16.5	15.0	--	--	--	--	--
JUL 08...	0715	1980	732	--	17.5	19.0	--	--	--	--	--
27...	1225	4850	364	--	27.0	22.0	--	--	--	--	--
AUG 04...	0830	2970	558	--	21.0	20.5	--	--	--	--	--
11...	1445	2520	607	--	31.0	25.0	--	--	--	--	--
SEP 15...	0925	2120	705	7.6	12.0	12.0	340	218	64	44	20

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 06...	10	0.4	7.8	120	11	0.10	17	345	344	0.47	2250
SEP 15...	11	0.5	8.8	150	15	0.20	18	451	481	0.65	2750

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 06...	5	50	40	<1	20	40	<0.1	1	<1	260
SEP 15...	4	60	20	<1	40	20	0.1	1	<1	320

RED RIVER OF THE NORTH BASIN

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

LOCATION.--Lat 46°39'35", long 96°47'44", in SW¹/₄, sec.19, T.137 N., R.48 W., Clay County, MN, Hydrologic Unit 09020104, on right bank 60 ft downstream from bridge on township road, and 1 mi southeast of Hickson, ND.

DRAINAGE AREA.--4,300 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 877.06 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at 1,070 ft above sea level, adjustment of 1912; Lake Traverse, capacity, 137,000 acre-ft, available for flood control, numerous other controlled lakes and ponds, and several powerplants.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	259	225	e245	e135	e300	276	e5000	1480	1820	2230	4290	2150
2	227	210	e280	e140	e305	254	e6200	1480	2090	2010	4090	2140
3	215	215	e260	e140	e310	255	e6300	1460	2020	1920	3790	2140
4	220	215	e220	e140	e315	260	e6300	1450	1770	2110	3550	2150
5	230	207	e195	e140	e320	261	e6000	1400	1560	2180	3350	2160
6	244	155	e175	e140	e325	282	e5500	1270	1460	2270	3180	2170
7	247	133	e165	e140	e330	328	e5000	1170	1320	2220	3040	2180
8	245	154	e140	e145	e335	368	4540	1080	1230	2080	2930	2170
9	247	256	e155	e150	e340	408	3320	1050	1270	1980	2850	2170
10	244	372	e180	e170	e340	429	2250	1050	1330	1900	2770	2160
11	225	339	e200	e200	e340	403	1690	1040	1370	1920	2710	2140
12	209	297	e235	e210	e338	337	1620	1040	1440	2080	2650	2130
13	204	282	e250	e195	e335	318	1740	1020	1490	2240	2580	2120
14	201	223	e250	e185	e330	312	1820	1030	1400	2340	2540	2110
15	203	182	e250	e175	e325	372	1810	1030	1310	2410	2510	2100
16	201	192	e250	e165	e320	402	1740	1010	1300	2500	2500	2100
17	187	257	e250	e165	e315	418	1680	981	1290	2610	2470	2030
18	210	351	e248	e165	e306	442	1720	954	1240	2930	2480	1950
19	229	e380	e245	e160	e295	451	1750	929	1180	3240	2400	2040
20	190	e320	e220	e180	e290	453	1730	866	1130	3440	2290	2130
21	177	e285	e180	e210	e280	476	1710	825	1150	3390	2220	2170
22	172	e260	e160	e235	e270	490	1690	792	1180	3030	2170	2200
23	174	e220	e160	e245	e260	504	1680	757	1200	2600	2160	2200
24	184	e230	e195	e250	e255	556	1710	772	1320	2280	2150	2190
25	198	e230	e210	e250	e250	756	1810	812	1450	2250	2160	2180
26	204	e210	e195	e265	242	e1000	1890	982	2080	2580	2160	2170
27	204	e185	e190	e275	235	e1500	1750	1180	2660	3410	2170	2150
28	204	e165	e185	e275	257	e2400	1600	1310	2910	3820	2190	2130
29	219	e140	e170	e280	---	e2800	1520	1290	2850	4190	2190	2120
30	236	e190	e150	e285	---	e3300	1480	1260	2580	4350	2180	2110
31	235	---	e130	e295	---	e3700	---	1360	---	4370	2170	---
TOTAL	6644	7080	6338	6105	8463	24511	84550	34130	48400	82880	82890	64060
MEAN	214	236	204	197	302	791	2818	1101	1613	2674	2674	2135
MAX	259	380	280	295	340	3700	6300	1480	2910	4370	4290	2200
MIN	172	133	130	135	235	254	1480	757	1130	1900	2150	1950
AC-FT	13180	14040	12570	12110	16790	48620	167700	67700	96000	164400	164400	127100

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1993, BY WATER YEAR (WY)

	MEAN	323	284	261	249	286	711	1634	938	926	791	507	453
MAX	1312	900	817	747	745	1543	4165	3394	2485	2674	2674	2135	
(WY)	1987	1987	1986	1986	1987	1986	1978	1986	1986	1993	1993	1993	
MIN	2.02	.000	.000	4.95	14.0	75.9	165	22.0	86.4	73.4	35.6	12.6	
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1976	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1975 - 1993
ANNUAL TOTAL	139280	456051	
ANNUAL MEAN	381	1249	614
HIGHEST ANNUAL MEAN			1604
LOWEST ANNUAL MEAN			53.1
HIGHEST DAILY MEAN	1700	Mar 10	12000
LOWEST DAILY MEAN	125	Jan 21	.00
ANNUAL SEVEN-DAY MINIMUM	132	Jan 17	.00
INSTANTANEOUS PEAK FLOW		6400	12900
INSTANTANEOUS PEAK STAGE		28.30	35.81
ANNUAL RUNOFF (AC-FT)	276300	904600	444500
10 PERCENT EXCEEDS	633	2650	1430
50 PERCENT EXCEEDS	330	929	340
90 PERCENT EXCEEDS	181	183	74

e Estimated.

RED RIVER OF THE NORTH BASIN

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05051522 RED RIVER OF THE NORTH AT HICKSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (00410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 01...	0845	258	--	627	--	15.5	8.0	--	--	--	--
NOV 12...	1110	294	--	658	--	3.0	2.0	--	--	--	--
JAN 13...	1320	195	--	563	--	-8.0	0.5	--	--	--	--
FEB 18...	1000	307	--	575	--	-3.0	0.0	--	--	--	--
APR 03...	1150	6370	--	486	--	11.0	1.0	--	--	--	--
05...	1000	--	6000	492	--	8.0	5.0	--	--	--	--
MAY 27...	1030	1160	--	801	--	12.5	15.0	--	--	--	--
JUL 08...	1325	2080	--	751	--	22.5	20.0	--	--	--	--
17...	0905	2560	--	606	--	27.0	22.0	--	--	--	--
18...	1300	2970	--	592	--	29.0	23.5	--	--	--	--
23...	1600	2510	--	616	--	22.5	22.0	--	--	--	--
27...	0650	3440	--	500	--	27.0	22.5	--	--	--	--
AUG 03...	1455	3710	--	530	--	24.0	22.0	--	--	--	--
12...	0910	2640	--	608	--	22.0	24.0	--	--	--	--
SEP 15...	1600	2110	--	688	8.0	16.0	15.5	340	218	64	43
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
SEP 15...	19	11	0.5	8.8	150	15	0.20	18	449	478	0.65
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
SEP 15...	2720	4	60	10	<1	40	10	<0.1	1	<1	280

RED RIVER OF THE NORTH BASIN

05051600 WILD RICE RIVER NEAR RUTLAND, ND

LOCATION.--Lat 46°01'20", long 97°30'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.130 N., R.55 W., Sargent County, Hydrologic Unit 09020105, on right bank 1,000 ft upstream from bridge on county highway, 2 mi south of Rutland, and 10 mi upstream from Lake Tewaukon.

DRAINAGE AREA.--546 mi², of which about 250 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1959 to current year (seasonal records only since 1982).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,197.73 ft above sea level. Prior to Dec. 11, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 300 ft³/s, Mar. 28, gage height, 6.12 ft, backwater from ice; no flow Mar. 1-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	194	18	12	59	126	17
2	---	---	---	---	---	.00	180	16	12	57	113	15
3	---	---	---	---	---	.00	159	14	12	57	100	14
4	---	---	---	---	---	.00	139	13	12	60	90	13
5	---	---	---	---	---	.00	128	9.1	11	60	81	12
6	---	---	---	---	---	.00	112	7.1	10	57	73	12
7	---	---	---	---	---	.00	95	6.7	10	55	62	11
8	---	---	---	---	---	.00	80	6.6	12	54	54	11
9	---	---	---	---	---	.00	69	6.2	13	64	49	10
10	---	---	---	---	---	.00	67	6.1	13	71	44	9.6
11	---	---	---	---	---	.00	75	5.7	12	71	39	8.9
12	---	---	---	---	---	.00	75	5.2	11	65	36	8.4
13	---	---	---	---	---	.00	78	4.8	9.3	62	33	7.8
14	---	---	---	---	---	.00	77	4.2	7.7	60	33	7.4
15	---	---	---	---	---	.00	68	4.2	7.1	58	30	7.2
16	---	---	---	---	---	.00	60	4.1	7.5	64	29	6.7
17	---	---	---	---	---	.00	53	4.0	7.7	67	27	6.3
18	---	---	---	---	---	.00	46	4.1	8.5	67	26	6.2
19	---	---	---	---	---	.00	40	3.8	9.2	81	26	6.1
20	---	---	---	---	---	.00	33	3.3	9.5	101	33	6.2
21	---	---	---	---	---	.00	29	3.0	10	145	40	6.4
22	---	---	---	---	---	.00	27	2.9	10	179	40	6.5
23	---	---	---	---	---	.00	25	3.6	11	185	38	6.5
24	---	---	---	---	---	.00	25	6.3	11	180	39	6.3
25	---	---	---	---	---	e.20	21	9.8	11	185	39	5.9
26	---	---	---	---	---	e1.0	19	10	15	171	35	5.5
27	---	---	---	---	---	e30	18	9.1	39	178	31	5.3
28	---	---	---	---	---	e200	19	7.8	58	182	28	5.1
29	---	---	---	---	---	251	21	7.4	60	177	24	5.0
30	---	---	---	---	---	220	20	8.2	62	165	21	4.8
31	---	---	---	---	---	204	---	9.7	---	145	19	---
TOTAL	---	---	---	---	---	906.20	2052	224.0	493.5	3182	1458	253.1
MEAN	---	---	---	---	---	29.2	68.4	7.23	16.4	103	47.0	8.44
MAX	---	---	---	---	---	251	194	18	62	185	126	17
MIN	---	---	---	---	---	.00	18	2.9	7.1	54	19	4.8
AC-FT	---	---	---	---	---	1800	4070	444	979	6310	2890	502

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

	MEAN	.54	.36	.14	.004	.068	15.7	39.2	12.5	9.54	13.6	3.43	1.16
MAX	4.81	5.87	2.90	.10	1.00	138	347	69.3	61.4	103	47.0	9.07	
(WY)	1963	1963	1963	1963	1976	1966	1969	1986	1967	1993	1993	1969	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1960	1960	1960	1960	1960	1965	1977	1977	1973	1961	1960	1960	

SUMMARY STATISTICS

WATER YEARS 1960 - 1993

ANNUAL MEAN	a8.36	
HIGHEST ANNUAL MEAN	a44.8	1969
LOWEST ANNUAL MEAN	a.000	1977
HIGHEST DAILY MEAN	1130	Apr 9 1969
LOWEST DAILY MEAN	.00	Oct 1 1959
ANNUAL SEVEN-DAY MINIMUM	.00	Oct 1 1959
INSTANTANEOUS PEAK FLOW	1270	Apr 8 1969
INSTANTANEOUS PEAK STAGE	8.78	Apr 8 1969
ANNUAL RUNOFF (AC-FT)	a6050	
10 PERCENT EXCEEDS	19	
50 PERCENT EXCEEDS	.00	
90 PERCENT EXCEEDS	.00	

e Estimated.

a Based on complete water years only (1960-82, 1984).

RED RIVER OF THE NORTH BASIN

49

05051600 WILD RICE RIVER NEAR RUTLAND, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 17...	1320	0.2	1300	--	0.0	0.5	--	--	--	--	--
MAR 30...	1215	221	695	--	4.5	4.0	--	--	--	--	--
APR 02...	1430	180	639	--	11.5	6.0	--	--	--	--	--
06...	1600	110	670	7.5	4.0	4.5	290	131	61	33	24
12...	1915	75	755	--	6.0	7.0	--	--	--	--	--
MAY 26...	0900	10	1590	--	14.5	--	--	--	--	--	--
JUN 03...	1310	12	1680	--	17.5	17.5	--	--	--	--	--
15...	1435	6.8	1730	--	16.5	17.0	--	--	--	--	--
JUL 08...	1120	54	1150	--	21.0	19.0	--	--	--	--	--
19...	1420	82	1170	--	24.5	23.0	--	--	--	--	--
AUG 11...	1200	39	1170	--	27.5	24.5	--	--	--	--	--
SEP 14...	1855	7.6	1420	8.3	8.0	13.0	610	312	110	82	88

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L AS SIO2) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 06...	15	0.6	14	190	12	0.10	16	429	443	0.60	132
SEP 14...	23	2	26	450	41	0.20	24	1010	1080	1.47	22.2

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 06...	2	80	50	<1	40	20	<0.1	2	<1	310
SEP 14...	6	110	20	<1	110	60	0.1	1	<1	650

RED RIVER OF THE NORTH BASIN

05053000 WILD RICE RIVER NEAR ABERCROMBIE, ND

LOCATION.--Lat 46°28'05", long 96°47'00", in NE¹/₄NE¹/₄ sec.36, T.135 N., R.49 W., Richland County, Hydrologic Unit 09020105, on right bank 420 ft upstream from bridge on county highway, 0.75 mi upstream from rubble masonry dam which serves as control, 3.2 mi northwest of Abercrombie, and 7 mi downstream from Antelope Creek.

DRAINAGE AREA.--2,080 mi², of which about 590 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1388: 1939, 1941(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 907.94 ft above sea level. Prior to Dec. 7, 1939, nonrecording gage at site 420 ft downstream at datum 5.0 ft lower. Dec. 7, 1939, to Nov. 24, 1952, nonrecording gage at site 0.75 mi downstream at present datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor. Some regulation by Fish and Wildlife Service reservoirs, of which Lake Tewaukon is the largest. Some small diversions for irrigation.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in spring of 1897 reached a stage of 27.5 ft, present site and datum, from floodmarks pointed out by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.00	e1.7	e.00	e.00	2.1	3600	171	257	294	1620	166
2	.16	.00	e1.5	e.00	e.00	2.3	3480	163	268	248	1220	164
3	.12	.00	e1.4	e.00	e.00	2.3	3140	156	218	214	926	161
4	.09	.00	e1.3	e.00	e.00	2.4	2700	149	170	202	773	156
5	.05	.00	e1.1	e.00	e.00	2.6	2130	141	144	332	702	150
6	.01	.00	e1.0	e.00	e.20	2.7	1480	134	125	268	661	144
7	.00	.00	e.96	e.00	e.50	3.1	838	131	108	357	629	138
8	.00	.88	e.92	e.00	e.80	3.7	449	126	105	391	594	133
9	.00	.89	e.91	e.00	e1.0	4.3	327	122	109	294	555	127
10	.00	.89	e.89	e.00	e1.5	3.8	290	119	108	241	514	121
11	.00	.86	e.86	e.00	e2.0	2.0	275	118	108	231	475	114
12	.00	e2.0	e.83	e.00	e2.5	e1.8	283	118	107	241	442	108
13	.00	e4.5	e.80	e.00	e3.0	e1.4	322	116	100	255	405	103
14	.00	e4.4	e.75	e.00	e3.5	e1.2	303	112	90	266	380	97
15	.00	e4.2	e.70	e.00	4.5	e1.0	247	105	79	291	364	91
16	.00	e4.0	e.65	e.00	4.9	e.90	234	101	79	388	367	86
17	.00	e3.9	e.60	e.00	5.0	e.80	232	98	83	818	365	82
18	.00	e3.8	e.55	e.00	4.5	e.70	226	94	68	1230	341	79
19	.00	e3.6	e.50	e.00	4.4	e.60	216	88	67	1540	316	75
20	.00	e3.3	e.45	e.00	e4.0	e.80	204	84	71	1720	297	73
21	.00	e3.2	e.33	e.00	e3.8	e1.0	195	81	73	1770	282	71
22	.00	e3.1	e.30	e.00	e3.4	e5.0	187	78	72	1690	268	67
23	.00	e3.1	e.25	e.00	e3.1	e1.0	182	77	75	1480	254	65
24	.00	e3.0	e.20	e.00	e2.6	e1.2	193	81	132	1160	238	65
25	.00	e2.8	e.20	e.00	e2.1	e1.4	209	82	175	922	223	64
26	.00	e2.6	e.15	e.00	e1.8	e2.0	234	88	201	1390	210	61
27	.00	e2.5	e.10	e.00	e1.7	e8.0	233	102	319	1820	198	58
28	.00	e2.2	e.05	e.00	e2.0	e9.00	209	108	364	1970	186	56
29	.00	e2.1	e.00	e.00	---	1580	193	107	363	2030	180	54
30	.00	e1.9	e.00	e.00	---	2220	181	121	343	2010	174	51
31	.00	---	e.00	e.00	---	2870	---	185	---	1910	169	---
TOTAL	0.63	63.72	19.95	0.00	62.80	7752.50	22992	3556	4581	27973	14328	2980
MEAN	.020	2.12	.64	.000	2.24	250	766	115	153	902	462	99.3
MAX	.20	4.5	1.7	.00	5.0	2870	3600	185	364	2030	1620	166
MIN	.00	.00	.00	.00	.00	.60	181	77	67	202	169	51
AC-FT	1.2	126	40	.00	125	15380	45600	7050	9090	55480	28420	5910

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1993, BY WATER YEAR (WY)

	MEAN	6.04	5.01	2.51	.76	1.57	130	386	106	100	104	25.8	11.1
MAX	111	60.4	19.2	6.94	37.6	1006	3077	728	929	1787	462	159	
(WY)	1943	1943	1943	1987	1984	1945	1969	1962	1962	1993	1993	1986	
MIN	.000	.000	.000	.000	.000	.000	2.81	.11	.085	.000	.000	.000	
(WY)	1933	1933	1933	1933	1934	1937	1991	1934	1988	1933	1932	1932	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1932 - 1993
ANNUAL TOTAL	14085.28	84309.60	
ANNUAL MEAN	38.5	231	73.7
HIGHEST ANNUAL MEAN			372
LOWEST ANNUAL MEAN			.48
HIGHEST DAILY MEAN	973	Jun 18	9360
LOWEST DAILY MEAN	.00	Sep 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Oct 7	.00
INSTANTANEOUS PEAK FLOW			9540
INSTANTANEOUS PEAK STAGE		17.52	24.58
ANNUAL RUNOFF (AC-FT)	27940	167200	53410
10 PERCENT EXCEEDS	79	491	123
50 PERCENT EXCEEDS	2.1	64	1.4
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

51

05053000 WILD RICE RIVER NEAR ABERCROMBIE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 06...	0740	0.20	--	--	12.5	7.0	--	--	--	--	--
NOV 13...	1250	4.5	1120	--	1.0	0.5	--	--	--	--	--
FEB 17...	1210	4.7	2600	--	-12.0	0.0	--	--	--	--	--
MAR 10...	1620	4.7	2410	--	-9.0	0.0	--	--	--	--	--
MAR 27...	0900	78	738	--	7.5	0.5	--	--	--	--	--
APR 06...	1030	1430	520	7.8	3.0	5.0	190	122	43	19	25
JUN 06...	1350	142	1270	--	16.5	18.0	--	--	--	--	--
JUL 08...	1155	411	870	--	22.5	19.0	--	--	--	--	--
JUL 27...	1000	1890	345	--	26.0	23.0	--	--	--	--	--
AUG 03...	1300	907	910	--	27.0	21.5	--	--	--	--	--
AUG 12...	0725	456	1110	--	18.5	23.5	--	--	--	--	--
SEP 15...	1330	91	1280	8.0	18.0	14.5	570	354	110	71	79

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 06...	21	0.8	11	110	13	0.10	16	311	321	0.44	1240
SEP 15...	22	1	20	350	32	0.20	28	903	1010	1.37	250

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 06...	4	70	90	<1	30	70	<0.1	<1	<1	250
SEP 15...	7	140	20	<1	90	110	<0.1	1	<1	610

LOCATION.--Lat 46°51'40", long 96°47'00", in NW¹/₄NE¹/₄ sec.18, T.139 N., R.48 W., Cass County, Hydrologic Unit 09020104, at waterplant on 4th St. S. in Fargo, 25 mi upstream from mouth of Sheyenne River, and at mi 453.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 1308: 1902-4, 1906-7, 1910-14, 1916, 1918, 1924. WSP 1388: 1905-6, 1917-20 (M), 1935 (M), 1938-39 (M), 1943.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at 1,070 ft above sea level, adjustment of 1912; Lake Traverse, capacity 137,000 acre-ft, available for flood control, other controlled lakes and ponds, and several power-plants. Some small diversions for municipal supply. Figures of daily discharge do not include diversions to cities of Fargo and Moorhead and from Sheyenne River.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1897, reached a stage of 39.1 ft present datum, discharge, 25,000 ft³/s at site 1.5 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901 - 1993, BY WATER YEAR (WY)

MEAN	290	261	217	198	197	638	1663	975	999	828	407	316
MAX	1435	942	800	740	778	3756	9924	4589	5122	5692	3293	2280
(WY)	1987	1907	1987	1986	1987	1966	1969	1986	1962	1962	1993	1993
MIN	.000	.000	.000	.000	.18	26.8	102	8.12	2.87	.000	.000	.000
(WY)	1935	1937	1938	1933	1933	1937	1934	1934	1936	1934	1932	1934

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1901 - 1993

ANNUAL TOTAL	152895		574308				
ANNUAL MEAN	418 (*428)		1573 (*1586)			584	
HIGHEST ANNUAL MEAN						1928	1986
LOWEST ANNUAL MEAN						17.5	1934
HIGHEST DAILY MEAN	2570	Jun 19	9940	Apr 6	24800		Apr 14 1969
LOWEST DAILY MEAN	150	Jan 20	150	Nov 8	.00		Jul 25 1932
ANNUAL SEVEN-DAY MINIMUM	152	Jan 18	158	Dec 30	.00		Jul 25 1932
INSTANTANEOUS PEAK FLOW			10100	Apr 5	25300		Apr 15 1969
INSTANTANEOUS PEAK STAGE			28.27	Apr 5	37.34		Apr 15 1969
INSTANTANEOUS LOW FLOW					.00		Jul 25 1932
ANNUAL RUNOFF (AC-FT)	303300 (*310500)		1139000 (*1151000)		422800		
10 PERCENT EXCEEDS	701		3650		1280		
50 PERCENT EXCEEDS	350		994		293		
90 PERCENT EXCEEDS	183		185		38		

e Estimated.

+ Diversions in acre-feet to cities of Fargo and Moorhead.

* Adjusted for diversions to cities of Fargo and Moorhead.

RED RIVER OF THE NORTH BASIN

53

05054000 RED RIVER OF THE NORTH AT FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT											
01...	1130	250	588	--	23.0	8.5	--	--	--	--	--
NOV											
10...	0920	246	524	--	2.0	1.5	--	--	--	--	--
JAN											
05...	1320	157	640	--	-14.0	1.0	--	--	--	--	--
FEB											
18...	1620	295	650	--	11.0	0.0	--	--	--	--	--
APR											
04...	1025	8780	--	--	2.0	1.5	--	--	--	--	--
05...	1450	9820	436	--	12.0	3.0	--	--	--	--	--
13...	1510	1250	735	--	6.5	6.0	--	--	--	--	--
MAY											
27...	0820	1250	665	--	10.0	15.0	--	--	--	--	--
JUL											
09...	0825	2700	724	--	25.0	19.5	--	--	--	--	--
17...	1430	5610	355	--	28.5	22.0	--	--	--	--	--
20...	1005	6100	522	--	22.5	22.0	--	--	--	--	--
22...	1810	5760	505	--	18.5	21.0	--	--	--	--	--
29...	1805	5620	394	--	30.0	24.0	--	--	--	--	--
AUG											
03...	0825	5960	518	--	15.5	21.5	--	--	--	--	--
04...	1340	5150	556	--	26.0	22.5	--	--	--	--	--
12...	1515	3120	673	--	24.0	24.0	--	--	--	--	--
SEP											
17...	0840	2300	728	7.7	10.0	9.0	360	224	68	45	22

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
SEP											
17...	12	0.5	9.1	160	16	0.20	18	473	490	0.67	3040

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
SEP										
17...	5	60	20	<1	40	10	<0.1	1	<1	340

RED RIVER OF THE NORTH BASIN

05054500 SHEYENNE RIVER ABOVE HARVEY, ND

LOCATION.--Lat 47°42'10", long 99°56'55", in SW¹/₄SE¹/₄ sec.24, T.149 N., R.73 W., Wells County, Hydrologic Unit 09020202, on right bank just downstream from county road, and 4.5 mi south of Harvey.

DRAINAGE AREA.--424 mi², of which about 270 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1955 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,547.30 ft above sea level.

REMARKS.--Records fair except those for period of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	2.5	e2.8	e.26	e.14	e.44	e45	1.6	5.3	17	81	7.8
2	1.7	2.4	e2.7	e.25	e.16	e.54	e35	1.6	6.1	19	66	7.7
3	2.1	e2.4	e2.7	e.23	e.18	e.78	e26	1.6	7.6	18	57	7.4
4	2.1	e2.5	e2.5	e.21	e.23	e1.0	e17	1.5	8.0	17	49	6.7
5	1.5	e2.6	e2.4	e.20	e.32	e1.4	12	1.2	7.8	16	42	6.0
6	1.1	e2.5	e2.2	e.18	e.41	e1.6	9.6	1.1	8.2	17	36	5.0
7	1.3	e2.4	e2.1	e.17	e.50	e1.8	9.1	4.1	7.7	19	31	3.9
8	1.5	e2.4	e1.9	e.16	e.62	e2.0	8.2	4.3	11	19	27	3.7
9	1.6	e2.3	e1.9	e.15	e.68	e2.2	7.5	8.2	16	21	22	3.7
10	1.5	e2.5	e2.0	e.13	e.72	e2.8	7.4	6.7	13	20	19	3.7
11	1.8	e2.7	e2.1	e.12	e.70	e2.5	7.9	6.4	14	20	18	3.7
12	2.5	e2.9	e2.0	e.11	e.66	e2.4	6.4	6.9	14	18	21	3.6
13	1.4	e3.1	e1.9	e.10	e.62	e2.3	4.8	7.4	16	18	18	3.6
14	1.1	e2.8	e1.6	e.10	e.58	e2.4	4.1	7.3	16	17	18	3.6
15	1.5	e2.5	e1.5	e.09	e.54	e2.5	3.5	5.7	14	17	16	3.6
16	1.4	e2.3	e1.3	e.09	e.52	e2.9	2.7	4.1	14	22	16	3.6
17	1.4	e2.2	e1.2	e.09	e.51	e3.2	2.0	2.7	13	36	15	3.6
18	1.5	e2.0	e1.0	e.08	e.50	e3.5	1.9	2.0	13	33	14	4.8
19	1.4	e2.0	e.92	e.08	e.48	e3.7	1.4	2.0	14	34	13	10
20	1.5	e1.9	e.78	e.08	e.45	e4.0	1.1	2.3	13	36	13	7.5
21	1.4	e1.9	e.68	e.08	e.44	e4.5	.82	6.0	13	42	12	5.2
22	1.4	e2.0	e.63	e.09	e.42	e7.2	.63	8.9	12	72	11	3.8
23	1.3	e2.2	e.57	e.09	e.41	e21	1.4	9.0	15	83	11	3.6
24	1.3	e2.2	e.62	e.08	e.40	e52	3.2	7.7	17	116	10	3.6
25	1.3	e2.1	e.64	e.09	e.38	e85	1.4	6.1	16	149	8.5	3.5
26	1.3	e2.1	e.62	e.09	e.38	e100	1.4	4.8	15	153	8.1	3.5
27	1.4	e2.2	e.56	e.10	e.36	e135	2.8	6.0	15	173	8.6	3.5
28	1.4	e2.3	e.47	e.10	e.35	e125	2.7	5.5	14	205	8.8	3.5
29	1.5	e2.4	e.42	e.09	---	e119	1.9	4.8	15	162	8.7	3.5
30	1.5	e2.6	e.36	e.11	---	e88	1.8	6.8	18	131	9.2	3.4
31	1.7	---	e.31	e.13	---	e64	---	5.6	---	105	8.2	---
TOTAL	47.1	70.9	43.38	3.93	12.66	844.66	230.65	149.9	381.7	1825	696.1	140.3
MEAN	1.52	2.36	1.40	.13	.45	27.2	7.69	4.84	12.7	58.9	22.5	4.68
MAX	2.5	3.1	2.8	.26	.72	135	45	9.0	18	205	81	10
MIN	1.1	1.9	.31	.08	.14	.44	.63	1.1	5.3	16	8.1	3.4
AC-FT	93	141	86	7.8	25	1680	457	297	757	3620	1380	278

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1993, BY WATER YEAR (WY)

	2.45	2.13	.91	.48	2.67	25.0	28.3	13.5	7.43	7.07	2.70	1.69
MEAN	2.45	2.13	.91	.48	2.67	25.0	28.3	13.5	7.43	7.07	2.70	1.69
MAX	11.8	10.4	6.27	4.10	26.7	123	101	62.1	54.0	58.9	25.6	4.79
(WY)	1983	1983	1983	1983	1983	1982	1969	1984	1971	1993	1985	1977
MIN	.43	.26	.090	.000	.000	.000	2.13	1.59	.30	.071	.000	.061
(WY)	1991	1977	1962	1959	1956	1969	1991	1977	1961	1961	1959	1976

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1956 - 1993

ANNUAL TOTAL	961.13	4446.28	
ANNUAL MEAN	2.63	12.2	7.87
HIGHEST ANNUAL MEAN			28.3
LOWEST ANNUAL MEAN			.76
HIGHEST DAILY MEAN	40 Mar 2	205 Jul 28	690 Apr 20 1979
LOWEST DAILY MEAN	.31 Dec 31	.08 Jan 18	.00 Jan 21 1956
ANNUAL SEVEN-DAY MINIMUM	.42 Aug 13	.08 Jan 18	.00 Jan 21 1956
INSTANTANEOUS PEAK FLOW		224 Jul 28	1000 Apr 20 1979
INSTANTANEOUS PEAK STAGE		9.67 Jul 28	10.30 Apr 1 1971
ANNUAL RUNOFF (AC-FT)	1910	8820	5700
10 PERCENT EXCEEDS	4.6	21	18
50 PERCENT EXCEEDS	1.6	2.7	1.5
90 PERCENT EXCEEDS	.47	.32	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

55

05054500 SHEYENNE RIVER ABOVE HARVEY, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
OCT 14...	1710	1.2	1370	8.3	7.0	7.0	65	9.7	85	120	557
NOV 23...	1115	2.2	2090	8.6	1.0	0.0	150	10.0	73	150	742
MAR 29...	1200	146	345	8.1	2.0	1.5	90	--	--	78	125
APR 09...	1900	9.8	840	8.1	10.0	8.5	--	--	--	110	314
MAY 19...	1245	2.1	1360	8.1	13.0	12.0	70	--	--	180	553
AUG 11...	1645	23	838	7.7	29.0	--	110	--	--	240	356
SEP 07...	1100	5.2	1150	8.1	17.0	13.0	--	--	--	190	442

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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
OCT 14...	30	12	260	81	10	4.2	160	16	0.30	28	846
NOV 23...	27	21	440	85	15	7.9	330	28	0.50	26	1330
MAR 29...	17	8.5	41	50	2	9.8	48	3.9	0.10	12	219
APR 09...	24	13	140	71	6	7.0	140	9.8	0.20	22	546
MAY 19...	34	22	260	75	9	7.7	210	16	0.40	27	911
AUG 11...	50	27	91	44	3	10	93	9.2	0.20	34	531
SEP 07...	43	19	200	69	6	4.9	150	12	0.30	32	727

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	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)
OCT 14...	874	1.19	2.83	<0.010	--	<0.050	0.020	0.060	40	2	65
NOV 23...	1380	1.88	8.20	0.030	0.090	0.120	0.160	0.130	20	4	<100
MAR 29...	231	0.31	91.1	0.030	0.510	0.540	0.100	0.230	170	2	28
APR 09...	560	0.76	14.8	0.010	0.087	0.097	0.040	0.170	20	3	43
MAY 19...	954	1.30	5.41	<0.010	--	<0.050	0.030	0.220	10	4	61
AUG 11...	555	0.75	33.9	<0.010	--	0.150	0.060	0.450	<10	4	79
SEP 07...	766	1.04	10.8	--	--	--	--	--	60	2	80

RED RIVER OF THE NORTH BASIN

05054500 SHEYENNE RIVER ABOVE HARVEY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	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)	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)
OCT 14...	770	<1.0	1	<1	<1	40	<1	100	39	<0.1	1
NOV 23...	1100	<1.0	<1	<1	1	80	<1	190	20	<0.1	1
MAR 29...	150	<1.0	<1	<1	1	210	<1	22	82	0.1	<1
APR 09...	410	<1.0	<1	<1	1	79	<1	65	42	<0.1	<1
MAY 19...	800	<1.0	<1	<1	<1	43	<1	120	47	0.5	<1
AUG 11...	30	<1.0	<1	<1	2	78	<1	56	71	0.1	<1
SEP 07...	600	<1.0	<1	<1	5	72	<1	78	36	0.1	1

DATE	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	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)	CYANIDE TOTAL (MG/L AS CN) (00720)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	2, 4-D TOTAL (UG/L) (99906)
OCT 14...	2	<1	160	--	<3	<0.010	--	--	--	--
NOV 23...	<1	<1	180	5	<10	0.030	--	--	--	--
MAR 29...	1	<1	82	4	3	<0.010	--	--	--	--
APR 09...	2	<1	130	3	<3	<0.010	--	--	--	--
MAY 19...	2	<1	210	5	<3	<0.010	--	--	--	--
AUG 11...	3	<1	230	6	10	<0.010	<0.05	<0.06	<0.04	<0.700
SEP 07...	<1	1	180	3	<3	--	--	--	--	--

RED RIVER OF THE NORTH BASIN

57

05056000 SHEYENNE RIVER NEAR WARWICK, ND

LOCATION.--Lat 47°48'20", long 98°42'57", on south quarter of line between secs.15 and 16, T.150 N., R.63 W., Eddy County, Hydrologic Unit 09020203, on left bank on downstream side of county highway bridge, and 3.3 mi south of Warwick.

DRAINAGE AREA.--2,070 mi², approximately, of which about 1,310 mi² is probably noncontributing, including 227 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: 1952(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and rubble masonry control. Elevation of gage is 1,370 ft above sea level, by barometer.

REMARKS.--Records good except those periods of estimated discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.75	2.8	3.8	e3.6	e3.0	3.0	889	19	31	31	1450	146
2	.74	3.5	4.4	e3.7	e3.0	3.0	834	15	29	36	1400	115
3	.90	3.6	4.4	e3.9	e3.3	3.0	631	13	27	36	1260	90
4	1.0	3.8	4.4	e4.0	e3.0	3.0	490	13	26	38	1130	78
5	1.2	3.4	4.0	e4.1	e3.0	3.3	408	13	25	33	1010	70
6	.66	3.2	4.0	e4.2	e2.9	3.3	338	12	31	31	853	60
7	.66	3.0	3.7	e4.3	e2.8	4.0	279	11	22	31	717	50
8	.69	3.0	3.7	e4.4	e2.8	4.4	233	16	14	33	600	45
9	.77	3.1	3.7	e4.4	e2.8	4.9	197	40	17	39	491	39
10	.78	3.9	3.7	e4.5	e2.8	4.5	164	88	16	43	407	37
11	.82	3.7	3.7	e4.3	e2.8	4.0	131	133	22	41	353	34
12	.81	3.7	3.7	e4.1	e2.8	4.4	113	120	23	37	331	30
13	.72	3.7	e4.0	e3.8	e3.0	4.9	102	101	20	40	304	27
14	.79	3.4	e4.3	e3.5	e3.0	4.9	89	84	14	42	278	25
15	.90	3.2	e4.6	e3.0	e3.0	4.9	76	79	13	44	255	24
16	1.1	3.0	e5.0	e2.8	e3.0	4.9	64	72	15	56	232	23
17	1.0	2.6	e5.5	e2.5	e3.0	4.9	56	68	14	77	213	21
18	1.1	2.4	e5.4	e2.3	e2.8	4.4	49	69	13	124	197	20
19	1.4	2.7	e5.3	e2.1	3.0	4.4	44	64	12	249	183	19
20	1.6	3.0	e5.0	2.0	3.0	4.4	35	59	10	279	171	19
21	1.8	3.0	e5.0	2.0	3.0	4.9	30	55	9.4	276	153	17
22	1.9	3.0	e4.7	2.0	3.0	4.4	30	49	10	293	142	18
23	2.3	3.0	e4.4	2.0	3.0	4.9	28	43	17	333	130	18
24	2.4	2.7	e3.7	2.0	3.0	7.1	24	41	22	365	111	16
25	2.5	2.5	e3.3	e1.8	3.0	15	24	40	29	549	98	17
26	2.3	2.4	e3.0	2.0	3.0	18	22	38	30	704	81	16
27	2.6	2.4	e3.0	2.0	3.0	73	20	40	29	765	73	15
28	1.7	2.4	e3.1	e1.8	3.0	280	21	38	27	910	66	15
29	1.6	3.0	e3.2	e1.6	---	514	20	35	25	1090	90	16
30	1.6	3.3	e3.3	e1.8	---	710	21	35	29	1250	187	15
31	1.9	---	e3.4	e2.4	---	844	---	34	---	1400	158	---
TOTAL	40.99	92.4	126.4	92.9	82.8	2557.8	5462	1537	621.4	9275	13124	1135
MEAN	1.32	3.08	4.08	3.00	2.96	82.5	182	49.6	20.7	299	423	37.8
MAX	2.6	3.9	5.5	4.5	3.3	844	889	133	31	1400	1450	146
MIN	.66	2.4	3.0	1.6	2.8	3.0	20	11	9.4	31	66	15
AC-FT	81	183	251	184	164	5070	10830	3050	1230	18400	26030	2250

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1993, BY WATER YEAR (WY)

	MEAN	12.7	11.3	6.81	4.64	9.77	113	270	98.6	50.9	40.4	24.1	11.5
MAX	73.2	50.3	29.6	26.3	154	793	1421	854	326	299	423	63.0	
(WY)	1983	1981	1983	1983	1981	1983	1950	1950	1954	1993	1993	1957	
MIN	1.16	1.28	.76	.47	.75	1.46	15.8	10.4	1.75	.36	.090	.71	
(WY)	1953	1961	1961	1990	1990	1964	1977	1990	1961	1989	1961	1961	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1950 - 1993
ANNUAL TOTAL	13714.55	34147.69	
ANNUAL MEAN	37.5	93.6	54.4
HIGHEST ANNUAL MEAN			204
LOWEST ANNUAL MEAN			5.31
HIGHEST DAILY MEAN	942	Mar 7	4370
LOWEST DAILY MEAN	.02	Aug 21	.00
ANNUAL SEVEN-DAY MINIMUM	.07	Aug 16	.00
INSTANTANEOUS PEAK FLOW		1470	4660
INSTANTANEOUS PEAK STAGE		6.00	7.51
ANNUAL RUNOFF (AC-FT)	27200	67730	39440
10 PERCENT EXCEEDS	48	277	98
50 PERCENT EXCEEDS	4.3	13	8.4
90 PERCENT EXCEEDS	.64	2.0	1.3

e Estimated.

RED RIVER OF THE NORTH BASIN

05056000 SHEYENNE RIVER NEAR WARWICK, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1953, 1958 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)
OCT										
01...	1350	0.75	560	--	21.5	16.5	--	--	--	--
NOV										
24...	1250	3.4	633	--	-1.5	2.5	--	--	--	--
JAN										
04...	1500	4.0	790	--	-16.0	2.5	--	--	--	--
FEB										
24...	1030	2.7	755	--	-19.5	1.0	--	--	--	--
MAR										
29...	1150	531	440	--	4.0	0.5	--	--	--	--
31...	1230	845	311	7.9	-2.0	0.5	--	--	87	--
APR										
08...	1100	238	551	--	6.5	3.0	--	--	--	--
22...	1500	32	674	--	27.0	12.0	--	--	--	--
JUN										
14...	1730	13	990	--	18.5	18.0	--	--	--	--
JUL										
02...	1345	39	1020	--	25.5	16.5	--	--	--	--
14...	1040	43	975	8.0	--	18.0	7.0	78	280	351
21...	1120	273	717	8.1	--	20.0	3.6	42	220	256
AUG										
05...	1415	1020	769	7.5	18.0	20.0	2.1	24	210	277
SEP										
03...	0930	96	838	8.1	9.5	14.0	6.1	62	310	341

DATE	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CAR- BONATE WATER DIS IT FIELD CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
MAR										
31...	106	20	9.0	28	39	1	7.3	--	--	42
JUL										
14...	--	53	35	120	48	3	7.1	0	429	150
21...	--	45	25	72	41	2	7.6	0	313	85
AUG										
05...	--	43	24	85	46	3	11	0	338	91
SEP										
03...	--	63	38	75	33	2	9.2	0	461	84

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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
MAR										
31...	5.6	0.20	9.4	185	192	0.26	438	--	--	--
JUL										
14...	16	0.20	15	608	646	0.88	75.0	<0.010	<0.050	0.050
21...	11	0.20	24	425	456	0.62	336	0.010	0.051	0.090
AUG										
05...	9.3	0.40	40	471	530	0.72	1460	<0.010	<0.050	0.100
SEP										
03...	11	0.20	36	545	561	0.76	146	0.040	0.260	0.080

RED RIVER OF THE NORTH BASIN

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05056000 SHEYENNE RIVER NEAR WARWICK, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	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, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
MAR 31...	--	--	--	--	--	2	60	120	<1	20
JUL 14...	1.2	1.1	0.260	0.250	0.210	--	--	24	--	--
21...	1.8	1.0	0.320	0.300	0.270	--	--	55	--	--
AUG 05...	1.4	1.2	0.510	0.440	0.400	--	--	83	--	--
SEP 03...	1.2	1.1	0.300	0.270	0.280	--	--	33	--	--

DATE	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)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)
MAR 31...	60	<0.1	<1	--	<1	--	130	--	--
JUL 14...	15	--	--	--	--	--	--	17	0.3
21...	18	--	--	--	--	--	--	15	0.4
AUG 05...	71	--	--	--	--	--	--	16	0.3
SEP 03...	120	--	--	<10	--	<1.0	--	17	0.5

RED RIVER OF THE NORTH BASIN

05056060 MAUVAIS COULEE TRIBUTARY NO. 3 NEAR CANDO, ND

LOCATION.--Lat 48°27'28", long 99°14'06", in NW¹/₄NW¹/₄ sec.6, T.157 N., R.66 W., Townner County, Hydrologic Unit 09020201, at bridge 2.1 mi south of CandoDRAINAGE AREA.--60.2 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1955-71 (annual maximum discharges only), 1986-88 (discharge measurements only), March 1989 to current year (seasonal records only since 1989).

GAGE.--Nonrecording gage. Elevation of gage is 1,460 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods of estimated discharge, which are poor.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 292 ft³/s, Aug. 2, gage height, 8.43 ft, from flood mark; no flow much of the time.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	e1.1	e.60	.76	e200	19
2	---	---	---	---	---	.00	e.20	e1.1	e.60	e.70	244	21
3	---	---	---	---	---	.00	e.40	1.0	e.60	e.70	168	23
4	---	---	---	---	---	.00	e1.3	e1.0	e.60	e.65	e140	22
5	---	---	---	---	---	.00	e1.8	e1.0	e.65	e.65	e110	21
6	---	---	---	---	---	.00	2.1	e1.0	e.75	e.60	e90	20
7	---	---	---	---	---	.00	e6.0	e1.0	e.80	e.60	e75	19
8	---	---	---	---	---	.00	e10	e1.2	e.85	e.60	e65	18
9	---	---	---	---	---	.00	e14	e1.7	e.90	e.60	e58	17
10	---	---	---	---	---	.00	e15	e2.1	e.95	e.60	50	16
11	---	---	---	---	---	.00	e14	e2.0	e1.0	e.65	41	17
12	---	---	---	---	---	.00	e12	1.8	e1.0	e.75	44	16
13	---	---	---	---	---	.00	e10	e1.6	e1.1	e.80	39	16
14	---	---	---	---	---	.00	e9.5	e1.5	e1.1	e.90	37	15
15	---	---	---	---	---	.00	e8.5	e1.3	1.2	e1.0	34	14
16	---	---	---	---	---	.00	e7.5	e1.2	e1.3	e1.1	33	e13
17	---	---	---	---	---	.00	e7.0	e1.1	e1.4	e1.2	30	e13
18	---	---	---	---	---	.00	e6.5	e1.0	e1.4	e1.3	25	e12
19	---	---	---	---	---	.00	e5.5	e.95	e1.5	e1.5	23	e11
20	---	---	---	---	---	.00	e5.0	e.90	e1.5	e1.6	21	e11
21	---	---	---	---	---	.00	e4.5	e.85	e1.4	e1.8	20	e10
22	---	---	---	---	---	.00	4.0	e.85	e1.4	e2.0	17	e10
23	---	---	---	---	---	.00	e3.5	e.80	e1.3	e2.5	16	9.7
24	---	---	---	---	---	.00	e2.5	e.80	e1.3	e2.8	15	e9.0
25	---	---	---	---	---	.00	e2.0	e.75	e1.3	e3.0	13	e8.5
26	---	---	---	---	---	.00	e1.7	e.70	e1.2	e3.5	12	e8.0
27	---	---	---	---	---	.00	e1.5	e.65	e1.1	e5.0	11	e7.5
28	---	---	---	---	---	.00	e1.4	e.65	e1.0	e7.0	11	e7.0
29	---	---	---	---	---	.00	e1.3	e.60	e.95	e10	11	e6.5
30	---	---	---	---	---	.00	e1.1	e.60	e.85	e60	11	e6.0
31	---	---	---	---	---	.00	---	e.60	---	e120	12	---
TOTAL	---	---	---	---	---	0.00	159.80	33.40	31.60	234.86	1676	416.2
MEAN	---	---	---	---	---	.000	5.33	1.08	1.05	7.58	54.1	13.9
MAX	---	---	---	---	---	.00	15	2.1	1.5	120	244	23
MIN	---	---	---	---	---	.00	.00	.60	.60	.60	11	6.0
AC-FT	---	---	---	---	---	.00	317	66	63	466	3320	826

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1993, BY WATER YEAR (WY)

MEAN	---	---	---	---	---	26.1	14.0	1.94	.62	1.69	8.33	1.98
MAX	---	---	---	---	---	141	36.7	9.16	2.26	7.58	54.1	13.9
(WY)	---	---	---	---	---	1992	1989	1986	1991	1993	1993	1993
MIN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000
(WY)	---	---	---	---	---	1989	1990	1988	1988	1988	1988	1988

SUMMARY STATISTICS

WATER YEARS 1986 - 1993

HIGHEST DAILY MEAN	310	Mar 23 1992
LOWEST DAILY MEAN	.00	Mar 1 1986
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 1 1986
INSTANTANEOUS PEAK FLOW	a2300	Apr 14 1969
INSTANTANEOUS PEAK STAGE	a9.35	Apr 14 1969
10 PERCENT EXCEEDS	14	
50 PERCENT EXCEEDS	.00	
90 PERCENT EXCEEDS	.00	

e Estimated.

a Site and datum then in use.

RED RIVER OF THE NORTH BASIN

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05056060 MAUVAIS COULEE TRIBUTARY NO. 3 NEAR CANDO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
APR 06...	1610	2.1	703	7.5	6.0	1.5	--	270	90	63	27
22...	1450	4.0	560	7.4	--	--	--	260	156	60	26
MAY 12...	1255	1.8	775	--	23.5	19.5	--	--	--	--	--
JUN 15...	1415	1.2	910	--	20.0	16.5	--	--	--	--	--
JUL 01...	1415	0.76	--	--	23.0	18.0	--	--	--	--	--
AUG 03...	1520	159	450	--	18.5	18.5	--	--	--	--	--
27...	1035	11	678	--	15.0	18.0	--	--	--	--	--
SEP 15...	0930	14	690	7.8	12.0	10.5	2.4	340	312	71	39
23...	1115	9.7	719	--	15.0	12.0	--	--	--	--	--

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
APR 06...	32	20	0.8	14	210	24	0.10	12	437	476	0.65
22...	16	11	0.4	15	130	8.9	0.10	23	373	399	0.54
SEP 15...	21	11	0.5	13	61	9.9	0.10	18	421	447	0.61

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 06...	2.75	3	60	60	<1	30	170	<0.1	1	2	260
22...	4.31	3	40	30	<1	20	10	<0.1	2	<1	230
SEP 15...	--	6	70	40	<1	40	10	0.1	<1	<1	320

RED RIVER OF THE NORTH BASIN

05056100 MAUVAIS COULEE NEAR CANDU, ND

LOCATION.--Lat 48°26'53", long 99°06'08", in SE¹/₄NE¹/₄ sec.1, T.157 N., R.66 W., Towner County, Hydrologic Unit 09020201, on left bank 0.3 mi upstream from highway bridge, about 4 mi upstream from West Fork, 5.5 mi southeast of Cando, and 7 mi northeast of Maza.

DRAINAGE AREA.--387 mi², of which about 10 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1956 to current year (seasonal records only since 1982).

GAGE.--Water-stage recorder. Elevation of gage is 1,445 ft above sea level, from topographic map. Prior to July 2, 1957, nonrecording gage at present site and datum.

REMARKS.--Records fair except those for period of estimated discharges, which are poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1954, reached a stage of 9.83 ft, and flood of Apr. 20, 1956, reached a stage of 10.71 ft, from floodmarks set by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 711 ft³/s, Aug. 2, gage height, 8.83 ft, no flow Mar. 1-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e.00	e.05	4.7	2.2	10	485	91
2	---	---	---	---	---	e.00	e.07	4.7	2.0	9.0	696	87
3	---	---	---	---	---	e.00	e.25	4.4	1.9	8.8	660	84
4	---	---	---	---	---	e.00	e.30	4.9	1.7	9.1	595	82
5	---	---	---	---	---	e.00	e.40	4.0	1.6	8.4	540	79
6	---	---	---	---	---	e.00	e.40	4.2	3.0	7.9	481	76
7	---	---	---	---	---	e.00	e.70	3.9	2.5	7.0	429	73
8	---	---	---	---	---	e.00	e.60	5.4	5.1	6.5	383	71
9	---	---	---	---	---	e.00	e30	9.6	8.5	7.1	351	70
10	---	---	---	---	---	e.00	99	e15	6.7	6.7	328	67
11	---	---	---	---	---	e.00	77	e12	8.3	6.8	302	64
12	---	---	---	---	---	e.00	64	e10	9.7	7.7	282	61
13	---	---	---	---	---	e.00	77	9.4	10	9.3	262	59
14	---	---	---	---	---	e.00	70	8.0	9.7	9.7	249	58
15	---	---	---	---	---	e.00	63	7.0	9.7	9.6	232	55
16	---	---	---	---	---	e.00	52	6.4	12	11	211	53
17	---	---	---	---	---	e.00	42	5.2	12	13	190	50
18	---	---	---	---	---	e.00	34	4.4	11	12	178	48
19	---	---	---	---	---	e.00	27	3.9	12	13	169	47
20	---	---	---	---	---	e.00	23	3.8	12	13	159	45
21	---	---	---	---	---	e.00	20	3.7	11	13	149	44
22	---	---	---	---	---	e.00	17	3.2	11	15	141	42
23	---	---	---	---	---	e.00	16	3.0	13	17	135	40
24	---	---	---	---	---	e.00	14	2.8	12	19	130	39
25	---	---	---	---	---	e.00	12	2.7	12	22	124	37
26	---	---	---	---	---	e.00	11	2.5	11	25	117	36
27	---	---	---	---	---	e.00	9.2	2.6	10	33	111	35
28	---	---	---	---	---	e.01	8.2	2.6	10	43	106	33
29	---	---	---	---	---	e.02	7.1	2.6	8.6	50	103	32
30	---	---	---	---	---	e.03	6.0	2.6	10	86	101	31
31	---	---	---	---	---	e.04	---	2.5	---	213	96	---
TOTAL	---	---	---	---	---	0.10	781.27	161.7	250.2	721.6	8495	1689
MEAN	---	---	---	---	---	.003	26.0	5.22	8.34	23.3	274	56.3
MAX	---	---	---	---	---	.04	99	15	13	213	696	91
MIN	---	---	---	---	---	.00	.05	2.5	1.6	6.5	96	31
AC-FT	---	---	---	---	---	.2	1550	321	496	1430	16850	335

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1993, BY WATER YEAR (WY)

MEAN	1.78	.96	.25	.018	.19	18.7	119	37.3	7.86	6.19	10.7	4.57
MAX	27.1	10.4	3.86	.34	5.01	198	656	281	69.3	80.5	274	62.3
(WY)	1966	1981	1981	1981	1981	1992	1969	1974	1974	1971	1993	1965
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1959	1960	1957	1957	1957	1958	1991	1961	1961	1959	1959	1959

SUMMARY STATISTICS WATER YEARS 1956 - 1993

ANNUAL MEAN	a19.1	
HIGHEST ANNUAL MEAN	a71.7	1974
LOWEST ANNUAL MEAN	a.004	1961
HIGHEST DAILY MEAN	2580	Apr 25 1979
LOWEST DAILY MEAN	.00	Aug 21 1956
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 21 1956
INSTANTANEOUS PEAK FLOW	2660	Apr 25 1979
INSTANTANEOUS PEAK STAGE	11.18	Apr 25 1979
ANNUAL RUNOFF (AC-FT)	a13870	
10 PERCENT EXCEEDS	26	
50 PERCENT EXCEEDS	.07	
90 PERCENT EXCEEDS	.00	

e Estimated.

a Based on complete water years only (1957-82).

RED RIVER OF THE NORTH BASIN

63

05056100 MAUVAIS COULEE NEAR CANDO, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

		DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	
APR													
05...	1455	0.40	1650	7.3	--	12.0	1.0	0.9	--	800	299	170	
15...	1255	63	450	7.1	--	10.0	9.0	9.1	--	200	137	48	
22...	0945	17	620	7.5	--	15.0	8.0	8.8	--	270	170	61	
MAY													
12...	1450	9.5	852	--	7.9	23.5	19.5	--	--	390	233	87	
JUN													
15...	1515	9.6	1050	--	--	23.0	18.0	--	--	--	--	--	
JUL													
01...	1135	10	--	--	--	27.5	18.5	--	--	--	--	--	
AUG													
03...	1345	656	780	7.7	--	17.0	18.5	3.4	38	350	248	74	
10...	0920	331	688	--	--	18.0	21.0	--	--	--	--	--	
17...	1445	188	700	7.6	--	27.0	22.0	1.5	18	330	293	71	
30...	1325	99	750	7.8	--	18.0	17.5	2.9	32	350	382	76	
SEP													
23...	1315	39	835	--	7.8	20.0	13.0	12.2	--	400	349	80	
DATE		MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
APR													
05...	90	80	18	1	11	590	50	0.20	21	1200	1230	1.67	
15...	20	16	14	0.5	15	91	9.7	0.10	20	304	345	0.47	
22...	28	21	14	0.6	15	130	18	0.10	20	396	420	0.57	
MAY													
12...	42	37	16	0.8	14	200	27	0.20	22	570	611	0.83	
AUG													
03...	39	39	19	0.9	13	150	24	0.10	54	543	552	0.75	
17...	36	27	15	0.7	14	86	17	0.10	44	473	503	0.68	
30...	39	30	15	0.7	17	78	17	0.10	38	526	520	0.71	
SEP													
23...	49	38	16	0.8	14	100	20	0.10	13	525	565	0.77	
DATE		SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	
APR													
05...	1.33	5	<10	110	<1	100	2100	0.2	<1	<1	640		
15...	58.7	4	40	50	2	20	30	0.9	<1	<1	180		
22...	18.9	2	40	50	<1	20	30	<0.1	<1	<1	190		
MAY													
12...	15.6	4	50	80	<1	40	210	0.3	1	<1	330		
AUG													
03...	978	4	70	50	<1	40	30	<0.1	<1	<1	310		
17...	255	6	80	110	<1	30	680	<0.1	1	<1	300		
30...	139	5	70	40	<1	40	90	0.1	<1	<1	400		
SEP													
23...	59.6	4	70	40	<1	40	80	0.5	<1	1	290		

RED RIVER OF THE NORTH BASIN

05056200 EDMORE COULEE NEAR EDMORE, ND

LOCATION.--Lat 48°20'14", long 98°39'33", in NW¹/₄NW¹/₄ sec.17, T.156 N., R.62 W., Ramsey County, Hydrologic Unit 09020201, on right bank 50 ft upstream from bridge on county highway, 11 mi southwest of Edmore, and about 13 mi upstream from Sweetwater Lake.

DRAINAGE AREA.--382 mi², of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to June 1956, June 1957 to current year (seasonal records only since 1982).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level. June 26, 1957, to Sept. 30, 1985, water-stage recorder at same site at a datum of 1,479.79 ft above sea level. Prior to June 26, 1957, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,180 ft³/s, July 30, gage height, 87.76 ft; no flow Mar. 1 to Apr. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e.00	e.00	20	7.2	187	1140	77
2	---	---	---	---	---	e.00	e.00	18	6.4	278	1090	74
3	---	---	---	---	---	e.00	e.00	16	5.7	269	1030	70
4	---	---	---	---	---	e.00	e.00	14	4.9	251	965	69
5	---	---	---	---	---	e.00	e10	12	4.1	256	887	70
6	---	---	---	---	---	e.00	e50	11	3.7	266	797	68
7	---	---	---	---	---	e.00	e75	10	3.3	281	696	67
8	---	---	---	---	---	e.00	e140	12	4.7	284	601	66
9	---	---	---	---	---	e.00	e250	17	8.0	285	544	63
10	---	---	---	---	---	e.00	318	25	8.1	261	484	60
11	---	---	---	---	---	e.00	305	27	7.9	227	452	60
12	---	---	---	---	---	e.00	264	27	7.3	195	599	58
13	---	---	---	---	---	e.00	221	26	6.3	180	493	54
14	---	---	---	---	---	e.00	190	e25	4.1	170	444	49
15	---	---	---	---	---	e.00	167	25	3.1	157	409	46
16	---	---	---	---	---	e.00	143	23	3.1	139	370	43
17	---	---	---	---	---	e.00	119	22	2.9	134	331	39
18	---	---	---	---	---	e.00	99	21	3.0	120	288	36
19	---	---	---	---	---	e.00	82	20	5.8	118	248	33
20	---	---	---	---	---	e.00	68	19	10	108	224	31
21	---	---	---	---	---	e.00	57	18	13	97	205	30
22	---	---	---	---	---	e.00	50	17	14	94	185	28
23	---	---	---	---	---	e.00	43	15	19	98	168	26
24	---	---	---	---	---	e.00	38	14	26	121	150	25
25	---	---	---	---	---	e.00	35	12	33	179	134	23
26	---	---	---	---	---	e.00	31	11	35	256	120	22
27	---	---	---	---	---	e.00	28	10	33	495	110	20
28	---	---	---	---	---	e.00	26	9.6	33	809	100	19
29	---	---	---	---	---	e.00	24	9.0	38	931	96	18
30	---	---	---	---	---	e.00	22	8.4	75	1080	94	17
31	---	---	---	---	---	e.00	---	7.9	---	1170	86	---
TOTAL	---	---	---	---	---	0.00	2855.00	521.9	428.6	9496	13540	1361
MEAN	---	---	---	---	---	.000	95.2	16.8	14.3	306	437	45.4
MAX	---	---	---	---	---	.00	318	27	75	1170	1140	77
MIN	---	---	---	---	---	.00	.00	7.9	2.9	94	86	17
AC-FT	---	---	---	---	---	.00	5660	1040	850	18840	26860	2700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

	MEAN	.77	.31	.057	.000	.46	18.5	91.6	23.1	5.39	15.2	16.1	1.75
MAX	9.79	5.73	.98	.000	.000	11.6	159	314	205	66.5	306	437	45.4
(WY)	1986	1981	1981	1958	1981	1992	1974	1974	1963	1993	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1959	1959	1958	1958	1958	1959	1960	1991	1958	1958	1958	1958	1958

SUMMARY STATISTICS

WATER YEARS 1957 - 1993

ANNUAL MEAN	a13.3
HIGHEST ANNUAL MEAN	a47.7 1974
LOWEST ANNUAL MEAN	a.028 1958
HIGHEST DAILY MEAN	1170 Jul 31 1993
LOWEST DAILY MEAN	.00 Jul 1 1957
ANNUAL SEVEN-DAY MINIMUM	.00 Jul 1 1957
INSTANTANEOUS PEAK FLOW	1180 Jul 30 1993
INSTANTANEOUS PEAK STAGE	87.76 Jul 30 1993
ANNUAL RUNOFF (AC-FT)	a9640
10 PERCENT EXCEEDS	25
50 PERCENT EXCEEDS	.00
90 PERCENT EXCEEDS	.00

e Estimated.

a Based on complete water years only (1958-82).

RED RIVER OF THE NORTH BASIN

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05056200 EDMORE COULEE NEAR EDMORE, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
APR												
06...	1020	45	--	3	7.6	--	7.5	1.0	7.3	54	120	87
07...	1110	73	--	311	7.6	--	4.5	1.5	7.3	55	120	86
a13...	1940	221	--	460	7.9	--	10.0	9.0	7.4	68	160	135
21...	1340	58	--	500	7.5	--	11.0	8.0	--	--	180	160
MAY												
13...	1345	28	--	579	--	7.8	29.5	19.0	--	--	230	193
JUN												
17...	1300	2.8	--	810	--	--	20.0	15.0	--	--	--	--
30...	1555	82	--	680	--	--	22.5	18.0	--	--	--	--
AUG												
02...	1415	1100	--	330	7.6	--	19.0	19.0	5.1	59	--	--
10...	1535	484	--	429	--	--	30.0	27.0	--	--	--	--
17...	1040	321	--	445	7.6	--	18.5	21.0	2.6	31	190	197
31...	0905	87	--	550	7.8	--	15.0	14.5	4.5	47	230	249
SEP												
08...	1245	--	66	663	7.7	--	19.5	16.5	8.4	92	260	280
21...	1040	29	--	748	7.8	--	12.0	14.0	7.0	--	300	296

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 SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
APR												
06...	31	10	10	14	0.4	14	46	7.2	0.10	16	203	206
07...	31	10	9.5	13	0.4	14	49	5.9	0.10	15	202	195
a13...	40	15	26	24	0.9	15	75	11	0.10	23	294	325
21...	47	16	26	22	0.8	18	84	12	0.10	30	330	347
MAY												
13...	59	21	32	22	0.9	16	100	11	0.10	18	375	415
AUG												
17...	45	18	23	20	0.7	10	42	6.3	0.10	22	286	314
31...	56	23	28	20	0.8	13	39	11	0.10	20	342	368
SEP												
08...	59	28	42	25	1	14	69	18	0.10	12	412	408
21...	66	32	46	24	1	16	85	19	0.10	2.1	445	485

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR												
06...	0.28	25.1	3	<10	40	<1	10	40	0.1	1	<1	150
07...	0.27	38.6	3	<10	40	<1	10	20	0.2	1	<1	150
a13...	0.44	194	5	40	40	<1	10	10	<0.1	3	<1	160
21...	0.47	53.9	6	40	30	<1	20	10	0.2	2	<1	190
MAY												
13...	0.56	31.1	5	70	50	<1	20	20	1.4	<1	<1	280
AUG												
17...	0.43	272	5	50	30	<1	20	110	<0.1	<1	<1	210
31...	0.50	86.2	4	50	20	<1	20	110	0.1	<1	<1	330
SEP												
08...	0.55	72.7	4	40	30	<1	40	60	<0.1	<1	1	300
21...	0.66	38.5	4	50	20	<1	30	50	<0.1	<1	<1	400

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05056215 EDMORE COULEE TRIBUTARY NEAR WEBSTER, ND

LOCATION.--Lat 48°15'59", long 98°40'50", in NW¹/₄, NW¹/₄, sec.7, T.155 N., R.62 W., Ramsey County, Hydrologic Unit 09020201, on upstream side of bridge on county road, 9 mi east of Webster.

DRAINAGE AREA.--148 mi², approximately, of which about 44 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year (seasonal records only). Discharge record available for 1986 water year in files of the District office.

GAGE.--Water-stage recorder. Datum of gage is 1400 ft above sea level, from topographic map. Prior to October 1986 nonrecording gage at present site and datum.

REMARKS.--Records fair except those for period July 25 to Aug. 30, which are good.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in spring of 1959 reached a stage of about 75.00 ft, from conversation with local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,330 ft³/s, Aug. 2, gage height, 75.06 ft; no flow Mar. 1-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e.00	e1.0	2.7	e3.3	22	e1300	248
2	---	---	---	---	---	e.00	e3.0	2.1	e3.2	29	1310	239
3	---	---	---	---	---	e.00	e8.0	1.6	e3.0	31	1300	228
4	---	---	---	---	---	e.00	e25	.89	e2.9	37	1290	212
5	---	---	---	---	---	e.00	e80	.34	e2.9	37	1280	210
6	---	---	---	---	---	e.00	e140	.00	e2.8	42	1260	200
7	---	---	---	---	---	e.00	e160	e.00	e2.7	45	1240	198
8	---	---	---	---	---	e.00	e150	e.20	e2.9	49	1230	188
9	---	---	---	---	---	e.00	e140	e.60	e4.0	55	1230	176
10	---	---	---	---	---	e.00	e100	1.8	e5.0	58	1250	172
11	---	---	---	---	---	e.00	e60	2.0	e4.5	60	1200	169
12	---	---	---	---	---	e.00	e50	1.5	e4.0	62	1200	159
13	---	---	---	---	---	e.00	42	1.5	e3.5	67	1090	e140
14	---	---	---	---	---	e.00	44	4.0	e3.3	73	990	122
15	---	---	---	---	---	e.00	41	4.5	e3.2	75	931	122
16	---	---	---	---	---	e.00	40	4.5	e3.1	78	871	115
17	---	---	---	---	---	e.00	37	4.8	3.6	84	850	105
18	---	---	---	---	---	e.00	33	5.2	3.1	85	e800	98
19	---	---	---	---	---	e.00	30	e5.2	2.9	87	752	98
20	---	---	---	---	---	e.00	26	e5.2	2.1	87	665	100
21	---	---	---	---	---	e.00	23	e5.1	1.4	84	598	97
22	---	---	---	---	---	e.00	25	e5.0	1.5	81	555	e94
23	---	---	---	---	---	e.00	20	e4.9	3.0	81	516	e85
24	---	---	---	---	---	e.00	17	e4.6	5.1	111	470	e78
25	---	---	---	---	---	e.00	e10	e4.5	5.4	e200	435	e72
26	---	---	---	---	---	e.00	6.5	e4.2	5.4	300	394	e65
27	---	---	---	---	---	e.00	5.5	e4.0	5.6	610	374	e60
28	---	---	---	---	---	e.00	4.9	e3.8	6.7	870	349	e56
29	---	---	---	---	---	e.00	4.2	e3.7	8.6	950	328	e52
30	---	---	---	---	---	e.00	3.3	e3.6	12	1280	281	e48
31	---	---	---	---	---	e.00	---	e3.4	---	e1290	267	---
TOTAL	---	---	---	---	---	0.00	1329.4	95.43	120.7	7020	26606	4006
MEAN	---	---	---	---	---	.000	44.3	3.08	4.02	226	858	134
MAX	---	---	---	---	---	.00	160	5.2	12	1290	1310	248
MIN	---	---	---	---	---	.00	1.0	.00	1.4	22	267	48
AC-FT	---	---	---	---	---	.00	2640	189	239	13920	52770	7950

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1993, BY WATER YEAR (WY)

MEAN	---	---	---	---	---	14.7	64.0	3.97	.86	36.7	110	16.7
MAX	---	---	---	---	---	98.6	324	19.5	4.02	226	858	134
(WY)	---	---	---	---	---	1992	1987	1987	1993	1993	1993	1993
MIN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000
(WY)	---	---	---	---	---	1989	1990	1990	1988	1988	1988	1987

SUMMARY STATISTICS

WATER YEARS 1986 - 1993

HIGHEST DAILY MEAN	1310	Aug 2 1993
LOWEST DAILY MEAN	.00	Mar 1 1986
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 1 1986
INSTANTANEOUS PEAK FLOW	1330	Aug 2 1993
INSTANTANEOUS PEAK STAGE	75.06	Aug 2 1993
10 PERCENT EXCEEDS	71	
50 PERCENT EXCEEDS	.00	
90 PERCENT EXCEEDS	.00	

e Estimated.

RED RIVER OF THE NORTH BASIN

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05056215 EDMOURE COULEE TRIBUTARY NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
APR												
05...	1335	77	646	7.5	7.3	8.5	1.5	--	--	240	84	55
06...	1105	97	446	--	--	8.5	2.0	--	--	--	--	--
21...	1630	24	620	--	--	17.0	13.0	--	--	--	--	--
JUN												
17...	1545	3.0	--	--	--	22.5	15.5	--	--	--	--	--
30...	1905	14	670	--	--	21.5	18.5	--	--	--	--	--
AUG												
02...	1710	1310	300	--	--	20.5	19.5	--	--	--	--	--
10...	1720	1250	400	--	--	21.0	21.0	--	--	--	--	--
19...	1240	726	400	7.5	7.3	19.0	19.0	9.0	102	180	176	45
25...	0910	446	496	--	--	20.0	21.0	--	--	--	--	--
SEP												
09...	1145	172	580	--	--	16.0	16.0	--	--	--	--	--
14...	1220	122	610	--	7.8	15.5	10.5	9.4	--	260	252	59
21...	1210	100	653	--	--	15.5	14.5	--	--	--	--	--

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED PER AC-FT) (70303)
APR												
05...	24	29	20	0.8	15	180	22	0.10	17	393	424	0.58
AUG												
19...	17	17	16	0.5	9.8	44	7.5	0.10	27	274	286	0.39
SEP												
14...	27	33	21	0.9	13	74	9.6	0.10	15	382	391	0.53

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR											
05...	88.1	4	<10	20	<1	20	20	0.1	1	1	240
AUG											
19...	561	3	60	40	3	20	30	<0.1	<1	<1	220
SEP											
14...	129	4	50	20	<1	30	20	<0.1	<1	<1	290

RED RIVER OF THE NORTH BASIN

05056220 SWEETWATER LAKE AT SWEETWATER, ND

LOCATION.--Lat 48°12'39", long 98°52'15", in NE¹/₄,SW¹/₄, sec.27, T. 155 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, at southwest arm of lake 6 mi north of Devils Lake.

DRAINAGE AREA.--670 mi² of which about 290 mi² is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960, 1962-87, 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CAO3) (00900)	ALKA- LITY LAB (MG/L AS CAO3) (90410)	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)
MAR 16...	1710	0.80	1.1	1480	--	580	540	120	69	99
MAY 12...	1547	0.0	2.0	667	--	250	221	55	27	38
AUG 10...	1810	0.0	3.0	364	7.3	150	151	38	14	17
SEP 14...	1715	0.0	2.2	568	8.2	230	237	53	24	31

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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 CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 16...	25	2	42	280	35	0.30	11	1030	987	1.40
MAY 12...	23	1	18	120	16	0.10	1.1	417	410	0.57
AUG 10...	18	0.6	8.7	38	7.4	0.10	28	260	7770	0.35
SEP 14...	21	0.9	14	65	12	0.10	16	359	358	0.49

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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 ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR 16...	--	<0.010	<0.050	1.90	5.2	0.740	0.680	5	130	90
MAY 12...	--	<0.010	0.260	0.030	1.5	0.150	0.080	5	60	10
AUG 10...	--	--	--	--	--	0.370	--	2	60	70
SEP 14...	--	<0.010	<0.050	0.050	1.2	0.290	0.270	3	50	20

DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
MAR 16...	<1	80	1100	0.1	1	2	500	0.200	<0.100
MAY 12...	<1	30	40	0.3	<1	<1	240	1.50	0.200
AUG 10...	<1	10	110	0.1	<1	<1	290	1.30	0.200
SEP 14...	<1	20	10	<0.1	<1	<1	260	1.60	<0.100

RED RIVER OF THE NORTH BASIN

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05056220 SWEETWATER LAKE AT SWEETWATER, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
MAR												
16...	1700	1.1	1440	7.4	1.5	0.6	4	733	24.0	-17.0	320	10
MAY												
12...	1538	0.0	657	7.6	18.5	10.9	122	728	56.4	26.5	30	10
12...	1539	0.45	657	7.8	18.5	10.8	--	--	--	--	--	--
12...	1540	0.76	657	7.9	18.5	10.7	--	--	--	--	--	--
12...	1541	1.1	657	8.0	18.5	10.7	--	--	--	--	--	--
12...	1542	1.4	658	8.1	18.5	10.7	--	--	--	--	--	--
12...	1543	1.6	658	8.1	18.5	10.7	--	--	--	--	--	--
12...	1545	2.0	657	8.1	18.5	10.8	--	--	--	--	--	--
AUG												
10...	1750	0.0	373	7.3	25.0	2.8	36	723	71.0	29.0	175	<5.0
10...	1752	0.50	372	7.2	25.0	2.8	--	--	--	--	--	--
10...	1754	1.0	371	7.2	24.5	2.3	--	--	--	--	--	--
10...	1756	1.5	378	7.1	23.5	2.0	--	--	--	--	--	--
10...	1758	2.0	389	7.1	22.5	1.7	--	--	--	--	--	--
10...	1800	2.5	409	7.2	20.0	2.9	--	--	--	--	--	--
10...	1802	2.8	417	7.3	20.0	3.0	--	--	--	--	--	--
SEP												
14...	1710	0.0	570	8.1	12.0	10.1	99	726	72.0	14.0	315	<5.0
14...	1711	0.50	569	8.2	12.0	10.0	--	--	--	--	--	--
14...	1712	1.1	571	8.2	11.5	9.9	--	--	--	--	--	--
14...	1713	1.6	574	8.1	11.5	9.6	--	--	--	--	--	--
14...	1714	2.1	602	8.0	11.5	8.7	--	--	--	--	--	--

LOCATION.--Lat 48°15'35", long 98°50'48", in NW¹/₄ sec.11, T.155 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, on northwest shoreline of Morrison Lake, 2 mi southeast of Webster.

DRAINAGE AREA.--501 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level.

REMARKS.--Stage frequently affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 62.36 ft, Aug. 8, 1993, from flood mark; minimum recorded, 53.35 ft, Sept. 17, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 62.36 ft, Aug. 8, from flood mark; minimum recorded, 57.04 ft, May 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

[illegible]

RED RIVER OF THE NORTH BASIN

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05056222 MORRISON LAKE NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March to September 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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)
MAR 16...	1435	1.2	1.5	1350	7.7	480	417	88	62	110
MAY 12...	1345	0.0	2.3	759	8.2	260	217	48	33	58
AUG 10...	1725	0.0	2.9	411	--	160	157	37	16	21
SEP 14...	1655	0.0	1.6	501	8.1	200	207	46	20	26

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
MAR 16...	32	2	30	290	39	0.50	18	918	893	1.25
MAY 12...	31	2	22	160	21	0.10	3.2	493	476	0.67
AUG 10...	21	0.7	10	52	9.4	0.10	26	292	7790	0.40
SEP 14...	21	0.8	13	57	11	0.10	15	297	313	0.40

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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 ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR 16...	<0.010	0.094	1.70	4.4	0.520	0.470	2	110	30
MAY 12...	<0.010	<0.050	0.090	1.8	0.120	0.060	3	90	30
AUG 10...	--	--	--	--	0.460	--	2	60	30
SEP 14...	<0.010	<0.050	0.090	1.2	0.310	0.260	3	50	20

DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CHLOR-A PHYTO- PLANK- TON CHROMO (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO (UG/L) (70954)
MAR 16...	<1	70	1100	0.1	3	2	390	0.400	0.100
MAY 12...	<1	40	20	0.1	2	<1	270	1.50	0.100
AUG 10...	<1	20	20	0.1	<1	<1	300	22.0	<0.100
SEP 14...	<1	30	20	<0.1	6	<1	240	8.50	0.200

RED RIVER OF THE NORTH BASIN

05056222 MORRISON LAKE NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
MAR												
16...	1430	1.5	1320	7.5	2.5	12.4	95	730	18.0	-15.0	330	20
MAY												
12...	1336	0.0	766	8.2	17.0	9.1	--	--	65.0	22.0	30	6.5
12...	1337	0.45	765	8.3	17.0	9.0	--	--	--	--	--	--
12...	1338	0.76	766	8.3	17.0	8.9	--	--	--	--	--	--
12...	1339	1.1	766	8.3	17.0	8.8	--	--	--	--	--	--
12...	1340	1.4	767	8.3	168.0	8.8	--	--	--	--	--	--
12...	1341	1.7	767	8.3	17.0	8.8	--	--	--	--	--	--
12...	1342	2.0	767	8.3	17.0	8.7	--	--	--	--	--	--
12...	1343	2.3	768	8.3	17.0	7.0	--	--	--	--	--	--
AUG												
10...	1710	0.0	431	8.1	25.0	7.7	98	723	46.0	30.0	160	<5.0
10...	1712	0.50	430	8.2	25.0	7.8	--	--	--	--	--	--
10...	1714	1.0	421	8.2	22.5	7.7	--	--	--	--	--	--
10...	1716	1.5	425	8.0	22.5	6.5	--	--	--	--	--	--
10...	1718	2.0	427	7.9	22.0	5.9	--	--	--	--	--	--
10...	1720	2.5	425	7.8	22.0	5.5	--	--	--	--	--	--
10...	1722	2.9	423	7.8	21.5	5.0	--	--	--	--	--	--
SEP												
14...	1650	0.0	498	8.2	12.5	9.7	95	726	32.4	13.5	315	<5.0
14...	1651	0.60	499	8.2	12.5	9.6	--	--	--	--	--	--
14...	1652	1.2	499	8.2	12.5	9.5	--	--	--	--	--	--
14...	1653	2.0	499	8.2	12.5	9.3	--	--	--	--	--	--
14...	1654	2.3	499	8.2	12.0	8.7	--	--	--	--	--	--

RED RIVER OF THE NORTH BASIN

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05056239 STARKWEATHER COULEE NEAR WEBSTER, ND

LOCATION.--Lat 48°19'13", long 98°56'23", in NW¹/₄SW¹/₄NW¹/₄, sec.19, T.156 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, on right bank 100 ft upstream from bridge on township road, 3.8 mi northwest of Webster.

DRAINAGE AREA.--About 310 mi², of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to current year (seasonal records only since 1988).

GAGE.--Water-stage recorder. Elevation of gage is 1,448 ft above sea level, from topographic map. Prior to July 23, 1986, nonrecording gage 100 ft downstream at same datum.

REMARKS.--Records fair except those for periods of estimated discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 335 ft³/s, July 30, gage height, 8.43 ft; maximum gage height, 9.07 ft, Apr. 5; backwater from ice and snow; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	e2.5	2.1	.00	37	320	47
2	---	---	---	---	---	.00	e6.0	1.7	.00	71	307	47
3	---	---	---	---	---	.00	e20	1.0	.00	76	287	43
4	---	---	---	---	---	.00	e50	.63	.00	64	263	43
5	---	---	---	---	---	.00	e175	.36	.00	53	241	39
6	---	---	---	---	---	.00	e110	.34	.00	58	221	36
7	---	---	---	---	---	.00	e90	.79	.00	63	202	33
8	---	---	---	---	---	.00	e100	1.6	.78	70	e190	32
9	---	---	---	---	---	.00	e130	2.5	7.4	80	e180	31
10	---	---	---	---	---	.00	e150	2.6	8.0	96	168	26
11	---	---	---	---	---	.00	e180	3.1	8.9	103	157	25
12	---	---	---	---	---	.00	e200	3.6	8.9	102	151	27
13	---	---	---	---	---	.00	e220	3.8	8.5	103	147	25
14	---	---	---	---	---	.00	e200	3.9	7.7	104	139	19
15	---	---	---	---	---	.00	e180	3.3	7.2	102	130	17
16	---	---	---	---	---	.00	e150	2.9	6.1	99	121	17
17	---	---	---	---	---	.00	e130	2.7	6.2	97	110	17
18	---	---	---	---	---	.00	e110	2.5	6.3	91	101	15
19	---	---	---	---	---	.00	e80	2.1	5.9	86	95	14
20	---	---	---	---	---	.00	e65	1.9	5.5	77	86	13
21	---	---	---	---	---	.00	e50	1.4	5.1	e50	76	13
22	---	---	---	---	---	.00	e40	1.0	4.6	e45	71	12
23	---	---	---	---	---	.00	31	.79	7.6	e55	74	11
24	---	---	---	---	---	.00	22	.44	8.4	e70	70	9.8
25	---	---	---	---	---	e.00	14	.28	9.5	e100	65	9.8
26	---	---	---	---	---	e.50	9.6	.16	13	e200	60	9.4
27	---	---	---	---	---	e1.5	7.2	.15	14	e270	56	8.4
28	---	---	---	---	---	e2.5	4.7	.12	e16	289	50	7.5
29	---	---	---	---	---	e1.0	3.2	.04	e20	319	50	6.9
30	---	---	---	---	---	e.50	2.5	.02	24	332	53	6.5
31	---	---	---	---	---	e.40	---	.00	---	332	48	---
TOTAL	---	---	---	---	---	6.40	2532.7	47.82	209.58	3694	4289	660.3
MEAN	---	---	---	---	---	.21	84.4	1.54	6.99	119	138	22.0
MAX	---	---	---	---	---	2.5	220	3.9	24	332	320	47
MIN	---	---	---	---	---	.00	2.5	.00	.00	37	48	6.5
AC-FT	---	---	---	---	---	13	5020	95	416	7330	8510	1310

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1993, BY WATER YEAR (WY)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.27	.14	.011	.000	.82	27.7	63.7	4.23	4.14	18.4	14.3	2.13		
MAX	5.53	1.09	.092	.000	6.61	180	265	34.3	22.2	119	138	22.0		
(WY)	1983	1981	1983	1980	1981	1992	1987	1986	1984	1993	1993	1993		
MIN	.000	.000	.000	.000	.000	.000	2.07	.000	.000	.000	.000	.000		
(WY)	1980	1980	1980	1980	1980	1980	1991	1980	1980	1980	1980	1981		

SUMMARY STATISTICS

WATER YEARS 1980 - 1993

ANNUAL MEAN	a11.1
HIGHEST ANNUAL MEAN	a24.5 1987
LOWEST ANNUAL MEAN	a.88 1980
HIGHEST DAILY MEAN	569 Apr 11 1987
LOWEST DAILY MEAN	.00 Oct 1 1979
ANNUAL SEVEN-DAY MINIMUM	.00 Oct 1 1979
INSTANTANEOUS PEAK FLOW	570 Apr 11 1987
INSTANTANEOUS PEAK STAGE	10.05 Apr 6 1989
ANNUAL RUNOFF (AC-FT)	a8030

e Estimated.

a Based on complete water years only (1980-87).

RED RIVER OF THE NORTH BASIN

05056239 STARKWEATHER COULEE NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED WATER (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L CACO3) (00900)	ALKA- LITY LAB (MG/L CACO3) (90410)
MAR											
28...	1750	2.3	--	--	--	4.0	1.0	--	--	--	--
30...	0920	0.48	270	--	--	--	0.5	--	--	--	--
APR											
01...	1510	2.4	345	7.3	--	1.0	1.0	5.4	40	120	108
05...	0945	175	344	7.9	--	7.0	1.0	10.0	75	130	90
06...	1320	104	335	--	--	8.0	2.0	--	--	--	--
15...	1030	177	430	7.6	--	8.0	7.0	--	--	170	143
MAY											
13...	1000	3.6	629	--	7.9	23.5	17.0	--	--	300	217
JUN											
16...	1755	5.8	--	--	--	13.0	15.0	--	--	--	--
JUL											
01...	0930	33	530	--	--	24.5	19.5	--	--	--	--
AUG											
03...	1010	301	390	7.7	--	15.0	17.5	6.4	70	180	163
17...	1245	108	530	8.1	--	25.0	19.0	5.9	68	260	241
30...	1520	52	560	8.3	--	19.0	16.5	10.5	113	270	264
SEP											
21...	1620	12	647	--	8.3	15.0	13.0	--	--	300	285

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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
APR											
01...	31	10	9.0	12	0.4	20	30	13	0.10	19	215
05...	33	11	12	15	0.5	15	52	9.0	0.10	21	224
15...	43	15	11	11	0.4	17	51	8.2	0.10	28	266
MAY											
13...	77	26	16	10	0.4	19	120	6.3	0.20	22	418
AUG											
03...	45	16	12	12	0.4	11	45	6.9	0.10	33	268
17...	61	25	16	11	0.4	13	51	10	0.10	27	349
30...	63	28	17	11	0.4	13	37	11	0.10	15	344
SEP											
21...	64	35	23	13	0.6	16	59	14	0.10	0.40	383

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AM- MONIA + ORGANIC (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHOPHOS- PHATE DIS- SOLVED (MG/L AS P) (00671)
APR										
01...	238	0.32	1.54	0.230	3.37	3.60	0.050	2.0	0.640	0.580
05...	243	0.33	115	0.140	3.46	3.60	0.070	1.4	0.390	0.320
15...	403	0.55	193	0.050	1.25	1.30	0.030	1.0	0.290	0.280
MAY										
13...	438	0.60	4.21	<0.010	--	<0.050	0.030	1.3	0.500	0.140
AUG										
03...	250	0.34	203	<0.010	--	<0.050	0.040	0.80	0.280	0.200
17...	373	0.51	109	<0.010	--	<0.050	0.050	<0.20	0.240	0.210
30...	374	0.51	52.3	0.030	--	<0.050	0.020	1.2	0.240	0.200
SEP										
21...	412	0.56	13.8	<0.010	--	<0.050	0.040	1.3	0.120	0.100

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR										
01...	3	30	90	<1	10	20	<0.1	<1	<1	130
05...	8	20	60	<1	10	10	<0.1	<1	<1	160
15...	7	40	40	<1	10	10	0.8	1	<1	120
MAY										
13...	7	90	40	<1	30	60	0.1	1	<1	340
AUG										
03...	4	50	40	20	20	10	<0.1	<1	<1	190
17...	6	60	30	<1	20	30	<0.1	<1	<1	260
30...	6	60	10	<1	30	20	0.1	<1	<1	350
SEP										
21...	4	50	10	3	30	10	0.1	<1	<1	390

RED RIVER OF THE NORTH BASIN

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05056241 DRY LAKE NEAR PENN, ND

LOCATION.--Lat 48°13'52", long 98°58'59", in NW¹/₄NW¹/₄SW¹/₄ sec.23, T.155 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on west shoreline of Dry Lake, 6 mi east of Penn.

DRAINAGE AREA.--920 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1983 to present (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level.

REMARKS.--Stage affected by wind. Gage height record for the period June 7-16, and June 24 - July 28 was estimated.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 51.66 ft, Aug. 15, 1993; minimum recorded, 41.80 ft, Sept. 14 and Oct. 1-20, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 51.66 ft, Aug. 15; minimum recorded, 45.61 ft, Jan. 10.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46.10	45.76	45.72	45.81	45.82	---	---	46.96	46.92	47.20	49.41	50.07
2	46.12	45.89	45.70	45.78	45.88	---	---	46.96	46.95	47.20	49.52	49.98
3	46.07	46.05	45.72	45.77	45.98	---	---	46.94	46.94	47.20	49.65	49.84
4	46.01	45.84	45.71	45.76	46.05	---	---	46.96	47.00	47.20	49.80	49.78
5	46.00	45.78	45.71	45.75	46.06	---	---	46.96	47.00	47.20	50.06	49.65
6	46.01	45.78	45.71	45.75	---	---	---	46.94	47.00	47.20	50.31	49.49
7	46.01	45.77	45.70	45.77	---	---	---	46.94	47.00	47.20	50.54	49.40
8	45.97	45.78	45.70	45.73	---	---	---	47.03	47.00	47.20	50.76	49.30
9	45.97	45.76	45.70	45.68	---	---	---	47.09	47.00	47.20	51.05	49.21
10	45.95	45.80	45.70	45.63	---	---	---	47.09	47.00	47.20	51.28	49.04
11	45.96	45.80	45.71	45.64	---	---	---	47.08	47.00	47.20	51.39	48.92
12	45.91	45.80	45.70	45.77	---	---	---	47.11	47.10	47.20	51.57	48.91
13	45.93	45.79	45.73	45.78	---	---	---	47.09	47.10	47.20	51.58	48.81
14	45.90	45.78	45.74	45.83	---	---	---	47.13	47.10	47.20	51.61	48.62
15	45.90	45.77	45.73	45.83	---	---	---	47.08	47.10	47.20	51.62	48.50
16	45.89	45.77	45.75	45.85	---	---	---	47.03	47.10	47.20	51.58	48.45
17	45.90	45.77	45.75	45.94	---	---	---	47.04	47.12	47.25	51.52	48.35
18	45.86	45.76	45.75	45.98	---	---	---	47.01	47.14	47.30	51.47	48.26
19	45.84	45.75	45.76	46.00	---	---	---	47.00	47.13	47.35	51.44	48.17
20	45.87	45.75	45.75	46.02	---	---	---	47.00	47.12	47.40	51.36	48.12
21	45.81	45.75	45.75	46.02	---	---	---	46.96	47.15	47.50	51.25	48.03
22	45.84	45.75	45.76	46.03	---	---	46.88	46.97	47.08	47.60	51.15	47.99
23	45.83	45.74	45.75	46.03	---	---	46.89	47.09	47.13	47.80	51.07	47.88
24	45.82	45.74	45.76	46.00	---	---	46.97	47.03	47.20	48.00	50.99	47.86
25	45.85	45.74	45.73	46.00	---	---	46.94	46.94	47.20	48.20	50.91	47.80
26	45.79	45.74	45.73	45.89	---	---	46.85	46.92	47.20	48.50	50.77	47.76
27	45.81	45.73	45.73	45.79	---	---	46.94	46.98	47.20	48.70	50.67	47.62
28	45.78	45.73	45.73	45.80	---	---	46.95	46.92	47.20	48.99	50.54	47.51
29	45.76	45.73	45.75	45.83	---	---	46.99	46.91	47.20	49.14	50.42	47.37
30	45.73	45.72	45.75	45.84	---	---	46.99	47.00	47.20	49.22	50.30	47.31
31	45.75	---	45.75	45.79	---	---	---	46.95	---	49.34	50.15	---
MEAN	45.90	45.78	45.73	45.84	---	---	---	47.00	47.09	47.66	50.83	48.60
MAX	46.12	46.05	45.76	46.03	---	---	---	47.13	47.20	49.34	51.62	50.07
MIN	45.73	45.72	45.70	45.63	---	---	---	46.91	46.92	47.20	49.41	47.31

RED RIVER OF THE NORTH BASIN
05056241 DRY LAKE NEAR PENN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March to September 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

		DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)		
DATE	TIME											
MAR 16...	1250	0.40	0.70	2910	--	1500	1200	350	150	150		
MAY 12...	1222	0.0	4.3	643	--	260	209	62	26	25		
AUG 10...	1350	0.0	2.3	586	8.1	220	195	49	24	32		
SEP 15...	0745	0.0	0.55	477	8.5	200	204	47	19	24		
DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)		
MAR 16...	17	2	100	660	65	0.40	110	2330	2320	3.17		
MAY 12...	16	0.7	17	110	14	0.10	17	404	397	0.55		
AUG 10...	22	0.9	19	100	15	0.10	22	402	7460	0.55		
SEP 15...	20	0.7	14	53	10	0.10	1.6	293	292	0.40		
DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)		
MAR 16...	1.16	0.040	1.20	0.950	5.3	1.80	1.70	33	290	40		
MAY 12...	--	<0.010	<0.050	0.030	1.2	0.300	0.190	8	60	20		
AUG 10...	--	--	--	--	--	0.370	--	5	70	30		
SEP 15...	--	<0.010	<0.050	0.030	0.90	0.270	0.170	4	70	30		
DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)			
MAR 16...	<1	160	1400	0.1	17	1	1200	<0.100	<0.100			
MAY 12...	<1	30	<10	0.2	1	<1	260	3.60	0.400			
AUG 10...	<1	30	10	0.1	1	<1	350	20.0	<0.100			
SEP 15...	<1	20	10	0.1	<1	<1	300	20.0	<0.100			
DATE	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	
MAR 16...	1245	0.70	2860	7.3	0.5	0.6	4	730	11.0	-15.0	330	20
MAY 12...	1216	0.0	633	7.3	17.5	9.8	107	730	12.0	21.5	30	8.0
12...	1217	0.45	632	7.5	17.5	9.7	--	--	--	--	--	--
12...	1218	0.76	632	7.6	17.5	9.7	--	--	--	--	--	--
12...	1219	1.1	632	7.6	17.5	9.6	--	--	--	--	--	--
12...	1220	1.3	632	7.7	17.5	9.6	--	--	--	--	--	--
AUG 10...	1340	0.0	604	8.4	25.0	10.9	140	725	34.0	36.0	160	<5.0
10...	1342	0.50	601	8.5	24.0	11.1	--	--	--	--	--	--
10...	1344	1.0	607	8.3	21.5	8.1	--	--	--	--	--	--
10...	1346	2.0	611	8.3	21.0	8.0	--	--	--	--	--	--
SEP 15...	0740	0.0	473	8.4	10.5	10.3	97	724	10.8	5.5	135	8.0
15...	0741	0.50	473	8.4	10.5	10.2	--	--	--	--	--	--
15...	0742	0.90	473	8.4	10.5	10.1	--	--	--	--	--	--
15...	0743	1.4	473	8.4	10.5	10.0	--	--	--	--	--	--

RED RIVER OF THE NORTH BASIN

77

05056250 LAKE ALICE NEAR CHURCHS FERRY, ND

LOCATION.--Lat 48°07'21", long 99°05'42", in SE¹/₄NE¹/₄NE¹/₄, sec.11, T.156 N., R.66 W., Ramsey County,
Hydrologic Unit 09020201, at northwest corner of lake 7.5 mi northwest of Churchs Ferry.

DRAINAGE AREA.--2,100 mi², approximately, of which about 500 mi² is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960, 1962-64, 1966-87, 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR 16...	1040	0.20	0.50	5110	7.6	3300	2800	830	290	200
MAY 12...	1015	0.0	0.90	717	8.1	330	263	85	29	24
AUG 10...	1130	0.0	1.5	723	7.9	300	242	67	33	35
SEP 15...	0955	0.0	1.9	590	7.9	250	241	57	25	25

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED PER AC-FT) (70303)
MAR 16...	11	2	130	970	130	0.50	80	4330	4370	5.89
MAY 12...	13	0.6	19	110	17	0.20	1.0	463	445	0.63
AUG 10...	19	0.9	14	130	19	0.10	38	519	7570	0.71
SEP 15...	17	0.7	19	71	13	0.10	21	364	378	0.50

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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 ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR 16...	0.010	<0.050	3.00	13	12.0	9.70	20	100	190
MAY 12...	<0.010	<0.050	0.020	1.1	0.530	0.450	4	70	20
AUG 10...	--	--	--	--	0.550	--	3	80	30
SEP 15...	<0.010	<0.050	0.100	1.2	0.470	0.440	3	70	10

DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
MAR 16...	<1	280	25000	0.3	1	2	2100	7.30	0.900
MAY 12...	<1	30	60	0.2	5	<1	320	0.500	<0.100
AUG 10...	<1	40	110	0.1	<1	<1	430	4.90	0.300
SEP 15...	<1	30	50	<0.1	5	1	270	2.00	0.200

RED RIVER OF THE NORTH BASIN

05056250 LAKE ALICE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
MAR												
16...	1030	0.0	4550	--	0.0	0.7	5	730	4.00	-10.0	330	15
MAY												
11...	1007	0.0	726	8.7	18.0	11.8	129	740	47.0	18.5	30	9.0
11...	1008	0.45	727	8.4	18.0	11.7	--	--	--	--	--	--
11...	1009	0.76	727	8.2	18.0	11.7	--	--	--	--	--	--
11...	1010	1.1	727	8.1	18.0	11.7	--	--	--	--	--	--
AUG												
10...	1120	0.0	766	7.6	23.5	7.8	98	724	56.0	30.0	170	<5.0
10...	1122	0.50	765	7.6	23.0	7.4	--	--	--	--	--	--
10...	1124	1.0	768	7.5	22.5	5.9	--	--	--	--	--	--
10...	1126	1.5	766	7.4	21.5	0.6	--	--	--	--	--	--
SEP												
15...	0950	0.0	625	7.9	10.5	7.2	68	724	39.6	9.5	150	<5.0
15...	0951	0.50	624	7.9	10.5	7.2	--	--	--	--	--	--
15...	0952	1.0	624	7.9	10.5	7.2	--	--	--	--	--	--
15...	0953	1.5	624	7.9	10.5	7.3	--	--	--	--	--	--
15...	0954	1.9	624	7.8	10.5	7.3	--	--	--	--	--	--

RED RIVER OF THE NORTH BASIN

79

05056260 LAKE IRVINE NEAR CHURCHS FERRY, ND

LOCATION.--Lat 48°16'57", long 99°10'25", in SE¹/₄SW¹/₄SW¹/₄ sec.32, T.156 N., R.66 W., Ramsey County, Hydrologic Unit 09020201, at south end of lake 1¹/₄ mi northwest of Churchs Ferry.

DRAINAGE AREA.--2,120 mi², approximately, of which about 500 mi² is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966-87, 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR 16...	1120	0.30	0.60	1390	--	720	676	180	65	40
MAY 12...	1105	0.0	1.2	625	--	280	258	71	26	17
AUG 10...	1255	0.0	1.9	604	8.7	270	261	64	27	21
SEP 15...	0840	0.0	1.2	664	8.2	290	261	65	30	28

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
MAR 16...	10	0.7	34	140	24	0.30	52	977	951	1.33
MAY 12...	11	0.4	18	63	12	0.10	13	381	377	0.52
AUG 10...	13	0.6	20	77	14	0.10	10	416	7030	0.57
SEP 15...	16	0.7	19	91	16	0.10	25	425	432	0.58

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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 ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR 16...	<0.010	<0.050	0.850	3.4	2.20	1.80	5	110	150
MAY 12...	<0.010	0.210	0.020	0.90	0.350	0.300	5	50	30
AUG 10...	--	--	--	--	0.540	--	5	60	20
SEP 15...	<0.010	<0.050	0.050	1.7	0.530	0.440	4	70	20

RED RIVER OF THE NORTH BASIN

05056260 LAKE IRVINE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE		LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
MAR										
16...		<1	70	2400	0.3	<1	3	570	2.90	0.600
MAY										
12...		1	30	20	0.2	<1	<1	270	2.20	0.300
AUG										
10...		<1	30	20	0.2	<1	<1	390	24.0	<0.100
SEP										
15...		<1	40	10	<0.1	<1	<1	310	8.30	<0.100

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
MAR												
16...	1110	0.60	1300	7.2	0.0	0.7	5	730	12.0	-15.0	330	15
MAY												
12...	1100	0.0	619	7.8	17.0	9.7	105	730	24.0	22.0	30	8.0
12...	1101	0.45	619	7.8	17.0	9.6	--	--	--	--	--	--
12...	1102	0.76	619	7.8	17.0	9.6	--	--	--	--	--	--
12...	1103	1.2	619	7.8	17.0	9.6	--	--	--	--	--	--
AUG												
10...	1340	0.0	624	8.5	24.0	9.7	122	725	78.0	35.0	160	<5.0
10...	1342	0.50	621	8.6	23.0	10.0	--	--	--	--	--	--
10...	1344	1.0	631	8.4	22.0	7.9	--	--	--	--	--	--
10...	1346	1.5	640	8.4	22.0	8.2	--	--	--	--	--	--
10...	1348	1.9	661	8.3	21.5	6.4	--	--	--	--	--	--
SEP												
15...	0835	0.0	655	8.4	10.5	10.3	97	724	24.0	6.5	150	9.0
15...	0836	0.50	654	8.4	10.5	10.1	--	--	--	--	--	--
15...	0837	1.0	655	8.5	10.5	10	--	--	--	--	--	--
15...	0838	1.5	655	8.5	10.5	10	--	--	--	--	--	--
15...	0839	2.0	655	8.5	10.5	9.9	--	--	--	--	--	--

RED RIVER OF THE NORTH BASIN

81

05056390 LITTLE COULEE NEAR BRINSMADE, ND

LOCATION.--Lat 48°11'15", long 99°14'34", in SW¹/₄, sec.2, T.154 N., R.67 W., Benson County, Hydrologic Unit 09020201, on right bank 100 ft downstream from bridge on township road, 0.5 mi downstream from Silver Lake, and 4 mi east of Brinsmade.

DRAINAGE AREA.--350 mi², of which about 160 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year (seasonal records only since 1983).

GAGE.--Water-stage recorder. Elevation of gage is 1,435 ft above sea level, from topographic map.

REMARKS.--Records fair except those for Apr. 4-7, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 193 ft³/s, July 29, gage height, 10.78 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.00	.00	.00	.45	e100	31
2	---	---	---	---	---	.00	.00	.00	.00	.03	e75	31
3	---	---	---	---	---	.00	.00	.00	.00	.00	65	30
4	---	---	---	---	---	.00	e.04	.00	.00	.00	58	28
5	---	---	---	---	---	.00	e.10	.00	.00	.00	53	28
6	---	---	---	---	---	.00	e.05	.00	.00	.00	48	27
7	---	---	---	---	---	.00	e.02	.00	.00	.00	44	27
8	---	---	---	---	---	.00	.00	.00	.00	.00	43	27
9	---	---	---	---	---	.00	.00	.00	.00	.05	43	26
10	---	---	---	---	---	.00	.00	.00	.00	.00	41	25
11	---	---	---	---	---	.00	.00	.00	.00	.00	41	25
12	---	---	---	---	---	.00	.00	.00	.00	.00	40	25
13	---	---	---	---	---	.00	.00	.00	.00	.18	39	23
14	---	---	---	---	---	.00	.00	.00	.00	.12	40	22
15	---	---	---	---	---	.00	.00	.00	.00	.01	39	21
16	---	---	---	---	---	.00	.00	.00	.00	.03	39	21
17	---	---	---	---	---	.00	.00	.00	.00	.97	38	20
18	---	---	---	---	---	.00	.00	.00	.00	.32	36	20
19	---	---	---	---	---	.00	.00	.00	.00	.45	35	19
20	---	---	---	---	---	.00	.00	.00	.00	.05	33	19
21	---	---	---	---	---	.00	.00	.00	.00	.00	33	19
22	---	---	---	---	---	.00	.00	.00	.01	.50	33	19
23	---	---	---	---	---	.00	.00	.00	.05	.64	33	18
24	---	---	---	---	---	.00	.00	.00	.02	6.4	32	17
25	---	---	---	---	---	.00	.00	.00	.00	3.1	31	17
26	---	---	---	---	---	.00	.00	.00	.00	2.0	29	16
27	---	---	---	---	---	.00	.00	.00	.00	4.4	29	14
28	---	---	---	---	---	.00	.00	.00	.00	.62	30	13
29	---	---	---	---	---	.00	.00	.00	.01	181	30	13
30	---	---	---	---	---	.00	.00	.00	1.1	168	31	13
31	---	---	---	---	---	.00	---	.00	---	e130	31	---
TOTAL	---	---	---	---	---	0.00	0.21	0.00	1.19	560.70	1292	654
MEAN	---	---	---	---	---	.000	.007	.000	.040	18.1	41.7	21.8
MAX	---	---	---	---	---	.00	.10	.00	1.1	181	100	31
MIN	---	---	---	---	---	.00	.00	.00	.00	.00	29	13
AC-FT	---	---	---	---	---	.00	.4	.00	2.4	1110	2560	1300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1993, BY WATER YEAR (WY)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	.003	.000	.000	.000	.018	3.43	14.7	16.2	4.28	2.72	2.74	1.18							
MAX	.018	.001	.000	.000	.13	23.2	91.9	231	68.1	27.9	41.7	21.8							
(WY)	1981	1981	1976	1976	1981	1976	1979	1979	1979	1979	1993	1993							
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000							
(WY)	1976	1976	1976	1976	1976	1979	1977	1977	1977	1977	1976	1976							

SUMMARY STATISTICS

WATER YEARS 1975 - 1993

ANNUAL MEAN	a7.02		
HIGHEST ANNUAL MEAN	a35.8	1979	
LOWEST ANNUAL MEAN	a.006	1977	
HIGHEST DAILY MEAN	375	May 4 1979	
LOWEST DAILY MEAN	.00	Aug 27 1975	
ANNUAL SEVEN-DAY MINIMUM	.00	Sep 7 1975	
INSTANTANEOUS PEAK FLOW	425	May 1 1979	
INSTANTANEOUS PEAK STAGE	10.78	Jul 29 1993	
ANNUAL RUNOFF (AC-FT)	a5090		
10 PERCENT EXCEEDS	7.6		
50 PERCENT EXCEEDS	.00		
90 PERCENT EXCEEDS	.00		

e Estimated.

a Based on complete years only (1976-82).

RED RIVER OF THE NORTH BASIN

05056390 LITTLE COULEE NEAR BRINSMADE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
JUL 02...	1045	0.05	--	--	29.0	16.5	--	--	--	--	--
AUG 03...	1625	65	870	--	19.5	20.5	--	--	--	--	--
10...	1430	40	870	--	31.0	29.5	--	--	--	--	--
19...	1740	33	792	--	21.0	23.5	--	--	--	--	--
SEP 15...	1445	23	910	8.2	17.5	13.5	7.0	330	281	65	40
23...	0925	19	915	--	11.5	10.0	--	--	--	--	--
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
SEP 15...	70	30	2	24	170	29	0.10	20	587	609	0.83
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
SEP 15...	37.0	7	120	10	<1	60	30	<0.1	<1	<1	320

RED RIVER OF THE NORTH BASIN

83

05056400 BIG COULEE NEAR CHURCHS FERRY, ND

LOCATION.--Lat 48°10'40", long 99°13'15", in NW¹/₄, NW¹/₄, sec.12, T. 154 N., R.67 W., Benson County, Hydrologic Unit 09020201, on left bank on downstream side of bridge on U.S. Highway 281, 1 mi downstream from Little Coulee, and 6 mi south of Churchs Ferry.

DRAINAGE AREA.--1,620 mi², approximately, of which about 158 mi² is probably noncontributing. Drainage area reduced from approximately 2,510 mi² with the completion of Channel A in March 1979.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1950 to current year. Prior to October 1960, published as Mauvais Coulee near Churchs Ferry.

REVISED RECORDS.--1985: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,432.65 ft above sea level. Prior to June 21, 1950, reference marks, and June 21, 1950, to July 17, 1956, nonrecording gage at former bridge on U.S. Highway 281, 0.1 mi upstream at datum 0.70 ft higher.

REMARKS.--Records fair except those for period July to September which are good and those for periods of estimated discharges which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	.88	2.3	e.26	e.00	e.00	e1.0	43	1.1	33	190	342
2	20	.80	1.9	e.26	e.00	e.00	e.70	41	.58	31	163	342
3	18	.78	1.4	e.24	e.00	e.00	e1.5	38	.38	27	145	342
4	16	.65	1.3	e.24	e.00	e.00	e2.5	34	.18	26	140	340
5	14	.85	e1.2	e.22	e.00	e.00	e3.0	34	.00	23	147	341
6	9.5	1.4	e1.1	e.20	e.00	e.00	e3.5	32	.00	23	172	341
7	8.1	1.5	e1.0	e.20	e.00	e.00	e4.0	31	.41	28	194	341
8	9.2	1.5	e.95	e.16	e.00	e.00	e5.0	29	24	31	214	342
9	9.8	1.6	e.90	e.14	e.00	e.00	e6.5	43	110	75	224	340
10	8.8	2.2	e.90	e.12	e.00	e.00	e8.0	49	56	75	237	342
11	7.4	2.6	e.85	e.10	e.00	e.00	e10	41	24	52	252	344
12	6.0	3.0	e.80	e.08	e.00	e.00	e12	37	15	41	256	345
13	6.2	2.4	e.75	e.06	e.00	e.00	e14	34	13	41	262	346
14	7.6	1.9	e.70	e.04	e.00	e.00	e16	30	12	44	268	345
15	7.2	1.9	e.65	e.04	e.00	e.00	e18	31	20	43	271	341
16	6.0	2.2	e.65	e.04	e.00	e.01	e25	27	24	40	275	336
17	5.3	2.3	e.60	e.04	e.00	e.02	e33	21	23	46	281	334
18	2.7	2.3	e.55	e.02	e.00	e.03	39	19	26	46	285	332
19	2.5	2.5	e.50	e.02	e.00	e.04	45	17	26	46	289	331
20	2.3	2.5	e.50	e.02	e.00	e.05	55	13	23	45	299	330
21	2.0	2.6	e.48	e.02	e.00	e.08	45	11	19	44	309	329
22	1.8	3.3	e.46	e.01	e.00	e.10	43	7.2	19	47	317	326
23	1.3	3.9	e.42	e.00	e.00	e.50	44	5.6	29	55	325	324
24	.90	2.7	e.38	e.00	e.00	e1.0	45	9.8	21	113	333	320
25	.79	2.5	e.34	e.00	e.00	e2.0	45	10	13	127	339	319
26	.73	2.3	e.32	e.00	e.00	e3.5	44	5.1	6.1	128	340	315
27	.81	2.1	e.30	e.00	e.00	e5.0	39	2.6	5.7	134	340	313
28	1.0	2.1	e.30	e.00	e.00	e7.0	41	2.4	5.9	167	340	310
29	1.1	2.3	e.28	e.00	---	e9.0	41	1.6	8.6	225	342	310
30	1.3	2.2	e.28	e.00	---	e4.0	43	1.2	30	233	347	305
31	1.1	---	e.28	e.00	---	e2.0	---	1.7	---	217	345	---
TOTAL	202.43	61.76	23.34	2.53	0.00	34.33	732.70	702.2	555.95	2306	8241	9968
MEAN	6.53	2.06	.75	.082	.000	1.11	24.4	22.7	18.5	74.4	266	332
MAX	23	3.9	2.3	.26	.00	9.0	55	49	110	233	347	346
MIN	.73	.65	.28	.00	.00	.00	.70	1.2	.00	23	140	305
AC-FT	402	123	46	5.0	.00	68	1450	1390	1100	4570	16350	19770

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1993, BY WATER YEAR (WY)

	MEAN	7.36	5.52	2.30	.83	.45	6.04	75.6	136	95.4	58.9	31.7	18.6
MAX	67.7	49.4	22.7	18.0	8.00	82.7	432	1211	1030	459	266	332	332
(WY)	1975	1975	1955	1955	1955	1983	1976	1979	1974	1974	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1952	1952	1951	1951	1951	1952	1953	1952	1952	1952	1952	1951	1951

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1951 - 1993

ANNUAL TOTAL	9986.03	22830.24	a36.7
ANNUAL MEAN	27.3	62.5	235
HIGHEST ANNUAL MEAN			.000
LOWEST ANNUAL MEAN			1979
HIGHEST DAILY MEAN	147	Apr 22	1400
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			1420
INSTANTANEOUS PEAK STAGE			7.59
ANNUAL RUNOFF (AC-FT)	19810	45280	26560
10 PERCENT EXCEEDS	87	314	97
50 PERCENT EXCEEDS	14	5.0	.03
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a The average discharge for the 15 years (1979-93), since the completion of Channel A, is 35.5 ft³/s.

RED RIVER OF THE NORTH BASIN

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1958, 1961 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
OCT											
07...	1125	7.5	648	--	--	7.5	10.5	--	--	--	--
NOV											
23...	1525	3.1	783	--	--	-1.0	0.5	--	--	--	--
JAN											
04...	1145	0.24	1420	--	--	-17.0	0.0	--	--	--	--
MAR											
25...	0930	1.9	1470	--	--	2.0	1.0	--	--	--	--
29...	1515	8.3	560	--	--	6.0	5.0	--	--	--	--
APR											
02...	1140	0.71	594	7.4	--	5.5	1.0	4.5	--	230	163
05...	1755	2.9	--	--	--	4.0	1.0	--	--	--	--
a14...	1200	17	450	--	7.8	11.0	1.5	--	--	190	160
23...	1000	42	639	8.1	--	13.0	8.0	8.3	--	300	267
MAY											
11...	1345	41	709	7.9	--	24.0	19.0	--	--	320	262
JUN											
15...	1030	20	700	--	--	16.0	14.0	--	--	--	--
JUL											
01...	1725	31	690	--	--	16.0	19.0	--	--	--	--
08...	1415	32	702	7.9	--	25.5	19.0	--	--	320	276
AUG											
03...	1810	143	690	--	--	19.5	19.5	--	--	--	--
11...	1000	250	671	--	--	24.0	23.0	--	--	--	--
16...	1300	275	680	7.7	--	27.0	23.0	2.3	28	290	254
25...	1320	340	700	7.4	--	22.0	22.0	1.3	--	300	258
SEP											
03...	1445	341	700	7.5	--	--	18.0	3.1	--	300	259
13...	1540	352	680	7.8	--	5.5	11.5	2.6	25	300	261
22...	1020	322	708	--	7.9	9.5	12.0	2.4	--	300	265

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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
APR											
02...	59	20	28	19	0.8	21	120	15	0.10	22	394
a14...	48	17	16	15	0.5	11	64	8.9	0.10	12	274
23...	75	27	19	11	0.5	17	76	12	0.10	14	401
MAY											
11...	78	30	28	15	0.7	18	120	16	0.10	16	465
JUL											
08...	77	30	28	15	0.7	21	100	14	0.10	15	454
AUG											
16...	66	30	31	18	0.8	20	100	18	0.10	14	434
25...	68	31	32	18	0.8	20	95	15	0.10	17	435
SEP											
03...	67	32	33	18	0.8	19	100	18	0.10	27	454
13...	67	31	30	17	0.8	19	94	17	0.10	26	444
22...	68	32	31	17	0.8	20	98	15	0.10	24	450

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

85

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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 ORTHO, DIS- SOLVED (MG/L AS P) (00671)
APR										
02...	401	0.55	0.77	0.190	1.61	1.80	0.380	2.0	0.500	0.440
a14...	286	0.39	12.8	<0.010	--	<0.050	0.010	1.2	0.260	0.150
23...	410	0.56	46.2	<0.010	--	<0.050	0.020	1.1	0.330	0.290
MAY										
11...	488	0.66	53.4	<0.010	--	<0.050	0.030	1.0	0.470	0.440
JUL										
08...	473	0.64	41.0	<0.010	--	0.410	0.060	1.1	0.400	0.380
AUG										
16...	456	0.62	339	<0.010	--	<0.050	0.090	<0.20	0.580	0.550
25...	463	0.63	425	<0.010	--	<0.050	0.100	1.4	0.610	0.520
SEP										
03...	496	0.67	457	0.020	0.041	0.061	0.100	1.2	0.540	0.540
13...	463	0.63	440	0.060	0.090	0.150	0.200	1.5	0.520	0.500
22...	471	0.64	409	0.090	0.130	0.220	0.110	1.3	0.540	0.520

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR										
02...	7	50	140	<1	30	820	<0.1	2	<1	220
a14...	2	40	20	<1	20	340	<0.1	1	<1	180
23...	6	50	20	<1	30	30	<0.1	1	<1	250
MAY										
11...	6	60	20	<1	40	40	0.1	1	<1	330
JUL										
08...	4	60	20	<1	40	70	0.3	<1	<1	360
AUG										
16...	7	70	30	<1	40	130	<0.1	<1	<1	270
25...	5	60	30	<1	40	50	<0.1	<1	<1	400
SEP										
03...	3	70	30	<1	50	20	<0.1	<1	<1	310
13...	4	80	20	<1	40	30	0.1	<1	<1	360
22...	5	70	20	<1	30	30	<0.1	<1	<1	390

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05056410 CHANNEL A NEAR PENN, ND

LOCATION.--Lat 48°10'00", long 98°58'47", in SE¹/₄SW¹/₄SW¹/₄ sec.11, T.154 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on right bank 200 ft upstream from U.S. Highway 2, 9 mi northwest of Devils Lake, and 7 mi southeast of Penn.

DRAINAGE AREA.--930 mi², approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level. Prior to Oct. 1, 1985, water-stage recorder at same site at datum of 1,437.31 ft.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated by gate control on Dry Lake (station 05056241) 3 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	7.7	e17	.31	e.00	e.00	e5.0	.36	.02	52	576	1070
2	23	14	e14	.33	e.00	e.00	11	.38	.03	58	631	1050
3	23	25	e13	.00	e.00	e.00	9.7	.31	.03	64	699	1040
4	20	24	e10	e.00	e.00	e.00	16	.28	.03	61	761	1020
5	14	24	e5.0	e.00	e.00	e.00	22	.24	.03	62	862	991
6	23	24	e3.0	e.00	e.00	e.00	22	.20	.04	69	948	954
7	21	23	e2.0	e.00	e.00	e.00	33	.19	.04	66	1040	921
8	19	24	e1.5	e.00	e.00	e.00	45	.14	.06	65	1120	881
9	18	24	e1.4	e.00	e.00	e.01	59	.15	.14	67	1240	880
10	20	21	e1.2	e.00	e.00	e.02	67	.14	.06	72	1340	812
11	17	12	e1.0	e.00	e.00	e.01	73	.09	.03	75	1380	768
12	23	13	e1.0	e.00	e.00	e.01	73	.07	.04	77	1480	772
13	17	14	e.70	e.00	e.00	e.00	75	.05	2.3	82	1490	768
14	3.5	15	e.60	e.00	e.00	e.00	64	.05	57	87	1520	695
15	.48	15	e.55	e.00	e.00	e.00	14	.02	59	90	1540	634
16	.61	14	e.50	e.00	e.00	e.00	8.3	.02	43	96	1540	641
17	9.1	15	e.45	e.00	e.00	e.00	6.8	.03	42	111	1520	607
18	18	16	e.40	e.00	e.00	e.00	5.4	.03	39	110	1510	581
19	12	17	.03	e.00	e.00	e.00	4.6	.03	15	120	1510	557
20	16	21	.21	e.00	e.00	e.00	3.8	.03	9.5	127	1480	544
21	10	23	.03	e.00	e.00	e.00	2.7	.03	2.8	129	1450	511
22	9.8	29	.17	e.00	e.00	e.00	1.7	.05	.86	137	1410	515
23	15	e22	.02	e.00	e.00	e.00	1.4	.06	.91	151	1410	474
24	14	e14	.40	e.00	e.00	e.02	1.4	.04	24	168	1380	459
25	15	16	.00	e.00	e.00	e.10	1.0	.03	33	200	1360	445
26	19	23	.41	e.00	e.00	e.17	.74	.03	40	208	1320	473
27	14	33	.21	e.00	e.00	e.40	.66	.03	52	282	1280	412
28	20	25	.01	e.00	e.00	e.80	.49	.02	52	357	1230	393
29	12	22	.11	e.00	---	e1.5	.42	.02	52	404	1190	344
30	9.2	18	.27	e.00	---	e3.0	.39	.02	52	455	1160	314
31	6.6	---	.08	e.00	---	e4.0	---	.02	---	512	1100	---
TOTAL	462.29	587.7	75.25	0.64	0.00	10.04	628.50	3.16	576.92	4614	38477	20526
MEAN	14.9	19.6	2.43	.021	.000	.32	20.9	.10	19.2	149	1241	684
MAX	23	33	17	.33	.00	4.0	75	.38	59	512	1540	1070
MIN	.48	7.7	.00	.00	.00	.00	.39	.02	.02	52	576	314
AC-FT	917	1170	149	1.3	.00	20	1250	6.3	1140	9150	76320	40710

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1993, BY WATER YEAR (WY)

	MEAN	7.31	9.56	2.02	.013	.30	4.43	83.7	47.5	16.5	15.4	126	71.5
MAX	22.4	43.0	10.7	.047	2.80	17.0	568	351	100	149	1241	684	
(WY)	1987	1987	1987	1984	1984	1985	1987	1987	1987	1993	1993	1993	
MIN	.000	.010	.005	.000	.000	.000	.098	.049	.028	.000	.010	.010	
(WY)	1984	1990	1990	1985	1986	1990	1991	1990	1989	1988	1989	1988	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1984 - 1993
ANNUAL TOTAL	2688.26	65961.50	
ANNUAL MEAN	7.34	181	32.1
HIGHEST ANNUAL MEAN			181
LOWEST ANNUAL MEAN			.048
HIGHEST DAILY MEAN	47	1540	1540
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.01	.00	.00
INSTANTANEOUS PEAK FLOW		1560	1560
INSTANTANEOUS PEAK STAGE		43.67	43.67
ANNUAL RUNOFF (AC-FT)	5330	130800	23250
10 PERCENT EXCEEDS	24	832	35
50 PERCENT EXCEEDS	.62	6.8	.05
90 PERCENT EXCEEDS	.01	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

87

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT												
13...	1320	18	816	8.5	--	1.5	5.5	--	--	--	--	--
NOV												
24...	0925	14	968	--	--	-2.0	1.0	--	--	--	--	--
MAR 1993												
10...	1215	0.02	2250	--	--	-4.0	1.0	--	--	--	--	--
26...	1110	0.17	1350	--	--	3.0	1.0	--	--	--	--	--
30...	1445	3.5	470	--	--	3.0	0.5	--	--	--	--	--
APR												
02...	0855	9.2	470	7.6	--	4.0	0.0	11.4	83	170	79	38
14...	1740	73	1210	7.9	--	11.5	--	--	--	510	404	120
23...	0645	1.3	849	7.9	--	8.5	8.0	--	--	320	185	71
MAY												
12...	0835	0.06	658	--	7.6	15.0	15.0	--	--	280	185	58
JUN												
16...	1040	42	780	--	8.0	22.5	15.0	5.5	--	310	258	73
JUL												
02...	0755	52	700	--	--	16.5	17.0	--	--	--	--	--
08...	1700	64	665	7.9	--	23.0	--	--	--	270	226	64
AUG												
04...	1120	821	590	8.3	--	18.0	18.5	8.3	93	240	196	53
11...	1400	1400	500	--	--	21.0	21.0	--	--	--	--	--
16...	1630	1490	510	8.4	--	28.0	23.0	9.2	113	210	184	46
26...	1345	1290	482	7.5	--	21.0	19.0	6.6	75	180	179	44
SEP												
02...	0830	1060	455	8.2	--	20.5	17.0	9.8	--	180	184	42
13...	1750	731	462	8.7	--	7.0	11.5	9.3	90	200	197	46
22...	1415	523	492	--	8.5	13.5	13.0	10.1	--	200	210	47

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
APR												
02...	18	28	25	0.9	9.9	130	10	<1.0	14	310	331	0.45
14...	52	52	17	1	30	230	24	0.20	33	786	838	1.14
23...	34	58	27	1	16	250	15	0.10	6.0	562	577	0.78
MAY												
12...	32	37	22	1	11	170	8.4	0.20	28	457	486	0.66
JUN												
16...	32	34	18	0.8	26	130	15	0.10	13	480	496	0.67
JUL												
08...	27	29	17	0.8	24	120	9.6	0.10	27	440	446	0.61
AUG												
04...	25	31	20	0.9	21	110	14	0.90	25	400	387	0.53
16...	22	29	22	0.9	16	86	12	0.10	22	345	353	0.48
26...	18	24	21	0.8	14	54	7.4	0.10	23	294	309	0.42
SEP												
02...	18	23	20	0.7	14	51	9.4	0.10	16	285	271	0.37
13...	20	25	20	0.8	14	55	10	0.10	9.2	298	276	0.38
22...	20	24	19	0.7	14	57	10	0.10	0.40	299	310	0.42

RED RIVER OF THE NORTH BASIN

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,TOT IN BOT- TOM MA- TERIAL (MG/KG AS N) (00603)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)
OCT 1992 13...	--	--	--	--	0.105	--	1.2	1.3	0.3	--	0.474
APR 02...	8.23	0.080	2.82	2.90	--	0.110	--	0.90	--	0.170	--
14...	165	<0.010	--	0.064	--	0.020	--	1.9	--	0.550	--
23...	2.06	<0.010	--	<0.050	--	0.040	--	1.1	--	0.170	--
MAY 12...	0.08	<0.010	--	<0.050	--	0.030	--	1.5	--	0.060	--
JUN 16...	56.6	<0.010	--	<0.050	--	0.040	--	1.0	--	0.450	--
JUL 08...	77.2	0.020	0.360	0.380	--	0.040	--	0.90	--	0.450	--
AUG 04...	858	0.010	0.150	0.160	--	0.060	--	1.1	--	0.420	--
16...	1420	<0.010	--	<0.050	--	0.050	--	<0.20	--	0.310	--
26...	1080	0.020	0.080	0.100	--	0.130	--	1.3	--	0.430	--
SEP 02...	776	<0.010	--	<0.050	--	0.030	--	0.80	--	0.340	--
13...	545	<0.010	--	<0.050	--	0.030	--	0.80	--	0.290	--
22...	438	<0.010	--	<0.050	--	0.040	--	1.6	--	0.320	--

DATE	PHOS- PHORUS ORTHOPHOS- PHATE DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
OCT 1992 13...	0.340	--	--	--	--	--	--	--	--	--	--
APR 02...	0.200	3	50	70	<1	20	320	<0.1	<1	1	200
14...	0.460	14	110	10	<1	60	110	<0.1	5	<1	390
23...	0.120	4	80	70	<1	50	170	<0.1	1	<1	330
MAY 12...	0.010	6	50	60	<1	40	750	0.1	1	<1	300
JUN 16...	0.420	10	100	20	<1	40	20	<0.1	<1	<1	380
JUL 08...	0.410	7	60	20	<1	30	20	0.1	2	<1	330
AUG 04...	0.310	7	60	40	<1	30	20	<0.1	<1	<1	230
16...	0.270	6	60	10	<1	20	30	<0.1	<1	<1	190
26...	0.340	3	50	30	<1	20	40	<0.1	<1	<1	340
SEP 02...	0.300	3	50	40	<1	30	20	<0.1	<1	<1	230
13...	0.190	3	60	40	<1	30	10	<0.1	<1	1	220
22...	0.150	4	60	30	<1	20	30	<0.1	<1	<1	320

RED RIVER OF THE NORTH BASIN

89

05056500 DEVILS LAKE NEAR DEVILS LAKE, ND

LOCATION.--Lat 48°04'00", long 98°56'07", in SW¹/₄, sec.18, T.153 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, at Lakewood on east bank of Creel Bay, and 4.5 mi southwest of city of Devils Lake. Creel Bay, which is 0.5 mi wide, is an arm of Devils Lake and extends 2 mi to the north of the lake.

DRAINAGE AREA.--3,130 mi², approximately, of which about 1,000 mi² is probably noncontributing.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--1867, 1879, 1883, 1887, 1890, 1896 (one gage height for each year), 1901-63 (fragmentary), 1964 to current year.

REVISED RECORDS.--WSP 1913: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level. June 23, 1950, to June 6, 1963, nonrecording gage at present site and datum. See WSP 1913 for history of changes prior to June 23, 1950. Prior to October 1979 only monthend elevations were published.

REMARKS.--Elevation at gage frequently affected by wind.

EXTREMES OUTSIDE PERIOD OF RECORD.--The lake level was at an elevation of about 1,441 ft around 1830 and lower thereafter. Reference is Geological Survey monograph, volume XXV, the Glacial History of Lake Agassiz by Warren Upham.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,427.10 ft, Sept. 30; minimum, 1,422.42 ft, Oct. 31. Gage heights for the period Sept. 18-30 were estimated. The maximum elevation for the year which occurred on Sept. 30 was determined from an observation on the following day.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.66	22.47	22.56	22.65	22.67	22.66	22.74	23.01	e22.89	23.24	24.57	26.33
2	22.65	22.51	22.56	22.63	22.67	22.67	22.73	23.02	e22.87	23.27	24.54	26.38
3	22.66	22.54	22.59	22.63	22.67	22.68	22.73	23.03	e22.85	23.22	24.57	26.45
4	22.64	22.56	22.59	22.65	22.66	22.68	22.73	23.01	e22.83	23.31	24.62	26.45
5	22.70	22.56	22.56	22.66	22.65	22.68	22.74	23.00	e22.81	23.39	24.67	26.50
6	22.65	22.55	22.58	22.66	22.65	22.68	22.76	22.98	e22.80	23.33	24.72	26.53
7	22.64	22.56	22.59	22.66	22.65	22.68	22.78	23.00	22.79	23.28	24.78	26.55
8	22.62	22.54	22.60	22.66	22.64	22.68	22.80	23.08	22.95	23.30	24.85	26.62
9	22.62	22.55	22.62	22.66	22.64	22.70	22.81	23.19	23.14	23.33	24.95	26.64
10	22.62	22.62	22.66	22.66	22.64	22.72	22.84	23.17	23.13	23.33	25.02	26.62
11	22.62	22.61	22.60	22.65	22.63	22.72	22.87	23.16	23.12	23.35	25.09	26.65
12	22.62	22.61	22.51	22.64	22.63	22.72	22.88	23.15	23.11	23.30	25.24	26.70
13	22.53	22.58	22.56	22.65	22.64	22.71	22.89	23.18	23.22	23.32	25.27	26.71
14	22.54	22.56	22.58	22.65	22.64	22.71	22.90	23.15	23.20	23.35	25.36	26.73
15	22.55	22.56	22.59	22.65	22.64	22.70	22.93	23.12	23.07	23.34	25.44	26.73
16	22.56	22.57	22.60	22.66	22.64	22.72	22.94	23.09	23.10	23.41	25.49	26.78
17	22.55	22.57	22.60	22.66	22.64	22.71	22.95	23.06	23.11	23.57	25.57	e26.80
18	22.52	22.57	22.61	22.66	22.64	22.68	22.96	23.06	23.12	23.58	25.67	e26.83
19	22.51	22.58	22.62	22.66	22.64	22.65	22.95	23.06	23.12	23.62	25.68	e26.86
20	22.51	22.59	22.62	22.66	22.64	22.68	22.97	23.05	23.13	23.58	25.72	e26.87
21	22.52	22.59	22.62	22.66	22.65	22.67	22.97	23.03	23.10	23.56	25.77	e26.90
22	22.52	22.59	22.62	22.66	22.65	22.63	22.96	23.04	23.09	23.65	25.81	e26.93
23	22.52	22.59	22.62	22.67	22.65	22.62	22.97	23.03	23.20	23.75	25.92	e26.96
24	22.52	22.59	22.62	22.67	22.65	22.65	22.99	23.03	23.31	23.80	25.95	e26.98
25	22.55	22.59	22.64	22.66	22.65	22.67	22.97	23.03	23.38	23.93	25.96	e27.00
26	22.51	22.59	22.63	22.66	22.65	22.68	22.98	22.95	23.23	24.03	26.04	e27.02
27	22.55	22.59	22.64	22.66	22.64	22.70	23.00	e22.94	23.13	24.14	26.12	e27.04
28	22.49	22.58	22.65	22.67	22.66	22.71	23.04	e22.93	23.10	24.32	26.14	e27.06
29	22.48	22.58	22.66	22.67	---	22.73	23.03	e22.92	23.06	24.34	26.18	e27.08
30	22.46	22.56	22.64	22.66	---	22.74	23.00	e22.91	23.21	24.39	26.30	e27.10
31	22.44	---	22.65	22.65	---	22.74	---	e22.90	---	24.47	26.31	---
MEAN	22.57	22.57	22.61	22.66	22.65	22.69	22.89	23.04	23.07	23.61	25.43	26.76
MAX	22.70	22.62	22.66	22.67	22.67	22.74	23.04	23.19	23.38	24.47	26.31	27.10
MIN	22.44	22.47	22.51	22.63	22.63	22.62	22.73	22.90	22.79	23.22	24.54	26.33

e Estimated.

RED RIVER OF THE NORTH BASIN

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND

LOCATION.--Lat 47°25'58", long 98°01'38", in NW1/4, NW1/4, SW1/4 sec.26, T.146 N., R.58 W., Griggs County, Hydrologic Unit 09020203, on right bank at Ueland Dam 0.7 mi downstream from State Highway 200, and 5 mi east of Cooperstown.

DRAINAGE AREA.--6,470 mi², approximately, of which about 5,200 mi² is probably noncontributing, includes 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1944 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area. WRD ND-80-1: Gage datum.

GAGE.--Water-stage recorder and artificial control. Datum of gage is 1,271.76 ft above sea level (Coast and Geodetic Survey bench mark). Aug. 31, 1950, to Oct. 22, 1985, gage located on right bank 300 ft downstream of present site and datum. Prior to Aug. 3, 1950, nonrecording gage at site 150 ft downstream of present site at same datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	13	18	10	9.5	8.7	e340	106	84	115	1630	400
2	3.9	12	18	10	9.9	8.4	e380	104	81	118	1680	393
3	3.9	18	17	10	10	9.1	e460	103	77	125	1670	397
4	5.1	19	17	9.9	9.7	9.2	e520	99	72	123	1640	398
5	6.1	20	15	9.8	9.5	9.5	e610	94	69	127	1680	393
6	5.2	20	14	9.7	9.5	10	707	93	68	132	1660	362
7	4.3	20	14	9.4	9.5	11	815	91	64	134	1670	343
8	4.3	20	13	9.1	9.5	13	930	91	67	134	1690	313
9	6.5	20	12	e8.7	9.5	14	972	123	68	137	1700	287
10	7.8	21	12	e7.9	9.2	14	926	205	72	140	1680	261
11	7.1	21	11	e7.9	9.1	12	829	251	72	152	1610	241
12	7.6	20	11	e7.9	9.4	13	661	251	71	168	1560	224
13	9.9	19	11	e7.9	9.6	11	495	230	67	171	1460	209
14	7.4	18	11	e7.9	9.0	12	392	200	64	168	1350	196
15	5.1	20	11	e7.9	e9.0	12	322	177	61	166	1210	186
16	4.6	20	11	e7.9	e9.0	12	280	167	60	277	1080	176
17	7.8	20	11	e7.8	e9.0	12	254	153	62	302	979	171
18	8.5	20	11	e7.8	e9.2	12	231	137	61	390	843	162
19	8.7	20	11	e7.8	e9.4	12	211	119	67	473	696	151
20	8.7	21	10	e7.8	e9.6	12	195	108	70	513	589	147
21	9.1	21	10	e8.5	e9.8	11	181	97	74	527	506	141
22	9.1	21	e10	9.4	e10	12	170	93	68	525	440	136
23	9.7	21	e10	9.5	e9.8	12	159	91	78	560	390	130
24	10	21	e10	9.1	e9.6	19	153	92	81	1080	350	124
25	23	21	e10	9.0	e9.3	e55	138	90	83	2380	330	122
26	23	20	e10	9.5	e8.8	e80	129	92	89	2290	305	116
27	12	19	e10	9.5	e8.5	e105	123	88	85	1930	290	111
28	10	19	e10	9.1	e8.2	e140	119	89	83	1750	277	110
29	11	19	e10	9.1	---	e180	113	87	85	1650	281	107
30	21	18	10	9.5	---	e225	109	87	105	1560	371	106
31	15	---	10	9.5	---	e275	---	86	---	1530	406	---
TOTAL	277.5	582	369	274.8	262.1	1340.9	11924	3894	2208	19847	32023	6613
MEAN	8.95	19.4	11.9	8.86	9.36	43.3	397	126	73.6	640	1033	220
MAX	23	21	18	10	10	275	972	251	105	2380	1700	400
MIN	2.1	12	10	7.8	8.2	8.4	109	86	60	115	277	106
AC-FT	550	1150	732	545	520	2660	23650	7720	4380	39370	63520	13120

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1993, BY WATER YEAR (WY)

	MEAN	24.7	24.7	15.9	10.2	11.0	161	546	210	109	79.3	50.6	25.8
MAX	114	71.0	61.0	28.9	74.7	1094	2293	1953	435	640	1033	220	
(WY)	1983	1986	1983	1983	1981	1983	1950	1950	1974	1993	1993	1993	
MIN	.83	2.83	3.14	1.94	.000	2.14	42.4	37.3	6.66	3.84	.68	.000	
(WY)	1964	1977	1977	1964	1963	1964	1991	1961	1961	1961	1961	1959	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1945 - 1993
ANNUAL TOTAL	27509.8	79615.3	
ANNUAL MEAN	75.2	218	106
HIGHEST ANNUAL MEAN			399
LOWEST ANNUAL MEAN			13.2
HIGHEST DAILY MEAN	1090	Mar 16	7410
LOWEST DAILY MEAN	1.7	Sep 22	.00
ANNUAL SEVEN-DAY MINIMUM	3.9	Sep 16	.00
INSTANTANEOUS PEAK FLOW			7830
INSTANTANEOUS PEAK STAGE			18.69
ANNUAL RUNOFF (AC-FT)	54570	157900	76510
10 PERCENT EXCEEDS	137	572	215
50 PERCENT EXCEEDS	20	67	21
90 PERCENT EXCEEDS	7.8	8.8	3.8

e Estimated.

RED RIVER OF THE NORTH BASIN

91

5057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	HARD- NESS TOTAL (MG/L) AS CACO3 (00900)	ALKA- LINITY LAB (MG/L) AS CACO3 (90410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)
NOV 17...	1505	19	842	--	4.0	1.0	--	--	--	--	--
JAN 06...	1445	9.1	1170	--	-14.0	0.0	--	--	--	--	--
FEB 22...	1300	9.9	1050	--	-12.5	0.0	--	--	--	--	--
APR 07...	2000	845	380	--	5.0	2.5	--	--	--	--	--
13...	1230	493	510	--	12.0	7.0	--	--	--	--	--
MAY 17...	1345	970	970	--	25.0	14.5	--	--	--	--	--
JUN 18...	1250	61	990	--	25.0	19.0	--	--	--	--	--
21...	1620	74	--	--	37.5	24.5	--	--	--	--	--
JUL 16...	0950	256	950	--	21.0	18.5	--	--	--	--	--
17...	1215	303	870	--	31.5	21.0	--	--	--	--	--
26...	1915	2130	395	--	24.0	20.5	--	--	--	--	--
29...	1910	1620	610	--	29.0	23.0	--	--	--	--	--
AUG 09...	1100	1700	660	--	28.0	23.0	--	--	--	--	--
SEP 10...	1020	259	930	7.9	17.5	15.5	9.4	350	362	72	42
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
SEP 10...	73	30	2	10	140	17	0.20	29	601	626	0.85
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
SEP 10...	438	4	140	10	<1	70	<10	<0.1	<1	<1	320

RED RIVER OF THE NORTH BASIN

05057200 BALDHILL CREEK NEAR DAZEY, ND

LOCATION.--Lat 47°13'45", long 98°07'28", in NW¹/₄, SE¹/₄, SW¹/₄, sec.2, T.143 N., R.59 W., Barnes County, Hydrologic Unit 09020203, on left bank 500 ft upstream from bridge on county highway, 4.5 mi northeast of Dazey, and 14 mi upstream from mouth.

DRAINAGE AREA.--691 mi², of which about 340 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1956 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Prior to Nov. 9, 1956, nonrecording gage 500 ft downstream at same datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.50	e3.2	e1.5	e.26	e.10	e1.0	266	14	11	30	342	145
2	e.30	e3.1	e1.5	e.26	e.14	e1.0	224	13	9.3	37	303	123
3	e.15	e2.8	e1.5	e.25	e.19	e1.0	201	12	8.5	32	271	110
4	e.05	e2.6	e1.4	e.25	e.25	e1.0	190	12	6.9	30	234	100
5	e.01	e2.4	e1.4	e.24	e.32	e1.0	157	11	5.4	28	208	91
6	e5.0	e2.3	e1.3	e.24	e.45	e1.0	134	9.4	7.6	32	186	84
7	e.50	e2.3	e1.3	e.20	e.60	e1.0	116	9.8	9.5	37	165	79
8	e.12	e2.2	e1.3	e.05	e.80	e1.0	99	12	31	41	150	73
9	e.20	e2.2	e1.3	e.00	e1.0	e1.0	89	20	26	42	161	66
10	e.25	e2.3	e1.3	e.00	e1.3	e.95	81	24	21	44	185	58
11	e.30	e2.3	e1.2	e.00	e1.5	e.90	75	30	14	44	166	54
12	e.45	e2.3	e1.2	e.00	e1.6	e.85	67	28	11	44	150	53
13	e.75	e2.2	e1.0	e.00	e1.8	e.82	59	31	9.1	44	137	49
14	e1.5	e2.2	e1.0	e.00	e2.0	e.75	52	34	7.6	40	124	45
15	e2.5	e1.9	e1.0	e.00	e2.1	e.72	48	33	7.0	42	112	41
16	e3.0	e1.8	e.90	e.00	e2.1	e.70	42	28	12	82	101	39
17	e3.0	e1.8	e.82	e.00	e2.1	e.69	36	24	12	92	94	36
18	e3.0	e1.8	e.73	e.00	e2.0	e.68	32	21	8.3	90	82	34
19	e2.4	e1.8	e.66	e.00	e1.8	e.67	28	19	7.2	100	79	31
20	e2.1	e1.9	e.60	e.00	e1.6	e.65	26	17	6.5	e145	72	30
21	e2.4	e1.9	e.55	e.00	e1.5	e.67	23	15	5.6	e300	66	28
22	e2.4	e1.8	e.53	e.00	e1.4	e.70	21	15	5.3	e485	63	27
23	e2.5	e1.8	e.50	e.00	e1.3	e.75	19	16	15	e825	61	26
24	e2.9	e1.8	e.41	e.00	e1.2	e1.5	19	21	14	e1270	54	25
25	e2.9	e1.8	e.39	e.00	e1.1	e35	16	16	14	756	52	24
26	e2.0	e1.8	e.38	e.00	e1.1	e85	15	14	14	773	51	22
27	e2.8	e1.7	e.37	e.00	e1.0	240	16	18	12	807	54	21
28	e2.8	e1.6	e.34	e.00	e1.0	599	16	16	10	760	50	21
29	e2.8	e1.6	e.29	e.00	---	520	15	14	13	557	48	22
30	e2.8	e1.6	e.26	e.00	---	485	14	15	31	474	119	17
31	e2.8	---	e.26	e.00	---	373	---	13	---	389	193	---
TOTAL	55.18	62.8	27.19	1.75	33.35	2358.00	2196	575.2	364.8	8472	4133	1574
MEAN	1.78	2.09	.88	.056	1.19	76.1	73.2	18.6	12.2	273	133	52.5
MAX	5.0	3.2	1.5	.26	2.1	599	266	34	31	1270	342	145
MIN	.01	1.6	.26	.00	.10	.65	14	9.4	5.3	28	48	17
AC-FT	109	125	54	3.5	66	4680	4360	1140	724	16800	8200	3120

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1993, BY WATER YEAR (WY)

	4.03	3.67	2.02	.81	1.25	43.8	84.7	16.4	10.8	13.6	5.74	5.18
MEAN	4.03	3.67	2.02	.81	1.25	43.8	84.7	16.4	10.8	13.6	5.74	5.18
MAX	29.8	20.5	7.42	3.05	5.37	270	654	82.0	50.6	273	133	58.5
(WY)	1958	1958	1958	1987	1983	1987	1979	1979	1970	1993	1993	1957
MIN	.47	.38	.15	.000	.000	.59	2.44	1.71	.91	.021	.076	.094
(WY)	1992	1960	1959	1959	1957	1964	1981	1981	1961	1989	1984	1984

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1956 - 1993
ANNUAL TOTAL	3279.24	19853.27	
ANNUAL MEAN	8.96	54.4	16.0
HIGHEST ANNUAL MEAN			62.4
LOWEST ANNUAL MEAN			1.52
HIGHEST DAILY MEAN	228	1270	4500
LOWEST DAILY MEAN	.01	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.33	.00	.00
INSTANTANEOUS PEAK FLOW		1450	a9000
INSTANTANEOUS PEAK STAGE		b14.50	b17.78
ANNUAL RUNOFF (AC-FT)	6500	39380	11570
10 PERCENT EXCEEDS	9.8	140	23
50 PERCENT EXCEEDS	1.7	7.6	2.5
90 PERCENT EXCEEDS	.59	.25	.20

e Estimated.

a About, based on indirect measurement of peak flow at site 4.5 mi downstream.

b From floodmark.

RED RIVER OF THE NORTH BASIN

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05057200 BALDHILL CREEK NEAR DAZEY, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 08...	1305	0.12	969	--	--	8.5	9.5	--	--	--	--
NOV 17...	1325	1.8	528	--	--	4.5	2.5	--	--	--	--
JAN 06...	1110	0.20	1630	--	--	-12.5	1.5	--	--	--	--
FEB 23...	1540	1.3	1300	--	--	-15.0	1.0	--	--	--	--
MAR 29...	1205	521	--	--	--	3.5	1.0	--	--	--	--
31...	1740	354	287	7.7	--	0.0	0.5	110	90	26	11
APR 04...	1405	265	--	--	--	8.0	1.0	--	--	--	--
MAY 17...	1715	23	--	--	--	13.0	15.5	--	--	--	--
JUN 21...	1905	5.8	--	--	--	34.5	25.0	--	--	--	--
JUL 16...	1440	91	--	--	--	21.0	18.0	--	--	--	--
30...	1130	462	560	--	--	33.0	23.0	--	--	--	--
AUG 09...	1440	154	700	--	--	31.0	24.5	--	--	--	--
SEP 08...	1540	72	820	--	8.0	29.5	18.5	350	331	69	44
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 31...	13	19	0.5	10	47	5.1	0.10	13	180	183	0.25
SEP 08...	51	23	1	15	120	14	0.20	23	535	560	0.76
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 31...	175	1	40	120	<1	10	140	<0.1	<1	<1	170
SEP 08...	109	4	110	30	<1	60	200	0.1	<1	<1	410

RED RIVER OF THE NORTH BASIN

05057500 LAKE ASHTABULA AT BALDHILL DAM, ND

LOCATION.--Lat 47°02'00", long 98°05'00", in NW¹/₄, sec.18, T.141 N., R.58 W., Barnes County, Hydrologic Unit 09020203, at Baldhill Dam on Sheyenne River, and 8 mi northwest of Valley City.

DRAINAGE AREA.--7,470 mi², approximately, of which about 5,560 mi² is probably noncontributing, including 3,800 mi² in closed basins.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--July 1949 to current year.

REVISED RECORDS.--WSP 1238: 1950(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by an earth-filled dam, 1,650 ft long; storage began on July 30, 1949; dam completed September 1949. Usable capacity, 69,100 acre-ft between invert of outlet conduit, elevation, 1,238.0 ft, and normal pool level, elevation, 1,266.0 ft. Dead storage below elevation 1,238.0 ft, 1,500 acre-ft. Maximum pool elevation, 1,273.2 ft, capacity, 116,500 acre-ft. Low flows are controlled by 2 sluice gates 3 ft in diameter. The spillway crest is 120 ft long at elevation 1,252.0 ft, surmounted by 3 taintor gates, each 15 ft high and 40 ft long. The reservoir is operated for flood control and to increase low-water flow.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 91,400 acre-ft, May 14, 1950, elevation, 1,269.46 ft; minimum since reservoir first reached spillway level, 6,660 acre-ft, Aug. 11-14, 1950, elevation, 1,245.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 85,630 acre-ft, July 28, elevation, 1,268.57 ft; minimum, 48,060 acre-ft, Mar. 24, elevation, 1,261.57 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	1,265.12	65,670	--
Oct. 31-----	1,264.86	64,230	-1,440
Nov. 30-----	1,265.10	65,560	+1,330
Dec. 31-----	1,264.72	63,460	-2,100
CAL YR 1992-----	--	--	+3,360
Jan. 31-----	1,263.80	58,500	-4,960
Feb. 28-----	1,262.65	52,920	-5,580
Mar. 31-----	1,263.27	55,850	+2,930
Apr. 30-----	1,266.02	70,710	+14,860
May 31-----	1,266.23	71,910	+1,200
June 30-----	1,266.16	71,510	-400
July 31-----	1,267.95	81,810	+10,300
Aug. 31-----	1,266.05	70,880	-10,930
Sept. 30-----	1,265.50	67,800	-3,080
WTR YR 1993-----	--	--	+2,130

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DRAINAGE AREA.--7,470 mi², approximately, of which about 5,560 mi² is probably noncontributing, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,200.00 ft above sea level.

REMARKS.--Records fair. Flow completely regulated by Lake Ashtabula (station 05057500). Records 1955 to 1972 include releases at Baldhill Dam to the fish-rearing ponds of the Fish and Wildlife Service. Small diversions are still made but not published.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	10	11	69	89	86	581	e130	140	196	3440	473
2	22	9.5	11	68	88	90	438	e130	92	196	3380	466
3	21	9.5	11	66	93	89	381	e130	94	193	3320	615
4	21	9.1	11	66	93	87	346	e130	74	196	3100	706
5	21	9.1	11	68	96	87	346	e130	61	193	2860	659
6	20	9.1	11	69	96	85	340	e130	62	175	2480	641
7	20	9.1	19	69	95	84	340	e130	64	162	1930	623
8	20	9.1	30	65	96	86	346	e130	60	162	1760	606
9	19	9.1	30	71	91	86	363	e130	92	162	1760	540
10	19	9.1	30	69	93	92	313	e130	113	162	1900	487
11	19	9.1	40	66	92	93	351	158	113	162	2040	425
12	19	9.1	47	64	91	91	363	297	118	196	2070	425
13	19	9.1	47	64	89	94	369	351	121	216	2050	369
14	19	9.1	47	65	93	97	318	334	121	254	2060	241
15	15	9.1	47	69	95	111	277	345	121	335	2050	302
16	11	9.1	47	69	90	165	241	345	121	900	1820	241
17	11	9.1	47	69	92	172	232	236	143	277	1350	208
18	11	9.1	46	66	95	168	236	185	162	1290	1160	204
19	11	9.1	46	69	98	158	220	185	162	1620	1050	200
20	11	9.1	46	68	94	171	193	e185	162	1580	917	200
21	11	9.1	58	82	93	e175	101	e185	118	1530	706	200
22	11	9.1	71	93	100	e180	e69	e185	84	1500	540	196
23	11	9.5	68	96	94	e180	e71	e185	116	1480	480	196
24	11	9.5	68	96	99	e183	e185	e185	196	1810	480	196
25	11	9.5	68	94	97	e230	e185	e185	212	3020	517	196
26	11	9.5	68	90	99	e280	e168	189	212	3530	533	196
27	11	9.8	68	93	98	328	e137	189	208	3590	445	196
28	11	10	69	98	89	598	e137	189	204	3680	399	196
29	11	10	69	98	---	792	e135	189	200	3640	418	196
30	11	11	68	89	---	767	e130	193	196	3540	581	193
31	11	---	71	86	---	758	---	196	---	3480	615	---
TOTAL	472	280.7	1381	2364	2628	6663	7912	5991	3942	39427	48211	10592
MEAN	15.2	9.36	44.5	76.3	93.9	215	264	193	131	1272	1555	353
MAX	22	11	71	98	100	792	581	351	212	3680	3440	706
MIN	11	9.1	11	64	88	84	69	130	60	162	399	193
AC-FT	936	557	2740	4690	5210	13220	15690	11880	7820	78200	95630	21010

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1993, BY WATER YEAR (WY)

MEAN	39.1	56.6	54.9	52.9	58.2	167	470	253	142	105	71.6	41.4
MAX	153	238	191	140	200	1236	1936	2906	1154	1272	1555	353
(WY)	1982	1983	1987	1986	1969	1983	1969	1950	1950	1993	1993	1993
MIN	1.92	5.27	4.32	3.64	7.66	7.81	2.07	6.86	5.88	7.28	6.72	.81
(WY)	1956	1956	1980	1956	1956	1955	1953	1959	1958	1959	1977	1955

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1950 - 1993

ANNUAL TOTAL	26506.7			129863.7					
ANNUAL MEAN	72.4			356			126		
HIGHEST ANNUAL MEAN							521		1950
LOWEST ANNUAL MEAN							12.8		1991
HIGHEST DAILY MEAN	1230	Mar	8	3680	Jul	28	4710	Apr	24 1979
LOWEST DAILY MEAN	9.1	Nov	4	9.1	Nov	4	.00	Sep	8 1950
ANNUAL SEVEN-DAY MINIMUM	9.1	Nov	4	9.1	Nov	4	.00	Aug	8 1952
INSTANTANEOUS PEAK FLOW				3720	Jul	28	4740	Apr	24 1979
INSTANTANEOUS PEAK STAGE				34.98	Jul	28	36.26	Apr	24 1979
ANNUAL RUNOFF (AC-FT)	52580			257600			91250		
10 PERCENT EXCEEDS	111			777			253		
50 PERCENT EXCEEDS	32			118			37		
90 PERCENT EXCEEDS	11			11			9.1		

e Estimated.

RED RIVER OF THE NORTH BASIN

05058000 SHEYENNE RIVER BELOW BALDHILL DAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
NOV 25...	1115	9.3	686	--	0.0	2.5	--	--	--	--	--
JAN 05...	1305	71	753	--	-2.0	3.0	--	--	--	--	--
JAN 29...	1125	90	828	--	-10.0	0.0	--	--	--	--	--
FEB 23...	1030	92	750	--	-12.0	0.5	--	--	--	--	--
MAR 24...	1040	183	798	--	5.5	3.0	--	--	--	--	--
MAR 31...	1900	738	780	8.2	4.0	0.5	--	280	274	58	32
MAY 18...	1100	187	560	--	11.0	12.5	--	--	--	--	--
JUN 22...	1015	67	560	--	25.0	18.0	--	--	--	--	--
JUL 17...	1650	201	--	--	31.0	21.0	--	--	--	--	--
JUL 27...	1350	3590	570	--	23.0	20.0	--	--	--	--	--
JUL 30...	1445	3520	650	--	24.0	24.5	--	--	--	--	--
AUG 10...	0945	1830	460	--	28.0	21.5	--	--	--	--	--
SEP 08...	0940	670	640	7.9	26.0	19.5	9.3	240	251	51	27

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 31...	63	32	2	12	120	16	0.20	15	481	499	0.68
SEP 08...	44	27	1	13	78	11	0.10	28	403	425	0.58

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 31...	994	4	120	20	<1	50	260	<0.1	1	<1	320
SEP 08...	769	4	80	20	<1	40	70	0.1	<1	<1	300

RED RIVER OF THE NORTH BASIN

97

05058500 SHEYENNE RIVER AT VALLEY CITY, ND

LOCATION.--Lat 46°54'50", long 98°00'30", in SE¹/₄NW¹/₄, sec.28, T.140 N., R.58 W., Barnes County, Hydrologic Unit 09020204, on left bank 100 ft downstream from College Dam in Valley City, and at mile 253.0.

DRAINAGE AREA.--7,810 mi², approximately, of which about 5,700 mi² is probably noncontributing, includes 3,800 mi² in closed basins.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March to August 1919, March to June 1938, August 1938 to September 1975; October 1979 to current year (gage heights and annual maximum discharge since 1979). Records for July 1938, published in WSP 855, have been found to be unreliable and should not be used.

REVISED RECORDS.---WSP 1388: 1939 (M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,199.27 ft above sea level. March to August 1919, nonrecording gage at site 0.5 mi upstream at different datum. March to Oct. 13, 1938, nonrecording gage at present site and datum.

REMARKS.--Flow regulated by Lake Ashtabula 13 mi upstream (see station 05057500). Small diversions above station for municipal supply.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,830 ft³/s, July 28, gage height, 17.30 ft; maximum gage height, 18.05 ft, July 16.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.99	2.92	2.85	---	3.78	3.92	6.66	3.28	3.77	4.34	16.54	5.23
2	2.98	2.94	2.85	---	3.75	3.94	5.64	3.24	3.43	4.23	16.33	4.81
3	2.97	2.91	2.84	---	3.73	3.94	5.41	3.23	3.34	4.13	16.11	5.43
4	2.96	2.87	2.84	---	3.77	3.81	4.94	3.23	3.33	4.08	15.85	5.97
5	2.97	2.83	2.84	3.43	3.72	3.77	4.74	3.18	3.23	4.03	14.99	6.00
6	2.96	2.83	2.84	3.42	3.78	3.71	4.73	3.20	3.23	3.99	14.29	6.00
7	2.96	2.83	2.85	3.45	3.72	3.72	4.75	3.22	3.24	3.82	12.42	5.99
8	2.96	2.83	2.86	3.42	3.72	3.99	4.75	3.23	3.30	3.74	10.54	6.19
9	2.95	2.84	2.90	3.45	3.67	3.69	4.85	3.28	3.30	3.73	10.28	5.93
10	2.95	2.88	2.91	3.52	3.64	3.47	5.43	3.26	3.37	3.79	10.34	5.38
11	2.96	2.86	2.91	3.53	3.64	3.45	5.52	3.48	3.39	3.74	10.81	4.90
12	2.95	2.86	2.91	3.50	3.73	3.43	5.53	3.90	3.39	3.75	10.93	4.81
13	2.95	2.84	3.05	3.46	3.70	3.43	5.66	4.86	3.44	4.17	10.89	4.62
14	2.95	2.83	---	3.42	3.69	3.44	5.67	4.71	3.41	4.20	10.89	3.94
15	2.95	2.83	---	3.44	3.74	3.45	5.50	4.77	3.42	5.40	10.81	4.29
16	2.94	2.83	---	3.42	3.75	3.59	4.95	4.80	3.70	16.92	10.62	3.96
17	2.91	2.83	---	3.45	3.74	3.80	4.39	4.66	3.51	12.77	9.71	3.65
18	2.88	2.84	---	3.46	3.81	3.83	4.17	3.90	3.57	8.97	8.40	3.63
19	2.87	2.85	---	3.48	3.91	3.78	3.56	3.76	3.59	10.90	7.92	3.63
20	2.87	2.85	---	3.54	3.92	3.73	3.83	3.37	3.60	10.73	7.29	3.63
21	2.85	2.85	---	3.52	3.89	3.76	3.68	3.28	3.59	10.22	6.73	3.63
22	2.86	2.85	---	3.82	3.91	3.77	3.35	3.31	3.40	9.88	4.76	3.64
23	2.85	2.85	---	4.15	3.92	3.88	3.32	3.33	3.70	9.75	4.88	3.63
24	2.85	2.85	---	4.09	3.84	4.34	3.60	3.38	3.94	9.85	4.94	3.65
25	2.86	2.84	---	3.92	3.95	5.51	3.67	3.71	4.14	13.77	4.97	3.65
26	2.85	2.84	---	3.88	3.96	6.48	3.64	3.79	4.11	16.60	4.97	3.65
27	2.86	2.83	---	3.91	4.01	6.73	3.52	3.92	4.06	17.15	4.81	3.64
28	2.85	2.83	---	3.90	4.00	7.01	3.48	3.82	4.01	17.27	4.30	3.64
29	2.85	2.83	---	3.86	---	7.25	3.47	3.80	4.20	17.24	4.24	3.63
30	2.84	2.84	---	3.90	---	7.15	3.45	3.87	4.88	17.02	4.51	3.64
31	2.85	---	---	3.82	---	7.13	---	3.81	---	16.76	5.25	---
MEAN	2.91	2.85	---	---	3.80	4.42	4.53	3.70	3.62	8.93	9.37	4.48
MAX	2.99	2.94	---	---	4.01	7.25	6.66	4.86	4.88	17.27	16.54	6.19
MIN	2.84	2.83	---	---	3.64	3.43	3.32	3.18	3.23	3.73	4.24	3.63

SUMMARY STATISTICS

WATER YEARS 1919 - 1993

ANNUAL MEAN
HIGHEST ANNUAL MEAN
LOWEST ANNUAL MEAN
HIGHEST DAILY MEAN
LOWEST DAILY MEAN
ANNUAL SEVEN-DAY MINIMUM
INSTANTANEOUS PEAK FLOW
INSTANTANEOUS PEAK STAGE
10 PERCENT EXCEEDS
50 PERCENT EXCEEDS
90 PERCENT EXCEEDS

a124
a537 1950
a18.4 1939
a4500 Apr 19 1969
a.00 Aug 24 1938
a.00 Aug 24 1938
4580 Apr 28 1948
18.05 Jul 16 1993
a261
a30
a4.2

a Based on water years 1939-75.

RED RIVER OF THE NORTH BASIN

05058700 SHEYENNE RIVER AT LISBON, ND

LOCATION.--Lat 46°26'49", long 97°40'44", on line between secs.1 and 2, T.134 N., R.56 W., Ransom County, Hydrologic Unit 09020204, on left bank 150 ft downstream from dam at State Fish Hatchery at north edge of city of Lisbon, 3 mi upstream from Timber Coulee, and at mile 162.1.

DRAINAGE AREA.--8,190 mi², approximately, of which about 5,700 mi² is probably noncontributing, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1956 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,066.46 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Lake Ashtabula (station 05057500) 108.5 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	25	17	e75	e124	e105	e1100	124	217	327	3710	367
2	23	31	17	e75	e112	e110	e1050	122	218	469	3770	495
3	23	32	e16	e75	e110	e110	e950	113	204	460	3770	514
4	24	29	e15	e75	e109	e110	e850	88	185	369	3740	446
5	28	33	e11	e76	e107	e110	720	74	146	314	3680	531
6	29	32	e10	e76	e107	e120	582	69	121	286	3600	612
7	30	24	e9.0	e76	e103	e140	460	72	115	266	3510	640
8	30	30	e8.0	e75	e106	e190	e420	69	119	252	3370	645
9	31	24	e7.5	e72	e113	e225	e415	72	117	237	3070	650
10	31	24	e9.0	e70	e109	e250	e415	80	115	217	2380	686
11	29	19	e9.0	e70	e107	e240	e410	80	136	202	1920	656
12	28	19	e11	e70	e110	e210	e560	85	143	198	1870	564
13	26	13	e12	e68	e108	e160	e550	81	145	208	1930	481
14	27	22	e13	e68	e108	e145	e535	118	248	200	2000	430
15	31	22	e15	e67	e106	e132	523	331	518	229	2020	396
16	32	23	e20	e66	e102	e124	527	305	342	424	2000	302
17	32	20	e25	e66	e100	e126	501	298	422	1610	1990	285
18	32	23	e35	e66	e97	e126	423	305	601	2600	1940	285
19	32	23	e45	e65	e96	e148	331	306	432	3170	1740	221
20	31	25	e45	e70	e95	e171	283	255	307	3340	1410	205
21	27	23	e42	e72	e95	e201	244	199	261	2570	1220	200
22	25	23	e42	e73	e95	e232	189	172	239	2080	1050	198
23	21	23	e40	e78	e95	e244	218	138	238	1910	e800	198
24	18	23	e40	e88	e94	e300	178	125	241	1820	e650	194
25	20	22	e45	e98	e92	e350	132	117	239	2100	489	193
26	17	16	e53	e101	e91	e450	129	115	277	2270	503	191
27	18	18	e60	e104	e90	e700	171	134	293	2500	490	191
28	16	17	e68	e103	e90	e1000	174	178	282	2990	491	188
29	16	18	e73	e104	---	e1200	155	214	275	3320	474	186
30	16	17	e74	e116	---	e1200	132	242	287	3550	372	188
31	20	---	e75	e123	---	e1150	---	226	---	3650	335	---
TOTAL	786	693	961.5	2481	2871	10079	13327	4907	7483	44138	60294	11338
MEAN	25.4	23.1	31.0	80.0	103	325	444	158	249	1424	1945	378
MAX	32	33	75	123	124	1200	1100	331	601	3650	3770	686
MIN	16	13	7.5	65	90	105	129	69	115	198	335	186
AC-FT	1560	1370	1910	4920	5690	19990	26430	9730	14840	87550	119600	22490

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

	MEAN	46.5	64.1	60.5	58.1	69.1	287	596	259	152	148	98.4	52.1
MAX	141	195	190	140	202	1328	2548	1989	555	1424	1945	378	
(WY)	1982	1983	1987	1986	1969	1987	1969	1979	1974	1993	1993	1993	
MIN	7.66	12.2	8.69	8.15	10.7	19.8	20.3	17.5	14.8	6.07	6.54	5.25	
(WY)	1957	1991	1991	1991	1991	1964	1991	1959	1961	1973	1961	1959	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1957 - 1993

ANNUAL TOTAL	38505.5	159358.5	
ANNUAL MEAN	105	437	158
HIGHEST ANNUAL MEAN			437
LOWEST ANNUAL MEAN			25.9
HIGHEST DAILY MEAN	1400	Mar 11	5210
LOWEST DAILY MEAN	7.5	Dec 9	.00
ANNUAL SEVEN-DAY MINIMUM	9.1	Dec 5	.87
INSTANTANEOUS PEAK FLOW			5270
INSTANTANEOUS PEAK STAGE			19.04
ANNUAL RUNOFF (AC-FT)	76380	316100	114200
10 PERCENT EXCEEDS	174	1210	326
50 PERCENT EXCEEDS	55	129	50
90 PERCENT EXCEEDS	20	22	14

e Estimated.

RED RIVER OF THE NORTH BASIN

99

05058700 SHEYENNE RIVER AT LISBON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
NOV											
17...	1050	21	702	--	1.0	-0.5	--	--	--	--	--
JAN											
06...	1045	76	929	--	-10.0	1.5	--	--	--	--	--
FEB											
09...	1120	115	840	7.9	-2.0	0.0	12.4	89	270	257	58
MAR											
26...	1330	471	516	8.0	3.5	1.0	9.8	72	170	159	38
31...	1200	1150	477	7.9	1.0	0.5	12.0	86	160	139	37
APR											
12...	1630	560	687	--	10.0	7.5	--	--	--	--	--
21...	1000	247	618	8.8	10.5	9.0	10.6	95	220	190	50
MAY											
12...	0915	87	746	8.3	12.5	14.0	10.8	109	260	205	60
25...	1605	114	663	--	17.5	16.0	--	--	--	--	--
JUN											
08...	0815	E117	795	8.0	14.5	15.0	8.4	89	270	211	62
21...	1915	258	773	--	25.5	23.0	--	--	--	--	--
22...	0910	E237	785	7.1	24.0	22.0	7.0	84	240	177	56
JUL											
17...	1400	1720	681	7.8	17.5	18.0	10.2	112	200	--	46
18...	1145	2590	420	--	28.0	19.5	--	--	--	--	--
19...	1150	3150	390	--	21.0	20.0	--	--	--	--	--
20...	1035	3410	445	--	21.0	20.0	--	--	--	--	--
22...	1200	2060	545	--	22.0	21.0	--	--	--	--	--
27...	1445	2470	600	--	22.0	24.5	--	--	--	--	--
30...	1215	3600	566	--	33.0	23.5	--	--	--	--	--
AUG											
02...	1430	3610	649	--	19.5	21.5	--	--	--	--	--
06...	0900	E3490	669	8.0	16.5	18.0	6.2	68	230	212	51
11...	0900	1940	573	--	25.0	--	--	--	--	--	--
25...	0955	484	723	7.9	29.0	23.0	8.8	108	--	--	--
SEP											
14...	1650	408	720	--	17.5	16.5	--	--	--	--	--

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)
FEB											
09...	30	71	35	2	11	314	0	140	22	0.20	18
MAR											
26...	18	37	31	1	11	194	0	87	13	0.10	13
31...	16	32	29	1	12	169	0	73	13	0.10	14
APR											
21...	23	48	31	1	9.8	206	13	110	15	0.20	9.4
MAY											
12...	27	59	32	2	10	245	3	120	21	0.20	11
JUN											
08...	29	66	32	2	19	258	0	180	26	0.20	10
22...	24	68	37	2	11	215	0	180	30	0.20	18
JUL											
17...	21	47	32	1	9.8	--	--	--	--	--	--
AUG											
06...	25	56	33	2	9.5	259	0	130	12	0.20	20

05058700 SHEYENNE RIVER AT LISBON, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

RED RIVER OF THE NORTH BASIN

101

05059000 SHEYENNE RIVER NEAR KINDRED, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°37'54", long 97°00'01", in SE¹/₄,SE¹/₄,SW¹/₄, sec.33, T.137 N., R.50 W., Cass County, Hydrologic Unit 09020204, on left bank 100 ft downstream from North Dakota State Highway 46 bridge crossing, 1.5 mi southeast of Kindred, and at mile 67.9.

