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Water Resources Data
Iowa
Water Year 1998

Volume 2. Surface Water—Missouri River Basin, and Ground Water

By J.E. May, J.G. Gorman, R.D. Goodrich, V.E. Miller, M.J. Turco, and S.M. Linhart

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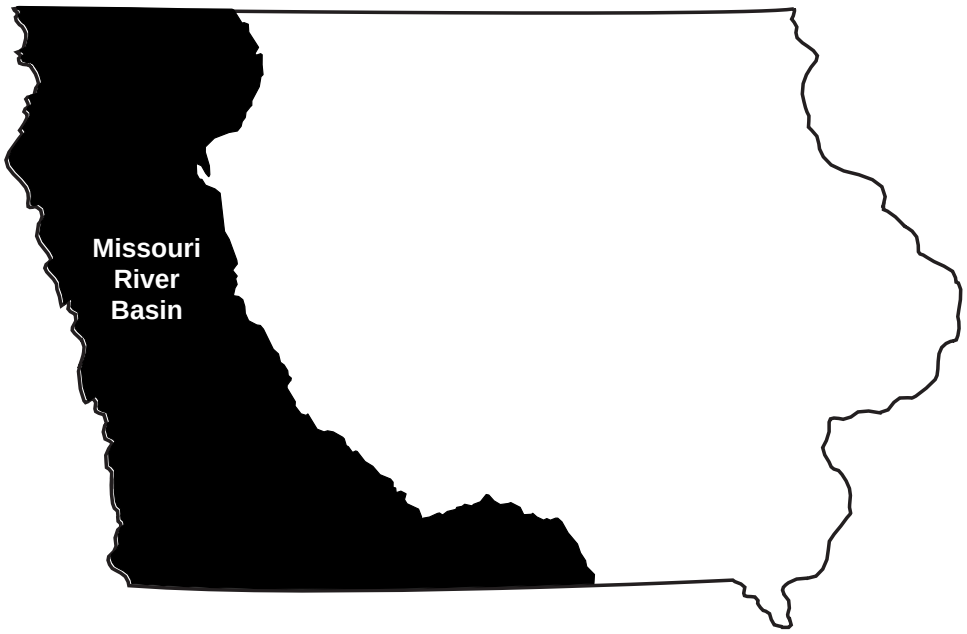

Prepared in cooperation with the Iowa Department of Natural Resources (Geological Survey Bureau), Iowa Department of Transportation, and with Federal agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

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District Chief, Water Resources Division
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1999

PREFACE

This volume of the annual hydrologic data report of Iowa is one of a series of annual reports that document 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 local, State, 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. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines.

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for Iowa for the 1998 water year consists of records of stage, discharge, and water quality of streams; stage, and/or contents of lakes and reservoirs; ground water levels and water quality of ground-water wells. This report volume contains discharge records for 32 gaging stations; stage or contents for 2 lakes; water quality for 1 stream-gaging station, and sediment records for 3 stream-gaging stations. Also included are data for 34 crest-stage partial record stations and ground-water levels for 176 wells. Additional water data were collected at various sites, but are not part of the systematic data collection program and are published as miscellaneous discharge and miscellaneous water-quality analyses.

14. SUBJECT TERMS

*Iowa, *Hydrological data, *Surface water, *Water quality, Flow rates, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediment, Water temperatures, Sampling sites, Water levels, Water analyses, Data collection.

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{Letter after station name designates types of data: (d) discharge, (c) chemical, (p) precipitation, (s) sediment, (t) temperature, (e) elevations, gage heights, or contents}

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

(h)—10-year hydrograph included with data

(h)—10-year hydrograph included with data

(h)—10-year hydrograph included with data

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(h)—10-year hydrograph included with data

DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Iowa 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. 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.

[(d), discharge station; (e), elevation (stage only) station; *, currently operated as crest-stage partial-record station]

Station name	Station number	Drainage area (mi^2)	Period of record
Upper Iowa River at Decorah, Ia. (d)	05387500	511	1952-83
Upper Iowa River near Decorah, Ia. (d)	05388000	568	1913-14; 1919-27, 1933-51
Paint Creek at Waterville, Ia. (d)	05388500	42.8	1952-73
Yellow River at Ion, Ia. (d)	05389000	221	1934-51
Mississippi River at Clayton, Ia. (d)	05411500	79,200	1930-36
Turkey River at Spillville, Ia. (d)	05411600	177	1957-73; 1978-91
Big Springs near Elkader, Ia. (d)	05411950	103	1938; 1982-83; 1988-95
Turkey River at Elkader, Ia. (d)	05412000	891	1932-42
Silver Creek near Luana, Ia (d)	05412060	4.39	1986-98
Unnamed Creek near Luana, Ia. (d)	05412070	1.15	1986-92
Little Maquoketa River near Durango, Ia. (d)	05414500*	130	1934-82
Maquoketa River near Manchester, Ia. (d)	05417000	305	1933-73
Maquoketa River near Delhi, Ia. (d)	05417500	347	1933-40
Bear Creek near Monmouth, Ia. (d)	05417700	61.3	1957-76
Maquoketa River above North Fork Maquoketa River near Maquoketa, Ia. (d)	05418000	938	1913-14
North Fork Maquoketa River at Fulton, Ia. (d)	05418450	516	1977-91
Elk River near Almont, Ia. (d)	05420300	55.9	1995-97
Wapsipinicon River near Elma, Ia. (d)	05420560	95.2	1958-92
Wapsipinicon River at Stone City, Ia. (d)	05421500	1,324	1903-14
Crow Creek at Eldridge, Ia. (d)	05422420	2.20	1977-82
Crow Creek at Mt. Joy, Ia. (d)	05422450	6.90	1977-82
Pine Creek near Muscatine, Ia. (d)	05448150	38.9	1975-82
Eagle Lake Inlet near Britt, Ia. (e)	05448285	3.83	1975-80
Eagle Lake Outlet near Britt, Ia. (e)	05448290	11.3	1975-80
West Branch (West Fork) Iowa River near Klemme, Ia. (d)	05448500	112	1948-58
East Branch (East Fork) Iowa River near Klemme, Ia. (d)	05449000	133	1948-76; 1977-95
Iowa River near Iowa Falls, Ia. (d)	05450000	665	1911-14
Upper Pine Lake at Eldora, Ia. (e)	05450500	14.9	1936-70
Lower Pine Lake at Eldora, Ia. (e)	05451000	15.9	1936-70
Iowa River near Belle Plaine, Ia. (d)	05452500	2,455	1939-59
Lake Macbride near Solon, Ia. (e)	05453500	27.0	1937-71
Ralston Creek at Iowa City, Ia. (d)	05455000	3.01	1924-87
Cedar River at Mitchell, Ia. (d)	05457500	826	1933-42
Shell Rock River near Northwood, Ia. (d)	05459000	300	1945-86
Shell Rock River at Marble Rock, Ia. (d)	05460500	1,318	1933-53
Shell Rock River at Greene, Ia. (d)	05461000	1,357	1933-42
Shell Rock River near Clarksville, Ia. (d)	05461500	1,626	1915-27; 1932-34
Black Hawk Creek at Hudson, Ia. (d)	05463500	303	1952-95
Fourmile Creek near Lincoln, Ia. (d)	05464130	13.8	1962-67; 1969-74; 1976-80
Half Mile Creek near Gladbrook, Ia. (d)	05464133	1.33	1962-67; 1969-74; 1976-80
Fourmile Creek near Traer, Ia. (d)	05464137	19.5	1962-74; 1975-80
Prairie Creek at Fairfax, Ia. (d)	05464640	178	1966-82
Lake Keomah near Oskaloosa, Ia. (e)	05472000	3.06	1936-71
Skunk River at Coppock, Ia. (d)	05473000	2,916	1913-44
Big Creek near Mount Pleasant, Ia. (d)	05473500	106	1955-79
Des Moines River at Estherville (d)	05476500	1,372	1951-95

Discontinued Surface-Water Discharge or Stage-Only Stations—continued

Station name	Station number	Drainage area (mi^2)	Period of record
East Fork Des Moines River near Burt, Ia. (d)	05478000	462	1951-74
Des Moines River near Fort Dodge, Ia. (d)	05479500	3,753	1911-13
Lizard Creek near Clare, Ia. (d)	05480000	257	1940-82
Des Moines River near Boone, Ia. (d)	05481500	5,511	1920-68
North Raccoon River near Newell, Ia. (d)	05482135	233	1982-95
Storm Lake at Storm Lake, Ia. (e)	05482140	28.3	1970-75
Big Cedar Creek near Varina, Ia. (d)	05482170	80.0	1960-91
East Fork Hardin Creek near Churdan, Ia. (d)	05483000	24.0	1953-91
Hazelbrush Creek near Maple River, Ia. (d)	05483343	9.22	1990-94
Springbrook Lake near Guthrie Center, Ia. (e)	05483460	5.18	1936-71
Raccoon River at Des Moines, Ia. (e)	05485000	3,628	1902-03
Lake Ahquabi near Indianola, Ia. (e)	05487000	4.93	1936-71
White Breast Creek near Knoxville, Ia. (d)	05488000	380	1945-62
Muchakinock Creek near Eddyville, Ia. (d)	05489190	70.2	1975-79
Lake Wapello near Drakesville, Ia. (e)	05490000	7.75	1936-71
Sugar Creek near Keokuk, Ia. (d)	05491000	105	1922-31; 1958-73
Fox River at Cantril, Ia. (d)	05494500	161	1940-51
Rock River at Rock Rapids, Ia. (d)	06483270	788	1959-74
Dry Creek at Hawarden, Ia. (d)	06484000	48.4	1948-69
West Branch Floyd River near Struble, Ia. (d)	06600300*	108	1955-95
Monona-Harrison Ditch near Blencoe, IA (d)	06602410	4,440	1939-42
Loon Creek near Orleans, Ia. (d)	06603920	31.0	1971-74
Spirit Lake Outlet at Orleans, Ia. (e)	06604100	75.6	1971-74
Milford Creek at Milford, Ia. (d)	06604400	146	1971-74
Little Sioux River at Spencer, Ia. (d)	06605100	990	1936-42
Little Sioux River at Gillett Grove, Ia. (d)	06605600	1,334	1958-73
Little Sioux River near Kennebeck, Ia. (d)	06606700	2,738	1939-69
Odebolt Creek near Arthur, Ia. (d)	06607000	39.3	1957-75
Maple River at Turin, Ia. (d)	06607300	725	1939-41
Little Sioux River near Blencoe, Ia. (d)	06607510	4,440	1939-42
Steer Creek near Magnolia, Ia. (d)	06609200	9.26	1963-69
Thompson Creek near Woodbine, Ia. (d)	06609590	6.97	1963-69
Willow Creek near Logan, Ia. (d)	06609600	129	1972-75
Indian Creek at Council Bluffs, Ia. (d)	06610500	6.92(revised)	1954-76
Mosquito Creek near Earling, Ia. (d)	06610520	32.0	1965-79
Waubonsie Creek near Bartlett, Ia. (d)	06806000	30.4	1946-69
West Nishnabotna River at Harlan, Ia. (d)	06807320	316	1977-82
West Nishnabotna River at (near) White Cloud, Ia. (d)	06807500	967	1918-24
Mule Creek near Malvern, Ia. (d)	06808000	10.6	1954-69
Spring Valley Creek near Tabor, Ia. (d)	06808200	7.6	1955-64
Davids Creek near Hamlin, Ia. (d)	06809000	26.0	1952-73
Tarkio River at Stanton, Ia. (d)	06811840	49.3	1958-91
Tarkio River at Blanchard, Ia. (d)	06812000	200	1934-40
West Nodaway River at Villisca, Ia. (d)	06816500	342	1918-25
Platte River near Diagonal, Ia. (d)	06818750*	217	1969-91
East Fork One Hundred and Two River near Bedford, Ia. (d)	06819190	92.1	1959-83
Elk River near Decatur City, Ia. (d)	06897950*	52.5	1968-94
Weldon River near Leon, Ia. (d)	06898400	104	1959-91
Honey Creek near Russell, Ia. (d)	06903500	13.2	1952-62
Chariton River near Centerville, Ia. (d)	06904000	708	1938-59

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following water-quality stations have been discontinued in Iowa. Continuous daily records of water temperature, specific conductance, or sediment and monthly or periodic samples of chemical quality or biological data were collected and published for the period of record shown for each station.

[Type of record: Chem.–chemical quality, Cond.–specific conductance, Temp.–water temperature, Sed.–sediment, Bio.–biological; *, periodic data available subsequent to period of daily record]

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Upper Iowa River at Decorah, Ia.	05387500	511	Sed. Temp.	1963-68 1963-83
Upper Iowa River near Dorchester, Ia.	05388250	770	Sed., Temp.*, Cond.*	1975-81
Paint Creek at Waterville, Ia.	05388500	42.8	Temp. Sed.	1952-56 1952-57
Unnamed Creek near Luana	05412070	1.15	Chem.	1986-92
Turkey River at Garber, Ia.	05412500	1,545	Temp.*, Sed.*	1957-62
Mississippi River at Dubuque, Ia.	05414700	81,600	Chem.	1969-73
Maquoketa River near Maquoketa, Ia	05418500	1,553	Sed., Temp., Cond.	1995-97
Elk River near Almont, Ia	05420300	55.9	Sed., Temp., Cond.	1995-97
Mississippi River at Clinton, Ia	05420500	85,600	Sed.	1995-97
Wapsipinicon River at Independence, Ia.	05421000	1,048	Cond.* Temp.*, Sed.*	1968-70 1967-70
Crow Creek at Bettendorf, Ia.	05422470	17.8	Cond.*, Temp.*, Sed.	1978-82
Iowa River near Rowan, Ia.	05449500	429	Temp.*, Sed.*	1957-62
Iowa River at Marshalltown, Ia	05451500	1,532	Temp., Sed.	1988-95
Iowa River at Iowa City, Ia.	05454500	3,271	Chem.. Temp.*, Sed. Cond.	1906-07; 1944-54 1944-87 1968-87
Ralston Creek at Iowa City, Ia.	05455000	3.01	Cond Sed. Temp.	1968-87 1952-87 1967-87
Shell Rock River at Shell Rock, Ia.	05462000	1,746	Temp.*	1953-68
Cedar River at Cedar Falls, Ia	05463050	4,734	Chem.	1975-79; 1984; 1986-1995
Cedar River near (at) Gilbertville, Ia.	05464020	5,234	Chem.	1971; 1975-81
Fourmile Creek near Lincoln, Ia.	05464130	13.78	Chem., Temp., Sed.	1969-74
Half Mile Creek near Gladbrook, Ia.	05464133	1.33	Chem., Temp., Sed.	1969-74
Fourmile Creek near Traer, Ia.	05464137	19.51	Chem., Temp., Sed.	1969-74
Cedar River near Palo, Ia.	05464450	6,380	Chem.	1975-79
Cedar River at Cedar Rapids, Ia.	05464500	6,510	Chem.* Temp.* Sed.	1906-07; 1944-54 1944-54 1943-54
Cedar River near Bertram, Ia.	05464760	6,955	Chem.	1975-81
Iowa River at Wapello, Ia	05465500	12, 499	Chem.	1977-95
Mississippi River at Burlington, Ia.	05469720	114,000	Chem.	1969-73
South Skunk River at Colfax, Ia	05471050	803	Cond.*, Temp.*, Sed.	1989-93
Skunk River at Augusta, Ia	05474000	4,303	Chem.	1977-95
Mississippi River at Keokuk, Ia.	05474500	119,000	Chem.	1974-87
Des Moines River at Fort Dodge, Ia.	05480500	4,190	Chem.	1972-73
Des Moines River at 2nd Avenue at Des Moines, Ia.	05482000	6,245	Chem. Temp.*, Sed.	1954-55 1954-61
East Fork Hardin Creek near Churdan, Ia.	05483000	24.0	Temp.*, Sed.*	1952-57
Hazelbrush Creek near Maple River, Ia	05483343	9.22	Cond., Temp., Sed.	1991-94
Middle Raccoon River near Bayard, Ia.	05483450	375	Cond.*, Temp.*, Sed.	1979-85
Middle Raccoon River at Panora, Ia.	05483600	440	Cond.*, Temp.*, Sed.	1979-85
Raccoon River at Van Meter, Ia	05484500	3,441	Chem. Bio.	1974-79; 1986-94 1974-79
Raccoon River at Des Moines, Ia.	05485000	3,590	Chem., Temp.	1945-47

Discontinued Surface-Water Quality Stations—continued

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
Des Moines River below Raccoon River at Des Moines, Ia.	05485500	9,879	Chem.* Temp.*, Sed.	1944-45 1944-47
Des Moines River below Des Moines, Ia.	05485520	9,901	Chem.	1971; 1974-81
Middle River near Indianola, Ia.	05486490	503	Temp.*, Sed.	1962-67
White Breast Creek near Dallas, Ia.	05487980	342	Chem. Temp.*, Sed.	1969-73 1967-73
Big Sioux River at Sioux City, Ia.	06485950	9,410	Chem.	1969-73
Missouri River at Sioux City, Ia.	06486000	314,600	Chem.	1972-86
Floyd River at James, Ia.	06600500	886	Temp.*, Sed., Cond.*	1968-73
Floyd River at Sioux City, Ia.	06600520	921	Chem.	1969-73
Missouri River at Decatur, Neb.	06601200	316,160	Chem.	1974-81
Spirit Lake near Orleans, Ia.	06604000	75.6	Temp.	1968-75
Little Sioux River at Correctionville, Ia.	06606600	2,500	Chem.* Temp.* Sed.	1954-55 1951-62 1950-62
Little Sioux River near Kennebec, Ia.	06606700	2,738	Temp. Sed.	1951-55 1950-57
Little Sioux River at River Sioux, Ia.	06607513	3,600	Chem.	1969-73
Soldier River near Mondamin, Ia.	06608505	440	Chem.	1970-73
Steer Creek near Magnolia, Ia.	06609200	9.26	Temp., Sed., Cond.	1963-69
Thompson Creek near Woodbine, Ia.	06609590	6.97	Temp., Sed., Cond.	1963-69
Willow Creek near Logan, Ia.	06609600	129	Cond., Temp. Sed.	1972-75 1971-75
Missouri River at Omaha, Nebr.	06610000	322,800	Cond.*	1969-86
Mule Creek near Malvern, Ia.	06808000	10.6	Temp. Sed.	1958-69 1954-69
Davids Creek near Hamlin, Ia.	06809000	26.0	Temp.* Sed.	1952-53; 1965-68 1952-68
East Nishnabotna River at Red Oak, Ia.	06809500	894	Temp.*, Sed., Cond.*	1962-73
Nishnabotna River above Hamburg, Ia.	06810000	2,806	Chem. Temp.*, Cond. Bio.	1979-93 1979-81 1979-81
Nodaway River at Clarinda	06817000	762	Cond.*, Temp.*, Sed.	1976-92
Platte River near Diagonal, Ia.	06818750	217	Chem.	1969-73
Elk Creek near Decatur City, Ia.	06897950	52.5	Bio. Chem.	1970-72 1968-94
Thompson River at Davis City, Ia.	06898000	701	Chem. Temp.*, Sed., Cond.*	1967-73 1968-73
Weldon River near Leon, Ia.	06898400	104	Chem.	1968-73
Chariton River near Chariton, Ia.	06903400	182	Temp.*, Sed., Cond.*	1969-73
Honey Creek near Russell, Ia.	06903500	13.2	Sed.	1952-62
Chariton River near Rathbun, Ia.	06903900	549	Temp.*, Sed.*, Cond.*	1962-69

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State, county, municipal, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Iowa 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 of the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Iowa" as part of the National Water Data System.

Water resources data for water year 1998 for Iowa consist of records of stage, discharge, and water quality of streams; stage and contents of lakes and reservoirs; and water levels and water quality of ground water. This report in two volumes contains stage or discharge records for 130 gaging stations; stage or contents for 9 lakes and reservoirs; water quality records for 2 gaging stations; sediment records for 12 gaging stations; and water levels for 185 ground-water observation wells. Also included are data for 93 crest-stage partial-record stations and water-quality data from 45 municipal wells. Additional water data were collected at various sites not included in the systematic data-collection program and are published here as miscellaneous measurements and analyses. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating local, State, and Federal agencies in Iowa.

Records of discharge or stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were published in an annual series; during 1961-65 and 1966-70, they were published in 5-year series. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or they may be purchased from Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225.

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

Beginning with the 1971 water year, water data for streamflow, water quality, and ground water are published in official U.S. Geological Survey reports on a State-boundary basis. These official reports carry an identification number consisting of the two-letter State postal abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report IA-98-1." These water-data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Additional information for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone, (319) 337-4191.

COOPERATION

The U.S. Geological Survey and organizations in the State of Iowa have had cooperative agreements for the systematic collection of streamflow records since 1914, for ground-water levels since 1935, and for water-quality records since 1943. Organizations that assisted in collecting data through cooperative agreements with the U.S. Geological Survey in Iowa during water year 1998 are:

Iowa Department of Natural Resources (Geological Survey Bureau)
Iowa Department of Transportation
Iowa Highway Research Board

Iowa State University
University of Iowa, Institute of Hydraulic Research
University of Iowa, Hygienic Laboratory
University of Iowa

Appanoose County Board of Supervisors
Davis County Board of Supervisors
Van Buren County Board of Supervisors

City of Ames
City of Bloomfield
City of Cedar Rapids
City of Charles City
City of Clear Lake
City of Clinton
City of Coralville
City of Davenport
City of Des Moines
City of Des Moines Water Works
City of Fort Dodge
City of Iowa City
City of Marshalltown
City of Mt. Pleasant
City of Sioux City
City of Waterloo Sewage Treatment Plant
City of West Des Moines

Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers in collecting streamflow records for 74 stream gaging stations. Assistance was also furnished by NOAA-National Weather Service, U.S. Department of Commerce, and National Biological Survey Division of U.S. Geological Survey.

The following organizations aided in collecting records: Milford Municipal Utilities, Central Iowa Energy Cooperative, Union Electric Company,

Organizations that supplied data are acknowledged in the station descriptions.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

For water year 1998 (October 1, 1997 to September 30, 1998) climatological conditions were generally wetter than normal and warmer than normal. Recorded precipitation for the year ranged from 2.00 inches above normal in the North-central Iowa Climatological District to 9.80 inches greater than normal in the Southeast Iowa Climatological District (fig. 1). The Northwest District was the only District to report below normal precipitation for the year. Precipitation recorded for the State averaged 30.77 inches, which was 5.68 inches greater than normal, or 117 percent of the normal 33.11 inches for 1961-90 (table 1). Overall, water year 1998 was the 9th wettest and the 13th warmest for 125 years of record. [In this summary of hydrologic conditions, all data and statistics pertaining to precipitation and temperature in Iowa were provided by Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, (oral and written commun., 1998)].

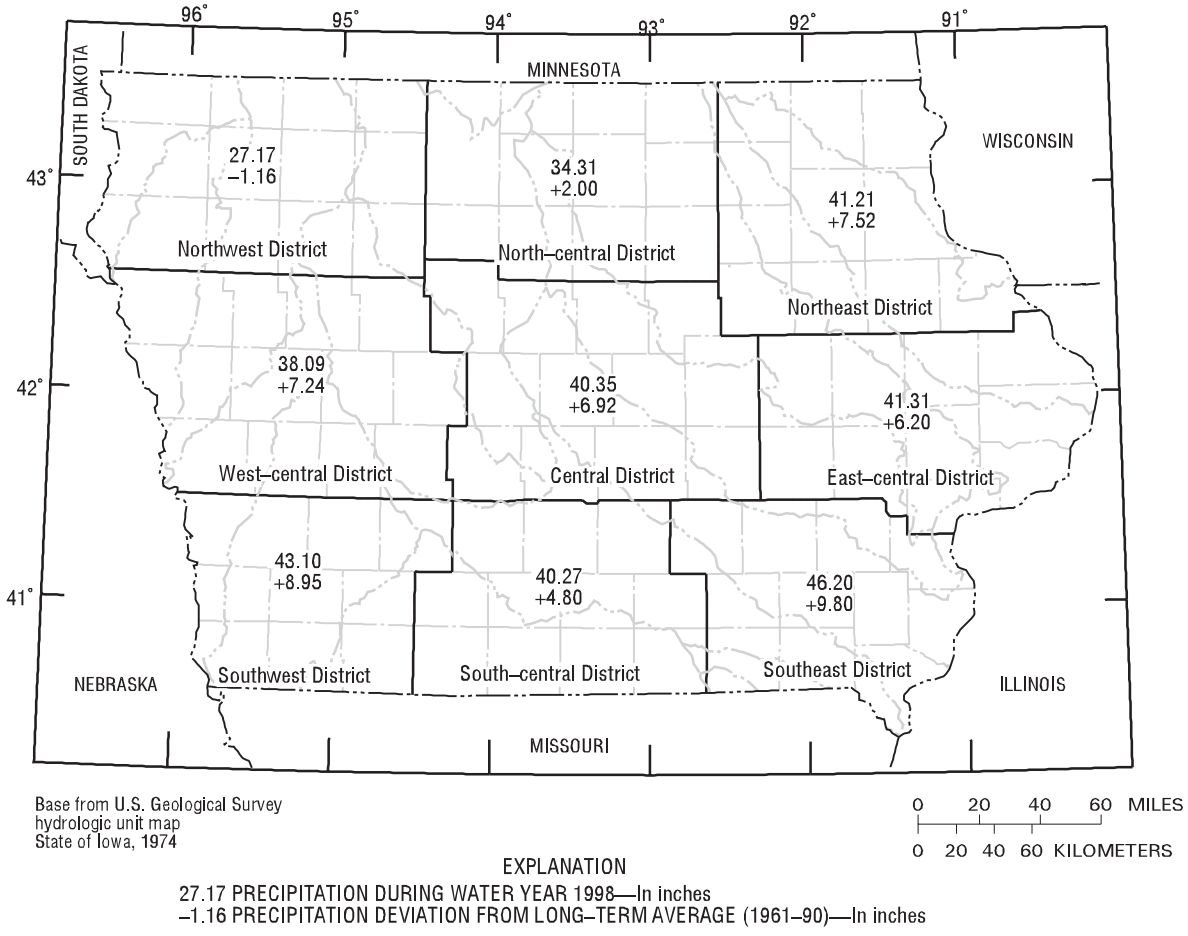

Figure 1. Precipitation record for the National Weather Service's designated Climatological Districts for water year 1998 (source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 1998).

Table 1. Monthly and annual precipitation during the 1998 water year as a percentage of normal precipitation (1961-90).
[Source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 1998]

National Weather Service Climatological District	1997			1998									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Annual
Northwest	80	51	43	166	107	145	168	86	110	85	102	34	96
North-central	104	35	53	139	129	125	135	106	178	44	143	54	106
Northeast	147	31	53	114	212	190	128	114	209	41	177	56	122
West-central	107	64	55	146	122	140	175	112	206	126	127	25	123
Central	160	58	80	122	174	171	93	120	230	60	119	42	121
East-central	117	48	81	111	241	199	121	96	169	42	150	98	118
Southwest	170	129	103	118	261	169	112	123	193	149	65	32	126
South-central	178	60	133	86	173	199	113	119	143	82	89	58	114
Southeast	128	73	111	161	258	201	135	112	183	55	134	103	127
Statewide	133	59	80	128	186	171	131	110	182	74	125	55	117

Precipitation was above normal for October. Average precipitation was 139 percent of normal throughout the state with all Climatological District reports above normal except for the Northwest District, which reported an average precipitation 80 percent of normal. October snowfall was the 2nd highest in 111 years of record and the greatest since 1925. For the three index surface-water stations in Iowa, mean monthly discharge for 05464500 Cedar River at Cedar Rapids (East-central District), 05480500 Des Moines River at Fort Dodge (Central District), and 06810000 Nishnabotna River above Hamburg (Southwest District) were all in the normal range (fig. 3). For the remainder of this section, these stations will be referred to as "Cedar Rapids," "Fort Dodge," and "Hamburg," respectively.

During November, the statewide average precipitation was 59 percent of normal. Most Climatological Districts reported below normal precipitation ranging from 31 percent of normal in the Northeast District to 73 percent of normal in the Southeast District. The exception was the Southwest District which reported precipitation 129 percent of normal. Mean monthly discharge for the three index stations was within the normal range.

Below normal precipitation continued in December with statewide average precipitation 80 percent of normal. However, the Southwest, South-central, and Southeast Districts reported precipitation 103, 133, and 111 percent of normal. The mean discharge at Cedar Rapids and Fort Dodge was in the normal range while the discharge at Hamburg was above normal.

The month of January saw an increase in precipitation statewide to 128 percent of normal. Precipitation amounts ranged from 111 percent in the East-central District to 166 percent of normal in the Northwest District. The South-central District precipitation was 86 percent of normal and the only district that was below normal. Mean monthly discharges for Cedar Rapids and Fort Dodge remained in the normal range, while Hamburg was above normal for the 2nd consecutive month.

February was the 15th wettest month and the 4th warmest in 126 years of record. All Climatological District precipitation was above normal. The Southeast District recorded precipitation amounts that totalled 258 percent of normal while the state wide average was 186 percent of normal. Index stations Cedar Rapids and Fort Dodge mean discharge continued in the normal range but discharge for Hamburg was above normal.

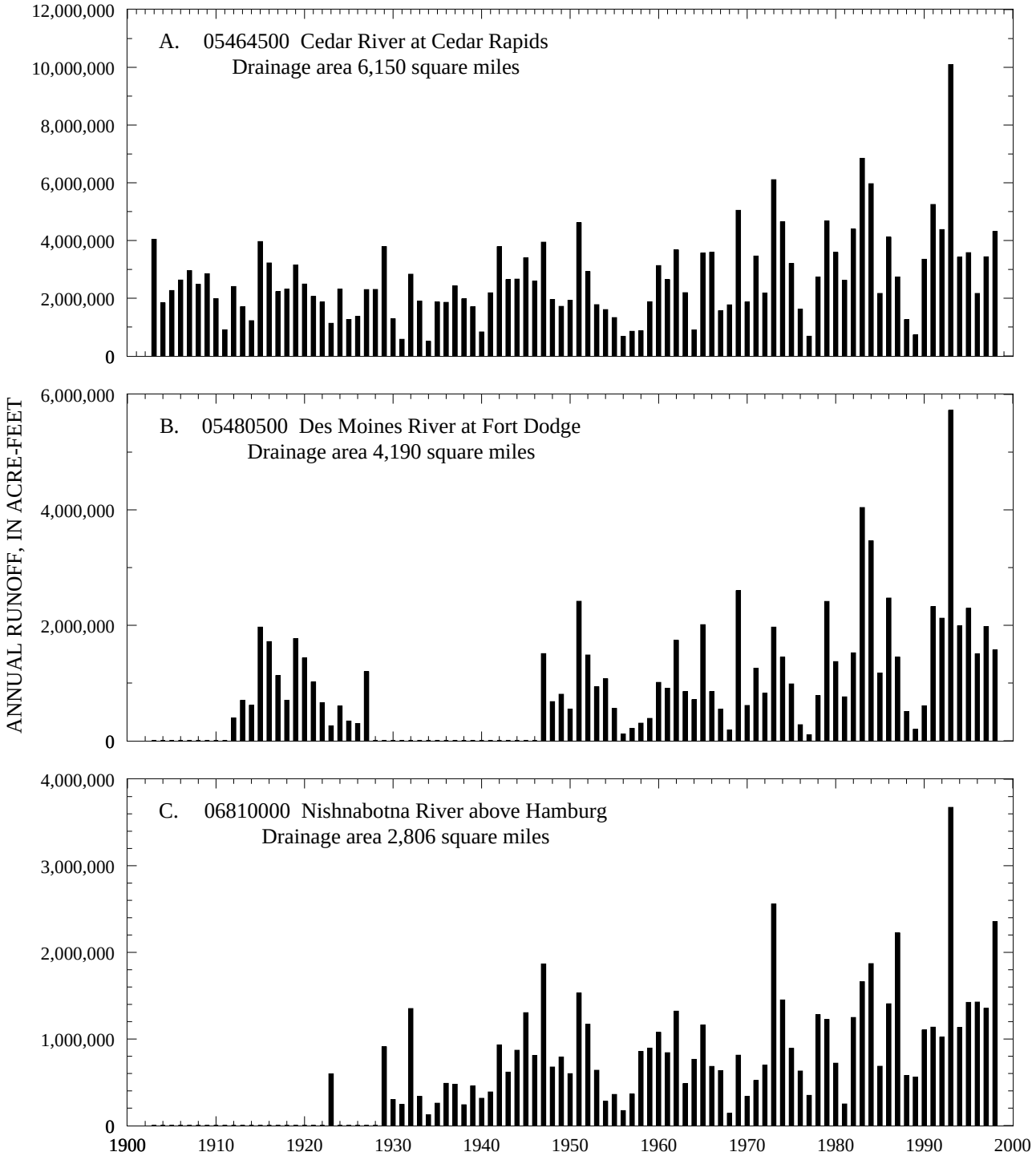

Figure 2. Annual runoff for period of record at index stations.

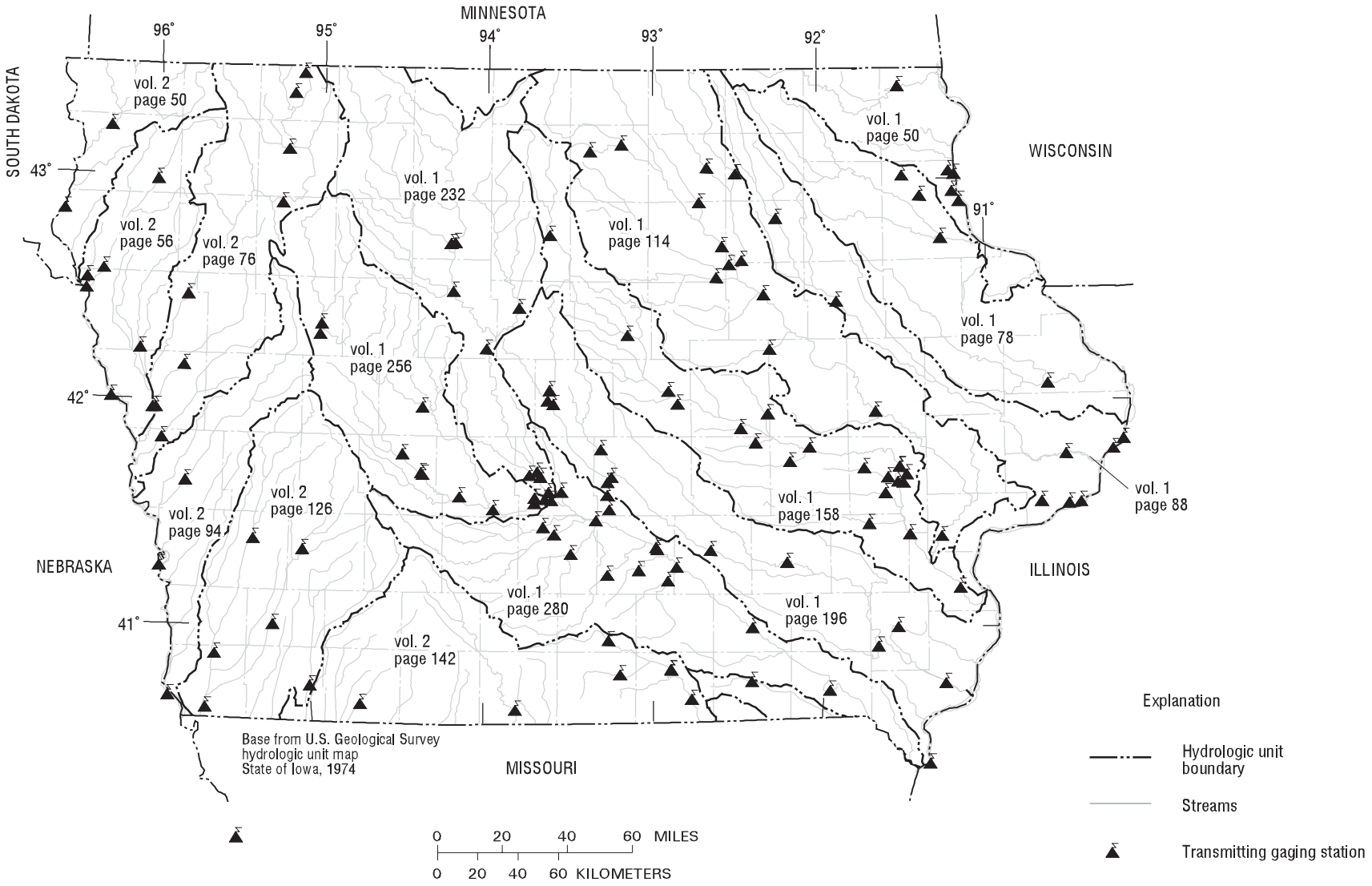

Figure 3. Location of active, continuous-record gaging stations in Iowa, water year 1998.
[See indicated volume and page number for gaging-station identification.]

Statewide precipitation for March was 171 percent of normal with all Climatologic Districts again reporting above normal precipitation. Despite statewide precipitation above normal, the mean discharge continued in the normal range at Cedar Rapids and Fort Dodge while mean discharge for Hamburg remained in the above normal range. This was the 9th wettest March for 126 years of record.

Precipitation in April was 131 percent of normal. Eight Climatological Districts received precipitation above normal, but the Central District was 93 percent of normal. Cedar Rapids, Fort Dodge, and Hamburg all reported mean daily discharges above normal.

May precipitation was above normal for the 5th consecutive month. Overall precipitation was 110 percent of normal in the state with the Northwest District and the East Central District reporting below normal precipitation for the month, and the remaining districts reporting above normal precipitation. Average temperature for the month was the 13th warmest for 126 years of record. Mean daily discharge for index stations at Cedar Rapids, Fort Dodge, and Hamburg was above normal for the month.

Above normal precipitation continued in June, resulting in high flow and flooding in many streams and rivers throughout the state. The most significant flooding occurred in the Southwest District resulting in record flows for the East Nisnabotna River near Atlantic (06809210), East Nishnabotna River at Red Oak (06809500), and Nishnabotna River above Hamburg (06810000). Flooding at these stations occurred as a result of a record 24-hour rainfall total of 13.18 inches near Atlantic, Iowa on June 14. Statewide precipitation was 182 percent of normal with all Climatological Districts reporting above normal precipitation. This June was the 5th wettest for 126 years of record. Above normal mean daily discharge was determined at all index stations with the mean flow at station Nishnabotna River above Hamburg at 721 percent of normal.

After six consecutive months of above normal precipitation, July statewide average precipitation was 74 percent of normal. The Southwest and West Central Districts reported above normal precipitation 149 percent and 126 percent of normal respectively. The remaining Districts reported precipitation that ranged from 85 percent of normal in the Northwest District to 41 percent in the Northeast District. The mean daily discharge at all three index stations remained above normal for the month.

The statewide average precipitation increased to above normal for August. The statewide average was 125 percent of normal with all districts reporting above normal precipitation except the South-central and Southeast Districts, which were 65 percent and 89 percent of normal precipitation respectively. Once again, all index stations reported flow above the monthly normal flow.

September ended the water year as the 28th driest on record with precipitation 55 percent of normal. All districts, except the Southeast District, which reported precipitation 103 percent of normal, reported below normal precipitation. Precipitation in these districts ranged from 98 percent in the East Central District to 25 percent of normal precipitation in the West-central District. The mean daily discharge continued above normal for the index station at Hamburg for the ninth consecutive month, while flow for stations at Cedar Rapids and Fort Dodge receded into the normal range.

The water-year 1998 runoff at Cedar Rapids was 4,309,000 acre-feet, which is greater than the mean annual runoff for the period of record, 2,688,000 acre-feet. The water-year 1998 runoff at Fort Dodge was 1,571,000 acre-feet, which is greater than the mean for the period of record, 1,278,000 acre-feet. The water-year 1998 runoff at Hamburg was 2,355,000 acre-feet, which is greater than the mean for the period of record, 912,100 acre-feet.

The location of all active continuous-record gaging stations is shown in figure 3, and the location of all active crest-stage gaging stations is shown in figure 4.

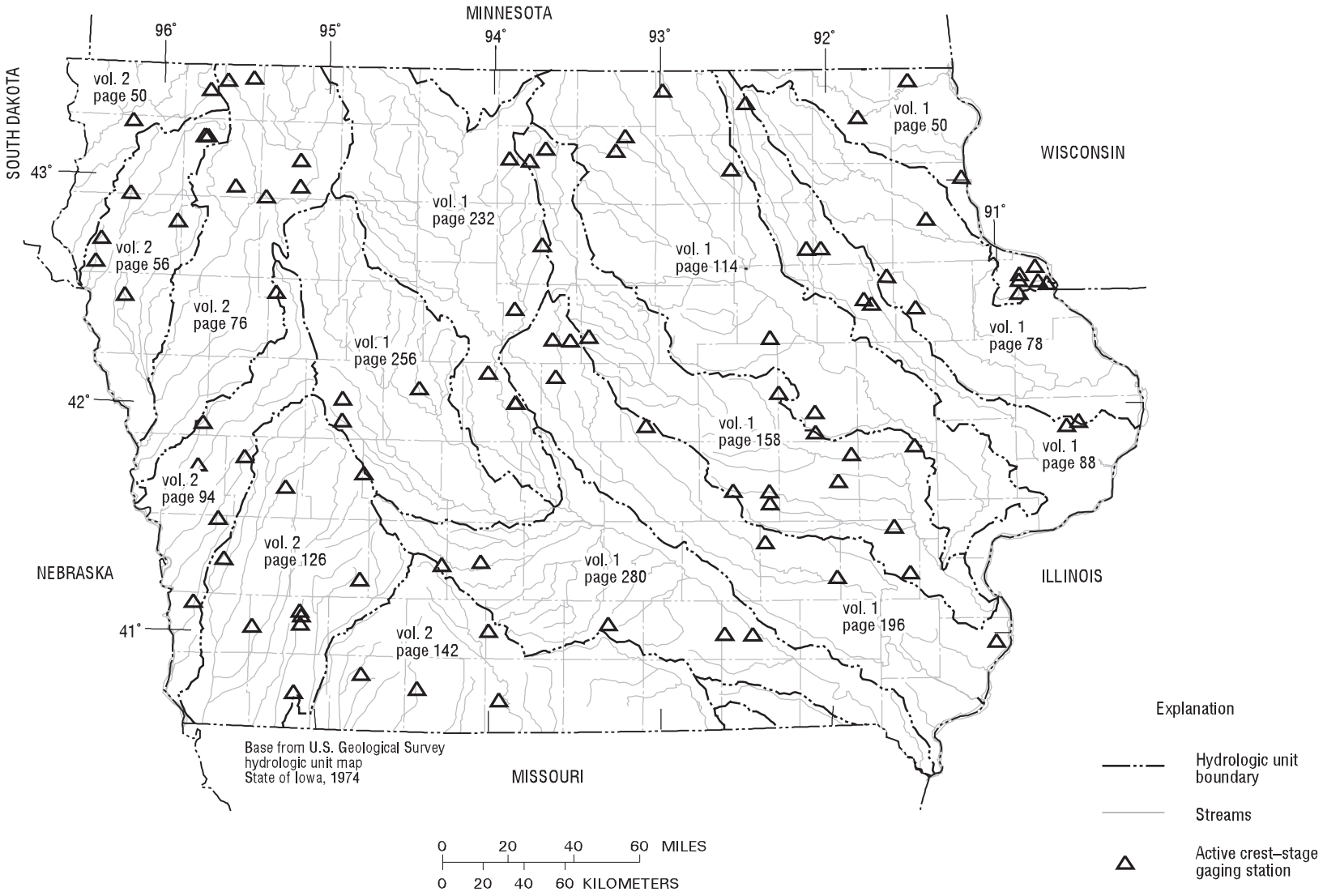

Figure 4. Location of active, crest-stage gaging stations in Iowa, water year 1998.

Suspended Sediment

Daily suspended-sediment discharge data (hereafter referred to as sediment discharge in this report) were collected at 12 streamflow-gaging stations in Iowa during the 1998 water year. Four stations have 20 years or more of record: 05389500 Mississippi River at McGregor, 05465500 Iowa River at Wapello, 05474000 Skunk River at Augusta, and 05481650 Des Moines River near Saylorville; three stations on the Missouri River have 12 years of record: 06486000 Missouri River at Sioux City, Iowa, 06610000 Missouri River at Omaha, Nebraska, and 06807000 Missouri River at Nebraska City, Nebraska; two stations in northeast Iowa have 7 years of record: 05389400 Bloody Run Creek near Marquette and 05411400 Sny Magill Creek near Clayton; and three stations in central Iowa have 3 years of record: 05471040 Squaw Creek near Colfax, 05487540 Walnut Creek near Prairie City, and 05487550 Walnut Creek near Vandalia. Three other sediment stations were discontinued at the end of the 1997 water year in east-central Iowa as the associated project was completed: 05418500 Maquoketa River near Maquoketa, 05420300 Elk River near Almont, and 05420500 Mississippi River at Clinton. The locations of active sediment and surface water-quality stations are shown in figure 5.

The peak daily sediment discharge on 5 of 12 stations occurred between March 30 and April 3, at the end of the winter period and after a significant rain event. Five others peaked between May 25 and June 25.

Mississippi River at McGregor, which has most of its drainage basin in Minnesota and Wisconsin, had an annual sediment discharge of 721,000 tons, which was the third lowest sediment discharge in 23 years of record, and 41.1 percent of the average mean sediment discharge (fig. 6).

The sediment station on the Des Moines River near Saylorville in central Iowa is downstream from a major flood-control reservoir (Saylorville Reservoir). The annual sediment discharge at this station for water year 1998 was 115,000 tons, which was the sixth smallest discharge in 21 years since the dam was completed. The mean annual sediment discharge since dam completion is 254,000 tons (fig. 6).