DRAINAGE AREA.--8,800 mi², approximately, of which about 5,780 mi² is probably noncontributing, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1949 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 925.55 ft above sea level. From Oct. 1 1962, to Sept. 30 1989, gage was located at site 1,500 ft upstream. July 1949 to Sept. 30, 1962, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of estimated discharges, which are fair. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 202 mi upstream and several small reservoirs.

EXTREMES OUTSIDE PERIOD OF RECORD.--Spring flood in 1947 or 1948 reached a stage of 22.1 ft from floodmarks, discharge about 3,600 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	46	42	e58	e84	e105	e1050	231	279	433	2700	580
2	65	55	40	e60	e86	e105	e1100	220	280	425	2850	494
3	60	63	36	e62	e88	e100	e1250	206	270	414	3000	453
4	56	63	31	e64	e90	e100	e1300	198	259	673	3130	471
5	54	55	32	e65	e92	e100	e1250	193	256	806	3230	518
6	52	37	35	e68	e96	e100	e1200	185	252	724	3340	464
7	49	29	33	e70	e100	e100	e1100	172	242	598	e3400	415
8	49	46	31	e74	e105	e105	e950	167	227	515	e3450	525
9	52	77	32	e80	e110	e120	786	168	215	462	e3500	680
10	55	92	28	e85	e110	e115	663	169	212	425	e3400	734
11	57	74	21	e90	e110	e120	625	160	204	402	e3300	762
12	56	67	20	e85	e110	e130	612	153	193	374	e3100	784
13	56	49	18	e80	e110	e140	e620	153	184	360	e2900	805
14	56	20	16	e78	e110	e180	e650	145	189	352	e2600	733
15	54	26	14	e76	e110	e200	e680	135	198	346	e2300	636
16	56	53	12	e76	e115	e220	e700	142	206	500	e2200	571
17	55	62	10	e74	e115	e205	e720	152	267	680	e2200	532
18	54	55	12	e74	e115	e190	e720	298	367	706	e2150	486
19	55	49	16	e72	e115	e180	e680	340	326	1150	e2100	412
20	57	42	20	e72	e115	e160	e600	341	483	1800	e2050	408
21	59	65	30	e72	e115	e150	e505	349	600	2220	1990	386
22	60	60	35	e72	e115	e160	434	343	477	2500	1800	338
23	60	56	38	e72	e115	e210	382	301	394	2710	1520	315
24	60	51	40	e72	e115	e240	331	295	405	2750	1340	307
25	57	45	42	e72	e115	e260	299	288	e440	2600	1170	285
26	54	12	44	e72	e110	e360	296	247	e470	2330	990	284
27	52	12	48	e74	e110	e400	264	215	e420	2160	765	280
28	47	23	50	e76	e110	e600	233	213	e380	2170	707	279
29	44	39	52	e78	---	e800	221	206	e390	2260	681	279
30	42	42	54	e80	---	e900	236	217	414	2380	657	280
31	42	---	56	e82	---	e1000	---	258	---	2530	641	---
TOTAL	1692	1465	988	2285	2991	7855	20457	6860	9499	38755	69161	14496
MEAN	54.6	48.8	31.9	73.7	107	253	682	221	317	1250	2231	483
MAX	67	92	56	90	115	1000	1300	349	600	2750	3500	805
MIN	42	12	10	58	84	100	221	135	184	346	641	279
AC-FT	3360	2910	1960	4530	5930	15580	40580	13610	18840	76870	137200	28750

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1993, BY WATER YEAR (WY)

	MEAN	67.7	80.0	71.4	67.2	74.7	269	661	409	252	215	130	74.1
MAX	186	231	205	170	221	1256	2464	3053	1938	1466	2231	483	
(WY)	1966	1980	1987	1987	1976	1987	1969	1950	1950	1975	1993	1993	
MIN	24.6	22.7	17.6	17.5	21.7	35.1	71.7	53.6	48.4	26.7	17.5	25.1	
(WY)	1957	1956	1956	1991	1956	1956	1991	1990	1961	1988	1988	1959	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1949 - 1993
ANNUAL TOTAL	44669	176504	
ANNUAL MEAN	122	484	198
HIGHEST ANNUAL MEAN			633
LOWEST ANNUAL MEAN			48.0
HIGHEST DAILY MEAN	1300	Mar 15	3500
LOWEST DAILY MEAN	10	Dec 17	10
ANNUAL SEVEN-DAY MINIMUM	14	Dec 13	14
INSTANTANEOUS PEAK FLOW			3550
INSTANTANEOUS PEAK STAGE			19.84
ANNUAL RUNOFF (AC-FT)	88600	350100	143400
10 PERCENT EXCEEDS	203	1320	413
50 PERCENT EXCEEDS	69	189	75
90 PERCENT EXCEEDS	42	42	32

e Estimated.

RED RIVER OF THE NORTH BASIN

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED
(National stream quality accounting network station)

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)
OCT											
16...	1100	57	--	938	8.6	1.5	3.0	3.8	12.1	92	320
NOV											
12...	1320	65	--	943	--	3.0	1.5	--	--	--	--
JAN											
06...	1435	66	--	1210	--	-15.0	0.5	--	--	--	--
FEB											
09...	1400	--	110	881	7.7	-2.0	0.0	--	8.4	60	290
23...	1600	115	--	878	7.8	-13.0	0.5	8.7	10.9	77	300
MAR											
17...	1530	210	--	660	--	-6.5	0.0	--	--	--	--
31...	1530	993	--	418	8.0	2.0	0.5	--	12.5	90	160
APR											
04...	0855	1310	--	476	--	-2.0	0.5	--	--	--	--
12...	1310	609	--	740	--	8.5	5.0	--	--	--	--
21...	1230	517	--	654	8.5	11.0	10.5	--	11.4	105	250
MAY											
13...	1120	154	--	803	8.3	16.5	16.5	21	8.4	89	310
27...	1415	216	--	716	--	11.5	14.0	--	--	--	--
JUN											
08...	1215	--	227	822	8.2	14.0	15.0	--	9.0	95	300
22...	1545	450	--	855	--	19.5	22.5	--	--	--	--
23...	1405	--	394	772	6.9	24.0	22.0	--	6.6	79	250
JUL											
17...	1630	--	675	630	8.1	18.0	19.5	--	--	--	--
19...	1745	1350	--	660	--	28.0	21.5	--	--	--	--
20...	1100	1790	--	562	8.0	18.0	20.5	--	7.8	89	180
23...	0925	2740	--	445	--	20.0	--	--	--	--	--
24...	0910	2750	--	527	--	21.0	20.5	--	--	--	--
26...	1230	2220	--	568	--	27.5	21.5	--	--	--	--
30...	1520	2370	--	580	--	32.0	24.0	--	--	--	--
AUG											
03...	1225	3020	--	605	--	22.0	21.5	--	--	--	--
05...	1300	3400	--	640	8.1	17.5	20.5	--	6.8	78	220
09...	1235	3550	--	656	--	33.0	23.0	--	--	--	--
25...	1410	1180	--	672	8.0	37.0	24.5	--	5.8	72	--
SEP											
08...	1045	476	--	755	8.3	14.5	15.0	48	5.6	58	290

DATE	ALKA- LINITY WAT DIS TOT IT FIELD	COLI- FORM, FECAL, 0.7 UM-MF (COLS./	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3
	MG/L AS CACO3 (39086)	(COLS./ 100 ML) (31625)	(COLS. PER 100 ML) (31673)	(MG/L AS CA) (00915)	(MG/L AS MG) (00925)	(MG/L AS NA) (00930)	(00932)	(00931)	(00935)	(00453)	(00452)
OCT 16...	289	38	120	80	29	64	30	2	9.4	343	5
FEB 09...	277	--	--	66	31	70	33	2	10	338	0
23...	271	K9	K12	70	30	68	32	2	10	331	0
MAR 31...	142	--	--	38	16	30	27	1	11	174	0
APR 21...	202	--	--	57	25	50	30	1	9.7	246	7
MAY 13...	251	K19	75	77	29	57	28	1	9.7	307	0
JUN 08...	236	--	--	72	30	64	31	2	11	288	0
23...	191	--	--	59	25	63	34	2	9.9	233	0
JUL 20...	147	--	--	44	18	37	29	1	9.1	179	0
AUG 05...	201	--	--	51	23	51	32	1	11	246	0
SEP 08...	232	93	240	68	29	55	28	1	10	283	0

RED RIVER OF THE NORTH BASIN

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05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED
(National stream quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	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, NITRITE DIS- SOLVED (MG/L AS N) (00613)
OCT 16...	150	32	0.20	14	553	585	0.80	89.4	<0.010	<0.010
FEB 09...	150	25	0.20	20	541	531	0.72	158	--	0.030
23...	150	24	0.20	20	538	560	0.76	174	--	0.020
MAR 31...	76	12	0.20	13	286	297	0.40	796	--	0.030
APR 21...	110	16	0.20	11	407	387	0.53	540	--	<0.010
MAY 13...	150	25	0.30	16	516	530	0.72	220	--	<0.010
JUN 08...	170	26	0.30	12	527	537	0.73	329	--	<0.010
23...	170	27	0.20	19	490	487	0.66	518	--	0.040
JUL 20...	110	15	0.20	16	340	353	0.48	1710	--	0.050
AUG 05...	120	13	0.20	15	406	419	0.57	3850	--	0.030
SEP 08...	140	19	0.20	29	493	508	0.69	653	--	<0.010

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT 16...	--	<0.050	<0.050	0.030	0.020	0.57	--	0.60	--	0.080
FEB 09...	0.420	--	0.450	--	0.210	--	0.79	0.90	1.0	0.100
23...	0.460	--	0.480	--	0.190	--	--	0.90	--	0.110
MAR 31...	0.650	--	0.680	--	0.180	--	0.82	1.3	1.0	0.280
APR 21...	--	--	<0.050	--	0.020	--	0.68	0.80	0.70	0.090
MAY 13...	--	--	<0.050	--	0.010	--	--	0.60	--	0.150
JUN 08...	--	--	<0.050	--	0.020	--	0.48	0.70	0.50	0.080
23...	0.420	--	0.460	--	0.110	--	0.59	1.1	0.70	0.380
JUL 17...	--	--	--	--	--	--	--	1.7	--	0.500
20...	0.360	--	0.410	--	0.190	--	0.51	1.1	0.70	0.300
AUG 05...	0.130	--	0.160	--	0.080	--	0.62	1.0	0.70	0.150
25...	--	--	--	--	--	--	--	0.80	--	0.310
SEP 08...	--	--	0.490	--	0.050	--	--	0.90	--	0.390

RED RIVER OF THE NORTH BASIN

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED
(National stream quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)
OCT 16...	0.050	0.050	0.040	30	85	<3	10	50	56	<10
FEB 09...	0.060	--	0.070	--	--	--	9	--	66	--
23...	0.070	--	0.070	<10	74	<3	8	50	52	<10
MAR 31...	0.190	--	0.170	--	--	--	72	--	150	--
APR 21...	0.040	--	0.030	--	--	--	10	--	19	--
MAY 13...	0.040	--	0.040	30	95	<3	6	49	69	<10
JUN 08...	0.060	--	0.040	--	--	--	4	--	28	--
23...	0.120	--	0.110	--	--	--	16	--	4	--
JUL 20...	0.060	--	0.050	--	--	--	71	--	53	--
AUG 05...	0.110	--	0.100	--	--	--	18	--	17	--
SEP 08...	0.210	--	0.190	10	64	<3	8	47	18	10

DATE	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)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 16...	3	<1	<1.0	370	<6	--	--	--	--	--
FEB 09...	--	--	--	--	--	--	--	134	40	57
23...	6	<1	<1.0	340	<6	--	--	--	--	--
APR 21...	--	--	--	--	--	--	--	143	200	93
MAY 13...	5	<1	<1.0	360	<6	--	--	--	--	--
JUL 20...	--	--	--	--	--	7.9	>5.0	--	--	--
AUG 05...	--	--	--	--	--	9.5	1.2	--	--	--
SEP 08...	8	<1	<1.0	330	<6	9.6	--	157	202	97

RED RIVER OF THE NORTH BASIN

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05059300 SHEYENNE RIVER ABOVE SHEYENNE RIVER DIVERSION NEAR HORACE, ND

LOCATION.--Lat 46°45'01", long 96°55'35", in NE $\frac{1}{4}$,SE $\frac{1}{4}$,SE $\frac{1}{4}$, sec.24, T.138 N., R.50 W., Cass County, Hydrologic Unit 09020204, on right bank 300 ft upstream from diversion structure 1 mi southwest of Horace.

DRAINAGE AREA.--8,840 mi², approximately, of which about 7,580 mi² is probably noncontributing, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1992 to September 1993.

GAGE.--Water-stage recorder. Datum of gage is 890 ft above sea level.

REMARKS.--Records good except those for periods of estimated discharges, which are fair. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 230 mi upstream. These records represent the total Sheyenne River flow immediately upstream from the Horace flood diversion.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	45	e40	e58	e80	e110	e830	242	e260	423	2290	591
2	52	48	e40	e60	e82	e105	e920	239	e280	431	2490	511
3	57	55	e38	e62	e82	e100	e1000	230	e270	419	2710	451
4	54	64	e36	e62	e84	e100	e1150	215	e265	521	2840	436
5	51	e75	e34	e62	e84	e100	e1270	e201	e260	778	2960	498
6	50	e55	e32	e62	e86	e100	e1300	e208	e250	781	3030	558
7	48	e40	e30	e64	e82	e100	e1250	e198	e240	670	3100	531
8	47	e35	e28	e68	e80	e105	e1100	e190	e230	e560	3180	559
9	45	e50	e27	e70	e90	e110	e880	e180	e225	e490	3240	701
10	43	72	e26	e80	e92	e125	e780	e170	e215	e450	3300	784
11	44	92	e24	e84	e95	e135	e750	e165	206	e420	3350	805
12	48	90	e22	e88	e100	e150	e680	e160	198	e390	3360	803
13	51	e60	e20	e84	e105	e180	e660	e155	e190	e350	3300	821
14	53	e40	e18	e86	e110	e190	e620	e150	e185	327	2990	821
15	54	e45	e16	e84	e110	e200	e660	e145	e190	325	2480	709
16	55	e55	e15	e82	e110	e220	675	e160	e200	635	2220	580
17	55	62	e14	e80	e110	e200	674	e210	205	951	2140	503
18	e56	67	e13	e78	e110	e190	678	e240	290	931	2160	463
19	e58	72	e15	e76	e110	e180	678	276	375	819	2140	410
20	e60	71	e20	e74	e110	e170	653	356	358	1220	2110	364
21	60	64	e25	e72	e110	e160	568	360	510	1720	2060	361
22	59	62	e30	e70	e105	e190	e510	366	556	2070	1940	339
23	59	70	e35	e70	e105	e200	e450	357	463	2340	1700	307
24	60	66	e40	e70	e100	e230	e396	325	416	2520	1470	290
25	59	e55	e42	e70	e100	e270	e340	309	433	2600	1340	279
26	59	e35	e44	e70	e105	e320	e320	290	448	2440	1230	266
27	57	e25	e46	e72	e110	e400	e290	250	440	2150	988	272
28	54	e20	e50	e74	e115	e500	e270	220	381	1980	753	270
29	50	e18	e52	e76	---	e550	e250	208	354	1980	690	270
30	47	e35	e54	e76	---	e680	e240	207	384	2040	654	269
31	45	---	e56	e78	---	e750	---	224	---	2150	621	---
TOTAL	1639	1643	982	2264	2762	7120	20842	7206	9277	35881	68836	14822
MEAN	52.9	54.8	31.7	73.0	98.6	230	695	232	309	1157	2221	494
MAX	60	92	56	88	115	750	1300	366	556	2600	3360	821
MIN	43	18	13	58	80	100	240	145	185	325	621	266
AC-FT	3250	3260	1950	4490	5480	14120	41340	14290	18400	71170	136500	29400

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1993, BY WATER YEAR (WY)

	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MEAN	52.9	54.8	31.7	73.0	98.6	230	695	232	309	1157	2221	494
MAX	52.9	54.8	31.7	73.0	98.6	230	695	232	309	1157	2221	494
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MIN	52.9	54.8	31.7	73.0	98.6	230	695	232	309	1157	2221	494
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993

SUMMARY STATISTICS

FOR 1993 WATER YEAR

ANNUAL TOTAL	173274
ANNUAL MEAN	475
HIGHEST DAILY MEAN	3360 Aug 12
LOWEST DAILY MEAN	13 Dec 18
ANNUAL SEVEN-DAY MINIMUM	16 Dec 13
INSTANTANEOUS PEAK FLOW	3410 Aug 11
INSTANTANEOUS PEAK STAGE	24.36 Aug 11
ANNUAL RUNOFF (AC-FT)	343700
10 PERCENT EXCEEDS	1320
50 PERCENT EXCEEDS	198
90 PERCENT EXCEEDS	45

e Estimated.

RED RIVER OF THE NORTH BASIN

05059300 SHEYENNE RIVER ABOVE SHEYENNE RIVER DIVERSION NEAR HORACE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1992 to September 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT											
07...	0945	47	826	--	8.5	10.0	--	--	--	--	--
NOV											
10...	1415	80	750	--	2.0	2.5	--	--	--	--	--
24...	1340	62	896	--	--	0.5	--	--	--	--	--
JAN											
07...	1345	63	1340	--	--	1.0	--	--	--	--	--
FEB											
10...	1055	93	796	--	-20.0	0.5	--	--	--	--	--
MAR											
30...	1850	661	507	--	8.5	1.5	--	--	--	--	--
APR											
01...	1140	824	--	--	6.0	0.5	--	--	--	--	--
03...	0940	1000	486	--	6.0	0.5	--	--	--	--	--
05...	0940	1270	467	--	1.0	0.5	--	--	--	--	--
09...	1255	994	700	--	5.0	2.0	--	--	--	--	--
MAY											
20...	1135	356	820	--	24.0	13.5	--	--	--	--	--
JUN											
23...	0830	486	876	--	20.0	21.5	--	--	--	--	--
JUL											
09...	1135	493	769	--	22.5	19.0	--	--	--	--	--
17...	1425	995	485	--	25.0	22.0	--	--	--	--	--
20...	0920	1230	670	--	23.0	21.5	--	--	--	--	--
22...	1455	2120	450	--	21.0	20.0	--	--	--	--	--
23...	1245	2330	--	--	22.0	20.5	--	--	--	--	--
24...	1150	2520	466	--	21.0	20.5	--	--	--	--	--
26...	1515	2380	528	--	28.5	22.5	--	--	--	--	--
AUG											
03...	1510	2830	595	--	--	22.0	--	--	--	--	--
05...	1250	2970	620	--	31.5	22.0	--	--	--	--	--
09...	1510	3280	679	--	33.5	23.0	--	--	--	--	--
17...	1040	2160	540	--	25.5	22.5	--	--	--	--	--
24...	1125	1450	638	--	31.5	23.0	--	--	--	--	--
30...	1125	676	803	--	23.5	20.5	--	--	--	--	--
SEP											
a16...	0900	597	715	8.0	14.0	15.0	280	272	64	30	50

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
SEP											
a16...	27	1	12	110	17	0.20	23	470	476	0.65	767

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
SEP										
a16...	6	100	20	<1	50	20	<0.1	1	<1	350

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

107

05059310 SHEYENNE RIVER DIVERSION NEAR HORACE, ND

LOCATION.--Lat 46°45'06", long 96°55'33", in NE $\frac{1}{4}$,SE $\frac{1}{4}$,SE $\frac{1}{4}$, sec.24, T.138 N., R.50 W., Cass County, Hydrologic Unit 09020204, at diversion structure 1 mi southwest of Horace.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1992 to September 1993.

GAGE.--Water-stage recorder for Sheyenne River above Sheyenne River Diversion near Horace (station 05059300) is used to obtain stage record for this station. Datum of gage is 890 ft above sea level.

REMARKS.--Records fair. The records are for the flow that is diverted from the Sheyenne River at this location. When flows are greater than about 600 ft³/s, diversions are made in order to control flood discharges downstream. The diverted flow returns to the Sheyenne River main channel at a location about 13 mi downstream, below the city of West Fargo. See station 05059480 (Sheyenne River Diversion at West Fargo) for return flows.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	e150	.00	.00	.00	930	.00
2	.00	.00	.00	.00	.00	.00	e200	.00	.00	.00	1070	.00
3	.00	.00	.00	.00	.00	.00	e250	.00	.00	.00	1210	.00
4	.00	.00	.00	.00	.00	.00	e330	.00	.00	.00	1320	.00
5	.00	.00	.00	.00	.00	.00	e390	.00	.00	.00	1390	.00
6	.00	.00	.00	.00	.00	.00	e280	.00	.00	.00	1430	.00
7	.00	.00	.00	.00	.00	.00	e50	.00	.00	.00	1470	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1520	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1550	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1580	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1610	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1620	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1590	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1400	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1060	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	852	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	792	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	806	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	790	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	111	771	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	454	728	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	645	639	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	846	468	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	1030	296	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	1160	137	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	979	8.9	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	730	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	619	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	631	.00	.00
30	.00	.00	.00	.00	---	e50	.00	.00	.00	697	.00	.00
31	.00	---	.00	.00	---	e100	---	.00	---	801	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	150.00	1650.00	0.00	0.00	8703.00	27037.90	0.00
MEAN	.000	.000	.000	.000	.000	4.84	55.0	.000	.000	281	872	.000
MAX	.00	.00	.00	.00	.00	100	390	.00	.00	1160	1620	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	298	3270	.00	.00	17260	53630	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1993, BY WATER YEAR (WY)

MEAN	.000	.000	.000	.000	.000	4.84	55.0	.000	.000	281	872	.000
MAX	.000	.000	.000	.000	.000	4.84	55.0	.000	.000	281	872	.000
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MIN	.000	.000	.000	.000	.000	4.84	55.0	.000	.000	281	872	.000
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993

SUMMARY STATISTICS

FOR 1993 WATER YEAR

ANNUAL TOTAL	37540.90
ANNUAL MEAN	103
HIGHEST DAILY MEAN	1620 Aug 12
LOWEST DAILY MEAN	.00 Oct 1
ANNUAL SEVEN-DAY MINIMUM	.00 Oct 1
INSTANTANEOUS PEAK FLOW	1650 Aug 11
INSTANTANEOUS PEAK STAGE	24.36 Aug 11
ANNUAL RUNOFF (AC-FT)	74460
10 PERCENT EXCEEDS	310
50 PERCENT EXCEEDS	.00
90 PERCENT EXCEEDS	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05059310 SHEYENNE RIVER DIVERSION NEAR HORACE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March to September 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)
MAR					
30...	1630	66	488	4.5	0.5
APR					
01...	0920	144	--	4.0	0.5
03...	1150	246	475	8.0	0.5
05...	1150	377	471	4.0	0.5
JUL					
20...	1235	82	--	37.5	22.5
23...	1440	856	428	22.5	20.5
24...	1440	999	466	22.0	20.5
26...	1800	926	546	29.0	21.5
AUG					
03...	1820	1210	592	20.0	21.5
04...	1550	1300	640	25.0	21.5
09...	1840	1550	671	36.5	23.0
18...	0805	811	546	21.5	22.0
24...	1315	274	659	36.0	24.0

RED RIVER OF THE NORTH BASIN

109

05059480 SHEYENNE RIVER DIVERSION AT WEST FARGO, ND

LOCATION.--Lat 46°53'15", long 96°55'09", in NE¹/₄NE¹/₄NW¹/₄ sec.6, T.139 N., R.50 W., Cass County, Hydrologic Unit 09020204, on right bank, 50 ft upstream from 12th Ave N bridge in West Fargo, 0.5 mi upstream from confluence with the Sheyenne River.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1992 to September 1993.

GAGE.--Water-stage recorder. Datum of gage is 876.78 ft above sea level.

REMARKS.--Records fair. These records are for the flood flows that are diverted around West Fargo.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00 e1150		e.00	e.00	e.00	e2400	.00
2	.00	.00	.00	.00	.00	.00 e1180		e.00	e.00	e.00	e2540	.00
3	.00	.00	.00	.00	.00	.00 e1200		e.00	e.00	e.00	e2680	.00
4	.00	.00	.00	.00	.00	.00 e1250		e.00	e.00	e.00	e2770	.00
5	.00	.00	.00	.00	.00	.00 e1300		e.00	e.00	e.00	e2870	.00
6	.00	.00	.00	.00	.00	.00 e1400		e.00	e.00	e.00	e2960	.00
7	.00	.00	.00	.00	.00	.00 e1480		e.00	e.00	e.00	e3020	.00
8	.00	.00	.00	.00	.00	.00 e1520		e.00	e.00	e.00	e3090	.00
9	.00	.00	.00	.00	.00	.00 e1130		e.00	e.00	e.00	e3140	.00
10	.00	.00	.00	.00	.00	.00 e754		e.00	e.00	e.00	e3190	.00
11	.00	.00	.00	.00	.00	.00 e640		e.00	e.00	e3.0	e3240	.03
12	.00	.00	.00	.00	.00	.00 e680		e.00	e.00	e2.0	3220	.27
13	.00	.00	.00	.00	.00	.00 e281		e.00	e.00	1.8	3160	.79
14	.00	.00	.00	.00	.00	.00 e14		e.00	e.00	.40	3070	5.3
15	.00	.00	.00	.00	.00	.00 e10		e.00	e.00	2.4	2810	.24
16	.00	.00	.00	.00	.00	.00	e6.0	e.00	e.00	e1180	2500	.00
17	.00	.00	.00	.00	.00	.00	e4.0	e.00	e.00	e1670	2280	.00
18	.00	.00	.00	.00	.00	.00	e2.0	e.00	e.00	e1410	2220	.00
19	.00	.00	.00	.00	.00	.00	e1.0	e.00	e.00	e1150	2180	.00
20	.00	.00	.00	.00	.00	.00	e.00	e.00	e.00	e1190	2150	.00
21	.00	.00	.00	.00	.00	e.00	e.00	e.00	e.00	e1660	2100	.00
22	.00	.00	.00	.00	.00	e170	e.00	e.00	e.00	e2060	2000	.00
23	.00	.00	.00	.00	.00	e150	e.00	e.00	e.00	e2270	1830	.00
24	.00	.00	.00	.00	.00	e200	e.00	e.00	e.00	e2450	1540	.00
25	.00	.00	.00	.00	.00	e250	e.00	e.00	e.00	e2500	1150	.00
26	.00	.00	.00	.00	.00	e300	e.00	e.00	e.00	e2490	805	.00
27	.00	.00	.00	.00	.00	e380	e.00	e.00	e.00	e2310	531	.00
28	.00	.00	.00	.00	.00	e410	e.00	e.00	e.00	e2100	345	.00
29	.00	.00	.00	.00	---	e550	e.00	e.00	e.00	e2120	281	.00
30	.00	.00	.00	.00	---	e680	e.00	e.00	e.00	e2170	364	.00
31	.00	---	.00	.00	---	e950	---	e.00	---	e2270	37	---
TOTAL	0.00	0.00	0.00	0.00	0.00	4040.00	14002.00	0.00	0.00	31009.60	66473	6.63
MEAN	.000	.000	.000	.000	.000	.130	.467	.000	.000	.1000	.2144	.22
MAX	.00	.00	.00	.00	.00	.950	1520	.00	.00	.2500	3240	5.3
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.37	.00
AC-FT	.00	.00	.00	.00	.00	.8010	27770	.00	.00	.61510	131800	.13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1993, BY WATER YEAR (WY)

MEAN	.000	.000	.000	.000	.000	.130	.467	.000	.000	1000	2144	.22
MAX	.000	.000	.000	.000	.000	.130	.467	.000	.000	1000	2144	.22
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.130	.467	.000	.000	1000	2144	.22
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993

SUMMARY STATISTICS

FOR 1993 WATER YEAR

ANNUAL TOTAL	115531.23
ANNUAL MEAN	317
HIGHEST DAILY MEAN	3240 Aug 11
LOWEST DAILY MEAN	.00 Oct 1
ANNUAL SEVEN-DAY MINIMUM	.00 Oct 1
INSTANTANEOUS PEAK FLOW	3250 Aug 11
INSTANTANEOUS PEAK STAGE	21.53 Jul 26
ANNUAL RUNOFF (AC-FT)	229200
10 PERCENT EXCEEDS	1530
50 PERCENT EXCEEDS	.00
90 PERCENT EXCEEDS	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05059480 SHEYENNE RIVER DIVERSION AT WEST FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March to September 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)
MAR					
22...	1355	178	708	3.5	0.5
23...	1245	142	728	2.0	0.5
27...	1450	409	562	10.0	4.0
29...	1700	673	387	10.5	4.0
APR					
01...	1510	1150	433	8.0	2.0
03...	1450	1200	458	10.0	2.0
05...	1350	1300	475	10.0	2.0
08...	1800	1530	700	7.0	2.0
JUL					
12...	1100	3.1	380	23.5	21.5
16...	1600	1410	1770	22.0	20.5
18...	1210	1450	420	22.0	21.0
19...	1300	1120	420	26.0	22.0
20...	1700	1160	--	30.5	28.5
22...	1155	2070	483	24.5	21.0
23...	0905	2240	450	22.0	21.0
24...	1010	2460	440	24.5	20.5
26...	1905	2490	560	24.5	22.0
28...	1010	2070	590	26.0	--
30...	0815	2120	575	25.0	22.0
AUG					
03...	0850	2670	610	16.0	21.0
06...	0800	2930	660	18.5	20.0
10...	1100	3200	679	32.5	23.0
11...	1100	3250	660	31.0	23.0
17...	1350	2240	549	30.0	23.5
24...	1600	1530	638	34.0	24.5
30...	1355	535	791	22.5	21.0

05059500 SHEYENNE RIVER AT WEST FARGO, ND

LOCATION.--Lat 46°53'28", long 96°54'24", in SE $\frac{1}{4}$ /SE $\frac{1}{4}$, sec.31, T.140 N., R.49 W., Cass County, Hydrologic Unit 09020204, on right bank at downstream side of county highway bridge, 1 mi north of West Fargo, 3 mi upstream from Maple River, and at mile 24.5.

DRAINAGE AREA.--8,870 mi², approximately, of which about 5,780 mi² is probably noncontributing, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to November 1902 (gage heights only), April 1903 to October 1905, March to August 1919, September 1929 to current year. Published as "at or near Haggart" 1902-7, 1919. Records for March to November 1902 and November 1905 to June 1907, published in WSP 100, 171, 207, and 245, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1388: 1904(M). WSP 1728: Drainage area. See also "PERIOD OF RECORD."

GAGE.--Water-stage recorder. Datum of gage is 877.19 ft above sea level. June 27, 1933, to September 1969 on left bank about 600 ft downstream on unimproved channel at same datum. See WSP 1728 or 1913 for history of changes prior to June 27, 1933.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 246 mi upstream. Since March 1993 flood flows that are diverted from the Sheyenne River just downstream from gaging station Sheyenne River above Sheyenne River Diversion near Horace, ND (station 05059300) bypass this station. These flows are measured at streamflow station Sheyenne River diversion at West Fargo (station 05059480). Figures of discharge given here include flow of the bypass. During some years, flow is diverted from just above the station into the Red River of the North in order to maintain adequate supply for municipal uses. Figures of daily discharge do not include this diversion.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	50	e40	e62	e82	e100	e1150	282	277	481	2400	627
2	50	52	e40	e62	e84	e100	e1180	297	307	498	2540	598
3	57	55	e38	e64	e86	e100	e1200	286	312	486	2680	552
4	57	58	e36	e64	e90	e100	e1250	271	307	554	2770	527
5	54	64	e34	e64	e92	e100	e1300	252	293	741	2870	547
6	49	73	e32	e66	e94	e100	e1400	240	295	830	2960	596
7	50	69	e32	e66	e96	e100	e1480	238	288	810	3020	596
8	51	71	e30	e66	e96	e105	e1520	227	283	e780	3090	587
9	53	55	e28	e66	e98	e110	e1130	213	266	e600	3140	640
10	49	59	e26	e66	e100	e115	e759	207	249	491	3190	689
11	45	59	e24	e68	e100	e120	e645	202	234	452	3240	701
12	52	74	e22	e68	e100	e130	e980	195	229	418	3220	702
13	58	80	e20	e68	e105	e140	e966	181	220	401	3160	702
14	e59	91	e19	e70	e110	e150	e605	170	202	376	3070	714
15	e60	90	e19	e70	e110	e160	e617	171	199	377	2810	684
16	e61	65	e19	e70	e110	e180	e638	153	237	e1280	2500	629
17	e62	54	e20	e70	e110	e190	e640	151	234	e1690	2280	582
18	e63	e20	e22	e72	e110	e200	e639	158	268	e1420	2220	552
19	e64	e10	e24	e72	e110	e195	e639	249	383	e1150	2180	525
20	e65	e10	e28	e72	e110	e190	634	363	387	e1190	2150	475
21	65	e10	e30	e72	e110	e190	597	373	451	e1660	2100	456
22	62	65	e32	e72	e110	e355	537	380	554	e2060	2000	444
23	58	68	e36	e72	e110	e330	481	394	525	e2270	1830	406
24	58	69	e40	e72	e110	e390	447	376	503	e2450	1540	377
25	58	e65	e44	e72	e110	e420	407	339	484	e2500	1150	363
26	58	e55	e50	e74	e105	e320	379	332	495	e2490	810	344
27	58	e35	e54	e76	e105	e385	351	309	504	e2310	541	340
28	56	e25	e56	e76	e100	e412	323	265	449	e2100	365	341
29	53	e30	e58	e78	---	e552	293	242	408	2120	951	337
30	51	e35	e60	e78	---	e682	269	251	443	2170	1280	336
31	50	---	e60	e80	---	e952	---	248	---	2270	710	---
TOTAL	1737	1616	1073	2168	2853	7673	23456	8015	10286	39425	68767	15969
MEAN	56.0	53.9	34.6	69.9	102	248	782	259	343	1272	2218	532
MAX	65	91	60	80	110	952	1520	394	554	2500	3240	714
MIN	45	10	19	62	82	100	269	151	199	376	365	336
AC-FT	3450	3210	2130	4300	5660	15220	46520	15900	20400	78200	136400	31670

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1993, BY WATER YEAR (WY)

	MEAN	59.1	69.1	58.8	52.6	58.5	219	669	390	238	181	113	65.9
MAX	194	241	227	176	211	1123	1789	2654	1785	1358	2218	532	
(WY)	1966	1980	1987	1987	1976	1987	1969	1950	1950	1975	1993	1993	
MIN	9.88	12.4	7.48	6.37	5.47	6.76	65.2	54.0	25.2	14.7	7.46	7.43	
(WY)	1937	1937	1937	1940	1937	1940	1991	1959	1934	1934	1936	1976	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1903 - 1993
ANNUAL TOTAL	44374	183038	
ANNUAL MEAN	121	501	180
HIGHEST ANNUAL MEAN			584
LOWEST ANNUAL MEAN			37.1
HIGHEST DAILY MEAN	1030	Mar 17	3480
LOWEST DAILY MEAN	10	Nov 19	al.0
ANNUAL SEVEN-DAY MINIMUM	20	Dec 12	2.0
INSTANTANEOUS PEAK FLOW		3250	3480
INSTANTANEOUS PEAK STAGE		17.86	b22.25
ANNUAL RUNOFF (AC-FT)	88020	363100	130300
10 PERCENT EXCEEDS	203	1530	392
50 PERCENT EXCEEDS	70	207	70
90 PERCENT EXCEEDS	40	50	20

e Estimated.

a Caused by diversion to Red River of the North.

b Backwater from Red and/or Maple Rivers.

RED RIVER OF THE NORTH BASIN

05059500 SHEYENNE RIVER AT WEST FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 02...	0920	46	--	768	--	15.5	8.5	--	--	--	--
NOV 24...	1130	63	--	626	--	-0.5	0.5	--	--	--	--
FEB 10...	1330	100	--	1100	--	-17.0	0.5	--	--	--	--
MAR 23...	1620	--	180	718	--	3.0	0.5	--	--	--	--
APR 26...	1330	318	--	696	--	14.0	11.0	--	--	--	--
MAY 20...	1425	345	--	862	--	21.5	14.0	--	--	--	--
JUN 23...	1150	538	--	833	--	23.5	22.0	--	--	--	--
JUL 09...	1440	583	--	739	--	25.0	20.5	--	--	--	--
AUG 31...	0830	748	--	829	--	14.5	19.0	--	--	--	--
SEP 16...	1345	699	--	710	7.9	17.0	15.5	280	269	63	29

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
SEP 16...	49	27	1	12	110	16	0.20	24	465	481	0.65

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
SEP 16...	908	6	100	20	<1	50	10	<0.1	1	<1	350

05059600 MAPLE RIVER NEAR HOPE, ND

LOCATION.--Lat 47°19'30", long 97°47'25", in NW¼NW¼, sec.4, T.144 N., R.56 W., Steele County, Hydrologic Unit 09020205, 100 ft downstream from box culvert on State Highway 38, 500 ft east of the intersection of State Highway 32 and 38, and 3 mi west of Hope.

DRAINAGE AREA.--20.2 mi², of which about 2.8 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year (seasonal records only since 1983).

GAGE.--Water-stage recorder. Datum of gage is 1,296.62 ft above sea level.

REMARKS.--Records fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 585 ft³/s, July 24, gage height, 7.53 ft; no flow for several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e.00	e27	.62	1.2	6.3	35	2.6
2	---	---	---	---	---	e.00	e15	.55	.90	6.4	30	4.0
3	---	---	---	---	---	e.00	e10	.55	.73	17	25	6.8
4	---	---	---	---	---	e.00	e6.4	.52	.55	10	21	6.0
5	---	---	---	---	---	e.00	4.9	.46	.46	6.4	17	3.9
6	---	---	---	---	---	e.00	5.3	.67	.46	4.7	14	2.7
7	---	---	---	---	---	e.00	6.6	.64	.52	4.0	12	2.8
8	---	---	---	---	---	e.00	6.2	.52	2.4	2.9	10	2.6
9	---	---	---	---	---	e.00	5.3	.67	2.4	3.9	17	2.0
10	---	---	---	---	---	e.00	4.5	.84	1.9	3.4	9.3	1.8
11	---	---	---	---	---	e2.0	4.0	12	4.3	2.2	6.9	1.5
12	---	---	---	---	---	e1.8	3.6	10	4.6	1.9	5.4	1.3
13	---	---	---	---	---	e1.5	3.1	7.1	2.8	1.6	4.6	1.2
14	---	---	---	---	---	e1.2	2.7	4.4	1.9	1.7	3.2	1.1
15	---	---	---	---	---	e1.0	2.2	2.6	1.3	1.8	3.1	1.0
16	---	---	---	---	---	e.80	1.9	2.0	1.1	26	3.1	.95
17	---	---	---	---	---	e.50	1.6	1.3	1.1	14	3.2	.80
18	---	---	---	---	---	e.20	1.4	.94	.99	87	2.9	.70
19	---	---	---	---	---	e.00	1.3	.80	.77	65	2.3	.53
20	---	---	---	---	---	e.00	1.2	.71	.65	35	2.2	.55
21	---	---	---	---	---	e.00	1.0	.60	.45	19	2.0	.56
22	---	---	---	---	---	e.00	.89	.53	.34	13	1.8	.56
23	---	---	---	---	---	e.00	.86	.55	1.7	12	1.7	.46
24	---	---	---	---	---	e.00	.92	.82	2.1	253	1.7	.42
25	---	---	---	---	---	e131	.93	1.1	1.6	528	1.5	.37
26	---	---	---	---	---	e105	.78	.94	8.7	402	1.4	.32
27	---	---	---	---	---	e82	.72	.93	8.0	207	1.4	.26
28	---	---	---	---	---	e70	.72	1.0	5.6	119	1.3	.21
29	---	---	---	---	---	e50	.72	1.2	4.2	71	1.3	.18
30	---	---	---	---	---	e40	.72	1.2	10	55	2.3	.15
31	---	---	---	---	---	e34	---	1.3	---	44	2.9	---
TOTAL	---	---	---	---	---	521.00	122.46	58.06	73.72	2024.2	246.5	48.32
MEAN	---	---	---	---	---	16.8	4.08	1.87	2.46	65.3	7.95	1.61
MAX	---	---	---	---	---	131	27	12	10	528	35	6.8
MIN	---	---	---	---	---	.00	.72	.46	.34	1.6	1.3	.15
AC-FT	---	---	---	---	---	1030	243	115	146	4020	489	96

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1993, BY WATER YEAR (WY)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
MEAN	.060	.003	.000	.000	.000	.000	9.02	14.2	2.16	2.82	4.23	.36	.083						
MAX	1.07	.054	.000	.000	.000	.006	41.8	56.5	11.9	34.5	65.3	7.95	1.61						
(WY)	1966	1966	1965	1965	1981	1987	1969	1972	1968	1993	1993	1993	1993						
MIN	.000	.000	.000	.000	.000	.000	.007	.000	.000	.000	.000	.000	.000						
(WY)	1965	1965	1965	1965	1965	1965	1969	1991	1980	1973	1973	1967	1967						

SUMMARY STATISTICS

WATER YEARS 1965 - 1993

ANNUAL MEAN	a2.82	
HIGHEST ANNUAL MEAN	a5.55	1969
LOWEST ANNUAL MEAN	a.002	1981
HIGHEST DAILY MEAN	528	Jul 25 1993
LOWEST DAILY MEAN	.00	Oct 1 1964
ANNUAL SEVEN-DAY MINIMUM	.00	Oct 1 1964
INSTANTANEOUS PEAK FLOW	900	Apr 18 1979
INSTANTANEOUS PEAK STAGE	7.53	Jul 24 1993
ANNUAL RUNOFF (AC-FT)	a2040	
10 PERCENT EXCEEDS	3.5	
50 PERCENT EXCEEDS	.00	
90 PERCENT EXCEEDS	.00	

e Estimated.

a Based on complete water years only (1965-82).

RED RIVER OF THE NORTH BASIN

05059600 MAPLE RIVER NEAR HOPE, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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)
MAR											
25...	1320	246	254	--	4.5	2.0	--	--	--	--	--
27...	1900	90	--	--	5.0	0.5	--	--	--	--	--
APR											
07...	1330	6.8	940	7.6	5.0	5.0	330	185	71	37	67
22...	1120	0.82	1610	--	20.5	7.0	--	--	--	--	--
MAY											
18...	1410	0.90	1220	--	10.0	10.5	--	--	--	--	--
JUN											
22...	1830	0.32	--	--	26.5	22.0	--	--	--	--	--
JUL											
26...	1630	391	350	--	28.0	24.0	--	--	--	--	--
29...	1600	61	650	--	30.0	26.0	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR											
07...	30	2	10	270	25	0.10	21	613	616	0.84	11.3

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR										
07...	3	80	40	<1	40	20	<0.1	1	<1	300

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LOCATION.--Lat 46°37'18", long 97°34'25", on west line sec.2, T.136 N., R.55 W., Ransom County, Hydrologic Unit 09020205, on left bank 25 ft downstream from county highway bridge, 1 mi downstream from South Branch, and 1.2 mi east of Enderlin.

WATER-DISCHARGE RECORDS

GAGE.--Water-stage recorder. Datum of gage is 1,056.72 ft above sea level. Sept. 21, 1956, to June 9, 1969, recording gage on right bank at same datum. Prior to Sept. 20, 1956, nonrecording gage at site 25 ft upstream at same datum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1993, BY WATER YEAR (WY)

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1956 - 1993
--------------------	------------------------	---------------------	-------------------------

ANNUAL TOTAL	10321.5		60241.8				
ANNUAL MEAN	28.2		165		41.8		
HIGHEST ANNUAL MEAN					165		1993
LOWEST ANNUAL MEAN					2.14		1990
HIGHEST DAILY MEAN	620	Mar 11	3430	Jul 18	5450		Jun 30 1975
LOWEST DAILY MEAN	1.3	Jun 14	1.4	Oct 1	.10		Dec 7 1963
ANNUAL SEVEN-DAY MINIMUM	1.4	Jun 8	1.5	Oct 10	.67		Dec 7 1963
INSTANTANEOUS PEAK FLOW			3770	Jul 17	7610		Jun 30 1975
INSTANTANEOUS PEAK STAGE			12.72	Jul 17	15.41		Jun 30 1975
ANNUAL RUNOFF (AC-FT)	20470		119500		30280		
10 PERCENT EXCEEDS	47		503		54		
50 PERCENT EXCEEDS	2.5		10		3.2		
90 PERCENT EXCEEDS	1.5		1.6		1.7		

e Estimated.

RED RIVER OF THE NORTH BASIN

05059700 MAPLE RIVER NEAR ENDERLIN, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV											
17...	0900	1.8	1220	--	-0.5	0.5	--	--	--	--	--
JAN											
06...	0830	2.3	1780	--	-32.0	1.0	--	--	--	--	--
FEB											
17...	1530	1.7	1750	--	-3.0	0.0	--	--	--	--	--
24...	1100	1.4	1350	--	-15.0	1.0	--	--	--	--	--
MAR											
09...	1515	70	481	--	0.5	0.0	--	--	--	--	--
26...	1330	138	474	--	9.0	1.0	--	--	--	--	--
28...	1720	669	456	--	5.5	1.5	--	--	--	--	--
31...	1100	1060	383	--	3.5	2.5	--	--	--	--	--
APR											
07...	0930	421	540	7.8	2.0	4.5	200	144	52	18	23
MAY											
25...	1410	13	1390	--	19.0	14.5	--	--	--	--	--
JUN											
21...	1430	184	930	--	30.5	24.0	--	--	--	--	--
JUL											
07...	1410	144	1110	--	17.0	17.5	--	--	--	--	--
17...	1215	1630	410	--	21.0	19.0	--	--	--	--	--
17...	2005	3650	410	--	23.0	19.0	--	--	--	--	--
19...	1600	2510	510	--	22.0	21.0	--	--	--	--	--
27...	1845	1220	--	--	22.5	24.5	--	--	--	--	--
AUG											
02...	1750	1330	613	--	21.0	21.5	--	--	--	--	--
10...	1645	583	626	--	33.5	27.0	--	--	--	--	--
SEP											
14...	1310	52	1020	8.1	18.0	14.0	480	383	120	44	51

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR											
07...	18	0.7	15	100	14	0.10	22	331	334	0.45	380
SEP											
14...	18	1	21	180	24	0.30	23	694	726	0.99	102

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR										
07...	3	60	50	3	20	50	<0.1	1	<1	240
SEP										
14...	7	120	40	<1	50	190	<0.1	1	<1	500

RED RIVER OF THE NORTH BASIN

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05060500 RUSH RIVER AT AMENIA, ND

LOCATION.--Lat 47°01'00", long 97°12'50", in SE¹/₄, NW¹/₄, sec.24, T.141 N., R.52 W., Cass County, Hydrologic Unit 09020204, on left bank on downstream side of bridge on State Highway 18, and 0.6 mi north of Amenia.

DRAINAGE AREA.--116 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1946 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 943 ft above sea level, from topographic map. See WSP 1913 for history of changes prior to June 10, 1961.

REMARKS.--Records good except those below 10 ft³/s, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	e.00	125	6.0	7.0	7.7	73	6.0
2	.00	.00	.00	.00	.00	e.00	108	5.7	6.9	17	62	3.6
3	.00	.00	.00	.00	.00	e.00	80	5.5	5.9	17	54	2.9
4	.00	.00	.00	.00	.00	e.00	61	5.6	4.9	15	47	4.0
5	.00	.00	.00	.00	.00	e.00	52	4.9	2.5	11	41	1.5
6	.00	.00	.00	.00	.00	e.00	47	4.7	2.1	7.4	37	.62
7	.00	.00	.00	.00	.00	e.00	41	4.9	2.2	5.3	33	.30
8	.00	.00	.00	.00	.00	e.00	37	5.9	2.8	4.2	29	.31
9	.00	.00	.00	.00	.00	e.00	33	25	2.4	2.1	27	.15
10	.00	.00	.00	.00	.00	e.50	30	31	3.7	2.9	24	.34
11	.00	.00	.00	.00	.00	e2.0	27	19	4.7	4.1	22	.10
12	.00	.00	.00	.00	.00	e10	24	15	4.7	3.5	21	.15
13	.00	.00	.00	.00	.00	e4.0	21	10	4.8	7.3	21	1.1
14	.00	.00	.00	.00	.00	e.50	22	8.0	6.8	6.5	19	.97
15	.00	.00	.00	.00	.00	e.10	20	6.1	8.2	5.9	19	.24
16	.00	.00	.00	.00	.00	e.00	17	4.0	9.7	914	18	.11
17	.00	.00	.00	.00	.00	e.00	15	2.6	20	1280	17	.88
18	.00	.00	.00	.00	.00	e.00	14	2.6	29	363	16	.43
19	.00	.00	.00	.00	.00	e.00	13	2.1	22	220	15	.20
20	.00	.00	.00	.00	.00	e.00	12	1.4	15	145	12	.09
21	.00	.00	.00	.00	.00	e.00	10	.70	11	105	12	.08
22	.00	.00	.00	.00	.00	e.00	9.1	.70	6.8	76	10	.10
23	.00	.00	.00	.00	.00	e.00	8.5	1.0	5.5	57	8.9	.10
24	.00	.00	.00	.00	.00	e2.0	8.1	4.1	4.9	50	7.9	.10
25	.00	.00	.00	.00	.00	e80	7.8	3.9	4.8	285	8.2	.09
26	.00	.00	.00	.00	.00	e230	7.8	6.5	4.6	609	7.2	.09
27	.00	.00	.00	.00	.00	e210	7.4	8.1	5.1	377	5.9	.45
28	.00	.00	.00	.00	.00	e185	7.6	7.4	5.0	245	5.0	.13
29	.00	.00	.00	.00	---	e170	7.1	7.8	4.4	161	4.6	.12
30	.00	.00	.00	.00	---	154	6.2	7.9	7.2	114	6.9	.10
31	.00	---	.00	.00	---	139	---	7.5	---	89	6.6	---
TOTAL	0.00	0.00	0.00	0.00	0.00	1187.10	878.6	225.60	224.6	5206.9	690.2	25.35
MEAN	.000	.000	.000	.000	.000	38.3	29.3	7.28	7.49	168	22.3	.84
MAX	.00	.00	.00	.00	.00	230	125	31	29	1280	73	6.0
MIN	.000	.000	.000	.000	.000	.00	6.2	.70	2.1	2.1	4.6	.08
AC-FT	.00	.00	.00	.00	.00	2350	1740	447	445	10330	1370	50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

	MEAN	.63	.54	.14	.014	.13	19.9	60.9	10.8	9.24	9.09	.81	.45
MAX	11.4	3.50	1.24	.45	2.21	136	382	81.3	48.9	168	22.3	7.88	
(WY)	1983	1983	1963	1987	1976	1984	1979	1950	1953	1993	1993	1973	
MIN	.000	.000	.000	.000	.000	.000	1.12	.12	.009	.000	.000	.000	
(WY)	1949	1953	1950	1947	1947	1948	1981	1955	1988	1955	1946	1946	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1946 - 1993

ANNUAL TOTAL	1667.90		8438.35									
ANNUAL MEAN	4.56		23.1							9.36		
HIGHEST ANNUAL MEAN										34.1		1975
LOWEST ANNUAL MEAN										.68		1977
HIGHEST DAILY MEAN	192	Jul 2	1280	Jul 17	3160	Apr 19	1979					
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Aug 1	1946					
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Aug 1	1946					
INSTANTANEOUS PEAK FLOW			2970	Jul 17	3490	Apr 19	1979					
INSTANTANEOUS PEAK STAGE			10.23	Jul 19	a12.15	Mar 23	1966					
ANNUAL RUNOFF (AC-FT)	3310		16740		6780							
10 PERCENT EXCEEDS	6.7		37		12							
50 PERCENT EXCEEDS	.00		.15		.00							
90 PERCENT EXCEEDS	.00		.00		.00							

e Estimated.

a Backwater from ice.

RED RIVER OF THE NORTH BASIN
05060500 RUSH RIVER AT AMENIA, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR											
25...	1420	79	753	--	5.0	1.0	--	--	--	--	--
27...	1330	214	340	--	7.0	1.0	--	--	--	--	--
31...	1620	147	447	--	2.5	0.5	--	--	--	--	--
APR											
07...	1130	45	670	7.8	3.0	4.0	290	172	70	27	25
22...	0840	9.6	1030	--	8.5	9.0	--	--	--	--	--
MAY											
27...	1845	8.6	1380	--	12.0	13.5	--	--	--	--	--
JUN											
22...	1500	5.9	1080	--	1.5	24.5	--	--	--	--	--
JUL											
09...	1220	2.1	1340	--	23.5	19.5	--	--	--	--	--
16...	1250	489	208	--	21.0	17.5	--	--	--	--	--
17...	0915	1160	320	--	--	18.5	--	--	--	--	--
18...	1615	314	478	--	25.0	22.5	--	--	--	--	--
26...	1545	536	--	--	35.0	22.0	--	--	--	--	--
AUG											
04...	1015	47	660	--	34.0	20.0	--	--	--	--	--
13...	0645	20	812	--	19.0	20.0	--	--	--	--	--
SEP											
10...	1525	0.50	1170	7.8	20.5	17.5	590	389	140	57	53
14...	0955	0.62	1230	7.7	12.5	11.5	590	399	140	58	55

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR											
07...	15	0.6	12	150	14	0.20	18	420	430	0.58	51.9
SEP											
10...	16	1	19	260	34	0.30	32	830	868	1.18	1.17
14...	16	1	18	280	34	0.30	32	859	906	1.23	1.52

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR										
07...	5	90	60	<1	40	160	<0.1	1	<1	340
SEP										
10...	14	150	50	<1	80	960	0.1	1	<1	660
14...	16	180	20	<1	90	950	0.1	2	<1	770

RED RIVER OF THE NORTH BASIN

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05064500 RED RIVER OF THE NORTH AT HALSTAD, MN
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 47°21'10", long 96°50'50", on line between secs.24 and 25, T.145 N., R.49 W., Traill County, Hydrologic Unit 09020107, on left bank on upstream side of highway bridge, 0.5 mi west of Halstad, 2.5 mi downstream from Wild Rice River, and at mile 375.2.

DRAINAGE AREA.--21,800 mi², approximately, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1936 to June 1937 (no winter records), April 1942 to September 1960 (spring and summer months only), May 1961 to current year.

REVISED RECORDS.--WSP 1388: 1936, 1950. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 826.65 ft above sea level. Prior to July 17, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good except those for Nov. 2 to Apr. 3, which are fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of about 38.5 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	548	352	e430	e405	e490	e390	e12500	3200	e2200	4880	22000	4330
2	611	e320	e420	e405	e490	e380	e15000	3100	e2360	4820	22300	4210
3	581	e310	e410	e400	e480	e380	e16500	3060	e2800	4630	22200	4070
4	543	e295	e405	e380	e470	e380	17000	3000	e3290	4410	20700	3950
5	496	e285	e400	e370	e470	e380	16400	2920	3290	4330	20100	3850
6	463	e280	e400	e360	e480	e380	15600	2830	3170	4650	19100	3780
7	444	e285	e395	e350	e480	e390	14800	2730	2940	5220	17900	3760
8	440	e300	e385	e340	e480	e400	14200	2590	2720	5490	16700	3720
9	448	e340	e380	e320	e480	e410	13400	2380	2510	5350	15600	3650
10	439	e330	e375	e300	e480	e460	12600	2140	2360	5000	14600	3590
11	419	e310	e370	e320	e480	e500	11400	2140	2300	4620	13900	3560
12	402	e295	e370	e340	e480	e540	9570	2070	2350	4350	13400	3550
13	393	e285	e385	e360	e480	e550	7130	2030	2330	4170	12900	3520
14	369	e275	e400	e380	e490	e560	5310	1960	2430	4130	12400	3480
15	357	e270	e410	e400	e500	e560	4670	1900	2570	4130	11500	3450
16	358	e300	e415	e410	e510	e550	4410	1860	2610	5030	10800	3410
17	351	e350	e420	e420	e520	e540	4250	1810	2770	9000	10000	3350
18	351	e400	e425	e430	e530	e540	4080	1740	3070	12300	9100	3250
19	346	e470	e430	e440	e540	e530	3940	1670	3110	14900	8240	3110
20	330	e540	e440	e450	e540	e520	3850	1620	3060	16600	7640	3000
21	335	e500	e440	e450	e520	e540	3810	1600	3020	17700	7220	2980
22	344	e580	e440	e450	e500	e560	3720	e1620	2920	18300	6880	2960
23	334	e600	e435	e450	e470	e580	3570	e1660	3020	18100	6590	2960
24	323	e500	e435	e450	e430	e600	3420	e1720	3620	17800	e6200	2920
25	295	e500	e430	e450	e420	e640	3340	e1740	4180	18000	5910	2870
26	289	e420	e430	e450	e410	e700	3320	1680	4200	19000	5490	2810
27	293	e370	e420	e450	e400	e1500	3370	1610	4220	19600	5150	2750
28	302	e360	e420	e460	e400	e3500	3460	e1720	4410	20000	4830	2700
29	327	e410	e415	e470	---	e6000	3420	e1800	4620	20200	4560	2660
30	335	e440	e415	e480	---	e8000	3310	e1900	4770	21100	4370	2610
31	336	---	e410	e490	---	e10000	---	e2000	---	21900	4310	---
TOTAL	12202	11272	12755	12630	13420	41960	241350	65800	93220	339710	362590	100810
MEAN	394	376	411	407	479	1354	8045	2123	3107	10960	11700	3360
MAX	611	600	440	490	540	10000	17000	3200	4770	21900	22300	4330
MIN	289	270	370	300	400	380	3310	1600	2200	4130	4310	2610
AC-FT	24200	22360	25300	25050	26620	83230	478700	130500	184900	673800	719200	200000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

	665	626	493	418	431	1985	6556	3015	2516	2451	1089	668
MEAN	665	626	493	418	431	1985	6556	3015	2516	2451	1089	668
MAX	2188	1771	1253	1023	1052	9429	20080	8994	10310	20060	11700	3360
(WY)	1987	1972	1987	1987	1987	1966	1969	1979	1962	1975	1993	1993
MIN	61.5	92.3	51.2	32.1	45.9	249	705	449	242	153	59.5	38.4
(WY)	1977	1977	1977	1977	1977	1962	1981	1977	1977	1988	1977	1976

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1961 - 1993

	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1961 - 1993
ANNUAL TOTAL	353845	1307719	
ANNUAL MEAN	967	3583	1757
HIGHEST ANNUAL MEAN			3968
LOWEST ANNUAL MEAN			214
HIGHEST DAILY MEAN	5000	Mar 10	41500
LOWEST DAILY MEAN	260	Jan 20	10
ANNUAL SEVEN-DAY MINIMUM	270	Jan 16	295
INSTANTANEOUS PEAK FLOW			22500
INSTANTANEOUS PEAK FLOW			30.56
ANNUAL RUNOFF (AC-FT)	701900	2594000	1273000
10 PERCENT EXCEEDS	2230	12400	3790
50 PERCENT EXCEEDS	699	1660	686
90 PERCENT EXCEEDS	320	351	200

e Estimated.

RED RIVER OF THE NORTH BASIN

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED
(National stream-quality accounting network station and radiochemical program station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-67, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
OCT												
14...	1045	378	685	--	8.2	2.0	5.0	19	11.8	95	280	254
NOV												
20...	1105	600	848	8.4	--	1.0	1.0	7.7	16.2	118	340	291
JAN												
04...	1315	382	825	--	--	-10.0	0.5	--	--	--	--	--
FEB												
10...	1420	478	771	7.6	--	-13.0	0.5	--	8.7	61	320	332
24...	1215	430	747	7.8	--	-11.5	0.5	6.7	--	--	320	280
APR												
04...	1100	17300	419	8.1	--	5.0	2.0	--	11.2	83	170	--
06...	1200	16600	434	--	--	9.0	4.0	--	--	--	--	--
16...	1145	4410	714	8.2	--	6.5	7.0	--	10.7	91	310	195
MAY												
14...	1215	2030	748	8.2	--	23.0	19.0	60	6.0	67	370	231
JUN												
02...	1410	2360	876	6.9	--	17.5	17.0	--	--	--	--	--
15...	1115	2580	790	7.8	--	20.0	19.5	--	6.5	73	350	222
JUL												
07...	1020	5200	678	7.9	--	--	--	--	--	--	--	--
18...	1000	12100	314	8.0	--	18.5	19.0	--	5.0	56	130	100
22...	1010	18400	378	7.8	--	20.0	20.0	--	3.2	36	160	--
26...	1200	19100	--	7.4	--	20.5	21.0	--	2.9	--	--	--
29...	1145	20000	453	--	--	27.0	24.0	--	--	--	--	--
31...	0900	22000	--	7.7	--	19.5	21.5	--	1.9	--	220	160
AUG												
04...	1730	19700	305	--	--	23.0	21.5	--	--	--	--	--
13...	1205	13000	638	--	--	21.0	22.0	--	--	--	--	--
18...	1305	9240	633	--	--	29.0	24.0	--	--	--	--	--
26...	1205	5400	680	--	--	21.5	23.0	--	--	--	--	--
SEP												
09...	1000	3630	1220	8.2	--	13.5	15.0	73	7.8	80	320	220

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT												
14...	K13	K16	59	31	25	16	0.7	6.8	290	10	72	18
NOV												
20...	K5	89	72	39	48	23	1	7.4	323	16	120	37
FEB												
10...	--	--	65	38	31	17	0.8	7.0	405	0	83	19
24...	37	K28	65	38	33	18	0.8	6.4	341	0	78	18
APR												
04...	--	--	39	18	15	15	0.5	9.9	--	--	60	11
16...	--	--	68	35	29	16	0.7	9.8	238	0	160	16
MAY												
14...	29	95	78	42	36	17	0.8	11	282	0	180	22
JUN												
15...	--	--	71	42	33	17	0.8	9.9	271	0	170	18
JUL												
18...	--	--	30	13	10	14	0.4	6.2	122	0	44	6.8
22...	--	--	39	16	10	11	0.3	8.2	--	0	53	7.5
31...	--	--	50	22	15	13	0.4	10	196	0	64	9.4
SEP												
09...	110	180	67	37	27	15	0.7	8.1	--	--	130	14

RED RIVER OF THE NORTH BASIN

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05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED
(National stream-quality accounting network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	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, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
OCT 14...	0.20	12	378	421	0.57	430	0.010	<0.010	--	0.240	0.240
NOV 20...	0.30	12	514	525	0.71	850	<0.010	<0.010	--	0.180	0.200
FEB 10...	0.20	20	466	453	0.62	585	--	0.030	0.530	--	0.560
24...	0.20	21	430	437	0.59	507	--	0.020	0.550	--	0.570
APR 04...	0.20	15	266	282	0.38	13200	--	0.190	3.41	--	3.60
16...	0.20	17	456	503	0.68	5990	--	0.020	0.900	--	0.920
MAY 14...	0.30	10	523	546	0.74	2990	--	0.070	0.740	--	0.810
JUN 15...	0.20	12	494	525	0.71	3660	--	0.060	0.880	--	0.940
JUL 18...	0.10	16	189	198	0.27	6470	--	0.030	0.460	--	0.490
22...	0.20	20	238	251	0.34	12500	--	0.020	0.210	--	0.230
31...	0.10	27	295	324	0.44	19200	--	0.030	0.068	--	0.098
SEP 09...	0.20	22	458	456	0.62	4470	--	0.010	0.330	--	0.340

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, ORGANIC SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	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)
OCT 14...	0.020	0.020	0.88	--	0.90	--	1.1	0.220	0.100	0.110	0.100
NOV 20...	1.10	1.20	1.4	--	2.5	--	2.7	0.470	0.370	0.400	0.360
FEB 10...	--	0.310	--	0.59	1.0	0.90	--	0.100	0.080	--	0.080
24...	--	0.240	--	--	0.90	--	--	0.090	0.060	--	0.060
APR 04...	--	0.250	--	1.0	1.4	1.3	--	0.280	0.260	--	0.240
16...	--	0.050	--	0.75	1.4	0.80	--	0.280	0.120	--	0.100
MAY 14...	--	0.080	--	--	1.0	--	--	0.240	0.130	--	0.130
JUN 15...	--	0.050	--	0.75	0.80	0.80	--	0.170	0.130	--	0.130
JUL 18...	--	0.090	--	0.41	2.5	0.50	--	0.840	0.240	--	0.250
22...	--	0.070	--	0.63	1.1	0.70	--	0.350	0.250	--	0.220
26...	--	--	--	--	1.3	--	--	0.340	--	--	--
31...	--	0.090	--	0.81	1.1	0.90	--	0.380	0.330	--	0.290
SEP 09...	--	0.060	--	--	0.80	--	--	0.350	0.220	--	0.210

RED RIVER OF THE NORTH BASIN

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED
(National stream-quality accounting network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)
OCT 14...	20	51	<3	12	27	7	<10	3	<1	<1.0	210
FEB 10...	--	--	--	5	--	39	--	--	--	--	--
APR 04...	--	--	--	110	--	87	--	--	--	--	--
16...	--	--	--	25	--	6	--	--	--	--	--
MAY 14...	20	79	<3	11	46	2	<10	4	<1	<1.0	320
JUN 15...	--	--	--	5	--	<1	--	--	--	--	--
JUL 18...	--	--	--	130	--	6	--	--	--	--	--
22...	--	--	--	70	--	11	--	--	--	--	--
31...	--	--	--	44	--	14	--	--	--	--	--
SEP 09...	20	63	<3	20	37	4	<10	4	<1	<1.0	280

DATE	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ALPHA COUNT, 2 SIGMA WAT DIS AS TH-230 (PCI/L) (75987)	ALPHA, 2 SIGMA SED SUS TOT DRY AS TH-230 (PCI/L) (76004)	ALPHA, COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L) (75986)	GROSS ALPHA, DIS- SOLVED (UG/L U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L U-NAT) (80040)	BETA, 2 SIGMA WATER, DISS, AS CS-137 (PCI/L) (75989)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	BETA, 2 SIGMA WATER, DISS, AS Y90 (PCI/L (75988)	GROSS BETA, DIS- SOLVED (PCI/L AS Y90) (80050)
OCT 14...	<6	--	--	--	--	--	--	--	--	--	--
MAY 14...	<6	--	--	--	--	--	--	--	--	--	--
JUL 07...	--	2.5	6.7	3.6	5.3	13	2.5	13	11	1.8	9.9
SEP 09...	<6	--	--	--	--	--	--	--	--	--	--

DATE	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90) (80060)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L) (09511)	BETA, 2 SIGMA SED, SUSP, TOT DRY SR90Y90 (PCI/L) (76005)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDEDED TOTAL (MG/L AS C) (00689)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 14...	--	--	--	--	--	--	--	--	--	--	94
FEB 24...	--	--	--	--	--	--	--	--	64	74	82
JUL 07...	10	0.020	0.10	2.6	<1.0	2.2	--	--	--	--	--
22...	--	--	--	--	--	--	8.9	1.1	104	5170	97

RED RIVER OF THE NORTH BASIN

123

05064900 BEAVER CREEK NEAR FINLEY, ND
(Hydrologic bench-mark network station and radiochemical program station)

LOCATION.--Lat 47°35'40", long 97°42'18", in NE 1/4, sec.31, T.148 N., R.55 W., Steele County, Hydrologic Unit 09020109, on right bank 500 ft upstream from bridge on county highway, and 7 mi northeast of Finley.

DRAINAGE AREA.--160 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder and concrete broad-crested weir. Datum of gage is 1,170.08 ft above sea level.

REMARKS.--Records poor. Since June 1987, some regulation by flood control dam 2.0 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.00	.00	.00	.00	e20	e.44	e.58	e2.0	e80	e45
2	.00	.00	e.00	.00	.00	.00	e18	e.42	e.56	e1.9	e60	e43
3	.00	.01	e.00	.00	.00	.00	e15	e.40	e.55	e1.9	e50	e40
4	.00	.03	e.00	.00	.00	.00	e12	e.38	e.54	e1.9	e55	e38
5	.00	.04	e.00	.00	.00	.00	e10	e.36	e.54	e1.9	e60	e32
6	.00	.04	e.00	.00	.00	.00	e8.0	e.45	e.80	e2.0	e45	e30
7	.00	.05	e.00	.00	.00	.00	e6.0	e.55	e1.5	e2.2	e40	e29
8	.00	.02	e.00	.00	.00	.00	e5.0	e.80	e2.0	e2.4	e38	e27
9	.00	.00	e.00	.00	.00	.00	e4.0	e1.0	e2.5	e2.4	e36	e25
10	.00	.07	e.00	.00	.00	.00	e3.5	e1.8	e3.0	e2.8	e32	e24
11	.00	.14	e.00	.00	.00	.00	e2.5	e1.6	e3.5	e4.0	e29	e23
12	.00	e.12	e.00	.00	.00	.00	e2.2	e1.5	e4.0	e6.0	e27	e22
13	.00	e.10	e.00	.00	.00	.00	e2.0	e1.4	e4.5	e8.0	e24	e21
14	.00	e.08	e.00	.00	.00	.00	e1.7	e1.3	e4.2	e10	e23	e20
15	.00	e.02	e.00	.00	.00	.00	e1.4	e1.2	e3.8	e12	e21	e20
16	.00	e.00	e.00	.00	.00	.00	e1.3	e1.2	e3.5	e20	e19	e19
17	.00	e.00	e.00	.00	.00	.00	e1.2	e1.1	e3.2	e40	e18	e18
18	.00	e.00	e.00	.00	.00	.00	e1.1	e1.1	e3.1	e60	e17	e17
19	.00	e.00	e.00	.00	.00	.00	e1.0	e1.0	e3.0	e80	e17	e16
20	.00	e.00	e.00	.00	.00	.00	e.90	e.95	e3.0	e100	e16	e16
21	.00	e.00	.00	.00	.00	.00	e.85	e.90	e2.9	e130	e15	e15
22	.00	e.00	.00	.00	.00	e.10	e.80	e.88	e2.8	e200	e15	e14
23	.00	e.00	.00	.00	.00	e30	e.80	e.84	e2.7	e600	e14	e13
24	.00	e.00	.00	.00	.00	e200	e.75	e.80	e2.6	e400	e14	e12
25	.00	e.00	.00	.00	.00	e145	e.70	e.78	e2.5	e350	e14	e11
26	.00	e.00	.00	.00	.00	e120	e.65	e.74	e2.4	e280	e13	e10
27	.00	e.00	.00	.00	.00	e90	e.60	e.70	e2.3	e250	e13	e10
28	.00	e.00	.00	.00	.00	e60	e.55	e.66	e2.2	e220	e12	e9.0
29	.00	e.00	.00	.00	---	e45	e.50	e.64	e2.1	e200	e12	e9.5
30	.00	e.00	.00	.00	---	e30	e.48	e.60	e2.0	e130	e11	e8.0
31	.00	---	.00	.00	---	e25	---	e.60	---	e90	e20	---
TOTAL	0.00	0.72	0.00	0.00	0.00	745.10	123.48	27.09	72.87	3211.4	860	636.5
MEAN	.000	.024	.000	.000	.000	24.0	4.12	.87	2.43	104	27.7	21.2
MAX	.00	.14	.00	.00	.00	200	20	1.8	4.5	600	80	45
MIN	.00	.00	.00	.00	.00	.00	.48	.36	.54	1.9	11	8.0
AC-FT	.00	1.4	.00	.00	.00	1480	245	54	145	6370	1710	1260

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1993, BY WATER YEAR (WY)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.00	.36	.061	.001	.23	22.4	51.4	8.79	4.16	7.55	2.60	1.80																	
MAX	9.30	1.87	.36	.031	2.61	64.6	244	47.0	19.8	104	27.7	21.2																	
(WY)	1983	1984	1984	1983	1984	1966	1979	1979	1987	1993	1993	1993																	
MIN	.000	.000	.000	.000	.000	.000	.19	.042	.001	.000	.000	.000																	
(WY)	1968	1968	1965	1965	1965	1965	1981	1977	1980	1972	1969	1967																	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1965 - 1993
ANNUAL TOTAL	1201.34	5677.16	
ANNUAL MEAN	3.28	15.6	8.36
HIGHEST ANNUAL MEAN			24.3
LOWEST ANNUAL MEAN			.12
HIGHEST DAILY MEAN	90 Mar 5	600 Jul 23	1540 Apr 19 1979
LOWEST DAILY MEAN	.00 Jan 1	.00 Oct 1	.00 Nov 21 1964
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Oct 1	.00 Nov 21 1964
INSTANTANEOUS PEAK FLOW		a700 Jul 23	1900 Apr 19 1979
INSTANTANEOUS PEAK STAGE		b6.42 Jul 23	9.70 Mar 14 1966
ANNUAL RUNOFF (AC-FT)	2380	11260	6050
10 PERCENT EXCEEDS	5.0	31	13
50 PERCENT EXCEEDS	.14	.54	.02
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.
a About.
b From floodmark.

RED RIVER OF THE NORTH BASIN

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED
(Hydrologic bench-mark network station and radiochemical program station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD (MG/L AS CACO3 (39086)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	
MAR	25...	1515	145	574	7.9	6.0	1.0	11	12.8	93	200	--	--
APR	27...	1050	7.6	1040	8.2	5.0	10.0	1.1	10.2	95	380	194	--
JUN	21...	1330	2.9	1240	--	30.5	25.5	--	--	--	--	--	--
JUL	16...	0900	18	1440	8.0	15.0	16.5	3.2	6.5	70	520	317	--
	24...	1710	374	--	--	23.5	21.5	--	--	--	--	--	--
	29...	1100	195	--	--	26.0	22.0	--	--	--	--	--	--
AUG	02...	1025	49	--	--	19.0	20.0	--	--	--	--	--	--
	17...	1350	18	1100	--	17.0	18.0	--	--	--	--	--	--
SEP	10...	0900	24	1000	8.3	14.0	16.0	2.7	4.8	51	350	289	76

DATE	STREP- TOCOCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 RATIO (00932) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)	
MAR 25...	--	49	20	31	24	0.9	10	--	--	130	12	0.10
APR 27...	--	91	36	74	29	2	13	237	0	300	16	0.20
JUL 16...	--	110	59	140	37	3	8.2	386	0	490	25	0.20
SEP 10...	K15	77	39	93	36	2	4.6	353	0	230	15	0.20

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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)
MAR 25...	14	349	367	0.50	144	--	--	--	--	--	--
APR 27...	14	662	734	1.0	15.1	<0.010	--	<0.050	0.020	1.0	0.110
JUL 16...	24	1030	1070	1.46	53.4	<0.010	--	0.055	0.070	1.4	0.270
SEP 10...	25	684	716	0.97	46.2	0.010	0.047	0.057	0.040	1.3	0.260

RED RIVER OF THE NORTH BASIN

125

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED
(Hydrologic bench-mark network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)
MAR 25...	--	--	10	29	<3	92	25	320	<10	4	<1
APR 27...	0.110	0.080	20	38	<3	29	49	45	<10	2	<1
JUL 16...	0.290	0.220	<10	39	<3	70	86	160	<10	3	<1
SEP 10...	0.250	0.230	<10	39	<3	160	57	110	<10	4	<1

DATE	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)	ALPHA COUNT, 2 SIGMA WAT DIS AS TH-230 (PCI/L) (75987)	ALPHA, 2 SIGMA SED SUS TOT DRY AS TH-230 (PCI/L) (76004)	ALPHA, COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L) (75986)	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	BETA, 2 SIGMA WATER, DISS, AS CS-137 (PCI/L) (75989)	GROSS BETA, DIS- SOLVED AS CS-137 (PCI/L) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)
MAR 25...	<1.0	190	<6	--	--	--	--	--	--	--	--
APR 27...	<1.0	360	<6	--	--	--	--	--	--	--	--
JUL 16...	<1.0	490	6	4.4	0.61	6.9	6.6	0.9	3.8	17	1.4
SEP 10...	<1.0	350	<6	2.3	0.31	3.2	2.0	<0.6	3.9	23	1.2

DATE	BETA, 2 SIGMA WATER, DISS, AS SR90 /Y90 (PCI/L (75988)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90) (80060)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L) (09511)	BETA, 2 SIGMA SED, SUSP, TOT DRY SR90Y90 (PCI/L) (76005)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR 25...	--	--	--	--	--	--	--	--	23	9.0	100
APR 27...	--	--	--	--	--	--	--	--	22	0.45	99
JUL 16...	2.8	13	1.3	0.020	0.06	0.63	<1.0	4.4	18	0.90	96
SEP 10...	2.9	17	1.1	0.100	0.61	0.57	<1.0	4.6	10	0.65	100

RED RIVER OF THE NORTH BASIN

05066500 GOOSE RIVER AT HILLSBORO, ND

LOCATION.--Lat 47°24'34", long 97°03'39", in NW¹/₄, sec.5, T.14S N., R.50 W., Traill County, Hydrologic Unit 09020109, on right bank 600 ft upstream from Fooman Dam in Hillsboro, and 27.5 mi upstream from mouth.

DRAINAGE AREA.--1,203 mi², of which about 110 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1931 to current year (no winter records 1932-34). Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and masonry dam. Datum of gage is 879.52 ft above sea level. Sept. 26, 1941, to Oct. 27, 1965, at site 600 ft downstream at same datum. See WSP 1728 or 1913 for history of changes prior to Sept. 26, 1941.

REMARKS.--Records good except those for period of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	12	e14	e4.9	e4.6	3.5	836	55	68	53	2960	182
2	5.0	10	e14	e4.8	e4.8	3.7	774	51	61	60	2160	306
3	7.2	9.2	e13	e4.8	e5.0	e3.8	659	45	50	43	1560	373
4	10	8.6	e13	e4.7	e5.4	e4.0	558	44	47	65	1160	371
5	10	10	e13	e4.6	e5.6	e4.5	471	41	44	30	910	389
6	6.4	11	e12	e4.4	e5.8	e5.0	396	40	41	56	746	384
7	5.0	11	e11	e4.1	e6.0	e6.0	322	38	42	93	609	376
8	6.2	11	e11	e3.9	e6.2	e7.0	299	38	45	84	512	352
9	7.5	11	e11	e3.5	e6.2	e8.0	245	37	44	66	447	317
10	7.8	15	e11	e3.1	e6.0	e9.0	208	39	45	30	403	286
11	4.4	14	e11	e2.8	e5.8	e10	191	41	54	37	367	256
12	3.4	14	e10	e2.9	e5.6	e11	175	49	72	48	332	224
13	3.0	16	e10	e3.1	e5.6	e28	160	51	90	68	304	201
14	3.5	17	e10	e3.3	e5.6	e31	139	59	87	67	291	178
15	4.5	18	e10	e3.4	e5.6	e29	126	56	79	67	281	161
16	5.2	18	e9.0	e3.6	e5.6	e18	114	49	74	101	271	152
17	5.8	20	e8.5	e3.8	e5.6	e10	103	42	67	127	254	137
18	5.4	21	e8.2	e4.0	e5.4	e8.0	98	39	61	126	239	130
19	5.9	21	e8.0	e4.2	e5.4	e6.0	91	34	46	144	225	122
20	5.8	23	e7.6	e4.3	e5.4	e5.8	82	31	40	215	211	114
21	5.0	24	e7.4	e4.0	e5.4	e5.8	76	34	39	278	198	116
22	5.0	24	e7.2	e3.7	e5.4	e6.0	72	33	34	329	185	116
23	5.8	24	e7.0	e3.8	e5.2	6.4	66	33	24	417	172	112
24	5.9	24	e6.8	e3.9	5.0	17	67	33	19	459	167	110
25	6.5	24	e6.6	e3.9	5.0	59	66	30	15	450	159	107
26	5.9	19	e6.3	e4.0	4.5	153	66	30	14	1410	151	99
27	6.7	18	e6.0	e4.1	3.5	722	65	38	22	2420	149	94
28	7.0	e17	e5.7	e4.1	3.5	932	62	41	48	3170	145	84
29	7.7	e16	e5.4	e4.1	---	985	59	44	36	4080	134	79
30	9.4	e15	e5.0	e4.3	---	909	55	57	45	4270	129	73
31	18	---	e4.9	e4.5	---	885	---	71	---	3740	134	---
TOTAL	199.4	495.8	283.6	122.6	148.7	4891.5	6701	1323	1453	22603	15965	6001
MEAN	6.43	16.5	9.15	3.95	5.31	158	223	42.7	48.4	729	515	200
MAX	18	24	14	4.9	6.2	985	836	71	90	4270	2960	389
MIN	3.0	8.6	4.9	2.8	3.5	3.5	55	30	14	30	129	73
AC-FT	396	983	563	243	295	9700	13290	2620	2880	44830	31670	11900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1993, BY WATER YEAR (WY)

	6.41	6.63	4.60	2.78	3.19	132	431	106	58.1	43.6	19.0	11.3
MEAN	62.9	46.5	22.5	12.7	20.0	1106	2878	2275	385	729	515	200
MAX	1983	1972	1988	1987	1932	1966	1979	1950	1968	1993	1993	1993
(WY)	.000	.000	.000	.000	.000	.000	6.51	1.12	1.35	.000	.000	.000
MIN	1939	1939	1939	1939	1939	1940	1938	1939	1938	1940	1938	1938
(WY)												

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1931 - 1993
ANNUAL TOTAL	15424.00	60187.6	
ANNUAL MEAN	42.1	165	70.9
HIGHEST ANNUAL MEAN			394
LOWEST ANNUAL MEAN			3.47
HIGHEST DAILY MEAN	947	Mar 8	14400
LOWEST DAILY MEAN	.00	Jan 20	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 20	.00
INSTANTANEOUS PEAK FLOW			14800
INSTANTANEOUS PEAK STAGE			16.76
ANNUAL RUNOFF (AC-FT)	30590	119400	51360
10 PERCENT EXCEEDS	77	358	98
50 PERCENT EXCEEDS	11	30	4.6
90 PERCENT EXCEEDS	.00	4.5	.10

e Estimated.

RED RIVER OF THE NORTH BASIN

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05066500 GOOSE RIVER AT HILLSBORO, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT											
07...	1240	4.7	1230	--	10.5	8.5	--	--	--	--	--
NOV											
20...	0800	26	1350	--	0.0	0.5	--	--	--	--	--
JAN											
04...	1530	4.7	1920	--	-6.0	0.5	--	--	--	--	--
FEB											
11...	1240	5.8	2180	--	-4.0	0.5	--	--	--	--	--
MAR											
27...	1545	845	530	--	9.0	5.0	--	--	--	--	--
29...	1520	1010	--	--	8.0	1.0	--	--	--	--	--
APR											
07...	1530	394	650	7.8	6.0	2.0	--	250	143	60	25
MAY											
20...	1715	33	1020	--	20.5	14.0	--	--	--	--	--
JUN											
02...	1655	58	1450	--	17.0	18.0	--	--	--	--	--
JUL											
12...	1555	62	1400	--	23.0	21.0	--	--	--	--	--
26...	1125	1410	970	--	29.5	26.5	--	--	--	--	--
28...	1740	3280	420	--	25.5	22.0	--	--	--	--	--
29...	1935	4310	350	--	25.0	21.0	--	--	--	--	--
31...	1525	3650	401	--	20.0	20.5	--	--	--	--	--
AUG											
02...	1530	2070	800	--	21.0	22.0	--	--	--	--	--
04...	1325	1170	920	--	28.0	20.5	--	--	--	--	--
10...	1450	410	1150	--	35.0	23.0	--	--	--	--	--
SEP											
09...	1445	323	1240	7.8	19.0	16.5	9.4	540	357	120	57

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
APR											
07...	30	20	0.8	10	150	15	0.10	17	394	420	0.57
SEP											
09...	84	25	2	16	320	29	0.20	31	872	883	1.20

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR											
07...	447	3	70	50	<1	30	240	<0.1	2	<1	290
SEP											
09...	770	7	120	20	<1	70	130	<0.1	1	<1	550

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND

LOCATION.--Lat 47°55'38", long 97°01'34", in sec.2, T.151 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on the right bank 200 ft upstream from the DeMers Avenue bridge, 0.4 mi downstream from Red Lake River, and at mile 293.8.

DRAINAGE AREA.--30,100 mi², approximately, including 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1882 to current year. Prior to January 1904 monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 855: 1936(M). WSP 1115: 1942. WSP 1175: 1897(M). WSP 1388: 1904, 1914-15, 1917-19, 1921-22, 1927, 1950. WSP 1728: Drainage area. WRD-ND-81-1: 1882, 1897 (M).

GAGE.--Water-stage recorder. Datum of gage is 779.00 ft above sea level. Oct. 1, 1983, to Sept. 30, 1986, datum of gage was 780.00 ft at same site. Apr. 14, 1965, to Sept. 30, 1983, water-stage recorder 1.9 mi downstream at a datum of 778.35 ft. Nov. 3, 1933, to Apr. 13, 1965, water-stage recorder 0.3 mi upstream at 778.35 ft datum. See WSP 1728 or 1913 for history of changes prior to Nov. 3, 1933.

REMARKS.--Records good except those for period of estimated daily discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1540	681	754	e840	e1000	e1050	17700	4570	3130	6210	25900	8220
2	1480	689	1020	e830	e1000	e1080	20100	4490	3410	6090	26100	9400
3	1440	726	e1000	e800	e1000	e1100	22200	4420	3580	6070	26200	9680
4	1380	752	e990	e760	e1000	e1120	23000	4440	3910	5900	26200	9170
5	1330	765	e960	e750	e1000	1140	25200	4460	4260	5730	26100	8440
6	1280	752	e880	e750	1050	1140	25500	4350	4430	6100	25900	7660
7	1250	673	e810	e740	1050	1140	25200	4210	4360	7130	25500	7080
8	1220	609	e800	e730	1040	1140	24500	4110	4230	7780	25000	6830
9	1190	648	e830	e740	e1050	1130	23500	3960	4060	8030	24400	6630
10	1150	743	e860	e750	e1050	1160	22600	3750	3970	7810	23600	6420
11	1120	775	e890	e775	e1100	1190	21700	3610	4060	7320	22900	6230
12	1040	812	e900	e780	e1150	e1200	20700	3440	4200	6760	22200	6140
13	1010	668	e900	e780	e1150	e1250	19300	3370	4360	6270	20900	6070
14	989	619	e900	e780	e1150	e1300	17100	3240	4290	5880	19900	6050
15	973	596	e900	e780	e1150	e1300	14200	3120	4160	5590	18800	5970
16	954	554	e900	e790	e1150	e1300	11300	3030	4170	5510	17500	5860
17	941	659	e900	e790	e1150	e1300	8750	2970	4220	6340	16100	5850
18	916	757	e900	e790	e1200	e1300	7110	2970	4360	9580	14800	5790
19	921	897	e900	e790	e1200	e1300	6500	3000	4620	12900	13500	5620
20	915	948	e900	e790	e1200	e1300	6160	2900	4830	15100	12700	5420
21	932	990	e880	e800	e1190	e1300	5950	2860	4820	16600	11900	5290
22	903	985	e860	e800	e1170	e1320	5720	2880	4680	17600	11100	5240
23	908	977	e850	e800	e1150	e1340	5400	2880	4590	18300	10400	5120
24	901	1070	e850	e800	e1100	e1350	5180	2880	4590	18900	9360	5090
25	870	1060	e850	e820	e1050	e1400	4930	2860	4960	19700	9010	5050
26	901	906	e850	e840	e1030	1530	4740	2830	5480	20500	8340	4950
27	846	694	e860	e860	e1000	1880	4670	2760	5610	21600	7500	4860
28	808	556	e850	e900	e1000	2970	4670	2680	5680	22900	6850	4710
29	745	540	e840	e960	---	5520	4690	2660	5790	24100	6640	4470
30	730	600	e840	e980	---	10600	4640	2770	5980	24900	6550	4220
31	713	---	e840	e1000	---	14800	---	2880	---	25500	6800	---
TOTAL	32296	22701	27264	25095	30530	67950	412910	105350	134790	378700	528650	187530
MEAN	1042	757	879	810	1090	2192	13760	3398	4493	12220	17050	6251
MAX	1540	1070	1020	1000	1200	14800	25500	4570	5980	25500	26200	9680
MIN	713	540	754	730	1000	1050	4640	2660	3130	5510	6550	4220
AC-FT	64060	45030	54080	49780	60560	134800	819000	209000	267400	751200	1049000	372000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1904 - 1993, BY WATER YEAR (WY)

	MEAN	1312	1139	920	788	757	2310	9127	4871	3837	3123	1708	1392
MAX	4290	5218	3073	1929	1869	10250	31480	36510	19340	25270	17050	6251	
(WY)	1972	1972	1972	1951	1952	1966	1979	1950	1962	1975	1993	1993	
MIN	12.1	30.5	17.8	18.8	2.87	42.1	954	373	151	88.8	30.6	20.3	
(WY)	1937	1937	1937	1937	1937	1937	1937	1934	1934	1936	1934	1936	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1904 - 1993
ANNUAL TOTAL	637444	1953766	
ANNUAL MEAN	1742	5353	2586
HIGHEST ANNUAL MEAN			7580
LOWEST ANNUAL MEAN			244
HIGHEST DAILY MEAN	7940	Mar 13	80900
LOWEST DAILY MEAN	442	Jan 1	a1.8
ANNUAL SEVEN-DAY MINIMUM	469	Jan 1	2.5
INSTANTANEOUS PEAK FLOW			b85000
INSTANTANEOUS PEAK STAGE			c50.20
ANNUAL RUNOFF (AC-FT)	1264000	3875000	1873000
10 PERCENT EXCEEDS	3690	17900	5770
50 PERCENT EXCEEDS	1190	2830	1280
90 PERCENT EXCEEDS	526	780	260

e Estimated.

a Caused by unusual regulating during repair of dam at Grand Forks.

b About, from rating curve extended above 58,000 ft³/s.

c Site and datum then in use.

RED RIVER OF THE NORTH BASIN

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05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949, 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)
NOV											
13...	1515	628	--	645	--	-3.0	1.0	--	--	--	--
DEC											
16...	1425	920	--	583	--	--	1.5	--	--	--	--
JAN											
11...	1430	773	--	561	--	-10.0	0.0	--	--	--	--
29...	1030	964	--	--	--	-10.0	0.0	--	--	--	--
FEB											
08...	1515	1050	--	577	7.7	-5.5	0.5	14.5	103	240	256
25...	1215	1050	--	585	--	--	--	--	--	--	--
MAR											
16...	1715	1300	--	760	--	-4.0	0.0	--	--	--	--
APR											
04...	1500	22400	--	371	7.8	9.5	5.0	11.8	94	160	114
06...	1600	26700	--	370	--	9.0	2.0	--	--	--	--
09...	1620	22700	--	498	--	9.0	4.0	--	--	--	--
19...	1215	6470	--	668	8.4	9.0	8.0	10.1	88	300	212
MAY											
03...	1110	4270	--	770	8.4	14.0	10.0	10.5	96	350	205
JUN											
02...	0945	3490	--	655	8.1	16.5	15.0	7.8	80	290	217
28...	1600	5920	--	--	--	27.0	19.0	--	--	--	--
JUL											
12...	1030	6720	--	611	8.0	18.5	19.0	7.4	82	290	186
28...	1445	23400	--	445	7.8	20.5	21.5	5.2	61	200	150
AUG											
03...	0900	25800	--	466	7.5	15.0	21.0	3.9	45	240	174
05...	1435	26100	--	266	--	21.0	21.0	--	--	--	--
13...	1545	20600	--	600	--	22.0	21.5	--	--	--	--
19...	0930	13600	--	659	--	23.5	22.5	--	--	--	--
24...	1200	9660	--	--	--	33.0	24.5	--	--	--	--
SEP											
03...	0910	--	9680	648	7.9	11.0	19.0	6.9	77	260	182
22...	1315	5400	--	652	--	10.0	12.0	--	--	--	--
23...	1300	--	5120	520	8.1	14.0	11.0	10.9	101	250	177

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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)
FEB											
08...	53	27	17	13	0.5	4.6	312	0	44	10	0.10
APR											
04...	38	16	11	12	0.4	9.8	140	0	50	11	0.20
19...	67	31	23	14	0.6	8.6	258	0	140	12	0.20
MAY											
03...	77	38	27	14	0.6	7.8	247	2	170	15	0.20
JUN											
02...	63	33	25	15	0.6	6.5	264	0	110	15	0.20
JUL											
12...	65	31	22	14	0.6	7.2	227	0	120	11	0.20
28...	48	20	12	11	0.4	7.6	183	0	61	5.0	0.20
AUG											
03...	61	22	4.7	4	0.1	5.6	212	0	57	5.6	0.10
SEP											
03...	60	27	16	11	0.4	8.4	222	0	83	12	0.30
23...	58	26	12	9	0.3	5.9	216	0	73	7.8	0.20

RED RIVER OF THE NORTH BASIN

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
FEB 08...	15	326	333	0.45	944	0.020	0.330	0.350	0.170	0.63	0.90
APR 04...	13	235	248	0.34	15000	0.180	3.42	3.60	0.320	0.98	1.5
19...	15	427	447	0.61	7810	0.020	0.680	0.700	0.040	0.86	1.2
MAY 03...	10	470	504	0.69	5810	0.010	0.220	0.230	0.060	0.84	1.0
JUN 02...	9.2	394	426	0.58	4010	0.020	0.430	0.450	0.030	0.57	0.70
JUL 12...	19	388	431	0.59	7820	<0.010	--	0.190	0.040	0.86	0.90
28...	19	264	293	0.40	18500	0.020	0.180	0.200	0.080	0.82	0.90
AUG 03...	20	282	325	0.44	22600	0.030	0.150	0.180	0.080	1.4	1.4
SEP 03...	20	338	366	0.50	9570	0.010	0.360	0.370	0.060	0.94	1.1
23...	13	303	336	0.46	4640	<0.010	--	0.130	0.060	0.74	0.80

DATE	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, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 08...	0.80	0.070	0.040	0.050	7	21	--	--	--	--	--
APR 04...	1.3	0.260	0.200	0.170	69	130	--	--	--	--	--
19...	0.90	0.220	0.100	0.070	24	11	--	--	--	--	--
MAY 03...	0.90	0.120	0.080	0.050	30	7	--	--	161	1860	98
JUN 02...	0.60	0.140	0.110	0.100	150	22	--	--	181	1710	99
JUL 12...	0.90	0.180	0.150	0.090	32	3	14	1.2	253	4590	100
28...	0.90	0.280	0.200	0.160	50	19	--	--	101	6380	98
AUG 03...	1.5	0.140	0.120	0.100	70	20	--	--	--	--	--
SEP 03...	1.0	0.180	0.170	0.170	70	11	12	3.2	--	--	--
23...	0.80	0.090	0.070	0.080	17	10	9.2	1.4	66	912	100

RED RIVER OF THE NORTH BASIN

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05082625 TURTLE RIVER AT TURTLE RIVER STATE PARK NEAR ARVILLA, ND

LOCATION.--Lat 47°55'55", long 97°30'51", in NE¹/₄NW¹/₄ sec.1, T.151 N., R.54 W., Grand Forks County, Hydrologic Unit 09020307, on right bank 200 ft upstream from U.S.Highway 2, ¹/₄ mi upstream from Turtle River State Park, 1 mi northwest of Arvilla and 65 mi above mouth.

DRAINAGE AREA.--311 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1992 to September 1993.

GAGE.--Water-stage recorder. Elevation of gage is 980 ft above sea level, from topographic map.

REMARKS.--Records fair except those for period Oct. 1 to Apr. 15, which are poor. Some regulation by Larimore Dam located 4 mi upstream on the south branch of the Turtle River.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.0	e8.3	e6.4	e5.1	e3.6	e5.4	e200	e14	e6.9	10	241	e325
2	e3.1	e9.0	e6.3	e5.1	e3.8	e6.6	e190	e15	e6.9	13	207	e330
3	e3.3	e10	e6.2	e5.1	e4.2	e8.2	e170	e15	e6.9	11	e195	e225
4	e3.4	e8.6	e6.2	e5.1	e4.4	e9.2	e150	e15	e6.9	13	e160	e155
5	e3.5	e8.5	e6.1	e5.1	e4.7	e10	e135	e16	e6.9	10	e145	145
6	e3.6	e8.6	e6.1	e4.8	e4.8	e9.8	e120	e18	e7.2	10	125	140
7	e3.7	e8.7	e6.0	e4.6	e4.9	e9.5	e105	e22	9.2	11	109	132
8	e3.9	e8.7	e6.0	e4.3	e5.0	e9.0	e93	e23	19	15	100	114
9	e4.0	e8.6	e5.9	e4.1	e5.1	e9.5	e82	e21	24	17	82	99
10	e4.2	e8.6	e5.8	e3.8	e5.2	e9.2	e72	e19	22	14	69	81
11	e4.4	e8.4	e5.8	e3.8	e5.2	e9.0	e65	e17	e20	14	66	67
12	e4.6	e8.2	e5.7	e3.8	e5.2	e8.8	e55	e16	e17	10	63	49
13	e4.8	e8.0	e5.6	e3.8	e5.1	e8.6	e49	e15	e20	12	57	45
14	e5.0	e7.8	e5.6	e3.8	e5.1	e8.4	e43	e14	e19	9.0	54	38
15	e5.2	e7.6	e5.6	e3.8	e5.0	e8.0	e40	e12	e17	8.0	52	35
16	e5.4	e7.4	e5.5	e3.8	e5.0	e7.7	e20	e11	e25	15	51	33
17	e5.6	e7.2	e5.5	e3.8	e4.9	e7.4	e13	e10	e24	25	50	27
18	e5.8	e7.0	e5.4	e3.8	e4.8	e7.2	e12	e9.0	e19	52	47	23
19	e6.0	e7.5	e5.4	e3.7	e4.7	e7.3	e12	8.5	e14	94	38	21
20	e6.2	e7.2	e5.3	e3.7	e4.5	e7.4	e12	8.4	e10	115	37	19
21	e6.4	e7.1	e5.3	e3.6	e4.4	e7.8	e12	8.4	e9.0	103	34	17
22	e6.6	e7.0	e5.2	e3.6	e4.3	e8.2	e12	8.5	e11	101	29	16
23	e6.8	e6.9	e5.2	e3.5	e4.2	e9.0	e12	9.7	e20	95	28	15
24	e7.0	e6.8	e5.2	e3.4	e4.1	e12	e13	9.4	13	94	20	14
25	e7.2	e6.8	e5.2	e3.3	e4.0	e25	e13	8.4	e11	138	24	14
26	e7.4	e6.7	e5.2	e3.4	e4.0	e50	e13	8.2	e9.5	280	29	14
27	e7.6	e6.6	e5.2	e3.5	e4.0	e130	e13	7.9	e9.0	274	33	13
28	e7.8	e6.6	e5.2	e3.5	e4.3	e250	e14	7.5	e8.6	369	37	12
29	e7.9	e6.5	e5.1	e3.5	---	e235	e14	6.9	e9.8	338	80	12
30	e8.0	e6.5	e5.1	e3.5	---	e220	e14	e6.9	e13	300	150	12
31	e8.1	---	e5.1	e3.5	---	e205	---	e6.9	---	273	e205	---
TOTAL	169.5	231.4	173.4	123.2	128.5	1318.2	1768	387.6	414.8	2843.0	2617	2242
MEAN	5.47	7.71	5.59	3.97	4.59	42.5	58.9	12.5	13.8	91.7	84.4	74.7
MAX	8.1	10	6.4	5.1	5.2	250	200	23	25	369	241	330
MIN	3.0	6.5	5.1	3.3	3.6	5.4	12	6.9	6.9	8.0	20	12
AC-FT	336	459	344	244	255	2610	3510	769	823	5640	5190	4450

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1993, BY WATER YEAR (WY)

	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MEAN	5.47	7.71	5.59	3.97	4.59	42.5	58.9	12.5	13.8	91.7	84.4	74.7
MAX	5.47	7.71	5.59	3.97	4.59	42.5	58.9	12.5	13.8	91.7	84.4	74.7
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
MIN	5.47	7.71	5.59	3.97	4.59	42.5	58.9	12.5	13.8	91.7	84.4	74.7
(WY)	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993

SUMMARY STATISTICS

FOR 1993 WATER YEAR

ANNUAL TOTAL	12416.6
ANNUAL MEAN	34.0
HIGHEST DAILY MEAN	369 Jul 28
LOWEST DAILY MEAN	3.0 Oct 1
ANNUAL SEVEN-DAY MINIMUM	3.4 Oct 1
INSTANTANEOUS PEAK FLOW	448 Jul 28
INSTANTANEOUS PEAK STAGE	6.98 Jul 28
ANNUAL RUNOFF (AC-FT)	24630
10 PERCENT EXCEEDS	107
50 PERCENT EXCEEDS	9.0
90 PERCENT EXCEEDS	4.1

e Estimated.

05082625 TURTLE RIVER AT TURTLE RIVER STATE PARK NEAR ARVILLA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February to September 1993.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May to October 1993

WATER TEMPERATURE: May to October 1993

INSTRUMENTATION.--Water-quality sensors since May 1993.

REMARKS.--Records fair. Interruptions in record due to malfunction of recording instruments.

EXTREMES FOR CURRENT PERIOD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 1,400 microsiemens, Aug. 29, minimum recorded, 707 microsiemens, June 9.

WATER TEMPERATURE: Maximum recorded, 25.8°C, June 21, minimum recorded, 7.5°C, Sept. 29.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
FEB											
08...	1015	5.1	--	837	7.5	-8.5	0.5	9.2	66	370	239
MAR											
05...	1145	9.7	--	815	7.7	8.5	0.5	11.8	84	360	248
26...	1155	47	--	643	7.8	4.5	1.0	12.8	94	300	218
28...	0940	245	--	523	7.9	4.0	0.5	12.3	88	170	110
30...	1130	220	--	529	8.0	2.0	--	--	--	180	115
APR											
15...	1020	40	--	795	8.0	11.0	6.0	10.8	90	320	--
28...	0925	14	--	796	8.0	8.0	8.5	9.8	87	350	228
MAY											
12...	1020	16	--	783	8.0	18.5	16.5	8.5	90	340	254
24...	1340	10	--	819	8.0	12.5	15.0	11.3	116	350	--
JUN											
07...	1130	9.2	--	792	7.9	16.0	16.0	8.8	94	330	221
08...	1340	16	--	734	7.9	11.0	15.5	8.6	92	330	--
09...	1350	22	--	721	8.3	14.0	16.5	10.3	111	340	230
24...	1320	13	--	907	8.1	19.0	23.5	9.7	119	390	258
JUL											
13...	1010	11	--	931	7.7	13.0	17.0	8.9	95	400	255
20...	1300	114	--	870	7.8	22.0	20.0	8.1	92	360	--
27...	0900	--	274	812	7.9	18.0	20.0	5.8	67	--	164
AUG											
02...	1050	211	--	929	7.9	22.0	18.0	7.0	77	320	--
11...	0930	62	--	1040	7.7	23.0	22.5	9.5	114	360	265
23...	1010	28	--	1190	7.8	22.0	20.0	8.0	93	470	299
25...	0950	24	--	1090	8.2	19.5	20.5	6.2	72	440	305
SEP											
02...	1310	356	--	1030	8.1	13.5	17.0	8.1	87	330	205
09...	0935	101	--	1110	7.7	14.5	15.0	8.4	87	380	244

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 (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3 (00452)	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)
FEB											
08...	96	31	24	12	0.5	5.2	292	0	110	160	0.30
MAR											
05...	95	31	23	12	0.5	5.7	308	0	140	20	0.20
26...	78	25	17	11	0.4	6.3	266	0	110	16	0.20
28...	45	15	26	23	0.9	10	134	0	110	19	0.10
30...	46	17	33	27	1	11	140	0	130	19	0.10
APR											
15...	81	28	50	25	1	7.4	--	--	200	23	0.20
28...	90	31	39	19	0.9	6.0	278	0	180	15	0.20
MAY											
12...	87	29	34	18	0.8	6.2	310	0	160	19	<0.10
24...	91	31	33	17	0.8	5.8	--	--	160	20	0.30
JUN											
07...	83	29	31	17	0.7	5.9	266	2	150	18	0.30
08...	84	29	28	15	0.7	5.3	--	--	140	16	0.10
09...	85	30	31	16	0.7	5.1	268	6	140	18	0.30
24...	97	36	47	20	1	6.5	288	14	180	26	0.30
JUL											
13...	99	36	47	20	1	5.7	311	0	180	26	0.30
20...	90	33	47	22	1	5.9	--	--	180	26	0.20
27...	--	--	--	--	--	--	200	0	--	--	--
AUG											
02...	79	31	73	32	2	9.5	--	--	210	23	0.20
11...	90	34	73	30	2	8.8	323	0	220	26	0.20
23...	120	42	78	26	2	8.5	365	0	250	30	0.30
25...	110	41	75	26	2	10	372	0	250	30	0.30
SEP											
02...	80	31	73	32	2	4.7	250	0	240	38	0.20
09...	90	37	88	33	2	9.6	298	0	280	30	0.20

RED RIVER OF THE NORTH BASIN

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05082625 TURTLE RIVER AT TURTLE RIVER STATE PARK NEAR ARVILLA, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
FEB											
08...	27	600	462	0.63	6.31	0.020	0.610	0.630	0.190	0.31	0.60
MAR											
05...	25	496	505	0.69	13.2	0.030	0.860	0.890	0.090	0.31	0.50
26...	22	408	424	0.58	54.3	0.020	0.560	0.580	0.090	0.41	0.70
28...	15	312	326	0.44	216	0.060	1.04	1.10	0.140	0.76	1.5
30...	16	347	348	0.47	207	0.060	1.04	1.10	0.090	0.81	1.2
APR											
15...	19	529	549	0.75	59.1	0.010	0.220	0.230	0.030	0.47	0.80
28...	13	511	538	0.73	20.6	<0.010	--	<0.050	<0.010	--	0.50
MAY											
12...	16	504	511	0.69	21.9	<0.010	--	<0.050	0.020	0.38	0.40
24...	15	513	525	0.71	14.3	<0.010	--	<0.050	<0.010	--	0.40
JUN											
07...	13	463	485	0.66	12.0	<0.010	--	<0.050	0.010	0.39	0.30
08...	16	457	480	0.65	20.3	<0.010	--	0.330	0.020	0.48	0.40
09...	17	465	486	0.66	28.7	<0.010	--	0.098	0.030	0.37	0.50
24...	19	568	585	0.80	20.1	<0.010	--	<0.050	0.020	0.48	0.70
JUL											
13...	17	564	573	0.78	17.6	<0.010	--	<0.050	0.030	0.47	0.50
20...	26	553	565	0.77	174	0.010	0.082	0.092	0.040	0.56	1.0
27...	--	--	--	--	--	--	--	--	--	--	1.5
AUG											
02...	41	616	643	0.87	366	0.020	0.079	0.099	0.070	0.93	1.3
11...	37	650	693	0.94	116	0.030	0.220	0.250	0.070	0.83	1.1
23...	35	746	780	1.06	58.3	0.010	0.350	0.360	0.060	0.74	1.0
25...	32	734	772	1.05	49.4	<0.010	--	0.370	0.030	0.67	0.80
SEP											
02...	29	621	646	0.88	621	0.010	0.140	0.150	0.060	0.84	1.0
09...	29	712	722	0.98	197	0.010	0.230	0.240	0.010	0.99	1.1
DATE	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, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PENDEED TOTAL (MG/L AS C) (00689)	SEDI- MENT, DIS- CHARGE, SUS- PENDEED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDEED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. & FINER THAN .062 MM (70331)
FEB											
08...	0.50	0.050	0.030	0.040	8	92	5.7	0.3	9	0.12	75
MAR											
05...	0.40	0.070	0.050	0.050	20	140	5.8	0.4	79	2.1	70
26...	0.50	0.190	0.240	0.120	20	120	7.4	0.6	17	2.2	97
28...	0.90	0.360	0.270	0.270	100	320	--	1.8	58	38	83
30...	0.90	0.330	0.320	0.280	110	240	14	1.5	--	--	--
APR											
15...	0.50	0.120	0.070	0.070	30	240	8.5	0.7	7	0.75	100
28...	0.40	0.060	0.030	0.020	15	140	6.3	0.5	6	0.23	100
MAY											
12...	0.40	0.070	0.070	0.060	9	130	6.9	0.4	7	0.30	88
24...	0.30	0.060	0.040	0.050	8	89	5.9	0.3	25	0.68	70
JUN											
07...	0.40	0.060	0.070	0.050	10	59	6.0	0.4	1	0.02	100
08...	0.50	0.060	0.070	0.050	7	60	6.6	0.4	5	0.21	100
09...	0.40	0.070	0.090	0.050	11	44	6.8	0.5	4	0.24	100
24...	0.50	0.110	0.080	0.100	9	61	8.7	0.4	4	0.14	91
JUL											
13...	0.50	0.090	0.090	0.080	11	56	7.8	<0.1	3	0.09	87
20...	0.60	0.140	0.080	0.070	11	57	9.6	0.6	--	--	--
27...	--	0.250	--	--	--	--	--	--	163	121	92
AUG											
02...	1.0	0.460	0.360	0.350	52	290	14	0.5	40	23	54
11...	0.90	0.360	0.330	0.330	25	290	13	0.4	8	1.3	96
23...	0.80	0.360	0.330	0.270	12	250	11	0.3	7	0.52	96
25...	0.70	0.340	0.270	0.260	12	210	10	0.3	78	5.0	90
SEP											
02...	0.90	0.320	0.290	0.270	40	120	14	0.8	44	42	76
09...	1.0	0.300	0.300	0.270	32	220	13	0.4	14	3.8	95

RED RIVER OF THE NORTH BASIN

05082625 TURTLE RIVER AT TURTLE RIVER STATE PARK NEAR ARVILLA, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	877	862	871
20	---	---	---	---	---	---	---	---	---	869	810	851
21	---	---	---	---	---	---	---	---	---	860	816	845
22	---	---	---	---	---	---	---	---	---	853	835	848
23	---	---	---	---	---	---	---	---	---	835	822	829
24	---	---	---	---	---	---	---	---	---	826	816	821
25	---	---	---	---	---	---	---	---	---	829	821	826
26	---	---	---	---	---	---	---	---	---	827	809	816
27	---	---	---	---	---	---	---	---	---	816	798	811
28	---	---	---	---	---	---	---	---	---	818	810	814
29	---	---	---	---	---	---	---	---	---	813	798	806
30	---	---	---	---	---	---	---	---	---	805	792	798
31	---	---	---	---	---	---	---	---	---	803	796	800
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	821	803	815	812	793	804	920	879	897	1020	860	973
2	825	815	821	825	793	807	970	920	950	1040	1020	1030
3	828	820	824	842	819	835	1030	970	994	1060	1040	1060
4	832	823	828	861	826	842	1030	981	1000	1090	1060	1080
5	829	797	806	869	860	863	981	975	979	1110	1060	1100
6	809	761	796	885	868	876	994	980	985	1130	1110	1120
7	799	765	785	882	868	878	1010	991	997	1140	1130	1130
8	767	727	742	893	868	881	1020	1010	1010	1150	1130	1140
9	735	707	724	894	883	889	1020	1010	1010	1150	1130	1140
10	---	---	---	887	850	866	1030	1000	1010	1130	1130	1130
11	---	---	---	909	879	899	1030	1010	1020	1130	1120	1120
12	---	---	---	913	902	908	1010	983	996	1120	1100	1110
13	---	---	---	---	---	---	1030	999	1010	1100	1090	1100
14	---	---	---	---	---	---	1020	984	1010	1090	1070	1080
15	1130	1050	1100	---	---	---	1040	1020	1030	1100	1080	1090
16	1100	934	972	---	---	---	1050	1030	1040	1110	1090	1100
17	977	921	959	---	---	---	1100	1050	1070	1100	1090	1100
18	921	801	860	---	---	---	1140	1100	1120	1100	1090	1090
19	801	763	776	---	---	---	1180	1140	1150	1090	1080	1080
20	790	760	768	---	---	---	1190	1170	1170	1080	1070	1070
21	864	790	830	---	---	---	1170	1160	1170	1070	1050	1060
22	883	845	872	---	---	---	1170	1120	1150	1080	1050	1060
23	863	814	846	---	---	---	1140	1090	1120	1080	1070	1070
24	853	804	838	---	---	---	1120	1090	1100	1070	1060	1070
25	847	800	831	---	---	---	1110	1070	1090	1070	1060	1070
26	863	765	820	---	---	---	1080	1030	1050	1070	1040	1060
27	896	787	864	---	---	---	1060	1010	1040	1050	1030	1040
28	828	781	804	---	---	---	1040	932	1010	1060	1040	1050
29	826	792	814	---	---	---	1400	970	1210	1050	1030	1040
30	814	801	806	---	---	---	1210	999	1090	1050	1030	1040
31	---	---	---	---	---	---	1050	752	892	---	---	---
MONTH	---	---	---	---	---	---	1400	752	1040	1150	860	1080

RED RIVER OF THE NORTH BASIN

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05082625 TURTLE RIVER AT TURTLE RIVER STATE PARK NEAR ARVILLA, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	15.3	10.7	12.8
20	---	---	---	---	---	---	---	---	---	17.7	10.0	14.0
21	---	---	---	---	---	---	---	---	---	21.2	13.8	17.4
22	---	---	---	---	---	---	---	---	---	18.5	13.0	15.5
23	---	---	---	---	---	---	---	---	---	15.6	11.6	13.6
24	---	---	---	---	---	---	---	---	---	16.8	11.2	13.8
25	---	---	---	---	---	---	---	---	---	17.0	11.0	14.1
26	---	---	---	---	---	---	---	---	---	14.4	11.5	12.8
27	---	---	---	---	---	---	---	---	---	18.8	10.0	14.2
28	---	---	---	---	---	---	---	---	---	16.4	13.3	14.8
29	---	---	---	---	---	---	---	---	---	19.3	13.6	15.9
30	---	---	---	---	---	---	---	---	---	19.7	13.0	16.1
31	---	---	---	---	---	---	---	---	---	19.3	12.8	16.1
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	20.5	13.3	16.8	18.0	16.0	16.9	22.4	20.3	21.4	18.0	16.4	17.1
2	19.7	13.9	16.9	20.9	16.6	18.7	20.3	19.0	19.7	17.5	16.3	17.0
3	21.5	13.8	17.7	21.1	18.8	20.0	20.0	18.0	19.0	17.9	15.5	16.7
4	21.5	14.7	18.4	21.5	19.5	20.6	20.6	18.1	19.3	17.5	16.1	16.8
5	20.1	16.6	18.3	20.5	18.7	19.2	20.3	18.4	19.3	16.9	15.1	16.0
6	18.3	15.8	16.9	18.7	17.6	18.0	21.2	17.6	19.4	16.5	14.3	15.4
7	18.0	15.4	16.5	17.9	17.1	17.5	21.4	18.0	19.7	16.8	14.3	15.6
8	---	---	---	18.8	16.4	17.5	22.4	19.0	20.8	16.7	14.8	15.7
9	---	---	---	20.7	17.1	18.9	23.9	20.1	22.0	16.0	14.8	15.5
10	25.2	19.9	21.6	20.7	18.9	19.9	24.5	21.0	22.9	16.3	13.5	14.9
11	24.5	19.3	21.6	19.6	17.7	18.5	23.5	21.6	22.6	17.0	13.6	15.3
12	24.5	21.1	23.2	19.1	16.1	17.7	22.2	20.2	21.1	16.2	14.6	15.4
13	23.4	21.8	23.1	---	---	---	20.6	17.8	19.4	14.6	11.6	12.7
14	21.8	18.6	20.2	---	---	---	22.5	18.8	20.4	13.2	11.0	12.0
15	19.7	17.4	18.5	---	---	---	23.2	20.3	21.5	12.7	10.1	11.5
16	18.6	17.3	17.7	---	---	---	22.7	19.3	21.0	13.0	11.1	12.1
17	19.8	16.3	17.9	---	---	---	21.1	19.4	20.0	13.3	10.4	11.9
18	21.1	17.8	19.6	---	---	---	22.0	18.4	20.2	13.9	10.6	12.2
19	22.3	18.9	20.7	---	---	---	20.7	18.8	19.8	13.1	10.4	12.0
20	23.7	19.4	21.7	---	---	---	21.0	18.3	19.7	13.5	12.2	12.8
21	25.8	21.5	23.7	---	---	---	21.8	18.2	20.1	12.8	12.1	12.5
22	25.5	23.3	24.6	---	---	---	20.8	19.3	19.9	12.7	10.8	12.0
23	25.2	22.2	23.8	---	---	---	21.7	18.6	20.0	12.8	9.2	11.0
24	24.7	22.0	23.1	---	---	---	23.8	19.1	21.4	14.2	10.3	12.1
25	22.0	18.6	19.6	---	---	---	22.6	20.4	21.4	14.2	10.8	12.6
26	18.6	17.6	18.0	---	---	---	20.8	18.3	19.4	13.0	9.9	11.2
27	17.6	16.8	17.1	---	---	---	20.6	17.3	18.9	11.8	8.7	10.2
28	17.4	16.2	16.8	---	---	---	19.9	17.1	18.5	10.6	8.9	9.7
29	17.1	15.8	16.5	---	---	---	18.5	16.5	17.5	10.7	7.5	9.1
30	16.5	15.8	16.1	---	---	---	18.0	16.1	16.9	11.3	8.1	9.8
31	---	---	---	---	---	---	17.6	15.9	16.7	---	---	---
MONTH	---	---	---	---	---	---	24.5	15.9	20.0	18.0	7.5	13.3

RED RIVER OF THE NORTH BASIN

05084000 FOREST RIVER NEAR FORDVILLE, ND

LOCATION.--Lat 48°11'50", long 97°43'49", on line between secs.32 and 33, T.155 N., R.55 W., Walsh County, Hydrologic Unit 09020308, on right bank 50 ft upstream from highway bridge, 0.5 mi downstream from South Branch, and 3 mi southeast of Fordville.

DRAINAGE AREA.--456 mi², of which about 120 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,035 ft above sea level, from topographic map. Prior to July 21, 1951, nonrecording gage at site 50 ft downstream at same datum.

REMARKS.--Records good except those for Dec. 8 to Mar. 28, which are fair. Some regulation of high flows by temporary retention in several retarding basins above station. Retarding basins have a combined capacity of about 14,000 acre-ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	5.9	6.8	e7.2	e6.0	e3.8	86	20	7.9	72	437	106
2	4.4	6.5	6.8	e7.2	e6.0	e4.0	84	18	6.7	73	436	93
3	4.3	7.6	6.4	e7.2	e6.0	e4.5	81	17	6.3	74	418	86
4	4.4	7.6	6.7	e7.2	e6.0	e5.0	93	16	5.9	74	403	82
5	4.4	6.9	6.8	e7.2	e6.0	e5.5	118	14	6.9	70	387	84
6	4.5	6.5	6.9	e7.2	e6.0	e6.5	124	14	11	70	372	86
7	4.6	6.4	6.7	e7.2	e6.0	e6.5	122	14	13	69	360	77
8	4.5	6.6	e6.8	e6.9	e5.8	e6.7	107	16	24	66	350	71
9	4.3	7.0	e6.8	e6.9	e5.6	e6.5	94	21	26	65	464	66
10	4.4	8.5	e6.8	e6.7	e5.4	e6.2	85	24	48	61	574	61
11	4.8	8.4	e7.2	e6.2	e5.2	e6.0	83	29	40	57	421	57
12	5.0	7.3	e7.0	e6.2	e5.0	e5.9	78	35	35	49	373	54
13	4.9	8.1	e8.0	e6.2	e4.7	e5.8	75	37	33	45	356	50
14	4.5	7.3	e8.2	e6.1	e4.6	e5.8	70	33	29	42	344	48
15	4.4	7.3	e8.4	e6.1	e4.4	e5.6	66	29	26	39	350	52
16	4.7	7.5	e8.4	e6.0	e4.4	e5.1	62	26	27	37	326	46
17	4.8	7.2	e8.4	e6.0	e4.4	e5.1	58	22	26	52	294	42
18	4.7	7.2	e8.2	e6.0	e4.4	e5.1	51	19	24	59	267	39
19	4.8	7.2	e8.0	e6.0	e4.4	e5.1	50	17	22	54	240	36
20	5.0	7.2	e8.0	e5.8	e4.4	e5.1	47	16	20	69	215	34
21	5.2	7.3	e8.0	e5.8	e4.2	e5.1	46	16	18	76	188	35
22	5.2	7.2	e8.0	e6.1	e4.2	e5.1	43	15	18	93	172	33
23	5.3	7.2	e8.0	e5.5	e4.2	e5.2	39	14	37	110	151	31
24	5.4	7.2	e7.8	e5.5	e4.2	e6.1	36	15	38	117	129	29
25	5.4	6.6	e7.8	e5.5	e4.2	e9.4	32	13	40	217	108	28
26	5.3	6.6	e7.7	e6.2	e4.2	e24	29	12	41	859	98	30
27	5.5	6.7	e7.6	e5.8	e3.8	e27	28	11	41	642	87	37
28	5.4	6.7	e7.5	e5.6	e3.8	e84	26	11	49	685	80	36
29	5.5	6.6	e7.2	e5.6	---	95	23	9.9	52	565	77	35
30	5.8	6.6	e7.2	e6.0	---	84	21	9.1	67	470	83	34
31	5.8	---	e7.2	e6.0	---	86	---	8.8	---	446	118	---
TOTAL	151.5	212.9	231.3	195.1	137.5	540.7	1957	571.8	838.7	5477	8678	1598
MEAN	4.89	7.10	7.46	6.29	4.91	17.4	65.2	18.4	28.0	177	280	53.3
MAX	5.8	8.5	8.4	7.2	6.0	95	124	37	67	859	574	106
MIN	4.3	5.9	6.4	5.5	3.8	3.8	21	8.8	5.9	37	77	28
AC=FT	401	422	459	387	273	1070	3880	1130	1660	10860	17210	3178

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1993, BY WATER YEAR (WY)

MEAN	9.83	8.64	7.15	6.17	7.22	57.7	197	61.6	32.5	24.5	12.6	8.78
MAX	57.9	23.7	19.2	16.3	29.9	278	1182	1037	255	232	280	53.3
(WY)	1983	1983	1983	1986	1981	1966	1950	1950	1964	1982	1993	1993
MIN	1.52	2.03	2.06	2.70	1.21	4.07	9.46	7.07	2.74	3.34	1.64	.91
(WY)	1941	1941	1941	1941	1963	1941	1991	1961	1940	1941	1945	1940

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1940 - 1993
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ANNUAL TOTAL	8549.3		20589.5			
ANNUAL MEAN	23.4		56.4		36.5	
HIGHEST ANNUAL MEAN					193	1950
LOWEST ANNUAL MEAN					6.37	1990
HIGHEST DAILY MEAN	505	Mar 7	859	Jul 26	10900	Apr 18 1950
LOWEST DAILY MEAN	2.9	Aug 22	3.8	Feb 27	.00	Apr 1 1940
ANNUAL SEVEN-DAY MINIMUM	3.6	Aug 16	4.0	Feb 24	.00	Apr 1 1940
INSTANTANEOUS PEAK FLOW			1090	Jul 26	16400	Apr 18 1950
INSTANTANEOUS PEAK STAGE			5.72	Jul 26	14.48	Apr 18 1950
ANNUAL RUNOFF (AC-FT)	16960		40840		26480	
10 PERCENT EXCEEDS	57		113		42	
50 PERCENT EXCEEDS	7.2		9.4		8.0	
90 PERCENT EXCEEDS	4.6		4.9		3.5	

e Estimated.

a From rating extended above 5,600 ft³/s on basis of indirect measurement.

b From floodmarks.

RED RIVER OF THE NORTH BASIN

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05084000 FOREST RIVER NEAR FORDVILLE, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 15...	1015	4.5	775	--	13.0	12.0	--	--	--	--	--
NOV 20...	1405	7.2	710	--	0.0	2.0	--	--	--	--	--
JAN 04...	1220	7.1	885	--	--	0.0	--	--	--	--	--
FEB 26...	1305	4.3	775	--	-10.0	0.5	--	--	--	--	--
APR 03...	1400	84	--	--	10.5	2.0	--	--	--	--	--
15...	1245	66	722	7.9	12.0	9.0	300	167	72	28	43
JUN 10...	1130	57	795	--	22.0	20.0	--	--	--	--	--
JUL 26...	1250	978	590	--	25.0	21.0	--	--	--	--	--
AUG 02...	1355	440	605	--	19.0	21.0	--	--	--	--	--
SEP 16...	1135	45	980	8.2	15.0	12.5	390	290	89	41	62

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 15...	23	1	7.8	200	15	0.20	16	483	507	0.69	90.6
SEP 16...	25	1	9.9	220	20	0.20	22	639	655	0.89	80.3

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 15...	2	40	30	<1	30	140	0.1	1	<1	260
SEP 16...	3	70	10	<1	50	320	0.1	<1	<1	340

RED RIVER OF THE NORTH BASIN

05085000 FOREST RIVER AT MINTO, ND

LOCATION.--Lat 48°16'10", long 97°22'10", in SE¹/₄ sec.51, T.156 N., R.52 W., Walsh County, Hydrologic Unit 09020308, on right bank 30 ft upstream from dam in Minto, 150 ft upstream from Burlington Northern Railway bridge, and 900 ft east of U.S. Highway 81.

DRAINAGE AREA.--740 mi², of which about 120 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1944 to current year.

REVISED RECORDS.--WSP 1438: 1948-50. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 806.95 ft above sea level. Prior to July 15, 1954, nonrecording gage at site 400 ft upstream at same datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Occasionally during high stages, particularly when the channel is filled with snow, overflow occurs 0.5 mi below the municipality of Forest River and bypasses the gage 3 mi south of Minto and flows into Lake Ardoch. Bypass flow is not included in computation of discharge record for station at Minto.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	4.3	5.1	e1.6	e2.4	e2.2	110	27	15	35	508	121
2	.24	4.2	5.1	e1.6	e3.0	e2.4	130	23	14	38	485	135
3	.28	4.8	5.1	e1.6	e3.3	e2.7	147	21	13	41	465	121
4	.32	5.0	5.0	e2.0	e3.3	e3.2	158	20	12	42	449	116
5	.32	4.6	5.2	e1.6	e3.3	e3.4	161	17	11	43	431	107
6	.33	4.6	4.9	e1.6	e3.3	e3.4	166	17	11	44	421	102
7	.44	4.7	4.5	e1.4	e3.4	e3.3	199	16	8.7	45	407	105
8	.62	4.6	4.3	e1.4	e3.6	e2.9	193	18	11	44	393	101
9	.81	5.0	4.1	e1.4	e3.5	e2.9	171	16	17	43	403	94
10	.95	6.2	4.2	e1.4	e4.5	e2.9	147	16	26	42	416	87
11	1.2	5.8	3.9	e1.4	e3.7	e3.0	129	18	31	42	589	81
12	1.2	5.9	3.7	e1.4	e3.0	e2.4	115	21	36	41	482	71
13	1.4	5.6	3.9	e1.4	e2.7	e2.2	106	27	39	39	425	65
14	1.6	5.2	3.7	e1.4	e2.7	e2.0	100	36	33	38	402	61
15	2.4	5.1	3.7	e1.6	e2.4	e2.0	87	38	31	37	388	55
16	3.9	5.4	3.7	e1.6	e2.2	e2.0	82	37	31	35	382	64
17	4.1	5.7	3.8	e1.6	e2.4	e2.0	79	35	27	35	373	62
18	4.1	6.2	e3.7	e1.6	e2.4	e2.2	73	32	24	34	346	57
19	4.1	6.2	e3.7	e1.6	e2.2	e2.0	67	29	22	34	308	54
20	4.3	6.2	e3.7	e1.6	e2.2	e2.0	61	27	19	34	275	49
21	4.3	6.2	e3.7	e1.6	e2.2	e2.0	57	24	17	38	250	44
22	4.3	6.2	e3.4	e1.6	e2.2	e2.2	56	23	16	39	231	42
23	4.5	6.2	e3.0	e1.4	e2.2	e2.7	53	25	18	45	212	39
24	4.8	6.0	e3.0	e1.6	e2.2	e3.4	50	24	18	50	190	38
25	4.9	6.0	e2.7	e1.6	e2.0	5.7	47	24	21	120	166	36
26	4.5	5.5	e2.0	e1.6	e2.2	6.5	42	27	24	194	159	32
27	4.6	5.1	e2.0	e1.6	e2.2	13	38	24	25	345	142	31
28	5.0	5.0	e1.8	e1.6	e2.0	54	37	19	26	679	121	31
29	4.9	5.0	e1.8	e1.8	---	53	36	19	26	624	106	35
30	4.8	5.0	e1.8	e1.8	---	95	32	18	30	648	116	34
31	4.7	---	e1.8	e2.0	---	118	---	17	---	542	115	---
TOTAL	84.11	161.5	112.0	49.0	76.7	406.6	2929	735	652.7	4110	10156	2070
MEAN	2.71	5.38	3.61	1.58	2.74	13.1	97.6	23.7	21.8	133	328	69.0
MAX	5.0	6.2	5.2	2.0	4.5	118	199	38	39	679	589	135
MIN	.20	4.2	1.8	1.4	2.0	2.0	32	16	8.7	34	106	31
AC-FT	167	320	222	97	152	806	5810	1460	1290	8150	20140	4110

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1993, BY WATER YEAR (WY)

	MEAN	8.96	8.68	4.68	2.34	1.96	57.5	288	93.1	44.8	26.5	15.2	8.53
MAX	59.1	23.6	13.4	9.66	17.3	438	1573	1515	267	236	328	69.0	
(WY)	1983	1983	1983	1983	1981	1966	1950	1950	1964	1982	1993	1993	
MIN	.000	.97	.29	.000	.000	.000	21.9	10.6	4.21	1.87	.000	.000	
(WY)	1991	1991	1990	1977	1961	1962	1953	1946	1991	1980	1946	1961	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1944 - 1993

ANNUAL TOTAL	9893.35	21542.61	
ANNUAL MEAN	27.0	59.0	47.1
HIGHEST ANNUAL MEAN			268
LOWEST ANNUAL MEAN			4.36
HIGHEST DAILY MEAN	588	Mar 8	11600
LOWEST DAILY MEAN	.10	Sep 29	.00
ANNUAL SEVEN-DAY MINIMUM	.20	Sep 25	.00
INSTANTANEOUS PEAK FLOW			a16600
INSTANTANEOUS PEAK STAGE			b11.80
ANNUAL RUNOFF (AC-FT)	19620	42730	34130
10 PERCENT EXCEEDS	72	160	62
50 PERCENT EXCEEDS	6.2	13	7.1
90 PERCENT EXCEEDS	1.1	1.6	.40

e Estimated.

a From rating curve extended above 7,200 ft³/s on basis of contracted opening measurement of peak flow.

b From floodmark.

RED RIVER OF THE NORTH BASIN

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05085000 FOREST RIVER AT MINTO, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 23...	1610	6.5	900	--	-2.0	1.0	--	--	--	--	--
JAN 04...	1440	2.0	1350	--	--	0.0	--	--	--	--	--
FEB 25...	1620	2.0	1080	--	-10.0	0.0	--	--	--	--	--
APR 15...	1015	87	755	7.6	9.5	7.5	310	175	76	30	46
JUN 11...	1000	29	775	--	23.0	22.0	--	--	--	--	--
JUL 28...	1625	687	555	--	25.0	22.5	--	--	--	--	--
AUG 02...	1600	482	655	--	19.0	21.0	--	--	--	--	--
SEP 16...	1440	61	966	8.1	15.0	13.0	400	300	93	41	56

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 15...	24	1	8.4	210	21	0.20	17	514	534	0.73	125
SEP 16...	23	1	9.5	190	23	0.20	24	617	634	0.86	105

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 15...	2	50	20	<1	30	70	0.1	1	<1	310
SEP 16...	3	80	10	<1	50	240	0.1	<1	<1	340

RED RIVER OF THE NORTH BASIN

05088500 HOMME RESERVOIR NEAR PARK RIVER, ND

LOCATION.--Lat 48°24'20", long 97°47'10", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.19, T.157 N., R.55 W., Walsh County, Hydrologic Unit 09020310, at Homme Dam on South Branch Park River, and 2 mi west of town of Park River.

DRAINAGE AREA.--226 mi².

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--September 1949 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by an earth-fill dam, 865 ft long; storage began in September 1949, dam completed in October 1950. Usable capacity between invert of outlet, elevation, 1,048.0 ft, and crest of spillway, elevation, 1,080.0 ft, is 3,550 acre-ft. Dead storage is 100 acre-ft. Low flows are controlled by two gates 3 x 5 ft. The spillway, which is 150 ft long, is uncontrolled. The records herein represent total contents. The reservoir is operated for flood control, water supply, and pollution abatement during low-flow periods.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 4,710 acre-ft, Apr. 20, 1979, elevation, 1,084.58 ft; minimum since first reaching spillway level, 184 acre-ft, Feb. 8, 1952, elevation, 1,051.22 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,500 acre-ft, July 28, elevation, 1,083.23 ft; minimum, 877 acre-ft, Mar. 22, elevation, 1,065.30 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	1,078.83	2,630	--
Oct. 31-----	1,078.92	2,650	+20
Nov. 30-----	1,079.30	2,710	+60
Dec. 31-----	1,079.53	2,760	+50
CAL YR 1992-----	--	--	+390
Jan. 31-----	1,078.46	2,570	-190
Feb. 28-----	1,074.85	1,970	-600
Mar. 31-----	1,066.73	1,010	-960
Apr. 30-----	1,079.95	2,830	+1,820
May 31-----	1,080.00	2,840	+10
June 30-----	1,080.03	2,850	+10
July 31-----	1,081.42	3,120	+270
Aug. 31-----	1,080.38	2,920	-200
Sept. 30-----	1,080.14	2,870	-50
WTR YR 1993-----	--	--	+240

RED RIVER OF THE NORTH BASIN

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05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND

LOCATION.--Lat 48°24'07", long 97°46'55", in SE¹/₄, sec.19, T.157 N., R.55 W., Walsh County, Hydrologic Unit 09020310, on right bank 0.5 mi downstream from Homme Dam, and 2 mi west of town of Park River.

DRAINAGE AREA.--226 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for October and November 1949, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above sea level.

REMARKS.--Records good except those below 1.0 ft³/s, which are fair. Flow regulated by Homme Reservoir (station 05088500).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.05	.03	.04	e12	12	.45	12	5.1	43	559	62
2	.05	.06	.03	.04	e12	13	.34	12	4.3	48	408	56
3	.05	.09	.03	.04	e12	13	.37	12	3.7	49	315	51
4	.04	.07	e.03	.04	e12	13	.44	9.4	3.3	56	259	51
5	.05	.06	e.03	.04	e12	13	.53	8.7	3.1	53	224	57
6	.05	.05	e.03	.04	11	13	.51	8.3	5.0	48	186	50
7	.03	.05	e.03	.04	11	13	.54	9.4	5.2	37	155	44
8	.03	.04	e.03	.04	11	13	.45	11	16	33	143	41
9	.03	.05	.03	.04	11	13	29	25	19	29	475	36
10	.03	.11	.03	.04	11	13	104	414	26	25	506	27
11	.04	.07	.03	.04	11	12	78	264	22	25	330	28
12	.05	.03	.03	.04	11	17	59	122	18	20	371	29
13	.05	.01	.03	.12	11	55	49	76	17	23	329	25
14	.06	.01	.03	.11	11	55	44	49	16	22	242	22
15	.05	.01	.03	.11	11	61	40	36	7.4	21	235	20
16	.04	.01	.03	.06	11	63	36	27	18	21	164	23
17	.04	.01	.03	.11	11	62	35	23	20	30	133	17
18	.04	.02	.03	.15	12	59	33	20	19	41	129	14
19	.04	.01	.03	.18	12	36	32	18	16	32	125	14
20	.04	.02	.03	.13	12	12	32	17	15	22	101	14
21	.04	.02	.03	.15	12	12	28	14	12	18	85	13
22	.04	.02	.03	.15	12	11	23	14	12	19	74	15
23	.04	.03	.03	.15	11	10	18	13	24	117	68	12
24	.04	.03	.03	.15	12	10	20	12	23	561	59	9.3
25	.04	.03	.04	.13	12	10	15	7.2	31	1670	50	11
26	.03	.03	.04	.18	12	5.9	14	5.0	40	2630	47	16
27	.04	.03	.04	6.1	12	2.2	15	9.8	47	1910	41	8.0
28	.06	.03	.04	10	12	2.3	18	8.4	40	3600	37	5.4
29	.05	.03	.04	e12	---	1.6	14	6.9	34	2380	39	3.4
30	.05	.03	.04	e12	---	.57	12	8.8	40	1140	51	12
31	.05	---	.04	e12	---	.57	---	6.5	---	781	61	---
TOTAL	1.33	1.11	1.00	54.46	323	627.14	751.63	1279.4	562.1	15504	6001	786.1
MEAN	.043	.037	.032	1.76	11.5	20.2	25.1	41.3	18.7	500	194	26.2
MAX	.06	.11	.04	12	12	63	104	414	47	3600	559	62
MIN	.03	.01	.03	.04	11	.57	.34	5.0	3.1	18	37	3.4
AC-FT	2.6	2.2	2.0	108	641	1240	1490	2540	1110	30750	11900	1560

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1993, BY WATER YEAR (WY)

	3.70	3.53	4.19	5.28	5.63	30.2	145	48.1	19.6	21.8	7.49	5.40
MEAN	3.70	3.53	4.19	5.28	5.63	30.2	145	48.1	19.6	21.8	7.49	5.40
MAX	25.7	16.0	12.2	31.2	28.6	234	749	706	181	500	194	36.2
(WY)	1983	1985	1983	1974	1981	1966	1950	1950	1964	1993	1993	1951
MIN	.000	.015	.010	.000	.000	.059	.61	.73	.78	.028	.000	.000
(WY)	1950	1989	1990	1990	1990	1991	1977	1977	1989	1990	1990	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1950 - 1993

ANNUAL TOTAL	7976.57	25892.27	
ANNUAL MEAN	21.8	70.9	25.0
HIGHEST ANNUAL MEAN			125
LOWEST ANNUAL MEAN			.52
HIGHEST DAILY MEAN	654	Mar 30	4870
LOWEST DAILY MEAN	.01	Nov 13	.00
ANNUAL SEVEN-DAY MINIMUM	.01	Nov 13	.00
INSTANTANEOUS PEAK FLOW		4210	Jul 28
INSTANTANEOUS PEAK STAGE		29.53	Jul 28
ANNUAL RUNOFF (AC-FT)	15820	51360	18080
10 PERCENT EXCEEDS	33	75	28
50 PERCENT EXCEEDS	.59	12	3.1
90 PERCENT EXCEEDS	.03	.03	.22

e Estimated.

a About, from rating curve extended above 5,500 ft³/s, result of failure of emergency embankment at site of Homme Dam.

RED RIVER OF THE NORTH BASIN

05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 07...	1450	0.03	1210	--	15.0	12.5	--	--	--	--	--
NOV 20...	1115	0.02	1040	--	-1.0	0.5	--	--	--	--	--
JAN 12...	1330	0.04	1000	--	-10.0	0.0	--	--	--	--	--
FEB 05...	1205	12	900	--	-4.0	2.5	--	--	--	--	--
25...	1245	12	880	--	-15.0	1.0	--	--	--	--	--
APR 07...	1345	0.54	975	--	9.5	9.5	--	--	--	--	--
14...	1515	45	622	7.7	15.0	6.5	240	153	60	22	39
JUN 10...	1340	29	650	--	26.0	22.0	--	--	--	--	--
JUL 14...	1105	22	762	--	23.0	20.0	--	--	--	--	--
26...	1540	2520	345	--	26.0	21.0	--	--	--	--	--
28...	1255	4060	318	--	25.0	20.5	--	--	--	--	--
30...	1430	1090	325	--	17.5	20.0	--	--	--	--	--
AUG 16...	1530	161	505	--	23.0	21.0	--	--	--	--	--
SEP 20...	1305	14	792	8.0	15.0	18.0	300	254	74	28	51

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 14...	25	1	7.4	160	14	0.20	8.0	403	418	0.57	51.2
SEP 20...	26	1	10	150	15	0.20	24	506	519	0.71	19.9

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 14...	2	70	30	2	30	690	0.1	1	<1	310
SEP 20...	4	110	10	<1	50	790	<0.1	<1	<1	360

RED RIVER OF THE NORTH BASIN

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05090000 PARK RIVER AT GRAFTON, ND

LOCATION.--Lat 48°25'29", long 97°24'42", in NE¹/₄ sec.13, T.157 N., R.53 W., Walsh County, Hydrologic Unit 09020310, on right bank at the upstream corner of U.S. Highway 81 bridge in Grafton, and 3.5 mi downstream from South Branch.

DRAINAGE AREA.--695 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: 1941. WSP 1438: 1932, 1933(M), 1936-37(M), 1939(M), 1944. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 811.00 ft above sea level. Prior to Oct. 1, 1984, gage located on right bank 30 ft upstream of Wakeman Avenue bridge. Datum of gage was 807.39 ft. Prior to Sept. 30, 1940, nonrecording gage at site 30 ft downstream at same datum. Oct. 1, 1940, to Sept. 17, 1946, nonrecording gage at site 2 mi downstream above masonry dam at same datum. Sept. 18, 1946, to July 25, 1952, nonrecording gage at site 30 ft downstream at same datum.

REMARKS.--Records fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.20	e5.0	7.7	53	28	20	56	1760	165
2	.00	.00	.00	.05	e8.0	8.6	53	29	18	57	1590	156
3	.00	.00	.00	.05	e11	9.5	48	29	16	61	1470	145
4	.00	.00	.00	.20	e14	11	49	27	15	66	1230	143
5	.00	.00	.00	.05	e17	11	41	26	13	73	971	143
6	.00	.00	.00	.05	17	11	38	26	13	75	758	136
7	.00	.00	.00	.05	17	13	39	24	12	78	586	126
8	.00	.00	.00	.04	17	15	86	26	17	79	480	115
9	.00	.00	.00	.02	17	15	138	25	20	75	552	100
10	.00	.00	.00	.00	17	15	169	33	22	73	758	93
11	.00	.00	.00	.00	17	17	233	325	24	65	671	76
12	.00	.00	.00	.00	14	15	229	240	26	61	607	70
13	.00	.00	.25	.00	8.8	14	202	144	26	57	659	66
14	.00	.00	.60	.00	8.6	15	166	113	24	50	615	62
15	.00	.00	.60	.00	8.6	e15	148	114	23	50	559	56
16	.00	.00	.60	.00	8.6	e15	130	82	23	46	514	52
17	.00	.00	.60	.00	8.6	e15	116	69	18	46	432	47
18	.00	.00	.60	.00	8.6	e15	103	59	25	49	384	45
19	.00	.00	.60	.00	8.6	e15	90	53	28	55	357	41
20	.00	.03	.60	.00	8.6	e15	81	47	28	66	337	37
21	.00	.05	.44	.00	9.2	e15	78	41	28	56	306	37
22	.00	.05	.05	.00	11	e15	69	39	27	46	273	35
23	.00	.05	.05	.00	7.5	18	59	34	28	44	e254	32
24	.00	.05	.05	.00	7.5	20	51	32	38	64	e226	32
25	.00	.05	.60	.00	6.9	23	42	32	37	443	206	30
26	.00	.05	.05	.00	6.9	22	63	28	33	988	201	25
27	.00	.03	.05	.00	6.9	24	59	26	40	1440	192	30
28	.00	.00	.20	.00	6.9	34	46	24	53	1630	166	25
29	.00	.00	.60	.00	---	32	40	24	57	1890	157	28
30	.00	.00	.05	e.05	---	73	35	21	56	2310	181	35
31	.00	---	.60	e2.5	---	97	---	20	---	2200	174	---
TOTAL	0.00	0.36	7.19	3.26	302.8	640.8	2754	1840	808	12349	17626	2183
MEAN	.000	.012	.23	.11	10.8	20.7	91.8	59.4	26.9	398	569	72.8
MAX	.00	.05	.60	2.5	17	97	233	325	57	2310	1760	165
MIN	.00	.00	.00	.00	5.0	7.7	35	20	12	44	157	25
AC-FT	.00	.7	14	6.5	601	1270	5460	3650	1600	24490	34960	4330

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1993, BY WATER YEAR (WY)

	4.81	3.25	2.15	1.21	2.15	62.3	386	107	44.3	27.2	13.8	7.65
MEAN	4.81	3.25	2.15	1.21	2.15	62.3	386	107	44.3	27.2	13.8	7.65
MAX	69.9	31.3	17.4	13.9	45.7	410	2051	2071	576	398	569	151
(WY)	1983	1981	1983	1983	1981	1945	1950	1950	1964	1993	1993	1957
MIN	.000	.000	.000	.000	.000	.000	.000	2.05	.000	.000	.000	.000
(WY)	1934	1934	1933	1932	1933	1936	1991	1939	1961	1990	1932	1932

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1931 - 1993

ANNUAL TOTAL	20204.41	38514.41	
ANNUAL MEAN	55.2	106	55.2
HIGHEST ANNUAL MEAN			353
LOWEST ANNUAL MEAN			1.38
HIGHEST DAILY MEAN	991	Mar 8	2310
LOWEST DAILY MEAN	.00	Aug 22	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Sep 15	.00
INSTANTANEOUS PEAK FLOW			2420
INSTANTANEOUS PEAK STAGE			12.22
ANNUAL RUNOFF (AC-FT)	40080	76390	20.13
10 PERCENT EXCEEDS	127	204	39990
50 PERCENT EXCEEDS	5.1	20	66
90 PERCENT EXCEEDS	.00	.00	1.3

e Estimated.

a From rating curve extended above 9,000 ft³/s.

RED RIVER OF THE NORTH BASIN

05090000 PARK RIVER AT GRAFTON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
FEB 25...	1440	7.0	1460	--	-10.0	0.5	--	--	--	--	--
APR 14...	1110	154	582	7.5	12.0	5.0	200	129	51	18	41
JUL 26...	1835	1070	350	--	28.0	21.0	--	--	--	--	--
29...	1415	1930	370	--	26.5	21.0	--	--	--	--	--
SEP a24...	1345	29	1230	8.1	21.0	14.0	460	327	110	46	93

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 14...	30	1	8.1	120	31	0.20	16	363	386	0.52	160
SEP a24...	30	2	12	240	81	0.30	20	800	808	1.10	63.3

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 14...	2	80	70	2	30	100	0.1	2	<1	270
SEP a24...	3	180	30	<1	70	360	0.1	1	<1	500

a Replicate sample also collected for quality-assurance purposes.

LOCATION.--Lat 48°34'20", long 97°08'50", in SE¹/₄SE¹/₄SE¹/₄ sec.24, T.159 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on downstream side of bridge on North Dakota State Highway 11, at the North Dakota-Minnesota border, 1.5 mi northeast of Drayton, and at mile 206.7.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 1388: 1949-50. WSP 1728: Drainage area.

REMARKS.--Records good except those for periods of estimated discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1993, BY WATER YEAR (WY)

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1949 - 1993
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e Estimated.

RED RIVER OF THE NORTH BASIN

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

		DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	
DATE	TIME											
NOV												
12...	1505	726	928	--	--	0.0	1.0	--	--	--	--	
DEC												
21...	1505	921	910	--	--	--	0.0	--	--	--	--	
30...	1430	892	766	--	--	--	0.0	--	--	--	--	
JAN												
12...	1600	833	610	--	--	-10.0	0.0	--	--	--	--	
21...	1220	880	835	--	--	-3.5	0.5	--	--	--	--	
FEB												
01...	1310	900	--	--	--	-4.0	0.0	--	--	--	--	
12...	1105	1000	590	--	--	--	0.5	--	--	--	--	
26...	1610	973	--	--	--	--	0.0	--	--	--	--	
MAR												
05...	1120	1010	755	--	--	5.0	0.0	--	--	--	--	
16...	1235	1210	650	--	--	-4.0	0.0	--	--	--	--	
APR												
08...	1000	24000	410	--	--	6.5	2.0	--	--	--	--	
09...	1230	25200	451	--	--	7.0	3.5	--	--	--	--	
13...	1705	24900	458	--	8.0	12.0	6.0	200	135	47	21	
20...	1420	9700	751	--	--	11.0	8.0	--	--	--	--	
MAY												
06...	1435	4800	770	--	--	30.0	--	--	--	--	--	
JUN												
09...	1600	4660	788	--	--	21.5	28.5	--	--	--	--	
JUL												
14...	1250	7100	--	--	--	23.5	20.0	--	--	--	--	
23...	1450	14500	338	--	--	20.0	18.5	--	--	--	--	
28...	1100	20700	362	--	--	16.5	19.5	--	--	--	--	
AUG												
05...	1050	27400	535	--	--	17.5	21.5	--	--	--	--	
12...	0920	27400	450	--	--	25.0	22.0	--	--	--	--	
20...	1230	19800	628	--	--	26.0	22.5	--	--	--	--	
25...	1610	15100	690	--	--	29.0	23.0	--	--	--	--	
SEP												
01...	1150	10300	687	--	--	20.0	19.5	--	--	--	--	
10...	1320	9570	687	--	--	19.5	17.5	--	--	--	--	
23...	1345	5960	748	7.8	--	18.0	14.0	320	233	69	36	
DATE		SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	
APR												
13...	16	14	0.5	8.5	80	16	0.20	10	280	301	0.41	
SEP												
23...	32	17	0.8	7.7	120	29	0.20	16	450	472	0.64	
DATE		SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS A) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR												
13...	20200	3	50	40	<1	20	30	0.1	1	<1	240	
SEP												
23...	7600	4	80	10	<1	40	<10	<0.1	<1	<1	280	

RED RIVER OF THE NORTH BASIN

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05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND
(International gaging station)LOCATION.--Lat 48°57'10", long 99°25'35", in SE¹/₄, SW¹/₄, sec.11, T.163 N., R.68 W., Towner County, Hydrologic Unit 09020313, on right bank 400 ft downstream from bridge on county highway, and 2.5 mi west of Hansboro.DRAINAGE AREA.--38 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,615 ft above sea level, from topographic map. Prior to May 20, 1962, nonrecording gage 400 ft upstream at same datum.

REMARKS.--Records fair except those for the period Mar. 3 to Apr. 6, which are poor.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	e.00	e18	.57	e.20	6.9	40	4.1
2	.00	.00	.00	.00	.00	.00	e22	.45	e.20	17	29	3.9
3	.00	.00	.00	.00	.00	e.02	e27	.40	e.20	9.3	24	3.6
4	.00	.00	.00	.00	.00	e.05	e25	.34	e.20	9.5	21	3.9
5	.00	.00	.00	.00	.00	e.10	e23	.28	e.20	11	18	3.6
6	.00	.00	.00	.00	.00	e.30	e21	.27	e.25	10	16	3.6
7	.00	.00	.00	.00	.00	e.50	15	.26	.38	8.9	14	3.5
8	.00	.00	.00	.00	.00	e.40	10	.44	2.8	13	12	3.3
9	.00	.00	.00	.00	.00	e.40	7.1	1.1	2.6	17	10	3.1
10	.00	.00	.00	.00	.00	e.30	6.0	1.6	2.0	15	8.0	2.9
11	.00	.00	.00	.00	.00	e.20	4.9	1.1	1.4	16	6.5	2.7
12	.00	.00	.00	.00	.00	e.10	4.4	.83	1.3	12	5.9	2.4
13	.00	.00	.00	.00	.00	e.02	4.1	.66	2.6	10	5.0	2.5
14	.00	.00	.00	.00	.00	e.02	3.8	.44	3.4	8.3	6.2	2.5
15	.00	.00	.00	.00	.00	e.02	3.1	.32	2.8	6.3	5.3	2.1
16	.00	.00	.00	.00	.00	e.02	1.5	.30	2.7	6.2	4.4	2.1
17	.00	.00	.00	.00	.00	e.02	.87	.30	3.1	7.7	4.3	1.8
18	.00	.00	.00	.00	.00	e.02	.87	.30	2.9	12	4.4	1.7
19	.00	.00	.00	.00	.00	e.02	1.3	.30	2.5	103	3.8	1.5
20	.00	.00	.00	.00	.00	e.02	1.3	.30	2.3	263	e3.3	1.4
21	.00	.00	.00	.00	.00	e.02	1.1	e.25	1.9	121	3.0	1.3
22	.00	.00	.00	.00	.00	e.02	1.1	e.25	1.6	114	1.7	1.3
23	.00	.00	.00	.00	.00	e.02	1.0	e.25	1.6	121	1.1	1.3
24	.00	.00	.00	.00	.00	e.10	.86	e.25	2.5	128	2.4	1.2
25	.00	.00	.00	.00	.00	e1.0	.72	e.25	2.5	109	3.2	1.2
26	.00	.00	.00	.00	.00	e40	.60	e.20	2.3	88	3.7	1.0
27	.00	.00	.00	.00	.00	e30	.65	e.20	1.8	112	3.6	.98
28	.00	.00	.00	.00	.00	e20	.87	e.20	1.6	147	3.7	.86
29	.00	.00	.00	.00	---	e18	.78	e.20	1.6	130	3.7	.82
30	.00	.00	.00	.00	---	e13	.66	e.25	2.9	88	4.2	.75
31	.00	---	.00	.00	---	e14	---	e.25	---	58	4.5	---
TOTAL	0.00	0.00	0.00	0.00	0.00	138.69	208.58	13.11	54.33	1778.1	275.9	66.91
MEAN	.000	.000	.000	.000	.000	4.47	6.95	.42	1.81	57.4	8.90	2.23
MAX	.00	.00	.00	.00	.00	.40	.27	1.6	3.4	263	40	4.1
MIN	.00	.00	.00	.00	.00	.00	.60	.20	.20	6.2	1.1	.75
AC-FT	.00	.00	.00	.00	.00	275	414	26	108	3530	547	133

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1993, BY WATER YEAR (WY)

	MEAN	.063	.029	.033	.000	.35	5.47	22.6	4.57	1.18	3.17	1.10	.66
MAX	1.05	.54	1.02	.000	11.4	77.5	117	43.9	9.34	57.4	17.1	16.7	
(WY)	1981	1981	1983	1962	1981	1992	1974	1974	1986	1993	1968	1968	
MIN	.000	.000	.000	.000	.000	.000	.003	.000	.000	.000	.000	.000	.000
(WY)	1962	1962	1962	1962	1962	1962	1963	1963	1977	1962	1962	1962	1962

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1962 - 1993

ANNUAL TOTAL	2784.36	2535.62	
ANNUAL MEAN	7.61	6.95	
HIGHEST ANNUAL MEAN			3.26
LOWEST ANNUAL MEAN			13.8
HIGHEST DAILY MEAN	196	Mar 29	1000
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			355
INSTANTANEOUS PEAK STAGE			8.30
INSTANTANEOUS LOW FLOW			a10.50
ANNUAL RUNOFF (AC-FT)	5520	5030	.00
10 PERCENT EXCEEDS	10	13	2.5
50 PERCENT EXCEEDS	.00	.25	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a From floodmark, backwater from ice.

RED RIVER OF THE NORTH BASIN

05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
MAR 30...	1430	13	--	--	--	1.5	1.0	--	--	--	--
APR 21...	1625	1.1	--	--	7.9	16.0	9.0	440	222	100	47
JUN 08...	1225	2.9	1380	--	--	15.0	14.5	--	--	--	--
JUN 08...	1454	2.2	--	--	--	12.0	12.0	--	--	--	--
JUL 28...	1905	150	--	--	--	--	--	--	--	--	--
AUG 20...	1040	3.4	818	--	--	18.0	20.0	--	--	--	--
SEP a21...	1530	1.2	1020	7.9	--	12.0	13.5	550	408	110	67

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
APR 21...	40	16	0.8	15	300	16	0.20	12	664	688	0.94
SEP a21...	59	18	1	12	240	16	0.20	16	766	809	1.10

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 21...	2.12	3	40	40	<1	50	10	0.1	2	<1	390
SEP a21...	2.71	6	50	30	<1	70	40	0.1	<1	<1	470

a Replicate sample also collected for quality-assurance purposes.

05098820 CYPRESS CREEK ABOVE INTERNATIONAL BOUNDARY NEAR SARLES, ND
(International gaging station)

LOCATION.--Lat 48°58'37", long 98°56'04", in NW¹/₄ NW¹/₄ sec.3, T.163 N., R.64 W., Cavalier County, Hydrologic Unit 09020313, on right bank 12 ft downstream of bridge on State Highway 20, 4.5 mi northeast of Sarles.

DRAINAGE AREA.--83 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1, 1988, to current year. Records for May 1961 to Sept. 1988, published as Cypress Creek near Sarles, ND (station 05098800) at site 3 mi upstream, are not equivalent because of difference in drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,550 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods when discharges are less than 10 ft³/s, which are poor.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum observed discharge at site 3 mi upstream, (station 05098800 Cypress Creek near Sarles, ND) 2,000 ft³/s, Apr. 21, 1979.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	e34	e2.0	.00	1.4	52	e7.5
2	.00	.00	.00	.00	.00	.00	e8.1	e1.6	.00	1.6	34	e7.0
3	.00	.00	.00	.00	.00	.00	e4.1	e1.3	.00	.96	28	e6.0
4	.00	.00	.00	.00	.00	.00	e21	e1.1	.00	.88	23	e5.0
5	.00	.00	.00	.00	.00	.00	e125	e1.0	.00	1.3	20	e4.5
6	.00	.00	.00	.00	.00	.00	e102	e.95	.00	1.6	18	e4.2
7	.00	.00	.00	.00	.00	.00	e50	e.90	.00	2.1	15	e4.0
8	.00	.00	.00	.00	.00	.00	e42	e3.0	.16	1.4	14	e3.6
9	.00	.00	.00	.00	.00	.00	31	e7.0	1.2	1.8	14	e3.2
10	.00	.00	.00	.00	.00	.00	22	e4.0	1.3	1.5	13	e3.0
11	.00	.00	.00	.00	.00	.00	17	e3.0	.33	1.4	14	2.8
12	.00	.00	.00	.00	.00	.00	13	e2.0	.27	1.4	16	2.5
13	.00	.00	.00	.00	.00	.00	11	e1.2	6.4	.63	15	2.2
14	.00	.00	.00	.00	.00	.00	11	e.80	8.2	.50	18	1.1
15	.00	.00	.00	.00	.00	.00	9.3	e.50	5.4	.22	19	2.0
16	.00	.00	.00	.00	.00	.00	8.2	e.40	5.1	.89	22	2.7
17	.00	.00	.00	.00	.00	.00	7.7	e.30	3.4	2.1	24	2.5
18	.00	.00	.00	.00	.00	.00	6.6	e.15	2.0	1.2	23	3.3
19	.00	.00	.00	.00	.00	.00	5.4	e.12	1.4	1.9	20	4.6
20	.00	.00	.00	.00	.00	.00	4.2	e.10	1.8	2.0	18	5.8
21	.00	.00	.00	.00	.00	.00	3.1	e.05	1.3	1.5	16	4.3
22	.00	.00	.00	.00	.00	.00	e2.7	.00	.05	2.0	15	4.6
23	.00	.00	.00	.00	.00	.00	e2.6	.00	.44	3.1	14	3.9
24	.00	.00	.00	.00	.00	.00	e2.0	.00	.00	3.4	13	2.7
25	.00	.00	.00	.00	.00	.00	e1.7	.00	.00	5.9	13	2.5
26	.00	.00	.00	.00	.00	e.00	e2.0	.00	.00	14	12	2.5
27	.00	.00	.00	.00	.00	e.00	e2.6	.00	.00	50	11	1.8
28	.00	.00	.00	.00	.00	e.60	e3.5	.00	.00	166	e10	.88
29	.00	.00	.00	.00	---	e1.1	e3.0	.00	.00	183	e9.5	.88
30	.00	.00	.00	.00	---	e1.6	e2.5	.00	1.0	143	e9.0	.66
31	.00	---	.00	.00	---	e17	.00	.00	---	86	e8.0	---
TOTAL	0.00	0.00	0.00	0.00	0.00	20.30	558.3	31.47	39.75	684.68	550.5	102.22
MEAN	.000	.000	.000	.000	.000	.65	18.6	1.02	1.32	22.1	17.8	3.41
MAX	.00	.00	.00	.00	.00	17	125	7.0	8.2	183	52	7.5
MIN	.00	.00	.00	.00	.00	.00	1.7	.00	.00	.22	8.0	.66
AC-FT	.00	.00	.00	.00	.00	40	1110	62	79	1360	1090	203

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 1993, BY WATER YEAR (WY)

	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989
MEAN	.000	.000	.000	.000	.000	19.2	21.1	.92	.71	4.50	3.55	.68
MAX	.000	.000	.000	.000	.000	83.7	49.1	2.40	2.15	22.1	17.8	3.41
(WY)	1989	1989	1989	1989	1989	1992	1992	1991	1991	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.000	2.41	.042	.000	.000	.000	.000
(WY)	1989	1989	1989	1989	1989	1989	1991	1989	1992	1990	1989	1989

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1989 - 1993
ANNUAL TOTAL	4095.25	1987.22	
ANNUAL MEAN	11.2	5.44	4.24
HIGHEST ANNUAL MEAN			11.2
LOWEST ANNUAL MEAN			1.38
HIGHEST DAILY MEAN	800	183	800
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		190	a1000
INSTANTANEOUS PEAK STAGE		15.14	b17.63
ANNUAL RUNOFF (AC-FT)	8120	3940	3070
10 PERCENT EXCEEDS	11	14	3.2
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a About.

b Backwater from ice.

RED RIVER OF THE NORTH BASIN

05098820 CYPRESS CREEK ABOVE INTERNATIONAL BOUNDARY NEAR SARLES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1989 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (00410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
APR											
06...	1405	88	452	--	7.6	7.5	2.0	160	96	39	15
21...	1435	2.9	--	--	--	15.0	14.0	--	--	--	--
JUN											
08...	1500	0.23	765	--	--	14.5	14.5	--	--	--	--
AUG											
17...	1150	23	--	--	--	15.0	17.5	--	--	--	--
20...	1235	18	570	--	--	22.0	21.0	--	--	--	--
SEP											
21...	1315	4.8	807	7.8	--	12.0	13.0	350	363	79	37
28...	1200	0.99	--	--	--	0.0	2.0	--	--	--	--

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
APR											
06...	24	24	0.8	6.9	100	6.8	0.20	11	261	292	0.40
SEP											
21...	48	22	1	8.8	76	14	0.20	17	498	526	0.72

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR											
06...	69.5	4	30	20	<1	20	60	0.1	1	<1	210
SEP											
21...	6.75	4	50	20	<1	50	40	0.1	<1	<1	370

RED RIVER OF THE NORTH BASIN

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05099100 SNOWFLAKE CREEK NEAR SNOWFLAKE, MANITOBA
(International gaging station)LOCATION.--Lat 49°01'17", long 98°36'13", in SW¹/₄, sec.10, T.1, R.9 W., first meridian, Hydrologic Unit 09020313,
at traffic bridge, 2.5 mi east, and 1.5 mi south of Snowflake, Manitoba.DRAINAGE AREA.--348 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1961 to current year.

GAGE.--Water-stage recorder since March 1968 and nonrecording gage prior thereto. Datum of gage is Geodetic
Survey of Canada Datum of 1929. Prior to Jan. 1, 1987, recording gage at same site at datum of 1221.66 ft
above Geodetic Survey of Canada Datum of 1929. Prior to Apr. 2, 1964, nonrecording gage at present site and
datum. Apr. 2, 1964, to May 10, 1965, nonrecording gage at site 0.5 mi downstream at present datum.COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with
the United States. Records provided by the Water Survey of Canada.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.00	e.00	e.00	.00	.00	.00	8.9	44	15	e26	46	107
2	e.00	e.00	e.00	.00	.00	.00	10	42	14	e35	40	108
3	e.00	e.11	e.00	.00	.00	.00	14	40	13	e43	37	109
4	e.00	e.21	e.00	.00	.00	.00	22	38	12	e40	34	111
5	e.00	e.21	e.00	.00	.00	.00	77	36	11	e35	31	109
6	e.00	e.21	e.00	.00	.00	.00	61	34	12	e29	30	108
7	e.00	e.25	e.00	.00	.00	.00	e59	34	12	e26	29	109
8	e.00	e.25	e.00	.00	.00	.00	e53	38	15	e24	29	106
9	e.00	e.28	e.00	.00	.00	.00	e43	52	19	e20	31	104
10	e.00	e.28	e.00	.00	.00	.00	e34	48	17	e17	33	106
11	e.00	e.28	e.00	.00	.00	.00	e28	40	14	e15	34	113
12	e.00	e.28	e.00	.00	.00	.00	e24	36	14	e13	90	118
13	e.00	e.28	e.00	.00	.00	.00	21	34	34	14	82	109
14	e.00	e.28	e.00	.00	.00	.00	13	31	27	13	89	105
15	e.00	e.28	e.00	.00	.00	.00	12	28	18	13	90	103
16	e.00	e.28	e.00	.00	.00	.00	13	27	16	14	83	101
17	e.00	e.28	e.00	.00	.00	.00	22	26	e15	21	86	98
18	e.00	e.28	e.00	.00	.00	.00	52	25	e14	21	89	98
19	e.00	e.28	e.00	.00	.00	.00	55	24	e13	20	83	96
20	e.00	e.28	e.00	.00	.00	.00	62	24	e12	18	81	96
21	e.00	e.32	e.00	.00	.00	.00	66	23	e12	16	83	96
22	e.00	e.32	e.00	.00	.00	.00	61	22	e13	17	85	95
23	e.00	e.35	e.00	.00	.00	.00	56	21	e13	18	87	94
24	e.00	e.35	e.00	.00	.00	.00	54	19	e14	20	88	92
25	e.00	e.35	e.00	.00	.00	.04	52	18	e12	33	89	89
26	e.00	e.35	e.00	.00	.00	.04	54	18	e12	71	91	86
27	e.00	e.35	e.00	.00	.00	1.1	58	18	e11	80	96	84
28	e.00	e.28	e.00	.00	.00	2.1	54	17	e11	148	100	81
29	e.00	e.25	e.00	.00	---	2.2	50	17	e15	118	103	80
30	e.00	e.11	e.00	.00	---	2.2	46	16	e21	73	106	80
31	e.00	---	e.00	.00	---	1.9	---	16	---	56	107	---
TOTAL	0.00	7.63	0.00	0.00	0.00	9.58	1234.9	906	451	1107	2182	2991
MEAN	.000	.25	.000	.000	.000	.31	41.2	29.2	15.0	35.7	70.4	99.7
MAX	.00	.35	.00	.00	.00	2.2	77	52	34	148	107	118
MIN	.00	.00	.00	.00	.00	.00	8.9	16	11	13	29	80
AC-FT	.00	15	.00	.00	.00	19	2450	1800	895	2200	4330	5930

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1993, BY WATER YEAR (WY)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.00	.52	.051	.002	.16	5.60	81.7	53.9	17.2	6.84	4.03	4.03																					
MAX	12.3	5.24	.75	.041	4.90	42.5	353	390	123	35.7	70.4	99.7																					
(WY)	1968	1981	1983	1992	1981	1992	1992	1979	1974	1993	1993	1993																					
MIN	.000	.000	.000	.000	.000	.000	.22	.061	.000	.000	.000	.000																					
(WY)	1962	1962	1962	1962	1962	1962	1973	1988	1962	1961	1961	1961																					

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1961 - 1993

ANNUAL TOTAL	14913.95	8889.11	
ANNUAL MEAN	40.7	24.4	15.0
HIGHEST ANNUAL MEAN			65.1
LOWEST ANNUAL MEAN			.38
HIGHEST DAILY MEAN	519	148	1130
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		155	1130
INSTANTANEOUS PEAK STAGE		1226.69	1229.94
ANNUAL RUNOFF (AC-FT)	29580	17630	10870
10 PERCENT EXCEEDS	157	89	25
50 PERCENT EXCEEDS	.28	8.9	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05099150 MOWBRAY CREEK NEAR MOWBRAY, MANITOBA
(International gaging station)

LOCATION.--Lat 49°00'00", long 98°27'15", in SE¹/₄ sec.3, T.1, R.8 W., first meridian, Hydrologic Unit 09020313, on downstream side of bridge on Municipal Road on international boundary, and 1.5 mi east of Mowbray, Manitoba.