Sediment discharges for Iowa River at Wapello and Skunk River at Augusta in southeast Iowa were indicative of the above-normal precipitation in central and eastern Iowa. The Iowa River basin drainage includes parts of the Southeast, East-central, Central, Northeast, and North-central Climatological Districts, and drains an area nearly three times as large as the Skunk Basin. These Districts had about 119 percent of normal precipitation. Wapello had an annual sediment discharge of 2.82 million tons. This represents 101 percent of the 20-year mean sediment discharge of 2.79 million tons (fig. 6). The headwaters of the Skunk River basin are in central Iowa, and flow is southeasterly to the confluence with the Mississippi River. A substantial part of the drainage basin is located in the Southeast Climatological District. The annual precipitation for this District was 127 percent of normal for water year 1998. The 1998 annual sediment discharge for Skunk River at Augusta was 5.37 million tons, which is 189 percent of the 23-year mean sediment discharge of 2.83 million tons (fig. 6).

The 1998 annual sediment discharge for the two small drainage area stations located in northeast Iowa reflect the effect of precipitation patterns on small drainage basins. The annual sediment discharge for Bloody Run Creek near Marquette (05489400) was 2,254 tons, of which approximately 53 percent was measured during the month of March. This runoff was 44.7 percent of the 7-year mean sediment discharge of 5,030 tons. The annual sediment discharge for Sny Magill Creek near Clayton (05411400) was 7,315 tons. This runoff represents 149 percent of the 7-year mean sediment discharge of 4,924 tons. . Fifty-six percent of Sny Magill's annual sediment discharge was measured in March and approximately 45 percent of the yearly total was measured on March 30. These stations are paired in a study on sediment reduction techniques, with the Sny Magill Basin having the techniques implemented and the Bloody Run Basin not implemented.

The annual sediment discharge for the three stations located in central Iowa with less than approximately 20 square miles of drainage reflect precipitation patterns on small drainage basins. The 1998 sediment discharge for Squaw Creek near Colfax (05471040) was 20,460 tons. The 1998 sediment discharge for Walnut Creek near Prairie City (05487540) was 2,757 tons, while Walnut Creek near Vandalia (05487550) was 18,370 tons of annual sediment discharge. Vandalia has a drainage area approximately three times the size of Prairie City, but had about 6.7 times the amount of sediment discharge of Prairie City.

The three Missouri River stations (fig. 5) have large drainage areas, which the sediment discharges reflect. The annual sediment discharge at Sioux City was 12.1 million tons, which was 93 percent of the 12-year mean of 13.0 million tons. The sediment discharge at Omaha was 23.0 million tons, which was equal to the 12-year mean of 23.0 million tons. The annual sediment discharge at Nebraska City was 38.7 million tons, which was 109 percent of the 12-year mean of 35.4 million tons.

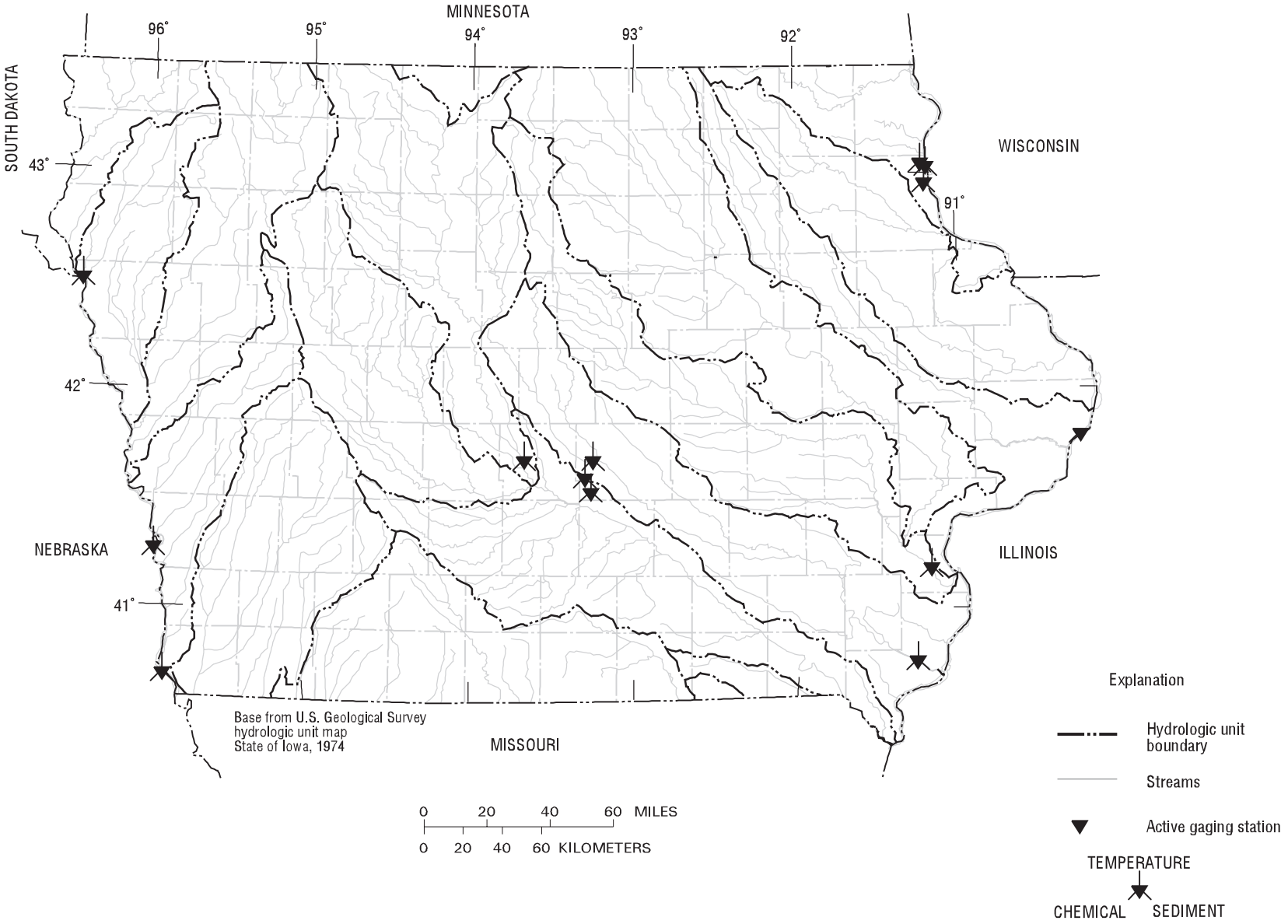

Figure 5. Location of active sediment and surface-water-quality stations in Iowa, water year 1998.

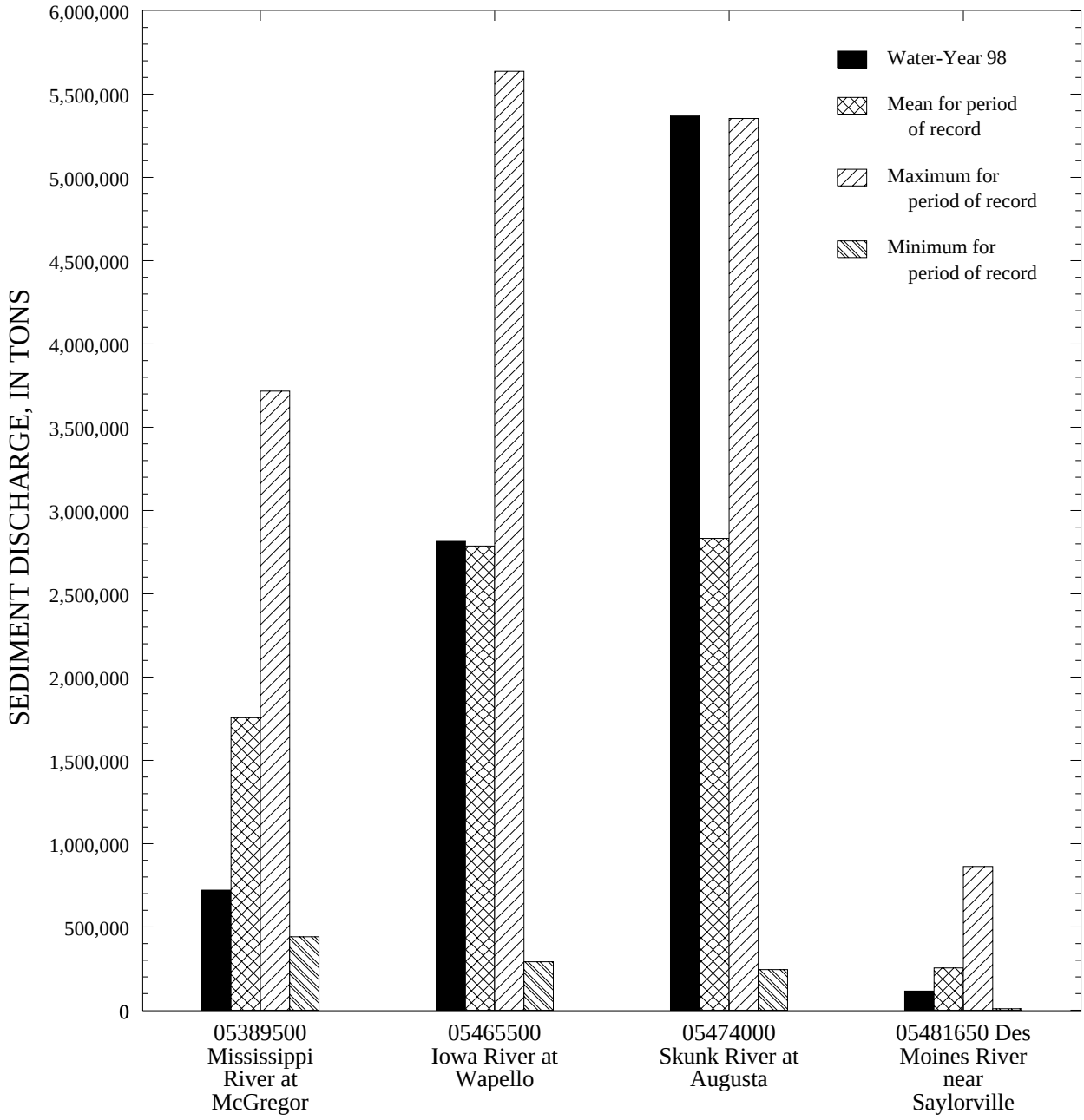

Figure 6. Comparison of annual sediment discharge for water year 1998 with mean, previous maximum, and previous minimum annual sediment discharges for periods of record at four long-term daily sediment stations in Iowa.

Ground-Water-Level Observation Network

The ground-water-level observation network in Iowa provides a historical record of the water-level changes in the State's most important aquifers. The locations of the 176 wells monitored on a quarterly, monthly, or intermittent basis during water year 1998 are shown in figure 7.

In this report, records of water levels are presented for a network of observation wells. However, many other water levels are measured through Federal, State, and local agency cooperative projects and entered into computer storage. Information for specific projects may be obtained from the District Chief, Iowa District.

Measurements of water levels are made in many types of wells under various techniques, 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 principal identification number for a specific 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-section location of the well.

Water-level records are obtained from direct measurements with a steel tape or from an airline. The water-level measurements in this report are given in feet with reference to land-surface datum. Land-surface datum is a datum plane that is approximately at land surface at each well. The measuring point is the height above or below the land-surface datum and the point where the water level is measured. Both the measuring point and land-surface datum are listed for each well.

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement to a depth of 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.

Ground-water supplies in Iowa are withdrawn from unconsolidated and bedrock aquifers. There are three types of unconsolidated aquifers: (1) alluvial aquifers, which consist of sand-and-gravel deposits associated with present-day fluvial systems; (2) glacial-drift aquifers, which consist of shallow, discontinuous, permeable lenses of sand and gravel interbedded with less-permeable glacial drift; and (3) buried-channel aquifers. Buried-channel aquifers are formed in areas where coarse sand and gravel were deposited in bedrock valleys and overlain by a thick layer of glacial drift.

One well completed in an unconsolidated aquifer recorded a new measured historical high water level during the 1998 water year (table 2). There were no recorded historical low water levels.

Table 2. Historical high water level measured during the 1998 water year in a well completed in an unconsolidated aquifer.

County	Well number	Aquifer type	New historical high water level (ft below land surface)	Date measured	Previous historical high water level (ft below land surface)	Date measured
Harrison	413524095490601	Alluvial	1.68	07-07-1998	2.71	04-12-1983

The five major bedrock-aquifer units in Iowa are the Cambrian-Ordovician, Silurian-Devonian, Mississippian, Pennsylvanian, and Dakota. The Cambrian-Ordovician aquifer system consists of aquifers in sandstone of Early Cambrian age and dolomite and sandstone of Late Cambrian to Early Ordovician age. The Dresbach is the basal aquifer of the Cambrian-Ordovician aquifer system and is present locally in northeastern and east-central Iowa. Overlying the Dresbach aquifer is the more areally extensive Jordan-St. Peter aquifer. A confining shale unit separates the Jordan-St. Peter aquifer from the Galena aquifer, the uppermost aquifer in the Cambrian-Ordovician aquifer system. Overlying the Cambrian-Ordovician aquifer system is the Silurian-Devonian aquifer, which yields water from fractures in Silurian dolomite and Devonian limestone. Overlying the Silurian-Devonian aquifer is the Mississippian aquifer, which is composed of limestone and dolomite of Mississippian age and underlies about 60 percent of Iowa. Overlying the Mississippian aquifer are discontinuous lenses of sandstone in the Cherokee and Kansas City Groups of Pennsylvanian age, which form small, localized aquifers. The Dakota aquifer is the youngest bedrock-aquifer unit in the State and yields water from sandstone of Cretaceous age in northwest and western Iowa.

Twenty-nine wells completed in bedrock aquifers recorded new historical water levels during the 1998 water year. Twenty-one wells recorded historical low water levels (table 4), and eight wells recorded historical high water levels (table 5).

Table 3. Historical high water level measured during the 1998 water year in wells completed in bedrock aquifers.

County	Well number	Aquifer type	New historical high water level (ft below land surface)	Date measured	Previous historical high water level (ft below land surface)	Date measured
Audubon	415023094593801	Cretaceous	159	08-05-1998	159.73	05-07-1997
Calhoun	422339094375101	Cambrian/Ordovician	199	10-07-1997, 02-10-1998	205	02-14-1997
Delaware	423648091335701	Silurian	81.41	05-18-1998	84.32	08-07-1997
Linn	420200091363001	Cambrian/Ordovician	260	04-21-1998	283	08-12-1997
Linn	421207091312201	Silurian	12	05-04-1998, 08-03-1998	16	08-07-1998
Muscatine	412740090503201	Silurian	104.79	01-06-1998, 02-03-1998	122.79	06-10-1997
Plymouth	424833096324201	Cretaceous	136.54	05-05-1998	136.95	08-08-1998
Pottawattamie	412407095391201	Cambrian/Ordovician	72.86	08-06-1998	73.60	02-28-1997

Table 4. Historical low water level measured during the 1998 water year in wells completed in bedrock aquifers.

County	Well number	Aquifer type	New historical low water level (ft below land surface)	Date measured	Previous historical low water level (ft below land surface)	Date measured
Bremer	424224092133901	Silurian	92	05-05-1998	89	08-07-1997
Clinton	414921090450401	Silurian	95	08-07-1998	43	08-06-1997
Dallas	413613093530401	Cambrian/Ordovician	428	02-09-1998	398	08-05-1997
Greene	420146094272301	Cretaceous	19.57	11-06-1997	19.23	10-07-1985
Jackson	420433090502401	Devonian	63.19	08-04-1998	62.89	08-06-1997
Jackson	420842090165701	Cambrian/Ordovician	9.23	09-02-1998	8.25	01-08-1996, 05-13-1996
Johnson	413929091322401	Cambrian/Ordovician	216	04-30-1998	195	03-13-1996
Johnson	413950091322402	Cambrian/Ordovician	340	04-30-1998	279	01-02-1997
Johnson	414107091322901	Silurian	153.24	07-30-1998	152.21	09-05-1995
Johnson	414132091345502	Silurian	252.30	07-30-1998	251.34	07-22-1994
Lee	404306091270201	Cambrian/Ordovician	264.74	08-06-1998	263.99	08-07-1997
Linn	420200091363001	Cambrian/Ordovician	293	07-24-1998	283	08-12-1997
Linn	420219091344101	Cambrian/Ordovician	351	08-10-1998	343	08-12-1997
Linn	421207091312201	Silurian	22	02-23-1998	16	08-07-1997
Mitchell	432156092484103	Devonian	12.69	02-11-1998	12.65	05-07-1996
Muscatine	412740090503201	Silurian	160.79	09-01-1998	127.80	09-02-1997
Muscatine	412833090482001	Devonian/Silurian	260	04-07-1998	257	09-02-1997
Muscatine	412839090472601	Silurian	236.42	04-07-1998	224.28	09-02-1997
Muscatine	412952090501101	Devonian/Silurian	160	09-01-1998	142	09-02-1997
Osceola	432828095283611	Cretaceous	350.68	11-05-1997	347.02	02-07-1996
Washington	411813091411202	Cambrian/Ordovician	256	05-06-1998	251	01-31-1997

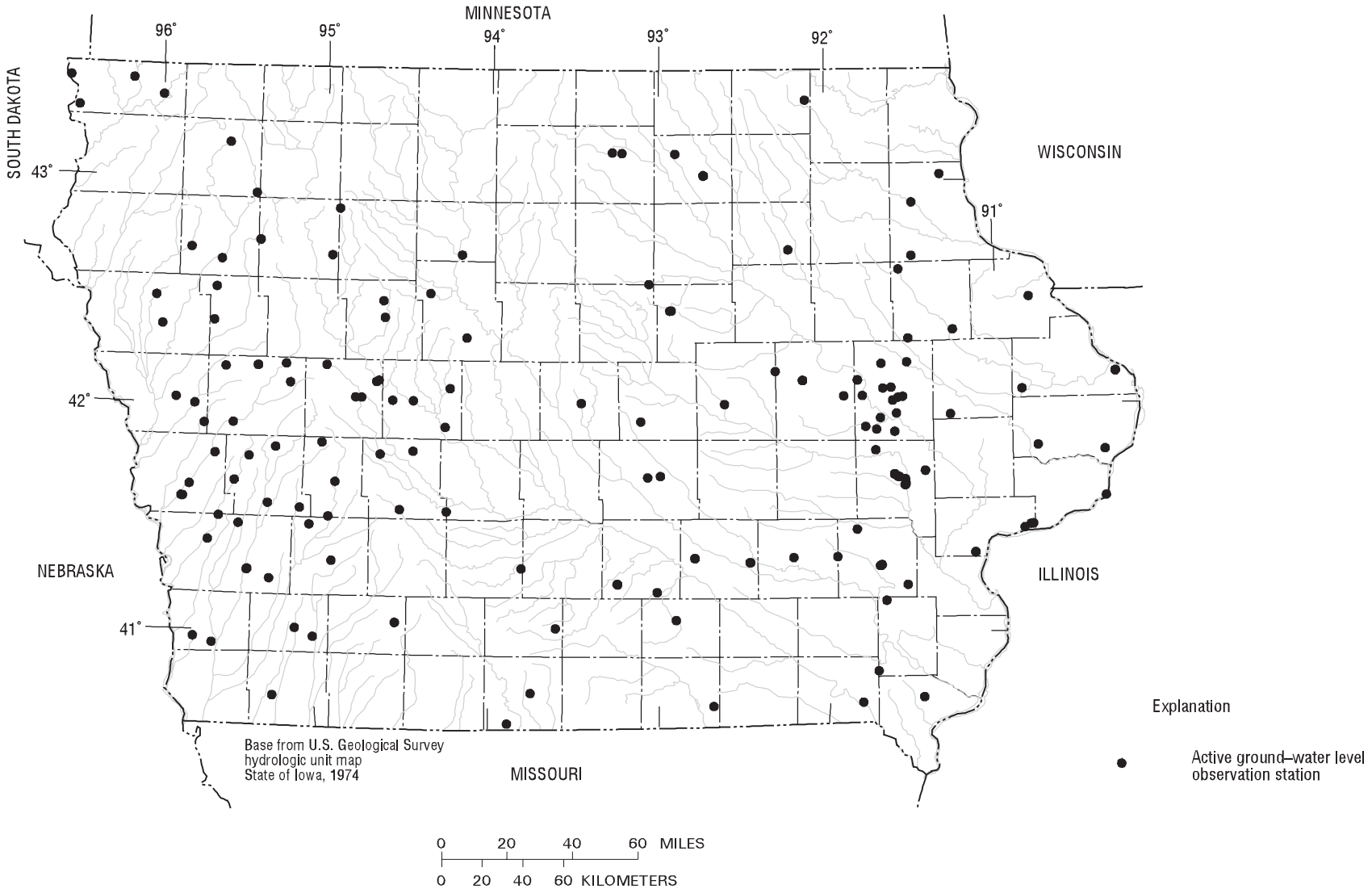

Figure 7. Location of wells in the ground-water-level observation network in Iowa, water year 1998.

Surface-Water Quality

Surface-water-quality data were collected in Iowa during water year 1998 at two National Stream-Quality Accounting Network (NASQAN) stations. The NASQAN stations in Iowa are the Mississippi River at Clinton (station number 05420500) and Missouri River at Omaha (06610000). The combined drainage area of the two stations is approximately 408,000 sq. miles. Land use throughout the two drainage basins is primarily agricultural. Fifteen water samples were collected at Missouri River at Omaha and thirteen water sample were collected at Mississippi River at Clinton during the 1998 water year.

Nearly all the samples collected at the two stations contained detectable concentrations of agricultural chemicals. Dissolved nitrite plus nitrate as nitrogen (hereafter referred to as nitrate) were common during the 1998 water year, with all samples containing concentrations greater than the detection level of 0.05 mg/L (milligrams per liter). Nitrate concentrations at Clinton ranged from 0.629 to 2.81 mg/L, and 0.233 to 3.08 mg/L at Omaha. Nitrate concentrations in these samples did not exceed 10 mg/L, which is the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) for public drinking water (USEPA, 1990 Maximum contaminant levels, subpart B of part 141, National primary drinking-water regulations: U.S.Code of Federal Regulations, Title 40, Parts 100 to 149, revised as of July 1, 1990, p.553-677).

Pesticide analysis were completed for 28 water samples collected at the NASQAN stations. Atrazine and Metolachlor, two of the most commonly used herbicides in Iowa, were detected throughout the year at both NASQAN stations. Acetochlor and cyanazine were detected at least 8 times at both sites. The largest herbicide concentration was 2.20 ug/L (micrograms per liter) of atrazine in the water sample collected from the Missouri River on June 10. The largest overall concentration of these compounds in a single event was also on the Missouri River on June 10. This water contained the 2.20 ug/L of atrazine, 1.06 ug/L of metolachlor, 0.880 ug/L of cyanazine 0.378 ug/L of acetochlor, and 0.038 ug/L of alachlor. No concentrations for any herbicides exceeded USEPA MCL's (USEPA,1992, Fact sheet: EPA 570/9-91-012FS, December 1992). Herbicide concentrations were generally larger in samples collected during May, June, and July than in samples collected at other times during water year 1998. Water samples collected in November through February had the lowest overall concentrations of the five herbicides during the 1998 water year.

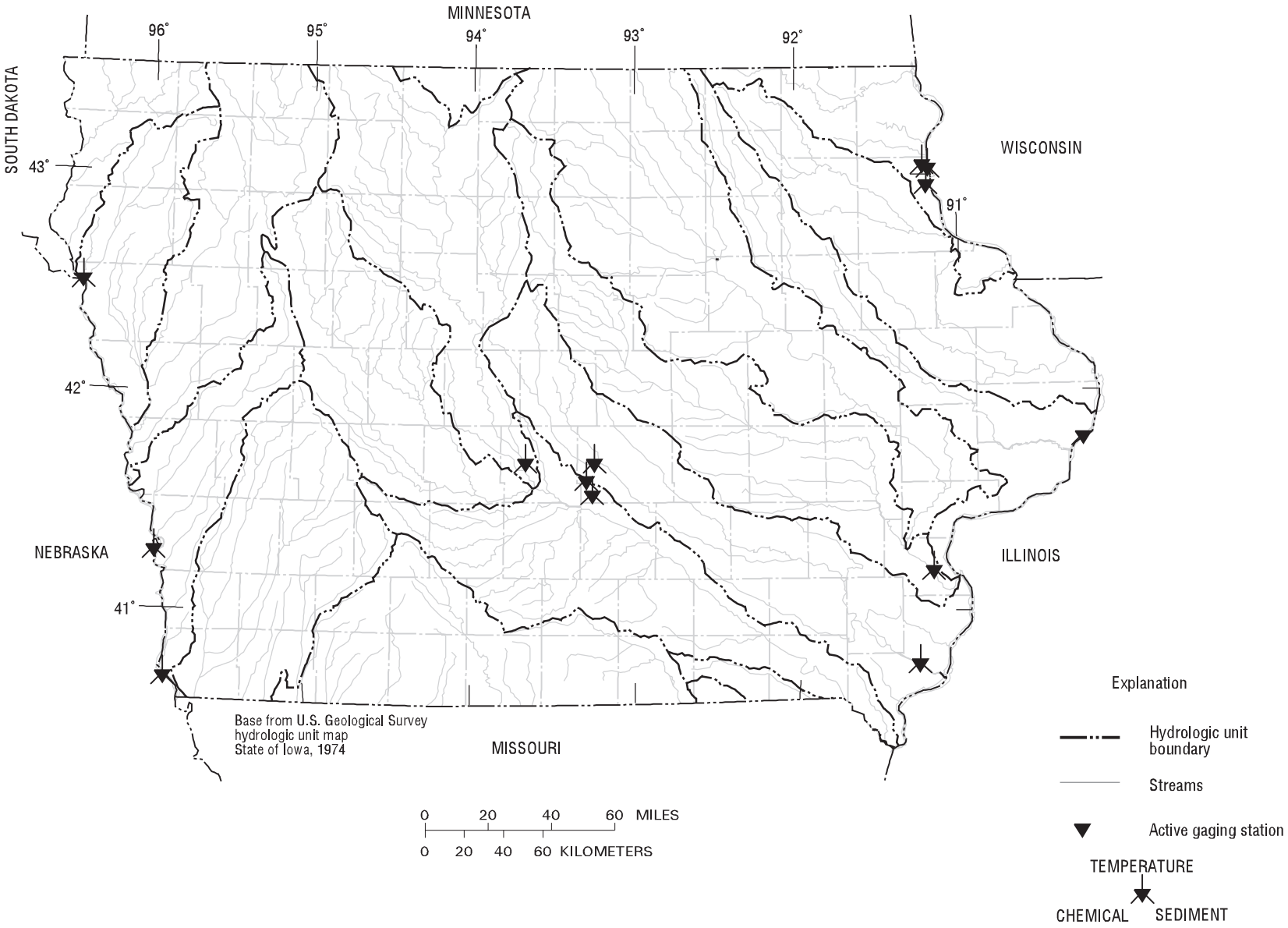

Figure 8. Location of surface-water quality gaging stations in Iowa.

Ground-Water Quality

The Iowa ground-water-quality monitoring program has been operated since 1982 by the U.S. Geological Survey in cooperation with the University of Iowa Hygienic Laboratory and the Iowa Department of Natural Resources, Geological Survey Bureau. The purpose of the program is twofold: (1) provide consistent and representative data describing the chemical water quality of the principal aquifers of the State; and (2) determine possible trends in both water quality and spatial distribution of water quality.

The ground-water-quality monitoring program was initiated to continue a program begun in 1950 by the State Health Department that consisted of periodic, nonspecific sampling of untreated water from municipal supply wells. Each year, approximately 250 wells, primarily municipal supply, were randomly-selected for sampling between April and November. Between 1985 and 1989, the emphasis of the program was on the analysis of nitrate and herbicide concentrations in samples from wells less than 200 feet in depth. Because of the random pattern of sampling both spatially (different wells each year) and seasonally (different times during the year), trends in ground-water quality were difficult to determine from the data. Therefore, in 1990, to provide year-to-year continuity of data and a more statistically sound basis for the study of long-term water-quality trends, a sampling strategy based on a random selection of wells weighted by aquifer vulnerability was implemented. Aquifer vulnerability was determined by the frequency of atrazine detections in water samples collected from wells in the respective aquifers. In 1990 and 1991, a fixed network of 50 wells was selected to be sampled annually, and approximately 200 wells continued to be selected on a rotational basis.

In 1992, the investigation of water-quality trends became the primary focus of the program, and a 10-year work plan was designed to eliminate spatial and seasonal variance, yet allow flexibility within the schedule to address additional data needs. For sampling site selection in 1992, the well inventory was divided into categories based on aquifer type and again on well depth for surficial aquifers, and into categories designated "vulnerable to contamination" and "not vulnerable to contamination" based on the map *Groundwater Vulnerability Regions of Iowa* (Hoyer, B.E., and Hallberg, G.R., 1991, Special Map Series 11: Iowa Department of Natural Resources, scale 1:500,000) for bedrock aquifers. Vulnerability was determined by the combination and interpretation of factors including geologic and soil data, thickness of Quaternary cover, proximity to agricultural injection wells and sinkholes through which contaminants can be introduced to the aquifer, and evaluation of historical ground water and well contamination. A total of 90 sites were selected for sampling from a well inventory comprising approximately 1,640 public supply wells. From the 90 sites in the fixed network, 45 wells from two surficial aquifer types were selected to be sampled annually. The other 45 wells (from the bedrock aquifers) were selected to be sampled on a rotational schedule based on aquifer vulnerability to contamination. The wells determined to be vulnerable to contamination would be sampled every 2 years and those wells categorized as not vulnerable to contamination would be sampled every 4 years. All 90 wells were sampled in the first 2 years (1992 and 1993) and the sampling rotation began in 1994. The sampling effort during the 1998 water year is the seventh year of this 10-year program to determine possible ground-water-quality trends.

During the 1998 water year, a total of 45 ground-water samples were collected from municipal wells located in two types of surficial aquifers throughout the State (fig. 9). These wells were sampled as part of the Iowa ground-water monitoring (GWM) program to determine water-quality trends.

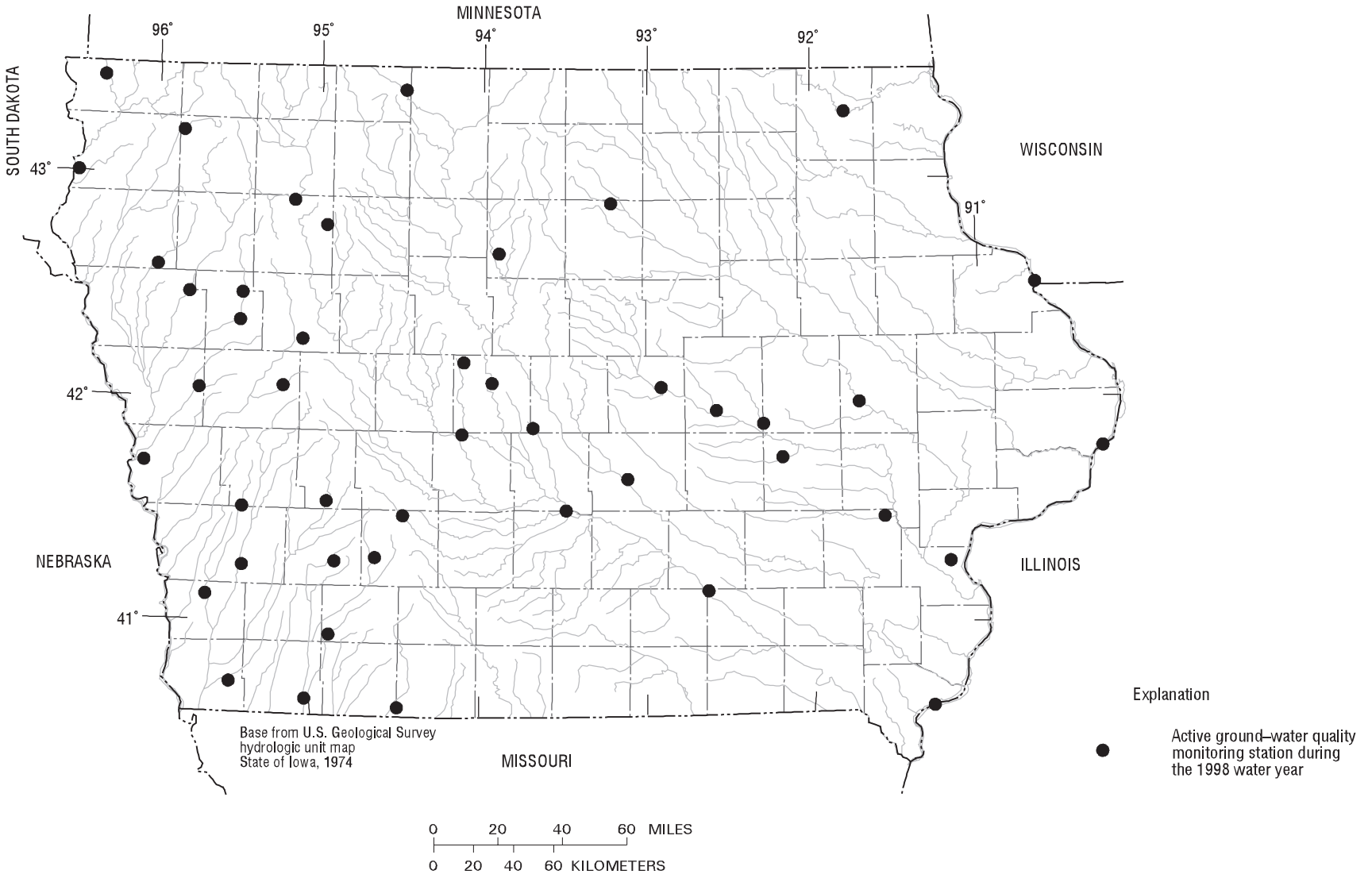

Figure 9. Location of active ground-water-quality monitoring wells in Iowa.

Ground-Water Monitoring Network

The forty-five wells that were sampled as part of the ground-water monitoring network are distributed throughout the State (fig. 9). Aquifer types include: (1) alluvial aquifers comprising sand and gravel associated with present-day fluvial systems; and (2) glacial drift and buried-channel aquifers associated with previous glaciation. Samples were collected during June, July, and August 1998. All samples were analyzed by the University of Iowa Hygienic Laboratory. Constituents analysed for include: common ions, nutrients, herbicides, and volatile organic compounds (VOC's). Results for all constituents are published in this report. Discussion of analytical results will be limited to the nitrogen species nitrate and ammonia, and herbicides.

A summary of results for nutrient and herbicide analyses are listed by compound in table 5. Nitrate or ammonia was detected in 43 of the 45 samples analyzed for these compounds, and one or more herbicides were detected in 8 of the 45 samples. The laboratory minimum reporting level (MRL) for ammonia and nitrate is 0.10 mg/L. The MRL's for the herbicides listed below are 0.10µg/L. The MRL is the lowest concentration reliably measured by the laboratory.

Table 5. Summary of nitrogen species and herbicides detected in samples from the Ground-Water-Quality Monitoring project, water year 1998
[µg/L, micrograms per liter; mg/L, milligrams per liter; <, less than detection limit]

Compound	Number of samples analyzed	Number of samples in which compound was detected	Median value	Maximum concentration detected
Acetochlor	45	0	<0.10 µg/L	<0.10 µg/L
Ammonia	45	20	< .10 mg/L	6.8 mg/L
Alachlor	45	0	< .10 µg/L	< .10 µg/L
Atrazine	45	7	< .10 µg/L	.34 µg/L
Butylate	45	0	< .10 µg/L	< .10 µg/L
Cyanazine	45	0	< .10 µg/L	< .10 µg/L
Deethylatrazine	45	3	< .10 µg/L	.22 µg/L
Deisopropylatrazine	45	2	< .10 µg/L	.19 µg/L
Metolachlor	45	3	< .10 µg/L	.94 µg/L
Metribuzin	45	0	< .10 µg/L	< .10 µg/L
Nitrate	45	27	1.10 mg/L	13.0 mg/L
Prometone	45	2	< .10 µg/L	.13 µg/L
Trifluralin	45	0	< .10 µg/L	< .10 µg/L

Concentrations of nitrate greater than 3.0 mg/L generally can be attributed to human activities, whereas concentrations less than 3.0 mg/L may indicate ambient concentrations from naturally occurring soil nitrogen or geologic deposits (Madison,

R.J., and Brunett, J.O., 1984, Overview of the occurrence of nitrate in ground water of the United States, in National Water Summary 1984 -- Water quality trends: U.S. Geological Survey Water-Supply Paper 2275, p. 93-105). Nitrate concentrations were greater than 3.0 mg/L in 16 of 45 samples. Concentrations in four samples exceeded 10 mg/L, which is the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) for public drinking water. Of the 27 samples that contained detectable concentrations of nitrate, 89 percent were from wells completed in alluvial aquifers and 11 percent were from glacial drift and buried-channel aquifers. The median concentration of the 27 samples with detections was 4.1 mg/l. The median concentration of all samples was 1.1 mg/L. However when all the wells are separated into categories based on well depth, the median nitrate concentrations vary from 2.4 mg/L in wells less than 50 feet deep to 3.0 mg/L in wells from 50 to 100 feet deep to <0.10 mg/L in wells greater than 100 feet deep. The maximum nitrate concentration was 13.0 mg/L. Twenty samples had detectable ammonia concentrations. Of these samples, 50 percent were collected from alluvial aquifers and 50 percent were from glacial drift and buried-channel aquifers.

Nine commonly used herbicides and two atrazine degradation products were sampled for during the 1998 water year. Water from 8 of the 45 wells sampled for herbicides contained detectable concentrations of one or more herbicides or herbicide degradation products. No sample contained herbicide concentrations that exceeded the MCL or proposed MCL of any of the analytes. Seven of the eight samples contained atrazine or its degradates, deethylatrazine and deisopropylatrazine. Metolachlor and/or prometone were also detected in four of the samples. No detectable amounts of cyanazine, metribuzin, butylate, trifluralin, alachlor, or acetochlor were found in any of the samples. All samples with detectable herbicide concentrations were from wells completed in alluvial aquifers and with depths less than 100 ft. The detection frequency in wells less than 100 feet deep was 23 percent. The rate of occurrence during the same period of the previous six years was 15 percent in 1992; 11 percent in 1993; 20 percent in 1994; 25 percent in 1995; 25 percent 1996; 20 percent in 1997; and a 22-percent rate described for the same periods prior to 1988 (Detroy, M.G., 1988, Ground-water-quality-monitoring program in Iowa: Nitrate and pesticides in shallow aquifers: U.S. Geological Survey Water-Resources Investigations Report 88-4123, 32 p.). A direct comparison of detection frequency between 1988 and 1998 may be misleading because each year different wells were sampled. Comparison is feasible between years 1992 through 1998 because essentially the same wells were used, see table 6. Variance in detection frequency may reflect several factors including changes in agricultural practices concerning use of herbicides, and climatic conditions.

Trends in Groundwater Quality

Table 6. Trends in herbicide detection frequencies (in percent) (--, no wells sampled)

	Water Year						
Well Type	1992	1993	1994	1995	1996	1997	1998
All Wells (<100ft.)	15%	11%	20%	25%	25%	20%	23%
Vulnerable Bedrock	14%	14%	--	13%	--	9%	--
Non-Vulnerable Bedrock	9%	5%	--	--	--	5%	--

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 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 human activities.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO2 emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO2 and NOx scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

`http://nadp.nrel.colostate.edu/NADP`

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 wet atmospheric deposition, which includes snow, rain, sleet and hail. 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, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents 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.

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

ties to collaborate efforts among the agencies.

Additional information about the NAWQA Program is available through the world wide web at:

http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html

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

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1998 water year that began October 1, 1997, and ended September 30, 1998. 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 3-5, 7, 9, 10. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

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

Downstream Order System

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

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 05388250, which appears just to the left of the station name, includes the two-digit Part number "05" plus the six-digit downstream-order number "388250." The Part number designates the major river basin; for example, Part "05" is the Mississippi 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 lati-

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

Latitude and longitude coordinates for wells:

1. 414315091252001
2. 414315091252002
3. 414316091251901

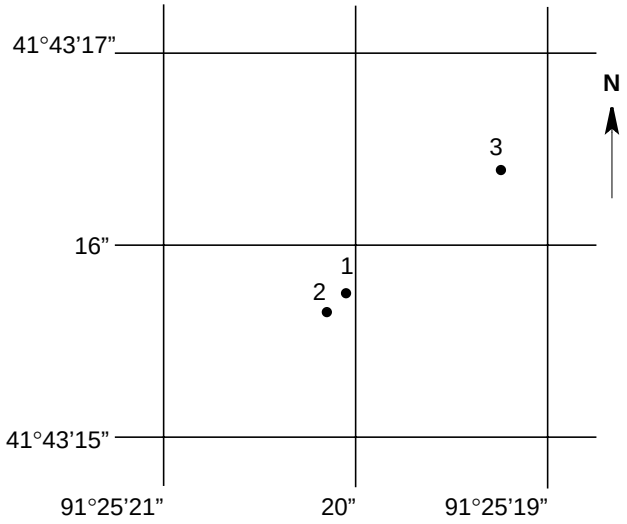

Figure 9. Latitude-longitude well number.

Numbering System For Wells

Each well is identified by means of (1) a 15-digit number that is based on the grid system of latitude and longitude, and (2) a local number that is provided for continuity with older reports and for other use as dictated by local needs. For maximum utility, latitude and longitude code numbers are determined to seconds in order that each well may have a unique number. The first six digits denote degrees, minutes, and seconds of north latitude; the next seven digits are degrees, minutes, and seconds of west longitude; and the last two numbers are a sequential number assigned in the order in which the wells are located in a 1-second quadrangle.

The local well numbers are in accordance with the Bureau of Land Management's system of land subdivision. Each well number is made up of three segments. The first segment indicates the township, the second the range, and the third the section in which the well is located (fig. 12). The letters after the section number which are assigned in a counter-clockwise direction (beginning with "A" in the northeast quarter), represent subdivisions of the section. The first letter denotes a 160-acre tract, the second a 40-acre tract, the third a 10-acre tract, and the fourth a 2.5 acre tract. Numbers are added as suffixes to distinguish wells in the same tract. Thus, the number 96-20-3CDBD1 designates the well in the SE 1/4 NW 1/4 SE 1/4 SW 1/4 sec.3, T.96 N., R.20 W.

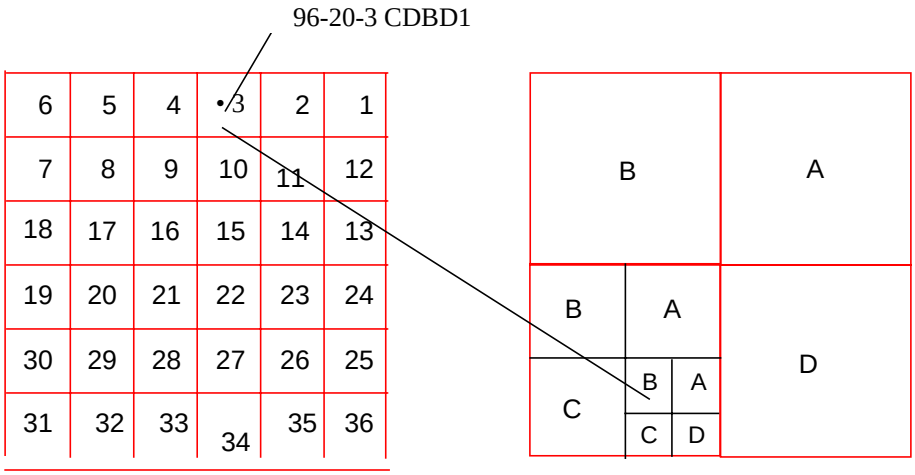

Figure 10. Local well-numbering system for well 96-20-3 CDBD1.

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.” Location of all complete-record surface water stations which are given in this report are shown in figure 3

Partial records are obtained through discrete measurements without using a continuous stage-recording device and generally pertain only to a characteristic of either high, medium or low flow. The location of all active, crest-stage gaging stations are shown in figure 4.

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-capacity curves or tables to compute lake storage.

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

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and

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

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

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

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 relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. 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 using stage-discharge relations.

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 these periods, the daily discharges are estimated from the recorded range in stage, discharge computed before and after the missing 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 preference.

The records published for each continuous-record surface-water discharge station (gaging station) 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. For the first time this year, we are also including a hydrograph for the water year.

Station manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside 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 gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages 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 there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.-- 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 sea level (see "Definition of Terms"), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a REMARKS 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 Geological Survey by a cooperating organization are identified here.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Extremes are published only for stations with significant flow regulation and where extremes occurred in pre-regulation periods. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did no occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

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 is now presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate. EXTREMES FOR PERIOD OF RECORD are now presented only for stations with significant flow regulation and where extremes occurred in pre-regulation periods. No changes have been made to the data presentations of lake contents or reservoir storage.

Data table of daily mean values

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

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 PERIOD OF RECORD, BY WATER YEAR (WY)," for unregulated streams for the water years listed in 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. For significantly regulated streams the first and last water years of the range of years will be given for the post-regulation period.

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, "PERIOD OF RECORD," for unregulated streams, 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. For significantly regulated streams the period selected will be designated as "WATER YEARS ___ - ___ ," for the post regulation period. All of the calculations for the statistical characteristics designated ANNUAL (See line headings below.), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff data are also 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 (CSFM) 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 is exceeded 10 percent of the time for the designated period.

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

90 PERCENT EXCEEDS.--The discharge that is 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 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 specail 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 by listing the dates of the estimated record in the REMARKS paragraph of the station description, and are flagged “e” in tables.

Accuracy of the Records

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

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

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

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published.

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 various field offices of the Iowa District. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the offices whose addresses are 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 streamgaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

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

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 5.

Arrangement of Records

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

On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, alkalinity and dissolved oxygen, are made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures are 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 of onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. C2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed on p. 54-56 of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey 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 the representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network 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 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.

Water Temperature and Specific Conductance

Water temperatures are measured at most of the water-quality stations. The measurement of temperature and specific conductance is performed during each regular site visit (usually at a six week interval) to streamgaging stations. Records of stream temperature indicate significant thermal characteristics of the stream when analyzed over a long period of record. Large streams have small daily temperature variations while shallow streams may have a daily range of several degrees and may closely follow the changes in air temperature. Furthermore, some streams may be affected by waste-heat discharge.