DRAINAGE AREA.--93.9 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1962 to current year (seasonal records only most years).

GAGE.--Water-stage recorder. Datum of gage is Geodetic Survey of Canada datum of 1929. Nonrecording gage prior to 1971.

COOPERATION.--Records furnished by the Water Survey of Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.00	e.00	e.00	e.00	e.00	e13	4.3	1.8	42.4	283	16.7
2	.00	e.00	e.00	e.00	e.00	e.00	e21	4.4	1.7	36.4	309	15.1
3	.00	e.00	e.00	e.00	e.00	e.00	e23	4.3	1.5	28.9	314	14.2
4	.00	e.00	e.00	e.00	e.00	e.00	13.3	4.1	1.4	26.7	304	13.7
5	.00	e.00	e.00	e.00	e.00	e.00	24.5	4.0	1.2	27.7	279	12.1
6	.00	e.00	e.00	e.00	e.00	e.00	e8.2	3.8	1.4	31.1	250	10.8
7	.00	e.00	e.00	e.00	e.00	e.00	123	3.7	1.3	34.2	224	9.8
8	.00	e.00	e.00	e.00	e.00	e.00	196	3.8	2.3	37.1	201	8.9
9	.00	e.00	e.00	e.00	e.00	e.00	128	5.1	2.8	38.5	184	7.8
10	.00	e.00	e.00	e.00	e.00	e.00	135	5.2	3.2	36.7	160	7.0
11	.00	e.00	e.00	e.00	e.00	e.00	120	7.3	3.8	33.3	149	6.3
12	.00	e.00	e.00	e.00	e.00	e.00	107	6.9	4.4	30.0	164	5.9
13	.00	e.00	e.00	e.00	e.00	e.00	84.8	17.7	9.0	27.1	149	5.4
14	.00	e.00	e.00	e.00	e.00	e.00	65.3	20.3	15.5	24.9	149	5.0
15	.00	e.00	e.00	e.00	e.00	e.00	49.8	19.3	15.3	22.7	144	4.8
16	.00	e.00	e.00	e.00	e.00	e.00	41.3	16.3	15.8	21.9	137	4.6
17	.00	e.00	e.00	e.00	e.00	e.00	28.3	12.9	15.1	37.1	130	4.3
18	.00	e.00	e.00	e.00	e.00	e.00	21.5	9.9	13.3	39.9	124	4.0
19	.00	e.00	e.00	e.00	e.00	e.00	17.4	7.6	11.8	41.0	107	3.9
20	.00	e.00	e.00	e.00	e.00	e.00	17.5	6.3	10.6	38.1	95.0	3.7
21	.00	e.00	e.00	e.00	e.00	e.00	16.5	5.1	9.7	33.9	85.8	3.5
22	.00	e.00	e.00	e.00	e.00	e.00	14.4	4.5	9.1	31.1	75.6	3.4
23	.00	e.00	e.00	e.00	e.00	e.00	11.2	3.9	9.4	34.7	66.7	3.2
24	.00	e.00	e.00	e.00	e.00	e.00	9.3	3.5	11.9	37.8	56.9	3.1
25	.00	e.00	e.00	e.00	e.00	e.00	7.4	3.1	10.5	68.2	47.0	2.9
26	.00	e.00	e.00	e.00	e.00	e.64	5.5	2.7	10.2	88.6	39.2	2.6
27	.00	e.00	e.00	e.00	e.00	e.18	4.6	2.6	10.4	92.9	34.2	2.5
28	.00	e.00	e.00	e.00	e.00	e.14	4.4	2.4	10.4	130	28.7	2.3
29	.00	e.00	e.00	e.00	---	e5.3	4.4	2.2	10.5	129	24.5	2.3
30	e.00	e.00	e.00	e.00	---	e11	4.4	2.1	17.2	185	22.6	2.3
31	e.00	---	e.00	e.00	---	e7.2	---	1.9	---	237	19.7	---
TOTAL	0.00	0.00	0.00	0.00	0.00	24.46	1380.0	201.2	242.5	1723.9	4356.9	192.1
MEAN	.000	.000	.000	.000	.000	.79	46.0	6.49	8.08	55.6	141	6.40
MAX	.00	.00	.00	.00	.00	.11	196	20	17	237	314	17
MIN	.00	.00	.00	.00	.00	.00	4.4	1.9	1.2	22	20	2.3
AC-FT	.00	.00	.00	.00	.00	.49	2740	399	481	3420	8640	381

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1993, BY WATER YEAR (WY)

	MEAN	.58	.057	.003	.000	.41	9.50	63.0	15.3	5.58	4.14	5.21	.78
MAX	5.15	.63	.036	.000	.000	5.68	62.0	208	159	32.0	55.6	141	8.03
(WY)	1981	1988	1988	1963	1981	1985	1974	1974	1986	1993	1993	1979	
MIN	.000	.000	.000	.000	.000	.000	1.05	.009	.000	.000	.000	.000	.000
(WY)	1963	1963	1963	1963	1963	1963	1973	1973	1968	1968	1962	1962	1962

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1962 - 1993
ANNUAL TOTAL	5722.84	8121.06	
ANNUAL MEAN	15.6	22.2	8.26
HIGHEST ANNUAL MEAN			22.2
LOWEST ANNUAL MEAN			.59
HIGHEST DAILY MEAN	576	314	787
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		317	943
INSTANTANEOUS PEAK STAGE		1533.25	1534.57
ANNUAL RUNOFF (AC-FT)	11350	16110	5980
10 PERCENT EXCEEDS	12	68	15
50 PERCENT EXCEEDS	.00	1.4	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

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05099300 PEMBINA RIVER NEAR WINDYGATES, MANITOBA
(International gaging station)LOCATION.--Lat 49°01'53", long 98°16'40", in SE 1/4, sec.13, T.1, R.7 W., first meridian, Hydrologic Unit 09020313,
on left bank 0.2 mi downstream from bridge, and 3 mi northeast of Windygates, Manitoba.DRAINAGE AREA.--3,020 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is Geodetic Survey of Canada datum of 1929. Prior to Jan. 1, 1985,
datum of gage at 1102.02 ft above Geodetic Survey of Canada datum of 1929.COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with
the United States. Records provided by Water Survey of Canada.DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	3.6	e1.7	e1.6	e1.8	e.57	e150	284	109	85	678	735
2	2.4	3.7	e1.3	e1.7	e2.0	e.81	e243	266	106	108	685	727
3	2.3	4.7	e.64	e1.9	e1.8	e1.2	e335	251	100	123	685	724
4	2.3	4.8	e1.3	e2.2	e1.6	e1.6	e420	237	92	108	678	710
5	2.3	4.6	e.99	e1.9	e1.5	e1.9	e505	225	89	94	650	696
6	2.3	e4.5	e1.6	e1.6	e1.7	e2.0	e540	215	89	90	622	675
7	2.4	e4.3	e1.9	e1.9	e1.4	e2.2	618	208	93	91	590	660
8	3.3	e4.1	e1.9	e1.9	e1.6	e2.4	685	211	126	90	569	653
9	2.5	e4.1	e1.9	e1.7	e1.7	e2.7	622	263	133	90	562	629
10	2.3	e5.3	e2.0	e1.7	e1.6	e2.9	505	293	123	89	540	611
11	2.2	e3.5	e2.1	e1.5	e1.4	e2.4	456	293	120	86	537	600
12	2.2	e3.0	e2.3	e1.7	e1.2	e2.3	438	282	114	80	586	593
13	2.2	e3.2	e1.9	e2.0	e1.2	e2.1	438	261	125	77	664	583
14	2.5	e3.0	e1.9	e2.2	e1.2	e2.0	431	240	127	75	770	565
15	2.9	e3.3	e2.0	e2.1	e1.3	e1.9	406	222	120	73	932	551
16	3.2	e3.9	e2.2	e2.1	e1.2	e1.9	381	206	118	74	953	544
17	3.4	e4.3	e2.3	e2.0	e1.0	e1.8	367	193	114	109	886	523
18	3.8	e3.7	e1.9	e2.2	e1.0	e1.7	357	182	102	113	862	505
19	3.5	e3.2	e1.8	e2.2	e.95	e1.6	364	173	88	109	830	494
20	3.8	e3.2	e1.6	e2.2	e.85	e1.8	357	165	84	113	798	484
21	4.0	e2.6	e1.3	e2.0	e.78	e1.9	351	158	79	115	780	463
22	4.3	e2.3	e1.3	e1.8	e.71	e2.4	348	150	75	125	777	452
23	4.2	e2.3	e1.6	e1.7	e.64	e4.2	343	146	78	141	766	438
24	4.0	e2.3	e1.7	e1.8	e.57	e7.2	333	138	76	147	749	424
25	3.9	e2.0	e2.0	e1.8	e.49	e12	320	132	70	301	735	413
26	4.7	e2.1	e1.7	e1.8	e.49	e26	309	126	64	554	727	396
27	5.8	e1.7	e1.8	e1.9	e.49	e43	304	122	59	593	731	381
28	4.5	e2.0	e1.9	e2.0	e.49	e87	299	117	55	1040	735	371
29	4.1	e2.3	e1.9	e1.6	---	e125	295	114	52	851	735	357
30	3.7	e2.1	e2.0	e1.6	---	e115	297	115	62	770	742	347
31	3.7	---	e2.0	e1.8	---	e115	---	112	---	713	738	---
TOTAL	101.3	99.7	54.43	58.1	32.66	576.48	11817	6100	2842	7227	22292	16304
MEAN	3.27	3.32	1.76	1.87	1.17	18.6	394	197	94.7	233	719	543
MAX	5.8	5.3	2.3	2.2	2.0	125	685	293	133	1040	953	735
MIN	2.2	1.7	.64	1.5	.49	.57	150	112	52	73	537	347
AC-FT	201	198	108	115	65	1140	23440	12100	5640	14330	44220	32340

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1993, BY WATER YEAR (WY)

	MEAN	38.3	21.2	9.10	4.60	4.50	63.9	814	675	277	124	86.1	64.8
MAX	343	171	45.3	19.1	44.5	320	3112	3616	1512	633	719	543	
(WY)	1969	1969	1969	1969	1976	1985	1969	1974	1974	1970	1993	1993	
MIN	.000	.000	.000	.000	.000	.000	21.3	27.0	4.03	.070	.000	.000	
(WY)	1989	1989	1989	1989	1965	1963	1977	1988	1988	1988	1988	1988	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1962 - 1993

ANNUAL TOTAL	110150.12	67504.67	
ANNUAL MEAN	301	185	185
HIGHEST ANNUAL MEAN			737
LOWEST ANNUAL MEAN			9.61
HIGHEST DAILY MEAN	3030	1040	11200
LOWEST DAILY MEAN	.64	.49	.00
ANNUAL SEVEN-DAY MINIMUM	1.3	.53	.00
INSTANTANEOUS PEAK FLOW		1140	11500
INSTANTANEOUS PEAK STAGE		1109.73	1121.52
ANNUAL RUNOFF (AC-FT)	218500	133900	133800
10 PERCENT EXCEEDS	1180	651	467
50 PERCENT EXCEEDS	5.1	64	25
90 PERCENT EXCEEDS	2.1	1.6	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05099600 PEMBINA RIVER AT WALHALLA, ND

LOCATION.--Lat 48°54'50", long 97°55'00", in NE¹/₄NE¹/₄ sec.29, T.163 N., R.56 W., Pembina County, Hydrologic Unit 09020313, on left bank at downstream side of bridge on State Highway 32, at south edge of Walhalla, and 7 mi downstream from Little South Pembina River.

DRAINAGE AREA.--3,350 mi², approximately.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1962-90, 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
FEB											
17...	1135	4.0	1100	7.7	-17.5	0.5	12.8	91	460	359	120
APR											
08...	1150	938	549	8.2	2.0	1.0	12.4	91	190	132	50
22...	1155	422	738	8.4	14.0	8.0	11.8	104	290	199	70
JUN											
04...	1150	114	799	8.2	19.0	15.0	9.6	99	320	224	77
18...	0830	188	814	8.3	15.5	15.0	8.4	88	300	219	78
JUL											
13...	1045	112	834	8.2	17.0	15.0	9.2	94	320	226	81
29...	1000	1820	559	7.9	18.0	21.0	6.4	75	210	159	57
SEP											
01...	1000	816	719	8.3	13.5	15.0	6.2	64	280	206	66
22...	0900	383	797	8.3	6.5	12.0	9.6	92	290	219	68

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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)
FEB										
17...	38	50	19	1	8.1	437	0	220	25	0.30
APR										
08...	17	36	28	1	8.5	161	0	120	11	0.30
22...	27	46	25	1	11	228	8	140	14	0.20
JUN										
04...	30	52	25	1	21	273	0	190	14	0.30
18...	26	60	29	2	10	267	0	190	15	0.30
JUL										
13...	28	65	30	2	11	275	0	200	16	0.30
29...	16	36	26	1	8.8	194	0	110	7.7	0.30
SEP										
01...	28	46	25	1	10	251	0	150	12	0.20
22...	30	44	24	1	11	267	0	150	13	0.30

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)
FEB											
17...	699	704	0.96	7.62	0.020	--	<0.050	0.030	0.27	<0.20	0.30
APR											
08...	354	380	0.52	962	0.100	2.50	2.60	0.090	0.71	0.90	0.80
22...	450	497	0.68	566	<0.010	--	<0.050	0.020	0.78	0.80	0.80
JUN											
04...	540	554	0.75	171	<0.010	--	0.210	0.020	0.48	0.50	0.50
18...	535	550	0.75	279	<0.010	--	0.110	0.030	0.47	0.50	0.50
JUL											
13...	561	574	0.78	174	<0.010	--	<0.050	0.040	0.46	2.4	0.50
29...	362	379	0.52	1860	0.010	0.160	0.170	0.060	1.0	2.0	1.1
SEP											
01...	465	487	0.66	1070	<0.010	--	0.086	0.030	0.67	0.70	0.70
22...	473	491	0.67	508	<0.010	--	0.063	0.030	0.57	0.60	0.60

RED RIVER OF THE NORTH BASIN

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05099600 PEMBINA RIVER AT WALHALLA, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB										
17...	0.040	0.030	0.030	9	530	--	--	127	1.4	22
APR										
08...	0.380	0.290	0.300	180	64	--	--	--	--	--
22...	0.190	0.140	0.120	17	9	--	--	--	--	--
JUN										
04...	0.150	0.140	0.130	6	52	--	--	39	12	96
18...	0.200	0.190	0.140	6	33	--	--	76	39	99
JUL										
13...	0.210	0.220	0.210	5	58	7.0	<0.1	23	7.0	97
29...	1.00	0.270	0.250	83	24	11	5.5	--	--	--
SEP										
01...	0.370	0.300	0.290	32	12	10	1.6	--	--	--
22...	0.230	0.200	0.220	20	26	15	1.3	--	--	--

RED RIVER OF THE NORTH BASIN

05100000 PEMBINA RIVER AT NECHE, ND
(International gaging station)

LOCATION.--Lat 48°59'20", long 97°33'05", in SE¹/₄NW¹/₄ sec.31, T.164 N., R.53 W., Pembina County, Hydrologic Unit 09020313, on right bank 0.3 mi east of State Highway 18, and at north edge of Neche.

DRAINAGE AREA.--3,410 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to September 1908, June 1909 to September 1915, April 1919 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1904-8, 1910-15, 1920, 1921, 1923, 1924. WSP 1388: 1904(M), 1914, 1915(M), 1931(M), 1933, 1938(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 809.69 ft above sea level. Prior to May 24, 1932, nonrecording gage at Burlington Northern Railway bridge 1 mi upstream, at same datum. May 25, 1932, to Apr. 17, 1939, nonrecording gage on bridge on State Highway 18, 500 ft downstream from railway bridge, at same datum.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	9.8	13	4.6	e4.4	e2.8	396	335	169	e110	1660	853
2	7.2	12	13	4.6	e4.4	e3.1	339	335	166	e185	1300	846
3	9.0	11	13	4.6	e4.3	e3.5	335	325	160	e195	1120	844
4	8.6	7.3	13	4.6	e4.2	e4.6	453	309	157	e215	1060	843
5	7.0	7.8	10	4.6	e4.1	5.1	594	293	152	e210	1020	832
6	6.8	9.8	11	4.6	e4.1	5.1	812	281	148	e205	967	820
7	9.6	10	9.0	4.6	e4.0	5.1	1100	269	143	e200	901	800
8	9.7	11	8.9	4.6	e3.9	5.4	1040	265	160	e195	840	779
9	7.3	12	8.9	4.6	e3.8	5.7	964	288	197	e190	806	758
10	7.8	15	8.0	4.6	e3.8	5.1	867	354	399	e180	778	738
11	7.9	13	e6.5	4.6	e3.7	5.1	725	617	427	e175	750	720
12	7.2	14	e6.5	4.6	e3.6	5.1	636	517	327	e170	729	707
13	7.3	15	e6.5	4.6	e3.5	4.9	588	450	281	e160	735	688
14	8.9	13	e6.5	4.6	e3.5	5.1	553	404	251	153	781	680
15	8.2	11	e6.5	4.6	e3.4	5.1	543	367	308	141	858	662
16	8.5	12	e6.5	4.6	e3.3	5.1	527	338	303	132	985	646
17	8.9	13	e6.0	4.6	e3.2	5.7	497	311	267	125	1080	627
18	8.4	13	e6.0	4.6	e3.2	6.0	472	284	249	119	1050	611
19	7.3	15	e6.0	4.6	e3.1	6.5	456	269	232	141	1030	589
20	9.8	14	e6.0	4.9	e3.0	6.5	437	254	211	165	1010	571
21	12	15	e5.5	5.1	e2.9	6.7	435	241	189	169	974	552
22	13	16	e5.5	5.1	e2.8	51	425	234	168	167	934	528
23	12	17	e5.5	5.1	e2.8	e15	420	223	163	172	917	519
24	11	18	e5.5	5.1	e2.8	e10	411	214	156	191	903	504
25	11	18	e5.5	5.1	e2.8	11	394	206	162	316	894	491
26	11	16	e5.0	5.1	e2.8	12	374	197	e150	1110	e890	469
27	11	14	e5.0	5.1	e2.8	16	365	192	e140	2370	e885	465
28	10	12	e5.0	4.6	e2.8	31	354	188	e125	3050	e880	449
29	9.8	11	e5.0	4.8	---	89	352	182	e120	3260	e875	435
30	9.2	12	e5.0	5.1	---	223	343	176	e115	3490	e868	425
31	9.3	---	4.7	e4.5	---	418	---	170	---	2450	854	---
TOTAL	282.9	387.7	228.0	147.0	97.0	983.3	16207	9088	6195	20111	29334	19451
MEAN	9.13	12.9	7.35	4.74	3.46	31.7	540	293	206	649	946	648
MAX	13	18	13	5.1	4.4	418	1100	617	427	3490	1660	853
MIN	6.8	7.3	4.7	4.5	2.8	2.8	335	170	115	110	729	425
AC-FT	561	769	452	292	192	1950	32150	18030	12290	39890	58180	38580

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1993, BY WATER YEAR (WY)

	MEAN	64.5	41.6	19.0	9.88	6.99	84.9	762	620	305	161	96.3	73.4
MAX	378	234	130	66.0	49.5	741	3146	4618	1777	839	946	648	
(WY)	1969	1945	1905	1960	1945	1945	1969	1974	1974	1904	1993	1993	
MIN	.000	.000	.000	.000	.000	.000	24.7	11.8	6.56	.000	.000	.000	
(WY)	1939	1939	1939	1933	1933	1936	1939	1939	1940	1940	1939	1938	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1903 - 1993
ANNUAL TOTAL	130141.8	102511.9	
ANNUAL MEAN	356	281	189
HIGHEST ANNUAL MEAN			865
LOWEST ANNUAL MEAN			3.96
HIGHEST DAILY MEAN	3790	Apr 1	9950
LOWEST DAILY MEAN	4.7	Dec 31	.00
ANNUAL SEVEN-DAY MINIMUM	5.0	Dec 25	.00
INSTANTANEOUS PEAK FLOW			a10700
INSTANTANEOUS PEAK STAGE			b23.64
INSTANTANEOUS LOW FLOW			.00
ANNUAL RUNOFF (AC-FT)	258100	203300	136600
10 PERCENT EXCEEDS	1380	845	427
50 PERCENT EXCEEDS	16	119	38
90 PERCENT EXCEEDS	7.0	4.6	1.0

e Estimated.

a From rating curve extended above 5,300 ft³/s.

b Backwater from ice.

RED RIVER OF THE NORTH BASIN

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05100000 PEMBINA RIVER AT NECHE, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 13...	1445	7.5	1050	--	0.5	5.0	--	--	--	--	--
NOV 04...	1030	7.2	--	--	-2.0	1.0	--	--	--	--	--
23...	1325	18	1050	--	-1.0	1.0	--	--	--	--	--
JAN 12...	1405	4.6	1230	--	-10.0	0.5	--	--	--	--	--
FEB 24...	1345	2.8	1010	--	-18.0	0.0	--	--	--	--	--
APR 08...	1220	1020	558	--	9.5	1.0	--	--	--	--	--
20...	1230	437	805	7.7	11.0	9.0	340	231	85	30	49
MAY 03...	1255	344	--	--	22.0	12.0	--	--	--	--	--
JUN 01...	1645	170	805	--	19.0	17.0	--	--	--	--	--
JUL 15...	1230	141	1130	--	21.0	21.5	--	--	--	--	--
28...	1340	2990	295	--	21.0	21.0	--	--	--	--	--
AUG 30...	1140	844	--	--	18.0	17.0	--	--	--	--	--
SEP 17...	1200	626	790	8.2	14.0	12.0	310	249	70	32	44

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 20...	23	1	12	190	18	0.30	23	546	563	0.77	664
SEP 17...	23	1	10	150	18	0.20	24	498	514	0.70	869

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 20...	4	120	10	<1	60	10	0.1	4	1	440
SEP 17...	3	80	40	<1	60	30	<0.1	<1	<1	370

RED RIVER OF THE NORTH BASIN

05101000 TONGUE RIVER AT AKRA, ND

LOCATION.--Lat 48°46'42", long 97°44'43", in SW¹/₄ sec.10, T.161 N., R.55 W., Pembina County, Hydrologic Unit 09020313, on left bank 300 ft downstream from Renwick Dam, 0.9 mi northwest of Akra, and 6 mi west of Cavalier.

DRAINAGE AREA.--160 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to June 1950 (WSP 1137-B), October 1951 to current year (seasonal record since 1983).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 930.00 ft above sea level. Prior to July 10, 1954, nonrecording gage 1.2 mi downstream at datum 30.00 ft lower. July 23, 1954, to Dec. 19, 1973, water stage recorder 2.7 mi downstream at datum 9.10 ft lower.

REMARKS.--Records fair. Flow regulated by temporary retention in ten retarding basins beginning 300 ft above station, four of which have slow release outlet structures to regulate the flow. Retarding basins were completed during the period 1955 to 1961 and have a combined capacity of 19,245 acre-ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 492 ft³/s, July 29, gage height, 14.11 ft; minimum recorded daily discharge, 3.5 ft³/s, Mar. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	e10	5.0	31	e4.9	27	417	45
2	---	---	---	---	---	e10	6.9	28	4.7	31	392	44
3	---	---	---	---	---	e10	12	25	4.5	31	369	42
4	---	---	---	---	---	e13	13	25	4.3	31	335	39
5	---	---	---	---	---	e15	29	26	4.1	30	269	37
6	---	---	---	---	---	16	68	26	7.7	32	217	37
7	---	---	---	---	---	16	96	27	9.8	32	179	35
8	---	---	---	---	---	17	108	31	18	28	157	34
9	---	---	---	---	---	20	95	42	31	24	159	33
10	---	---	---	---	---	18	78	53	53	24	175	33
11	---	---	---	---	---	18	68	65	60	25	162	33
12	---	---	---	---	---	17	57	71	52	24	143	35
13	---	---	---	---	---	17	50	68	69	24	129	35
14	---	---	---	---	---	16	50	62	59	24	116	35
15	---	---	---	---	---	18	49	56	33	24	104	21
16	---	---	---	---	---	26	49	51	23	24	96	7.6
17	---	---	---	---	---	25	49	46	18	24	90	8.7
18	---	---	---	---	---	25	48	42	13	24	104	10
19	---	---	---	---	---	31	47	38	13	29	105	11
20	---	---	---	---	---	39	46	35	12	25	95	12
21	---	---	---	---	---	45	50	24	12	23	88	13
22	---	---	---	---	---	50	51	18	15	23	74	16
23	---	---	---	---	---	47	50	e17	22	28	70	18
24	---	---	---	---	---	46	47	e15	24	45	67	19
25	---	---	---	---	---	33	43	e14	25	98	62	22
26	---	---	---	---	---	10	39	e13	24	284	59	21
27	---	---	---	---	---	9.0	36	e12	22	420	49	21
28	---	---	---	---	---	11	34	e10	23	465	40	20
29	---	---	---	---	---	8.3	33	e9.0	23	486	44	19
30	---	---	---	---	---	5.0	33	e7.5	24	472	45	20
31	---	---	---	---	---	3.5	---	e6.5	---	446	45	---
TOTAL	---	---	---	---	---	644.8	1439.9	994.0	708.0	3327	4456	776.3
MEAN	---	---	---	---	---	20.8	48.0	32.1	23.6	107	144	25.9
MAX	---	---	---	---	---	50	108	71	69	486	417	45
MIN	---	---	---	---	---	3.5	5.0	6.5	4.1	23	40	7.6
AC-FT	---	---	---	---	---	1280	2860	1970	1400	6600	8840	1540

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1993, BY WATER YEAR (WY)

	6.29	6.76	4.46	3.16	3.60	19.9	103	47.6	18.9	11.0	7.58	6.32
MEAN	6.29	6.76	4.46	3.16	3.60	19.9	103	47.6	18.9	11.0	7.58	6.32
MAX	30.1	22.7	12.9	7.27	18.7	135	294	225	78.7	107	144	28.3
(WY)	1981	1981	1971	1971	1981	1966	1956	1974	1964	1993	1993	1980
MIN	.51	.56	.065	.51	.24	.22	.43	1.63	.47	.086	.21	.096
(WY)	1962	1976	1953	1953	1953	1964	1991	1980	1988	1978	1988	1989

SUMMARY STATISTICS

WATER YEARS 1952 - 1993

ANNUAL MEAN	a21.4	
HIGHEST ANNUAL MEAN	a50.1	1956
LOWEST ANNUAL MEAN	a3.11	1961
HIGHEST DAILY MEAN	1150	Apr 20 1956
LOWEST DAILY MEAN	.00	Dec 1 1952
ANNUAL SEVEN-DAY MINIMUM	.00	Dec 1 1952
INSTANTANEOUS PEAK FLOW	b11800	Apr 18 1950
INSTANTANEOUS PEAK STAGE	c48.70	Apr 18 1950
ANNUAL RUNOFF (AC-FT)	a15480	
10 PERCENT EXCEEDS	41	
50 PERCENT EXCEEDS	4.4	
90 PERCENT EXCEEDS	.70	

e Estimated.

a Based on complete water years only (1952-82).

b Site and datum then in use, from indirect measurement of peak flow.

c From floodmark.

RED RIVER OF THE NORTH BASIN

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05101000 TONGUE RIVER AT AKRA, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINEITY LAB (MG/L AS CACO3) (90410)	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)
FEB 02...	1435	2.5	790	--	--	1.0	--	--	--	--	--
APR 07...	0950	95	486	7.4	7.5	3.5	190	146	51	14	25
JUN 01...	1410	4.9	622	--	18.0	16.5	--	--	--	--	--
JUL 28...	1610	473	325	--	24.0	22.0	--	--	--	--	--
AUG 16...	1235	96	--	--	20.0	21.0	--	--	--	--	--
SEP 17...	1515	8.8	596	8.1	17.5	13.5	250	234	68	19	30

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 07...	22	0.8	6.0	73	13	0.20	15	286	297	0.40	76.2
SEP 17...	20	0.8	8.1	80	11	0.30	14	371	391	0.53	9.29

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 07...	2	60	30	<1	20	500	0.1	1	<1	240
SEP 17...	3	80	20	<1	40	220	<0.1	1	<1	320

LOCATION.--Lat 49°00'30", long 97°12'40", in sec.2, T.1, R.2 E., Hydrologic Unit 09020311, on right bank 1,500 ft downstream from Canadian National Railway bridge in Emerson, 0.8 mi downstream from international boundary, 3.6 mi downstream from Pembina River, and at mile 154.3.

DRAINAGE AREA.--40,200 mi², approximately, includes 3,800 mi² in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to November 1902 (gage heights only), May 1912 to September 1929 (monthly discharge only, published in WSP 1308), October 1929 to current year.

GAGE.--Water-stage recorder. Datum of gage is Geodetic Survey of Canada Datum of 1929. See WSP 1728 or 1913 for history of changes prior to Apr. 10, 1953.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by Water Survey of Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1993, BY WATER YEAR (WY)

MEAN	1424	1268	936	777	740	2014	12490	8306	4891	3807	2010	1572
MAX	4533	5163	2760	2053	1914	9361	45820	72820	25430	28020	27000	10010
(WY)	1986	1972	1966	1951	1952	1966	1950	1962	1975	1993	1993	
MIN	28.6	23.7	33.3	7.05	1.21	2.25	1282	663	196	121	46.6	23.6
(WY)	1937	1937	1937	1937	1937	1937	1938	1934	1934	1936	1934	1934

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1912 - 1993
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ANNUAL TOTAL	1073089		2368490				
ANNUAL MEAN	2932		6489			3361	
HIGHEST ANNUAL MEAN						12100	1950
LOWEST ANNUAL MEAN						333	1934
HIGHEST DAILY MEAN	15700	Apr 4	31900	Aug 17	94400		May 13 1950
LOWEST DAILY MEAN	501	Jan 4	759	Nov 6		.90	Feb 6 1937
ANNUAL SEVEN-DAY MINIMUM	515	Jan 1	775	Nov 3		.97	Feb 4 1937
INSTANTANEOUS PEAK FLOW			31900	Aug 16	95500		May 13 1950
INSTANTANEOUS PEAK STAGE			779.02	Aug 16		791.19	May 1 1979
INSTANTANEOUS LOW FLOW						.90	Feb 6 1937
ANNUAL RUNOFF (AC-FT)	2128000		4698000			2435000	
10 PERCENT EXCEEDS	8100					7400	
50 PERCENT EXCEEDS	1440		3020			1370	
90 PERCENT EXCEEDS	557		846			254	

e Estimated.

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

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 current year.

REMARKS.--Records of daily mean values of water temperature and specific conductance are furnished by Water Survey of Canada.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily mean, 2,180 microsiemens, Dec. 8, 1989; minimum daily mean, 259 microsiemens, Apr. 14, 1989.

WATER TEMPERATURES: Maximum daily mean, 26.7°C, Aug. 16, 1988; minimum daily mean, 0.0°C, on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily mean, 1,100 microsiemens, Dec. 9; minimum daily mean, 351 microsiemens, July 23.

WATER TEMPERATURES: Maximum daily mean, 21.9°C, Aug. 28; minimum daily mean, 0.0°C, on many days during the winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CaCO3) (00900)
OCT											
15...	1215	1150	--	710	8.8	7.0	6.0	33	7.9	65	290
NOV											
19...	1130	--	833	1020	8.6	-5.0	3.0	6.4	14.6	110	310
FEB											
09...	1340	1020	--	735	7.7	-6.0	0.5	--	14.4	103	280
23...	1130	--	1040	896	7.7	-14.0	0.0	3.5	12.6	88	290
APR											
07...	1115	--	E18500	383	8.0	--	0.5	--	11.8	84	160
13...	1035	25500	--	438	7.7	--	5.0	--	9.9	79	180
20...	1120	--	14600	699	8.0	5.0	9.5	--	10.3	92	270
27...	1115	--	5900	792	8.1	16.5	10.5	65	10.4	97	310
MAY											
04...	1105	--	5230	771	8.2	19.5	12.5	--	10.0	98	330
10...	1305	--	4840	789	7.9	23.5	17.0	--	8.4	89	330
20...	1030	--	3450	850	8.0	10.5	14.5	--	9.6	97	330
JUN											
03...	1115	--	3120	807	8.1	17.0	16.5	--	9.5	99	320
16...	1515	--	5090	736	7.9	15.5	19.0	--	7.7	86	300
JUL											
01...	1020	--	6040	753	7.8	19.5	18.5	--	7.7	85	310
15...	1110	7240	--	696	7.6	18.0	20.5	230	6.6	75	280
23...	0900	--	12300	321	7.8	19.0	18.5	--	3.2	35	--
29...	1050	--	22600	545	7.7	23.5	21.0	--	4.4	51	200
AUG											
04...	1030	--	27700	536	7.4	18.0	20.5	--	2.1	24	210
09...	1015	--	29100	--	7.8	18.0	19.5	--	2.8	--	310
16...	1140	--	31800	565	7.5	22.0	21.5	--	1.3	16	260
SEP											
07...	1130	--	15300	600	8.0	17.0	15.0	54	6.2	63	260
20...	1145	--	7520	693	8.1	15.5	14.5	--	5.4	55	300

DATE	ALKA- LINITY WAT IT TOT IT FIELD MG/L AS CaCO3 (39086)	ALKA- LINITY LAB (MG/L AS CaCO3) (90410)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOC- CI, FECAL, KF AGAR (COLS./ PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT											
15...	--	232	K6	K2	68	29	34	20	0.9	5.5	--
NOV											
19...	227	--	<1	K13	68	35	80	35	2	9.6	233
FEB											
09...	255	--	--	--	62	30	37	22	1	5.5	311
23...	260	--	K7	K240	66	30	58	30	1	6.0	317
APR											
07...	112	--	--	--	36	16	12	13	0.4	9.8	136
13...	128	--	--	--	44	18	15	14	0.5	9.5	155
20...	187	--	--	--	62	27	36	22	1	9.9	228
27...	214	--	--	--	71	32	39	21	1	9.2	262
MAY											
04...	219	--	--	--	73	35	37	19	0.9	8.3	260
10...	208	--	--	--	74	36	35	18	0.8	8.5	252
20...	226	--	--	--	74	36	46	23	1	8.8	264
JUN											
03...	216	--	--	--	70	35	44	22	1	8.6	257
16...	200	--	--	--	66	34	37	20	0.9	7.2	244
JUL											
01...	212	--	--	--	69	34	39	21	1	8.8	258
15...	183	--	--	--	64	30	32	19	0.8	7.1	224
29...	129	--	--	--	48	20	30	23	0.9	8.9	157
AUG											
04...	--	164	--	--	51	20	21	17	0.6	10	--
09...	--	276	--	--	73	31	7.5	5	0.2	8.8	--
16...	--	207	--	--	64	24	22	15	0.6	10	--
SEP											
07...	175	--	K37	140	60	26	22	15	0.6	9.2	214
20...	215	--	--	--	68	32	29	17	0.7	8.3	262

RED RIVER OF THE NORTH BASIN

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	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, NITRITE DIS- SOLVED (MG/L AS N) (00613)
OCT											
15...	--	79	42	0.20	10	408	466	0.63	1450	0.030	<0.010
NOV											
19...	22	110	110	0.20	5.4	555	578	0.79	1300	<0.010	0.010
FEB											
09...	0	63	41	0.10	15	409	407	0.55	1120	--	0.020
23...	0	69	81	0.20	16	485	498	0.68	1400	--	0.020
APR											
07...	0	46	11	0.10	13	228	245	0.33	--	--	0.170
13...	0	73	13	0.20	14	276	291	0.40	20000	--	0.140
20...	0	120	40	0.20	16	429	448	0.61	17700	--	0.040
27...	0	150	38	0.20	13	483	478	0.65	7610	--	<0.010
MAY											
04...	4	150	31	0.20	9.4	477	503	0.68	7100	--	<0.010
10...	1	160	28	0.20	9.4	477	513	0.70	6700	--	<0.010
20...	6	170	44	0.30	9.9	526	547	0.74	5100	--	<0.010
JUN											
03...	7	140	38	0.20	9.2	480	504	0.69	4250	--	<0.010
16...	0	140	31	0.20	12	451	487	0.66	6690	--	<0.010
JUL											
01...	0	130	33	0.20	14	459	480	0.65	7830	--	<0.010
15...	0	120	25	0.20	18	409	451	0.61	8820	--	<0.010
29...	0	82	30	0.20	21	319	337	0.46	20600	--	0.030
AUG											
04...	--	70	17	0.20	26	315	342	0.47	25600	--	0.020
09...	--	44	11	0.20	38	380	423	0.58	33200	--	0.010
16...	--	73	15	0.20	28	362	375	0.51	32200	--	0.020
SEP											
07...	0	80	24	0.20	20	349	371	0.50	15300	--	0.010
20...	0	110	21	0.20	19	418	452	0.61	9180	--	<0.010

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 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, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT											
15...	--	0.130	0.150	0.050	0.040	1.0	--	1.1	--	1.2	0.210
NOV											
19...	--	<0.050	<0.050	0.020	0.020	0.78	--	0.80	--	--	0.110
FEB											
09...	0.340	--	0.360	--	0.200	--	0.60	0.80	0.80	--	0.070
23...	0.440	--	0.460	--	0.190	--	--	0.90	--	--	0.070
APR											
07...	3.53	--	3.70	--	0.300	--	1.2	1.6	1.5	--	0.490
13...	2.56	--	2.70	--	0.200	--	1.1	1.3	1.3	--	0.350
20...	1.16	--	1.20	--	0.120	--	0.98	1.2	1.1	--	0.180
27...	--	--	0.370	--	0.020	--	--	0.80	--	--	0.120
MAY											
04...	--	--	0.190	--	0.030	--	0.67	1.0	0.70	--	0.140
10...	--	--	0.120	--	0.030	--	1.2	0.90	1.2	--	0.160
20...	--	--	0.290	--	0.030	--	0.57	0.80	0.60	--	0.090
JUN											
03...	--	--	0.400	--	0.040	--	0.56	1.0	0.60	--	0.240
16...	--	--	0.820	--	0.020	--	0.68	1.9	0.70	--	0.360
JUL											
01...	--	--	0.920	--	0.030	--	0.67	0.70	0.70	--	0.180
15...	--	--	0.360	--	0.030	--	0.77	1.1	0.80	--	0.390
29...	0.230	--	0.260	--	0.090	--	0.81	0.90	0.90	--	0.330
AUG											
04...	0.120	--	0.140	--	0.070	--	0.83	1.1	0.90	--	0.360
09...	0.057	--	0.067	--	0.070	--	0.73	1.1	0.80	--	0.330
16...	0.120	--	0.140	--	0.120	--	0.88	1.4	1.0	--	0.450
SEP											
07...	0.290	--	0.300	--	0.040	--	--	0.90	--	--	0.190
20...	--	--	0.260	--	0.050	--	1.4	1.4	1.4	--	0.250

RED RIVER OF THE NORTH BASIN

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05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)
OCT 15...	0.110	0.150	0.100	30	51	<3	17	27	4	<10
NOV 19...	0.090	0.070	0.070	--	--	--	--	--	--	--
FEB 09...	0.040	--	0.050	--	--	--	4	--	31	--
23...	0.050	--	0.050	<10	65	<3	9	28	35	<10
APR 07...	0.200	--	0.180	--	--	--	260	--	47	--
13...	0.150	--	0.110	--	--	--	67	--	31	--
20...	0.120	--	0.140	--	--	--	25	--	5	--
27...	0.090	--	0.050	20	60	<3	5	38	1	<10
MAY 04...	0.060	--	0.050	--	--	--	7	--	1	--
10...	0.050	--	0.050	--	--	--	4	--	1	--
20...	0.070	--	0.070	--	--	--	7	--	1	--
JUN 03...	0.090	--	0.080	--	--	--	23	--	2	--
16...	0.100	--	0.100	--	--	--	8	--	<1	--
JUL 01...	0.160	--	0.150	--	--	--	22	--	1	--
15...	0.170	--	0.150	--	--	--	--	--	--	--
29...	0.210	--	0.170	--	--	--	49	--	10	--
AUG 04...	0.250	--	0.210	--	--	--	87	--	26	--
09...	0.280	--	0.270	--	--	--	110	--	36	--
16...	0.290	--	0.280	--	--	--	43	--	85	--
SEP 07...	0.170	--	0.160	20	54	<3	54	26	9	<10
20...	0.150	--	0.140	--	--	--	16	--	4	--

DATE	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)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 15...	3	<1	<1.0	240	<6	--	--	--	--	--
NOV 19...	--	--	--	--	--	--	--	63	142	84
FEB 09...	--	--	--	--	--	14	0.3	--	--	--
23...	2	<1	<1.0	280	<6	--	--	89	250	96
APR 07...	--	--	--	--	--	12	8.6	--	--	--
13...	--	--	--	--	--	12	1.3	--	--	--
20...	--	--	--	--	--	12	1.4	--	--	--
27...	2	1	<1.0	280	<6	--	--	190	3030	99
MAY 04...	--	--	--	--	--	11	3.9	--	--	--
10...	--	--	--	--	--	11	2.2	--	--	--
20...	--	--	--	--	--	11	1.7	--	--	--
JUN 03...	--	--	--	--	--	10	1.4	--	--	--
16...	--	--	--	--	--	12	3.5	--	--	--
JUL 01...	--	--	--	--	--	12	2.7	--	--	--
15...	--	--	--	--	--	--	--	334	6530	99
29...	--	--	--	--	--	8.7	3.2	--	--	--
AUG 04...	--	--	--	--	--	22	--	--	--	--
09...	--	--	--	--	--	12	1.1	--	--	--
16...	--	--	--	--	--	13	0.5	--	--	--
SEP 07...	4	<1	<1.0	210	<6	--	--	125	5160	100
20...	--	--	--	--	--	14	--	--	--	--

RED RIVER OF THE NORTH BASIN

05102500 RED RIVER OF THE NORTH AT EMERSON, MANITOBA--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	742	770	1030	753	743	734	709	751	684	620	526	564
2	731	752	1010	746	736	730	696	751	696	580	521	556
3	738	736	1020	745	721	733	680	750	691	562	496	575
4	722	727	1010	737	704	737	656	739	699	647	475	588
5	716	717	1020	718	698	743	614	729	693	639	481	510
6	725	721	1040	675	704	744	590	729	666	635	494	512
7	735	719	1070	657	707	747	566	737	631	610	506	499
8	741	736	1090	655	698	755	533	747	629	595	516	519
9	741	764	1100	671	689	765	509	732	726	595	516	550
10	740	809	1050	677	683	769	489	735	714	593	521	558
11	739	862	1020	658	677	763	452	724	668	600	531	582
12	734	949	994	644	677	760	428	709	681	588	540	552
13	728	1020	974	643	680	746	450	712	671	601	590	579
14	724	991	958	621	671	721	464	744	665	594	586	599
15	729	958	943	621	666	699	474	796	678	616	589	576
16	718	954	924	618	712	671	509	729	657	629	598	595
17	690	957	909	613	819	654	550	723	657	632	606	600
18	743	969	912	622	831	651	580	772	627	713	610	591
19	828	972	904	678	826	658	620	759	603	691	619	635
20	831	1010	884	756	860	722	662	785	619	681	626	627
21	831	991	871	744	887	737	700	814	645	671	642	609
22	801	965	848	732	865	793	747	815	646	536	645	591
23	787	936	834	730	821	840	778	815	629	351	652	648
24	784	983	829	734	773	845	788	813	618	356	665	632
25	806	1040	820	743	745	850	782	788	579	373	675	650
26	817	1010	813	752	720	722	771	761	538	389	632	635
27	809	1030	806	764	720	679	773	758	625	410	648	623
28	808	1020	804	755	719	674	772	725	641	447	667	633
29	823	1010	798	750	---	666	766	715	659	495	666	728
30	818	1010	793	757	---	646	759	711	647	488	668	725
31	816	---	797	758	---	641	---	706	---	501	585	---
MEAN	764	903	931	701	741	729	629	751	653	563	584	595

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.5	4.6	.0	.0	.0	.0	.1	8.9	12.6	15.3	21.2	17.8
2	13.9	3.8	.0	.0	.0	.0	.4	9.1	13.1	15.7	20.7	16.6
3	14.3	2.5	.0	.0	.0	.0	.5	9.5	13.5	14.8	19.9	15.9
4	14.5	1.4	.0	.0	.0	.0	.9	10.2	14.4	17.5	19.3	16.3
5	14.8	.8	.0	.0	.0	.0	1.3	11.7	15.4	18.6	19.2	16.0
6	14.4	.4	.0	.0	.0	.0	1.9	12.7	15.7	16.4	19.3	14.5
7	13.6	.2	.0	.0	.0	.0	2.3	13.4	15.4	16.1	19.6	13.0
8	12.8	.0	.0	.0	.0	.0	2.6	13.9	14.5	16.0	19.9	13.1
9	12.6	.0	.0	.0	.0	.0	2.8	14.2	15.3	16.0	20.3	12.8
10	12.6	.0	.0	.0	.0	.0	3.0	14.6	16.2	15.9	20.7	13.4
11	10.7	.0	.0	.0	.0	.0	3.3	15.4	17.2	17.6	21.2	13.1
12	10.3	.0	.0	.0	.0	.0	3.5	15.1	17.1	16.1	21.4	11.9
13	9.8	.0	.0	.0	.0	.0	4.1	15.5	18.4	16.6	20.5	11.7
14	8.3	.0	.0	.0	.0	.0	4.7	16.3	17.6	17.0	20.5	12.0
15	7.9	.0	.0	.0	.0	.0	5.1	15.5	17.5	17.9	20.6	12.1
16	7.5	.0	.0	.0	.0	.0	5.9	14.4	17.2	17.9	20.7	12.3
17	6.9	.0	.0	.0	.0	.0	6.0	13.0	16.9	17.9	20.9	12.2
18	6.4	.0	.0	.0	.0	.0	6.6	13.0	17.0	20.4	20.7	11.0
19	4.5	.0	.0	.0	.0	.0	6.8	12.0	18.3	19.1	20.7	10.9
20	3.9	.0	.0	.0	.0	.0	6.2	12.4	18.1	18.9	20.6	10.9
21	4.4	.0	.0	.0	.0	.0	6.2	12.7	18.4	18.9	20.8	11.8
22	5.4	.0	.0	.0	.0	.0	6.8	13.1	19.1	19.2	20.8	10.7
23	6.2	.0	.0	.0	.0	.0	7.5	13.2	18.7	19.3	20.8	10.5
24	6.6	.0	.0	.0	.0	.0	7.9	13.1	19.3	19.3	21.1	9.8
25	7.0	.0	.0	.0	.0	.0	7.7	12.5	16.8	19.6	21.2	10.0
26	6.7	.0	.0	.0	.0	.0	7.8	12.5	14.0	19.5	21.3	10.1
27	6.3	.0	.0	.0	.0	.0	8.5	12.7	15.8	19.8	21.4	9.8
28	6.3	.0	.0	.0	.0	.0	8.6	12.8	15.4	19.6	21.9	9.4
29	6.4	.1	.0	.0	---	.0	8.9	12.8	15.9	19.9	20.8	10.5
30	5.8	.0	.0	.0	---	.0	9.0	13.3	15.3	20.5	20.5	10.2
31	5.7	---	.0	.0	---	.0	---	13.3	---	21.0	19.2	---
MEAN	9.0	.5	.0	.0	.0	.0	4.9	13.0	16.3	18.0	20.6	12.3

RED RIVER OF THE NORTH BASIN

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05113360 LONG CREEK AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY, SASKATCHEWAN
(International gaging station)

LOCATION.--Lat 49°00'01", long 103°21'08", in SE $\frac{1}{4}$ sec.1, T.1, R.11 W., second meridian, Hydrologic Unit 09010001, on right bank 10 mi south of Outram, Saskatchewan.

DRAINAGE AREA.--1,320 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1959 to current year.

GAGE.--Water-stage recorder and artificial control. Datum of gage is 1,894.00 ft above sea level (international boundary survey).

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by the Water Survey of Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.00	e.00	e.00	e.00	e.00	e.00	e5.7	.46	.00	.00	501	21
2	e.00	e.00	e.00	e.00	e.00	e.00	5.4	.32	.00	.00	410	21
3	e.00	e.00	e.00	e.00	e.00	e.00	5.1	.25	.00	.00	347	21
4	e.00	e.00	e.00	e.00	e.00	e.00	6.1	.18	.00	223	292	19
5	e.00	e.00	e.00	e.00	e.00	e.00	6.0	.11	.00	1070	244	19
6	e.00	e.00	e.00	e.00	e.00	e.00	6.2	.04	.00	706	199	18
7	e.00	e.00	e.00	e.00	e.00	e.00	5.8	.04	.00	501	162	16
8	e.00	e.00	e.00	e.00	e.00	e.00	5.5	.04	.00	326	134	14
9	e.00	e.00	e.00	e.00	e.00	e.00	5.0	.00	.00	200	111	13
10	e.00	e.00	e.00	e.00	e.00	e.00	4.2	.00	.00	125	94	12
11	e.00	e.00	e.00	e.00	e.00	e.00	3.2	.00	.00	81	81	10
12	e.00	e.00	e.00	e.00	e.00	e.00	2.6	.00	.00	60	71	9.3
13	e.00	e.00	e.00	e.00	e.00	e.00	2.0	.00	.00	60	66	8.5
14	e.00	e.00	e.00	e.00	e.00	e.00	1.7	.00	.00	46	60	7.6
15	e.00	e.00	e.00	e.00	e.00	e.00	1.6	.00	.00	37	52	6.4
16	e.00	e.00	e.00	e.00	e.00	e.00	1.2	.00	.00	32	46	4.6
17	e.00	e.00	e.00	e.00	e.00	e.00	1.0	.00	.00	29	43	3.4
18	e.00	e.00	e.00	e.00	e.00	e.00	.81	.00	.00	24	39	3.4
19	e.00	e.00	e.00	e.00	e.00	e.00	.78	.00	.00	23	34	2.8
20	e.00	e.00	e.00	e.00	e.00	e.00	.74	.00	.00	25	32	2.0
21	e.00	e.00	e.00	e.00	e.00	e.00	.46	.00	.00	72	34	2.6
22	e.00	e.00	e.00	e.00	e.00	e.00	.35	.00	.00	79	56	3.0
23	e.00	e.00	e.00	e.00	e.00	e.00	.39	.00	.00	77	114	3.5
24	e.00	e.00	e.00	e.00	e.00	e.00	1.2	.00	.00	73	77	4.6
25	e.00	e.00	e.00	e.00	e.00	e.00	1.1	.00	.00	87	60	5.4
26	e.00	e.00	e.00	e.00	e.00	e.00	.74	.00	.00	100	53	5.5
27	e.00	e.00	e.00	e.00	e.00	e.00	.60	.00	.00	96	41	5.5
28	e.00	e.00	e.00	e.00	e.00	e.18	.53	.00	.00	209	31	6.2
29	e.00	e.00	e.00	e.00	---	e.71	.46	.00	.00	636	24	7.6
30	e.00	e.00	e.00	e.00	---	e1.8	.46	.00	.00	819	24	8.7
31	e.00	---	e.00	e.00	---	e4.0	---	.00	---	671	24	---
TOTAL	0.00	0.00	0.00	0.00	0.00	6.69	76.92	1.44	0.00	6487.00	3556	284.6
MEAN	.000	.000	.000	.000	.000	.22	2.56	.046	.000	209	115	9.49
MAX	.00	.00	.00	.00	.00	4.0	6.2	.46	.00	1070	501	21
MIN	.00	.00	.00	.00	.00	.00	.35	.00	.00	.00	24	2.0
AC-FT	.00	.00	.00	.00	.00	13	153	2.9	.00	12870	7050	565

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

MEAN	1.02	.24	.089	.016	.93	50.1	200	59.3	28.6	32.9	6.79	3.15
MAX	25.1	4.17	.82	.25	26.5	397	1052	578	360	415	115	61.4
(WY)	1979	1979	1979	1992	1981	1976	1979	1970	1976	1978	1993	1978
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1960	1960	1960	1960	1960	1964	1961	1961	1961	1961	1960	1960

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1960 - 1993

ANNUAL TOTAL	380.91	10412.65	
ANNUAL MEAN	1.04	28.5	31.9
HIGHEST ANNUAL MEAN			150
LOWEST ANNUAL MEAN			.000
HIGHEST DAILY MEAN	32	1070	4350
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		1200	4690
INSTANTANEOUS PEAK STAGE		7.04	12.05
ANNUAL RUNOFF (AC-FT)	756	20650	23120
10 PERCENT EXCEEDS	1.7	60	31
50 PERCENT EXCEEDS	.11	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05113600 LONG CREEK NEAR NOONAN, ND
(International gaging station)

LOCATION.--Lat 48°58'52", long 103°04'34", near north line of NE¹/₄, sec.1, T.163 N., R.96 W., Divide County, Hydrologic Unit 09010001, on right bank 150 ft upstream from county highway bridge, 1.5 mi upstream from international boundary, and 7 mi northwest of Noonan.

DRAINAGE AREA.--1,790 mi², approximately, of which about 1,160 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1959 to current year.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,840 ft above sea level, from topographic map. Prior to Aug. 18, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good except for periods of estimated daily discharges, which are fair.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	e.00	.00	.00	e.08	e.00	.00	.00	602	29
2	.00	.00	.00	e.00	.00	.00	e.07	e.00	.00	.00	454	27
3	.00	.00	.00	e.00	.00	.00	e.06	e.00	.00	.15	375	25
4	.00	.00	.00	e.00	.00	.00	e.07	e.00	.00	1.4	327	23
5	.00	.00	.00	e.00	.00	.00	e.10	e.00	.00	519	286	21
6	.00	.00	.00	.00	.00	e.00	e.30	e.00	.00	1020	245	19
7	.00	.00	.00	.00	.00	e.00	e3.0	e.02	.00	651	201	19
8	.00	.00	.00	.00	.00	e.00	e2.3	e.17	.04	436	167	17
9	.00	.00	.00	.00	.00	e.00	e1.9	e.06	.09	288	142	16
10	.00	.00	.00	.00	.00	e.00	e1.6	e.00	.19	197	110	13
11	.00	.00	.00	.00	.00	.00	e1.5	e.00	.23	136	93	11
12	.00	.00	.00	.00	.00	.00	e1.2	e.00	.23	93	80	10
13	.00	.00	.00	.00	.00	.00	e.90	e.00	.13	68	67	10
14	.00	.00	.00	.00	.00	.00	e.51	e.00	.09	61	64	8.8
15	.00	.00	.00	.00	.00	.00	e.27	e.00	.01	49	57	7.0
16	.00	.00	.00	.00	.00	.00	e.20	e.00	.00	40	49	5.7
17	.00	.00	.00	.00	.00	.00	e.16	e.00	.00	36	46	4.8
18	.00	.00	.00	.00	.00	.00	e.14	e.00	.00	33	45	e4.3
19	.00	.00	.00	.00	.00	.00	e.13	e.00	.00	32	39	e3.7
20	.00	.00	.00	.00	.00	.00	e.12	e.00	.00	29	37	e3.0
21	.00	.00	.00	.00	.00	.00	e.11	e.00	.00	31	37	e2.3
22	.00	.00	.00	.00	.00	.00	e.10	e.00	.00	68	44	e2.6
23	.00	.00	.00	.00	.00	.00	e.10	e.00	.00	74	78	e2.9
24	.00	.00	.00	.00	.00	e.03	e.09	e.00	.00	67	105	e3.5
25	.00	.00	.00	.00	.00	e.10	e.08	.00	.00	64	70	e4.5
26	.00	.00	.00	.00	.00	e.08	e.08	.00	.00	73	56	e5.6
27	.00	.00	.00	.00	.00	e.06	e.08	.00	.00	85	51	e5.6
28	.00	.00	.00	.00	.00	e.07	e.07	.00	.00	84	41	e6.2
29	.00	.00	.00	.00	---	e.10	e.07	.00	.00	281	35	e7.2
30	.00	.00	e.00	.00	---	e.15	e.07	.00	.00	724	33	e9.2
31	.00	---	e.00	.00	---	e.12	---	.00	---	803	30	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.71	15.46	0.25	1.01	6043.55	4066	326.9
MEAN	.000	.000	.000	.000	.000	.023	.52	.008	.034	195	131	10.9
MAX	.00	.00	.00	.00	.00	.15	3.0	.17	.23	1020	602	29
MIN	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	30	2.3
AC-FT	.00	.00	.00	.00	.00	1.4	31	.5	2.0	11990	8060	648

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

MEAN	1.65	.77	.52	.32	2.64	69.7	257	73.9	34.3	42.8	8.82	4.13
MAX	31.0	7.17	4.35	5.11	71.3	595	1396	728	375	452	131	77.2
(WY)	1979	1979	1976	1976	1981	1976	1979	1970	1976	1978	1993	1978
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1960	1961	1961	1961	1961	1965	1990	1990	1961	1961	1960	1960

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1960 - 1993

ANNUAL TOTAL	495.06	10453.88	41.3
ANNUAL MEAN	1.35	28.6	200
HIGHEST ANNUAL MEAN			.017
LOWEST ANNUAL MEAN			1976
HIGHEST DAILY MEAN	53	1020	5710
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		1190	6310
INSTANTANEOUS PEAK STAGE		9.99	17.61
ANNUAL RUNOFF (AC-FT)	982	20740	29890
10 PERCENT EXCEEDS	2.2	62	44
50 PERCENT EXCEEDS	.03	.00	.28
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

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05113600 LONG CREEK NEAR NOONAN, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR											
04...	1300	0.03	840	--	18.5	1.0	--	--	--	--	--
26...	1307	0.08	1620	--	18.0	15.0	--	--	--	--	--
JUN											
08...	1010	0.04	1050	--	11.0	13.5	--	--	--	--	--
JUL											
07...	1030	669	522	7.6	19.5	15.5	160	82	32	19	41
20...	1430	29	1180	--	24.0	22.0	--	--	--	--	--
30...	1215	730	831	--	24.0	21.0	--	--	--	--	--
AUG											
02...	2100	416	564	--	15.0	19.0	--	--	--	--	--
23...	1855	105	944	--	29.0	23.5	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED PER AC-FT) (70303)	SOLIDS, DIS- SOLVED PER DAY) (70302)
JUL											
07...	34	1	8.9	160	5.8	0.10	20	336	363	0.49	656

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
JUL										
07...	2	30	100	<1	20	50	<0.1	1	<1	220

RED RIVER OF THE NORTH BASIN

05113750 EAST BRANCH SHORT CREEK RESERVOIR NEAR COLUMBUS, ND

LOCATION.--Lat 48°59'26", long 102°47'07", in SW¹/₄NW¹/₄, sec.32, T.164 N., R.93 W., Burke County, Hydrologic Unit 09010001, on left bank of reservoir on East Branch Short Creek, 0.5 mi south of international boundary, and 6.0 mi north of Columbus.

DRAINAGE AREA.--280 mi², of which 175 mi² is probably noncontributing.

MONTHEND-GAGE HEIGHT AND CONTENTS RECORDS

PERIOD OF RECORD.--April 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above sea level.

REMARKS.--Records good except those for estimated periods, which are fair. Reservoir is formed by earth-fill dam; storage began April 1963. Outlet of lake is a fixed-crest concrete dam; average crest elevation, 1,886.90 ft above sea level. Reservoir capacity at crest elevation, 1,200 acre-ft. The reservoir is operated for water supply and recreation. Records of daily reservoir stage and contents are available from files at the Bismarck District office.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,850 acre-ft, Mar. 28, 1976, gage height, 32.13 ft; minimum, 770 acre-ft, Dec. 10, 1988, gage height, 22.57 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,530 acre-ft, Aug. 23, gage height, 29.77 ft; minimum contents, 830 acre-ft, Feb. 16, gage height, 23.18 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	23.46	850	--
Oct. 31-----	23.31	840	-10
Nov. 30-----	23.30	840	0
Dec. 31-----	23.26	830	-10
CAL YR 1992-----	--	--	-140
Jan. 31-----	23.26	830	0
Feb. 28-----	23.25	830	0
Mar. 31-----	24.40	940	+110
Apr. 30-----	24.41	940	0
May 31-----	24.07	910	-30
June 30-----	24.30	930	+20
July 31-----	28.03	1,320	+390
Aug. 31-----	e29.25	1,470	+150
Sept. 30-----	e28.25	1,350	-120
WTR YR 1993-----	--	--	+500

e Estimated.

RED RIVER OF THE NORTH BASIN

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05113800 SHORT CREEK BELOW INTERNATIONAL BOUNDARY NEAR ROCHE PERCEE, SASKATCHEWAN
(International gaging station)LOCATION.--Lat 49°01'42", long 102°51'00", in SW $\frac{1}{4}$ sec.14, T.1, R.7 W., second meridian, Hydrologic Unit 09010001, 4 mi southwest of Roche Percee, Saskatchewan, and 5 mi upstream from mouth.DRAINAGE AREA.--480 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.00	e.00	e.00	e.00	15	.14	.00	1.6	115	58
2	.00	.00	e.00	e.00	e.00	e.00	11	.07	.00	1.5	87	49
3	.00	.00	e.00	e.00	e.00	e.04	8.1	.07	.07	2.0	65	38
4	.00	.00	e.00	e.00	e.00	e.18	5.1	.07	.00	2.6	56	30
5	.00	.00	e.00	e.00	e.00	e.14	1.3	.04	.00	2.5	48	27
6	.00	.00	e.00	e.00	e.00	e.14	.88	.07	.04	2.6	38	24
7	.00	.00	e.00	e.00	e.00	e.25	.56	.04	.04	6.9	30	21
8	.00	.00	e.00	e.00	e.00	e.28	2.3	.00	.18	15	25	19
9	.00	.00	e.00	e.00	e.00	e.28	2.6	.00	.11	15	22	15
10	.00	.00	e.00	e.00	e.00	e.18	2.0	.00	.07	15	22	14
11	.00	.00	e.00	e.00	e.00	e.07	1.6	.00	.04	17	24	13
12	.00	.00	e.00	e.00	e.00	e.04	1.2	.00	.11	16	24	12
13	.00	.00	e.00	e.00	e.00	e.04	.92	.00	4.6	15	24	11
14	.00	.00	e.00	e.00	e.00	e.00	.88	.00	3.2	14	22	10
15	.00	e.00	e.00	e.00	e.00	e.04	.78	.00	2.4	14	20	9.5
16	.00	e.00	e.00	e.00	e.00	e.11	.60	.00	2.2	12	18	8.4
17	.00	e.00	e.00	e.00	e.00	e.07	.42	.00	4.1	9.4	17	7.6
18	.00	e.00	e.00	e.00	e.00	e.11	.35	.00	4.9	8.1	16	7.1
19	.00	e.00	e.00	e.00	e.00	e.18	.32	.00	4.2	6.8	14	6.8
20	.00	e.00	e.00	e.00	e.00	e.07	.28	.00	3.5	5.2	14	6.3
21	.00	e.00	e.00	e.00	e.00	e.18	.25	.00	3.0	4.3	13	6.9
22	.00	e.00	e.00	e.00	e.00	e.14	.25	.00	2.8	4.8	22	6.9
23	.00	e.00	e.00	e.00	e.00	e.71	.18	.00	2.4	5.3	90	6.3
24	.00	e.00	e.00	e.00	e.00	e.81	.11	.00	2.6	5.2	306	5.6
25	.00	e.00	e.00	e.00	e.00	e.64	.11	.00	3.0	8.4	245	5.2
26	.00	e.00	e.00	e.00	e.00	e5.0	.11	.00	2.5	32	203	4.4
27	.00	e.00	e.00	e.00	e.00	e8.7	.11	.00	2.1	40	160	4.2
28	.00	e.00	e.00	e.00	e.00	e9.1	.11	.00	1.9	87	136	3.8
29	.00	e.00	e.00	e.00	---	e5.1	.11	.00	2.0	172	116	3.7
30	.00	e.00	e.00	e.00	---	e16	.14	.00	1.8	159	98	3.6
31	.00	---	e.00	e.00	---	e19	---	.00	---	144	77	---
TOTAL	0.00	0.00	0.00	0.00	0.00	67.60	57.67	0.50	53.86	844.2	2167	437.3
MEAN	.000	.000	.000	.000	.000	2.18	1.92	.016	1.80	27.2	69.9	14.6
MAX	.00	.00	.00	.00	.00	.19	.15	.14	4.9	172	306	58
MIN	.00	.00	.00	.00	.00	.00	.11	.00	.00	1.5	13	3.6
AC-FT	.00	.00	.00	.00	.00	134	114	1.0	107	1670	4300	867

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1993, BY WATER YEAR (WY)

	MEAN	.95	.40	.093	.028	1.60	26.6	62.2	20.7	7.91	5.85	4.69	1.51
MAX	10.9	6.00	1.42	.28	27.9	285	311	169	100	41.1	69.9	16.5	
(WY)	1976	1976	1976	1976	1983	1976	1979	1975	1975	1986	1993	1975	
MIN	.000	.000	.000	.000	.000	.000	.016	.010	.000	.000	.000	.000	.000
(WY)	1962	1962	1961	1962	1962	1965	1991	1990	1980	1961	1961	1961	1961

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1960 - 1993

ANNUAL TOTAL	255.33	3628.13	
ANNUAL MEAN	.70	9.94	10.8
HIGHEST ANNUAL MEAN			51.9
LOWEST ANNUAL MEAN			.029
HIGHEST DAILY MEAN	42	Apr 23	1410
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW		347	1700
INSTANTANEOUS PEAK STAGE		7.26	14.39
ANNUAL RUNOFF (AC-FT)	506	7200	7790
10 PERCENT EXCEEDS	.47	21	12
50 PERCENT EXCEEDS	.00	.04	.04
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970, 1972 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: August 1983 to current year.

PH: August 1992 to current year.

WATER TEMPERATURE: August 1983 to current year.

DISSOLVED OXYGEN: May 1993 to September 1993.

INSTRUMENTATION.--Water-quality monitor since August 1983.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,490 microsiemens, Apr. 28, 1991; minimum, 94 microsiemens,

Apr. 5, 1990.

WATER TEMPERATURE: Maximum, 28.6°C, June 7, 11, 1988; minimum, 0.0°C several days during winter months each year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	
NOV 17...	1215	0.05	1700	8.3	4.0	2.0	7.1	54	420	--	<1	59	
MAR 08...	1410	2.8	1950	8.2	5.0	0.0	2.3	17	500	--	K4	72	
29...	1540	170	3500	8.2	6.0	1.0	3.1	23	--	631	K100	--	
31...	1300	112	2250	8.4	4.5	0.5	10.6	78	--	400	K8	--	
APR 06...	1030	65	1150	8.2	5.5	2.5	10.0	79	200	--	<1	34	
14...	1010	20	1400	8.7	11.0	6.5	16.2	140	250	--	<1	45	
MAY 07...	0945	11	1290	8.2	13.0	17.0	4.8	53	270	--	37	49	
JUN a08...	0930	4.2	1440	8.7	12.0	14.5	5.5	59	330	--	680	53	
AUG 31...	1300	172	1000	8.2	20.0	17.0	7.2	81	160	--	--	32	
DATE		MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM AD-SORP-TION RATIO (00931)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	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, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
NOV 17...	67	220	5	320	110	0.30	1	1110	<0.050	--	0.050	--	--
MAR 08...	77	250	5	--	--	--	9	--	--	0.320	--	--	1.70
29...	--	--	--	1000	150	0.90	15	2540	--	0.053	--	--	3.30
31...	--	--	--	700	47	0.50	7	1560	--	0.053	--	--	0.010
APR 06...	27	170	5	350	25	0.20	11	808	--	0.200	--	--	0.420
14...	34	220	6	410	36	0.20	32	978	--	<0.050	--	--	0.030
MAY 07...	37	150	4	330	36	0.20	15	804	--	<0.050	--	--	0.060
JUN a08...	49	210	5	410	120	0.40	<1	1220	--	<0.050	--	--	0.030
AUG 31...	20	180	6	250	16	0.20	10	724	--	--	--	--	--
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)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM, TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	
NOV 17...	1.9	1.9	0.540	20	5	<100	<10	730	<1	9	<1	<1	
MAR 08...	--	4.5	1.90	120	10	200	<10	780	<1	1	1	1	
29...	--	7.5	1.10	180	18	100	<10	1900	<1	<1	<1	<1	
31...	--	1.6	0.420	160	4	<100	<10	460	<1	--	--	2	
APR 06...	--	1.9	0.230	--	2	<100	<10	220	<1	<1	<1	<1	
14...	--	2.0	0.260	--	3	<100	<10	310	<1	<1	<1	1	
MAY 07...	--	1.2	0.250	--	4	<100	<10	310	<1	<1	<1	1	
JUN a08...	--	1.7	0.520	100	6	<100	<10	500	<1	<1	<1	<1	
AUG 31...	--	--	--	60	7	<100	<10	240	<1	<1	<1	<1	

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	MOLYB- DENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	SELE- NIUM, TOTAL RECOVERABLE (UG/L AS SE) (01147)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALDI- CARB WATER WHOLE TOT.REC (UG/L) (82619)
NOV 17...	<1	140	<1	2	4	<1	20	24	3	--	--
MAR 08...	2	370	<1	<1	5	<1	20	40	8	--	--
29...	2	480	<1	3	6	1	<10	36	3	--	--
31...	<1	280	<1	3	4	<1	<10	22	3	--	--
APR 06...	3	310	<1	4	2	<1	10	17	<1	--	--
14...	4	330	2	3	3	<1	20	19	<1	<0.05	<0.5
MAY 07...	<1	220	<1	1	2	<1	<10	19	1	--	--
JUN a08...	1	190	<1	1	2	<1	<10	22	2	--	--
AUG 31...	2	430	<1	2	4	<1	<10	21	4	--	--

DATE	ALDI- CARB SULFONE WATER WHOLE TOT.REC (UG/L) (82587)	ALDICAR SULF- OXIDE WATER WHOLE TOT.REC (UG/L) (82586)	ALDRIN, TOTAL (UG/L) (39330)	AMETRYN WATER, DISS, REC, (UG/L) (38401)	ATRA- ZINE, WATER, DISS, REC, (UG/L) (39632)	TRIAZIN SCREEN WAT,WH REC,AS ATRAZIN (UG/L) (34757)	TRIAZIN SCREEN WAT,DIS REC,AS ATRAZIN (UG/L) (34756)	CARBO- FURAN WATER WHOLE TOT.REC (UG/L) (82615)	CARBO- FURAN, TOTAL SCREEN (UG/L) (99902)	CARBO- FURAN, DIS SCREEN (UG/L) (99901)	3-HYDRX CARBO- FURAN WATER WHOLE TOT.REC (UG/L) (82584)
APR 14...	<0.5	<0.5	<0.010	<0.05	<0.05	--	--	<0.5	<0.06	--	<0.5
JUN a08...	--	--	--	--	--	--	<0.05	--	--	<0.06	--
AUG 31...	--	--	--	--	--	<0.05	--	--	<0.06	--	--

DATE	CHLOR- DANE, TOTAL (UG/L) (39350)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L) (38932)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	CYANA- ZINE, TOTAL SCREEN (UG/L) (99904)	CYANA- ZINE, DIS SCREEN (UG/L) (99903)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DEF TOTAL (UG/L) (39040)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DEISO- PROPYL ATRAZIN WATER, DISS, REC (UG/L) (04038)
APR 14...	<0.1	<0.01	<0.20	<0.04	--	<0.010	<0.010	<0.010	<0.01	<0.05	<0.05
JUN a08...	--	--	--	--	<0.04	--	--	--	--	--	--
AUG 31...	--	--	--	0.06	--	--	--	--	--	--	--

DATE	DI- AZINON, TOTAL (UG/L) (39570)	DICAMBA (MED- IBEN) (BAN- VEL D) TOTAL (UG/L) (82052)	DI- ELDRIN TOTAL (UG/L) (39380)	DI- SYSTON TOTAL (UG/L) (39011)	ENDO- SULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L) (82614)	HEPTA- CHLOR, TOTAL (UG/L) (39410)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)
APR 14...	<0.01	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

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05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	MALA- THION, TOTAL (UG/L) (39530)	METHIO- CARB WATER WHOLE RECOV. (UG/L) (30282)	METHO- MYL TOTAL (UG/L) (39051)	METH- OXY- CHLOR, TOTAL (UG/L) (39480)	METHYL PARA- THION, TOTAL (UG/L) (39600)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MIREX, TOTAL (UG/L) (39755)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L) (39250)	OXYAMYL WATER TOT.REC (UG/L) (82613)	PCB, TOTAL (UG/L) (39516)
APR 14...	<0.01	<0.5	<0.5	<0.01	<0.01	<0.05	<0.05	<0.01	<0.10	<0.5	<0.1
DATE	PARA- THION, TOTAL (UG/L) (39540)	PER- THANE TOTAL (UG/L) (39034)	PHORATE TOTAL (UG/L) (39023)	PICLO- RAM (TOR- DON) (AMDON) TOTAL (UG/L) (39720)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRO- METRYN, WATER, DISS, REC (UG/L) (04036)	PROP- AZINE WATER DISS REC (UG/L) (38535)	PROPHAM TOTAL (UG/L) (39052)	PROPO- 88UR WATER WHOLE RECOV. (UG/L) (30296)	SEVIN, TOTAL (UG/L) (39750)	SILVEX, TOTAL (UG/L) (39760)
APR 14...	<0.01	<0.1	<0.01	<0.01	<0.05	<0.05	<0.05	<0.5	<0.5	<0.5	<0.01
DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TOX- APHENE, TOTAL (UG/L) (39400)	TOTAL TRI- THION (UG/L) (39786)	1-NAPH- THOL WATER WHOLE REC (UG/L) (77441)	2, 4-D, TOTAL (UG/L) (39730)	2, 4-D, SCREEN TOTAL (UG/L) (99906)	2, 4-D, SCREEN DIS (UG/L) (99905)	2, 4-DP TOTAL (UG/L) (82183)	2, 4, 5-T TOTAL (UG/L) (39740)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
MAR 29...	--	--	--	--	--	--	--	--	--	15.0	1.10
MAR 31...	--	--	--	--	--	--	--	--	--	8.00	1.20
APR 06...	--	--	--	--	--	--	--	--	--	21.0	1.40
APR 14...	<0.05	<1	<0.01	<0.5	<0.01	--	--	<0.01	<0.01	45.0	2.50
MAY 07...	--	--	--	--	--	--	--	--	--	19.0	3.80
JUN a08...	--	--	--	--	--	--	<0.700	--	--	2.10	<0.100
AUG 31...	--	--	--	--	--	0.800	--	--	--	40.0	6.60

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	1500	1480	1490
16	---	---	---	---	---	---	---	---	---	1510	1480	1500
17	---	---	---	---	---	---	---	---	---	1530	1510	1520
18	---	---	---	---	---	---	---	---	---	1540	1520	1530
19	---	---	---	---	---	---	---	---	---	1550	1530	1540
20	---	---	---	---	---	---	---	---	---	1560	1540	1550
21	---	---	---	---	---	---	---	---	---	1600	1550	1570
22	---	---	---	---	---	---	---	---	---	1610	1560	1590
23	---	---	---	---	---	---	---	---	---	1620	1590	1600
24	---	---	---	---	---	---	---	---	---	1630	1580	1610
25	---	---	---	---	---	---	---	---	---	1640	1600	1620
26	---	---	---	---	---	---	---	---	---	1640	1610	1630
27	---	---	---	---	---	---	---	---	---	1650	1610	1630
28	---	---	---	---	---	---	---	---	---	1640	1610	1630
29	---	---	---	---	---	---	---	---	---	1640	1590	1620
30	---	---	---	---	---	---	---	---	---	1610	1580	1600
31	---	---	---	---	---	---	---	---	---	1620	1570	1600
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	1640	1590	1610	1580	1550	1570	---	---	---	1000	958	975
2	1630	1560	1610	1590	1540	1570	---	---	---	988	953	969
3	1570	1510	1540	1590	1500	1550	---	---	---	995	977	987
4	1550	1520	1540	1530	1480	1510	---	---	---	984	940	962
5	1550	1510	1540	1490	1450	1470	---	---	---	951	923	938
6	1540	1510	1520	1480	1460	1480	---	---	---	927	910	919
7	1530	1490	1520	1500	1460	1480	---	---	---	965	920	938
8	1500	1430	1450	---	---	---	---	---	---	992	958	975
9	1450	1430	1440	---	---	---	---	---	---	1020	990	1000
10	1470	1430	1450	---	---	---	2080	2050	2070	1030	1020	1030
11	1520	1470	1500	---	---	---	2050	1930	2000	1050	1030	1040
12	1520	1460	1490	---	---	---	1930	1750	1850	1050	1040	1050
13	1510	1460	1490	---	---	---	1780	1670	1730	1070	1040	1060
14	1540	1480	1500	---	---	---	1680	1620	1650	1090	1060	1080
15	1540	1490	1520	---	---	---	1620	1460	1570	1100	1080	1090
16	1530	1490	1510	---	---	---	1580	1470	1540	1110	1090	1110
17	1540	1480	1510	---	---	---	1500	1400	1450	1130	1110	1120
18	1540	1500	1520	---	---	---	1410	1310	1350	1140	1110	1130
19	1570	1530	1550	---	---	---	1310	1250	1270	1140	1120	1130
20	1590	1530	1560	---	---	---	1250	1220	1240	1150	1130	1140
21	1590	1540	1570	---	---	---	1250	1220	1230	1150	1130	1140
22	1600	1570	1590	---	---	---	1240	1200	1220	1140	1130	1140
23	1590	1560	1580	---	---	---	1260	1220	1240	1150	1120	1130
24	1570	1550	1560	---	---	---	1250	1220	1240	1140	1120	1130
25	1560	1530	1550	---	---	---	1260	1220	1240	1130	1120	1130
26	1550	1530	1540	---	---	---	1250	1230	1250	1150	1120	1140
27	1540	1510	1540	---	---	---	1260	1230	1250	1170	1140	1150
28	1580	1530	1550	---	---	---	1230	1010	1110	1170	1110	1140
29	1600	1570	1580	---	---	---	1120	908	1050	1120	1090	1100
30	1590	1550	1570	---	---	---	962	846	897	1120	1100	1110
31	---	---	---	---	---	---	1010	962	994	---	---	---
MONTH	1640	1430	1530	---	---	---	---	---	---	1170	910	1070

RED RIVER OF THE NORTH BASIN

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05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	8.7	8.4	8.7	8.4	8.5	8.1	8.3	8.0
2	---	---	---	---	8.8	8.5	8.8	8.4	8.5	8.3	8.4	8.1
3	---	---	---	---	8.7	8.3	8.7	8.3	8.6	8.3	8.4	8.1
4	---	---	---	---	8.6	8.2	8.3	8.2	8.5	8.4	8.4	8.1
5	---	---	---	---	8.6	8.3	8.5	8.0	8.6	8.4	8.3	8.1
6	---	---	---	---	8.6	8.3	8.4	8.1	8.5	8.4	8.3	8.0
7	---	---	---	---	8.8	8.5	8.4	8.1	8.6	8.3	8.3	8.0
8	---	---	---	---	8.7	8.4	8.5	8.2	8.6	8.4	8.4	8.0
9	---	---	---	---	8.9	8.5	8.7	8.3	8.7	8.4	8.3	8.0
10	---	---	---	---	8.9	8.6	8.7	8.5	8.8	8.6	8.4	8.1
11	---	---	---	---	9.0	8.7	8.6	8.4	8.9	8.6	8.5	8.1
12	---	---	---	---	8.9	8.4	8.9	8.4	8.8	8.6	8.4	8.1
13	---	---	---	---	8.6	8.3	8.9	8.5	8.8	8.6	8.4	8.1
14	---	---	---	---	8.7	8.4	8.7	8.4	8.7	8.6	8.5	8.1
15	---	---	8.4	8.1	8.5	8.3	8.6	8.4	8.6	8.4	8.5	8.2
16	---	---	8.5	8.2	8.5	8.4	8.5	8.2	8.5	8.3	8.6	8.2
17	---	---	8.5	8.3	8.5	8.2	8.6	8.4	8.4	8.2	8.6	8.2
18	---	---	8.7	8.2	8.4	8.1	8.6	8.4	8.4	8.1	8.6	8.3
19	---	---	8.6	8.4	8.4	8.1	8.8	8.5	8.4	8.1	8.5	8.3
20	---	---	8.6	8.4	8.4	8.2	8.7	8.5	8.3	8.1	8.5	8.3
21	---	---	8.7	8.4	8.6	8.3	8.6	8.5	8.4	8.1	8.4	8.3
22	---	---	8.7	8.3	8.6	8.3	8.6	8.3	8.3	7.6	8.4	8.1
23	---	---	8.6	8.3	8.5	8.3	8.5	8.1	8.3	8.0	8.4	8.1
24	---	---	8.6	8.3	8.4	8.3	8.6	8.3	8.3	7.9	8.3	8.1
25	---	---	8.6	8.3	8.5	8.3	8.4	8.2	8.3	8.1	8.4	8.1
26	---	---	8.7	8.4	8.5	8.3	8.6	8.2	8.4	8.2	8.4	8.1
27	---	---	8.7	8.4	8.6	8.3	8.4	8.2	8.4	8.1	8.5	8.2
28	---	---	8.6	8.5	9.0	8.5	8.4	8.2	8.4	8.1	8.5	8.1
29	---	---	8.7	8.5	8.9	8.5	8.4	8.0	8.3	8.0	8.4	8.2
30	---	---	8.6	8.4	8.7	8.2	8.3	8.1	8.2	7.9	8.4	8.2
31	---	---	8.7	8.4	---	---	8.4	8.1	8.3	8.1	---	---
MONTH	---	---	---	---	9.0	8.1	8.9	8.0	8.9	7.6	8.6	8.0

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	18.8	16.2	17.4
16	---	---	---	---	---	---	---	---	---	17.9	13.6	15.6
17	---	---	---	---	---	---	---	---	---	16.6	14.9	15.8
18	---	---	---	---	---	---	---	---	---	15.6	13.4	14.3
19	---	---	---	---	---	---	---	---	---	14.8	12.6	13.6
20	---	---	---	---	---	---	---	---	---	17.6	11.5	14.3
21	---	---	---	---	---	---	---	---	---	17.5	13.1	15.6
22	---	---	---	---	---	---	---	---	---	20.8	15.1	17.9
23	---	---	---	---	---	---	---	---	---	19.2	15.5	17.6
24	---	---	---	---	---	---	---	---	---	16.7	14.2	15.2
25	---	---	---	---	---	---	---	---	---	19.0	12.8	15.2
26	---	---	---	---	---	---	---	---	---	15.5	13.2	14.1
27	---	---	---	---	---	---	---	---	---	13.2	11.6	12.3
28	---	---	---	---	---	---	---	---	---	14.6	10.9	12.9
29	---	---	---	---	---	---	---	---	---	13.6	12.8	13.3
30	---	---	---	---	---	---	---	---	---	17.3	12.0	14.3
31	---	---	---	---	---	---	---	---	---	18.6	12.9	15.6

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	20.3	14.3	17.2	20.5	17.5	18.9	23.2	21.3	22.2	17.8	16.9	17.3
2	18.2	14.4	15.9	24.2	17.0	20.4	21.9	21.0	21.3	17.9	16.8	17.3
3	18.8	13.3	15.7	21.1	18.2	19.3	21.1	19.6	20.3	18.4	16.2	17.2
4	19.5	14.8	17.2	21.3	17.7	19.2	20.2	18.6	19.5	17.6	16.7	17.1
5	17.9	15.6	16.8	19.3	17.1	17.8	21.1	18.9	19.9	17.1	16.0	16.6
6	20.2	15.1	17.5	18.3	15.9	17.1	21.2	18.6	19.9	16.3	14.7	15.6
7	19.3	15.9	17.3	20.8	15.7	18.1	21.9	19.4	20.6	16.5	14.3	15.3
8	16.4	14.5	15.4	19.5	16.7	18.0	22.0	20.5	21.2	17.8	15.3	16.4
9	20.5	14.4	17.1	21.0	16.2	18.3	23.5	20.4	21.9	17.1	15.7	16.3
10	23.5	17.4	20.2	21.6	17.7	19.6	23.4	21.6	22.5	17.0	14.1	15.6
11	24.3	20.1	22.1	21.5	17.0	19.2	24.4	21.9	23.0	17.9	14.2	16.1
12	23.7	20.8	22.5	19.8	16.8	18.3	23.5	21.5	22.5	17.5	14.3	15.7
13	22.2	18.2	19.8	19.5	17.2	18.5	22.4	20.4	21.4	14.3	12.2	12.8
14	22.0	16.0	18.4	20.5	17.2	18.9	22.9	20.7	21.7	12.7	10.2	11.6
15	20.6	17.3	18.8	20.0	18.2	18.7	23.8	20.6	22.2	12.9	10.4	11.7
16	18.4	16.3	16.9	18.8	18.3	18.6	24.1	21.2	22.7	12.8	11.2	12.0
17	22.2	14.5	17.8	21.2	17.1	19.0	24.3	21.9	23.1	12.4	10.0	11.3
18	21.9	16.0	18.8	21.0	19.2	19.9	22.9	20.3	21.8	12.9	10.2	11.7
19	23.7	17.7	20.5	21.6	18.3	19.9	23.0	20.5	21.7	12.7	10.9	12.0
20	27.1	19.5	22.8	22.1	18.8	20.4	23.1	20.1	21.6	14.1	11.3	12.6
21	26.7	21.6	24.2	21.0	19.6	20.1	23.6	20.4	22.0	13.4	12.0	12.7
22	25.8	22.6	23.9	21.9	19.3	20.3	23.6	21.8	22.5	13.1	10.8	11.8
23	22.8	19.4	21.0	21.8	20.2	21.0	23.9	21.3	22.5	12.9	10.4	11.7
24	19.4	16.8	18.0	22.9	19.3	21.0	23.7	21.2	22.6	13.5	11.1	12.2
25	17.1	14.6	15.7	22.4	20.4	21.4	23.1	21.3	22.2	13.0	11.4	12.2
26	15.9	14.2	14.9	24.7	20.4	22.3	21.9	20.6	21.0	12.2	10.0	11.1
27	18.4	13.1	15.4	23.9	21.2	22.0	21.5	19.5	20.4	12.0	10.4	11.1
28	19.8	15.0	16.8	23.4	19.9	21.5	20.6	19.3	19.9	11.2	9.8	10.5
29	16.6	14.6	15.2	25.7	21.0	23.0	19.9	18.6	19.2	10.9	9.4	10.2
30	22.1	14.6	18.0	25.3	22.7	23.9	18.6	17.6	18.1	11.6	9.8	10.6
31	---	---	---	24.8	21.7	23.3	18.3	16.4	17.3	---	---	---
MONTH	27.1	13.1	18.4	25.7	15.7	19.9	24.4	16.4	21.2	18.4	9.4	13.5

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

RED RIVER OF THE NORTH BASIN

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05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	11.1	7.9	9.6	9.8	6.8	8.1	8.9	4.1	6.3	7.8	6.0	6.8
2	10.1	7.2	8.6	9.9	6.7	8.2	8.1	4.8	6.4	8.5	6.1	7.1
3	8.8	6.2	7.2	8.5	5.1	6.8	7.0	4.7	5.9	9.0	6.2	7.5
4	9.2	6.3	8.4	7.3	3.7	5.5	7.2	4.6	5.7	8.9	6.3	7.4
5	8.8	6.6	8.0	8.2	5.1	6.5	7.5	4.6	6.0	9.1	6.4	7.6
6	9.0	6.1	7.1	9.4	4.8	6.9	7.4	4.7	6.0	9.0	6.5	7.7
7	9.5	6.2	7.9	11.5	6.3	8.6	8.4	4.8	6.3	9.5	6.8	8.0
8	8.5	5.1	6.5	10.7	6.6	8.7	7.6	5.1	6.2	9.6	6.7	8.0
9	12.7	5.8	8.8	11.8	6.0	8.3	8.7	4.2	6.2	9.1	6.4	7.7
10	12.4	5.6	8.6	11.2	5.2	8.0	7.2	4.5	5.7	10.5	6.6	8.3
11	11.2	4.7	7.2	11.4	4.9	7.7	8.0	3.9	5.7	11.0	6.6	8.6
12	8.0	4.0	5.9	10.7	5.5	7.8	8.2	4.1	5.9	8.8	6.4	7.3
13	7.2	4.8	5.9	8.5	6.0	7.1	7.3	4.4	5.6	9.7	6.4	7.8
14	8.4	5.5	6.7	9.2	4.6	6.6	6.1	3.9	4.9	11.6	7.5	9.3
15	9.1	6.2	7.6	7.2	4.3	5.5	6.3	3.3	4.6	11.9	8.2	10.0
16	7.4	4.6	6.0	5.7	3.6	4.7	6.2	3.2	4.6	11.4	8.2	9.8
17	7.2	3.6	5.2	9.6	4.0	6.4	6.4	2.9	4.6	11.3	8.3	9.9
18	7.7	4.0	5.9	8.2	4.6	6.7	7.0	3.0	4.9	10.9	8.4	9.7
19	7.9	6.6	7.3	10.5	5.0	7.2	7.0	3.4	5.1	10.6	8.2	9.4
20	8.7	6.4	7.3	10.3	5.5	7.8	8.0	3.8	5.6	10.5	8.1	9.3
21	8.1	5.6	6.7	8.2	5.5	7.0	8.3	3.7	5.8	9.5	7.8	8.2
22	7.0	4.7	5.8	8.9	4.7	6.5	6.2	3.3	4.6	10.2	7.2	8.5
23	6.8	3.8	5.3	8.4	4.1	6.4	7.4	2.9	4.9	10.3	8.0	9.1
24	7.8	3.1	5.6	10.0	4.1	6.7	7.9	3.1	5.3	10.2	8.1	9.2
25	8.8	6.0	7.3	6.6	4.6	5.5	7.1	3.7	5.3	10.0	7.8	9.0
26	10.2	6.1	8.3	9.7	4.1	6.3	6.9	4.3	5.4	10.5	8.1	9.3
27	10.5	7.7	9.1	5.7	4.2	4.9	8.3	4.3	6.1	10.4	8.7	9.4
28	11.4	7.4	9.1	7.2	3.0	4.9	6.7	4.9	5.7	10.6	8.8	9.5
29	9.9	6.7	7.9	8.5	3.7	5.7	5.8	5.2	5.5	10.5	8.9	9.6
30	9.5	5.2	7.2	7.6	4.0	5.4	7.3	4.7	5.9	10.5	8.9	9.5
31	---	---	---	8.7	3.3	5.8	8.5	5.8	7.0	---	---	---
MONTH	12.7	3.1	7.3	11.8	3.0	6.7	8.9	2.9	5.6	11.9	6.0	8.6

RED RIVER OF THE NORTH BASIN

05115500 LAKE DARLING NEAR FOXHOLM, ND

LOCATION.--Lat 48°27'27", long 101°35'14", in NE¹/₄NE¹/₄ sec.1, T.157 N., R.85 W., Ward County, Hydrologic Unit 09010001, on control structure of Lake Darling Dam, reservoir of Fish and Wildlife Service, on Souris River about 6 mi north of Foxholm, and at mile 430.0.

DRAINAGE AREA.--9,450 mi², approximately, of which about 6,200 mi² is probably noncontributing.

MONTHEND-GAGE HEIGHT AND CONTENTS RECORDS

PERIOD OF RECORD.--April 1936 to current year (no winter records 1936-39).

REVISED RECORDS.--WSP 1338: 1942. WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,577.00 ft above sea level. April 1936 to Aug. 8, 1963, nonrecording gages at same site and datum.

REMARKS.--Reservoir is formed by earth dam; storage began in April 1936; dam completed in July 1936. Usable capacity, 108,500 acre-ft between gage heights of 0.0 ft, sill of control gages, and 21.0 ft, crest of spillway. Dead storage, 3,500 acre-ft. Figures given herein represent total contents based on capacity table dated June 7, 1943. Water is used during periods of low flow at wildlife refuges downstream. Elevations are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 145,400 acre-ft Apr. 17, 1976, gage height, 24.24 ft; minimum observed since April 1943 when reservoir was first filled to spillway level, 31,200 acre-ft, Feb. 18 and 25, 1963, gage height, 10.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 38,800 acre-ft, Sept. 16, gage height, 11.75 ft; minimum daily contents, 32,700 acre-ft, June 29, gage height, 10.43 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	11.43	37,200	--
Oct. 31-----	11.11	35,200	-1,600
Nov. 30-----	11.24	36,200	+600
Dec. 31-----	11.27	36,400	+200
CAL YR 1992-----	--	--	-8,200
Jan. 31-----	11.40	37,000	+600
Feb. 28-----	11.44	37,200	+200
Mar. 31-----	11.38	36,900	-300
Apr. 30-----	10.92	34,700	-2,200
May 31-----	10.62	33,500	-1,200
June 30-----	10.52	33,100	-400
July 31-----	11.05	35,200	+2,100
Aug. 31-----	11.44	37,200	+2,000
Sept. 30-----	11.72	38,600	+1,400
WTR YR 1993-----	--	--	+1,400

RED RIVER OF THE NORTH BASIN

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05115500 LAKE DARLING NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1992 to September 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	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)
OCT											
06...	1208	0.50	1.0	1660	8.3	310	388	50	45	240	6
06...	1235	2.5	3.0	1650	8.3	310	412	50	45	240	6
MAR											
04...	1000	1.0	1.6	2350	8.0	470	--	74	69	370	7
04...	1005	3.4	4.0	2340	8.0	490	--	77	72	390	8
MAY											
19...	1100	0.50	1.0	1730	8.7	350	--	55	51	270	6
19...	1105	2.8	3.3	1730	8.7	350	--	55	51	270	6
JUN											
a10...	1100	0.0	0.50	1610	8.8	300	--	49	43	220	6
a10...	1130	2.7	3.2	1610	8.8	320	--	52	46	230	6
10...	1200	0.0	2.4	--	--	--	--	--	--	--	--
JUL											
27...	1145	0.70	1.0	1540	8.7	310	--	50	44	220	5
27...	1150	3.2	3.5	1550	8.7	300	--	49	43	220	6
SEP											
08...	0925	0.80	1.0	1610	8.5	300	--	51	42	230	6
08...	0930	3.3	3.5	1620	8.4	310	--	52	43	230	6
08...	0935	0.0	1.5	--	--	--	--	--	--	--	--

DATE	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)	RESIDUE TOTAL AT 105 DEG. C, PENDE (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
OCT											
06...	471	1	340	100	0.50	74	1080	0.160	--	0.590	--
06...	459	22	340	100	0.50	32	1080	0.190	--	0.510	--
MAR											
04...	--	--	470	140	0.50	<1	1610	--	0.510	--	1.70
04...	--	--	490	150	0.50	13	1700	--	0.440	--	1.60
MAY											
19...	--	--	360	96	0.40	13	1130	--	0.130	--	0.240
19...	--	--	370	98	0.40	2	1170	--	0.120	--	0.250
JUN											
a10...	--	--	330	92	0.40	1	1040	--	0.160	--	0.110
a10...	--	--	340	93	0.40	5	1090	--	0.160	--	0.130
JUL											
27...	--	--	320	81	0.40	349	1020	--	<0.050	--	0.070
27...	--	--	330	81	0.40	357	1070	--	<0.050	--	0.070
SEP											
08...	--	--	320	89	0.40	9	1070	--	--	--	--
08...	--	--	320	91	0.40	21	1060	--	--	--	--

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)
OCT											
06...	2.4	3.0	3.2	0.970	--	--	--	--	--	--	--
06...	2.3	2.8	3.0	0.990	--	--	--	--	--	--	--
MAR											
04...	--	4.4	--	1.40	30	17	100	<10	1600	<1	<1
04...	--	4.3	--	1.40	60	19	<100	<10	1800	<1	<1
MAY											
19...	--	2.4	--	0.970	160	20	<100	<10	1200	<1	<1
19...	--	2.3	--	0.910	180	17	<100	<10	1200	<1	<1
JUN											
a10...	--	1.9	--	0.800	160	15	<100	<10	1100	<1	<1
a10...	--	2.1	--	0.830	220	16	<100	<10	1100	<1	<1
JUL											
27...	--	1.9	--	0.870	930	17	<100	<10	1200	<1	1
27...	--	2.3	--	0.780	980	18	200	<10	1100	<1	<1
SEP											
08...	--	--	--	--	180	20	100	<10	1100	<1	<1
08...	--	--	--	--	200	23	100	<10	1100	<1	<1

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05115500 LAKE DARLING NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SELE- NIUM, TOTAL (UG/L AS SE) (01147)	ZINC, TOTAL RECOV- ERABLE (UG/L AS 2N) (01092)
MAR										
04...	1	<1	90	2	--	<0.1	8	8	<1	10
04...	<1	6	110	<1	--	<0.1	8	8	<1	10
MAY										
19...	1	3	290	<1	--	<0.1	6	6	<1	<10
19...	<1	3	340	1	--	0.1	6	6	<1	<10
JUN										
a10...	<1	3	270	<1	<0.10	--	6	6	<1	<10
a10...	<1	4	400	<1	0.20	--	6	5	<1	<10
JUL										
27...	1	5	1900	2	<0.10	--	6	7	<1	20
27...	2	13	2000	2	<0.10	--	7	7	<1	30
SEP										
08...	<1	3	350	<1	0.10	--	8	5	<1	20
08...	<1	2	400	<1	<0.10	--	8	5	<1	20

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	ALA- CHLOR, WATER, DISS, REC, TOTAL (UG/L) (46342)	ATRA- ZINE, WATER, DIS REC TOTAL (UG/L) (39632)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE, WATER, DISS, REC TOTAL (UG/L) (04041)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	DEETHYL ATRA- ZINE, WATER, DISS, REC TOTAL (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)
OCT										
06...	28	2	--	--	--	--	--	--	--	--
06...	37	2	--	--	--	--	--	--	--	--
MAR										
04...	--	2	--	--	--	--	--	--	--	--
04...	--	1	--	--	--	--	--	--	--	--
MAY										
19...	25	1	--	--	<0.06	--	<0.04	--	--	--
19...	25	1	--	--	<0.06	--	<0.04	--	--	--
JUN										
a10...	49	<1	<0.01	0.01	--	<0.01	--	<0.02	<0.01	<0.02
a10...	27	2	<0.01	0.01	--	<0.01	--	<0.02	<0.01	<0.02
JUL										
27...	28	3	--	--	--	--	--	--	--	--
27...	28	4	--	--	--	--	--	--	--	--
SEP										
08...	23	2	--	--	--	--	--	--	--	--
08...	24	2	--	--	--	--	--	--	--	--

DATE	LINDANE DIS- SOLVED (UG/L) (39341)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	2, 4-D SCREEN, TOTAL (UG/L) (99906)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT										
06...	--	--	--	--	--	--	--	--	2.90	0.300
06...	--	--	--	--	--	--	--	--	2.70	0.200
MAR										
04...	--	--	--	--	--	--	--	--	2.50	0.900
MAY										
19...	--	--	--	--	--	--	--	<0.700	--	--
19...	--	--	--	--	--	--	--	<0.700	--	--
19...	--	--	--	--	--	--	--	--	0.600	<0.100
JUN										
a10...	<0.01	<0.01	0.01	0.06	<0.01	<0.01	<0.01	--	--	--
a10...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--	--
10...	--	--	--	--	--	--	--	--	0.800	0.100
JUL										
27...	--	--	--	--	--	--	--	--	36.0	1.80
SEP										
08...	--	--	--	--	--	--	--	<0.700	--	--
08...	--	--	--	--	--	--	--	1.04	--	--
08...	--	--	--	--	--	--	--	--	1.30	<0.100

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

181

05115500 LAKE DARLING NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT							
06...	1200	10.5	0.0	1600	7.9	10.5	7.5
06...	1202	--	0.50	1600	8.0	10.5	7.4
06...	1204	--	1.0	1600	8.0	10.0	7.1
06...	1206	--	2.0	1600	8.0	10.0	6.7
06...	1207	--	3.0	1600	8.0	10.0	6.5
06...	1225	16.4	0.0	1600	8.1	11.5	8.9
06...	1226	--	0.50	1600	8.1	11.5	8.9
06...	1229	--	1.0	1600	8.1	11.0	8.8
06...	1230	--	2.0	1600	8.1	11.0	8.8
06...	1232	--	3.0	1600	8.1	11.0	8.8
06...	1234	--	4.0	1600	8.1	11.0	8.7
06...	1236	--	5.0	1600	8.1	11.0	8.5
MAR							
04...	0950	17.0	0.0	2280	7.7	2.5	2.4
04...	0951	--	0.50	2390	7.8	2.5	2.1
04...	0952	--	1.0	2380	7.8	3.0	2.3
04...	0953	--	2.0	2400	7.8	3.0	2.4
04...	0954	--	3.0	2440	7.7	3.5	1.2
04...	0955	--	4.0	2580	7.7	4.0	0.4
04...	0956	--	4.3	2600	7.7	4.5	0.3
MAY							
19...	1050	15.8	0.0	1740	8.5	13.5	9.6
19...	1051	--	1.0	1740	8.6	13.5	9.6
19...	1052	--	2.0	1750	8.5	13.5	9.0
19...	1053	--	3.0	1750	8.5	13.5	8.9
19...	1054	--	4.0	1750	8.6	13.5	8.8
19...	1055	--	4.8	1750	8.6	13.5	8.7
JUN							
10...	1040	16.5	0.0	1630	8.8	16.5	9.0
10...	1042	--	0.50	1630	8.8	16.5	8.9
10...	1044	--	1.0	1640	8.8	16.5	8.9
10...	1046	--	1.5	1640	8.8	16.5	8.8
10...	1050	--	2.0	1640	8.8	16.5	8.1
10...	1052	--	2.5	1640	8.8	15.5	8.0
10...	1054	--	3.0	1640	8.8	15.0	7.7
10...	1056	--	3.5	1640	8.8	14.5	7.3
10...	1058	--	4.0	1630	8.8	14.5	7.3
JUL							
27...	1130	12.8	0.0	1530	8.9	21.0	7.8
27...	1132	--	0.90	1530	9.0	21.0	7.8
27...	1134	--	1.8	1540	9.0	21.0	7.7
27...	1136	--	2.8	1530	9.0	21.0	7.7
27...	1138	--	3.9	1530	8.9	20.5	7.6
SEP							
08...	0915	11.0	0.0	1610	8.5	15.0	8.9
08...	0916	--	0.70	1610	8.5	15.0	8.8
08...	0917	--	1.1	1610	8.5	15.0	8.8
08...	0918	--	1.8	1610	8.5	15.0	8.7
08...	0919	--	2.8	1610	8.5	15.0	8.7
08...	0920	--	3.7	1610	8.5	15.0	8.6
08...	0921	--	4.0	1610	8.5	15.0	8.6

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
06...	70	730	--	12.0	13.5	--	--
06...	86	730	--	16.0	13.5	--	--
MAR							
04...	18	722	2.15	48.0	5.0	--	--
MAY							
19...	98	720	--	60.0	14.5	40	<5.0
JUN							
10...	99	716	--	47.0	24.0	240	8.0
JUL							
27...	94	710	--	12.0	18.5	30	15
SEP							
08...	96	711	--	31.0	17.0	220	15

RED RIVER OF THE NORTH BASIN

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, ND

LOCATION.--Lat 48°22'20", long 101°30'18", in SW $\frac{1}{4}$ SE $\frac{1}{4}$, sec.34, T.157 N., R.84 W., Ward County, Hydrologic Unit 09010001, on left bank 30 ft upstream from county highway bridge, 3 mi east of Foxholm, 19 mi upstream from Des Lacs River, and at mile 414.5.

DRAINAGE AREA.--9,470 mi², approximately, of which about 6,200 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1904 to November 1905, March to July 1906 (gage heights only), October 1936 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River near Foxholm, 1904-6.

REVISED RECORDS.--WSP 1308: 1905. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and sheet piling weir. Datum of gage is 1,560.73 ft above sea level. June 23, 1904, to July 31, 1906, nonrecording gage at site 3.2 mi upstream at different datum. Apr. 1, 1937, to Mar. 25, 1938, nonrecording gage at site 600 ft downstream at datum about 0.5 ft higher.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow almost completely regulated since 1936 by Lake Darling (station 05115500) 15 mi upstream and several small reservoirs, combined capacity, about 184,000 acre-feet. Some small diversions for irrigation and municipal supply.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.00	.01	.00	e.00	e.00	.01	.05	e.02	.28	10	.50
2	.08	.00	.02	.00	e.00	e.00	.01	.05	e.02	.30	6.8	5.0
3	.07	.01	.01	.00	e.00	e.00	.02	.04	9.1	.47	4.7	32
4	.06	.00	.01	.00	e.00	e.01	.02	.02	76	.93	2.8	27
5	.05	.00	.01	.00	e.00	e.01	.02	.03	74	1.2	e1.5	27
6	.03	.00	.01	.00	e.00	e.02	.02	.06	78	1.7	e.90	27
7	.02	.00	.01	.00	e.00	e.02	.02	.21	73	1.8	e.70	27
8	.01	.00	.01	.00	e.00	e.02	.02	1.1	70	1.8	e.50	27
9	.01	.01	.00	.00	e.00	e.03	.01	2.8	21	1.8	e.45	26
10	.01	.02	.01	.00	e.00	e.02	.02	1.8	12	1.7	.46	26
11	.01	.02	.00	.00	e.00	e.01	.04	.72	7.5	1.7	.47	26
12	.00	.02	.00	.00	e.00	e.01	.19	.42	6.5	1.7	.65	26
13	.00	.01	.00	e.00	e.00	e.01	44	.36	5.4	1.9	.59	26
14	.00	.01	.00	e.00	e.00	e.00	190	e.30	7.1	1.8	.70	26
15	.00	.01	.00	e.00	e.00	e.00	257	e.25	3.5	2.0	.69	26
16	.00	.01	.00	e.00	e.00	e.00	268	e.20	2.0	2.7	.60	26
17	.00	.02	.00	e.00	e.00	e.00	259	e.15	1.6	3.3	.55	26
18	.00	.02	.00	e.00	e.00	e.01	255	e.10	1.0	3.0	.45	25
19	.00	.02	.00	e.00	e.00	e.02	131	e.05	.58	3.2	.37	25
20	.00	.02	.00	e.00	e.00	e.04	4.3	e.04	.37	2.6	.32	25
21	.00	.02	.00	e.00	e.00	e.05	1.1	e.03	.29	2.4	.30	31
22	.00	.02	.00	e.00	e.00	e.05	.42	e.03	e.25	6.0	.41	24
23	.00	.02	.00	e.00	e.00	.07	.27	e.04	e.20	8.9	.49	24
24	.00	.02	.00	e.00	e.00	1.3	.19	e.05	e.15	8.3	.44	28
25	.00	.02	.00	e.00	e.00	.43	.13	e.04	e.10	7.4	.38	40
26	.00	.02	.00	e.00	e.00	.14	.10	e.03	e.02	6.1	.33	40
27	.00	.02	.00	e.00	e.00	.07	.08	e.05	e.01	26	.34	39
28	.00	.02	.00	e.00	e.00	.05	.07	e.03	e.30	46	.32	38
29	.00	.01	.00	e.00	---	.02	.06	e.04	.52	29	.45	37
30	.00	.01	.00	e.00	---	.01	.06	e.05	.36	21	.65	37
31	.00	---	.00	e.00	---	.01	---	e.03	---	14	.55	---
TOTAL	0.45	0.38	0.10	0.00	0.00	2.43	1411.18	9.17	450.89	210.98	38.86	819.50
MEAN	.015	.013	.003	.000	.000	.078	47.0	.30	15.0	6.81	1.25	27.3
MAX	.10	.02	.02	.00	.00	1.3	268	2.8	78	46	10	40
MIN	.00	.00	.00	.00	.00	.00	.01	.02	.01	.28	.30	.50
AC-FT	.9	.8	.2	.00	.00	4.8	2800	18	894	418	77	1630

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1993, BY WATER YEAR (WY)

	1937	1937	1937	1937	1937	1937	1942	1942	1991	1991	1937	1937
MEAN	26.2	28.4	27.2	27.1	28.7	80.4	475	492	154	103	54.8	34.2
MAX	108	137	144	166	241	1058	5443	4242	1138	1238	435	162
(WY)	1973	1952	1976	1976	1976	1976	1976	1975	1975	1953	1976	1955
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.017	.010	.000	.000
(WY)	1937	1937	1937	1937	1937	1937	1942	1942	1991	1991	1937	1937

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1937 - 1993

	6060.78	2943.94	128
ANNUAL TOTAL	6060.78	2943.94	128
ANNUAL MEAN	16.6	8.07	948
HIGHEST ANNUAL MEAN			1.13
LOWEST ANNUAL MEAN			1976
HIGHEST DAILY MEAN	450	Mar 25	8500
LOWEST DAILY MEAN	.00	Jan 1	a-5.0
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW		273	Apr 15
INSTANTANEOUS PEAK STAGE		7.42	Apr 15
INSTANTANEOUS LOW FLOW		.00	Oct 12
ANNUAL RUNOFF (AC-FT)	12020	5840	a,b-25
10 PERCENT EXCEEDS	7.3	26	92620
50 PERCENT EXCEEDS	.01	.03	214
90 PERCENT EXCEEDS	.00	.00	15

e Estimated.

a Reverse flow caused by backwater from the Des Lacs River.

b No flow at times in many years.

RED RIVER OF THE NORTH BASIN

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05116000 SOURIS RIVER NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)
NOV 19...	0945	0.02	2500	--	-1.0	2.0	--	--	--	--	--
MAR 22...	1600	0.05	2900	--	5.0	1.5	--	--	--	--	--
APR 14...	0930	148	2300	8.6	4.0	7.0	12.6	111	590	590	K1
15...	1205	247	2010	8.8	13.5	9.0	13.8	129	470	495	K1
20...	1000	4.7	1680	9.1	0.0	7.5	12.0	106	340	419	--
JUN a07...	1130	74	2020	8.4	15.0	16.0	8.0	87	410	486	25
AUG 09...	1630	0.37	1600	8.4	27.0	23.5	9.3	117	370	492	26

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)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C, DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
APR 14...	110	76	350	6	560	130	0.50	62	1620	--	--
15...	84	63	300	6	460	110	0.40	26	1380	<0.050	0.030
20...	56	49	250	6	330	99	0.40	7	1170	<0.050	0.040
JUN a07...	71	57	280	6	450	110	0.40	<1	1350	<0.050	0.040
AUG 09...	59	55	270	6	350	100	0.40	2	1300	<0.050	0.030

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)
APR 14...	3.2	0.660	90	12	<100	<10	920	<1	<1	<1	2
15...	2.5	0.590	90	11	<100	<10	870	<1	<1	1	3
20...	2.3	0.630	80	13	<100	<10	1200	<1	<1	<1	2
JUN a07...	2.3	0.760	90	15	<100	<10	1300	<1	<1	1	1
AUG 09...	2.7	1.30	40	14	<100	<10	1200	<1	1	<1	2

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SELE-NIUM, TOTAL RECOV-ERABLE (UG/L AS SE) (01147)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
APR 14...	190	<1	1	6	<1	10	37	2	5.20	1.20
15...	250	2	5	5	<1	30	32	2	59.0	4.70
20...	110	<1	6	5	<1	<10	27	1	6.60	0.400
JUN a07...	70	<1	5	5	<1	<10	40	2	--	--
AUG 09...	100	<1	2	4	<1	<10	26	2	--	--

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05116150 DES LACS RIVER NEAR KENMARE, ND

LOCATION.--Lat 48°35'23", long 101°59'49", in NE¹/₄NE¹/₄NE¹/₄ sec.23, T.159 N., R.88 W., Ward County, Hydrologic Unit 09010001, on right bank 500 ft upstream from crossing on U.S. Highway 52, 150 ft downstream from U.S. Fish and Wildlife Service Dam No. 8, and 6.5 mi southeast of Kenmare.

DRAINAGE AREA.--687 mi², approximately, of which 354 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1987 to September 1993 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,777.00 ft above sea level.

REMARKS.--Records fair except those for period of estimated daily discharge, which are poor. Flow slightly regulated by small upstream reservoirs.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY 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	3.1	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.8	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.84	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.19	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.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	.00
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	.00	.00	e1.0	.12	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	e5.0	.01	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	e3.0	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	e2.0	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	e1.0	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.38	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.17	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	9.6	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	5.6	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.21	6.17	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	3.04	.20	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.38	3.1	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	187	12	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1993, BY WATER YEAR (WY)

	MEAN	.027	.018	.003	.000	.000	.29	1.17	1.96	1.60	1.77	.12	.020
MAX	.13	.080	.015	.000	.002	1.73	6.91	11.6	9.57	7.58	.50	.12	
(WY)	1990	1990	1990	1988	1988	1989	1989	1989	1989	1989	1989	1989	1989
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1989	1989	1989	1988	1989	1991	1991	1991	1990	1990	1988	1988	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1988 - 1993

ANNUAL TOTAL							100.38						
ANNUAL MEAN							.28				.58		
HIGHEST ANNUAL MEAN											3.18		1989
LOWEST ANNUAL MEAN											.000		1991
HIGHEST DAILY MEAN							38	Jul 28		38	Jul 28	1993	
LOWEST DAILY MEAN							.00	Oct 1		.00	Dec 15	1987	
ANNUAL SEVEN-DAY MINIMUM				.00	Jan 1		.00	Oct 1		.00	Dec 15	1987	
INSTANTANEOUS PEAK FLOW							53	Jul 27		53	Jul 27	1993	
INSTANTANEOUS PEAK STAGE							5.62	Jul 27		5.62	Jul 27	1993	
ANNUAL RUNOFF (AC-FT)							199			423			
10 PERCENT EXCEEDS				.00			.00			.11			
50 PERCENT EXCEEDS				.00			.00			.00			
90 PERCENT EXCEEDS				.00			.00			.00			

e Estimated.

RED RIVER OF THE NORTH BASIN

185

05116150 DES LACS RIVER NEAR KENMARE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1989 to September 1993 (discontinued).

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
JUL 29...	1330	16	343	7.6	22.0	19.0	130	109	31	13	16
AUG 03...	1515	0.82	680	--	18.0	19.0	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
JUL 29...	19	0.6	12	68	4.1	0.10	28	238	229	0.31	10.0

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
JUL 29...	3	40	180	<1	10	60	<0.1	<1	<1	150

RED RIVER OF THE NORTH BASIN

05116500 DES LACS RIVER AT FOXHOLM, ND

LOCATION.--Lat 48°22'14", long 101°34'11", in NW¼NE¼NW¼, sec 2, T.156 N., R.85 W., Ward County, Hydrologic Unit 09010002, on left bank 200 ft upstream from county highway bridge in Foxholm, and at mile 23.0.

DRAINAGE AREA.--939 mi², of which about 400 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1904 to July 1906, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,632.98 ft above sea level. June 14 to Oct. 23, 1955, non-recording gage at site 200 ft downstream from present gage at same datum. See WSP 1728 or 1913 for history of changes prior to June 14, 1955.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.00	.00	.00	.00	5.7	.68	.51	.45	59	2.8
2	.00	.00	e.00	.00	.00	.00	5.1	.67	.51	.38	40	2.5
3	.00	.00	e.00	.00	.00	.05	4.9	.61	.48	.29	30	2.4
4	.00	.00	e.00	.00	.00	.33	4.8	.57	.45	.35	24	2.1
5	.00	.00	e.00	.00	.00	1.3	4.8	.48	.42	.37	19	1.8
6	.00	.00	e.00	.00	.00	6.5	4.1	.31	.49	.50	16	1.7
7	.00	.00	e.00	.00	.00	7.0	3.7	.29	.54	.89	14	1.5
8	.00	.00	e.00	.00	.00	6.0	3.3	.50	1.5	1.2	12	1.3
9	.00	.00	e.00	.00	.00	3.9	3.1	.48	5.8	1.3	10	1.2
10	.00	.00	e.00	.00	.00	3.0	2.9	.35	11	1.0	8.5	1.1
11	.00	.00	.00	.00	.00	e2.3	3.5	.21	13	.77	7.3	1.1
12	.00	.00	.00	.00	.00	e2.0	3.5	.15	15	.59	6.2	1.2
13	.00	.00	.00	.00	.00	e1.7	1.9	.17	13	.50	5.3	1.6
14	.00	.00	.00	.00	.00	e1.5	1.3	.18	11	.51	5.1	1.6
15	.00	.00	.00	.00	.00	e1.4	1.0	.17	8.7	.52	4.8	1.5
16	.00	.00	.00	.00	.00	e1.3	1.2	.16	6.7	.86	4.4	1.5
17	.00	.00	.00	.00	.00	e1.2	1.3	.15	5.1	2.1	4.0	1.4
18	.00	.00	.00	.00	.00	e1.3	1.3	.15	4.0	4.0	3.3	1.4
19	.00	.00	.00	.00	.00	1.5	1.3	.15	2.5	5.6	2.9	1.3
20	.00	e.00	.00	.00	.00	1.5	1.4	.13	1.4	6.5	2.7	1.2
21	.00	e.00	.00	.00	.00	1.4	1.3	.12	.91	7.0	2.3	1.1
22	.00	e.00	.00	.00	.00	1.5	1.0	.10	.64	7.7	2.3	1.1
23	.00	e.00	.00	.00	.00	3.5	1.0	.12	.50	14	2.8	1.2
24	.00	e.00	.00	.00	.00	e25	.93	.16	.44	31	4.2	1.2
25	.00	e.00	.00	.00	.00	e90	.70	.18	.50	47	9.2	1.3
26	.00	e.00	.00	.00	.00	e60	.58	.17	.53	39	7.1	1.3
27	.00	e.00	.00	.00	.00	33	.54	.20	.68	36	4.9	1.3
28	.00	e.00	.00	.00	.00	19	.52	.33	.79	291	3.9	1.3
29	.00	e.00	.00	.00	---	12	.61	.35	.65	278	3.6	1.2
30	.00	e.00	.00	.00	---	8.9	.67	.45	.54	151	3.7	1.2
31	.00	---	.00	.00	---	7.0	---	.47	---	102	3.4	---
TOTAL	0.00	0.00	0.00	0.00	0.00	305.08	67.95	9.21	108.28	1032.38	325.9	44.4
MEAN	.000	.000	.000	.000	.000	9.84	2.26	.30	3.61	33.3	10.5	1.48
MAX	.00	.00	.00	.00	.00	90	5.7	.68	15	291	59	2.8
MIN	.00	.00	.00	.00	.00	.00	.52	.10	.42	.29	2.3	1.1
AC-FT	.00	.00	.00	.00	.00	605	135	18	215	2050	646	88

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1904 - 1993, BY WATER YEAR (WY)

	9.50	5.62	2.38	1.08	4.05	40.5	117	59.8	37.8	20.0	12.2	11.1
MEAN	9.50	5.62	2.38	1.08	4.05	40.5	117	59.8	37.8	20.0	12.2	11.1
MAX	83.5	50.7	15.2	8.10	76.1	362	730	399	228	111	108	97.9
(WY)	1976	1976	1976	1951	1981	1976	1976	1975	1975	1975	1972	1975
MIN	.000	.000	.000	.000	.000	.10	1.77	.30	.020	.000	.000	.000
(WY)	1993	1993	1959	1946	1946	1948	1963	1993	1961	1961	1961	1958

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1904 - 1993

ANNUAL TOTAL	278.73	1893.20	
ANNUAL MEAN	.76	5.19	26.8
HIGHEST ANNUAL MEAN			148
LOWEST ANNUAL MEAN			.44
HIGHEST DAILY MEAN	15	291	3200
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		413	4260
INSTANTANEOUS PEAK STAGE		9.92	a21.23
ANNUAL RUNOFF (AC-FT)	553	3760	19390
10 PERCENT EXCEEDS	3.1	7.0	56
50 PERCENT EXCEEDS	.00	.44	2.4
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a From high-water mark.

RED RIVER OF THE NORTH BASIN

187

05116500 DES LACS RIVER AT FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1969-70, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
MAR												
08...	1835	5.7	500	8.7	0.5	0.0	--	--	130	128	24	16
22...	1535	1.4	1500	--	5.0	1.5	--	--	--	--	--	--
24...	1045	21	860	--	14.0	0.5	--	--	--	--	--	--
25...	1350	104	310	--	7.5	1.0	--	--	--	--	--	--
30...	0840	8.7	600	--	0.0	0.5	--	--	--	--	--	--
APR												
12...	1300	3.5	1100	--	5.0	7.0	--	--	--	--	--	--
MAY												
05...	1035	0.54	1470	--	20.5	15.0	--	--	--	--	--	--
JUN												
a02...	0845	0.51	1850	8.3	5.0	16.0	7.2	78	340	480	52	51
JUL												
29...	1130	295	340	--	20.0	20.0	--	--	--	--	--	--
AUG												
03...	1745	34	700	--	19.0	19.5	--	--	--	--	--	--

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR											
08...	52	44	2	14	120	9.0	0.10	7.9	320	309	0.42
JUN											
a02...	280	63	7	13	430	33	0.30	2.2	1150	1170	1.59

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR											
08...	4.78	3	50	140	<1	20	180	0.1	1	1	160
JUN											
a02...	1.61	4	140	20	<1	80	10	0.1	<1	<1	470

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05117500 SOURIS (MOUSE) RIVER ABOVE MINOT, ND

LOCATION.--Lat 48°14'45", long 101°22'15", in NW¹/₄NW¹/₄SE¹/₄, sec.17, T.155 N., R.83 W., Ward County, Hydrologic Unit 09010001, on right bank 180 ft downstream from county highway bridge, 3.5 mi west of Minot, 7 mi downstream from Des Lacs River, and at mile 388.5.

DRAINAGE AREA.--10,600 mi², approximately, of which about 6,700 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to current year. Monthly discharge only for some periods, published in WSP 1308.

Published as Mouse River at Minot, 1903-24, Souris River at Minot, 1927-28, 1929-34, and Souris River near Minot, 1928-29.

REVISED RECORDS.--WSP 1308: 1905, 1909-14, 1918, 1924-25, 1927. WSP 1338: 1903-4, 1906, 1917, 1928, 1929(M). WSP 2113: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,545.75 ft above sea level. May 5, 1903, to Sept. 30, 1928; Oct. 1, 1929, to Sept. 30, 1934; nonrecording gages at mile 377.6 in Minot, at datum 12.5 ft lower, Oct. 1, 1928, to Sept. 30, 1929, nonrecording gages at Saugstad bridge at mile 366.8, 5 mi southeast of Minot and at datum 19.2 ft lower than present datum. Records equivalent except those for periods of extreme low flow, as some industrial and sanitary waste enters the river between the sites.

REMARKS.--Records good except those for period of estimated daily discharges, which are fair. Flow almost completely regulated by Lake Darling (station 05115500), 41 mi upstream and several smaller reservoirs; combined capacity, about 248,000 acre-ft. Some small diversions for irrigation and municipal supply.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage in Minot at least 3 ft higher than 1904 peak, in 1881, according to Apr. 20, 1904, issue of Minot Daily Optic. This peak probably occurred in 1882.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.25	e.04	e.00	.00	3.9	e.06	.00	e.25	292	11
2	.00	.00	e.23	e.04	e.02	.00	3.4	e.05	.00	e.60	160	9.7
3	.00	.00	e.22	e.04	e.04	.00	2.9	e.02	.00	e.30	90	9.0
4	.00	.00	e.20	e.04	e.06	.06	2.6	e.00	.00	e.40	65	9.1
5	.00	.00	e.15	e.04	e.10	.28	2.3	e.02	.00	e.70	49	10
6	.00	.00	e.15	e.04	e.10	.45	2.1	e.05	47	e1.3	38	26
7	.00	.00	e.15	e.04	e.10	.58	1.9	e.10	68	e2.5	29	32
8	.00	.00	e.11	e.04	e.08	.44	1.6	e1.0	110	e3.5	22	31
9	.00	.00	e.11	e.04	e.05	.43	1.9	e2.0	102	e3.5	19	29
10	.00	.00	e.09	e.04	e.03	e.36	2.7	e1.7	67	e3.4	16	29
11	.00	.00	e.08	e.03	e.03	e.33	3.4	e1.5	38	e3.3	14	29
12	.00	.00	e.08	e.03	e.02	e.28	3.4	e1.3	19	e3.4	13	29
13	.00	.00	e.09	e.03	e.02	e.25	3.4	e1.0	14	e3.5	11	29
14	.00	.00	e.09	e.03	e.02	e.25	9.6	e.63	8.9	e3.7	12	29
15	.00	.00	e.09	e.03	e.02	e.23	133	e.21	4.7	e4.0	12	29
16	.00	.00	e.10	e.03	e.02	e.19	229	.00	3.3	e5.0	11	29
17	.00	.00	e.09	e.02	e.02	e.15	254	.00	2.1	e7.0	9.7	29
18	.00	.00	e.08	e.02	e.02	e.10	259	.00	1.1	e6.5	8.7	29
19	.00	e.01	e.09	e.02	.00	e.16	256	.00	.58	e6.0	7.9	29
20	.00	e.02	e.08	e.02	.00	e.22	180	.00	e.45	e6.5	7.1	29
21	.00	e.02	e.07	e.02	.00	e.30	44	.00	e.37	e8.0	7.6	30
22	.00	e.03	e.08	e.02	.00	e.40	6.2	.00	e.30	130	8.7	31
23	.00	e.04	e.07	e.02	.00	.63	e1.5	.00	e.25	230	9.1	35
24	.00	e.06	e.07	e.02	.00	1.4	e.70	.00	e.22	405	9.0	32
25	.00	e.07	e.07	e.01	.00	1.9	e.30	.00	e.17	202	8.1	29
26	.00	e.10	e.07	e.01	.00	12	e.22	.00	e.13	147	6.8	32
27	.00	e.15	e.07	e.01	.00	55	e.15	.00	e.08	135	12	41
28	.00	e.19	e.05	e.00	.00	33	e.10	.00	e.05	812	14	41
29	.00	e.21	e.05	e.00	---	18	e.08	.00	e.08	857	14	41
30	.00	e.24	e.04	e.00	---	13	e.07	.00	e.12	647	15	39
31	.00	---	e.04	e.00	---	6.8	---	.00	---	430	13	---
TOTAL	0.00	1.14	3.21	0.77	0.75	147.19	1409.42	9.64	487.90	4068.35	1003.7	836.8
MEAN	.000	.038	.10	.025	.027	4.75	47.0	.31	16.3	131	32.4	27.9
MAX	.00	.24	.25	.04	.10	55	259	2.0	110	857	292	41
MIN	.00	.00	.04	.00	.00	.00	.07	.00	.00	.25	6.8	9.0
AC-FT	.00	2.3	6.4	1.5	1.5	292	2800	19	968	8070	1990	1660

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1993, BY WATER YEAR (WY)

	MEAN	31.4	28.5	22.6	20.2	24.4	110	638	563	203	124	60.2	44.2
MAX	266	159	164	170	265	1272	6209	4916	1402	1393	435	748	
(WY)	1904	1952	1976	1976	1976	1976	1976	1904	1975	1953	1976	1903	
MIN	.000	.000	.000	.000	.000	.000	1.27	.31	.000	.000	.000	.000	
(WY)	1935	1935	1935	1935	1935	1936	1937	1993	1938	1937	1937	1935	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1903 - 1993

ANNUAL TOTAL	5889.33	7968.87	
ANNUAL MEAN	16.1	21.8	155
HIGHEST ANNUAL MEAN			1105
LOWEST ANNUAL MEAN			1.30
HIGHEST DAILY MEAN	450	Mar 28	857
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			a916
INSTANTANEOUS PEAK STAGE			9.37
ANNUAL RUNOFF (AC-FT)	11680	15810	b12000
10 PERCENT EXCEEDS	6.4	32	b,c21.90
50 PERCENT EXCEEDS	.00	.15	112500
90 PERCENT EXCEEDS	.00	.00	297
			21
			.20

e Estimated.

a About.

b At site in Minot, from rating curve extended above 8,100 ft³/s.

c Maximum stage at present site, about 23 ft in April 1904.

RED RIVER OF THE NORTH BASIN

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05117500 SOURIS RIVER ABOVE MINOT, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
		JAN 05...	1000	0.04	3000	--	-9.0	0.0	--	--	--
MAR 23...	1624	0.98	2050	--	19.0	2.0	--	--	--	--	--
MAR 30...	1055	14	1150	--	1.0	0.5	--	--	--	--	--
APR 19...	1500	257	1750	8.6	5.5	9.0	390	473	65	56	270
AUG 10...	0915	18	840	7.7	--	--	240	267	48	29	92
DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF DIS- CONSTI- TUENTS, DIS- SOLVED (MG/L AS SIO2) (70301)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED PER AC-FT) (70303)	SOLIDS, DIS- SOLVED PER DAY) (70302)
		APR 19...	58	6	22	390	110	0.50	5.2	1200	1220
AUG 10...	44	3	14	170	30	0.20	20	564	607	0.83	29.2
DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	
	APR 19...	7	870	20	<1	70	10	0.4	7	<1	470
AUG 10...	6	240	120	<1	30	40	0.1	<1	<1	440	

RED RIVER OF THE NORTH BASIN

05120000 SOURIS (MOUSE) RIVER NEAR VERENDRYE, ND

LOCATION.--Lat 48°09'35", long 100°43'45", in NW¹/₄SW¹/₄, sec.17, T.154 N., R.78 W., McHenry County, Hydrologic Unit 09010003, on left bank 2.7 mi north of Verendrye, 19 mi upstream from mouth of Wintering River, and at mile 302.0.

DRAINAGE AREA.--11,300 mi², approximately, of which about 6,900 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February to June 1933 (gage heights only), April 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,464.87 ft above sea level. February to June 1933, at site 4 mi upstream at datum 1.65 ft higher. Apr. 1, 1937, to Mar. 3, 1938, nonrecording gage at present site, at datum 1.97 ft higher.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by reservoirs on Souris and Des Lacs Rivers, the largest of which is Lake Darling (station 05115500), 128 mi upstream, combined capacity about 248,000 acre-ft. Some small diversions for irrigation and municipal supply.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	7.6	4.9	e3.5	e1.4	e2.1	20	12	14	14	988	16
2	7.8	8.0	5.1	e3.4	e1.4	e2.0	17	9.8	15	15	745	18
3	13	13	4.9	e3.4	e1.4	e2.0	18	8.3	14	19	525	37
4	7.2	12	4.4	e3.4	e1.4	e2.0	26	7.5	14	21	351	36
5	3.4	8.7	3.9	e3.3	e1.4	e2.0	27	6.9	13	20	231	24
6	3.1	7.0	3.7	e3.1	e1.4	e2.2	27	6.7	15	34	161	22
7	2.8	6.6	3.3	e2.9	e1.4	e3.0	21	8.8	14	90	130	23
8	1.7	6.9	3.0	e2.8	e1.4	e1.0	16	15	20	104	113	21
9	1.9	7.6	2.8	e2.6	e1.4	e2.6	16	15	170	88	98	19
10	13	8.8	2.8	e2.5	e1.4	e1.8	16	12	613	74	85	18
11	8.6	10	3.1	e2.5	e1.5	e1.4	16	13	528	65	70	27
12	6.9	13	3.4	e2.4	e1.5	e1.0	15	18	341	59	59	41
13	6.7	9.3	3.1	e2.4	e1.5	e9.0	14	19	214	58	51	37
14	6.9	6.7	3.0	e2.3	e1.6	e7.0	14	16	145	47	45	34
15	7.7	8.8	2.8	e2.3	e1.7	e6.2	13	13	98	38	38	34
16	8.4	10	2.8	e2.2	e1.9	e6.0	13	12	66	31	36	34
17	4.6	9.3	2.8	e2.2	e2.1	e5.6	17	11	51	29	33	34
18	2.3	8.5	2.8	e2.1	e2.1	e5.2	90	10	42	26	29	31
19	1.5	8.5	e2.8	e2.1	e2.2	e5.0	184	9.9	38	54	27	30
20	1.6	8.0	e2.8	e2.0	e2.2	e4.8	206	9.4	29	119	24	28
21	1.5	7.4	e2.8	e1.9	e2.2	e4.8	211	9.3	21	122	22	30
22	1.6	6.8	2.8	e1.9	e2.2	e4.5	209	11	16	126	22	31
23	5.4	6.1	2.9	e1.8	e2.2	e7.6	178	11	14	137	21	32
24	6.9	5.8	3.3	e1.8	e2.2	e1.5	124	11	14	213	21	33
25	5.3	5.6	3.1	e1.7	e2.2	27	85	11	12	444	21	33
26	3.9	5.3	e3.1	e1.6	e2.1	28	61	10	11	567	20	32
27	3.6	5.1	e3.3	e1.5	e2.1	40	44	11	9.9	692	18	30
28	2.9	5.0	e3.4	e1.5	e2.1	45	27	13	9.9	994	17	28
29	3.8	4.7	e3.4	e1.4	---	40	20	17	12	1460	18	31
30	8.3	4.7	e3.4	e1.4	---	34	16	17	13	1450	17	30
31	8.0	---	e3.3	e1.4	---	27	---	15	---	1250	16	---
TOTAL	168.1	234.8	103.0	71.3	49.6	415.0	1761	369.6	2586.8	8460	4052	874
MEAN	5.42	7.83	3.32	2.30	1.77	13.4	58.7	11.9	86.2	273	131	29.1
MAX	13	13	5.1	3.5	2.2	45	211	19	613	1460	988	41
MIN	1.5	4.7	2.8	1.4	1.4	2.0	13	6.7	9.9	14	16	16
AC-FT	333	466	204	141	98	823	3490	733	5130	16780	8040	1730

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1993, BY WATER YEAR (WY)

	MEAN	47.0	44.1	34.0	31.0	44.6	181	633	673	267	165	84.1	53.1
MAX	199	169	160	171	277	1209	6280	4918	2122	1599	512	208	
(WY)	1976	1976	1976	1976	1976	1976	1976	1975	1975	1953	1976	1955	
MIN	1.50	1.00	1.00	.50	.50	2.25	11.7	6.80	2.33	.67	.42	.10	
(WY)	1938	1938	1938	1938	1938	1940	1937	1938	1938	1937	1937	1937	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR			FOR 1993 WATER YEAR			WATER YEARS 1937 - 1993		
ANNUAL TOTAL	7183.5			19145.2					
ANNUAL MEAN	19.6			52.5			191		
HIGHEST ANNUAL MEAN							1185		
LOWEST ANNUAL MEAN							18.8		
HIGHEST DAILY MEAN	453			Mar 26			9700		
LOWEST DAILY MEAN	1.2			Aug 10			.10		
ANNUAL SEVEN-DAY MINIMUM	1.2			Aug 10			.10		
INSTANTANEOUS PEAK FLOW				1530			9900		
INSTANTANEOUS PEAK STAGE				13.35			17.84		
INSTANTANEOUS LOW FLOW				1.4					
ANNUAL RUNOFF (AC-FT)	14250			37970			138500		
10 PERCENT EXCEEDS	28			90			380		
50 PERCENT EXCEEDS	4.4			11			36		
90 PERCENT EXCEEDS	1.8			2.0			3.2		

e Estimated.

RED RIVER OF THE NORTH BASIN

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05120000 SOURIS RIVER NEAR VERENDRYE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1957 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT												
05...	1435	2.9	1670	--	14.5	13.5	--	--	--	--	--	--
NOV												
16...	1520	9.8	2300	8.2	1.0	1.0	10.0	74	520	474	K6	96
JAN												
04...	1650	3.4	3100	--	-9.0	0.0	--	--	--	--	--	--
FEB												
17...	1155	2.1	2700	7.8	-10.0	0.0	3.3	24	570	566	41	120
MAR												
09...	1330	28	1650	--	0.5	0.5	--	--	--	--	--	--
23...	1235	7.6	1350	8.2	10.0	0.5	4.9	36	370	303	K11	82
APR												
19...	1150	187	1750	--	4.0	9.0	--	--	--	--	--	--
MAY												
06...	1345	6.7	1820	--	22.0	17.0	--	--	--	--	--	--
JUN												
a09...	1000	36	1660	8.5	15.0	14.5	6.7	70	420	448	51	81
30...	0840	14	1220	--	18.0	16.5	--	--	--	--	--	--
JUL												
28...	1400	1040	700	--	22.0	20.0	--	--	--	--	--	--
AUG												
a05...	0945	240	670	7.1	17.0	19.5	4.4	50	220	209	78	49

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	NITRO- GEN, NO2+NO3 DIS- SOLVED (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, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
NOV												
16...	69	350	7	590	150	0.50	3	1600	<0.050	--	0.090	--
FEB												
17...	65	360	7	620	130	0.50	20	1730	--	0.079	--	0.640
23...	39	140	3	330	37	0.20	7	890	--	0.270	--	0.380
JUN												
a09...	53	250	5	460	84	0.30	<1	1250	--	<0.050	--	0.020
AUG												
a05...	24	70	2	150	14	0.20	27	500	--	0.180	--	0.220

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)	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL RECOV- ERABLE (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)
NOV											
16...	1.5	1.6	0.370	30	5	<100	<10	470	<1	<1	<1
FEB											
17...	--	1.7	0.750	30	6	<100	<10	470	<1	14	<1
MAR											
23...	--	1.3	0.240	100	4	<100	<10	240	<1	<1	<1
JUN											
a09...	--	1.3	0.630	50	11	<100	<10	610	<1	<1	<1
AUG											
a05...	--	1.2	0.400	500	6	<100	<10	170	<1	<1	1

DATE	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE) (01147)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
NOV											
16...	2	240	<1	1	6	<1	20	16	1	--	--
FEB											
17...	<1	870	<1	2	5	<1	10	14	1	--	--
MAR											
23...	2	600	<1	1	3	<1	<10	13	<1	--	--
JUN											
a09...	<1	170	<1	2	3	<1	<10	18	<1	3.70	0.500
AUG											
a05...	2	1200	2	<1	6	<1	<10	11	<1	--	--

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05120500 WINTERING RIVER NEAR KARLSRUHE, ND

LOCATION.--Lat 48°10'14", long 100°32'20", on line between secs.10 and 11, T.154 N., R.77 W., McHenry County, Hydrologic Unit 09010003, on left bank 30 ft upstream from county highway bridge, 4 mi upstream from mouth, and 7 mi northeast of Karlsruhe.

DRAINAGE AREA.--705 mi², of which about 420 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,480 ft above sea level, from river-profile map.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes, controlled capacity, about 850 acre-ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.35	1.1	e.00	e.00	e.02	e8.4	2.3	3.6	.63	48	53
2	.00	.56	1.1	e.00	e.00	e.05	e8.0	2.0	3.7	.86	39	51
3	.00	.63	e.88	e.00	e.00	e.20	e8.5	1.9	4.2	1.2	34	49
4	.00	.64	e.80	e.00	e.00	e.40	e9.0	1.8	4.0	1.4	30	44
5	.00	.64	e.76	e.00	e.00	e.80	e10	1.9	3.3	1.2	27	40
6	.00	.66	e.70	e.00	e.00	e.90	e8.5	2.9	4.0	1.3	24	37
7	.00	.79	e.66	e.00	e.00	e1.0	e7.0	3.0	3.9	.84	22	34
8	.00	.96	e.60	e.00	e.00	e.80	3.6	2.8	4.0	.47	63	32
9	.00	.98	e.62	e.00	e.00	e.65	3.6	2.6	3.1	.37	159	28
10	.00	1.0	e.58	e.00	e.00	e.90	3.0	2.8	2.5	.31	152	26
11	.00	.98	e.60	e.00	e.00	e.85	3.5	2.2	2.2	.33	146	24
12	.00	.98	e.56	e.00	e.00	e.80	6.7	1.9	1.7	.17	140	21
13	.00	1.1	e.54	e.00	e.00	e.75	7.8	1.5	1.6	.58	132	20
14	.00	1.2	e.50	e.00	e.00	e.70	8.0	1.6	1.4	.46	139	19
15	.00	1.2	e.49	e.00	e.00	e.60	7.4	2.0	1.4	.37	136	18
16	.00	1.2	e.38	e.00	e.00	e.65	6.7	2.2	1.3	.41	128	16
17	.00	1.2	e.35	e.00	e.00	e.60	6.1	2.3	1.2	.70	124	16
18	.00	1.2	e.30	e.00	e.00	e.55	4.8	3.1	1.1	.65	117	15
19	.00	1.2	e.26	e.00	e.00	e.55	4.0	3.1	1.1	1.1	108	14
20	.00	1.2	e.24	e.00	e.00	e.80	5.1	2.9	.78	.91	100	14
21	.00	1.1	e.20	e.00	e.00	e.76	5.2	3.4	.58	.93	96	13
22	.00	1.0	e.17	e.00	e.00	e.72	4.5	2.7	.55	3.9	95	13
23	.00	1.0	e.15	e.00	e.00	e.70	4.2	2.6	.52	3.1	92	13
24	.00	1.0	e.13	e.00	e.00	e1.0	3.5	2.9	.94	4.9	86	13
25	.00	1.0	e.12	e.00	e.00	e16	3.2	3.1	.78	6.1	79	12
26	.05	1.1	e.08	e.00	e.00	e25	3.2	3.5	.63	5.3	73	12
27	.16	1.1	e.05	e.00	e.00	e30	2.5	3.8	.77	22	70	11
28	.16	1.1	e.02	e.00	e.00	e26	2.8	2.9	.65	29	66	11
29	.15	1.1	e.02	e.00	---	e24	2.4	2.7	.81	36	62	11
30	.24	1.1	e.01	e.00	---	e22	2.2	3.8	.83	71	61	10
31	.28	---	e.01	e.00	---	e15	---	3.7	---	63	58	---
TOTAL	1.04	29.27	12.98	0.00	0.00	173.75	163.4	81.9	57.14	259.49	2706	690
MEAN	.034	.98	.42	.000	.000	5.60	5.45	2.64	1.90	8.37	87.3	23.0
MAX	.28	1.2	1.1	.00	.00	30	10	3.8	4.2	.71	159	53
MIN	.00	.35	.01	.00	.00	.02	2.2	1.5	.52	.17	22	10
AC-FT	2.1	58	26	.00	.00	345	324	162	113	515	5370	1370

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1993, BY WATER YEAR (WY)

	4.21	3.79	1.92	.90	1.12	16.7	57.5	25.8	13.3	9.24	6.67	4.34
MEAN	4.21	3.79	1.92	.90	1.12	16.7	57.5	25.8	13.3	9.24	6.67	4.34
MAX	15.3	10.7	7.29	4.51	9.13	149	386	183	92.4	46.9	87.3	29.7
(WY)	1983	1983	1983	1976	1981	1976	1949	1970	1954	1954	1993	1952
MIN	.034	.50	.000	.000	.000	.000	2.81	1.65	.43	.23	.006	.000
(WY)	1993	1938	1938	1938	1938	1951	1992	1992	1992	1989	1989	1992

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1937 - 1993

ANNUAL TOTAL	382.44	4174.97	
ANNUAL MEAN	1.04	11.4	12.3
HIGHEST ANNUAL MEAN			37.1
LOWEST ANNUAL MEAN			1.36
HIGHEST DAILY MEAN	7.0 Mar 3	159 Aug 9	2500 Apr 7 1949
LOWEST DAILY MEAN	.00 Aug 17	.00 Oct 1	.00 Mar 1 1937
ANNUAL SEVEN-DAY MINIMUM	.00 Aug 17	.00 Oct 1	.00 Mar 1 1937
INSTANTANEOUS PEAK FLOW		161 Aug 9	a3000 Apr 7 1949
INSTANTANEOUS PEAK STAGE		6.61 Aug 9	b12.00 Apr 7 1949
ANNUAL RUNOFF (AC-FT)	759	8280	8910
10 PERCENT EXCEEDS	2.9	34	24
50 PERCENT EXCEEDS	.65	1.0	3.0
90 PERCENT EXCEEDS	.00	.00	.08

e Estimated.

a By velocity-area study.

b Channel choked by packed snow.

RED RIVER OF THE NORTH BASIN

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05120500 WINTERING RIVER NEAR KARLSRUHE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1954-56, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 16...	1315	1.2	630	--	0.0	1.5	--	--	--	--	--
MAR 09...	1100	0.65	570	--	1.0	0.0	--	--	--	--	--
23...	0930	0.71	760	--	3.0	0.5	--	--	--	--	--
25...	1030	16	420	--	4.5	0.5	--	--	--	--	--
30...	1410	22	450	8.1	3.0	0.5	170	172	40	17	31
APR 01...	1030	8.4	450	--	1.0	1.0	--	--	--	--	--
05...	1600	10	650	--	4.0	2.5	--	--	--	--	--
13...	1730	8.1	540	--	10.0	5.0	--	--	--	--	--
30...	1045	2.1	647	--	9.0	8.5	--	--	--	--	--
JUN a08...	1500	4.0	600	8.2	15.0	14.5	270	325	58	31	41
30...	1015	0.72	680	--	--	--	--	--	--	--	--
JUL 23...	1950	29	536	--	20.0	21.0	--	--	--	--	--
AUG 04...	1530	29	490	--	24.0	19.5	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 30...	28	1	4.4	63	7.8	0.10	14	281	292	0.40	17.6
JUN a08...	24	1	2.8	28	6.2	0.10	8.4	371	388	0.53	4.23

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 30...	4	60	310	<1	10	40	<0.1	4	<1	150
JUN a08...	2	110	50	<1	20	60	<0.1	<1	<1	250

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND

LOCATION.--Lat 48°30'20", long 100°26'04", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.14, T.158 N., R.76 W., McHenry County, Hydrologic Unit 09010003, on left bank 200 ft upstream from Nelson bridge, 8 mi east of Bantry, 18 mi upstream from Willow Creek, and at mile 228.0.

DRAINAGE AREA.--12,300 mi² approximately, of which about 7,600 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,427.56 ft above sea level. Prior to Mar. 16, 1938, nonrecording gage at same site at datum 0.17 ft lower.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated by reservoirs on Souris, Des Lacs, and Wintering Rivers, total capacity, about 249,000 acre-ft. Diversions for irrigation of about 7,600 acres at Eaton Dam about 42 mi above station and other small diversions for irrigation and municipal supply.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.00	27	e10	e3.4	e1.5	e.70	e15	4.7	70	28	487	169
2	e.00	27	e10	e3.4	e1.5	e.70	e25	7.3	65	25	538	162
3	e.00	28	e9.0	e3.4	e1.5	e.70	e20	7.4	62	25	586	153
4	e.00	28	e8.0	e3.3	e1.5	e.80	e18	3.1	57	29	627	145
5	e.00	e26	e7.7	e3.3	e1.5	e.90	e17	2.1	53	26	643	135
6	e.00	e24	e7.4	e3.3	e1.5	e1.0	e16	1.7	54	27	634	127
7	e.00	e23	e7.0	e3.3	e1.5	e2.0	e15	2.1	46	29	606	122
8	e.00	e23	e7.0	e3.2	e1.4	e4.0	e14	2.0	45	30	570	118
9	.00	e22	e7.0	e3.1	e1.3	e4.5	e8.0	.32	41	34	534	113
10	.00	e21	e7.0	e3.0	e1.3	e4.0	e4.0	.00	41	38	495	106
11	.00	e21	e7.0	e2.9	e1.2	e3.0	e4.5	.00	44	43	466	101
12	.00	e21	e6.5	e2.7	e1.2	e2.5	e5.0	.00	47	54	450	95
13	.00	e18	e6.0	e2.6	e1.1	e2.0	e6.0	.00	94	71	435	88
14	.00	e18	e5.8	e2.5	e1.0	e1.5	e7.0	.00	206	81	428	82
15	.00	e17	e5.4	e2.4	e1.0	e1.2	e8.0	.00	279	86	418	78
16	.00	e17	e5.2	e2.4	e.90	e1.2	e7.0	.01	303	88	399	76
17	.00	e16	e4.8	e2.3	e.85	e1.1	e8.0	15	295	90	381	75
18	.00	e16	e4.5	e2.2	e.80	e1.1	e9.0	22	270	89	358	75
19	.10	e16	e4.5	e2.1	e.79	e1.0	e10	26	241	89	335	73
20	5.5	e16	e4.5	e2.0	e.78	e1.0	e10	31	209	86	313	72
21	14	e16	e4.2	e2.0	e.77	e1.0	e9.0	41	176	87	295	71
22	17	e16	e4.0	e2.0	e.76	e1.1	e7.0	92	145	92	301	69
23	19	e15	e4.0	e2.0	e.75	e1.2	e5.0	129	117	95	296	67
24	22	e14	e4.0	e2.0	e.74	e1.5	2.5	130	99	100	275	65
25	23	e13	e4.0	e2.0	e.73	e2.0	4.7	116	78	118	259	63
26	19	e12	e3.8	e1.9	e.72	e3.0	6.1	105	63	142	244	60
27	16	e12	e3.6	e1.8	e.71	e4.0	6.7	101	52	179	230	58
28	15	e11	e3.5	e1.7	e.70	e5.0	6.8	94	42	240	215	58
29	15	e11	e3.5	e1.6	---	e8.0	6.3	86	37	332	201	56
30	15	e10	e3.5	e1.5	---	e10	5.9	82	33	402	190	55
31	21	---	e3.5	e1.5	---	e11	---	75	---	450	178	---
TOTAL	201.60	555	175.9	76.8	30.00	82.70	286.5	1175.73	3364	3305	12387	2787
MEAN	6.50	18.5	5.67	2.48	1.07	2.67	9.55	37.9	112	107	400	92.9
MAX	23	28	10	3.4	1.5	11	25	130	303	450	643	169
MIN	.00	10	3.5	1.5	.70	.70	2.5	.00	33	25	178	55
AC-FT	400	1100	349	152	60	164	568	2330	6670	6560	24570	5530

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1993, BY WATER YEAR (WY)

	MEAN	57.5	55.9	40.2	33.2	37.4	111	553	781	400	210	112	65.9
MAX	255	219	172	175	247	890	5666	5161	2821	1616	547	288	
(WY)	1976	1976	1976	1976	1976	1976	1976	1979	1975	1953	1953	1975	
MIN	.68	.50	1.00	.50	.000	.44	5.60	3.04	11.7	2.73	1.03	.010	
(WY)	1941	1941	1938	1938	1938	1937	1990	1937	1992	1992	1992	1939	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1937 - 1993
ANNUAL TOTAL	6608.91	24427.23	
ANNUAL MEAN	18.1	66.9	209
HIGHEST ANNUAL MEAN			1226
LOWEST ANNUAL MEAN			15.9
HIGHEST DAILY MEAN	216	643	9260
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		644	9330
INSTANTANEOUS PEAK STAGE		10.34	14.59
ANNUAL RUNOFF (AC-FT)	13110	48450	151100
10 PERCENT EXCEEDS	35	221	462
50 PERCENT EXCEEDS	7.6	12	49
90 PERCENT EXCEEDS	.23	.76	4.5

e Estimated.

05122000 SOURIS RIVER NEAR BANTRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
NOV 19...	1430	16	1440	1440	8.5	0.0	0.0	11.6	83	350	455	K4
JAN 07...	1108	3.3	2900	--	--	-10.0	0.0	--	--	--	--	--
FEB 18...	1050	0.81	--	1980	7.8	-12.0	0.0	0.3	--	530	538	27
MAR 23...	1330	1.2	1520	--	--	10.0	1.5	--	--	--	--	--
MAR 31...	1400	11	1360	1360	7.8	0.0	0.5	6.0	44	340	371	<1
APR 13...	1400	5.7	1040	--	--	10.0	5.0	--	--	--	--	--
MAY 06...	0945	1.6	923	--	--	15.5	17.0	--	--	--	--	--
MAY 25...	1220	117	1500	1490	8.3	18.0	15.0	25.8	272	340	394	K18
JUN 29...	1500	37	1100	--	--	20.0	16.0	--	--	--	--	--
AUG 03...	1255	587	540	627	7.6	--	19.0	--	--	180	176	110

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)	SULFATE SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	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)
NOV 19...	60	49	190	4	290	47	0.30	6	938	<0.050	--	0.030
FEB 18...	110	62	250	5	400	110	0.30	58	1320	--	<0.050	--
MAR 31...	72	40	150	4	270	67	0.30	5	870	--	0.055	--
MAY 25...	64	44	190	4	300	76	0.30	1	1010	--	<0.050	--
AUG 03...	40	20	57	2	120	13	0.20	15	427	--	0.110	--

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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)	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)
NOV 19...	--	1.1	1.1	0.230	80	4	<100	<10	320	<1	4	<1
FEB 18...	0.420	--	1.7	1.60	490	7	200	<10	40	<1	14	1
MAR 31...	0.380	--	1.2	0.520	70	5	200	<10	230	<1	2	<1
MAY 25...	0.050	--	1.6	0.370	80	5	100	<10	390	<1	<1	<1
AUG 03...	0.100	--	1.2	0.340	530	3	<100	<10	140	<1	<1	1

DATE	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SELE- NIUM, TOTAL (UG/L AS SE) (01147)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
NOV 19...	<1	170	<1	2	4	<1	10	15	5	--	--
FEB 18...	2	3400	1	<1	5	<1	20	15	4	--	--
MAR 31...	<1	2300	<1	6	3	<1	<10	12	1	0.200	<0.100
MAY 25...	1	140	<1	1	3	<1	<10	24	1	0.700	<0.100
AUG 03...	4	930	2	1	5	<1	30	12	<1	--	--

RED RIVER OF THE NORTH BASIN

05123000 LAKE METIGOSHE NEAR BOTTINEAU, ND

LOCATION.--Lat 48°59'05", long 100°20'52", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.35, T.164 N., R.75 W., Bottineau County, Hydrologic Unit 09010004, on east bridge railing of bridge over Lake Metigoshe, and 11.7 mi northeast of Bottineau.

DRAINAGE AREA.--59 mi².

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--June 1931 to September 1932, September 1953 to September 1987, August 1992 to current year.

GAGE.--Weekly observations of water level. Datum of gage is 2,130.00 ft above sea level. 1931-32, nonrecording gage on north abutment of bridge at datum 6.32 ft lower (reduced to elevations NGVD). September 1953 to January 1955, nonrecording gage at present datum on east end of south abutment of bridge. January 1955 to September 1987, water-stage recorder at current site and datum.

REMARKS.--Outlet of lake is a concrete dam with removable stoplogs; average crest elevation without stoplogs about 2,138.00 ft above sea level. Lake level regulated since 1959 by dam and control works in the outlet of Sharpe Lake located on the principal tributary in Manitoba.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 9.70 ft, May 3, 1975; minimum 4.28 ft, Sept. 17, 1932, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 5.13 ft, July 31 and Aug. 3; minimum observed, 4.47 ft, Nov. 2.

MONTH-END GAGE HEIGHT, IN FEET, AUGUST 1992 TO SEPTEMBER 1993

Aug. 31, 1992..	4.80	Dec. 31.....	--	Apr. 30.....	4.80	July 31.....	5.13
Sept. 30.....	4.62	Jan. 31.....	--	May 31.....	e4.68	Aug. 31.....	5.11
Oct. 31.....	e4.48	Feb. 28.....	e4.58	June 30.....	4.72	Sept. 30.....	5.02
Nov. 30.....	--	Mar. 31.....	4.72				

e - Estimated.

RED RIVER OF THE NORTH BASIN

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05123400 WILLOW CREEK NEAR WILLOW CITY, ND

LOCATION.--Lat 48°35'20", long 100°26'30", in NE¼,NW¼, sec.23, T.159 N., R.76 W., McHenry County, Hydrologic Unit 09010004, on left bank 50 ft downstream from bridge on county road, 1.5 mi upstream from Snake Creek, and 7 mi west of Willow City.

DRAINAGE AREA.--1,160 mi², approximately, of which about 430 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1956 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,430 ft above sea level, from topographic map. Prior to Oct. 5, 1956, nonrecording gage at site 50 ft upstream at same datum.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	55	31
2	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	59	32
3	.00	.00	.00	.00	.00	.00	14	.00	.00	.00	61	32
4	.00	.00	.00	.00	.00	.00	e20	.00	.00	.00	61	31
5	.00	.00	.00	.00	.00	.00	e25	.00	.00	.00	61	29
6	.00	.00	.00	.00	.00	.00	28	.00	.00	.00	63	28
7	.00	.00	.00	.00	.00	.00	19	.00	.00	.00	66	27
8	.00	.00	.00	.00	.00	.00	15	.00	.00	.00	64	26
9	.00	.00	.00	.00	.00	.00	14	.00	.00	.00	60	24
10	.00	.00	.00	.00	.00	.00	e10	.00	.00	.00	59	22
11	.00	.00	.00	.00	.00	.00	e8.0	.00	.00	.00	58	21
12	.00	.00	.00	.00	.00	.00	e7.0	.00	.00	.00	55	19
13	.00	.00	.00	.00	.00	.00	e6.0	.00	.00	.00	50	17
14	.00	.00	.00	.00	.00	.00	e5.0	.00	.00	.00	47	15
15	.00	.00	.00	.00	.00	.00	e4.0	.00	.00	.00	44	14
16	.00	.00	.00	.00	.00	.00	e3.0	.00	.00	.00	40	12
17	.00	.00	.00	.00	.00	.00	e2.5	.00	.00	.00	37	11
18	.00	.00	.00	.00	.00	.00	e1.9	.00	.00	.00	33	9.3
19	.00	.00	.00	.00	.00	.00	e1.5	.00	.00	.00	30	7.8
20	.00	.00	.00	.00	.00	.00	e1.3	.00	.00	.00	28	6.5
21	.00	.00	.00	.00	.00	.00	e1.0	.00	.00	.00	26	6.1
22	.00	.00	.00	.00	.00	.00	e.80	.00	.00	.00	33	6.0
23	.00	.00	.00	.00	.00	.00	e.70	.00	.00	.00	34	5.6
24	.00	.00	.00	.00	.00	.00	e.50	.00	.00	.00	33	5.8
25	.00	.00	.00	.00	.00	.00	e.40	.00	.00	.04	34	6.2
26	.00	.00	.00	.00	.00	.00	e.35	.00	.00	15	33	6.7
27	.00	.00	.00	.00	.00	.00	e.30	.00	.00	26	33	6.3
28	.00	.00	.00	.00	.00	.00	e.25	.00	.00	28	32	5.6
29	.00	.00	.00	.00	---	.00	e.20	.00	.00	26	32	10
30	.00	.00	.00	.00	---	.00	e.15	.00	.00	35	32	12
31	.00	---	.00	.00	---	.00	---	.00	---	49	32	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	189.85	0.15	0.00	179.04	1385	484.9
MEAN	.000	.000	.000	.000	.000	.000	6.33	.005	.000	5.78	44.7	16.2
MAX	.00	.00	.00	.00	.00	.00	28	.10	.00	49	66	32
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	26	5.6
AC-FT	.00	.00	.00	.00	.00	.00	377	.3	.00	355	2750	962

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1993, BY WATER YEAR (WY)

MEAN	6.54	4.95	1.67	.26	.65	30.9	213	113	38.9	15.8	13.1	8.86
MAX	71.8	39.6	24.8	4.39	16.4	305	1242	787	350	128	146	75.5
(WY)	1981	1960	1960	1960	1981	1972	1969	1975	1974	1974	1965	1980
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1957	1957	1957	1957	1958	1959	1977	1959	1959	1958	1957	1957

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1956 - 1993
ANNUAL TOTAL	6509.46	2238.94	
ANNUAL MEAN	17.8	6.13	37.3
HIGHEST ANNUAL MEAN			182
LOWEST ANNUAL MEAN			.005
HIGHEST DAILY MEAN	479	Mar 17	5310
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			5900
INSTANTANEOUS PEAK STAGE			16.76
ANNUAL RUNOFF (AC-FT)	12910	4440	26990
10 PERCENT EXCEEDS	19	28	75
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

RED RIVER OF THE NORTH BASIN

05123400 WILLOW CREEK NEAR WILLOW CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-62, 1964-65, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L CACO3) (00900)	ALKA- LITY LAB (MG/L CACO3) (90410)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
APR 06...	1630	29	800	8.3	8.0	3.0	9.5	74	190	119	K3
13...	1530	5.8	1000	8.5	10.0	6.0	15.0	129	240	151	--
AUG 03...	1515	62	1160	7.7	--	19.5	3.7	42	310	311	49

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)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
APR 06...	35	24	94	3	210	55	0.10	15	545	0.620	0.250
13...	46	31	110	3	250	69	0.20	20	666	0.160	0.050
AUG 03...	58	40	180	4	330	51	0.20	6	966	<0.050	0.080

DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)
APR 06...	1.7	0.350	230	3	<100	<10	140	<1	<1	<1	3
13...	1.4	0.240	290	4	<100	<10	110	<1	<1	<1	2
AUG 03...	2.0	0.640	60	5	<100	<10	380	<1	<1	<1	2

DATE	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE) (01147)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
APR 06...	300	<1	1	2	<1	10	17	<1	6.60	1.40
13...	360	<1	1	3	1	10	21	2	37.0	7.80
AUG 03...	400	<2	<1	4	<1	<10	23	2	--	-

RED RIVER OF THE NORTH BASIN

199

05123500 STONE CREEK NEAR KRAMER, ND

LOCATION.--Lat 48°40'42", long 100°42'40", in NW¹/₄NW¹/₄NW¹/₄, sec.23, T.160 N., R.78 W., Bottineau County, Hydrologic Unit 09010003, on left bank 60 ft upstream from bridge on State Highway 14, and 1.0 mi south of Kramer.

DRAINAGE AREA.--168 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to September 1993 (seasonal record only) (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,425 ft above sea level, from topographic map. Prior to Sept. 16, 1986, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 48 ft³/s, July 31, gage height, 3.97 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	.00	.00	.78	.04	.00	.00	40	2.6
2	---	---	---	---	.00	.00	2.5	.00	.00	.00	33	3.2
3	---	---	---	---	.00	.00	e15	.00	.00	.00	28	3.6
4	---	---	---	---	.00	.00	e20	.00	.00	.00	25	4.8
5	---	---	---	---	.00	.00	e15	.00	.00	.00	24	5.8
6	---	---	---	---	.00	.00	9.4	.00	.00	.00	23	5.8
7	---	---	---	---	.00	.00	5.5	.00	.00	.00	22	5.3
8	---	---	---	---	.00	.00	5.6	.00	.00	.00	20	5.1
9	---	---	---	---	.00	.00	13	.00	.00	.00	19	4.7
10	---	---	---	---	.00	.00	12	.00	.00	.00	17	4.5
11	---	---	---	---	.00	.00	9.7	.00	.00	.00	16	4.2
12	---	---	---	---	.00	.00	6.3	.00	.00	.00	15	3.8
13	---	---	---	---	.00	.00	4.0	.00	.00	.00	13	3.3
14	---	---	---	---	.00	.00	2.9	.00	.00	.00	11	2.8
15	---	---	---	---	.00	.00	2.2	.00	.00	.00	9.7	2.4
16	---	---	---	---	.00	.00	1.7	.00	.00	.00	8.2	2.0
17	---	---	---	---	.00	.00	1.4	.00	.00	.00	7.0	1.6
18	---	---	---	---	.00	.00	1.2	.00	.00	.00	5.8	1.4
19	---	---	---	---	.00	.00	.98	.00	.00	.00	4.9	1.1
20	---	---	---	---	.00	.00	.79	.00	.00	.00	4.0	1.0
21	---	---	---	---	.00	.00	.65	.00	.00	.00	2.9	.90
22	---	---	---	---	.00	.00	.54	.00	.00	.32	6.6	.79
23	---	---	---	---	.00	.00	.43	.00	.00	.74	5.5	.67
24	---	---	---	---	.00	.00	.34	.00	.00	1.2	4.2	.57
25	---	---	---	---	.00	.00	.26	.00	.00	1.1	3.3	.54
26	---	---	---	---	.00	.00	.20	.00	.00	.75	2.6	.48
27	---	---	---	---	.00	1.2	.22	.00	.00	2.8	2.3	.44
28	---	---	---	---	.00	2.1	.15	.00	.00	13	2.0	.38
29	---	---	---	---	---	2.5	.14	.00	.00	28	2.0	.34
30	---	---	---	---	---	1.8	.11	.00	.00	37	2.5	.31
31	---	---	---	---	---	1.2	---	.00	---	47	2.3	---
TOTAL	---	---	---	---	0.00	8.80	132.99	0.04	0.00	131.91	381.8	74.42
MEAN	---	---	---	---	.000	.28	4.43	.001	.000	4.26	12.3	2.48
MAX	---	---	---	---	.00	2.5	20	.04	.00	47	40	5.8
MIN	---	---	---	---	.00	.00	.11	.00	.00	.00	2.0	.31
AC-FT	---	---	---	---	.00	17	264	.08	.00	262	757	148

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1993, BY WATER YEAR (WY)

	MEAN	---	---	---	---	.001	21.3	15.3	.63	.48	.88	1.54	.31
MAX	---	---	---	---	---	.004	84.1	88.5	2.92	3.79	4.26	12.3	2.48
(WY)	---	---	---	---	---	1992	1992	1989	1986	1989	1993	1993	1993
MIN	---	---	---	---	---	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	---	---	---	---	---	1988	1988	1988	1988	1987	1986	1986	1986

SUMMARY STATISTICS

WATER YEARS 1986 - 1993

HIGHEST DAILY MEAN	620	Apr	6 1989
LOWEST DAILY MEAN	.00	Mar	1 1986
ANNUAL SEVEN-DAY MINIMUM	.00	Jun	8 1986
INSTANTANEOUS PEAK FLOW	a636	Apr	6 1989
INSTANTANEOUS PEAK STAGE	a5.89	Apr	6 1989
10 PERCENT EXCEEDS	4.4		
50 PERCENT EXCEEDS	.00		
90 PERCENT EXCEEDS	.00		

e Estimated.

a Maximum observed.

RED RIVER OF THE NORTH BASIN

05123500 STONE CREEK NEAR KRAMER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1986 to September 1993 (seasonal records only) (discontinued).