Specific conductance can be used as a general indicator of stream quality. This determination is easily made in the field with a portable meter, and the results are very useful as general indicators of dissolved-solids concentration or as a base for extrapolating other analytical data. Records for temperature and specific conductance appear in the section "Analyses of samples collected at miscellaneous sites".

Sediment

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

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

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

In addition to the records of the quantities of suspended-sediment, records of the periodic measurements of the particle-size distribution of the suspended-sediment and bed material are included. Miscellaneous suspended-sediment samples were collected during flood events have been included with the station's water quality data or in the section "Analyses of samples at miscellaneous sites".

Laboratory Measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the U.S. Geological Survey laboratory in Arvada, Colorado and the University of Iowa Hygienic Laboratory. 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 laboratories are given in TWRI, Book 1, Chap. D2, Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

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

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

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

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

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

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

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

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

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

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

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

Remarks Codes

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

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

Water Quality-Control Data

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

Blank Samples

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

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

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

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

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

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

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

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

Reference Samples

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

Replicate Samples

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

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

Split sample - a type of replicate sample in which a sample is split into subsamples contemporaneous in time and space.

Spike Samples

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

Dissolved Trace-Element Concentrations

NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/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). Data above the µg/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 began using new trace-element protocols at some stations in water year 1994.

Change in National Trends Network Procedures

Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

Records of Ground-Water Levels

Ground-water level data from a network of observation wells in Iowa are published in this report. These data provide a limited historical record of water-level changes in the State's most important aquifers. Locations of the observation wells in this network in Iowa are shown in figure 6. Information about the availability of the data in the water-level files and reports of the U.S. Geological Survey may be obtained from the Iowa District Office (see address on back of title page).

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 ensures that measurements at each well are of consistent accuracy and reliability.

Tables of water-level data are arranged alphabetically by counties. The site identification number, based on latitude and longitude, for a given well is the 15-digit numeric value that appears in the upper left corner of the station description. The secondary identification number is the local well number, an alphanumeric value, derived from the township, range, and section location of the well (fig. 15).

Water-level records are obtained from direct measurements with a chalked steel tape, electric line, airline, or from the graph of a water-level recorder. The water-level measurements in this report are in feet with reference to land-surface datum. Land-surface datum is a 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 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-level measurements are reported to the nearest hundredth of a foot. Estimates, indicated by an "e" may be reported in tenths of a foot. Adjustments to the water level recorder chart are indicated by an "a". The error of water-level measurements may be, at most, a few hundredths of a foot.

Data Presentation

Each well record consists of two parts, the station description and the table of water levels observed during the water year. The description of the well is presented by headings preceding the tabular data. The following explains the information presented under each heading.

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

AQUIFER.--This entry is the aquifer(s) name (if one exists) and geologic age of the strata open to the well.

WELL CHARACTERISTICS.--This entry describes the well depth, casing diameter, casing depth, opening or screened interval(s), method of construction, and use of water from the well.

INSTRUMENTATION.--This paragraph provides information on the frequency of measurement and the collection method used.

DATUM.--This entry includes the land-surface elevation and the measuring point at the well. The elevation of the land-surface datum is describe in feet above (or below) sea level; it is reported with a precision depending on the method of determination. The measuring point is described physically and in relation to land surface.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level and any information not presented in the other parts of the station description but considered useful.

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 beginning of publication of water-level records by the U.S. Geological Survey.

REVISED RECORDS.--If any revisions of previously published data were made for water-levels, the Water Data Report in which they appeared and year published would appear here.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels for the period of record, below 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. For wells equipped with recorders, only abbreviated tables are published. The highest and lowest water levels of the water year and the 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. Missing records are indicated by dashes in place of the water level.

Hydrographs are included for 59 wells which are representative of hydrologic conditions in the important aquifers in Iowa.

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation's most important aquifers. Locations of the observation wells in this network in Iowa are shown in figure 7.

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. The quality of ground water ordinarily changes only slowly; therefore, for most 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.

The records of ground-water quality in this report were obtained as a part a statewide ground-water quality monitoring network operated by the Iowa District. All samples were obtained from municipal wells throughout Iowa. This program is conducted in cooperation with the University of Iowa Hygienic Laboratory (UHL) and the Iowa Department of Natural Resources (Geological Survey Bureau). All samples are collected by USGS personnel, field-preserved and submitted to UHL for analysis. Chemical analyses include common constituents (major ions), nutrients, organic compounds, radionuclides and pesticides. Approximately 10 percent of the samples receive additional analyses for about 90 organic priority pollutants, however these analyses are not presented in this report but are on file in the Iowa District Office.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey Techniques of Water-Resources Investigations" manuals listed on a following page. The values reported 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 comprising the casings. The samples collected represent raw water

Data Presentation

The records of ground-water quality are published in a section titled GROUND-WATER QUALITY DATA immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by county, and are identified by station number. The prime identification number for wells sampled is the 15-digit station number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the station number, date and time of sampling, depth of well, 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.

Explanation of Quality of Ground-Water Data Tables -- Descriptive Headings

STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	SAMPLE TIME	AQUI-FER CODE	DEPTH OF WELL, TOTAL (FT)
411441094401602	075N33W32CDDD	1943	BRIDGEWATER 1	ADAIR	08-11-92	1130	111ALVM	49

STATION NUMBER**:** 15-digit number based on grid system of latitude and longitude.

LOCAL WELL NUMBER**:** Refers to the Bureau of Land Management System of land subdivision.

DATE: The date that construction on the well was completed.

LOCAL WELL NAME**:** Name used by community to identify well.

COUNTY: The name of the county where the well is located.

SAMPLE DATE: Date the well was sampled.

SAMPLE TIME: Time the sample was collected.

AQUIFER CODE: Refers to the lithologic unit in which the well is completed. Derived from two digits of the GEOLOGIC UNIT, the principal unit which provides the majority of water to the well.

11 - Quaternary	33- Mississippian	36 - Ordovician
21 - Cretaceous	34 - Devonian	37 - Cambrian
32 - Pennsylvanian	35 - Silurian	

The third digit and remaining alphabetic characters refer to the more specific lithologic unit which the well is tapping. The following examples are commonly used units:

Code	General	Specific
111ALVM	Quaternary	(alluvium)
217DKOT	Cretaceous	(Dakota sandstone)
344CDVL	Devonian	(Cedar Valley limestone)

DEPTH OF WELL, TOTAL (FT): Total depth of well in feet.

ACCESS TO USGS WATER DATA

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

`http://www.usgs.gov`

Some water-quality and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on magnetic tape or 3-1/2 inch floppy disk. 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 District Offices (See address on the back of the title page.)

The Iowa District maintains a web site highlighting many of the District's activities. Many of the continuous stream gages presented in these reports have near-real-time data available, and all gages have historic data available. These data may be accessed at

`http://diaiwc.cr.usgs.gov`

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 warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 Cplus or minus 0.2 Con 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 Cplus or minus 1.0 Con KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

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

Bottom material: See Bed material.

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

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

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

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic foot per second day 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 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 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.

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 withe the 7-day 10-year low-flow statistic).

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

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

Dissolved refers to that material in a representative water sample which passes through a 0.45 mm 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 ($CaCO_3$).

Hydrologic Benchmark Network is a network of 53 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

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

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

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

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

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

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

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

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

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

Parameter Code is a 5-digit number used in the U.S. Geological Survey data system, National Water Information System (NWIS),, to uniquely identify a specific constituent. The codes used in NWIS are the same as those used in the U.S. Environmental Protection Agency data system, STORET.

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

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

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

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

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

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

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 x 10 radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

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

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

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

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

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 of the first-order level nets of both 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.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

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

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

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

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

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

Total sediment discharge (tons/day) is the sum of the suspended sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

7-day 10-year low flow (7 Q_{10}) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65-percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

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

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

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

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

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

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45 mm 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 mm 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.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

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, 1992, is called the "1992 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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

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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.

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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.

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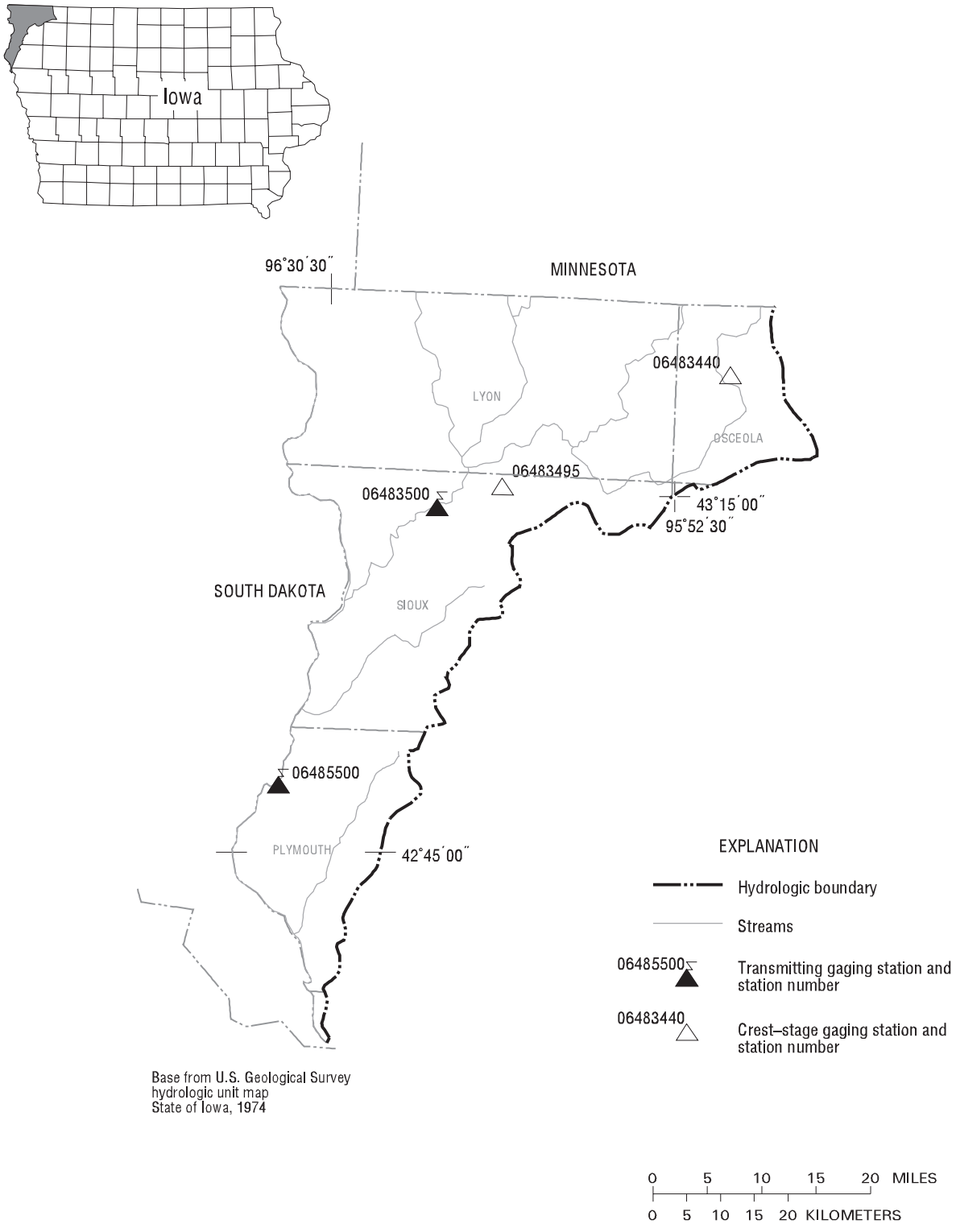
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06483500
43°15′00″
95°52′30″
SOUTH DAKOTA
SIOUX
06485500
PLYMOUTH
42°45′00″
EXPLANATION
Hydrologic boundary
Streams
06485500
Transmitting gaging station and station number
06483440
Crest–stage gaging station and station number
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974
0 5 10 15 20 MILES
0 5 10 15 20 KILOMETERS

Gaging Stations

Crest Stage Gaging Stations

06483500 ROCK RIVER NEAR ROCK VALLEY, IA

LOCATION.--Lat 43°12'52", long 96°17'39", in $SW^1/_4$ $SW^1/_4$ sec.16, T.97 N., R.46 W., Sioux County, Hydrologic Unit 10170204, on left bank 3 ft upstream from bridge on county highway K30, 0.3 mi north of Rock Valley, and at mile 19.1.

DRAINAGE AREA.--1,592 mi^2.

PERIOD OF RECORD.--June 1948 to current year.

REVISED RECORDS.--WSP 1439: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,222.54 ft above sea level. Prior to Aug. 13, 1952, nonrecording gage with supplementary water-stage recorder operating above 6.2 ft gage height. June 4, 1949 to Aug. 12, 1952 and Aug. 13, 1952 to May 4, 1976, water-stage recorder, at site 3.2 mi downstream at datum 10.73 ft lower.

REMARKS.--Estimated daily discharges: Nov. 14-26, and Dec. 4 to Mar. 20. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of 17.0 ft, former site and datum, discharge not determined, from information by State Highway Commission.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	113	142	169	e150	e85	e250	1990	1120	425	593	192	245
2	113	141	169	e170	e80	e240	1980	1020	425	515	187	216
3	114	133	158	e160	e75	e245	1850	970	440	464	223	200
4	109	136	e100	e100	e70	e240	1720	915	451	715	222	186
5	106	141	e95	e130	e80	e240	1600	854	460	1280	228	175
6	106	146	e105	e140	e75	e210	1470	802	444	983	234	163
7	106	146	e140	e140	e75	e240	1410	754	429	805	253	154
8	109	147	e150	e130	e80	e200	1610	716	438	690	266	144
9	110	151	e150	e95	e95	e160	1950	689	445	621	274	138
10	116	147	e130	e90	e100	e150	1960	681	441	539	327	131
11	119	138	e110	e90	e95	e130	1700	655	438	476	323	126
12	136	135	e90	e60	e90	e120	1520	667	433	423	291	124
13	181	141	e110	e50	e95	e180	1410	638	417	382	270	119
14	192	e150	e120	e55	e105	e160	1250	598	414	342	288	115
15	191	e140	e150	e65	e115	e200	1150	630	443	359	288	111
16	188	e85	e145	e70	e125	e220	1100	674	485	411	262	109
17	180	e110	e140	e60	e130	e210	1030	631	493	413	243	107
18	176	e140	e150	e55	e130	e205	977	607	499	376	232	104
19	166	e160	e170	e60	e135	e220	933	579	503	399	221	101
20	155	e170	e150	e65	e135	e240	948	541	491	364	218	98
21	150	e160	e130	e70	e160	262	958	507	466	345	232	95
22	148	e155	e160	e65	e200	289	915	491	430	321	220	95
23	147	e150	e140	e65	e300	302	858	486	400	288	212	97
24	146	e155	e150	e70	e380	305	806	488	398	269	206	104
25	143	e165	e150	e65	e375	299	758	480	403	257	202	104
26	139	e175	e145	e70	e320	354	1390	468	680	251	205	101
27	135	169	e130	e70	e300	534	1750	452	761	238	220	98
28	140	166	e135	e70	e280	1310	1550	435	741	223	235	94
29	143	159	e130	e75	---	2420	1380	429	758	211	264	95
30	145	156	e145	e80	---	2200	1230	419	699	205	326	93
31	142	---	e130	e90	---	2050	---	440	---	203	287	---
TOTAL	4364	4409	4246	2725	4285	14385	41153	19836	14750	13961	7651	3842
MEAN	141	147	137	87.9	153	464	1372	640	492	450	247	128
MAX	192	175	170	170	380	2420	1990	1120	761	1280	327	245
MIN	106	85	90	50	70	120	758	419	398	203	187	93
AC-FT	8660	8750	8420	5410	8500	28530	81630	39340	29260	27690	15180	7620
CFSM	.09	.09	.09	.06	.10	.29	.86	.40	.31	.28	.16	.08
IN.	.10	.10	.10	.06	.10	.34	.96	.46	.34	.33	.18	.09

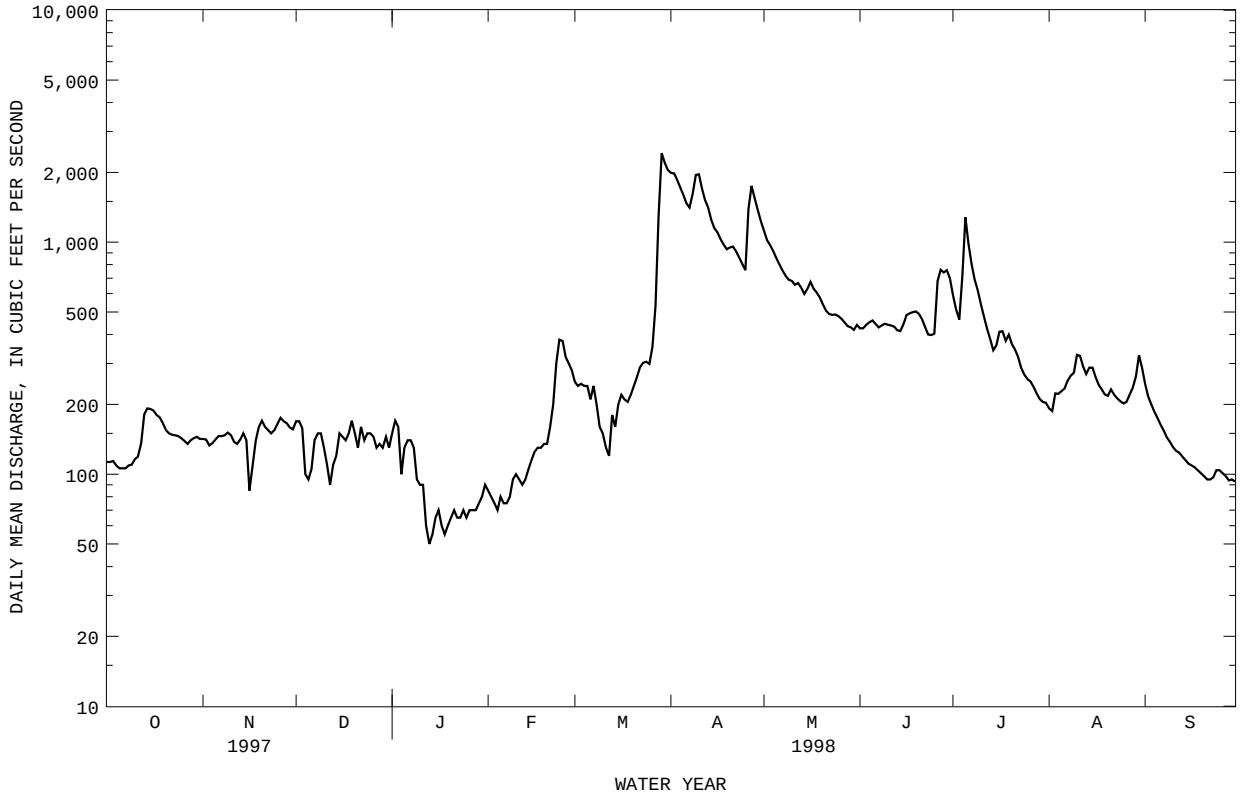
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1998, BY WATER YEAR (WY)

MEAN	239	247	138	78.8	212	1049	1285	688	949	609	273	243
MAX	1232	2039	676	434	1059	4646	6507	3728	6495	9088	2251	2135
(WY)	1993	1980	1983	1996	1966	1997	1969	1993	1993	1993	1993	1986
MIN	2.39	9.70	3.22	.037	.30	35.1	35.9	44.4	46.3	21.9	6.79	3.26
(WY)	1959	1959	1959	1977	1959	1959	1959	1968	1964	1976	1976	1955

06483500 ROCK RIVER NEAR ROCK VALLEY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1949 - 1998	
ANNUAL TOTAL	464116		135607			
ANNUAL MEAN	1272		372		501	
HIGHEST ANNUAL MEAN					2656	1993
LOWEST ANNUAL MEAN					31.0	1968
HIGHEST DAILY MEAN	13100	Mar 22	2420	Mar 29	35400	Apr 7 1969
LOWEST DAILY MEAN	80	Jan 12	50	Jan 13	.00	Feb 20 1959a
ANNUAL SEVEN-DAY MINIMUM	109	Jan 10	59	Jan 12	.00	Feb 27 1959
INSTANTANEOUS PEAK FLOW			2580	Mar 29	40400	Apr 7 1969
INSTANTANEOUS PEAK STAGE			8.71	Mar 29	17.32	Apr 7 1969
ANNUAL RUNOFF (AC-FT)	920600		269000		363100	
ANNUAL RUNOFF (CFSM)	.80		.23		.31	
ANNUAL RUNOFF (INCHES)	10.84		3.17		4.28	
10 PERCENT EXCEEDS	3010		915		1140	
50 PERCENT EXCEEDS	245		200		130	
90 PERCENT EXCEEDS	120		95		15	

a Many days during winter periods in 1959 and 1977
e Estimated



06485500 BIG SIOUX RIVER AT AKRON, IA

LOCATION.--Lat 42°50'14", long 96°33'41", in SW¼ SE¼ SW¼ sec.30, T.93 N., R.48 W., Plymouth County, Hydrologic Unit 10170203, on left bank 15 ft downstream from Iowa Highway 403 bridge, 0.5 mi northwest of Akron, and 2.9 mi upstream from Union Creek.

DRAINAGE AREA.--8,424 mi^2, of which 1,487 mi^2 usually is noncontributing (213 mi^2 of the noncontributing area contributed runoff in the 1994-98 water years).

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

REVISED RECORDS.--WSP 1309: 1929(M), 1931-33(M), 1936(M), 1938(M), 1940(M). WSP 1389: Drainage area. WDR SD-84-1: Drainage area. WDR SD-94-1 only: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,118.90 ft above sea level. Prior to Dec. 3, 1934, nonrecording gage at bridge 0.5 mi downstream at same datum. From Dec. 3, 1934, to Oct. 31, 1985, water-stage recorder at site 0.6 mi downstream at same datum.

REMARKS.--Records good except those for Mar. 22 to Apr. 6, which are fair, and those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data-collection platform at station. Water temperature and specific conductance measured during the year are compiled in the Miscellaneous Temperature Measurements and Field Determinations section.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	980	978	922	e640	e320	e2000	5320	3680	1740	1770	878	802
2	961	990	937	e650	e320	e2000	5440	3460	1720	1660	836	751
3	943	994	972	e630	e310	e2250	5430	3270	1680	1570	832	711
4	925	979	953	e610	e310	e2200	5210	3090	1690	1510	918	676
5	923	973	e950	e580	e300	e2000	5150	2930	1720	1940	1030	650
6	911	970	e900	e590	e300	e1900	4970	2790	1690	2780	1010	624
7	893	985	e850	e570	e320	e1700	4770	2660	1670	2770	1100	595
8	891	1010	e850	e550	e350	e1500	4890	2530	1660	2230	1140	572
9	899	989	e800	e530	e380	e1300	5740	2410	1700	2110	1190	550
10	915	959	e800	e510	e400	e1000	6850	2320	1700	1880	1180	531
11	968	966	e750	e490	e480	e900	6840	2260	1670	1730	1170	532
12	980	897	e750	e470	e550	e950	5980	2240	1630	1630	1130	514
13	989	986	e750	e450	e600	e1000	5450	2210	1630	1550	1050	500
14	1100	975	e775	e430	e650	e1100	5090	2190	1710	1470	967	488
15	1160	994	e775	e410	e700	e1200	4870	2230	1690	1380	927	475
16	1150	e880	e800	e400	e750	e1250	4640	2420	1870	1330	907	472
17	1150	e730	e775	e390	e800	e1300	4390	2490	2090	1330	864	473
18	1140	e700	e750	e390	e900	e1300	4100	2400	2120	1350	806	458
19	1160	e700	e725	e380	e950	e1300	3850	2270	2040	1330	763	447
20	1150	e750	e700	e370	e1050	e1350	3690	2190	2000	1360	757	431
21	1120	e800	e700	e370	e1200	e1400	3650	2090	1910	1430	785	425
22	1090	e800	e690	e370	1280	1420	3570	2030	1830	1310	749	422
23	1080	e780	e680	e360	1410	1440	3420	1990	1820	1230	720	420
24	1060	e780	e670	e360	1560	1560	3260	1970	2030	1170	705	430
25	1040	e757	e660	e360	1750	1650	3130	1930	1700	1140	689	430
26	1010	e850	e650	e360	1860	1730	3250	1910	1670	1090	690	431
27	1000	e950	e650	e350	1950	1880	4470	1880	1920	1060	692	430
28	1000	975	e640	e350	2140	2360	5150	1840	1970	1010	697	420
29	991	953	e630	e360	---	4060	4670	1800	1880	954	701	421
30	987	930	e620	e360	---	5440	4190	1760	1850	908	734	420
31	979	---	e620	e330	---	5390	---	1740	---	871	823	---
TOTAL	31545	26980	23694	13970	23890	57830	141430	72980	54000	46853	27440	15501
MEAN	1018	899	764	451	853	1865	4714	2354	1800	1511	885	517
MAX	1160	1010	972	650	2140	5440	6850	3680	2120	2780	1190	802
MIN	891	700	620	330	300	900	3130	1740	1630	871	689	420
AC-FT	62570	53510	47000	27710	47390	114700	280500	144800	107100	92930	54430	30750

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1998, BY WATER YEAR (WY)

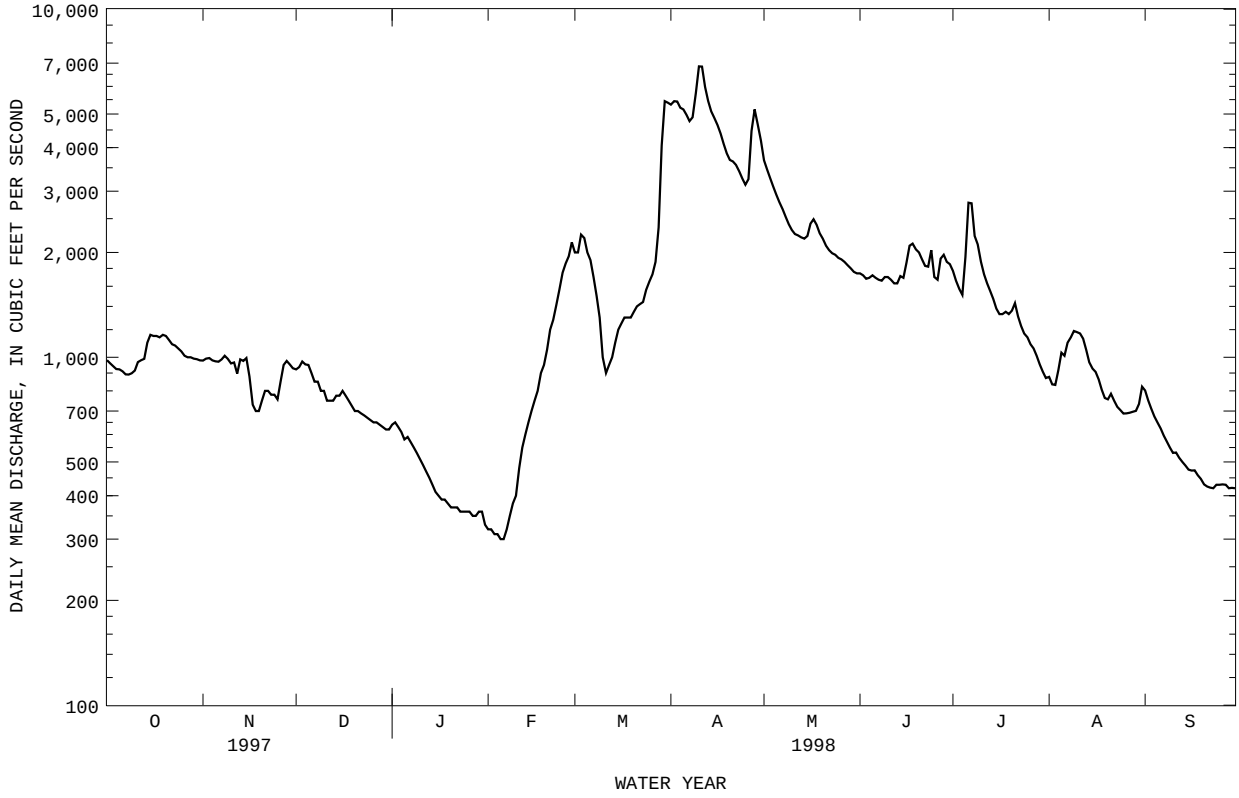
MEAN	529	493	330	202	498	2419	3264	1761	2141	1474	760	680
MAX	4039	3022	1967	920	2399	8866	20690	9499	15820	21740	6200	7313
(WY)	1987	1980	1983	1996	1966	1983	1969	1993	1984	1993	1993	1986
MIN	32.9	47.9	32.1	6.68	12.1	124	139	73.3	100	50.7	45.2	36.4
(WY)	1959	1959	1977	1977	1936	1931	1931	1934	1933	1931	1976	1976

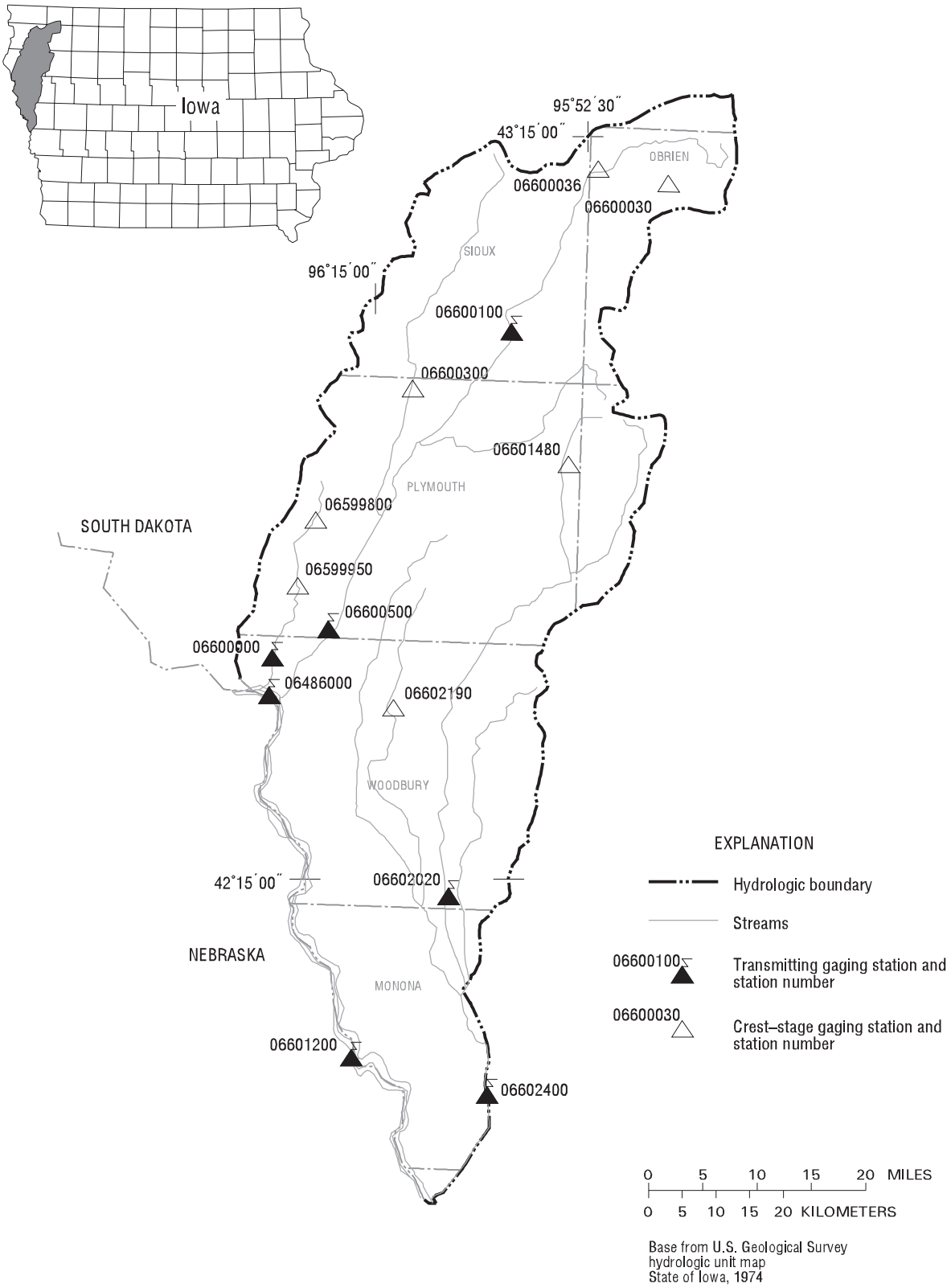
e Estimated

06485500 BIG SIOUX RIVER AT AKRON, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1929 - 1998	
ANNUAL TOTAL	1270912		536113			
ANNUAL MEAN	3482		1469		1213a	
HIGHEST ANNUAL MEAN					6271	1993
LOWEST ANNUAL MEAN					120	1931
HIGHEST DAILY MEAN	30300	Apr 9	6850	Apr 10	77500	Apr 9 1969
LOWEST DAILY MEAN	390	Jan 28	300	Feb 5	4.0	Jan 17 1977
ANNUAL SEVEN-DAY MINIMUM	407	Jan 25	311	Feb 1	4.4	Jan 15 1977
INSTANTANEOUS PEAK FLOW			7170	Apr 10	80800	Apr 9 1969b
INSTANTANEOUS PEAK STAGE			15.93	Apr 10	23.05	May 10 1993c
ANNUAL RUNOFF (AC-FT)	2521000		1063000		878900	
10 PERCENT EXCEEDS	9310		3110		2850	
50 PERCENT EXCEEDS	1170		994		378	
90 PERCENT EXCEEDS	518		430		70	

a Median of annual mean discharges, 810 ft^3/s.
b Gage height, 22.99 ft.
c From floodmark; discharge, 66,700 ft^3/s.




Iowa
95°52′30″
43°15′00″
OBRIEN
06600036
06600030
SIOUX
96°15′00″
06600100
06600300
06601480
PLYMOUTH
06599800
SOUTH DAKOTA
06599950
06600500
06600000
06486000
06602190
WOODBURY
42°15′00″
06602020
NEBRASKA
MONONA
06601200
06602400
EXPLANATION
Hydrologic boundary
Streams
06600100 Transmitting gaging station and station number
06600030 Crest–stage gaging station and station number
0 5 10 15 20 MILES
0 5 10 15 20 KILOMETERS
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

06486000 MISSOURI RIVER AT SIOUX CITY, IA

LOCATION.--Lat. 42°29'09", long 96°24'49", in NW$^1/_4$ SE$^1/_4$ sec.16, T.29 N., R.9 E., sixth prinicipal meridian, Dakota County, Nebraska, Hydrologic Unit 10230001, on right bank on upstream side of bridge on U.S. Highway 20 and 77 at South Sioux City, Nebraska, 1.9 mi downstream from Big Sioux River, and at mile 732.2.

DRAINAGE.--314,600 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1897 to current year in reports of the U.S. Geological Survey. Prior to October 1928 and October 1931 to September 1938, monthly discharges only, published in WSP 1310. January 1879 to December 1890, monthly discharges only, in House Document 238, 73rd Congress, 2d session, Missouri River. Gage height records collected in this vicinity September 1878 to December 1899 are contained in reports of Missouri River Commission and since July 1889 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 716: 1929-30. WSP 876: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,056.98 ft above sea level. Sept. 2, 1878 to Dec. 31, 1905, nonrecording gages at various locations within 1.7 mi of present site and at various datums. Jan. 1, 1906 to Feb. 14, 1935, nonrecording gage, and Feb. 15, 1935 to Sept. 30, 1969, water-stage recorder at site 227 ft downstream at datum 19.98 ft higher, and Oct. 1, 1969 to Sept. 30, 1970 at datum 20.00 ft higher. Oct. 1, 1970 to Jan. 30, 1981, water-stage recorder at site 227 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Jan. 6, 13-18, 21, and Jan. 23. Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 441,000 ft^3/s Apr. 14, 1952, gage height, 24.28 ft, datum then in use; minimum, 2,500 ft^3/s Dec. 29, 1941; minimum gage height, 7.02 ft Jan. 19, 1996.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69200	72900	70100	29700	28300	29400	31800	30800	36100	33600	32400	33000
2	69100	73200	68100	29200	28100	29200	30500	32000	36100	33500	32700	33500
3	69300	71800	65400	29400	27800	29100	30500	32700	36300	33500	33800	34500
4	69400	71600	62600	28200	27800	28900	30900	32600	36700	33400	33000	34300
5	69300	71800	58900	29000	28200	28900	30700	32200	37200	33200	32700	34200
6	69200	71300	55800	e29200	28400	28600	30900	31900	37300	33600	32700	34100
7	69200	70400	53300	28400	27800	28600	30800	31700	37400	35800	32900	33700
8	69700	70500	51000	26900	27700	28600	32100	31100	38000	33800	32100	33300
9	69800	70600	48700	25400	28000	27200	33400	30800	39000	31700	31000	33300
10	68700	71200	46300	22200	28100	26400	31800	31500	38600	32900	31800	33600
11	69200	71400	43200	23200	28100	27500	30600	31600	38700	33100	31600	33600
12	70100	71500	39700	24100	28000	26900	29100	32100	39200	33900	31700	33500
13	71600	71800	37000	e24300	28200	27500	28800	32100	36800	33800	31800	33400
14	68800	71500	33300	e24600	27800	26800	28600	31400	33800	33300	31500	33200
15	68500	71800	30800	e24000	27600	26600	30600	31800	34000	33000	31800	33800
16	69400	71500	30700	e25400	27700	26800	31500	32900	30700	32800	32600	33700
17	68900	71200	30300	e25600	28200	27700	30800	32300	28700	32400	32600	33500
18	67100	70800	30000	e24300	28400	29100	30100	34300	29200	32400	32400	33800
19	68000	71100	29800	24600	28300	28800	30400	36000	29100	32400	32200	33800
20	68500	71400	29500	24400	28000	28600	30400	36100	28200	32200	32200	34000
21	69100	71900	29100	e24800	28200	29000	30800	35500	27900	32200	32600	33700
22	68800	72400	29200	e25400	28200	30400	31100	35500	27600	32400	32000	33600
23	68300	71800	29200	e25800	28700	30700	30700	34800	27400	32100	31300	33300
24	68500	71900	29100	26500	29100	30200	30500	33200	31000	32100	31400	33600
25	69200	71700	29200	27000	29200	30000	30200	32800	32000	32000	31800	33400
26	69800	71200	29200	28000	29500	30000	34100	33400	31500	33000	32100	33900
27	69600	72300	29000	28000	29600	30800	33900	34800	33700	33200	32200	34200
28	70100	72300	29300	29000	29500	32600	32200	35200	34400	33100	32500	34100
29	70600	72000	29400	28800		32700	31100	35600	34300	32800	32100	33600
30	70500	71100	29600	28000	---	33200	30100	36200	34300	32800	32000	33200
31	70900	---	29600	28200	---	32600	---	36800	---	32500	32200	---
TOTAL	2148400	2147900	1236400	821600	792500	903400	929000	1031700	1015200	1022500	997700	1010400
MEAN	69300	71600	39880	26500	28300	29140	30970	33280	33840	32980	32180	33680
MAX	71600	73200	70100	29700	29600	33200	34100	36800	39200	35800	33800	34500
MIN	67100	70400	29000	22200	27600	26400	28600	30800	27400	31700	31000	33000
AC-FT	4261000	4260000	2452000	1630000	1572000	1792000	1843000	2046000	2014000	2028000	1979000	2004000
CFSM	.22	.23	.13	.08	.09	.09	.10	.11	.11	.10	.10	.11
IN.	.25	.25	.15	.10	.09	.11	.11	.12	.12	.12	.12	.12

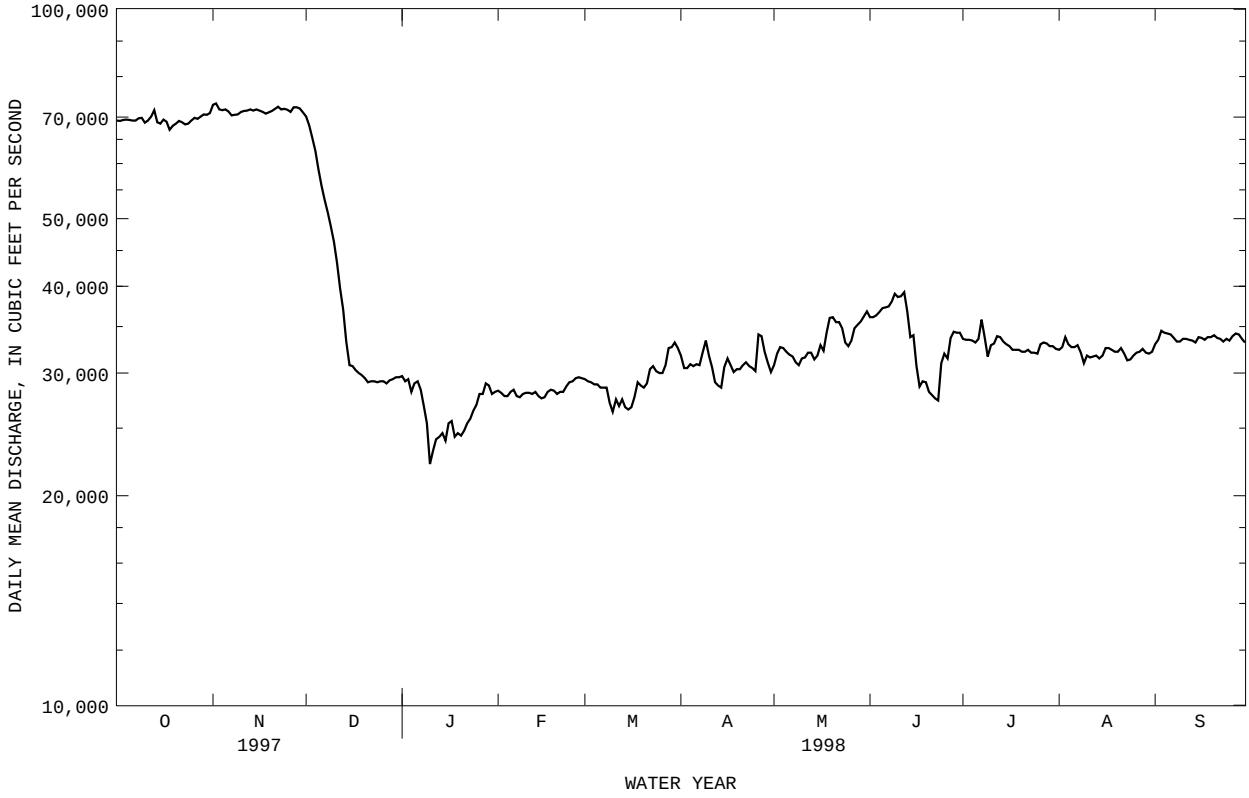
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1998, BY WATER YEAR (WY)

MEAN	36150	30800	18550	15830	17060	23200	33350	33910	35660	36270	36750	36800
MAX	69300	71600	39880	27720	31120	47020	88040	78720	66400	65550	65360	66400
(WY)	1998	1998	1998	1987	1997	1997	1997	1997	1997	1997	1997	1997
MIN	14350	6951	8271	7316	6293	9135	17450	23820	23270	26890	24270	25790
(WY)	1962	1962	1962	1964	1963	1957	1957	1962	1960	1958	1993	1962

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1953 - 1998a	
ANNUAL TOTAL	21754200		14056700			
ANNUAL MEAN	59600		38510		29570	
HIGHEST ANNUAL MEAN					55890	1997
LOWEST ANNUAL MEAN					19770	1957
HIGHEST DAILY MEAN	97400	Apr 10	73200	Nov 2	105000	Jun 25 1953
LOWEST DAILY MEAN	21000	Jan 11	22200	Jan 10	3000	Dec 11 1961
ANNUAL SEVEN-DAY MINIMUM	23500	Jan 10	24000	Jan 9	5430	Feb 22 1963
INSTANTANEOUS PEAK FLOW			73600	Nov 1	101000	Apr 3 1960
INSTANTANEOUS PEAK STAGE			23.24	Oct 13	30.65	Feb 19 1971
INSTANTANEOUS LOW FLOW			21700	Jan 10		
ANNUAL RUNOFF (AC-FT)	43150000		27880000		21420000	
ANNUAL RUNOFF (CFSM)	.19		.12		.094	
ANNUAL RUNOFF (INCHES)	2.57		1.66		1.28	
10 PERCENT EXCEEDS	81000		70100		46600	
50 PERCENT EXCEEDS	65900		32400		30100	
90 PERCENT EXCEEDS	28600		27900		11400	

a Post regulation, revised
e Estimated



06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1971 to current year. Daily sediment loads October 1954 to September 1971 in reports of U.S. Army Corps of Engineers.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1972 to September 1976, November 1977 to September 1981, October 1991 to current year.
WATER TEMPERATURES: October 1971 to September 1976, November 1977 to September 1981, October 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976, October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens June 17, 19, 1981; minimum daily, 410 microsiemens Mar. 22, 1978.
WATER TEMPERATURES: Maximum daily, 28.0°C July 30, 1976, Aug. 7, 1979, and July 28, 1997; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,690 mg/L July 17, 1996; minimum daily mean, 42 mg/L Dec. 29, 1975.
SEDIMENT LOADS: Maximum daily, 370,000 tons July 17, 1996; minimum daily, 2,150 tons Nov. 20, 1991.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 873 microsiemens June 19; minimum daily, 732 microsiemens Feb. 23.
WATER TEMPERATURES: Maximum daily, 27.0°C Aug. 24; minimum daily, 0.0°C Dec. 5, 22, Jan. 23, Mar. 16, 20.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,130 mg/L Nov. 21; minimum daily mean, 87 mg/L Aug. 10, 11.
SEDIMENT LOADS: Maximum daily, 220,000 tons Nov. 21; minimum daily, 7,450 tons Aug. 11.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	NUMBER OF SAMPLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
OCT										
10...	1200	3	0	25	97	100	--	--	--	--
NOV										
07...	1110	3	0	16	94	99	100	--	--	--
DEC										
01...	1130	3	0	11	81	93	95	96	99	100
MAR										
02...	1300	3	0	15	91	96	97	97	97	100
MAY										
01...	1027	3	0	8	91	99	100	--	--	--
JUN										
01...	1245	3	0	13	88	99	100	--	--	--
SEP										
11...	1130	3	0	11	94	99	100	--	--	--