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

		DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L CACO3) (00900)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	CALCIUM DIS-SOLVED AS CA (MG/L) (00915)
MAR 30...	1100	1.9	290	7.3	0.0	1.0	9.0	67	80	--	17
APR 13...	0930	4.2	680	7.6	-2.0	5.0	8.7	73	190	--	37
AUG 04...	1320	25	770	7.4	--	18.5	5.4	--	280	67	58

		MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM AD-SORP-TION RATIO (00931)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
MAR 30...	9.2	16	0.8	77	5.8	<0.10	18	205	0.640	0.450		1.9
APR 13...	23	47	1	170	7.9	0.10	54	402	<0.050	0.050		1.2
AUG 04...	33	77	2	190	11	<0.10	5	713	<0.050	0.040		1.7

		PHOS-PHORUS TOTAL (MG/L AS P) (00665)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)
MAR 30...	0.690	170	2	<100	<10	60	<1	<1	<1		2
APR 13...	0.330	40	5	<100	<10	80	<1	<1	<1		3
AUG 04...	0.830	30	5	<100	<10	320	<1	<1	<1		1

		IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)
MAR 30...	210	<1	1	3	<1	<10	14	4	3.30	0.700
APR 13...	70	<1	1	2	<1	10	18	3	40.0	3.10
AUG 04...	110	<1	<1	4	<1	<10	18	1	--	--

RED RIVER OF THE NORTH BASIN

201

05123510 DEEP RIVER NEAR UPHAM, ND

LOCATION.--Lat 48°35'03", long 100°51'44", in SW¹/₄NW¹/₄ sec.22, T.159 N., R.79 W., McHenry County, Hydrologic Unit 09010005, 60 ft downstream from county highway bridge, 0.8 mi downstream from Little Deep River, and 6.3 mi west of Upham.

DRAINAGE AREA.--975 mi², of which about 605 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1980, March 1985 to current year (seasonal records only since 1985).

GAGE.--Water-stage recorder. Elevation of gage is 1,430 ft above sea level, from topographic map.

REMARKS.--Records good.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1951 reached a stage of about 16 ft, discharge, 2,700 ft³/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2.3 ft³/s, Mar. 25, gage height, 6.97 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	.00	.00	.09	.00	.00	.00	.00	.00
2	---	---	---	---	.00	.00	.03	.00	.00	.00	.00	.00
3	---	---	---	---	.00	.00	.01	.00	.00	.00	.00	.00
4	---	---	---	---	.00	.00	.01	.00	.00	.00	.00	.00
5	---	---	---	---	.00	.00	.01	.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	.00	.00	.00	.00	.00	.00
21	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
22	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
23	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
24	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
25	---	---	---	---	.00	1.1	.00	.00	.00	.00	.00	.00
26	---	---	---	---	.00	2.0	.00	.00	.00	.00	.00	.00
27	---	---	---	---	.00	1.3	.00	.00	.00	.00	.00	.00
28	---	---	---	---	.00	.76	.00	.00	.00	.00	.00	.00
29	---	---	---	---	---	.46	.00	.00	.00	.00	.00	.00
30	---	---	---	---	---	.28	.00	.00	.00	.00	.00	.00
31	---	---	---	---	---	.16	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	0.00	6.06	0.15	0.00	0.00	0.00	0.00	0.00
MEAN	---	---	---	---	.000	.20	.005	.000	.000	.000	.000	.000
MAX	---	---	---	---	.00	2.0	.09	.00	.00	.00	.00	.00
MIN	---	---	---	---	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	.00	12	.3	.00	.00	.00	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1993, BY WATER YEAR (WY)

	MEAN	.12	.72	.24	.034	.12	21.2	132	37.2	4.60	1.60	.46	.024
MAX	1.99	16.1	5.08	.77	2.37	276	1300	367	44.5	22.3	8.37	.39	
(WY)	1976	1976	1976	1976	1976	1976	1976	1976	1975	1974	1975	1969	1969
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1958	1958	1958	1958	1958	1959	1959	1959	1959	1958	1958	1958	1958

SUMMARY STATISTICS

WATER YEARS 1958 - 1993

ANNUAL MEAN	a20.5	
HIGHEST ANNUAL MEAN	a140	1976
LOWEST ANNUAL MEAN	a.000	1959
HIGHEST DAILY MEAN	5700	Apr 12 1969
LOWEST DAILY MEAN	.00	Oct 1 1957
ANNUAL SEVEN-DAY MINIMUM	a.00	Oct 1 1957
INSTANTANEOUS PEAK FLOW	6760	Apr 12 1969
INSTANTANEOUS PEAK STAGE	18.18	Apr 12 1969
ANNUAL RUNOFF (AC-FT)	a14820	
10 PERCENT EXCEEDS	7.6	
50 PERCENT EXCEEDS	.00	
90 PERCENT EXCEEDS	.00	

a Based on complete water years (1958-80).

RED RIVER OF THE NORTH BASIN

05123510 DEEP RIVER AT UPHAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-80, 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR 30...	0900	0.30	420	7.4	0.0	0.5	150	68	30	19	13

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 30...	14	0.5	21	110	12	0.10	8.3	255	286	0.39	0.23

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 30...	<1	20	60	<1	20	160	0.2	<1	2	160

RED RIVER OF THE NORTH BASIN

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05123900 BOUNDARY CREEK NEAR LANDA, ND

LOCATION.--Lat 48°48'46", long 100°51'46" at east line sec.35, T.162 N., R.79 W., Bottineau County, Hydrologic Unit 09010003, on right bank 80 ft downstream from bridge on county road, 5 mi upstream from mouth, and 6 mi southeast of Landa.

DRAINAGE AREA.--230 mi², of which about 60 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1981, March 1985 to current year (seasonal records only from 1985 to current year).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,420.03 ft above sea level.

REMARKS.--Records fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25.0 ft³/s, July 29, gage height, 8.41 ft; backwater from beaver dam; maximum gage height, 8.42 ft, Mar. 29; backwater from beaver dam; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	.00	.00	12	.00	.00	.00	19	e.40
2	---	---	---	---	.00	.00	11	.00	.00	.00	17	e.30
3	---	---	---	---	.00	.00	8.5	.00	.00	.00	16	e.20
4	---	---	---	---	.00	.00	7.7	.00	.00	.00	14	e.10
5	---	---	---	---	.00	.00	7.9	.00	.00	.00	12	e.05
6	---	---	---	---	.00	.00	7.4	.00	.00	.00	11	e.00
7	---	---	---	---	.00	.00	6.6	.00	.00	.00	10	e.00
8	---	---	---	---	.00	.00	8.0	.00	.00	.00	9.2	e.00
9	---	---	---	---	.00	.00	7.9	.00	.00	.00	8.2	e.00
10	---	---	---	---	.00	.00	7.3	.00	.00	.00	7.2	e.00
11	---	---	---	---	.00	.00	6.2	.00	.00	.00	6.5	e.00
12	---	---	---	---	.00	.00	5.5	.00	.00	.00	5.5	e.00
13	---	---	---	---	.00	.00	5.0	.00	.00	.00	5.2	e.00
14	---	---	---	---	.00	.00	4.9	.00	.00	.00	4.8	e.00
15	---	---	---	---	.00	.00	4.9	.00	.00	.00	4.3	e.00
16	---	---	---	---	.00	.00	4.4	.00	.00	.00	3.7	e.00
17	---	---	---	---	.00	.00	3.8	.00	.00	.00	3.2	e.00
18	---	---	---	---	.00	.00	4.2	.00	.00	.00	2.8	e.00
19	---	---	---	---	.00	.00	4.5	.00	.00	.00	2.5	e.00
20	---	---	---	---	.00	.00	3.8	.00	.00	.00	2.2	e.00
21	---	---	---	---	.00	.00	2.8	.00	.00	.00	2.0	e.00
22	---	---	---	---	.00	.00	2.0	.00	.00	.04	e1.8	e.00
23	---	---	---	---	.00	.00	1.7	.00	.00	3.1	e1.6	e.00
24	---	---	---	---	.00	.00	1.1	.00	.00	9.2	e1.4	e.00
25	---	---	---	---	.00	.10	.64	.00	.00	11	e1.2	e.00
26	---	---	---	---	.00	1.9	.32	.00	.00	12	e1.0	e.00
27	---	---	---	---	.00	5.4	.29	.00	.00	15	e.90	e.00
28	---	---	---	---	.00	4.8	.24	.00	.00	18	e.80	e.00
29	---	---	---	---	---	14	.14	.00	.00	21	e.70	e.00
30	---	---	---	---	---	14	.02	.00	.00	23	e.60	e.00
31	---	---	---	---	---	13	---	.00	---	20	e.50	---
TOTAL	---	---	---	---	0.00	53.20	140.75	0.00	0.00	132.34	176.80	1.05
MEAN	---	---	---	---	.000	1.72	4.69	.000	.000	4.27	5.70	.035
MAX	---	---	---	---	.00	14	12	.00	.00	23	19	.40
MIN	---	---	---	---	.00	.00	.02	.00	.00	.00	.50	.00
AC-FT	---	---	---	---	.00	106	279	.00	.00	262	351	2.1

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1993, BY WATER YEAR (WY)

	MEAN	3.19	1.06	.060	.006	.097	27.8	76.3	10.4	6.26	4.22	4.45	1.59
MAX	46.3	11.2	1.23	.14	2.24	167	537	81.5	75.2	35.5	52.3	22.2	
(WY)	1960	1976	1976	1976	1981	1985	1976	1975	1972	1989	1981	1973	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1958	1958	1958	1958	1959	1965	1991	1958	1959	1958	1958	1958	1958

SUMMARY STATISTICS

WATER YEARS 1958 - 1993

ANNUAL MEAN	a12.3	
HIGHEST ANNUAL MEAN	a53.9	1976
LOWEST ANNUAL MEAN	a.041	1977
HIGHEST DAILY MEAN	2690	Apr 10 1969
LOWEST DAILY MEAN	.00	Oct 1 1957
ANNUAL SEVEN-DAY MINIMUM	.00	Oct 1 1957
INSTANTANEOUS PEAK FLOW	3580	Apr 9 1969
INSTANTANEOUS PEAK STAGE	b12.70	Apr 9 1969
ANNUAL RUNOFF (AC-FT)	a8920	
10 PERCENT EXCEEDS	14	
50 PERCENT EXCEEDS	.00	
90 PERCENT EXCEEDS	.00	

e Estimated.

a Based on complete water years only (1958-81).

b Backwater from ice and snow.

RED RIVER OF THE NORTH BASIN

05123900 BOUNDARY CREEK NEAR LANDA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-81, 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

		DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)
MAR 30...	1430	14	410	7.5	2.0	0.5	9.8	72	110	64	--
APR 01...	1346	12	370	--	4.0	3.0	--	--	--	--	--
13...	1130	5.1	560	7.8	4.0	6.0	10.1	87	160	115	--
29...	1439	0.10	628	--	14.5	9.5	--	--	--	--	--
AUG 04...	1200	14	840	7.4	--	17.5	1.7	19	220	338	120
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)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDE (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
MAR 30...	24	12	29	1	120	7.1	0.10	11	274	0.610	0.280
APR 13...	34	18	50	2	150	8.2	0.10	8	387	<0.050	0.020
AUG 04...	45	26	120	4	160	12	0.20	3	645	<0.050	0.030
DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)
MAR 30...	1.7	0.570	160	2	<100	<10	50	<1	<1	<1	2
APR 13...	1.1	0.190	60	3	<100	<10	20	<1	<1	<1	3
AUG 04...	2.0	1.10	<10	7	<100	<10	170	<1	<1	<1	<1
DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SELE-NIUM, TOTAL RECOV-ERABLE (UG/L AS SE) (01147)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L) (70954)	
MAR 30...	220	<1	<1	2	<1	<10	17		6	5.10	1.20
APR 13...	120	<1	1	2	2	10	29	3	3.90		0.900
AUG 04...	240	<1	<1	5	<1	<10	22	3	--	--	

05124000 SOURIS (MOUSE) RIVER NEAR WESTHOPE, ND

(International gaging station)

(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 48°59'47", long 100°57'29", in SW¹/₄SE¹/₄ sec.30, T.164 N., R.79 W., Bottineau County, Hydrologic Unit 09010003, on left bank 1,200 ft upstream from second crossing of international boundary, 1 mi downstream from Fish and Wildlife Service Dam 357, 7 mi northeast of Westhope, 11 mi downstream from Boundary Creek, and at mile 154.5.

DRAINAGE AREA.--16,900 mi², approximately, of which about 10,300 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to October 1929, April 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1338: 1932. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and control. Datum of gage is 1,402.45 ft above sea level. Prior to Mar. 28, 1938, nonrecording gage at site 6.3 mi upstream at datum 2.52 ft higher.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by dams on Souris River and tributaries, combined capacity, about 321,000 acre-ft. Diversion at Eaton Dam for irrigation of about 7,600 acres and other small diversions for irrigation and municipal supply upstream from station.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	17	e.00	.00	.00	.00	e.10	e.00	6.6	20	20	134
2	25	1.6	e.00	.00	.00	.00	.10	e.00	14	22	20	138
3	24	.50	e.00	.00	.00	.00	.08	e.00	14	24	20	139
4	25	e.40	e.00	.00	.00	.00	.07	e.00	15	23	20	139
5	24	e.30	e.00	.00	.00	.00	.06	e.00	13	22	21	139
6	24	e.25	e.00	.00	.00	.00	.05	e.00	12	22	21	139
7	24	e.20	e.00	.00	.00	.00	e.05	e.00	12	21	23	139
8	24	e.16	e.00	.00	.00	.00	e.05	e.00	13	21	24	137
9	24	e.16	e.00	.00	.00	.00	e.03	e.00	11	21	24	135
10	24	e.16	e.00	.00	.00	.00	e.02	e.00	11	20	24	136
11	24	e.16	e.00	.00	.00	.00	e.01	.00	9.2	20	25	135
12	24	e.15	e.00	.00	.00	.00	e.00	.00	8.7	20	25	136
13	23	e.14	e.00	.00	.00	.00	e.00	.00	7.4	20	26	136
14	18	e.12	e.00	.00	.00	.00	e.05	.00	8.2	19	26	128
15	25	e.10	e.00	.00	.00	.00	e.10	.00	9.9	20	26	109
16	26	e.05	e.00	.00	.00	.00	e.05	.00	9.5	21	26	106
17	25	e.00	e.00	.00	.00	.00	e.02	.00	15	21	27	106
18	25	e.00	e.00	.00	.00	.00	e.00	.00	17	20	26	105
19	24	e.00	e.00	.00	.00	.00	e.00	.00	17	20	26	104
20	26	e.00	e.00	.00	.00	.00	e.00	.00	17	20	27	103
21	25	e.00	.00	.00	.00	.00	e.00	.00	18	20	27	104
22	27	e.00	.00	.00	.00	.00	e.00	.00	21	e20	30	104
23	27	e.00	.00	.00	.00	e.00	e.00	.00	21	e20	51	104
24	27	e.00	.00	.00	.00	e.02	e.00	.00	21	e20	119	104
25	26	e.00	.00	.00	.00	e.10	e.00	.00	20	e20	117	104
26	27	e.00	.00	.00	.00	e.20	e.00	.00	21	e20	96	102
27	26	e.00	.00	.00	.00	e.18	e.00	.00	22	e20	97	81
28	27	e.00	.00	.00	.00	e.16	e.00	.00	23	e20	97	33
29	27	e.00	.00	.00	---	e.14	e.00	.00	23	e20	97	30
30	28	e.00	.00	.00	---	e.12	e.00	.00	23	20	97	29
31	27	---	.00	.00	---	e.10	---	.02	---	19	110	---
TOTAL	777	21.45	0.00	0.00	0.00	1.02	0.84	0.02	453.5	636	1415	3338
MEAN	25.1	.71	.000	.000	.000	.033	.028	.001	15.1	20.5	45.6	111
MAX	28	17	.00	.00	.00	.20	.10	.02	23	24	119	139
MIN	18	.00	.00	.00	.00	.00	.00	.00	6.6	19	20	29
AC-FT	1540	43	.00	.00	.00	2.0	1.7	.04	900	1260	2810	6620

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	MEAN	61.6	47.4	27.1	23.5	24.8	60.4	726	908	533	255	110	62.8
MAX	473	360	201	191	190	779	8850	5967	4216	1682	1014	402	
(WY)	1976	1976	1976	1976	1976	1983	1976	1976	1975	1975	1953	1983	
MIN	.000	.000	.000	.000	.000	.000	.010	.000	.000	.000	.000	.000	
(WY)	1933	1935	1935	1935	1935	1936	1941	1937	1937	1937	1931	1931	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1929 - 1993

ANNUAL TOTAL	7487.08	6642.83	
ANNUAL MEAN	20.5	18.2	239
HIGHEST ANNUAL MEAN			1697
LOWEST ANNUAL MEAN			.15
HIGHEST DAILY MEAN	204	139	12400
LOWEST DAILY MEAN	.00 Jan 18	.00 Nov 17	.00 Jul 20 1931
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 18	.00 Nov 17	.00 Jul 20 1931
INSTANTANEOUS PEAK FLOW		141	12600
INSTANTANEOUS PEAK STAGE		6.73	19.16
INSTANTANEOUS LOW FLOW		.00	a-35
ANNUAL RUNOFF (AC-FT)	14850	13180	173100
10 PERCENT EXCEEDS	28	40	534
50 PERCENT EXCEEDS	22	.05	24
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a Reverse flow caused by backwater from downstream tributary inflow.

RED RIVER OF THE NORTH BASIN

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970, 1972 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1992 to current year.

PH: June 1992 to current year.

WATER TEMPERATURE: June 1992 to current year.

DISSOLVED OXYGEN: May 1993 to September 1993.

INSTRUMENTATION.--Water-quality monitor since June 1992.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 1,400 microsiemens, June 1, 1993; minimum recorded, 812 microsiemens, June 19, 1992.

PH: Maximum recorded, 10.1 units, July 12, 1993; minimum recorded, 8.0 units, Sept. 7-9, 1993.

WATER TEMPERATURE: Maximum recorded, 27.2°C, Aug. 8, 1992; minimum recorded, 5.8°C, Sept. 28, 1992.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)
OCT 07...	1530	24	1300	8.6	--	13.0	10.0	17	8.3	77	320
MAR 31...	0830	0.10	850	--	--	-5.0	0.5	--	--	--	--
JUN 01...	1300	7.1	1300	8.9	--	20.0	17.5	4.8	10.6	118	310
AUG a04...	1015	20	990	--	8.8	--	16.5	12	5.5	59	270

DATE	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
OCT 07...	428	--	K40	K54	52	47	160	50	4	20	519
JUN 01...	--	423	K11	120	46	47	170	53	4	20	--
AUG a04...	--	284	K7	<1	40	41	160	55	4	17	--

DATE	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	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)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, DIS- SOLVED (MG/L AS N) (00615)
OCT 07...	1	240	57	0.30	13	22	847	878	1.19	57.8	0.030
JUN 01...	--	210	60	0.20	1.4	--	810	904	1.23	17.3	--
AUG a04...	--	260	53	0.30	16	--	759	808	1.10	42.5	--

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00605)	NITRO- GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, PHOS- PHORUS TOTAL (MG/L AS P) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)
OCT 07...	0.030	0.029	0.067	0.059	0.360	0.380	2.6	3.0	3.1	0.390	0.260
JUN 01...	0.020	0.035	--	0.055	--	0.240	--	2.8	--	0.320	0.260
AUG a04...	<0.010	--	--	<0.050	--	0.120	--	3.6	--	0.560	0.390

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

207

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED
(National stream quality accounting network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	PHOS- PHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)
OCT 07...	0.230	0.200	10	110	<3	15	78	40	<10	4	<1
JUN 01...	--	0.170	<10	89	<3	15	75	77	<10	6	<1
AUG a04...	--	0.330	80	88	<3	59	70	57	<10	3	<1

DATE	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)	ALPHA COUNT, 2 SIGMA WAT DIS AS TH-230 (PCI/L) (75987)	ALPHA, 2 SIGMA SED SUS TOT DRY AS TH-230 (PCI/L) (76004)	ALPHA, 2 SIGMA COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L) (75986)	GROSS ALPHA, DIS- SOLVED (UG/L U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL AS U-NAT) (80040)	BETA, 2 SIGMA WATER, DISS, AS CS-137 (PCI/L) (75989)	GROSS BETA, DIS- SOLVED AS CS-137 (PCI/L) (03515)	GROSS BETA, SUSP. TOTAL AS CS-137 (PCI/L) (03516)
OCT 07...	<1.0	310	<6	--	--	--	--	--	--	--	--
JUN 01...	<1.0	270	<6	3.0	0.34	4.3	3.8	<0.6	4.9	28	<0.6
AUG a04...	<1.0	230	<6	2.1	0.62	2.7	<0.6	<0.6	4.6	27	0.7

DATE	BETA, 2 SIGMA WATER, DISS, AS SR90 /Y90 (PCI/L (75988)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90) (80050)	GROSS BETA, SUSP. TOTAL AS SR/ YT-90) (80060)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L) (09511)	BETA, 2 SIGMA SED, SUSP, TOT DRY SR90Y90 (PCI/L) (76005)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	PHENOLS TOTAL (UG/L) (32730)
OCT 07...	--	--	--	--	--	--	--	--	32	1
JUN 01...	3.6	21	<0.6	0.020	0.09	0.55	<1.0	2.2	--	--
AUG a04...	3.5	20	0.6	0.060	0.36	0.75	<1.0	1.4	--	--

a Replicate sample also collected for quality-assurance purposes.

RED RIVER OF THE NORTH BASIN

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	1190	1170	1180
19	---	---	---	---	---	---	---	---	---	1210	1190	1190
20	---	---	---	---	---	---	---	---	---	1260	1190	1220
21	---	---	---	---	---	---	---	---	---	1240	1170	1210
22	---	---	---	---	---	---	---	---	---	1250	1160	1210
23	---	---	---	---	---	---	---	---	---	1270	1240	1260
24	---	---	---	---	---	---	---	---	---	1310	1230	1270
25	---	---	---	---	---	---	---	---	---	1340	1250	1280
26	---	---	---	---	---	---	---	---	---	1350	1290	1310
27	---	---	---	---	---	---	---	---	---	1340	1310	1330
28	---	---	---	---	---	---	---	---	---	1370	1300	1330
29	---	---	---	---	---	---	---	---	---	1350	1330	1340
30	---	---	---	---	---	---	---	---	---	1350	1320	1330
31	---	---	---	---	---	---	---	---	---	1360	1320	1340
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	1400	1310	1350	1100	1000	1040	989	959	975	1280	1220	1250
2	1330	1210	1260	1040	1010	1030	991	968	982	1280	1230	1260
3	1260	1210	1230	1040	1000	1010	1000	982	988	1290	1260	1280
4	1230	1200	1220	1020	988	1000	1010	994	1000	1300	1260	1280
5	1230	1200	1220	1010	970	991	1030	958	1000	1300	1260	1280
6	1220	1180	1210	987	952	976	1090	997	1020	1310	1280	1290
7	1200	1110	1190	992	941	976	1060	1010	1030	1310	1250	1290
8	1200	1180	1190	989	953	975	1060	1040	1050	1290	1210	1270
9	1190	1130	1160	990	958	973	1060	1020	1050	1280	1210	1250
10	1140	1080	1100	990	948	970	1080	1040	1060	1280	1230	1260
11	1160	1080	1100	990	949	975	1100	1060	1080	1290	1240	1260
12	1130	1090	1110	1030	954	977	1100	1080	1090	1260	1220	1240
13	1130	1080	1110	1110	957	1020	1110	1070	1090	1250	1190	1230
14	1110	1090	1100	1070	1000	1040	1140	1090	1120	1240	1160	1210
15	1120	1080	1100	1050	967	1010	1140	1100	1120	1240	1170	1210
16	1100	1060	1090	1060	961	1010	1160	1130	1140	1240	1140	1200
17	1090	1070	1080	981	945	973	1160	1120	1140	1220	1160	1190
18	1090	1060	1070	983	944	972	1170	1120	1150	1230	1130	1200
19	1070	1060	1070	975	950	966	1190	1150	1170	1250	1190	1210
20	1060	1050	1060	977	943	964	1190	1170	1180	1220	1180	1200
21	1060	1040	1060	979	957	971	1190	1170	1180	1220	1140	1190
22	1080	1010	1040	998	956	974	1200	1160	1170	1200	1140	1180
23	1040	1000	1020	998	954	975	1170	1150	1160	1190	1140	1170
24	1000	993	997	972	935	959	1190	1160	1170	1190	1130	1160
25	1010	987	997	977	946	965	1200	1140	1170	1180	1040	1150
26	991	973	985	974	949	966	1220	1180	1200	1180	1070	1150
27	981	957	973	980	911	950	1230	1200	1220	1200	1120	1170
28	987	974	979	991	954	967	1240	1200	1220	1190	1120	1180
29	1020	972	995	982	957	971	1250	1230	1240	1170	1120	1150
30	1020	1000	1010	978	957	969	1260	1230	1250	1160	1090	1140
31	---	---	---	985	948	972	1260	1230	1250	---	---	---
MONTH	1400	957	1100	1110	911	983	1260	958	1120	1310	1040	1220

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DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	9.0	8.9	9.7	9.4	9.5	9.2	8.5	8.3
2	---	---	---	---	9.1	9.0	9.8	9.5	9.5	9.2	8.4	8.3
3	---	---	---	---	9.1	9.0	9.7	9.6	9.5	9.3	8.4	8.2
4	---	---	---	---	9.1	9.1	9.8	9.5	9.4	9.2	8.3	8.2
5	---	---	---	---	9.2	9.1	9.7	9.5	9.5	9.2	8.3	8.3
6	---	---	---	---	9.4	9.2	9.7	9.5	9.5	9.2	8.4	8.3
7	---	---	---	---	9.3	9.3	9.8	9.6	9.5	9.0	8.5	8.0
8	---	---	---	---	9.3	9.2	9.9	9.7	9.3	8.8	8.2	8.0
9	---	---	---	---	9.4	9.2	10.0	9.7	9.5	9.1	8.2	8.0
10	---	---	---	---	9.4	9.2	10.0	9.7	9.5	9.3	8.3	8.1
11	---	---	---	---	9.4	9.3	9.9	9.7	9.4	9.0	8.4	8.1
12	---	---	---	---	9.5	9.4	10.1	9.7	9.4	9.0	8.4	8.2
13	---	---	---	---	9.6	9.5	9.9	9.7	9.4	9.1	8.2	8.2
14	---	---	---	---	9.7	9.5	9.8	9.6	9.3	8.7	8.4	8.1
15	---	---	---	---	9.5	9.4	9.8	9.6	9.2	8.9	8.4	8.3
16	---	---	---	---	9.5	9.4	9.6	9.4	9.2	8.8	8.4	8.2
17	---	---	---	---	9.6	9.4	9.7	9.4	9.1	8.8	8.4	8.3
18	---	---	8.7	8.7	9.7	9.4	9.7	9.4	9.2	8.9	8.5	8.4
19	---	---	8.7	8.7	9.7	9.4	9.8	9.5	9.1	8.7	8.4	8.4
20	---	---	8.7	8.7	9.8	9.5	9.8	9.6	9.2	8.8	8.4	8.3
21	---	---	8.8	8.7	9.9	9.6	9.7	9.5	9.3	9.1	8.4	8.3
22	---	---	8.8	8.8	9.8	9.5	9.5	8.8	9.2	8.9	8.3	8.2
23	---	---	8.8	8.8	9.5	9.3	9.3	8.7	9.2	8.9	8.3	8.2
24	---	---	8.8	8.8	9.7	9.5	9.6	9.2	9.1	9.0	8.4	8.3
25	---	---	8.9	8.8	9.7	9.5	9.5	9.2	9.1	8.9	8.3	8.3
26	---	---	8.9	8.9	9.6	9.5	9.4	9.3	8.9	8.6	8.3	8.2
27	---	---	8.9	8.9	9.7	9.6	9.4	9.2	8.8	8.6	8.3	8.1
28	---	---	8.9	8.7	9.7	9.5	9.4	9.1	8.8	8.5	8.3	8.1
29	---	---	8.9	8.9	9.7	9.5	9.5	9.2	8.7	8.6	8.3	8.2
30	---	---	8.9	8.8	9.7	9.5	9.4	9.1	8.6	8.4	8.3	8.2
31	---	---	8.9	8.9	---	---	9.5	9.0	8.7	8.3	---	---
MONTH	---	---	---	---	9.9	8.9	10.1	8.7	9.5	8.3	8.5	8.0

[illegible]

05124000 SOURIS RIVER NEAR WESTHOPE, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	20.4	16.0	17.7	20.8	17.8	19.0	22.9	20.0	21.0	17.3	16.1	16.6
2	18.4	16.0	17.0	21.6	18.2	20.0	20.5	18.4	19.3	17.0	16.1	16.6
3	17.0	14.5	15.8	20.7	18.1	19.1	18.4	16.6	17.7	17.7	15.2	16.4
4	18.5	15.0	16.7	19.9	17.8	18.8	18.3	16.7	17.4	17.1	15.9	16.3
5	18.4	16.0	17.4	19.2	17.1	17.9	20.6	17.6	19.0	16.3	15.3	15.8
6	20.5	16.2	18.1	17.1	15.5	16.0	21.5	17.9	19.7	15.7	14.6	15.2
7	19.4	15.1	17.2	17.7	14.7	16.1	22.9	19.1	21.0	16.0	14.2	15.0
8	15.1	13.4	13.9	20.2	15.9	18.0	23.1	20.0	21.3	16.8	14.8	15.7
9	20.9	13.1	15.9	23.3	17.3	19.5	25.0	20.6	22.8	16.4	15.0	15.6
10	21.9	17.3	19.8	22.1	19.0	20.5	25.1	21.9	23.6	16.7	14.0	15.3
11	23.0	19.7	21.4	20.4	17.5	19.0	26.1	22.8	24.2	17.5	14.3	15.9
12	23.9	20.7	22.3	21.2	17.0	18.5	23.9	21.1	22.4	17.2	13.6	15.8
13	22.7	18.0	20.0	20.0	16.7	17.6	22.7	19.4	21.1	13.6	10.6	11.7
14	18.0	14.8	16.2	21.5	17.0	19.2	21.4	19.7	20.4	12.7	9.9	11.1
15	17.5	15.2	16.4	20.2	18.7	19.1	23.7	19.9	21.2	12.7	10.6	11.5
16	15.9	14.2	15.0	18.8	18.2	18.5	23.3	19.9	21.7	11.5	10.5	11.0
17	18.6	13.0	15.4	22.7	17.2	19.1	22.7	20.1	21.4	11.6	9.6	10.6
18	22.7	15.9	18.9	21.6	18.8	19.9	21.1	18.6	20.1	12.8	10.0	11.3
19	22.2	18.1	20.2	21.3	18.6	19.8	22.4	19.0	20.5	12.8	11.1	12.0
20	25.1	19.4	22.0	24.7	18.9	21.4	22.1	19.0	20.8	13.9	11.4	12.6
21	27.1	22.3	24.0	21.2	18.4	19.7	23.5	20.0	21.6	13.4	12.1	12.8
22	23.8	21.3	22.3	20.0	18.4	19.1	23.0	21.3	22.0	12.7	11.1	11.8
23	21.3	18.3	19.8	20.0	18.5	19.1	23.3	21.0	21.9	12.5	10.5	11.5
24	18.3	16.8	17.6	22.5	18.5	20.2	22.9	21.2	22.0	13.3	10.8	12.0
25	17.0	14.2	15.0	22.3	20.2	20.7	22.6	21.1	21.8	13.2	11.7	12.4
26	14.3	12.7	13.4	22.1	19.4	20.3	21.5	20.3	20.8	12.3	9.9	10.7
27	15.1	12.2	13.4	22.4	19.1	20.5	20.9	19.4	20.2	11.2	9.3	10.1
28	17.3	13.5	15.1	23.7	18.0	19.9	19.8	18.3	19.0	10.4	8.3	9.5
29	15.8	14.4	14.8	25.1	20.0	22.7	19.0	17.3	18.0	10.3	8.4	9.4
30	19.3	14.1	16.3	24.4	21.5	22.9	17.9	16.5	17.1	11.0	8.8	9.9
31	---	---	---	24.0	21.3	22.8	17.3	15.4	16.4	---	---	---
MONTH	27.1	12.2	17.6	25.1	14.7	19.5	26.1	15.4	20.6	17.7	8.3	13.1

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

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OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

MISSOURI RIVER MAIN STEM

06185500 MISSOURI RIVER NEAR CULBERTSON, MT
(National stream quality accounting network station)

LOCATION.--Lat 48°07'30", long 104°28'20", in SE¹/₄NW¹/₄ sec.3, T.27 N., R.56 E., Richland County, Hydrologic Unit 10060005, on right bank at upstream side of bridge on State Highway 16, 2.5 mi southeast of Culbertson, 10 mi downstream from Big Muddy Creek, and at river mile 1,620.76.

DRAINAGE AREA.--91,557 mi².

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 sea level (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 higher. 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: Dec. 6 to Mar. 31. 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. U.S. Army Corps of Engineers satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year. Water-quality data are available from the U.S. Geological Survey, Montana District office.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAILY MEAN VALUES

DAY	DRIFT MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3270	3430	3690	e8000	e8000	e5100	8570	7260	7120	7170	12100	6380
2	3270	3460	3510	e8400	e8000	e5000	8180	7320	7190	6860	11500	6150
3	3260	3440	3880	e7900	e8300	e4600	8280	7410	7320	7350	11000	6100
4	3220	3470	6000	e8000	e8100	e4200	8730	7730	7370	7580	10300	6140
5	3260	3450	8040	e8200	e8000	e4600	8870	8150	7410	7760	9430	5990
6	3460	3420	e7300	e8000	e8400	e5000	8190	7920	7560	9230	8470	5950
7	3520	3430	e8200	e8000	e7800	e5200	8220	7860	7430	9390	7780	5870
8	3490	3490	e7800	e8000	e7900	e5600	7990	7920	7360	8150	7270	5850
9	3490	3540	e7900	e8800	e8100	e5700	7890	7770	7270	8220	6930	5820
10	3470	3570	e8600	e8400	e8100	e5400	7880	7870	7290	8490	6960	5930
11	3460	3540	e8100	e8800	e8500	e6000	7760	8000	7220	8520	6860	5600
12	3410	3480	e7700	e8400	e8200	e6400	7630	7820	7380	8520	7050	5130
13	3300	3460	e7300	e8100	e8000	e8700	7460	7610	7300	8500	7230	4910
14	3280	3420	e7900	e8000	e8200	e8200	7480	7540	7240	8060	7130	4770
15	3310	3440	e7800	e7900	e8000	e8900	7460	7470	7290	7820	7100	4740
16	3360	3450	e8000	e8000	e8000	e8400	7490	7310	7180	7650	6580	4910
17	3390	3450	e8100	e7800	e8400	e8600	7480	7250	7210	7600	6320	4830
18	3400	3470	e7900	e8000	e8100	e8700	7480	7280	7190	7460	6320	4680
19	3380	3490	e7800	e7900	e7100	e8300	7030	6950	7200	7480	6180	4760
20	3390	3520	e8200	e8000	e6700	e8200	6860	6910	7210	7390	6080	4920
21	3380	3530	e8000	e7900	e7200	e8500	7020	6950	7290	7400	6160	4940
22	3400	3530	e8300	e8200	e6200	e9000	6840	6950	7350	7710	6380	4980
23	3490	3500	e7900	e8400	e6200	e9500	6810	6900	7320	12800	6560	4990
24	3490	3470	e7700	e8300	e5800	e9500	6810	6990	7380	16200	7570	4800
25	3570	3490	e7900	e8200	e5600	e9500	7030	7260	7460	13600	8540	4860
26	3680	3560	e8500	e8000	e4900	e9500	7250	7050	7310	11500	8220	4750
27	3470	3660	e8900	e8200	e5200	e9000	7400	6960	7220	10800	8360	4750
28	3360	3730	e8400	e8100	e5000	e9000	7240	7070	7110	11300	8130	4680
29	3370	3740	e8600	e8000	---	e9000	7160	7160	7110	13100	7680	4650
30	3400	3730	e8400	e8200	---	e9000	7150	7130	7090	14100	7170	4600
31	3400	---	e8100	e7900	---	e9000	---	7170	---	12800	6670	---
TOTAL	105400	105360	234420	252000	206000	231300	227640	228940	218380	290510	240030	157430
MEAN	3400	3512	7562	8129	7357	7461	7588	7385	7279	9371	7743	5248
MAX	3680	3740	8900	8800	8500	9500	8870	8150	7560	16200	12100	6380
MIN	3220	3420	3510	7800	4900	4200	6810	6900	7090	6860	6080	4600
AC-FT	209100	209000	465000	499800	408600	458800	451500	454100	433200	576200	476100	312300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1993, BY WATER YEAR (WY)*

MEAN	10970	9282	9071	9797	10530	10590	10870	9517	9503	10260	11530	11300
MAX	28570	22440	13280	14400	17450	20690	32840	26220	26650	37050	25300	26590
(WY)	1949	1952	1944	1986	1976	1976	1979	1979	1975	1975	1948	1948
MIN	1237	1126	1061	1010	1167	2674	1965	1353	1366	1273	3823	3771
(WY)	1942	1942	1962	1943	1942	1950	1945	1945	1945	1945	1963	1992

e Estimated.

MISSOURI RIVER MAIN STEM

06185500 MISSOURI RIVER NEAR CULBERTSON, MT--Continued

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1941 - 1993*	
ANNUAL TOTAL	2437710		2497410			
ANNUAL MEAN	6660		6842		10270	
HIGHEST ANNUAL MEAN					16580	1975
LOWEST ANNUAL MEAN					4083	1942
HIGHEST DAILY MEAN	9200	Apr 20	16200	Jul 24	69200	Mar 27 1943
LOWEST DAILY MEAN	3210	Sep 26	3220	Oct 4	575	Nov 22 1941
ANNUAL SEVEN-DAY MINIMUM	3250	Sep 26	3320	Oct 1	709	Nov 19 1941
INSTANTANEOUS PEAK FLOW			a16700	Jul 24	d78200	Mar 26 1943
INSTANTANEOUS PEAK STAGE			b11.09	Jan 7	b19.66	Apr 14 1979
INSTANTANEOUS LOW FLOW			c3210	Oct 4	575	Nov 22 1941
ANNUAL RUNOFF (AC-FT)	4835000		4954000		7439000	
10 PERCENT EXCEEDS	8500		8600		16000	
50 PERCENT EXCEEDS	7630		7300		9420	
90 PERCENT EXCEEDS	3440		3470		4090	
SUMMARY STATISTICS	WATER YEARS 1941 - 1951**		WATER YEARS 1958 - 1993***			
ANNUAL TOTALS						
ANNUAL MEAN	9245		10560			
HIGHEST ANNUAL MEAN	14520	1948	16580		1975	
LOWEST ANNUAL MEAN	4083	1942	6121		1963	
HIGHEST ANNUAL MEAN	69200	Mar 27 1943	52000	Apr 18 1979		
LOWEST DAILY MEAN	574	Nov 22 1941	2000	Nov 20 1964		
ANNUAL SEVEN-DAY MINIMUM	709	Nov 19 1941	2130	Nov 19 1964		
INSTANTANEOUS PEAK FLOW	d78200	Mar 26 1943	52000	Apr 18 1979		
INSTANTANEOUS PEAK STAGE	15.12	Mar 26 1943	b19.66	Apr 14 1979		
ANNUAL RUNOFF (AC-FT)	6698000		7650000			
10 PERCENT EXCEEDS	21000		15200			
50 PERCENT EXCEEDS	6910		9710			
90 PERCENT EXCEEDS	1400		6000			

* During period of operation (1941-52, 1958 to 1993).

** Before operational level at Fort Peck Lake was reached.

*** After operational level at Fort Peck Lake was reached.

a Gage height, 8.19 ft.

b Backwater from ice.

c Gage height, 2.48 ft.

d Gage height, 14.80 ft, from rating curve extended above 30,000 ft³/s.

LOCATION.--Lat 48°02'10", long 104°09'40", in NE 1/4, sec.1, T.26 N., R.58 E., Richland County, Hydrologic Unit 10060005, on right bank 4.5 mi northwest of Nohly, and at mile 1,595.7.

DRAINAGE AREA.--93,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above sea level. Prior to Apr. 18, 1962, at datum 60.00 ft lower.

REMARKS.--Stage regulated by Fort Peck Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 21.20 ft, Mar. 23, 1960, present datum; minimum daily recorded, 6.87 ft, Apr. 18, 1963.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

[illegible]

MISSOURI RIVER MAIN STEM

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06185650 MISSOURI RIVER STAGE GAGE NO. 5 AT NOHLY, MT

LOCATION.--Lat 48°00'10", long 104°05'30", in SE $\frac{1}{4}$ sec.16, T.26 N., R.59 E., Richland County, Hydrologic Unit 10060005, at downstream side of bridge, 0.2 mi northwest of Nohly, and at mile 1,587.7.

DRAINAGE AREA.--93,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,800.00 ft above sea level.

REMARKS.--Stage regulated by Fort Peck Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 77.22 ft, Mar. 15, 1972; minimum daily recorded, 59.12 ft, Nov. 22, 1964.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	63.96	65.39	64.84	67.37	64.16
2	---	---	---	---	---	---	---	64.01	65.46	64.90	66.88	63.99
3	---	---	---	---	---	---	---	64.05	65.51	65.13	66.52	63.86
4	---	---	---	---	---	---	---	64.11	65.50	65.23	66.25	63.87
5	---	---	---	---	---	---	---	64.36	65.52	66.05	65.90	63.80
6	---	---	---	---	---	---	---	64.50	65.49	67.11	65.52	63.70
7	---	---	---	---	---	---	---	64.42	65.38	67.22	65.13	63.63
8	---	---	---	---	---	---	---	64.46	65.30	66.75	64.80	63.61
9	---	---	---	---	---	---	---	64.44	65.85	66.25	64.50	63.57
10	---	---	---	---	---	---	---	64.37	65.87	66.06	64.38	63.56
11	---	---	---	---	---	---	---	64.50	65.68	65.99	64.39	63.51
12	---	---	---	---	---	---	---	64.54	65.75	65.80	64.32	63.31
13	---	---	---	---	---	---	---	64.41	65.72	65.73	64.54	63.09
14	---	---	---	---	---	---	64.18	64.31	65.48	65.92	64.47	62.95
15	---	---	---	---	---	---	64.13	64.26	65.64	66.07	64.56	62.90
16	---	---	---	---	---	---	64.15	64.26	65.85	65.68	64.27	62.95
17	---	---	---	---	---	---	64.14	64.35	65.52	65.39	64.05	63.02
18	---	---	---	---	---	---	64.17	64.68	65.20	65.18	63.97	62.88
19	---	---	---	---	---	---	64.05	64.96	65.26	65.14	63.95	62.87
20	---	---	---	---	---	---	63.81	65.13	65.55	65.16	63.81	62.95
21	---	---	---	---	---	---	63.81	65.17	65.63	64.98	63.85	63.03
22	---	---	---	---	---	---	63.83	64.99	65.45	64.88	64.03	63.02
23	---	---	---	---	---	---	63.74	65.00	65.44	65.46	64.18	63.07
24	---	---	---	---	---	---	63.74	65.21	65.51	67.42	64.38	62.96
25	---	---	---	---	---	---	63.78	65.74	65.73	67.48	65.08	62.95
26	---	---	---	---	---	---	63.91	66.06	65.90	66.78	65.27	62.94
27	---	---	---	---	---	---	64.05	65.64	65.71	66.42	65.15	62.91
28	---	---	---	---	---	---	64.08	65.01	65.27	66.64	65.20	62.89
29	---	---	---	---	---	---	64.00	64.71	64.88	67.81	65.01	62.83
30	---	---	---	---	---	---	63.93	64.71	64.71	68.69	64.77	62.86
31	---	---	---	---	---	---	---	65.09	---	68.24	64.40	---
MEAN	---	---	---	---	---	---	---	64.69	65.50	66.14	64.87	63.25
MAX	---	---	---	---	---	---	---	66.06	65.90	68.69	67.37	64.16
MIN	---	---	---	---	---	---	---	63.96	64.71	64.84	63.81	62.83

YELLOWSTONE RIVER BASIN

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT
(National stream-quality accounting network station)

LOCATION.--Lat 47°40'42", long 104°09'22", in SW¹/₄, NE¹/₄, SW¹/₄, sec.9, T.22 N., R.59 E., Richland County, Hydrologic Unit 10100004, on left bank at Montana-Dakota Utilities Company powerplant, 0.2 mi downstream from bridge on State Highway 23, 2.5 mi south of Sidney, 3.0 mi downstream from Fox Creek, and at river mile 29.2.

DRAINAGE AREA.--69,103 mi². Area at site 4.5 mi upstream, 68,812 mi².

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 above sea level (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: Dec. 2 to Mar. 28. Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated to some extent by Bighorn Lake, usable capacity, 1,356,000 acre-ft, on the Bighorn River and on other tributary streams in Wyoming and Montana. Diversion for irrigation of about 1,250,000 acres upstream from station. Lower Yellowstone Project Main Canal diverts from left bank in NW¹/₄, sec.36, T.18 N., R.56 E., at Lower Yellowstone diversion dam at Intake about 36.6 mi upstream for irrigation of about 52,000 acres of which about one-third lies upstream from station. U.S. Army Corps of Engineers satellite telemeter at station. Water-quality data are available from the U.S. Geological Survey, Montana District office.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993												
DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6330	6530	6950	e4000	e6000	e4000	8240	7490	34700	27800	26200	8750
2	6540	6570	e6500	e3000	e6000	e5000	8020	7460	34500	28500	23200	8690
3	6600	6590	e6000	e2500	e6000	e6000	7870	7360	33700	27000	21700	8530
4	6350	6650	e5500	e2300	e6000	e7000	7760	7150	33600	30100	20200	8260
5	6160	6740	e5000	e2500	e5500	e8000	7560	7610	33200	44800	18600	8100
6	6070	6760	e5000	e3000	e5500	e9000	7360	7500	31600	48200	17300	7900
7	6260	7160	e5000	e4000	e5500	e10000	7160	7630	29200	43000	17100	7780
8	6700	7290	e5000	e5000	e5500	e11500	7060	8150	33500	38900	15500	7760
9	6680	7300	e4500	e5500	e5500	e13000	6960	10600	39300	34600	15100	7660
10	6950	7490	e5000	e5500	e5500	e12000	6860	12100	37500	32600	14900	7600
11	6960	7900	e6000	e6000	e5500	e11000	6840	16900	37600	30300	14300	7400
12	6920	7810	e7000	e6000	e5000	e10000	6750	16300	39400	28300	13700	7100
13	6980	7640	e7500	e5500	e5000	e10000	6710	15100	35600	28500	12600	6950
14	6780	7620	e8500	e5500	e4500	e9000	6790	13600	34800	34200	12100	6900
15	6670	7540	e8000	e5500	e4500	e8000	7450	13900	37600	32500	11900	7020
16	6690	7360	e8500	e6000	e4500	e7500	7840	18300	36500	28900	11900	7550
17	6900	7360	e8500	e6000	e4500	e7500	7820	23400	32000	27100	11500	7790
18	7070	7590	e8000	e6500	e4000	e7000	7620	27500	31200	26300	11400	7780
19	7410	7550	e7500	e6000	e3500	e7000	7590	31500	34100	26800	10800	7600
20	7390	7450	e7000	e6000	e3000	e8000	8160	33400	35300	25900	10300	7690
21	7190	7430	e6000	e6500	e2800	e9000	8810	32200	33800	23400	9850	7760
22	7110	7380	e5000	e7000	e2500	e10000	8540	31400	33000	23100	9650	7700
23	7090	7360	e6000	e7500	e2500	e12000	7940	33000	33300	25100	9550	7620
24	6940	7380	e6500	e7500	e2500	e13000	7850	36000	34900	22500	9470	7540
25	6070	7270	e7000	e7000	e2800	e12000	7850	40200	36200	21900	10100	7790
26	6630	6940	e6500	e7000	e2800	e11000	7650	40000	36000	20600	10400	7980
27	6660	7300	e6000	e6500	e3000	e10000	7640	33900	31600	24500	10700	8330
28	6630	7430	e7000	e7000	e3500	e9500	7930	28400	27500	35200	9910	8330
29	6590	7150	e7000	e7500	---	9450	7970	26900	25800	49600	9430	8310
30	6560	7010	e6000	e7000	---	8730	7720	30000	26300	46500	9390	8190
31	6560	---	e5000	e6500	---	8330	---	33600	---	34100	9140	---
TOTAL	208440	217550	198950	173300	123400	283510	228320	658550	1013300	970800	417890	234360
MEAN	6724	7252	6418	5590	4407	9145	7611	21240	33780	31320	13480	7812
MAX	7410	7900	8500	7500	6000	13000	8810	40200	39400	49600	26200	8750
MIN	6070	6530	4500	2300	2500	4000	6710	7150	25800	20600	9140	6900
AC-FT	413400	431500	394600	343700	244800	562300	452900	1306000	2010000	1926000	828900	464900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1993, BY WATER YEAR (WY)*

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
MEAN	8288	7354	5923	5686	6762	11120	10460	18400	39400	23490	8833	7225
MAX	29130	12150	9594	13110	17750	25980	39160	38100	77280	55000	20470	16000
(WY)	1924	1924	1976	1925	1971	1972	1924	1928	1918	1917	1912	1941
MIN	3726	3700	3019	2087	2702	5191	2821	5409	11580	3311	1602	2389
(WY)	1922	1922	1961	1937	1936	1961	1961	1961	1919	1919	1961	1934

e Estimated.

YELLOWSTONE RIVER BASIN

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT--Continued
(National stream-quality accounting network station)

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1911 - 1993*	
ANNUAL TOTAL	3558490		4728370		12760	
ANNUAL MEAN	9723		12950		21250	1924
HIGHEST ANNUAL MEAN					5814	1934
LOWEST ANNUAL MEAN					142000	Jun 21 1921
HIGHEST DAILY MEAN	39300	Jun 20	49600	Jul 29	570	May 17 1961
LOWEST DAILY MEAN	4310	Aug 20	2300	Jan 4	1010	Aug 8 1961
ANNUAL SEVEN-DAY MINIMUM	4480	Aug 16	2700	Feb 20	a159000	Jun 2 1921
INSTANTANEOUS PEAK FLOW			51100	Jul 29	b21.85	Mar 22 1947
INSTANTANEOUS PEAK STAGE			14.04	Jul 29	c470	May 17 1961
INSTANTANEOUS LOW FLOW			2300	Jan 4	9244000	
ANNUAL RUNOFF (AC-FT)	7058000		9379000		28600	
10 PERCENT EXCEEDS	18500		33200		8040	
50 PERCENT EXCEEDS	6970		7640		4130	
90 PERCENT EXCEEDS	5590		5500			
SUMMARY STATISTICS	WATER YEARS 1911 - 1965**		WATER YEARS 1967 - 1993***			
ANNUAL TOTAL	12890		12670			
ANNUAL MEAN	21250	1924	17960	1975		
HIGHEST ANNUAL MEAN	5814	1934	7319	1988		
LOWEST ANNUAL MEAN	142000	Jun 21 1921	104000	May 23 1978		
HIGHEST DAILY MEAN	570	May 17 1961	800	Jan 2 1989		
LOWEST DAILY MEAN	1010	Aug 8 1961	1500	Aug 21 1988		
ANNUAL SEVEN-DAY MINIMUM	a159000	Jun 21 1921	d111000	May 23 1978		
INSTANTANEOUS PEAK FLOW	b21.85	Mar 22 1947	f21.67	Feb 17 1971		
INSTANTANEOUS PEAK STAGE	c470	May 17 1961				
INSTANTANEOUS LOW FLOW	9341000		9179000			
ANNUAL RUNOFF (AC-FT)	29900		27200			
10 PERCENT EXCEEDS	7690		8980			
50 PERCENT EXCEEDS	3820		5160			
90 PERCENT EXCEEDS						

* During period of operation 1911-31, 1934-93. Published as "at Intake" 1911-31.

** Prior to Bighorn Lake reaching operational level.

*** After Bighorn Lake reached operational level.

a Gage height, 12.6 ft, site and datum then in use.

b Backwater from ice, site and datum then in use.

c Gage height, 2.73 ft, site and datum then in use.

d Gage height, 20.02 ft.

f Backwater from ice.

LOCATION.--Lat 47°48'34", long 104°02'36", sec. 18, T.150 N., R.104 W., McKenzie County, Hydrologic Unit 101000004, on left bank 3 mi south of Fairview, and at mile 15.2.

DRAINAGE AREA.--70,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above sea level. Prior to Feb. 19, 1962, at datum 60.00 ft lower.

REVISED RECORDS.--WDR ND-82: 1980-81.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 23.78 ft, Mar. 21, 1960, present datum; minimum daily recorded, 7.92 ft, Aug. 17, 1988, present datum.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

[illegible]

YELLOWSTONE RIVER BASIN

219

06329610 YELLOWSTONE RIVER STAGE GAGE NO. 2 NEAR CARTWRIGHT, ND

LOCATION.--Lat 47°51'50", long 103°58'06", on south line sec.26, T.151 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on bridge on State Highway 23, 2 mi west of Cartwright, and at mile 8.6.

DRAINAGE AREA.--70,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,800.00 ft above sea level.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 87.08 ft, Mar. 23, 1978; minimum daily recorded, 58.58 ft, July 26, 1974.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64.94	---	---	---	---	---	---	---	---	70.85	70.91	65.84
2	65.05	---	---	---	---	---	---	---	72.09	71.12	70.02	65.78
3	65.01	---	---	---	---	---	---	---	71.95	71.00	69.57	65.76
4	64.97	---	---	---	---	---	---	---	71.85	71.12	69.21	65.66
5	64.98	---	---	---	---	---	---	---	71.87	72.50	68.84	65.59
6	64.93	---	---	---	---	---	---	---	71.60	73.60	68.47	65.51
7	64.99	---	---	---	---	---	---	---	71.10	73.41	68.23	65.47
8	65.03	---	---	---	---	---	---	---	71.20	72.95	68.19	65.47
9	65.03	---	---	---	---	---	---	---	72.64	72.35	67.73	65.44
10	65.05	---	---	---	---	---	---	---	72.40	71.86	67.72	65.36
11	65.15	---	---	---	---	---	---	---	72.29	71.61	67.49	65.34
12	65.13	---	---	---	---	---	---	---	72.57	71.12	67.28	65.19
13	65.03	---	---	---	---	---	64.73	---	72.25	71.01	67.05	65.11
14	65.08	---	---	---	---	---	64.73	---	71.90	71.93	66.83	65.10
15	---	---	---	---	---	---	64.84	---	72.25	72.15	66.78	65.15
16	---	---	---	---	---	---	65.03	---	72.38	71.34	66.78	65.26
17	---	---	---	---	---	---	65.06	---	71.69	71.00	66.71	65.37
18	---	---	---	---	---	---	65.00	---	71.35	70.69	66.61	65.42
19	---	---	---	---	---	---	64.97	---	71.75	70.79	66.50	65.38
20	---	---	---	---	---	---	---	---	72.22	70.78	66.34	65.39
21	---	---	---	---	---	---	---	---	72.15	70.26	66.23	65.41
22	---	---	---	---	---	---	---	---	71.90	69.95	66.16	65.37
23	---	---	---	---	---	---	---	---	71.88	70.26	66.20	65.33
24	---	---	---	---	---	---	---	---	72.05	69.86	66.11	65.31
25	---	---	---	---	---	---	---	---	72.38	69.62	66.23	65.37
26	---	---	---	---	---	---	---	---	72.43	69.39	66.36	65.41
27	---	---	---	---	---	---	---	---	71.87	69.78	66.53	65.57
28	---	---	---	---	---	---	---	---	71.05	71.56	66.35	65.57
29	---	---	---	---	---	---	---	---	70.60	73.88	66.10	65.54
30	---	---	---	---	---	---	---	---	70.60	74.06	66.05	65.52
31	---	---	---	---	---	---	---	---	---	72.60	65.97	---
MEAN	---	---	---	---	---	---	---	---	---	71.43	67.28	65.43
MAX	---	---	---	---	---	---	---	---	---	74.06	70.91	65.84
MIN	---	---	---	---	---	---	---	---	---	69.39	65.97	65.10

YELLOWSTONE RIVER BASIN

06329620 YELLOWSTONE RIVER STAGE GAGE NO. 3 NEAR BUFORD, ND

LOCATION.--Lat 47°55'14", long 103°57'56", in SW¹/₄ sec.2, T.151 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on left bank 4 mi south of Buford, and 6.5 mi southeast of Nohly.

DRAINAGE AREA.--70,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,850.00 ft above sea level. Prior to Apr. 19, 1962, at datum 50.00 ft lower. Prior to Apr. 23, 1987, gage was located 1 mi downstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 29.55 ft, Mar. 15, 1972; minimum daily recorded, 6.18 ft, Aug. 24, 1961, present datum.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.17	---	---	---	---	---	---	10.59	18.06	16.75	---	11.81
2	10.30	---	---	---	---	---	---	10.54	18.21	17.04	---	11.72
3	10.29	---	---	---	---	---	---	10.54	18.11	17.03	---	11.68
4	10.22	---	---	---	---	---	---	10.42	18.01	17.09	---	11.52
5	10.09	---	---	---	---	---	---	10.54	18.07	19.03	---	11.43
6	10.06	---	---	---	---	---	---	10.66	17.83	20.03	---	---
7	10.03	---	---	---	---	---	---	10.65	17.45	19.66	---	---
8	10.19	---	---	---	---	---	---	10.92	17.56	19.22	---	---
9	10.26	---	---	---	---	---	---	11.50	18.81	18.61	---	---
10	10.36	---	---	---	---	---	---	12.24	18.59	18.11	---	---
11	10.41	---	---	---	---	---	---	13.41	18.41	17.84	---	---
12	10.38	---	---	---	---	---	---	14.24	18.70	17.36	---	---
13	10.41	---	---	---	---	---	---	13.91	18.52	17.17	---	---
14	10.33	---	---	---	---	---	10.31	13.46	18.10	17.97	---	---
15	---	---	---	---	---	---	10.45	13.13	18.42	18.32	---	---
16	---	---	---	---	---	---	10.74	13.97	18.63	17.54	---	---
17	---	---	---	---	---	---	10.82	15.34	17.97	17.15	---	---
18	---	---	---	---	---	---	10.74	16.64	17.52	16.79	---	---
19	---	---	---	---	---	---	10.67	17.44	17.84	16.83	---	---
20	---	---	---	---	---	---	10.71	17.86	18.30	16.82	12.27	---
21	---	---	---	---	---	---	11.16	17.69	18.21	---	12.13	---
22	---	---	---	---	---	---	11.18	17.45	17.91	---	12.10	---
23	---	---	---	---	---	---	10.93	17.58	17.91	---	12.14	---
24	---	---	---	---	---	---	10.75	18.07	18.14	---	12.03	---
25	---	---	---	---	---	---	10.76	18.68	18.44	---	12.20	---
26	---	---	---	---	---	---	10.68	18.93	18.55	---	12.42	---
27	---	---	---	---	---	---	10.65	18.24	18.02	---	12.62	---
28	---	---	---	---	---	---	10.71	17.14	17.14	---	12.46	---
29	---	---	---	---	---	---	10.80	16.54	16.59	---	12.17	---
30	---	---	---	---	---	---	10.74	16.79	16.50	---	12.03	---
31	---	---	---	---	---	---	---	17.62	---	---	11.96	---
MEAN	---	---	---	---	---	---	---	14.60	18.02	---	---	---
MAX	---	---	---	---	---	---	---	18.93	18.81	---	---	---
MIN	---	---	---	---	---	---	---	10.42	16.50	---	---	---

MISSOURI RIVER MAIN STEM

221

06329640 MISSOURI RIVER STAGE GAGE NO. 5A AT BUFORD, ND

LOCATION.--Lat 47°59'06", long 103°59'05", in SE 1/4, sec.15, T.152 N., R.104 W., Williams County, Hydrologic Unit 10110101, on left bank 1.5 mi southwest of Buford, and at mile 1,580.7.

DRAINAGE AREA.--164,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1960 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,850.00 ft above sea level. Prior to Mar. 8, 1962, at datum 50.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 19.37 ft, Mar. 23, 1978; minimum daily recorded, 2.63 ft, Aug. 15, 16, 1966.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	7.56	14.15	---	14.94	8.44
2	---	---	---	---	---	---	---	7.53	14.34	---	13.84	8.25
3	---	---	---	---	---	---	---	7.54	14.33	---	13.29	---
4	---	---	---	---	---	---	---	7.50	14.25	---	12.82	---
5	---	---	---	---	---	---	---	7.69	14.28	---	12.32	---
6	---	---	---	---	---	---	---	7.95	14.11	---	11.79	---
7	---	---	---	---	---	---	---	7.88	13.77	16.05	11.29	---
8	---	---	---	---	---	---	---	8.05	13.80	15.58	11.09	---
9	---	---	---	---	---	---	---	8.45	14.96	15.02	10.46	---
10	---	---	---	---	---	---	---	9.07	14.87	14.60	10.33	---
11	---	---	---	---	---	---	---	9.96	14.62	14.40	10.16	---
12	---	---	---	---	---	---	---	10.87	14.78	13.98	9.93	---
13	---	---	---	---	---	---	---	10.49	14.66	13.81	9.82	---
14	---	---	---	---	---	---	7.41	10.02	14.27	14.35	9.55	---
15	---	---	---	---	---	---	7.48	9.64	14.52	14.78	9.51	---
16	---	---	---	---	---	---	7.71	10.23	14.78	14.21	9.35	---
17	---	---	---	---	---	---	7.78	11.55	14.25	13.74	9.16	---
18	---	---	---	---	---	---	7.76	12.66	13.76	13.36	9.02	---
19	---	---	---	---	---	---	7.66	13.40	13.95	13.35	8.92	---
20	---	---	---	---	---	---	7.52	13.88	14.42	13.33	8.68	---
21	---	---	---	---	---	---	7.84	13.85	14.41	12.90	8.58	---
22	---	---	---	---	---	---	7.95	13.57	14.12	12.60	8.66	---
23	---	---	---	---	---	---	7.74	13.61	14.09	13.07	8.78	---
24	---	---	---	---	---	---	7.54	14.03	14.27	14.03	8.74	---
25	---	---	---	---	---	---	7.58	14.71	14.56	13.95	9.19	---
26	---	---	---	---	---	---	7.59	15.10	14.73	13.41	9.55	---
27	---	---	---	---	---	---	7.61	14.54	14.34	13.21	9.61	---
28	---	---	---	---	---	---	7.68	13.47	13.53	14.55	9.52	---
29	---	---	---	---	---	---	7.74	12.78	---	16.56	9.20	---
30	---	---	---	---	---	---	7.67	12.87	---	17.26	8.96	---
31	---	---	---	---	---	---	---	13.64	---	16.39	8.70	---
MEAN	---	---	---	---	---	---	---	11.10	---	---	10.19	---
MAX	---	---	---	---	---	---	---	15.10	---	---	14.94	---
MIN	---	---	---	---	---	---	---	7.50	---	---	8.58	---

MISSOURI RIVER MAIN STEM

06329650 MISSOURI RIVER STAGE GAGE NO. 6 NEAR BUFORD, ND

LOCATION.--Lat 47°57'18", long 103°54'36", in SE $\frac{1}{4}$ sec.30, T.152 N., R.103 W., Williams County, Hydrologic Unit 10110101, on right bank 5 mi southeast of Buford, and at mile 1,576.0.

DRAINAGE AREA.--164,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--December 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft above sea level. Prior to Apr. 17, 1962, at datum 40.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 24.61 ft, June 11, 1991; minimum daily recorded, 8.23 ft, Aug. 15, 22, 1963.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.27	---	---	---	---	---	---	14.71	21.54	20.24	22.20	15.56
2	17.33	---	---	---	---	---	---	14.66	21.74	20.56	21.13	15.34
3	17.36	---	---	---	---	---	---	14.66	21.75	20.82	20.52	15.23
4	17.31	---	---	---	---	---	---	14.64	21.66	20.83	20.03	15.14
5	17.20	---	---	---	---	---	---	14.78	21.69	22.28	19.51	15.05
6	17.18	---	---	---	---	---	---	15.06	21.52	23.36	18.96	14.91
7	17.24	---	---	---	---	---	---	15.00	21.22	23.10	18.45	14.80
8	17.35	---	---	---	---	---	---	15.15	21.18	22.57	18.25	14.71
9	17.46	---	---	---	---	---	---	15.52	22.22	22.09	17.62	14.67
10	17.50	---	---	---	---	---	---	16.12	22.12	21.79	17.45	14.60
11	17.57	---	---	---	---	---	---	16.97	21.83	21.63	17.31	14.58
12	17.57	---	---	---	---	---	---	17.97	21.98	21.27	17.06	14.37
13	17.58	---	---	---	---	---	---	17.70	21.96	21.08	16.97	14.16
14	17.53	---	---	---	---	---	---	17.27	21.62	21.53	16.69	14.07
15	---	---	---	---	---	---	14.64	16.88	21.80	22.07	16.63	14.02
16	---	---	---	---	---	---	14.88	17.36	22.10	21.50	16.51	14.07
17	---	---	---	---	---	---	14.96	18.73	21.67	20.97	16.30	14.29
18	---	---	---	---	---	---	14.96	19.90	21.16	20.56	16.13	14.31
19	---	---	---	---	---	---	14.86	20.74	21.30	20.50	16.04	14.23
20	---	---	---	---	---	---	14.70	21.23	21.79	20.55	15.79	14.21
21	---	---	---	---	---	---	14.96	21.21	21.86	20.14	15.66	14.29
22	---	---	---	---	---	---	15.12	20.92	21.56	19.79	15.68	14.31
23	---	---	---	---	---	---	14.93	20.93	21.50	20.18	15.83	14.31
24	---	---	---	---	---	---	14.73	21.34	21.66	21.26	15.78	14.26
25	---	---	---	---	---	---	14.73	21.97	21.95	21.26	16.22	14.22
26	---	---	---	---	---	---	14.74	22.31	22.11	20.74	16.66	14.27
27	---	---	---	---	---	---	14.75	21.81	21.82	20.45	16.73	14.34
28	---	---	---	---	---	---	14.83	20.82	20.99	21.70	16.69	14.43
29	---	---	---	---	---	---	14.89	20.17	20.30	23.51	16.36	14.39
30	---	---	---	---	---	---	14.84	20.22	20.05	24.20	16.11	14.34
31	---	---	---	---	---	---	---	21.01	---	23.47	15.85	---
MEAN	---	---	---	---	---	---	---	18.31	21.59	21.48	17.33	14.52
MAX	---	---	---	---	---	---	---	22.31	22.22	22.20	22.20	15.56
MIN	---	---	---	---	---	---	---	14.64	20.05	19.79	15.66	14.02

MISSOURI RIVER MAIN STEM

223

06329660 MISSOURI RIVER STAGE GAGE NO. 7 NEAR TRENTON, ND

LOCATION.--Lat 47°59'21", long 103°47'57", in NE¼ sec.13, T.152 N., R.103 W., McKenzie County, Hydrologic Unit 10110101, on right bank 5 mi south of Trenton, and at mile 1,566.7.

DRAINAGE AREA.--164,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft above sea level. Prior to Aug. 7, 1962, at site 0.8 mi upstream. Prior to May 29, 1963, at datum 40.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 21.56 ft, July 10, 1975; minimum daily recorded, 4.34 ft, Aug. 19, 22, 1963.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.93	---	---	---	---	---	---	---	---	16.28	18.28	12.17
2	9.98	---	---	---	---	---	---	---	---	16.64	17.42	11.99
3	10.01	---	---	---	---	---	---	---	17.63	16.94	16.59	11.89
4	9.99	---	---	---	---	---	---	---	17.54	16.99	16.36	11.79
5	9.92	---	---	---	---	---	---	---	17.54	18.09	15.86	11.70
6	9.90	---	---	---	---	---	---	---	17.41	18.91	15.28	11.58
7	9.96	---	---	---	---	---	---	---	17.17	18.65	14.82	11.48
8	10.05	---	---	---	---	---	---	---	17.11	18.29	14.58	11.41
9	10.14	---	---	---	---	---	---	---	17.89	17.95	13.99	11.37
10	10.11	---	---	---	---	---	---	---	17.86	17.73	13.76	11.30
11	10.13	---	---	---	---	---	---	---	17.54	17.67	13.63	11.29
12	10.09	---	---	---	---	---	---	---	17.65	17.39	13.40	11.14
13	10.10	---	---	---	---	---	---	---	17.80	17.21	13.27	10.95
14	10.04	---	---	---	---	---	---	---	17.56	17.49	13.06	10.87
15	---	---	---	---	---	---	11.00	---	17.64	18.03	12.96	10.82
16	---	---	---	---	---	---	11.20	---	17.97	17.68	12.85	10.87
17	---	---	---	---	---	---	11.30	---	17.71	17.18	12.69	11.04
18	---	---	---	---	---	---	11.26	---	17.26	16.79	12.52	11.07
19	---	---	---	---	---	---	11.19	---	17.28	16.69	12.43	11.01
20	---	---	---	---	---	---	11.06	---	17.73	16.71	12.21	10.98
21	---	---	---	---	---	---	11.25	---	17.85	16.40	12.08	11.07
22	---	---	---	---	---	---	11.45	---	17.66	16.06	12.22	11.08
23	---	---	---	---	---	---	11.31	---	17.55	16.26	12.27	11.06
24	---	---	---	---	---	---	11.13	---	17.69	17.26	12.22	11.00
25	---	---	---	---	---	---	11.08	---	17.97	17.42	12.55	10.97
26	---	---	---	---	---	---	11.11	---	18.12	17.00	12.99	11.01
27	---	---	---	---	---	---	11.14	---	17.89	16.68	13.07	11.06
28	---	---	---	---	---	---	---	---	17.17	17.63	13.09	11.13
29	---	---	---	---	---	---	---	---	16.51	19.12	12.84	11.06
30	---	---	---	---	---	---	---	---	16.20	19.55	12.59	11.02
31	---	---	---	---	---	---	---	---	---	19.15	12.37	---
MEAN	---	---	---	---	---	---	---	---	---	17.48	13.69	11.24
MAX	---	---	---	---	---	---	---	---	---	19.55	18.28	12.17
MIN	---	---	---	---	---	---	---	---	---	16.06	12.08	10.82

MISSOURI RIVER MAIN STEM

06330000 MISSOURI RIVER NEAR WILLISTON, ND

LOCATION.--Lat 48°06'45", long 103°43'04", in SE $\frac{1}{4}$ sec.31, T.154 N., R.101 W., Williams County, Hydrologic Unit 10110101, at city waterplant on left bank, 5 mi southwest of Williston, 29.3 mi downstream from Yellowstone River, and at mile 1,552.7.

DRAINAGE AREA.--164,500 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1966 to current year. Operated as a stage-discharge station October 1897 to July 1965.

GAGE.--Water-stage recorder. Datum of gage is 1,830.20 ft above sea level. See WSP 1917 for history of changes prior to April 1966.

REMARKS.--Stage regulated by upstream reservoirs and backwater from Lake Sakakawea.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 26.46 ft, Mar. 26, 1978; minimum daily recorded, 7.80 ft, Nov. 2, 1966.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.13	12.16	11.77	17.28	---	15.95	14.85	13.59	17.98	17.53	18.50	14.43
2	12.18	12.13	12.13	16.72	---	15.87	14.78	13.52	18.08	17.70	18.05	14.22
3	12.25	12.10	12.04	16.34	---	15.92	14.46	13.50	18.07	18.01	17.85	14.10
4	12.25	12.14	11.96	16.30	---	16.26	14.34	13.51	17.98	18.10	17.73	14.01
5	12.15	12.16	13.13	16.45	---	16.56	14.33	13.51	17.93	18.29	17.54	13.94
6	12.06	12.16	14.04	16.56	---	16.96	14.26	13.79	17.80	18.87	17.26	13.84
7	12.10	12.18	14.55	---	---	17.42	14.05	13.80	17.65	18.75	16.91	13.73
8	12.18	12.29	14.95	---	---	18.22	13.93	13.84	17.58	18.40	16.68	13.63
9	12.26	12.36	15.09	---	---	18.87	13.85	14.06	17.76	18.04	16.15	13.57
10	12.31	12.42	15.14	---	---	19.40	13.73	14.59	17.90	17.84	15.85	13.55
11	12.36	12.47	15.27	---	---	19.74	13.70	15.02	17.71	17.86	15.73	13.54
12	12.38	12.51	15.79	---	---	19.78	13.64	16.04	17.80	17.87	15.51	13.40
13	12.39	12.54	16.40	---	---	19.52	13.60	16.17	17.90	17.80	15.43	13.22
14	12.36	12.49	16.47	---	---	19.12	13.50	15.90	17.74	17.95	15.22	13.15
15	12.29	12.46	16.57	---	---	18.80	13.50	15.51	17.84	18.20	15.11	13.09
16	12.22	12.42	16.51	---	---	18.76	13.65	15.47	18.12	18.10	15.04	13.06
17	12.23	12.38	16.60	---	---	18.55	13.79	16.37	18.05	17.78	14.85	13.24
18	12.30	12.39	16.95	---	---	18.42	13.83	17.24	17.83	17.65	14.69	13.31
19	12.35	12.45	17.36	---	---	18.32	13.74	17.78	17.91	17.65	14.64	13.26
20	12.40	12.46	17.24	---	---	18.06	13.60	17.97	18.22	17.82	14.41	13.21
21	12.44	12.46	16.66	---	---	17.96	13.68	17.95	18.41	17.84	14.83	13.25
22	12.40	12.49	16.49	---	---	18.22	13.88	17.73	18.40	17.66	14.44	13.27
23	12.36	12.42	16.48	---	---	18.35	13.84	17.67	18.34	17.71	14.55	13.29
24	12.37	12.36	16.51	---	16.30	18.61	13.62	17.77	18.34	18.19	14.48	13.26
25	12.34	12.35	17.05	---	16.20	19.06	13.58	18.03	18.33	18.37	14.63	13.18
26	12.16	12.29	17.45	---	16.17	19.29	13.59	18.28	18.41	18.20	15.11	13.19
27	12.20	12.20	17.31	---	16.16	18.81	13.54	18.14	18.35	17.94	15.29	13.21
28	12.25	12.25	17.11	---	16.07	17.84	13.60	17.48	18.04	18.24	15.37	13.35
29	12.24	12.35	16.93	---	---	15.44	13.64	17.13	17.70	18.98	15.20	13.31
30	12.26	11.70	17.00	---	---	14.96	13.69	17.15	17.52	19.40	14.94	13.23
31	12.20	---	17.35	---	---	14.95	---	17.57	---	19.15	14.75	---
MEAN	12.27	12.32	15.69	---	---	17.87	13.86	16.00	17.99	18.13	15.70	13.47
MAX	12.44	12.54	17.45	---	---	19.78	14.85	18.28	18.41	19.40	18.50	14.43
MIN	12.06	11.70	11.77	---	---	14.95	13.50	13.50	17.52	17.53	14.41	13.06

MISSOURI RIVER MAIN STEM

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06330110 MISSOURI RIVER STAGE GAGE NO. 9 AT WILLISTON, ND

LOCATION.--Lat 48°08'13", long 103°36'16", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.25, T.154 N., R.101 W., Williams County, Hydrologic Unit 10110101, on left bank levee at southeast edge of Williston 0.5 mi upstream from Little Muddy Creek, and at mile 1,546.2.

DRAINAGE AREA.--164,500 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,820.00 ft above sea level. Prior to May 13, 1969, at site 900 ft downstream. At datum 20.00 ft lower prior to Apr. 7, 1962.

REMARKS.--Stage regulated by upstream reservoirs and backwater from Lake Sakakawea.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 34.22 ft, July 25, 28, 1975; minimum daily recorded, 5.44 ft, Aug. 20, 1961, present datum.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.38	21.52	21.52	24.02	24.89	23.61	22.22	21.56	24.17	24.13	25.13	22.21
2	21.41	21.49	21.57	23.83	24.75	23.54	22.23	21.53	24.27	24.22	24.62	22.05
3	21.48	21.42	21.59	23.52	24.61	23.51	22.10	21.44	24.33	24.51	24.36	21.99
4	21.49	21.41	21.59	23.39	24.59	23.66	22.18	21.49	24.30	24.55	24.21	21.91
5	21.32	21.42	21.60	23.42	24.57	24.02	22.26	21.60	24.26	24.59	24.09	21.87
6	21.34	21.43	21.63	23.54	24.56	24.26	22.09	21.76	24.20	25.30	23.99	21.79
7	21.38	21.43	22.05	23.64	24.55	24.59	21.83	21.66	24.12	25.46	23.78	21.72
8	21.39	21.44	22.75	23.73	24.59	25.03	21.73	21.61	24.06	25.22	23.64	21.69
9	21.37	21.46	22.80	23.85	24.61	25.37	21.69	21.72	24.26	24.83	23.36	21.63
10	21.34	21.47	22.80	24.05	24.53	25.78	21.65	22.15	24.50	24.54	23.08	21.60
11	21.35	21.50	22.83	24.28	24.48	26.11	21.62	22.47	24.43	24.44	22.96	21.54
12	21.33	21.48	22.97	24.52	24.53	26.31	21.54	23.07	24.40	24.39	22.85	21.50
13	21.41	21.51	23.22	24.64	24.52	26.30	21.54	23.23	24.46	24.33	22.79	21.47
14	21.40	21.49	23.36	24.66	24.46	26.08	21.50	23.06	24.27	24.35	22.70	21.47
15	21.41	21.49	23.41	24.69	24.37	25.85	21.49	22.82	24.32	24.56	22.62	21.49
16	21.41	21.48	23.41	24.71	24.34	25.65	21.52	22.73	24.45	24.50	22.62	21.49
17	21.42	21.48	23.36	24.71	24.35	25.51	21.55	23.16	24.43	24.30	22.65	21.47
18	21.43	21.48	23.49	24.68	24.36	25.42	21.69	23.73	24.25	24.17	22.58	21.47
19	21.47	21.48	23.62	24.64	24.31	25.35	21.63	24.00	24.24	24.14	22.44	21.47
20	21.44	21.48	23.56	24.61	24.22	25.19	21.54	24.13	24.37	24.24	22.37	21.45
21	21.38	21.46	23.18	24.62	24.11	25.04	21.53	24.23	24.52	24.35	22.28	21.45
22	21.40	21.48	22.79	24.68	23.97	25.06	21.61	24.11	24.57	24.18	23.57	21.45
23	21.41	21.49	22.58	24.76	23.88	25.12	21.65	23.98	24.45	24.12	23.50	21.44
24	21.41	21.47	22.64	24.82	23.83	25.15	21.51	24.04	24.45	24.36	23.22	21.41
25	21.37	21.48	22.94	24.89	23.80	25.24	21.54	24.24	24.41	24.51	23.17	21.41
26	21.40	21.48	23.57	24.93	23.73	25.22	21.52	24.53	24.51	24.44	23.19	21.41
27	21.36	21.46	23.73	24.94	23.73	24.51	21.45	24.58	24.53	24.30	23.14	21.39
28	21.37	21.46	23.76	24.90	23.72	24.57	21.44	24.18	24.49	24.37	23.09	21.37
29	21.39	21.48	23.69	24.89	---	22.99	21.47	23.79	24.31	24.82	22.86	21.36
30	21.42	21.54	23.66	24.90	---	22.30	21.54	23.64	24.11	25.51	22.56	21.36
31	21.47	---	23.89	24.91	---	22.15	---	23.86	---	25.72	22.37	---
MEAN	21.40	21.47	22.89	24.40	24.32	24.79	21.70	23.04	24.35	24.56	23.22	21.58
MAX	21.49	21.54	23.89	24.94	24.89	26.31	22.26	24.58	24.57	25.72	25.13	22.21
MIN	21.32	21.41	21.52	23.39	23.72	22.15	21.44	21.44	24.06	24.12	22.28	21.36

LITTLE MUDDY RIVER BASIN

06331000 LITTLE MUDDY RIVER BELOW COW CREEK NEAR WILLISTON, ND

LOCATION.--Lat 48°17'04", long 103°34'21", in NE¹/₄ NW¹/₄ sec.5, T.155 N., R.100 W., Williams County, Hydrologic Unit 10110102, on left bank 37 ft downstream from centerline of highway, 1 mi downstream from Cow Creek, 4 mi upstream from Camp Creek, 10 mi northeast of Williston, and 13 mi upstream from mouth.

DRAINAGE AREA.--875 mi², approximately, of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1954 to current year (seasonal records only since 1984).

GAGE.--Water-stage recorder. Datum of gage is 1,863.18 ft above sea level.

REMARKS.--Records good except those for period of estimated daily discharges, which are poor. Some small diversions for irrigation. Some regulation by Lake Zahl, Fish and Wildlife Service reservoir 22 mi upstream and Blacktail Dam about 15 mi upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 157 ft³/s, Mar. 24, gage height, 6.25 ft; minimum daily discharge, 4.1 ft³/s, Feb. 22 to Mar. 2, but may have been less during period of nonoperation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e5.1	4.1	8.7	11	8.2	8.9	37	22
2	---	---	---	---	5.1	4.1	7.3	11	7.7	8.8	28	20
3	---	---	---	---	5.2	4.3	6.3	11	8.0	12	23	18
4	---	---	---	---	5.2	5.1	11	10	8.1	19	19	17
5	---	---	---	---	5.2	6.2	22	9.8	8.3	31	17	16
6	---	---	---	---	5.2	e10	24	9.3	10	41	15	15
7	---	---	---	---	5.4	e15	24	9.6	10	67	14	13
8	---	---	---	---	5.4	e30	23	9.9	15	76	13	12
9	---	---	---	---	5.5	e50	20	9.9	15	57	12	11
10	---	---	---	---	5.7	e75	20	9.9	16	41	11	11
11	---	---	---	---	5.7	47	19	9.9	16	32	10	11
12	---	---	---	---	5.7	27	17	9.6	16	26	10	10
13	---	---	---	---	5.7	28	15	9.2	16	22	8.3	10
14	---	---	---	---	5.7	20	15	8.7	15	18	8.8	9.6
15	---	---	---	---	5.7	15	16	8.0	13	18	8.7	8.8
16	---	---	---	---	5.7	11	16	7.6	14	17	8.1	8.4
17	---	---	---	---	5.5	8.6	14	7.8	13	17	8.5	8.2
18	---	---	---	---	5.4	7.6	14	7.4	12	15	8.3	8.2
19	---	---	---	---	5.2	8.5	13	7.2	12	16	7.8	7.8
20	---	---	---	---	4.6	8.2	13	7.1	11	14	7.7	8.8
21	---	---	---	---	4.3	7.7	13	6.9	11	14	7.5	8.9
22	---	---	---	---	4.1	8.4	13	7.3	9.9	15	62	8.6
23	---	---	---	---	4.1	31	12	7.9	9.7	15	61	8.5
24	---	---	---	---	4.1	122	12	8.3	10	16	74	7.8
25	---	---	---	---	4.1	79	13	8.1	11	16	80	7.9
26	---	---	---	---	4.1	44	13	7.4	10	15	52	7.9
27	---	---	---	---	4.1	21	13	8.3	9.2	18	46	7.9
28	---	---	---	---	4.1	17	12	8.5	9.0	28	41	7.6
29	---	---	---	---	---	14	12	8.4	9.2	42	33	7.5
30	---	---	---	---	---	11	12	9.0	9.6	59	28	7.5
31	---	---	---	---	---	10	---	8.7	---	48	25	---
TOTAL	---	---	---	---	140.9	749.8	443.3	272.7	342.9	842.7	784.7	325.9
MEAN	---	---	---	---	5.03	24.2	14.8	8.80	11.4	27.2	25.3	10.9
MAX	---	---	---	---	5.7	122	24	11	16	76	80	22
MIN	---	---	---	---	4.1	4.1	6.3	6.9	7.7	8.8	7.5	7.5
AC-FT	---	---	---	---	279	1490	879	541	680	1670	1560	64

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1993, BY WATER YEAR (WY)

MEAN	10.2	11.0	8.62	6.98	18.0	151	114	27.0	17.5	19.8	7.94	7.56
MAX	17.4	17.7	12.1	24.5	180	1018	996	114	91.4	170	49.1	18.9
(WY)	1973	1973	1955	1974	1981	1976	1979	1965	1965	1978	1972	1954
MIN	5.28	4.66	3.55	2.33	.91	6.21	10.6	8.44	3.77	2.80	2.51	2.54
(WY)	1962	1961	1961	1962	1959	1965	1990	1958	1988	1988	1988	1990

SUMMARY STATISTICS WATER YEARS 1954 - 1993

ANNUAL MEAN	a38.8	
HIGHEST ANNUAL MEAN	a110	1976
LOWEST ANNUAL MEAN	a9.24	1961
HIGHEST DAILY MEAN	6610	Apr 18 1979
LOWEST DAILY MEAN	.50	Feb 17 1959
ANNUAL SEVEN-DAY MINIMUM	.50	Feb 17 1959
INSTANTANEOUS PEAK FLOW	9180	Apr 18 1979
INSTANTANEOUS PEAK STAGE	13.57	Mar 27 1960
ANNUAL RUNOFF (AC-FT)	a28120	
10 PERCENT EXCEEDS	37	
50 PERCENT EXCEEDS	9.3	
90 PERCENT EXCEEDS	4.3	

e Estimated.

a Based on complete water years only (1955-83).

LITTLE MUDDY RIVER BASIN

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06331000 LITTLE MUDDY RIVER BELOW COW CREEK NEAR WILLISTON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 07...	1400	4.2	2240	--	--	15.0	10.5	--	--	--	--
FEB 01...	1710	5.1	2410	--	--	0.5	0.5	--	--	--	--
MAR 11...	1120	42	1240	--	--	20.0	0.5	--	--	--	--
MAR 25...	0915	75	720	8.4	--	15.0	0.5	190	203	34	25
MAY 11...	0950	9.9	2300	--	--	26.0	16.5	--	--	--	--
JUN 08...	1320	17	2080	--	--	17.0	12.5	--	--	--	--
JUL 08...	0715	79	2160	--	--	14.0	17.5	--	--	--	--
AUG 24...	0915	73	1730	--	8.1	22.0	20.5	300	457	41	48

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 25...	88	49	3	9.8	190	4.6	0.10	11	485	478	0.65
AUG 24...	300	67	8	13	500	6.8	0.20	13	1200	1220	1.66

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 25...	96.3	2	80	60	<1	20	40	0.1	1	1	380
AUG 24...	241	8	290	60	<1	60	10	<0.1	<1	<1	680

MISSOURI RIVER MAIN STEM

06331670 LAKE SAKAKAWEA AT LEWIS AND CLARK BAY NR WILLISTON, ND

LOCATION.--Lat 48°05'42", long 103°14'40", in SE 1/4 sec.2, T.153 N., R.98 W., McKenzie County, Hydrologic Unit 10110101, near southeast corner of Lewis and Clark State Park, 17 mi east of Williston.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	
OCT													
14...	1530	0.0	1.3	675	8.5	250	155	60	25	65	36	2	
JAN													
27...	1240	0.0	1.5	732	7.6	280	181	68	26	57	31	1	
MAY													
24...	1610	0.0	0.30	379	7.9	130	95	34	12	26	29	1	
24...	1615	1.4	1.7	380	8.0	130	96	33	12	26	29	1	
JUN													
16...	1500	0.0	0.30	501	7.4	150	102	38	13	40	36	1	
16...	1510	2.0	2.3	497	7.5	140	102	36	13	38	36	1	
JUL													
20...	1210	0.0	0.30	564	7.7	160	124	41	15	49	39	2	
20...	1215	3.7	4.0	561	7.8	160	121	40	15	50	40	2	
AUG													
25...	1300	0.0	0.50	555	7.9	180	135	43	17	49	37	2	
25...	1305	5.0	5.5	550	7.9	180	138	43	17	48	37	2	
SEP													
21...	1440	0.0	0.50	660	7.9	240	164	56	24	62	36	2	
21...	1445	4.5	5.0	656	7.6	240	161	55	24	62	36	2	
DATE		POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	SULFATE (MG/L AS SO4) (00946)	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 AS (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT													
14...	3.9	--	190	11	0.50	3.5	--	--	--	<0.010	0.15	0.064	
JAN													
27...	3.4	190	--	12	--	--	468	0.64	0.321	0.056	0.37	0.060	
MAY													
24...	2.1	87	--	5.9	--	--	224	0.30	<0.005	0.109	0.22	0.031	
24...	2.5	86	--	5.5	--	--	223	0.30	<0.005	0.593	3.8	1.41	
JUN													
16...	3.0	130	--	3.6	--	--	285	0.39	0.257	0.877	1.7	0.204	
16...	3.1	130	--	7.1	--	--	284	0.39	0.269	1.01	1.6	0.327	
JUL													
20...	3.0	150	--	8.4	--	--	336	0.46	0.179	0.035	0.48	<0.020	
20...	2.7	150	--	8.5	--	--	336	0.46	0.181	0.031	0.47	0.020	
AUG													
25...	3.3	130	--	8.1	--	--	335	0.46	<0.005	0.046	0.53	0.064	
25...	3.3	140	--	8.0	--	--	338	0.46	0.008	0.061	0.33	0.070	
SEP													
21...	3.9	170	--	9.9	--	--	419	0.57	<0.005	0.118	<0.18	0.036	
21...	3.9	160	--	9.9	--	--	411	0.56	0.006	0.135	0.27	0.040	
DATE		PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	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)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
OCT													
14...	<0.010	--	--	54	<2	<4.0	<10	<6	--	--	78	8	
JAN													
27...	--	0.012	2.3	46	--	<0.2	.6	--	<3	<0.2	--	3	
MAY													
24...	--	0.027	--	--	--	--	--	--	28	--	--	13	
24...	--	0.020	--	--	--	--	--	--	30	--	--	10	
JUN													
16...	--	0.026	2.1	35	--	<0.2	1.1	--	51	2.0	--	<2	
16...	--	0.024	1.9	41	--	<0.2	.6	--	52	2.4	--	5	
JUL													
20...	--	0.016	1.3	42	--	<0.2	.5	--	19	1.2	--	<2	
20...	--	0.014	1.6	41	--	<0.2	.5	--	24	1.0	--	5	
AUG													
25...	--	0.016	1.9	41	--	<0.2	.6	--	25	.8	--	2	
25...	--	0.017	1.4	42	--	<0.2	.6	--	31	.5	--	2	
SEP													
21...	--	0.017	2.2	48	--	<0.2	1.5	--	<7	4.5	--	<2	
21...	--	0.020	3.0	48	--	<0.2	.7	--	8	1.4	--	3	

06331670 LAKE SAKAKAWEA AT LEWIS AND CLARK BAY NR WILLISTON, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC SOLVED (MG/L AS C) (00681)	CHLORO- HPYLL A PHYTO- PLANK- TON ACID M. (UG/L) (32211)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT 14...	<10	<20	--	<10	590	<4	<2	--	--	<1.00	--	--
JAN 27...	--	--	3.0	--	--	--	30	<5.0	<5.0	--	<3.00	<1.00
MAY 24...	--	--	--	--	--	--	--	<5.0	<5.0	--	<3.00	--
JUN 16...	--	--	2.6	--	--	--	52	<5.0	<5.0	--	<3.00	<1.00
JUL 16...	--	--	2.6	--	--	--	46	<5.0	<5.0	--	--	--
JUL 20...	--	--	1.7	--	--	--	73	<5.0	<5.0	--	<3.00	<1.00
AUG 20...	--	--	1.1	--	--	--	39	<5.0	<5.0	--	--	--
SEP 25...	--	--	.6	--	--	--	56	<5.0	<5.0	--	<3.00	<1.00
SEP 25...	--	--	<.2	--	--	--	44	<5.0	<5.0	--	--	--
SEP 21...	--	--	.5	--	--	--	19	<5.0	<5.0	--	3.00	<1.00
SEP 21...	--	--	.7	--	--	--	18	<5.0	<5.0	--	--	--

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT 14...	1500	4.3	0.0	724	--	6.5	11.3
OCT 14...	1501	--	0.5	724	--	6.5	11.4
OCT 14...	1502	--	1.0	724	--	6.5	11.4
JAN 27...	1235	4.9	0.0	693	8.0	0.0	11.5
JAN 27...	1236	--	0.3	692	8.0	0.0	11.3
JAN 27...	1237	--	1.0	700	8.0	0.0	11.2
MAY 24...	1600	5.5	0.0	380	8.0	15.0	9.5
MAY 24...	1601	--	0.5	380	8.0	15.0	9.5
MAY 24...	1602	--	1.0	380	8.0	15.0	9.5
MAY 24...	1603	--	1.3	380	8.0	15.0	9.5
JUN 16...	1440	8.9	0.0	482	8.0	15.0	8.3
JUN 16...	1442	--	0.5	485	8.0	15.0	8.2
JUN 16...	1444	--	1.0	485	8.0	15.0	8.2
JUN 16...	1446	--	1.5	485	8.0	15.0	8.2
JUN 16...	1448	--	2.1	482	7.8	15.5	0.5
JUN 16...	1450	--	2.3	509	7.8	15.5	0.3
JUL 20...	1200	13.0	0.0	562	7.8	19.5	8.4
JUL 20...	1201	--	1.0	562	7.9	19.5	8.2
JUL 20...	1202	--	2.0	562	7.9	19.5	8.5
JUL 20...	1203	--	3.0	563	7.9	19.5	8.0
JUL 20...	1204	--	4.0	564	7.8	19.0	7.6
AUG 25...	1252	18.0	0.0	565	7.8	21.0	8.0
AUG 25...	1253	--	1.0	564	7.9	21.0	7.8
AUG 25...	1254	--	2.0	564	8.0	21.0	7.7
AUG 25...	1255	--	3.0	564	8.0	21.0	7.6
AUG 25...	1256	--	4.0	564	8.0	21.0	7.6
AUG 25...	1257	--	5.0	564	8.0	21.0	7.0
AUG 25...	1258	--	5.6	564	8.0	21.0	7.0
SEP 21...	1430	18.0	0.0	658	8.1	14.0	9.0
SEP 21...	1431	--	0.5	658	8.1	14.0	9.0
SEP 21...	1432	--	1.1	659	8.1	14.0	8.9
SEP 21...	1433	--	2.0	659	8.2	14.0	8.9
SEP 21...	1434	--	3.0	659	8.2	14.0	8.9
SEP 21...	1435	--	3.8	659	8.2	14.0	8.8
SEP 21...	1436	--	4.9	665	8.1	13.0	8.4
SEP 21...	1437	--	5.4	666	8.1	13.0	8.3

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT 14...	98	712	--	12.0	3.5	180	7.0
JAN 27...	85	707	1.80	16.0	5.0	180	<5.0
MAY 24...	100	715	--	2.00	16.5	280	11
JUN 16...	89	711	--	4.00	13.0	15	10
JUL 20...	98	714	--	13.0	23.0	90	10
AUG 25...	96	714	--	16.0	22.0	335	6.0
SEP 21...	94	709	--	24.0	14.5	280	7.0

MISSOURI RIVER MAIN STEM

06332200 LAKE SAKAKAWA AT WHITE EARTH BAY, ND

LOCATION.--Lat 48°06'46, long 102°44'12", in SW¹/₄ sec.35, T.153 N., R.94 W.,
Mountrail County, Hydrologic Unit 10110101, south of White Earth Bay,
13 mi northwest of New Town.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER-	SAM-	SPE-	PH	TEMPER-	OXYGEN,	
		VOIR DEPTH (FEET) (72025)	PLING DEPTH (M) (00098)	CIFIC CON- DUCT- ANCE (US/CM) (00095)	WATER WHOLE FIELD (STAND- ARD UNITS) (00400)			ATURE WATER (DEG C) (00010)
OCT								
14...	1344	29.9	0.0	705	--	9.5	9.5	
14...	1345	--	1.0	705	--	9.5	9.5	
14...	1346	--	2.0	705	--	9.5	9.5	
14...	1347	--	3.0	708	--	9.5	9.5	
14...	1348	--	4.0	705	--	9.5	9.5	
14...	1349	--	5.0	708	--	9.5	9.5	
14...	1350	--	6.0	708	--	9.5	9.5	
14...	1351	--	7.0	708	--	9.5	9.5	
14...	1352	--	8.0	714	--	9.5	9.5	
14...	1353	--	9.0	711	--	9.5	9.5	
FEB								
02...	0855	22.6	0.0	704	8.0	0.5	11.2	
02...	0856	--	1.0	704	8.0	0.0	10.9	
02...	0859	--	2.1	705	8.0	0.0	11.5	
02...	0900	--	3.1	706	8.0	0.0	11.4	
02...	0901	--	4.1	736	8.0	0.5	12.1	
02...	0902	--	5.0	743	8.0	0.5	11.3	
02...	0903	--	6.3	758	8.0	0.5	10.9	
02...	0904	--	6.9	765	8.0	1.0	10.5	
MAY								
24...	1424	28.2	0.0	703	8.2	14.5	9.3	
24...	1425	--	1.5	704	8.2	14.5	9.3	
24...	1426	--	3.6	705	8.3	14.5	9.2	
24...	1427	--	5.5	709	8.3	14.5	9.2	
24...	1428	--	7.1	711	8.3	14.5	9.1	
24...	1429	--	8.5	712	8.3	14.5	9.0	
24...	1430	--	8.6	713	8.3	14.5	9.0	
JUN								
16...	1250	34.1	0.0	367	8.0	15.0	8.9	
16...	1252	--	2.0	367	8.1	15.0	8.9	
16...	1254	--	3.7	367	8.1	15.0	8.8	
16...	1256	--	6.4	367	8.1	15.0	8.8	
16...	1258	--	8.3	367	8.1	15.0	8.8	
16...	1300	--	10.1	368	8.1	15.0	8.8	
JUL								
20...	1017	41.0	0.0	528	7.9	18.0	8.5	
20...	1018	--	1.4	528	7.9	18.0	8.4	
20...	1019	--	3.3	528	7.9	18.0	8.3	
20...	1020	--	5.8	525	7.9	17.5	8.1	
20...	1021	--	8.6	524	7.9	17.5	8.0	
20...	1022	--	11.0	502	7.9	17.0	7.8	
20...	1023	--	12.4	497	7.9	17.0	7.6	
AUG								
25...	1033	45.0	0.0	593	7.9	20.5	8.1	
25...	1034	--	2.0	594	8.0	20.5	8.0	
25...	1035	--	4.0	594	8.0	20.5	7.9	
25...	1036	--	6.1	594	8.0	20.5	7.9	
25...	1037	--	8.0	593	8.1	20.5	7.8	
25...	1038	--	10.1	594	8.1	20.5	7.8	
25...	1039	--	12.0	596	8.1	20.5	7.8	
25...	1040	--	13.8	596	8.1	20.5	7.7	
SEP								
21...	1305	43.0	0.0	592	8.2	15.5	8.7	
21...	1306	--	1.9	592	8.2	15.5	8.6	
21...	1307	--	4.5	592	8.2	15.5	8.5	
21...	1308	--	6.3	593	8.2	15.5	8.5	
21...	1309	--	8.6	593	8.2	15.5	8.5	
21...	1310	--	11.8	598	8.2	15.5	8.4	
21...	1311	--	13.1	599	8.2	15.5	8.3	
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT	14...	90	712	--	26.0	3.5	140	10
FEB	02...	83	711	2.40	54.0	-1.0	315	<5.0
MAY	24...	98	714	--	14.0	13.0	280	10
JUN	16...	96	709	--	8.00	14.0	15	5.0
JUL	20...	96	716	--	24.0	19.0	120	10
AUG	25...	97	707	--	25.0	18.5	300	7.0
SEP	21...	93	709	--	32.0	13.5	275	18

06332510 LAKE SAKAKAWEA NEAR NEW TOWN, ND

LOCATION.--Lat 47°58'47", long 102°33'12", SW¹/₄, sec.15, T.152 N., R.93 W., McKenzie County, Hydrologic Unit 10110101, 300 ft upstream from bridge 3 mi west of New Town.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978-82, 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	
OCT	14...	1230	0.0	14.8	634	8.6	240	169	58	23	60	35	2
JAN	27...	1020	0.0	0.30	808	7.8	320	203	79	31	70	31	2
	27...	1025	11.7	12.0	818	7.7	330	206	79	32	74	33	2
MAY	24...	1240	0.0	0.30	740	8.4	250	163	59	24	65	36	2
	24...	1245	17.0	17.3	719	8.2	240	157	58	23	64	36	2
JUN	16...	1130	0.0	0.30	384	7.8	110	96	28	10	24	31	1
	16...	1140	18.7	19.0	392	7.8	120	96	31	12	27	32	1
JUL	20...	0810	0.0	0.30	458	7.9	150	107	38	13	37	34	1
	20...	0815	21.0	21.3	461	7.8	140	108	36	13	35	34	1
AUG	25...	0855	0.0	0.50	558	8.0	160	125	40	15	57	43	2
	25...	0900	11.5	12.0	572	8.0	150	125	38	13	49	41	2
	25...	0905	15.5	16.0	553	7.9	160	129	41	15	48	39	2
	25...	0910	22.0	22.5	550	7.8	160	128	41	14	44	37	2
SEP	21...	1115	0.0	0.50	581	7.8	190	132	48	18	62	40	2
	21...	1120	20.5	21.0	577	7.8	180	133	41	18	60	42	2
DATE		POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	SULFATE (MG/L AS SO4) (00946)	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 AS SIO2) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT	14...	3.8	--	180	10	0.60	3.5	--	--	--	<0.010	9.0	0.015
JAN	27...	4.4	230	--	14	--	--	549	0.75	0.292	0.013	0.39	0.028
	27...	4.5	220	--	14	--	--	543	0.74	0.282	0.007	0.28	0.025
MAY	24...	3.9	210	--	12	--	--	476	0.65	<0.005	0.078	0.85	0.044
	24...	4.2	190	--	13	--	--	444	0.60	0.015	0.058	0.72	0.049
JUN	16...	2.3	77	--	6.0	--	--	205	0.28	0.278	0.134	0.58	0.089
	16...	2.6	81	--	5.7	--	--	217	0.29	0.275	0.057	0.45	0.089
JUL	20...	2.7	110	--	7.4	--	--	271	0.37	0.131	0.028	0.39	<0.020
	20...	2.3	110	--	7.1	--	--	268	0.36	0.205	0.046	0.40	<0.020
AUG	25...	3.6	150	--	7.4	--	--	350	0.48	0.139	0.080	0.49	0.041
	25...	3.3	140	--	7.4	--	--	329	0.45	0.145	0.058	0.58	0.033
	25...	2.8	140	--	7.8	--	--	330	0.45	0.217	0.047	0.31	0.037
	25...	2.7	140	--	7.4	--	--	323	0.44	0.249	0.052	<0.18	0.052
SEP	21...	4.0	160	--	7.3	--	--	381	0.52	0.171	0.127	0.23	0.028
	21...	3.7	160	--	7.4	--	--	367	0.50	0.169	0.161	0.19	0.031
DATE		PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	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)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
OCT	14...	<0.010	--	--	65	2	<4.0	<10	<6	23	--	96	5
JAN	27...	--	0.009	2.6	55	--	<0.2	.5	--	<3	0.3	--	3
	27...	--	0.010	3.0	54	--	<0.2	.9	--	<3	<.2	--	3
MAY	24...	--	0.006	--	--	--	--	--	--	<7	--	--	1
	24...	--	0.007	--	--	--	--	--	--	<7	--	--	4
JUN	16...	--	0.026	1.9	31	--	<0.2	.4	--	35	1.4	--	<2
	16...	--	0.033	2.2	33	--	<0.2	<.2	--	34	<.2	--	2
JUL	20...	--	0.008	1.2	36	--	<0.2	.3	--	67	1.1	--	4
	20...	--	0.014	1.3	36	--	<0.2	.4	--	37	1.0	--	4
AUG	25...	--	0.018	1.0	45	--	<0.2	.6	--	36	1.2	--	<2
	25...	--	0.018	.9	42	--	<0.2	.6	--	13	1.0	--	<2
	25...	--	0.024	.5	43	--	<0.2	.5	--	20	.6	--	<2
	25...	--	0.028	.4	42	--	<0.2	.4	--	23	1.1	--	2
SEP	21...	--	0.028	2.1	49	--	<0.2	1.4	--	9	2.3	--	<2
	21...	--	0.027	2.2	49	--	<0.2	1.2	--	27	.7	--	<2

MISSOURI RIVER MAIN STEM

06332510 LAKE SAKAKAWEA NEAR NEW TOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CHLORO- PHYLL A PHYTO- PLANK- TON ACID M. (UG/L) (32211)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT 14...	<10	<20	--	<10	570	6	6	--	--	<1.00	--	--
JAN 27...	--	--	3.0	--	--	--	<9	<5.0	<5.0	--	<3.00	<1.00
27...	--	--	4.0	--	--	--	<9	<5.0	<5.0	--	--	--
MAY 24...	--	--	--	--	--	--	--	<5.0	<5.0	--	<3.00	--
24...	--	--	--	--	--	--	--	<5.0	<5.0	--	--	--
JUN 16...	--	--	1.2	--	--	--	36	<5.0	<5.0	--	<3.00	<1.00
16...	--	--	1.9	--	--	--	55	<5.0	<5.0	--	--	--
JUL 20...	--	--	.3	--	--	--	46	<5.0	<5.0	--	6.40	<1.00
20...	--	--	.6	--	--	--	55	<5.0	<5.0	--	--	--
AUG 25...	--	--	.5	--	--	--	56	<5.0	<5.0	--	<3.00	<1.00
25...	--	--	1.0	--	--	--	65	<5.0	<5.0	--	--	--
25...	--	--	.5	--	--	--	82	<5.0	<5.0	--	--	--
25...	--	--	1.8	--	--	--	69	<5.0	<5.0	--	--	--
SEP 21...	--	--	.6	--	--	--	11	<5.0	<5.0	--	<3.00	<1.00
21...	--	--	.4	--	--	--	12	<5.0	<5.0	--	--	--

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT 14...	1210	48.6	0.0	694	--	10.5	9.3
14...	1212	--	2.0	694	--	10.5	9.3
14...	1214	--	4.0	695	--	10.5	9.3
14...	1216	--	6.0	698	--	10.5	9.3
14...	1218	--	8.0	698	--	10.5	9.3
14...	1220	--	10.0	695	--	10.5	9.3
14...	1222	--	12.0	699	--	10.5	9.3
14...	1224	--	14.0	698	--	10.5	9.3
JAN 27...	1011	40.0	0.0	758	8.1	0.0	13.2
27...	1012	--	1.0	761	8.1	0.0	13.2
27...	1013	--	3.0	770	8.1	0.0	13.6
27...	1014	--	5.4	794	8.2	0.0	15.0
27...	1015	--	7.4	787	8.2	0.5	14.2
27...	1016	--	8.9	784	8.2	0.5	14.0
27...	1017	--	11.1	786	8.1	1.0	13.6
27...	1018	--	12.2	784	8.1	1.0	13.1
MAY 24...	1226	59.1	0.0	739	8.3	14.0	9.4
24...	1227	--	2.1	739	8.4	14.0	9.3
24...	1228	--	4.3	740	8.4	14.0	9.3
24...	1229	--	6.4	741	8.4	14.0	9.2
24...	1230	--	8.4	740	8.4	14.0	9.2
24...	1231	--	10.2	740	8.4	13.5	9.2
24...	1232	--	12.1	741	8.4	13.5	9.2
24...	1233	--	14.3	720	8.3	12.0	8.3
24...	1234	--	16.3	710	8.2	11.5	8.3
24...	1235	--	18.0	705	8.2	11.5	8.2
JUN 16...	1100	63.0	0.0	374	8.0	15.0	8.5
16...	1102	--	1.3	374	8.0	15.0	8.5
16...	1104	--	3.6	374	8.1	15.0	8.5
16...	1106	--	6.1	373	8.1	15.0	8.4
16...	1108	--	9.2	372	8.1	15.0	8.4
16...	1110	--	11.4	373	8.1	15.0	8.4
16...	1112	--	14.6	376	8.1	15.0	8.4
16...	1114	--	17.2	386	8.1	15.0	8.4
16...	1116	--	19.2	380	8.1	15.0	8.3
JUL 20...	0758	71.0	0.0	457	8.1	18.0	8.6
20...	0759	--	1.8	459	8.1	18.0	8.4
20...	0800	--	3.3	471	8.0	17.5	7.9
20...	0801	--	6.3	472	8.0	17.5	7.8
20...	0802	--	10.1	476	8.0	17.5	7.8
20...	0803	--	12.4	471	8.0	17.5	7.8
20...	0804	--	15.3	460	8.0	17.0	7.6
20...	0805	--	18.3	454	8.0	17.0	7.5
20...	0806	--	21.1	454	8.0	17.0	7.3

MISSOURI RIVER MAIN STEM

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06332510 LAKE SAKAKAWEA NEAR NEW TOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
AUG							
25...	0844	75.0	0.0	580	8.0	20.0	8.2
25...	0845	--	1.0	581	8.0	20.0	8.1
25...	0846	--	3.3	580	8.1	20.0	8.0
25...	0847	--	5.8	581	8.1	20.5	8.0
25...	0848	--	8.6	588	8.1	20.0	7.9
25...	0849	--	11.8	582	8.1	20.0	7.8
25...	0850	--	13.8	579	8.0	19.5	7.0
25...	0851	--	16.0	568	7.9	18.5	7.0
25...	0852	--	18.3	562	7.8	17.5	5.5
25...	0853	--	20.5	561	7.8	17.5	5.4
25...	0854	--	22.9	561	7.8	17.5	5.1
SEP							
21...	1100	70.0	0.0	585	8.1	15.5	9.1
21...	1101	--	1.9	586	8.1	15.5	9.0
21...	1102	--	4.2	584	8.1	15.5	9.0
21...	1103	--	6.1	586	8.1	15.5	8.9
21...	1104	--	8.4	584	8.1	15.5	8.8
21...	1105	--	10.2	583	8.1	15.0	8.8
21...	1106	--	12.5	590	8.1	15.0	8.8
21...	1107	--	14.2	585	8.1	15.0	8.8
21...	1108	--	16.6	585	8.1	15.0	8.6
21...	1109	--	18.2	575	8.1	15.0	8.6
21...	1110	--	20.4	590	8.1	15.0	8.4
21...	1111	--	21.3	590	8.1	15.0	8.4

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
14...	90	712	--	67.0	2.0	70	<5.0
JAN							
27...	98	706	1.30	65.0	2.0	350	<5.0
MAY							
24...	97	715	--	29.0	12.5	280	11
JUN							
16...	91	708	--	12.0	14.0	60	6.0
JUL							
20...	96	716	--	24.0	14.0	90	8.0
AUG							
25...	97	709	--	38.0	17.5	315	8.0
SEP							
21...	98	709	--	41.0	15.5	265	12

BEAR DEN CREEK BASIN

06332515 BEAR DEN CREEK NEAR MANDAREE, ND
(Hydrologic bench-mark network station and radiochemical program station)

LOCATION.--Lat 47°47'14", long 102°46'05", in NW¼, sec.30, T.150 N., R.94 W., McKenzie County, Hydrologic Unit 10110101, on right bank 0.5 mi upstream from county highway culvert, and 5.5 mi northwest of Mandaree.

DRAINAGE AREA.--74 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,947.58 ft above sea level.

REMARKS.--Records poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	.28	e.22	e.00	e.11	e.00	e.78	e.15	.47	.23	4.3	.31
2	.17	.26	e.17	e.00	e.10	e.10	e.72	e.15	.38	.26	3.0	.31
3	.17	.25	e.12	e.00	e.09	e.90	e.63	e.14	.42	22	2.2	.30
4	.17	.22	e.10	e.00	e.10	e3.0	e.54	e.13	.42	17	1.6	.24
5	.18	.23	e.08	e.00	e.09	e15	e.78	e.17	.54	39	1.7	.23
6	.16	.22	e.09	e.00	e.08	e60	e.73	.18	.89	56	1.3	.21
7	.20	.21	e.08	e.00	e.06	e250	e.59	.22	1.9	23	.97	.21
8	.20	.24	e.08	e.00	e.08	e140	e.47	.23	59	6.0	.74	.20
9	.18	.30	e.08	e.00	e.08	e50	e.40	.19	21	2.4	.61	.18
10	.18	.32	e.09	e.00	e.02	e14	e.47	.17	2.6	2.9	.45	.18
11	.16	.26	e.08	e.00	e.00	e8.8	e.42	.17	1.2	1.4	.40	.18
12	.15	.25	e.08	e.00	e.00	e4.3	e.38	.14	.65	.70	.29	.19
13	.17	.26	e.07	e.00	e.00	e3.2	e.35	.14	.40	1.3	.25	.19
14	.17	.24	e.05	e.00	e.00	e4.2	e.35	.14	.31	1.3	.25	.19
15	.19	.23	e.04	e.00	e.00	e8.0	e.32	.12	.25	1.9	.22	.19
16	.20	.24	e.04	e.00	e.00	e17	e.30	.10	.20	1.2	.21	.19
17	.20	.24	e.03	e.00	e.00	e10	e.28	.11	.20	5.1	.19	.19
18	.20	.25	e.03	e.00	e.00	e5.4	e.26	.12	e.18	4.9	.18	.19
19	.19	.26	e.02	e.00	e.00	e4.0	e.26	.11	e.14	3.1	.18	.19
20	.19	.27	e.01	e.01	e.00	3.5	e.24	.13	e.16	2.9	.18	.19
21	.19	.27	e.00	e.04	e.00	2.7	e.22	.14	e.14	52	.18	.19
22	.19	.25	e.00	e.06	e.00	4.6	e.20	.24	e.13	185	.20	.18
23	.19	.26	e.00	e.05	e.00	9.6	e.24	.29	e.11	46	.20	e.18
24	.20	.27	e.00	e.04	e.00	13	e.23	.24	e.16	15	.19	e.18
25	.20	.27	e.00	e.07	e.00	13	e.22	.18	e.20	6.4	.17	e.19
26	.20	.26	e.00	e.08	e.00	10	e.20	.18	e.14	3.1	.17	e.22
27	.20	e.23	e.00	e.09	e.00	2.3	e.19	.55	e.12	e270	.20	e.26
28	.20	e.24	e.00	e.08	e.00	1.7	e.17	.53	e.14	e380	.20	e.27
29	.20	e.22	e.00	e.07	---	e1.0	e.17	1.5	.36	76	.55	e.34
30	.23	e.21	e.00	e.09	---	e.94	e.16	2.5	.54	22	.42	e.33
31	.27	---	e.00	e.10	---	e.86	---	.63	---	8.8	.33	---
TOTAL	5.87	7.51	1.56	0.78	0.81	661.10	11.27	9.99	93.35	1256.89	22.03	6.60
MEAN	.19	.25	.050	.025	.029	21.3	.38	.32	3.11	40.5	.71	.22
MAX	.27	.32	.22	.10	.11	250	.78	2.5	59	380	4.3	.34
MIN	.15	.21	.00	.00	.00	.00	.16	.10	.11	.23	.17	.18
AC-FT	12	15	3.1	1.5	1.6	1310	22	20	185	2490	44	13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1993, BY WATER YEAR (WY)

MEAN	1.68	.29	.14	.16	7.10	36.6	23.0	4.23	2.29	3.50	.32	.68
MAX	23.0	.95	.33	1.51	41.7	217	243	42.0	13.2	40.5	1.52	5.12
(WY)	1983	1972	1974	1974	1983	1982	1975	1970	1969	1993	1974	1973
MIN	.13	.13	.031	.000	.000	.51	.27	.15	.12	.076	.075	.091
(WY)	1985	1968	1985	1967	1967	1991	1991	1981	1987	1968	1988	1990

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1966 - 1993
ANNUAL TOTAL	504.40	2077.76	
ANNUAL MEAN	1.38	5.69	6.68
HIGHEST ANNUAL MEAN			22.7
LOWEST ANNUAL MEAN			.27
HIGHEST DAILY MEAN	60	Feb 27	380
LOWEST DAILY MEAN	.00	Dec 21	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Dec 21	.00
INSTANTANEOUS PEAK FLOW		1360	Jul 27
INSTANTANEOUS PEAK STAGE		7.73	Mar 7
ANNUAL RUNOFF (AC-FT)	1000	4120	4840
10 PERCENT EXCEEDS	1.8	4.4	4.2
50 PERCENT EXCEEDS	.19	.20	.22
90 PERCENT EXCEEDS	.04	.00	.00

e Estimated.

BEAR DEN CREEK BASIN
06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark network station and radiochemical program station)

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WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)
OCT												
06...	1000	0.18	2790	8.5	--	-2.0	3.5	76	11.4	92	180	925
NOV												
23...	1400	0.25	2770	8.2	--	-1.0	0.0	55	13.4	99	200	908
MAR												
25...	1415	19	1000	--	--	24.0	0.5	--	--	--	--	--
MAY												
05...	1130	0.17	2970	--	8.5	14.5	3.0	23	9.6	77	200	900
20...	1210	0.12	3250	8.9	--	22.5	15.0	--	9.1	99	170	--
JUN												
09...	1152	8.3	1310	--	--	22.0	14.0	--	--	--	--	--
15...	1115	0.25	1910	8.5	--	20.0	16.0	180	9.5	103	150	540
16...	1430	0.21	1970	8.3	--	13.0	15.0	--	7.7	82	160	--
JUL												
28...	1700	333	3990	--	7.7	26.5	20.5	--	6.4	77	73	--
AUG												
11...	1430	0.51	1490	8.1	--	30.0	27.0	--	7.9	107	160	--
24...	1330	0.19	2330	8.5	--	26.0	22.5	27	8.0	99	220	694

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD HCO3 (MG/L AS 00453)	CAR- BONATE WATER DIS IT FIELD CO3 (MG/L AS 00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT												
06...	700	K4	29	27	650	88	21	6.1	1060	34	650	2.8
NOV												
23...	--	--	37	25	650	88	20	5.3	1030	38	660	21
MAY												
05...	420	61	35	28	660	87	20	7.1	986	55	810	3.0
20...	31	K17	19	29	730	90	25	6.1	--	--	860	2.3
JUN												
15...	--	--	31	18	390	84	14	7.0	610	24	500	2.5
16...	380	140	30	20	460	86	16	6.8	--	--	520	2.1
JUL												
28...	2600	6700	18	6.8	48	55	2	9.0	--	--	67	6.1
AUG												
11...	210	580	36	18	310	79	11	12	--	--	360	4.4
24...	--	--	46	25	510	83	15	9.8	803	22	620	3.4

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	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, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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)
OCT												
06...	0.60	11	1930	1900	2.58	0.92	0.040	<0.010	--	<0.050	<0.050	0.060
NOV												
23...	0.40	9.4	1950	1910	2.60	1.29	0.020	0.020	0.036	<0.050	0.056	0.030
MAY												
05...	0.50	9.9	2090	2170	2.95	0.97	--	0.010	--	--	<0.050	--
20...	0.60	2.3	2200	--	2.99	0.71	--	<0.010	--	--	<0.050	--
JUN												
15...	0.40	13	1290	1340	1.82	0.90	--	0.030	--	--	<0.050	--
16...	<0.10	12	1380	--	1.88	0.75	--	0.010	--	--	<0.050	--
JUL												
28...	0.20	13	237	--	0.32	213	--	<0.010	--	--	0.076	--
AUG												
11...	0.40	13	1020	--	1.39	1.40	--	<0.010	--	--	<0.050	--
24...	0.50	13	1650	1350	1.84	0.70	--	<0.010	--	--	<0.050	--

BEAR DEN CREEK BASIN
06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark network station and radiochemical program station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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 DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHOS DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
OCT 06...	0.020	0.64	0.70	0.070	0.010	0.040	<0.010	10	<100	4	20	80
NOV 23...	0.010	0.37	0.40	0.050	<0.010	0.010	<0.010	--	--	--	--	--
MAY 05...	0.050	--	0.60	0.030	0.030	--	<0.010	20	24	<9	52	65
20...	0.030	--	0.50	0.050	--	--	<0.010	--	--	--	40	--
JUN 15...	0.040	--	1.1	0.160	0.020	--	0.010	--	--	--	--	--
16...	0.040	--	0.90	0.110	--	--	<0.010	--	--	--	780	--
JUL 28...	0.110	--	1.6	0.350	--	--	0.030	--	--	--	130	--
AUG 11...	0.040	--	1.1	0.170	--	--	0.040	--	--	--	99	--
24...	0.040	--	0.70	0.060	0.010	--	<0.010	20	<100	1	30	70

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)	ALPHA COUNT, 2 SIGMA WAT DIS AS TH-230 (PCI/L) (75987)	ALPHA, 2 SIGMA SED SUS TOT DRY AS TH-230 (PCI/L) (76004)	ALPHA, 2 SIGMA COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L) (75986)	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)
OCT 06...	60	2	5	<1	<1.0	390	7	16	2.3	21	50	2.9
MAY 05...	36	<30	5	<1	<1.0	420	<18	7.0	0.93	11	5.8	0.8
20...	10	--	--	--	--	--	--	--	--	--	--	--
16...	30	--	--	--	--	--	--	--	--	--	--	--
JUL 28...	78	--	--	--	--	--	--	--	--	--	--	--
AUG 11...	19	--	--	--	--	--	--	--	--	--	--	--
24...	20	<1	5	<1	<1.0	480	9	7.1	0.93	9.2	8.1	0.8

DATE	BETA, 2 SIGMA WATER, DISS, AS CS-137 (PCI/L) (75989)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, TOTAL (PCI/L AS CS-137) (03516)	BETA, 2 SIGMA WATER, DISS, AS SR90 /Y90 (PCI/L YT-90) (75988)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90) (80060)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L) (09511)	BETA, 2 SIGMA SED, SUSP, TOT DRY SR90Y90 (PCI/L) (76005)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
OCT 06...	4.1	9.4	4.5	3.1	7.1	4.3	0.090	0.52	1.2	<1.0	3.0	--
MAY 05...	5.1	11	1.8	3.8	8.1	1.7	0.120	0.75	0.72	<1.0	3.2	--
JUN 16...	--	--	--	--	--	--	--	--	--	--	--	19
JUL 28...	--	--	--	--	--	--	--	--	--	--	--	23
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	16
24...	4.7	15	1.8	3.5	12	1.7	0.020	0.09	0.69	<1.0	3.2	--

DATE	TRIAZIN SCREEN (ELISA) WAT, WH REC, AS ATRAZIN (UG/L) (34757)	TRIAZIN SCREEN (ELISA) WAT, DIS REC, AS ATRAZIN (UG/L) (34756)	CARBO- FURAN SCREEN, DIS- SOLVED (UG/L) (99902)	CYANA- ZINE SCREEN, DIS- SOLVED (UG/L) (99904)	CYANA- ZINE SCREEN, DIS- SOLVED (UG/L) (99903)	2, 4-D SCREEN, DIS- SOLVED (UG/L) (99906)	2, 4-D SCREEN, DIS- SOLVED (UG/L) (99905)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 06...	--	--	--	--	--	--	--	156	0.08	100
NOV 23...	--	--	--	--	--	--	--	158	0.11	99
MAY 05...	--	--	--	--	--	--	--	49	0.02	98
20...	<0.05	--	<0.06	--	<0.04	--	<0.700	--	--	--
JUN 16...	<0.05	--	<0.06	--	<0.04	--	<0.700	148	0.08	100
JUL 28...	--	<0.05	--	<0.06	--	<0.04	--	--	--	--
AUG 11...	--	--	--	<0.06	--	<0.04	--	--	--	--
24...	--	--	--	--	--	--	--	38	0.02	100

MISSOURI RIVER MAIN STEM

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06332518 LAKE SAKAKAWEA ABOVE VAN HOOK ARM NR MANDAREE, ND

LOCATION.--Lat 47°45'35", long 102°25'21", in SW¹/₄ sec.35, T.150 N., R.92 W.,
Mountrail County, Hydrologic Unit 10110101, upstream from Van Hook Arm,
11 mi east of Mandaree.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT							
14...	0915	66.3	0.0	571	8.4	12.0	9.1
14...	0916	--	2.0	571	8.4	12.0	9.1
14...	0917	--	4.0	573	8.4	12.0	9.1
14...	0918	--	6.0	570	8.4	12.0	9.1
14...	0919	--	8.0	566	8.4	12.0	9.2
14...	0920	--	10.0	565	8.4	11.5	9.2
14...	0921	--	12.0	567	8.5	11.5	9.2
14...	0922	--	14.0	570	8.5	11.5	9.2
14...	0923	--	16.0	565	8.5	11.5	9.2
14...	0924	--	18.0	560	8.5	11.5	9.2
14...	0925	--	20.0	553	8.5	11.5	9.2
FEB							
01...	1445	60.7	0.0	606	8.4	0.5	11.8
01...	1446	--	1.2	613	8.4	0.5	11.7
01...	1447	--	2.1	623	8.4	0.5	11.8
01...	1448	--	4.1	653	8.4	1.0	11.8
01...	1449	--	6.3	717	8.4	0.5	12.0
01...	1450	--	8.0	757	8.3	0.5	12.3
01...	1451	--	10.0	769	8.3	0.5	12.3
01...	1452	--	11.5	774	8.3	0.5	12.2
01...	1453	--	13.5	774	8.3	0.5	12.0
01...	1454	--	15.5	770	8.3	0.5	11.8
01...	1455	--	17.5	776	8.2	1.0	11.5
01...	1456	--	18.5	776	8.3	1.0	11.4
MAY							
25...	0952	65.0	0.0	698	8.4	12.5	10
25...	0953	--	3.3	697	8.4	12.5	10
25...	0954	--	6.0	698	8.4	12.5	10
25...	0955	--	9.7	693	8.4	12.0	9.9
25...	0956	--	12.2	653	8.3	11.0	9.9
25...	0957	--	15.3	630	8.1	9.0	9.7
25...	0958	--	18.3	640	8.1	8.5	9.6
25...	0959	--	19.8	630	8.1	8.5	9.6
JUN							
16...	0830	68.2	0.0	569	8.1	14.0	9.6
16...	0832	--	2.8	573	8.1	14.0	9.5
16...	0834	--	5.1	573	8.1	14.0	9.5
16...	0836	--	7.7	577	8.1	14.0	9.5
16...	0838	--	10.3	579	8.1	14.0	9.4
16...	0840	--	13.1	590	8.1	14.0	9.3
16...	0842	--	15.3	623	8.1	13.5	9.3
16...	0844	--	17.8	647	8.1	13.0	9.5
16...	0846	--	20.8	648	8.1	12.5	9.3
JUL							
19...	1815	75.0	0.0	450	8.0	18.5	8.5
19...	1816	--	1.9	448	8.0	17.5	8.2
19...	1817	--	5.1	447	8.0	17.5	8.0
19...	1818	--	9.1	454	8.0	17.5	7.9
19...	1819	--	13.0	490	7.9	16.5	7.5
19...	1820	--	15.7	580	7.9	15.5	7.2
19...	1821	--	19.4	600	7.9	15.0	6.9
19...	1822	--	22.9	605	7.9	14.5	6.8
AUG							
24...	1905	91.0	0.0	552	8.1	21.0	8.0
24...	1906	--	2.9	555	8.2	21.0	7.9
24...	1907	--	5.9	554	8.2	20.5	7.3
24...	1908	--	9.8	557	8.2	20.0	7.1
24...	1909	--	12.5	555	8.2	20.0	7.1
24...	1910	--	15.3	548	8.1	19.5	6.9
24...	1911	--	19.0	566	8.0	17.0	5.7
24...	1912	--	22.3	580	7.9	16.0	5.2
24...	1913	--	25.3	594	7.9	15.5	4.8
24...	1914	--	27.5	590	7.8	15.5	4.7
SEP							
21...	0850	80.0	0.0	581	8.0	15.5	9.1
21...	0851	--	2.2	582	8.0	15.5	8.8
21...	0852	--	4.1	581	8.0	15.5	8.8
21...	0853	--	6.5	581	8.0	15.5	8.7
21...	0854	--	10.7	582	8.0	15.5	8.5
21...	0855	--	13.4	581	8.0	15.5	8.4
21...	0856	--	16.0	582	8.0	15.5	8.4
21...	0857	--	18.3	581	8.0	15.5	8.3
21...	0858	--	20.5	580	8.0	15.5	8.2
21...	0859	--	22.5	582	8.0	15.0	8.2
21...	0900	--	24.2	579	8.0	15.0	8.0
21...	0901	--	24.3	580	8.0	15.0	8.0

MISSOURI RIVER MAIN STEM

06332518 LAKE SAKAKAWEA ABOVE VAN HOOK ARM NR MANDAREE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT 14...	90	713	--	68.0	1.5	180	<5.0
FEB 01...	88	712	2.10	194	5.5	165	5.0
MAY 25...	100	714	--	65.0	16.5	260	10
JUN 16...	100	708	--	30.0	13.0	110	<5.0
JUL 19...	97	718	--	34.0	25.0	45	<5.0
AUG 24...	97	708	--	74.0	25.5	355	<5.0
SEP 21...	98	708	--	78.0	14.0	195	<5.0

SHELL CREEK BASIN

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06332523 EAST FORK SHELL CREEK NEAR PARSHALL, ND

LOCATION.--Lat 47°56'55", long 102°12'52", in NW¹/₄NW¹/₄NW¹/₄ sec.33, T.152 N., R.90 W., Mountrail County,
Hydrologic Unit 10110101, on right bank 10 ft upstream from bridge on county road, 4 mi west of Parshall.

DRAINAGE AREA.--360 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1991 to September 1992.

GAGE.--Water-stage recorder. Elevation of gage is 1,890 ft above sea level, from topographic map.

REMARKS.--Records fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.30	e.35	e1.4	e.25	e.60	e.90	6.2	1.9	6.1	1.8	77	e6.0
2	e.29	e.50	e1.3	e.27	e.70	e.95	5.3	1.6	4.6	2.1	61	e7.0
3	e.27	e.48	e1.2	e.30	e.80	e1.0	4.7	1.5	4.6	2.5	49	e6.0
4	e.26	e.45	e1.1	e.35	e.90	e1.1	4.1	1.3	4.2	3.6	39	e5.0
5	e.25	e.42	e.90	e.33	e1.0	e1.5	4.5	1.5	3.7	7.3	30	e4.3
6	e.25	e.39	e.80	e.30	e1.0	e8.0	6.0	1.5	3.9	9.0	22	e3.5
7	e.25	e.38	e.80	e.28	e1.0	e40	5.9	1.9	4.7	8.5	16	e3.0
8	e.24	e.36	e.80	e.27	e.90	e35	5.2	2.1	11	6.7	10	e2.7
9	e.23	e.70	e.90	e.29	e.85	e25	4.5	2.8	17	5.5	7.1	e2.5
10	e.23	e1.4	e.90	e.32	e.80	e17	4.5	2.8	12	4.9	5.2	e2.3
11	e.22	e1.5	e.90	e.33	e.80	e14	5.0	2.5	9.1	4.3	4.2	e2.2
12	e.24	e1.4	e.85	e.32	e.80	e10	5.7	2.3	7.8	3.4	3.4	e2.1
13	e.26	e1.4	e.80	e.30	e.80	e8.0	5.0	1.1	6.5	4.6	3.1	e2.0
14	e.29	e1.5	e.75	e.29	e.75	e6.0	4.9	1.2	5.7	6.3	2.7	e1.9
15	e.30	e1.6	e.70	e.30	e.70	e5.0	4.6	1.2	4.3	8.1	2.8	e1.8
16	e.30	e1.7	e.65	e.31	e.65	e4.7	3.8	1.4	2.8	11	2.6	e1.8
17	e.27	e1.6	e.60	e.31	e.65	e4.3	3.7	1.5	2.1	17	2.1	e1.7
18	e.26	e1.6	e.55	e.30	e.70	e4.0	3.6	1.6	1.7	18	2.1	e1.7
19	e.25	e1.6	e.50	e.30	e.80	e3.7	3.2	1.7	1.4	15	1.8	e1.7
20	e.26	e1.5	e.50	e.30	e.80	e3.6	e3.0	2.3	.98	15	1.5	e1.7
21	e.27	e1.5	e.45	e.31	e.78	e3.5	e2.8	2.3	1.1	16	1.2	e1.8
22	e.27	e1.4	e.40	e.32	e.75	e4.0	2.5	6.3	.87	47	1.1	e1.9
23	e.28	e1.4	e.35	e.33	e.72	e7.0	2.2	13	.96	78	1.2	e1.9
24	e.27	e1.4	e.40	e.32	e.75	17	3.1	7.2	1.1	52	1.2	e1.8
25	e.26	e1.4	e.39	e.32	e.75	23	3.6	4.6	1.2	40	1.1	e1.7
26	e.25	e1.4	e.35	e.35	e.78	20	3.4	3.1	1.3	34	1.0	e1.7
27	e.25	e1.4	e.35	e.37	e.80	16	2.7	3.4	1.2	39	1.3	e1.7
28	e.27	e1.4	e.34	e.35	e.85	12	2.3	3.8	.97	66	1.2	e1.6
29	e.28	e1.4	e.30	e.36	---	9.8	2.1	4.8	1.1	46	1.7	e1.6
30	e.29	e1.4	e.26	e.42	---	9.2	1.9	7.1	1.6	72	2.5	e1.6
31	e.28	---	e.25	e.50	---	7.6	---	8.1	---	83	3.6	---
TOTAL	8.19	34.93	20.74	9.97	22.18	322.85	120.0	99.4	125.58	727.6	359.7	78.2
MEAN	.26	1.16	.67	.32	.79	10.4	4.00	3.21	4.19	23.5	11.6	2.61
MAX	.30	1.7	1.4	.50	1.0	.40	6.2	13	17	83	77	7.0
MIN	.22	.35	.25	.25	.60	.90	1.9	1.1	.87	1.8	1.0	1.6
AC-FT	16	69	41	20	44	640	238	197	249	1440	713	155

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1993, BY WATER YEAR (WY)

	1991	1992	1993	1991	1992	1993	1991	1992	1993	1991	1992	1993
MEAN	.93	1.87	.84	.37	1.82	10.3	4.24	2.42	2.42	8.22	4.00	1.87
MAX	1.59	2.58	1.01	.42	2.80	10.4	4.49	3.21	4.19	23.5	11.6	2.66
(WY)	1992	1992	1992	1992	1992	1993	1992	1993	1993	1993	1993	1991
MIN	.26	1.16	.67	.32	.79	10.1	4.00	1.64	.66	.42	.19	.34
(WY)	1993	1993	1993	1993	1993	1992	1993	1992	1992	1992	1992	1992

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1991 - 1993

ANNUAL TOTAL	705.79	1929.34	
ANNUAL MEAN	1.93	5.29	3.73
HIGHEST ANNUAL MEAN			5.29
LOWEST ANNUAL MEAN			2.19
HIGHEST DAILY MEAN	36	Mar 1	83
LOWEST DAILY MEAN	.00	Jul 29	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 11	.00
INSTANTANEOUS PEAK FLOW			94
INSTANTANEOUS PEAK STAGE			a5.24
ANNUAL RUNOFF (AC-FT)	1400	3830	2710
10 PERCENT EXCEEDS	5.1	11	7.1
50 PERCENT EXCEEDS	.54	1.6	1.1
90 PERCENT EXCEEDS	.15	.30	.17

e Estimated.

a Backwater from ice.

SHELL CREEK BASIN

06332523 EAST FORK SHELL CREEK NEAR PARSHALL, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--July 1991 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L CACO3) (00900)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT											
14...	1200	0.29	3090	--	--	5.5	6.0	--	--	--	--
NOV											
27...	1115	1.4	4220	--	--	5.0	2.5	--	--	--	--
JAN											
21...	1230	0.31	2440	--	--	5.0	0.5	--	--	--	--
MAR											
04...	1400	1.1	1620	--	--	10.5	1.0	--	--	--	--
11...	1050	14	1000	--	7.4	-2.5	0.0	9.2	67	160	--
26...	1040	19	1360	8.2	--	12.0	3.5	9.1	74	240	--
APR											
26...	1210	3.4	3490	8.7	--	15.5	11.5	8.7	87	490	--
MAY											
04...	0930	1.4	3420	8.7	--	13.0	12.5	6.7	69	450	21
25...	0945	4.2	3300	8.5	--	17.0	13.0	5.2	54	360	110
JUN											
09...	1215	18	2890	8.4	--	20.0	15.0	--	--	420	1200
22...	1115	0.63	3580	8.5	--	23.5	22.0	8.8	111	390	700
24...	1156	0.97	3550	8.8	--	16.0	16.0	5.3	59	370	--
JUL											
07...	0945	8.6	3210	8.7	--	19.0	17.0	7.6	86	390	K300
27...	1230	33	2200	7.7	--	18.0	20.0	--	--	390	78
AUG											
10...	1100	5.5	1830	8.1	--	26.0	23.0	7.9	99	370	64

DATE	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)
MAR											
11...	--	29	22	160	66	5	13	320	6.6	<0.10	16
26...	--	40	33	220	66	6	8.2	410	6.9	0.20	15
APR											
26...	--	70	77	690	75	14	10	900	20	0.40	6.9
MAY											
04...	640	61	72	700	77	14	10	820	19	0.40	6.1
25...	310	44	61	640	79	15	13	1200	27	0.10	10
JUN											
09...	1500	58	68	650	76	14	11	1200	15	0.40	12
22...	840	42	69	800	81	18	9.7	1200	16	0.40	5.8
24...	--	42	64	830	83	19	7.3	1200	16	0.40	8.5
JUL											
07...	880	40	71	620	77	14	11	1000	17	0.40	11
27...	1700	59	60	400	68	9	12	720	9.3	0.30	31
AUG											
10...	75	61	53	310	64	7	12	540	11	0.10	26

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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 ORTHO, DIS- SOLVED (MG/L AS P) (00671)
MAR											
11...	698	720	0.98	26.4	0.050	1.55	1.60	0.210	--	--	0.290
26...	919	962	1.31	48.8	0.020	--	<0.050	0.040	--	--	0.110
APR											
26...	2180	1990	2.71	18.3	<0.010	--	<0.050	0.050	--	--	0.020
MAY											
04...	2140	--	2.92	7.93	<0.010	--	<0.050	0.060	1.2	0.180	0.110
25...	2380	--	3.24	27.3	0.080	0.150	0.230	0.040	1.7	0.480	0.340
JUN											
09...	2430	--	3.30	117	<0.010	--	<0.050	0.050	1.7	0.360	0.240
22...	2600	--	3.54	4.42	<0.010	--	<0.050	0.060	1.7	0.280	0.210
24...	2600	2630	3.58	6.89	0.010	--	<0.050	0.070	--	--	0.220
JUL											
07...	2190	--	2.97	50.8	<0.010	--	<0.050	0.060	1.5	0.380	0.300
27...	1600	--	2.17	144	<0.010	--	0.091	0.100	1.9	0.490	0.250
AUG											
10...	1320	--	1.79	19.6	<0.010	--	<0.050	0.110	1.8	0.450	0.290

SHELL CREEK BASIN

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06332523 EAST FORK SHELL CREEK NEAR PARSHALL, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
MAR 11...	6	180	240	<1	48	110	<0.1	<1	<1	520	--
MAR 26...	2	290	150	<1	56	68	--	<1	<1	750	--
APR 26...	4	480	30	<1	160	30	<1.0	1	<1	1600	--
MAY 04...	--	--	20	--	--	50	--	--	--	--	--
MAY 25...	--	--	50	--	--	20	--	--	--	--	--
JUN 09...	--	--	100	--	--	30	--	--	--	--	27
JUN 22...	--	--	50	--	--	90	--	--	--	--	23
JUN 24...	9	700	50	1	160	40	0.3	<1	<1	1200	--
JUL 07...	--	--	70	--	--	10	--	--	--	--	24
JUL 27...	--	--	160	--	--	80	--	--	--	--	24
AUG 10...	--	--	68	--	--	53	--	--	--	--	22

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA- ZINE, WATER, DISS, REC, (UG/L) (39632)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	TRIAZIN SCREEN (ELISA) WAT,DIS REC,AS ATRAZIN (UG/L) (34756)	CARBO- FURAN SCREEN, DIS- SOLVED TOTAL (UG/L) (99902)	CYANA- ZINE, WATER, DISS, REC, (UG/L) (99901)	CYANA- ZINE, WATER, DISS, REC, (UG/L) (04041)	CYANA- ZINE SCREEN, DIS- SOLVED TOTAL (UG/L) (99904)	CYANA- ZINE SCREEN, DIS- SOLVED TOTAL (UG/L) (99903)	DEETHYL ATRA- ZINE, WATER, DISS, REC, (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)
MAR 11...	--	--	--	--	<0.06	--	--	<0.04	--	--	--
MAY 04...	<0.01	<0.01	--	--	--	<0.06	<0.01	--	<0.04	<0.02	<0.01
MAY 25...	--	--	<0.05	--	<0.06	--	--	<0.04	--	--	--
JUN 09...	<0.01	0.01	--	--	--	--	<0.01	--	--	<0.02	0.01
JUN 22...	--	--	--	<0.05	--	<0.06	--	--	<0.04	--	--
JUN 24...	--	--	--	<0.05	--	<0.06	--	--	<0.04	--	--
JUL 07...	<0.01	0.01	--	0.1	--	<0.06	<0.01	--	<0.04	<0.02	<0.01
JUL 27...	<0.01	0.01	--	<0.05	--	<0.06	<0.01	--	<0.04	<0.02	<0.01
AUG 10...	<0.01	<0.01	--	<0.05	--	<0.06	<0.01	--	<0.04	<0.02	<0.01

DATE	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	LINDANE DIS- SOLVED (UG/L) (39341)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	2, 4-D SCREEN, DIS- SOLVED TOTAL (UG/L) (99906)	2, 4-D SCREEN, DIS- SOLVED (UG/L) (99905)
MAR 11...	--	--	--	--	--	--	--	--	<0.700	--
MAY 04...	<0.02	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	--	<0.700
MAY 25...	--	--	--	--	--	--	--	--	<0.700	--
JUN 09...	<0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	--	--
JUN 22...	--	--	--	--	--	--	--	--	--	<0.700
JUN 24...	--	--	--	--	--	--	--	--	--	<0.700
JUL 07...	<0.02	<0.01	<0.01	<0.01	0.02	<0.02	0.02	<0.01	--	<0.700
JUL 27...	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	0.01	<0.01	--	0.740
AUG 10...	<0.02	<0.01	<0.01	<0.01	0.03	<0.02	0.02	<0.01	--	--

DEEPWATER CREEK BASIN

06332770 DEEPWATER CREEK AT MOUTH NEAR RAUB, ND

LOCATION.--Lat 47°44'16", long 102°06'26", in NW1/4NW1/4SW1/4 sec.8, T.149 N., R.89 W., McLean County, Hydrologic Unit 10110101, on right bank 20 ft upstream from Highway 1804 bridge, 3 mi west and 0.6 mi south of Raub.

DRAINAGE AREA.--220 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,832 ft above sea level, from topographic map.

REMARKS.--Records good except for missing periods, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	1.1	e.00	.00	e.01	11	1.7	15	.12	28	5.0
2	.00	.01	.98	e.00	.00	e.10	8.9	1.4	11	.18	21	4.6
3	.00	.01	1.0	e.00	.00	e.50	6.3	1.3	7.7	.36	18	3.1
4	.00	.00	e.95	e.00	.00	e4.6	3.3	1.2	5.5	13	15	2.0
5	.00	.00	e1.0	e.00	.00	e10	3.5	1.3	3.6	30	13	1.5
6	.00	.00	e.95	e.00	.00	e25	4.9	1.0	2.9	23	11	1.4
7	.00	.00	e.95	e.00	.00	e50	5.3	1.2	2.7	18	9.4	1.1
8	.00	.00	e.98	e.00	.00	e47	5.3	1.2	7.1	15	7.9	.91
9	.00	.01	1.1	e.00	.00	e43	6.5	1.2	23	12	6.7	.74
10	.00	.01	1.5	e.00	.00	e38	6.9	1.2	27	8.9	5.6	.62
11	.00	.01	1.4	e.00	.00	e35	7.2	1.4	19	6.5	4.7	.45
12	.00	.01	1.1	e.00	.00	33	12	2.4	14	5.0	3.4	.44
13	.00	.01	e1.0	e.00	.00	24	8.8	2.0	10	4.8	2.7	.40
14	.00	.01	e1.0	e.00	.00	17	7.0	1.5	7.4	4.1	2.9	.35
15	.00	.01	e1.0	e.00	.00	14	5.7	1.2	5.6	6.6	2.9	.35
16	.00	.01	e.98	e.00	.00	12	7.1	.86	3.7	7.1	2.7	.44
17	.00	.01	e.90	e.00	.00	9.8	7.8	.65	2.4	7.4	2.6	.42
18	.00	.01	e.80	e.00	.00	10	5.1	.44	1.9	9.4	2.1	.37
19	.00	.02	e.75	e.00	.00	8.0	2.8	.21	1.3	17	1.8	.23
20	.00	.02	e.80	e.00	.00	7.6	2.4	.12	.48	16	1.5	.21
21	.00	.01	e.70	e.00	.00	8.1	2.4	.12	.32	16	1.3	.34
22	.00	.01	e.60	.00	.00	9.1	2.0	.26	.34	15	1.2	.34
23	.00	.01	.46	.00	.03	10	2.0	.12	.27	30	.98	.30
24	.00	.01	.08	.00	.00	13	2.0	.11	.17	38	.89	.30
25	.00	.01	.10	.00	e.00	21	1.8	.15	.11	30	.72	.22
26	.00	.33	.03	.00	e.00	23	2.3	.28	.10	24	.91	.21
27	.00	.92	.01	.00	e.00	23	2.6	.54	.09	22	1.1	.19
28	.00	1.1	.01	.00	e.00	21	2.3	.72	.05	40	1.1	.14
29	.00	1.1	.00	.00	---	19	2.2	.92	.10	65	1.1	.12
30	.00	1.1	.00	.00	---	16	2.1	4.0	.12	52	1.8	.13
31	.01	---	e.00	.00	---	13	---	11	---	36	2.2	---
TOTAL	0.01	4.77	22.23	0.00	0.03	564.81	149.5	41.70	172.95	572.46	176.20	26.92
MEAN	.000	.16	.72	.000	.001	18.2	4.98	1.35	5.76	18.5	5.68	.90
MAX	.01	1.1	1.5	.00	.03	50	12	11	27	65	28	5.0
MIN	.00	.00	.00	.00	.00	.01	1.8	.11	.05	.12	.72	.12
AC-FT	.02	9.5	44	.00	.06	1120	297	83	343	1140	349	53

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1993, BY WATER YEAR (WY)

	1991	1992	1993	1991	1992	1993	1991	1992	1993	1991	1992	1993
MEAN	.14	1.37	.65	.22	2.75	14.0	4.89	1.07	2.90	6.30	1.90	1.80
MAX	.27	2.59	.72	.45	5.40	18.2	4.98	1.35	5.76	18.5	5.68	4.49
(WY)	1992	1992	1993	1992	1992	1993	1993	1993	1993	1993	1993	1991
MIN	.000	.16	.57	.000	.001	9.72	4.81	.80	.040	.009	.001	.000
(WY)	1993	1993	1992	1993	1993	1992	1992	1992	1992	1992	1991	1992

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1991 - 1993
ANNUAL TOTAL	669.67	1731.58	
ANNUAL MEAN	1.83	4.74	3.39
HIGHEST ANNUAL MEAN			4.74
LOWEST ANNUAL MEAN			2.04
HIGHEST DAILY MEAN	40 Feb 29	65 Jul 29	65 Jul 29 1993
LOWEST DAILY MEAN	.00 Jun 23	.00 Oct 1	.00 Jul 27 1991
ANNUAL SEVEN-DAY MINIMUM	.00 Jul 23	.00 Oct 1	.00 Jul 27 1991
INSTANTANEOUS PEAK FLOW		67 Jul 29	67 Jul 29 1993
INSTANTANEOUS PEAK STAGE		8.42 Jul 29	8.42 Jul 29 1993
ANNUAL RUNOFF (AC-FT)	1330	3430	2460
10 PERCENT EXCEEDS	6.0	15	9.1
50 PERCENT EXCEEDS	.09	.86	.43
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

DEEPWATER CREEK BASIN

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06332770 DEEPWATER CREEK AT MOUTH NEAR RAUB, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1991 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	
NOV 27...	1300	0.92	3050	--	--	6.0	2.5	--	--	--	--	
MAR 04...	1715	4.6	3680	--	--	10.5	1.0	--	--	--	--	
11...	1325	35	720	--	7.6	-3.0	0.5	8.3	61	140	--	
APR 26...	1515	2.4	1890	8.5	--	16.0	11.0	7.3	71	--	--	
MAY 04...	1045	1.2	2080	8.7	--	19.0	14.0	6.0	64	410	120	
25...	1205	0.16	2260	8.7	--	17.5	13.5	8.7	91	420	K180	
JUN 09...	1600	26	2310	8.7	--	24.5	16.5	--	--	400	160	
22...	1500	0.34	2380	8.5	--	24.0	26.0	7.0	94	410	--	
24...	1406	0.17	2420	8.6	--	17.5	16.0	5.0	55	400	--	
JUL 07...	1520	18	1830	8.5	--	23.0	19.0	6.5	76	290	130	
27...	1445	20	1390	7.7	--	15.0	18.0	--	--	300	140	
AUG a10...	1330	5.4	1450	8.2	--	28.0	23.0	7.8	97	330	53	
a31...	1235	1.9	1780	8.6	--	26.5	16.0	5.8	--	390	--	
DATE		STREP- TOCOC- CI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)	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)	
MAR 11...	--	22	20	90	56	3	14	180	4.5	--	15	
MAY 04...	260	56	66	350	64	8	11	620	12	0.50	9.2	
25...	190	48	72	410	67	9	11	720	13	0.40	1.2	
JUN 09...	200	46	70	410	68	9	9.6	710	11	0.60	3.0	
22...	580	44	73	450	70	10	10	700	9.7	0.60	3.7	
24...	--	43	70	420	69	9	9.5	680	9.6	0.50	5.5	
JUL 07...	250	39	46	300	68	8	11	540	7.4	0.40	15	
27...	320	44	47	230	61	6	10	370	6.3	0.30	27	
AUG a10...	150	50	49	180	54	4	9.7	340	6.4	0.40	17	
a31...	--	50	63	270	60	6	10	460	8.6	0.50	2.8	
DATE		SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS ORTHOPHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHOPHOS- PHORUS TOTAL (MG/L AS P) (00671)
MAR 11...	453	488	0.66	45.5	0.060	1.44	1.50	0.280	--	--	0.360	
MAY 04...	1440	--	1.96	4.71	<0.010	--	<0.050	0.080	1.3	0.110	0.040	
25...	1620	--	2.21	0.70	<0.010	--	<0.050	0.040	1.5	0.120	0.040	
JUN 09...	1610	--	2.18	114	<0.010	--	<0.050	0.030	1.4	0.100	0.030	
22...	1660	--	2.26	1.53	<0.010	--	<0.050	0.050	1.7	0.230	0.180	
24...	1620	1710	2.33	0.78	<0.010	--	<0.050	0.060	--	--	0.230	
JUL 07...	1240	--	1.68	59.8	<0.010	--	<0.050	0.070	1.3	0.250	0.190	
27...	992	--	1.35	54.7	<0.010	--	<0.050	0.100	1.8	0.440	0.260	
AUG a10...	937	--	1.27	13.7	<0.010	--	<0.050	0.050	1.7	0.400	0.290	
a31...	1190	1210	1.65	6.21	<0.010	--	<0.050	0.030	--	--	0.100	

DEEPWATER CREEK BASIN

06332770 DEEPWATER CREEK AT MOUTH NEAR RAUB, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
MAR 11...	2	170	310	<1	26	73	<0.1	<1	<1	350	--
MAY 04...	--	--	20	--	--	80	--	--	--	--	--
MAY 25...	--	--	10	--	--	90	--	--	--	--	--
JUN 09...	--	--	20	--	--	20	--	--	--	--	19
JUN 22...	--	--	30	--	--	70	--	--	--	--	22
JUN 24...	11	680	60	<1	110	90	<0.1	<1	<1	900	--
JUL 07...	--	--	99	--	--	20	--	--	--	--	22
JUL 27...	--	--	200	--	--	66	--	--	--	--	24
AUG a10...	--	--	44	--	--	35	--	--	--	--	24
AUG a31...	7	480	27	<1	73	16	<0.1	<1	<1	810	--

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA- ZINE, WATER, DISS, REC, (UG/L) (39632)	TRIAZIN SCREEN (ELISA) WAT,DIS REC,AS ATRAZIN (UG/L) (34756)	CARBO- FURAN SCREEN, DIS- TOTAL SOLVED (UG/L) (99902)	CARBO- FURAN SCREEN, DIS- TOTAL SOLVED (UG/L) (99901)	CYANA- ZINE, WATER, DISS, REC, (UG/L) (04041)	CYANA- ZINE SCREEN, TOTAL SOLVED (UG/L) (99904)	CYANA- ZINE SCREEN, DIS- TOTAL SOLVED (UG/L) (99903)	DEETHYL ATRA- ZINE, WATER, DISS, REC, (UG/L) (04040)	DI- AZINON, DIS- TOTAL SOLVED (UG/L) (39572)
MAR 11...	--	--	--	<0.06	--	--	<0.04	--	--	--
MAY 04...	<0.01	<0.01	--	--	<0.06	<0.01	--	<0.04	<0.02	<0.01
MAY 25...	--	--	<0.05	<0.06	--	--	<0.04	--	--	--
JUN 09...	<0.01	0.01	--	--	--	<0.01	--	--	<0.02	<0.01
JUN 22...	--	--	<0.05	--	<0.06	--	--	<0.04	--	--
JUN 24...	--	--	--	--	--	--	--	<0.04	--	--
JUL 07...	<0.01	0.01	<0.05	--	<0.06	<0.01	--	<0.04	<0.02	<0.01
JUL 27...	<0.01	<0.01	<0.05	--	<0.06	<0.01	--	<0.04	<0.02	<0.01
AUG a10...	<0.01	<0.01	<0.05	--	<0.06	<0.01	--	<0.04	<0.02	<0.01

DATE	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	LINDANE DIS- SOLVED (UG/L) (39341)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PRO- METON, WATER, DISS, REC, (UG/L) (04037)	SI- MAZINE, WATER, DISS, REC, (UG/L) (04035)	2, 4-D SCREEN, TOTAL SOLVED (UG/L) (99906)	2, 4-D SCREEN, DIS- TOTAL SOLVED (UG/L) (99905)
MAR 11...	--	--	--	--	--	--	--	--	<0.700	--
MAY 04...	<0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	--	<0.700
MAY 25...	--	--	--	--	--	--	--	--	<4.62	--
JUN 09...	<0.02	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	--	--
JUN 22...	--	--	--	--	--	--	--	--	--	<0.700
JUN 24...	--	--	--	--	--	--	--	--	--	<0.700
JUL 07...	<0.02	<0.01	<0.01	<0.01	0.01	<0.02	<0.01	<0.01	--	0.950
JUL 27...	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	--	0.740
AUG a10...	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	--	--

a Replicate sample also collected for quality-assurance purposes.

MISSOURI RIVER MAIN STEM

245

06332780 LAKE SAKAKAWEA ABOVE LITTLE MISSOURI RIVER NR HALLIDAY, ND

LOCATION.--Lat 47°36'47", long 102°15'20", in NE 1/4 sec.27, T.148 N., R.91 W.,
Dunn County, Hydrologic Unit 10110101, upstream from mouth of Little
Missouri River, 18 mi north of Halliday.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT							
14...	0830	86.9	0.0	555	8.3	12.0	8.9
14...	0831	--	2.0	556	8.3	12.0	8.9
14...	0832	--	4.0	556	8.4	12.0	8.9
14...	0833	--	6.0	557	8.4	12.5	8.9
14...	0834	--	8.0	556	8.4	12.5	9.0
14...	0835	--	10.0	557	8.4	12.0	9.0
14...	0836	--	12.0	557	8.4	12.0	8.9
14...	0837	--	14.0	557	8.4	12.5	9.0
14...	0838	--	16.0	556	8.4	12.5	9.0
14...	0839	--	18.0	557	8.4	12.5	9.0
14...	0840	--	20.0	557	8.4	12.5	8.9
14...	0841	--	22.0	557	8.4	12.5	8.9
14...	0842	--	24.0	557	8.4	12.5	8.9
14...	0843	--	26.0	557	8.4	12.5	8.9
FEB							
01...	1255	70.2	0.0	580	8.2	0.5	12.0
01...	1256	--	1.0	582	8.3	0.5	12.2
01...	1257	--	2.9	581	8.2	0.5	12.4
01...	1258	--	5.4	582	8.3	1.0	12.2
01...	1259	--	7.0	596	8.3	1.0	12.0
01...	1300	--	8.8	610	8.3	1.5	11.8
01...	1301	--	11.3	669	8.3	1.5	11.6
01...	1302	--	13.0	680	8.3	1.0	11.5
01...	1303	--	15.0	698	8.3	1.0	11.4
01...	1304	--	17.0	702	8.3	1.0	11.4
01...	1305	--	19.0	702	8.3	1.0	11.3
01...	1306	--	21.0	688	8.2	2.0	10.5
MAY							
25...	1048	78.4	0.0	629	8.1	10.0	10.5
25...	1049	--	4.5	630	8.2	10.0	10.5
25...	1050	--	9.5	635	8.2	9.5	10.5
25...	1051	--	14.0	638	8.2	9.0	10.5
25...	1052	--	18.6	630	8.1	7.0	10.5
25...	1053	--	22.4	640	8.1	6.5	10.6
25...	1054	--	23.9	635	8.1	6.5	10.5
JUN							
16...	0800	90.0	0.0	643	8.1	13.0	9.5
16...	0802	--	2.4	644	8.2	13.0	9.4
16...	0804	--	5.2	645	8.2	13.0	9.3
16...	0806	--	8.4	648	8.2	12.5	9.3
16...	0808	--	11.2	643	8.2	12.5	9.3
16...	0810	--	14.1	644	8.2	12.5	9.3
16...	0812	--	18.3	645	8.2	12.5	9.2
16...	0814	--	21.9	639	8.1	11.5	9.1
16...	0816	--	24.3	637	8.1	11.0	9.0
16...	0818	--	27.1	634	8.1	11.0	8.9
JUL							
19...	1730	88.0	0.0	532	8.2	19.0	8.5
19...	1731	--	1.4	526	8.3	18.0	8.5
19...	1732	--	5.9	526	8.1	17.0	7.5
19...	1733	--	8.9	530	8.1	17.0	7.4
19...	1734	--	13.5	570	8.0	16.0	6.9
19...	1735	--	18.1	631	8.0	15.0	6.8
19...	1736	--	23.0	639	8.0	13.5	6.6
19...	1737	--	26.2	645	7.9	13.5	6.3
19...	1738	--	27.0	646	7.9	13.5	6.2
AUG							
24...	1809	95.0	0.0	547	8.1	21.0	7.8
24...	1810	--	3.2	547	8.2	20.5	7.6
24...	1811	--	6.5	548	8.2	20.0	7.4
24...	1812	--	9.0	543	8.2	20.0	7.3
24...	1813	--	11.9	550	8.2	20.0	7.2
24...	1814	--	15.0	570	8.2	18.5	7.0
24...	1815	--	18.2	594	8.1	16.5	6.6
24...	1816	--	21.1	605	8.0	15.5	6.5
24...	1817	--	23.9	612	8.0	15.0	6.1
24...	1818	--	27.0	618	7.9	14.5	5.7
24...	1819	--	29.0	625	7.9	14.5	5.5
SEP							
21...	0805	91.0	0.0	571	8.0	15.5	9.0
21...	0806	--	2.5	570	8.1	15.5	9.0
21...	0807	--	4.6	572	8.1	15.5	8.9
21...	0808	--	6.8	571	8.1	15.5	8.9
21...	0809	--	9.8	573	8.1	15.5	8.9
21...	0810	--	13.4	573	8.1	15.5	8.9
21...	0811	--	16.2	572	8.1	15.5	8.8
21...	0812	--	19.2	570	8.1	15.5	8.8
21...	0813	--	22.0	570	8.1	15.5	8.8
21...	0814	--	25.5	571	8.1	15.5	8.7
21...	0815	--	27.8	575	8.0	15.5	7.7

MISSOURI RIVER MAIN STEM

06332780 LAKE SAKAKAWEA ABOVE LITTLE MISSOURI RIVER NR HALLIDAY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT 14...	89	712	--	59.0	1.0	90	<5.0
FEB 01...	89	714	1.50	281	10.0	190	<5.0
MAY 25...	100	714	--	125	18.0	260	7.0
JUN 16...	97	708	--	122	12.0	120	<5.0
JUL 19...	97	718	--	68.0	25.0	270	<5.0
AUG 24...	95	708	--	116	24.0	345	<5.0
SEP 21...	97	708	--	78.0	14.0	210	<5.0

LITTLE MISSOURI RIVER BASIN

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06335500 LITTLE MISSOURI RIVER AT MARMARTH, ND

LOCATION.--Lat 46°17'44", long 103°55'06", in SW¹/₄, sec.30, T.133 N., R.105 W., Slope County, Hydrologic Unit 10110203, on left bank 90 ft downstream from bridge on U.S. Highway 12 in Marmarth, and 1.5 mi downstream from Little Beaver Creek.

DRAINAGE AREA.--4,640 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS (WATER YEARS).--WSP 896: 1938-39. WSP 1086: 1943-44. WSP 1279: 1943(M), 1945-46, 1948. WSP 1439: 1950 (calendar year figures).

GAGE.--Water-stage recorder. Datum of gage is 2,686.32 ft above sea level. Prior to June 23, 1950, various nonrecording gages on former highway bridge at present site and datum. June 23, 1950, to Sept. 2, 1957, nonrecording gage at site 90 ft upstream at present datum.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. Small diversions for irrigation upstream from station.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, the greatest known flood prior to 1953 occurred in June 1907 (stage unknown). Other major floods occurred in March 1913, May 1929, and March 1920 and reached stages of about 21.5 ft, 20.2 ft, and 19.7 ft, respectively. These stages are not comparable to stages during period of record, owing to construction of levees.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	10	e13	e.00	e.00	e.00	e925	e138	e61	504	1920	73
2	4.5	12	e13.5	e.00	e.00	e.00	e678	e130	e75	562	1560	72
3	4.4	11	e14	e.00	e.00	e45	e478	e119	108	856	1210	71
4	4.4	13	e12	e.00	e.00	e200	e427	e106	86	1710	1030	67
5	4.0	19	e11	e.00	e.00	e450	e340	e95	66	1620	974	64
6	3.7	22	e10	e.00	e.00	e2000	e292	e80	57	1320	815	62
7	5.9	22	e10	e.00	e.00	e3500	e264	e76	269	1440	579	60
8	5.9	24	e11	e.00	e.00	e3900	e220	e121	3360	1770	419	56
9	5.9	32	e12	e.00	e.00	e2500	e296	e472	1930	1390	326	52
10	6.5	37	e13	e.00	e.00	e1310	e234	e309	2380	1900	264	51
11	6.9	37	e12	e.00	e.00	e800	e217	e340	4830	1080	225	49
12	6.5	27	e11	e.00	e.00	e350	e194	e406	4650	717	195	46
13	7.2	29	e10	e.00	e.00	e450	e185	e230	3560	828	194	e44
14	7.3	29	e9.5	e.00	e.00	e300	e210	e248	2600	883	189	e49
15	7.3	24	e9.0	e.00	e.00	e275	e182	e238	1930	1120	167	e48
16	7.6	25	e9.0	e.00	e.00	e220	e152	e171	1400	1290	148	e48
17	8.1	23	e8.0	e.00	e.00	e150	e185	e148	945	1750	133	e47
18	8.9	20	e7.5	e.00	e.00	e95	e275	e121	676	2440	129	e49
19	9.7	18	e7.2	e.00	e.00	e650	e245	e100	561	3160	203	e50
20	13	17	e7.0	e.00	e.00	e700	e264	e94	409	3010	314	e50
21	15	15	e7.0	e.00	e.00	e680	e462	e85	311	2310	271	e46
22	15	15	e6.5	e.00	e.00	e900	e1050	e77	254	2600	191	e44
23	14	e15	e6.5	e.00	e.00	e1200	e772	e71	231	3120	150	e42
24	12	e14	e6.0	e.00	e.00	e1500	e590	e69	207	3420	128	e40
25	11	e13	e6.0	e.00	e.00	e1580	e386	e58	198	2820	113	e40
26	10	e13	e5.9	e.00	e.00	e2050	e296	e58	182	2040	105	e38
27	9.9	e12.5	e3.0	e.00	e.00	e2620	e238	e60	163	3780	103	e40
28	9.3	e12.5	e1.5	e.00	e.00	e2920	e176	e61	146	3070	95	e38
29	9.7	e12	e.8	e.00	---	e2380	e150	e62	220	2370	90	e33
30	9.7	e12	e.00	e.00	---	e1630	e148	e220	434	2380	85	e33
31	9.2	---	e.00	e.00	---	e1260	---	e70	---	2180	76	---
TOTAL	258.2	585.0	252.90	0.00	0.00	36615.00	10531	4633	32299	59440	12401	1502
MEAN	8.33	19.5	8.16	.000	.000	1181	351	149	1077	1917	400	50.1
MAX	15	37	14	.00	.000	3900	1050	472	4830	3780	1920	73
MIN	3.7	10	.00	.00	.00	.00	148	58	57	504	76	33
AC-FT	512	1160	502	.00	.00	72630	20890	9190	64070	117900	24600	2980

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1993, BY WATER YEAR (WY)

	MEAN	100	30.7	14.8	17.7	174	884	802	566	696	227	78.2	72.3
MAX	1489	241	107	260	2207	5079	6691	3840	4705	1917	400	526	
(WY)	1972	1947	1952	1973	1943	1978	1952	1975	1944	1993	1993	1941	
MIN	.87	.37	.000	.000	.000	23.1	10.7	4.75	3.51	.10	.16	.000	
(WY)	1959	1956	1956	1939	1939	1992	1981	1980	1961	1980	1988	1955	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1938 - 1993

ANNUAL TOTAL	10645.82	158517.10	
ANNUAL MEAN	29.1	434	307
HIGHEST ANNUAL MEAN			986
LOWEST ANNUAL MEAN			20.5
HIGHEST DAILY MEAN	318	Jun 16	28600
LOWEST DAILY MEAN	.00	Dec 30	.00
ANNUAL SEVEN-DAY MINIMUM	1.1	Sep 15	.00
INSTANTANEOUS PEAK FLOW			5020
INSTANTANEOUS PEAK STAGE			8.55
ANNUAL RUNOFF (AC-FT)	21120	314400	222600
10 PERCENT EXCEEDS	80	1620	608
50 PERCENT EXCEEDS	12	61	30
90 PERCENT EXCEEDS	2.1	.00	.50

e Estimated.

a Backwater from ice.

LITTLE MISSOURI RIVER BASIN

06335500 LITTLE MISSOURI RIVER AT MARMARTH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1970 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 06...	0840	3.3	2100	--	5.0	6.0	--	--	--	--	--
NOV 17...	0910	24	1660	--	0.0	0.5	--	--	--	--	--
MAR 09...	0850	2870	285	8.0	2.0	0.5	--	--	--	--	--
24...	0905	1300	402	8.2	23.5	1.0	67	103	16	6.5	50
JUN 02...	1110	74	1470	--	14.0	14.0	--	--	--	--	--
JUL 29...	1120	2360	552	--	27.0	21.0	--	--	--	--	--
SEP 13...	1330	44	1610	8.8	7.0	8.0	200	323	34	28	260

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 24...	60	3	3.9	99	3.9	0.20	4.8	246	228	0.31	800
SEP 13...	72	8	13	500	10	0.40	8.3	1050	1080	1.47	127

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 24...	1	10	110	<1	20	10	0.1	2	1	190
SEP 13...	1	260	10	<1	60	10	<0.1	4	<1	510

LITTLE MISSOURI RIVER BASIN

249

06336600 BEAVER CREEK NEAR TROTTERS, ND

LOCATION.--Lat 47°09'47", long 103°59'32", in SW¼SW¼/NE¼ 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 27 mi above mouth.

DRAINAGE AREA.--616 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to current year (seasonal records only since 1984).

REVISED RECORDS.--1982: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,370 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 427 ft³/s, July 7, gage height, 8.42 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e.00	e.00	12	5.1	.36	17	127	e3.2
2	---	---	---	---	e.00	e10	11	4.5	.93	16	76	e3.0
3	---	---	---	---	e.00	e60	10	4.1	1.0	33	49	e2.8
4	---	---	---	---	e.00	e120	9.7	4.4	.95	42	39	e2.7
5	---	---	---	---	e.00	e185	8.8	5.1	.74	45	32	e2.5
6	---	---	---	---	e.00	e170	8.3	5.9	1.3	41	27	e2.3
7	---	---	---	---	e.00	e100	7.6	6.7	12	235	22	e2.2
8	---	---	---	---	e.00	e55	7.0	7.5	20	249	19	e2.1
9	---	---	---	---	e.00	e60	6.4	8.3	22	132	e17	e1.9
10	---	---	---	---	e.00	e80	5.7	9.4	28	85	e15	e1.7
11	---	---	---	---	e.00	e70	5.3	7.9	42	61	e13	e1.6
12	---	---	---	---	e.00	e60	4.9	6.5	114	46	e12	e1.6
13	---	---	---	---	e.00	e55	4.7	5.0	68	39	e11	e1.5
14	---	---	---	---	e.00	e50	4.5	3.6	47	34	e10	e1.5
15	---	---	---	---	e.00	e45	4.1	2.4	40	29	e9.0	e1.4
16	---	---	---	---	e.00	e40	3.7	1.9	34	26	e9.3	e1.4
17	---	---	---	---	e.00	e37	3.4	2.2	30	24	e8.6	e1.3
18	---	---	---	---	e.00	e34	3.1	1.3	28	21	e8.0	e1.2
19	---	---	---	---	e.00	e32	4.6	.79	24	18	e7.5	e1.1
20	---	---	---	---	e.00	e29	4.8	.57	22	16	e7.0	e1.0
21	---	---	---	---	e.00	e25	4.9	.47	19	15	e6.6	e.96
22	---	---	---	---	e.00	e21	5.3	.57	18	15	e6.2	e.90
23	---	---	---	---	e.00	e17	5.7	.35	17	14	e5.8	e.88
24	---	---	---	---	e.00	e15	5.7	.38	17	14	e5.4	e.85
25	---	---	---	---	e.00	e16	5.4	.41	16	15	e5.0	e.81
26	---	---	---	---	e.00	e16	5.7	.36	15	16	e4.7	e.78
27	---	---	---	---	e.00	15	6.2	.34	15	23	e4.4	e.75
28	---	---	---	---	e.00	14	5.4	.29	14	28	e4.2	e.73
29	---	---	---	---	---	14	5.6	.34	15	34	e3.9	e.71
30	---	---	---	---	---	13	5.7	.44	16	36	e3.7	e.70
31	---	---	---	---	---	12	---	.30	---	87	e3.4	---
TOTAL	---	---	---	---	0.00	1470.00	185.2	97.41	698.28	1506	571.7	46.07
MEAN	---	---	---	---	.000	47.4	6.17	3.14	23.3	48.6	18.4	1.54
MAX	---	---	---	---	.00	185	12	9.4	114	249	127	3.2
MIN	---	---	---	---	.00	.00	3.1	.29	.36	14	3.4	.70
AC-FT	---	---	---	---	.00	2920	367	193	1390	2990	1130	91

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1993, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.10	2.62	2.59	4.40	34.6	102	54.6	15.2	19.6	9.21	2.42	.68				
MAX	3.29	6.34	5.13	14.7	141	609	406	45.7	125	48.6	18.4	4.72				
(WY)	1983	1983	1979	1983	1983	1978	1979	1979	1982	1993	1993	1986				
MIN	.006	.010	.032	.000	.000	1.21	1.11	1.05	.12	.000	.000	.000				
(WY)	1982	1982	1982	1982	1989	1991	1991	1981	1992	1988	1985	1981				

SUMMARY STATISTICS

WATER YEARS 1978 - 1993

ANNUAL MEAN	a33.3	
HIGHEST ANNUAL MEAN	a79.7	1978
LOWEST ANNUAL MEAN	a2.77	1981
HIGHEST DAILY MEAN	2500	Mar 22 1978
LOWEST DAILY MEAN	.00	Aug 1 1981
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 10 1981
INSTANTANEOUS PEAK FLOW	2720	Mar 29 1978
INSTANTANEOUS PEAK STAGE	b19.27	Mar 22 1978
ANNUAL RUNOFF (AC-FT)	a24110	
10 PERCENT EXCEEDS	35	
50 PERCENT EXCEEDS	2.4	
90 PERCENT EXCEEDS	.00	

e Estimated.

a Based on complete water years only (1978-83).

b Backwater from ice.

LITTLE MISSOURI RIVER BASIN

06336600 BEAVER CREEK NEAR TROTTERS, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR											
05...	1220	144	620	--	5.0	0.5	--	--	--	--	--
10...	1230	77	1170	8.2	0.0	1.0	300	200	55	40	130
24...	1550	14	--	--	23.0	1.5	--	--	--	--	--
JUN											
01...	1335	0.42	3040	--	11.0	13.0	--	--	--	--	--
JUL											
28...	1255	27	1860	--	23.0	19.5	--	--	--	--	--
SEP											
09...	1246	1.9	1920	8.0	20.0	16.0	480	386	65	78	310

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR											
10...	47	3	14	390	5.9	0.10	7.3	763	751	1.02	157
SEP											
09...	57	6	15	780	9.7	0.20	0.30	1490	1560	2.12	8.17

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR										
10...	1	220	100	<1	30	80	0.1	<1	<1	660
SEP										
09...	1	580	10	<1	50	10	<0.1	2	1	970

LITTLE MISSOURI RIVER BASIN

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06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°35'45", long 103°15'45", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.35, T.148 N., R.99 W., McKenzie County, Hydrologic Unit 10110205, 0.8 mi upstream from U.S. Highway 85 crossing, 17 mi upstream from Cherry Creek, and 17.5 mi south of Watford City.

DRAINAGE AREA.--8,310 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1934 to current year.

REVISED RECORDS (WATER YEARS).--WSP 926: 1935. WSP 1270: 1943.

GAGE.--Water-stage recorder. Datum of gage is 1,929.03 ft above sea level. From Oct. 2, 1959, to June 17, 1963, and Nov. 28, 1964, to Sept. 30, 1990, water-stage recorder at site at U.S. Highway 85 crossing, 0.8 mi downstream. From June 18, 1963, to Nov. 28, 1964, at site 0.6 mi downstream at present datum. See WSP 1729 or 1917 for history of changes prior to Oct. 2, 1959.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	9.5	e10	e.00	e.00	e1.0	2560	378	115	488	2340	252
2	6.8	11	e10	e.00	e.00	e2.0	1970	314	e150	578	2220	214
3	7.0	12	e10	e.00	e.00	e20	1610	262	e200	902	2160	196
4	6.9	20	e9.5	e.00	e.00	e100	1320	228	e400	4440	1990	181
5	6.1	14	e9.0	e.00	e.00	e500	1100	206	e600	5020	1680	172
6	6.2	15	e8.5	e.00	e.00	e1000	874	194	e800	e4000	1330	163
7	6.5	14	e8.0	e.00	e.00	e1300	723	188	e1000	e3200	1070	155
8	6.8	16	e7.5	e.00	e.00	e1000	578	188	e1500	e2200	912	146
9	6.4	21	e7.5	e.00	e.00	1520	491	213	e1200	e1800	847	136
10	6.5	32	e7.0	e.00	e.00	1940	438	298	911	e1700	788	131
11	6.3	32	e6.0	e.00	e.00	3630	414	221	2270	e1730	658	128
12	5.7	33	e5.0	e.00	e.00	3430	410	188	2570	1760	e600	120
13	5.8	21	e4.5	e.00	e.00	1940	386	173	1370	2020	e550	119
14	5.8	23	e4.0	e.00	e.00	988	357	208	3510	e1500	e500	117
15	6.1	29	e3.0	e.00	e.00	718	353	318	5050	e1100	e480	114
16	5.7	30	e2.0	e.00	e.00	335	e340	228	5080	909	e470	107
17	6.4	29	e1.0	e.00	e.00	564	e330	194	3550	827	e460	106
18	7.2	29	e.80	e.00	e.00	417	e320	173	2530	867	e450	101
19	6.4	e26	e.60	e.00	e.00	509	e300	216	2100	861	e440	97
20	6.3	e25	e.50	e.00	e.00	687	e285	222	1570	1370	e430	95
21	6.4	e23	e.40	e.00	e.00	508	e270	196	1060	1790	e420	93
22	6.2	e22	e.30	e.00	e.00	742	291	175	874	3000	e400	91
23	6.1	e21	e.20	e.00	e.00	1010	372	166	762	3100	e390	88
24	6.3	e20	e.10	e.00	e.00	999	365	158	628	2670	e380	85
25	6.0	e19	e.00	e.00	e.00	804	637	144	499	2760	e360	83
26	6.2	e18	e.00	e.00	e.00	794	961	132	407	3560	337	79
27	6.2	e16	e.00	e.00	e.00	e1000	951	130	e350	8200	318	78
28	6.4	e14	e.00	e.00	e.00	e1300	666	128	300	9880	298	75
29	6.8	e12	e.00	e.00	---	e1800	560	122	321	4730	322	75
30	7.6	e11	e.00	e.00	---	2160	455	122	312	4880	429	72
31	8.2	---	e.00	e.00	---	2870	---	118	---	3690	322	---
TOTAL	200.8	617.5	115.40	0.00	0.00	34588.0	20687	6201	41989	85532	24351	3669
MEAN	6.48	20.6	3.72	.000	.000	1116	690	200	1400	2759	786	122
MAX	8.2	33	10	.00	.00	3630	2560	378	5080	9880	2340	252
MIN	5.7	9.5	.00	.00	.00	1.0	270	118	115	488	298	72
AC-FT	398	1220	229	.00	.00	68610	41030	12300	83290	169700	48300	7280

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1993, BY WATER YEAR (WY)

	MEAN	157	50.6	13.3	9.92	226	1807	1497	733	1111	529	221	173
MAX	2364	409	138	121	3023	10220	12170	4302	5646	2759	1405	1174	
(WY)	1972	1947	1947	1983	1943	1972	1952	1975	1944	1993	1937	1941	
MIN	.83	.33	.000	.000	.000	22.2	29.5	18.0	14.8	9.26	.023	1.38	
(WY)	1989	1989	1989	1935	1935	1964	1981	1981	1988	1980	1988	1936	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1935 - 1993

ANNUAL TOTAL	23079.42	217950.70	
ANNUAL MEAN	63.1	597	545
HIGHEST ANNUAL MEAN			1637
LOWEST ANNUAL MEAN			38.0
HIGHEST DAILY MEAN	750	Feb 29	55000
LOWEST DAILY MEAN	.00	Dec 25	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Dec 25	.00
INSTANTANEOUS PEAK FLOW		12000	110000
INSTANTANEOUS PEAK STAGE		11.28	a24.00
ANNUAL RUNOFF (AC-FT)	45780	432300	394500
10 PERCENT EXCEEDS	158	1860	1160
50 PERCENT EXCEEDS	29	132	68
90 PERCENT EXCEEDS	1.6	.00	.10

e Estimated.

a From floodmark, site and datum then in use.

LITTLE MISSOURI RIVER BASIN

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT 05...	1515	6.1	2660	8.4	17.0	13.0	0.20	10.2	104	340	492	<2
NOV 18...	1230	27	2420	--	2.0	0.0	--	--	--	--	--	--
MAR 25...	1540	749	633	--	18.0	1.0	--	--	--	--	--	--
MAY 06...	1140	186	1180	8.0	21.0	18.0	330	9.2	105	170	220	K33
JUL 12...	1415	1900	695	--	18.0	17.5	--	--	--	--	--	--
AUG 25...	0940	361	1340	8.5	22.5	19.0	1200	--	--	230	230	--

DATE	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT 05...	K12	68	42	500	75	12	14	581	10	900	13
MAY 06...	K80	43	16	180	68	6	8.2	268	0	380	7.8
AUG 25...	--	58	21	210	65	6	9.8	281	0	460	6.8

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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	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, 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, AMMONIA TOTAL (MG/L AS N) (00610)
OCT 05...	0.50	13	1850	1860	2.53	30.9	0.010	<0.010	<0.050	<0.050	0.030
MAY 06...	0.40	9.5	777	800	1.09	402	--	0.010	--	<0.050	--
AUG 25...	0.40	10	916	918	1.25	895	--	<0.010	--	0.340	--

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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 DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTH TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTH DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT 05...	0.030	0.57	0.60	0.020	<0.010	<0.010	<0.010	20	<100	10	20
MAY 06...	0.040	--	0.40	0.040	0.010	--	0.010	20	41	<3	5
AUG 25...	0.020	--	0.30	0.030	0.010	--	0.020	20	53	<3	18

LITTLE MISSOURI RIVER BASIN

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06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)	SEDI- MENT, CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 05...	70	20	5	6	<1	<1.0	900	3	--	--	--
MAY 06...	45	1	<10	3	<1	<1.0	410	<6	731	367	99
AUG 25...	48	<1	10	4	2	<1.0	530	<6	--	--	--

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	SAM- PLING DEPTH (FEET) (00003)	DEPTH TO TOP OF SAMPLE INTER- VAL (FT) (72015)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT								
05...	1516	6.00	--	0.38	2670	8.2	13.0	10.1
05...	1517	8.00	--	0.52	2650	8.4	13.0	10.2
05...	1518	10.0	--	0.52	2660	8.4	13.0	10.2
05...	1519	12.0	--	0.50	2660	8.5	13.0	10.2
05...	1520	14.0	--	0.26	2660	8.2	13.0	10.1
MAY								
06...	1142	10.0	1.05	--	1170	7.9	18.0	9.3
06...	1144	20.0	1.10	--	1170	7.9	18.0	9.2
06...	1146	30.0	1.10	--	1170	8.0	18.0	9.2
06...	1148	40.0	1.00	--	1180	8.0	18.0	9.1
06...	1150	50.0	0.90	--	1180	8.0	18.0	9.3
06...	1152	60.0	0.85	--	1180	7.9	18.0	9.2
06...	1154	70.0	0.85	--	1170	7.9	18.0	9.2
06...	1156	80.0	0.90	--	1180	8.0	18.5	9.1
06...	1158	90.0	2.40	--	1170	8.0	18.5	9.1
06...	1200	100	2.10	--	1170	8.0	18.5	9.1
AUG								
25...	1006	20.0	2.20	--	1340	8.4	19.0	7.9
25...	1007	40.0	2.30	--	1340	8.5	19.0	7.8
25...	1008	60.0	1.90	--	1340	8.5	19.0	7.9
25...	1009	80.0	1.60	--	1330	8.5	19.0	7.8
25...	1010	100	0.70	--	1340	8.5	19.0	7.7

MISSOURI RIVER MAIN STEM

06337550 LAKE SAKAKAWEA AT BEAVER CREEK BAY NR WHITESHIELD, ND

LOCATION.--Lat 47°31'10", long 101°55'00", in NW1/4, sec. 32, T.147 N., R.88 W., Mercer County, Hydrologic Unit 10110101, near mouth of Beaver Creek Bay, 8 mi southwest of Whiteshield.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	
OCT	13...	1220	1.0	35.0	556	8.4	210	144	52	20	54	35	2
JAN	a26...	1210	0.0	0.30	598	--	220	156	54	21	54	34	2
	26...	1215	28.7	29.0	639	--	230	164	55	22	59	36	2
MAY	26...	0910	0.0	0.30	639	8.2	230	154	52	23	55	34	2
	26...	0915	29.7	30.0	655	8.1	240	159	55	25	58	34	2
JUN	15...	1100	0.0	0.30	642	--	200	154	48	20	52	35	2
	15...	1110	32.3	32.6	649	--	210	155	51	21	54	35	2
JUL	a21...	1115	0.0	0.30	618	7.9	200	144	48	18	50	35	2
	21...	1120	30.7	31.0	649	7.7	210	156	50	20	51	35	2
AUG	24...	1050	0.0	0.50	553	8.1	190	132	45	18	49	36	2
	24...	1055	17.0	17.5	564	8.1	180	132	44	17	44	35	1
	24...	1100	25.0	25.5	613	8.1	190	149	46	18	45	33	1
	24...	1105	35.0	35.5	622	8.0	200	148	49	19	47	33	1
SEP	20...	1100	0.0	0.50	564	8.2	200	138	45	21	51	36	2
	20...	1105	35.0	35.5	585	8.0	190	143	44	20	50	36	2
DATE		POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	SULFATE (MG/L AS SO4) (00946)	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)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT	13...	3.7	--	160	9.0	0.50	3.2	--	--	--	<0.010	0.21	0.014
JAN	a26...	3.5	150	--	9.8	--	--	390	0.53	0.074	0.013	0.23	0.024
	26...	3.4	170	--	10	--	--	417	0.57	0.068	0.031	0.33	0.030
MAY	26...	3.6	160	--	9.6	--	--	393	0.53	0.118	0.003	1.1	0.039
	26...	3.5	150	--	9.8	--	--	401	0.54	0.093	0.007	0.82	0.031
JUN	15...	3.4	160	--	9.8	--	--	384	0.52	0.133	0.120	0.41	<0.020
	15...	3.9	150	--	9.8	--	--	383	0.52	0.134	0.021	0.55	0.032
JUL	a21...	2.9	150	--	10	--	--	370	0.50	0.131	0.040	0.51	<0.020
	21...	3.1	160	--	9.5	--	--	389	0.53	0.125	0.043	0.27	<0.020
AUG	24...	3.2	140	--	8.4	--	--	346	0.47	0.138	0.054	<0.18	<0.020
	24...	2.6	140	--	8.5	--	--	336	0.46	0.137	0.039	<0.18	0.024
	24...	3.0	150	--	9.7	--	--	365	0.50	0.156	0.025	0.25	0.054
	24...	3.2	160	--	9.4	--	--	374	0.51	0.172	0.034	0.41	<0.020
SEP	20...	3.3	150	--	8.2	--	--	364	0.49	0.156	0.142	<0.18	<0.020
	20...	2.7	150	--	8.7	--	--	366	0.50	0.179	0.133	<0.18	<0.020
DATE		PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	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)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
OCT	13...	0.017	--	--	52	<2	<4.0	<10	<6	32	--	75	<5
JAN	a26...	--	0.008	2.1	53	--	<0.2	.6	--	<3	1.2	--	2
	26...	--	0.007	1.9	52	--	<0.2	.6	--	<3	<.2	--	9
MAY	26...	--	0.008	--	--	--	--	--	--	9	--	--	1
	26...	--	0.008	--	--	--	--	--	--	<7	--	--	<2
JUN	15...	--	0.010	1.8	42	--	<0.2	.5	--	7	1.6	--	<2
	15...	--	0.010	1.8	44	--	0.2	.9	--	28	2.0	--	<2
JUL	a21...	--	0.005	1.0	41	--	<0.2	.3	--	12	1.3	--	3
	21...	--	0.008	.8	45	--	4.1	.6	--	12	.4	--	4
AUG	24...	--	<0.010	1.1	40	--	<0.2	.9	--	20	1.0	--	3
	24...	--	<0.010	.3	39	--	<0.2	.6	--	24	.9	--	<2
	24...	--	0.010	1.1	40	--	<0.2	.6	--	15	.5	--	<2
	24...	--	0.012	.9	43	--	0.7	.6	--	14	8.8	--	<2
SEP	20...	--	0.013	1.8	44	--	<0.2	1.1	--	<7	1.0	--	<2
	20...	--	0.021	2.1	45	--	<0.2	.6	--	<7	.7	--	<2

a Replicate sample also collected for quality-assurance purposes.

MISSOURI RIVER MAIN STEM

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06337550 LAKE SAKAKAWA AT BEAVER CREEK BAY NR WHITESHIELD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC SOLVED (MG/L AS C) (00681)	CHLORO- PHYLL A PHYTO- PLANK- TON CHROMO ACID M. (UG/L) (32211)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT 13...	<10	<20	--	<10	500	<4	<2	--	--	3.00	--	--
JAN a26...	--	--	3.0	--	--	--	<9	<5.0	<5.0	--	<3.00	<1.00
26...	--	--	2.0	--	--	--	26	--	--	--	--	--
MAY 26...	--	--	--	--	--	--	--	<5.0	<5.0	--	<3.00	--
26...	--	--	--	--	--	--	--	<5.0	<5.0	--	--	--
JUN 15...	--	--	1.2	--	--	--	35	<5.0	<5.0	--	<3.00	<1.00
15...	--	--	1.2	--	--	--	48	<5.0	<5.0	--	--	--
JUL a21...	--	--	1.3	--	--	--	40	<5.0	<5.0	--	<3.00	<1.00
21...	--	--	2.2	--	--	--	44	<5.0	<5.0	--	--	--
AUG 24...	--	--	.8	--	--	--	54	<5.0	<5.0	--	<3.00	<1.00
24...	--	--	.5	--	--	--	53	<5.0	<5.0	--	--	--
24...	--	--	.8	--	--	--	74	<5.0	<5.0	--	--	--
24...	--	--	.6	--	--	--	55	<5.0	<5.0	--	--	--
SEP 20...	--	--	<.2	--	--	--	<9	<5.0	<5.0	--	<3.00	<1.00
20...	--	--	.2	--	--	--	14	<5.0	<5.0	--	--	--

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT 13...	1200	115	0.0	620	8.3	13.0	8.8
13...	1201	--	3.0	621	8.3	13.0	8.7
13...	1202	--	6.0	622	8.3	13.0	8.7
13...	1203	--	9.0	622	8.3	13.0	8.7
13...	1204	--	12.0	622	8.3	13.0	8.7
13...	1205	--	15.0	623	8.3	13.0	8.7
13...	1206	--	18.0	623	8.3	13.0	8.7
13...	1207	--	21.0	623	8.3	13.0	8.7
13...	1208	--	24.0	623	8.3	13.0	8.7
13...	1209	--	27.0	623	8.3	13.0	8.7
13...	1210	--	30.0	623	8.3	13.0	8.7
13...	1211	--	33.0	623	8.4	13.0	8.7
13...	1212	--	35.0	624	8.4	13.0	8.7
JAN 26...	1153	95.8	0.0	580	8.2	0.0	13.4
26...	1154	--	1.0	580	8.3	0.0	13.4
26...	1155	--	2.1	575	8.3	0.5	13.3
26...	1156	--	4.0	565	8.3	0.5	13.0
26...	1157	--	7.0	572	8.3	0.5	13.1
26...	1158	--	10.0	576	8.3	0.5	13.1
26...	1159	--	14.0	572	8.3	1.0	12.8
26...	1200	--	18.0	616	8.3	1.0	12.4
26...	1201	--	22.0	633	8.3	1.0	12.2
26...	1202	--	26.0	630	8.2	1.5	11.7
26...	1203	--	29.2	630	8.1	2.0	9.7
MAY 26...	0856	101	0.0	632	8.2	10.0	10.5
26...	0857	--	3.8	632	8.3	10.0	10.4
26...	0858	--	7.2	632	8.3	10.0	10.5
26...	0859	--	10.0	634	8.3	10.0	10.5
26...	0900	--	13.1	639	8.3	9.5	10.6
26...	0901	--	16.0	639	8.2	8.5	10.7
26...	0902	--	19.0	645	8.2	8.0	10.7
26...	0903	--	23.6	645	8.2	6.5	10.9
26...	0904	--	21.1	646	8.2	7.0	10.8
26...	0905	--	27.5	645	8.2	6.0	10.8
26...	0906	--	30.7	645	8.2	6.0	10.8

a Replicate sample also collected for quality-assurance purposes.

MISSOURI RIVER MAIN STEM

06337550 LAKE SAKAKAWEA AT BEAVER CREEK BAY NR WHITESHIELD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	
JUN								
15...	1030	107	0.0	631	8.0	12.5	9.6	
15...	1032	--	1.8	634	8.1	12.5	9.4	
15...	1034	--	4.7	631	8.1	12.5	9.3	
15...	1036	--	7.1	635	8.1	12.5	9.3	
15...	1038	--	10.2	634	8.1	12.0	9.3	
15...	1040	--	13.2	633	8.1	11.5	9.5	
15...	1042	--	16.6	630	8.1	11.5	9.5	
15...	1044	--	19.8	638	8.1	11.0	9.4	
15...	1046	--	23.3	633	8.1	11.0	9.5	
15...	1048	--	26.5	634	8.1	10.5	9.5	
15...	1050	--	29.1	633	8.1	10.0	9.4	
15...	1052	--	32.6	637	8.1	10.0	9.3	
JUL								
21...	1058	101	0.0	606	8.0	16.0	9.1	
21...	1059	--	3.0	606	8.1	16.0	9.0	
21...	1100	--	5.9	610	8.1	16.0	9.0	
21...	1101	--	6.8	612	8.1	15.5	8.8	
21...	1102	--	9.5	620	8.1	15.5	8.9	
21...	1103	--	13.0	620	8.0	14.5	9.0	
21...	1104	--	16.6	624	8.0	14.0	9.0	
21...	1105	--	19.4	624	8.0	13.5	8.8	
21...	1106	--	21.8	628	8.0	13.5	8.7	
21...	1107	--	24.6	625	8.0	13.0	8.7	
21...	1108	--	27.0	628	8.0	13.0	8.6	
21...	1109	--	29.6	635	8.0	13.0	8.6	
21...	1110	--	31.0	628	8.0	12.5	8.5	
AUG								
24...	1030	117	0.0	572	8.0	19.5	8.3	
24...	1031	--	1.0	572	8.1	19.5	8.3	
24...	1032	--	3.4	573	8.1	19.5	8.2	
24...	1033	--	6.8	574	8.2	19.5	8.2	
24...	1034	--	10.2	574	8.2	19.5	8.1	
24...	1035	--	13.0	573	8.2	19.0	8.0	
24...	1036	--	16.1	577	8.2	19.0	8.0	
24...	1037	--	19.7	596	8.1	17.5	7.6	
24...	1038	--	17.5	580	8.2	19.0	8.0	
24...	1039	--	21.6	615	8.1	16.5	7.7	
24...	1040	--	24.1	618	8.1	15.5	7.7	
24...	1041	--	25.7	628	8.1	15.5	7.6	
24...	1042	--	28.8	620	8.0	14.5	7.3	
24...	1043	--	31.6	630	8.0	14.0	7.1	
24...	1044	--	34.6	630	8.0	14.0	7.0	
24...	1045	--	35.7	623	8.0	14.0	6.9	
SEP								
20...	1045	116	0.0	575	8.0	16.0	8.8	
20...	1046	--	1.9	575	8.1	16.0	8.7	
20...	1047	--	4.0	575	8.1	16.0	8.7	
20...	1048	--	7.5	576	8.1	16.0	8.7	
20...	1049	--	10.0	576	8.1	16.0	8.6	
20...	1050	--	13.1	578	8.1	16.0	8.6	
20...	1051	--	16.4	577	8.1	16.0	8.6	
20...	1052	--	20.0	570	8.1	16.0	8.6	
20...	1053	--	23.1	575	8.1	16.0	8.6	
20...	1054	--	26.8	570	8.1	16.0	8.5	
20...	1055	--	28.9	567	8.1	15.5	8.3	
20...	1056	--	31.4	572	8.1	15.5	8.2	
20...	1057	--	33.4	590	8.0	15.0	7.2	
20...	1058	--	35.5	600	7.9	14.5	5.7	
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT								
13...	91	703	--	82.0	7.5	180	13	
JAN								
26...	98	714	1.30	198	1.0	300	13	
MAY								
26...	100	712	--	143	9.0	100	15	
JUN								
15...	96	714	--	41.0	15.5	125	15	
JUL								
21...	99	712	--	66.0	18.0	125	13	
AUG								
24...	98	709	--	161	23.0	285	<5.0	
SEP								
20...	96	711	--	124	13.5	150	<5.0	

MISSOURI RIVER MAIN STEM

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06337580 LAKE SAKAKAWEA AT DOUGLAS CREEK BAY NEAR GARRISON, ND

LOCATION.--Lat 47°33'10", long 101°33'08", in NW¹/₄ sec.7, T.147 N., R.85 W.,
McLean County, Hydrologic Unit 10110101, near mouth of Douglas Creek
Bay, 8 mi southwest of Garrison.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT							
15...	1050	103	0.0	650	--	12.5	8.9
15...	1051	--	3.0	650	--	12.5	8.9
15...	1052	--	6.0	651	--	12.5	8.9
15...	1053	--	9.0	650	--	12.5	8.8
15...	1054	--	12.0	651	--	12.5	8.8
15...	1055	--	15.0	650	--	12.5	8.8
15...	1056	--	18.0	651	--	12.5	8.8
15...	1057	--	21.0	651	--	12.5	8.8
15...	1058	--	24.0	650	--	12.5	8.8
15...	1059	--	27.0	650	--	12.5	8.8
15...	1100	--	30.0	651	--	12.0	8.9
FEB							
02...	1205	85.3	0.0	580	8.3	0.0	13.0
02...	1206	--	2.6	580	8.3	0.0	13.2
02...	1207	--	5.1	592	8.3	0.5	13.4
02...	1208	--	8.3	614	8.3	0.5	12.0
02...	1209	--	11.8	621	8.3	0.5	11.8
02...	1210	--	15.3	613	8.3	0.5	11.7
02...	1211	--	18.3	619	8.3	1.0	11.6
02...	1212	--	21.3	622	8.3	1.0	11.5
02...	1213	--	24.3	625	8.3	1.0	11.5
02...	1214	--	26.0	620	8.3	1.0	11.5
MAY							
25...	1741	107	0.0	643	8.2	9.5	10.7
25...	1742	--	3.8	644	8.2	9.5	10.7
25...	1743	--	9.3	645	8.2	9.0	10.7
25...	1744	--	15.6	646	8.2	8.5	10.8
25...	1745	--	20.3	648	8.2	8.0	10.8
25...	1746	--	24.6	650	8.2	7.0	11.0
25...	1747	--	29.1	652	8.2	6.5	11.0
25...	1748	--	32.6	653	8.2	6.5	11.0
JUN							
17...	1100	91.9	0.0	643	8.1	11.5	9.5
17...	1102	--	1.4	643	8.1	11.5	9.5
17...	1104	--	3.7	644	8.1	11.5	9.5
17...	1106	--	7.0	642	8.2	11.5	9.5
17...	1108	--	10.0	643	8.2	11.5	9.5
17...	1110	--	13.0	643	8.2	11.5	9.5
17...	1112	--	16.0	647	8.2	11.5	9.4
17...	1114	--	19.2	644	8.2	11.5	9.4
17...	1116	--	22.1	644	8.2	11.0	9.5
17...	1118	--	25.4	650	8.2	10.5	9.5
17...	1120	--	28.0	645	8.1	10.5	9.5
JUL							
19...	1457	125	0.0	648	8.0	15.5	9.4
19...	1458	--	1.4	647	8.0	15.5	9.4
19...	1459	--	3.6	648	8.1	15.5	9.4
19...	1500	--	7.7	645	8.1	15.0	9.4
19...	1501	--	11.6	644	8.0	14.0	9.3
19...	1502	--	15.4	644	8.0	13.5	9.2
19...	1503	--	19.3	644	8.0	13.5	9.2
19...	1504	--	22.3	645	8.0	13.0	9.3
19...	1505	--	24.7	645	8.0	13.0	9.3
19...	1506	--	28.2	646	8.0	13.0	9.3
19...	1507	--	31.4	646	8.0	13.0	9.2
19...	1508	--	36.6	646	8.0	13.0	9.2
19...	1509	--	38.2	646	8.0	12.5	9.1

MISSOURI RIVER MAIN STEM

06337580 LAKE SAKAKAWEA AT DOUGLAS CREEK BAY NEAR GARRISON, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
AUG							
24...	1454	116	0.0	623	8.1	21.0	7.9
24...	1455	--	3.4	611	8.2	19.5	7.8
24...	1456	--	6.1	613	8.2	19.0	7.7
24...	1457	--	8.9	616	8.2	19.0	7.6
24...	1458	--	12.4	619	8.2	19.0	7.5
24...	1459	--	15.4	622	8.2	19.0	7.5
24...	1500	--	17.9	626	8.2	18.5	7.4
24...	1501	--	21.0	630	8.2	18.5	7.4
24...	1502	--	24.0	633	8.2	18.0	6.8
24...	1503	--	27.2	634	8.2	18.0	6.8
24...	1504	--	29.8	631	8.2	17.5	7.0
24...	1505	--	32.6	633	8.1	15.5	6.9
24...	1506	--	35.3	637	8.1	15.0	6.6
24...	1507	--	35.5	644	8.0	14.5	6.6
SEP							
20...	1546	125	0.0	597	8.2	18.0	8.8
20...	1547	--	2.2	595	8.2	16.5	8.7
20...	1548	--	4.6	595	8.2	16.5	8.6
20...	1549	--	7.4	598	8.2	16.5	8.5
20...	1550	--	9.7	595	8.2	16.0	8.5
20...	1551	--	12.4	594	8.2	16.5	8.4
20...	1552	--	14.8	598	8.2	16.0	8.4
20...	1553	--	17.9	595	8.2	16.0	8.4
20...	1554	--	21.1	596	8.2	16.0	8.4
20...	1555	--	24.5	606	8.2	16.0	8.2
20...	1556	--	28.3	600	8.2	16.0	8.3
20...	1557	--	31.1	598	8.2	16.0	8.3
20...	1558	--	34.1	600	8.2	16.0	8.3
20...	1559	--	37.1	621	8.2	15.5	8.2
20...	1600	--	38.1	610	8.2	15.5	8.2

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
15...	89	716	--	82.0	0.0	180	8.0
FEB							
02...	96	712	1.90	269	5.0	270	<5.0
MAY							
25...	100	714	--	160	22.0	345	<5.0
JUN							
17...	93	720	--	89.0	14.5	60	8.0
JUL							
19...	100	718	--	88.0	22.5	270	5.0
AUG							
24...	96	708	--	158	27.5	225	<5.0
SEP							
20...	100	710	--	132	20.5	65	<5.0

MISSOURI RIVER MAIN STEM

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06337995 LAKE SAKAKAWA AT RIVERDALE, ND

LOCATION.--Lat 47°30'47", long 101°22'34", in NW¹/₄, NW¹/₄, sec.34, T.147 N., R.84 W., Mercer County,
Hydrologic Unit 10110101, 1.0 mi northwest of Riverdale.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1977-1982, 1991 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)
OCT 13...	1630	0.0	44.0	601	8.5	220	144	53	21	57	36	2
JAN 26...	1430	0.0	0.30	617	--	210	156	51	20	50	34	2
26...	1435	38.8	39.1	653	--	220	161	53	21	55	35	2
MAY 25...	1440	0.0	0.30	661	8.3	220	159	54	22	55	34	2
25...	1445	31.7	32.0	662	8.2	220	157	53	21	54	35	2
25...	1450	34.7	35.0	670	8.2	230	161	55	22	56	34	2
25...	1455	40.7	41.0	673	8.1	230	160	55	22	56	34	2
JUN 15...	1340	0.0	0.30	654	--	220	158	51	22	56	35	2
15...	1350	32.7	33.0	658	8.0	220	154	51	22	53	34	2
15...	1400	42.4	42.7	660	--	220	158	52	22	54	34	2
JUL 19...	1310	0.0	0.30	648	8.2	220	157	54	21	54	34	2
19...	1315	46.5	46.8	645	7.9	210	157	51	20	52	35	2
AUG 24...	1300	0.0	0.50	626	8.2	210	152	50	20	52	35	2
24...	1305	23.0	23.5	618	8.2	200	151	48	19	47	34	1
24...	1310	36.0	36.5	626	8.1	200	152	48	19	48	34	1
24...	1315	46.5	47.0	630	8.0	199	155	48	19	47	34	1
SEP 20...	1340	0.0	0.50	616	8.1	210	151	46	22	52	35	2
20...	1345	39.5	40.0	625	8.0	200	152	45	21	51	36	2
20...	1350	42.0	42.5	626	7.9	200	152	45	22	50	34	2
20...	1355	44.9	45.4	617	7.8	220	155	50	23	54	34	2

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	SULFATE (MG/L AS SO4) (00946)	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)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT 13...	3.6	--	170	9.0	0.50	3.6	--	--	--	<0.010	0.70	0.026
JAN 26...	3.0	150	--	10	--	--	380	0.52	0.087	0.008	0.38	0.022
26...	3.4	160	--	11	--	--	403	0.55	0.102	0.009	0.68	0.031
MAY 25...	3.9	160	--	9.8	--	--	395	0.54	0.096	0.095	0.53	<0.020
25...	3.0	160	--	9.7	--	--	397	0.54	0.090	0.121	0.53	0.026
25...	3.6	160	--	10	--	--	403	0.55	0.093	0.078	0.52	0.024
25...	3.8	170	--	11	--	--	412	0.56	0.101	0.091	0.50	<0.020
JUN 15...	3.6	150	--	9.9	--	--	391	0.53	0.116	0.062	0.34	0.016
15...	3.8	160	--	10	--	--	392	0.53	0.114	0.026	0.26	0.027
15...	3.5	150	--	9.6	--	--	390	0.53	0.128	0.164	0.28	0.031
JUL 19...	3.6	160	--	10	--	--	395	0.54	0.107	0.032	0.46	<0.020
19...	3.3	160	--	9.9	--	--	392	0.53	0.126	0.030	0.37	<0.020
AUG 24...	3.0	160	--	9.3	--	--	381	0.52	0.094	0.045	<0.18	<0.020
24...	3.2	150	--	9.2	--	--	369	0.50	0.099	0.032	<0.18	0.034
24...	2.8	150	--	9.0	--	--	373	0.51	0.143	0.038	0.28	<0.020
24...	3.1	150	--	9.6	--	--	374	0.51	0.154	0.028	0.31	<0.020
SEP 20...	3.4	160	--	9.4	--	--	382	0.52	0.121	0.131	<0.18	<0.020
20...	3.1	170	--	9.6	--	--	394	0.54	0.114	0.125	<0.18	<0.020
20...	3.4	150	--	9.1	--	--	375	0.51	0.169	0.125	<0.18	<0.020
20...	3.5	160	--	9.0	--	--	393	0.53	0.178	<0.010	<0.18	<0.020

MISSOURI RIVER MAIN STEM

06337995 LAKE SAKAKAWEA AT RIVERDALE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	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)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
OCT 13...	0.018	--	--	51	<2	<4.0	<10	<6	<10	--	76	<5
JAN 26...	--	0.009	1.8	52	--	<0.2	.5	--	<3	.4	--	<1
JAN 26...	--	0.008	1.5	52	--	<0.2	.6	--	<3	<.2	--	1
MAY 25...	--	0.005	--	--	--	--	--	--	1	--	--	1
MAY 25...	--	0.008	--	--	--	--	--	--	4	--	--	<2
MAY 25...	--	0.006	--	--	--	--	--	--	<7	--	--	<2
MAY 25...	--	0.008	--	--	--	--	--	--	4	--	--	<2
JUN 15...	--	0.008	1.7	45	--	<0.2	.4	--	9	1.5	--	<2
JUN 15...	--	0.009	1.9	45	--	<0.2	.2	--	20	2.5	--	2
JUN 15...	--	0.008	1.6	45	--	<0.2	.2	--	24	2.5	--	2
JUL 19...	--	0.003	1.3	44	--	0.2	<.2	--	31	1.0	--	5
JUL 19...	--	0.003	.8	44	--	<0.2	1.1	--	20	1.4	--	3
AUG 24...	--	<0.010	.4	42	--	<0.2	.6	--	12	1.4	--	2
AUG 24...	--	<0.010	1.5	43	--	<0.2	.7	--	16	1.3	--	2
AUG 24...	--	<0.010	.5	41	--	<0.2	.8	--	20	.8	--	<2
AUG 24...	--	<0.010	.3	43	--	<0.2	.6	--	39	.3	--	<2
SEP 20...	--	0.012	1.5	48	--	<0.2	1.0	--	<7	1.0	--	<2
SEP 20...	--	0.017	1.3	50	--	<0.2	.5	--	<7	.5	--	<2
SEP 20...	--	0.013	1.7	49	--	<0.2	1.0	--	<7	1.4	--	<2
SEP 20...	--	0.014	2.0	48	--	<0.2	.3	--	<7	1.0	--	<2

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC SOLVED (MG/L AS C) (00681)	CHLORO- HPYLL A PHYTO- PLANK- TON ACID M. (UG/L) (32211)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT 13...	<10	<20	--	<10	530	<4	<2	--	--	<1.00	--	--
JAN 26...	--	--	2.0	--	--	--	47	<5.0	<5.0	--	<3.00	<1.00
JAN 26...	--	--	2.0	--	--	--	<9	<5.0	<5.0	--	--	--
MAY 25...	--	--	--	--	--	--	--	<5.0	<5.0	--	<3.00	--
MAY 25...	--	--	--	--	--	--	--	<5.0	<5.0	--	--	--
MAY 25...	--	--	--	--	--	--	--	<5.0	<5.0	--	--	--
MAY 25...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 15...	--	--	1.5	--	--	--	51	<5.0	<5.0	--	<3.00	<1.00
JUN 15...	--	--	1.0	--	--	--	36	<5.0	<5.0	--	--	--
JUN 15...	--	--	1.4	--	--	--	35	<5.0	<5.0	--	--	--
JUL 19...	--	--	1.0	--	--	--	40	<5.0	<5.0	--	<3.00	<1.00
JUL 19...	--	--	<.2	--	--	--	47	<5.0	<5.0	--	--	--
AUG 24...	--	--	1.0	--	--	--	67	<5.0	<5.0	--	<3.00	<1.00
AUG 24...	--	--	.6	--	--	--	58	<5.0	<5.0	--	--	--
AUG 24...	--	--	.6	--	--	--	75	<5.0	<5.0	--	--	--
AUG 24...	--	--	.2	--	--	--	64	<5.0	<5.0	--	--	--
SEP 20...	--	--	<.2	--	--	--	14	<5.0	<5.0	--	<3.00	<1.00
SEP 20...	--	--	.6	--	--	--	14	<5.0	<5.0	--	--	--
SEP 20...	--	--	<.2	--	--	--	12	<5.0	<5.0	--	--	--
SEP 20...	--	--	<.2	--	--	--	11	<5.0	<5.0	--	--	--

MISSOURI RIVER MAIN STEM

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06337995 LAKE SAKAKAWEA AT RIVERDALE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT							
13...	1610	144	0.0	659	8.4	13.0	8.8
13...	1611	--	3.0	661	8.4	13.0	8.9
13...	1612	--	6.0	661	8.4	13.0	8.8
13...	1613	--	9.0	659	8.4	13.0	8.8
13...	1614	--	12.0	660	8.4	13.0	8.8
13...	1615	--	15.0	665	8.4	13.0	8.8
13...	1616	--	18.0	663	8.4	13.0	8.8
13...	1617	--	21.0	666	8.4	13.0	8.8
13...	1618	--	24.0	662	8.4	13.0	8.8
13...	1619	--	27.0	665	8.4	13.0	8.8
13...	1620	--	30.0	663	8.4	13.0	8.8
13...	1621	--	33.0	667	8.4	13.0	8.7
13...	1622	--	36.0	667	8.4	13.0	8.7
13...	1623	--	39.0	664	8.4	13.0	8.7
13...	1624	--	42.0	659	8.4	13.0	8.7
13...	1625	--	44.0	667	8.4	13.0	8.7
JAN							
26...	1416	129	0.0	596	8.4	0.5	13.4
26...	1417	--	4.1	594	8.3	0.5	13.0
26...	1418	--	8.0	604	8.3	0.5	12.8
26...	1419	--	12.0	606	8.3	0.5	12.6
26...	1420	--	16.0	617	8.3	0.5	12.8
26...	1421	--	20.0	618	8.3	0.5	12.8
26...	1422	--	24.0	624	8.3	1.0	12.6
26...	1423	--	28.0	626	8.3	1.0	12.6
26...	1424	--	32.2	625	8.3	1.0	12.4
26...	1425	--	36.4	629	8.3	1.5	12.2
26...	1426	--	39.3	645	8.2	2.0	11.0
MAY							
25...	1426	136	0.0	647	8.2	9.5	10.7
25...	1427	--	6.2	650	8.2	9.0	10.7
25...	1428	--	9.9	650	8.2	9.0	10.6
25...	1429	--	14.2	656	8.3	9.0	10.7
25...	1430	--	20.3	655	8.3	9.0	10.6
25...	1431	--	25.9	658	8.3	9.0	10.8
25...	1432	--	30.2	648	8.3	9.0	10.6
25...	1433	--	32.0	664	8.3	9.0	10.6
25...	1434	--	34.8	660	8.2	6.5	11.0
25...	1435	--	38.3	656	8.2	6.0	11.1
25...	1436	--	41.6	660	8.2	5.5	11.1
JUN							
15...	1300	140	0.0	643	8.1	11.5	10.0
15...	1302	--	2.6	643	8.1	11.5	9.8
15...	1304	--	5.6	643	8.1	11.5	9.8
15...	1306	--	8.6	643	8.1	11.5	9.7
15...	1308	--	12.8	644	8.2	11.5	9.7
15...	1310	--	16.4	644	8.2	11.5	9.6
15...	1312	--	19.7	644	8.2	11.0	9.6
15...	1314	--	23.1	644	8.2	11.0	9.6
15...	1316	--	26.1	644	8.2	11.0	9.6
15...	1318	--	29.6	643	8.2	11.0	9.6
15...	1320	--	32.6	644	8.2	10.5	9.6
15...	1322	--	34.8	644	8.1	9.5	9.8
15...	1324	--	37.4	644	8.1	8.0	9.8
15...	1326	--	40.2	645	8.1	8.0	9.9
15...	1328	--	42.7	645	8.1	8.0	9.9
JUL							
19...	1250	154	0.0	646	8.0	16.5	8.8
19...	1251	--	1.0	646	8.1	16.5	8.8
19...	1252	--	4.1	648	8.1	16.5	8.7
19...	1253	--	7.4	648	8.1	16.5	8.7
19...	1254	--	10.8	653	8.1	16.5	8.7
19...	1255	--	13.7	646	8.1	16.5	8.7
19...	1256	--	18.1	648	8.1	16.0	8.7
19...	1257	--	21.0	641	8.1	15.5	8.7
19...	1258	--	24.0	649	8.1	14.5	8.7
19...	1259	--	27.1	644	8.0	14.0	8.7
19...	1300	--	29.9	642	8.0	13.5	8.7
19...	1301	--	33.0	646	8.0	13.0	8.7
19...	1302	--	36.6	648	8.0	12.5	8.6
19...	1303	--	38.6	648	8.0	12.5	8.6
19...	1304	--	42.1	646	8.0	12.5	8.5
19...	1305	--	45.9	645	7.9	12.0	8.4
19...	1306	--	47.1	647	7.9	12.0	8.1

MISSOURI RIVER MAIN STEM

06337995 LAKE SAKAKAWEA AT RIVERDALE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
AUG							
24...	1240	156	0.0	637	8.2	20.5	8.2
24...	1241	--	1.3	636	8.2	20.0	8.2
24...	1242	--	3.7	636	8.3	19.5	8.2
24...	1243	--	5.9	636	8.3	19.5	8.2
24...	1244	--	9.0	636	8.3	19.5	8.2
24...	1245	--	12.9	636	8.3	19.5	8.2
24...	1246	--	16.3	637	8.3	19.5	8.1
24...	1247	--	20.3	635	8.3	19.5	8.1
24...	1248	--	23.5	636	8.3	19.5	8.1
24...	1249	--	25.6	637	8.2	18.5	8.0
24...	1250	--	26.7	636	8.2	17.0	7.9
24...	1251	--	30.1	634	8.2	16.0	7.8
24...	1252	--	33.2	635	8.1	15.5	7.8
24...	1253	--	36.2	640	8.1	14.5	7.8
24...	1254	--	39.4	640	8.1	14.0	7.6
24...	1255	--	41.8	642	8.1	13.5	7.5
24...	1256	--	45.4	641	8.0	13.5	7.4
24...	1257	--	47.4	641	8.0	13.0	7.2
SEP							
20...	1315	150	0.0	622	8.2	16.5	8.8
20...	1316	--	2.5	620	8.2	16.5	8.7
20...	1317	--	5.2	624	8.2	16.5	8.7
20...	1318	--	8.7	625	8.2	16.5	8.6
20...	1319	--	11.3	625	8.2	16.5	8.5
20...	1320	--	14.1	624	8.2	16.5	8.5
20...	1321	--	17.1	624	8.2	16.5	8.5
20...	1322	--	19.8	623	8.2	16.5	8.5
20...	1323	--	23.4	622	8.2	16.5	8.4
20...	1324	--	26.8	622	8.2	16.5	8.4
20...	1325	--	29.6	620	8.2	16.5	8.4
20...	1326	--	32.2	624	8.2	16.0	8.3
20...	1327	--	35.0	628	8.2	16.0	8.3
20...	1328	--	37.0	628	8.2	16.0	8.2
20...	1329	--	39.5	624	8.2	16.0	8.3
20...	1330	--	40.7	623	8.2	16.0	8.2
20...	1331	--	42.4	626	8.0	14.5	6.6
20...	1332	--	45.0	634	8.0	14.5	6.3
20...	1333	--	45.4	629	7.9	14.5	6.3

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
13...	91	705	--	67.0	4.5	60	28
JAN							
26...	99	712	1.70	186	1.0	315	8.0
MAY							
25...	100	714	--	121	17.5	285	10
JUN							
15...	98	712	--	66.0	13.5	150	7.0
JUL							
19...	97	718	--	110	21.5	290	5.0
AUG							
24...	99	709	--	120	26.0	265	<5.0
SEP							
20...	97	711	--	150	18.0	150	<5.0

MISSOURI RIVER MAIN STEM

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06338000 LAKE SAKAKAWEA NEAR RIVERDALE, ND

LOCATION.--Lat 47°30'10", long 101°25'50", in S¹/₂, sec.31, T.147 N., R.84 W., Mercer County, Hydrologic Unit 10110101, in control structure of Garrison Dam, 2.5 mi west of Riverdale, 14 mi upstream from Knife River, and at mile 1,389.9.

DRAINAGE AREA.--181,400 mi², approximately.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1966, published as Garrison Reservoir near Riverdale.

REVISED RECORDS.--WSP 1559: 1957 (M).

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by earth-fill dam; storage began in November 1953. Maximum capacity, 24,200,000 acre-ft below elevation 1,854.0 ft, top of 29-ft gates. Normal maximum, 22,700,000 acre-ft below elevation 1,850.0 ft, of which about 4,300,000 acre-ft is designated for flood control. Elevation of crest of spillway, 1,825.0 ft, surmounted by radial gates. Inactive storage, 5,000,000 acre-ft below elevation 1,775.0 ft. Dead storage, zero at elevation 1,672.0 ft. Snake Creek arm of the reservoir has connecting gate to main reservoir, with sill at elevation 1,810 ft. Figures herein represent total contents.

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers. Elevations are observed elevations at midnight on the last day of each month. Contents are computed based on reservoir inflow, reservoir outflow, evaporation, and rainfall; and are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 24,368,000 acre-ft, July 25, 1975, elevation, 1,854.6 ft; minimum since first reaching normal maximum level in July of 1969, 12,155,000 acre-ft, May 10, 1991, adjusted for wind effect; minimum elevation, 1,815.0 ft, May 14, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,988,000 acre-ft, Sept. 3, adjusted for wind effect; maximum elevation, 1,837.4 ft, Sept. 25; minimum contents, 12,482,000 acre-ft, Mar. 2, adjusted for wind effect; minimum elevation, 1,816.8 ft, Feb. 27, Mar. 1.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	1,821.8	13,720,000	--
Oct. 31-----	1,821.3	13,614,000	-106,000
Nov. 30-----	1,821.3	13,602,000	-12,000
Dec. 31-----	1,818.8	12,989,000	-613,000
CAL YR 1992-----	--	--	-1,503,000
Jan. 31-----	1,816.9	12,526,000	-463,000
Feb. 28-----	1,816.8	12,484,000	-42,000
Mar. 31-----	1,819.4	13,135,000	+651,000
Apr. 30-----	1,820.5	13,412,000	+277,000
May 31-----	1,822.9	14,020,000	+608,000
June 30-----	1,828.8	15,569,000	+1,549,000
July 31-----	1,835.6	17,535,000	+1,966,000
Aug. 31-----	1,837.1	17,984,000	+449,000
Sept. 30-----	1,837.2	17,935,000	-49,000
WTR YR 1993-----	--	--	+4,215,000

MISSOURI RIVER MAIN STEM

06338490 MISSOURI RIVER AT GARRISON DAM, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°30'08", long 101°25'50", in S 1/2 sec.31, T.147 N., R.84 W., Mercer County, Hydrologic Unit 10130101, downstream from dam at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam, 2.5 mi west of Riverdale, 14 mi upstream from Knife River, and at mile 1,389.9.

DRAINAGE AREA.--181,400 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Flow meter and gate readings.

REMARKS.--Records good. Many diversions above station. Flow regulated by Lake Sakakawea (station 06338000). Prior to October 1969 records were obtained at a site 9.1 mi downstream. Discharges at the downstream site were generally about 7 percent greater than those furnished by the U.S. Army Corps of Engineers for the present site.

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10100	9800	16000	18700	18000	11200	9700	11400	15900	15900	14900	15900
2	10400	10000	18300	18100	17100	10000	10400	12200	15900	15700	15400	15300
3	10500	9700	18000	18200	15900	9600	10100	11600	15500	15600	15700	15800
4	9740	10100	18800	18400	16200	10300	10000	11500	15400	15900	16200	16400
5	10200	9600	18300	18900	15400	10300	9900	11800	15900	15800	15400	16100
6	10400	10300	18700	18600	15000	11600	9900	11900	15800	16200	15500	16000
7	10300	9900	18400	18200	14000	11800	10500	11900	15400	15900	15600	13200
8	10600	10200	18400	18600	14100	11600	10100	11800	15200	15700	15600	9700
9	9700	9800	18400	18600	13500	10700	9900	14600	15200	15700	15500	9400
10	9300	10200	18400	18600	14000	10800	9800	17400	15400	15600	16000	9700
11	9540	9600	18500	19200	14200	11300	10300	17000	15700	15700	15400	9800
12	9600	9800	18800	19400	14500	10700	10300	17400	15600	15500	15500	10500
13	9900	10300	18400	19800	14100	10800	10300	17000	15600	16100	16100	9900
14	9900	10300	18900	19300	14800	10700	10400	17100	16100	15700	16000	9900
15	10000	10400	18900	19000	14200	10400	10200	17500	15400	16200	15800	10200
16	9300	10600	18700	18500	14400	11200	10800	17800	15600	13800	15700	10200
17	10600	9400	18500	19100	12600	9800	10000	17800	15800	13700	15800	10000
18	10200	10600	19100	19200	12700	9600	9600	16100	15700	14900	16200	10100
19	9900	10600	18800	18800	12800	10000	9500	16200	15900	15500	16300	9900
20	9600	9800	18200	18900	12500	10200	10300	15600	15700	15500	15400	10200
21	9900	9900	18600	19200	12400	10100	9800	16100	15900	14800	15500	10200
22	9900	10000	17200	19200	12300	9600	9500	16300	16100	12800	15500	10600
23	9800	9800	17500	19300	11800	9700	9500	16500	16200	13300	16100	10600
24	9900	10000	17200	18700	12000	10100	9500	16000	16100	12600	15900	10500
25	10100	9700	17100	19100	12100	9900	10100	16000	15500	12700	16500	9500
26	10100	10000	18200	19000	12100	9500	10400	16000	15800	14000	15800	9800
27	10400	9700	18400	19500	11000	9800	12000	16300	15500	13200	15800	9600
28	9800	10200	17800	19200	11300	10200	12000	16000	15500	12000	15700	10100
29	9900	9600	18300	19100	---	10600	11900	15900	15400	12700	16500	9900
30	9500	13300	18200	17300	---	9600	11600	15900	15900	14100	16300	9800
31	9670	---	18200	18400	---	9800	---	15900	---	15100	16000	---
TOTAL	308750	303200	565200	584100	385000	321500	308300	472500	470600	457900	489600	338800
MEAN	9960	10110	18230	18840	13750	10370	10280	15240	15690	14770	15790	11290
MAX	10600	13300	19100	19800	18000	11800	12000	17800	16200	16200	16500	16400
MIN	9300	9400	16000	17300	11000	9500	9500	11400	15200	12000	14900	9400
AC-FT	612400	601400	1121000	1159000	763600	637700	611500	937200	933400	908200	971100	672000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1993, BY WATER YEAR (WY)

	18980	20820	21790	24860	26410	21360	20070	21870	23810	25160	24000	19630
MEAN	18980	20820	21790	24860	26410	21360	20070	21870	23810	25160	24000	19630
MAX	32430	33240	29530	30500	31500	28210	37500	38490	40120	61800	54130	37230
(WY)	1976	1979	1970	1979	1976	1983	1972	1972	1975	1975	1975	1975
MIN	9960	10110	17250	18840	13750	10370	10280	10560	13960	14770	15790	10990
(WY)	1993	1993	1991	1993	1993	1993	1993	1986	1984	1993	1993	1990

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR				FOR 1993 WATER YEAR				WATER YEARS 1970 - 1993			
ANNUAL TOTAL	6090350				5005450				22380			
ANNUAL MEAN	16640				13710				33000			
HIGHEST ANNUAL MEAN									13710			
LOWEST ANNUAL MEAN									13710			
HIGHEST DAILY MEAN	23500				Feb 1				65200			
LOWEST DAILY MEAN	9300				Oct 10				6000			
ANNUAL SEVEN-DAY MINIMUM	9650				Oct 10				9600			
ANNUAL RUNOFF (AC-FT)	12080000				9928000				16210000			
10 PERCENT EXCEEDS	20500				18400				31300			
50 PERCENT EXCEEDS	18200				14200				20900			
90 PERCENT EXCEEDS	9900				9800				13800			

MISSOURI RIVER MAIN STEM

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06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

LOCATION.--Samples collected at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam.

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED SATUR-ATION (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)
OCT 06...	1330	10400	650	8.4	14.5	0.70	9.1	95	210	163	K5
FEB 17...	1430	12600	650	8.3	2.5	0.70	12.4	98	210	160	--
APR 21...	0900	9800	698	8.3	4.0	0.60	12.1	98	230	171	<1
JUN 29...	0945	15400	643	8.4	12.5	0.40	8.9	90	210	160	K2
AUG 17...	1115	15800	653	8.2	14.5	0.60	12.8	135	220	160	K2

DATE	STREP-TOCOC CI, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
OCT 06...	<1	49	20	55	36	2	3.7	198	0	160
FEB 17...	<1	52	19	53	35	2	3.8	195	0	160
APR 21...	<1	57	22	57	34	2	3.9	208	0	180
JUN 29...	K4	51	20	54	35	2	3.4	195	0	170
AUG 17...	43	53	20	54	35	2	4.7	195	0	160

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, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	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, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
OCT 06...	9.3	0.60	5.7	402	403	0.55	11300	<0.010	<0.010	0.092
FEB 17...	9.4	0.50	6.7	401	397	0.54	13500	--	<0.010	--
APR 21...	10	0.50	7.0	441	437	0.59	11600	--	<0.010	--
JUN 29...	9.0	0.50	6.6	411	388	0.53	16100	--	<0.010	--
AUG 17...	8.8	0.50	6.7	405	408	0.55	17400	--	<0.010	--

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (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 TOTAL (MG/L AS P) (70507)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
OCT 06...	0.100	0.020	0.010	<0.20	<0.010	<0.010	<0.010	<0.010	<10	48
FEB 17...	0.100	--	0.030	<0.20	<0.010	0.010	--	<0.010	<10	49
APR 21...	0.120	--	0.020	0.20	0.030	0.020	--	0.010	20	51
JUN 29...	0.110	--	0.020	<0.20	<0.010	<0.010	--	<0.010	--	--
AUG 17...	0.160	--	0.030	1.5	0.250	<0.010	--	<0.010	<10	49

MISSOURI RIVER MAIN STEM

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)
OCT 06...	<3	4	45	1	<10	2	<1	<1.0	510	<6
FEB 17...	<3	<3	43	1	<10	<1	<1	<1.0	510	<6
APR 21...	<3	4	47	<1	<10	1	<1	<1.0	550	<6
AUG 17...	<3	4	44	<1	<10	2	<1	<1.0	530	<6

MISSOURI RIVER MAIN STEM

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06339010 MISSOURI RIVER ABOVE STANTON, ND

LOCATION.--Lat 47°21'45", long 101°21'25", SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.22, T.145 N., R.84 W., McLean County, Hydrologic Unit 10130101, on left bank 9 mi south of Riverdale, and at mile 1,379.

DRAINAGE AREA.--181,400 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1600.00 ft above sea level.

REMARKS.--Stage regulated completely by releases from Garrison Dam (station 06338490) 13 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 72.24 ft, Jan. 29, 1977; minimum daily recorded, 62.07 ft, Sept. 18, 1991.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	65.22	---	65.64	64.41	64.25	---	65.40	65.56	65.47	---
2	---	---	65.65	---	---	64.19	64.27	---	65.39	65.56	65.42	---
3	---	---	65.79	---	---	64.17	---	---	65.45	65.63	65.57	---
4	---	---	65.53	---	---	64.31	---	---	65.39	65.64	65.44	---
5	---	---	65.63	---	---	64.34	---	---	65.42	65.61	65.82	---
6	---	---	65.92	---	---	64.57	---	---	65.42	65.58	---	---
7	64.10	---	66.00	65.12	---	64.65	---	---	65.39	65.66	65.50	---
8	64.23	---	65.90	67.64	---	64.97	---	---	65.36	65.62	65.55	---
9	64.09	---	65.86	68.11	---	64.27	---	---	65.36	65.56	65.48	64.14
10	64.06	---	65.97	68.46	---	64.55	---	---	65.41	65.60	65.51	64.16
11	64.17	---	65.89	69.43	---	64.43	---	---	65.45	65.69	65.44	64.17
12	64.15	---	65.91	68.88	---	64.37	---	---	65.42	---	65.38	64.24
13	64.07	---	65.82	68.65	---	64.37	---	---	65.42	---	65.42	64.25
14	64.17	---	65.94	68.43	---	64.24	---	---	65.52	65.75	65.64	64.17
15	64.10	---	66.03	68.25	---	64.40	---	---	65.46	65.76	65.36	64.27
16	64.01	---	---	68.02	---	64.35	---	---	65.42	65.35	65.50	64.18
17	64.22	---	---	68.13	65.17	64.16	---	---	65.49	65.51	65.54	64.15
18	64.18	---	---	68.71	64.87	64.20	---	65.59	65.47	65.40	65.40	64.19
19	64.09	---	---	68.14	65.01	63.99	---	65.51	65.18	65.64	65.62	64.19
20	64.07	64.04	---	68.01	64.80	64.38	---	65.38	65.72	65.55	65.45	64.21
21	64.06	64.09	---	67.81	64.46	64.24	---	65.45	65.33	65.64	65.41	64.31
22	64.13	64.06	---	66.98	64.68	64.24	---	65.47	65.79	65.13	65.43	64.28
23	64.10	64.00	---	66.87	64.63	64.24	---	65.64	65.52	65.27	65.38	64.18
24	64.08	64.05	---	66.89	64.63	64.32	---	65.40	65.52	65.03	65.66	64.11
25	63.94	64.08	---	67.23	64.52	64.31	---	65.48	65.53	65.19	65.45	63.94
26	---	64.13	---	66.60	64.60	64.33	---	65.49	65.45	65.24	65.54	64.23
27	---	63.99	---	66.33	64.43	64.17	---	65.50	65.55	65.50	---	64.18
28	---	64.19	---	66.66	64.44	64.41	---	65.48	65.55	64.83	---	64.18
29	---	64.00	---	66.35	---	64.36	---	65.48	65.46	64.97	---	64.23
30	---	64.72	---	66.07	---	64.29	---	65.37	65.51	65.20	---	64.08
31	---	---	---	66.01	---	64.28	---	65.55	---	65.22	---	---
MEAN	---	---	---	---	---	64.34	---	---	65.46	---	---	---
MAX	---	---	---	---	---	64.97	---	---	65.79	---	---	---
MIN	---	---	---	---	---	63.99	---	---	65.18	---	---	---

KNIFE RIVER BASIN

06339100 KNIFE RIVER AT MANNING, ND

LOCATION.--Lat 47°14'10", long 102°46'10", in SE 1/4 NW 1/4 sec.6, T.143 N., R.95 W., Dunn County, Hydrologic Unit 10130201, on left bank 50 ft downstream from bridge on State Highway 22, and 0.4 mi north of Manning.

DRAINAGE AREA.--205 mi², approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 2,156.55 ft above sea level.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

REVISIONS.--Maximum discharge for water year 1970 was revised to 2,940 ft³/s, June 15, gage height, 16.20 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.55	e.17	.27	.34	3.5	.99	e.14	e1.3	25	.30
2	.00	.00	.59	.18	.33	.76	3.2	.94	e.14	e1.6	17	.33
3	.00	.00	.55	.18	.40	e150	2.6	.71	e.13	e1.2	10	.28
4	.00	.00	.48	.16	.47	e450	2.1	e.65	e.12	14	5.6	.29
5	.00	.01	.39	.17	.49	e400	2.1	e.62	e.11	68	3.7	.34
6	.00	.11	.37	.16	.53	990	2.0	e.60	e.10	54	2.9	.32
7	.00	.17	.34	.19	.68	591	1.9	e.60	e.09	46	2.1	.30
8	.00	.18	.34	.18	.79	109	1.9	e.60	6.8	35	1.7	.29
9	.00	.23	.34	.17	.88	52	1.9	e.58	17	24	1.2	.23
10	.00	.25	.39	.17	1.0	31	2.1	e.56	e10	17	.88	.21
11	e.01	.23	.36	.17	.98	17	1.7	e.56	e1.7	11	.86	.21
12	e.02	.23	.46	.17	.76	14	1.7	e.54	e1.4	7.2	1.1	.21
13	e.02	.30	.49	.18	.59	9.6	1.9	e.52	e1.0	5.9	.94	.21
14	e.02	.53	.42	e.18	.50	7.3	2.1	e.52	e.81	5.3	.78	.21
15	e.02	.54	.37	.18	.35	6.3	2.0	e.50	e.69	5.5	.63	.21
16	e.02	.51	.29	.18	.26	5.0	1.7	e.47	e.58	7.6	.59	.20
17	e.02	.41	.41	.17	.22	4.4	1.3	e.43	e.46	6.9	.52	.19
18	e.02	.44	.40	.18	.20	3.9	1.2	e.41	e.42	5.7	.43	.19
19	e.02	.51	.42	.17	.20	4.1	1.3	e.38	e.36	4.5	.38	.19
20	e.02	.53	.24	e.18	.20	4.0	1.6	e.34	e.26	3.7	.38	.19
21	e.02	.50	.28	e.20	.20	3.9	1.8	e.31	e.25	5.7	.40	.21
22	e.02	.55	.27	.22	.22	3.8	1.7	e.30	e.36	3.7	.40	.22
23	e.01	.57	e.25	.24	.20	4.3	1.9	e.26	e.24	4.0	.34	.20
24	.00	.58	.25	.18	e.23	5.4	1.9	e.22	e.19	5.3	.32	.19
25	.00	.63	.33	.21	.25	6.4	2.0	e.20	e.16	7.0	.34	.19
26	.00	.61	.23	.23	e.24	6.5	2.1	e.19	e.12	7.4	.36	.17
27	.00	.62	.22	.24	.23	6.3	2.2	e.18	e.08	31	.34	.17
28	.00	.57	e.20	.22	.24	5.2	1.9	e.17	e.05	456	.36	.17
29	.00	.60	e.18	.19	---	4.5	1.6	e.16	e.13	718	.36	.16
30	.00	.56	e.17	.20	---	4.4	1.3	e.16	e.25	76	.40	.17
31	.00	---	e.16	.25	---	4.0	---	e.15	---	38	.35	---
TOTAL	0.24	10.97	10.74	5.87	11.91	2904.40	58.2	13.82	44.14	1677.5	80.66	6.75
MEAN	.008	.37	.35	.19	.43	93.7	1.94	.45	1.47	54.1	2.60	.22
MAX	.02	.63	.59	.25	1.0	990	3.5	.99	17	718	25	.34
MIN	.00	.00	.16	.16	.20	.34	1.2	.15	.05	1.2	.32	.16
AC-FT	.5	22	21	12	24	5760	115	27	88	3330	160	13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1993, BY WATER YEAR (WY)

	4.70	1.73	1.36	3.78	17.3	84.9	59.6	17.6	14.3	9.77	2.73	5.20
MEAN	4.70	1.73	1.36	3.78	17.3	84.9	59.6	17.6	14.3	9.77	2.73	5.20
MAX	54.1	6.73	3.15	30.5	89.5	399	485	104	91.5	96.1	32.6	68.5
(WY)	1983	1983	1987	1974	1986	1972	1975	1970	1970	1969	1983	1978
MIN	.000	.057	.066	.000	.36	1.37	1.32	.45	.077	.018	.000	.000
(WY)	1991	1991	1991	1991	1975	1990	1990	1993	1992	1992	1988	1990

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1967 - 1993
ANNUAL TOTAL	589.48	4825.20	
ANNUAL MEAN	1.61	13.2	18.6
HIGHEST ANNUAL MEAN			48.1
LOWEST ANNUAL MEAN			.90
HIGHEST DAILY MEAN	48	Feb 28	2400
LOWEST DAILY MEAN	.00	Jun 22	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jun 22	.00
INSTANTANEOUS PEAK FLOW		1800	2940
INSTANTANEOUS PEAK STAGE		10.32	16.20
ANNUAL RUNOFF (AC-FT)	1170	9570	13470
10 PERCENT EXCEEDS	4.2	6.6	20
50 PERCENT EXCEEDS	.25	.38	1.4
90 PERCENT EXCEEDS	.00	.04	.08

e Estimated.

KNIFE RIVER BASIN

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06339100 KNIFE RIVER AT MANNING, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 13...	0930	0.25	2570	--	15.0	0.0	--	--	--	--	--
JAN 06...	1300	0.17	3880	--	0.0	1.5	--	--	--	--	--
22...	1335	0.20	3970	--	-1.5	0.5	--	--	--	--	--
FEB 12...	1200	0.73	3800	--	-4.0	0.5	--	--	--	--	--
MAR 05...	1335	300	202	--	8.5	1.0	--	--	--	--	--
09...	1345	41	317	--	--	--	--	--	--	--	--
15...	1540	6.3	617	8.4	11.0	0.5	72	168	17	7.0	100
MAY 03...	1038	0.65	1560	--	18.5	14.0	--	--	--	--	--
JUN 09...	1325	15	1960	--	22.5	14.0	--	--	--	--	--
22...	1250	0.19	2060	--	31.0	24.0	--	--	--	--	--
JUL 15...	1320	5.2	1070	--	20.0	16.5	--	--	--	--	--
AUG a12...	1230	0.94	760	8.3	23.0	19.5	110	253	26	12	130

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 15...	72	5	9.4	130	5.4	0.20	5.6	376	373	0.51	6.29
AUG a12...	69	5	9.5	150	5.9	0.30	40	526	505	0.69	1.28

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 15...	<1	130	110	<1	10	50	0.1	1	<1	210
AUG a12...	2	210	150	<1	10	20	<0.1	1	<1	430

a Replicate sample also collected for quality-assurance purposes.

KNIFE RIVER BASIN

06339500 KNIFE RIVER NEAR GOLDEN VALLEY, ND

LOCATION.--Lat 47°09'40", long 102°03'39", in SE¹/₄, sec.34, T.143 N., R.90 W., Mercer County, Hydrologic Unit 10130201, on left bank 6 ft downstream from highway bridge, 4.5 mi downstream from Elm Creek, and 9 mi south of Golden Valley.

DRAINAGE AREA.--1,230 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to November 1906, April 1907 to November 1915, April 1916 to October 1919, and October 1921 to September 1924 (published as "at Broncho" or "near Broncho"), and April 1943 to current year. Monthly discharge only for some periods published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1006:0 Drainage area. WSP 1279: 1904, 1914-19(M), 1922-24(M), 1944.

GAGE.--Water-stage recorder. Datum of gage is 1,847.13 ft above sea level. See WSP 1729 or 1917 for history of changes prior to May 1, 1946.

REMARKS.--Records fair except those for period of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	1.4	e4.1	e2.6	2.2	e2.2	54	19	11	6.4	271	e5.2
2	.16	1.9	e4.3	e2.4	2.2	e2.0	48	16	12	16	e140	e4.8
3	.03	2.2	e4.4	e2.2	2.4	e10	44	14	13	27	e100	e4.6
4	.00	2.2	e4.6	e2.1	2.4	e85	39	10	16	69	e60	e4.4
5	.00	2.2	e4.6	e1.9	2.4	e600	32	7.8	15	147	e35	e4.2
6	.00	2.2	e4.9	e1.8	2.4	e1000	32	7.1	13	234	e25	e4.2
7	.00	2.0	e5.2	e1.7	2.5	e1500	32	7.6	18	102	e15	e4.2
8	.00	2.0	e5.3	1.6	2.4	e1400	31	8.1	224	74	e11	e5.2
9	.03	2.2	e5.4	1.5	2.5	e900	29	9.3	302	100	e8.0	e5.0
10	.06	2.5	e5.6	1.3	2.6	e400	38	8.8	169	84	e6.0	e5.0
11	.10	2.7	e5.8	1.1	2.6	e280	44	8.7	140	63	e5.5	e3.9
12	.13	2.8	e6.1	1.1	2.8	e180	e47	9.0	106	106	e7.0	e3.8
13	.13	2.9	e5.9	1.2	e2.9	e110	e50	8.6	68	80	e10	e3.7
14	.17	3.1	e5.8	1.3	e3.0	99	e40	7.4	42	78	e8.5	e3.7
15	.21	2.8	e5.6	1.3	e3.1	65	e34	7.5	28	51	e7.5	e3.7
16	.21	2.8	e5.3	1.4	e3.0	44	e30	9.4	20	42	e6.5	e3.6
17	.23	2.8	e5.2	1.4	e2.9	38	e27	9.2	15	207	e6.0	e3.6
18	.31	3.0	e5.0	1.4	e3.1	e30	e25	7.7	12	148	e5.5	e3.5
19	.70	3.3	e4.9	1.5	e3.0	e25	e23	6.5	9.7	114	e5.2	e3.5
20	.96	3.3	e4.7	1.4	e2.9	e22	e20	5.9	7.9	58	e5.2	e3.5
21	1.1	3.3	e4.6	1.4	e2.8	e19	e19	5.6	8.0	69	e5.2	e3.9
22	1.2	3.4	e4.5	1.5	e2.9	e18	18	5.7	6.7	356	e5.2	e3.9
23	1.3	3.5	e4.4	1.5	e3.0	e17	19	5.9	5.7	613	e5.2	e3.8
24	1.0	e3.4	e4.1	1.6	e2.8	e16	20	6.6	4.9	613	e5.2	e3.9
25	.79	e3.5	e4.2	1.7	e2.7	e16	50	7.0	4.0	660	e5.2	e3.8
26	.81	e3.7	e4.4	1.8	e2.5	e30	58	6.4	3.5	831	e5.0	e3.8
27	.89	e3.9	e4.1	1.8	e2.6	79	50	6.1	2.8	811	e5.0	e3.8
28	.92	e4.2	e3.8	1.8	e2.5	71	41	6.3	2.4	863	e5.0	e3.8
29	.91	e4.3	e3.5	2.2	---	72	33	7.0	3.8	522	e5.0	e3.8
30	.84	e4.2	e3.1	2.3	---	72	28	12	7.5	295	e6.0	e3.8
31	.85	---	e2.8	2.2	---	64	---	14	---	321	e5.2	---
TOTAL	14.22	87.7	146.2	52.0	75.1	7266.2	1055	270.2	1290.9	7760.4	795.1	121.6
MEAN	.46	2.92	4.72	1.68	2.68	234	35.2	8.72	43.0	250	25.6	4.05
MAX	1.3	4.3	6.1	2.6	3.1	1500	58	19	302	863	271	5.2
MIN	.00	1.4	2.8	1.1	2.2	2.0	18	5.6	2.4	6.4	5.0	3.5
AC-FT	28	174	290	103	149	14410	2090	536	2560	15390	1580	241

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1993, BY WATER YEAR (WY)

	MEAN	15.6	11.0	7.00	9.27	37.6	345	323	92.1	147	48.9	35.5	15.7
MAX	245	69.7	23.0	140	299	1729	2448	1031	1193	255	725	97.5	
(WY)	1983	1983	1983	1974	1982	1972	1952	1970	1914	1969	1918	1978	
MIN	.46	1.93	.52	.026	.000	2.30	6.98	1.42	1.03	1.91	.28	1.12	
(WY)	1993	1962	1962	1962	1959	1964	1981	1923	1961	1992	1959	1992	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1903 - 1993

ANNUAL TOTAL	2194.83	18934.62	90.5
ANNUAL MEAN	6.00	51.9	235
HIGHEST ANNUAL MEAN			1982
LOWEST ANNUAL MEAN			1991
HIGHEST DAILY MEAN	89	Mar 5	10300
LOWEST DAILY MEAN	.00	Aug 17	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 17	.00
INSTANTANEOUS PEAK FLOW		al600	11200
INSTANTANEOUS PEAK STAGE		b16.24	c26.70
ANNUAL RUNOFF (AC-FT)	4350	37560	65580
10 PERCENT EXCEEDS	13	91	120
50 PERCENT EXCEEDS	2.8	5.2	10
90 PERCENT EXCEEDS	.11	1.3	2.0

e Estimated.

a About.

b Backwater from ice.

c From floodmark.

KNIFE RIVER BASIN

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06339500 KNIFE RIVER NEAR GOLDEN VALLEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1964-65, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 02...	1115	0.17	2790	--	--	23.0	13.0	--	--	--	--
NOV 13...	1230	2.5	2730	--	--	22.0	0.0	--	--	--	--
JAN 07...	0920	1.7	4400	--	--	-16.5	0.5	--	--	--	--
FEB 12...	1415	2.8	4040	--	--	-4.0	0.5	--	--	--	--
MAR 04...	1112	92	2210	--	--	13.0	1.0	--	--	--	--
MAR 15...	1245	66	574	8.4	--	10.5	0.5	89	147	19	10
MAY 03...	1300	12	2210	--	--	25.0	15.0	--	--	--	--
JUN 10...	1015	175	1600	--	--	23.0	15.0	--	--	--	--
JUN 29...	1055	3.4	2260	--	--	20.0	18.0	--	--	--	--
JUL 22...	1015	367	645	--	--	25.0	18.5	--	--	--	--
JUL 26...	1345	859	490	--	--	25.0	21.0	--	--	--	--
AUG 25...	1550	5.2	1420	--	8.3	23.0	21.5	250	432	51	29

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 15...	86	65	4	11	140	2.6	0.20	6.1	364	362	0.49
AUG 25...	240	67	7	12	350	5.0	0.40	13	961	970	1.32

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 15...	64.5	1	90	130	<1	10	40	0.1	<1	<1	260
AUG 25...	13.6	2	230	30	<1	30	40	<0.1	2	<1	830

KNIFE RIVER BASIN

06340000 SPRING CREEK AT ZAP, ND

LOCATION.--Lat 47°17'10", long 101°55'31", in SW¹/₄ sec.14, T.144 N., R.89 W., Mercer County, Hydrologic Unit 10130201, on right bank 250 ft downstream from Burlington Northern Railway bridge in Zap, and 9 mi upstream from mouth.

DRAINAGE AREA.--549 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to September 1924, October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,819.39 ft above sea level. Mar. 4 to Sept. 30, 1924, non-recording gage at site 250 ft upstream at different datum. Oct. 1, 1945, to Sept. 30, 1947, nonrecording gage 250 ft upstream at datum 1.12 ft higher.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor. Flow slightly regulated by Lake Ilo, 56 mi upstream, capacity 7,130 acre-ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known occurred in about 1902, from ice jam. Floods of February 1913 and March 1943 reached a stage of about 20 ft and 19.5 ft, respectively, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.0	e5.0	e6.9	e2.3	e2.2	e2.6	24	10	13	67	185	9.3
2	e2.6	e5.2	e6.4	e2.2	e2.3	e2.9	23	9.3	12	103	147	9.0
3	e2.5	e5.6	e5.7	e2.2	e2.4	e30	23	8.8	13	117	123	8.8
4	e2.4	e5.8	e4.8	e2.3	e2.4	e110	23	8.0	9.7	278	105	8.4
5	e2.3	e5.9	e4.3	e2.3	e2.5	e150	21	7.7	8.1	104	91	8.1
6	e2.8	e6.0	e4.1	e2.3	e2.9	e330	21	7.9	7.3	88	76	8.1
7	e2.8	e5.6	e4.4	e2.2	e3.1	e420	21	8.0	7.9	59	62	7.8
8	e2.7	e5.7	e4.0	e2.2	e3.1	e280	20	8.1	24	43	51	7.8
9	e2.5	e5.9	e3.6	e2.1	e3.1	e190	19	7.9	54	43	43	7.8
10	e2.6	e6.4	e4.0	e2.2	e3.2	e130	25	7.5	56	74	36	7.7
11	e2.7	e6.3	e4.1	e2.1	e3.1	e90	29	7.1	39	92	31	e7.8
12	e2.9	e6.2	e4.2	e2.0	e3.2	e62	24	6.7	25	52	32	e7.7
13	e3.0	e6.0	e4.3	e1.9	e3.2	e50	22	6.7	20	44	31	e7.7
14	e3.2	e6.5	e3.8	e1.7	e3.2	e54	22	6.1	28	44	56	e7.6
15	e3.5	e6.9	e3.5	e1.7	e3.3	e74	18	5.6	25	38	38	e7.7
16	e4.1	e7.3	e3.4	e1.6	e3.4	e56	16	5.5	22	37	25	e7.6
17	e4.3	e7.9	e3.2	e1.5	e3.8	e37	15	5.4	20	e35	20	e7.5
18	e4.2	e7.8	e3.0	e1.3	e3.3	e41	14	5.2	18	32	17	e7.5
19	e4.2	e8.0	e2.7	e1.4	e3.0	e46	13	5.1	14	31	15	e7.5
20	e4.3	e8.1	e2.5	e1.4	e2.8	e40	13	4.8	11	25	14	e7.4
21	e4.3	e8.0	e2.7	e1.6	e2.6	e38	12	4.7	8.8	67	13	e7.3
22	e4.6	e7.9	e2.7	e1.6	e2.5	e37	12	5.9	8.1	569	13	e7.5
23	e4.5	e7.7	e2.6	e1.5	e2.4	e42	13	6.1	8.1	369	13	e7.6
24	e4.4	e7.4	e2.8	e1.5	e2.3	e47	17	5.7	7.6	220	12	e7.7
25	e4.5	e7.0	e2.7	e1.8	e2.2	e46	14	6.0	6.8	315	11	e7.5
26	e4.5	e6.6	e2.5	e1.9	e2.2	e45	14	6.2	6.1	312	11	e7.4
27	e4.6	e6.9	e2.3	e2.0	e2.3	e43	13	7.7	6.2	437	12	e7.4
28	e4.7	e6.8	e2.2	e1.9	e2.4	42	13	8.4	6.3	340	12	e7.4
29	e4.7	e6.9	e2.2	e1.8	---	34	13	7.7	28	196	10	e7.5
30	e4.9	e6.6	e2.1	e2.0	---	29	11	12	72	198	10	e7.6
31	e5.0	---	e2.2	e2.1	---	26	---	14	---	236	9.9	---
TOTAL	113.3	199.9	109.9	58.6	78.4	2624.5	538	225.8	585.0	4665	1324.9	233.7
MEAN	3.65	6.66	3.55	1.89	2.80	84.7	17.9	7.28	19.5	150	42.7	7.79
MAX	5.0	8.1	6.9	2.3	3.8	420	29	14	72	569	185	9.3
MIN	2.3	5.0	2.1	1.3	2.2	2.6	11	4.7	6.1	25	9.9	7.3
AC-FT	225	397	218	116	156	5210	1070	448	1160	9250	2630	464

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1993, BY WATER YEAR (WY)

	MEAN	10.1	9.56	6.63	5.75	23.8	152	150	37.5	45.7	26.3	10.7	7.64
MAX	74.4	51.9	21.2	30.6	143	933	1044	292	290	178	53.2	16.5	
(WY)	1983	1983	1973	1973	1954	1972	1952	1970	1971	1962	1990	1986	
MIN	1.76	2.88	.80	.000	.000	3.39	9.41	5.77	3.10	1.84	.96	1.10	
(WY)	1959	1962	1962	1959	1949	1949	1992	1992	1961	1961	1961	1958	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1924 - 1993

ANNUAL TOTAL	2929.7	10757.0		
ANNUAL MEAN	8.00	29.5		
HIGHEST ANNUAL MEAN			40.5	
LOWEST ANNUAL MEAN			99.5	1972
HIGHEST DAILY MEAN	136	Feb 28	569	Jul 22
LOWEST DAILY MEAN	1.5	Aug 19	1.3	Jan 18
ANNUAL SEVEN-DAY MINIMUM	1.8	Aug 16	1.5	Jan 17
INSTANTANEOUS PEAK FLOW			749	Jul 22
INSTANTANEOUS PEAK STAGE			a9.23	Mar 7
ANNUAL RUNOFF (AC-FT)	5810	21340	29350	
10 PERCENT EXCEEDS	14	62	53	
50 PERCENT EXCEEDS	4.9	7.6	8.6	
90 PERCENT EXCEEDS	2.5	2.3	2.7	

e Estimated.

a Backwater from ice.

KNIFE RIVER BASIN

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06340000 SPRING CREEK AT ZAP, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-70, 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 07...	0810	2.8	1820	--	3.5	10.0	--	--	--	--	--
NOV 17...	1330	7.9	1970	--	2.0	2.5	--	--	--	--	--
JAN 07...	1315	2.3	2400	--	-12.0	0.5	--	--	--	--	--
FEB 17...	1100	3.8	2820	--	-20.0	0.5	--	--	--	--	--
MAR 05...	1300	121	660	--	9.0	1.0	--	--	--	--	--
MAR 10...	1720	128	319	8.0	2.0	0.0	80	82	18	8.5	26
APR 21...	1410	12	--	--	15.0	8.5	--	--	--	--	--
MAY 27...	1545	7.8	1610	--	12.0	13.0	--	--	--	--	--
JUL 22...	1340	744	547	--	23.0	18.0	--	--	--	--	--
AUG 17...	0805	21	1210	8.3	18.0	21.5	290	348	58	36	170

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 10...	38	1	11	78	1.7	0.10	5.5	199	222	0.30	76.7
AUG 17...	55	4	11	310	7.0	0.30	13	815	829	1.13	45.9

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 10...	1	70	370	<1	10	70	<0.1	<1	<1	300
AUG 17...	2	280	20	<1	40	10	<0.1	1	<1	990

KNIFE RIVER BASIN

06340500 KNIFE RIVER AT HAZEN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°17'07", long 101°37'18", in SW¹/₄SE¹/₄SE¹/₄, sec.18, T.144 N., R.86 W., Mercer County, Hydrologic Unit 10130201, on left bank at downstream side of highway bridge, 0.5 mi south of Hazen, and 3 mi upstream from Antelope Creek.

DRAINAGE AREA.--2,240 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October to November 1928, March 1929 to September 1933, August 1937 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1146: 1943. WSP 1279: 1930-31, 1932-33(M). WSP 1917: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,712.35 ft above sea level. Prior to Sept. 25, 1947, nonrecording gages at same site and datum.

REMARKS.--Records good except those for period of estimated daily discharges, which are fair. Slight regulation by Lake Ilo 81 mi upstream, capacity, 7,130 acre-ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, the floods of 1943 and 1950 were not exceeded during the period 1884 to 1942.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	14	e16	e6.5	e9.0	e8.3	78	42	32	77	623	29
2	3.0	14	e16	e7.2	e9.2	e8.6	71	38	31	84	496	27
3	3.1	14	e15	e7.4	e9.7	e9.5	63	35	29	183	350	27
4	2.8	14	e14	e7.5	e9.6	e9.0	57	32	28	304	268	28
5	2.6	15	e13	e7.3	e9.8	e280	54	30	26	325	219	27
6	4.2	15	e14	e6.9	e9.6	e700	53	29	26	231	186	26
7	4.7	21	e13	e7.0	e9.6	e1500	51	28	26	301	159	25
8	3.8	13	e13	e6.8	e9.5	e1400	50	28	42	180	137	24
9	4.0	14	e12	e6.5	e9.3	e1100	48	28	242	139	118	24
10	4.2	15	e12	e6.8	e9.2	e930	54	27	370	160	103	23
11	5.2	16	e13	e6.9	e9.2	e550	67	29	261	172	94	23
12	5.1	17	e11	e6.8	e9.0	e465	83	29	201	164	169	23
13	8.1	25	e10	e6.6	e8.7	e440	73	27	153	157	243	22
14	6.0	18	e9.6	e6.5	e8.6	e480	64	25	116	148	151	22
15	6.2	16	e10	e6.6	e8.5	e490	62	24	96	133	132	21
16	6.5	16	e9.8	e6.9	e8.5	e410	56	23	76	694	104	22
17	9.1	17	e9.4	e6.8	e8.6	e375	49	22	67	994	79	21
18	9.4	18	e8.5	e6.9	e8.5	e320	45	21	57	391	66	21
19	9.4	18	e8.0	e6.8	e8.6	283	41	20	50	258	55	20
20	9.4	18	e8.4	e7.0	e8.6	261	39	19	44	210	49	20
21	9.4	18	e8.4	e7.3	e8.2	218	37	19	38	161	45	20
22	9.4	18	e8.0	e7.4	e8.0	208	35	23	32	2050	42	20
23	9.7	e17	e7.7	e7.4	e7.8	182	38	22	29	3420	40	20
24	10	e15	e7.4	e7.2	e7.7	198	45	20	28	1700	38	21
25	10	e14	e7.5	e7.6	e7.6	237	63	19	26	1830	36	21
26	10	e14	e7.3	e8.1	e7.6	193	53	19	24	2310	34	20
27	10	e15	e7.1	e8.4	e7.6	135	62	23	21	3140	33	19
28	10	e15	e6.8	e8.4	e7.8	123	55	23	20	2940	32	19
29	11	e15	e6.0	e8.2	---	107	49	23	28	1280	32	19
30	12	e15	e6.2	e8.6	---	96	46	29	45	862	31	20
31	12	---	e6.0	e8.9	---	88	---	31	---	656	30	---
TOTAL	225.1	484	314.1	225.2	243.6	11804.4	1641	807	2264	25654	4194	674
MEAN	7.26	16.1	10.1	7.26	8.70	381	54.7	26.0	75.5	828	135	22.5
MAX	12	25	16	8.9	9.8	1500	83	42	370	3420	623	29
MIN	2.6	13	6.0	6.5	7.6	8.3	35	19	20	77	30	19
AC-FT	446	960	623	447	483	23410	3250	1600	4490	50880	8320	1340

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1993, BY WATER YEAR (WY)

	35.5	30.5	20.8	19.6	85.1	677	537	165	237	121	48.3	34.5
MEAN	35.5	30.5	20.8	19.6	85.1	677	537	165	237	121	48.3	34.5
MAX	365	223	83.1	145	927	3228	4293	1530	1041	979	215	143
(WY)	1983	1983	1983	1974	1930	1943	1952	1970	1944	1938	1954	1978
MIN	6.39	7.71	3.79	.70	.000	11.6	26.3	17.0	8.70	10.5	2.00	.50
(WY)	1962	1962	1962	1962	1962	1965	1981	1931	1961	1961	1933	1933

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1929 - 1993

ANNUAL TOTAL	8254.1	48530.4	
ANNUAL MEAN	22.6	133	169
HIGHEST ANNUAL MEAN			441
LOWEST ANNUAL MEAN			21.7
HIGHEST DAILY MEAN	335 Mar 1	3420 Jul 23	22400 Mar 27 1943
LOWEST DAILY MEAN	2.6 Oct 5	2.6 Oct 5	.00 Jan 21 1933
ANNUAL SEVEN-DAY MINIMUM	3.5 Oct 2	3.5 Oct 2	.00 Jan 21 1933
INSTANTANEOUS PEAK FLOW		5100 Jul 23	35300 Jun 24 1966
INSTANTANEOUS PEAK STAGE		19.52 Jul 23	27.01 Jun 24 1966
ANNUAL RUNOFF (AC-FT)	16370	96260	122100
10 PERCENT EXCEEDS	35	264	250
50 PERCENT EXCEEDS	13	22	30
90 PERCENT EXCEEDS	5.7	7.2	9.0

e Estimated.

KNIFE RIVER BASIN

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06340500 KNIFE RIVER AT HAZEN--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1951, 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	
OCT													
07...	1130	4.8	1610	8.3	9.5	9.5	5.6	10.5	99	290	488	--	
13...	1150	5.8	1620	--	9.0	8.0	--	--	--	--	--	--	
NOV													
17...	1630	17	1770	--	2.5	2.5	--	--	--	--	--	--	
JAN													
04...	1510	7.5	2300	--	-15.0	0.5	--	--	--	--	--	--	
FEB													
18...	1215	8.5	2310	7.9	-4.0	0.5	4.7	7.2	54	460	720	--	
MAR													
05...	1050	236	1730	--	8.0	1.0	--	--	--	--	--	--	
APR													
20...	1230	39	1460	8.5	10.0	9.5	18	10.9	102	250	--	385	
MAY													
27...	1345	26	1700	--	11.0	13.0	--	--	--	--	--	--	
JUL													
22...	1125	1250	680	--	--	18.0	--	--	--	--	--	--	
23...	1745	2260	448	--	21.0	19.0	--	--	--	--	--	--	
AUG													
16...	1255	103	1100	8.4	28.0	24.5	5.5	10.6	136	250	311	--	
DATE		COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 (MG/L AS K) (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	
OCT													
07...	140	1300	52	39	240	63	6	8.4	595	0	380	9.0	
FEB													
18...	<1	--	96	53	390	64	8	10	879	0	580	9.7	
APR													
20...	K3	26	51	29	230	66	6	9.1	--	--	340	6.1	
AUG													
16...	200	170	52	28	160	57	4	9.6	369	5	260	6.4	
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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED TOTAL (MG/L AS N) (00615)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED TOTAL (MG/L AS N) (00631)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT													
07...	0.50	7.6	1030	1050	1.43	13.7	<0.010	<0.010	--	<0.050	<0.050	0.020	
FEB													
18...	0.50	18	1590	1580	2.15	36.2	--	0.020	0.290	--	0.310	--	
APR													
20...	0.40	5.6	903	986	1.34	103	--	<0.010	--	--	<0.050	--	
AUG													
16...	0.30	12	716	714	0.97	199	--	<0.010	--	--	<0.050	--	

KNIFE RIVER BASIN

06340500 KNIFE RIVER AT HAZEN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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 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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT 07...	<0.010	0.38	0.40	0.010	<0.010	<0.010	<0.010	<10	62	<3	9
FEB 18...	0.130	--	0.60	0.020	0.020	--	<0.010	<10	<100	<1	30
APR 20...	0.010	--	0.80	0.070	0.020	--	<0.010	30	52	<3	29
AUG 16...	0.030	--	<0.20	0.020	0.070	--	0.050	<10	81	<3	27

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. # FINER THAN .062 MM (70331)
OCT 07...	52	45	10	3	<1	<1.0	980	<6	74	0.97	98
FEB 18...	60	170	2	3	<1	<1.0	1600	2	106	2.4	19
APR 20...	36	12	10	3	<1	<1.0	810	<6	54	5.7	56
AUG 16...	29	4	10	5	<1	<1.0	720	<6	85	24	98

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	SAMPLE LOC- ATION, CROSS SECTION (FT FM R BK) (72103)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT								
07...	1132	3.00	--	1.35	1610	8.6	9.5	--
07...	1134	7.00	--	1.52	1610	8.6	9.5	10.5
07...	1136	11.0	--	1.68	1610	8.5	9.5	--
07...	1138	15.0	--	1.47	1610	8.5	9.5	--
07...	1140	19.0	--	1.51	1610	8.5	9.5	10.5
07...	1142	23.0	--	1.59	1610	8.5	9.5	--
07...	1144	27.0	--	1.69	1610	8.5	9.5	--
07...	1146	31.0	--	1.50	1610	8.5	9.5	10.5
07...	1148	35.0	--	1.14	1610	8.5	9.5	--
FEB								
18...	1400	--	2.0	0.68	2380	7.9	0.5	--
18...	1402	--	4.0	1.00	2390	7.9	0.5	--
18...	1404	--	6.0	1.02	2380	7.9	0.5	7.2
18...	1406	--	8.0	0.65	2360	7.9	0.5	--
18...	1408	--	10.0	0.32	2320	8.0	0.5	--
APR								
20...	1235	2.00	--	0.90	1470	8.6	10.0	--
20...	1237	5.00	--	1.58	1470	8.6	10.0	10.7
20...	1239	10.0	--	1.60	1470	8.7	10.0	--
20...	1241	15.0	--	1.22	1470	8.7	10.0	10.9
20...	1243	20.0	--	1.38	1470	8.7	9.5	--
20...	1245	25.0	--	1.32	1470	8.6	9.5	--
20...	1247	30.0	--	1.18	1470	8.6	9.5	10.9
20...	1249	34.0	--	1.21	1470	8.6	9.5	--
AUG								
16...	1300	1.00	--	1.26	1120	8.4	24.5	--
16...	1302	3.00	--	1.82	1120	8.4	24.5	--
16...	1304	8.00	--	1.50	1120	8.4	24.5	10.5
16...	1306	13.0	--	2.24	1120	8.4	24.5	--
16...	1308	18.0	--	2.30	1120	8.4	24.5	--
16...	1310	23.0	--	2.45	1120	8.4	24.5	10.6
16...	1312	28.0	--	2.48	1120	8.4	24.5	--
16...	1314	33.0	--	2.56	1120	8.4	24.5	10.6
16...	1316	38.0	--	2.48	1120	8.4	24.5	--
16...	1318	40.0	--	1.88	1120	8.3	24.5	--

MISSOURI RIVER MAIN STEM

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06340700 MISSOURI RIVER NEAR STANTON, ND

LOCATION.--Lat 47°17'14", long 101°20'25", in SW¼, sec.16, T.144 N., R.84 W., Mercer County, Hydrologic Unit 10130101, on right bank 3 mi southeast of Stanton, 0.1 mi below Ft. Clark irrigation pumping station, 0.4 mi above the United Power Association power plant, and at mile 1,372.

DRAINAGE AREA.--182,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,650.00 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 50.00 ft lower.

REMARKS.--Stage regulated completely by releases from Garrison Dam (station 06338490) 18 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 24.56 ft, Feb. 22, 1965; minimum daily recorded, 8.92 ft, Nov. 3, 1991.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.58	---	10.78	---	12.53	10.09	9.48	10.00	11.18	11.23	11.12	11.26
2	9.45	---	11.44	---	11.96	9.75	9.75	10.14	11.18	11.26	11.25	11.00
3	9.71	---	---	---	11.73	9.76	9.56	10.51	11.28	11.42	11.19	11.36
4	9.53	---	---	---	11.58	9.69	9.61	9.80	11.19	11.35	11.35	11.26
5	9.44	---	---	14.01	11.48	9.99	9.84	10.13	11.20	11.29	11.22	11.27
6	---	---	---	14.23	11.14	10.23	9.55	10.17	11.25	11.25	11.22	11.28
7	---	---	---	14.24	10.79	10.55	9.86	10.14	11.27	11.38	11.25	10.90
8	---	---	---	13.84	10.99	11.23	9.30	10.14	11.21	11.33	11.17	9.96
9	---	---	---	---	10.89	10.19	9.29	10.66	11.15	11.26	11.23	9.43
10	---	---	11.96	---	10.96	10.35	9.72	11.05	11.18	11.29	11.13	9.43
11	---	---	11.90	14.11	10.93	9.98	9.63	11.57	11.26	11.38	11.53	9.47
12	9.51	---	11.89	14.39	11.05	10.07	9.62	11.90	11.20	11.09	11.28	9.52
13	---	---	11.92	14.34	10.85	9.93	9.50	11.69	11.18	11.40	11.27	9.64
14	---	---	---	14.35	10.93	9.65	9.60	11.48	11.27	11.31	11.29	9.48
15	9.47	---	---	13.70	11.39	10.00	9.65	11.65	11.25	11.38	11.20	9.63
16	---	---	---	14.12	11.28	9.78	9.92	11.61	11.20	11.09	11.48	9.45
17	---	---	---	13.99	12.39	9.71	9.05	11.84	11.28	11.12	11.24	9.50
18	9.47	---	---	14.40	11.96	9.63	9.60	11.52	11.23	10.92	---	9.53
19	9.54	9.54	---	14.12	11.76	9.30	9.68	11.37	10.64	11.21	---	9.55
20	9.38	9.47	---	13.63	11.29	9.88	9.39	11.25	11.63	11.14	---	9.49
21	9.48	---	---	13.88	10.79	9.69	9.42	11.24	10.93	11.40	---	9.65
22	9.53	9.41	---	13.28	10.84	9.70	9.46	11.21	11.71	10.90	---	9.64
23	9.48	9.45	---	13.28	10.98	9.64	9.41	11.55	11.28	11.52	---	9.57
24	9.44	9.46	---	13.14	11.12	9.70	9.47	11.21	11.24	10.99	---	9.76
25	9.46	---	---	13.19	10.93	9.61	9.49	11.36	11.35	10.95	---	9.38
26	---	---	---	12.92	10.85	9.64	9.62	---	11.01	11.25	---	9.50
27	9.62	9.39	---	12.95	10.52	9.41	9.82	---	11.27	11.65	---	9.65
28	9.31	---	---	13.23	10.28	9.75	10.12	---	11.32	11.15	11.31	9.65
29	---	9.39	---	13.05	---	9.69	9.91	11.36	11.17	10.72	11.24	9.54
30	9.20	---	---	12.74	---	9.57	10.16	11.20	11.17	10.98	11.44	9.47
31	---	---	---	12.47	---	9.61	---	11.40	---	11.08	11.28	---
MEAN	---	---	---	---	11.22	9.86	9.62	---	11.22	11.22	---	9.94
MAX	---	---	---	---	12.53	11.23	10.16	---	11.71	11.65	---	11.36
MIN	---	---	---	---	10.28	9.30	9.05	---	10.64	10.72	---	9.38

MISSOURI RIVER MAIN STEM

06340900 MISSOURI RIVER NEAR HENSLEY, ND

LOCATION.--Lat 47°16'45", long 101°11'03", in SW¹/₄ sec.22, T.144 N., R.83 W., McLean County, Hydrologic Unit 10130101, on left bank about 7.5 mi west of Washburn, and at mile 1,362.

DRAINAGE AREA.--183,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--May 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,640.00 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 40 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 28 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 27.77 ft, Mar. 20, 1965; minimum daily recorded, 13.62 ft, Nov. 29, 1992.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.11	14.09	14.84	---	17.74	14.84	13.94	14.44	15.53	15.57	15.54	15.71
2	14.01	14.02	15.65	17.82	17.14	14.09	14.12	14.52	15.54	15.60	15.50	15.42
3	14.26	14.05	16.03	---	16.74	14.03	13.96	14.90	15.61	15.72	15.62	15.71
4	14.05	14.06	15.95	---	16.52	13.82	13.97	14.30	15.55	15.64	15.49	15.67
5	14.02	13.87	16.11	---	16.28	14.51	14.25	14.50	15.54	15.56	15.75	15.77
6	14.03	14.16	15.96	---	15.87	14.62	14.04	14.48	15.62	15.59	15.54	15.70
7	13.92	13.95	16.01	---	15.59	14.85	14.24	14.67	15.67	15.66	15.59	15.66
8	14.27	14.09	15.90	---	15.74	15.62	13.79	14.53	15.63	15.65	15.64	14.71
9	13.99	14.23	15.82	---	15.50	14.81	13.78	15.02	15.55	15.60	15.61	14.05
10	14.01	13.92	15.76	19.73	15.58	14.77	14.16	15.06	15.49	15.64	15.62	13.96
11	14.09	13.92	15.72	19.67	16.07	14.43	14.04	15.89	15.60	15.61	15.58	14.02
12	14.04	14.00	15.65	20.09	16.31	14.53	14.03	16.29	15.54	15.47	15.56	14.02
13	14.03	14.04	15.71	20.04	15.93	14.28	13.93	16.03	15.52	15.69	15.55	14.22
14	14.13	13.92	15.62	20.00	15.89	14.09	14.06	15.90	15.57	15.61	15.90	14.01
15	13.99	14.09	15.67	---	16.71	14.35	14.03	15.87	15.56	15.72	15.51	14.16
16	13.91	14.23	15.45	19.73	---	14.23	14.28	15.95	15.54	15.71	15.66	13.99
17	14.21	14.10	15.37	19.51	---	14.30	13.63	16.13	15.62	15.29	15.58	14.04
18	13.97	14.07	15.24	19.70	17.75	14.03	13.95	15.91	15.56	15.26	15.58	14.07
19	14.16	14.07	---	19.73	17.85	13.76	14.18	15.75	15.04	15.43	15.81	14.13
20	13.90	14.01	15.38	19.37	17.33	14.23	13.80	15.68	15.81	15.51	15.70	13.94
21	14.09	14.08	15.21	19.58	16.95	14.09	13.93	15.59	15.33	15.72	15.60	14.15
22	14.01	13.91	15.25	19.20	---	14.17	13.84	15.53	15.87	15.56	15.58	14.13
23	14.03	13.95	---	19.05	---	14.06	13.80	15.86	15.61	15.79	15.57	14.09
24	14.04	13.95	---	18.85	---	14.15	13.91	15.62	15.53	15.55	15.85	14.31
25	13.97	13.83	14.36	18.83	---	14.02	13.89	15.70	15.72	15.31	15.78	13.84
26	14.04	13.87	16.48	18.55	---	14.05	14.03	15.61	15.24	15.52	15.84	14.07
27	14.22	13.77	18.12	18.52	---	13.88	14.04	15.71	15.55	15.98	15.64	14.13
28	13.94	13.80	---	18.51	15.49	14.14	14.56	15.73	15.60	15.77	15.75	14.13
29	13.96	13.62	---	19.18	---	14.17	14.36	15.70	15.54	15.33	15.68	14.08
30	14.08	14.03	---	18.83	---	14.02	14.57	15.58	15.48	15.15	15.83	13.99
31	14.04	---	---	17.94	---	14.05	---	15.75	---	15.25	15.68	---
MEAN	14.05	13.99	---	---	---	14.29	14.04	15.43	15.55	15.56	15.65	14.46
MAX	14.27	14.23	---	---	---	15.62	14.57	16.29	15.87	15.98	15.90	15.77
MIN	13.90	13.62	---	---	---	13.76	13.63	14.30	15.04	15.15	15.49	13.84

MISSOURI RIVER MAIN STEM

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06341000 MISSOURI RIVER AT WASHBURN, ND

LOCATION.--Lat 47°17'20", long 101°02'15", in SE $\frac{1}{4}$, SW $\frac{1}{4}$, sec.14, T.144 N., R.82 W., McLean County, Hydrologic Unit 10130101, on left bank near municipal water plant in Washburn, and at mile 1,355.

DRAINAGE AREA.--184,000 mi², approximately.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,640.00 ft above sea level. Prior to Sept. 30, 1964, at datum 40 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 35 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 22.76 ft, Jan. 11, 1964; minimum daily recorded, 9.44 ft, Sept. 25, 1991.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.77	9.64	10.43	---	15.12	12.87	9.58	10.12	11.14	11.32	11.27	11.41
2	9.62	9.58	11.08	---	14.52	11.65	9.79	10.18	11.15	11.37	11.25	11.19
3	9.85	9.60	---	---	13.86	10.74	9.71	10.49	11.20	11.42	11.34	11.38
4	9.67	9.58	---	---	13.45	10.10	9.70	10.05	11.18	11.44	11.27	11.37
5	9.65	9.46	---	---	12.97	10.47	9.99	10.15	11.16	11.37	11.45	11.46
6	9.63	9.69	11.70	---	---	10.39	9.78	10.10	11.22	11.38	11.30	11.41
7	9.54	9.60	---	---	12.03	10.61	9.89	10.36	11.19	11.41	11.33	11.44
8	9.84	9.61	11.74	---	---	11.25	9.57	10.19	11.26	11.40	11.36	10.63
9	9.59	9.69	11.73	---	11.59	10.67	9.55	10.61	11.20	11.37	11.35	9.84
10	9.63	9.57	11.70	---	11.61	10.49	9.84	10.61	11.13	11.39	11.34	9.75
11	9.65	9.50	11.71	---	12.92	---	9.76	11.48	11.24	11.32	11.33	9.82
12	9.61	9.52	11.66	---	14.07	---	9.73	11.85	11.20	11.28	11.31	9.80
13	9.62	9.57	11.81	---	13.50	---	9.67	11.66	11.25	11.40	11.30	9.98
14	9.68	9.50	11.76	---	---	---	9.74	11.57	11.23	11.36	11.56	9.79
15	9.59	9.61	11.87	---	---	---	9.73	11.48	11.24	11.46	11.29	9.91
16	9.52	9.77	11.76	16.49	---	---	9.90	11.58	11.19	11.53	11.38	9.76
17	9.72	9.67	11.74	---	---	---	9.51	11.68	11.27	11.01	11.30	9.78
18	9.55	9.57	11.71	---	---	---	9.56	11.55	11.25	11.06	11.34	9.81
19	9.73	9.61	---	---	14.45	---	9.80	11.37	10.91	11.15	11.47	9.86
20	9.50	9.56	---	16.26	14.22	---	9.53	11.33	11.36	11.31	11.44	9.67
21	9.68	9.59	11.96	16.48	13.87	---	9.67	11.22	11.15	11.42	11.34	9.87
22	9.56	9.54	11.95	16.41	---	---	9.56	11.17	11.46	11.39	11.28	9.88
23	9.61	9.55	---	16.33	---	9.81	9.51	11.43	11.35	11.47	11.30	9.87
24	9.66	9.56	12.57	16.10	---	9.89	9.63	11.27	11.31	11.43	11.45	10.04
25	9.53	9.51	13.04	---	---	9.75	9.61	11.32	11.47	11.10	11.47	9.61
26	9.61	9.56	---	15.85	---	9.79	9.75	11.21	11.04	11.25	11.53	9.84
27	9.73	---	---	15.80	---	9.63	9.77	11.30	11.27	11.65	11.34	9.79
28	9.55	---	---	---	13.16	9.81	10.30	11.34	11.31	11.61	11.44	9.83
29	9.55	---	---	---	---	9.89	10.06	11.29	11.31	11.18	11.34	9.84
30	9.63	---	---	15.39	---	9.75	10.18	11.21	11.25	10.91	11.50	9.76
31	9.59	---	---	15.22	---	9.73	---	11.32	---	11.06	11.39	---
MEAN	9.63	---	---	---	---	---	9.75	11.05	11.23	11.33	11.37	10.21
MAX	9.85	---	---	---	---	---	10.30	11.85	11.47	11.65	11.56	11.46
MIN	9.50	---	---	---	---	---	9.51	10.05	10.91	10.91	11.25	9.61

TURTLE CREEK BASIN

06341410 TURTLE CREEK ABOVE WASHBURN, ND

LOCATION.--Lat 47°23'06", long 100°54'43", in NW¼NE¼NE¼ sec.18, T.145 N., R.80 W., McLean County, Hydrologic Unit 10130101, on right bank 250 ft downstream from bridge on county highway, 8.5 mi northeast of Washburn, and 8.8 mi south of Turtle Lake.

DRAINAGE AREA.--350 mi², approximately, of which 195 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,780 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. Water from the McClusky Canal is sometimes diverted into the stream at a point upstream from the gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	e49	1.1	e.00	e.00	e.00	4.2	3.9	3.1	5.1	23	25
2	22	e48	.88	e.00	e.00	e.20	3.2	3.6	2.2	7.8	19	25
3	24	e47	.86	e.00	e.00	e.50	2.6	3.2	1.7	5.5	18	26
4	26	e49	.60	e.00	e.00	e1.0	2.8	2.5	1.2	4.6	19	26
5	26	e50	.38	e.00	e.00	e3.0	3.8	2.2	.84	4.0	20	26
6	23	e51	.38	e.00	e.00	e45	2.7	2.4	.89	3.7	19	26
7	25	e52	.38	e.00	e.00	e115	e2.5	2.8	1.9	3.6	18	26
8	24	e52	.30	e.00	e.00	e110	e2.3	4.0	28	3.6	17	25
9	24	e51	.30	e.00	e.00	e45	e2.3	4.8	24	5.5	16	23
10	25	e49	e.28	e.00	e.00	e38	e2.7	4.3	12	6.3	15	22
11	26	e47	e.26	e.00	e.00	e27	e3.4	3.9	7.9	5.9	14	23
12	28	e48	e.20	e.00	e.00	e23	e5.0	3.4	5.5	4.8	14	24
13	30	e48	e.14	e.00	e.00	e19	e7.0	3.1	3.6	5.7	14	21
14	32	e47	e.09	e.00	e.00	e17	e6.2	2.4	2.4	5.8	22	19
15	31	e45	e.07	e.00	e.00	e15	e5.4	1.9	1.6	6.4	31	19
16	31	e46	e.06	e.00	e.00	e14	e4.8	1.6	1.2	16	38	19
17	31	e47	e.05	e.00	e.00	e21	e4.2	1.0	1.1	16	39	18
18	32	e35	e.04	e.00	e.00	e25	e3.7	.59	.95	11	37	17
19	32	e27	e.02	e.00	e.00	e20	e3.2	.46	1.0	7.7	35	17
20	32	11	e.00	e.00	e.00	e28	e2.8	.44	.92	6.0	37	17
21	32	6.2	e.00	e.00	e.00	e15	e3.0	.37	.77	5.2	38	17
22	31	4.6	e.00	e.00	e.00	e9.0	e3.1	.42	.41	31	36	23
23	30	3.2	e.00	e.00	e.00	e15	e4.7	.84	.43	68	34	49
24	30	4.5	e.00	e.00	e.00	e30	8.3	1.2	2.6	63	31	66
25	40	3.0	e.00	e.00	e.00	44	8.3	1.1	2.3	59	30	67
26	43	2.0	e.00	e.00	e.00	29	5.8	.79	1.7	52	29	64
27	45	1.8	e.00	e.00	e.00	18	4.9	1.4	1.1	53	28	64
28	51	1.6	e.00	e.00	e.00	13	4.5	2.0	.84	75	26	62
29	50	1.3	e.00	e.00	---	e13	4.4	2.3	4.9	62	26	64
30	e50	1.1	e.00	e.00	---	8.7	4.0	4.3	6.0	41	27	64
31	e49	---	e.00	e.00	---	6.3	---	4.5	---	30	26	---
TOTAL	998	928.3	6.39	0.00	0.00	767.70	125.8	71.71	123.05	674.2	796	984
MEAN	32.2	30.9	.21	.000	.000	24.8	4.19	2.31	4.10	21.7	25.7	32.8
MAX	51	52	1.1	.00	.00	115	8.3	4.8	28	75	39	67
MIN	22	1.1	.00	.00	.00	.00	2.3	.37	.41	3.6	14	17
AC-FT	1980	1840	13	.00	.00	1520	250	142	244	1340	1580	1950

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1993, BY WATER YEAR (WY)

	7.46	5.59	.17	.054	2.52	23.5	10.2	4.36	2.24	4.77	6.54	9.71
MEAN	7.46	5.59	.17	.054	2.52	23.5	10.2	4.36	2.24	4.77	6.54	9.71
MAX	32.2	30.9	.38	.22	10.3	116	54.8	18.7	8.89	21.7	25.7	32.8
(WY)	1993	1993	1988	1987	1992	1987	1987	1987	1987	1993	1993	1993
MIN	.092	.043	.000	.000	.000	.22	.28	.069	.009	.000	.033	2.31
(WY)	1990	1990	1990	1989	1989	1990	1990	1992	1989	1988	1991	1988

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1987 - 1993	
ANNUAL TOTAL	2809.23		5475.15		6.45	
ANNUAL MEAN	7.68		15.0		19.8	
HIGHEST ANNUAL MEAN					1.10	
LOWEST ANNUAL MEAN					1990	
HIGHEST DAILY MEAN	103	Feb 27	115	Mar 7	767	Mar 21 1987
LOWEST DAILY MEAN	.00	May 16	.00	Dec 20	.00	Jan 5 1988
ANNUAL SEVEN-DAY MINIMUM	.00	May 23	.00	Dec 20	.00	Jan 5 1988
INSTANTANEOUS PEAK FLOW			a170	Mar 7	845	Mar 21 1987
INSTANTANEOUS PEAK STAGE			b4.69	Mar 7	6.94	Mar 21 1987
ANNUAL RUNOFF (AC-FT)	5570		10860		4670	
10 PERCENT EXCEEDS	31		46		17	
50 PERCENT EXCEEDS	.98		4.7		.60	
90 PERCENT EXCEEDS	.00		.00		.00	

e Estimated.

a About.

b Backwater from ice.

TURTLE CREEK BASIN

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06341410 TURTLE CREEK ABOVE WASHBURN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1987 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)
OCT											
05...	1100	26	5100	8.5	14.0	13.0	8.0	7.1	73	500	718
30...	1125	50	4100	8.3	3.0	4.0	6.0	11.1	92	380	544
NOV											
19...	1330	25	1740	--	0.0	2.0	--	--	--	--	--
MAR											
29...	1215	13	2020	8.7	3.0	3.0	7.3	10.5	84	240	632
APR											
22...	1200	3.1	2940	8.8	9.0	20.5	16	9.0	109	340	947
MAY											
19...	1310	0.63	3070	8.7	12.0	11.5	13	6.1	60	400	1060
JUL											
01...	1055	4.9	2200	8.4	17.0	18.0	27	4.5	51	230	741
AUG											
25...	1515	30	2630	8.2	24.0	21.5	4.5	5.8	71	320	860

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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)
OCT										
05...	40	96	1100	82	22	32	2000	80	0.70	8.8
30...	43	66	820	81	18	28	1500	61	0.70	2.4
MAR										
29...	17	48	410	77	12	21	480	19	0.20	15
APR										
22...	27	67	610	78	14	27	610	24	0.40	5.1
MAY										
19...	32	77	630	76	14	26	660	26	0.40	7.9
JUL										
01...	21	43	460	80	13	18	470	12	0.30	14
AUG										
25...	20	65	510	77	12	10	640	21	0.40	15

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT										
05...	3790	3800	5.17	266	<0.010	<0.050	0.030	0.150	1000	50
30...	2850	2870	3.90	387	<0.010	<0.050	0.020	0.020	830	20
MAR										
29...	1390	1430	1.94	48.6	<0.010	<0.050	0.120	0.280	850	70
APR										
22...	1940	2120	2.88	17.6	0.010	<0.050	0.030	0.230	1200	500
MAY										
19...	2100	2190	2.98	3.73	0.020	<0.050	0.050	0.310	1400	57
JUL										
01...	1490	1580	2.15	20.7	<0.010	<0.050	0.030	0.350	1200	620
AUG										
25...	1800	1810	2.46	146	<0.010	<0.050	0.040	0.160	1300	60

PAINTED WOODS CREEK BASIN

06341800 PAINTED WOODS CREEK NEAR WILTON, ND

LOCATION.--Lat 47°16'30", long 100°47'30", in SW¹/₄SW¹/₄, sec.23, T.144 N., R.80 W., McLean County, Hydrologic Unit 10130101, on right bank 600 ft upstream from county highway bridge, 7 mi upstream from Yanktonal Creek, and 8 mi north of Wilton.

DRAINAGE AREA.--427 mi², approximately, of which about 310 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1957 to September 1981, August 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,764.93 ft above sea level (levels by U.S. Fish and Wildlife Service).

REMARKS.--Records good except those for period of estimated daily discharges, which are poor. Since the fall of 1982 Missouri River basin water has been diverted into the stream at a point several miles upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	24	e22	e21	e31	e25	44	37	30	37	162	46
2	24	24	e22	e22	e32	e26	47	37	27	42	119	46
3	23	18	e22	e22	e33	e27	43	37	25	46	97	44
4	22	22	e21	e22	e33	e32	40	37	22	42	82	43
5	22	26	e21	e22	e34	e38	38	36	16	36	68	42
6	23	24	e20	e21	e34	e50	35	37	14	36	57	40
7	22	22	e20	e21	e33	e72	35	39	14	35	54	39
8	22	24	e20	e20	e32	e115	36	41	20	34	59	38
9	24	24	e21	e20	e31	e100	35	45	30	32	61	37
10	25	23	e21	e21	e30	e88	35	49	32	33	70	35
11	24	20	e23	e21	e29	e77	37	44	28	39	98	35
12	25	21	e24	e22	e28	e70	35	42	26	39	91	34
13	24	14	e24	e21	e29	e61	34	41	27	44	78	33
14	24	24	e23	e21	e27	e54	33	38	21	49	78	32
15	23	20	e23	e21	e26	e49	33	31	14	51	81	32
16	23	22	e23	e22	e26	e65	32	25	10	120	96	22
17	23	22	e22	e21	e25	e50	32	26	13	403	88	12
18	24	22	e22	e21	e25	e46	31	28	22	339	72	7.8
19	24	22	e21	e20	e24	e41	30	29	22	233	55	6.7
20	24	22	e22	e20	e23	e37	29	30	20	155	52	6.4
21	24	22	e22	e24	e23	e39	28	30	21	106	52	6.2
22	24	22	e21	e25	e22	e42	28	30	21	408	54	5.7
23	24	19	e21	e24	e22	e82	31	33	22	1230	55	5.4
24	23	e18	e23	e22	e23	e180	37	33	23	1220	54	5.1
25	23	e18	e22	e22	e22	e350	36	30	19	869	53	5.0
26	24	e17	e22	e24	e21	e220	36	34	19	862	50	4.6
27	22	e19	e21	e27	e22	e160	36	33	19	729	48	4.7
28	23	e23	e22	e26	e23	104	36	30	19	532	47	4.6
29	23	e22	e21	e26	---	70	35	29	25	389	46	4.4
30	23	e21	e21	e28	---	47	35	35	31	295	47	4.1
31	23	---	e20	e29	---	41	---	34	---	222	48	---
TOTAL	726	641	673	699	763	2458	1052	1080	652	8707	2172	680.7
MEAN	23.4	21.4	21.7	22.5	27.2	79.3	35.1	34.8	21.7	281	70.1	22.7
MAX	25	26	24	29	34	350	47	49	32	1230	162	46
MIN	22	14	20	20	21	25	28	25	10	32	46	4.1
AC-FT	1440	1270	1330	1390	1510	4880	2090	2140	1290	17270	4310	1350

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1993, BY WATER YEAR (WY)

	24.7	24.9	22.9	22.0	26.6	64.2	32.0	29.1	25.0	48.4	31.4	25.3
MEAN	38.4	33.3	33.9	30.5	36.2	162	56.5	48.0	42.6	281	70.1	43.2
MAX (WY)	1987	1990	1987	1990	1992	1987	1986	1986	1984	1993	1993	1986
MIN (WY)	.16	5.45	6.24	3.42	14.8	18.2	8.20	1.08	2.37	1.43	.22	2.52
(WY)	1989	1989	1984	1984	1983	1989	1989	1990	1990	1990	1983	1988

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1983 - 1993

ANNUAL TOTAL	9428.9	20303.7	
ANNUAL MEAN	25.8	55.6	31.5
HIGHEST ANNUAL MEAN			55.6
LOWEST ANNUAL MEAN			19.3
HIGHEST DAILY MEAN	160	Feb 28	1230
LOWEST DAILY MEAN	2.2	Sep 2	4.1
ANNUAL SEVEN-DAY MINIMUM	6.5	Sep 11	4.6
INSTANTANEOUS PEAK FLOW			1580
INSTANTANEOUS PEAK STAGE			8.13
ANNUAL RUNOFF (AC-FT)	18700	40270	22790
10 PERCENT EXCEEDS	37	77	45
50 PERCENT EXCEEDS	24	28	27
90 PERCENT EXCEEDS	14	20	4.6

e Estimated.

PAINTED WOODS CREEK BASIN

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06341800 PAINTED WOODS CREEK NEAR WILTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-64, 1970 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINEITY LAB (MG/L AS CACO3) (90410)
OCT 05...	1515	22	1260	8.2	12.0	13.5	8.7	9.8	101	340	268
NOV 18...	1700	23	1250	8.5	-2.0	0.5	2.2	13.0	97	340	259
JAN 05...	1230	22	1280	--	-10.0	0.5	--	--	--	--	--
FEB 09...	1215	32	1270	--	-2.0	0.5	--	--	--	--	--
MAR 22...	1350	42	1040	--	1.0	0.5	--	--	--	--	--
MAR 29...	1520	64	502	8.0	3.0	3.0	6.2	10.0	80	130	150
APR 22...	0915	28	1010	8.4	9.0	9.0	11	9.7	91	270	230
MAY 19...	1100	29	1390	8.4	10.0	12.0	8.5	6.7	67	390	311
JUL 01...	1335	39	1310	8.2	21.0	19.5	13	6.6	77	330	287
JUL 24...	1235	1190	293	--	--	--	--	--	--	--	--
AUG 03...	0945	100	723	--	16.5	16.0	--	--	--	--	--
AUG a25...	1800	53	1260	8.1	22.0	22.0	4.1	7.6	93	360	300

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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
OCT 05...	49	54	150	48	4	2.1	380	20	0.60	1.5	818
NOV 18...	49	52	140	44	3	41	380	18	0.60	0.70	837
MAR 29...	24	17	50	43	2	10	100	4.6	0.10	15	312
APR 22...	46	38	110	46	3	8.2	270	13	0.40	5.0	629
MAY 19...	59	59	180	49	4	10	440	18	0.50	4.2	958
JUL 01...	47	51	170	52	4	9.0	420	14	0.50	6.4	890
AUG a25...	56	53	140	45	3	8.4	360	14	0.40	10	823

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT 05...	852	1.16	49.9	<0.010	--	<0.050	0.020	<0.010	300	13
NOV 18...	818	1.11	50.8	0.030	--	<0.050	0.010	<0.010	290	4
MAR 29...	330	0.45	56.8	<0.010	--	0.054	0.070	0.090	160	140
APR 22...	640	0.87	47.7	<0.010	--	<0.050	0.030	0.020	200	20
MAY 19...	974	1.32	76.0	<0.010	--	<0.050	0.030	0.020	350	18
JUL 01...	886	1.20	94.0	<0.010	--	<0.050	0.030	0.030	330	31
AUG a25...	818	1.11	117	0.010	0.061	0.071	0.080	0.110	280	25

a Replicate sample also collected for quality-assurance purposes.

MISSOURI RIVER MAIN STEM

06342020 MISSOURI RIVER AT PRICE, ND

LOCATION.--Lat 47°04'47", long 100°55'55", in NW¹/₄ sec.34, T.142 N., R.81 W., Oliver County, Hydrologic Unit 10130101, on right bank 0.5 mi south of Price, and at mile 1,338.

DRAINAGE AREA.--185,000 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--November 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,620.00 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 20 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 52 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 30.12 ft, Jan. 22, 1967; minimum daily recorded, 17.07 ft, Mar. 11, 1993.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.97	17.86	18.41	23.04	22.68	20.35	17.76	18.16	19.29	19.27	19.18	19.31
2	17.87	17.86	19.03	23.21	22.60	20.21	17.75	18.15	19.24	19.38	19.25	19.21
3	17.97	17.83	19.60	23.16	22.27	20.09	17.82	18.35	19.26	19.36	19.29	19.20
4	17.97	17.77	19.70	23.14	22.06	19.78	17.75	18.27	19.27	19.43	19.30	19.27
5	17.91	17.79	19.80	23.12	21.93	19.97	17.90	18.10	19.24	19.39	19.31	19.31
6	17.85	17.84	19.82	23.12	21.72	19.63	17.85	18.16	19.28	19.37	19.32	19.32
7	17.83	17.91	19.85	23.16	21.53	18.96	17.80	18.35	19.28	19.35	19.26	19.31
8	17.94	17.81	19.85	23.13	21.32	18.26	17.76	18.23	19.40	19.39	19.29	18.83
9	17.90	17.88	19.83	22.96	21.23	17.88	17.61	18.46	19.27	19.38	19.32	18.09
10	17.87	17.93	19.79	23.00	21.05	17.29	17.72	18.68	19.22	19.37	19.28	17.88
11	17.84	17.75	19.83	22.97	20.58	17.07	17.77	19.37	19.30	19.30	19.33	17.90
12	17.83	17.74	19.77	23.16	20.90	---	17.74	19.71	19.31	19.35	19.27	17.88
13	17.86	17.81	19.87	23.33	21.14	---	17.74	19.74	19.29	19.29	19.23	17.97
14	17.84	17.83	19.81	23.33	21.11	---	17.70	19.62	19.28	19.37	19.42	17.88
15	17.85	17.81	19.90	23.29	20.87	---	17.73	19.49	19.29	19.45	19.39	17.91
16	17.78	17.96	19.87	23.23	20.69	---	17.80	19.62	19.25	19.57	19.29	17.88
17	17.83	17.91	19.82	23.14	20.57	---	17.79	19.65	19.27	19.08	19.28	---
18	17.86	17.79	19.82	23.09	20.62	---	17.47	19.77	19.28	19.15	19.30	---
19	17.91	17.87	20.06	23.30	20.74	---	17.70	19.43	19.21	19.14	19.32	---
20	17.81	17.84	20.44	23.16	20.86	---	17.61	19.38	19.15	19.35	19.40	---
21	17.84	17.77	21.16	23.15	20.63	---	17.63	19.29	19.37	19.31	19.30	---
22	17.81	17.81	21.46	23.36	20.43	---	17.60	19.32	19.25	19.65	19.22	---
23	17.84	17.77	21.16	23.22	20.43	---	17.55	19.40	19.46	19.54	19.26	---
24	17.86	17.75	20.96	23.15	20.33	---	17.62	19.42	19.35	19.80	19.28	---
25	17.78	17.73	21.45	23.03	20.34	---	17.59	19.32	19.36	19.44	19.41	---
26	17.81	17.77	21.43	23.02	20.40	17.94	17.70	19.31	19.22	19.38	19.38	---
27	17.87	17.79	22.73	23.01	20.42	17.83	17.66	19.35	19.20	19.67	19.34	---
28	17.88	17.75	23.75	23.02	20.30	17.81	18.09	19.38	19.28	19.85	19.33	---
29	17.79	17.78	23.06	22.80	---	17.94	18.15	19.36	19.36	19.43	19.28	---
30	17.82	17.79	23.01	22.91	---	17.84	18.09	19.34	19.27	19.08	19.35	---
31	17.85	---	22.93	22.76	---	17.75	---	19.32	---	19.15	19.34	---
MEAN	17.86	17.82	20.58	23.11	21.06	---	17.75	19.08	19.28	19.39	19.31	---
MAX	17.97	17.96	23.75	23.36	22.68	---	18.15	19.77	19.46	19.85	19.42	---
MIN	17.78	17.73	18.41	22.76	20.30	---	17.47	18.10	19.15	19.08	19.18	---

SQUARE BUTTE CREEK BASIN

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06342260 SQUARE BUTTE CREEK BELOW CENTER, ND

LOCATION.--Lat 47°03'25", long 101°11'35", in SE 1/4 sec.4, T.141 N., R.83 W., Oliver County, Hydrologic Unit 10130101, on right bank at southeast corner of farmyard, and 6 mi southeast of Center.

DRAINAGE AREA.--146 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1965 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,865 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Nelson Lake 1.5 mi upstream beginning Aug. 24, 1967, capacity 5,000 acre-ft. The capacity of Nelson Lake was increased to 10,000 acre-ft in Aug. 1975.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.5	2.1	1.5	e1.1	1.8	e1.7	1.5	1.5	1.7	1.5	1.9	1.7
2	e1.5	2.1	1.5	e1.2	1.8	e2.0	1.5	1.5	1.6	1.7	1.9	1.7
3	e1.5	2.1	1.5	e1.2	1.6	e3.5	1.4	1.5	1.5	1.5	1.9	1.7
4	e1.5	e2.0	1.5	e1.4	1.5	5.0	1.4	1.5	1.5	e1.5	1.8	1.7
5	e1.5	e1.9	1.5	e1.5	1.6	7.5	1.3	1.5	1.6	e1.5	35	1.7
6	e1.4	e1.9	1.5	e1.5	1.5	13	1.2	1.7	1.7	e1.7	64	1.7
7	e1.4	e1.8	1.5	e1.6	1.5	8.8	1.4	1.7	1.9	e1.8	64	1.7
8	e1.4	e1.8	1.5	e1.6	1.5	1.9	1.3	1.6	28	e12	64	1.7
9	1.4	e1.8	1.5	e1.6	1.5	1.3	1.3	1.7	4.5	e26	189	1.7
10	1.5	e1.8	1.5	e1.6	1.5	1.1	1.5	1.6	1.5	e31	242	1.6
11	1.5	e1.7	1.5	e1.6	1.5	1.1	1.5	1.6	1.5	e31	143	1.7
12	1.5	e1.7	1.5	e1.6	1.5	1.4	4.0	1.5	1.4	e31	222	1.7
13	1.5	e1.6	1.5	e1.6	1.5	1.3	11	1.6	1.3	e3.0	5.3	1.5
14	1.6	e1.6	1.5	e1.5	1.5	1.2	30	1.6	1.3	e1.7	2.1	1.5
15	1.7	e1.6	1.5	e1.5	1.5	1.3	30	1.5	1.3	e20	1.8	1.5
16	1.7	e1.5	1.5	e1.4	1.5	2.9	30	1.6	1.5	e480	1.8	1.5
17	1.7	e1.5	1.5	e1.4	e1.4	1.2	2.8	1.5	1.5	e185	1.8	1.5
18	1.6	1.5	1.5	e1.5	e1.4	1.2	1.5	1.5	1.5	e5.5	1.7	1.5
19	1.5	1.5	1.5	e1.5	e1.4	1.2	1.5	1.5	1.5	e3.5	1.7	1.5
20	1.5	1.5	1.5	e1.5	e1.3	1.2	1.3	1.6	1.5	e3.0	1.8	1.6
21	1.5	1.5	1.5	e1.6	e1.3	1.2	1.4	1.5	1.5	e2.7	1.8	1.7
22	1.5	1.5	1.4	1.7	e1.3	1.2	1.5	1.7	1.6	e970	1.8	1.5
23	1.5	1.5	1.4	1.7	e1.3	1.3	1.6	1.6	1.6	e770	1.9	1.6
24	1.5	1.5	e1.3	1.6	e1.3	1.4	1.6	1.6	1.6	247	1.8	1.6
25	1.8	1.5	e1.3	1.7	e1.3	11	1.4	1.5	1.5	751	1.9	1.5
26	2.1	1.5	e1.3	1.7	e1.4	30	1.5	1.6	1.5	1110	1.9	1.5
27	2.1	1.5	e1.2	1.6	e1.5	22	1.5	1.8	1.5	342	1.9	1.5
28	2.1	1.5	e1.2	e1.6	e1.6	1.6	1.5	1.7	1.5	199	1.9	1.5
29	2.1	1.5	e1.1	e1.5	---	1.5	1.5	1.7	1.9	122	1.9	1.5
30	2.1	1.5	e1.1	e1.6	---	1.5	1.5	1.8	1.6	54	1.9	1.5
31	2.1	---	e1.0	1.7	---	1.5	---	1.7	---	16	1.8	---
TOTAL	50.8	50.0	43.8	47.4	41.3	134.0	142.4	49.5	75.6	5427.6	1069.0	47.8
MEAN	1.64	1.67	1.41	1.53	1.47	4.32	4.75	1.60	2.52	175	34.5	1.59
MAX	2.1	2.1	1.5	1.7	1.8	30	30	1.8	28	1110	242	1.7
MIN	1.4	1.5	1.0	1.1	1.3	1.1	1.2	1.5	1.3	1.5	1.7	1.5
AC-FT	101	99	87	94	82	266	282	98	150	10770	2120	95

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1993, BY WATER YEAR (WY)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
MEAN	1.57	1.43	1.38	1.37	3.10	50.9	35.8	7.53	6.16	11.7	3.34	1.64
MAX	2.98	2.99	3.35	2.04	12.2	216	223	44.9	65.0	175	34.5	3.64
(WY)	1981	1983	1978	1983	1985	1987	1969	1970	1966	1993	1993	1980
MIN	.24	.19	.21	.20	.089	1.36	1.29	.79	.57	.71	.83	.35
(WY)	1968	1968	1968	1968	1966	1991	1991	1989	1989	1989	1982	1967

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1965 - 1993

ANNUAL TOTAL	738.5	7179.2	10.6
ANNUAL MEAN	2.02	19.7	30.0
HIGHEST ANNUAL MEAN			.86
LOWEST ANNUAL MEAN			1969
HIGHEST DAILY MEAN	58	Mar 7	2670
LOWEST DAILY MEAN	1.0	Dec 31	.00
ANNUAL SEVEN-DAY MINIMUM	1.2	Jan 13	.00
INSTANTANEOUS PEAK FLOW			9700
INSTANTANEOUS PEAK STAGE			14.35
INSTANTANEOUS LOW FLOW			.00
ANNUAL RUNOFF (AC-FT)	1460	14240	7660
10 PERCENT EXCEEDS	1.7	8.0	6.3
50 PERCENT EXCEEDS	1.5	1.5	1.5
90 PERCENT EXCEEDS	1.3	1.3	.90

e Estimated.

a Maximum recorded.

SQUARE BUTTE CREEK BASIN

06342260 SQUARE BUTTE CREEK BELOW CENTER, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 08...	1025	1.5	1820	--	4.0	8.0	--	--	--	--	--
NOV 16...	1445	1.5	1790	--	2.0	1.5	--	--	--	--	--
JAN 11...	1040	1.6	1860	--	-10.0	0.5	--	--	--	--	--
MAR 03...	0920	1.7	1380	--	1.0	2.5	--	--	--	--	--
MAR 15...	0940	1.5	1770	8.1	7.0	2.0	450	423	99	48	260
JUN 28...	1030	1.5	1760	--	17.0	17.0	--	--	--	--	--
JUL 23...	1235	526	1440	--	17.5	24.0	--	--	--	--	--
AUG 25...	1010	1.9	1770	8.1	24.5	21.5	420	408	92	46	260

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 15...	55	5	9.9	550	24	0.40	19	1270	1260	1.71	4.97
AUG 25...	57	6	8.3	540	20	0.40	18	1230	1210	1.65	6.21

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 15...	2	700	20	<1	50	350	0.1	2	<1	1200
AUG 25...	1	740	10	<1	50	140	<0.1	1	<1	1300

BURNT CREEK BASIN

287

06342450 BURNT CREEK NEAR BISMARCK, ND

LOCATION.--Lat 46°54'54", long 100°48'48", in SW¹/₄NW¹/₄SW¹/₄ sec.29, T.140 N., R.80 W., Burleigh County, Hydrologic Unit 10130101, on left bank on upstream side of county highway bridge, and 7 mi northwest of Bismarck.

DRAINAGE AREA.--108 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1967 to current year (seasonal records only since 1982).

GAGE.--Water-stage recorder. Elevation of gage is 1,690 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods of estimated daily discharge periods, which are fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge about 913 ft³/s, July 23, gage height, 12.17 ft; no flow for several months.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e.00	.00	3.8	2.9	3.8	8.9	16	e1.2
2	---	---	---	---	e.00	.00	2.4	2.0	4.2	11	13	e1.1
3	---	---	---	---	.00	.00	1.7	1.6	2.6	7.4	11	e.78
4	---	---	---	---	.00	.31	1.4	1.1	1.6	5.5	9.4	e.66
5	---	---	---	---	.00	15	1.2	.87	1.1	3.8	8.4	e.63
6	---	---	---	---	.00	29	1.0	.99	.93	2.8	7.2	e.62
7	---	---	---	---	.00	60	1.4	.75	.86	1.9	6.3	e.55
8	---	---	---	---	.00	98	1.6	.61	1.6	1.6	5.7	e.52
9	---	---	---	---	.00	51	1.7	.87	7.2	1.4	5.3	e.47
10	---	---	---	---	.00	27	1.9	1.9	12	1.4	4.5	e.45
11	---	---	---	---	.00	21	2.3	3.1	9.2	1.4	4.7	.43
12	---	---	---	---	.00	17	2.8	2.7	6.4	1.4	4.8	.39
13	---	---	---	---	.00	8.7	3.2	1.9	4.4	2.2	4.7	.36
14	---	---	---	---	.00	5.6	2.7	1.1	2.5	2.0	43	.36
15	---	---	---	---	.00	4.7	2.1	.70	1.6	e40	61	.38
16	---	---	---	---	.00	3.6	1.8	.44	1.2	e290	36	.33
17	---	---	---	---	.00	3.7	1.5	.26	.87	214	18	e.29
18	---	---	---	---	.00	3.8	1.1	.18	.60	60	11	e.32
19	---	---	---	---	.00	3.3	1.0	.12	.45	34	8.4	e.27
20	---	---	---	---	.00	2.5	1.2	.09	.35	23	6.6	e.28
21	---	---	---	---	.00	2.0	1.3	.07	.30	17	5.5	e.28
22	---	---	---	---	.00	1.9	1.1	.07	.25	239	4.2	e.27
23	---	---	---	---	.00	2.3	1.4	.07	.23	641	3.8	e.27
24	---	---	---	---	.00	29	2.0	.07	.31	172	3.5	e.25
25	---	---	---	---	.00	32	2.8	.05	.25	133	3.1	.18
26	---	---	---	---	.00	16	4.8	.03	.20	66	2.6	.20
27	---	---	---	---	.00	11	4.9	.10	.33	62	2.4	.20
28	---	---	---	---	.00	9.8	4.6	.07	.31	76	e2.1	.22
29	---	---	---	---	.00	9.1	4.0	.30	.75	53	e1.7	.22
30	---	---	---	---	.00	6.8	3.3	1.5	3.2	35	e1.6	.22
31	---	---	---	---	.00	5.0	---	1.9	---	23	e1.5	---
TOTAL	---	---	---	---	0.00	479.11	68.0	28.41	69.59	2230.7	317.0	12.70
MEAN	---	---	---	---	.000	15.5	2.27	.92	2.32	72.0	10.2	.42
MAX	---	---	---	---	.00	98	4.9	3.1	12	641	61	1.2
MIN	---	---	---	---	.00	.00	1.0	.03	.20	1.4	1.5	.18
AC-FT	---	---	---	---	.00	950	135	56	138	4420	629	25

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1993, BY WATER YEAR (WY)

	1968	1968	1968	1968	1968	1968	1968	1968	1968	1968	1968	1968
MEAN	.31	.26	.10	.054	7.15	34.9	32.4	3.60	2.27	3.46	.69	.28
MAX	1.97	1.19	.66	.45	39.6	170	256	9.36	13.6	72.0	10.2	3.45
(WY)	1981	1981	1978	1979	1992	1987	1969	1975	1971	1993	1993	1978
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1968	1968	1968	1968	1968	1990	1990	1990	1977	1973	1972	1970

SUMMARY STATISTICS

WATER YEARS 1968 - 1993

ANNUAL MEAN	a7.57
HIGHEST ANNUAL MEAN	a22.2 1969
LOWEST ANNUAL MEAN	a.55 1977
HIGHEST DAILY MEAN	3900 Apr 18 1979
LOWEST DAILY MEAN	.00 Oct 1 1967
ANNUAL SEVEN-DAY MINIMUM	.00 Oct 1 1967
INSTANTANEOUS PEAK FLOW	b10000 Apr 18 1979
INSTANTANEOUS PEAK STAGE	16.93 Apr 18 1979
ANNUAL RUNOFF (AC-FT)	a5490
10 PERCENT EXCEEDS	7.0
50 PERCENT EXCEEDS	.04
90 PERCENT EXCEEDS	.00

e Estimated.

a Based on complete water years only (1968-81).

b From rating curve extended above 2,200 ft³/s, on basis of culvert and flow-over-road indirect measurement of peak flow at U.S. Highway No. 83.

BURNT CREEK BASIN

06342450 BURNT CREEK NEAR BISMARCK, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR 11...	1140	28	291	8.0	1.0	0.5	100	113	18	14	18
MAY 03...	1430	1.5	968	8.3	23.0	15.5	350	365	58	50	95
JUN 08...	0930	1.3	1060	--	19.0	14.0	--	--	--	--	--
JUL 14...	1515	2.0	1110	--	21.0	17.0	--	--	--	--	--
AUG 23...	1415	3.8	970	8.2	25.0	23.0	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 11...	25	0.8	11	43	1.8	0.10	7.8	182	198	0.27	14.9
MAY 03...	36	2	7.9	190	7.6	0.20	3.9	632	629	0.86	2.56

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 11...	2	50	190	<1	20	40	<0.1	<1	2	200
MAY 03...	1	130	10	<1	70	10	<0.1	<1	<1	550

06342500 MISSOURI RIVER AT BISMARCK, ND

LOCATION.--Lat 46°48'51", long 100°49'12", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.31, T.139 N., R.80 W., Burleigh County, Hydrologic Unit 10130101, on left bank 40 ft upstream from Bismarck City waterplant, 2,100 ft downstream from Burlington Northern Railway bridge, 1.6 mi northwest of Bismarck Post Office, 3.5 mi upstream from Heart River, and at mi 1,314.5.

DRAINAGE AREA.--186,400 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October to November 1927, April 1928 to current year. See WSP 1729 or 1917 for history of data prior to April 1928.

GAGE.--Water-stage recorder. Datum of gage is 1,618.28 ft above sea level, revised. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1937.

REMARKS.--Records good except those for period of estimated daily discharges, which are fair. Flow regulated by Lake Sakakawea (station 06338000) 75.4 mi upstream since November 1953.

EXTREMES SINCE COMPLETION OF GARRISON DAM.--Since completion of Garrison Dam in 1953, maximum discharge, 68,900 ft³/s, July 13, 1975, gage height, 14.24 ft; maximum gage height, 14.58 ft, Dec. 18, 1979; backwater from ice.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 31.6 ft, Mar. 31, 1881, present site and datum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11200	11100	12300	e18900	e18900	e12000	e10000	12100	17300	17100	17000	17500
2	11100	11100	14600	e19000	e18000	e11800	e9800	12000	16700	17600	17700	17400
3	10800	11000	17100	e18800	e17000	e11000	e9700	12300	16600	17600	17600	16600
4	11300	10900	18700	e18900	e16000	e10000	e10200	13200	16800	18000	17800	17400
5	11000	10900	19100	e19000	e16200	e10200	e9800	11900	16700	18100	17400	17400
6	10900	10600	19900	e19100	e15500	e10500	e10000	12200	16800	17900	18000	17700
7	10900	11200	19600	e19200	e15000	e11800	e10300	12300	16900	17600	17400	17400
8	10800	10800	19800	e18500	e14500	e12000	e10500	12800	17500	17800	17500	16800
9	11400	11000	19700	e18500	e14200	e11800	10300	12600	17500	17800	17700	13300
10	10900	11400	19500	e18700	e13800	e11000	10200	14000	17000	17800	17600	11300
11	10800	10800	19500	e19200	e14200	e11100	11000	15100	16800	17700	17900	11000
12	11000	10700	19400	e19700	e14500	e11200	10800	17700	17200	17600	17800	11100
13	11000	10900	19500	e19800	e14500	e11000	10700	19200	17000	17300	17400	11100
14	10900	11000	20000	e20000	e14500	e10900	10500	18600	17100	17800	18100	11500
15	11100	10700	e19500	e20200	e15000	e10500	10600	18000	17000	18600	18800	11100
16	10900	11200	e19300	e20000	e14500	e10200	10700	18000	16900	21900	17400	11500
17	10700	11400	e19000	e19500	e14500	e10800	11300	18400	16800	20800	17600	11000
18	11200	10900	e19000	e19000	e14500	e10100	9740	18900	17000	18100	17500	11100
19	10900	11000	e19000	e19200	e13000	e10100	10100	18100	16900	17400	17400	11200
20	11200	11000	e19000	e19200	e13100	e10200	10600	17400	15500	17600	18100	11200
21	10600	10800	e18500	e19500	e12900	e10400	10000	16900	17600	17600	17600	10900
22	11000	10900	e18700	e19800	e12700	e10300	10200	17000	16400	20100	17300	11400
23	10900	10700	e18900	e19900	e12200	e10100	10100	17000	18200	24900	17200	11400
24	10900	10800	e18000	e20000	e11900	e10200	9990	17900	17600	25700	17200	11300
25	10900	10800	e17900	e19500	e12000	e10100	10100	17000	17300	23800	18100	11700
26	10800	10700	e17900	e19800	e12300	e10000	10100	17100	17600	22500	17800	10700
27	11000	11000	e18900	e19900	e12500	e10000	10600	17100	16200	22100	17800	11200
28	11400	10700	e19000	e20000	e11800	e10200	10900	17200	16900	22400	17300	11200
29	10800	11100	e18800	e19500	---	e10300	12100	17300	17600	20800	17600	11300
30	10700	10700	e18900	e19000	---	e10600	11800	17600	17300	18300	17500	11300
31	11000	---	e19000	e18000	---	e10400	---	16900	---	17100	18000	---
TOTAL	340000	327800	578000	599300	399700	330800	312730	493800	510700	597400	547100	387000
MEAN	10970	10930	18650	19330	14270	10670	10420	15930	17020	19270	17650	12900
MAX	11400	11400	20000	20200	18900	12000	12100	19200	18200	25700	18800	17700
MIN	10600	10600	12300	18000	11800	10000	9700	11900	15500	17100	17000	10700
AC-FT	674400	650200	1146000	1189000	792800	656100	620300	979500	1013000	1185000	1085000	767600

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1993, BY WATER YEAR (WY)

	MEAN	21010	21170	21000	23170	25570	23310	21870	22690	23940	24880	24420	21250
MAX	35080	35040	31690	32350	34840	34370	40370	42030	43540	64610	57010	39700	
(WY)	1969	1979	1970	1969	1969	1972	1972	1972	1975	1975	1975	1975	
MIN	8399	8155	7890	6519	5883	6317	10420	9234	8445	10840	9271	8121	
(WY)	1963	1963	1955	1955	1956	1955	1993	1963	1960	1960	1962	1962	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1954 - 1993

ANNUAL TOTAL	6482500												
ANNUAL MEAN	17710												
HIGHEST ANNUAL MEAN										22840			
LOWEST ANNUAL MEAN										35630			1975
HIGHEST DAILY MEAN				24000	Jan 17		25700	Jul 24		14320			1960
LOWEST DAILY MEAN				10200	Sep 25		9700	Apr 3		68800		Jul 13 1975	
ANNUAL SEVEN-DAY MINIMUM				10800	Sep 21		9970	Apr 1		4000		Mar 25 1955	
INSTANTANEOUS PEAK FLOW							26000	Jul 24		4860		Mar 21 1955	
INSTANTANEOUS PEAK STAGE							a12.84	Dec 29		500000		Apr 6 1952	
ANNUAL RUNOFF (AC-FT)	12860000						10760000			27.90		Apr 6 1952	
10 PERCENT EXCEEDS	21500						19200			16550000			
50 PERCENT EXCEEDS	19100						16200			33700			
90 PERCENT EXCEEDS	10900						10500			22000			
										11600			

e Estimated.

a Backwater from ice.

MISSOURI RIVER MAIN STEM

06342500 MISSOURI RIVER AT BISMARCK, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
APR 21...	1115	10400	700	8.3	11.0	5.0	240	181	58	24	58
SEP 27...	1245	11000	677	8.4	13.0	12.5	220	168	50	22	52

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 21...	34	2	3.6	180	12	0.40	6.2	452	454	0.62	12700
SEP 27...	34	2	4.3	170	11	0.50	5.9	417	428	0.58	12700

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 21...	1	120	10	<1	50	10	<0.1	2	<1	600
SEP 27...	2	110	10	<1	40	10	0.1	4	<1	460

HEART RIVER BASIN

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06343000 HEART RIVER NEAR SOUTH HEART, ND

LOCATION.--Lat 46°51'56", long 102°56'53", in NE¹/₄SE¹/₄SW¹/₄ sec.8, T.139 N., R.97 W., Stark County,
Hydrologic Unit 10130202, on left bank 1.7 mi downstream from North Creek, 2 mi east of South Heart,
and 5.5 mi upstream from Edward Arthur Patterson Lake.

DRAINAGE AREA.--315 mi².

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR 10...	0945	22	500	8.0	0.0	0.5	--	--	--	--	--
a25...	1045	3.7	932	8.2	22.0	4.5	96	208	20	11	170

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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 AS SIO2) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L AS (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR a25...	78	8	6.4	270	6.4	0.30	8.2	618	615	0.84	6.16

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR a25...	3	110	50	<1	10	100	0.1	1	<1	310

a Replicate sample also collected for quality-assurance purposes.

HEART RIVER BASIN

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND

LOCATION.--Lat 46°52'11", long 102°49'37", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.8, T.139 N., R.96 W., Stark County, Hydrologic Unit 10130202, at left edge of spillway, and 2 mi southwest of Dickinson.

DRAINAGE AREA.--400 mi², approximately.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--May 1950 to current year. Prior to October 1958, published as Dickinson Reservoir near Dickinson.

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by Bureau of Reclamation). Prior to Jan. 4, 1961, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth-fill dam; storage began May 23, 1950; dam completed Aug. 9, 1950. Total capacity is 24,600 acre-ft at maximum pool, elevation, 2,428.9 ft. Dead storage is 1,000 acre-ft below lowest point of outlet, elevation, 2,404.0 ft. Conservation storage is 9,100 acre-ft between elevations 2,404.0 ft and 2,420.0 ft, crest of spillway. The crest of the spillway was raised 3.5 ft in 1981 from 2,416.5 ft. Figures given herein represent total contents based on capacity table dated Jan. 1, 1965. The reservoir is for flood control, irrigation, and municipal supply.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 11,590 acre-ft, June 9, 1982, elevation, 2,421.13 ft; minimum since initial filling of reservoir, 2,080 acre-ft, Feb. 8, 1993, elevation, 2,408.08 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents 7,400 acre-ft, Aug. 15, elevation, 2,417.34 ft; minimum, 2,080 acre-ft, Feb. 8, elevation 2,408.08 ft.

MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	2,408.47	2,220	--
Oct. 31-----	2,408.09	2,080	-140
Nov. 30-----	2,408.16	2,110	+30
Dec. 31-----	2,408.21	2,120	+10
CAL YR 1992-----	--	--	-620
Jan. 31-----	2,408.27	2,150	+30
Feb. 28-----	2,408.10	2,080	-70
Mar. 31-----	2,413.74	4,740	+2,660
Apr. 30-----	2,414.19	5,020	+280
May 31-----	2,414.19	5,020	0
June 30-----	2,415.30	5,760	+740
July 31-----	2,417.22	7,290	+1,530
Aug. 31-----	2,417.09	7,170	-120
Sept. 30-----	2,416.44	6,630	-540
WTR YR 1993-----	--	--	+4,410

HEART RIVER BASIN

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06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971, 1975, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 29...	1055	1.0	1.3	2350	8.5	280	408	42	42
FEB 10...	0955	1.0	1.3	2900	8.2	350	531	58	50
JUN 24...	0915	0.50	1.0	1220	8.1	190	241	37	23
AUG 26...	0820	0.50	1.0	1200	8.2	200	262	43	23

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
OCT 29...	450	77	12	14	770	18	0.60	3.1	1650
FEB 10...	560	77	13	18	980	25	0.60	7.9	2050
JUN 24...	190	67	6	9.8	380	10	0.30	0.40	822
AUG 26...	190	66	6	10	350	10	0.40	6.2	802

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BORON, DIS- SOLVED (UG/L AS B) (01020)
OCT 29...	1590	2.24	0.130	0.030	0.160	0.590	0.140	0.090	520
FEB 10...	2020	2.79	0.140	0.010	0.150	0.170	0.030	0.020	600
JUN 24...	795	1.12	--	<0.010	<0.050	0.100	0.040	0.020	280
AUG 26...	792	1.09	0.190	0.050	0.240	0.390	0.140	0.120	290

HEART RIVER BASIN

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT								
29...	1050	7.3	--	0.0	2270	8.6	6.5	9.5
29...	1051	--	--	1.60	2270	8.6	6.5	9.4
29...	1052	--	--	3.30	2270	8.6	6.5	9.4
29...	1053	--	--	6.60	2270	8.6	6.5	9.4
FEB								
10...	0944	11.8	0.0	--	2780	8.3	0.5	12.9
10...	0945	--	0.50	--	2800	8.2	1.0	7.3
10...	0946	--	1.0	--	2800	8.1	1.0	6.9
10...	0947	--	2.0	--	2790	8.1	1.5	1.2
10...	0950	--	3.6	--	2930	7.9	2.0	0.2
JUN								
24...	0905	13.1	0.0	--	1230	8.2	17.5	8.7
24...	0906	--	0.50	--	1230	8.2	17.5	8.6
24...	0907	--	1.0	--	1230	8.2	17.5	8.6
24...	0908	--	2.0	--	1230	8.2	17.5	8.5
24...	0909	--	4.0	--	1230	8.2	17.5	8.5
AUG								
26...	0810	--	0.0	--	1210	8.1	20.0	8.2
26...	0811	--	0.50	--	1210	8.1	20.0	8.1
26...	0812	--	1.0	--	1210	8.1	20.0	8.1
26...	0813	--	2.0	--	1210	8.2	20.0	8.0
26...	0814	--	4.0	--	1210	8.2	20.0	8.0
26...	0815	--	6.0	--	1220	8.2	19.5	8.1
26...	0816	--	6.8	--	1220	8.2	19.5	8.2

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
29...	85	700	--	12.0	6.0	120	12
FEB							
10...	98	702	1.70	18.0	-10.0	30	6.0
JUN							
24...	100	693	--	26.0	13.0	240	13
AUG							
26...	98	700	--	34.8	14.0	255	<5.0

HEART RIVER BASIN

295

06344300 HEART RIVER AT DICKINSON, ND

LOCATION.--Lat 46°51'56", long 102°44'10", in SW¹/₄NW¹/₄SE¹/₄ sec.12, T.139 N., R.96 W., Stark County, Hydrologic Unit 10130202, on left bank near the southeast corner of Dickinson sewage lagoon cell No. 3, 1.9 mi southeast of Dickinson, and 9.5 mi downstream from Edward Arthur Patterson Lake.

DRAINAGE AREA.--440 mi², approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,360 ft above sea level, from topographic map.

REMARKS.--Records fair except for periods of estimated daily discharges, which are poor. Flow regulated by Edward Arthur Patterson Lake (station 06343500) 10 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.6	2.7	1.7	1.4	e2.5	e1.9	1.9	1.8	2.5	2.9	1.3	3.8
2	e1.5	3.2	1.6	1.4	e4.0	e1.9	1.3	1.8	3.9	2.6	1.5	3.8
3	e2.3	3.0	1.6	1.5	e4.5	e2.0	1.4	2.0	2.9	26	1.6	4.5
4	e10.6	1.7	1.6	1.5	e3.7	e2.2	1.3	1.9	2.1	13	1.4	4.4
5	e12.0	2.0	1.6	1.5	e3.5	e3.0	1.2	1.7	2.1	8.4	1.8	4.9
6	e22.6	1.9	1.6	1.5	e3.4	e5.0	1.3	2.2	7.7	3.7	1.5	5.3
7	e4.7	1.8	1.6	1.5	e3.5	e10	1.2	8.4	30	7.8	1.4	4.8
8	3.6	1.9	1.6	1.5	e3.1	e4.0	1.2	3.7	76	5.0	1.5	4.2
9	3.3	2.7	1.5	1.5	e2.7	e3.7	1.1	2.5	8.9	2.8	1.9	3.7
10	2.6	4.1	1.5	1.5	e2.3	e3.0	11	2.3	2.8	10	1.6	3.1
11	3.5	2.4	1.5	1.5	e2.0	2.3	4.6	2.1	2.5	3.3	1.9	3.4
12	3.8	1.9	1.6	1.5	e1.9	2.1	1.8	2.1	1.5	2.0	1.9	3.7
13	3.0	1.5	1.6	1.5	e1.8	1.9	1.5	2.1	1.2	3.4	1.9	3.7
14	2.6	1.6	1.6	1.5	e1.8	1.8	1.4	1.9	1.2	3.5	3.6	3.5
15	2.5	1.7	1.6	1.5	e1.8	2.0	1.3	1.7	1.1	2.5	3.6	3.8
16	2.4	1.7	1.5	1.5	e1.7	1.8	1.4	1.6	1.3	4.3	2.2	4.1
17	2.1	1.7	1.5	1.5	e1.6	1.5	1.3	1.9	1.4	5.7	2.1	3.9
18	1.6	1.8	1.5	1.5	e1.5	1.5	1.3	2.6	1.3	2.3	2.1	3.5
19	1.6	1.7	1.5	1.5	e1.6	1.4	11	2.7	1.3	1.7	1.8	3.9
20	1.5	1.7	1.5	1.5	e1.9	1.3	9.7	3.0	1.2	1.4	1.7	4.2
21	1.5	1.7	1.5	1.6	e2.1	1.3	3.1	2.7	1.2	1.3	2.0	4.2
22	1.5	1.6	1.5	1.6	e2.0	1.2	2.0	3.6	1.2	1.4	2.5	3.8
23	1.5	1.6	1.5	1.5	e1.9	1.3	9.2	3.2	1.1	2.1	5.7	3.3
24	1.7	1.7	e1.5	1.5	e1.8	1.3	7.0	2.8	3.6	2.7	3.7	3.5
25	2.0	1.7	1.5	1.5	e1.8	1.3	2.4	2.5	2.0	13	2.6	3.7
26	2.1	1.6	1.5	1.5	e1.8	1.2	1.8	2.3	1.3	14	2.2	3.8
27	2.2	1.6	e1.5	1.7	e1.9	1.3	1.9	2.8	1.1	9.4	3.3	3.9
28	2.0	1.6	1.5	1.6	e1.9	1.2	1.9	2.3	.96	3.5	3.9	3.7
29	2.0	1.7	1.5	e1.6	---	1.2	2.0	2.3	23	1.7	3.1	3.9
30	2.1	1.6	1.5	1.6	---	1.9	2.0	16	14	1.4	3.8	4.2
31	2.3	---	1.4	e1.8	---	4.6	---	3.7	---	1.3	4.2	---
TOTAL	110.3	59.1	47.7	47.3	66.0	72.1	91.5	94.2	202.36	164.1	75.3	118.2
MEAN	3.56	1.97	1.54	1.53	2.36	2.33	3.05	3.04	6.75	5.29	2.43	3.94
MAX	23	4.1	1.7	1.8	4.5	10	11	16	76	26	5.7	5.3
MIN	1.5	1.5	1.4	1.4	1.5	1.2	1.1	1.6	.96	1.3	1.3	3.1
AC-FT	219	117	95	94	131	143	181	187	401	325	149	234

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1993, BY WATER YEAR (WY)

	4.79	3.09	2.58	2.14	4.89	52.0	43.7	12.3	22.4	29.1	3.45	5.31
MEAN	4.79	3.09	2.58	2.14	4.89	52.0	43.7	12.3	22.4	29.1	3.45	5.31
MAX	20.7	6.60	6.41	3.28	16.2	414	377	57.8	163	256	6.71	29.0
(WY)	1987	1984	1987	1984	1987	1986	1987	1984	1984	1986	1984	1986
MIN	1.51	1.56	1.40	1.53	1.25	1.78	1.80	1.99	2.57	1.39	1.54	1.38
(WY)	1991	1991	1991	1993	1989	1990	1992	1992	1988	1991	1990	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1984 - 1993

ANNUAL TOTAL	934.76	1148.16	
ANNUAL MEAN	2.55	3.15	14.8
HIGHEST ANNUAL MEAN			67.1
LOWEST ANNUAL MEAN			2.34
HIGHEST DAILY MEAN	37 Jun 14	76 Jun 8	3000 Mar 3 1986
LOWEST DAILY MEAN	.89 Aug 3	.96 Jun 28	.10 Mar 27 1984
ANNUAL SEVEN-DAY MINIMUM	1.0 Jul 29	1.2 Apr 3	.50 Mar 22 1984
INSTANTANEOUS PEAK FLOW		169 Jun 8	3500 Mar 3 1986
INSTANTANEOUS PEAK STAGE		5.11 Jun 8	a10.93 Mar 1 1986
ANNUAL RUNOFF (AC-FT)	1850	2280	10700
10 PERCENT EXCEEDS	3.3	4.5	10
50 PERCENT EXCEEDS	1.8	1.9	2.2
90 PERCENT EXCEEDS	1.5	1.4	1.4

e Estimated.

a Backwater from ice.

HEART RIVER BASIN

06344300 HEART RIVER AT DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 07...	1120	5.0	2100	--	--	5.0	9.5	--	--	--	--
NOV 18...	0755	1.7	2450	--	--	-0.5	2.0	--	--	--	--
JAN 06...	1200	1.5	2750	--	--	-15.0	0.5	--	--	--	--
FEB 24...	1100	1.8	2420	--	--	-20.0	0.5	--	--	--	--
MAR 10...	0830	3.4	1120	7.9	--	-3.0	1.0	210	229	47	23
MAR 25...	0850	1.3	--	--	--	13.5	3.5	--	--	--	--
JUN 04...	0908	2.4	1340	--	--	14.5	15.5	--	--	--	--
AUG 06...	1050	1.6	2080	--	--	22.0	18.5	--	--	--	--
SEP 10...	1034	3.8	1880	--	7.9	16.0	14.0	360	457	71	45
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 10...	150	59	4	9.5	280	33	0.20	7.7	689	719	0.98
SEP 10...	330	66	8	11	610	56	0.50	13	1410	1450	1.97
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 10...	6.58	2	140	140	<1	20	310	<0.1	1	<1	460
SEP 10...	14.7	1	400	20	<1	50	10	<0.1	3	<1	770

HEART RIVER BASIN

297

06344600 GREEN RIVER NEAR NEW HRADEC, ND

LOCATION.--Lat 47°01'40", long 103°03'10", on line between secs.13 and 14, T.141 N., R.98 W., Billings County,
Hydrologic Unit 10130202, on left bank above county highway bridge, and 8 mi west of New Hradec.

DRAINAGE AREA.--152 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,510 ft above sea level, from topographic map.