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	775	---	---	---	---	848	789	---	---	---
2	---	---	---	---	760	751	---	---	---	801	---	---
3	807	---	---	---	---	---	805	---	---	---	784	---
4	---	---	---	---	---	---	---	832	---	---	---	794
5	---	---	778	767	---	---	---	---	847	---	---	---
6	---	---	---	---	---	---	788	834	---	809	---	---
7	813	805	---	---	---	---	---	---	---	---	784	---
8	---	---	783	---	---	---	---	831	839	---	---	792
9	---	---	---	---	---	---	---	---	---	---	---	---
10	787	829	---	---	743	---	---	---	---	801	771	---
11	---	---	---	---	---	---	---	823	---	---	---	791
12	---	---	---	---	---	---	---	---	851	---	---	---
13	---	---	---	---	---	---	857	---	---	809	---	---
14	777	794	---	---	---	---	---	---	---	---	787	793
15	---	---	---	---	---	---	---	798	840	---	---	---
16	---	---	820	---	---	789	---	---	---	---	---	---
17	797	742	---	---	745	---	846	---	---	820	785	---
18	---	---	---	---	---	---	---	804	---	---	---	794
19	---	---	---	---	---	---	---	---	873	---	---	---
20	800	---	---	---	---	792	---	---	---	---	---	---
21	---	794	---	---	---	---	836	---	---	821	786	783
22	---	---	803	---	---	---	---	788	---	---	---	---
23	---	---	---	796	732	768	---	---	864	---	---	---
24	803	770	---	---	---	---	827	---	---	824	794	---
25	---	---	---	---	---	---	---	---	---	---	---	775
26	---	---	---	781	---	---	---	806	846	---	---	---
27	800	---	---	---	---	741	808	---	---	814	---	---
28	---	---	---	---	---	---	---	---	---	---	789	786
29	---	---	---	---	---	---	---	791	817	---	---	---
30	---	---	---	---	---	766	---	---	---	803	---	---
31	804	---	---	---	---	---	---	---	---	---	796	---

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	4.0	---	---	---	---	13.5	19.0	---	---	---
2	---	---	---	---	4.0	.5	---	---	---	---	---	---
3	20.0	---	---	---	---	---	6.5	---	---	---	22.5	---
4	---	---	---	---	---	---	---	14.5	---	---	---	24.2
5	---	---	.0	.5	---	---	---	---	15.5	---	---	---
6	---	---	---	---	---	---	9.5	16.0	---	---	---	---
7	---	6.0	---	---	---	---	---	---	---	---	---	---
8	---	---	.5	---	---	---	---	14.5	---	---	---	24.0
9	---	---	---	---	---	---	---	---	---	---	---	---
10	18.0	6.0	---	---	1.5	---	---	---	---	---	24.0	---
11	---	---	---	---	---	---	---	16.5	---	---	---	---
12	---	---	---	---	---	---	---	---	17.0	---	---	---
13	---	---	---	---	---	---	13.0	---	---	---	---	---
14	4.0	5.0	---	---	---	---	---	---	---	---	25.0	23.5
15	---	---	---	---	---	---	---	19.0	17.5	---	---	---
16	---	---	.5	---	---	.0	---	---	---	---	---	---
17	---	2.5	---	---	1.0	---	7.5	---	---	---	25.0	---
18	---	---	---	---	---	---	---	---	---	---	---	23.0
19	---	---	---	---	---	---	---	---	---	---	---	---
20	14.0	---	---	---	---	.0	---	---	---	---	---	---
21	---	4.0	---	---	---	---	11.0	---	---	---	25.5	---
22	---	---	.0	---	---	---	---	18.0	---	---	---	---
23	---	---	---	.0	1.0	---	---	---	---	---	---	---
24	11.0	---	---	---	---	---	12.5	---	---	---	27.0	---
25	---	---	---	---	---	---	---	---	---	---	---	20.0
26	---	---	---	2.0	---	---	---	---	24.0	---	---	---
27	8.0	---	---	---	---	5.0	9.5	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	24.0	21.0
29	---	---	---	---	---	---	---	18.5	---	---	---	---
30	---	---	---	---	---	6.0	---	---	---	---	---	---
31	10.0	---	---	---	---	---	---	---	---	---	24.5	---

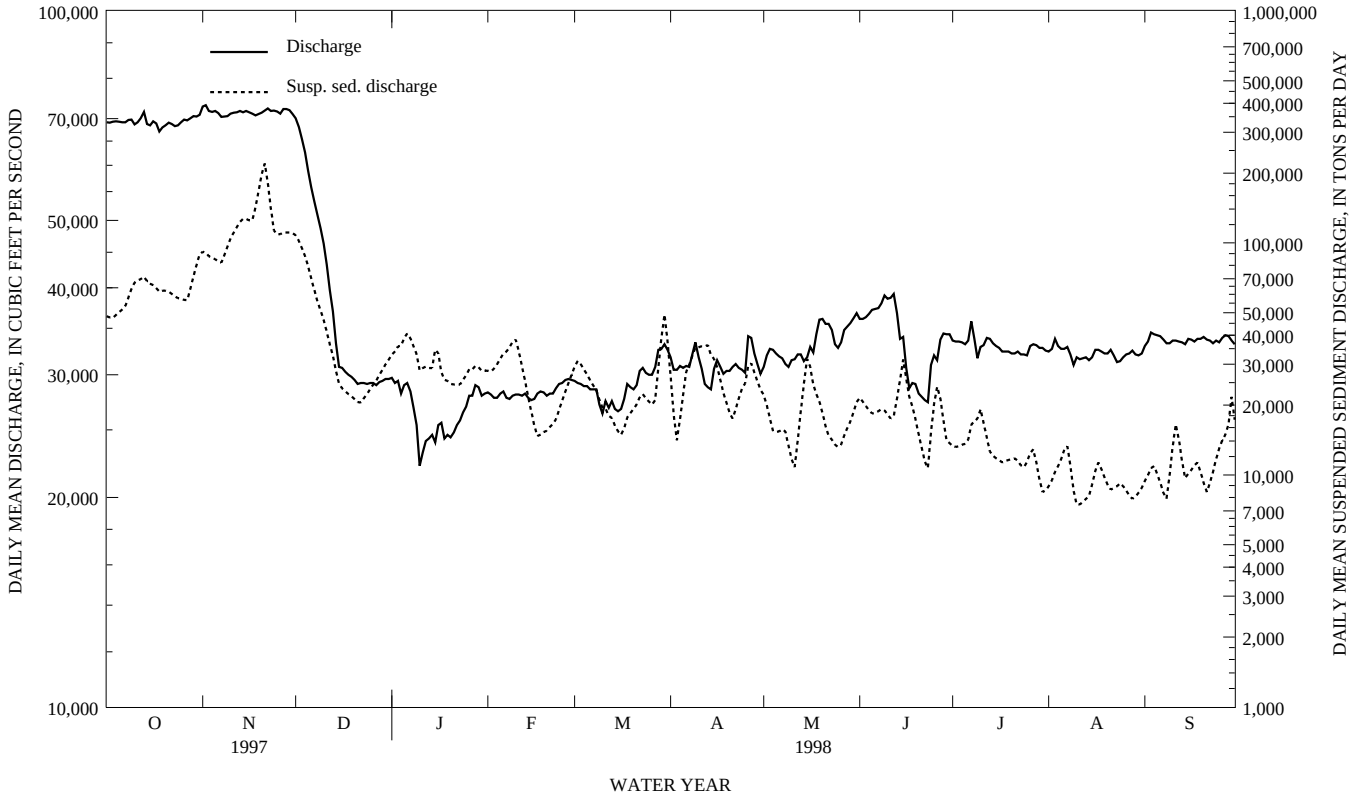
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	259	48300	465	91600	573	108000	411	33000	368	28100	368	29200
2	256	47700	458	90600	556	102000	431	34000	368	27900	394	31000
3	254	47600	452	87600	537	94800	452	35800	382	28700	383	30000
4	261	48900	446	86100	519	87700	473	36000	399	30000	365	28500
5	268	50200	439	85100	498	79300	497	38900	417	31700	347	27100
6	276	51600	433	83300	467	70400	516	40700	435	33300	331	25600
7	286	53400	433	82300	436	62700	505	38800	454	34000	315	24300
8	309	58100	466	88700	408	56200	494	35900	474	35500	301	23200
9	337	63500	506	96500	389	51200	482	33100	494	37400	286	21100
10	364	67500	547	105000	372	46600	472	28200	505	38300	273	19400
11	369	68900	576	111000	356	41500	461	28900	448	34000	260	19300
12	369	69800	604	117000	340	36500	450	29300	388	29400	248	18000
13	370	71500	634	123000	325	32500	440	28900	336	25500	236	17600
14	369	68500	659	127000	311	28000	430	28900	291	21800	225	16300
15	360	66700	655	127000	297	24700	420	34600	251	18800	214	15400
16	351	65800	645	125000	286	23600	411	33500	218	16300	206	14900
17	343	63800	650	125000	280	22900	401	27700	193	14700	213	15900
18	340	61700	745	142000	276	22300	392	25700	194	14900	225	17700
19	339	62200	872	167000	271	21800	383	25400	200	15300	237	18500
20	336	62200	1020	197000	267	21200	375	24700	206	15500	249	19200
21	331	61700	1130	220000	262	20600	366	24500	211	16100	257	20100
22	325	60300	927	181000	260	20500	358	24600	217	16600	263	21600
23	319	58800	722	140000	271	21400	351	24500	225	17400	268	22300
24	313	57800	579	113000	284	22300	359	25700	243	19100	262	21400
25	307	57400	563	109000	297	23400	369	26900	264	20900	255	20700
26	301	56800	565	109000	311	24500	378	28600	287	22900	248	20100
27	302	56700	567	111000	326	25500	378	28500	312	24900	252	21000
28	335	63400	570	111000	342	27000	376	29500	339	27000	328	28900
29	376	71600	572	111000	358	28400	374	29100	---	---	440	38800
30	422	80400	574	110000	375	30000	372	28100	---	---	547	49100
31	465	89100	---	---	393	31400	370	28100	---	---	428	37600
TOTAL	---	1911900	---	3572800	---	1308900	---	940100	---	696000	---	733800

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEA CON TRA (MG	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	307	26400	267	22200	220	21500	146	13300	102	8950	106	9420
2	220	18100	232	20000	213	20700	146	13200	107	9480	110	9980
3	171	14100	199	17600	202	19800	147	13300	113	10300	115	10700
4	207	17300	176	15500	191	19000	150	13500	122	10900	118	10900
5	266	22100	176	15300	183	18400	152	13600	133	11700	109	10100
6	333	27800	178	15400	184	18500	156	14200	145	12800	100	9230
7	358	29800	183	15700	186	18800	170	16500	150	13300	92	8360
8	376	32600	184	15400	187	19200	187	17000	126	10900	88	7910
9	394	35500	161	13400	181	19000	205	17500	103	8590	111	9990
10	414	35500	138	11700	174	18200	215	19200	87	7480	147	13300
11	434	35900	126	10800	168	17500	187	16700	87	7450	182	16500
12	455	35800	162	14100	170	18000	159	14500	90	7670	157	14200
13	466	36300	218	18900	215	21300	138	12600	92	7870	128	11500
14	425	32900	292	24800	280	25600	134	12100	96	8120	108	9680
15	382	31600	367	31600	342	31400	132	11800	106	9100	110	10100
16	344	29200	330	29300	315	26100	131	11600	118	10400	116	10500
17	309	25700	281	24500	280	21700	129	11300	128	11300	122	11000
18	278	22600	241	22300	249	19700	131	11500	121	10600	124	11300
19	251	20500	213	20700	222	17400	133	11600	112	9770	113	10300
20	226	18500	190	18500	196	15000	134	11700	104	9060	101	9250
21	210	17500	169	16200	173	13100	135	11800	98	8650	93	8440
22	230	19300	153	14700	153	11400	131	11500	101	8770	102	9240
23	258	21400	151	14200	145	10700	127	11000	106	8930	115	10300
24	286	23500	150	13500	182	15200	125	10800	109	9210	129	11700
25	303	24800	149	13200	235	20300	131	11400	104	8950	144	13000
26	319	29400	149	13500	282	24000	139	12400	99	8570	153	14100
27	331	30300	157	14800	236	21400	144	12900	94	8150	162	14900
28	317	27600	167	15900	186	17300	126	11300	90	7890	180	16500
29	301	25300	177	17000	152	14100	108	9560	93	8060	239	21700
30	286	23200	191	18700	148	13700	95	8430	97	8390	193	17300
31	---	---	207	20600	---	---	98	8580	101	8800	---	---
TOTAL	---	790500	---	550000	---	568000	---	396370	---	290110	---	351400
YEAR		12109880										


Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
100,000
70,000
50,000
40,000
30,000
20,000
10,000
1,000,000
700,000
500,000
400,000
300,000
200,000
100,000
70,000
50,000
40,000
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1998
WATER YEAR

06600000 PERRY CREEK AT 38th STREET, SIOUX CITY, IA

LOCATION.--Lat 42°32'08", long 96°24'39", in $SE^1/_4$ $SE^1/_4$ sec.8, T.89 N., R.47 W., Woodbury County, Hydrologic Unit 10230001, on left bank at downstream side of bridge on 38th Street in Sioux City, 1.9 mi downstream from West Branch, and 4.2 mi. upstream from mouth.

DRAINAGE AREA.--65.1 mi^2.

PERIOD OF RECORD.--October 1945 to September 1969, June 1981 to current year.

REVISED RECORDS.--WSP 1440: Drainage area. WDR IA-95-1: River mile.

GAGE.--Water-stage recorder. Datum of gage is 1,112.04 ft above sea level (City of Sioux City benchmark). Prior to May 20, 1954, nonrecording gage with supplementary water-stage recorder in operation above 5.0 ft gage height and May 20, 1954 to Sept. 30, 1969, water-stage recorder at present site at datum 5.0 ft higher.

REMARKS.--Estimated daily discharges: Nov. 16, Dec. 5, 6, 12, 13, 21, 27-31, Jan. 4-27, Feb. 3, and Mar. 11-15. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station. U.S. Army Corps of Engineers rain gage satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 7, 1944 reached a stage of about 30.5 ft from floodmarks, present datum, discharge, 9,600 ft^3/s, on basis of contracted-opening measurement of peak flow by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	13	10	12	18	18	47	29	33	13	20	15
2	8.9	16	10	16	7.3	24	16	26	25	14	22	14
3	9.0	21	9.8	12	e6.5	18	12	22	22	15	34	15
4	9.0	20	8.2	e6.0	5.8	23	13	18	23	14	28	15
5	9.2	25	e7.0	e8.0	6.6	21	11	15	27	144	27	15
6	9.3	21	e8.0	e10	12	16	11	13	20	89	31	15
7	9.6	19	10	e9.3	12	16	25	12	21	139	54	15
8	12	19	9.6	e8.5	11	13	114	10	48	32	38	15
9	13	16	9.8	e7.7	7.1	10	67	10	86	63	28	15
10	12	15	9.4	e7.0	7.0	8.3	26	11	36	223	27	15
11	14	14	9.7	e8.0	6.0	e7.0	18	11	35	44	24	14
12	23	14	e7.0	e7.0	7.3	e8.0	17	16	32	36	98	14
13	29	14	e7.7	e5.2	7.6	e7.5	18	9.8	24	33	66	14
14	14	14	8.6	e6.5	7.2	e10	15	8.7	26	30	28	14
15	13	13	8.7	e7.1	9.4	e13	158	54	28	28	32	15
16	12	e9.0	8.1	e8.0	13	17	111	72	25	27	24	15
17	12	12	9.4	e7.5	12	23	51	15	23	27	20	15
18	14	10	8.6	e7.0	14	33	37	11	45	25	19	15
19	12	8.9	9.0	e7.5	15	22	36	9.5	31	24	17	16
20	12	10	8.8	e8.0	13	28	39	12	26	24	22	19
21	12	9.6	e7.0	e7.5	12	50	26	9.1	23	27	30	17
22	13	9.9	10	e7.0	13	14	19	21	23	28	19	17
23	12	12	9.6	e7.5	15	16	16	42	32	24	19	17
24	13	16	10	e8.0	12	14	13	38	91	25	17	22
25	14	9.6	9.9	e7.5	15	18	50	15	24	26	16	19
26	12	8.7	8.8	e8.5	19	50	153	12	18	24	16	19
27	13	11	e7.5	e9.5	16	53	77	10	15	23	18	16
28	15	12	e8.5	11	17	123	44	41	14	22	18	16
29	14	13	e8.0	17	---	26	38	29	17	21	16	17
30	13	10	e9.5	28	---	14	33	296	15	21	15	16
31	13	---	e8.5	39	---	43	---	70	---	20	15	---
TOTAL	399.6	415.7	274.7	318.8	316.8	756.8	1311	968.1	908	1305	858	476
MEAN	12.9	13.9	8.86	10.3	11.3	24.4	43.7	31.2	30.3	42.1	27.7	15.9
MAX	29	25	10	39	19	123	158	296	91	223	98	22
MIN	8.6	8.7	7.0	5.2	5.8	7.0	11	8.7	14	13	15	14
AC-FT	793	825	545	632	628	1500	2600	1920	1800	2590	1700	944
CFSM	.20	.21	.14	.16	.17	.38	.67	.48	.46	.65	.43	.24
IN.	.23	.24	.16	.18	.18	.43	.75	.55	.52	.75	.49	.27

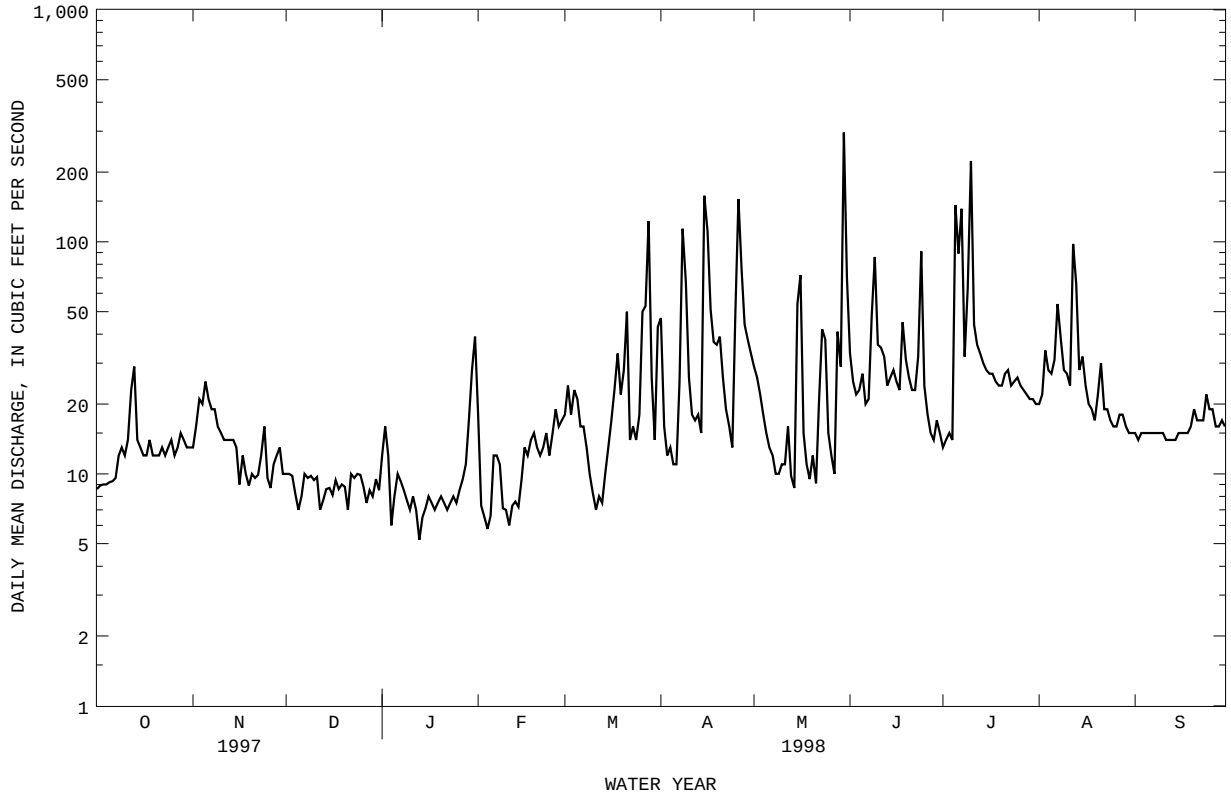
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1998, BY WATER YEAR (WY)

MEAN	8.13	7.89	6.42	6.78	20.0	45.5	25.6	23.9	31.5	22.5	13.5	12.9
MAX	29.5	31.9	20.5	47.5	78.4	188	123	140	125	99.6	85.5	147
(WY)	1993	1997	1997	1952	1948	1962	1985	1990	1984	1952	1951	1949
MIN	.38	.81	.48	.33	1.31	2.62	2.30	2.91	.94	.35	.30	.083
(WY)	1959	1982	1959	1982	1959	1964	1959	1968	1956	1946	1965	1958

06600000 PERRY CREEK AT 38th STREET, SIOUX CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1946 - 1998	
ANNUAL TOTAL	10841.5		8308.5			
ANNUAL MEAN	29.7		22.8		18.8	
HIGHEST ANNUAL MEAN					38.6	1984
LOWEST ANNUAL MEAN					2.38	1968
HIGHEST DAILY MEAN	300	Mar 9	296	May 30	2260	May 19 1990
LOWEST DAILY MEAN	7.0	Dec 5	5.2	Jan 13	.00	Jul 14 1946a
ANNUAL SEVEN-DAY MINIMUM	8.3	Dec 12	6.9	Jan 12	.00	Sep 24 1958
INSTANTANEOUS PEAK FLOW			1480	May 30	8670	May 19 1990b
INSTANTANEOUS PEAK STAGE			13.15	May 30	28.54	May 19 1990
INSTANTANEOUS LOW FLOW			1.2	Dec 26		
ANNUAL RUNOFF (AC-FT)	21500		16480		13600	
ANNUAL RUNOFF (CFSM)	.46		.35		.29	
ANNUAL RUNOFF (INCHES)	6.20		4.75		3.92	
10 PERCENT EXCEEDS	60		38		32	
50 PERCENT EXCEEDS	19		15		6.2	
90 PERCENT EXCEEDS	9.1		8.0		.90	

a Many days 1946, 1958-1960
b From rating curve extended above 1,700 ft^3/s on basis of slope-area measurement of peak flow
e Estimated



06600100 FLOYD RIVER AT ALTON, IA

LOCATION.--Lat 42°58'55", long 96°00'03", in NE$^1/_4$ NE$^1/_4$ sec.11, T.94 N., R.44 W., Sioux County, Hydrologic Unit 10230002, on left bank 270 ft downstream from South County Road at east edge of Alton, 34.3 mi upstream from West Branch Floyd River, and at mile 58.1.