REMARKS--Records fair except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.27	.27	e.00	e.00	e.00	2.1	1.7	e.81	e8.0	14	.20
2	.00	.28	.27	e.00	e.00	e.10	1.7	1.5	.84	e20	9.6	.21
3	.00	.31	.23	e.00	e.00	e3.0	1.6	1.2	.67	e25	6.7	.22
4	.00	.27	.21	e.00	e.00	e30	1.6	.96	.64	e22	4.9	.21
5	.00	.30	.19	e.00	e.00	e100	1.3	e.60	.70	e20	3.4	.22
6	.00	.28	.17	e.00	e.00	e150	1.2	e1.0	.83	e17	2.5	.21
7	.00	.31	.15	e.00	e.00	e140	1.2	e8.0	1.4	e15	3.1	.20
8	.00	.33	.16	e.00	e.00	e60	1.0	e5.0	13	e15	1.8	.14
9	.00	.41	.16	e.00	e.00	40	.91	e2.5	38	e17	1.4	.20
10	.00	.42	.18	e.00	e.00	16	1.3	e2.0	26	e20	1.0	.30
11	.00	.38	.18	e.00	e.00	11	1.1	e1.7	16	e30	.88	.18
12	.00	.38	e.17	e.00	e.00	7.9	1.6	e1.5	11	e50	.68	.05
13	.00	.36	e.16	e.00	e.00	6.6	1.5	e1.3	8.5	e40	.51	.02
14	.00	.30	e.15	e.00	e.00	4.0	1.7	e1.1	6.5	e30	.38	.03
15	.01	.28	e.16	e.00	e.00	3.3	1.5	e1.0	5.1	e27	.30	.02
16	.03	.27	e.15	e.00	e.00	2.9	1.7	e1.0	3.8	e25	.34	.02
17	.06	.25	e.16	e.00	e.00	2.0	1.8	e.95	e3.0	e22	.32	.06
18	.11	.29	e.14	e.00	e.00	1.6	1.2	e.92	e2.0	e18	.28	.07
19	.13	.30	e.11	e.00	e.00	1.9	1.7	e.90	e1.5	e14	.30	.13
20	.14	.32	e.10	e.00	e.00	2.1	1.7	e.90	e1.3	e10	.25	.13
21	.15	.35	e.10	e.00	e.00	2.1	2.1	e.86	e1.1	e100	.28	.12
22	.15	.32	e.10	e.00	e.00	2.0	3.0	e.84	e.90	e80	e.25	.13
23	.16	.32	e.11	e.00	e.00	2.4	3.9	e.80	e.80	e60	e.22	.11
24	.21	.31	e.11	e.00	e.00	3.1	5.3	e.75	e.70	e50	e.19	.15
25	.19	.29	e.10	e.00	e.00	3.3	6.7	e.70	e.60	e40	.16	.22
26	.17	.28	e.07	e.00	e.00	3.8	5.6	e.72	e.50	e60	.15	.16
27	.16	.28	e.05	e.00	e.00	3.9	4.9	e.74	e.45	e100	.20	.15
28	.15	.27	e.03	e.00	e.00	3.5	3.5	e.75	e.40	e170	.15	.20
29	.14	.25	e.02	e.00	---	2.9	2.7	e.80	e2.5	133	.11	.18
30	.18	.25	e.01	e.00	---	2.8	1.9	e1.2	e10	46	.17	.19
31	.22	---	e.00	e.00	---	2.6	---	e1.0	---	25	.20	---
TOTAL	2.36	9.23	4.17	0.00	0.00	614.80	69.01	44.89	159.54	1309.0	54.72	4.43
MEAN	.076	.31	.13	.000	.000	19.8	2.30	1.45	5.32	42.2	1.77	.15
MAX	.22	.42	.27	.00	.00	150	6.7	8.0	38	170	14	.30
MIN	.00	.25	.00	.00	.00	.00	.91	.60	.40	8.0	.11	.02
AC-FT	4.7	18	8.3	.00	.00	1220	137	89	316	2600	109	8.8

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1993, BY WATER YEAR (WY)

	MEAN	3.64	1.58	.96	1.49	8.33	59.6	44.6	19.2	20.5	13.8	3.42	1.97
MAX	47.7	8.89	2.74	14.3	67.4	323	314	141	101	123	29.5	21.1	
(WY)	1983	1983	1978	1974	1983	1972	1975	1970	1970	1964	1981	1986	
MIN	.076	.31	.13	.000	.000	.33	.71	.60	.067	.000	.000	.010	
(WY)	1993	1993	1993	1993	1993	1964	1990	1992	1988	1988	1988	1990	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1964 - 1993
ANNUAL TOTAL	237.81	2272.15	
ANNUAL MEAN	.65	6.23	14.9
HIGHEST ANNUAL MEAN			35.9
LOWEST ANNUAL MEAN			.74
HIGHEST DAILY MEAN	11 Feb 5	170 Jul 28	2700 Mar 13 1972
LOWEST DAILY MEAN	.00 Jul 25	.00 Oct 1	.00 May 25 1964
ANNUAL SEVEN-DAY MINIMUM	.00 Jul 25	.00 Oct 1	.00 May 31 1964
INSTANTANEOUS PEAK FLOW		270 Mar 6	4120 May 9 1970
INSTANTANEOUS PEAK STAGE		a9.45 Mar 6	a17.60 Mar 22 1978
ANNUAL RUNOFF (AC-FT)	472	4510	10780
10 PERCENT EXCEEDS	1.6	15	14
50 PERCENT EXCEEDS	.25	.30	1.1
90 PERCENT EXCEEDS	.00	.00	.15

e Estimated.

a Backwater from ice.

HEART RIVER BASIN

06344600 GREEN RIVER NEAR NEW HRADEC, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 18...	0850	0.30	1410	--	0.0	1.0	--	--	--	--	--
MAR 10...	1520	20	330	7.7	0.0	0.5	59	88	13	6.5	41
MAR 25...	1410	3.8	--	--	21.0	4.0	--	--	--	--	--
JUN 01...	1655	0.80	1750	--	12.0	14.0	--	--	--	--	--
JUL 28...	1720	204	455	--	29.0	19.0	--	--	--	--	--
SEP 09...	1710	0.10	630	8.2	17.0	16.0	140	260	29	17	94

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 10...	56	2	8.4	70	3.0	0.10	14	209	197	0.27	10.9
SEP 09...	57	3	10	110	4.2	0.20	9.9	431	456	0.62	0.12

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 10...	1	130	360	<1	10	60	0.1	<1	<1	140
SEP 09...	2	240	10	<1	10	<10	<0.1	1	1	220

LOCATION.--Lat 46°44'46", long 102°18'27", in NE¹/₄ sec.29, T.138 N., R.92 W., Stark County, Hydrologic Unit 10130202, on right bank 5 ft upstream from bridge on State Highway 8, 0.5 mi downstream from Plum Creek, and 9.5 mi south of Richardson.

WATER-DISCHARGE RECORDS

REVISED RECORDS (WATER YEARS).--WSP 1209: Drainage area. WSP 1239: 1906, 1918(M), 1947(M).

REMARKS.--Records poor. Flow is regulated by E.A. Patterson Lake (station 06343500) 85 river miles upstream since 1950. Some diversions for irrigation and water supply at low flow.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 5, 1938, reached a stage of about 26 ft, from information by local residents, discharge, 16,000 ft³/s; flood of Mar. 25, 1943, reached a stage of 24.2 ft from floodmarks, discharge, 11,700 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.2	e5.6	6.9	e1.4	e3.5	e3.4	e24	12	e10	39	125	e5.1
2	e3.0	e5.0	6.6	e1.4	e3.8	e3.7	e23	12	e9.0	71	100	e5.0
3	e2.0	e4.6	6.6	e1.5	e4.2	e4.0	e22	12	e11	61	69	e5.0
4	e3.0	e5.0	6.3	e1.5	e4.5	e5.0	e20	11	e13	40	49	e5.1
5	e4.0	e5.8	5.9	e1.5	e5.0	e20	e19	9.6	e13	68	38	e5.1
6	e3.0	e6.6	5.9	e1.4	e5.4	e150	e18	36	e14	179	29	e5.1
7	e3.5	e6.4	5.8	e1.4	e5.4	e650	e17	124	e30	121	23	e5.0
8	e4.0	e6.8	5.7	e1.4	e5.4	e400	e16	57	e50	82	19	e5.0
9	12	e7.2	5.6	e1.3	e5.2	e300	e18	29	e90	66	16	e5.0
10	7.9	e7.4	e5.2	e1.3	e5.0	e200	e20	21	e70	86	14	e5.0
11	6.7	e7.2	e4.8	e1.3	e4.4	e140	e19	17	e55	94	12	e5.1
12	5.8	e6.6	e4.6	e1.4	e4.0	e100	e19	12	e50	92	11	e5.0
13	5.7	e6.8	e4.3	e1.4	e3.7	e80	e18	9.1	e48	80	11	e5.0
14	5.5	e8.0	e4.0	e1.5	e3.2	e75	e18	7.1	e44	61	11	e5.1
15	5.3	e7.8	e3.7	e1.7	e3.0	e70	e17	5.9	e38	55	11	e5.1
16	e5.2	e7.6	e3.5	e1.9	e2.9	e60	e16	e5.5	e36	52	10	e5.0
17	e4.8	7.1	e3.1	e2.2	e2.8	e55	e15	e5.0	33	43	9.1	e4.9
18	e5.0	7.1	e2.8	e2.5	e3.0	e50	e14	e4.6	28	39	e8.0	e4.8
19	e5.3	6.9	e2.6	e2.8	e3.5	e45	16	e4.3	25	35	e7.5	e4.8
20	e5.2	6.8	e2.4	e3.2	e4.1	e40	16	e4.2	22	31	e7.0	e4.8
21	e5.2	6.8	e2.1	e3.0	e4.0	e35	17	e4.1	20	26	e6.8	e5.0
22	e5.3	6.4	e1.9	e2.9	e3.9	e30	21	e4.0	17	66	e6.4	e5.2
23	e5.2	7.1	e1.7	e3.0	e3.2	e32	33	e4.0	15	198	e6.0	e5.2
24	e4.8	7.1	e1.6	e3.3	e2.9	e35	34	e4.0	14	86	e5.6	e5.3
25	e4.5	7.0	e1.5	e3.4	e2.9	e40	34	e4.1	13	59	e5.4	e5.2
26	e4.5	6.3	e1.4	e3.1	e2.9	e35	28	e4.4	16	48	e5.2	e5.2
27	e4.3	6.7	e1.4	e2.7	e3.0	e33	28	e4.8	23	54	e5.1	e5.2
28	e4.0	6.8	e1.3	e2.7	e3.2	e30	20	e5.2	33	49	e5.2	e5.1
29	e4.0	6.8	e1.3	e2.7	---	e29	15	e5.6	50	45	e5.3	e5.0
30	e5.0	6.2	e1.3	e2.8	---	e28	13	e9.0	46	38	e5.2	e5.0
31	e5.6	---	e1.3	e3.1	---	e26	---	e13	---	36	e5.2	---
TOTAL	152.5	199.5	113.1	66.7	108.0	2804.1	608	460.5	936.0	2100	641.0	151.4
MEAN	4.92	6.65	3.65	2.15	3.86	90.5	20.3	14.9	31.2	67.7	20.7	5.05
MAX	12	8.0	6.9	3.4	5.4	650	34	124	90	198	125	5.3
MIN	2.0	4.6	1.3	1.3	2.8	3.4	13	4.0	9.0	26	5.1	4.8
AC-FT	302	396	224	132	214	5560	1210	913	1860	4170	1270	308

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1993, BY WATER YEAR (WY)

MEAN	15.9	13.0	8.47	8.90	45.7	368	342	104	167	69.5	27.0	11.4
MAX	240	114	52.5	112	643	2125	2160	1318	1225	584	401	86.4
(WY)	1983	1983	1983	1973	1982	1945	1950	1970	1906	1969	1909	1986
MIN	.10	1.93	1.00	.000	.000	1.66	5.77	2.78	.37	.40	.000	.000
(WY)	1961	1961	1920	1962	1950	1964	1905	1992	1961	1919	1991	1958

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1903 - 1993
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ANNUAL TOTAL	2465.42		8340.8			
ANNUAL MEAN	6.74		22.9		99.3	
HIGHEST ANNUAL MEAN					316	1982
LOWEST ANNUAL MEAN					5.18	1961
HIGHEST DAILY MEAN	50	Jun 15	650	Mar 7	17000	Apr 17 1950
LOWEST DAILY MEAN	.34	Aug 21	1.3	Dec 28	.00	Jul 26 1903
ANNUAL SEVEN-DAY MINIMUM	.56	May 21	1.3	Dec 26	.00	Jul 26 1903
INSTANTANEOUS PEAK FLOW			a660	Mar 7	23400	Apr 16 1950
INSTANTANEOUS PEAK STAGE			Unknown		b28.05	Apr 16 1950
ANNUAL RUNOFF (AC-FT)	4890		16540		71920	
10 PERCENT EXCEEDS	10		55		128	
50 PERCENT EXCEEDS	5.2		6.4		11	
90 PERCENT EXCEEDS	2.1		2.8		1.5	

a About.
b From high-water mark in gage well.

HEART RIVER BASIN

06345500 HEART RIVER NEAR RICHARDTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (000061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT											
05...	1125	4.0	2350	--	--	16.0	12.5	--	--	--	--
NOV											
16...	1200	7.6	2350	--	--	0.0	0.5	--	--	--	--
JAN											
04...	1200	1.6	3750	--	--	-18.0	0.5	--	--	--	--
FEB											
22...	1130	3.9	2600	--	--	-20.0	0.0	--	--	--	--
MAR											
22...	1500	30	842	8.1	--	11.0	1.0	190	190	40	22
JUN											
04...	1141	13	1860	--	--	15.0	13.0	--	--	--	--
JUL											
27...	1515	53	1140	--	--	20.0	19.0	--	--	--	--
AUG											
05...	1052	38	917	--	--	--	--	--	--	--	--
SEP											
15...	1350	5.1	1840	--	8.0	18.0	12.0	320	388	53	45

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR											
22...	110	54	3	9.4	240	12	0.20	6.4	555	550	0.75
SEP											
15...	300	66	7	15	550	56	0.50	5.2	1260	1290	1.75

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR											
22...	45.1	1	120	160	<1	20	30	0.1	1	<1	540
SEP											
15...	17.9	1	420	10	<1	20	10	<0.1	4	<1	790

HEART RIVER BASIN

301

06345780 HEART RIVER ABOVE LAKE TSCHIDA NEAR GLEN ULLIN, ND

LOCATION.--Lat 46°39'24", Long 102°04'40", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.30, T.137 N., R.90 W., Grant County, Hydrologic Unit 10130202, on right bank 100 ft downstream from bridge on county road, and 16 mi south and 1 mi west of Hebron.

DRAINAGE AREA.--1,530 mi², approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 2,090 ft above sea level, from topographic map.

REMARKS.--Records fair except those for period of estimated daily discharges, which are poor. Flow is regulated by E.A. Patterson Lake (station 06343500) about 90 river mi upstream from station, and some diversions for irrigation and water supply at low flow.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	6.0	7.9	e1.4	e4.0	e3.8	41	24	29	62	e90	7.5
2	.89	e6.0	7.2	e1.4	e4.5	e4.2	36	22	21	43	e150	7.5
3	.85	e5.6	7.6	e1.5	e4.8	e5.0	34	20	15	53	e110	6.4
4	.76	e5.2	7.1	e1.6	e5.4	e10	31	20	19	68	e80	6.7
5	1.4	e4.5	7.0	e1.5	e5.6	e100	30	19	20	55	e60	7.3
6	2.7	e5.0	6.6	e1.5	e6.2	e700	29	18	19	67	e50	7.0
7	3.5	e5.2	6.4	e1.5	e6.4	e850	27	213	26	175	43	6.9
8	3.7	e6.0	6.4	e1.5	e6.2	e620	27	133	44	138	35	7.0
9	3.4	e7.6	6.4	e1.4	e6.0	e400	26	69	69	108	29	7.4
10	5.8	7.9	e5.9	e1.4	e6.0	e300	29	46	100	93	25	7.6
11	16	8.2	e5.4	e1.4	e5.5	e220	32	36	133	105	30	6.7
12	11	7.0	e5.0	e1.4	e4.5	e160	32	30	88	115	91	6.3
13	8.0	7.2	e4.9	e1.5	e5.0	e110	30	25	68	119	28	e6.3
14	6.8	8.9	e4.6	e1.7	e4.8	95	30	19	60	109	22	e6.3
15	6.2	7.7	e4.5	e2.0	e4.0	96	31	15	61	154	21	e6.0
16	5.7	8.3	e4.0	e2.3	e3.5	82	28	13	55	465	19	e6.0
17	5.7	9.5	e3.5	e2.5	e3.0	67	25	11	47	180	17	e5.8
18	5.3	9.1	e3.2	e2.9	e3.5	61	23	10	41	119	15	e5.8
19	5.5	8.4	e3.0	e3.2	e4.0	65	24	9.0	36	95	14	e5.8
20	6.0	8.3	e2.7	e4.0	e4.5	52	25	8.3	32	84	12	e5.8
21	5.7	8.2	e2.4	e3.8	e4.2	49	26	7.6	28	78	12	e6.0
22	6.0	7.6	e2.2	e3.4	e4.0	49	26	7.5	25	e2700	12	e6.4
23	6.0	8.1	e2.0	e3.5	e3.3	51	29	7.3	23	663	12	e6.8
24	5.7	8.0	e1.8	e3.8	e3.1	59	46	7.2	21	369	11	e7.0
25	5.6	8.2	e1.7	e4.0	e3.0	68	51	6.9	19	333	9.4	e7.0
26	5.0	7.9	e1.6	e3.8	e3.1	59	47	7.2	17	224	8.2	e6.8
27	5.0	8.1	e1.5	e3.2	e3.3	58	41	8.1	15	572	7.9	e6.8
28	4.5	7.7	e1.5	e3.0	e3.5	49	37	8.3	13	e500	7.4	e7.0
29	4.5	7.6	e1.5	e3.0	---	46	32	9.1	25	e200	7.2	e7.0
30	4.2	7.4	e1.4	e3.3	---	42	27	20	67	e90	8.8	e7.0
31	4.9	---	e1.4	e3.6	---	41	---	30	---	e80	8.1	---
TOTAL	157.22	220.4	128.3	76.0	124.9	4572.0	952	879.5	1236	8216	1045.0	199.9
MEAN	5.07	7.35	4.14	2.45	4.46	147	31.7	28.4	41.2	265	33.7	6.66
MAX	16	9.5	7.9	4.0	6.4	850	51	213	133	2700	150	7.6
MIN	.76	4.5	1.4	1.4	3.0	3.8	23	6.9	13	43	7.2	5.8
AC-FT	312	437	254	151	248	9070	1890	1740	2450	16300	2070	397

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1993, BY WATER YEAR (WY)

	1988	1989	1990	1991	1992	1993
MEAN	3.75	8.92	5.68	3.74	8.17	66.0
MAX	5.07	11.4	9.49	6.82	18.6	147
(WY)	1993	1990	1989	1990	1992	1993
MIN	2.23	6.52	4.14	.32	3.41	18.5
(WY)	1992	1991	1993	1991	1989	1990

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1988 - 1993
ANNUAL TOTAL	3361.23	17807.22	
ANNUAL MEAN	9.18	48.8	22.4
HIGHEST ANNUAL MEAN			48.8
LOWEST ANNUAL MEAN			9.17
HIGHEST DAILY MEAN	84	2700	2700
LOWEST DAILY MEAN	.18	.76	.00
ANNUAL SEVEN-DAY MINIMUM	.37	1.4	.00
INSTANTANEOUS PEAK FLOW		4540	4540
INSTANTANEOUS PEAK STAGE		a15.56	15.56
ANNUAL RUNOFF (AC-FT)	6670	35320	16220
10 PERCENT EXCEEDS	19	95	39
50 PERCENT EXCEEDS	5.8	8.1	6.9
90 PERCENT EXCEEDS	1.3	3.0	.28

e Estimated.

a Maximum observed.

HEART RIVER BASIN

06345780 HEART RIVER ABOVE LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT											
05...	1000	0.89	1900	--	--	15.0	12.0	--	--	--	--
NOV											
16...	1050	8.0	2300	--	--	0.0	0.5	--	--	--	--
JAN											
04...	1105	1.5	3500	--	--	-20.0	0.5	--	--	--	--
FEB											
22...	0910	4.0	2500	--	--	-25.0	0.0	--	--	--	--
MAR											
a08...	1030	606	410	8.1	--	0.0	2.0	98	108	21	11
22...	1145	47	691	--	--	9.0	1.0	--	--	--	--
MAY											
19...	1025	7.9	1760	--	--	15.0	11.0	--	--	--	--
AUG											
11...	1033	24	1090	--	--	28.0	22.0	--	--	--	--
SEP											
10...	1417	7.6	1330	--	8.1	22.0	16.0	290	389	49	40

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR											
a08...	42	45	2	12	98	3.1	0.10	5.6	258	281	0.38
SEP											
10...	210	60	5	14	400	17	0.50	7.1	972	998	1.36

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR											
a08...	460	1	70	150	<1	10	30	<0.1	<1	1	250
SEP											
10...	20.4	1	380	20	<1	40	10	<0.1	3	<1	750

a Replicate sample also collected for quality-assurance purposes.

HEART RIVER BASIN

303

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND

LOCATION.--Lat 46°35'43", long 101°48'34", in SW¹/₄NE¹/₄ sec.13, T.136 N., R.89 W., Grant County, Hydrologic Unit 10130202, 10 mi upstream from Heart Butte Creek, and 14 mi north of Elgin.

DRAINAGE AREA.--1,710 mi², approximately.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--August 1949 to current year. Prior to October 1957, published as Heart Butte Reservoir near Glen Ullin.

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by Bureau of Reclamation).

REMARKS.--Reservoir is formed by earth-fill dam; storage began Sept. 29, 1949; dam completed Dec. 9, 1949. Total capacity is 430,000 acre-ft at maximum pool, elevation, 2,118.2 ft. Dead storage is 6,750 acre-ft below lowest point of outlet, elevation, 2,030.0 ft. Active conservation storage is 69,030 acre-ft between elevations 2,030.0 ft and 2,064.5 ft, crest of spillway. Figures given herein represent total contents. Controlled releases are through 4 by 5 ft slide gate. The spillway is uncontrolled "glory hole" type and discharges through a conduit 14 ft in diameter. The reservoir is for flood control, irrigation, and incidental water supply.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 174,000 acre-ft, Apr. 9, 1952, elevation, 2,086.23 ft; minimum since first reaching spillway level, 32,820 acre-ft, Oct. 25, 1991, elevation, 2,049.00 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 78,520 acre-ft, July 29, elevation, 2,065.30 ft; minimum, 33,190 acre-ft, Oct. 15, elevation, 2,049.18 ft.

MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	2,049.29	33,420	--
Oct. 31-----	2,049.21	33,250	-170
Nov. 30-----	2,049.48	33,820	+570
Dec. 31-----	2,049.67	34,220	+400
CAL YR 1992-----	--	--	-100
Jan. 31-----	2,049.79	34,470	+250
Feb. 28-----	2,050.09	35,100	+630
Mar. 31-----	2,056.90	52,090	+16,990
Apr. 30-----	2,057.60	54,100	+2,010
May 31-----	2,057.73	54,470	+370
June 30-----	2,058.27	56,040	+1,570
July 31-----	2,065.24	78,320	+22,280
Aug. 31-----	2,064.53	75,890	-2,430
Sept. 30-----	2,064.16	74,630	-1,260
WTR YR 1993-----	--	--	+41,210

HEART RIVER BASIN

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 29...	1315	1.0	1.3	1640	8.7	300	316	46	44
FEB 10...	1210	1.0	1.3	1800	8.5	320	354	49	49
JUN a30...	0925	0.50	1.0	1300	8.4	250	256	42	35
AUG 26...	1035	0.50	1.0	1110	8.2	240	236	44	31

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
OCT 29...	250	64	6	13	500	16	0.40	5.0	1110
FEB 10...	280	64	7	13	520	19	0.40	4.3	1240
JUN a30...	190	62	5	1.4	400	13	0.40	4.1	902
AUG 26...	170	60	5	9.3	330	10	0.30	5.6	742

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BORON, DIS- SOLVED (UG/L AS B) (01020)
OCT 29...	1060	1.51	0.064	0.010	0.074	0.120	0.030	0.020	420
FEB 10...	1150	1.69	0.290	0.040	0.330	0.480	0.150	0.130	460
JUN a30...	841	1.23	0.170	0.020	0.190	0.100	0.030	0.010	330
AUG 26...	744	1.01	0.310	0.020	0.330	0.080	0.050	0.020	280

a Replicate sample also collected for quality-assurance purposes.

HEART RIVER BASIN

305

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT								
29...	1305	31.5	--	0.0	1600	8.6	8.0	9.8
29...	1306	--	--	1.60	1600	8.6	8.0	9.8
29...	1307	--	--	3.30	1590	8.6	8.0	9.8
29...	1308	--	--	6.60	1600	8.6	8.0	9.8
29...	1309	--	--	13.1	1580	8.6	8.0	9.8
29...	1310	--	--	19.7	1590	8.6	8.0	9.8
29...	1311	--	--	26.2	1600	8.6	8.0	9.8
29...	1312	--	--	31.5	1600	8.6	8.0	9.8
FEB								
10...	1157	33.5	0.0	--	1730	8.4	1.0	13.1
10...	1158	--	0.50	--	1740	8.4	0.5	13.0
10...	1159	--	1.0	--	1730	8.4	1.0	13.0
10...	1200	--	2.0	--	1730	8.4	2.0	12.8
10...	1201	--	4.0	--	1720	8.4	2.5	11.6
10...	1202	--	6.0	--	1770	8.3	3.0	10.0
10...	1203	--	8.0	--	1810	8.2	3.5	7.9
10...	1204	--	10.2	--	1870	8.1	3.5	6.8
JUN								
30...	0910	39.4	0.0	--	1270	8.3	17.0	8.8
30...	0911	--	0.50	--	1290	8.3	17.0	8.7
30...	0912	--	1.0	--	1300	8.3	16.5	8.6
30...	0913	--	2.0	--	1310	8.4	16.5	8.5
30...	0914	--	4.0	--	1310	8.4	16.5	8.5
30...	0915	--	6.0	--	1310	8.4	16.5	8.4
30...	0916	--	8.0	--	1320	8.4	16.5	8.4
30...	0917	--	10.0	--	1310	8.4	16.5	8.4
30...	0918	--	12.0	--	1320	8.4	16.5	8.4
AUG								
26...	1025	47.9	0.0	--	1120	8.0	20.5	8.1
26...	1026	--	0.50	--	1130	8.1	20.5	8.0
26...	1027	--	1.0	--	1130	8.1	20.5	7.9
26...	1028	--	2.0	--	1130	8.1	20.5	7.9
26...	1029	--	3.8	--	1130	8.1	20.5	7.8
26...	1030	--	6.3	--	1130	8.1	20.5	7.8
26...	1031	--	8.1	--	1130	8.1	20.5	7.8
26...	1032	--	10.0	--	1130	8.1	20.5	7.8
26...	1033	--	12.0	--	1130	8.1	20.5	7.8
26...	1034	--	14.4	--	1130	8.1	20.0	4.8

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
29...	91	705	--	78.0	6.5	125	6.0
FEB							
10...	98	714	1.80	172	-7.0	50	8.0
JUN							
30...	100	703	--	28.0	18.0	300	<5.0
AUG							
26...	97	709	--	45.6	15.0	345	7.0

HEART RIVER BASIN

06347500 BIG MUDDY CREEK NEAR ALMONT, ND

LOCATION.--Lat 46°41'40", long 101°27'50", in NE¹/₄/NE¹/₄/SE¹/₄, sec.12, T.137 N., R.86 W., Morton County, Hydrologic Unit 10130203, on left bank 50 ft downstream from county highway bridge, 2 mi downstream from Hallstone Creek, 3 mi southeast of Almont, and 12 mi upstream from mouth.

DRAINAGE AREA.--456 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to September 1970, October 1970 to September 1973 (annual maximum discharge), February 1991 to current year (seasonal records only since February 1991).

GAGE.--Water-stage recorder. Elevation of gage is 1,900 ft above sea level, from topographic map. Prior to Sept. 5, 1952, nonrecording gage at same site and datum.

REMARKS.--Records fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,390 ft³/s, July 23, gage height, 30.99 ft; minimum daily discharge recorded, 1.20 ft³/s, May 17-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e1.6	e10	3.6	4.6	7.8	e216	e210	20
2	---	---	---	---	e1.6	e29	3.2	4.5	7.8	e76	e160	20
3	---	---	---	---	e1.6	e80	2.7	4.4	8.6	51	e110	19
4	---	---	---	---	e1.6	151	2.4	3.8	7.0	33	e80	18
5	---	---	---	---	e1.6	342	2.0	3.5	5.9	19	e64	18
6	---	---	---	---	e1.6	583	2.2	3.7	7.8	13	e52	17
7	---	---	---	---	e1.6	673	2.4	4.3	e11	10	e47	16
8	---	---	---	---	e1.6	514	2.7	3.7	e18	e8.0	41	15
9	---	---	---	---	e1.6	301	e3.6	3.3	e40	e6.4	36	14
10	---	---	---	---	e1.5	133	5.3	3.0	e100	5.3	30	13
11	---	---	---	---	e1.5	85	8.7	2.5	e70	e6.8	37	12
12	---	---	---	---	e1.5	136	7.4	2.3	e40	e8.4	73	11
13	---	---	---	---	e1.5	115	5.5	2.0	e28	e30	324	11
14	---	---	---	---	e1.5	85	3.8	2.2	e22	e200	152	10
15	---	---	---	---	e1.5	70	4.2	2.1	e16	e1400	90	10
16	---	---	---	---	e1.5	24	5.1	2.1	e13	e3380	74	10
17	---	---	---	---	e1.4	22	4.5	1.6	e11	e1620	65	9.4
18	---	---	---	---	e1.4	18	3.8	2.0	e9.0	1100	55	8.5
19	---	---	---	---	e1.4	17	3.3	3.5	e7.2	356	49	8.3
20	---	---	---	---	e1.4	16	2.8	4.2	e5.8	140	45	8.8
21	---	---	---	---	e1.4	15	2.6	3.7	e5.0	94	42	8.7
22	---	---	---	---	e1.3	15	2.2	5.6	e4.5	1350	39	7.8
23	---	---	---	---	e1.3	16	3.5	7.3	e4.2	7570	38	6.9
24	---	---	---	---	e1.3	21	4.1	5.9	e80	3970	36	6.7
25	---	---	---	---	e1.3	27	4.1	11	e45	2720	33	6.1
26	---	---	---	---	e1.2	17	3.8	10	e20	2090	31	5.9
27	---	---	---	---	e1.2	9.4	3.7	7.8	e9.0	1490	29	6.0
28	---	---	---	---	e4.0	7.5	3.5	6.8	e5.0	1880	26	5.3
29	---	---	---	---	---	6.5	2.9	6.0	e5.8	1340	24	4.6
30	---	---	---	---	---	5.3	4.0	9.1	e9.0	e800	23	4.3
31	---	---	---	---	---	4.3	---	11	---	e330	22	---
TOTAL	---	---	---	---	43.5	3548.0	113.6	147.5	623.4	32312.9	2137	331.3
MEAN	---	---	---	---	1.55	114	3.79	4.76	20.8	1042	68.9	11.0
MAX	---	---	---	---	4.0	673	8.7	11	100	7570	324	20
MIN	---	---	---	---	1.2	4.3	2.0	1.6	4.2	5.3	22	4.3
AC-FT	---	---	---	---	86	7040	225	293	1240	64090	4240	65

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

MEAN	1.20	1.60	1.33	1.08	6.14	122	160	47.1	45.4	49.5	7.11	2.76
MAX	2.61	3.19	2.48	4.59	56.5	420	1160	540	405	1042	68.9	15.2
(WY)	1952	1952	1952	1947	1954	1948	1950	1970	1966	1993	1993	1953
MIN	.39	.58	.35	.065	.000	.73	1.48	1.01	.43	.042	.12	.35
(WY)	1962	1961	1949	1949	1966	1965	1992	1961	1961	1966	1961	1991

SUMMARY STATISTICS

WATER YEARS 1946 - 1993

ANNUAL MEAN	a37.0	
HIGHEST ANNUAL MEAN	a112	1950
LOWEST ANNUAL MEAN	a1.41	1961
HIGHEST DAILY MEAN	15000	Apr 17 1950
LOWEST DAILY MEAN	.00	Jan 28 1946
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 28 1946
INSTANTANEOUS PEAK FLOW	20200	Apr 17 1950
INSTANTANEOUS PEAK STAGE	30.99	Jul 23 1993
ANNUAL RUNOFF (AC-FT)	a26790	
10 PERCENT EXCEEDS	32	
50 PERCENT EXCEEDS	1.7	
90 PERCENT EXCEEDS	.40	

e Estimated.

a Based on complete water years only (1945-70).

HEART RIVER BASIN

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06347500 BIG MUDDY CREEK NEAR ALMONT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1991 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 01...	0930	0.60	2000	--	--	--	--	--	--	--	--
FEB 03...	1130	1.6	2600	--	--	--	--	--	--	--	--
MAR 23...	0955	17	812	--	--	--	--	--	--	--	--
MAR 26...	0950	24	840	8.5	--	9.0	4.0	120	261	24	14
MAY 04...	1005	3.9	1510	--	--	--	--	--	--	--	--
JUN 08...	0915	18	2000	--	--	--	--	--	--	--	--
AUG 25...	1125	34	1470	--	8.4	22.0	20.5	290	401	62	33
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 26...	150	72	6	9.2	180	6.0	0.30	7.6	548	541	0.74
AUG 25...	220	61	6	13	370	7.2	0.40	11	958	1010	1.37
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 26...	34.8	3	120	170	<1	20	90	0.1	1	<1	310
AUG 25...	92.4	2	290	20	<1	30	10	<0.1	2	<1	570

HEART RIVER BASIN

06348000 HEART RIVER NEAR LARK, ND

LOCATION.--Lat 46°36'37", long 101°22'54", in SW¹/₄/NW¹/₄/SW¹/₄, sec.9, T.136 N., R.85 W., Grant County, Hydrologic Unit 10130203, on right bank 20 ft downstream from county highway bridge, 0.6 mi downstream from Big Muddy Creek, and 10 mi north of Lark.

DRAINAGE AREA.--2,750 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1946 to current year (seasonal records only since Oct. 1982).

GAGE.--Water-stage recorder. Datum of gage is 1,802.83 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Nov. 16, 1948, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for periods of estimated discharges, which are poor. Flow regulated by Lake Tschida (06346000) 45 mi upstream since 1949.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,100 ft³/s, July 23,, gage height, 16.85 ft³/s; minimum daily discharge during period Feb. 1 to Sept. 30, 1.6 ft³/s, May 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e8.7	e5.2	30	14	31	136	e700	40
2	---	---	---	---	e8.8	e5.0	25	15	30	168	e500	39
3	---	---	---	---	e8.9	e20	23	16	27	86	e450	39
4	---	---	---	---	e9.0	e50	20	16	23	58	e400	36
5	---	---	---	---	e9.0	e500	19	14	15	41	e380	37
6	---	---	---	---	e9.0	e1000	20	16	13	35	e360	37
7	---	---	---	---	e9.0	e2000	22	16	12	31	e350	34
8	---	---	---	---	e9.0	1850	24	15	22	24	e320	31
9	---	---	---	---	e9.0	1000	23	16	56	19	e300	26
10	---	---	---	---	e8.8	500	28	15	181	15	e280	24
11	---	---	---	---	e8.6	300	42	15	147	13	e270	23
12	---	---	---	---	e8.2	270	51	14	100	19	e250	24
13	---	---	---	---	e8.0	250	36	11	64	25	e300	29
14	---	---	---	---	e7.8	230	29	8.0	44	33	e250	23
15	---	---	---	---	e7.6	200	25	5.4	35	65	e220	22
16	---	---	---	---	e7.4	160	23	4.4	30	e2000	208	21
17	---	---	---	---	e7.2	130	23	3.0	25	2190	173	23
18	---	---	---	---	e7.0	120	21	1.9	22	e2000	129	22
19	---	---	---	---	e6.8	100	19	1.6	17	e1200	118	21
20	---	---	---	---	e6.6	90	19	2.5	14	e500	105	21
21	---	---	---	---	e6.4	80	18	1.6	13	e350	97	22
22	---	---	---	---	e6.2	e70	18	6.0	10	e800	84	20
23	---	---	---	---	e6.0	e80	17	36	11	10900	77	20
24	---	---	---	---	e6.0	e90	20	36	149	e7500	71	19
25	---	---	---	---	e5.8	e87	19	38	112	e5000	69	19
26	---	---	---	---	e5.8	84	21	33	36	e3000	59	17
27	---	---	---	---	e5.6	73	19	37	20	e2750	54	16
28	---	---	---	---	e5.4	56	17	37	11	e2500	51	16
29	---	---	---	---	---	46	15	36	13	e2200	47	15
30	---	---	---	---	---	39	15	28	18	e1400	46	14
31	---	---	---	---	---	33	---	22	---	e900	43	---
TOTAL	---	---	---	---	211.6	9518.2	701	530.4	1301	45958	6761	750
MEAN	---	---	---	---	7.56	307	23.4	17.1	43.4	1483	218	25.0
MAX	---	---	---	---	9.0	2000	51	38	181	10900	700	40
MIN	---	---	---	---	5.4	5.0	15	1.6	10	13	43	14
AC-FT	---	---	---	---	420	18880	1390	1050	2580	91160	13410	1490

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

	46.1	33.7	24.9	19.6	59.5	625	765	295	252	185	80.5	54.2
MEAN	46.1	33.7	24.9	19.6	59.5	625	765	295	252	185	80.5	54.2
MAX	273	88.1	86.6	99.2	521	2695	4793	3221	1001	1483	218	138
(WY)	1978	1957	1954	1973	1982	1982	1952	1970	1982	1993	1993	1977
MIN	7.51	5.66	2.08	.048	.000	10.7	13.4	12.3	22.1	25.4	5.39	6.77
(WY)	1950	1950	1950	1950	1950	1975	1992	1961	1990	1949	1946	1992

SUMMARY STATISTICS

WATER YEARS 1946 - 1993

ANNUAL MEAN	a225	
HIGHEST ANNUAL MEAN	a684	1982
LOWEST ANNUAL MEAN	a30.0	1961
HIGHEST DAILY MEAN	23200	Apr 18 1950
LOWEST DAILY MEAN	.00	Jan 16 1950
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 16 1950
INSTANTANEOUS PEAK FLOW	b29200	Apr 17 1950
INSTANTANEOUS PEAK STAGE	20.70	Apr 17 1950
ANNUAL RUNOFF (AC-FT)	a163100	
10 PERCENT EXCEEDS	323	
50 PERCENT EXCEEDS	46	
90 PERCENT EXCEEDS	11	

e Estimated.

a Based on complete water years only (1947-82).

b From rating curve extended above 11,000 ft³/s on basis of contracted-opening measurement of peak flow.

HEART RIVER BASIN

309

06348000 HEART RIVER NEAR LARK, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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)
OCT 01...	1040	3.9	1560	--	--	--	--	--	--	--	--
FEB 03...	1005	8.9	1880	--	--	--	--	--	--	--	--
MAR 08...	1520	1870	238	--	--	--	--	--	--	--	--
25...	1450	87	750	8.2	19.5	9.5	200	227	40	24	87
MAY 04...	1055	15	1350	--	--	--	--	--	--	--	--
JUN 08...	1015	22	1390	--	--	--	--	--	--	--	--
AUG 25...	1620	69	1340	8.4	23.0	21.5	330	324	64	40	180

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 25...	47	3	9.8	160	7.4	0.20	7.6	473	471	0.64	111
AUG 25...	53	4	14	370	11	0.30	8.4	883	913	1.24	171

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 25...	1	50	60	<1	30	60	0.1	4	<1	430
AUG 25...	2	270	10	<1	40	10	<0.1	1	<1	650

HEART RIVER BASIN

06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND

LOCATION.--Lat 46°42'11", long 101°12'37", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.6, T.137 N., R.83 W., Morton County, Hydrologic Unit 10130203, on right bank 50 ft upstream from county bridge, and 9.5 mi southeast of Judson.

DRAINAGE AREA.--2,930 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to September 1988 (annual maximum discharges only), October 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,720 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated by Lake Tschida (06346000) since 1949.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	21	e10	e4.0	e4.5	e3.0	69	29	22	20	727	96
2	7.5	21	e10	e4.0	e4.8	e3.0	62	28	31	104	600	95
3	8.7	20	e10	e3.8	e5.0	e5.0	57	26	26	140	523	94
4	7.9	19	e10	e3.7	e5.2	e10	52	25	23	83	461	89
5	7.0	e18	e10	e3.5	e5.2	e50	50	25	16	60	426	87
6	9.0	e18	e9.8	e3.4	e5.2	e500	51	27	17	48	391	85
7	11	e18	e9.6	e3.2	e5.2	e1000	54	27	25	40	364	83
8	9.4	e17	e9.4	e3.0	e5.0	e2200	49	28	34	34	340	79
9	7.4	23	e9.2	e2.9	e4.8	e1400	50	28	29	28	316	72
10	11	24	e9.0	e2.8	e4.6	e800	60	25	52	25	292	64
11	9.7	23	e9.0	e2.7	e4.6	e500	55	24	152	21	273	59
12	10	e22	e9.0	e2.6	e4.4	e350	63	23	132	19	266	56
13	12	e22	e9.0	e2.5	e4.4	e320	68	21	97	27	303	53
14	11	e21	e9.0	e2.5	e4.2	e290	57	18	73	27	456	55
15	13	e21	e8.8	e2.4	e4.0	e250	51	16	57	101	368	51
16	15	e20	e8.8	e2.3	e4.0	e230	47	14	47	2110	290	49
17	14	20	e8.4	e2.2	e3.9	e200	44	11	39	2780	263	49
18	17	19	e8.2	e2.1	e3.8	e170	43	7.0	32	2240	235	50
19	15	19	e8.0	e2.0	e3.8	e140	41	4.6	22	1370	212	48
20	15	19	e7.8	e2.0	e3.8	e120	40	4.8	18	633	200	51
21	15	19	e7.6	e2.1	e3.7	e110	39	3.8	14	392	185	46
22	15	18	e7.5	e2.1	e3.6	e90	36	6.4	12	915	173	44
23	17	e17	e7.2	e2.2	e3.5	e85	38	7.5	14	7500	166	43
24	15	e16	e6.8	e2.2	e3.4	e90	39	19	23	8010	139	41
25	15	e14	e6.4	e2.3	e3.3	e100	36	31	101	4690	141	40
26	16	e13	e6.0	e2.4	e3.2	117	36	24	108	3870	137	35
27	15	e12	e5.6	e2.6	e3.1	108	36	21	47	2780	126	32
28	15	e11	e5.2	e2.8	e3.0	100	35	20	28	2690	116	24
29	13	e11	e4.8	e3.2	---	91	34	23	35	2580	114	23
30	13	e11	e4.5	e3.7	---	83	30	35	29	1550	108	26
31	15	---	e4.3	e4.2	---	76	---	27	---	953	105	---
TOTAL	380.8	547	248.9	87.4	117.2	9591.0	1422	629.1	1355	45840	8816	1719
MEAN	12.3	18.2	8.03	2.82	4.19	309	47.4	20.3	45.2	1479	284	57.3
MAX	17	24	10	4.2	5.2	2200	69	35	152	8010	727	96
MIN	6.2	11	4.3	2.0	3.0	3.0	30	3.8	12	19	105	23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 1993, BY WATER YEAR (WY)

	MEAN	16.5	18.5	10.9	7.61	10.7	106	36.3	24.0	47.0	325	86.0	29.0
MAX	19.4	21.8	13.9	12.1	23.9	309	75.6	45.2	125	1479	284	57.3	
(WY)	1989	1990	1989	1989	1992	1993	1989	1989	1991	1993	1993	1993	1993
MIN	12.3	14.1	7.07	.34	4.19	37.1	15.0	16.3	14.5	28.8	19.7	11.7	
(WY)	1993	1989	1991	1991	1993	1990	1990	1992	1990	1990	1992	1992	1992

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1989 - 1993
ANNUAL TOTAL	8102.30	70753.4	
ANNUAL MEAN	22.1	194	60.5
HIGHEST ANNUAL MEAN			194
LOWEST ANNUAL MEAN			22.3
HIGHEST DAILY MEAN	257	Mar 2	8010 Jul 24 1993
LOWEST DAILY MEAN	.50	Jun 12	.21 Jan 1 1991
ANNUAL SEVEN-DAY MINIMUM	.79	Jun 6	.22 Dec 31 1990
INSTANTANEOUS PEAK FLOW			9390 Jul 23 1990
INSTANTANEOUS PEAK STAGE			a15.47 Jul 24 1990
10 PERCENT EXCEEDS	39	296	16.70 Mar 23 1987
50 PERCENT EXCEEDS	15	23	68
90 PERCENT EXCEEDS	6.6	3.7	19
			5.2

e Estimated.

a Backwater from debris.

HEART RIVER BASIN

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06348300 HEART RIVER AT STARK BRIDGE NEAR JUDSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LILITY LAB (MG/L AS CACO3) (90410)	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)
OCT 01...	1200	6.4	1630	--	--	--	--	--	--	--	--
NOV 17...	1440	20	1550	--	--	--	--	--	--	--	--
DEC 22...	1350	8.1	2130	--	--	--	--	--	--	--	--
FEB 03...	1410	5.0	2200	--	--	--	--	--	--	--	--
MAR 09...	1445	1400	260	8.5	3.5	1.0	64	100	15	6.5	22
MAR 23...	1155	76	704	--	--	--	--	--	--	--	--
MAY 18...	0950	7.0	1570	--	--	--	--	--	--	--	--
JUN 08...	1130	37	1300	--	--	--	--	--	--	--	--
JUL 24...	1038	8490	271	--	--	--	--	--	--	--	--
AUG 23...	1345	165	1290	8.4	25.0	19.5	300	342	58	38	170

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 09...	38	1	9.9	41	1.1	0.10	5.5	162	176	0.24	665
AUG 23...	54	4	13	340	9.3	0.40	9.3	844	862	1.17	384

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 09...	1	40	240	<1	10	20	<0.1	<1	1	160
AUG 23...	2	290	10	<1	40	10	<0.1	2	<1	600

HEART RIVER BASIN

06349000 HEART RIVER NEAR MANDAN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°50'02", long 100°58'27", in NW¹/₄, NE¹/₄, sec.25, T.139 N., R.82 W., Morton County, Hydrologic Unit 10130203, on left bank near downstream wingwall of bridge on county highway, 3 mi west of Mandan, and 4 mi downstream from Sweetbriar Creek.

DRAINAGE AREA.--3,310 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1924, March 1928 to June 1933, August 1937 to current year. Published as "at Sunny" 1924, 1928-33.

REVISED RECORDS.--WSP 926: 1938. WSP 1209: Drainage area. WSP 1239: 1924, 1928-29, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,638.70 ft above sea level and 1,623.03 ft above Burlington Northern Railway datum. See WSP 1729 or 1917 for history of changes prior to June 30, 1958.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. Flow regulated by Lake Tschida (station 06346000) 105 mi upstream since 1949. Some diversions above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	43	e13	e2.8	e2.6	e1.7	104	41	47	101	980	e110
2	4.0	46	e13	e2.6	e2.8	e1.7	96	38	37	157	e750	e105
3	4.0	e44	e12	e2.4	e3.0	e2.0	87	37	36	300	e670	e100
4	2.1	e42	e12	e2.2	e3.2	e10	80	35	39	310	e600	e98
5	2.0	e40	e12	e2.0	e3.3	e50	74	32	34	205	e520	e94
6	e2.2	e39	e11	e1.9	e3.4	e500	75	34	35	143	e480	e90
7	e2.3	e38	e11	e1.9	e3.4	e1000	73	35	35	109	e440	e85
8	e2.5	e40	e10	e1.8	e3.5	e3000	72	35	212	86	e400	e80
9	e2.7	e36	e10	e1.8	e3.5	e2500	72	37	318	74	e350	e75
10	e2.8	e35	e10	e1.7	e3.5	e2000	73	35	184	74	e310	e70
11	e2.9	e34	e10	e1.7	e3.4	e1500	76	36	119	86	e290	e66
12	e3.0	e33	e10	e1.6	e3.3	e1300	76	35	153	81	e270	e62
13	e3.5	e32	e10	e1.6	e3.2	e1100	73	33	163	92	e300	e58
14	e4.0	e31	e9.0	e1.5	e3.1	e1000	78	29	128	88	e500	e56
15	e5.0	e30	e9.0	e1.5	e3.1	e800	74	27	110	492	e450	e54
16	e6.0	e28	e8.5	e1.4	e3.0	e650	68	26	85	5110	e420	e52
17	e7.0	e28	e8.0	e1.4	e2.9	e580	66	22	70	5810	e390	e50
18	e8.0	e27	e7.5	e1.4	e2.8	e500	62	21	58	2970	e360	e48
19	e10	e26	e7.0	e1.3	e2.7	e440	60	19	52	2430	e330	e46
20	e20	e26	e6.0	e1.3	e2.6	e370	56	16	42	1240	e300	e44
21	e30	e25	e5.5	e1.3	e2.5	e320	53	14	33	648	e280	e42
22	36	e24	e5.0	e1.3	e2.4	e270	52	18	27	1760	e260	e40
23	37	e23	e4.5	e1.4	e2.2	e230	51	14	28	8710	e240	e38
24	36	e20	e4.2	e1.5	e2.0	e200	51	16	62	10900	e220	e36
25	37	e18	e4.0	e1.5	e1.9	e170	48	17	81	9190	e200	e35
26	38	e15	e4.0	e1.5	e1.9	e150	47	31	61	7820	e180	e33
27	38	e14	e3.8	e1.6	e1.8	147	48	41	136	4870	e160	e31
28	37	e14	e3.6	e1.7	e1.7	137	43	35	78	3860	e150	e30
29	37	e14	e3.4	e1.8	---	130	42	32	66	3600	e140	e32
30	38	e13	e3.2	e2.0	---	120	41	42	94	2610	e130	e35
31	40	---	e3.0	e2.4	---	111	---	50	---	1490	e120	---
TOTAL	500.7	878	243.2	53.8	78.7	19290.4	1971	933	2623	75416	11190	1795
MEAN	16.2	29.3	7.85	1.74	2.81	622	65.7	30.1	87.4	2433	361	59.8
MAX	40	46	13	2.8	3.5	3000	104	50	318	10900	980	110
MIN	2.0	13	3.0	1.3	1.7	1.7	41	14	27	74	120	30
AC-FT	993	1740	482	107	156	38260	3910	1850	5200	149600	22200	3560

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1993, BY WATER YEAR (WY)

	MEAN	48.0	39.0	21.9	14.2	88.6	883	876	318	347	238	80.4	57.7
MAX	288	383	155	145	1046	3987	5885	3610	1925	2433	361	214	
(WY)	1978	1983	1983	1983	1930	1943	1950	1970	1941	1993	1993	1977	
MIN	5.41	6.95	.21	.000	.000	.28	25.2	18.5	23.4	11.3	3.65	1.43	
(WY)	1940	1938	1938	1938	1940	1965	1990	1992	1961	1990	1932	1932	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1924 - 1993

ANNUAL TOTAL	11258.3	114972.8	
ANNUAL MEAN	30.8	315	253
HIGHEST ANNUAL MEAN			898
LOWEST ANNUAL MEAN			19.2
HIGHEST DAILY MEAN	320	Mar 3	28400
LOWEST DAILY MEAN	1.3	Aug 21	.00
ANNUAL SEVEN-DAY MINIMUM	2.4	Oct 4	.00
INSTANTANEOUS PEAK FLOW			11800
INSTANTANEOUS PEAK STAGE			15.45
ANNUAL RUNOFF (AC-FT)	22330	228000	183200
10 PERCENT EXCEEDS	62	485	382
50 PERCENT EXCEEDS	18	37	45
90 PERCENT EXCEEDS	4.0	2.2	5.0

e Estimated.

a About.

HEART RIVER BASIN

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06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1971-76, 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED CENT SATUR- ATION (00301)	HARD- NESS TOTAL (MG/L CACO3) (00900)	ALKA- LITY WAT DIS TOT IT FIELD AS MG/L AS CACO3 (39086)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT 01...	1400	3.0	1880	--	--	--	--	--	--	--	--	--
NOV 16...	1025	28	1710	8.1	1.5	0.0	3.1	13.2	96	330	424	K10
JAN 05...	1120	2.1	2600	7.8	-11.5	0.0	1.7	11.2	81	630	844	K4
FEB 04...	1300	3.2	2260	--	--	--	--	--	--	--	--	--
MAR 09...	1055	2490	290	--	--	--	--	--	--	--	--	--
MAY 29...	1030	130	860	8.2	4.0	6.0	18	--	--	190	256	K16
JUN 17...	0935	23	1620	8.5	18.0	15.0	6.8	8.7	92	290	460	E160
JUL 08...	1355	266	1290	--	--	--	--	--	--	--	--	--
JUL 13...	0945	93	975	8.4	12.5	15.5	33	8.0	85	180	296	420
SEP 08...	1550	81	1540	--	--	--	--	--	--	--	--	--

DATE	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 CO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 CO3 (00452)	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)
NOV 16...	110	56	46	270	63	6	7.8	517	0	480	17	0.30
JAN 05...	59	120	80	440	60	8	11	1030	0	670	32	0.70
MAR 29...	180	40	22	110	54	3	10	312	0	200	6.6	0.30
MAY 17...	37	50	41	260	65	7	11	537	12	420	19	0.50
JUL 13...	4200	36	22	150	63	5	10	347	7	230	6.7	0.30

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	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, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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)
NOV 16...	5.4	1140	1130	1.54	84.5	0.020	0.010	--	<0.050	<0.050	0.030
JAN 05...	13	1880	1970	2.68	11.0	--	0.050	0.210	--	0.260	--
MAR 29...	7.3	551	557	0.76	196	--	0.020	0.170	--	0.190	--
MAY 17...	5.0	1080	1120	1.52	68.9	--	<0.010	--	--	<0.050	--
JUL 13...	7.0	640	654	0.89	165	--	0.010	0.140	--	0.150	--

HEART RIVER BASIN

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	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 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)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
NOV 16...	0.030	0.37	0.40	<0.010	0.010	<0.010	<0.010	<10	50	<3	4
JAN 05...	0.350	--	1.1	0.020	<0.010	--	0.010	10	<100	<1	20
MAR 29...	0.040	--	0.80	0.070	0.010	--	<0.010	40	51	<3	50
MAY 17...	0.030	--	0.40	<0.010	<0.010	--	<0.010	<10	72	<3	9
JUL 13...	0.040	--	0.90	0.160	0.020	--	<0.010	--	--	--	--
DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 16...	67	9	<10	2	<1	<1.0	780	<6	22	1.6	95
JAN 05...	120	90	2	4	<1	<1.0	1400	<1	136	0.76	19
MAR 29...	27	23	<10	4	<1	<1.0	420	<6	42	15	88
MAY 17...	67	29	10	3	<1	<1.0	740	<6	78	4.8	86

MISSOURI RIVER MAIN STEM

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06349070 MISSOURI RIVER BELOW MANDAN, ND

LOCATION.--Lat 46°44'32", long 100°49'54", at midsection of west half sec.30, T.138 N., R.80 W., Morton County, Hydrologic Unit 10130102, on right bank 1 mi south of Fort Lincoln State Park, 6 mi southeast of Mandan, and at mile 1,309.

DRAINAGE AREA.--189,800 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--September 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft above sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Stage regulated by Garrison Dam (station 06338490) 80.9 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 29.71 ft, Mar. 17, 1972; minimum daily recorded, 17.40 ft, Apr. 1, 1968.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.91	19.84	20.05	26.42	25.93	23.52	---	20.00	21.40	21.31	21.37	21.25
2	19.89	19.87	20.73	26.67	25.95	23.56	---	19.98	21.26	21.42	21.48	21.22
3	19.80	19.89	21.36	26.77	25.73	23.40	---	20.02	21.25	21.45	21.43	21.12
4	19.92	19.86	21.84	26.90	25.40	23.34	---	20.24	21.28	21.47	21.46	21.20
5	19.85	19.84	22.00	26.81	25.21	23.26	---	19.97	21.25	21.48	21.38	21.21
6	19.84	19.71	22.21	26.71	25.07	23.82	---	19.99	21.28	21.45	21.49	21.28
7	19.81	19.82	22.04	26.78	24.78	24.26	---	20.01	21.35	21.39	21.37	21.23
8	19.76	19.77	22.10	---	24.53	25.06	---	20.16	21.44	21.40	21.36	21.18
9	19.93	19.83	22.07	---	24.46	25.42	---	20.08	21.51	21.40	21.38	20.83
10	19.88	19.89	22.01	26.73	24.30	24.66	---	20.38	21.36	21.40	21.37	20.29
11	19.88	19.80	22.01	26.66	23.95	24.05	---	---	21.28	21.37	21.41	19.97
12	19.88	19.71	22.01	26.62	23.77	23.61	---	---	21.37	21.34	21.41	19.85
13	19.83	19.80	22.01	26.84	24.17	23.40	---	---	21.30	21.33	21.34	19.79
14	19.82	19.85	22.26	26.74	24.25	23.16	---	---	21.35	21.39	21.42	19.80
15	19.83	19.74	22.72	26.67	24.16	23.02	---	---	21.35	21.61	21.62	19.77
16	19.80	19.88	22.66	26.88	23.66	23.17	---	---	21.32	23.01	21.35	19.75
17	19.73	19.91	22.11	26.69	23.72	22.65	---	---	21.29	22.96	21.32	19.75
18	19.85	19.83	22.07	26.56	23.67	22.55	---	---	21.31	21.88	21.28	19.72
19	19.78	19.81	22.15	26.76	23.65	22.98	---	---	21.29	21.62	21.28	19.76
20	19.88	19.83	22.62	26.75	23.90	22.92	---	---	21.01	21.48	21.40	19.79
21	19.73	19.79	23.85	26.65	23.87	22.96	---	21.39	21.38	21.45	21.33	19.71
22	19.82	19.77	25.86	26.76	23.60	22.55	19.57	21.36	21.19	21.90	21.25	19.69
23	19.77	19.76	---	26.56	23.55	22.04	19.55	21.33	21.50	23.66	21.20	19.72
24	19.80	19.77	24.87	26.47	23.72	21.75	19.51	21.53	21.45	24.21	---	19.72
25	19.81	19.77	25.38	26.33	23.57	21.50	19.53	21.37	21.35	23.81	21.37	19.74
26	19.73	19.74	25.21	26.26	23.61	21.38	19.50	21.39	21.44	23.39	21.32	19.69
27	19.79	19.79	25.17	26.20	23.72	21.32	19.63	21.38	21.13	22.92	21.37	19.65
28	19.89	19.76	---	26.14	23.65	21.20	19.66	21.41	21.27	22.86	21.24	19.63
29	19.79	19.82	---	26.20	---	21.16	20.02	21.43	21.41	22.61	21.28	19.66
30	19.73	19.75	---	26.02	---	---	19.97	21.49	21.40	21.98	21.23	19.70
31	19.81	---	---	26.08	---	---	---	21.33	---	21.47	21.33	---
MEAN	19.82	19.81	---	---	24.27	---	---	---	21.33	22.01	---	20.19
MAX	19.93	19.91	---	---	25.95	---	---	---	---	21.51	---	21.28
MIN	19.73	19.71	---	---	23.55	---	---	---	21.01	21.31	---	19.63

APPLE CREEK BASIN

06349215 LONG LAKE CREEK ABOVE LONG LAKE NEAR MOFFIT, ND

LOCATION.--Lat 46°37'59", long 100°14'29", in NE¹/₄NE¹/₄NW¹/₄ sec.4, T.136 N., R.76 W., Emmons County, Hydrologic Unit 10130103, on left bank 2.5 mi upstream from Long Lake, and 4.5 mi southeast of Moffit.

DRAINAGE AREA.--280 mi² approximately, revised (based on information provided by U.S. Fish and Wildlife Service).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,720 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.81	.19	2.8	e.58	e1.0	e1.1	109	7.6	4.6	14	133	6.6
2	.81	.19	2.7	e.58	e1.1	e1.2	84	7.1	5.1	16	122	6.6
3	.70	.19	e2.4	e.60	e1.2	e1.3	72	6.8	4.9	17	100	6.2
4	.38	.43	e2.1	e.60	e1.3	e1.4	63	6.5	4.9	19	82	6.2
5	.64	2.1	e1.9	e.60	e1.4	e1.5	52	5.8	4.6	21	74	5.9
6	.38	2.1	e1.8	e.61	e1.5	e1.8	48	5.5	5.2	20	66	6.5
7	.33	1.9	e1.7	e.59	e1.5	e4.0	46	5.3	4.6	20	61	6.4
8	.18	1.9	e1.5	e.58	e1.6	e3.0	41	5.9	6.8	18	57	6.4
9	.18	2.0	e1.4	e.56	e1.7	e15.0	35	7.2	7.3	18	53	7.5
10	.12	2.2	e1.4	e.57	e1.7	e8.0	32	8.1	6.5	18	43	5.2
11	.10	2.4	e1.3	e.58	e1.7	e35	31	7.3	6.8	19	37	4.9
12	.10	2.5	e1.3	e.58	e1.7	e30	28	7.2	7.3	19	41	5.3
13	.10	2.2	e1.2	e.56	e1.7	e22	25	7.1	8.0	20	34	5.3
14	.10	2.4	e1.1	e.56	e1.6	e18	24	6.7	8.0	21	36	4.4
15	.10	2.2	e1.0	e.57	e1.6	e14	22	7.2	6.4	39	35	3.4
16	.10	2.1	e.97	e.58	e1.5	e15	20	6.1	6.3	1330	29	5.0
17	.10	2.1	e.92	e.58	e1.5	e18	19	5.3	6.2	1480	25	3.9
18	.10	2.1	e.86	e.56	e1.4	e24	18	5.6	6.0	826	22	3.9
19	.10	2.4	e.80	e.57	e1.3	e22	17	4.8	5.7	494	21	3.7
20	.10	3.3	e.78	e.59	e1.2	e20	16	e4.5	5.5	317	18	4.5
21	.10	3.7	e.76	e.68	e1.2	e18	15	e4.2	5.2	233	16	6.3
22	.10	3.7	e.74	e.68	e1.2	e22	14	e5.2	5.6	187	15	7.7
23	.10	3.5	e.68	e.66	e1.2	e30	13	e6.5	6.3	161	15	6.9
24	.13	3.3	e.66	e.65	e1.2	e200	13	e5.7	7.5	144	13	6.7
25	.19	2.9	e.64	e.70	e1.1	e790	13	4.2	8.0	211	12	7.5
26	.19	2.7	e.63	e.77	e1.1	e1100	11	3.7	6.5	238	11	10
27	.19	2.7	e.62	e.82	e1.1	e620	9.7	4.4	5.8	209	11	8.1
28	.19	2.8	e.60	e.84	e1.1	e540	10	4.0	5.6	204	9.8	7.0
29	.19	2.7	e.58	e.82	---	353	9.6	4.0	7.5	178	13	6.3
30	.19	2.7	e.56	e.80	---	238	8.1	5.3	13	173	9.8	8.3
31	.19	---	e.56	e.93	---	160	---	5.0	---	148	6.9	---
TOTAL	7.29	67.60	36.96	19.95	38.4	4561.3	918.4	179.8	191.7	6832	1221.5	182.6
MEAN	.24	2.25	1.19	.64	1.37	147	30.6	5.80	6.39	220	39.4	6.09
MAX	.81	3.7	2.8	.93	1.7	1100	109	8.1	13	1480	133	10
MIN	.10	.19	.56	.56	1.0	1.1	8.1	3.7	4.6	14	6.9	3.4
AC-FT	14	134	73	40	76	9050	1820	357	380	13550	2420	362

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 1993, BY WATER YEAR (WY)

	MEAN	.36	1.18	.87	.75	2.62	51.5	13.8	9.10	4.88	44.9	9.76	2.95
MAX	.69	2.25	1.41	1.41	5.57	147	30.6	24.2	8.78	220	39.4	6.09	
(WY)	1990	1993	1992	1992	1992	1993	1993	1991	1991	1993	1993	1993	
MIN	.24	.34	.22	.053	.51	3.67	5.74	2.19	.63	.32	.12	.15	
(WY)	1993	1991	1991	1991	1989	1991	1990	1992	1992	1989	1990	1990	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1989 - 1993
ANNUAL TOTAL	1141.36	14257.50	
ANNUAL MEAN	3.12	39.1	12.0
HIGHEST ANNUAL MEAN			39.1
LOWEST ANNUAL MEAN			3.06
HIGHEST DAILY MEAN	34 Feb 29	1480 Jul 17	1480 Jul 17 1993
LOWEST DAILY MEAN	.04 Aug 11	.10 Oct 11	.00 Dec 30 1990
ANNUAL SEVEN-DAY MINIMUM	.06 Aug 10	.10 Oct 11	.03 Dec 26 1990
INSTANTANEOUS PEAK FLOW		1760 Jul 16	1760 Jul 16 1993
INSTANTANEOUS PEAK STAGE		a10.05 Mar 25	a10.05 Mar 25 1993
INSTANTANEOUS LOW FLOW			.00 Dec 30 1990
ANNUAL RUNOFF (AC-FT)	2260	28280	8720
10 PERCENT EXCEEDS	8.4	62	16
50 PERCENT EXCEEDS	1.2	5.2	1.2
90 PERCENT EXCEEDS	.19	.56	.17

e Estimated.

a Backwater from ice.

APPLE CREEK BASIN

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06349215 LONG LAKE CREEK ABOVE LONG LAKE NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1988 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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)
OCT 09...	1050	0.09	750	--	11.0	9.0	--	--	--	--	--
NOV 23...	1145	3.5	1280	--	0.0	2.5	--	--	--	--	--
JAN 06...	1355	0.61	1330	--	-17.0	0.5	--	--	--	--	--
FEB 12...	1130	1.7	1600	--	-2.0	0.5	--	--	--	--	--
MAR 09...	1100	177	244	7.9	5.0	1.0	50	81	11	5.5	24
15...	1325	14	630	--	9.0	1.0	--	--	--	--	--
APR 01...	1330	106	320	--	2.5	4.5	--	--	--	--	--
15...	1210	22	667	--	13.5	9.0	--	--	--	--	--
MAY 24...	1205	5.7	1100	--	12.0	13.0	--	--	--	--	--
JUL 19...	1225	513	290	--	18.0	19.0	--	--	--	--	--
AUG 24...	1020	13	898	7.9	25.0	23.0	230	362	46	28	110

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 09...	45	1	11	33	1.5	0.10	6.9	142	162	0.22	77.4
AUG 24...	50	3	11	120	4.4	0.30	25	563	583	0.79	20.8

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 09...	1	70	300	<1	30	90	<0.1	<1	<1	90
AUG 24...	5	270	170	<1	130	270	<0.1	<1	<1	460

APPLE CREEK BASIN

06349275 LONG LAKE CREEK BELOW LONG LAKE NEAR MOFFIT, ND

LOCATION.--Lat 46°41'30", long 100°17'10", in NW¼NW¼NW¼, sec.16, T.137 N., R.76 W., Burleigh County, Hydrologic Unit 10130103, on right bank at road crossing of the outflow of Long Lake, and 1.0 mi north of Moffit.

DRAINAGE AREA.--700 mi², approximately, including an unknown amount of noncontributing area. Revised (based on information provided by U.S. Fish and Wildlife Service).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1988 to September 1993 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,715 ft above sea level, from topographic map.

REMARKS.--Records good. Some regulation by several U.S. Fish and Wildlife Service control structures on the Long Lake National Wildlife Refuge.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 271 ft³/s, July 18, gage height, 3.54 ft; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	.00	.00	50	.20	.08	.22	127	1.6
2	---	---	---	---	.00	.00	31	.16	.05	.31	114	1.4
3	---	---	---	---	.00	.00	22	.15	.04	.33	105	1.7
4	---	---	---	---	.00	.00	17	.15	.02	.15	98	1.7
5	---	---	---	---	.00	.00	15	.12	.04	.11	89	1.9
6	---	---	---	---	.00	.00	12	.24	.11	.16	82	2.0
7	---	---	---	---	.00	.00	10	.17	.22	.24	76	2.1
8	---	---	---	---	.00	.00	7.9	.12	.11	.28	67	1.9
9	---	---	---	---	.00	.00	6.5	.11	.05	.31	57	1.4
10	---	---	---	---	.00	.00	5.6	.12	.07	.37	45	2.1
11	---	---	---	---	.00	.00	4.9	.12	.16	.32	38	2.3
12	---	---	---	---	.00	.00	4.2	.11	.16	.40	30	1.9
13	---	---	---	---	.00	.00	3.6	.09	.06	.54	27	1.2
14	---	---	---	---	.00	.00	3.2	.05	.00	.51	23	1.7
15	---	---	---	---	.00	.02	2.8	.03	.05	2.9	20	1.9
16	---	---	---	---	.00	.10	2.5	.00	.07	101	18	.76
17	---	---	---	---	.00	.10	2.2	.02	.03	216	14	.97
18	---	---	---	---	.00	.10	2.1	.00	.02	262	11	1.0
19	---	---	---	---	.00	.07	1.3	.00	.02	221	9.3	1.2
20	---	---	---	---	.00	.05	.88	.00	.02	198	8.4	1.1
21	---	---	---	---	.00	.02	.76	.00	.02	188	8.5	1.2
22	---	---	---	---	.00	.02	.63	.03	.16	180	6.9	.86
23	---	---	---	---	.00	.04	.75	.06	.19	170	4.9	1.1
24	---	---	---	---	.00	.09	.43	.02	.07	161	4.9	1.1
25	---	---	---	---	.00	.06	.42	.00	.00	168	4.2	1.0
26	---	---	---	---	.00	5.9	.46	.05	.00	175	3.4	.51
27	---	---	---	---	.00	66	.27	.07	.00	176	2.8	.79
28	---	---	---	---	.00	118	.22	.00	.01	166	2.6	.81
29	---	---	---	---	---	112	.19	.00	.25	160	2.4	1.0
30	---	---	---	---	---	92	.22	.08	.20	153	1.7	.75
31	---	---	---	---	---	69	---	.05	---	143	1.8	---
TOTAL	---	---	---	---	0.00	463.57	209.03	2.32	2.28	2845.15	1102.8	40.95
MEAN	---	---	---	---	.000	15.0	6.97	.075	.076	91.8	35.6	1.36
MAX	---	---	---	---	.00	118	50	.24	.25	262	127	2.3
MIN	---	---	---	---	.00	.00	.19	.00	.00	.11	1.7	.51
AC-FT	---	---	---	---	.00	919	415	4.6	4.5	5640	2190	81

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 1993, BY WATER YEAR (WY)

	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989
MEAN	.000	.000	.000	.000	.000	2.99	2.32	.85	.15	18.4	7.11	.27
MAX	.000	.000	.000	.000	.000	15.0	6.97	4.18	.65	91.8	35.6	1.37
(WY)	1989	1989	1989	1989	1989	1993	1993	1989	1989	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1989	1989	1989	1989	1989	1990	1990	1990	1992	1989	1989	1989

SUMMARY STATISTICS

WATER YEARS 1989 - 1993

ANNUAL MEAN	a.27
HIGHEST ANNUAL MEAN	a.79 1989
LOWEST ANNUAL MEAN	a.002 1991
HIGHEST DAILY MEAN	262 Jul 18 1993
LOWEST DAILY MEAN	.00 Oct 1 1988
ANNUAL SEVEN-DAY MINIMUM	.00 Oct 1 1988
INSTANTANEOUS PEAK FLOW	271 Jul 18 1993
INSTANTANEOUS PEAK STAGE	3.54 Jul 18 1993
ANNUAL RUNOFF (AC-FT)	a192
10 PERCENT EXCEEDS	1.2
50 PERCENT EXCEEDS	.00
90 PERCENT EXCEEDS	.00

a Based on complete water years only (1989-90).

APPLE CREEK BASIN

319

06349275 LONG LAKE CREEK BELOW LONG LAKE NEAR MOFFIT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1988 to September 1993 (discontinued).

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR 24...	1300	0.01	1480	--	--	--	--	--	--	--	--
APR 01...	1000	57	320	--	0.0	1.5	--	--	--	--	--
15...	1400	2.6	1030	--	13.0	9.5	--	--	--	--	--
16...	1030	2.1	1030	8.5	14.0	9.5	140	308	16	25	170
MAY 03...	1100	0.14	1290	8.1	22.0	16.0	180	394	22	30	220
JUL 16...	1625	151	970	--	18.0	17.0	--	--	--	--	--
19...	1545	212	911	--	21.0	20.0	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
APR 16...	70	6	15	210	11	0.20	3.0	636	660	0.90	3.80
MAY 03...	70	7	20	270	15	0.20	2.6	817	841	1.14	0.32

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
APR 16...	4	330	50	<1	150	10	0.2	1	<1	190
MAY 03...	7	420	80	<1	190	180	<0.1	<1	<1	270

APPLE CREEK BASIN

06349500 APPLE CREEK NEAR MENOKEN, ND

LOCATION.--Lat 46°47'40", long 100°39'25", in NW¼/NE¼, sec.9, T.138 N., R.79 W., Burleigh County, Hydrologic Unit 10130103, on left bank 75 ft downstream from bridge on county highway, 4 mi upstream from Hay Creek, 6.3 mi west of Menoken, and 6.4 mi east of Bismarck.

DRAINAGE AREA.--1,680 mi², approximately, of which about 500 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to June 1905, October 1945 to current year. Published as "near Bismarck" 1905.

REVISED RECORDS.--WSP 1209: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,638.61 ft above sea level. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1953.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.37	.66	.52	.65	e.54	67	15	8.5	9.2	480	96
2	.14	.51	.64	.47	.66	e.56	53	15	7.7	16	417	94
3	.14	.44	.63	.46	.69	e.62	44	14	7.0	22	378	88
4	.14	.36	.59	.48	.74	e.85	38	13	6.6	24	344	84
5	.14	.31	.54	.45	.73	e2.0	34	12	7.0	24	318	81
6	.13	.29	.53	.42	.73	e20	31	12	8.8	37	298	78
7	.13	.34	.53	.37	.78	e80	30	12	9.7	39	278	74
8	.13	.36	.52	.36	.75	e75	28	13	15	36	265	69
9	.13	.39	.51	.34	.73	e50	26	15	14	32	252	64
10	.13	.48	.54	.38	.74	e45	25	14	11	31	237	59
11	.13	.49	.51	.42	.72	e30	25	12	9.2	29	226	56
12	.12	.57	.51	.45	.69	e25	23	11	8.2	27	227	54
13	.11	.66	e.50	.47	.62	e21	21	9.8	9.0	26	211	51
14	.11	.67	e.50	.53	.64	e19	21	9.2	7.7	26	228	49
15	.33	.66	e.47	.57	.65	e17	21	8.5	7.9	e190	236	43
16	.38	.64	e.50	.60	.58	e15	20	8.4	8.1	e1020	298	41
17	.50	.62	e.51	.62	.56	e13	20	8.7	7.2	1050	300	39
18	.70	.60	e.51	.62	.60	e11	20	8.6	6.7	749	245	37
19	.44	.62	e.50	.62	.58	e9.8	19	8.3	6.2	539	209	37
20	e.38	.64	e.47	.58	.58	e9.5	18	7.9	5.7	422	192	37
21	e.45	.64	e.52	.58	e.56	e9.2	17	7.5	5.3	367	181	35
22	e.45	.64	e.53	.59	e.54	e9.2	16	7.3	5.0	413	172	34
23	e.42	.65	e.52	.64	e.53	e9.1	17	7.3	6.4	722	163	33
24	e.33	.67	e.50	.68	e.52	e9.5	18	7.6	7.3	702	149	31
25	e.36	.62	e.48	.69	e.52	e116	17	7.3	6.7	840	141	32
26	.33	.60	.45	.64	e.52	e420	17	7.0	6.1	850	133	29
27	.24	.57	.42	.62	e.52	e560	17	8.0	5.6	773	123	25
28	.25	.57	.41	.63	e.54	e390	16	7.6	5.1	712	116	25
29	.25	.58	.36	.65	---	e220	15	7.3	6.2	653	111	24
30	.24	.60	.42	.64	---	e105	15	9.7	9.0	612	107	24
31	.25	---	.47	.62	---	e86	---	9.4	---	555	101	---
TOTAL	8.12	16.16	15.75	16.71	17.67	2378.87	749	313.4	233.9	11547.2	7136	1523
MEAN	.26	.54	.51	.54	.63	76.7	25.0	10.1	7.80	372	230	50.8
MAX	.70	.67	.66	.69	.78	560	67	15	15	1050	480	96
MIN	.11	.29	.36	.34	.52	.54	15	7.0	5.0	9.2	101	24
AC-FT	16	32	31	33	35	4720	1490	622	464	22900	14150	3020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1993, BY WATER YEAR (WY)

	2.75	2.09	1.73	1.25	6.11	80.7	171	55.5	33.0	21.9	8.93	4.78
MEAN	2.75	2.09	1.73	1.25	6.11	80.7	171	55.5	33.0	21.9	8.93	4.78
MAX	50.2	18.9	9.65	8.90	82.6	557	1498	1038	346	372	230	84.6
(WY)	1952	1952	1952	1987	1987	1987	1950	1950	1953	1993	1993	1951
MIN	.047	.062	.057	.040	.095	.99	.53	.23	.066	.025	.030	.030
(WY)	1991	1990	1992	1977	1975	1977	1990	1977	1977	1977	1991	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1946 - 1993

ANNUAL TOTAL	2583.92	23955.78	
ANNUAL MEAN	7.06	65.6	32.4
HIGHEST ANNUAL MEAN			243
LOWEST ANNUAL MEAN			.31
HIGHEST DAILY MEAN	453	1050	5590
LOWEST DAILY MEAN	.05 Jan 14	.11 Oct 13	.00 Aug 25 1946
ANNUAL SEVEN-DAY MINIMUM	.05 Jan 22	.12 Oct 8	.00 Aug 25 1946
INSTANTANEOUS PEAK FLOW		1290	6750
INSTANTANEOUS PEAK STAGE		16.05	17.46
ANNUAL RUNOFF (AC-FT)	5130	47520	23500
10 PERCENT EXCEEDS	11	222	50
50 PERCENT EXCEEDS	.50	7.9	1.5
90 PERCENT EXCEEDS	.11	.39	.10

e Estimated.

APPLE CREEK BASIN

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06349500 APPLE CREEK NEAR MENOKEN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 15...	1030	0.11	1720	--	4.0	5.5	--	--	--	--	--
NOV 23...	1350	0.67	1630	--	0.0	2.5	--	--	--	--	--
JAN 06...	1600	0.42	1830	--	-12.0	0.5	--	--	--	--	--
FEB 09...	1350	0.75	1880	--	-2.0	0.5	--	--	--	--	--
MAR 08...	1740	77	425	7.8	4.0	0.0	98	155	21	11	52
25...	1420	116	470	--	10.0	2.0	--	--	--	--	--
31...	1330	86	225	--	1.5	5.0	--	--	--	--	--
MAY 07...	1025	12	866	--	13.5	15.0	--	--	--	--	--
24...	1445	7.8	1140	--	19.0	14.0	--	--	--	--	--
JUL 02...	1040	15	1210	--	22.5	18.0	--	--	--	--	--
19...	1810	475	413	--	22.0	20.0	--	--	--	--	--
26...	1330	841	391	--	20.0	19.0	--	--	--	--	--
AUG a23...	1210	163	802	7.9	24.0	23.5	180	311	33	23	110

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 08...	51	2	9.4	55	7.5	0.10	10	260	273	0.37	56.8
AUG a23...	55	4	13	110	9.7	0.20	18	504	533	0.72	235

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 08...	2	210	420	<1	30	320	<0.1	<1	<1	180
AUG a23...	6	310	110	<1	80	100	<0.1	<1	<1	290

a Replicate sample also collected for quality-assurance purposes.

MISSOURI RIVER MAIN STEM

06349700 MISSOURI RIVER NEAR SCHMIDT, ND

LOCATION.--Lat 46°39'22", long 100°44'18", in SW¹/₄NE¹/₄ sec.26, T.137 N., R.80 W., Morton County, Hydrologic Unit 10130102, on right bank 2 mi southeast of abandoned townsite of Schmidt, 13 mi southeast of Mandan, and at mi 1,298.

DRAINAGE AREA.--191,700 mi², approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--September 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft above sea level.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 91.1 mi upstream, and backwater from Lake Oahe.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 23.56 ft, Dec. 9, 1976; minimum daily recorded, 7.92 ft, May 30, 1967.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.29	---	11.35	19.83	19.27	15.93	11.40	11.80	13.37	13.35	13.90	14.33
2	11.27	---	12.20	19.89	19.19	15.98	11.31	11.82	13.29	13.48	13.94	14.20
3	11.12	---	12.98	20.02	19.05	15.82	11.33	11.81	13.24	13.51	13.94	14.15
4	11.28	---	13.69	20.04	18.75	15.72	11.30	12.05	13.26	13.53	13.99	14.19
5	11.20	---	14.03	20.02	18.49	15.50	11.21	11.84	13.25	13.60	13.93	14.28
6	11.19	---	14.41	20.00	18.32	16.14	11.47	11.72	13.26	13.57	13.98	14.38
7	11.17	---	14.23	20.02	18.04	16.73	11.42	11.76	13.34	13.51	13.97	14.40
8	11.18	---	14.24	20.08	17.75	17.62	11.42	11.98	13.45	13.47	13.96	14.41
9	11.17	---	14.28	20.10	17.56	18.15	11.17	11.95	13.62	13.50	13.97	13.63
10	11.18	---	14.22	19.96	17.43	17.63	11.05	12.21	13.43	13.54	13.96	13.09
11	11.15	---	14.14	19.93	17.14	16.74	11.27	12.53	13.29	13.49	14.09	13.08
12	11.15	---	14.15	19.84	16.65	16.18	11.29	13.31	13.36	13.43	14.09	12.95
13	11.20	---	14.15	19.93	16.99	15.77	11.25	13.83	13.35	13.49	14.05	12.60
14	11.25	---	14.33	20.09	17.23	15.51	11.19	13.91	13.39	13.49	14.12	12.99
15	11.31	---	14.58	20.13	17.13	15.33	11.20	13.76	13.41	13.72	14.28	13.22
16	11.23	11.23	15.31	20.12	16.81	15.47	11.21	13.66	13.40	15.66	14.18	13.05
17	11.12	11.38	14.96	20.01	16.58	15.18	11.35	13.78	13.35	16.22	14.18	12.93
18	11.22	11.29	14.50	19.96	16.43	14.66	11.16	13.87	13.33	14.92	14.07	12.96
19	11.23	11.19	14.82	19.90	16.41	15.10	10.99	13.86	13.33	14.29	14.07	12.95
20	11.23	11.25	16.60	19.97	16.60	15.41	11.17	13.60	13.05	13.98	14.14	12.97
21	11.22	11.21	18.72	19.86	16.68	15.39	11.02	13.45	13.24	13.89	14.25	12.97
22	11.25	11.16	19.30	19.87	16.31	15.46	11.04	13.36	13.29	14.20	14.20	12.88
23	11.31	11.14	19.20	19.96	16.14	15.58	11.01	13.35	13.40	16.20	14.04	13.00
24	11.25	11.15	18.33	19.95	16.10	15.52	10.98	13.54	13.56	17.14	14.07	12.98
25	11.19	11.14	18.25	19.83	15.96	13.52	11.02	13.49	13.40	16.99	14.14	13.03
26	---	11.10	18.54	19.69	15.95	12.02	11.00	13.38	13.50	16.62	14.12	12.45
27	---	11.16	18.33	19.61	16.04	11.93	11.10	13.40	13.20	15.92	14.17	12.85
28	---	11.15	---	19.58	16.03	11.79	11.15	13.43	13.22	15.66	14.19	12.76
29	---	11.20	19.75	19.60	---	11.76	11.70	13.45	13.41	15.43	14.18	12.87
30	---	11.16	---	19.41	---	11.76	11.81	13.53	13.51	14.80	14.08	12.98
31	---	---	19.79	19.39	---	11.55	---	13.38	---	14.08	14.28	---
MEAN	---	---	---	19.89	17.18	15.06	11.23	12.99	13.35	14.47	14.08	13.32
MAX	---	---	---	20.13	19.27	18.15	11.81	13.91	13.62	17.14	14.28	14.41
MIN	---	---	---	19.39	15.95	11.55	10.98	11.72	13.05	13.35	13.90	12.45

CANNONBALL RIVER BASIN

323

06350000 CANNONBALL RIVER AT REGENT, ND

LOCATION.--Lat 46°25'36", long 102°33'05", in NE¹/₄NE¹/₄ sec.13, T.134 N., R.95 W., Hettinger County, Hydrologic Unit 10130204, on right bank 400 ft from bridge on county highway, and 0.3 mi north of Regent.

DRAINAGE AREA.--580 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,422.90 ft above sea level.

REMARKS.--Records good except those for periods of estimated discharges, which are fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1914, 26.1 ft, Apr. 16, 1950, from floodmarks, discharge, 20,300 ft³/s, on basis of slope-area measurement at site 4 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	e2.3	3.5	e1.4	1.4	2.5	9.6	6.5	3.5	9.7	10	1.9
2	1.1	e2.1	3.3	e1.4	1.6	3.8	9.0	6.7	3.5	8.1	8.1	1.8
3	1.0	e2.1	3.3	e1.4	1.6	21	8.9	6.9	3.6	7.4	7.0	2.1
4	1.1	e2.0	3.1	e1.3	1.7	35	8.1	6.9	3.6	11	6.3	1.9
5	1.1	e1.9	3.1	1.2	1.8	117	7.6	6.5	3.6	17	5.5	1.7
6	1.0	e2.1	3.0	1.2	1.9	137	7.5	6.2	3.5	14	4.9	1.7
7	e1.2	e2.3	2.7	1.2	2.0	124	7.5	6.5	3.4	12	4.7	1.5
8	e1.2	e2.5	2.4	1.2	2.2	95	7.2	6.8	4.5	11	4.3	1.5
9	e1.2	e2.5	2.1	1.2	2.3	117	6.9	6.9	5.0	12	3.8	1.4
10	e1.3	e2.6	2.2	1.2	2.4	82	7.0	6.7	5.6	15	3.5	1.4
11	e1.3	e2.6	2.3	1.1	e2.3	47	7.1	6.2	5.3	16	3.7	1.4
12	e1.3	e2.8	2.5	1.1	e2.2	28	7.1	5.8	6.0	14	3.8	1.4
13	e1.3	e2.9	2.6	1.1	e2.2	27	7.1	5.1	5.5	14	3.4	1.4
14	e1.2	e3.0	2.5	1.1	e2.1	34	7.1	4.7	4.5	13	3.3	1.7
15	e1.2	e3.1	2.3	1.0	e2.1	27	6.8	4.3	3.5	18	3.2	1.8
16	e1.1	e4.7	2.2	1.0	e2.0	16	6.4	3.9	3.8	22	2.7	1.9
17	e1.0	e3.3	2.2	1.0	e2.0	14	6.2	3.7	3.5	29	2.6	1.8
18	e1.2	3.4	2.2	.94	2.0	12	5.8	3.3	2.9	29	2.5	1.7
19	e1.4	3.1	2.2	.89	2.0	11	5.7	3.1	2.9	26	2.1	1.7
20	e1.8	3.3	2.1	.87	2.0	11	6.1	3.1	2.5	20	1.8	1.7
21	e2.1	3.5	2.1	.87	2.0	11	6.1	3.2	4.3	15	1.7	1.9
22	e2.5	3.5	2.1	.94	2.0	10	6.1	3.3	5.2	158	1.7	2.0
23	e2.8	3.7	2.1	.95	2.0	12	6.8	3.3	5.1	297	1.7	2.0
24	e3.0	3.8	2.0	.95	2.0	13	9.3	3.2	5.4	98	1.7	2.0
25	e3.3	3.8	2.0	.95	2.0	14	11	3.2	5.2	59	1.7	2.0
26	e3.2	3.5	1.9	.97	2.0	15	10	2.8	4.4	43	1.8	2.0
27	e3.1	3.4	1.8	1.1	2.0	14	9.8	2.8	3.7	35	1.7	2.0
28	e3.0	3.4	e1.7	1.2	2.1	14	8.9	2.8	3.2	27	1.7	2.1
29	e2.9	3.4	e1.6	1.2	---	11	8.0	2.8	5.9	21	1.7	2.1
30	e2.7	3.3	e1.5	1.2	---	11	7.1	3.5	9.4	16	1.9	2.1
31	e2.5	---	e1.5	1.3	---	10	---	3.6	---	13	1.9	---
TOTAL	55.2	89.9	72.1	34.43	55.9	1096.3	227.8	144.3	132.0	1100.2	106.4	53.6
MEAN	1.78	3.00	2.33	1.11	2.00	35.4	7.59	4.65	4.40	35.5	3.43	1.79
MAX	3.3	4.7	3.5	1.4	2.4	137	11	6.9	9.4	297	10	2.1
MIN	1.0	1.9	1.5	.87	1.4	2.5	5.7	2.8	2.5	7.4	1.7	1.4
AC-FT	109	178	143	68	111	2170	452	286	262	2180	211	106

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1993, BY WATER YEAR (WY)

	MEAN	8.73	6.03	4.13	5.14	23.2	138	125	65.2	82.6	27.8	18.9	5.14
MAX	124	51.6	15.7	63.2	393	963	1127	523	512	331	299	20.4	
(WY)	1983	1983	1983	1973	1982	1978	1952	1972	1957	1969	1981	1986	
MIN	1.25	1.87	.52	.000	.000	3.23	3.80	2.94	1.57	.78	.67	.70	
(WY)	1961	1961	1951	1952	1959	1964	1961	1992	1990	1989	1959	1960	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1951 - 1993

	ANNUAL TOTAL	1092.67	3168.13	
ANNUAL MEAN		2.99	8.68	42.5
HIGHEST ANNUAL MEAN				168
LOWEST ANNUAL MEAN				3.11
HIGHEST DAILY MEAN	16	Jul 7	297	7880
LOWEST DAILY MEAN	.61	Aug 21	.87	.00
ANNUAL SEVEN-DAY MINIMUM	.80	Aug 17	.92	.00
INSTANTANEOUS PEAK FLOW			415	10000
INSTANTANEOUS PEAK STAGE			6.65	20.55
ANNUAL RUNOFF (AC-FT)	2170		6280	30760
10 PERCENT EXCEEDS	5.0		14	45
50 PERCENT EXCEEDS	2.5		3.1	4.9
90 PERCENT EXCEEDS	1.2		1.2	1.3

e Estimated.

CANNONBALL RIVER BASIN

06350000 CANNONBALL RIVER AT REGENT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-66, 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 07...	0920	1.2	1860	--	--	4.0	9.0	--	--	--	--
NOV 17...	1440	3.3	1730	--	--	3.0	1.0	--	--	--	--
JAN 06...	0910	1.2	2350	--	--	-20.0	0.5	--	--	--	--
FEB 24...	0900	2.0	2250	--	--	-31.0	0.5	--	--	--	--
MAR 09...	1330	125	750	8.0	--	0.0	1.5	160	140	32	20
MAR 23...	1045	11	880	--	--	13.5	1.0	--	--	--	--
JUN 03...	0948	3.6	1620	--	--	15.0	16.0	--	--	--	--
AUG 06...	1420	4.7	1780	--	--	20.0	19.0	--	--	--	--
SEP 15...	1019	1.8	2020	--	8.3	15.5	10.0	320	398	40	54

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 09...	92	53	3	14	230	5.5	0.20	5.7	484	486	0.66
SEP 15...	330	68	8	12	710	11	0.50	2.9	1400	1470	2.00

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 09...	164	1	130	90	<1	10	70	0.1	<1	1	450
SEP 15...	7.26	1	620	10	<1	50	10	<0.1	1	<1	1000

CANNONBALL RIVER BASIN

325

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND

LOCATION.--Lat 46°19'20", long 102°59'45", in NW¼, sec.21, T.133 N., R.98 W., Slope County, Hydrologic Unit 10130205, on left bank 1,200 ft downstream from county highway bridge, and 13 mi northeast of Scranton.

DRAINAGE AREA.--42.9 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1965 to current year (seasonal records only since 1984).

GAGE.--Water-stage recorder. Elevation of gage is 2,825 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 100 ft³/s, Mar. 5, gage height, 4.67 ft, backwater from ice; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	e.00	.00	.21	e.00	e.00	.79	.38	.00
2	---	---	---	---	e.00	.00	.21	e.00	e.00	.31	.34	.00
3	---	---	---	---	e.00	.00	.21	e.00	e.00	.23	.31	.00
4	---	---	---	---	e.00	e1.0	.12	e.00	.00	.22	.62	.00
5	---	---	---	---	e.00	e30	.00	e.00	.00	.41	.79	.00
6	---	---	---	---	e.00	e50	.00	e.00	.00	.32	.67	.00
7	---	---	---	---	e.00	.27	.00	e.00	.00	.18	.55	.00
8	---	---	---	---	e.00	.18	.00	e.00	.21	.19	.41	.00
9	---	---	---	---	e.00	7.0	.00	e.00	.68	.25	.29	.00
10	---	---	---	---	e.00	6.4	.05	e.00	.32	.56	.24	.00
11	---	---	---	---	e.00	4.2	.21	e.00	.13	.76	.21	.00
12	---	---	---	---	e.00	2.4	.20	e.00	.05	.96	.08	.00
13	---	---	---	---	e.00	1.2	.09	e.00	.01	8.9	.00	.00
14	---	---	---	---	e.00	1.0	e.04	e.00	.00	17	.00	.00
15	---	---	---	---	e.00	.62	e.03	e.00	.00	11	.00	.00
16	---	---	---	---	e.00	.90	e.02	e.00	.00	9.1	.00	.00
17	---	---	---	---	e.00	.43	e.01	e.00	.00	8.2	.00	.00
18	---	---	---	---	e.00	.07	e.00	e.00	.00	4.0	.00	.00
19	---	---	---	---	e.00	.19	e.00	e.00	.00	11	.00	.00
20	---	---	---	---	e.00	.20	e.00	e.00	.00	6.7	.00	.00
21	---	---	---	---	e.00	.21	e.00	e.00	.00	3.5	.00	.00
22	---	---	---	---	e.00	.16	e.00	e.00	.00	3.9	.00	.00
23	---	---	---	---	e.00	.28	e.00	e.00	.00	4.6	.00	.00
24	---	---	---	---	.00	.39	e.00	e.00	.00	3.4	.00	.00
25	---	---	---	---	.00	.15	e.00	e.00	.00	2.7	.00	.00
26	---	---	---	---	.00	.17	e.00	e.00	.00	1.8	.00	.00
27	---	---	---	---	.00	.29	e.00	e.00	.00	1.6	.00	.00
28	---	---	---	---	.00	.21	e.00	e.00	.00	1.2	.00	.00
29	---	---	---	---	---	.21	e.00	e.00	.07	.88	.00	.00
30	---	---	---	---	---	.21	e.00	e.00	.45	.69	.00	.00
31	---	---	---	---	---	.21	---	e.00	---	.50	.00	---
TOTAL	---	---	---	---	0.00	153.10	1.40	0.00	1.92	105.85	4.89	0.00
MEAN	---	---	---	---	.000	4.94	.047	.000	.064	3.41	.16	.000
MAX	---	---	---	---	.00	.50	.21	.00	.68	.17	.79	.00
MIN	---	---	---	---	.00	.00	.00	.00	.00	.18	.00	.00
AC-FT	---	---	---	---	.00	304	2.8	.00	3.8	210	9.7	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1993, BY WATER YEAR (WY)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.58	.43	.22	.68	1.88	11.6	11.0	8.12	4.33	2.41	.88	.035																	
MAX	20.3	2.52	.85	7.20	10.6	70.0	47.3	36.4	29.3	37.6	15.2	.31																	
(WY)	1983	1983	1973	1973	1982	1971	1979	1975	1971	1969	1970	1971																	
MIN	.000	.000	.000	.000	.000	.000	.047	.000	.000	.000	.000	.000																	
(WY)	1967	1968	1969	1966	1966	1991	1993	1993	1990	1977	1965	1965																	

SUMMARY STATISTICS

WATER YEARS 1965 - 1993

ANNUAL MEAN	a4.45
HIGHEST ANNUAL MEAN	a11.9 1971
LOWEST ANNUAL MEAN	a.066 1980
HIGHEST DAILY MEAN	475 Mar 28 1971
LOWEST DAILY MEAN	.00 Jul 19 1965
ANNUAL SEVEN-DAY MINIMUM	.00 Jul 19 1965
INSTANTANEOUS PEAK FLOW	645 May 8 1970
INSTANTANEOUS PEAK STAGE	7.76 May 8 1967
ANNUAL RUNOFF (AC-FT)	a3220
10 PERCENT EXCEEDS	4.0
50 PERCENT EXCEEDS	.07
90 PERCENT EXCEEDS	.00

e Estimated.

a Based on complete water years (1966-83).

CANNONBALL RIVER BASIN

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
MAR 09...	1130	9.1	580	562	7.7	2.0	1.0	170	71	40	17
23...	1145	0.20	1370	--	--	19.0	5.0	--	--	--	--
JUL 30...	0948	0.80	--	1130	7.6	26.0	22.0	350	268	72	40
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 09...	45	35	2	10	200	4.4	0.10	7.8	368	370	0.50
JUL 30...	140	46	3	12	380	180	0.20	9.9	996	858	1.17
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 09...	9.05	2	140	150	<1	10	180	0.1	1	<1	580
JUL 30...	1.85	5	430	10	<1	30	10	<0.1	<1	<1	1000

CANNONBALL RIVER BASIN

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06352000 CEDAR CREEK NEAR HAYNES, ND

LOCATION.--Lat 46°09'15", long 102°28'25", in W¹/₂ sec.20, T.131 N., R.94 W., Adams County, Hydrologic Unit 10130205, on left bank 30 ft downstream from bridge on State Highway 8, and 12.5 mi north of Haynes.

DRAINAGE AREA.--553 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,472.90 ft above sea level (North Dakota Highway Department bench mark). Prior to May 20, 1951, nonrecording gage on former bridge 400 ft upstream at same datum.

REMARKS.--Records good except those for period of estimated daily discharges, which are poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 17, 1950, reached a stage of about 23 ft, discharge, 26,900 ft³/s, by slope-area measurement at site 9 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.36	1.4	1.8	e.00	e.00	e.25	12	11	e3.5	5.6	27	1.5
2	.57	1.7	1.6	e.00	e.00	e1.0	11	11	e2.9	21	21	1.8
3	.57	e1.6	1.8	e.00	e.00	e5.4	11	9.9	e2.7	15	17	1.8
4	.50	e1.5	e1.7	e.00	e.00	e22	11	9.1	1.8	10	15	1.6
5	.50	e1.5	e1.6	e.00	e.00	e100	11	7.7	1.4	9.8	12	1.7
6	.46	e1.4	e1.5	e.00	e.00	e300	11	6.9	1.5	8.1	11	1.7
7	.56	1.3	e1.1	e.00	e.00	e290	10	e8.2	2.1	6.4	9.5	1.8
8	.66	1.3	e.99	e.00	e.00	e194	9.7	e7.4	3.1	5.0	8.3	1.6
9	.64	1.6	e1.0	e.00	e.00	e128	8.9	e6.9	2.9	3.8	6.9	1.5
10	.57	1.8	e1.0	e.00	e.00	e110	8.6	e6.3	2.8	3.2	5.5	1.5
11	.62	2.0	e1.1	e.00	e.00	e88	8.8	e6.0	2.7	3.7	5.8	1.5
12	.71	2.0	e1.0	e.00	e.00	e82	8.6	e5.5	2.0	3.0	8.7	1.2
13	.76	2.4	e.88	e.00	e.00	e80	8.4	e5.2	1.8	3.8	4.1	1.3
14	.71	1.7	e.72	e.00	e.00	e75	7.9	e5.0	1.5	7.9	3.7	1.3
15	1.1	1.5	e.59	e.00	e.00	e64	7.9	e4.7	8.3	7.2	3.5	1.3
16	1.2	1.5	e.53	e.00	e.00	e56	7.3	e4.5	6.5	7.6	3.5	1.3
17	1.3	1.5	e.52	e.00	e.00	e49	6.8	e4.3	5.1	16	2.9	1.4
18	1.3	1.5	e.28	e.00	e.00	e41	6.8	e4.1	4.4	19	2.5	1.5
19	1.4	1.5	e.24	e.00	e.00	e35	7.5	e3.9	3.6	18	2.3	1.5
20	1.3	1.5	e.20	e.00	e.00	e30	8.0	e3.6	2.6	15	2.0	1.7
21	1.3	1.5	e.19	e.00	e.00	e24	7.6	e3.5	3.1	19	1.8	1.7
22	1.3	1.5	e.17	e.00	e.00	e20	7.6	e3.6	2.9	20	1.6	1.7
23	1.4	e1.4	e.15	e.00	e.00	e15	7.5	e3.3	2.6	647	1.5	1.7
24	1.0	e1.4	e.12	e.00	e.00	e16	7.6	e3.2	2.6	447	1.6	1.6
25	.98	e1.4	e.11	e.00	e.00	e17	7.5	e3.0	1.6	223	1.4	1.5
26	.87	e1.5	e.10	e.00	e.00	e16	8.2	e2.8	1.4	159	1.4	1.5
27	.94	e1.6	e.08	e.00	e.00	e15	12	e2.8	1.2	124	1.5	1.4
28	.83	1.7	e.05	e.00	e.06	e15	16	e2.6	1.5	88	1.3	1.3
29	.91	1.7	e.03	e.00	---	14	15	e3.0	2.3	60	1.7	1.3
30	1.0	1.7	e.02	e.00	---	13	13	e2.8	5.0	46	1.9	1.3
31	1.0	---	e.01	e.00	---	13	---	e2.7	---	35	1.7	---
TOTAL	27.32	47.6	21.18	0.00	0.06	1928.65	284.2	164.5	87.4	2057.1	189.6	45.5
MEAN	.88	1.59	.68	.000	.002	62.2	9.47	5.31	2.91	66.4	6.12	1.52
MAX	1.4	2.4	1.8	.00	.06	300	16	11	8.3	647	27	1.8
MIN	.36	1.3	.01	.00	.00	.25	6.8	2.6	1.2	3.0	1.3	1.2
AC-FT	54	94	42	.00	.1	3830	564	326	173	4080	376	90

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1993, BY WATER YEAR (WY)

	4.34	4.67	3.28	4.38	14.3	109	115	56.1	56.7	17.7	10.1	2.93
MEAN	4.34	4.67	3.28	4.38	14.3	109	115	56.1	56.7	17.7	10.1	2.93
MAX	43.2	54.4	20.4	59.4	242	837	1159	522	339	177	94.1	20.0
(WY)	1983	1983	1983	1973	1982	1978	1952	1975	1964	1969	1981	1977
MIN	.25	.60	.22	.000	.000	1.05	1.58	1.66	.77	.000	.000	.000
(WY)	1961	1962	1962	1962	1962	1964	1961	1961	1956	1961	1959	1960

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1951 - 1993

ANNUAL TOTAL	1054.33	4853.11	
ANNUAL MEAN	2.88	13.3	33.2
HIGHEST ANNUAL MEAN			122
LOWEST ANNUAL MEAN			1.04
HIGHEST DAILY MEAN	83	647	7060
LOWEST DAILY MEAN	.01	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.06	.00	.00
INSTANTANEOUS PEAK FLOW		985	7870
INSTANTANEOUS PEAK STAGE		12.58	a22.05
ANNUAL RUNOFF (AC-FT)	2090	9630	24060
10 PERCENT EXCEEDS	5.0	17	37
50 PERCENT EXCEEDS	1.5	1.7	3.0
90 PERCENT EXCEEDS	.40	.00	.60

e Estimated.

a Backwater from ice and snow.

CANNONBALL RIVER BASIN

06352000 CEDAR CREEK NEAR HAYNES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
OCT 05...	1315	0.49	1480	--	17.0	12.0	--	--	--	--	--
NOV 16...	1420	1.5	1630	--	4.0	0.5	--	--	--	--	--
MAR 08...	1400	194	310	7.9	5.0	1.5	93	90	19	11	25
23...	0815	15	1040	--	4.0	1.0	--	--	--	--	--
JUN 03...	1405	2.7	1510	--	14.0	17.0	--	--	--	--	--
JUL 30...	1350	48	1520	--	30.0	24.0	--	--	--	--	--
SEP 14...	1455	1.2	1650	8.8	16.5	12.0	350	363	36	64	250

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 08...	33	1	12	66	1.7	0.10	6.4	196	232	0.32	122
SEP 14...	60	6	12	550	9.7	0.40	0.70	1140	1160	1.58	3.85

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 08...	2	60	140	<1	10	80	<0.1	1	1	210
SEP 14...	1	520	10	<1	60	<10	<0.1	<1	<1	780

CANNONBALL RIVER BASIN

329

06353000 CEDAR CREEK NEAR RALEIGH, ND

LOCATION.--Lat 46°05'30", long 101°20'00", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.130 N., R.85 W., Grant County, Hydrologic Unit 10130205, on left bank at upstream side of bridge on N.D. Highway 31, 6 mi upstream from mouth, and 19 mi south of Raleigh.

DRAINAGE AREA.--1,750 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1939, March 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,881.23 ft above sea level. Prior to June 6, 1962, nonrecording gage at same site and datum, and June 6, 1962, to Sept. 7, 1972, at site 1 mi upstream at datum 9.58 ft higher.

REMARKS.--Records poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1950, about 18 ft, Apr. 18, 1950; discharge 45,000 ft³/s, on basis of slope-area measurement 5 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.16	e.00	e.00	e.00	55	14	3.3	130	317	16
2	.00	e.00	e.11	e.00	e.00	e.00	51	13	3.2	56	230	15
3	.00	e.00	e.07	e.00	e.00	e.00	46	12	2.6	e1550	172	14
4	.00	e.00	e.05	e.00	e.00	e.00	43	12	1.9	e1300	133	13
5	.00	e.00	e.03	e.00	e.00	e46	39	11	1.6	e1000	107	13
6	.00	e.00	e.02	e.00	e.00	e408	37	12	1.5	e800	90	12
7	.00	e.01	e.02	e.00	e.00	e640	37	11	162	e700	78	11
8	.00	e.01	e.00	e.00	e.00	e780	36	18	304	e550	68	9.9
9	.00	e.02	e.00	e.00	e.00	e700	33	57	82	e460	60	8.4
10	.00	e.13	e.00	e.00	e.00	e640	36	54	36	e400	53	7.9
11	.00	e.88	e.00	e.00	e.00	584	34	36	30	e370	48	7.7
12	.00	e.61	e.00	e.00	e.00	461	31	27	33	e320	46	7.1
13	.00	e.55	e.00	e.00	e.00	543	29	24	26	e320	41	6.4
14	.00	e.24	e.00	e.00	e.00	688	27	20	20	e300	50	6.1
15	.00	e.24	e.00	e.00	e.00	396	25	17	17	e280	41	5.8
16	.00	e.24	e.00	e.00	e.00	e330	23	15	14	e350	39	5.3
17	.00	.24	e.00	e.00	e.00	e265	22	13	12	71	48	5.1
18	.00	e.29	e.00	e.00	e.00	e210	21	11	10	283	75	5.2
19	.00	e.29	e.00	e.00	e.00	e180	20	10	9.2	s191	58	5.1
20	.00	e.29	e.00	e.00	e.00	e160	19	8.9	7.9	169	46	5.6
21	.00	e.29	e.00	e.00	e.00	e140	18	8.1	6.8	198	43	5.4
22	.00	e.34	e.00	e.00	e.00	e127	18	7.1	5.6	245	37	5.0
23	.00	e.40	e.00	e.00	e.00	e115	18	6.4	6.0	114	32	5.1
24	.00	e.45	e.00	e.00	e.00	e103	17	6.2	7.6	80	28	5.3
25	.00	e.45	e.00	e.00	e.00	94	17	5.0	6.2	81	26	4.8
26	.00	e.45	e.00	e.00	e.00	87	16	4.3	4.7	119	23	4.1
27	.00	e.40	e.00	e.00	e.00	84	16	3.9	4.0	1480	21	4.0
28	.00	e.40	e.00	e.00	e.00	76	15	3.6	3.3	2180	19	4.7
29	.00	e.34	e.00	e.00	---	70	14	3.2	134	1590	20	5.1
30	.00	e.24	e.00	e.00	---	65	14	3.7	432	741	20	4.5
31	.00	---	e.00	e.00	---	60	---	3.5	---	454	18	---
TOTAL	0.00	7.80	0.46	0.00	0.00	8052.00	827	450.9	1387.4	16882	2087	227.6
MEAN	.000	.26	.015	.000	.000	260	27.6	14.5	46.2	545	67.3	7.59
MAX	.00	.88	.16	.00	.00	780	55	57	432	2180	317	16
MIN	.00	.00	.00	.00	.00	.00	14	3.2	1.5	56	18	4.0
AC-FT	.00	15	.9	.00	.00	15970	1640	894	2750	33490	4140	451

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1993, BY WATER YEAR (WY)

	MEAN	9.20	7.82	6.10	12.0	37.0	341	246	176	106	77.6	21.0	6.71
MAX	66.4	48.8	31.3	217	664	1640	1460	1043	605	545	96.9	59.2	
(WY)	1978	1983	1983	1973	1982	1978	1982	1975	1964	1993	1984	1977	
MIN	.000	.000	.000	.000	.000	.25	.35	.89	2.03	.25	.000	.000	
(WY)	1965	1964	1964	1964	1964	1964	1991	1992	1992	1990	1974	1939	

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1939 - 1993
ANNUAL TOTAL	858.11	29922.16	
ANNUAL MEAN	2.34	82.0	89.5
HIGHEST ANNUAL MEAN			307
LOWEST ANNUAL MEAN			1.91
HIGHEST DAILY MEAN	37 Feb 27	2180 Jul 28	10900 Mar 28 1978
LOWEST DAILY MEAN	.00 Jan 1	.00 Oct 1	.00 Aug 1 1939
ANNUAL SEVEN-DAY MINIMUM	.00 Sep 11	.00 Oct 1	.00 Aug 20 1939
INSTANTANEOUS PEAK FLOW		3290 Jul 3	13400 Mar 28 1978
INSTANTANEOUS PEAK STAGE		8.10 Jul 3	13.70 Mar 28 1978
ANNUAL RUNOFF (AC-FT)	1700	59350	64840
10 PERCENT EXCEEDS	6.9	236	151
50 PERCENT EXCEEDS	.38	5.3	8.0
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

CANNONBALL RIVER BASIN

06353000 CEDAR CREEK NEAR RALEIGH, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
MAR											
11...	1210	584	385	8.1	-3.5	0.5	91	92	18	11	35
25...	1310	94	540	--	17.0	7.0	--	--	--	--	--
MAY											
05...	1025	11	1460	--	18.5	14.0	--	--	--	--	--
JUN											
07...	1140	2.2	1600	--	14.0	15.0	--	--	--	--	--
AUG											
24...	1330	28	1680	8.3	32.0	23.0	430	360	63	65	230

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR											
11...	42	2	11	90	1.9	0.10	5.2	228	255	0.35	402
AUG											
24...	53	5	16	550	10	0.40	11	1160	1220	1.66	91.9

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR										
11...	1	70	270	<1	10	60	<0.1	1	<1	250
AUG										
24...	2	470	10	<1	80	<10	<0.1	<1	<1	850

CANNONBALL RIVER BASIN

331

06354000 CANNONBALL RIVER AT BREIEN, ND

LOCATION.--Lat 46°22'33", long 100°56'03", in sec.36, T.134 N., R.82 W., Morton County, Hydrologic Unit 10130206, on left bank at downstream side of bridge on State Highway 6, 1,100 ft downstream from Dogtooth Creek, and 0.6 mi southeast of Breien.

DRAINAGE AREA.--4,100 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1934 to current year.

REVISED RECORDS.--WSP 786: 1934. WSP 1146: 1943. WSP 1279: 1936-37(M), 1947(M). WSP 1509: 1955(M).

GAGE.--Water-stage recorder. Datum of gage is 1,673.54 ft above sea level. From June 12, 1973, to July 1, 1985, at site 450 ft downstream. Prior to June 12, 1973, at site 50 ft upstream at datum 3.00 ft higher. June 13, 1973, to April 8, 1980, at datum 2.00 ft higher.

REMARKS.--Records good except those for period of estimated daily discharges, which are poor. Some storage in several small lakes above station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.38	2.9	e10	e2.4	e2.8	e21	143	49	16	e205	875	25
2	.38	8.7	e10	e2.3	e3.0	e80	128	51	14	399	680	21
3	.23	15	e6.6	e2.1	e3.2	e200	112	47	11	2060	552	20
4	.26	13	e5.7	e2.0	e3.3	e250	99	42	10	1560	459	20
5	.21	10	e5.2	e2.0	e3.5	e230	88	36	11	527	379	21
6	.19	7.2	e4.8	e2.0	e3.7	e170	84	44	33	316	323	24
7	.20	14	e4.4	e2.0	e3.9	e580	86	42	65	213	281	29
8	.28	13	e4.0	e2.0	e4.1	e3750	88	39	344	164	244	32
9	.28	17	e3.8	e2.0	e4.0	e3400	86	44	508	152	215	28
10	.30	25	e4.0	e1.9	e4.0	e2410	113	70	255	130	189	34
11	.31	43	e4.1	e1.8	e3.8	e1250	120	103	150	125	170	43
12	.26	49	e4.2	e1.8	e3.7	e1070	96	85	e94	101	156	37
13	.35	21	e4.2	e1.8	e3.7	e1000	84	76	e76	316	140	26
14	.43	21	e4.1	e1.8	e3.6	e880	79	98	e66	668	157	25
15	.65	22	e3.9	e1.7	e3.5	e1000	75	81	e60	669	172	25
16	.56	19	e3.7	e1.6	e3.5	e1250	72	64	e58	3320	238	21
17	.70	18	e3.6	e1.6	e3.6	e1500	67	52	e50	1560	194	18
18	.82	15	e3.6	e1.5	e3.7	e1750	e59	42	e40	1010	156	18
19	1.1	13	e3.5	e1.5	e3.7	e1700	e62	36	e35	982	169	18
20	1.2	14	e3.5	e1.5	e3.6	e550	e66	32	e30	761	137	26
21	1.2	13	e3.5	e1.6	e3.6	e350	e69	29	e27	659	118	18
22	1.2	e12	e3.5	e1.6	e3.7	e240	e75	25	e25	763	101	16
23	1.0	e11	e3.3	e1.7	e3.8	255	e85	22	e25	719	88	15
24	1.1	e12	e3.3	e1.8	e3.8	261	e107	21	32	591	71	15
25	.84	e12	e3.2	e1.8	e3.8	301	e102	17	46	1130	58	14
26	1.1	e11	e3.1	e1.9	e3.9	268	e92	16	52	2320	48	13
27	.82	e9.8	e2.9	e2.0	e4.1	222	e85	15	32	3200	41	12
28	.89	e11	e2.7	e2.2	e5.0	200	e60	13	21	3640	38	12
29	1.1	e11	e2.6	e2.3	---	183	e48	12	e95	2990	31	13
30	1.5	e11	e2.5	e2.4	---	169	48	21	e150	1910	30	13
31	1.6	---	e2.4	e2.6	---	152	---	18	---	1210	28	---
TOTAL	21.44	474.6	129.9	59.2	103.6	25642	2578	1342	2431	34370	6538	652
MEAN	.69	15.8	4.19	1.91	3.70	827	85.9	43.3	81.0	1109	211	21.7
MAX	1.6	49	10	2.6	5.0	3750	143	103	508	3640	875	43
MIN	.19	2.9	2.4	1.5	2.8	21	48	12	10	101	28	12
AC-FT	43	941	258	117	205	50860	5110	2660	4820	68170	12970	1290

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 1993, BY WATER YEAR (WY)

	MEAN	29.4	25.8	14.5	15.0	62.5	812	873	334	397	203	62.7	32.7
MAX	281	238	71.6	342	1058	4260	10070	2399	2384	1409	380	267	
(WY)	1978	1983	1983	1973	1982	1943	1950	1975	1937	1969	1981	1977	
MIN	.21	.63	.38	.000	.000	3.29	17.1	6.48	3.10	.17	.12	.010	
(WY)	1961	1961	1935	1941	1935	1965	1961	1992	1936	1974	1974		

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1934 - 1993

ANNUAL TOTAL	9764.63	74341.74	
ANNUAL MEAN	26.7	204	239
HIGHEST ANNUAL MEAN			994
LOWEST ANNUAL MEAN			9.90
HIGHEST DAILY MEAN	458	3750	63100
LOWEST DAILY MEAN	.19	.19	.00
ANNUAL SEVEN-DAY MINIMUM	.24	.24	.00
INSTANTANEOUS PEAK FLOW		6040	a94800
INSTANTANEOUS PEAK STAGE		10.92	b22.30
ANNUAL RUNOFF (AC-FT)	19370	147500	173000
10 PERCENT EXCEEDS	64	551	383
50 PERCENT EXCEEDS	10	24	25
90 PERCENT EXCEEDS	.91	1.6	.60

e Estimated.

a From rating extended above 16,000 ft³/s on basis of indirect measurement of peak flow.

b From floodmark.

CANNONBALL RIVER BASIN

06354000 CANNONBALL RIVER AT BREIEN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1970-72, 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)
NOV 18...	1025	15	1770	--	--	--	--	--	--	--	--
JAN 04...	1420	2.0	2580	--	--	--	--	--	--	--	--
FEB 04...	1045	3.3	1960	--	--	--	--	--	--	--	--
MAR 10...	1640	2410	360	7.9	-1.5	1.0	84	107	17	10	39
12...	1120	1070	380	--	--	--	--	--	--	--	--
22...	1250	240	508	--	--	--	--	--	--	--	--
25...	1100	314	510	--	--	--	--	--	--	--	--
APR 29...	0935	48	1370	--	--	--	--	--	--	--	--
JUN 07...	1000	22	1360	--	--	--	--	--	--	--	--
23...	1150	25	1470	--	--	--	--	--	--	--	--
JUL 15...	0900	399	440	--	--	--	--	--	--	--	--
AUG 24...	1752	75	1440	8.5	29.0	21.5	350	330	56	51	180
SEP 07...	1205	32	1450	--	--	--	--	--	--	--	--

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
MAR 10...	47	2	9.3	88	2.0	0.10	4.9	235	254	0.35	1650
AUG 24...	51	4	17	440	9.3	0.40	12	965	1010	1.37	204

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 10...	1	70	180	<1	10	30	0.1	1	<1	220
AUG 24...	2	420	10	<1	60	10	<0.1	2	<1	770

BEAVER CREEK BASIN

333

06354580 BEAVER CREEK BELOW LINTON, ND

LOCATION.--Lat 46°16'07", long 100°15'05", in NW¼NW¼SW¼ sec.7, T.132 N., R.76 W., Emmons County, Hydrologic Unit 10130104, on left bank 25 ft upstream from bridge on county road, 0.7 mi west of Linton, and 0.5 mi downstream from Spring Creek.

DRAINAGE AREA.--765 mi², of which about 100 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1989 to current year. Records for August 1949 to September 1989 at site 1.5 mi upstream published as "at Linton, ND" (station 06354580) are not equivalent because of difference in drainage area.

GAGE.--Water-stage recorder and artificial control. Elevation of gage is 1,690 ft above sea level, from topographic map.

REMARKS.--Records fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	1.7	3.0	.82	1.2	1.3	220	26	10	129	270	187
2	.00	2.1	3.2	.86	1.3	1.5	257	23	9.6	178	244	151
3	.00	1.6	2.8	.86	1.4	1.6	222	21	9.3	197	228	143
4	1.5	1.5	2.6	.79	1.4	1.7	208	19	9.0	199	212	122
5	.65	1.5	2.4	.70	1.5	2.4	171	19	9.2	205	202	108
6	.20	1.4	2.3	.69	1.5	12	148	17	9.6	155	190	95
7	.15	1.4	2.2	.67	1.6	60	131	19	10	127	184	84
8	.16	3.5	2.1	.67	1.6	e120	121	18	12	111	175	76
9	.29	4.8	2.0	.56	1.5	e94	113	20	13	105	164	67
10	.40	5.5	2.0	.54	1.5	e50	110	21	13	102	155	60
11	.50	7.0	2.0	.62	1.4	34	107	19	11	96	152	55
12	.57	1.8	1.9	.78	1.5	31	101	19	11	91	185	50
13	.45	e2.0	1.9	.75	1.4	25	99	19	9.5	99	171	44
14	.40	2.5	1.9	.77	1.4	19	94	27	8.9	105	184	40
15	.68	2.1	2.0	.80	1.4	16	87	23	9.1	108	188	34
16	.95	1.9	2.0	.84	1.3	e20	80	20	11	557	177	30
17	1.1	1.9	1.9	.79	1.2	e22	73	18	9.7	609	166	30
18	1.4	2.5	1.9	.83	1.2	e24	67	16	7.5	1340	149	29
19	1.3	e2.8	1.8	.85	1.2	e25	61	15	7.7	1100	131	28
20	1.2	3.0	1.7	.86	1.2	26	54	14	7.1	419	121	27
21	1.1	3.2	1.7	.89	1.1	35	51	12	5.9	339	112	24
22	1.2	2.7	1.7	1.0	1.1	50	46	12	8.1	265	103	22
23	1.3	3.3	1.6	1.0	1.2	51	44	12	8.5	227	97	20
24	1.2	2.4	1.5	1.1	1.1	363	42	12	8.1	212	92	19
25	1.3	e2.0	1.5	1.1	1.2	845	39	15	7.0	344	82	21
26	1.2	e2.5	1.3	1.1	1.4	1350	34	13	6.7	606	86	18
27	1.2	2.7	1.2	1.1	1.3	1650	30	12	9.7	610	86	16
28	1.1	3.1	1.1	1.2	1.2	1580	28	9.1	9.3	481	145	16
29	.95	3.4	1.0	1.1	---	2150	27	7.9	21	446	353	16
30	.87	3.1	.94	1.1	---	1020	26	9.9	56	355	337	16
31	1.0	---	.88	1.1	---	279	---	12	---	302	247	---
TOTAL	24.33	80.9	58.02	26.84	37.3	9959.5	2891	519.9	337.5	10219	5388	1648
MEAN	.78	2.70	1.87	.87	1.33	321	96.4	16.8	11.2	330	174	54.9
MAX	1.5	7.0	3.2	1.2	1.6	2150	257	27	56	1340	353	187
MIN	.00	1.4	.88	.54	1.1	1.3	26	7.9	5.9	91	82	16
AC-FT	48	160	115	53	74	19750	5730	1030	669	20270	10690	3270

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1993, BY WATER YEAR (WY)

	1990	1991	1992	1993
MEAN	1.00	2.08	1.34	1.10
MAX	2.85	3.59	1.97	2.04
(WY)	1990	1990	1990	1992
MIN	.16	.31	.36	.30
(WY)	1991	1991	1991	1991

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1990 - 1993

ANNUAL TOTAL	1843.80	31190.29	
ANNUAL MEAN	5.04	85.5	25.9
HIGHEST ANNUAL MEAN			85.5
LOWEST ANNUAL MEAN			4.76
HIGHEST DAILY MEAN	70	2150	2150
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.03	.32	.00
INSTANTANEOUS PEAK FLOW		2270	2270
INSTANTANEOUS PEAK STAGE		11.79	11.79
INSTANTANEOUS LOW FLOW		.00	.00
ANNUAL RUNOFF (AC-FT)	3660	61870	18790
10 PERCENT EXCEEDS	11	203	35
50 PERCENT EXCEEDS	1.5	11	2.1
90 PERCENT EXCEEDS	.24	.89	.19

e Estimated.

BEAVER CREEK BASIN

06354580 BEAVER CREEK BELOW LINTON, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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)
NOV 12...	1015	1.4	1080	--	2.0	2.0	--	--	--	--	--
JAN 07...	1115	0.67	1480	--	-8.0	0.0	--	--	--	--	--
MAR 09...	1445	94	347	8.0	2.0	0.5	110	99	26	11	25
25...	1140	886	160	--	5.0	0.5	--	--	--	--	--
31...	1045	285	225	--	0.0	4.5	--	--	--	--	--
JUN 10...	1215	15	1090	--	27.0	18.0	--	--	--	--	--
JUL 07...	1230	194	688	--	20.5	19.5	--	--	--	--	--
16...	1218	729	409	--	22.0	18.0	--	--	--	--	--
21...	1115	354	--	--	21.5	21.0	--	--	--	--	--
AUG 09...	1200	163	910	8.2	31.0	22.5	270	350	50	34	82

DATE	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED PER AC-FT) (70303)	SOLIDS, DIS- SOLVED PER DAY) (70302)
MAR 09...	30	1	13	76	2.7	0.10	13	227	239	0.33	60.4
AUG 09...	38	2	16	110	13	0.20	19	535	545	0.74	240

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 09...	2	80	590	<1	40	190	<0.1	<1	<1	170
AUG 09...	6	230	40	<1	90	20	<0.1	1	2	360

PORCUPINE CREEK BASIN

335

06354815 PORCUPINE CREEK NEAR FORT YATES, ND

LOCATION.--Lat 46°11'36", long 100°45'05", in NW1/4SW1/4, sec.6, T.131 N., R.80 W., Sioux County, Hydrologic Unit 10130102, on right bank at downstream side of bridge 8 mi northwest of Fort Yates.

DRAINAGE AREA.--220 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,640 ft above sea level, from topographic map.

REMARKS.--Records fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	2.2	1.6	e1.1	e1.9	e3.3	9.9	2.4	2.6	e180	20	2.9
2	1.1	2.0	1.4	e1.1	e2.1	e4.3	7.8	2.4	1.9	e190	15	2.8
3	.99	2.0	1.3	e1.0	e2.4	e6.0	6.8	2.4	1.5	e150	12	2.6
4	.96	3.9	1.4	e.98	e2.6	e10	6.0	2.2	1.4	101	10	2.7
5	.93	2.0	1.4	e.95	e2.7	e50	5.5	2.2	1.3	91	8.4	2.7
6	.94	1.5	1.4	e.87	e2.8	e100	5.3	2.3	1.7	38	7.4	2.6
7	1.1	1.4	1.4	e.86	e2.9	e250	5.4	2.3	3.0	18	6.9	2.5
8	1.1	1.4	1.4	e.82	e2.9	e350	5.8	2.3	45	10	6.5	2.4
9	1.1	2.1	1.4	e.75	e2.9	e300	6.5	2.3	45	9.2	6.0	2.4
10	1.1	3.6	1.4	e.72	e2.9	e253	9.3	2.2	19	5.4	5.6	2.3
11	1.1	11	1.2	e.85	e2.9	e262	33	2.2	6.1	16	5.3	2.3
12	1.3	8.9	1.2	e1.0	e2.8	e164	18	2.1	5.8	11	5.4	2.2
13	1.0	8.1	1.4	e1.0	e2.8	e156	8.2	1.9	4.3	75	5.0	2.1
14	.95	5.0	1.4	e1.0	e2.7	e100	5.9	1.8	2.9	e150	5.2	2.1
15	1.3	3.3	1.5	e1.0	e2.6	e85	5.2	1.7	2.3	e850	4.7	2.2
16	1.4	3.2	1.6	e1.1	e2.6	e92	4.7	1.6	2.0	e866	4.8	2.1
17	1.3	3.1	1.4	e1.1	e2.7	e100	4.4	1.5	1.7	e200	4.5	2.1
18	1.3	3.4	1.4	e1.1	e2.6	e107	4.0	1.7	1.5	e85	4.1	2.1
19	1.3	3.2	e1.4	e1.2	e2.4	e110	3.8	1.5	1.5	60	3.7	2.2
20	1.3	2.8	e1.4	e1.2	e2.3	e120	3.5	1.4	1.5	30	3.6	2.5
21	1.3	2.4	e1.4	e1.3	e2.3	e130	3.3	1.5	1.3	17	3.5	2.2
22	1.2	2.3	e1.4	e1.4	e2.3	e135	3.1	1.4	1.3	26	3.4	2.5
23	1.2	2.2	e1.3	e1.5	e2.2	e100	3.1	1.6	2.7	55	3.3	2.1
24	1.2	2.1	e1.3	e1.6	e2.2	e80	3.1	1.6	20	73	3.1	2.1
25	1.1	2.1	e1.2	e1.6	e2.2	e65	2.9	1.4	20	e110	3.3	2.0
26	1.1	1.8	e1.2	e1.6	e2.1	e53	2.7	1.4	4.3	e160	3.2	1.9
27	1.1	1.6	e1.2	e1.7	e2.2	e40	2.7	1.4	2.2	e175	3.0	1.8
28	1.0	1.6	e1.2	e1.8	e2.5	e28	2.6	1.4	3.4	e130	3.0	1.8
29	1.1	1.7	e1.1	e1.8	---	e22	2.5	1.4	38	96	3.2	1.8
30	1.2	1.6	e1.1	e1.7	---	e18	2.4	1.9	e135	53	3.0	1.8
31	1.4	---	e1.1	e1.7	---	13	---	1.8	---	31	2.9	---
TOTAL	35.57	93.5	41.5	37.40	70.5	3306.6	187.4	57.2	380.2	4061.6	179.0	67.8
MEAN	1.15	3.12	1.34	1.21	2.52	107	6.25	1.85	12.7	131	5.77	2.26
MAX	1.4	11	1.6	1.8	2.9	350	33	2.4	135	866	20	2.9
MIN	.93	1.4	1.1	.72	1.9	3.3	2.4	1.4	1.3	5.4	2.9	1.8
AC-FT	71	185	82	74	140	6560	372	113	754	8060	355	134

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1993, BY WATER YEAR (WY)

	1991	1992	1993	1991	1992	1993	1991	1992	1993	1991	1992	1993
MEAN	1.23	2.17	1.33	1.70	7.89	58.3	4.04	1.92	13.4	58.4	4.75	1.89
MAX	1.32	3.12	1.34	2.20	13.1	107	6.25	2.00	14.2	131	5.77	2.43
(WY)	1992	1993	1993	1992	1992	1993	1993	1992	1992	1993	1993	1992
MIN	1.15	1.22	1.32	1.21	2.52	9.93	1.84	1.85	12.7	15.3	3.29	.97
(WY)	1993	1992	1992	1993	1993	1992	1992	1993	1993	1992	1992	1991

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1991 - 1993
ANNUAL TOTAL	2120.27	8518.27	
ANNUAL MEAN	5.79	23.3	14.5
HIGHEST ANNUAL MEAN			23.3
LOWEST ANNUAL MEAN			5.65
HIGHEST DAILY MEAN	180	866	866
LOWEST DAILY MEAN	.93	.72	.40
ANNUAL SEVEN-DAY MINIMUM	1.0	.83	.46
INSTANTANEOUS PEAK FLOW		a1200	a1200
INSTANTANEOUS PEAK STAGE		b13.62	b13.62
ANNUAL RUNOFF (AC-FT)	4210	16900	10490
10 PERCENT EXCEEDS	12	74	23
50 PERCENT EXCEEDS	1.9	2.4	2.0
90 PERCENT EXCEEDS	1.1	1.1	1.1

e Estimated.
a About.
b From high-water mark.

PORCUPINE CREEK BASIN

06354815 PORCUPINE CREEK NEAR FORT YATES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1991 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT	05...	1000	1.0	1950	--	--	--	--	--	--
NOV	18...	1210	3.5	1360	--	--	--	--	--	--
JAN	06...	1045	0.87	1200	--	--	--	--	--	--
	31...	1250	2.4	1580	--	--	--	--	--	--
MAR	10...	1445	253	108	7.9	-0.5	1.0	12.5	92	9
	30...	1130	18	350	--	--	--	--	--	--
MAY	21...	1005	1.5	1900	8.4	19.0	14.5	8.9	93	120
JUN	10...	0940	20	930	8.2	22.0	17.0	7.2	79	66
AUG	05...	0915	8.8	830	8.0	18.0	18.5	7.6	86	84
SEP	07...	1015	2.5	1630	8.4	--	--	--	--	120

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)
MAR	10...	0.79	14	66	2	5.1	11	1.4	<0.10	4.8
MAY	21...	11	390	87	15	7.4	370	37	1.4	11
JUN	10...	5.1	180	84	10	6.7	230	4.6	0.40	16
AUG	05...	6.5	160	79	8	7.2	130	11	0.60	17
SEP	07...	10	340	85	13	6.3	300	25	1.3	17

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (MG/L AS AS) (01000)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
MAR	10...	82	0.11	56.0	0.020	0.400	0.420	0.190	0.140	1
MAY	21...	1280	1.74	5.08	<0.010	--	<0.050	0.030	<0.010	2
JUN	10...	744	1.01	41.0	0.030	0.470	0.500	0.060	0.040	4
AUG	05...	560	0.76	13.4	<0.010	--	<0.050	0.030	0.010	1
SEP	07...	1060	1.44	7.13	--	--	--	--	--	1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	TRIAZIN	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	2, 4-D SCREEN, TOTAL (UG/L) (99906)	
						SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)				
MAR	10...	6	35	<1	<1	18	--	<0.06	<0.04	<0.700
MAY	21...	130	96	5	<1	270	--	<0.06	<0.04	<0.700
JUN	10...	59	100	<1	1	160	<0.05	<0.06	<0.04	<0.700
AUG	05...	53	130	1	<1	170	<0.05	<0.06	<0.04	--
SEP	07...	110	86	4	<1	260	<0.05	<0.06	<0.04	<0.700

GRAND RIVER BASIN

337

06354988 BOWMAN-HALEY LAKE NEAR HALEY, ND

LOCATION.--Lat 45°59'06", long 103°14'43", in NE $\frac{1}{4}$ sec.24, T.129 N., R.101 W., Bowman County, Hydrologic Unit 10130301, at dam on North Fork Grand River, and 6 mi west of Haley.

DRAINAGE AREA.--446 mi², approximately.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--August 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by a rolled earth-fill dam; storage began Aug. 22, 1966; dam completed April 1967. Total capacity is 93,000 acre-ft at maximum pool, elevation, 2,777.0 ft. Dead storage is 4,280 acre-ft below lowest point of outlet, elevation, 2,740.0 ft. Normal operating storage is 20,100 acre-ft at elevation 2,755.0 ft, crest of spillway. Figures given herein represent total contents. Controlled releases are through a 30-inch or 8-inch gate valve. The spillway is uncontrolled "glory hole" type and discharges through a conduit 9 ft in diameter. The reservoir is for flood control, water supply, and recreation.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers. Elevations affected by wind. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 37,540 acre-ft, Mar. 28, 1978, elevation, 2,762.66 ft; minimum since first reaching spillway level, 9,190 acre-ft, June 12, 1992, elevation, 2,747.57 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 20,370 acre-ft, July 28, elevation, 2,755.66 ft; minimum, 13,790 acre-ft, Feb. 28, elevation, 2,751.48 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	2,751.82	14,190	--
Oct. 31-----	2,751.60	13,890	-300
Nov. 30-----	2,751.58	13,860	-30
Dec. 31-----	2,751.58	13,860	0
CAL YR 1992-----	--	--	+3,710
Jan. 31-----	2,751.55	13,880	+20
Feb. 28-----	2,751.48	13,790	-90
Mar. 31-----	2,755.15	19,390	+5,600
Apr. 30-----	2,755.02	19,140	-250
May 31-----	2,754.69	18,610	-530
June 30-----	2,754.88	18,910	+300
July 31-----	2,755.61	20,280	+1,370
Aug. 31-----	2,754.74	18,690	-1,590
Sept. 30-----	2,754.26	17,930	-760
WTR YR 1993-----	--	--	+3,740

GRAND RIVER BASIN

06355000 NORTH FORK GRAND RIVER AT HALEY, ND

LOCATION.--Lat 45°57'39", long 103°07'09", at southwest corner of sec.30, T.129 N., R.99 W., Bowman County, Hydrologic Unit 10130301, on left bank 10 ft downstream from county highway bridge at Haley, and 1 mi north of North Dakota-South Dakota state line.

DRAINAGE AREA.--509 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1908 to September 1917, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1239: 1908-10, 1913-15(M), 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 2,658.60 ft above sea level. Oct. 23, 1945, to June 18, 1951, nonrecording gage on downstream side of bridge near left abutment at present datum. See WSP 1729 or 1917 for history of changes prior to Oct. 23, 1945.

REMARKS.--Records good except those for periods of estimated daily discharge, which are poor. Flow regulated since August 1966 by Bowman-Haley Lake (station 06354988) 8 mi upstream. There are some small diversions for irrigation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.00	2.6	e.90	e.52	e.00	e.00	17	8.1	2.0	10	83	7.8
2	e.00	3.2	e.90	e.52	e.00	e.00	16	5.4	2.2	7.1	81	7.5
3	e.00	3.4	e.90	e.50	e.00	e1.0	15	4.6	2.2	3.5	73	7.4
4	e.00	2.0	e.90	e.50	e.00	e25	14	4.7	2.0	2.5	62	7.4
5	e.00	2.6	e.90	e.50	e.00	e35	14	4.4	1.8	3.7	54	7.4
6	e.00	2.6	e.88	e.50	e.00	e50	13	4.4	1.3	9.5	48	7.6
7	e.10	2.4	e.88	e.40	e.00	e60	11	4.8	1.2	9.9	43	7.8
8	e.15	2.4	e.86	e.30	e.00	e38	11	4.8	2.2	6.9	37	7.8
9	e.20	2.4	e.86	e.20	e.00	e10	11	5.3	2.7	3.5	33	7.8
10	e.20	2.4	e.84	e.10	e.00	e7.0	11	8.1	3.3	2.4	29	7.7
11	e.20	2.4	e.84	e.05	e.00	e5.0	11	6.9	3.3	1.9	26	6.8
12	e.20	2.4	e.82	e.02	e.00	e4.0	10	3.6	2.6	2.0	23	5.1
13	e.20	1.6	e.82	e.01	e.00	e10	8.4	2.2	1.7	2.6	21	4.0
14	e.20	1.6	e.74	e.01	e.00	e20	7.4	1.4	.80	3.4	19	3.6
15	e.50	1.6	e.74	e.00	e.00	e35	7.6	1.4	1.9	6.1	17	3.4
16	e1.0	1.3	e.70	e.00	e.00	e35	7.1	1.5	3.0	9.5	15	3.4
17	1.6	e1.2	e.68	e.00	e.00	e40	7.2	1.5	2.4	12	13	3.4
18	1.6	e1.2	e.66	e.00	e.00	e50	6.4	1.9	1.6	30	13	3.6
19	1.7	e1.2	e.64	e.00	e.00	e45	8.1	2.1	.47	33	12	3.7
20	1.8	e1.2	e.64	e.00	e.00	e40	7.8	2.2	.16	29	10	3.7
21	1.6	e1.2	e.62	e.00	e.00	e38	9.2	2.2	.09	31	8.7	3.7
22	1.6	e1.1	e.60	e.00	e.00	e36	9.9	1.9	.12	37	7.3	3.7
23	1.8	e1.1	e.60	e.00	e.00	e40	8.6	1.7	.17	42	6.4	3.2
24	1.9	e1.1	e.58	e.00	e.00	e35	8.4	2.0	.32	45	7.5	2.6
25	1.8	e1.1	e.58	e.00	e.00	e28	9.5	2.6	.69	47	7.7	2.3
26	1.8	e1.1	e.56	e.00	e.00	e22	10	3.2	1.8	49	7.4	2.0
27	2.0	e1.1	e.56	e.00	e.00	20	8.9	2.8	2.9	48	7.4	1.8
28	2.0	e1.0	e.54	e.00	e.00	19	14	2.2	2.9	54	7.4	1.8
29	2.0	e1.0	e.54	e.00	---	18	22	1.9	2.9	68	7.4	1.7
30	2.0	e1.0	e.54	e.00	---	19	15	1.8	6.5	78	7.8	1.6
31	1.9	---	e.54	e.00	---	18	---	2.0	---	83	7.8	---
TOTAL	30.05	52.5	22.36	4.13	0.00	803.00	329.5	103.6	57.22	770.5	794.8	141.3
MEAN	.97	1.75	.72	.13	.000	25.9	11.0	3.34	1.91	24.9	25.6	4.71
MAX	2.0	3.4	.90	.52	.00	60	22	8.1	6.5	83	83	7.8
MIN	.00	1.0	.54	.00	.00	.00	6.4	1.4	.09	1.9	6.4	1.6
AC-FT	60	104	44	8.2	.00	1590	654	205	113	1530	1580	280

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 1993, BY WATER YEAR (WY)

	MEAN	2.07	2.42	1.50	2.95	8.08	73.7	103	32.9	43.5	19.6	5.75	1.80
MAX	23.0	32.9	12.3	56.4	97.5	457	1683	266	291	210	49.1	27.0	
(WY)	1983	1983	1983	1973	1947	1972	1952	1982	1953	1915	1914	1951	
MIN	.16	.17	.029	.000	.000	.70	.69	.60	.20	.065	.000	.000	
(WY)	1962	1962	1962	1909	1949	1915	1961	1992	1990	1961	1961	1992	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1908 - 1993

ANNUAL TOTAL	461.76	3108.96	
ANNUAL MEAN	1.26	8.52	24.7
HIGHEST ANNUAL MEAN			143
LOWEST ANNUAL MEAN			.88
HIGHEST DAILY MEAN	38	83	13100
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		84	14100
INSTANTANEOUS PEAK STAGE		a6.38	17.10
ANNUAL RUNOFF (AC-FT)	916	6170	17900
10 PERCENT EXCEEDS	2.5	29	30
50 PERCENT EXCEEDS	.90	2.2	1.5
90 PERCENT EXCEEDS	.00	.00	.20

e Estimated.

a Backwater from ice.

GRAND RIVER BASIN

339

06355000 NORTH FORK GRAND RIVER AT HALEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
NOV 17...	1220	1.2	3100	--	--	2.0	1.0	--	--	--	--
MAR 08...	1610	37	350	7.9	--	5.0	1.0	76	87	18	7.5
23...	1450	41	1780	--	--	22.0	2.0	--	--	--	--
JUN 03...	1500	2.2	2680	--	--	19.0	18.0	--	--	--	--
JUL 29...	1515	70	217	--	--	30.0	24.5	--	--	--	--
SEP 14...	1037	3.4	2550	--	8.4	10.0	6.5	310	416	45	48
DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
MAR 08...	35	46	2	10	81	2.0	0.10	4.7	211	205	0.28
SEP 14...	470	76	12	17	950	12	0.50	1.2	1790	1810	2.46
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
MAR 08...	20.6	1	100	110	<1	10	60	0.1	<1	<1	190
SEP 14...	16.4	2	870	20	<1	40	10	<0.1	6	<1	660

MISSOURI-OAHE RIVER BASIN

06439980 LAKE OAHE NEAR PIERRE, SD

LOCATION.--Lat 44°27'30", LONG 100°23'29", in NE¹/₄, sec.1, T.111 N., R.80 W., 5th principal meridian, Hughes County, Hydrologic Unit 10130105, in Pier A of Control Tower No. 1 of powerhouse intake structure of dam on Missouri River, 6.0 mi northwest of Pierre, 7.1 mi upstream from Bad River, and at mile 1,072.3.

DRAINAGE AREA.--243,500 mi², approximately.

MONTHEND ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--August 1958 to current year (monthend contents only). Prior to October 1967, published as Oahe Reservoir near Pierre.

GAGE.--Water-stage recorder. Datum of gage is above sea level. Prior to Jan. 14, 1958, nonrecording gages at various locations upstream from outlet works, Jan. 14, 1959, to Sept. 30, 1962, recorder in Tower No. 1 of outlet works, all at same datum.

REVISED RECORDS.--WDR SD-88-1: September monthend elevation.

REMARKS.--Reservoir is formed by an earthfill dam; storage began in August 1958. Maximum capacity, 23,338,000 acre-ft below elevation 1,620.0 ft (top of spillway gates). Normal maximum, 22,240,000 acre-ft below 1,617.0 ft, of which about 2,390,000 acre-ft is designated for flood control. Inactive storage, 5,451,000 acre-ft below elevation 1,540.0 ft. Dead storage, 1,970 acre-ft below elevation 1,425.0 ft (invert of lowest outlet tunnel). Figures given herein represent elevations at powerhouse intake structure and total contents adjusted for wind effect.

The spillway consists of a gated chute with flat crest at elevation 1,596.5 ft, 8 gates, 50 by 23.5 ft each; design capacity, 300,000 ft³/s. The outlet works consist of 7 turbines with a generating capacity of 85,000 kilowatts each. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Records of elevation and contents provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 22,764,000 acre-ft, May 14, 1986, affected by wind; minimum since initial filling, 12,071,000 acre-ft, Oct. 30, 1989, Nov. 1, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 19,988,000 acre-ft, Sept. 9; minimum contents, 14,354,000 acre-ft, Oct. 17.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	1,591.37	14,531,000	-
Oct. 31-----	1,591.00	14,427,000	-104,000
Nov. 30-----	1,591.80	14,680,000	+253,000
Dec. 31-----	1,591.56	a14,405,000	a-275,000
CAL YR 1992-----	-	-	b+762,000
Jan. 31-----	1,592.23	14,554,000	+149,000
Feb. 28-----	1,592.70	14,672,000	+118,000
Mar. 31-----	1,596.37	15,623,000	+951,000
Apr. 30-----	1,597.86	16,014,000	+391,000
May 31-----	1,600.17	16,656,000	+642,000
June 30-----	1,601.87	17,139,000	+483,000
July 31-----	1,608.02	18,994,000	+1,855,000
Aug. 31-----	1,610.35	19,803,000	+809,000
Sept. 30-----	1,610.74	19,802,000	-1,000
WTR YR 1993-----	-	-	c+5,271,000

NOTE.--Lake frozen over Jan. 7 to Mar. 31.

a Based on a new area-capacity table that became effective Dec. 1, 1992, the change in contents during December was -56,000 acre-ft.

b The change in contents for calendar year 1992 was +543,000 acre-ft (see footnote a).

c The change in contents for water year 1993 was +5,052,000 acre-ft (see footnote a).

JAMES RIVER BASIN

341

06467600 JAMES RIVER NEAR MANFRED, ND

LOCATION.--Lat 47°38'40", long 99°49'40", near midpoint of north line sec.15, T.148 N., R.72 W., Wells County, Hydrologic Unit 10160001, on right upstream wingwall of bridge on county highway, and 5 mi southwest of Manfred.

DRAINAGE AREA.--253 mi², of which about 197 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1954 to August 1957 (annual maximum only), September 1957 to current year (seasonal records only from 1982 to 1985).

GAGE.--Water-stage recorder. Datum of gage is 1,605.73 ft above sea level. Prior to Sept. 16, 1957, crest-stage gage only on downstream side of bridge at same datum.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	e.10	e61	e4.6	1.4	25	85	5.5
2	.00	.00	.00	.00	.00	e.75	e55	e4.2	1.4	33	66	4.4
3	.00	.00	.00	.00	.00	e1.2	e49	e3.6	1.2	37	53	3.6
4	.00	.00	.00	.00	.00	e1.9	e42	e3.1	.90	41	46	3.2
5	.00	.00	.00	.00	.00	e2.5	e37	e3.5	.74	33	39	3.0
6	.00	.00	.00	.00	.00	e3.4	e31	e5.7	.90	28	32	2.5
7	.00	.00	.00	.00	.00	e4.1	e25	e8.4	1.0	25	26	2.2
8	.00	.00	.00	.00	.00	e4.6	e19	e11	2.1	27	22	2.1
9	.00	.00	.00	.00	.00	e4.2	e14	e14	9.2	29	19	1.9
10	.00	.00	.00	.00	.00	e3.3	e10	e16	15	27	17	1.7
11	.00	.00	.00	.00	.00	e2.6	e12	e12	10	21	16	1.7
12	.00	.00	.00	.00	.00	e2.3	e15	e9.5	6.3	18	16	1.7
13	.00	.00	.00	.00	.00	e2.1	e13	e8.2	6.7	18	15	1.6
14	.00	.00	.00	.00	.00	e2.4	e12	e7.3	6.7	18	14	1.5
15	.00	.00	.00	.00	.00	e2.8	e11	e6.1	5.9	18	14	1.4
16	.00	.00	.00	.00	.00	e3.0	e9.8	e5.4	5.3	22	14	1.4
17	.00	.00	.00	.00	.00	e3.7	e9.2	e3.9	5.0	59	13	1.2
18	.00	.00	.00	.00	.00	e3.5	e8.7	e2.3	5.2	53	12	1.2
19	.00	.00	.00	.00	.00	e3.4	e8.1	e1.3	5.3	54	11	1.2
20	.00	.00	.00	.00	.00	e3.9	e7.2	.84	5.2	83	11	1.2
21	.00	.00	.00	.00	.00	e4.6	e6.8	.53	4.5	79	10	1.2
22	.00	.00	.00	.00	.00	e8.8	e6.3	.40	3.5	116	9.8	1.2
23	.00	.00	.00	.00	.00	e35	e5.9	.56	3.3	2000	8.8	1.0
24	.00	.00	.00	.00	.00	e115	e6.2	.37	3.5	938	7.8	1.0
25	.00	.00	.00	.00	.00	e380	e7.1	.30	4.5	573	7.6	.96
26	.00	.00	.00	.00	.00	e310	e6.9	.30	30	458	6.3	.84
27	.00	.00	.00	.00	.00	e225	e6.3	.40	54	292	5.7	.79
28	.00	.00	.00	.00	.00	e160	e5.8	.40	38	223	5.2	.65
29	.00	.00	.00	.00	---	e90	e5.4	.49	28	183	4.5	.65
30	.00	.00	.00	.00	---	e78	e5.1	1.0	25	135	4.7	.69
31	.00	---	.00	.00	---	e69	---	1.2	---	108	5.3	---
TOTAL	0.00	0.00	0.00	0.00	0.00	1531.15	510.8	136.89	289.74	5774	616.7	53.18
MEAN	.000	.000	.000	.000	.000	49.4	17.0	4.42	9.66	186	19.9	1.77
MAX	.00	.00	.00	.00	.00	380	61	16	54	2000	85	5.5
MIN	.00	.00	.00	.00	.00	.10	5.1	.30	.74	18	4.5	.65
AC-FT	.00	.00	.00	.00	.00	3040	1010	272	575	11450	1220	105

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1993, BY WATER YEAR (WY)

	MEAN	.29	.26	.072	.004	.95	17.5	18.0	4.84	4.97	8.44	1.28	.33
MAX	2.65	4.05	.87	.094	17.6	82.4	118	31.5	58.5	186	19.9	2.90	
(WY)	1986	1981	1981	1958	1981	1983	1979	1974	1980	1993	1993	1981	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1959	1959	1959	1959	1959	1961	1977	1977	1961	1961	1958	1958	

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1958 - 1993

ANNUAL TOTAL	559.87	8912.46	
ANNUAL MEAN	1.53	24.4	4.36
HIGHEST ANNUAL MEAN			24.4
LOWEST ANNUAL MEAN			.000
HIGHEST DAILY MEAN	99	Feb 29	2000
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			a2700
INSTANTANEOUS PEAK STAGE			b9.40
ANNUAL RUNOFF (AC-FT)	1110	17680	3160
10 PERCENT EXCEEDS	.21	37	5.4
50 PERCENT EXCEEDS	.00	1.2	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a About.

b From high-water mark.

JAMES RIVER BASIN

06467600 JAMES RIVER NEAR MANFRED, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-60, 1962-64, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CaCO3) (00900)	ALKA-LINITY LAB (MG/L AS CaCO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS Ca) (00915)
MAR 25...	1835	401	170	--	6.0	2.0	--	--	--	--	--
MAR 29...	1415	90	188	7.5	5.0	2.5	11.0	85	61	76	14
APR 09...	1800	10	398	7.8	10.0	9.0	11.3	--	140	145	30
MAY 19...	1500	1.3	1190	7.9	12.0	13.5	8.7	89	370	516	66
AUG 03...	1615	49	488	7.6	19.5	19.0	6.7	77	190	221	40
SEP 07...	1330	2.2	968	7.9	20.0	15.5	7.9	84	340	449	73

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 29...	6.3	9.2	21	0.5	11	16	2.3	<0.10	108	134	0.18
APR 09...	15	26	27	1	11	56	4.5	0.10	230	260	0.35
MAY 19...	49	150	46	3	13	170	11	0.30	771	864	1.18
AUG 03...	21	28	23	0.9	10	40	3.8	0.20	277	324	0.44
SEP 07...	39	95	37	2	2.0	110	11	0.30	600	652	0.89

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)
MAR 29...	32.5	0.040	0.450	0.490	0.090	0.290	0.220	0.230	2	2	60
APR 09...	7.02	<0.010	--	<0.050	0.050	0.230	0.230	0.170	3	3	90
MAY 19...	3.03	0.010	--	<0.050	0.060	--	0.420	0.370	--	6	470
AUG 03...	43.2	<0.010	--	<0.050	0.030	0.480	0.420	0.370	5	5	110
SEP 07...	3.87	--	--	--	--	--	--	--	--	5	300

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	CARBO-FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA-ZINE SCREEN, TOTAL (UG/L) (99904)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE # FINER THAN .062 MM (70331)
MAR 29...	170	12	0.1	<1	<1	--	--	--	18	4.4	86
APR 09...	58	9	<0.1	<1	<1	--	--	--	6	0.16	71
MAY 19...	66	49	0.3	--	<1	--	--	--	4	0.01	86
AUG 03...	87	43	0.2	<1	<1	<0.05	<0.06	<0.04	7	0.93	83
SEP 07...	100	18	<0.1	--	<1	--	--	--	92	0.55	83

JAMES RIVER BASIN

343

06468170 JAMES RIVER NEAR GRACE CITY, ND

LOCATION.--Lat 47°33'29", long 98°51'45", in NW¹/₄NW¹/₄NW¹/₄, sec.17, T.147 N., R.64 W., Foster County, Hydrologic Unit 10160001, on left bank on upstream side of county highway bridge, and 2.5 mi northwest of Grace City.

DRAINAGE AREA.--1,060 mi², approximately, of which about 650 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,457.60 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	.30	e.10	e.00	e.00	e.00	e900	13	8.8	25	1640	193
2	.12	.30	e.05	e.00	e.00	e.00	e700	12	7.5	27	1410	179
3	.12	.30	e.00	e.00	e.00	e.00	e625	11	6.6	32	1260	165
4	.12	e.25	e.00	e.00	e.00	e.00	521	9.2	6.0	34	1110	154
5	.10	e.20	e.00	e.00	e.00	e.00	410	8.3	6.0	37	975	145
6	.02	e.15	e.00	e.00	e.00	e.00	376	8.0	5.5	41	836	137
7	.01	e.10	e.00	e.00	e.00	e.00	359	7.9	6.0	46	723	128
8	.01	e.15	e.00	e.00	e.00	e.00	330	7.6	7.2	50	615	121
9	.03	e.20	e.00	e.00	e.00	e.00	301	9.4	8.3	51	532	113
10	.06	e.25	e.00	e.00	e.00	e.00	272	9.1	6.7	51	474	100
11	.12	e.30	e.00	e.00	e.00	e.00	240	7.6	6.1	49	427	95
12	.11	e.35	e.00	e.00	e.00	e.00	216	7.7	8.0	48	413	95
13	.08	e.30	e.00	e.00	e.00	e.00	197	9.1	10	55	407	90
14	.08	e.25	e.00	e.00	e.00	e.00	179	10	11	66	395	84
15	.07	e.20	e.00	e.00	e.00	e.00	158	12	13	80	362	80
16	.06	e.20	e.00	e.00	e.00	e.00	140	13	15	91	335	75
17	.06	e.20	e.00	e.00	e.00	e.00	123	14	13	107	312	70
18	.09	e.25	e.00	e.00	e.00	e.00	105	13	14	120	293	65
19	.12	e.30	e.00	e.00	e.00	e.00	89	13	13	141	282	61
20	.12	e.35	e.00	e.00	e.00	e.00	72	12	12	160	269	57
21	.12	e.40	e.00	e.00	e.00	e.00	60	11	11	168	257	53
22	.10	e.40	e.00	e.00	e.00	e.00	51	10	11	191	244	50
23	.06	e.35	e.00	e.00	e.00	e.00	43	9.4	16	342	232	47
24	.24	e.30	e.00	e.00	e.00	e1.0	37	9.5	14	448	224	43
25	.30	e.25	e.00	e.00	e.00	e4.0	31	8.9	11	641	215	41
26	.24	e.20	e.00	e.00	e.00	e20	28	8.4	11	1150	206	39
27	.18	e.20	e.00	e.00	e.00	e40	23	8.8	12	2380	194	36
28	.12	e.15	e.00	e.00	e.00	e180	21	8.2	15	3430	183	32
29	.12	e.15	e.00	e.00	---	e350	17	8.0	20	2990	181	29
30	.18	e.10	e.00	e.00	---	e800	15	8.9	25	2440	229	28
31	.24	---	e.00	e.00	---	e1100	---	9.2	---	1970	213	---
TOTAL	3.52	7.40	0.15	0.00	0.00	2495.00	6639	307.2	329.7	17461	15448	2605
MEAN	.11	.25	.005	.000	.000	80.5	221	9.91	11.0	563	498	86.8
MAX	.30	.40	.10	.00	.00	1100	900	14	25	3430	1640	193
MIN	.01	.10	.00	.00	.00	.00	15	7.6	5.5	25	181	28
AC-FT	7.0	15	.3	.00	.00	4950	13170	609	654	34630	30640	5170

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1993, BY WATER YEAR (WY)

MEAN	1.62	2.01	.76	.26	3.12	69.6	156	51.3	18.8	33.3	23.4	6.06
MAX	14.0	19.0	6.65	2.28	49.9	471	775	264	99.9	563	498	86.8
(WY)	1983	1981	1981	1981	1981	1983	1969	1974	1980	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.000	.29	.18	.11	.022	.000	.000
(WY)	1977	1977	1977	1969	1969	1969	1977	1991	1973	1973	1988	1976

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1968 - 1993

ANNUAL TOTAL	5177.55	45295.97	
ANNUAL MEAN	14.1	124	30.8
HIGHEST ANNUAL MEAN			124
LOWEST ANNUAL MEAN			.21
HIGHEST DAILY MEAN	310	Mar 7	3430
LOWEST DAILY MEAN	.00	Jul 26	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 10	.00
INSTANTANEOUS PEAK FLOW			3520
INSTANTANEOUS PEAK STAGE			13.49
ANNUAL RUNOFF (AC-FT)	10270	89840	22300
10 PERCENT EXCEEDS	22	319	50
50 PERCENT EXCEEDS	.30	6.7	.50
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

JAMES RIVER BASIN

06468170 JAMES RIVER NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT 15...	1125	0.08	2010	8.6	--	5.0	4.5	7.0	57	220	459	35
NOV 24...	1615	0.35	1700	8.3	--	-4.0	1.0	11.4	--	230	527	38
MAR 25...	1615	5.0	588	--	--	5.0	1.0	--	--	--	--	--
MAR 29...	1800	384	190	7.4	--	3.0	1.0	9.2	69	62	64	14
APR 09...	0945	308	282	--	7.4	3.5	5.0	9.1	--	100	104	25
MAY 25...	1245	9.3	692	8.2	--	20.0	13.5	11.0	112	240	250	51
AUG 03...	1215	1270	402	7.9	--	19.0	18.5	5.5	62	160	164	36
SEP 09...	1345	112	613	8.1	--	17.0	16.0	7.8	84	260	287	52

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)
OCT 15...	33	310	74	9	12	330	130	0.30	1130	1170	1.59	0.25
NOV 24...	33	280	71	8	15	230	100	0.30	1010	1060	1.44	1.00
MAR 29...	6.6	7.3	18	0.4	8.6	25	3.0	<0.10	108	152	0.21	158
APR 09...	10	13	19	0.6	11	33	3.5	0.10	159	168	0.23	140
MAY 25...	27	53	31	1	14	110	16	0.20	422	464	0.63	11.7
AUG 03...	17	18	18	0.6	10	44	4.2	0.10	229	280	0.38	960
SEP 09...	31	36	23	1	7.1	61	8.9	0.20	368	412	0.56	125

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN, MONIA + ORGANIC DIS- SOLVED (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, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)
OCT 15...	<0.010	--	<0.050	0.070	--	--	--	0.040	<0.010	--	1	430
NOV 24...	0.040	0.018	0.058	0.130	--	--	--	0.010	0.020	--	2	260
MAR 29...	0.050	0.890	0.940	0.310	--	--	0.210	0.190	0.210	2	2	20
APR 09...	0.010	0.120	0.130	0.020	--	--	0.180	0.140	0.090	2	3	50
MAY 25...	<0.010	--	<0.050	0.040	0.46	0.50	--	0.190	0.170	--	3	110
AUG 03...	<0.010	--	<0.050	0.050	--	--	0.430	0.340	0.300	3	3	70
SEP 09...	--	--	--	--	--	--	--	--	--	--	4	90

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	SELE- NIUM, TOTAL (UG/L AS SE) (01147)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER ,062 MM (70331)
OCT 15...	7	24	<0.1	--	<1	--	--	--	7	0.00	87
NOV 24...	15	350	<0.1	--	<1	--	--	--	52	0.05	86
MAR 29...	87	78	<0.1	<1	<1	--	--	--	34	35	99
APR 09...	73	16	<0.1	<1	<1	--	--	--	10	8.3	71
MAY 25...	19	35	0.1	--	<1	--	--	--	6	0.15	84
AUG 03...	98	35	0.2	<1	<1	<0.05	<0.06	<0.04	--	--	--
SEP 09...	43	59	<0.1	--	<1	--	--	--	8	2.4	100

JAMES RIVER BASIN

345

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

LOCATION.--Lat 47°23'59", long 98°47'50", in SW¹/₄SW¹/₄SW¹/₄ sec.2, T.145 N., R.64 W., Foster County, Hydrologic Unit 10160003, on left bank 20 ft upstream from bridge.

DRAINAGE AREA.--1,200 mi², approximately, of which about 750 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Water year 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,440 ft above sea level, from topographic map.

REMARKS.--Records good except those for period of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	e.13	e.00	e.00	e.00	e240	31	12	28	2230	e265
2	.00	.00	e.11	e.00	e.00	e.00	e230	28	12	31	e2100	e253
3	.00	.00	e.09	e.00	e.00	e.00	e220	26	11	29	e1940	e244
4	.00	.00	e.07	e.00	e.00	e.00	e215	23	10	28	e1330	e221
5	.00	.00	e.03	e.00	e.00	e.00	e225	22	9.6	27	e1230	e212
6	.00	.00	e.01	e.00	e.00	e.00	e260	20	9.6	24	e1110	207
7	.00	.00	e.00	e.00	e.00	e.00	e315	25	9.2	22	e980	e195
8	.00	.00	e.00	e.00	e.00	e.00	e350	43	10	25	838	187
9	.00	.00	e.00	e.00	e.00	e.00	e380	38	12	29	739	169
10	.00	.00	e.00	e.00	e.00	e.00	452	37	12	31	675	155
11	.00	e.01	e.00	e.00	e.00	e.00	386	32	10	31	641	148
12	.00	e.05	e.00	e.00	e.00	e.00	324	27	9.2	30	603	136
13	.00	e.08	e.00	e.00	e.00	e.00	252	23	8.7	31	e560	126
14	.00	e.11	e.00	e.00	e.00	e.00	189	21	8.2	32	547	120
15	.00	e.14	e.00	e.00	e.00	e.00	169	e19	7.3	38	525	116
16	.00	e.20	e.00	e.00	e.00	e.00	157	e18	7.9	66	496	106
17	.00	e.16	e.00	e.00	e.00	e.00	145	e18	8.7	99	471	100
18	.00	e.13	e.00	e.00	e.00	e.00	133	e17	9.3	118	e430	94
19	.00	e.12	e.00	e.00	e.00	e.00	122	e16	11	144	e410	89
20	.00	e.13	e.00	e.00	e.00	e.00	107	e15	11	153	e365	84
21	.00	e.14	e.00	e.00	e.00	e.00	93	e14	11	151	e350	79
22	.00	e.13	e.00	e.00	e.00	e1.0	e82	e14	11	156	342	73
23	.00	e.12	e.00	e.00	e.00	e3.0	e74	e15	33	183	315	69
24	.00	e.12	e.00	e.00	e.00	e10	e65	e17	28	209	284	64
25	.00	e.11	e.00	e.00	e.00	e19	60	e15	26	322	273	61
26	.00	e.11	e.00	e.00	e.00	e40	55	e14	23	456	269	57
27	.00	e.10	e.00	e.00	e.00	e65	42	14	20	890	e252	54
28	.00	e.10	e.00	e.00	e.00	e95	44	14	19	2190	e245	50
29	.00	e.08	e.00	e.00	---	e160	38	13	21	3100	257	49
30	.00	e.09	e.00	e.00	---	e220	34	13	28	2810	e265	46
31	.00	---	e.00	e.00	---	e230	---	13	---	2670	e258	---
TOTAL	0.00	2.23	0.44	0.00	0.00	843.00	5458	655	418.7	14153	21330	3829
MEAN	.000	.074	.014	.000	.000	27.2	182	21.1	14.0	457	688	128
MAX	.000	.20	.13	.00	.00	230	452	43	33	3100	2230	265
MIN	.00	.00	.00	.00	.00	.00	34	13	7.3	22	245	46
AC-FT	.00	4.4	.9	.00	.00	1670	10830	1300	830	28070	42310	7590

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1993, BY WATER YEAR (WY)

	MEAN	.76	.62	.65	.29	.96	84.6	97.3	18.3	4.62	60.3	88.1	18.4
MAX	4.20	2.23	2.08	1.51	3.62	225	406	84.0	14.0	457	688	128	128
(WY)	1988	1987	1987	1987	1992	1987	1987	1986	1993	1993	1993	1993	1993
MIN	.000	.000	.000	.000	.000	.21	2.59	2.24	.077	.000	.000	.000	.000
(WY)	1989	1989	1989	1989	1989	1990	1991	1991	1991	1991	1988	1988	1988

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1986 - 1993
ANNUAL TOTAL	5959.08	46689.37	
ANNUAL MEAN	16.3	128	31.5
HIGHEST ANNUAL MEAN			128
LOWEST ANNUAL MEAN			.52
HIGHEST DAILY MEAN	390	Mar 9	3100
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			3400
INSTANTANEOUS PEAK STAGE			10.64
ANNUAL RUNOFF (AC-FT)	11820	92610	22800
10 PERCENT EXCEEDS	33	296	38
50 PERCENT EXCEEDS	.02	9.6	.66
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a Backwater from ice.

JAMES RIVER BASIN

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND--CONTINUED

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L) (00310)
NOV 23...	1400	0.12	--	1170	7.9	--	-2.0	0.5	1.4	6.8	--	--
MAR 25...	1240	19	264	--	--	--	7.0	1.5	--	--	--	--
30...	1200	216	482	--	--	7.4	2.5	1.5	4.0	7.3	55	6.2
APR 09...	1315	312	275	--	--	7.4	7.5	3.5	6.3	9.5	--	4.2
MAY 25...	1615	15	700	--	7.7	--	16.0	14.0	2.5	8.5	87	--
AUG 11...	1045	641	522	--	7.7	--	24.5	23.0	0.70	1.1	14	3.8
SEP 09...	1545	165	650	--	7.8	--	17.5	16.0	0.40	7.2	78	--

DATE	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINEITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)
NOV 23...	370	444	71	46	120	40	3	15	160	41	0.20
MAR 30...	81	131	16	10	38	47	2	9.1	41	15	0.10
APR 09...	95	100	22	9.7	14	22	0.6	9.8	31	4.1	0.10
MAY 25...	240	278	52	26	56	33	2	11	94	16	0.20
AUG 11...	190	212	42	21	25	21	0.8	11	46	6.6	0.10
SEP 09...	270	297	54	32	39	24	1	3.6	62	9.9	0.20

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
NOV 23...	<1	720	752	1.02	0.25	0.040	0.019	0.059	<0.010	--	--
MAR 30...	12	213	243	0.33	142	0.050	0.630	0.680	0.680	0.92	1.8
APR 09...	3	153	171	0.23	144	0.020	0.280	0.300	0.100	0.80	2.0
MAY 25...	4	423	464	0.63	18.2	<0.010	--	<0.050	0.090	0.91	--
AUG 11...	2	282	327	0.44	566	<0.010	--	0.220	0.060	1.5	1.4
SEP 09...	4	379	395	0.54	176	--	--	--	--	--	--

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

JAMES RIVER BASIN

06468500 JAMES RIVER NEAR PINGREE, ND

LOCATION.--Lat 47°08'30", long 98°47'00", in SW¹/₄SW¹/₄ sec.3, T.142 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, on right bank 500 ft upstream from dam at outlet of DePuy Marsh, 6.5 mi southeast of Pingree, and 6.25 mi northeast of Buchanan.

DRAINAGE AREA.--1,670 mi², approximately, of which about 900 mi² is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-60, 1962, 1965, 1979-89, 1993.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD ARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD ARD UNITS) (00403)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	TURBIDITY (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY ATION (MG/L) (00310)		
APR 14...	1630	488	--	7.6	10.0	6.0	--	2.5	12.8	--	6.1	
SEP 09...	1100	508	7.9	--	17.0	16.0	55	4.8	9.3	100	--	
DATE		HARDNESS TOTAL (MG/L AS CaCO3) (00900)	ALKALINITY LAB (MG/L AS CaCO3) (90410)	CALCIUM DISSOLVED (MG/L AS Ca) (00915)	MAGNESIUM, DISSOLVED (MG/L AS Mg) (00925)	SODIUM, DISSOLVED (MG/L AS Na) (00930)	SODIUM AD-SORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS Cl) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	
APR 14...	150	147	30	18	40	34	1	13	78	14	<0.10	
SEP 09...	200	218	44	22	28	22	0.9	8.1	47	6.8	0.10	
DATE		RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C, DISSOLVED (MG/L) (70300)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N) (00607)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DISSOLVED (MG/L AS N) (00623)	PHOSPHORUS TOTAL (MG/L AS P) (00665)
APR 14...	9	282	312	0.42	<0.010	<0.050	0.020	0.98	1.5	1.0	0.320	
SEP 09...	14	287	318	0.43	--	--	--	--	--	--	--	
DATE		PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)
APR 14...	0.230	0.210	30	2	3	23	70	<1	<10	<1	1	
SEP 09...	--	--	20	4	4	53	100	<1	<10	<1	<1	
DATE		IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)
APR 14...	140	38	<1	28	300	240	<0.1	<1	<1	<1	140	
SEP 09...	200	8	<1	23	180	4	<0.1	<1	<1	<1	210	
DATE		VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	CHLOR-A PHYTO-PLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO-PLANKTON CHROMO FLUOROM (UG/L) (70954)	PLANKTON BIOMASS ASH WT (MG/L) (81353)	PLANKTON BIOMASS DRY WT (MG/L) (81354)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 14...	2	<3	15	<0.010	<0.01	6.80	1.00	1220	1250	7	87	
SEP 09...	4	<3	--	--	--	11.0	0.100	1260	1280	--	--	

JAMES RIVER BASIN

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06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND

LOCATION.--Lat 46°55'50", long 98°42'23", in SE $\frac{1}{4}$, NW $\frac{1}{4}$, sec.24, T.140 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, on left bank in control house below Jamestown Dam on James River, 1.7 mi north of Jamestown Post Office, and 3.3 mi upstream from Pipestem Creek.

DRAINAGE AREA.--1,760 mi², approximately, of which about 1,010 mi² is probably noncontributing.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--November 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level; gage readings have been converted to sea level. From June 22, 1959, to June 3, 1971, site was located 0.2 mi upstream at same datum. Prior to June 22, 1959, nonrecording gages at different locations.

REMARKS.--Reservoir is formed by earth-fill dam, completed Oct. 1, 1953. Closure made May 7, 1953, and filling of dead storage started. Gates initially closed Feb. 8, 1954. Usable capacity, 229,470 acre-ft between elevations 1,400 ft, sill of outlet, and 1,454 ft, crest of spillway. Dead storage below elevation 1,400 ft, 820 acre-ft. Maximum design pool, 389,000 acre-ft, elevation, 1,464.6 ft. Figures given herein represent total contents based on capacity table dated Oct. 1, 1965. Reservoir is used for flood control and municipal supply. Elevations are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 103,100 acre-ft, May 1, 1969, elevation, 1,443.60 ft; minimum since initial filling of reservoir, 14,420 acre-ft, Mar. 1, 1993, elevation, 1,420.90 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 96,350 acre-ft, Aug. 12, elevation, 1,442.88 ft; minimum, 14,420 acre-ft, Mar. 1, elevation, 1,420.90 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	1,421.37	15,040	--
Oct. 31-----	1,421.05	14,620	-420
Nov. 30-----	1,421.11	14,700	+80
Dec. 31-----	1,420.96	14,500	-200
CAL YR 1992-----	--	--	-1,800
Jan. 31-----	1,420.95	14,490	-10
Feb. 28-----	1,420.91	14,440	-50
Mar. 31-----	1,422.42	16,460	+2,020
Apr. 30-----	1,425.11	20,420	+3,960
May 31-----	1,430.24	29,840	+9,420
June 30-----	1,432.01	33,880	+4,040
July 31-----	1,437.52	53,230	+19,350
Aug. 31-----	1,441.62	85,020	+31,790
Sept. 30-----	1,437.26	51,530	-33,490
WTR YR 1993-----	--	--	+36,490

JAMES RIVER BASIN

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT 26...	1040	1.0	1.5	869	8.6	280	290	56	34
JAN 21...	0920	1.0	1.5	988	8.4	330	337	64	41
JUN 09...	1115	1.0	1.5	733	8.3	230	230	47	28
SEP 28...	1605	1.0	1.5	551	8.3	200	221	42	23

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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)
OCT 26...	74	34	2	21	160	19	0.30	21	575
JAN 21...	89	35	2	22	180	22	0.30	24	661
JUN 09...	59	34	2	16	130	17	0.20	16	484
SEP 28...	35	26	1	13	62	8.3	0.10	16	352

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BORON, DIS- SOLVED (UG/L AS B) (01020)
OCT 26...	560	0.78	--	<0.010	<0.050	0.020	0.110	0.110	170
JAN 21...	646	0.90	0.063	0.020	0.083	0.210	0.240	0.220	190
JUN 09...	452	0.66	--	<0.010	<0.050	0.100	0.200	0.170	--
SEP 28...	332	0.48	--	--	--	--	--	--	110

JAMES RIVER BASIN

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06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND--CONTINUED

DATE	TIME	RESER- VOIR DEPTH (FEET) (72025)	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT								
26...	1030	18.4	--	0.0	845	8.5	8.0	11.1
26...	1031	--	--	1.60	845	8.5	7.5	11.0
26...	1032	--	--	3.30	845	8.5	7.5	11.0
26...	1033	--	--	6.60	847	8.5	7.5	11.0
26...	1034	--	--	13.1	849	8.5	7.5	11.1
26...	1035	--	--	18.4	847	8.5	7.5	11.1
JAN								
21...	0910	18.0	0.0	--	989	8.3	0.5	10.5
21...	0911	--	0.50	--	975	8.3	0.5	10.4
21...	0912	--	1.0	--	964	8.3	1.5	10.2
21...	0913	--	2.0	--	963	8.3	2.5	9.8
21...	0914	--	4.0	--	975	8.4	2.5	9.5
21...	0915	--	5.5	--	990	8.4	3.0	9.4
JUN								
09...	1100	27.2	0.0	--	726	8.4	15.5	9.1
09...	1101	--	0.50	--	727	8.4	15.5	8.9
09...	1102	--	1.0	--	728	8.4	15.5	8.9
09...	1103	--	2.0	--	732	8.4	15.5	8.9
09...	1104	--	4.0	--	734	8.4	15.5	8.8
09...	1105	--	6.0	--	736	8.4	15.5	8.8
09...	1106	--	8.0	--	737	8.4	15.5	8.8
09...	1107	--	8.3	--	737	8.4	15.5	8.7
SEP								
28...	1556	35.0	0.0	--	534	7.9	13.0	9.8
28...	1557	--	0.50	--	535	7.9	13.0	9.7
28...	1558	--	1.0	--	535	8.0	13.0	9.7
28...	1559	--	2.0	--	535	8.0	13.0	9.6
28...	1600	--	4.0	--	535	8.1	13.0	9.5
28...	1601	--	6.0	--	536	8.1	13.0	9.3
28...	1602	--	8.0	--	536	8.1	13.0	9.3
28...	1603	--	10.0	--	536	8.1	13.0	9.2
28...	1604	--	10.8	--	536	8.1	13.0	9.2

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
26...	98	725		26.0	10.0	210	<5.0
JAN							
21...	78	716	1.80	--	-2.0	160	8.0
JUN							
09...	97	715	--	53.0	15.0	330	13
SEP							
28...	97	732	--	28.0	15.0	330	19

JAMES RIVER BASIN

06469400 PIPESTEM CREEK NEAR PINGREE, ND

LOCATION.--Lat 47°10'03", long 98°58'07", in NE¹/₄NE¹/₄NW¹/₄ sec.31, T.143 N., R.65 W., Stutsman County, Hydrologic Unit 10160002, on right bank on downstream side of State Highway 36 bridge, and 3 mi west of Pingree.

DRAINAGE AREA.--700 mi², of which about 440 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,500.63 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.20	.04	e.00	e.00	.00	430	10	10	68	644	69
2	.00	.26	.03	e.00	e.00	.00	343	8.4	9.4	125	548	58
3	.00	.15	.03	e.00	e.00	e.05	257	7.8	8.0	203	469	51
4	.00	.09	.03	e.00	e.00	e.10	188	7.0	7.0	171	392	47
5	.00	.08	.01	.00	e.00	e.13	136	6.5	5.9	152	330	44
6	.00	.07	.00	e.00	e.00	e.45	97	6.4	6.8	136	278	41
7	.00	.07	.00	.00	e.00	e1.0	79	10	5.7	124	238	39
8	.00	.08	e.00	.00	.00	e1.6	67	13	6.4	119	214	38
9	.00	.11	e.00	.00	e.00	e2.2	60	21	9.6	110	195	36
10	.00	.12	e.00	.00	e.00	e1.5	55	22	12	100	173	33
11	.00	.10	e.00	.00	e.00	e1.0	52	19	14	84	155	34
12	.00	.09	e.00	.00	.00	e1.2	48	15	9.5	66	148	34
13	.00	.07	e.00	.00	.00	e1.5	44	12	8.2	62	129	29
14	.00	.05	e.00	.00	.00	e1.8	41	12	7.2	55	117	26
15	.00	.05	e.00	.00	.00	e1.5	37	12	4.7	61	103	27
16	.00	.05	e.00	.00	.00	e1.0	34	21	8.3	413	93	27
17	.00	.05	e.00	.00	.00	e1.2	31	27	21	467	86	27
18	.00	.05	e.00	.00	.00	e1.5	29	25	20	322	81	25
19	.00	.06	e.00	.00	.00	e1.3	26	24	23	323	76	23
20	.01	.07	e.00	.00	.00	e1.2	23	21	24	372	68	22
21	.02	.07	e.00	.00	.00	e1.8	21	18	25	421	62	21
22	.03	.07	e.00	.00	.00	e3.5	20	17	26	418	60	20
23	.06	.07	e.00	.00	.00	e15	19	17	46	699	55	16
24	.08	.07	e.00	.00	.00	e40	19	16	42	578	51	13
25	.08	.07	e.00	.00	.00	e56	14	14	36	681	50	12
26	.08	.06	e.00	.00	.00	e110	13	13	31	1090	52	13
27	.08	.04	e.00	.00	.00	e215	15	16	26	1040	50	11
28	.08	.03	e.00	.00	.00	e320	13	13	20	1080	46	9.9
29	.07	.03	e.00	.00	---	e530	12	13	16	977	52	9.5
30	.07	.04	e.00	.00	---	722	11	16	59	819	100	8.9
31	.10	---	e.00	e.00	---	623	---	12	---	729	80	---
TOTAL	0.76	2.42	0.14	0.00	0.00	2656.53	2234	465.1	547.7	12065	5195	864.3
MEAN	.025	.081	.005	.000	.000	85.7	74.5	15.0	18.3	389	168	28.8
MAX	.10	.26	.04	.00	.00	722	430	27	59	1090	644	69
MIN	.00	.03	.00	.00	.00	.00	11	6.4	4.7	55	46	8.9
AC-FT	1.5	4.8	.3	.00	.00	5270	4430	923	1090	23930	10300	1710

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1993, BY WATER YEAR (WY)

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
MEAN	1.32	1.42	.56	.17	4.35	83.3	109	24.8	12.2	28.5	11.8	5.14								
MAX	9.27	20.1	6.53	2.36	39.7	474	451	118	53.4	389	168	30.2								
(WY)	1981	1981	1981	1981	1981	1983	1975	1975	1983	1993	1993	1989								
MIN	.000	.000	.000	.000	.000	.003	.096	.038	.017	.000	.000	.000								
(WY)	1974	1977	1977	1974	1974	1991	1991	1977	1977	1985	1976	1976								

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1974 - 1993

	1992 CALENDAR YEAR	1993 WATER YEAR	1974 - 1993
ANNUAL TOTAL	2127.96	24030.95	
ANNUAL MEAN	5.81	65.8	23.6
HIGHEST ANNUAL MEAN			65.8
LOWEST ANNUAL MEAN			.035
HIGHEST DAILY MEAN	137 Mar 6	1090 Jul 26	2200 Apr 19 1975
LOWEST DAILY MEAN	.00 Jan 1	.00 Oct 1	.00 Oct 1 1973
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Oct 1	.00 Oct 1 1973
INSTANTANEOUS PEAK FLOW		1150 Jul 26	2520 Apr 20 1979
INSTANTANEOUS PEAK STAGE		10.64 Jul 26	a11.60 Apr 20 1979
ANNUAL RUNOFF (AC-FT)	4220	47670	17090
10 PERCENT EXCEEDS	13	172	40
50 PERCENT EXCEEDS	.10	7.2	.26
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated.

a Backwater from ice.

JAMES RIVER BASIN

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06469400 PIPESTEM CREEK NEAR PINGREE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	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 PERCENT (00932)
NOV 24...	1615	0.06	1100	--	4.5	1.5	--	--	--	--	--
MAR 25...	1240	56	248	--	5.0	1.5	--	--	--	--	--
30...	1610	726	270	--	3.0	2.5	--	--	--	--	--
APR 08...	1645	66	352	7.9	9.0	7.5	130	29	14	19	22
MAY 26...	1025	14	852	--	12.0	12.5	--	--	--	--	--
JUL 22...	1315	385	635	7.7	19.0	19.5	250	47	32	46	28

DATE	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)
APR 08...	0.7	12	50	5.2	0.10	14	222	232	0.32	41.3	2
JUL 22...	1	11	100	9.0	0.10	32	431	447	0.61	465	5

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	CARBO- FURAN SCREEN, DIS- SOLVED (UG/L) (99901)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, DIS- SOLVED (UG/L) (99903)	2, 4-D SCREEN, DIS- SOLVED (UG/L) (99905)
APR 08...	70	20	20	1	<1	170	--	--	--	--	--
JUL 22...	70	40	20	<1	5	290	<0.05	<0.06	<0.06	<0.04	<0.700

JAMES RIVER BASIN

06469420 PIPESTEM RESERVOIR NEAR JAMESTOWN, ND

LOCATION.--Lat 46°57'44", long 98°45'11", in NW¹/₄NW¹/₄ sec.10, T.140 N., R.64 W., Stutsman County, Hydrologic Unit 10160002, on left bank in control house above Pipestem Dam 2.5 mi northwest of Jamestown Post Office, and 3.5 mi upstream from James River.

DRAINAGE AREA.--1,010 mi², approximately, of which about 610 mi² is probably noncontributing.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--March 1974 to current year. Prior to October 1991, records are available from the U.S. Army Corps of Engineers.

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by earth-fill dam; storage began in July 1973; dam completed in 1973. Total capacity is 147,000 acre-ft at maximum pool, elevation 1,496.3 ft. Figures given herein represent total contents based on capacity table for the 1990 survey. The reservoir is used for flood control, fish and wildlife, and recreation.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers. Elevations affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 59,710 acre-ft, Aug. 14, 1993, elevation, 1,472.64 ft; minimum contents, 6,730 acre-ft, Feb. 17, 1993, elevation, 1,439.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 59,710 acre-ft, Aug. 14, elevation, 1,472.64 ft; minimum contents, 6,730 acre-ft, Feb. 17, elevation, 1,439.65 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30-----	1,439.94	6,940	--
Oct. 31-----	1,439.69	6,760	-180
Nov. 30-----	1,439.83	6,860	+100
Dec. 31-----	1,439.73	6,790	-70
CAL YR 1992-----	--	--	a
Jan. 31-----	1,439.70	6,770	-20
Feb. 28-----	1,439.65	6,730	-40
Mar. 31-----	1,447.91	14,390	+7,660
Apr. 30-----	1,448.19	14,730	+340
May 31-----	1,447.43	13,840	-890
June 30-----	1,446.68	12,990	-850
July 31-----	1,470.77	55,110	+42,120
Aug. 31-----	1,471.63	57,200	+2,090
Sept. 30-----	1,465.66	43,600	-13,600
WTR YR 1993-----	--	--	+36,660

a Not computed because a new capacity table was used beginning with water year 1993.

JAMES RIVER BASIN

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06470000 JAMES RIVER AT JAMESTOWN, ND

LOCATION.--Lat 46°53'22", long 98°40'58", in NW¹/₄, NE¹/₄ sec.6, T.139 N., R.63 W., Stutsman County, Hydrologic Unit 10160003, on left bank 200 ft upstream from Interstate 94 bridge at southeast corner of Jamestown, and 3 mi downstream from Pipestem Creek.

DRAINAGE AREA.--2,820 mi², approximately, of which about 1,650 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1928 to September 1933, March to May 1935, August 1937 to September 1939, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1239: 1938(M). WSP 1917: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,373.27 ft above sea level. Oct. 1, 1949, to Sept. 30, 1965, at former bridge 0.5 mi upstream at datum 2.00 ft higher. See WSP 1729 or 1917 for history of changes prior to Oct. 1, 1949.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor. Flow regulated by Arrowwood, Jim, and Pipestem Lakes, and Jamestown Reservoir, combined capacity, 393,000 acre-ft. Regulation by Jamestown Reservoir (station 06469000) 6 mi since 1953 and by Pipestem Lake, capacity 147,000 acre-ft, since 1973.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.48	e1.5	e1.9	e1.2	e1.4	e1.2	e140	8.0	53	120	433	721
2	e.47	e3.0	e1.8	e1.2	e1.5	e1.3	e135	8.1	53	108	435	884
3	e.45	e2.5	e1.8	e1.2	e1.6	e1.5	e130	40	53	114	e420	887
4	e.44	e2.0	e1.7	e1.2	e1.6	e1.7	128	28	54	109	e415	881
5	e.43	e2.2	e1.7	e1.2	e1.7	e2.0	128	12	54	107	486	886
6	e.42	e2.4	e1.7	e1.2	e1.6	e2.2	128	22	69	110	603	887
7	e.40	e2.7	e1.6	e1.2	e1.6	e2.7	129	71	58	109	650	887
8	e.40	e3.0	e1.6	e1.1	e1.5	e3.0	128	61	61	112	679	886
9	e.40	e4.0	e1.5	e1.1	e1.4	e4.0	127	121	61	113	707	940
10	e.41	e4.5	e1.5	e1.0	e1.4	e5.0	127	63	58	152	695	945
11	e.43	e4.3	e1.4	e.95	e1.3	e4.8	127	52	57	129	687	942
12	e.50	e4.3	e1.4	e.93	e1.2	e4.7	125	49	59	122	705	939
13	e.52	e4.2	e1.4	e.92	e1.1	e4.5	123	51	77	131	724	934
14	e.54	e4.1	e1.3	e.95	e1.1	e4.2	124	50	61	129	732	926
15	e.55	e4.0	e1.3	e.96	e1.1	e3.9	121	48	65	344	701	893
16	e.70	e4.0	e1.3	e1.0	e1.1	e3.8	72	49	150	1110	729	913
17	e1.1	e3.9	e1.3	e1.0	e1.0	e3.6	62	50	74	462	766	909
18	e1.0	e3.8	e1.3	e1.1	e1.0	e3.5	61	48	68	277	775	908
19	e.85	e3.7	e1.2	e1.1	e1.1	e3.5	61	50	69	199	827	905
20	e.75	e3.4	e1.2	e1.1	e1.1	e3.5	61	50	72	130	841	906
21	e.65	e3.2	e1.2	e1.2	e1.1	e3.6	61	50	74	97	871	906
22	e.64	e3.0	e1.2	e1.2	e1.1	e6.0	61	55	90	88	883	905
23	e.62	e2.8	e1.2	e1.2	e1.0	e10	61	62	233	82	894	914
24	e.70	e2.6	e1.2	e1.2	e1.0	e25	62	56	121	151	898	912
25	e.80	e2.5	e1.2	e1.2	e1.1	e45	60	51	92	244	920	924
26	e1.0	e2.3	e1.2	e1.2	e1.1	e60	60	51	86	260	924	931
27	e.98	e2.2	e1.1	e1.3	e1.1	e100	63	67	85	340	918	937
28	e.92	e2.1	e1.1	e1.3	e1.1	e150	33	53	86	380	914	942
29	e1.0	e2.0	e1.1	e1.3	---	e140	15	52	115	421	913	943
30	e.98	e2.0	e1.1	e1.3	---	e125	9.9	69	203	526	e450	941
31	e1.1	---	e1.1	e1.4	---	e130	---	54	---	457	517	---
TOTAL	20.63	92.2	42.6	35.41	35.0	859.2	2722.9	1551.1	2511	7233	22112	27234
MEAN	.67	3.07	1.37	1.14	1.25	27.7	90.8	50.0	83.7	233	713	908
MAX	1.1	4.5	1.9	1.4	1.7	150	140	121	233	1110	924	945
MIN	.40	1.5	1.1	.92	1.0	1.2	9.9	8.0	53	82	415	721
AC-FT	41	183	84	70	69	1700	5400	3080	4980	14350	43860	54020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1993, BY WATER YEAR (WY)

	30.4	15.3	6.22	3.55	9.21	77.9	223	148	99.3	64.1	51.0	46.1
MEAN	30.4	15.3	6.22	3.55	9.21	77.9	223	148	99.3	64.1	51.0	46.1
MAX	291	166	38.6	35.7	111	731	2434	2559	430	367	713	908
(WY)	1976	1980	1966	1966	1930	1966	1950	1950	1969	1969	1993	1993
MIN	.29	.35	.66	.29	.60	1.74	1.00	1.06	1.27	.67	.23	.20
(WY)	1990	1939	1939	1991	1939	1944	1939	1939	1931	1933	1933	1933

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1928 - 1993

ANNUAL TOTAL	3381.58	64449.04	
ANNUAL MEAN	9.24	177	63.7
HIGHEST ANNUAL MEAN			460
LOWEST ANNUAL MEAN			2.38
HIGHEST DAILY MEAN	120	Mar 18	1110
LOWEST DAILY MEAN	.00	Jun 14	.40
ANNUAL SEVEN-DAY MINIMUM	.25	Jun 23	.41
INSTANTANEOUS PEAK FLOW			1300
INSTANTANEOUS PEAK STAGE			13.58
ANNUAL RUNOFF (AC-FT)	6710	127800	46180
10 PERCENT EXCEEDS	34	883	194
50 PERCENT EXCEEDS	1.4	33	5.6
90 PERCENT EXCEEDS	.44	1.0	1.2

e Estimated.

a Site and datum then in use.

JAMES RIVER BASIN

06470000 JAMES RIVER AT JAMESTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1958 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L) (00310)
OCT 07...	1225	0.40	--	896	7.6	--	12.0	10.5	11	3.4	--	--
DEC 02...	1330	1.8	1260	--	7.9	--	-3.0	2.0	3.1	9.2	70	--
JAN 07...	1215	1.2	--	1420	7.9	--	-12.0	0.0	3.3	1.8	--	--
FEB 25...	1430	1.1	1260	--	7.7	--	-10.0	0.0	3.5	1.0	--	--
MAR 31...	1645	130	455	--	--	7.5	1.0	1.5	4.7	12.2	92	8.8
APR 06...	1400	128	342	--	--	7.3	5.0	4.0	4.3	10.5	85	5.4
MAY 26...	1300	51	529	--	8.0	--	17.5	15.5	4.6	9.0	95	--
AUG 19...	1100	265	543	--	7.7	--	21.0	20.5	14	6.7	79	--
SEP 09...	0845	948	526	--	8.0	--	14.0	18.0	6.9	772	8640	--

DATE	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)
OCT 07...	300	303	68	31	75	34	2	11	130	44	0.20
DEC 02...	390	370	94	38	110	37	2	9.4	180	53	0.20
JAN 07...	490	509	120	46	130	36	3	9.5	220	53	0.30
FEB 25...	380	388	95	34	120	40	3	8.1	150	79	0.20
MAR 31...	140	136	28	17	31	30	1	14	80	11	0.10
APR 06...	110	108	24	13	21	26	0.9	11	51	7.6	0.10
MAY 26...	170	174	37	20	36	29	1	13	89	12	0.20
AUG 19...	190	198	41	22	42	32	1	2.4	84	11	0.20
SEP 09...	200	208	41	23	41	31	1	0.70	79	10	0.20

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT 07...	26	543	574	0.78	0.62	<0.010	--	<0.050	0.190	0.61	--
DEC 02...	8	708	788	1.07	3.83	<0.010	--	<0.050	0.130	0.37	--
JAN 07...	14	888	934	1.27	3.03	0.030	0.090	0.120	0.720	0.38	--
FEB 25...	2	724	746	1.01	2.22	0.010	--	<0.050	1.10	0.50	--
MAR 31...	14	266	289	0.39	101	0.050	0.320	0.370	0.330	1.1	1.5
APR 06...	1	195	211	0.29	72.9	0.030	0.340	0.370	0.140	1.1	1.7
MAY 26...	8	314	329	0.45	44.9	0.030	0.280	0.310	0.120	0.68	--
AUG 19...	47	323	364	0.50	260	0.020	0.160	0.180	0.150	0.75	1.1
SEP 09...	28	320	347	0.47	888	--	--	--	--	--	--

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	2, 4-D SCREEN, TOTAL (UG/L) (99906)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (70954)	PLANK- TON BIOMASS ASH WT (81353)	PLANK- TON BIOMASS DRY WT (81354)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC 02...	--	--	--	--	--	--	--	--	136	0.66	40
JAN 07...	--	--	--	--	--	--	--	--	110	0.36	--
FEB 25...	--	--	--	--	--	--	--	--	16	0.05	94
MAR 31...	--	--	--	--	32.0	5.10	1250	1280	16	5.6	86
APR 06...	--	--	--	--	18.0	3.00	1250	1280	12	4.1	--
MAY 26...	--	--	--	--	--	--	--	--	12	1.6	92
AUG 19...	<0.05	<0.06	0.10	<0.700	0.700	<0.100	1320	1350	54	39	89
SEP 09...	--	--	--	--	--	--	--	--	32	82	92

06470500 JAMES RIVER AT LAMOURE, ND

LOCATION.--Lat 46°21'20", long 98°18'15", in NE¹/₄NE¹/₄ sec.11, T.133 N., R.61 W., LaMoure County, Hydrologic Unit 10160003, on left bank 80 ft downstream from bridge on State Highway 13, 0.5 mi west of LaMoure, and 12 mi upstream from Cottonwood Creek.

DRAINAGE AREA.--4,390 mi², approximately, of which about 2,600 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to July 1903 (gage-height record only), April 1950 to current year. Gage-height records for 1902-11 are contained in reports of the National Oceanic and Atmospheric Administration.

REVISED RECORDS.--WSP 1917: Drainage area.

GAGE.--Water-stage recorder and rubble-masonry control. Datum of gage is 1,290.00 ft above sea level. See WSP 1729 or 1917 for history of changes prior to Apr. 19, 1950.

REMARKS.--Records good except those for periods of estimated daily discharge, which are poor. Flow regulated by Arrowwood, Jim, and Pipestem Lakes and Jamestown Reservoir, combined capacity, 393,000 acre-ft. Regulation by Jamestown Reservoir (station 06469000) 85 mi upstream since 1953 and by Pipestem Lake, capacity 147,000 acre-ft, since 1973. On approximately Aug. 1, 1991, left wingwall on control structure eroded and failed. For the period Oct. 1-18, discharges were estimated using data from the James River at Grand Rapids, located approximately 6 mi upstream, provided by the North Dakota State Water Commission. The wingwall was repaired on Oct. 18, 1991.

EXTREMES OUTSIDE PERIOD OF RECORD.--Prior to flood of Apr. 14, 1969, a long-time resident said that the flood of May 16, 1950, was the highest since 1881, with stage in either 1942 or 1943 being almost as high owing to large ice jam.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	13	14	e4.6	e7.0	e8.0	e150	60	81	178	1310	970
2	6.0	19	13	e4.6	e7.5	e8.6	e135	54	84	185	1170	685
3	4.0	14	13	e5.0	e8.0	e9.6	e115	40	79	297	1030	558
4	3.7	7.6	13	e4.7	e9.0	e11	e135	29	80	423	884	678
5	6.6	9.2	12	e4.9	e8.8	e13	e175	22	78	459	758	829
6	5.0	11	12	e4.7	e8.4	e15	e185	13	82	352	643	915
7	6.2	12	10	e4.5	e8.0	e20	e180	18	75	254	567	947
8	4.9	13	e9.6	e4.3	e7.6	e24	150	40	88	217	579	961
9	4.9	20	e9.4	e4.1	e7.4	e29	136	52	92	199	694	955
10	6.1	27	e9.2	e4.1	e7.4	e34	134	37	80	183	817	951
11	5.1	28	e9.0	e3.7	e7.3	e40	133	54	73	173	841	971
12	6.0	32	e8.6	e3.9	e7.2	e45	127	87	73	166	837	987
13	4.0	21	e8.4	e4.0	e7.0	e54	125	111	96	167	826	991
14	4.4	26	e8.4	e4.0	e7.0	e52	125	119	83	161	830	992
15	5.3	27	e8.2	e4.0	e7.0	e48	123	91	69	165	828	1010
16	6.2	27	e8.0	e4.1	e6.8	e42	119	79	72	178	846	1010
17	7.3	27	e8.0	e4.2	e6.5	e37	117	73	73	365	859	999
18	6.1	27	e7.8	e4.3	e6.8	e33	120	63	69	1450	838	991
19	5.7	25	e7.6	e4.5	e7.0	e30	113	62	73	2240	829	990
20	7.7	24	e7.6	e4.7	e7.4	e28	92	60	77	2630	841	990
21	6.2	22	e7.2	e5.0	e7.2	e26	74	53	87	2800	869	990
22	7.2	20	e7.0	e5.4	e7.0	e25	69	60	93	2750	911	986
23	8.4	19	e6.8	e5.6	e6.8	e25	66	67	101	2410	935	980
24	6.6	19	e6.4	e5.8	e7.0	e45	71	62	94	1940	965	984
25	12	17	e6.2	e5.8	e7.0	e60	61	60	93	1610	982	991
26	4.0	16	e6.2	e5.8	e7.2	e90	54	69	95	1410	983	968
27	9.1	15	e6.0	e6.0	e7.5	e110	72	78	112	1560	981	955
28	6.4	15	e5.6	e6.0	e7.8	e130	61	76	159	1790	992	957
29	6.5	14	e5.4	e6.0	---	e200	61	76	182	1810	1010	978
30	7.0	13	e4.9	e6.2	---	e250	58	88	186	1650	1010	989
31	8.8	---	e4.7	e6.5	---	e230	---	82	---	1460	1010	---
TOTAL	192.1	579.8	263.2	151.0	206.6	1772.2	3336	1935	2779	31632	27475	28158
MEAN	6.20	19.3	8.49	4.87	7.38	57.2	111	62.4	92.6	1020	886	939
MAX	12	32	14	6.5	9.0	250	185	119	186	2800	1310	1010
MIN	3.7	7.6	4.7	3.7	6.5	8.0	54	13	69	161	567	558
AC-FT	381	1150	522	300	410	3520	6620	3840	5510	62740	54500	55850

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1993, BY WATER YEAR (WY)

	MEAN	53.2	34.4	16.6	11.3	14.0	149	304	219	165	134	79.2	71.5
MAX	351	192	52.2	39.4	44.4	1202	1697	3114	578	1020	886	939	939
(WY)	1976	1980	1966	1966	1954	1966	1969	1950	1950	1993	1993	1993	1993
MIN	5.32	8.42	6.83	3.69	1.90	4.57	18.0	12.4	8.10	1.93	3.20	2.56	2.56
(WY)	1991	1962	1989	1959	1959	1969	1991	1977	1973	1973	1961	1990	1990

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1950 - 1993

ANNUAL TOTAL	7549.18	98479.9	98.2
ANNUAL MEAN	20.6	270	293
HIGHEST ANNUAL MEAN			11.7
LOWEST ANNUAL MEAN			1990
HIGHEST DAILY MEAN	114	2800	6420
LOWEST DAILY MEAN	.51	3.7	.00
ANNUAL SEVEN-DAY MINIMUM	3.7	4.0	.01
INSTANTANEOUS PEAK FLOW		2830	6800
INSTANTANEOUS PEAK STAGE		14.64	16.17
ANNUAL RUNOFF (AC-FT)	14970	195300	71130
10 PERCENT EXCEEDS	57	982	270
50 PERCENT EXCEEDS	11	53	22
90 PERCENT EXCEEDS	5.0	5.5	7.0

e Estimated.

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1957 to current year.

PERIOD OF DAILY RECORDS.--

SPECIFIC CONDUCTANCE: October 1976 to current year.

WATER TEMPERATURE: June 1953 to September 1975, October 1976 to current year.

INSTRUMENTATION.--Temperature recorder from June 1953 to September 1978. Water-quality monitor since October 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 2,630 microsiemens, Jan. 8 and 9, 1993; minimum, 183 microsiemens, Mar. 30, 1989.

WATER TEMPERATURE: Maximum, 33.0°C, July 12 and 13, 1957, and July 23, 1977; minimum, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 2,630 microsiemens, Jan. 8 and 9; minimum, 330 microsiemens, July 20.

WATER TEMPERATURE: Maximum, 25.3°C, June 21; minimum, 0.4°C on many days.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L) (00310)	
OCT												
14...	1025	5.6	1210	8.5	--	2.0	4.5	45	12	10.0	81	--
NOV												
20...	1245	23	1060	8.4	--	2.5	1.5	--	1.9	13.0	99	--
JAN												
12...	1315	4.0	2590	7.7	--	-2.0	0.0	--	7.0	7.9	57	--
FEB												
24...	1330	7.1	1780	--	7.5	-13.0	0.0	--	3.1	0.5	4	--
APR												
08...	1030	158	488	--	7.5	4.5	4.0	--	3.9	12.8	--	6.4
MAY												
26...	1815	72	810	8.5	--	12.0	15.5	--	6.7	12.8	135	--
JUN												
02...	1045	84	--	--	--	--	--	--	--	--	--	--
JUL												
19...	1330	2220	335	7.7	--	21.0	20.0	--	61	3.7	--	1.5
SEP												
08...	1210	962	640	8.1	--	26.0	16.5	--	19	7.3	79	--

DATE	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)
OCT												
14...	380	377	85	40	120	40	3	9.4	190	78	0.30	23
NOV												
20...	340	314	80	33	85	35	2	10	180	40	0.20	2
JAN												
12...	790	719	190	76	310	45	5	22	510	180	0.90	21
FEB												
24...	540	518	130	52	150	37	3	11	270	90	0.30	8
APR												
08...	160	149	37	17	35	30	1	11	77	15	0.10	2
MAY												
26...	290	279	62	32	65	32	2	13	140	31	0.20	15
JUL												
19...	120	115	30	12	17	21	0.7	10	42	6.7	0.10	408
SEP												
08...	200	222	43	23	43	31	1	1.9	87	12	0.20	60

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT												
14...	750	796	1.08	12.0	<0.010	--	<0.050	0.030	0.67	--	0.70	--
NOV												
20...	618	639	0.87	39.9	0.040	0.030	0.070	0.060	0.44	--	0.50	--
JAN												
12...	1730	1790	2.43	19.3	0.030	0.520	0.550	0.310	1.1	--	1.4	--
FEB												
24...	1020	1050	1.43	20.1	0.020	0.073	0.093	1.50	0.30	--	1.8	--
APR												
08...	283	305	0.41	130	0.010	0.079	0.089	0.020	1.1	2.1	1.1	0.340
MAY												
26...	512	507	0.69	98.6	<0.010	--	0.054	0.060	0.64	--	0.70	--
JUL												
19...	188	211	0.29	1270	0.020	0.160	0.180	0.110	0.59	1.2	0.70	0.350
SEP												
08...	343	378	0.51	982	--	--	--	--	--	--	--	--

JAMES RIVER BASIN

06470500 JAMES RIVER AT LAMORE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)
OCT 14...	0.160	0.150	--	4	400	--	<10	1	--	<3	<1	--
NOV 20...	0.180	0.170	--	2	240	--	<10	2	--	<3	<1	--
JAN 12...	0.290	0.280	--	2	1000	--	<10	1	--	20	<1	--
FEB 24...	0.380	0.380	--	2	500	--	<10	<1	--	15	<1	--
APR 08...	0.200	0.130	2	2	110	<1	<10	<1	270	42	<1	210
MAY 26...	0.380	0.340	--	4	190	--	<10	<1	--	8	<1	--
JUL 19...	0.150	0.160	3	2	80	<1	<10	<1	4400	190	<1	230
SEP 08...	--	--	--	4	120	--	<10	2	--	22	<1	--

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS- SOLVED (MG/L AS CN) (00723)	TRIAZIN SCREEN (ELISA) WAT, DIS REC, AS ATRAZIN (UG/L) (34756)	TRIAZIN SCREEN (ELISA) WAT, WH REC, AS ATRAZIN (UG/L) (34757)	CARBO- FURAN SCREEN, DIS- SOLVED (UG/L) (99901)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)
OCT 14...	2	<0.1	--	<1	<3	--	--	<0.01	--	--	--	--
NOV 20...	55	<0.1	--	<1	<3	--	--	<0.01	--	--	--	--
JAN 12...	750	<0.1	--	<1	20	--	--	<0.01	--	--	--	--
FEB 24...	4800	<0.1	--	<1	<3	--	--	<0.01	--	--	--	--
APR 08...	150	<0.1	<1	<1	<3	15	<0.010	<0.01	--	--	--	--
MAY 26...	150	<0.1	--	<1	5	--	--	<0.01	--	--	--	--
JUN 02...	--	--	--	--	--	--	--	--	--	<0.05	--	<0.06
JUL 19...	21	0.6	<1	<1	10	15	<0.010	<0.01	<0.05	--	<0.06	--
SEP 08...	41	<0.1	--	<1	9	--	--	--	--	--	--	--

DATE	CYANA ZINE SCREEN, DIS- SOLVED (UG/L) (99903)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	2, 4-D SCREEN DIS- SOLVED (UG/L) (99905)	2, 4-D SCREEN, TOTAL (UG/L) (99906)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)	PLANK- TON BIOMASS ASH WT (MG/L) (81353)	PLANK- TON BIOMASS DRY WT (MG/L) (81354)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 14...	--	--	--	--	--	--	--	--	154	2.3	26
NOV 20...	--	--	--	--	--	--	--	--	8	0.50	84
JAN 12...	--	--	--	--	--	--	--	--	402	4.3	45
FEB 24...	--	--	--	--	--	--	--	--	117	2.2	23
APR 08...	--	--	--	--	42.0	7.30	1250	1280	12	5.1	54
MAY 26...	--	--	--	--	--	--	--	--	16	3.1	95
JUN 02...	--	<0.04	--	<0.700	--	--	--	--	--	--	--
JUL 19...	<0.04	--	<0.700	--	9.30	1.00	1330	1360	126	756	99
SEP 08...	--	--	--	--	--	--	--	--	60	156	100

JAMES RIVER BASIN

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06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	1170	1150	1160	1190	1150	1170	1290	1260	1270	2370	2300	2340
2	1180	1150	1160	1150	1130	1140	1310	1290	1300	2430	2370	2400
3	1180	1160	1170	1160	1130	1140	1330	1300	1310	2460	2420	2440
4	1180	1160	1170	1140	1130	1130	1350	1330	1340	2480	2440	2470
5	1180	1160	1170	1140	1130	1140	1390	1350	1360	2540	2470	2510
6	1180	1160	1170	1160	1140	1150	1420	1380	1400	2590	2540	2560
7	1190	1170	1180	1170	1150	1160	1450	1420	1440	2620	2570	2590
8	1190	1180	1190	1180	1160	1170	1480	1450	1470	2630	2590	2610
9	1200	1180	1190	1180	1170	1170	1510	1480	1490	2630	2600	2610
10	1210	1190	1200	1180	1170	1180	1540	1500	1520	2620	2590	2610
11	1210	1190	1200	1170	1120	1140	1560	1530	1540	2610	2580	2600
12	1210	1200	1200	1130	1060	1090	1590	1550	1570	2610	2570	2590
13	1220	1200	1210	1080	1060	1070	1620	1580	1600	2580	2520	2550
14	1210	1200	1210	1090	1080	1080	1640	1610	1620	2530	2460	2500
15	1220	1200	1210	1100	1080	1090	1660	1630	1640	2460	2390	2440
16	1220	1180	1200	1100	1090	1100	1680	1650	1660	2410	2340	2370
17	1210	1190	1200	1110	1090	1100	1710	1670	1690	2350	2300	2320
18	1200	1190	1200	1100	1080	1090	1720	1690	1700	2310	2270	2290
19	1210	1180	1200	1090	1070	1080	1730	1710	1720	2280	2220	2250
20	1210	1190	1200	1080	1040	1060	1740	1710	1730	2230	2190	2200
21	1210	1200	1200	1050	1040	1040	1770	1730	1750	2200	2150	2170
22	1210	1190	1200	1060	1040	1050	1810	1760	1780	2160	2110	2140
23	1220	1200	1210	1060	1050	1060	1850	1800	1820	2130	2090	2110
24	1210	1200	1210	1070	1060	1060	1900	1850	1860	2110	2050	2070
25	1220	1170	1190	1090	1070	1070	1930	1890	1910	2050	2010	2040
26	1190	1180	1190	1120	1080	1100	1990	1930	1960	2020	1980	2000
27	1200	1180	1190	1140	1120	1120	2040	1970	2000	1990	1960	1970
28	1200	1180	1190	1180	1140	1160	2090	2040	2060	1960	1940	1950
29	1200	1180	1190	1230	1180	1210	2150	2090	2110	1940	1890	1920
30	1210	1190	1200	1260	1220	1240	2210	2130	2180	1890	1860	1880
31	1200	1190	1200	---	---	---	2300	2210	2260	1870	1830	1850
MONTH	1220	1150	1190	1260	1040	1120	2300	1260	1680	2630	1830	2300

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1850	1800	1830	1780	1740	1770	390	370	380	610	600	600
2	1810	1780	1800	1780	1740	1760	380	370	380	610	590	600
3	1780	1740	1760	1750	1720	1740	380	370	370	620	610	610
4	1750	1700	1730	1720	1610	1690	380	360	370	660	620	640
5	1710	1680	1700	1610	820	1380	390	370	380	680	650	670
6	1690	1650	1670	820	550	650	430	390	400	700	670	680
7	1670	1650	1660	550	490	510	480	430	470	710	690	700
8	1660	1640	1650	490	460	470	500	480	490	700	690	700
9	1650	1630	1640	1060	470	820	500	480	490	700	680	690
10	1680	1650	1660	1080	660	850	500	480	490	720	690	700
11	1680	1640	1660	660	540	590	490	460	470	720	710	720
12	1680	1650	1660	550	510	520	470	450	460	750	720	740
13	1690	1670	1680	550	520	540	470	460	460	760	730	750
14	1690	1670	1680	530	490	500	470	460	470	800	730	770
15	1700	1680	1690	490	480	480	480	470	480	820	790	800
16	1710	1690	1700	510	480	500	480	470	480	830	810	820
17	1730	1700	1710	520	510	510	500	480	490	820	770	790
18	1730	1700	1720	530	520	520	490	480	490	790	780	790
19	1730	1710	1720	530	520	530	500	490	490	790	770	780
20	1760	1720	1740	540	530	540	500	490	500	780	750	760
21	1760	1740	1750	550	530	540	510	490	500	780	760	770
22	1770	1750	1760	550	530	540	510	500	500	820	780	800
23	1790	1760	1780	540	510	530	530	500	510	840	810	830
24	1790	1770	1780	510	420	480	540	520	530	840	830	830
25	1790	1760	1780	420	400	410	560	540	550	830	810	820
26	1790	1770	1780	410	390	400	570	560	560	820	810	820
27	1780	1770	1780	410	370	390	580	560	580	830	810	820
28	1780	1760	1770	370	360	370	600	580	590	830	800	820
29	---	---	---	390	360	370	610	600	610	820	770	790
30	---	---	---	390	380	390	610	600	600	780	740	750
31	---	---	---	390	370	390	---	---	---	750	730	730
MONTH	1850	1630	1720	1780	360	700	610	360	480	840	590	740

JAMES RIVER BASIN

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	810	740	780	720	700	720	570	560	560	620	600	610
2	820	810	810	710	660	690	570	560	570	610	600	600
3	820	790	810	670	560	620	600	570	590	620	600	610
4	810	790	800	570	540	560	610	600	610	630	610	620
5	810	800	810	570	530	560	630	610	620	640	620	630
6	820	800	810	540	520	520	640	620	630	640	630	640
7	820	800	810	570	530	550	640	630	640	640	640	640
8	800	780	790	600	570	590	650	630	640	650	630	640
9	790	760	770	610	590	600	640	610	620	650	610	620
10	780	760	770	620	600	610	620	600	610	610	610	610
11	780	770	780	650	610	630	610	590	600	620	600	610
12	790	770	780	670	640	650	600	590	590	610	590	600
13	780	740	760	680	660	670	600	580	590	610	600	610
14	750	730	740	700	680	690	600	580	590	610	610	610
15	780	740	760	710	690	700	610	580	600	610	590	600
16	790	760	780	710	680	700	610	600	610	600	590	600
17	780	770	770	720	590	700	610	590	600	600	590	600
18	790	770	780	640	350	480	610	590	600	610	600	600
19	780	760	770	360	340	350	620	600	610	610	600	610
20	770	730	750	350	330	340	650	610	620	610	590	600
21	750	730	740	410	340	370	740	650	690	600	590	600
22	740	720	730	430	410	420	800	730	760	600	580	590
23	740	720	730	460	420	440	920	800	870	600	580	590
24	740	720	740	490	460	470	920	870	910	590	570	580
25	730	720	730	520	490	510	870	830	850	590	570	580
26	730	700	720	550	520	540	830	700	780	590	580	580
27	730	680	700	560	550	560	710	630	660	590	570	580
28	700	680	690	550	490	510	640	630	640	590	580	580
29	700	660	680	500	480	490	660	640	650	590	570	580
30	710	630	670	530	490	510	660	640	650	580	570	580
31	---	---	---	560	530	550	640	610	630	---	---	---
MONTH	820	630	760	720	330	560	920	560	650	650	570	600
YEAR	2630	330	1040									

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	15.1	13.4	14.1	3.9	3.0	3.4	3.5	2.0	2.9	.8	.6	.7
2	16.7	13.8	15.1	3.0	1.1	2.1	3.2	1.9	2.4	.7	.6	.6
3	16.5	14.4	15.4	1.3	.4	.8	3.4	2.9	3.3	.8	.5	.6
4	16.6	13.9	15.2	1.2	.4	.8	3.1	2.4	2.8	.8	.6	.7
5	16.3	14.1	15.4	1.5	.9	1.2	2.4	1.4	2.0	.8	.7	.7
6	14.1	11.9	12.9	1.7	1.2	1.4	1.4	1.1	1.3	.7	.6	.7
7	12.5	9.5	10.8	2.1	1.5	1.8	1.3	1.1	1.2	.6	.5	.6
8	9.5	7.9	8.6	3.0	2.1	2.5	1.3	1.0	1.2	.7	.5	.6
9	10.1	8.1	8.9	3.5	3.0	3.2	1.3	1.1	1.2	.7	.6	.7
10	10.3	7.1	8.8	3.8	3.4	3.6	1.5	1.2	1.4	.8	.6	.7
11	11.7	8.2	9.8	3.5	2.3	3.0	1.6	1.3	1.5	.8	.6	.7
12	10.5	7.7	8.8	2.3	1.4	1.9	1.8	1.6	1.7	.8	.6	.7
13	8.3	6.8	7.7	1.9	.9	1.3	2.2	1.7	2.0	.8	.6	.7
14	6.8	4.7	5.8	2.3	1.7	2.0	2.1	1.6	1.8	.8	.6	.7
15	5.5	3.5	4.5	2.3	1.9	2.0	1.7	1.5	1.6	.9	.6	.7
16	4.7	2.7	3.6	1.9	1.4	1.6	1.6	1.3	1.5	.7	.7	.7
17	5.0	2.9	4.2	1.6	1.3	1.4	1.3	.7	.9	.7	.6	.7
18	4.7	3.7	4.2	1.7	1.5	1.6	1.0	.8	.9	.7	.6	.7
19	4.9	3.4	4.2	1.7	1.3	1.5	1.0	.7	.9	.7	.7	.7
20	5.8	4.0	4.8	1.6	1.2	1.4	.7	.6	.7	.7	.7	.7
21	7.9	5.1	6.3	1.6	1.3	1.4	.9	.7	.8	.7	.7	.7
22	10.6	7.4	8.8	1.8	1.4	1.7	.9	.7	.8	.7	.7	.7
23	12.0	9.5	10.6	2.1	1.6	1.9	.9	.8	.8	.7	.7	.7
24	11.9	9.8	10.9	2.2	2.1	2.2	.9	.7	.8	.7	.7	.7
25	11.9	10.2	11.0	2.4	2.0	2.2	1.2	.9	1.0	.7	.7	.7
26	10.4	8.4	9.4	3.0	2.2	2.6	1.3	1.2	1.3	.7	.7	.7
27	9.5	7.6	8.5	3.4	3.0	3.2	1.4	1.2	1.3	.7	.7	.7
28	8.0	6.9	7.3	3.4	3.2	3.3	1.4	1.2	1.3	.7	.7	.7
29	6.9	5.0	6.0	3.5	3.4	3.4	1.3	1.3	1.3	.7	.7	.7
30	6.0	4.8	5.3	3.6	3.3	3.5	1.3	1.0	1.2	.8	.7	.7
31	4.8	3.9	4.2	---	---	---	1.0	.7	.8	.8	.7	.7
MONTH	16.7	2.7	8.7	3.9	.4	2.1	3.5	.6	1.4	.9	.5	.7

JAMES RIVER BASIN

06470800 BEAR CREEK NEAR OAKES, ND

LOCATION.--Lat 46°13'31", long 98°04'17", in NE¹/₄NE¹/₄, sec.28, T.132 N., R.59 W., Dickey County, Hydrologic Unit 10160003, on right bank 80 ft downstream from bridge on ND Highway 13, 6 mi north, and 1 mi east of Oakes.

DRAINAGE AREA.--357 mi², of which about 255 mi² is noncontributing, revised.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,291.30 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1, 1975, reached a stage of 15.00 ft present datum, from floodmark, discharge 4,590 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	e.06	e.03	e.00	e.00	e.00	e105	5.5	4.6	88	224	9.3
2	.21	e.06	e.03	e.00	e.00	e.00	e100	5.3	5.3	91	188	9.2
3	.21	e.06	e.02	e.00	e.00	e.00	e95	5.0	4.9	86	160	11
4	.21	e.05	e.02	e.00	e.00	e.00	90	4.6	4.3	95	138	13
5	.21	e.05	e.02	e.00	e.00	e.00	64	4.3	3.6	98	122	12
6	.21	e.05	e.02	e.00	e.00	e.00	48	4.2	3.4	91	108	11
7	.20	e.05	e.02	e.00	e.00	e.00	36	4.6	3.0	84	97	11
8	.20	e.06	e.02	e.00	e.00	e.00	29	4.4	3.2	79	87	11
9	.15	e.06	e.02	e.00	e.00	e.00	26	4.3	4.0	72	77	9.9
10	.09	e.06	e.02	e.00	e.00	e.00	22	4.3	4.9	67	67	11
11	.05	e.07	e.02	e.00	e.00	e.00	21	4.1	5.9	60	61	10
12	.04	e.07	e.02	e.00	e.00	e.00	21	3.9	6.4	52	57	8.1
13	.03	e.07	e.02	e.00	e.00	e.00	19	3.6	7.4	53	50	6.6
14	.03	e.06	e.02	e.00	e.00	e.00	17	3.7	8.1	60	46	5.7
15	.03	e.06	e.02	e.00	e.00	e.00	15	3.5	8.3	63	46	4.9
16	.03	e.05	e.02	e.00	e.00	e.00	13	3.5	8.7	136	41	4.5
17	.03	e.05	e.02	e.00	e.00	e.00	12	3.4	8.2	165	37	4.5
18	.04	e.05	e.02	e.00	e.00	e.00	11	3.1	8.3	135	35	4.3
19	.04	e.05	e.02	e.00	e.00	e.00	10	2.9	9.2	141	31	4.1
20	.05	e.04	e.02	e.00	e.00	e.00	10	3.1	9.8	203	28	4.1
21	e.05	e.04	e.01	e.00	e.00	e.00	9.4	3.4	65	320	26	4.1
22	e.05	e.03	e.01	e.00	e.00	e.00	8.7	3.1	110	293	24	2.9
23	e.05	e.04	e.01	e.00	e.00	e.00	7.9	2.2	112	227	22	2.3
24	e.05	e.04	e.02	e.00	e.00	e.00	7.8	3.0	133	199	19	2.2
25	e.05	e.04	e.02	e.00	e.00	e10	7.5	5.0	118	193	16	2.3
26	e.05	e.04	e.02	e.00	e.00	e35	7.1	6.0	107	179	15	2.2
27	e.05	e.04	e.01	e.00	e.00	e70	6.9	5.6	100	334	13	1.9
28	e.06	e.04	e.01	e.00	e.00	e210	6.4	4.5	90	543	12	1.9
29	e.06	e.03	e.01	e.00	---	e170	6.0	3.7	82	560	12	2.2
30	e.06	e.03	e.01	e.00	---	e140	5.7	3.9	87	469	12	2.4
31	e.06	---	e.01	e.00	---	e115	---	4.5	---	320	10	---
TOTAL	2.85	1.50	0.56	0.00	0.00	750.00	837.4	126.2	1125.5	5556	1881	189.6
MEAN	.092	.050	.018	.000	.000	24.2	27.9	4.07	37.5	179	60.7	6.32
MAX	.21	.07	.03	.00	.00	210	105	6.0	133	560	224	13
MIN	.03	.03	.01	.00	.00	.00	5.7	2.2	3.0	52	10	1.9
AC-FT	5.7	3.0	1.1	.00	.00	1490	1660	250	2230	11020	3730	376

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1993, BY WATER YEAR (WY)

	MEAN	.091	.094	.038	.006	.17	29.1	44.4	8.56	4.92	12.3	3.83	1.75
MAX	.97	.49	.26	.089	2.13	142	323	50.4	37.5	179	60.7	21.9	
(WY)	1979	1987	1987	1992	1992	1987	1979	1986	1993	1993	1993	1978	
MIN	.000	.000	.000	.000	.000	.032	.10	.000	.005	.000	.000	.000	
(WY)	1977	1977	1977	1977	1977	1981	1985	1981	1977	1977	1977	1977	

SUMMARY STATISTICS FOR 1992 CALENDAR YEAR FOR 1993 WATER YEAR WATER YEARS 1977 - 1993

ANNUAL TOTAL	849.74	10470.61	
ANNUAL MEAN	2.32	28.7	8.79
HIGHEST ANNUAL MEAN			32.2
LOWEST ANNUAL MEAN			.042
HIGHEST DAILY MEAN	40	Mar 11	560
LOWEST DAILY MEAN	.00	Aug 8	.00
ANNUAL SEVEN-DAY MINIMUM	.01	Aug 5	.00
INSTANTANEOUS PEAK FLOW			591
INSTANTANEOUS PEAK STAGE			11.02
ANNUAL RUNOFF (AC-FT)	1690	20770	6370
10 PERCENT EXCEEDS	6.6	96	10
50 PERCENT EXCEEDS	.25	2.3	.02
90 PERCENT EXCEEDS	.02	.00	.00

e Estimated.

JAMES RIVER BASIN

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06470800 BEAR CREEK NEAR OAKES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- PER ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT 13...	1700	0.03	1480	--	10.5	8.0	--	--	--	--	--
NOV 19...	1330	0.45	1480	--	2.0	2.5	--	--	--	--	--
MAR 31...	1015	112	499	--	1.0	1.5	--	--	--	--	--
APR 07...	1830	33	602	7.6	6.0	5.0	8.6	71	170	134	36
JUN 02...	1155	5.4	1220	--	19.0	16.0	--	--	--	--	--
JUL 20...	1535	216	975	--	24.5	22.5	--	--	--	--	--
JUL 23...	1515	221	732	7.7	24.0	21.0	--	--	260	252	49
SEP 08...	1915	11	1060	--	25.0	19.0	--	--	--	--	--

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
APR 07...	20	48	35	2	14	130	32	0.20	13	374	383
JUL 23...	33	62	33	2	12	110	32	0.10	39	489	486

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)
APR 07...	0.52	34.1	3	20	80	<1	30	80	0.2	3
JUL 23...	0.66	290	5	90	60	<1	40	90	0.2	<1

DATE	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	TRIAZIN SCREEN (ELISA) WAT,WH REC,AS ATRAZIN (UG/L) (34757)	TRIAZIN SCREEN (ELISA) WAT,DIS REC,AS ATRAZIN (UG/L) (34756)	CARBO- FURAN SCREEN, DIS- SOLVED (UG/L) (99901)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, DIS- SOLVED (UG/L) (99903)	CYANA- ZINE SCREEN (UG/L) (99904)	2, 4-D SCREEN, DIS- SOLVED (UG/L) (99905)	2, 4-D SCREEN, TOTAL (UG/L) (99906)
APR 07...	<1	250	--	--	--	--	--	--	--	--
JUN 02...	--	--	<0.05	--	--	<0.06	--	<0.04	--	<0.700
JUL 20...	--	--	--	0.2	<0.06	--	0.07	--	<0.700	--
JUL 23...	<1	310	--	--	--	--	--	--	--	--

JAMES RIVER BASIN

06470830 JAMES RIVER AT OAKES, ND

LOCATION.--Lat 46°08'14", long 98°08'09", in NW¹/₄, NE¹/₄, NE¹/₄, sec.30, T.131 N., R.59 W., Dickey County, Hydrologic Unit 10160003, on left bank 10 ft downstream from bridge 1.0 mi west of Oakes.

DRAINAGE AREA.--5,320 mi², of which about 3,300 mi² is probably noncontributing.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,200.00 ft above sea level. Flow regulated by Jamestown Reservoir (station 06469000).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height, 95.20 ft, Dec. 20, 1984; minimum, 88.11 ft, Sept. 4, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 94.88, Aug. 1; minimum recorded, 88.97 ft, Nov. 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89.48	89.29	89.73	---	---	---	---	89.78	90.03	90.60	94.86	93.33
2	89.38	89.12	89.71	---	---	---	---	89.89	89.96	90.66	94.84	93.23
3	89.38	89.03	89.70	---	---	---	---	89.99	89.95	90.72	94.78	93.19
4	89.43	89.18	89.71	---	---	---	---	89.98	90.00	91.20	94.68	93.07
5	89.44	89.40	89.70	---	---	---	---	89.93	90.14	91.41	94.55	93.01
6	89.31	89.41	89.70	---	---	---	---	89.95	90.07	91.43	94.41	93.00
7	89.21	89.42	89.70	---	---	---	---	90.18	89.94	91.43	94.27	93.00
8	89.15	89.43	89.69	---	---	---	91.16	90.09	90.18	91.45	94.15	93.09
9	89.33	89.46	89.69	---	---	---	91.03	89.98	90.06	91.42	93.99	92.99
10	89.27	89.52	89.69	---	---	---	90.87	89.88	90.14	91.32	93.87	92.97
11	89.42	89.56	89.68	---	---	---	90.76	89.87	90.34	91.21	93.78	93.00
12	89.28	89.58	89.68	---	---	---	90.70	89.76	90.46	91.13	93.68	92.96
13	89.28	89.59	89.69	---	---	---	90.61	89.96	90.35	91.01	93.60	92.83
14	89.16	89.62	89.68	---	---	---	90.50	89.80	90.18	90.97	93.60	92.90
15	89.26	89.65	89.68	---	---	---	90.40	89.83	90.17	90.97	93.54	93.01
16	89.34	89.66	89.67	---	---	---	90.40	89.93	90.16	91.32	93.46	93.04
17	89.28	89.69	89.66	---	---	---	90.48	89.92	89.86	91.48	93.44	93.01
18	89.34	89.71	89.66	---	---	---	90.31	89.87	89.97	91.55	93.38	93.02
19	89.46	89.74	89.67	---	---	---	89.86	89.88	89.99	91.94	93.32	93.02
20	89.32	89.76	89.66	---	---	---	90.00	89.91	90.05	92.43	93.27	93.03
21	89.36	89.76	89.65	---	---	---	90.19	90.04	90.08	92.90	93.29	93.08
22	89.46	89.77	89.65	---	---	---	90.17	90.02	90.26	93.29	93.29	93.05
23	89.35	89.77	89.65	---	---	---	90.05	89.92	---	93.67	93.28	93.05
24	89.41	89.75	89.67	---	---	---	89.81	89.74	---	94.05	93.26	93.07
25	89.31	89.73	---	---	---	---	89.79	90.01	---	94.33	93.31	93.10
26	89.37	89.73	---	---	---	---	90.08	89.87	---	94.47	93.23	92.98
27	89.37	89.73	---	---	---	---	89.92	89.80	---	94.52	93.20	92.99
28	89.34	89.72	---	---	---	---	89.97	89.86	---	94.58	93.25	92.95
29	89.39	89.73	---	---	---	---	89.90	90.04	---	94.68	93.26	92.97
30	89.40	89.72	---	---	---	---	89.85	89.84	90.46	94.78	93.21	93.01
31	89.32	---	---	---	---	---	---	89.93	---	94.84	93.25	---
MEAN	89.34	89.57	---	---	---	---	---	89.92	---	92.31	93.72	93.03
MAX	89.48	89.77	---	---	---	---	---	90.18	---	94.84	94.86	93.33
MIN	89.15	89.03	---	---	---	---	---	89.74	---	90.60	93.20	92.83

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORDS.--

SPECIFIC CONDUCTANCE: Water years 1983 to current year.
WATER TEMPERATURE: Water years 1983 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 5,830 microsiemens, Jan. 30, 1991; minimum 180, microsiemens, Mar. 23 and 24, 1991.

WATER TEMPERATURE: Maximum, 31.7°C, Aug. 15, 1988; minimum, 0.0°C on many days during the winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 5,150 microsiemens, Feb. 4; minimum, 390 microsiemens, Apr. 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH	PH	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER-	TUR-	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN,	OXYGEN	HARD- NESS TOTAL (MG/L AS CACO3) (00900)
			WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	WATER WHOLE LAB (STAND- ARD UNITS) (00403)		ATURE WATER (DEG C) (00010)	BID- ITY (NTU) (00076)		SOLVED (PER- CENT SATUR- ATION) (00301)	DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L) (00310)	
OCT											
13...	1845	1270	--	8.3	5.0	7.0	3.8	11.0	96	--	400
NOV											
20...	1030	1300	--	8.3	1.0	2.0	6.1	14.3	109	--	350
JAN											
13...	1100	4650	7.7	--	-5.0	0.0	14	3.6	--	--	1600
FEB											
24...	1700	2520	7.4	--	-18.0	0.0	5.5	0.5	4	--	780
MAR											
30...	1845	680	7.5	--	4.0	1.5	4.5	7.3	55	6.9	170
APR											
07...	1400	398	--	7.4	9.0	4.0	3.0	10.3	--	4.9	130
MAY											
27...	0915	822	8.1	--	10.0	13.0	27	8.2	83	--	280
JUL											
19...	1745	718	7.6	--	27.0	21.0	17	4.5	54	2.2	270
SEP											
08...	1700	648	8.0	--	18.0	28.0	4.6	6.6	90	--	210

DATE	ALKA-	CALCIUM	MAGNE-	SODIUM,	SODIUM	SODIUM	POTAS-	SULFATE	CHLO-	FLUO-	TOTAL
	LINITY		S-UM,	S-UM,		AD-	S-UM,		RIDE,	RUO-	AT 105
	LAB		DIS-	DIS-		SORP-	DIS-		DIS-	DIS-	DEG. C,
	(MG/L		SOLVED	SOLVED		TION	SOLVED		SOLVED	SOLVED	SUS-
	AS	(MG/L	(MG/L	(MG/L	PERCENT	RATIO	(MG/L	(MG/L	(MG/L	(MG/L	PENDED
	CACO3)	AS CA)	AS MG)	AS NA)	(00932)	(00931)	AS K)	AS SO4)	AS CL)	AS F)	(00530)
	(90410)	(00915)	(00925)	(00930)					(00940)	(00950)	
OCT											
13...	393	81	47	140	42	3	15	220	83	0.30	67
NOV											
20...	332	73	40	120	42	3	12	210	81	0.20	18
JAN											
13...	1200	320	190	550	42	6	31	920	430	0.50	63
FEB											
24...	715	180	81	260	41	4	17	410	170	0.50	10
MAR											
30...	156	34	20	66	44	2	14	130	46	0.30	19
APR											
07...	121	30	13	26	28	1	11	57	15	0.10	14
MAY											
27...	260	60	31	68	33	2	13	150	36	0.20	367
JUL											
19...	241	58	31	54	29	1	12	110	24	0.20	77
SEP											
08...	231	44	25	46	31	1	11	86	13	0.20	18

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
OCT 13...	823	854	1.16	<0.010	--	<0.050	0.020	3.7	--	3.7	--
NOV 20...	736	758	1.03	0.040	--	<0.050	0.020	0.38	--	0.40	--
JAN 13...	3170	3330	4.53	0.020	0.037	0.057	0.720	1.9	--	2.6	--
FEB 24...	1550	1630	2.22	0.010	--	<0.050	0.860	0.74	--	1.6	--
MAR 30...	408	440	0.60	0.050	0.370	0.420	0.400	1.1	1.6	1.5	0.350
APR 07...	226	248	0.34	0.020	0.180	0.200	0.070	1.0	1.5	1.1	0.340
MAY 27...	515	545	0.74	<0.010	--	<0.050	0.050	0.75	--	0.80	--
JUL 19...	436	487	0.66	0.030	0.100	0.130	0.040	0.86	1.4	0.90	0.550
SEP 08...	364	398	0.54	--	--	--	--	--	--	--	--

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	
	OCT 13...	0.270	0.160	--	5	160	--	<10	1	--	<3
	NOV 20...	0.140	0.120	--	4	330	--	<10	1	--	<3
	JAN 13...	0.580	0.580	--	8	1500	--	10	4	--	30
FEB 24...	0.160	0.150	--	3	770	--	<10	<1	--	50	
MAR 30...	0.350	0.340	2	2	150	21	<10	2	380	110	
APR 07...	0.260	0.190	2	2	90	<1	<10	<1	490	69	
MAY 27...	0.050	0.040	--	2	210	--	<10	<1	--	8	
JUL 19...	0.360	0.360	5	4	160	<1	<10	<1	1300	24	
SEP 08...	--	--	--	4	130	--	<10	<1	--	25	

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 DIS- SOLVED (UG/L AS HG) (71890)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS- SOLVED (MG/L AS CN) (00723)
OCT 13...	<1	--	17	<0.1	--	<1	<3	--	--	<0.01
NOV 20...	<1	--	30	<0.1	--	<1	<3	--	--	<0.01
JAN 13...	<1	--	1500	<0.1	--	<1	20	--	--	<0.01
FEB 24...	<1	--	2600	<0.1	--	<1	<10	--	--	<0.01
MAR 30...	<1	490	440	0.2	<1	<1	<3	14	<0.010	<0.01
APR 07...	<1	130	62	<0.1	<1	<1	<3	12	<0.010	<0.01
MAY 27...	<1	--	200	0.1	--	<1	3	--	--	<0.01
JUL 19...	<1	370	130	0.3	<1	<1	8	17	<0.010	<0.01
SEP 08...	<1	--	61	0.1	--	<1	6	--	--	--

[illegible]

JAMES RIVER BASIN

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06470830 JAMES RIVER AT OAKES, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	1240	1210	1220	1320	1300	1310	1550	1520	1540	3520	3390	3450
2	1240	1220	1230	1320	1300	1310	1580	1550	1570	3650	3520	3590
3	1240	1220	1230	1310	1290	1300	1630	1580	1600	3770	3650	3710
4	1240	1220	1230	1290	1280	1290	1650	1620	1630	3870	3770	3830
5	1250	1230	1240	1290	1270	1280	1700	1650	1670	3990	3870	3930
6	1240	1230	1240	1280	1270	1280	1750	1690	1720	4110	3990	4050
7	1250	1230	1240	1290	1280	1280	1800	1740	1770	4210	4110	4160
8	1250	1230	1240	1300	1290	1290	1850	1800	1820	4300	4210	4260
9	1250	1240	1250	1300	1290	1300	1910	1850	1880	4390	4300	4350
10	1260	1240	1250	1310	1290	1300	1970	1910	1940	4460	4390	4430
11	1260	1240	1250	1300	1290	1300	2020	1970	1990	4560	4460	4500
12	1260	1250	1260	1300	1280	1290	2090	2020	2050	4630	4560	4600
13	1260	1250	1260	1280	1260	1270	2140	2080	2110	4670	4630	4650
14	1270	1250	1260	1280	1270	1280	2190	2130	2160	4660	4650	4650
15	1270	1260	1270	1280	1270	1280	2240	2190	2210	4650	4590	4620
16	1280	1260	1270	1290	1280	1280	2290	2240	2260	4590	4530	4560
17	1280	1270	1280	1300	1280	1290	2340	2290	2310	4530	4480	4510
18	1280	1270	1270	1300	1290	1300	2400	2340	2370	4490	4460	4470
19	1290	1270	1280	1310	1290	1300	2450	2390	2420	4510	4470	4480
20	1310	1280	1300	1300	1290	1290	2520	2450	2480	4540	4500	4520
21	1310	1300	1300	1320	1300	1310	2580	2510	2550	4550	4530	4540
22	1320	1300	1310	1340	1320	1330	2650	2580	2610	4550	4540	4540
23	1320	1300	1310	1360	1330	1350	2720	2650	2690	4540	4520	4530
24	1320	1300	1310	1380	1350	1360	2820	2720	2770	4520	4490	4510
25	1320	1300	1310	1400	1370	1390	2890	2820	2850	4500	4460	4480
26	1310	1300	1310	1420	1390	1410	2970	2890	2930	4470	4410	4440
27	1310	1300	1310	1440	1410	1420	3040	2960	3010	4410	4300	4360
28	1310	1300	1300	1460	1430	1450	3110	3040	3080	4300	4190	4250
29	1310	1300	1310	1490	1460	1480	3190	3110	3160	4190	4170	4180
30	1310	1300	1310	1520	1490	1510	3280	3190	3240	4330	4180	4240
31	1310	1300	1310	---	---	---	3390	3280	3340	4650	4330	4500
MONTH	1320	1210	1270	1520	1260	1330	3390	1520	2310	4670	3390	4320

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	4860	4650	4760	2370	2190	2280	660	600	630	610	600	600
2	5030	4850	4950	2190	1940	2060	600	540	570	620	610	620
3	5130	5030	5080	1940	1840	1880	540	500	520	630	620	620
4	5150	5120	5140	1850	1780	1830	510	460	490	650	630	630
5	5130	5030	5080	1780	1690	1730	470	430	450	670	630	650
6	5030	4850	4940	1690	1620	1660	430	420	420	680	660	670
7	4850	4660	4750	1620	1540	1590	420	400	400	700	670	680
8	4660	4440	4550	1550	1450	1500	400	390	390	710	690	700
9	4440	4240	4340	1470	1450	1460	400	390	390	700	690	700
10	4240	4020	4130	1460	1430	1440	400	390	390	700	680	690
11	4020	3820	3920	1440	1420	1430	410	390	400	720	680	690
12	3820	3620	3720	1430	1420	1420	420	400	410	730	700	720
13	3620	3460	3540	1430	1410	1420	460	420	440	750	720	730
14	3460	3330	3390	1420	1370	1400	480	460	470	760	740	750
15	3330	3190	3260	1370	1250	1320	500	480	490	760	750	750
16	3190	3080	3130	1250	1070	1150	510	490	500	760	740	750
17	3080	2970	3020	1070	970	1010	510	490	500	770	750	760
18	2970	2880	2920	980	870	930	500	490	490	770	760	760
19	2880	2790	2830	870	750	800	510	490	500	770	760	760
20	2790	2720	2760	760	700	730	520	510	520	780	760	770
21	2730	2650	2690	700	610	650	530	520	520	790	770	780
22	2650	2600	2630	620	580	610	530	510	520	810	780	790
23	2600	2550	2580	590	540	560	540	520	540	800	790	800
24	2550	2520	2530	550	530	540	550	530	540	810	790	800
25	2520	2500	2510	540	530	530	560	540	550	820	800	810
26	2500	2480	2490	550	530	540	570	550	560	820	810	820
27	2480	2460	2470	570	540	550	590	560	570	820	810	820
28	2470	2370	2430	600	560	570	580	570	580	840	820	830
29	---	---	---	650	590	610	600	570	590	860	840	850
30	---	---	---	690	650	670	600	590	600	860	850	850
31	---	---	---	700	660	680	---	---	---	880	850	860
MONTH	5150	2370	3590	2370	530	1150	660	390	500	880	600	740

JAMES RIVER BASIN

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	880	860	870	1000	960	980	630	580	610	650	630	640
2	880	870	870	960	920	950	660	630	650	650	640	640
3	890	870	880	930	900	910	700	660	680	650	630	640
4	890	870	880	900	860	890	710	690	700	650	640	640
5	890	870	880	870	840	850	720	710	710	650	630	640
6	880	870	880	850	810	830	720	700	710	650	630	640
7	880	860	870	810	760	780	710	690	710	660	640	650
8	870	860	860	760	730	740	720	700	710	660	640	650
9	870	860	870	730	710	720	720	700	710	640	630	630
10	880	860	870	710	690	700	720	700	710	630	620	620
11	890	870	880	700	680	690	710	700	700	630	610	620
12	900	870	880	690	680	690	750	710	740	620	600	610
13	890	870	880	710	690	700	760	740	750	610	590	600
14	880	850	860	720	700	710	740	720	730	600	580	590
15	860	850	860	740	710	730	720	700	710	600	590	590
16	870	850	860	740	720	730	700	680	690	600	580	590
17	870	860	860	720	700	710	690	670	680	590	580	590
18	880	870	870	730	710	720	700	670	690	590	580	580
19	880	870	880	730	720	720	700	680	690	590	580	590
20	890	860	880	790	710	740	700	670	680	590	580	580
21	910	870	880	810	720	750	690	670	680	580	570	580
22	910	890	900	910	810	870	670	660	660	590	580	590
23	980	900	940	970	900	940	670	660	660	590	580	590
24	990	970	980	1070	970	1020	670	660	670	610	590	600
25	1050	990	1030	1090	800	930	660	650	650	610	600	600
26	1060	1040	1050	800	690	740	650	630	640	610	590	600
27	1060	1040	1050	690	630	660	660	630	640	610	590	600
28	1060	1040	1050	630	600	610	660	650	650	610	600	600
29	1040	1010	1030	610	590	600	650	640	650	610	600	600
30	1020	1000	1010	620	600	610	660	640	650	610	590	600
31	---	---	---	600	570	590	660	640	650	---	---	---
MONTH	1060	850	910	1090	570	770	760	580	680	660	570	610
YEAR	5150	390	1510									

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	16.1	11.3	13.7	2.8	1.9	2.4	1.8	1.1	1.6	.5	.4	.4
2	16.3	12.7	14.5	1.9	.0	1.0	2.2	1.0	1.9	.5	.3	.4
3	15.9	12.3	14.1	.1	.0	.0	2.1	1.5	1.9	.7	.4	.6
4	16.3	12.2	14.4	.7	.0	.2	2.1	1.8	2.0	.8	.5	.7
5	15.8	12.9	14.5	1.3	.0	.5	1.8	1.5	1.6	.8	.4	.6
6	12.9	10.0	11.5	2.0	1.2	1.6	1.8	1.5	1.7	.6	.3	.4
7	10.8	7.8	9.1	1.9	1.4	1.8	1.8	1.5	1.7	.5	.2	.3
8	7.8	5.9	6.8	2.3	1.5	1.9	1.7	1.3	1.6	.5	.3	.4
9	8.6	6.2	7.3	2.7	2.1	2.4	1.7	.6	1.2	.4	.3	.4
10	9.5	5.3	7.4	3.6	2.5	3.0	2.0	.7	1.4	.4	.2	.3
11	10.3	5.7	7.9	4.2	2.8	3.3	1.5	.7	1.0	.4	.3	.3
12	8.8	5.8	7.1	2.9	.7	2.1	1.6	.9	1.3	.3	.2	.3
13	7.3	5.4	6.2	1.6	.0	.5	1.6	1.3	1.5	.4	.3	.3
14	5.9	2.9	4.4	1.8	.8	1.3	1.4	1.0	1.3	.4	.3	.4
15	4.5	2.1	2.8	1.5	.8	1.1	1.5	1.2	1.5	.4	.2	.3
16	3.8	1.0	2.1	1.0	.6	.8	1.7	1.4	1.6	.4	.2	.3
17	4.1	.9	2.4	.8	.3	.6	1.6	1.3	1.5	.3	.2	.3
18	3.3	1.4	2.2	.7	.3	.5	1.5	1.3	1.4	.5	.3	.4
19	4.4	2.2	3.2	.6	.2	.4	1.5	1.2	1.4	.5	.3	.4
20	5.9	2.6	4.2	.9	.4	.7	1.3	.8	1.0	.4	.3	.4
21	8.3	4.2	6.1	1.0	.3	.7	1.2	.9	1.1	.5	.4	.4
22	11.8	6.9	9.1	1.5	.7	1.0	1.3	.8	1.1	.4	.2	.4
23	12.3	8.7	10.5	.9	.3	.6	1.2	.8	1.0	.4	.2	.3
24	11.8	8.9	10.5	.8	.2	.5	1.0	.5	.8	.4	.1	.3
25	11.0	8.6	9.8	1.1	.1	.6	1.1	.4	.9	.3	.0	.2
26	9.0	5.5	7.4	1.7	.2	1.0	1.0	.7	.8	.1	.0	.0
27	8.1	5.3	6.9	2.1	1.0	1.6	1.0	.7	.9	.0	.0	.0
28	6.5	4.9	5.4	2.1	1.2	1.7	.9	.5	.8	.3	.0	.1
29	5.2	3.2	4.3	1.9	1.4	1.7	.6	.4	.6	.4	.2	.3
30	4.5	3.4	4.0	1.8	1.6	1.7	.7	.4	.6	.5	.0	.3
31	3.4	2.5	2.9	---	---	---	.6	.4	.5	.1	.0	.0
MONTH	16.3	.9	7.5	4.2	.0	1.2	2.2	.4	1.3	.8	.0	.3

JAMES RIVER BASIN

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND

LOCATION.--Lat 45°56'52", long 98°10'29", in SE¹/₄NE¹/₄NE¹/₄ sec.34, T.129 N., R.60 W., Dickey County, Hydrologic Unit 10160003, on left bank, 10 ft upstream from dam, 4.5 mi southwest of Ludden and .8 mi upstream from North Dakota-South Dakota state line.

DRAINAGE AREA.--5,480 mi², of which about 3,300 mi² are noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder and concrete dam control. Datum of gage is 1,280.00 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor. Flow regulated by upstream reservoirs, Jamestown Reservoir (station 06469000), Pipestem Lake, capacity 147,000 acre-ft, and Lake LaMoure.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	13	e44	e3.8	e1.6	e5.2	532	33	86	208	1610	939
2	1.8	77	e40	e3.2	e2.1	e5.6	415	21	123	226	1630	962
3	.19	82	e36	e2.8	e3.0	e6.0	392	14	116	234	1650	951
4	.03	27	e31	e2.4	e4.2	e6.4	399	e11	97	167	1630	945
5	.06	.09	e28	e2.0	e5.3	e6.0	423	e9.4	62	260	1620	922
6	2.4	.08	e25	e1.7	e7.4	e5.7	413	e8.5	117	352	1530	911
7	21	.14	e21	e1.4	e10	e6.0	399	e10	123	426	1410	903
8	14	.28	e19	e1.2	e12	e6.7	372	e17	58	463	1260	871
9	.20	.87	e20	e1.0	e13	e7.4	327	e22	156	474	1170	903
10	2.9	1.9	e22	e.88	e12	e6.8	299	e37	113	471	1090	899
11	.12	2.8	e19	e.76	e11	e5.9	280	e49	59	446	1060	888
12	1.2	6.0	e16	e.70	e10	e5.2	238	e58	30	402	1060	904
13	4.1	9.8	e15	e.65	e9.7	e4.8	185	e50	104	385	1040	926
14	6.1	10	e14	e.60	e9.3	e5.5	167	e43	159	348	1030	902
15	.61	13	e13	e.56	e8.8	e7.0	151	e45	122	327	1030	871
16	.00	18	e12	e.52	e8.5	e10	111	e48	151	407	1030	875
17	.71	e23	e11	e.48	e8.2	e15	85	e42	179	474	1010	897
18	.00	e27	e9.9	e.45	e7.8	e25	147	e38	104	499	1010	900
19	.00	e32	e9.3	e.43	e7.6	e45	146	e35	122	555	1000	912
20	.01	35	e9.0	e.41	e7.2	e60	57	e31	87	671	992	926
21	.00	35	e8.4	e.42	e7.0	e82	38	e28	81	773	972	913
22	.00	34	e8.0	e.48	e6.6	e95	53	e27	43	889	963	919
23	.11	32	e7.6	e.60	e6.2	e125	70	e32	124	1010	964	912
24	.00	33	e7.2	e.56	e6.0	e150	87	e40	101	1170	962	906
25	18	35	e7.6	e.52	e5.8	e185	46	e49	132	1290	949	e905
26	.21	e36	e8.0	e.60	e5.4	e220	6.9	e60	189	1390	961	e905
27	1.3	e38	e7.7	e.68	e5.2	e280	39	e72	179	1440	960	e915
28	.74	e40	e7.0	e.65	e4.8	e340	21	81	163	1520	945	e935
29	.07	e41	e6.2	e.62	---	e400	38	44	172	1590	955	e895
30	.01	e42	e5.2	e.78	---	e460	35	148	198	1620	976	893
31	.42	---	e4.5	e1.1	---	e500	---	106	---	1610	958	---
TOTAL	76.30	744.96	491.6	32.95	205.7	3082.2	5971.9	1308.9	3550	22097	35427	27305
MEAN	2.46	24.8	15.9	1.06	7.35	99.4	199	42.2	118	713	1143	910
MAX	21	82	44	3.8	13	500	532	148	198	1620	1650	962
MIN	.00	.08	4.5	.41	1.6	4.8	6.9	8.5	30	167	945	871
AC-FT	151	1480	975	65	408	6110	11850	2600	7040	43830	70270	54160

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1993, BY WATER YEAR (WY)

	MEAN	61.6	46.6	20.9	10.4	12.9	235	383	184	133	144	155	128
MAX	206	178	71.7	45.5	51.6	800	977	579	373	713	1143	910	910
(WY)	1988	1988	1987	1987	1987	1987	1987	1987	1987	1987	1993	1993	1993
MIN	1.86	.20	.28	.056	.62	26.0	33.4	9.92	2.12	.015	.000	.011	.011
(WY)	1989	1991	1991	1991	1991	1989	1990	1990	1990	1988	1988	1988	1990

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR	FOR 1993 WATER YEAR	WATER YEARS 1982 - 1993
ANNUAL TOTAL	9632.79	100293.51	
ANNUAL MEAN	26.3	275	127
HIGHEST ANNUAL MEAN			312
LOWEST ANNUAL MEAN			10.3
HIGHEST DAILY MEAN	235	Mar 31	2210
LOWEST DAILY MEAN	.00	May 6	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 18	.02
INSTANTANEOUS PEAK FLOW		1660	Aug 3
INSTANTANEOUS PEAK STAGE		13.53	Aug 3
ANNUAL RUNOFF (AC-FT)	19110	198900	91760
10 PERCENT EXCEEDS	73	960	327
50 PERCENT EXCEEDS	9.2	38	24
90 PERCENT EXCEEDS	.00	.62	.00

e Estimated.

a About.

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORDS.--

SPECIFIC CONDUCTANCE: Water years 1983 to current year.

PH: Water years 1983 to current year.

WATER TEMPERATURE: Water years 1983 to current year.

DISSOLVED OXYGEN: Water years 1983 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1982.

REMARKS.--Unpublished records for dissolved oxygen and pH are available in files at the District office for water years 1983 through 1987.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 3,580 microsiemens, Mar. 17, 1993; minimum recorded, 217 microsiemens, July 13, 1983.

PH: Maximum recorded, 10.1 units, Nov. 13, 1991; minimum recorded, 6.0 units, Nov. 20, 1984.

WATER TEMPERATURE: Maximum recorded, 31.3°C, July 16, 1991; minimum, 0.0°C, several days during winter months each year.

DISSOLVED OXYGEN: Maximum recorded, greater than 20 mg/L on many days; minimum recorded, 0.0 mg/L, on many days.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 3,580 microsiemens, Mar. 17; minimum recorded, 350 microsiemens, Apr. 8.

DISSOLVED OXYGEN: Maximum recorded, 18.8 mg/L, Apr. 7; minimum recorded, 0.4 mg/L, Aug. 5.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	
		HARD-NESS TOTAL (MG/L AS CaCO3) (00900)	ALKA-LINITY LAB (MG/L AS CaCO3) (90410)	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 PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV 19...	1645	32	1290	--	8.5	2.0	2.0	5.7	13.3	104	--	
JAN 13...	1615	0.70	2410	8.0	7.9	-3.0	0.0	6.5	12.4	90	--	
FEB 25...	1100	5.9	2670	7.8	7.7	-11.0	0.0	5.1	1.0	--	--	
APR 02...	1230	410	570	--	7.2	5.0	2.0	5.5	8.4	64	5.1	
07...	1115	404	398	--	7.5	3.5	2.5	2.7	12.9	--	4.5	
JUN 02...	1315	140	885	8.6	8.4	17.0	16.5	32	8.8	95	--	
JUL 20...	1130	660	690	8.0	7.8	26.0	21.5	22	6.6	79	2.5	
SEP 08...	1415	871	691	8.0	7.8	27.5	17.0	4.4	7.0	77	--	
DATE		HARD-NESS TOTAL (MG/L AS CaCO3) (00900)	ALKA-LINITY LAB (MG/L AS CaCO3) (90410)	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 PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV 19...	320	313	49	48	150	49	4	16	250	79	0.30	
JAN 13...	680	663	120	93	280	46	5	26	450	170	0.40	
FEB 25...	830	718	150	110	310	44	5	24	490	200	0.40	
APR 02...	160	134	34	18	50	39	2	11	100	33	0.20	
07...	120	113	27	13	28	31	1	10	57	16	0.10	
JUN 02...	280	276	62	31	69	33	2	14	150	35	0.30	
JUL 20...	240	217	51	28	56	32	2	12	110	28	0.20	
SEP 08...	230	249	48	27	50	31	1	12	88	17	0.20	
DATE		RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
NOV 19...	13	781	820	1.12	70.8	0.050	0.029	0.079	0.030	1.4	--	--
JAN 13...	35	1540	1630	2.22	3.08	0.020	0.120	0.140	0.180	1.3	--	--
FEB 25...	14	1730	1760	2.39	28.0	0.010	--	<0.050	1.80	1.4	--	--
APR 02...	7	330	355	0.48	393	0.020	0.480	0.500	0.230	0.77	1.6	1.6
07...	<1	220	238	0.32	260	0.020	0.090	0.110	0.010	0.79	1.2	1.2
JUN 02...	364	527	563	0.77	213	<0.010	--	<0.050	0.020	0.78	--	--
JUL 20...	354	417	464	0.63	827	<0.010	--	0.056	0.030	0.87	1.3	1.3
SEP 08...	16	392	433	0.59	1010	--	--	--	--	--	--	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TRIAZIN SCREEN (ELISA) WAT, WH REC, AS ATRAZIN (UG/L) (34757)	CARBO- FURAN SCREEN, TOTAL (UG/L) (99902)	CYANA- ZINE SCREEN, TOTAL (UG/L) (99904)	2, 4-D SCREEN, TOTAL (UG/L) (99906)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)	PLANK- TON BIOMASS ASH WT (MG/L) (81353)	PLANK- TON BIOMASS DRY WT (MG/L) (81354)	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 19...	--	--	--	--	--	--	--	--	23	2.0	18
JAN 13...	--	--	--	--	--	--	--	--	68	0.13	33
FEB 25...	--	--	--	--	--	--	--	--	75	1.2	29
APR 02...	--	--	--	--	17.0	1.30	1250	1280	19	21	57
07...	--	--	--	--	15.0	1.80	1240	1270	14	15	81
JUN 02...	--	--	--	--	--	--	--	--	72	27	98
JUL 20...	0.5	<0.06	0.19	<0.700	24.0	2.30	1320	1340	70	125	99
SEP 08...	--	--	--	--	--	--	--	--	14	33	86

JAMES RIVER BASIN

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06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	1180	1130	1150	1190	1160	1180	1430	1390	1410	2110	2060	2080
2	1180	1130	1150	1240	1170	1210	1440	1420	1420	2130	2070	2100
3	1190	1150	1180	1240	1190	1210	1470	1420	1440	2150	2110	2130
4	1200	1160	1190	1250	1200	1230	1510	1470	1490	2170	2130	2140
5	1220	1150	1180	1290	1240	1270	1510	1480	1500	2250	2170	2210
6	1200	1150	1170	1330	1280	1300	1550	1510	1530	2270	2230	2250
7	1200	1150	1170	1330	1290	1300	1580	1540	1560	2280	2240	2250
8	1230	1160	1200	1330	1280	1310	1590	1550	1570	2310	2250	2280
9	1200	1160	1190	1290	1220	1270	1590	1550	1570	2360	2310	2330
10	1250	1170	1220	1300	1260	1280	1590	1510	1570	2400	2340	2370
11	1230	1190	1210	1300	1270	1280	1580	1550	1560	2460	2370	2410
12	1250	1200	1230	1300	1290	1300	1590	1560	1580	2480	2370	2430
13	1230	1190	1210	1310	1290	1300	1610	1580	1600	2440	2370	2410
14	1270	1210	1230	1310	1290	1300	1620	1580	1610	---	---	---
15	1270	1200	1230	1310	1290	1300	1620	1590	1610	---	---	---
16	1250	1210	1230	1310	1300	1300	1660	1600	1630	2470	2430	2440
17	1250	1210	1230	1340	1300	1320	1630	1600	1620	2490	2410	2470
18	1280	1130	1240	1340	1300	1320	1660	1600	1640	2520	2440	2470
19	1300	1160	1260	1340	1280	1310	1700	1640	1670	2520	2470	2480
20	1310	1090	1240	1320	1280	1310	1700	1660	1680	2530	2480	2500
21	1340	1280	1310	1320	1300	1320	1710	1670	1690	2540	2490	2510
22	1340	1260	1300	1340	1300	1320	1740	1680	1710	2530	2490	2510
23	1310	1290	1300	1320	1280	1300	1740	1710	1730	2530	2490	2510
24	1320	1230	1280	1320	1280	1300	1820	1740	1780	2520	2490	2500
25	1290	1250	1260	1340	1300	1320	1840	1790	1820	2530	2490	2520
26	1290	1230	1260	1360	1320	1350	1850	1820	1840	2530	2450	2490
27	1280	1230	1260	1400	1360	1380	1910	1840	1870	2510	2470	2490
28	1280	1220	1250	1400	1360	1380	1950	1910	1930	2520	2470	2490
29	1260	1220	1230	1400	1380	1390	2010	1930	1980	2520	2480	2510
30	1230	1190	1220	1420	1390	1400	2030	1990	2020	2520	2430	2500
31	1200	1150	1180	---	---	---	2080	2020	2060	2530	2510	2520
MONTH	1340	1090	1220	1420	1160	1300	2080	1390	1670	---	---	---

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	2520	2500	2510	---	---	---	490	420	450	700	660	680
2	2530	2500	2510	2810	2770	2800	630	490	560	720	670	700
3	2530	2510	2530	2840	2770	2800	630	510	570	710	670	690
4	2550	2510	2540	2830	2770	2800	530	430	480	710	670	690
5	2560	2530	2550	2810	2760	2800	460	390	430	710	670	690
6	2590	2530	2560	2810	2760	2790	430	380	390	710	670	690
7	2590	2550	2560	2790	2710	2750	410	370	390	720	640	680
8	2590	2550	2570	2750	2670	2710	410	350	380	740	670	700
9	2570	2530	2550	---	---	---	680	370	420	740	680	710
10	2630	2530	2570	---	---	---	720	640	670	740	680	700
11	2630	2570	2600	---	---	---	720	630	670	750	680	710
12	---	---	---	2870	2770	2830	780	680	720	760	710	730
13	---	---	---	2930	2870	2910	790	700	730	790	740	770
14	---	---	---	3040	2930	2990	850	740	780	820	780	790
15	2630	2570	2600	3140	3020	3090	920	780	830	830	780	790
16	2610	2560	2600	3350	3130	3220	990	760	870	810	780	790
17	2610	2550	2590	3580	3350	3480	920	530	790	820	780	800
18	2600	2550	2580	3550	2660	3190	990	790	920	820	790	800
19	2620	2580	2600	2660	1220	1890	1060	960	1000	840	790	820
20	2630	2590	2600	1220	880	1010	1090	950	1030	870	800	830
21	2640	2600	2620	990	800	870	1100	960	1050	870	810	840
22	2670	2620	2640	810	700	750	1100	600	860	870	810	840
23	2710	2630	2670	710	660	680	660	600	620	870	800	840
24	2700	2620	2670	---	---	---	630	600	620	880	830	860
25	2740	2660	2700	---	---	---	700	600	640	880	840	860
26	2790	2740	2760	---	---	---	700	660	680	880	840	860
27	2800	2750	2770	550	470	520	680	640	660	880	830	860
28	---	---	---	490	420	450	680	640	670	880	850	870
29	---	---	---	450	380	410	700	660	670	910	870	880
30	---	---	---	430	350	390	710	660	680	890	840	860
31	---	---	---	420	370	400	---	---	---	880	840	860
MONTH	---	---	---	---	---	---	1100	350	670	910	640	780

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	890	850	870	1010	970	990	660	610	630	680	630	650
2	920	850	870	1030	970	1000	660	610	640	690	640	660
3	920	850	890	1030	990	1000	660	610	640	690	640	670
4	920	870	900	1020	940	990	680	610	640	720	660	690
5	930	890	910	1020	940	990	660	620	640	720	680	690
6	950	890	930	990	950	970	660	610	630	700	650	680
7	960	910	930	980	940	960	670	610	630	690	650	670
8	930	910	920	980	940	960	660	610	640	690	650	670
9	950	910	930	960	730	860	---	---	---	700	660	680
10	960	930	950	750	690	720	---	---	---	720	600	680
11	990	930	960	730	660	700	---	---	---	720	610	660
12	990	960	970	700	640	670	---	---	---	700	650	670
13	980	950	970	670	580	630	---	---	---	690	570	660
14	980	950	960	590	580	580	---	---	---	720	650	680
15	980	960	970	590	570	580	---	---	---	730	680	700
16	980	950	960	580	540	560	---	---	---	730	690	700
17	980	940	960	570	540	560	700	590	630	730	700	720
18	980	950	960	600	570	580	640	560	620	760	700	720
19	980	910	940	680	600	650	640	550	590	740	700	730
20	950	930	940	690	670	680	640	590	610	760	700	730
21	970	930	950	690	670	680	630	510	590	760	700	740
22	970	910	940	690	670	690	620	520	570	770	720	740
23	940	910	930	710	680	690	620	540	570	780	730	750
24	950	910	930	720	670	680	680	540	610	780	730	750
25	950	930	940	700	670	680	690	640	660	750	730	740
26	960	930	950	700	660	680	690	640	670	750	690	720
27	970	940	960	680	640	660	690	640	670	700	620	670
28	970	940	960	660	620	640	690	640	660	650	610	620
29	970	890	940	640	610	620	690	640	660	650	610	630
30	990	940	960	620	580	600	670	630	650	650	610	630
31	---	---	---	660	600	620	680	630	650	---	---	---
MONTH	990	850	940	1030	540	740	---	---	---	780	570	690

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	18.2	16.4	17.1	---	---	---	---	---	---	---	---	---
2	18.5	15.5	17.0	---	---	---	---	---	---	---	---	---
3	19.4	16.0	17.8	---	---	---	---	---	---	---	---	---
4	18.8	17.3	18.1	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	19.8	15.3	18.2	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	21.7	19.0	20.5	---	---	---	---	---	---	---	---	---
11	25.4	20.3	23.1	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	22.3	17.8	19.3	---	---	---	---	---	---	---	---	---
15	17.9	16.9	17.4	20.5	19.1	19.7	---	---	---	---	---	---
16	---	---	---	22.9	19.9	21.0	---	---	---	---	---	---
17	18.6	17.0	17.8	23.3	20.9	21.9	---	---	---	---	---	---
18	---	---	---	24.0	21.6	22.7	---	---	---	---	---	---
19	---	---	---	23.6	21.7	22.7	---	---	---	---	---	---
20	---	---	---	25.1	22.2	23.5	---	---	---	---	---	---
21	---	---	---	23.5	21.9	22.7	---	---	---	---	---	---
22	---	---	---	22.6	21.4	21.9	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	10.1	5.8	8.0	12.0	10.4	11.2	9.7	8.4	9.1	9.4	5.7	7.4
2	8.4	4.1	5.8	12.7	11.2	11.7	10.7	9.1	9.9	7.2	4.5	6.0
3	9.4	3.9	6.4	12.2	7.4	10.3	9.9	8.4	9.2	6.2	4.3	5.3
4	6.2	3.3	4.7	11.2	5.1	6.9	12.0	9.4	10.9	9.2	3.1	5.4
5	8.8	3.3	6.3	11.2	7.7	9.1	11.9	10.1	11.1	---	---	---
6	10.7	6.0	8.4	11.0	8.2	9.4	12.9	10.4	11.4	---	---	---
7	11.0	6.7	9.4	10.0	8.1	9.0	14.7	12.2	13.3	---	---	---
8	9.0	5.7	7.1	14.6	8.5	11.0	13.5	11.9	12.9	---	---	---
9	10.2	5.9	7.7	13.4	10.9	11.8	13.4	11.6	12.6	---	---	---
10	8.6	5.6	6.7	13.0	9.3	11.3	14.8	11.8	13.3	---	---	---
11	8.1	4.3	6.2	15.3	12.3	13.6	14.6	12.5	13.7	---	---	---
12	9.6	4.5	6.3	14.7	13.8	14.3	14.0	12.9	13.3	---	---	---
13	9.6	5.8	7.8	15.4	13.8	14.5	13.8	12.0	13.0	---	---	---
14	8.8	2.9	6.2	15.7	14.5	15.0	15.7	11.4	13.8	---	---	---
15	6.4	5.2	5.9	15.4	13.4	14.2	14.4	11.7	13.1	---	---	---
16	8.3	4.3	6.2	14.0	12.9	13.4	13.9	11.3	12.4	---	---	---
17	5.9	4.0	4.9	13.9	13.4	13.7	12.8	10.4	11.8	---	---	---
18	6.7	3.8	5.4	13.7	12.8	13.3	13.3	10.2	12.0	---	---	---
19	6.5	4.5	5.3	13.4	11.9	12.7	12.9	10.1	11.5	---	---	---
20	5.7	4.1	4.8	13.3	11.0	12.3	12.6	10.2	11.2	---	---	---
21	4.5	1.7	3.6	12.0	10.9	11.4	10.7	7.9	9.2	---	---	---
22	5.5	2.6	3.8	12.0	11.1	11.5	10.2	8.4	9.3	---	---	---
23	8.7	1.7	4.9	13.3	11.8	12.9	9.4	7.7	8.6	---	---	---
24	8.8	2.9	6.0	13.2	11.1	12.4	10.5	8.6	9.5	---	---	---
25	9.2	3.5	5.9	12.7	8.9	10.1	11.5	9.3	10.3	---	---	---
26	10.3	5.5	7.5	11.3	8.9	10.2	12.3	9.2	10.5	---	---	---
27	7.6	4.3	5.8	12.0	10.7	11.2	11.1	9.1	10.0	---	---	---
28	10.2	4.8	7.7	11.1	9.9	10.5	10.7	7.9	9.3	---	---	---
29	10.1	6.5	8.0	10.6	9.5	10.1	9.0	6.3	7.9	---	---	---
30	8.2	5.7	6.9	10.2	9.0	9.7	10.4	7.2	8.3	---	---	---
31	11.4	6.5	9.4	---	---	---	11.0	6.8	8.3	---	---	---
MONTH	11.4	1.7	6.4	15.7	5.1	11.6	15.7	6.3	11.0	---	---	---

JAMES RIVER BASIN

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06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	8.4	5.8	7.0	10.0	8.7	9.4
2	---	---	---	---	---	---	10.3	7.7	8.8	10.2	7.7	9.1
3	---	---	---	---	---	---	12.8	9.3	10.8	7.8	6.9	7.4
4	---	---	---	---	---	---	13.5	11.1	12.2	7.2	5.8	6.5
5	---	---	---	---	---	---	13.6	11.6	12.7	7.4	5.7	6.4
6	---	---	---	---	---	---	13.4	12.2	12.7	6.8	3.6	5.6
7	---	---	---	---	---	---	18.8	12.3	13.1	6.9	4.5	5.4
8	---	---	---	---	---	---	13.8	11.9	12.7	8.3	5.1	6.8
9	---	---	---	---	---	---	14.8	11.8	13.6	11.0	6.6	9.2
10	---	---	---	---	---	---	14.3	12.8	13.6	12.0	8.8	10.3
11	---	---	---	6.0	3.3	4.4	15.5	12.3	13.4	11.6	8.5	10.0
12	---	---	---	5.5	3.8	4.7	14.6	12.9	13.6	11.8	8.5	10.2
13	---	---	---	5.6	4.1	4.9	13.9	13.0	13.4	9.0	6.5	7.4
14	---	---	---	6.3	4.5	5.3	15.3	11.9	13.0	10.0	6.9	8.6
15	---	---	---	6.6	4.6	5.5	---	---	---	10.2	7.1	8.6
16	---	---	---	6.0	4.7	5.3	---	---	---	10.8	7.7	9.1
17	---	---	---	7.9	4.9	6.2	---	---	---	10.2	8.3	9.1
18	---	---	---	---	---	---	---	---	---	10.3	7.7	9.0
19	---	---	---	---	---	---	---	---	---	10.7	8.3	9.4
20	---	---	---	6.8	3.2	4.0	---	---	---	10.8	8.3	9.5
21	---	---	---	4.3	2.2	3.4	---	---	---	9.1	5.4	7.4
22	---	---	---	6.3	3.2	4.6	---	---	---	9.9	6.6	8.0
23	---	---	---	6.2	3.9	5.1	12.3	9.5	10.7	10.3	7.2	8.7
24	---	---	---	8.5	4.5	6.3	10.6	8.8	9.8	12.4	9.8	11.2
25	---	---	---	8.4	5.8	7.0	13.1	10.0	11.5	10.3	9.1	9.7
26	---	---	---	9.7	6.6	8.1	11.9	7.6	9.6	10.7	9.3	9.9
27	---	---	---	12.4	6.4	8.4	11.6	9.1	10.1	11.0	8.7	9.8
28	---	---	---	---	---	---	9.4	8.3	8.7	10.4	8.6	9.5
29	---	---	---	6.5	5.7	6.2	10.6	7.7	9.2	9.1	7.3	8.1
30	---	---	---	5.8	5.1	5.6	9.8	8.5	9.3	10.6	7.4	9.3
31	---	---	---	6.6	5.1	5.8	---	---	---	9.3	6.7	8.1
MONTH	---	---	---	---	---	---	---	---	---	12.4	3.6	8.6

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.2	6.5	7.3	9.0	5.7	7.3	3.4	.6	2.0	10.0	3.5	8.4
2	9.2	6.7	7.7	11.1	6.9	9.1	2.7	1.6	2.3	---	---	---
3	9.0	7.8	8.4	9.2	5.3	6.7	2.5	.7	1.9	9.3	7.1	8.2
4	8.7	7.0	7.7	6.6	5.0	5.7	2.1	.5	1.3	8.7	7.3	7.9
5	8.2	6.4	7.3	7.6	6.1	6.8	1.3	.4	.9	8.0	6.2	7.0
6	9.0	6.6	7.8	8.2	6.4	7.4	2.5	.5	1.5	7.7	5.7	6.6
7	7.7	6.2	6.9	8.3	6.4	6.9	2.8	1.3	2.1	7.1	4.8	5.9
8	7.9	5.1	6.5	6.7	6.0	6.4	3.9	2.1	3.0	9.2	4.8	6.7
9	9.2	6.6	7.8	8.0	5.5	6.6	---	---	---	10.5	6.9	8.6
10	7.5	5.4	6.4	7.1	5.1	6.0	---	---	---	9.9	6.8	8.3
11	7.4	4.1	5.9	6.3	4.6	5.5	---	---	---	8.6	6.8	7.6
12	7.0	4.5	5.6	6.1	5.0	5.3	---	---	---	8.3	5.9	7.1
13	7.2	4.9	6.0	5.2	4.7	5.0	---	---	---	8.8	6.8	7.8
14	8.9	5.2	7.2	6.6	4.6	5.4	---	---	---	9.6	7.3	8.5
15	7.1	5.8	6.5	5.1	4.6	4.9	---	---	---	9.0	7.6	8.3
16	10.8	5.6	7.7	7.6	4.7	5.8	---	---	---	9.7	8.2	8.8
17	8.4	6.2	7.6	7.3	5.0	5.9	5.7	3.6	4.7	9.2	8.1	8.6
18	7.8	5.9	6.7	7.3	5.5	6.3	8.2	3.8	5.6	8.8	7.8	8.2
19	8.8	5.6	7.1	6.8	5.2	5.9	8.2	4.2	6.4	8.1	7.0	7.5
20	8.4	4.9	6.7	7.4	4.8	6.0	9.1	5.1	6.5	8.0	7.0	7.5
21	5.9	3.7	5.1	6.0	4.0	5.1	7.0	3.9	5.6	7.9	6.8	7.4
22	5.6	2.9	4.6	5.3	4.6	5.0	7.7	5.1	6.1	---	---	---
23	8.2	4.7	6.3	4.6	3.6	4.0	9.3	5.7	7.5	---	---	---
24	7.2	5.1	6.1	3.6	2.6	3.1	11.2	6.5	7.8	---	---	---
25	8.2	6.1	7.2	4.3	2.1	3.2	9.9	5.3	7.8	---	---	---
26	9.2	6.5	7.9	3.9	2.6	3.4	8.9	6.6	7.6	---	---	---
27	8.7	6.5	7.6	4.1	1.7	3.1	9.2	5.9	7.6	---	---	---
28	8.9	6.1	7.4	5.1	3.7	4.4	8.2	5.9	7.1	---	---	---
29	6.9	4.9	6.3	4.1	2.2	3.3	7.7	6.0	6.7	---	---	---
30	8.3	5.0	6.7	3.0	1.4	2.1	9.7	6.8	8.3	---	---	---
31	---	---	---	2.7	1.1	1.7	9.5	7.5	8.5	---	---	---
MONTH	10.8	2.9	6.9	11.1	1.1	5.3	---	---	---	---	---	---

JAMES RIVER BASIN

06470878 JAMES RIVER AT NORTH DAKOTA-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 45°56'10", long 98°10'26", in SE $\frac{1}{4}$ SE $\frac{1}{4}$, sec. 34, T.129 N., R.60 W., Dickey County, Hydrologic Unit 10160003, at bridge on North Dakota-South Dakota state line road 6.5 mi south, and 1 mi west from Ludden.

DRAINAGE AREA.--5,480 mi², approximately, revised, of which about 3,300 mi² is probably noncontributing.

GAGE HEIGHT RECORDS

PERIOD OF RECORD.--October 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1,200 ft above sea level.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed, 93.60 ft, Mar. 28, 1987; minimum observed, 86.45 ft, Oct. 3, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum daily gage height recorded, 93.38 ft, Aug. 3; minimum daily gage height recorded, 87.49 ft, Oct. 18.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	87.51	---	---	---	---	---	---	88.94	89.69	93.32	92.24
2	---	87.51	---	---	---	---	---	---	88.95	89.78	93.35	92.31
3	---	87.52	---	---	---	---	---	---	88.95	89.86	93.38	92.27
4	---	87.51	---	---	---	---	---	---	88.94	89.80	93.35	92.25
5	---	87.51	---	---	---	---	---	---	88.96	89.93	93.33	92.19
6	---	87.53	---	---	---	---	---	---	88.99	90.26	93.27	92.15
7	---	87.55	---	---	---	---	---	---	89.03	90.46	93.18	92.12
8	---	87.56	---	---	---	---	---	---	89.07	90.56	93.07	92.02
9	---	87.59	---	---	---	---	---	---	89.13	90.61	93.00	92.09
10	---	87.66	---	---	---	---	---	---	89.10	90.61	92.91	92.10
11	---	87.69	---	---	---	---	---	---	89.12	90.58	92.83	92.05
12	---	87.70	---	---	---	---	---	---	89.12	90.49	92.82	92.08
13	---	87.70	---	---	---	---	---	---	89.09	90.44	92.73	92.18
14	87.52	87.71	---	---	---	---	---	---	89.14	90.38	92.67	92.10
15	87.51	87.71	---	---	---	---	---	---	89.13	90.29	92.66	91.99
16	87.50	87.73	---	---	---	---	---	---	89.17	90.43	92.62	91.98
17	87.50	87.74	---	---	---	---	---	---	89.30	90.62	92.54	92.05
18	87.49	87.77	---	---	---	---	---	---	89.14	90.66	92.52	92.05
19	87.52	87.81	---	---	---	---	---	---	89.14	90.77	92.48	92.09
20	87.55	87.89	---	---	---	---	---	---	89.11	91.01	92.44	92.13
21	87.54	87.93	---	---	---	---	---	---	89.06	91.33	92.37	92.09
22	87.54	87.96	---	---	---	---	---	---	89.11	91.66	92.34	92.10
23	87.55	87.99	---	---	---	---	---	---	89.12	92.00	92.33	92.08
24	87.54	87.99	---	---	---	---	---	---	89.28	92.40	92.32	92.05
25	87.54	87.99	---	---	---	---	---	---	89.33	92.69	92.27	92.03
26	87.53	88.01	---	---	---	---	---	---	89.46	92.86	92.33	92.11
27	87.52	88.03	---	---	---	---	---	---	89.48	92.95	92.32	92.08
28	87.51	88.04	---	---	---	---	---	88.86	89.42	93.06	92.27	92.08
29	87.50	88.06	---	---	---	---	---	88.89	89.49	93.13	92.30	92.03
30	87.50	88.07	---	---	---	---	---	88.98	89.63	93.19	92.38	91.97
31	87.50	---	---	---	---	---	---	88.95	---	93.27	92.32	---
MEAN	---	87.77	---	---	---	---	---	---	89.16	91.15	92.71	92.10
MAX	---	88.07	---	---	---	---	---	---	89.63	93.27	93.38	92.31
MIN	---	87.51	---	---	---	---	---	---	88.94	89.69	92.27	91.97

JAMES RIVER BASIN

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06471200 MAPLE RIVER AT NORTH DAKOTA-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 45°56'20", long 98°27'08", in SW¹/₄, SE¹/₄, sec.33, T.129 N., R.62 W., Dickey County, ND, Hydrologic Unit 10160004, on left bank 0.4 mi upstream from State line, 7.8 mi northeast of Frederick, SD, and 15.7 mi upstream from mouth.

DRAINAGE AREA.--716 mi², of which about 332 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1956 to current year.

REVISED RECORDS.--WDR SD-86-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Elevation of gage is 1,365 ft above sea level, from topographic map. Prior to June 14, 1962, nonrecording gage at site 0.4 mi downstream at datum 0.94 ft lower.

REMARKS.--Records good except those for estimated daily discharges and those for July 6 to Aug. 3, which are poor. Water-quality data are available from the U.S. Geological Survey, South Dakota District office.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	183	8.4	7.3	22	172	16
2	.00	.00	.00	.00	.00	.00	142	8.0	6.2	27	142	16
3	.00	.00	.00	.00	.00	.00	110	7.0	5.8	32	119	14
4	.00	.00	.00	.00	.00	.00	85	6.6	5.6	34	99	17
5	.00	.00	.00	.00	.00	.00	66	6.2	4.5	41	85	14
6	.00	.00	.00	.00	.00	.00	53	5.6	4.3	252	74	17
7	.00	.00	.00	.00	.00	.00	46	6.5	6.3	353	64	22
8	.00	.00	.00	.00	.00	e.50	40	7.2	8.2	353	57	24
9	.00	.00	.00	.00	.00	e.50	33	9.3	5.4	328	52	35
10	.00	.00	.00	.00	.00	e.50	29	8.2	4.0	287	47	32
11	.00	.00	.00	.00	.00	e.50	28	9.1	2.9	240	42	28
12	.00	.00	.00	.00	.00	e20	25	9.7	2.7	203	44	25
13	.00	.00	.00	.00	.00	e50	23	8.8	4.0	176	42	23
14	.00	.00	.00	.00	.00	e40	21	8.4	4.2	150	38	20
15	.00	.00	.00	.00	.00	e30	19	8.0	4.4	124	37	17
16	.00	.00	.00	.00	.00	e40	17	9.2	5.9	149	36	17
17	.00	.00	.00	.00	.00	e40	16	12	6.8	169	33	17
18	.00	.00	.00	.00	.00	e30	16	13	7.0	179	33	15
19	.00	.00	.00	.00	.00	e25	15	14	11	253	31	11
20	.00	.00	.00	.00	.00	e30	13	13	11	563	29	9.4
21	.00	.00	.00	.00	.00	e30	12	12	10	691	28	10
22	.00	.00	.00	.00	.00	e25	12	12	8.5	567	30	11
23	.00	.00	.00	.00	.00	e30	11	14	7.9	363	31	9.0
24	.00	.00	.00	.00	.00	e32	11	14	7.1	273	30	6.6
25	.00	.00	.00	.00	.00	34	10	13	5.9	276	25	6.6
26	.00	.00	.00	.00	.00	43	9.3	13	5.3	264	24	8.5
27	.00	.00	.00	.00	.00	75	9.6	13	5.7	232	19	14
28	.00	.00	.00	.00	.00	217	8.8	11	8.8	270	20	9.4
29	.00	.00	.00	.00	.00	264	8.4	9.7	14	265	19	7.7
30	.00	.00	.00	.00	.00	252	8.2	11	20	220	17	12
31	.00	.00	.00	.00	.00	242	---	9.0	---	202	18	---
TOTAL	0.00	0.00	0.00	0.00	0.00	1551.00	1080.3	309.9	210.7	7558	1537	484.2
MEAN	.000	.000	.000	.000	.000	50.0	36.0	10.0	7.02	244	49.6	16.1
MAX	.00	.00	.00	.00	.00	264	183	14	20	691	172	35
MIN	.00	.00	.00	.00	.00	.00	8.2	5.6	2.7	22	17	6.6
AC-FT	.00	.00	.00	.00	.00	3080	2140	615	418	14990	3050	960

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1993, BY WATER YEAR (WY)

MEAN	1.07	.45	.27	.073	.29	67.4	81.9	20.9	17.0	31.0	6.95	1.63
MAX	18.3	6.37	4.16	1.16	4.47	419	788	106	131	446	142	16.1
(WY)	1987	1987	1987	1987	1984	1966	1969	1986	1964	1962	1966	1993
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1957	1957	1957	1957	1957	1957	1959	1959	1959	1959	1959	1958

SUMMARY STATISTICS

FOR 1992 CALENDAR YEAR

FOR 1993 WATER YEAR

WATER YEARS 1957 - 1993

	1992	1993	1957-1993
ANNUAL TOTAL	332.47	12731.10	
ANNUAL MEAN	.91	34.9	a19.2
HIGHEST ANNUAL MEAN			70.5
LOWEST ANNUAL MEAN			.000
HIGHEST DAILY MEAN	42	691	5500
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		708	5930
INSTANTANEOUS PEAK STAGE		9.46	16.05
ANNUAL RUNOFF (AC-FT)	659	25250	13910
10 PERCENT EXCEEDS	.06	103	24
50 PERCENT EXCEEDS	.00	6.6	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

a Median of annual mean discharges, 11 ft³/s.

b Also 1988 and 1990.

c No flow for long periods in each year.

d Backwater from ice.

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 U.S. 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 crest-stage partial-record stations are presented in the following table. Discharge measurements made at low-flow partial-record sites and at miscellaneous sites and for special studies are given in separate tables.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device that 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 name and number	Location	Period of record	Water year 1993 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)
RED RIVER OF THE NORTH BASIN								
Red River at Grand Forks, N. Dak. 05082500	Lat 47°56'34", long 97°03'10", in SW ¹ / ₄ , NE ¹ / ₄ , sec.33, T.152 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on left bank 2.3 mi downstream from Red Lake River (previous site of Red River at Grand Forks). Drainage area is 30,100 mi ² .	1882-1983 [#] , 1987-93	04-06-93	36.62	26,600	04-10-1897	50.2	85,000
Turtle River at Manvel, N. Dak. 05083000	Lat 48°04'43", long 97°11'30", in SE ¹ / ₄ , sec.10, T.153 N., R. 51 W., Grand Forks County, Hydrologic Unit 0902307, on left bank, 10 ft downstream from bridge on State Highway No. 33, 0.3 mi west of Manvel. Drainage area is 613 mi ² .	1945-70 [#] , 1972-73, 1980-90, 1993	07-30-93	15.74	1,110	04-19-50	21.5	28,000
Red River of the North at Oslo, Minn. 05083500	Lat 48°11'40", long 97°08'30", in SW ¹ / ₄ , SW ¹ / ₄ , sec.36, T.155 N., R.51 W., Walsh County, Hydrologic Unit 09020306, on bridge crossing the Red River 0.5 mi west of Oslo, Minn. Drainage area is 31,200 mi ² .	1936-37 [#] , 1941-43 [#] , 1945-60 [#] , 1985-93	04-07-93	--	28,100	05-10-50	31.83	63,000
Red River of the North at Pembina, N. Dak. 05102490	Lat 48°58'17", long 97°14'16", in NE ¹ / ₄ , sec.4, T.163 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on bridge crossing the Red River 0.2 mi north of Pembina. Drainage area is 40,200 mi ² .	1985-93	08-16-93	769.99	31,900	04-23-89	785.30	38,400
Bonnes Coulee at Velva, N. Dak. 05119410	Lat 48°03'30", long 100°57'00", in NE ¹ / ₄ , SW ¹ / ₄ , sec. 21, T.153 N., R.80 W., McHenry County, at culvert on U.S. Highway 52, 0.5 mi west of Velva. Drainage area is 53.0 mi ² .	1962, 1965, 1971-73, 1976-77, 1987-93	07-27-93	6.71	a1,000	07-27-93	6.71	a1,000
MISSOURI RIVER BASIN								
West Branch Otter Creek near Beulah, N. Dak. 06340200	Lat 47°08'05", long 101°39'35", in NW ¹ / ₄ , NW ¹ / ₄ , SW ¹ / ₄ , sec.12, T.142 N., R.87 W., Oliver County Hydrologic Unit 10130201, on right bank 10 mi northeast of Beulah. Drainage area is 26.5 mi ² .	1965-83 [#] , 1984-93	07-22-93	11.72	a2,000	06-24-66	17.20	23,700

Operated as a continuous-record gaging station.

a Estimated.

DISCHARGE MEASUREMENTS AT PARTIAL RECORD AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations--Continued

			Water year 1993 maximum			Period of record maximum		
Station name and number	Location	Period of record	Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)
MISSOURI RIVER BASIN--Continued								
Elm Creek near Golden Valley, N. Dak. 06339490	Lat 47°06'25", long 102°03'05", in SE ¹ / ₄ NW ¹ / ₄ , sec.23, T.142 N., R.90 W., Mercer County, Hydrologic Unit 10130201, at bridge on county road, 13.5 mi south of Golden Valley. Drainage area is 82.0 mi ² .	1967-81 [#] , 1982-93	07-26-93	12.53	a1,000	05-08-70	23.55	10,000
Heart River near South Heart, N. Dak. 06343000	Lat 46°51'56", long 102°56'53", in NE ¹ / ₄ SE ¹ / ₄ SW ¹ / ₄ , sec.8, T.139 N., R.97 W., Stark County, Hydrologic Unit 10130202, on left bank 1.7 mi downstream from North Creek, 2 mi east of South Heart, and 5.5 mi upstream from Edward Arthur Patterson Lake. Drainage area is 311 mi ² .	1965-84 [#] , 1985-93	07-04-93	6.33	308	05-09-70	22.77	8,080

Operated as a continuous-record gaging station.

a Estimated.

Miscellaneous discharge measurement 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 1993

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
RED RIVER OF THE NORTH BASIN						
Bois de Sioux nr Fairmount, N. Dak. 05050500	Red River of the North	Lat 46°03'03", long 96°33'52", in SE ¹ / ₄ SW ¹ / ₄ sec.22, T.130 N., R. 47 W., Richland Co., Hydrologic Unit 09020101, 1.5 mi east of Fairmount on Highway 11.	1,540	1919-44#	04-19-93 862 04-23-93 876 05-12-93 313	
Wild Rice River near Wahpeton, N. Dak.	Red River of the North	Lat 46°15'17", long 96°42'19", in SE ¹ / ₄ SW ¹ / ₄ NE ¹ / ₄ sec.9, T.132 N., R.48 W., Richland County, Hydrologic Unit 09020105, approximately 4.5 mi west of Wahpeton on Highway 13.	1,560	---	03-31-93 1,280 07-29-93 1,210 07-29-93 1,130	
Webster Coulee at Webster, N. Dak. 05056225	Devils Lake	Lat 48°16'55", long 98°53'54", in SW ¹ / ₄ SW ¹ / ₄ SW ¹ / ₄ sec.33, T.156 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, 3/4 mi west of Webster.	670	1980-87	08-06-93 1,780	
St. Joe Coulee near Webster, N. Dak. 05056244	Devils Lake	Lat 48°19'23", long 99°00'19", in NE ¹ / ₄ NE ¹ / ₄ sec.21, T.156 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on bridge crossing 6.5 mi northwest of Webster.	--	1986-87	08-18-93 715 09-02-93 60.9	
Chain Lake outlet at Duck Road near Penn, N. Dak.	Devils Lake	Lat 48°21'50", long 99°05'31", in SE ¹ / ₄ NE ¹ / ₄ NE ¹ / ₄ sec.11, T.156 N., R.66 W., Ramsey County, Hydrologic Unit 09020201, at outlet of Chain Lake along Duck Road.	--	---	08-11-93 67.2	
Sheyenne River near Lisbon N. Dak.	Red River of the North	Lat 46°26'29", long 97°29'32", in SE ¹ / ₄ SE ¹ / ₄ SE ¹ / ₄ sec.5, T.134 N., R.54 W., Sargent County, Hydrologic Unit 09020204, approximately 9 mi east of Lisbon on Highway 27.	2,690	---	07-18-93 2,230 08-02-93 3,340	
Drain 21 nr West Fargo, N. Dak. 05059485	Sheyenne River	Lat 46°53'33", long 96°55'08", in SE ¹ / ₄ SE ¹ / ₄ SW ¹ / ₄ sec.31, T.140 N., R.49 W., Cass County, Hydrologic Unit 09020204, at control structure 100 ft at outlet from Sheyenne River Diversion 300 ft north of 12th Ave road crossing in West Fargo.	--	---	03-29-93 74.9 04-01-93 159 04-03-93 158 04-05-93 187 04-08-93 204 04-18-93 e1.5 04-23-93 0 07-16-93 223 07-18-93 462 07-19-93 350 07-20-93 460 07-21-93 3.01 07-22-93 1,020 08-06-93 1,170 08-11-93 1,140 08-17-93 303 08-24-93 197 08-30-93 111	
Overflow Channel of Sheyenne River	Red River of the North	Lat 46°58'38", long 96°52'10", in NW ¹ / ₄ NE ¹ / ₄ NE ¹ / ₄ sec.4, T.140 N., R.49 W., Cass County, Hydrologic Unit 09020204, at road crossing 0.5 mi east of Harwood.	--	---	07-27-93 547 08-10-93 19.4	
Sheyenne River at I-29 Crossing at Harwood, N. Dak.	Red River of the North	Lat 47°00'00", long 96°53'47", in SE ¹ / ₄ SE ¹ / ₄ NW ¹ / ₄ sec.28, T.141 N., R.49 W., Cass County, Hydrologic Unit 09020204, at Interstate 29 Crossing 1.7 mi northwest of Harwood.	--	---	07-27-93 5,450 07-27-93 6,540 08-10-93 4,860	
Lower Branch Rush River near West Fargo, N. Dak.	Red River of the North	Lat 46°58'38", long 96°55'18", in SW ¹ / ₄ SW ¹ / ₄ SW ¹ / ₄ sec.32, T.141 N., R.49 W., Cass County, Hydrologic Unit 09020204, on road crossing 2 mi west of Harwood.	--	---	07-20-93 295	
Goose River near Northwood, N. Dak.	Red River of the North	Lat 47°44'39", long 97°37'24", in SE ¹ / ₄ SE ¹ / ₄ SE ¹ / ₄ sec.1, T.149 N., R.55 W., Grand Forks County, Hydrologic Unit 09020109, approximately 3 mi northwest of Northwood on Highway 15.	260	---	07-26-93 216	

Measurements of streamflow at points other than gaging stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1993

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
RED RIVER OF THE NORTH BASIN						
Tongue River near Akra, N. Dak.	Pembina River	Lat 48°45'38", long 97°49'56", in SW ¹ / ₄ SE ¹ / ₄ SW ¹ / ₄ sec.13, T.161 N., R.56 W., Pembina County, Hydrologic Unit 09020313, approximately 4.5 mi west of Akra on Highway 5.	86	---	07-26-93 07-30-93	535 418
Turtle River at Manvel, N. Dak. 05083000	Red River of the North	Lat 48°04'43", long 97°11'03", in SE ¹ / ₄ sec.10, T.153 N., R.51 W., Grand Forks County, Hydrologic Unit 09020307, on left bank 10 ft downstream from bridge on State Highway No. 33, 0.3 mi west of Manvel, and 10 mi upstream from mouth.	613	1945-70*, 1972-73, 1980-91, 1992	07-27-93 07-30-93	845 1,110
Turtle River at mouth near Manvel, N. Dak. 05083100	Red River of the North	Lat 48°10'28", long 97°08'52", in NE ¹ / ₄ SE ¹ / ₄ NE ¹ / ₄ sec.11, T.154 N., R.51 W., Grand Forks County, Hydrologic Unit 09020307, at bridge on county road 0.1 mi above mouth, 2.0 mi southwest of Olso, Minn., and 9 mi north of Manvel.	803	1992	11-23-92 12-01-92 12-08-92 12-09-92 12-21-92 01-05-93 01-21-93 02-02-93	10.6 7.93 7.38 5.49 6.04 2.41 3.64 3.76
Forest River at Lake Ardoch Outlet near Ardoch, N. Dak. 05085040	Red River of the North	Lat 48°24'16", long 97°17'45", in SE ¹ / ₄ SE ¹ / ₄ SE ¹ / ₄ sec.14, T.155 N., R.52 W., Walsh County, Hydrologic Unit 09020308, at outlet of Lake Ardoch, 3 mi northeast of Ardoch, and 4 mi southeast of Minto.	---	1992	01-22-93 02-02-93	3.66 3.88
Forest River at mouth near Warsaw, N. Dak. 05085100	Red River of the North	Lat 48°21'11", long 97°09'00", in SE ¹ / ₄ SW ¹ / ₄ SE ¹ / ₄ sec.2, T.156 N., R.51 W., Walsh County, Hydrologic Unit 09020308, at county road crossing 0.2 mi above mouth, 6.5 mi northeast of Warsaw.	794	1992	11-23-92 11-30-92 12-08-92 12-14-92 12-22-92 01-05-93 01-22-93 02-01-93	4.37 4.93 5.00 2.89 3.51 0.29 5.96 5.27
Park River near mouth near Drayton, N. Dak. 05090080	Red River of the North	Lat 48°28'14", long 97°09'31", in SE ¹ / ₄ SE ¹ / ₄ SW ¹ / ₄ sec.25, T.158 N., R.51 W., Walsh County, Hydrologic Unit 09020310, at bridge on county road 0.4 mi above mouth, 6 mi south of Drayton, and 7 mi northeast of Oakwood.	982	1991-92	11-28-92 12-07-92 12-15-92 12-22-92 01-05-93 01-21-93	6.96 1.90 2.40 1.67 0.25 0
Pembina River at Walhalla, N. Dak. 05099600	Red River of the North	Lat 48°54'50", long 97°55'00", in NE ¹ / ₄ NE ¹ / ₄ sec.29, T.163 N., R.56 W., Pembina County, Hydrologic Unit 09020313, on left bank at downstream side of bridge on State Highway 32, at south edge of Walhalla, and 7 mi downstream from Little South Pembina River.	3,350	1940-90*, 1991-92	02-17-93 04-08-93 04-22-93 06-04-93 06-18-93 07-13-93 07-29-93 09-01-93 09-22-93	4.01 938 422 114 188 112 1,820 816 383
East Branch Short Creek below East Branch Short Creek Reservoir near Columbus, N. Dak. 05113750	Short Creek	Lat 48°59'26", long 102°47'07", in SW ¹ / ₄ NW ¹ / ₄ sec.32, T.164 N., R.93 W., Burke County, Hydrologic Unit 09010001, on left bank of reservoir 0.5 mi south of International Boundary, and 6.0 mi north of Columbus.	280	---	08-23-93	149
Russell Drain near Upham, N. Dak. 05123770	Souris River	Lat 48°38'04", long 100°49'08", in NW ¹ / ₄ SW ¹ / ₄ SW ¹ / ₄ sec.36, T.160 N., R.79 W., Bottineau County, Hydrologic Unit 09010005, at culvert of road approach, 1 mi upstream from Deep River, 3.5 mi northwest of Upham.	---	1992	04-07-93	0.21
MISSOURI RIVER BASIN						
Moccasin Creek at mouth near Mandaree, N. Dak. 06337470	Little Missouri River	Lat 47°36'00", long 102°30'38", in NE ¹ / ₄ SW ¹ / ₄ NE ¹ / ₄ sec.34, T.148 N., R.93 W., Dunn County, Hydrologic Unit 10110205, 10 mi south and 8 mi east of Mandaree.	53	1990-92	05-20-93 06-16-93 07-28-93 08-11-93	.01 .04 106 .06

DISCHARGE MEASUREMENTS AT PARTIAL RECORD AND MISCELLANEOUS SITES

Miscellaneous discharge measurement 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 1993

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
MISSOURI RIVER BASIN						
Squaw Creek above mouth near Mandaree, N. Dak. 06337480	Little Missouri River	Lat 47°38'27", long 102°30'40", in NW ¹ / ₄ , SW ¹ / ₄ , NE ¹ / ₄ , sec.15, T.148 N., R.93 W., Dunn County, Hydrologic Unit 10110205, 7 mi south and 8 mi east of Mandaree.	58	1990-92	06-16-93 07-28-93 08-11-93	0 59.7 .04
James River at New Rockford, N. Dak. 06468000	Missouri River	Lat 47°41'05", long 99°07'30", on east line sec. 32, T. 149 N., R.66 W., Eddy County, Hydrologic Unit 10160001, at bridge on U.S. Highway 281 at New Rockford.	714	1951-69#, 1970-73	07-27-93	312
JAMES RIVER BASIN						
Pipestem Creek below Pipestem Dam near Jamestown, N. Dak. 06469425	James River	Lat 46°57'00", long 98°45'26", on south line sec.9, T.140 N., R.64 W., Stutsman County, Hydrologic Unit 10160002, below Pipestem Reservoir embankment on county highway, 3 mi northwest of Jamestown.	1,010	1974-76, 1978-79, 1983-84, 1986-87, 1992	08-06-93 08-17-93 08-25-93 09-03-93 09-16-93 09-22-93 09-28-93	124 127 164 162 329 317 372
James River below Jamestown Reservoir at Jamestown, N. Dak.	Missouri River	Lat 46°54'44", long 98°43'06", in NW ¹ / ₄ , NE ¹ / ₄ , SE ¹ / ₄ , sec.26, T.140 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, at bridge on Highway 281, 1 mi below Jamestown Reservoir.	---	---	08-06-93 08-17-93 08-25-93 09-03-93 09-16-93 09-22-93 09-28-93	540 651 798 726 621 656 577
Bear Creek near Verona, N. Dak.	James River	Lat 46°26'35", long 98°02'44", in SE ¹ / ₄ , SE ¹ / ₄ , SW ¹ / ₄ , sec.1, T.134 N., R.59 W., LaMoure County, Hydrologic Unit 10160003, 5.5 mi north of Verona on Highway 1, then 1.5 mi west of Highway 27.	47*	---	07-28-93	319

c Approximately.

Operated as a continuous-record gaging station.

* Contributing drainage area.

Water-quality partial-record stations are particular sites where chemical-quality, biological and/or sediment data are collected systematically over a period of years for use in hydrologic analyses. These data are collected usually less than quarterly. Samples collected at sites other than gaging stations and partial-record stations to give better areal coverage in a river basin are referred to as miscellaneous sites.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
05059485 DRAIN 21 AT WEST FARGO, ND (LAT 46 53 33N LONG 096 55 08W)											
MAR											
29...	1840	75	--	377	--	12.5	3.0	--	--	--	--
APR											
01...	1745	159	--	425	--	7.0	2.0	--	--	--	--
03...	1610	158	--	486	--	10.0	2.0	--	--	--	--
05...	1510	187	--	492	--	14.0	3.0	--	--	--	--
08...	2010	204	--	--	--	4.0	3.0	--	--	--	--
JUL											
12...	1230	3.0	--	--	--	26.0	22.5	--	--	--	--
19...	1425	350	--	420	--	24.0	22.5	--	--	--	--
20...	1810	460	--	--	--	25.5	23.0	--	--	--	--
22...	1425	813	--	484	--	21.0	20.5	--	--	--	--
AUG											
06...	1215	1120	--	--	--	23.0	20.5	--	--	--	--
10...	1310	1170	--	678	--	33.5	23.5	--	--	--	--
11...	1410	1140	--	670	--	31.0	22.5	--	--	--	--
17...	1630	303	--	719	--	26.0	23.5	--	--	--	--
24...	1750	197	--	642	--	31.0	24.0	--	--	--	--
30...	1550	111	--	790	--	24.5	21.5	--	--	--	--
05083100 TURTLE RIVER AT MOUTH NR MANVEL, N. DAK. (LAT 48 10 28N LONG 097 08 52W)											
DEC											
01...	1045	7.9	--	--	--	--	1.0	--	--	--	--
08...	1620	7.4	--	6600	7.8	20.0	--	--	--	--	--
14...	1620	5.5	--	7710	8.0	--	--	--	--	--	--
21...	1605	6.0	--	6470	7.6	--	0.0	--	--	--	--
JAN											
05...	0950	2.4	--	3840	--	--	0.0	--	--	--	--
21...	1640	3.6	--	--	--	-3.5	0.5	--	--	--	--
FEB											
02...	1300	3.8	--	--	--	5.0	0.5	--	--	--	--
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)											
APR											
07...	1025	27800	--	412	--	9.5	3.0	--	--	--	--
09...	1200	--	a26000	428	7.9	3.0	1.0	190	145	44	19
AUG											
04...	1425	27200	--	--	--	21.0	21.5	--	--	--	--
05085040 FOREST RIVER AT LK ARDOCH OUTLET NR ARDOCH, N.DAK (LAT 48 24 16N LONG 097 17 45W)											
JAN											
22...	1100	3.7	--	--	--	-0.5	0.5	--	--	--	--
FEB											
02...	1015	3.9	--	12800	--	4.5	0.0	--	--	--	--
05085100 FOREST RIVER AT MOUTH NR WARSAW, N.DAK. (LAT 48 21 11N LONG 097 09 00W)											
NOV											
23...	1600	4.4	--	14200	8.1	--	--	--	--	--	--
30...	1540	4.9	--	16500	8.1	--	2.0	--	--	--	--
DEC											
08...	1155	5.0	--	16700	8.1	20.0	--	--	--	--	--
14...	1330	2.9	--	17900	7.8	--	--	--	--	--	--
22...	1300	3.5	--	15700	7.9	12.0	0.0	--	--	--	--
JAN											
05...	1120	0.29	--	18000	--	--	0.0	--	--	--	--
22...	1310	6.0	--	26500	--	-2.5	0.0	--	--	--	--
FEB											
01...	1700	5.3	--	8230	7.1	8.0	0.0	--	--	--	--
05119410 BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00W)											
MAR											
09...	1400	2.0	--	1060	8.7	0.5	0.5	350	156	81	36
JUL											
29...	0815	e100	--	414	7.8	18.0	19.0	130	124	32	13

a Discharge determined using Red River of the North at Grand Forks streamflow record.
e Estimated.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	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)	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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)
	05083500		RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)								
APR 09...	12	12	0.4	9.2	68	11	0.10	14	265	274	0.37
	05119410		BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00W)								
MAR 09...	100	37	2	19	420	7.1	0.10	11	769	808	1.10
JUL 29...	30	31	1	8.5	95	3.1	0.10	21	278	280	0.38
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
	05083500		RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)								
APR 09...	19200	3	40	40	<1	20	60	<0.1	1	<1	200
	05119410		BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00W)								
MAR 09...	4.45	2	80	230	<1	80	170	<0.1	<1	1	490
JUL 29...	--	3	60	210	<1	20	50	<0.1	<1	1	240

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINEITY LAB (MG/L AS CACO3) (90410)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
05123770 RUSSELL DR NR UPHAM, ND (LAT 48 37 59N LONG 100 49 08W)												
APR 07...	1337	0.21	160	8.3	--	8.0	3.0	7.5	59	71	62	<1
06337470 MOCCASIN CR AT MOUTH NR MANDAREE, N. DAK. (LAT 47 36 00N LONG 102 30 38W)												
MAY 20...	1415	0.01	2510	8.4	--	22.5	18.0	8.8	101	230	847	230
JUN 16...	1100	0.04	1500	7.7	--	18.0	15.0	5.7	61	200	433	100
JUL 28...	1500	106	495	--	7.7	27.0	19.0	7.6	88	86	158	8400
AUG 11...	1130	0.06	1050	7.7	--	25.0	23.0	8.1	101	180	366	K350
06337480 SQUAW CREEK AB MOUTH NR MANDAREE, N. DAK. (LAT 47 38 27N LONG 102 30 40W)												
JUL 28...	1130	60	675	7.7	--	21.0	24.0	6.8	86	69	184	K10000
AUG 11...	1245	0.04	2780	8.3	--	28.0	26.0	7.7	102	220	630	1100
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)												
MAR 08...	1400	99	343	8.5	--	7.0	1.5	--	--	50	88	--
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)												
MAR 05...	1555	40	630	--	--	-4.0	0.0	--	--	--	--	--
10...	1030	4.7	392	7.9	--	-4.0	0.0	--	--	86	90	--
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)												
MAR a25...	1045	3.7	932	8.2	--	22.0	4.5	--	--	96	208	--
06469420 PIPESTEM RESERVOIR NR JAMESTOWN, N. DAK. (LAT 46 57 44N LONG 098 45 11W)												
OCT 26...	1155	--	--	--	--	14.0	--	--	--	--	--	--
JAN 21...	1020	--	865	7.6	--	-2.0	0.5	1.8	13	--	--	--
06469425 PIPESTEM CREEK BELOW PIPESTEM DAM (LAT 46 55 50N LONG 099 00 00W)												
MAY 04...	0815	--	496	8.3	--	--	9.0	--	--	--	--	--
JUL 13...	0830	--	550	8.2	--	--	17.5	--	--	--	--	--

a Replicate sample also collected for quality-assurance purposes.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)
	05123770 RUSSELL DR NR UPHAM, ND (LAT 48 37 59N LONG 100 49 08W)											
APR 07...	--	129	--	--	--	--	<0.050	0.070	0.70	0.130	--	570
	06337470 MOCCASIN CR AT MOUTH NR MANDAREE, N. DAK. (LAT 47 36 00N LONG 102 30 38W)											
MAY 20...	1640	--	2.24	0.04	<0.010	--	<0.050	0.030	0.60	0.040	<0.010	--
JUN 16...	979	--	1.33	0.11	0.010	--	<0.050	0.020	0.70	0.060	<0.010	--
JUL 28...	300	--	0.41	86.0	<0.010	--	<0.050	0.210	3.6	1.10	0.020	--
AUG 11...	663	--	0.90	0.11	0.020	--	<0.050	0.100	1.0	0.100	0.020	--
	06337480 SQUAW CREEK AB MOUTH NR MANDAREE, N. DAK. (LAT 47 38 27N LONG 102 30 40W)											
JUL 28...	384	--	0.52	61.8	<0.010	--	0.075	0.090	1.4	0.100	0.040	--
AUG 11...	1850	--	2.52	0.20	0.030	0.024	0.054	0.150	1.3	0.210	0.080	--
	06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR 08...	216	245	0.33	65.6	--	--	--	--	--	--	--	--
	06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
MAR 10...	252	270	0.37	3.43	--	--	--	--	--	--	--	--
	06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR 25...	618	615	0.84	6.16	--	--	--	--	--	--	--	--
	06469420 PIPESTEM RESERVOIR NR JAMESTOWN, N. DAK. (LAT 46 57 44N LONG 098 45 11W)											
OCT 26...	--	--	--	--	<0.010	--	<0.050	0.030	--	--	0.020	--
JAN 21...	--	--	--	--	0.020	0.090	0.110	0.910	--	--	0.330	--
	06469425 PIPESTEM CREEK BELOW PIPESTEM DAM (LAT 46 55 50N LONG 099 00 00W)											
MAY 04...	--	--	--	--	0.010	0.100	0.110	0.190	--	--	0.230	--
JUL 13...	--	--	--	--	0.050	0.310	0.360	0.270	--	--	0.100	--

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
	05123770 RUSSELL DR NR UPHAM, ND (LAT 48 37 59N LONG 100 49 08W)											
APR 07...	4	--	<100	<10	10	--	<1	<1	<1	2	610	--
	06337470 MOCCASIN CR AT MOUTH NR MANDAREE, N. DAK. (LAT 47 36 00N LONG 102 30 38W)											
MAY 20...	--	--	--	--	--	--	--	--	--	--	--	20
JUN 16...	--	--	--	--	--	--	--	--	--	--	--	100
JUL 28...	--	--	--	--	--	--	--	--	--	--	--	150
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	99
	06337480 SQUAW CREEK AB MOUTH NR MANDAREE, N. DAK. (LAT 47 38 27N LONG 102 30 40W)											
JUL 28...	--	--	--	--	--	--	--	--	--	--	--	61
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	310
	06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR 08...	--	1	--	--	--	60	--	--	--	--	--	410
	06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
MAR 10...	--	1	--	--	--	60	--	--	--	--	--	420
	06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR 25...	--	3	--	--	--	110	--	--	--	--	--	50

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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, TOTAL RECOV- ERABLE (UG/L AS MO) (01062)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE) (01147)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)
	05123770 RUSSELL DR NR UPHAM, ND (LAT 48 37 59N LONG 100 49 08W)											
APR 07...	<1	--	--	--	--	1	--	2	<1	--	--	10
	06337470 MOCCASIN CR AT MOUTH NR MANDAREE, N. DAK. (LAT 47 36 00N LONG 102 30 38W)											
MAY 20...	--	--	--	<10	--	--	--	--	--	--	--	--
JUN 16...	--	--	--	38	--	--	--	--	--	--	--	--
JUL 28...	--	--	--	95	--	--	--	--	--	--	--	--
AUG 11...	--	--	--	140	--	--	--	--	--	--	--	--
	06337480 SQUAW CREEK AB MOUTH NR MANDAREE, N. DAK. (LAT 47 38 27N LONG 102 30 40W)											
JUL 28...	--	--	--	20	--	--	--	--	--	--	--	--
AUG 11...	--	--	--	140	--	--	--	--	--	--	--	--
	06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR 08...	--	<1	10	40	<0.1	--	<1	--	--	<1	140	--
	06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
MAR 10...	--	<1	10	90	<0.1	--	<1	--	--	<1	230	--
	06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR 25...	--	<1	10	100	0.1	--	1	--	--	<1	310	--

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

[illegible]

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL AS CACO3 (00900)	ALKA- LINITY LAB AS CACO3 (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)
480052099065400 DEVILS LAKE, WEST BAY (PUBLISHED AS MINNEWAUKAN FLATS IN WATER YEAR 1992)												
OCT 21...	1600	0.0	0.5	5370	8.1	1000	503	63	210	890	63	12
MAY 11...	1115	0.0	1.1	3140	8.6	570	325	46	110	450	60	8
AUG 09...	1605	0.0	0.8	1800	8.8	380	266	46	65	230	54	5
SEP 14...	1100	0.0	1.2	2200	8.8	450	311	47	80	260	53	5

DATE	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)	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 CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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)
OCT 21...	100	1900	380	0.50	16	4420	3870	6.01	0.280	0.090	0.060	0.330
MAY 11...	59	1000	220	--	--	--	2120	2.88	--	--	<0.010	--
AUG 09...	35	550	100	--	--	--	1190	1.62	--	--	<0.010	--
SEP 14...	41	570	140	--	--	--	1320	1.79	--	--	0.020	--

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (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 ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)
OCT 21...	0.340	1.50	1.60	5.9	0.340	0.030	0.020	15	--	830	--
MAY 11...	<0.050	--	0.050	2.2	0.110	--	<0.010	7	32	--	<2.0
AUG 09...	<0.050	--	0.030	1.6	0.130	--	0.040	9	33	--	<0.2
SEP 14...	<0.050	--	0.110	2.4	0.160	--	0.060	13	39	--	0.2

DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT 21...	--	20	<1	380	20	5	<1	460	--	14.0	1.10
MAY 11...	1	33	<2	--	<2	--	<2	--	39	7.00	<1.00
AUG 09...	1	43	2	--	2	--	1	--	43	104	<1.00
SEP 14...	1	51	5	--	2	--	0	--	46	58.0	<1.00

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
480052099065400 DEVILS LAKE, WEST BAY (PUBLISHED AS MINNEWAUKAN PLATS IN WATER YEAR 1992)							
OCT							
21...	1601	--	0.0	5320	8.0	4.0	12.4
21...	1602	--	1.00	5320	8.0	4.0	12.2
21...	1603	--	2.00	5320	8.0	4.0	12.1
21...	1604	--	3.00	5330	8.1	4.0	12.1
MAY							
11...	1100	0.0	--	3210	8.3	15.5	10.5
11...	1101	0.24	--	3210	8.4	15.5	10.3
11...	1102	0.85	--	3220	8.4	15.5	10.2
11...	1103	1.2	--	3210	8.4	15.0	10.1
AUG							
09...	1553	0.0	--	1870	8.7	23.0	7.7
09...	1554	0.50	--	1860	8.7	23.0	7.8
09...	1555	1.0	--	1970	8.7	22.5	5.5
09...	1556	1.6	--	2260	8.7	21.0	4.4
SEP							
14...	1045	0.0	--	2170	8.7	11.0	10.2
14...	1046	0.50	--	2170	8.8	11.0	10
14...	1047	1.0	--	2180	8.8	11.0	9.7
14...	1048	1.5	--	2170	8.8	11.0	9.7
14...	1049	2.0	--	2160	8.8	11.0	9.6

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT						
21...	102	719	4.80	15.0	165	<5.0
MAY						
11...	111	732	12.0	20.5	300	<5.0
AUG						
09...	96	723	11.0	29.5	240	<5.0
SEP						
14...	98	726	24.0	8.0	315	7.0

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL AS CACO3 (00900)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)
480623099013400 DEVILS LAKE, SIX MILE BAY												
OCT 21...	1515	0.0	1.5	5350	8.4	1000	482	58	210	880	62	12
MAY 11...	1025	0.0	2.4	4920	8.7	880	443	56	180	780	63	11
AUG 09...	1530	0.0	5.5	1170	8.5	320	229	52	45	120	43	3
SEP 14...	1015	0.0	2.1	1610	8.5	320	244	41	54	180	52	4

DATE	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)	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 CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO- GEN, NITRITE SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
OCT 21...	130	1900	420	0.40	21	4040	3910	5.49	0.056	0.030	0.030	0.100
MAY 11...	97	1700	380	--	--	--	3400	4.63	--	--	<0.010	--
AUG 09...	30	250	55	--	--	--	693	0.94	--	--	<0.010	--
SEP 14...	30	410	94	--	--	--	959	1.30	--	--	<0.010	--

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (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 ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)
OCT 21...	0.086	1.30	1.40	4.3	0.190	0.130	0.120	18	--	790	--
MAY 11...	<0.050	--	0.110	2.7	0.090	--	0.030	13	36	--	<2.0
AUG 09...	0.290	--	0.040	1.3	0.350	--	0.280	9	35	--	<0.2
SEP 14...	<0.050	--	0.030	1.4	0.260	--	0.170	7	35	--	<0.2

DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT 21...	--	20	<1	360	10	5	<1	440	--	3.90	0.300
MAY 11...	2	14	<2	--	1	--	<2	--	42	<3.00	<1.00
AUG 09...	1	21	2	--	5	--	1	--	37	12.0	<1.00
SEP 14...	1	21	1	--	7	--	0	--	39	14.0	<1.00

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

480623099013400 DEVILS LAKE, SIX MILE BAY

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
------	------	--	---	--	--	---	--

480623099013400 DEVILS LAKE, SIX MILE BAY

OCT							
21...	1516	--	0.0	5300	7.9	4.5	10.8
21...	1517	--	2.00	5290	8.0	4.5	10.6
21...	1518	--	4.00	5290	8.0	4.0	10.6
21...	1519	--	6.00	5300	8.1	4.0	10.6
21...	1520	--	8.00	5300	8.1	4.0	10.6
21...	1521	--	10.5	5320	8.1	4.0	10.4
MAY							
11...	1000	0.0	--	5010	8.4	15.0	9.0
11...	1002	0.30	--	5020	8.4	15.0	8.9
11...	1004	0.64	--	5020	8.4	15.0	8.9
11...	1006	0.91	--	5020	8.4	15.0	8.8
11...	1007	1.2	--	5020	8.4	15.0	8.8
11...	1009	1.5	--	5030	8.5	15.0	8.8
11...	1011	2.1	--	5050	8.5	15.0	8.8
11...	1012	2.7	--	5100	8.4	14.5	6.9
11...	1013	3.5	--	5130	8.4	14.0	5.3
AUG							
09...	1510	0.0	--	1210	8.3	22.5	8.0
09...	1511	0.50	--	1220	8.3	22.5	7.9
09...	1512	1.0	--	1230	8.3	22.5	7.9
09...	1513	2.0	--	2200	8.3	21.0	6.6
09...	1514	3.1	--	3380	8.5	21.0	6.8
09...	1515	3.7	--	3930	8.5	21.0	6.0
SEP							
14...	1000	0.0	--	1650	8.5	13.0	9.4
14...	1001	1.0	--	1640	8.5	13.0	9.4
14...	1002	2.0	--	1650	8.5	13.0	9.3
14...	1003	3.1	--	1670	8.5	13.0	9.2
14...	1004	4.0	--	3210	8.6	13.5	8.7

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT						
21...	90	720	28.8	16.5	180	<5.0
MAY						
11...	95	732	98.0	20.0	250	8.0
AUG						
09...	98	724	26.0	29.5	225	<5.0
SEP						
14...	94	726	44.4	6.0	345	7.0

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L CACO3) (00900)	ALKA- LINITY LAB (MG/L CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	
480500098561000 DEVILS LAKE, CREEL BAY													
OCT	21...	1340	0.0	3.0	5760	8.4	1100	503	60	220	980	64	13
MAR	22...	1415	0.50	1.0	6330	8.4	1300	566	72	260	1200	64	14
	22...	1420	3.5	4.0	6260	8.3	1300	567	71	260	1200	64	14
	22...	1425	4.5	5.0	6200	8.2	1300	568	75	270	1200	64	14
MAY	11...	0830	0.0	5.1	5630	8.6	1100	488	62	220	970	63	13
	11...	0835	0.0	0.3	5630	8.6	970	484	54	200	840	63	12
	11...	0840	3.0	3.4	5630	8.5	950	488	54	200	870	64	12
	11...	0845	4.6	4.9	5660	8.5	1100	494	63	220	980	63	13
AUG	09...	1330	0.0	0.5	5160	8.8	910	468	59	180	870	64	13
	09...	1335	3.7	3.9	5170	8.7	910	464	57	190	830	63	12
	09...	1340	5.4	5.6	5190	8.7	980	469	61	200	900	63	12
SEP	14...	0815	0.0	2.4	4690	8.6	780	436	49	160	640	61	10
DATE	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)	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)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO- GEN, NITRITE SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	
OCT	21...	130	2000	420	0.50	20	4730	4140	6.43	0.041	0.020	0.020	0.069
MAR	22...	140	2300	510	--	--	--	4830	6.56	--	--	--	0.351
	22...	140	2300	520	--	--	--	4840	6.58	--	--	--	0.357
	22...	140	2400	520	--	--	--	4900	6.66	--	--	--	0.300
MAY	11...	120	1900	440	--	--	--	3980	5.41	0.200	--	0.020	--
	11...	99	1900	420	--	--	--	3780	5.14	--	--	--	--
	11...	100	1900	440	--	--	--	3860	5.25	--	--	--	--
	11...	120	2000	440	--	--	--	4100	5.58	--	--	--	--
AUG	09...	100	1700	420	--	--	--	3600	4.89	--	--	<0.010	0.035
	09...	110	1700	420	--	--	--	3540	4.81	--	--	--	0.097
	09...	120	1700	420	--	--	--	3690	5.02	--	--	--	0.011
SEP	14...	83	1500	360	--	--	--	3080	4.19	0.080	--	0.080	--
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 ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)		
OCT	21...	0.061	1.70	1.60	4.9	0.240	0.160	0.160	21	--	890	--	
MAR	22...	--	0.664	--	4.4	0.243	--	0.234	--	--	--	--	
	22...	--	0.657	--	4.1	0.242	--	0.237	--	--	--	--	
	22...	--	0.724	--	4.2	0.265	--	0.262	--	--	--	--	
MAY	11...	0.220	--	0.280	3.0	0.150	--	0.090	14	38	--	<2.0	
	11...	--	--	--	--	--	--	--	15	38	--	<2.0	
	11...	--	--	--	--	--	--	--	14	32	--	<2.0	
	11...	--	--	--	--	--	--	--	14	40	--	<2.0	
AUG	09...	<0.050	0.050	0.040	4.4	0.325	--	0.169	14	44	--	<0.2	
	09...	--	0.071	--	2.8	0.224	--	0.160	16	44	--	<0.2	
	09...	--	0.133	--	2.6	0.223	--	0.175	15	44	--	<0.2	
SEP	14...	0.160	--	0.370	3.1	0.260	--	0.190	13	36	--	<0.2	

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
480500098561000 DEVILS LAKE, CREEL BAY											
OCT 21...	--	40	<1	380	10	4	<1	510	--	2.90	0.200
MAR 22...	--	3	--	--	4	--	--	--	--	--	--
22...	--	12	--	--	10	--	--	--	--	--	--
22...	--	<3	--	--	21	--	--	--	--	--	--
MAY 11...	1	3	1	--	10	--	<2	--	56	<3.00	<1.00
11...	1	220	0	--	2	--	<2	--	37	--	--
11...	1	<7	0	--	4	--	<2	--	46	--	--
11...	1	33	1	--	12	--	<2	--	42	--	--
AUG 09...	1	24	1	--	6	--	0	--	30	169	<1.00
09...	1	19	2	--	<2	--	1	--	77	--	--
09...	1	<7	1	--	7	--	0	--	25	--	--
SEP 14...	1	76	2	--	<2	--	<0	--	44	71.0	<1.00

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT 21...	1341	--	0.0	5700	8.5	6.0	7.0
21...	1342	--	3.00	5700	8.5	5.5	6.8
21...	1343	--	6.00	5710	8.4	5.5	6.7
21...	1344	--	9.00	5710	8.5	5.5	6.7
21...	1345	--	12.0	5720	8.4	5.5	6.7
21...	1346	--	15.0	5720	8.4	5.5	6.6
21...	1347	--	16.9	5720	8.4	5.5	6.6
MAR 22...	1355	0.0	--	6150	8.1	0.0	6.3
22...	1357	1.1	--	6170	8.2	0.0	5.9
22...	1359	2.0	--	6160	8.2	0.0	5.7
22...	1401	3.0	--	6170	8.3	0.0	5.3
22...	1403	4.1	--	6190	8.2	0.5	3.7
22...	1405	5.0	--	6200	8.2	1.0	0.6
MAY 11...	0805	0.0	--	5640	8.3	14.0	9.7
11...	0807	0.30	--	5650	8.3	14.0	9.7
11...	0809	0.91	--	5650	8.3	14.0	9.8
11...	0811	1.5	--	5650	8.3	14.0	9.7
11...	0813	2.1	--	5650	8.3	13.5	9.8
11...	0814	2.7	--	5630	8.3	12.5	8.1
11...	0815	3.4	--	5660	8.3	11.5	8.6
11...	0816	4.0	--	5700	8.3	10.5	7.4
11...	0817	4.6	--	5720	8.2	10.0	6.7
11...	0818	5.1	--	5770	8.2	10.0	5.8
AUG 09...	1250	0.0	--	5330	8.6	23.5	10.2
09...	1252	0.60	--	5340	8.6	23.0	10.7
09...	1254	1.1	--	5240	8.5	22.0	8.0
09...	1256	2.0	--	5350	8.5	21.0	8.0
09...	1258	3.0	--	5400	8.5	21.0	8.1
09...	1300	4.1	--	5440	8.5	21.0	7.9
09...	1302	5.0	--	5440	8.5	21.0	6.8
09...	1304	5.6	--	5440	8.5	20.5	5.8
SEP 14...	0755	0.0	--	4590	8.5	14.5	9.2
14...	0756	1.0	--	4610	8.5	14.5	9.1
14...	0757	2.1	--	4610	8.5	14.5	9.1
14...	0758	3.1	--	4620	8.5	14.5	9.1
14...	0759	4.2	--	4630	8.5	14.5	9.1
14...	0800	5.2	--	4640	8.5	14.5	9.0
14...	0801	6.1	--	4640	8.5	14.5	9.0

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE OF (HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT 21...	61	719	--	58.8	16.0	170	9.0
MAR 22...	46	728	2.50	126	3.0	210	18
MAY 11...	100	730	--	87.0	13.0	170	<5.0
AUG 09...	129	723	--	16.0	28.0	210	<5.0
SEP 14...	97	725	--	40.8	4.5	315	5.0

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINEITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)
480147098572200 DEVILS LAKE, MAIN BAY												
OCT 21...	1655	0.0	2.2	5750	8.6	1100	502	59	220	960	63	13
MAR 22...	1530	0.5	1.0	6300	8.4	1300	568	72	270	1200	63	14
22...	1535	4.0	4.5	6320	8.3	1300	569	72	260	1200	64	14
22...	1540	5.5	6.0	6370	8.3	1300	577	73	260	1200	64	14
MAY 11...	1245	0.0	3.8	5480	8.7	1100	488	62	220	960	63	13
AUG 09...	1410	0.0	6.0	5090	8.9	930	462	59	190	820	63	12
09...	1415	0.0	0.3	4900	8.9	970	455	59	200	920	64	13
09...	1420	4.7	5.0	5170	8.8	960	456	59	200	830	62	12
09...	1425	6.7	7.0	5180	8.8	990	468	60	200	880	63	12
SEP 14...	0915	0.0	3.0	4460	8.7	780	416	47	160	620	60	10
DATE	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)	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 CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00615)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00630)
OCT 21...	130	2100	420	0.50	20	4120	4210	5.60	0.078	0.020	0.020	0.110
MAR 22...	140	2300	510	--	--	--	4810	6.54	--	--	--	0.311
22...	140	2300	510	--	--	--	4770	6.49	--	--	--	0.313
22...	140	2300	530	--	--	--	4850	6.60	--	--	--	0.323
MAY 11...	110	1800	430	--	--	--	3930	5.35	0.150	--	0.020	--
AUG 09...	110	1700	410	--	--	--	3560	4.84	--	--	<0.010	--
09...	110	1600	400	--	--	--	3520	4.78	--	--	--	0.073
09...	110	1600	420	--	--	--	3490	4.75	--	--	--	0.010
09...	110	1600	410	--	--	--	3580	4.87	--	--	--	0.009
SEP 14...	80	1500	340	--	--	--	3010	4.09	0.110	--	0.040	--
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (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 ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	
OCT 21...	0.098	0.390	0.380	3.8	0.220	0.110	0.080	23	--	860	--	
MAR 22...	--	0.746	--	4.0	0.239	--	0.237	--	--	--	--	
22...	--	0.719	--	4.2	0.244	--	0.240	--	--	--	--	
22...	--	0.759	--	4.2	0.294	--	0.295	--	--	--	--	
MAY 11...	0.170	--	0.140	2.8	0.130	--	0.060	15	39	--	<2.0	
AUG 09...	<0.050	--	0.030	3.4	0.230	--	0.110	15	42	--	0.9	
09...	--	0.061	--	3.0	0.201	--	0.131	16	42	--	<0.2	
09...	--	0.057	--	2.7	0.192	--	0.140	17	43	--	0.4	
09...	--	0.053	--	2.7	1.98	--	0.144	17	43	--	<0.2	
SEP 14...	0.150	--	0.200	2.4	0.240	--	0.190	14	38	--	0.4	
DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)	
OCT 21...	--	10	<1	400	20	4	<1	480	--	35.0	3.10	
MAR 22...	--	11	--	--	15	--	--	--	--	--	--	
22...	--	<3	--	--	15	--	--	--	--	--	--	
22...	--	33	--	--	49	--	--	--	--	--	--	
MAY 11...	1	690	1	--	<2	--	<2	--	40	21.0	4.00	
AUG 09...	1	<3	2	--	3	--	1	--	43	60.0	<1.00	
09...	3	44	1	--	6	--	2	--	23	--	--	
09...	1	53	3	--	6	--	<0	--	100	--	--	
09...	2	46	2	--	3	--	<0	--	63	--	--	
SEP 14...	1	21	1	--	<2	--	1	--	54	13.0	<1.00	

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
480147098572200 DEVILS LAKE, MAIN BAY							
OCT							
21...	1656	--	0.0	5720	8.2	6.0	10.7
21...	1657	--	3.00	5720	8.3	6.0	10.6
21...	1658	--	6.00	5720	8.3	6.0	10.5
21...	1659	--	9.00	5720	8.3	6.0	10.5
21...	1701	--	12.0	5720	8.3	6.0	10.4
21...	1702	--	15.0	5720	8.3	6.0	10.4
21...	1703	--	18.0	5720	8.3	6.0	10.3
21...	1704	--	21.0	5720	8.3	6.0	10.3
21...	1705	--	22.5	5720	8.3	6.0	10.0
MAR							
22...	1515	0.0	--	6150	8.2	0.0	7.7
22...	1517	1.0	--	6100	8.3	0.0	6.6
22...	1519	2.0	--	6090	8.3	0.0	6.6
22...	1521	3.0	--	6100	8.3	0.0	6.5
22...	1523	4.0	--	6110	8.3	0.0	6.2
22...	1525	5.0	--	6130	8.3	1.0	3.8
22...	1527	6.0	--	6240	8.2	2.0	0.8
22...	1529	6.6	--	6400	8.2	3.0	0.2
MAY							
11...	1220	0.0	--	5450	8.4	15.0	15.5
11...	1221	0.30	--	5440	8.5	14.5	16.0
11...	1223	0.70	--	5420	8.5	14.0	16.2
11...	1224	0.97	--	5430	8.5	13.5	16.5
11...	1226	1.6	--	5460	8.4	12.5	17.1
11...	1227	2.1	--	5580	8.4	12.0	17.0
11...	1228	2.7	--	5630	8.4	11.5	17.2
11...	1229	3.4	--	5640	8.4	11.0	15.0
11...	1230	4.1	--	5690	8.4	10.0	14.5
11...	1231	5.0	--	5720	8.3	10.0	12.8
11...	1232	6.0	--	5720	8.3	10.0	12.5
11...	1233	6.8	--	5730	8.3	10.0	11.7
AUG							
09...	1350	0.0	--	5150	8.7	24.0	13.8
09...	1351	0.50	--	5130	8.7	23.0	11.8
09...	1352	1.1	--	5220	8.6	21.0	8.2
09...	1353	2.0	--	5340	8.6	20.5	7.2
09...	1354	3.0	--	5120	8.5	20.0	6.3
09...	1355	4.0	--	5450	8.5	20.0	6.5
09...	1356	5.0	--	5460	8.5	19.5	6.6
09...	1357	6.0	--	5470	8.5	19.5	5.7
09...	1358	7.0	--	5470	8.5	19.5	5.4
SEP							
14...	0850	0.0	--	4470	8.5	14.5	9.2
14...	0851	1.3	--	4460	8.5	14.5	9.0
14...	0852	2.2	--	4460	8.5	14.5	8.9
14...	0853	3.0	--	4460	8.5	14.5	8.9
14...	0854	4.0	--	4460	8.5	14.5	8.8
14...	0855	5.1	--	4460	8.5	14.5	8.8
14...	0856	6.1	--	4460	8.5	14.5	8.8
14...	0857	7.2	--	4460	8.5	14.5	8.8
14...	0858	7.9	--	4460	8.5	14.5	8.8

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
21...	93	720	--	43.2	13.5	135	<5.0
MAR							
22...	57	727	2.10	83.0	--	210	15
MAY							
11...	164	732	--	50.0	21.5	300	<5.0
AUG							
09...	176	725	--	36.0	30.0	240	<5.0
SEP							
14...	96	724	--	54.0	4.0	270	7.0

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)
480052098454100 DEVILS LAKE, EAST BAY EAST												
OCT 22...	0835	0.0	0.9	7940	8.8	1400	562	64	290	1400	66	17
MAY 11...	1420	0.0	3.5	7550	8.8	1400	530	68	310	1400	65	16
AUG 09...	1745	0.0	1.8	7190	8.9	1400	504	68	300	1400	65	16
SEP 14...	1245	0.0	1.4	7390	8.9	1300	509	56	270	1200	64	14
DATE	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)	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)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	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)
OCT 22...	180	2700	670	0.60	7.5	6560	5650	8.92	0.050	0.040	0.040	0.099
MAY 11...	160	2700	650	--	--	--	5570	7.57	0.130	--	0.030	--
AUG 09...	160	3100	620	--	--	--	5940	8.08	--	--	<0.010	--
SEP 14...	140	3100	620	--	--	--	5650	7.69	--	--	<0.010	--
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	
OCT 22...	0.090	0.600	0.620	3.9	0.200	0.120	0.100	32	--	130	--	
MAY 11...	0.160	--	0.020	2.6	0.180	--	0.110	21	26	--	<2.0	
AUG 09...	<0.050	--	0.080	6.3	0.410	--	0.110	22	31	--	<2.0	
SEP 14...	<0.050	--	0.160	3.9	0.260	--	0.160	21	28	--	<0.2	
DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)	
OCT 22...	--	<10	<1	540	10	5	<1	540	--	10.0	0.700	
MAY 11...	3	<7	0	--	<2	--	<2	--	36	8.00	<1.00	
AUG 09...	1	<7	1	--	2	--	1	--	59	36.0	2.25	
SEP 14...	1	44	3	--	2	--	<0	--	57	48.0	<1.00	

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	SAM- PLING DEPTH (M) (00098)	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
480052098454100 DEVILS LAKE, EAST BAY EAST							
OCT							
22...	0836	--	0.0	7890	8.0	5.0	11.8
22...	0837	--	2.00	7850	8.1	4.5	11.9
22...	0838	--	4.00	7830	8.1	4.5	11.8
22...	0839	--	6.00	7850	8.2	4.5	11.8
22...	0840	--	8.00	7850	8.2	4.5	11.8
22...	0841	--	10.0	7850	8.2	4.5	11.8
22...	0842	--	11.2	7830	8.3	4.5	11.7
MAY							
11...	1405	0.0	--	7650	8.5	17.5	9.0
11...	1406	0.33	--	7650	8.6	17.5	8.9
11...	1407	0.60	--	7650	8.6	16.5	8.9
11...	1408	1.2	--	7630	8.6	15.0	9.1
11...	1409	1.8	--	7630	8.6	14.5	9.4
11...	1410	2.4	--	7630	8.6	14.0	9.0
11...	1411	3.0	--	7630	8.6	13.5	8.6
11...	1412	3.9	--	7640	8.6	12.5	7.5
AUG							
09...	1725	0.0	--	7480	8.6	24.0	9.7
09...	1726	0.50	--	7480	8.6	23.5	9.4
09...	1727	1.1	--	7480	8.6	23.5	7.5
09...	1728	2.0	--	7480	8.6	20.5	6.6
09...	1729	3.0	--	7480	8.6	20.0	6.9
09...	1730	3.8	--	7490	8.6	20.0	6.8
SEP							
14...	1230	0.0	--	7280	8.7	13.5	9.5
14...	1231	1.0	--	7290	8.7	13.5	9.4
14...	1232	2.0	--	7300	8.7	13.5	9.3
14...	1233	2.9	--	7300	8.7	13.5	9.2
14...	1234	4.1	--	7300	8.7	13.5	9.2

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT						
22...	101	718	18.0	2.5	--	--
MAY						
11...	100	732	39.0	24.0	315	6.0
AUG						
09...	124	724	23.0	30.5	240	8.0
SEP						
14...	98	726	24.0	9.0	315	<5.0

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (IN METERS) (82047)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (IN METERS) (82048)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	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)	
		VAL (IN METERS) (82047)	VAL (IN METERS) (82048)	(US/CM) (90095)	CACO3) (00900)	CACO3) (90410)	AS CA) (00915)	AS MG) (00925)	AS NA) (00930)	PERCENT (00932)	(00931)	(00935)
475740098381600 - EAST DEVILS LAKE (MAIN BAY)												
OCT 22...	1045	0.0	2.5	13100	2200	661	71	490	2600	69	24	270
MAR 23...	1430	1.0	1.5	14200	2500	739	89	560	3100	70	27	320
23...	1435	3.5	4.0	14200	2500	730	88	560	3100	70	27	310
23...	1440	6.5	7.0	14300	2600	736	89	580	3100	69	26	320
MAY 11...	1635	0.0	4.9	12400	2300	638	80	510	2700	69	24	270
AUG 10...	0830	0.0	4.0	11900	2200	616	76	490	2400	67	22	260
10...	0835	0.0	0.20	12000	1900	619	69	430	2200	69	22	240
10...	0840	4.0	4.2	12000	1900	611	74	420	2400	70	23	240
10...	0845	7.8	8.0	12100	2000	622	72	430	2400	69	23	250
SEP 14...	1510	0.0	3.7	12100	2100	615	66	480	2200	66	21	220
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, 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)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO- GEN, NITRITE SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	
OCT 22...	5700	1100	1.0	3.4	11600	10600	15.8	--	0.010	0.020	<0.050	
MAR 23...	5700	1300	--	--	--	11600	15.7	--	--	--	0.297	
23...	5700	1300	--	--	--	11600	15.7	--	--	--	0.296	
23...	5700	1300	--	--	--	11500	15.7	--	--	--	0.290	
MAY 11...	5000	1100	--	--	--	10000	13.7	--	--	<0.010	--	
AUG 10...	4400	1100	--	--	--	9100	12.4	0.060	--	0.040	--	
10...	4300	1100	--	--	--	8720	11.9	--	--	--	0.068	
10...	4200	1100	--	--	--	8740	11.9	--	--	--	0.079	
10...	4200	1100	--	--	--	8740	11.9	--	--	--	0.110	
SEP 14...	4700	1100	--	--	--	9190	12.5	--	--	<0.010	--	
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 ORTHO TOTAL (MG/L AS P) (70507)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	
OCT 22...	<0.050	0.220	0.220	2.3	0.100	0.080	0.080	37	--	2000	--	
MAR 23...	--	0.425	--	5.1	0.270	--	0.224	--	--	--	--	
23...	--	0.545	--	5.0	0.243	--	0.231	--	--	--	--	
23...	--	0.514	--	4.4	0.227	--	0.225	--	--	--	--	
MAY 11...	<0.050	--	0.030	3.4	0.150	--	0.060	24	18	--	<2.0	
AUG 10...	0.100	--	0.070	4.4	0.260	--	0.170	24	23	--	<0.2	
10...	--	0.066	--	5.1	0.372	--	0.156	25	24	--	<0.2	
10...	--	0.093	--	3.8	0.262	--	0.159	25	27	--	<0.2	
10...	--	0.169	--	4.1	0.288	--	0.184	24	25	--	<0.2	
SEP 14...	<0.050	--	0.050	3.8	0.210	--	0.110	26	23	--	0.4	

ANALYSES OF SAMPLES COLLECTED AT DEVILS LAKE WATER-QUALITY SITES, WATER YEAR 1993

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
475740098381600 - EAST DEVILS LAKE (MAIN BAY)											
OCT 22...	--	30	<1	880	20	4	<1	560	--	1.80	0.100
MAR 23...	--	<3	--	--	<1	--	--	--	--	--	--
23...	--	<3	--	--	<1	--	--	--	--	--	--
23...	--	<3	--	--	<1	--	--	--	--	--	--
MAY 11...	2	<7	1	--	<2	--	<2	--	49	11.0	3.00
AUG 10...	1	<7	1	--	3	--	6	--	76	12.0	<1.00
10...	1	<7	2	--	4	--	6	--	<9	--	--
10...	2	<7	<0	--	<2	--	6	--	51	--	--
10...	1	33	0	--	4	--	2	--	50	--	--
SEP 14...	1	15	0	--	7	--	1	--	61	12.0	<1.00

DATE	TIME	SAM- PLING DEPTH (M) (000098)	SAM- PLING DEPTH (FEET) (000003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (000095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT							
22...	1046	--	0.0	13000	8.0	6.5	10.6
22...	1047	--	3.00	13000	8.2	6.5	10.4
22...	1048	--	6.00	13000	8.3	6.5	10.3
22...	1049	--	9.00	13000	8.3	6.5	10.2
22...	1050	--	12.0	13000	8.4	6.5	10.2
22...	1051	--	15.0	13000	8.4	6.5	10.2
22...	1052	--	18.0	13000	8.4	6.5	10.2
22...	1053	--	21.0	13000	8.4	6.5	10.2
22...	1054	--	24.0	13000	8.4	6.5	10.2
22...	1055	--	25.7	13000	8.5	6.5	10.1
MAR							
23...	1410	1.0	--	14200	7.9	0.5	9.4
23...	1412	2.0	--	15200	8.2	0.0	9.3
23...	1414	4.0	--	15200	8.3	0.0	9.2
23...	1416	6.0	--	15300	8.3	0.0	9.3
23...	1418	7.5	--	15200	8.4	0.0	9.3
MAY							
11...	1610	0.0	--	12100	8.2	14.0	14.5
11...	1611	0.60	--	12100	8.2	14.0	14.4
11...	1612	1.2	--	12100	8.3	14.0	14.4
11...	1613	1.8	--	12100	8.3	13.0	14.8
11...	1614	2.4	--	12200	8.4	11.0	14.8
11...	1615	3.0	--	12100	8.4	11.0	14.7
11...	1616	3.7	--	11800	8.4	11.0	13.6
11...	1617	4.3	--	12100	8.4	9.0	13.1
11...	1618	4.9	--	12200	8.4	8.0	12.8
11...	1619	5.5	--	12100	8.5	7.0	12.5
11...	1620	6.1	--	12700	8.5	6.0	11.6
11...	1621	6.7	--	12400	8.5	5.5	10.6
11...	1622	7.3	--	12500	8.5	5.0	10.0
11...	1623	8.3	--	12500	8.5	4.5	8.7
AUG							
10...	0750	0.0	--	11800	8.4	20.5	9.4
10...	0752	1.0	--	11800	8.4	20.5	9.5
10...	0754	2.0	--	12200	8.4	20.0	9.6
10...	0756	4.0	--	11800	8.4	20.0	8.8
10...	0758	6.0	--	11800	8.4	20.0	8.8
10...	0800	8.0	--	11800	8.4	19.5	6.8
SEP							
14...	1435	0.0	--	12400	8.2	15.0	9.8
14...	1436	1.0	--	12300	8.2	15.0	9.7
14...	1437	2.0	--	12400	8.2	15.0	9.6
14...	1438	3.0	--	12400	8.2	15.0	9.6
14...	1439	4.0	--	12400	8.2	15.0	9.5
14...	1440	5.0	--	12400	8.2	15.0	9.5
14...	1441	6.0	--	12400	8.2	15.0	9.5
14...	1442	7.0	--	12400	8.2	15.0	9.4
14...	1443	8.0	--	12400	8.2	14.5	9.5
14...	1444	9.5	--	12400	8.2	14.5	9.5

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM HG) (00025)	ICE THICK- NESS (FEET) (82130)	TRANS- PAR- ENCY (SECCHI DISK) (IN) (00077)	TEMPER- ATURE AIR (DEG C) (00020)	WIND DIREC- TION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)
OCT							
22...	96	720	--	49.2	9.5	--	--
MAR							
23...	73	720	2.60	120	2.0	165	13
MAY							
11...	154	732	--	60.0	26.5	315	<5.0
AUG							
10...	115	724	--	64.0	20.5	165	<5.0
SEP							
14...	106	726	--	62.4	12.5	315	<5.0

STATION RECORDS, GROUND WATER

407

GROUND-WATER LEVELS

BENSON COUNTY

480228098482501. Local number, 153-063-30CBC.

LOCATION.--Lat 48°02'28", long 098°48'25", Hydrologic Unit 09020201.

Owner: North Dakota State Water Commission.

AQUIFER.--Spiritwood.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 200 ft, cased to 137 ft, plastic pipe, No. 18 slot screen set 137 to 143 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,445.6 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

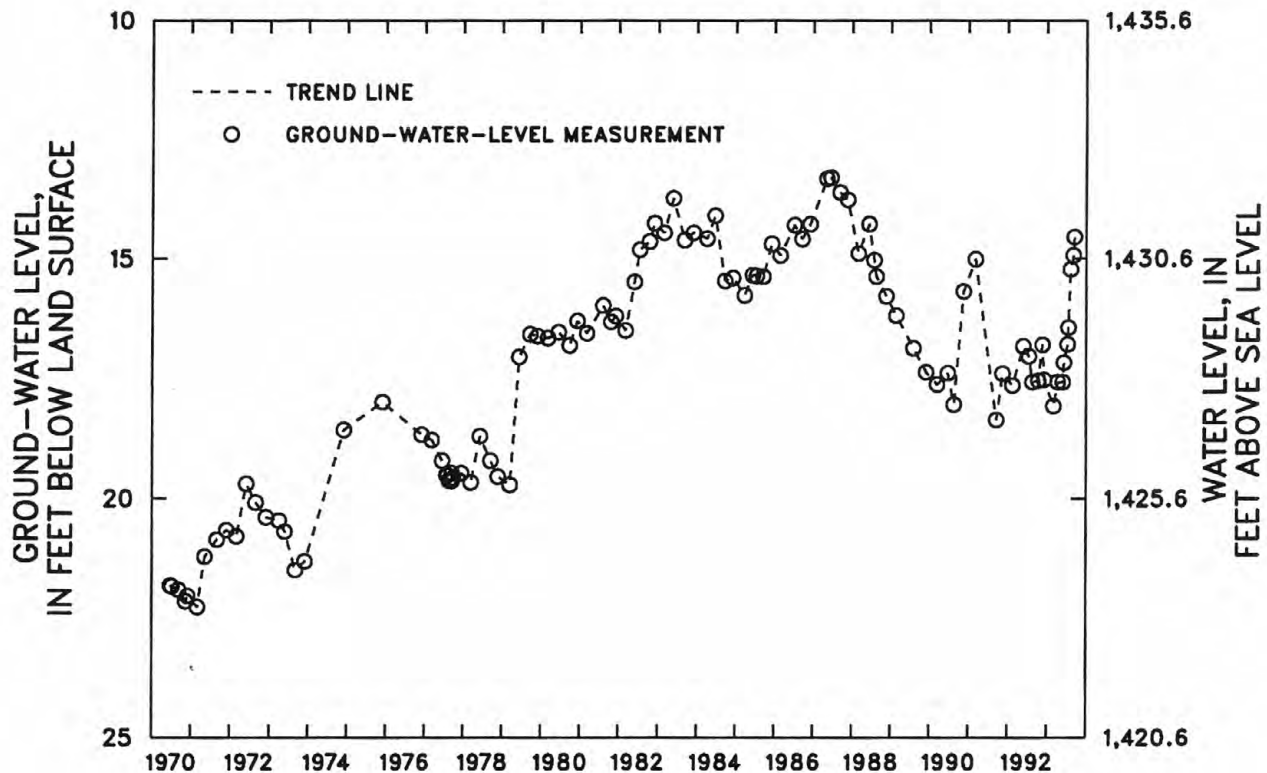
PERIOD OF RECORD.--June 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.32 ft below land-surface datum, June 15, 1987; lowest measured, 22.30 ft below land-surface datum, Mar. 3, 1971.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	17.55	MAR 6	18.08	JUNE 11	17.17	AUG 11	15.23
NOV 23	16.80	APR 15	17.58	JULY 15	16.79	SEPT 6	14.94
DEC 9	17.53	JUNE 1	17.58	JULY 22	16.44	SEPT 15	14.56

153-063-30CBC



BENSON COUNTY

480958099154801. Local number, 154-067-15BBB.

LOCATION.--Lat 48°09'58", long 099°15'48", Hydrologic Unit 09020201.

Owner: North Dakota State Water Commission.

AQUIFER.--Spiritwood.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 180 ft, cased to 147 ft, plastic pipe, No. 18 slot screen set 147 to 153 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,475 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

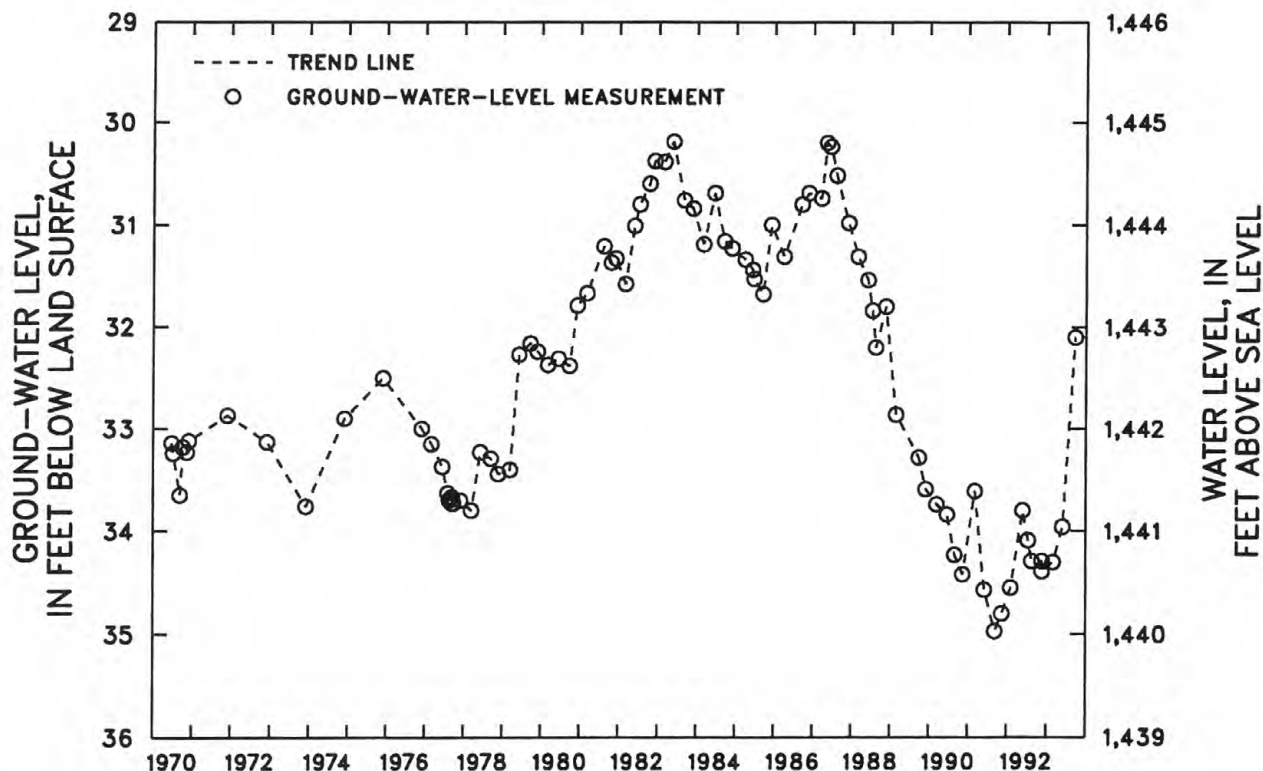
PERIOD OF RECORD.--June 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.19 ft below land-surface datum, May 26, 1983; lowest measured, 34.97 ft below land-surface datum, Sept. 10, 1991.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	34.29	MAR 6	34.30	JUNE 1	33.96	SEPT 25	32.10
NOV 23	34.39						

154-067-15BBB



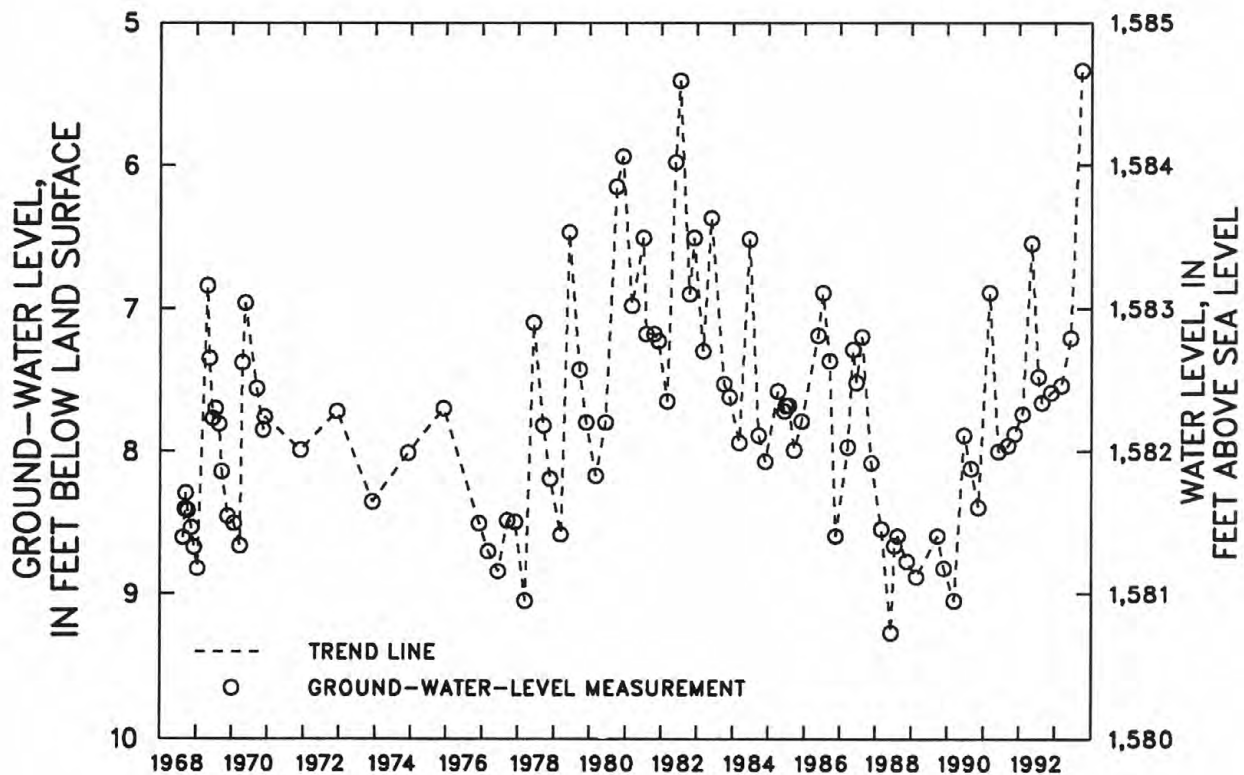
BENSON COUNTY

481041099442701. Local number, 154-071-11AAD1.
 LOCATION.--Lat 48°10'41", long 099°44'27", Hydrologic Unit 09020202.
 Owner: North Dakota State Water Commission.
 AQUIFER.--Fox Hills Sandstone.
 WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 100 ft, cased to 42 ft, plastic pipe, No. 12 slot screen set 42 to 45 ft below land-surface datum.
 INSTRUMENTATION.--Measured quarterly using a steel tape.
 DATUM.--Altitude of land-surface datum is 1,590 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
 PERIOD OF RECORD.--August 1968 to current year.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.34 ft below land-surface datum, Sept. 25, 1993; lowest measured, 9.27 ft below land-surface datum, June 8, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	7.59	MAR 6	7.54	JUNE 6	7.21	SEPT 25	5.34

154-071-11AAD1



BOWMAN COUNTY

461534103491701. Local number, 132-105-16BDB.

LOCATION.--Lat 46°15'34", long 103°49'17", Hydrologic Unit 10110203.

Owner: North Dakota State Water Commission.

AQUIFER.--Hell Creek-Fox Hills Sandstone.

WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 475 ft, cased to 441 ft, steel pipe, No. 12 slot screen set 441 to 459 ft below land-surface datum.

INSTRUMENTATION.--Measured annually, during late November or early December, using a steel tape.

DATUM.--Altitude of land-surface datum is 3,010 ft. Measuring point: Top of casing 3.40 ft above land-surface datum.

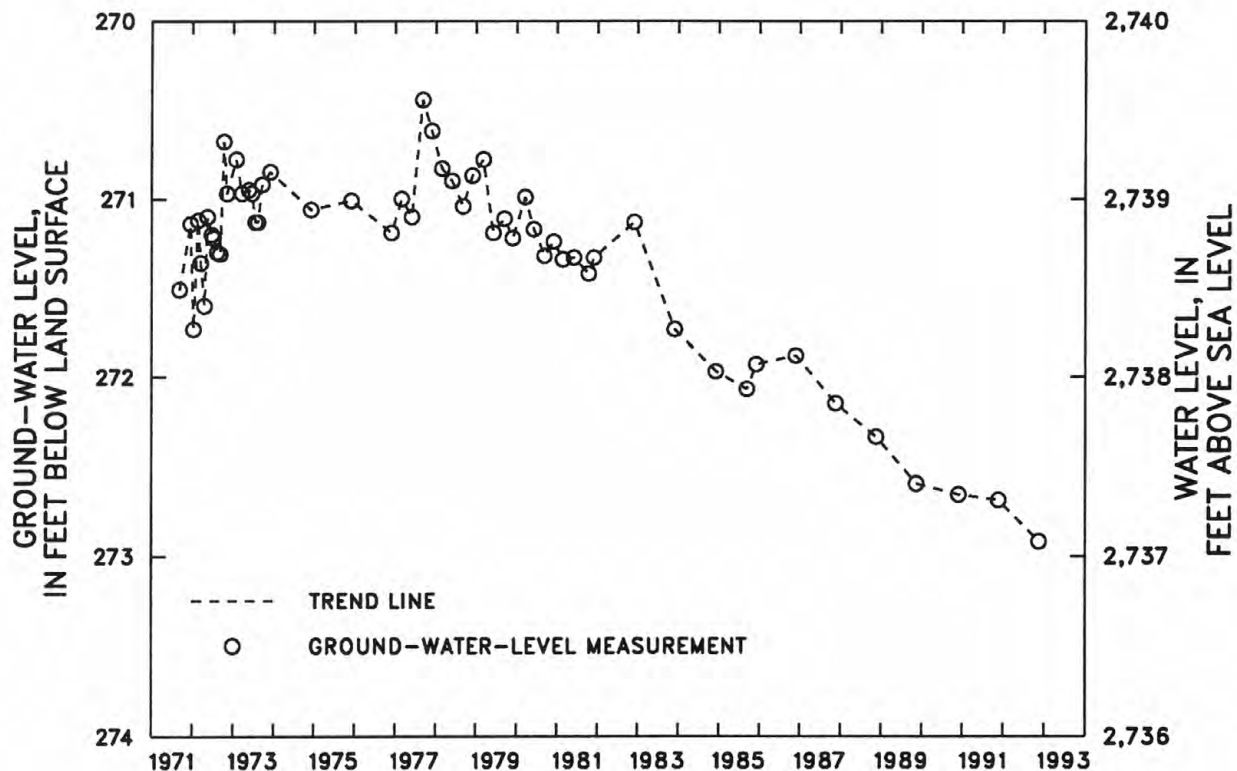
PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 270.45 ft below land-surface datum, Sept. 8, 1977; lowest measured, 272.92 ft below land-surface datum, Nov. 17, 1992.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL
NOV 17	272.92

132-105-16BDB



BURLEIGH COUNTY

464943100305801. Local number, 139-078-27CBB.

LOCATION.--Lat 46°49'43", long 100°30'58", Hydrologic Unit 10130103.

Owner: North Dakota State Water Commission.

AQUIFER.--McKenzie.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 255 ft, cased to 200 ft, plastic pipe, slotted 200 to 220 ft below land-surface datum, gravel packed.

INSTRUMENTATION.--Measured on a six-week schedule, except during the winter, using a steel tape.

DATUM.--Altitude of land-surface datum is 1,713. Measuring point: Top of casing 1.90 ft above land-surface datum.

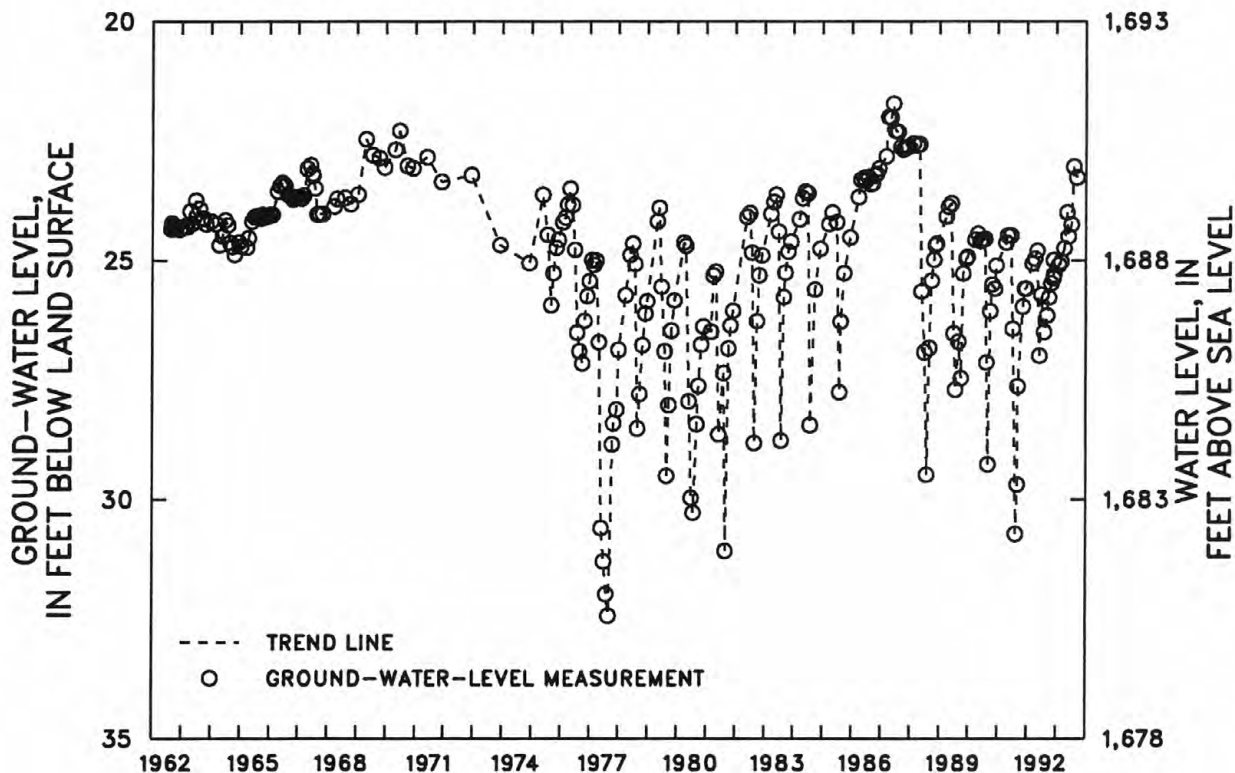
PERIOD OF RECORD.--August 1962 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.73 ft below land-surface datum, June 5, 1987; lowest measured, 32.44 ft below land-surface datum, Aug. 26, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	25.79	DEC 6	25.31	APR 12	24.75	JULY 9	24.25
NOV 3	25.49	FEB 5	25.10	MAY 17	24.00	AUG 6	23.05
NOV 30	25.38	MAR 5	25.03	JUNE 2	24.50	SEPT 13	23.27
DEC 2	25.00						

139-078-27CBB



DIVIDE COUNTY

485649103155701. Local number, 163-097-15BCC.

LOCATION.--Lat 48°56'49", long 103°15'57", Hydrologic Unit 09010001.

Owner: North Dakota State Water Commission.

AQUIFER.--Yellowstone.

WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 575 ft, cased to 546 ft, steel pipe,

No. 12 slot screen set 546 to 558 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,915 ft. Measuring point: Top of casing 1.50 ft above land-surface datum.

PERIOD OF RECORD.--January 1973 to current year.

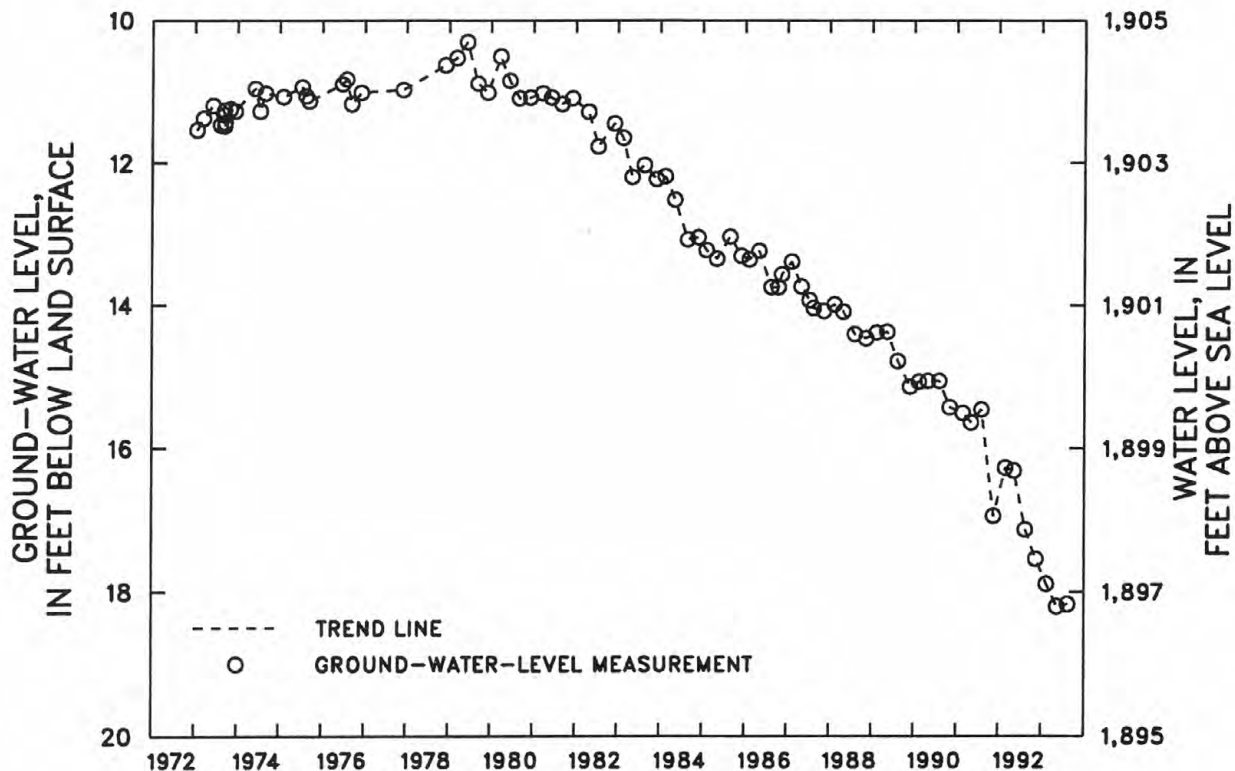
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.31 ft below land-surface datum, June 5, 1979;

lowest measured, 18.20 ft below land-surface datum, May 15, 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	17.54	FEB 15	17.89	MAY 15	18.20	AUG 15	18.17

163-097-15BCC



DUNN COUNTY

471323102290101. Local number, 143-093-09BCB.

LOCATION.--Lat 47°13'23", long 102°29'01", Hydrologic Unit 10130201.

Owner: North Dakota State Water Commission.

AQUIFER.--Sentinel Butte.

WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 965 ft, cased to 378 ft, steel pipe,

No. 12 slot screen set 378 to 396 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 2,133 ft. Measuring point: Top of casing 2.10 ft above land-surface datum.

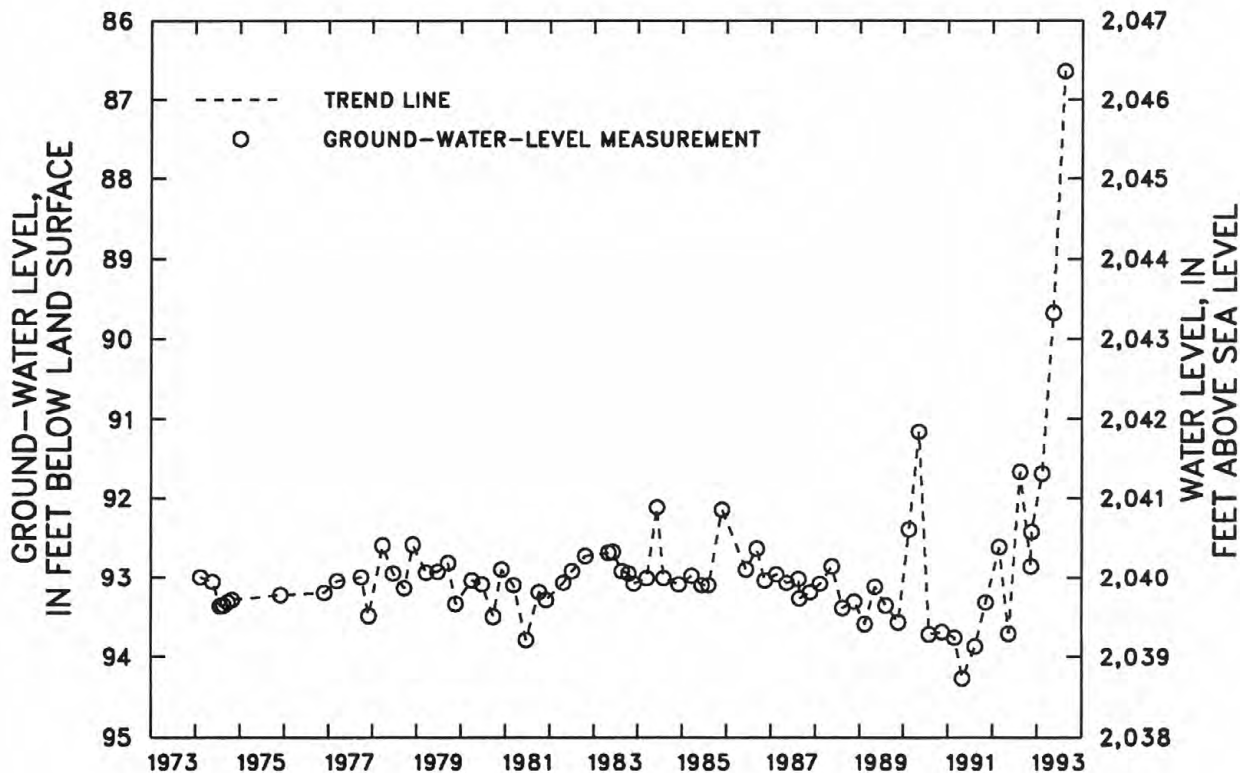
PERIOD OF RECORD.--February 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 86.64 ft below land-surface datum, Aug. 14, 1993;
lowest measured, 94.27 ft below land-surface datum, April 30, 1991.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	92.86	FEB 13	91.69	MAY 14	89.68	AUG 14	86.64
NOV 19	92.43						

143-093-09BCB



EDDY COUNTY

473720098592401. Local number, 148-065-19DAA.

LOCATION.--Lat 47°37'20", long 098°59'24", Hydrologic Unit 10160001.

Owner: North Dakota State Water Commission.

AQUIFER.--New Rockford.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 242 ft, cased to 220 ft, plastic pipe, slotted from 210 to 220 ft below land-surface datum.

INSTRUMENTATION.--Measured on a six-week schedule, except during the winter, using a steel tape.

DATUM.--Altitude of land-surface datum is 1,526 ft. Measuring point: Top of casing 1.90 ft above land-surface datum.

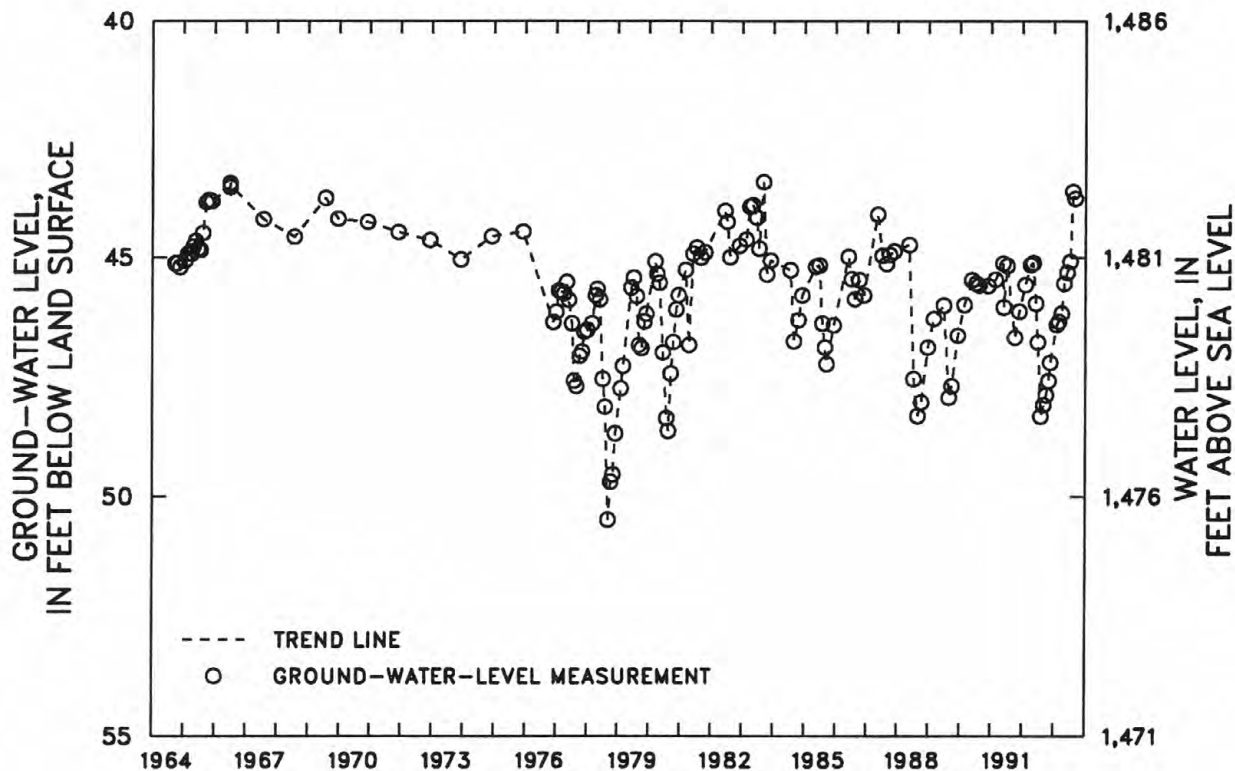
PERIOD OF RECORD.--September 1964 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.40 ft below land-surface datum, Sept. 6, 1983; lowest measured, 50.49 ft below land-surface datum, Sept. 6, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	47.90	FEB 6	46.42	MAY 2	45.55	AUG 9	43.60
NOV 1	47.60	MAR 1	46.35	JUNE 6	45.32	SEPT 3	43.75
NOV 21	47.22	APR 4	46.18	JULY 11	45.09		

148-065-19DAA



EMMONS COUNTY

463632100171901. Local number, 136-076-07CBC.

LOCATION.--Lat 46°36'32", long 100°17'19", Hydrologic Unit 10130103.

Owner: North Dakota State Water Commission.

AQUIFER.--Long Lake.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 150 ft, cased to 117 ft, plastic pipe, No. 12 slot screen set at 117 to 123 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,735 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

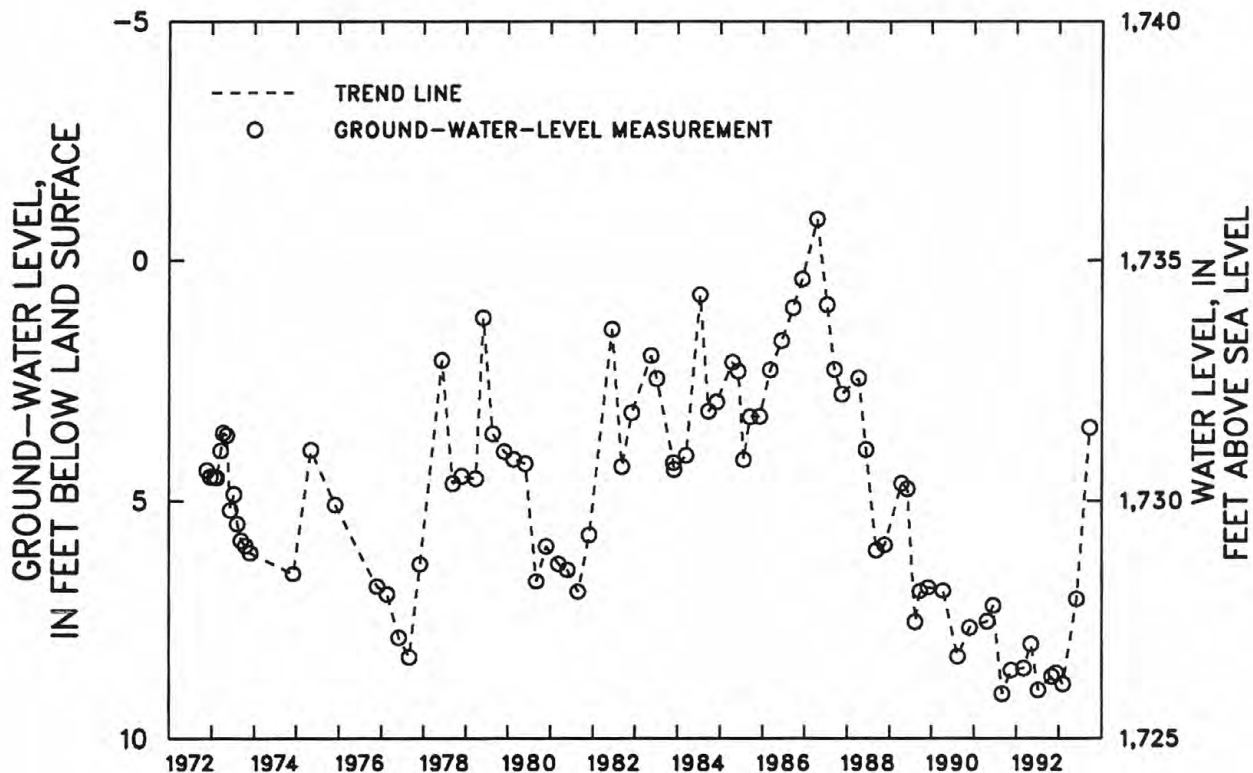
PERIOD OF RECORD.--November 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.87 ft above land-surface datum, Apr. 17, 1987; lowest measured, 9.08 ft below land-surface datum, Sept. 1, 1991.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	8.72	FEB 5	8.88	JUNE 2	7.10	SEPT 21	3.49
DEC 8	8.65						

136-076-07CBC



GRAND FORKS COUNTY

474957097343501. Local number, 150-054-04CCD.

LOCATION.--Lat 47°49'57", long 097°34'35", Hydrologic Unit 09020307.

Owner: North Dakota State Water Commission.

AQUIFER.--Elk Valley.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 126 ft, cased to 40 ft, plastic pipe, No. 12 slot screen set 40 to 43 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,127 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.

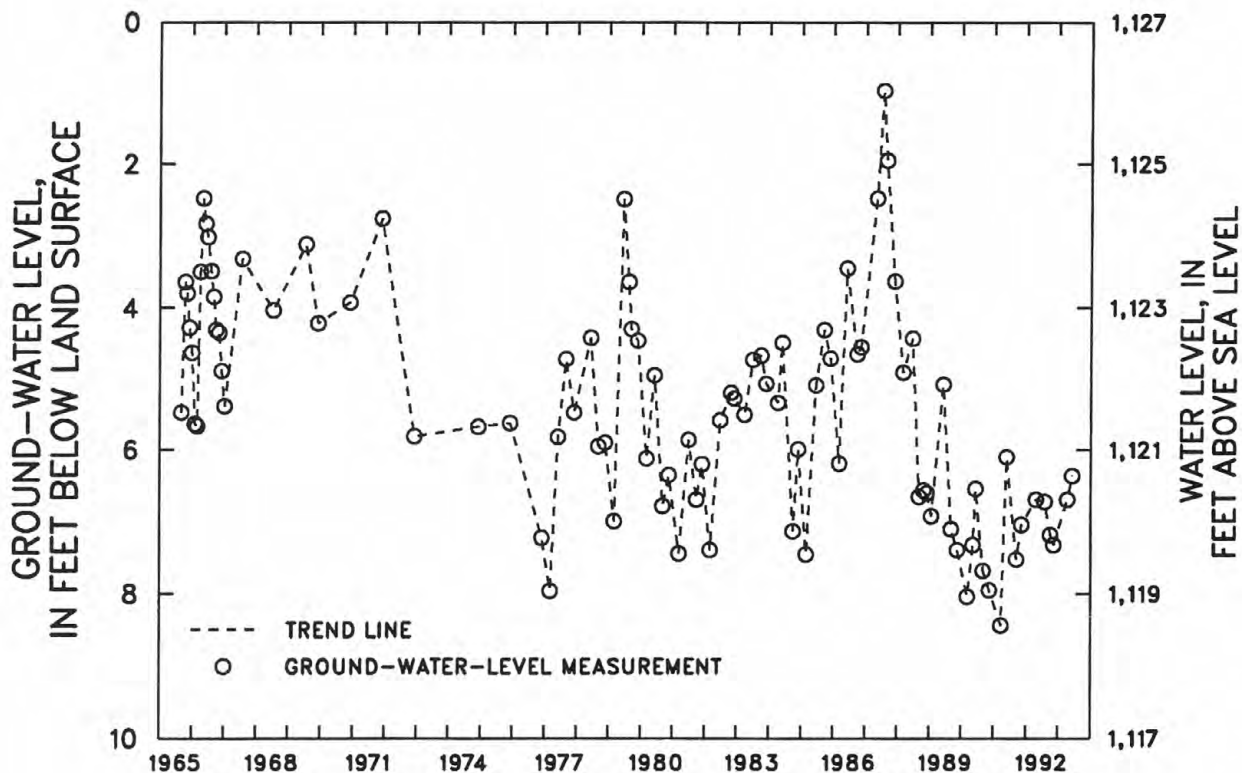
PERIOD OF RECORD.--September 1965 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.97 ft below land-surface datum, July 23, 1987; lowest measured, 8.44 ft below land-surface datum, Mar. 27, 1991.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	7.18	NOV 11	7.32	APR 15	6.69	JUNE 9	6.36

150-054-04CCD



GRIGGS COUNTY

471612098113101. Local number, 144-059-20CCC.

LOCATION.--Lat 47°16'12", long 098°11'31", Hydrologic Unit 09020203.

Owner: North Dakota State Water Commission.

AQUIFER.--Spiritwood.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 240 ft, cased to 158 ft, plastic pipe, No. 25 slot screen set 158 to 161 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since 1975.

DATUM.--Altitude of land-surface datum is 1,430 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

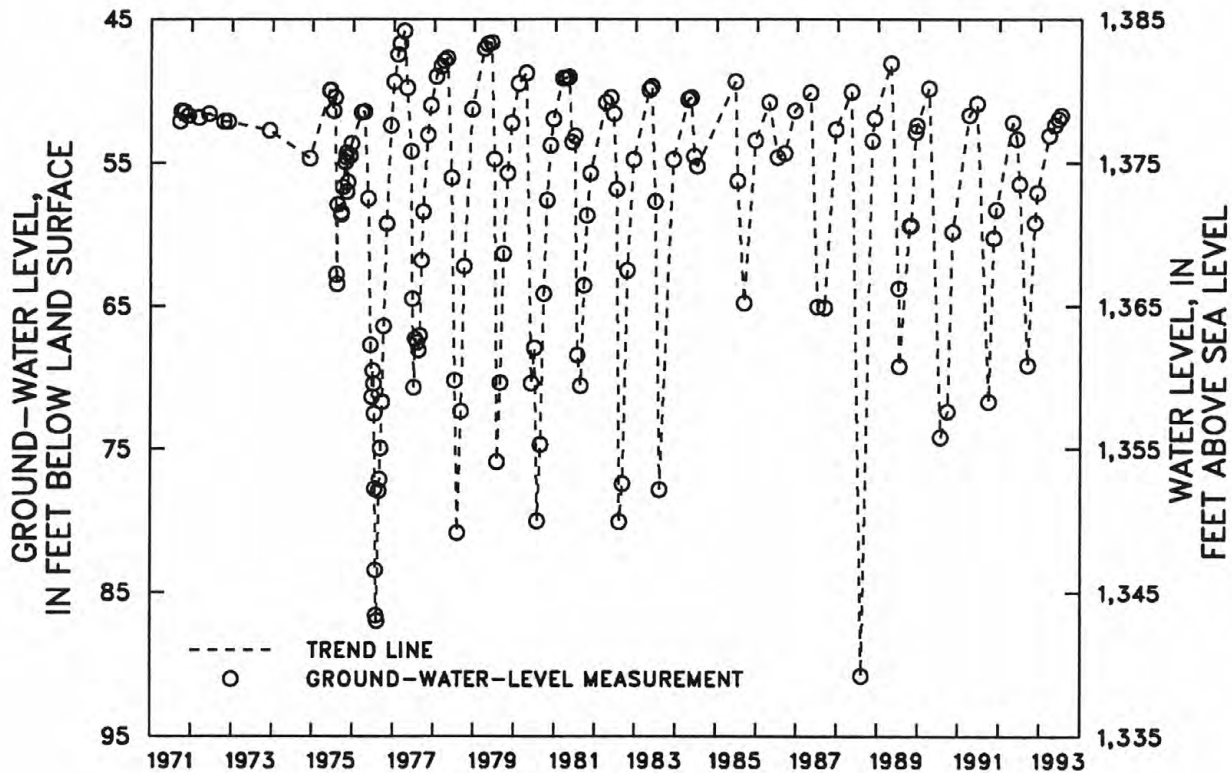
PERIOD OF RECORD.--September 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 45.84 ft below land-surface datum, Apr. 5, 1977; lowest measured, 90.80 ft below land-surface datum, Aug. 11, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	59.19	MAR 24	53.11	JUNE 14	51.97	JULY 7	51.72
DEC 9	57.07	MAY 12	52.39				

144-059-20CCC



GRIGGS COUNTY

473425098232901. Local number, 147-061-01CCC.

LOCATION.--Lat 47°34'25", long 098°23'29", Hydrologic Unit 09020203.

Owner: North Dakota State Water Commission.

AQUIFER.--Spiritwood.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 340 ft, cased to 237 ft, plastic pipe, No. 25 slot screen set 237 to 240 ft below land-surface datum.

INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since 1977.

DATUM.--Altitude of land-surface datum is 1,525 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

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

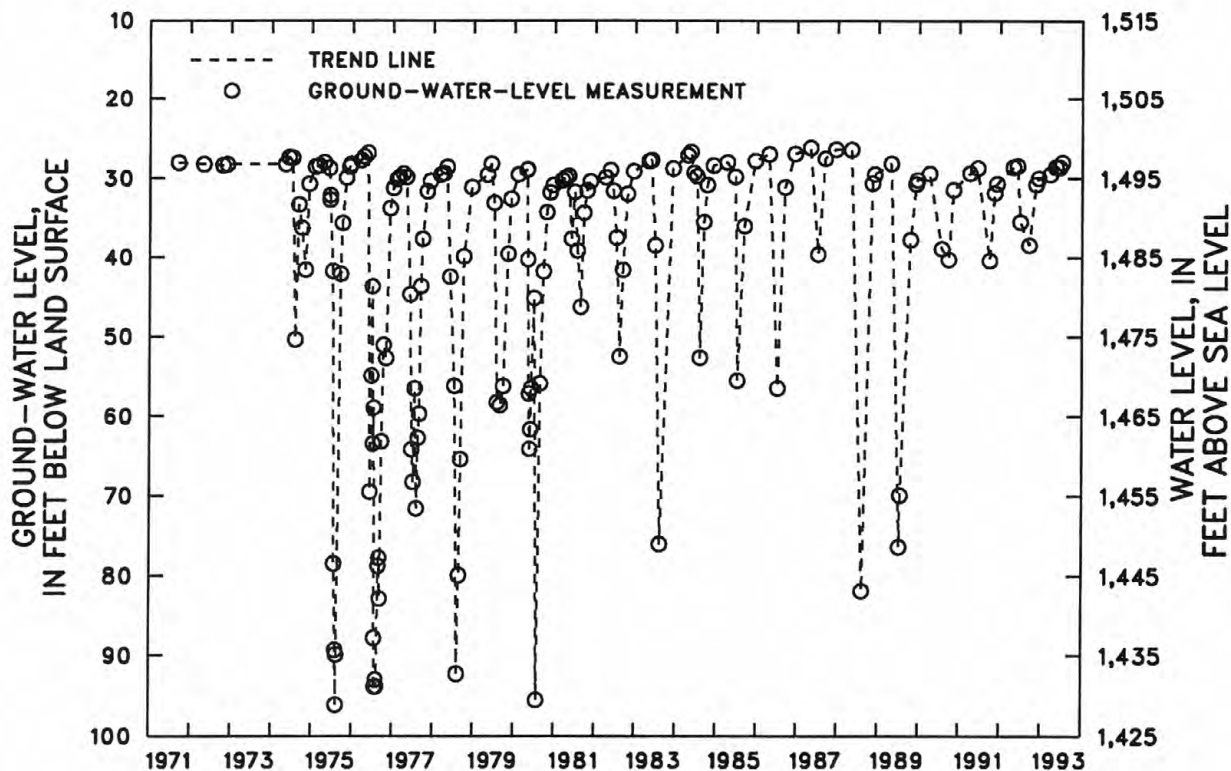
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.17 ft below land-surface datum, Apr. 29, 1987;

lowest measured, 96.10 ft below land-surface datum, Aug. 12, 1975.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	30.78	MAR 24	29.52	JUNE 15	28.63	JULY 9	28.00
DEC 10	29.99	MAY 13	28.59				

147-061-01CCC



GRIGGS COUNTY

473600098065901. Local number, 148-059-36AAB.

LOCATION.--Lat 47°36'00", long 098°06'59", Hydrologic Unit 09020203.

Owner: North Dakota State Water Commission.

AQUIFER.--McVille.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 180 ft, cased to 137 ft, plastic pipe, No. 12 slot screen set 137 to 143 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since 1984.

DATUM.--Altitude of land-surface datum is 1,320 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

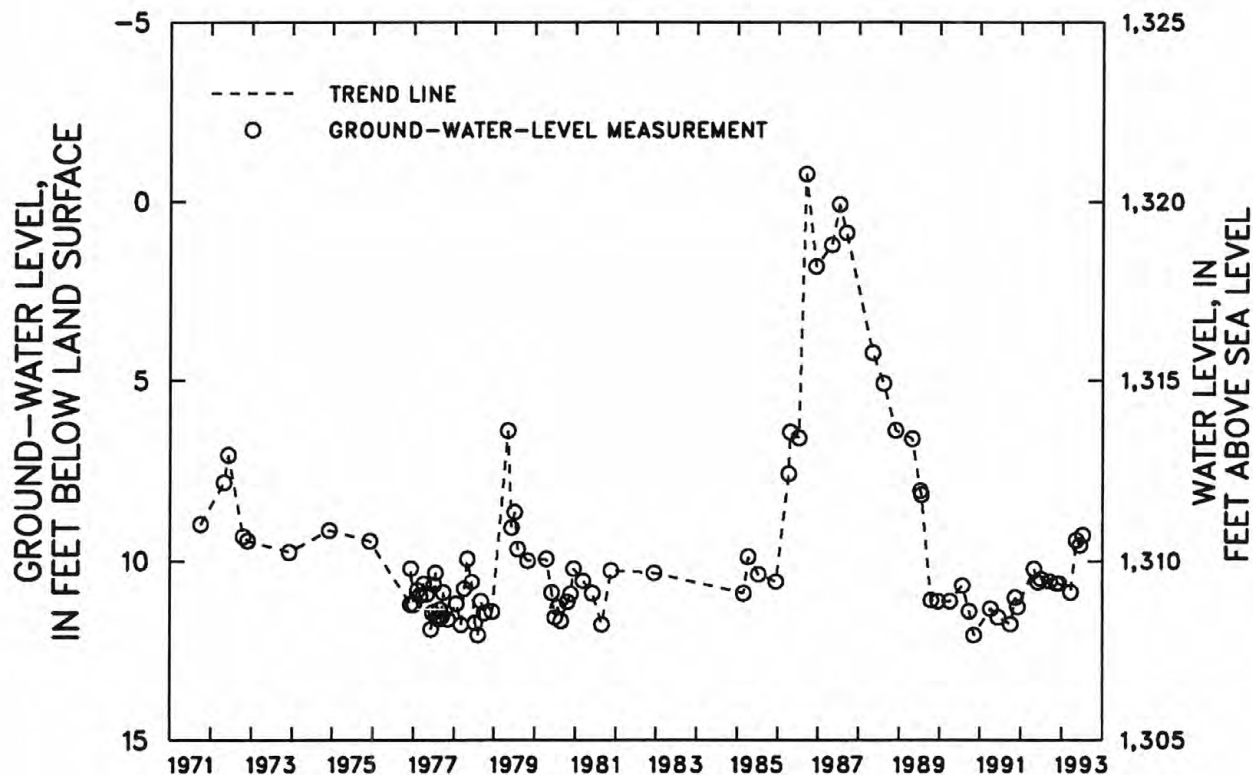
PERIOD OF RECORD.--October 1971 to December 1982, April 1985 to present.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.77 ft above land-surface datum, Sept. 11, 1986; lowest measured, 12.09 ft below land-surface datum, Aug. 9, 1978, and Nov. 7, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	10.64	MAR 24	10.89	JUNE 15	9.57	JULY 10	9.29
DEC 10	10.64	MAY 13	9.43				

148-059-36AAB



HETTINGER COUNTY

463153102521001. Local number, 135-097-04DCA.

LOCATION.--Lat 46°31'53", long 102°52'10", Hydrologic Unit 10130204.

Owner: North Dakota State Water Commission.

AQUIFER.--Fox Hills Sandstone.

WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 1,790 ft, cased to 1,320 ft, steel pipe, open hole.

INSTRUMENTATION.--Measured quarterly using a steel tape. Water-level recorder prior to May 1974.

DATUM.--Altitude of land-surface datum is 2,567 ft. Measuring point: Top of casing 0.70 ft above land-surface datum.

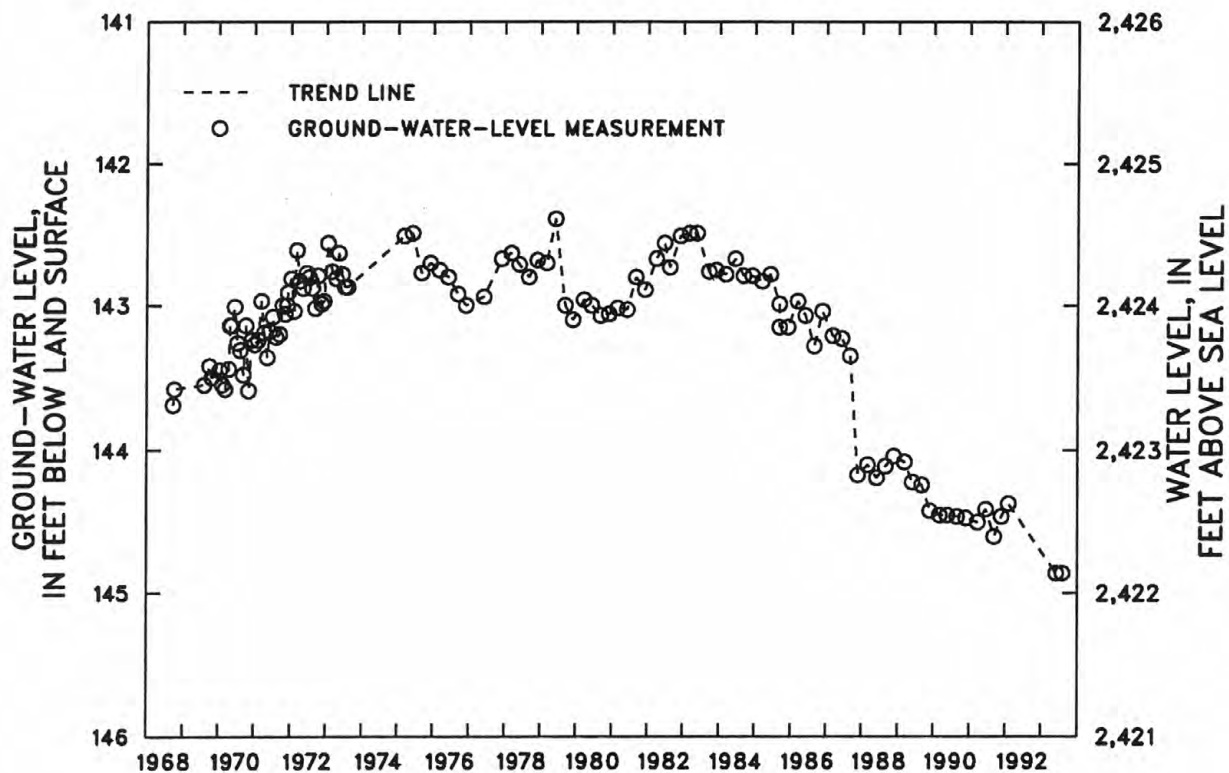
PERIOD OF RECORD.--September 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 142.39 ft below land-surface datum, June 4, 1979; lowest measured, 144.86 ft below land-surface datum, June 2 and Aug 5, 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL
JUNE 2	144.86	AUG 5	144.86

135-097-04DCA



KIDDER COUNTY

470638099324301. Local number, 142-070-16DDD.

LOCATION.--Lat 47°06'38", long 099°32'43", Hydrologic Unit 10130103.

Owner: North Dakota State Water Commission.

AQUIFER.--Long Lake.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 84 ft, cased to 70 ft, plastic pipe, No. 18 slot screen set 70 to 73 ft below land-surface datum.

INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since 1979.

DATUM.--Altitude of land-surface datum is 1,810 ft. Measuring point: Top of casing 1.90 ft above land-surface datum.

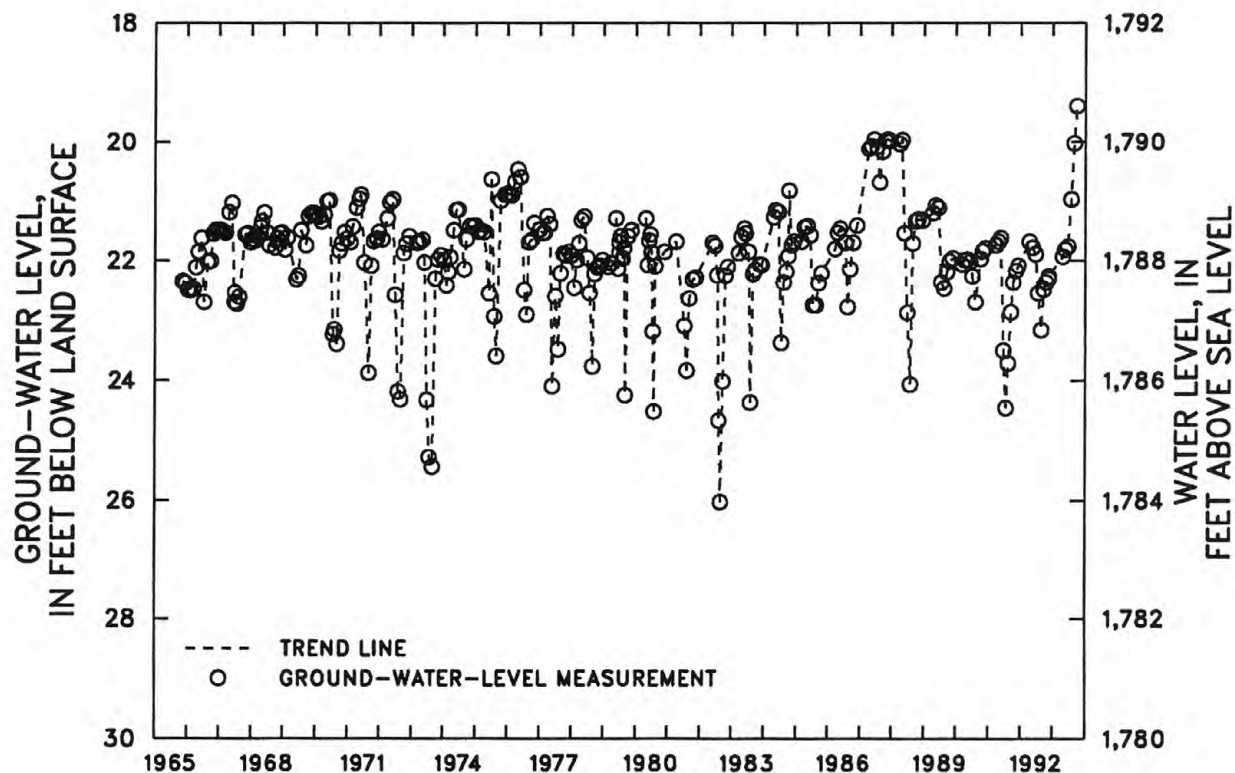
PERIOD OF RECORD.--November 1965 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.40 ft below land-surface datum, Sept. 30, 1993; lowest measured, 26.03 ft below land-surface datum, Aug. 27, 1982.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	22.37	APR 26	21.94	JUNE 24	21.77	SEPT 1	20.03
NOV 16	22.31	MAY 22	21.82	JULY 29	20.98	SEPT 30	19.40
NOV 17	22.27						

142-070-16DDD



MC LEAN COUNTY

473752101055301. Local number, 148-082-23BBB.

LOCATION.--Lat 47°37'52", long 101°05'53", Hydrologic Unit 10130101.

Owner: North Dakota State Water Commission.

AQUIFER.--Lake Nettie.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 300 ft, cased to 198 ft, plastic pipe, No. 24 slot screen set 198 to 204 ft below land-surface datum.

INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since December 1984.

DATUM.--Altitude of land-surface datum is 1,883.4 ft. Measuring point: Top of casing 2.30 ft above land-surface datum.

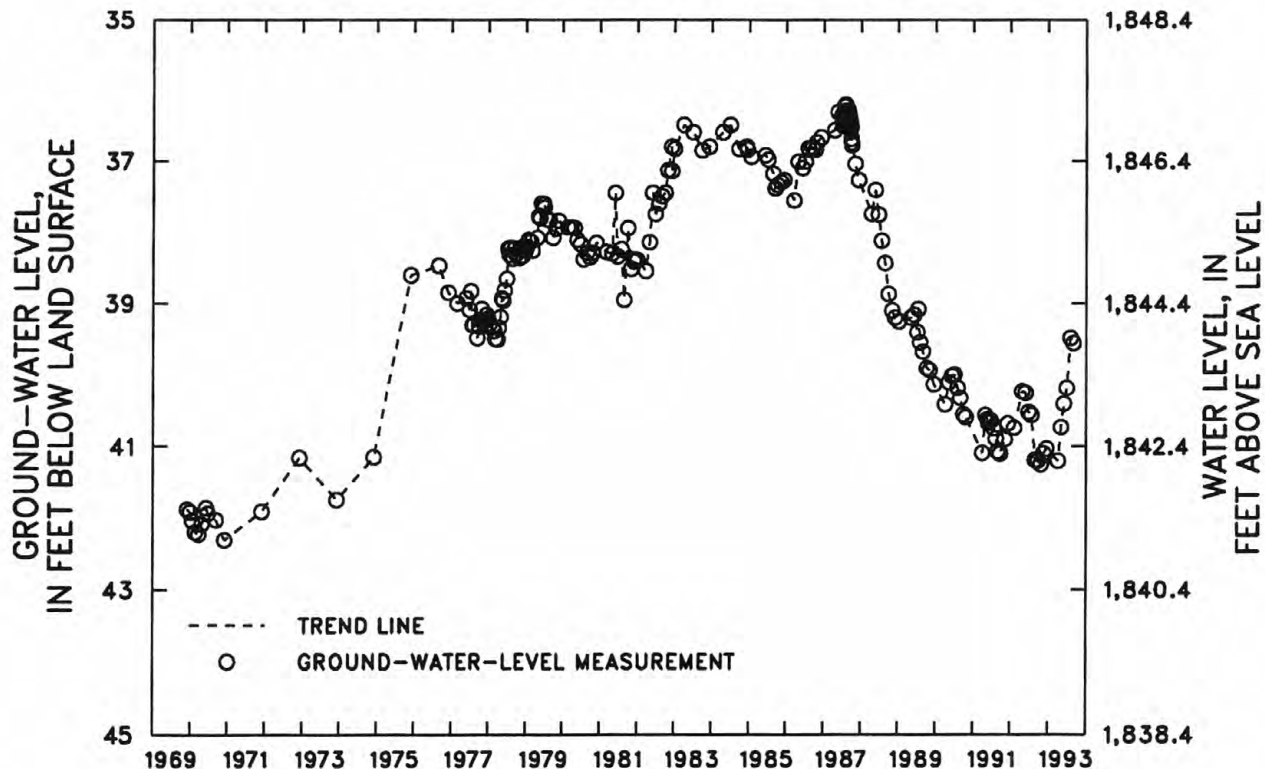
PERIOD OF RECORD.--December 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.21 ft below land-surface datum, July 31, 1987; lowest measured, 42.30 ft below land-surface datum, Dec. 2, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	41.25	APR 5	41.20	JUNE 1	40.40	AUG 4	39.48
NOV 16	41.10	MAY 5	40.73	JUNE 29	40.18	SEPT 1	39.55
DEC 14	41.03						

148-082-23BBB



OLIVER COUNTY

470642101162701. Local number, 142-084-24BBA.

LOCATION.--Lat 47°06'42", long 101°16'27", Hydrologic Unit 10130101.

Owner: North Dakota State Water Commission.

AQUIFER.--Fox Hills Sandstone.

WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 1,295 ft, cased to 966 ft, steel pipe, open ended.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 2,006 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

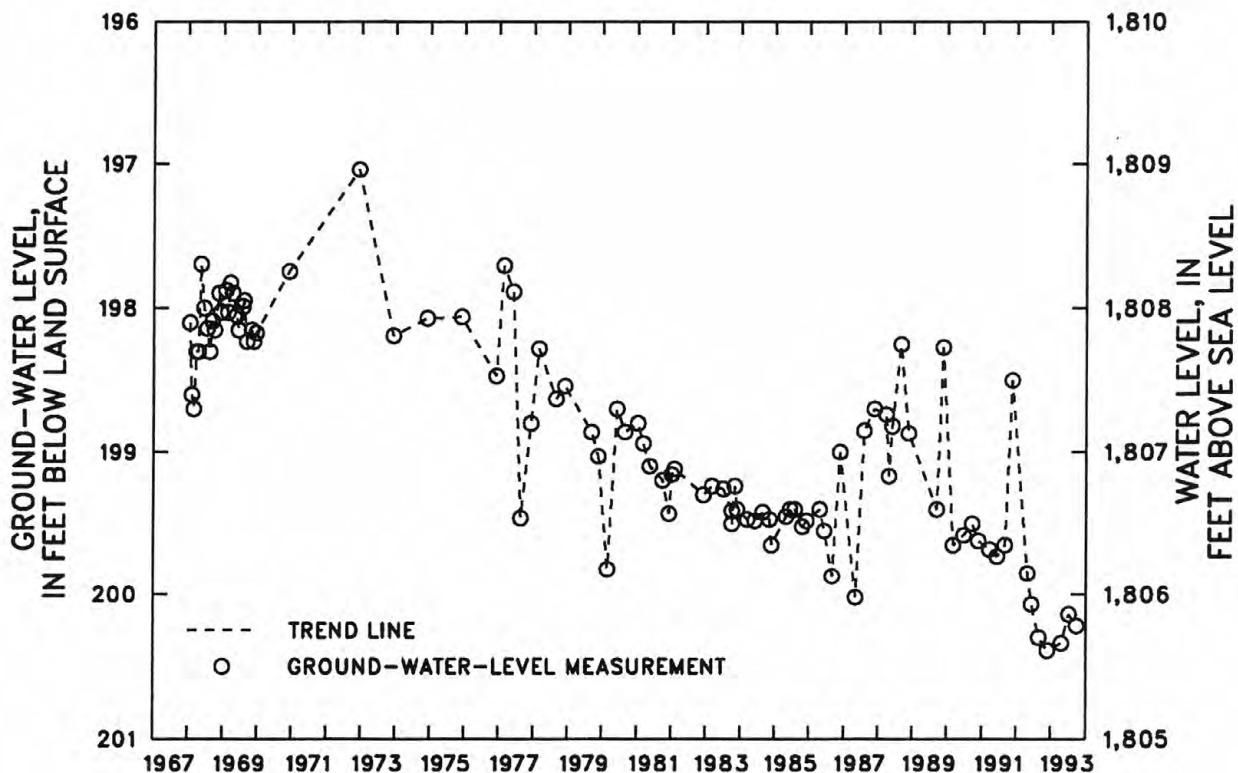
PERIOD OF RECORD.--January 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 197.04 ft below land-surface datum, Dec. 8, 1972; lowest measured, 200.39 ft below land-surface datum, Nov. 25, 1992.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	200.39	APR 20	200.34	JULY 8	200.14	SEPT 27	200.22

142-084-24BBA



PEMBINA COUNTY

485239097501702. Local number, 162-056-01CCC2.

LOCATION.--Lat 48°52'39", long 097°50'17", Hydrologic Unit 09020313.

Owner: North Dakota State Water Commission.

AQUIFER.--Icelandic.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 40 ft, cased to 37 ft, plastic pipe, No. 12 slot screen set 37 to 40 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 988 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.

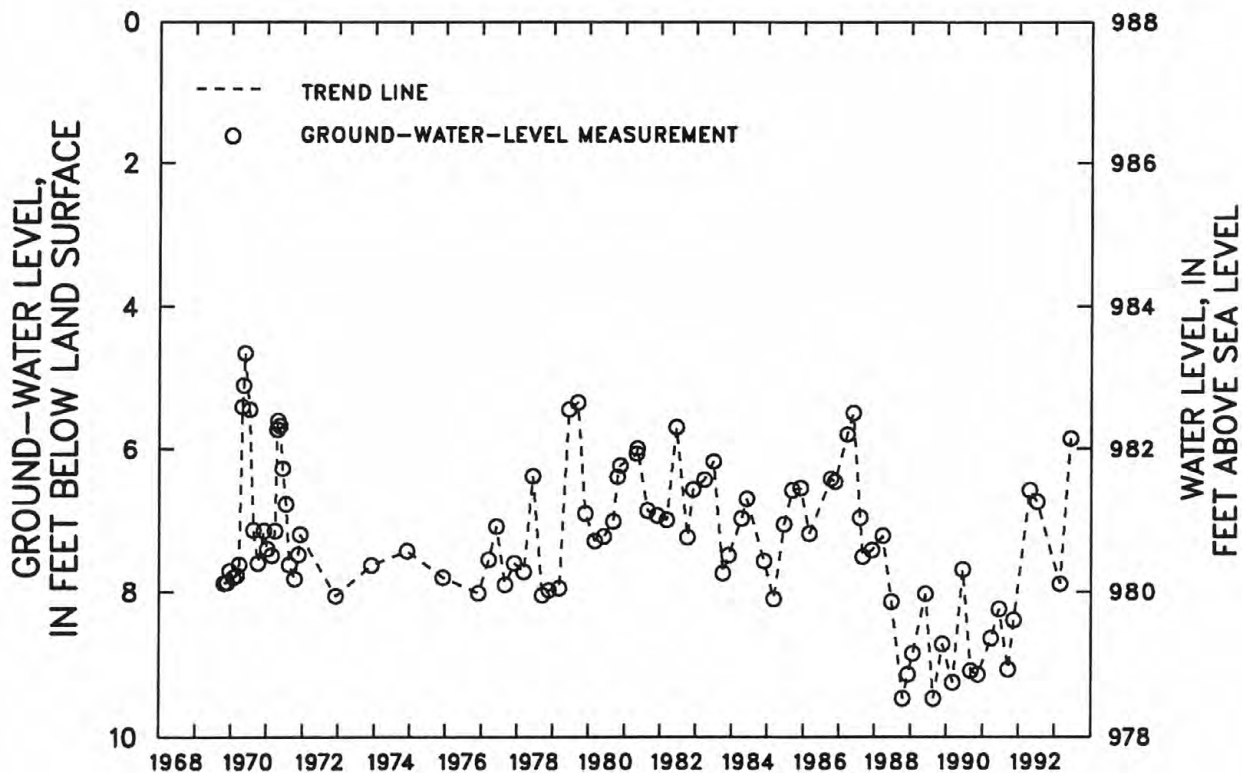
PERIOD OF RECORD.--October 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.65 ft below land-surface datum, May 21, 1970; lowest measured, 9.47 ft below land-surface datum, Oct. 14, 1988, and Aug. 22, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 24	7.89	JUNE 9	5.85

162-056-01CCC2



PIERCE COUNTY

475323100092101. Local number, 151-074-20AAA.

LOCATION.--Lat 47°53'23", long 100°09'21", Hydrologic Unit 09020202.

Owner: North Dakota State Water Commission.

AQUIFER.--New Rockford.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 320 ft, cased to 256 ft, plastic pipe, No. 18 slot screen set 256 to 259 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,605 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

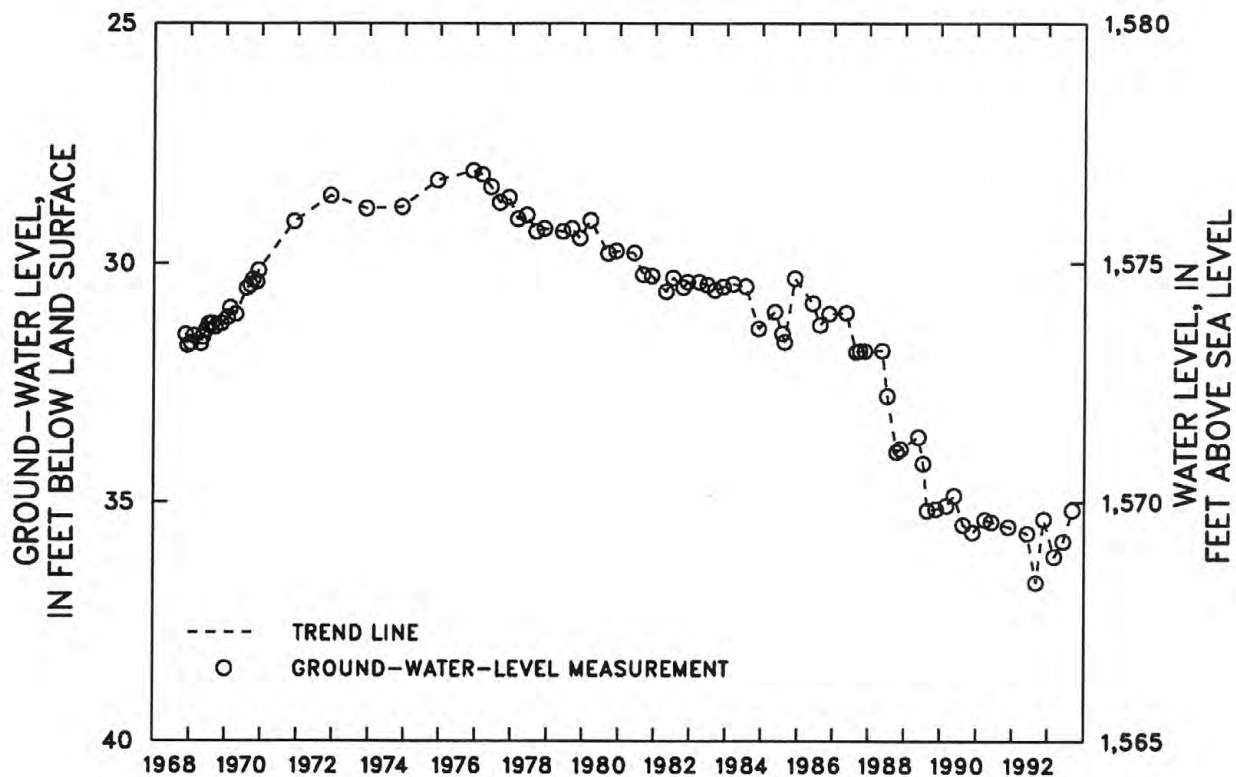
PERIOD OF RECORD.--November 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.08 ft below land-surface datum, Nov. 29, 1976; lowest measured, 36.70 ft below land-surface datum, September 4, 1992.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	35.36	MAR 7	36.15	JUNE 6	35.83	SEPT 6	35.17

151-074-20AAA



RICHLAND COUNTY

462633097163402. Local number, 134-052-06CCD2.

LOCATION.--Lat 46°26'33", long 097°16'34", Hydrologic Unit 09020204.

Owner: North Dakota State Water Commission.

AQUIFER.--Sheyenne Delta.

WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 40 ft, cased to 30 ft, plastic pipe, slotted 30 to 40 ft below land-surface datum.

INSTRUMENTATION.--Water level recorder October 1965 to current year. Prior to February 1972 only 5-day low and EOM water levels are available.

DATUM.--Altitude of land-surface datum is 1,067 ft. Measuring point: Top of casing 0.65 ft above land-surface datum.

REMARKS.--Key well reported in monthly Water Resources Review.

PERIOD OF RECORD.--September 1963 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest recorded water level, 0.78 ft below land-surface datum, May 13, 1972; lowest recorded, 9.12 ft below land-surface datum, Mar. 8-11, 1989.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
MAXIMUM VALUES (DAILY LOW WATER LEVEL)

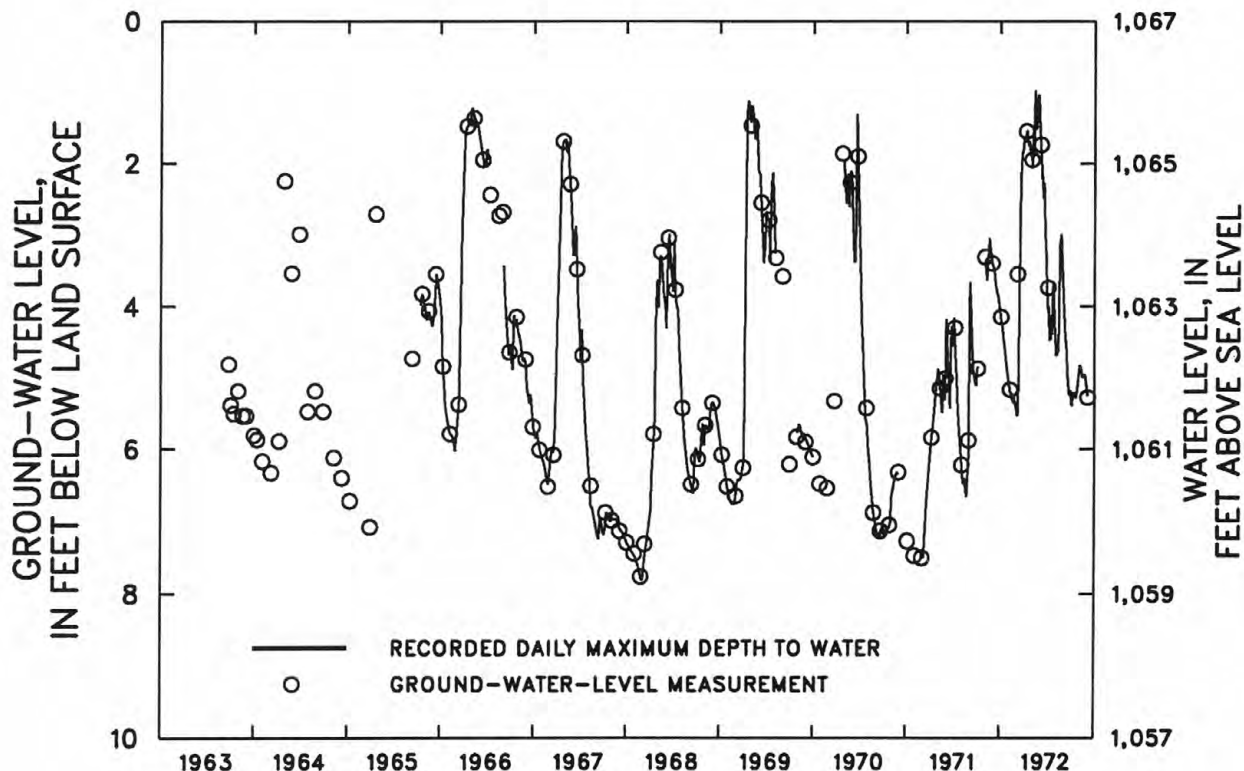
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	5.89	5.39	5.02	6.27	6.34	6.67	---	3.54	3.31	2.35	2.69	4.42
10	5.95	5.15	5.28	---	6.33	6.16	---	3.11	3.26	2.61	3.12	4.73
15	6.03	4.97	5.28	6.47	6.34	6.03	---	3.82	3.84	2.47	3.15	4.90
20	5.94	4.90	5.44	6.53	6.52	6.22	---	4.21	3.39	2.23	3.43	4.76
25	6.03	4.83	5.78	6.54	6.71	5.83	---	3.13	2.77	1.96	3.87	4.96
EOM	6.06	4.90	6.11	6.44	6.73	---	---	2.70	2.45	2.48	4.06	5.18
MAX	6.08	6.00	6.11	---	6.73	---	---	4.30	3.84	2.82	4.06	5.18

WATER YEAR 1993

HIGHEST WATER LEVEL 1.89 JULY 16

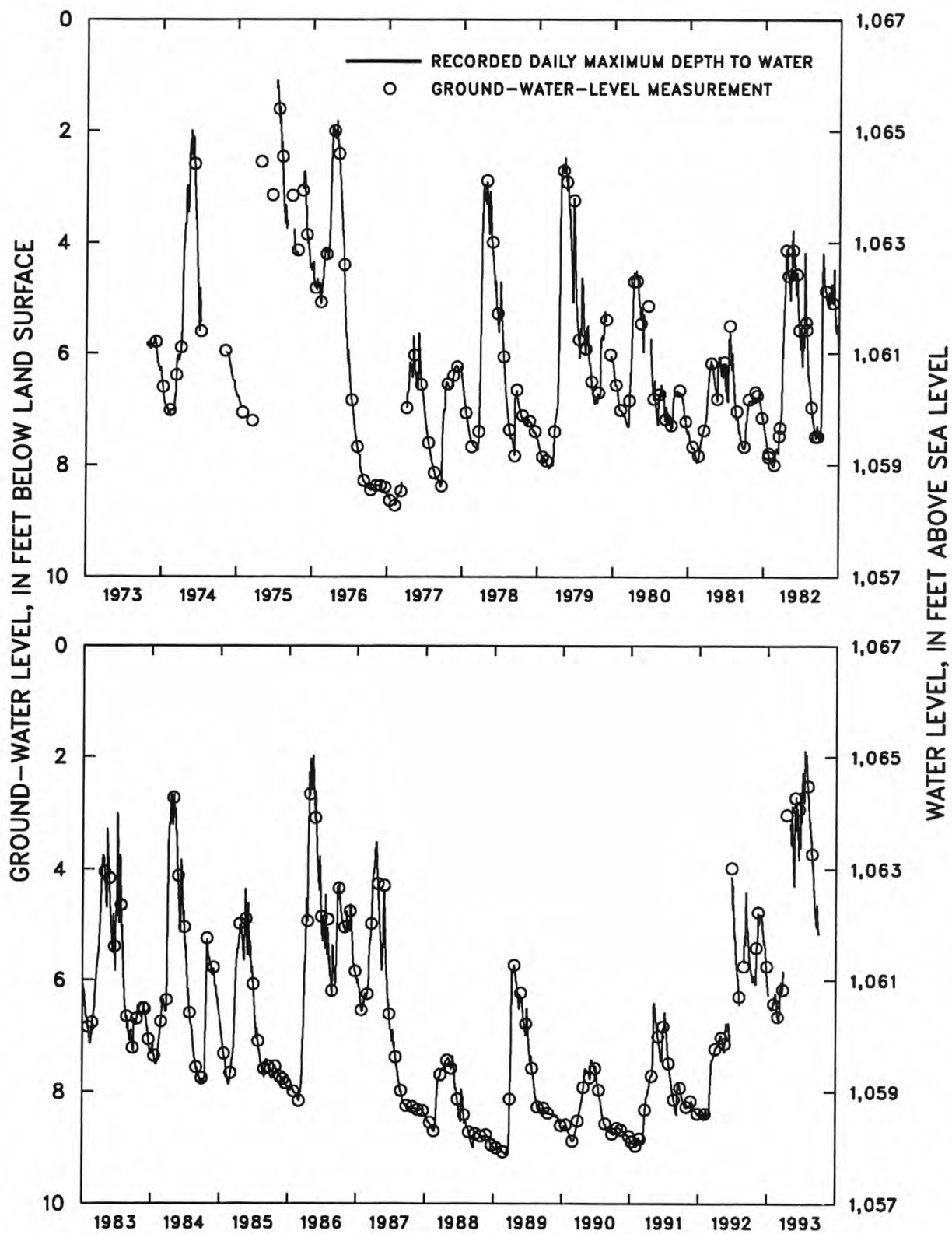
LOWEST WATER LEVEL 6.77 MARCH 4

134-052-06CCD2



GROUND-WATER LEVELS
134-052-06CCD2--Continued

427



STARK COUNTY

465755102410701. Local number, 140-095-08AAA.

LOCATION.--Lat 46°57'55", long 102°41'07", Hydrologic Unit 10130204.

Owner: North Dakota State Water Commission.

AQUIFER.--Sentinel Butte.

WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 160 ft, cased to 80 ft, plastic pipe, open ended.

INSTRUMENTATION.--Measured monthly using a steel tape.

DATUM.--Altitude of land-surface datum is 2,419 ft. Measuring point: Top of casing 1.70 ft above land-surface datum.

REMARKS.--Key well reported in monthly Water Resources Review.

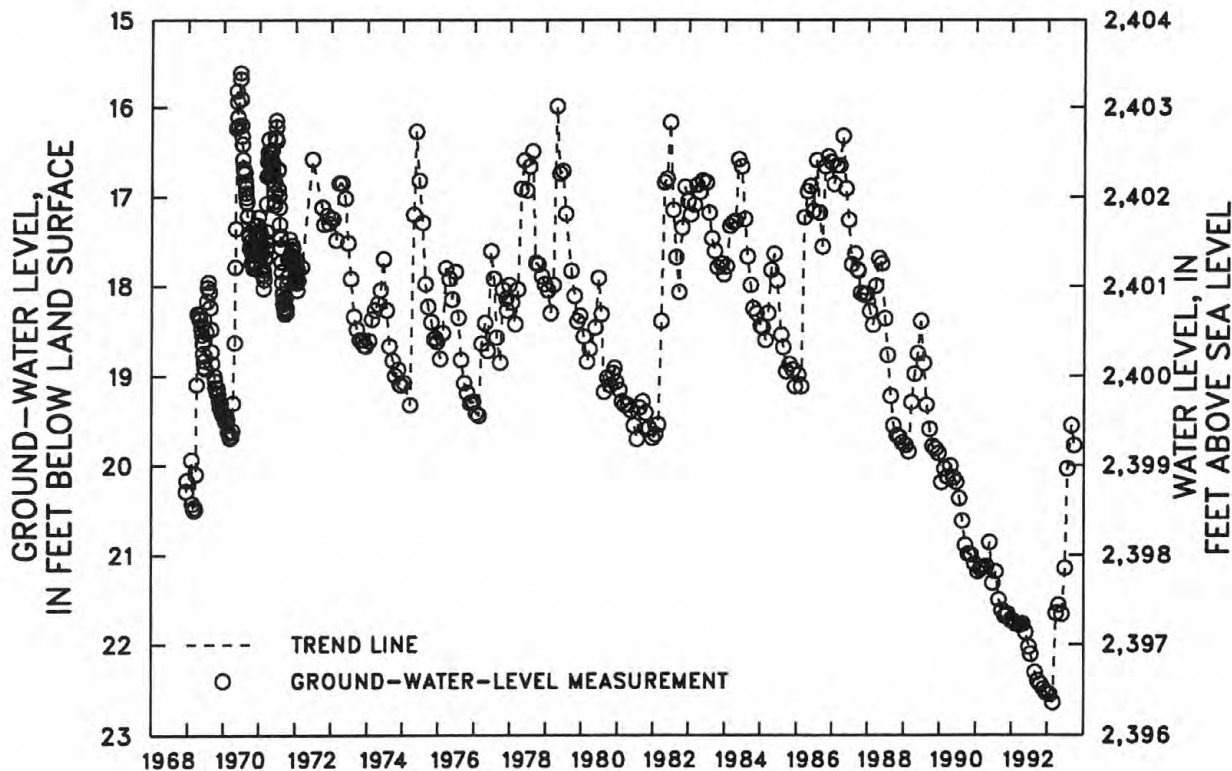
PERIOD OF RECORD.--December 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.61 ft below land-surface datum, June 19, 1970; lowest measured, 22.64 ft below land-surface datum, Feb. 25, 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	22.44	JAN 25	22.55	APR 26	21.57	JULY 21	20.04
NOV 24	22.49	FEB 25	22.64	MAY 26	21.67	AUG 30	19.56
DEC 21	22.53	MAR 31	21.66	JUNE 28	21.15	SEPT 26	19.78

140-095-08AAA



STEELE COUNTY

471601097371001. Local number, 144-055-26BBB.

LOCATION.--Lat 47°16'01", long 097°37'10", Hydrologic Unit 09020109.

Owner: North Dakota State Water Commission.

AQUIFER.--Galesburg.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 300 ft, cased to 53 ft, plastic pipe, slotted 53 to 68 ft below land-surface datum.

INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since 1982.

DATUM.--Altitude of land-surface datum is 1,160 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

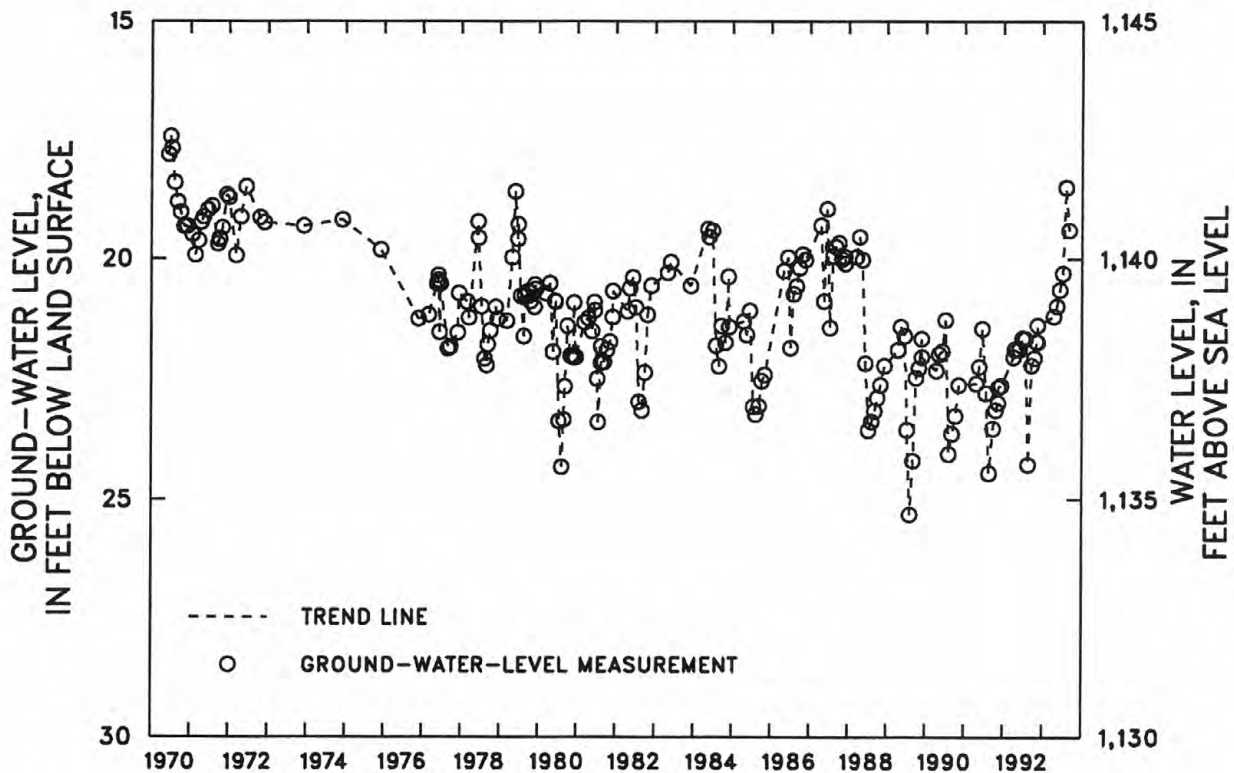
PERIOD OF RECORD.--June 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.43 ft below land-surface datum, June 27, 1970; lowest measured, 25.32 ft below land-surface datum, Aug. 5, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	22.07	NOV 17	21.39	JUNE 12	20.65	AUG 7	18.50
NOV 6	21.73	APR 17	21.20	JULY 9	20.31	SEPT 4	19.41
NOV 15	21.74	MAY 16	20.99				

144-055-26BBB



STUTSMAN COUNTY

463846098274101. Local number, 137-062-26DDD.

LOCATION.--Lat 46°38'46", long 098°27'41", Hydrologic Unit 10160003.

Owner: North Dakota State Water Commission.

AQUIFER.--Spiritwood.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 240 ft, cased to 157 ft, plastic pipe, No. 12 slot screen set 157 to 163 ft below land-surface datum.

INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.

COOPERATION.--Record provided by the North Dakota State Water Commission since 1982.

DATUM.--Altitude of land-surface datum is 1,441.8 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.

PERIOD OF RECORD.--September 1970 to current year.

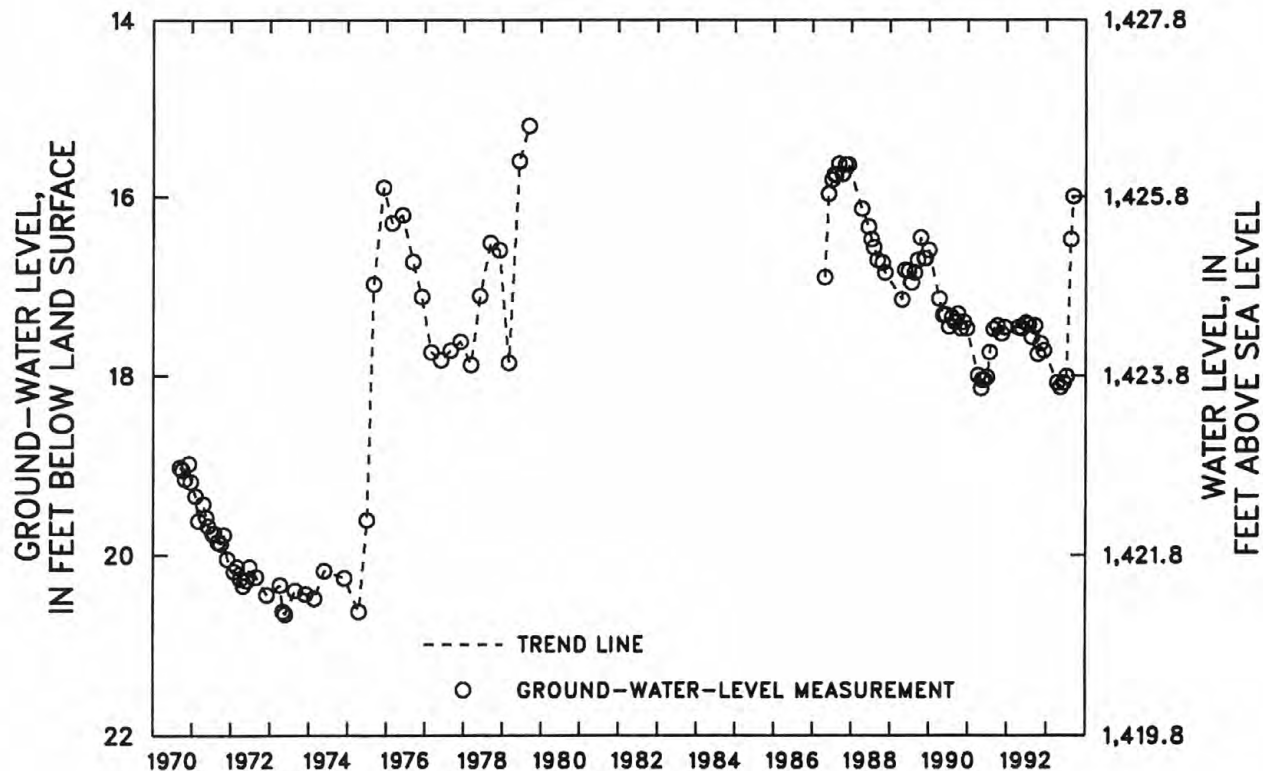
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.20 ft below land-surface datum, Sept. 6, 1979;

lowest measured, 20.67 ft below land-surface datum, May 28, 1973.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	17.76	APR 14	18.08	JUNE 11	18.08	AUG 17	16.48
NOV 9	17.64	MAY 12	18.13	JULY 8	18.01	SEPT 9	16.00
DEC 9	17.72						

137-062-26DDD



TRAILL COUNTY

473228097051501. Local number, 147-051-22BBB.

LOCATION.--Lat 47°32'28", long 097°05'15", Hydrologic Unit 09020301.

Owner: North Dakota State Water Commission.

AQUIFER.--Hillsboro.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 103 ft, cased to 97 ft, plastic pipe, No. 18 slot screen set 97 to 100 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 925 ft. Measuring point: Top of casing 2.40 ft above land-surface datum.

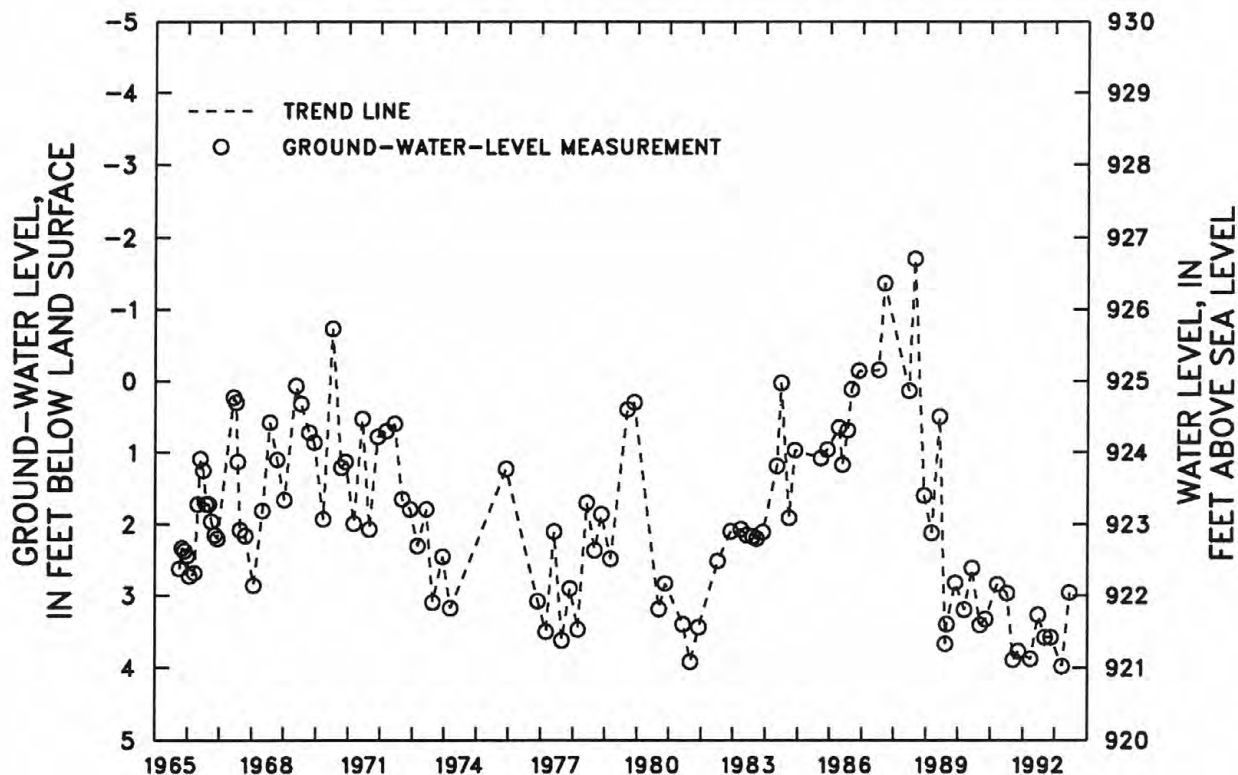
PERIOD OF RECORD.--August 1965 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +1.70 ft above land-surface datum, Aug. 24, 1988; lowest measured, 3.98 ft below land-surface datum, Mar. 23, 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	3.58	MAR 23	3.98	JUNE 16	2.96

147-051-22BBB



WALSH COUNTY

481657097473601. Local number, 156-056-36CCC1.

LOCATION.--Lat 48°16'57", long 097°47'36", Hydrologic Unit 09020308.

Owner: North Dakota State Water Commission.

AQUIFER.--Fordville.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 280 ft, cased to 27 ft, plastic pipe, No. 18 slot screen set 27 to 30 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,145 ft. Measuring point: Top of casing 1.85 ft above land-surface datum.

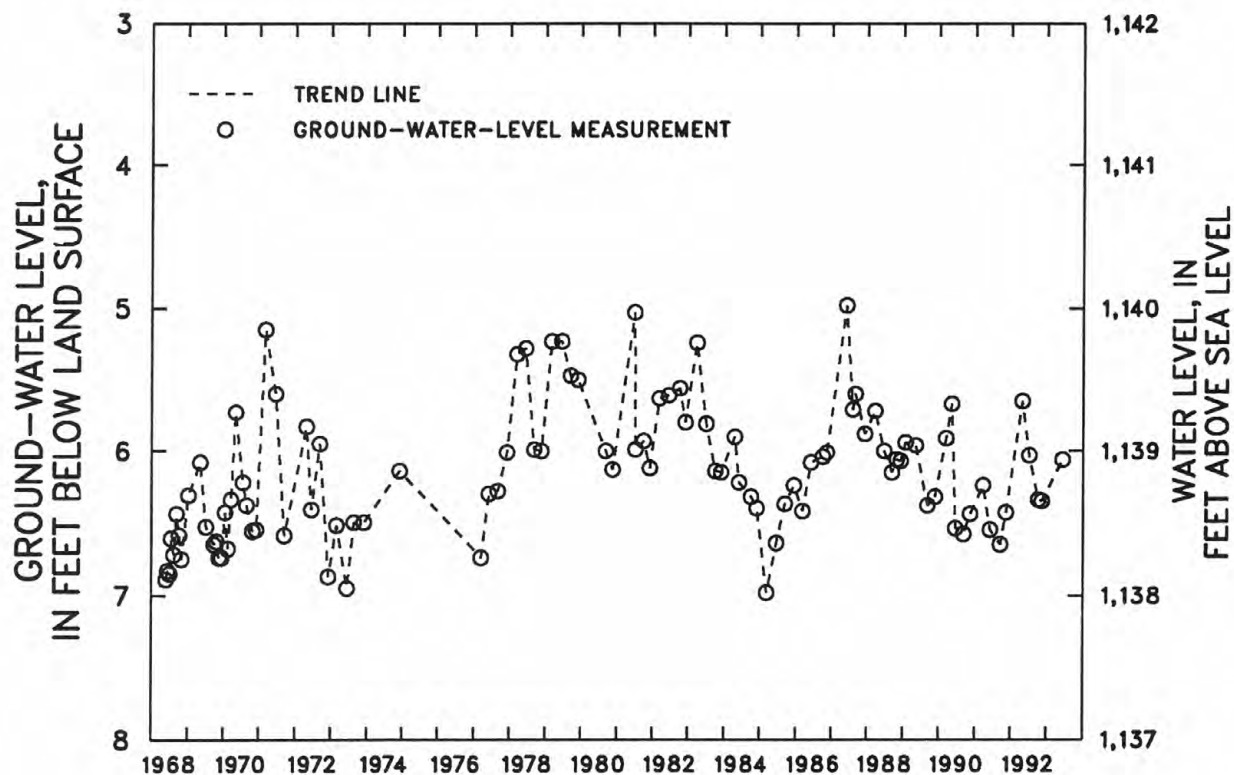
PERIOD OF RECORD.--May 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.98 ft below land-surface datum, June 3, 1987; lowest measured, 6.98 ft below land-surface datum, Mar. 11, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	6.34	NOV 11	6.35	JUNE 9	6.06

156-056-36CCC1



WALSH COUNTY

482408097443201. Local number, 157-055-21DBC.

LOCATION.--Lat 48°24'08", long 097°44'32", Hydrologic Unit 09020301.

Owner: North Dakota State Water Commission.

AQUIFER.--Dakota Formation.

WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 496 ft, cased to 491 ft, steel pipe, screen set 491 to 496 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

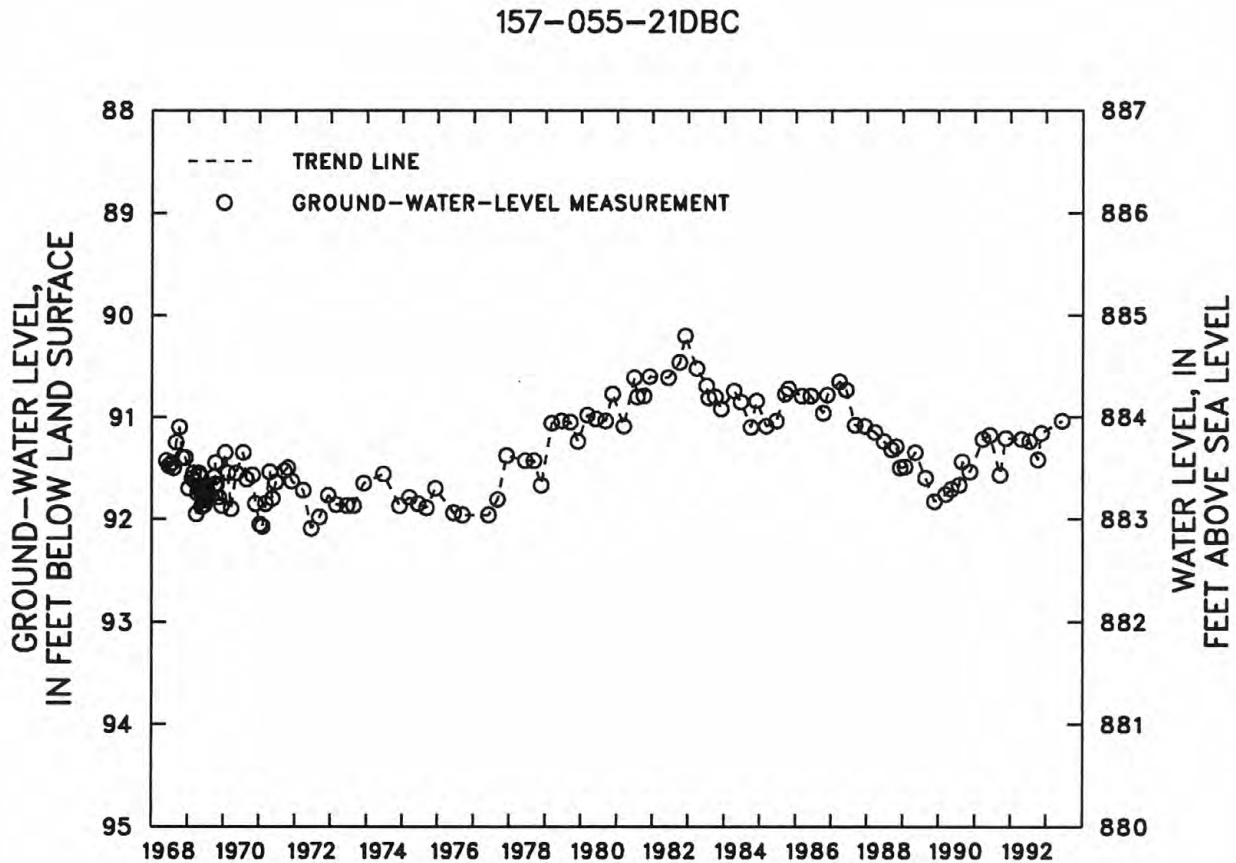
DATUM.--Altitude of land-surface datum is 975 ft. Measuring point: Top of casing at land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 90.20 ft below land-surface datum, Nov. 30, 1982; lowest measured, 92.09 ft below land-surface datum, June 15, 1972.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	91.42	NOV 11	91.16	JUNE 9	91.04



WALSH COUNTY

482449098095801. Local number, 157-058-18DDD.

LOCATION.--Lat 48°24'49", long 098°09'58", Hydrologic Unit 09020308.

Owner: North Dakota State Water Commission.

AQUIFER.--Pierre Shale.

WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 140 ft, cased to 80 ft, plastic pipe, slotted screen set 80 to 100 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,580 ft. Measuring point: Top of casing 1.00 ft above land-surface datum.

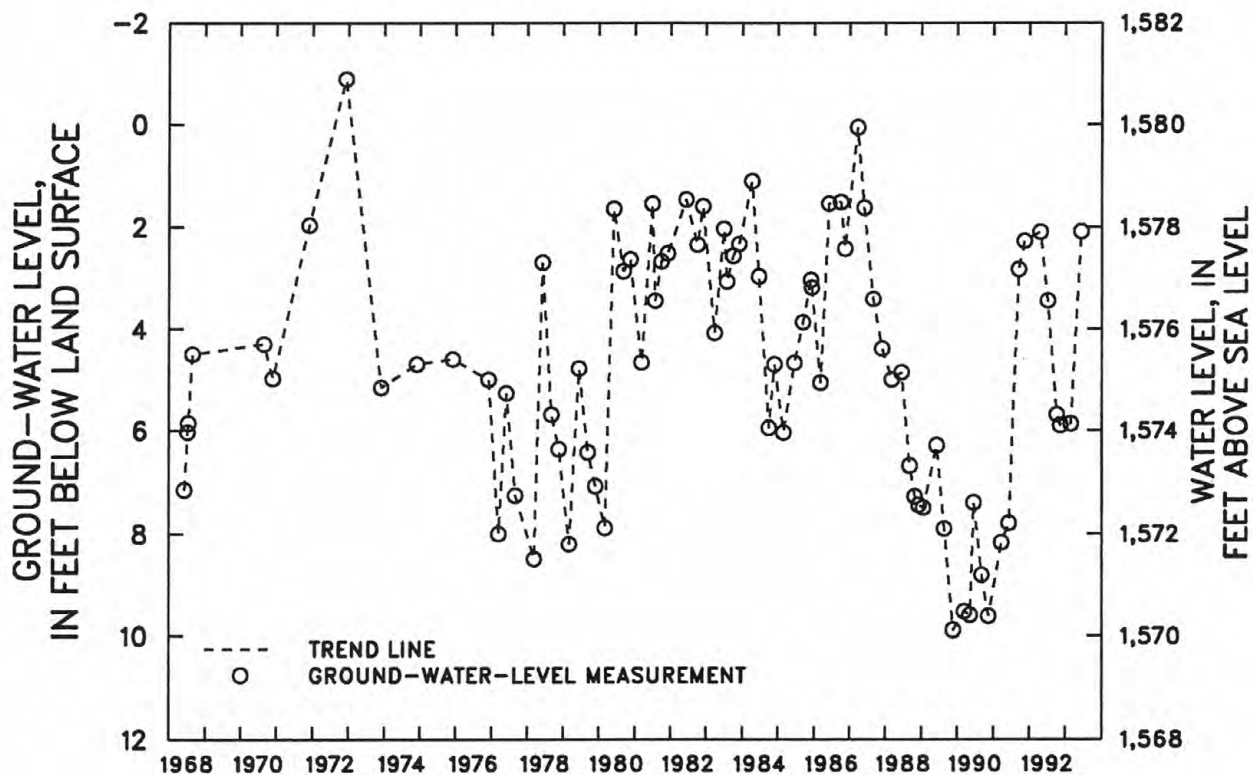
PERIOD OF RECORD.--June 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.89 ft above land-surface datum, Dec. 5, 1972; lowest measured, 9.89 ft below land-surface datum, Nov. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	5.69	NOV 11	5.90	FEB 24	5.87	JUNE 9	2.09

157-058-18DDD



WARD COUNTY

480912101090301. Local number, 154-082-24ABA.

LOCATION.--Lat 48°09'12", long 101°09'03", Hydrologic Unit 09010001.

Owner: North Dakota State Water Commission.

AQUIFER.--Lower Souris.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 115 ft, cased to 10 ft, plastic pipe, slotted screen set 10 to 40 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,850 ft. Measuring point: Top of casing 1.70 ft above land-surface datum.

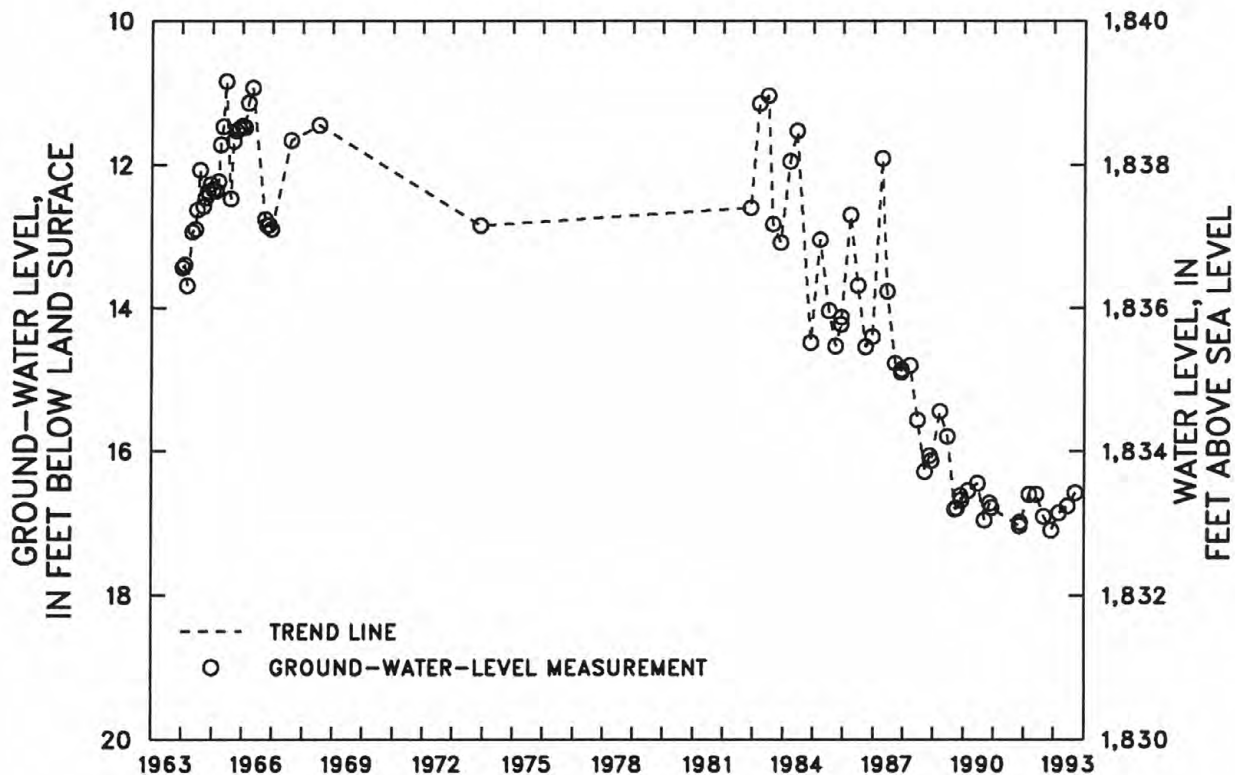
PERIOD OF RECORD.--January 1964 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.84 ft below land-surface datum, June 17, 1965; lowest measured, 17.08 ft below land-surface datum, Dec. 3, 1992.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 3	17.08	MAR 7	16.84	JUNE 17	16.75	SEPT 18	16.57

154-082-24ABA



WELLS COUNTY

474419099371201. Local number, 149-070-09DAA1.

LOCATION.--Lat 47°44'19", long 099°37'12", Hydrologic Unit 10160001.

Owner: North Dakota State Water Commission.

AQUIFER.--New Rockford.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 283 ft, cased to 177 ft, plastic pipe, slotted 177 to 197 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,613.1 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.

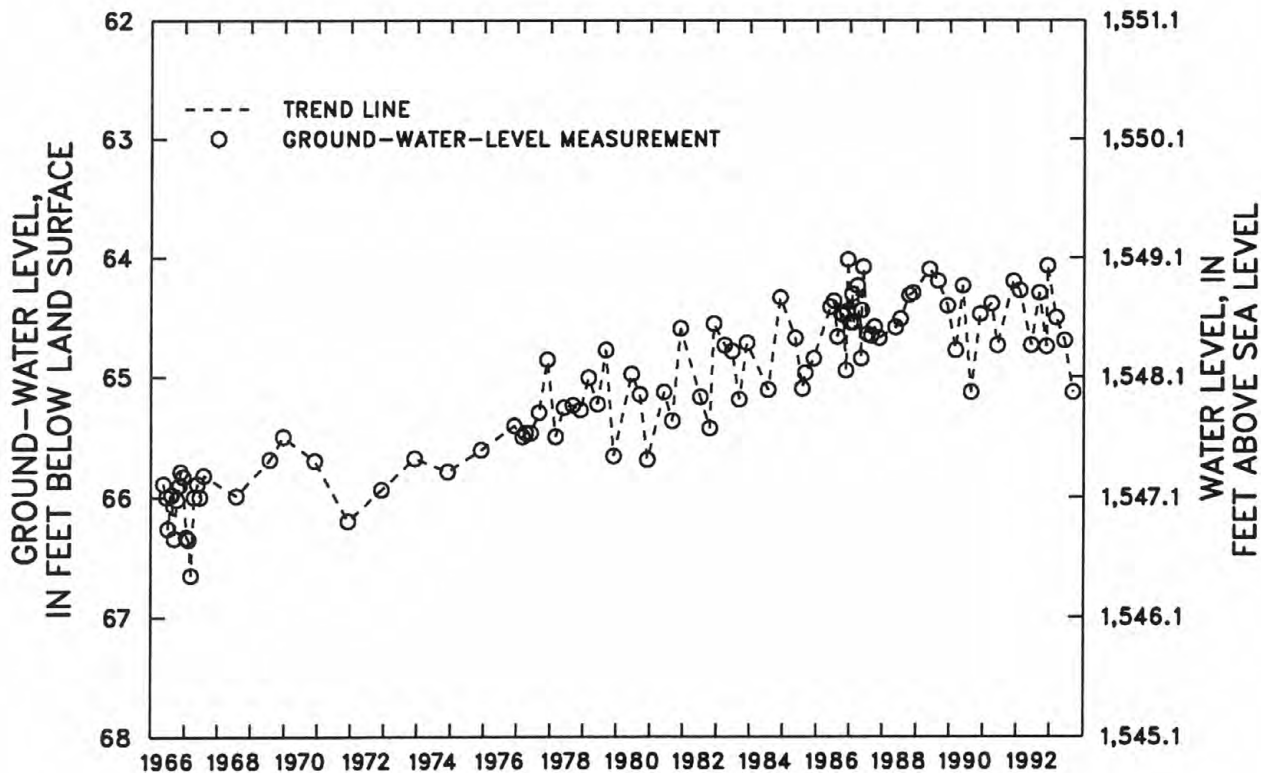
PERIOD OF RECORD.--May 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 64.02 ft below land-surface datum, Dec. 10, 1986; lowest measured, 66.65 ft below land-surface datum, Mar. 15, 1967.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	64.75	MAR 7	64.51	JUNE 6	64.70	SEPT 6	65.13
DEC 1	64.07						

149-070-09DAA1



WILLIAMS COUNTY

483048103373101. Local number, 158-100-17ADA.

LOCATION.--Lat 48°30'48", long 103°37'31", Hydrologic Unit 10110102.

Owner: North Dakota State Water Commission.

AQUIFER.--Little Muddy.

WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 52 ft, cased to 35 ft, plastic pipe, slotted 35 to 43 ft below land-surface datum.

INSTRUMENTATION.--Measured quarterly using a steel tape.

DATUM.--Altitude of land-surface datum is 1,987 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.

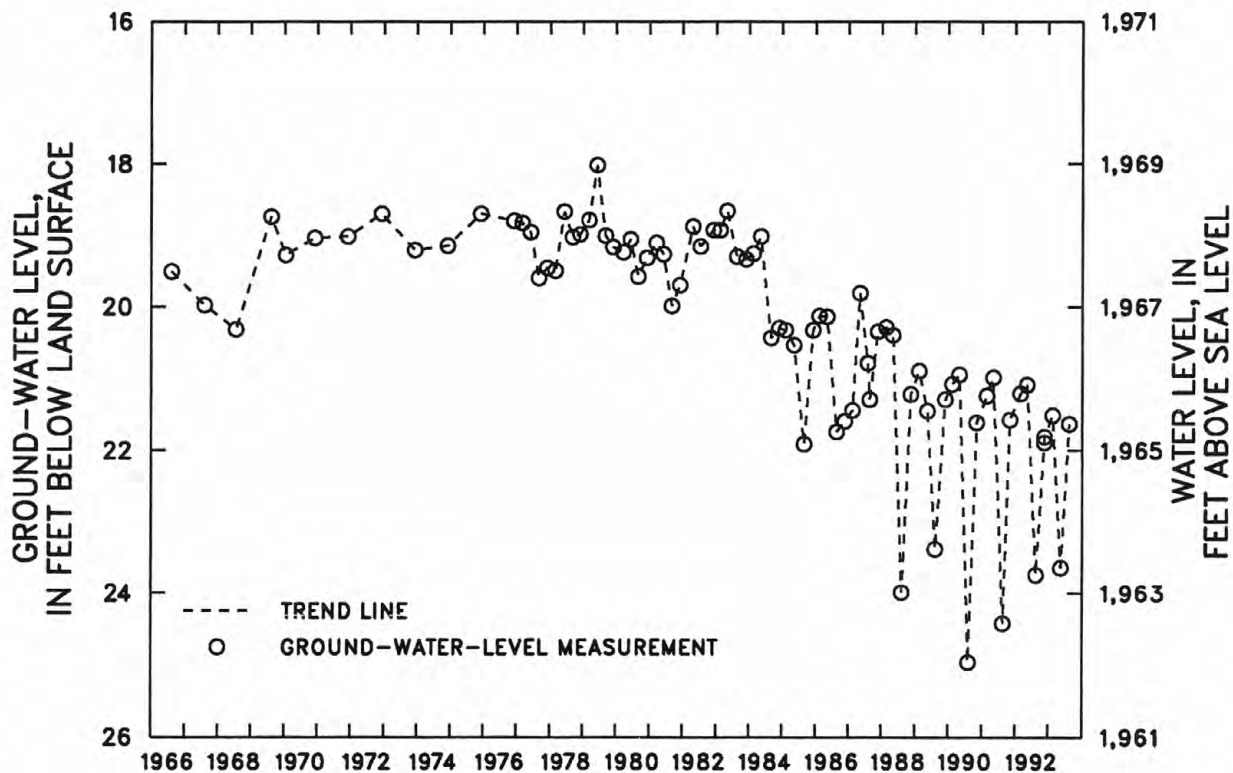
PERIOD OF RECORD.--August 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.02 ft below land-surface datum, June 5, 1979; lowest measured, 24.96 ft below land-surface datum, Aug. 8, 1990.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	21.89	FEB 15	21.51	MAY 15	23.64	AUG 15	21.63
NOV 19	21.81						

158-100-17ADA



QUALITY OF GROUND WATER

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

STATION	NUMBER	LOCAL IDENT- I- FIER	GEO- LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)
ADAMS COUNTY									
460056102061002	129-091-07AAA2		125LDLW	08-09-93	--	92.52	186.00	2630	2510
461130102122601	131-092-05DDD		125TGRV	08-10-93	--	73.20	125.00	2810	2680
460908102282702	131-094-20CBC2		125LHCK	08-10-93	--	85.57	537.00	1710	1660
BOWMAN COUNTY									
460705103041101	130-099-04BAA		125TRVL	08-12-93	1200	15.00	47.00	4780	4870
460856103024401	131-099-22DCC1		125HRMN	08-12-93	1200	48.27	76.00	5330	5740
DUNN COUNTY									
471514102390401	144-095-36AAA		112BGFV	08-04-93	--	8.59	161.00	2250	2170
EMMONS COUNTY									
460144100070202	130-075-31DCC2		112BDVL	09-15-93	--	83.15	184.00	1710	1630
460658100340201	130-079-04AAA		112TRRC	09-16-93	--	31.97	124.00	1800	1710
460658100350701	130-079-04BBB		--	09-16-93	--	31.50	143.00	1830	1740
461100100040301	131-075-09ADA		--	09-21-93	--	29.59	253.00	2680	2580
461306100200801	132-077-29DDD		112SBRG	09-16-93	--	48.55	68.00	1010	992
462539100061101	134-075-15BBB		211FXHL	09-16-93	--	57.82	103.00	940	926
463608100034601	136-075-14AAA		211FXHL	09-16-93	--	30.90	113.00	660	638
463429100233702	136-077-29BBB2		--	09-21-93	--	18.37	176.00	1030	1010
463748100323001	136-078-06BCB		112BGFV	09-15-93	--	24.25	144.00	1690	1590
GRAND FORKS COUNTY									
474444097195601	149-052-05DCC		112LCSR	07-07-93	1200	1.50	15.00	1330	1290
HETTINGER COUNTY									
462216102090801	134-091-32CCC		125TRVL	08-16-93	1200	51.34	478.00	1830	1890
462429102191001	134-093-23ADD		125TGRV	08-16-93	1200	127.92	263.00	1550	1520
463153102521001	135-097-04DCA		211FXHL	08-09-93	--	144.70	1320	2180	2110
LOGAN COUNTY									
463519099521501	136-073-16CCC1		112NPLN	09-23-93	--	20.00	195.00	900	907
463519099521502	136-073-16CCC2		112NPLN	09-23-93	--	18.08	137.00	790	764
463353099494401	136-073-26CBB1		112NPLN	09-23-93	--	8.75	160.00	980	934
463353099494402	136-073-26CBB2		112NPLN	09-23-93	--	10.25	94.00	770	750
463240099483801	136-073-35DDD1		112NPLN	09-23-93	--	33.25	171.00	1240	1200
463240099483802	136-073-35DDD2		112NPLN	09-23-93	--	37.07	121.00	980	951
MCKENZIE COUNTY									
475452103570101	151-104-11ADD		112TRNN	08-31-93	1300	8.15	25.00	1300	1210
SLOPE COUNTY									
462000103555602	133-106-13ADB2		211HCFH	08-04-93	1200	42.60	229.00	2450	2390
462000103555603	133-106-13ADB3		211HCFH	08-04-93	--	65.10	94.00	2350	2230
TRAILL COUNTY									
472958097080801	147-051-34DDD1		112BECH	07-08-93	--	9.35	120.00	4430	4280
WILLIAMS COUNTY									
480124103485901	152-103-01BBB		112TRNN	08-23-93	1303	1.93	110.00	1870	1740
475944103541601	152-103-07DDD		111ALVM	08-23-93	1533	1.34	153.00	1480	1390
475904103531801	152-103-17DBD		--	08-23-93	1629	1.60	--	--	728
481457103025301	155-096-17ADC		112BDVL	09-01-93	1200	11.47	141.00	--	2050
481702103063701	155-097-02AAA		125SNLB	09-01-93	1200	63.00	108.00	2040	2020

QUALITY OF GROUND WATER

439

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

STATION	NUMBER	DATE	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	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 PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
ADAMS COUNTY											
460056102061002	08-09-93	--	8.5	35	9.0	3.0	580	97	43	3.9	
461130102122601	08-10-93	--	8.4	59	15	5.0	610	95	35	6.4	
460908102282702	08-10-93	--	8.8	21	5.0	2.0	420	97	40	2.3	
BOWMAN COUNTY											
460705103041101	08-12-93	7.7	8.0	970	170	130	910	67	13	20	
460856103024401	08-12-93	7.5	7.9	1600	300	200	970	57	11	21	
DUNN COUNTY											
471514102390401	08-04-93	--	8.1	360	72	43	400	70	9	12	
EMMONS COUNTY											
460144100070202	09-15-93	7.6	7.6	750	150	90	170	33	3	14	
460658100340201	09-16-93	8.0	8.0	350	84	34	310	65	7	10	
460658100350701	09-16-93	8.0	8.0	180	21	30	330	79	11	11	
461100100040301	09-21-93	8.0	7.9	450	91	54	500	69	10	23	
461306100200801	09-16-93	8.2	8.2	280	62	29	140	52	4	9.3	
462539100061101	09-16-93	8.3	8.1	130	28	14	170	72	7	11	
463608100034601	09-16-93	7.8	7.8	280	83	18	28	17	0.7	15	
463429100233702	09-21-93	8.3	8.1	250	61	23	160	58	4	7.0	
463748100323001	09-15-93	8.2	8.1	220	53	20	330	76	10	7.4	
GRAND FORKS COUNTY											
474444097195601	07-07-93	--	7.8	770	200	65	12	3	0.2	9.8	
HETTINGER COUNTY											
462216102090801	08-16-93	8.4	8.6	17	5.0	1.0	490	98	52	2.3	
462429102191001	08-16-93	--	8.7	24	6.0	2.0	380	97	34	2.5	
463153102521001	08-09-93	--	8.9	20	6.0	1.0	530	98	53	2.0	
LOGAN COUNTY											
463519099521501	09-23-93	--	9.0	82	6.5	16	190	81	9	9.9	
463519099521502	09-23-93	8.1	8.1	320	82	27	52	26	1	9.9	
463353099494401	09-23-93	8.0	8.1	170	33	22	170	67	6	8.5	
463353099494402	09-23-93	8.0	8.0	370	100	30	29	14	0.7	7.4	
463240099483801	09-23-93	8.2	8.2	320	65	39	180	54	4	9.6	
463240099483802	09-23-93	7.9	7.9	340	84	32	100	38	2	8.4	
MCKENZIE COUNTY											
475452103570101	08-31-93	7.4	8.0	550	100	72	110	30	2	6.4	
SLOPE COUNTY											
462000103555602	08-04-93	--	8.7	24	6.0	2.0	570	98	51	1.9	
462000103555603	08-04-93	--	8.6	24	6.0	2.0	540	98	49	1.8	
TRAILL COUNTY											
472958097080801	07-08-93	--	7.9	700	170	65	690	68	11	24	
WILLIAMS COUNTY											
480124103485901	08-23-93	7.5	7.8	740	180	71	170	33	3	11	
475944103541601	08-23-93	7.7	7.9	500	120	49	160	40	3	11	
475904103531801	08-23-93	--	8.1	280	72	24	53	29	1	5.9	
481457103025301	09-01-93	--	8.0	500	77	74	330	59	6	9.8	
481702103063701	09-01-93	7.9	7.8	810	160	100	220	37	3	12	

QUALITY OF GROUND WATER

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

STATION	NUMBER	DATE	ALKA- LINTY 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 AS (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER AS AS) (01000)	ARSENIC DIS- SOLVED (UG/L)
ADAMS COUNTY											
460056102061002		08-09-93	384	920	7.0	1.1	6.9	1740	1760	2.37	<1
461130102122601		08-10-93	411	920	10	0.90	7.1	1880	1820	2.56	<1
460908102282702		08-10-93	843	120	12	5.0	7.4	1060	1080	1.44	<1
BOWMAN COUNTY											
460705103041101		08-12-93	307	2600	15	0.10	13	4120	4050	5.60	<1
460856103024401		08-12-93	540	3000	41	0.30	8.5	5120	4870	6.96	<1
DUNN COUNTY											
471514102390401		08-04-93	551	710	47	0.60	20	1650	1640	2.24	<1
EMMONS COUNTY											
460144100070202		09-15-93	960	87	15	0.20	26	944	1130	1.28	<1
460658100340201		09-16-93	674	350	11	0.30	32	1190	1240	1.62	<1
460658100350701		09-16-93	658	370	10	0.20	32	1210	1200	1.65	1
461100100040301		09-21-93	774	650	92	0.10	19	1760	1900	2.39	<1
461306100200801		09-16-93	464	120	8.0	0.20	27	640	675	0.87	2
462539100061101		09-16-93	376	150	5.4	0.30	41	640	646	0.87	2
463608100034601		09-16-93	349	24	5.2	0.10	28	428	416	0.58	4
463429100233702		09-21-93	458	150	2.9	0.40	28	695	708	0.95	20
463748100323001		09-15-93	623	300	19	0.40	20	958	1130	1.30	1
GRAND FORKS COUNTY											
474444097195601		07-07-93	524	280	8.3	0.10	24	901	915	1.23	<1
HETTINGER COUNTY											
462216102090801		08-16-93	1080	8.6	40	3.1	9.9	1200	1210	1.63	<1
462429102191001		08-16-93	757	260	14	3.5	29	1190	1150	1.62	2
463153102521001		08-09-93	940	110	110	4.2	4.4	1310	1330	1.78	<1
LOGAN COUNTY											
463519099521501		09-23-93	402	88	14	0.40	5.1	569	572	0.77	<1
463519099521502		09-23-93	335	100	5.0	0.20	27	484	506	0.66	<1
463353099494401		09-23-93	443	92	13	0.50	15	603	621	0.82	<1
463353099494402		09-23-93	362	88	3.0	0.20	27	456	504	0.62	<1
463240099483801		09-23-93	485	200	23	0.40	24	813	835	1.11	1
463240099483802		09-23-93	449	120	4.7	0.10	26	602	647	0.82	<1
MCKENZIE COUNTY											
475452103570101		08-31-93	478	230	14	0.10	20	874	843	1.19	3
SLOPE COUNTY											
462000103555602		08-04-93	623	660	9.3	0.20	8.8	1610	1630	2.19	<1
462000103555603		08-04-93	703	540	4.7	0.20	9.9	1470	1530	2.00	<1
TRAILL COUNTY											
472958097080801		07-08-93	230	1200	650	1.1	25	2960	2970	4.03	1
WILLIAMS COUNTY											
480124103485901		08-23-93	598	460	8.9	0.30	24	1210	1290	1.65	3
475944103541601		08-23-93	568	250	13	0.40	30	927	976	1.26	--
475904103531801		08-23-93	199	190	13	0.40	23	498	502	0.68	6
481457103025301		09-01-93	549	640	12	0.20	27	1510	1500	2.05	1
481702103063701		09-01-93	651	580	6.5	0.20	16	1440	1490	1.96	4

QUALITY OF GROUND WATER

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

STATION	NUMBER	DATE	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	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)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)
ADAMS COUNTY											
460056102061002	08-09-93	1100	10	<1	60	40	0.1	1	<1	520	
461130102122601	08-10-93	600	20	<1	60	80	0.1	2	<1	550	
460908102282702	08-10-93	1400	60	<1	40	30	0.1	7	<1	320	
BOWMAN COUNTY											
460705103041101	08-12-93	2900	20	<1	280	680	0.1	<1	2	5000	
460856103024401	08-12-93	830	50	13	130	90	0.1	<1	3	7200	
DUNN COUNTY											
471514102390401	08-04-93	430	20	<1	50	20	<0.1	2	<1	1300	
EMMONS COUNTY											
460144100070202	09-15-93	210	20	<1	50	300	0.1	<1	<1	1500	
460658100340201	09-16-93	1100	10	<1	280	60	0.1	<1	<1	780	
460658100350701	09-16-93	980	10	<1	400	<10	<0.1	<1	<1	460	
461100100040301	09-21-93	1500	10	<1	420	230	0.1	1	1	850	
461306100200801	09-16-93	480	10	<1	120	150	0.1	2	<1	640	
462539100061101	09-16-93	610	90	<1	180	110	<0.1	1	<1	230	
463608100034601	09-16-93	100	90	<1	40	4400	0.1	1	<1	310	
463429100233702	09-21-93	370	10	1	110	510	<0.1	<1	<1	550	
463748100323001	09-15-93	1200	20	<1	110	350	0.1	4	<1	530	
GRAND FORKS COUNTY											
474444097195601	07-07-93	70	20	<1	40	920	<0.1	<1	1	770	
HETTINGER COUNTY											
462216102090801	08-16-93	1800	30	1	50	10	0.1	16	<1	270	
462429102191001	08-16-93	1000	660	8	30	20	<0.1	16	<1	270	
463153102521001	08-09-93	1500	90	1	60	10	0.1	8	<1	420	
LOGAN COUNTY											
463519099521501	09-23-93	640	60	<1	120	20	<0.1	10	<1	220	
463519099521502	09-23-93	340	10	<1	90	1100	<0.1	<1	<1	600	
463353099494401	09-23-93	700	10	<1	110	470	<0.1	<1	<1	450	
463353099494402	09-23-93	210	10	<1	60	1400	<0.1	<1	<1	700	
463240099483801	09-23-93	540	10	<1	180	1500	<0.1	<1	<1	650	
463240099483802	09-23-93	490	10	<1	100	870	<0.1	<1	<1	700	
MCKENZIE COUNTY											
475452103570101	08-31-93	330	20	<1	90	2600	0.1	<1	<1	1100	
SLOPE COUNTY											
462000103555602	08-04-93	240	150	<1	50	30	0.1	<1	<1	320	
462000103555603	08-04-93	160	30	<1	100	20	<0.1	<1	<1	270	
TRAILL COUNTY											
472958097080801	07-08-93	1700	20	<1	260	370	0.2	8	1	3000	
WILLIAMS COUNTY											
480124103485901	08-23-93	150	1400	2	70	1100	<0.1	8	<1	1600	
475944103541601	08-23-93	170	20	<1	50	120	<0.1	3	<1	1300	
475904103531801	08-23-93	140	10	<1	50	210	<0.1	4	<1	740	
481457103025301	09-01-93	310	730	<1	80	140	<0.1	<1	<1	1100	
481702103063701	09-01-93	430	30	<1	100	560	<0.1	<1	<1	1600	

CHEMICAL QUALITY OF PRECIPITATION

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND
(National Trends Network precipitation-quality station)

LOCATION.--Lat 48°47'14", long 97°44'23", in SW¹/₄/NW¹/₄/SW¹/₄, sec. 10, T.161 N., R.55 W., Pembina County, Hydrologic Unit 09020313, at Icelandic State Park 5.6 mi west of Cavalier.

PERIOD OF RECORD.--October 1983 to current year (weekly composite).

INSTRUMENTATION.--The composite sample collector is an Aerochem Metrics¹ model 301 wet/dry precipitation collector mounted on ground surface. Precipitation quantity is determined by a Belfort¹ model 5-780 recording rain gage equipped with an event recorder and an Alter-type wind screen. The recording rain gage is installed 20 ft east of the sample collector with gage mouth and collector bucket elevations of 50.75 in above land surface.

REMARKS.--Data presented are provisional analyses by the Central Analytical Laboratory of the Illinois State Water Survey and have not completed quality-assurance review by the National Atmospheric Deposition Program. Unless noted starting and ending time for composite period is 9:00 a.m. Analyses are determined from water taken from the sample collector.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

PERIOD OF COLLECTION	PRECIP- ITATION TOTAL INCHES/ WEEK (00046)	COL- LECTOR EFFI- CIENCY WET DEPOS. PERCENT (82284)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
09/29 to 10/06	0.0	--	--	a2	--	a6.0	a0.021
10/06 to 10/13	b0.0	--	--	--	--	--	--
10/13 to 10/20	0.28	118	5	4	5.3	5.5	0.118
10/20 to 10/27	b0.0	--	--	--	--	--	--
10/27 to 11/03	0.50	14	7	5	5.8	5.9	0.565
11/03 to 11/10	0.55	75	8	8	4.9	5.0	0.057
11/10 to 11/17	b0.04	<25	--	--	--	--	--
11/17 to 11/24	0.29	21	13	15	4.6	4.6	0.035
11/24 to 12/01	b0.0	--	--	--	--	--	--
12/01 to 12/08	0.03	67	--	a7	--	a6.2	a0.464
12/08 to 12/15	0.55	22	26	28	4.3	4.3	0.127
12/15 to 12/22	0.14	36	13	9	4.6	5.1	0.075
12/22 to 12/29	b0.32	<3.0	--	--	--	--	--
12/29 to 01/05	b0.24	<4.0	--	9	--	6.4	--
01/05 to 01/12	0.15	80	6	6	4.9	5.1	0.024
01/12 to 01/19	0.21	24	4	4	5.2	5.9	0.041
01/19 to 01/26	b0.0	--	--	--	--	--	--
01/26 to 02/02	<0.01	100	--	a14	--	a6.3	a<0.145
02/02 to 02/09	b0.0	--	--	--	--	--	--
02/09 to 02/16	0.04	<25	--	a15	--	a5.8	a0.145
02/16 to 02/23	b0.0	--	--	--	--	--	--
02/23 to 03/02	b0.0	--	--	--	--	--	--
03/02 to 03/09	0.03	167	9	8	4.8	5.2	0.155
03/09 to 03/16	0.27	67	5	5	5.2	5.4	0.087
03/16 to 03/23	<0.01	100	--	a17	--	a6.8	a0.278
03/23 to 03/30	b0.0	--	--	--	--	--	--
03/30 to 04/06	b0.0	--	--	--	--	--	--
04/06 to 04/13	0.08	50	29	38	5.7	6.5	1.081
04/13 to 04/20	b<0.01	100	--	66	--	7.2	--
04/20 to 04/27	b<0.01	100	--	--	--	--	--
04/27 to 05/04	0.13	92	19	21	6.6	7.0	0.507
05/04 to 05/11	2.05	98	11	11	6.4	6.6	0.160
05/11 to 05/18	0.0	--	--	a3	--	a6.3	0.125
05/18 to 05/25	0.17	88	13	15	6.4	6.8	0.538
05/25 to 06/01	0.45	111	6	6	5.5	6.1	0.136
06/01 to 06/08	1.83	102	5	4	5.4	5.8	0.106
06/08 to 06/15	2.67	100	6	7	5.7	5.9	0.143
06/15 to 06/22	0.46	89	5	5	5.6	5.5	0.078
06/22 to 06/29	1.62	96	5	5	5.9	5.9	0.153
06/29 to 07/06	1.01	95	6	6	6.2	5.3	0.077
07/06 to 07/13	0.22	109	9	7	6.0	5.5	0.175
07/13 to 07/20	0.60	108	6	6	6.2	6.0	0.116
07/20 to 07/26	4.75	93	10	8	--	5.1	0.047
07/26 to 08/03	--	--	4	5	--	5.7	0.046
08/03 to 08/10	1.55	101	6	7	5.8	6.1	0.133
08/10 to 08/17	0.70	106	6	7	5.7	6.2	0.164
08/17 to 08/24	0.60	123	15	15	5.9	6.6	0.384
08/24 to 08/31	0.86	101	--	8	--	6.4	0.166
08/31 to 09/07	0.25	116	6	6	5.4	6.2	0.179
09/07 to 09/14	0.12	83	10	15	6.4	6.9	1.041
09/14 to 09/21	b0.0	--	--	--	--	--	--
09/21 to 09/28	0.07	86	14	18	6.3	6.6	0.831

1 The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

a To provide for an adequate sample, 50 milliliters of dilution water was added.

b Trace of water collected in field sampler.

CHEMICAL QUALITY OF PRECIPITATION

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RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND--CONTINUED
(National Trends Network precipitation-quality station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

PERIOD OF COLLECTION	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 N) (00618)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)
09/29 to 10/06	a0.004	a0.033	a0.005	a0.03	a<0.03	a0.010	a<0.020	a<0.007
10/06 to 10/13	--	--	--	--	--	--	--	--
10/13 to 10/20	0.030	0.020	0.015	0.43	0.04	0.080	0.110	<0.007
10/20 to 10/27	--	--	--	--	--	--	--	--
10/27 to 11/03	0.170	0.084	0.093	0.70	0.17	0.150	0.190	<0.007
11/03 to 11/10	0.005	0.032	0.011	0.63	0.04	0.250	0.260	<0.007
11/10 to 11/17	--	--	--	--	--	--	--	--
11/17 to 11/24	0.008	0.265	0.120	0.99	0.41	0.410	0.260	0.013
11/24 to 12/01	--	--	--	--	--	--	--	--
12/01 to 12/08	a0.182	a1.458	a0.100	a1.82	a0.69	a0.560	a0.640	a<0.023
12/08 to 12/15	0.026	0.075	0.023	1.74	0.13	0.720	0.280	<0.007
12/15 to 12/22	0.190	0.047	0.019	0.26	0.09	0.500	<0.020	<0.007
12/22 to 12/29	--	--	--	--	--	--	--	--
12/29 to 01/05	--	--	--	--	--	--	--	--
01/05 to 01/12	0.015	0.015	0.003	0.17	0.04	0.180	<0.020	<0.007
01/12 to 01/19	0.007	0.037	0.006	0.23	0.06	0.090	0.040	<0.007
01/19 to 01/26	--	--	--	--	--	--	--	--
01/26 to 02/02	a0.065	a0.468	a<0.048	a0.65	a<0.48	a0.220	a0.250	a<0.108
02/02 to 02/09	--	--	--	--	--	--	--	--
02/09 to 02/16	a0.036	a0.225	a<0.022	a0.73	a0.29	a0.250	a0.110	a<0.048
02/16 to 02/23	--	--	--	--	--	--	--	--
02/23 to 03/02	--	--	--	--	--	--	--	--
03/02 to 03/09	0.032	0.088	0.011	0.70	0.09	0.200	0.190	<0.007
03/09 to 03/16	0.021	0.049	0.008	0.43	0.07	0.180	0.170	<0.007
03/16 to 03/23	a0.079	a0.685	a<0.030	a1.49	a0.60	a0.380	a0.470	a<0.066
03/23 to 03/30	--	--	--	--	--	--	--	--
03/30 to 04/06	--	--	--	--	--	--	--	--
04/06 to 04/13	0.326	0.150	0.064	6.36	0.19	0.970	2.15	<0.007
04/13 to 04/20	--	--	--	--	--	--	--	--
04/20 to 04/27	--	--	--	--	--	--	--	--
04/27 to 05/04	0.097	0.087	0.036	1.51	0.11	0.490	1.40	<0.007
05/04 to 05/11	0.034	0.029	0.030	0.95	0.03	0.290	0.960	<0.007
05/11 to 05/18	a0.021	a0.031	a0.008	a0.03	a<0.03	a0.010	a<0.020	a0.010
05/18 to 05/25	0.171	0.044	0.031	1.49	0.07	0.240	0.840	<0.007
05/25 to 06/01	0.033	0.017	0.013	0.71	0.03	0.140	0.260	<0.007
06/01 to 06/08	0.026	0.016	0.016	0.33	<0.03	0.120	0.190	<0.007
06/08 to 06/15	0.030	0.024	0.061	0.68	0.06	0.170	0.020	<0.007
06/15 to 06/22	0.022	0.032	0.034	0.49	0.05	0.180	0.190	<0.007
06/22 to 06/29	0.034	0.020	0.021	0.52	0.05	0.200	0.300	<0.007
06/29 to 07/06	0.016	0.025	0.017	0.63	0.03	0.160	0.160	0.010
07/06 to 07/13	0.048	0.092	0.047	1.09	0.11	0.210	0.170	<0.007
07/13 to 07/20	0.033	0.075	0.022	0.69	0.10	0.200	0.260	<0.007
07/20 to 07/26	0.013	0.015	0.010	0.89	0.04	0.180	0.260	<0.007
07/26 to 08/03	0.010	0.043	0.018	0.53	0.06	0.100	0.270	<0.007
08/03 to 08/10	0.031	0.061	0.022	0.70	0.08	0.210	0.430	<0.007
08/10 to 08/17	0.034	0.045	0.035	0.65	0.06	0.230	0.410	<0.007
08/17 to 08/24	0.081	0.057	0.079	1.40	0.10	0.470	1.00	<0.007
08/24 to 08/31	0.039	0.067	0.048	0.80	0.08	0.200	0.470	<0.007
08/31 to 09/07	0.038	0.070	0.047	0.70	0.06	0.150	0.330	<0.007
09/07 to 09/14	0.257	0.165	0.150	1.00	0.13	0.180	0.370	<0.007
09/14 to 09/21	--	--	--	--	--	--	--	--
09/21 to 09/28	0.230	0.299	0.367	2.35	0.38	0.440	0.690	0.013

a To provide for an adequate sample, 50 milliliters of dilution water was added.

CHEMICAL QUALITY OF PRECIPITATION

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND
(National Trends Network precipitation-quality station)

LOCATION.--Lat 47°14'32", long 99°14'02", in SE¹/₄SW¹/₄, sec.12, T.142 N., R.68 W., Stutsman County, Hydrologic Unit 10160002, at U.S. Fish and Wildlife Service Northern Prairie Wildlife Research Center, at Woodworth Experiment Station 2.8 mi east and 1 mi south of Woodworth.

PERIOD OF RECORD.--November 1983 to current year (weekly composite).

INSTRUMENTATION.--The composite sample collector is an Aerochem Metrics¹ model 301 wet/dry precipitation collector mounted on ground surface. Precipitation quantity is determined by a Belfort¹ model 5-780 recording rain gage equipped with an event recorder and an Alter-type wind screen. The recording rain gage is installed 17 ft east of the sample collector with gage mouth and collector bucket elevations of 50.75 in above land surface.

REMARKS.--The station is located 300 ft west of an event sample-collection station which was operated by the North Dakota State Health Department (station discontinued 1987). Continuously recording meteorological instrumentation for air temperature, wind speed, and wind direction were installed 9.8 ft above land surface at the event station. Data presented are provisional analyses by the Central Analytical Laboratory of the Illinois State Water Survey and have not completed quality-assurance review by the National Atmospheric Deposition Program. Unless noted starting and ending time for composite periods is 9:00 a.m. Analyses are determined from water taken from the sample collector.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

PERIOD OF COLLECTION	PRECIP- TOTAL INCHES/ WEEK (00046)	COL- LECTOR EFFI- CIENCY WET DEPOS. PERCENT (82284)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (90095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
09/29 to 10/06	0.0	--	--	a2	--	a6.0	a0.035
10/06 to 10/13	0.0	--	--	--	--	--	--
10/13 to 10/20	0.05	80	--	10	--	6.3	0.245
10/20 to 10/27	0.0	--	--	a2	--	a6.1	a0.037
10/27 to 11/03	--	--	--	6	--	5.3	0.060
11/03 to 11/10	0.25	52	15	13	4.7	4.8	0.089
11/10 to 11/17	--	--	--	--	--	--	--
11/17 to 11/24	b0.05	>20	--	18	--	5.7	--
11/24 to 12/01	0.0	--	--	a2	--	a6.1	a0.235
12/01 to 12/08	0.0	--	--	--	--	--	--
12/08 to 12/15	b0.05	>20	--	47	--	5.3	--
12/15 to 12/22	0.04	50	--	a10	--	a5.3	a0.251
12/22 to 12/29	0.07	57	41	65	6.4	7.2	7.56
12/29 to 01/05	0.0	--	--	a2	--	a6.0	a0.032
01/05 to 01/12	b0.05	20	--	19	--	6.9	--
01/12 to 01/19	b0.03	<33	--	--	--	--	--
01/19 to 01/26	0.05	60	--	6	--	5.5	0.096
01/26 to 02/02	0.0	--	--	a2	--	a6.1	a<0.009
02/02 to 02/09	b0.0	--	--	--	--	--	--
02/09 to 02/16	0.10	20	--	a4	--	a5.8	a0.053
02/16 to 02/23	0.0	--	--	a2	--	a5.8	a0.026
02/23 to 03/02	0.0	--	--	a2	--	a5.7	a0.011
03/02 to 03/09	b0.02	<50	--	16	--	6.6	--
03/09 to 03/16	0.13	--	--	a22	--	a5.2	a0.215
03/16 to 03/23	0.03	167	5	6	5.4	6.3	0.129
03/23 to 03/30	0.05	100	57	38	4.2	4.5	0.148
03/30 to 04/06	0.05	20	--	a23	--	a5.9	a0.366
04/06 to 04/13	0.25	124	9	9	4.8	5.1	0.092
04/13 to 04/20	b0.0	--	--	--	--	--	--
04/20 to 04/27	0.31	90	19	15	5.6	6.4	0.604
04/27 to 05/04	0.08	200	12	12	6.0	6.5	0.148
05/04 to 05/11	2.40	101	7	5	6.4	6.0	0.070
05/11 to 05/18	0.05	60	--	25	--	7.0	0.892
05/18 to 05/25	0.60	108	16	13	6.2	6.6	0.492
05/25 to 06/01	1.31	105	11	8	5.8	6.1	0.224
06/01 to 06/08	--	--	7	6	5.5	5.8	0.150
06/08 to 06/15	0.95	99	4	4	5.7	5.6	0.057
06/15 to 06/22	0.20	140	11	11	6.5	6.4	0.272
06/22 to 06/29	2.38	100	6	6	5.8	5.9	0.133
06/29 to 07/06	3.08	89	5	5	6.1	5.7	0.071
07/06 to 07/13	0.98	104	9	8	5.9	5.3	0.104
07/13 to 07/20	4.95	101	5	5	5.9	5.3	0.041
07/20 to 07/27	2.16	105	6	5	7.1	5.8	0.115
07/27 to 08/03	0.09	33	--	124	--	7.5	3.84
08/03 to 08/10	0.0	--	--	a37	--	a6.6	a2.514
08/10 to 08/17	1.20	42	14	18	6.6	6.7	0.563
08/17 to 08/24	0.0	--	--	a10	--	a6.5	a0.708
08/24 to 08/31	1.95	--	--	a11	--	a6.6	a0.885
08/31 to 09/07	0.0	--	--	a18	--	a6.7	a1.69
09/07 to 09/14	0.0	--	--	a26	--	a7.0	a2.945
09/14 to 09/21	b0.0	--	--	--	--	7.7	--
09/21 to 09/28	b0.02	<50	--	--	--	--	--

1 The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

a To provide for an adequate sample, 50 milliliters of dilution water was added.

b Trace of water collected in field sampler.

CHEMICAL QUALITY OF PRECIPITATION

445

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

PERIOD OF COLLECTION	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 N) (00618)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)
09/29 to 10/06	a0.007	a0.068	a0.004	a0.06	a0.08	a0.030	a0.080	a<0.007
10/06 to 10/13	--	--	--	--	--	--	--	--
10/13 to 10/20	0.067	0.066	0.021	0.40	0.09	0.190	0.120	<0.007
10/20 to 10/27	a0.007	a0.044	a0.010	a<0.03	a0.05	a0.020	a<0.020	a<0.007
10/27 to 11/03	0.019	0.018	0.008	0.62	0.03	0.200	0.230	<0.007
11/03 to 11/10	0.018	0.051	0.018	1.4	0.07	0.420	0.390	<0.007
11/10 to 11/17	--	--	--	--	--	--	--	--
11/17 to 11/24	--	--	--	--	--	--	--	--
11/24 to 12/01	a0.010	a0.123	a0.014	a0.03	a0.05	a0.020	a<0.020	a<0.007
12/01 to 12/08	--	--	--	--	--	--	--	--
12/08 to 12/15	--	--	--	--	--	--	--	--
12/15 to 12/22	a0.072	a0.304	a0.016	a0.60	a0.13	a0.380	a<0.050	a<0.021
12/22 to 12/29	1.34	1.34	0.932	6.1	0.50	1.18	0.230	<0.007
12/29 to 01/05	a0.007	a0.116	a0.007	a0.06	a0.09	a0.050	a0.070	a0.010
01/05 to 01/12	--	--	--	--	--	--	--	--
01/12 to 01/19	--	--	--	--	--	--	--	--
01/19 to 01/26	0.072	0.104	0.060	0.81	0.18	0.170	0.070	<0.007
01/26 to 02/02	a<0.003	a0.091	a<0.003	a0.06	a0.08	a0.120	a0.050	a<0.007
02/02 to 02/09	--	--	--	--	--	--	--	--
02/09 to 02/16	a0.031	a0.065	a0.019	a0.28	a0.15	a0.210	a<0.050	a<0.021
02/16 to 02/23	a0.005	a0.076	a0.015	a0.04	a0.12	a0.030	a0.020	a<0.007
02/23 to 03/02	a0.003	a0.059	a0.003	a0.04	a0.07	a0.040	a0.020	a<0.007
03/02 to 03/09	--	--	--	--	--	--	--	--
03/09 to 03/16	a0.049	a0.215	a0.029	a3.07	a0.20	a0.580	a1.13	a<0.033
03/16 to 03/23	0.053	0.064	0.016	0.63	0.08	0.120	0.250	<0.007
03/23 to 03/30	0.036	0.048	0.011	6.1	0.12	0.730	0.137	<0.007
03/30 to 04/06	a0.090	a0.252	a0.067	a2.95	a0.43	a0.870	a1.00	a<0.032
04/06 to 04/13	0.016	0.021	<0.003	0.86	0.06	0.330	0.330	<0.007
04/13 to 04/20	--	--	--	--	--	--	--	--
04/20 to 04/27	0.074	0.244	0.031	2.01	0.11	0.600	0.850	<0.007
04/27 to 05/04	0.025	0.044	0.013	1.42	0.05	0.260	0.780	<0.007
05/04 to 05/11	0.012	0.033	0.012	0.50	0.04	0.140	0.330	<0.007
05/11 to 05/18	0.211	0.151	0.059	1.61	0.11	0.370	0.410	<0.007
05/18 to 05/25	0.116	0.049	0.038	1.09	0.05	0.320	0.900	<0.007
05/25 to 06/01	0.045	0.045	0.017	0.82	0.08	0.340	0.530	<0.007
06/01 to 06/08	0.020	0.035	0.019	0.69	0.05	0.170	0.350	<0.007
06/08 to 06/15	0.012	0.021	0.008	0.32	0.05	0.110	0.160	<0.007
06/15 to 06/22	0.033	0.035	0.017	1.07	0.07	0.410	0.810	<0.007
06/22 to 06/29	0.024	0.027	0.026	0.47	0.06	0.200	0.310	<0.007
06/29 to 07/06	0.012	0.026	0.013	0.52	0.03	0.160	0.230	<0.007
07/06 to 07/13	0.023	0.061	0.023	1.01	0.07	0.220	0.300	<0.007
07/13 to 07/20	0.007	0.032	0.007	0.44	0.05	0.130	0.180	<0.007
07/20 to 07/27	0.027	0.034	0.014	0.49	0.05	0.150	0.220	<0.007
07/27 to 08/03	1.04	0.712	17.0	10.11	0.52	0.910	9.50	6.63
08/03 to 08/10	a0.522	a1.80	a0.996	a3.00	a2.70	a1.01	a0.060	a0.043
08/10 to 08/17	0.145	0.146	0.339	1.40	0.22	0.460	0.730	<0.007
08/17 to 08/24	a0.150	a0.114	a0.216	a0.44	a0.22	a0.300	a0.160	a<0.007
08/24 to 08/31	a0.177	a0.163	a0.288	a0.57	a0.18	a<0.010	a<0.020	a<0.007
08/31 to 09/07	a0.286	a0.090	a0.430	a3.12	a0.12	a<0.010	a<0.020	a<0.007
09/07 to 09/14	a0.449	a0.476	a1.08	a2.45	a0.37	a0.050	a0.020	a<0.007
09/14 to 09/21	--	--	--	--	--	--	--	--
09/21 to 09/28	--	--	--	--	--	--	--	--

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b Trace of water collected in field sampler.

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	2.54×10^1	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^0	kilometer
<i>Area</i>		
acre	4.047×10^3	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi ²)	2.590×10^0	square kilometer
<i>Volume</i>		
gallon (gal)	3.785×10^0	liter
	3.785×10^0	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^3	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft ³)	2.832×10^1	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft ³ /s) d]	2.447×10^3	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^3	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft ³ /s)	2.832×10^1	liter per second
	2.832×10^1	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^1	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
<i>Mass</i>		
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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