DRAINAGE AREA.--268 mi^2.

PERIOD OF RECORD.--October 1955 to current year. Prior to December 1955, monthly discharge only, published in WSP 1730.

REVISED RECORDS.--WDR IA-82-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,269.55 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 3-14, 24, Dec. 5-7, 10-12, 17, 21, 27-29, 31, Jan. 4 to Feb. 22, Mar. 1-2, 5-6, 9-17, and Aug. 24 to Sept. 30. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1953 reached a discharge of about 45,500 ft^3/s, from information by U. S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	23	19	20	e18	e21	248	235	110	58	20	e11
2	16	23	24	23	e17	e21	244	219	107	54	20	e10
3	18	e20	19	20	e16	33	211	205	99	51	25	e10
4	20	e25	15	e13	e15	25	184	192	99	49	24	e9.5
5	19	e30	e11	e17	e17	e20	163	182	101	49	23	e9.5
6	19	e28	e14	e20	e16	e25	151	171	96	54	27	e9.5
7	18	e24	e18	e19	e16	30	151	163	93	53	33	e9.5
8	18	e25	19	e15	e17	15	200	154	105	46	41	e9.0
9	18	e25	19	e13	e18	e13	255	152	116	42	41	e9.0
10	18	e23	e18	e12	e19	e12	262	156	119	40	34	e9.0
11	17	e22	e17	e13	e18	e12	238	145	122	36	28	e8.5
12	17	e22	e16	e11	e17	e13	218	154	120	32	24	e8.5
13	21	e21	18	e9.5	e18	e13	205	143	110	30	22	e8.5
14	25	e27	19	e10	e19	e16	176	137	113	27	20	e8.5
15	28	12	19	e11	e20	e19	240	142	117	49	19	e8.5
16	26	14	21	e12	e26	e21	355	146	122	57	17	e8.5
17	25	20	e20	e11	e28	e22	335	132	129	52	17	e8.5
18	23	21	21	e11	e36	23	289	132	137	42	15	e8.5
19	23	22	22	e12	e65	23	260	128	129	50	15	e9.0
20	21	23	21	e12	e60	30	248	120	120	45	20	e8.5
21	20	18	e14	e13	e55	57	236	116	108	43	28	e8.0
22	21	19	17	e12	e55	64	227	114	94	41	27	e8.0
23	22	15	21	e12	49	42	212	126	93	37	24	e9.5
24	23	e14	20	e13	44	44	202	151	137	33	e21	e9.0
25	22	16	20	e13	40	50	194	149	112	31	e17	e9.0
26	21	20	17	e12	41	72	281	139	93	31	e15	e8.5
27	18	24	e15	e13	37	144	326	129	83	29	e15	e8.5
28	20	28	e16	e13	22	269	296	122	74	26	e14	e8.5
29	21	27	e15	e14	---	333	269	116	67	24	e13	e8.0
30	24	18	16	e15	---	260	250	117	63	23	e12	e7.5
31	23	---	e15	e19	---	234	---	118	---	21	e11	---
TOTAL	639	649	556	433.5	819	1976	7126	4605	3188	1255	682	266.0
MEAN	20.6	21.6	17.9	14.0	29.3	63.7	238	149	106	40.5	22.0	8.87
MAX	28	30	24	23	65	333	355	235	137	58	41	11
MIN	14	12	11	9.5	15	12	151	114	63	21	11	7.5
AC-FT	1270	1290	1100	860	1620	3920	14130	9130	6320	2490	1350	528
CFSM	.08	.08	.07	.05	.11	.24	.89	.55	.40	.15	.08	.03
IN.	.09	.09	.08	.06	.11	.27	.99	.64	.44	.17	.09	.04

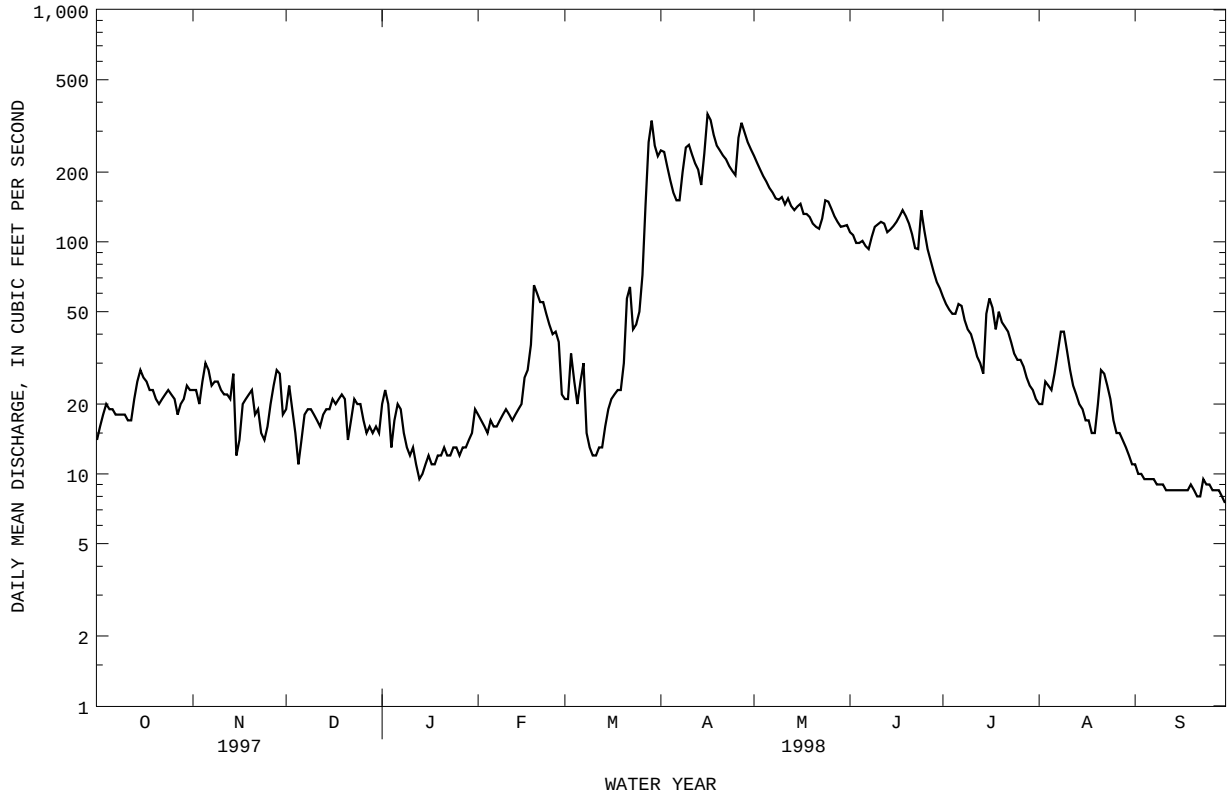
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1998, BY WATER YEAR (WY)

MEAN	44.3	42.7	28.3	18.7	45.9	175	182	119	184	90.9	46.2	31.7
MAX	234	287	128	109	252	605	906	454	973	878	369	175
(WY)	1993	1980	1983	1973	1971	1979	1969	1995	1984	1993	1995	1993
MIN	.058	.30	.074	.048	.15	1.77	3.67	2.92	2.36	3.29	.37	.080
(WY)	1957	1959	1959	1959	1977	1959	1959	1968	1968	1958	1968	1958

06600100 FLOYD RIVER AT ALTON, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1956 - 1998	
ANNUAL TOTAL	51776		22194.5			
ANNUAL MEAN	142		60.8		84.1	
HIGHEST ANNUAL MEAN					323	1993
LOWEST ANNUAL MEAN					2.66	1968
HIGHEST DAILY MEAN	1670	Mar 13	355	Apr 16	7160	Apr 4 1969
LOWEST DAILY MEAN	11	Dec 5	7.5	Sep 30	.00	Oct 14 1956a
ANNUAL SEVEN-DAY MINIMUM	16	Sep 27	8.4	Sep 16	.00	Oct 27 1956
INSTANTANEOUS PEAK FLOW			365	Apr 16	16300	Jun 20 1983b
INSTANTANEOUS PEAK STAGE			7.48	Apr 16	18.54	Jun 20 1983c
ANNUAL RUNOFF (AC-FT)	102700		44020		60920	
ANNUAL RUNOFF (CFSM)	.53		.23		.31	
ANNUAL RUNOFF (INCHES)	7.19		3.08		4.26	
10 PERCENT EXCEEDS	349		173		191	
50 PERCENT EXCEEDS	40		23		22	
90 PERCENT EXCEEDS	17		11		1.4	

a No flow at times in 1956, 1958-59, 1965, 1968, 1977
b From rating curve extended above 8,500 ft^3/s
c From floodmark
e Estimated



06600500 FLOYD RIVER AT JAMES, IA

LOCATION.--Lat 42°34'36", long 96°18'43", in $SE^1/_4$ $SE^1/_4$ sec.30, T.90 N., R.46 W., Plymouth County, Hydrologic Unit 10230002, on left bank at upstream side of bridge on county highway C70, 0.2 mi east of James, 14.3 mi downstream from West Branch Floyd River, and at mile 7.5.

DRAINAGE AREA.--886 mi^2.

PERIOD OF RECORD.--December 1934 to current year.

REVISED RECORDS.--WSP 1240: 1935 (M), 1936, 1937-38 (M), 1942, 1945. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,092.59 ft above sea level. Prior to Sept. 11, 1938, June 9 to Nov. 5, 1953, and Oct. 1, 1955, to May 22, 1957, nonrecording gage and May 23, 1957, to Sept. 30, 1970, water-stage recorder at same site at datum 10.0 ft higher.

REMARKS.--Estimated daily discharges: Nov. 16-18, Dec. 5-18, 20, 21, 26-31, Jan. 4 to Feb. 13, Mar. 9-19, and June 1-8. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage and discharge since 1892, that of June 8, 1953, from information by U. S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	133	126	124	112	e135	170	706	997	e745	401	205	150
2	134	127	124	138	e125	171	718	921	e680	388	201	146
3	129	128	123	114	e115	178	657	859	e605	385	217	143
4	127	125	113	e80	e105	170	583	806	e538	372	216	139
5	122	135	e65	e95	e120	165	534	769	e535	389	209	135
6	125	137	e85	e110	e110	168	497	729	e492	400	203	132
7	129	133	e110	e100	e115	175	503	692	e469	994	321	127
8	123	135	e120	e90	e120	160	627	659	e482	592	406	124
9	121	134	e130	e80	e130	e100	788	636	572	503	351	123
10	119	130	e120	e75	e140	e90	864	627	557	519	318	120
11	126	132	e110	e80	e130	e85	829	622	558	424	293	117
12	140	131	e100	e70	e120	e95	761	633	553	395	271	113
13	170	133	e110	e65	e125	e90	733	608	536	374	248	111
14	176	136	e120	e70	130	e100	660	574	521	354	232	111
15	163	131	e130	e75	137	e120	773	596	601	342	234	111
16	156	e100	e130	e80	157	e140	1100	655	678	375	215	111
17	151	e120	e120	e75	165	e150	1200	569	609	362	200	111
18	150	e140	e140	e70	177	e155	1110	542	629	341	187	111
19	147	152	148	e75	219	e155	980	534	592	323	179	110
20	148	158	e120	e80	215	146	910	521	552	335	183	112
21	149	138	e85	e80	206	161	831	504	519	331	245	108
22	148	128	97	e75	206	163	766	527	494	329	243	107
23	143	125	122	e75	202	181	729	627	486	305	208	108
24	135	122	113	e80	195	184	685	738	581	292	190	118
25	128	125	125	e75	191	189	665	677	605	280	178	116
26	138	127	e110	e80	205	230	1250	669	536	266	171	118
27	140	129	e90	e90	198	284	1430	657	491	258	167	114
28	129	127	e100	e100	188	558	1270	649	461	244	164	110
29	133	125	e95	e110	---	765	1160	715	440	231	160	108
30	129	123	e105	e120	---	728	1080	1180	433	221	155	104
31	129	---	e100	e140	---	679	---	950	---	213	151	---
TOTAL	4290	3912	3484	2759	4381	6905	25399	21442	16550	11538	6921	3568
MEAN	138	130	112	89.0	156	223	847	692	552	372	223	119
MAX	176	158	148	140	219	765	1430	1180	745	994	406	150
MIN	119	100	65	65	105	85	497	504	433	213	151	104
AC-FT	8510	7760	6910	5470	8690	13700	50380	42530	32830	22890	13730	7080
CFSM	.16	.15	.13	.10	.18	.25	.96	.78	.62	.42	.25	.13
IN.	.18	.16	.15	.12	.18	.29	1.07	.90	.69	.48	.29	.15

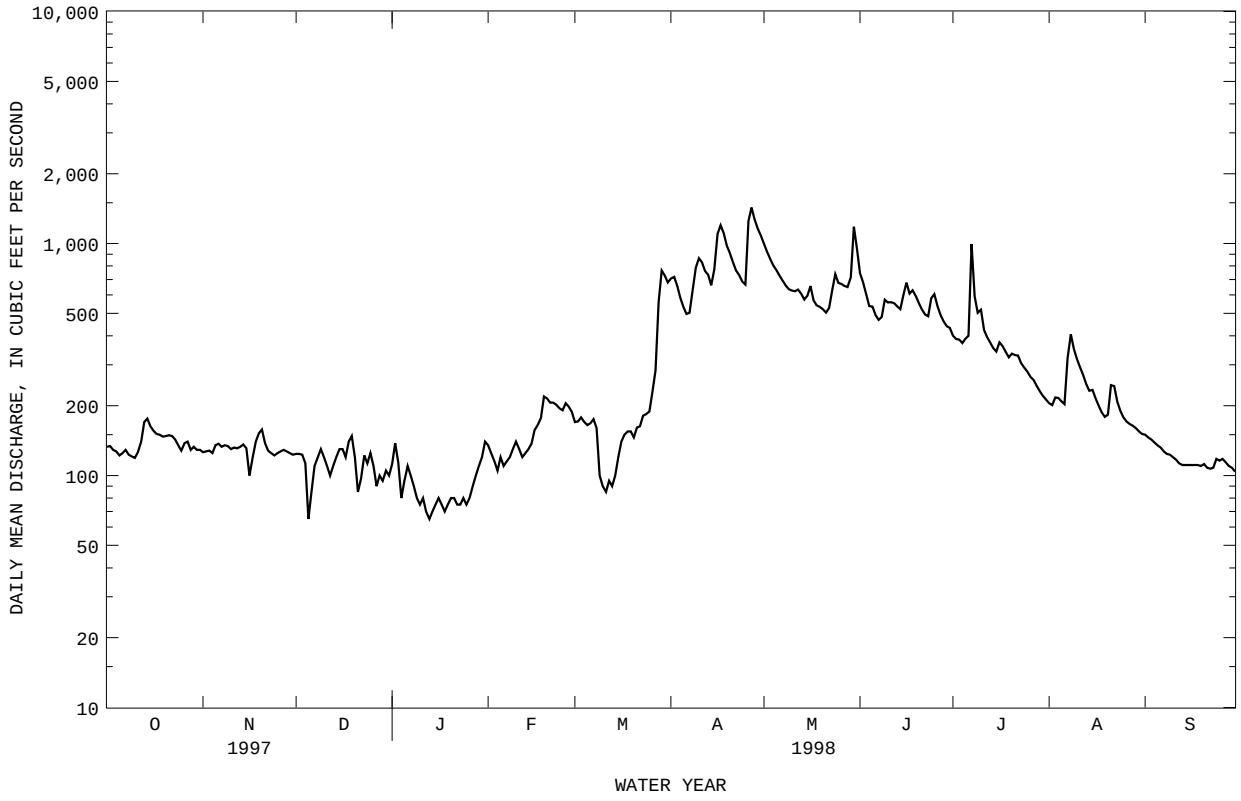
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 1998, BY WATER YEAR (WY)

MEAN	113	107	80.4	58.7	171	545	445	328	529	303	164	139
MAX	617	804	366	359	970	2080	2715	1393	2897	2196	1151	1353
(WY)	1993	1980	1980	1973	1952	1979	1969	1984	1984	1993	1951	1951
MIN	4.55	4.54	3.05	1.63	1.62	21.5	18.7	15.1	14.4	7.32	6.12	3.40
(WY)	1959	1959	1959	1959	1959	1964	1959	1968	1968	1936	1958	1958

06600500 FLOYD RIVER AT JAMES, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1936 - 1998	
ANNUAL TOTAL	166623		111149			
ANNUAL MEAN	457		305		249	
HIGHEST ANNUAL MEAN					958	1983
LOWEST ANNUAL MEAN					19.9	1956
HIGHEST DAILY MEAN	5290	Mar 12	1430	Apr 27	32400	Jun 8 1953
LOWEST DAILY MEAN	42	Jan 11	65	Dec 5,13	.90	Jan 10 1977a
ANNUAL SEVEN-DAY MINIMUM	61	Jan 11	72	Jan 12	.90	Jan 10 1977
INSTANTANEOUS PEAK FLOW			2160	May 30	71500	Jun 8 1953b
INSTANTANEOUS PEAK STAGE			13.91	May 30	35.30	Jun 8 1953c
ANNUAL RUNOFF (AC-FT)	330500		220500		180100	
ANNUAL RUNOFF (CFSM)	.52		.34		.28	
ANNUAL RUNOFF (INCHES)	7.00		4.67		3.81	
10 PERCENT EXCEEDS	995		688		540	
50 PERCENT EXCEEDS	206		161		80	
90 PERCENT EXCEEDS	110		100		12	

a Also Jan 11-22, 1977
b From rating curve extended above 16,000 ft^3/s on basis of contracted-opening and flow-over-embankment measurement of peak flow
c From floodmarks, current datum
e Estimated



06601200 MISSOURI RIVER AT DECATUR, NE

LOCATION.--Lat 42°00'26", long 96°14'29", in NE$^{1}/_{4}$ SW$^{1}/_{4}$ sec.36, T.24 N., R.10 E., Burt County, Hydrologic Unit 10230001, on right bank 0.1 mi upstream from Iowa Highway 175 bridge at Decatur, and at mile 691.0.

DRAINAGE AREA.--316,200 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,010.00 ft above sea level, supplementary adjustment of 1954.

REMARKS.--Estimated daily discharges: Nov. 25-27, and Jan. 24. Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

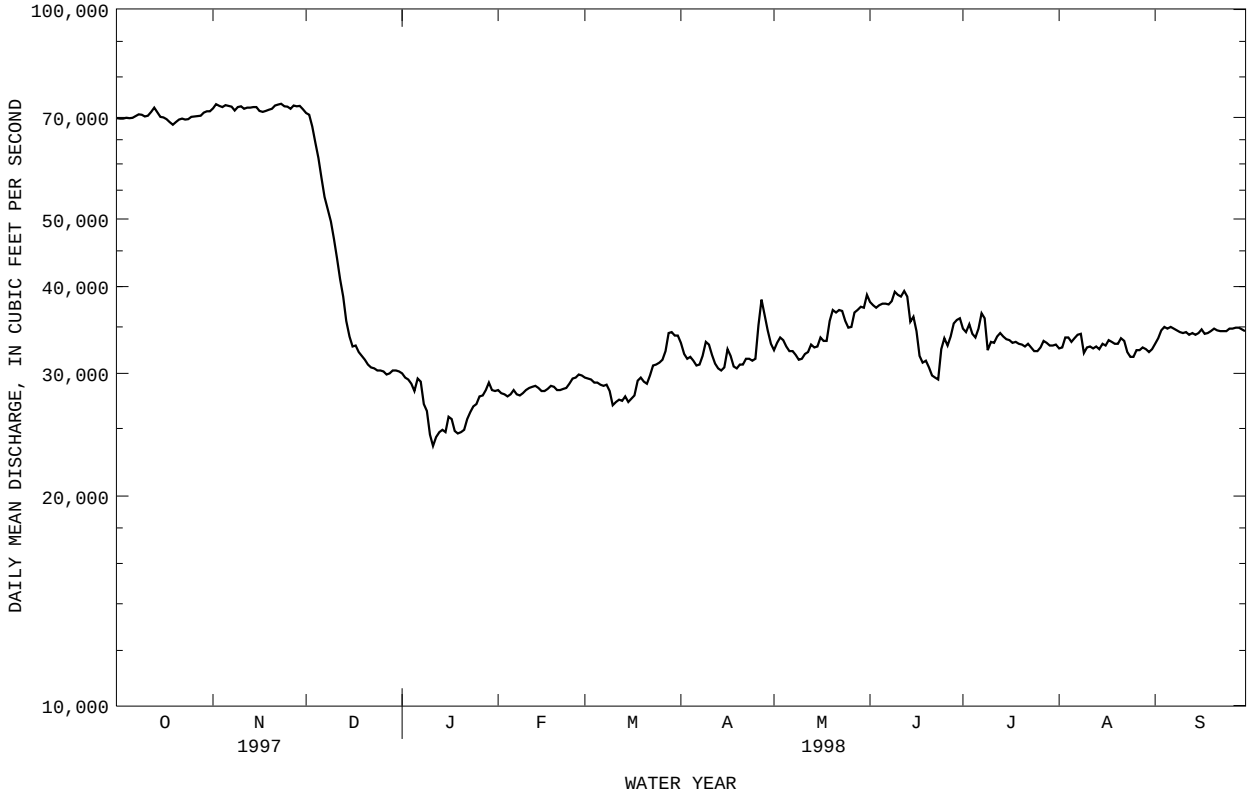
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69800	72100	71000	30000	28400	29600	33200	32400	38000	34800	32600	33100
2	69700	73100	70600	29600	28100	29500	32000	33200	37600	34400	32700	33700
3	69700	72700	67900	29400	28000	29400	31500	33800	37300	35300	33800	34600
4	69900	72400	64400	29000	27800	29100	31700	33500	37600	34200	33800	35000
5	69800	72900	61200	28300	28000	29100	31300	32800	37800	33800	33300	34800
6	69900	72700	57300	29500	28400	28900	30800	32300	37800	34800	33700	35000
7	70300	72500	53800	29200	28000	28800	30900	32300	37700	36600	34100	34800
8	70700	71600	51600	27100	27900	28900	31800	31900	38100	36000	34200	34600
9	70600	72400	49600	26500	28100	28300	33300	31400	39300	32400	32100	34400
10	70200	72600	46800	24500	28400	27000	33000	31500	38900	33300	32700	34300
11	70400	72000	43900	23600	28600	27300	31900	32000	38700	33200	32800	34400
12	71300	72300	41000	24300	28700	27500	31000	32200	39400	33900	32600	34100
13	72300	72300	38700	24700	28800	27400	30500	33000	38700	34300	32800	34300
14	71200	72400	35700	24900	28600	27800	30300	32700	35600	33900	32500	34100
15	70100	72400	33900	24700	28300	27300	30600	32800	36200	33600	33100	34300
16	70000	71500	32800	26000	28300	27600	32500	33800	34500	33500	32900	34700
17	69600	71300	32900	25800	28500	27900	31800	33400	31800	33200	33500	34200
18	68900	71500	32200	24800	28800	29300	30700	33400	31100	33300	33300	34300
19	68300	71800	31800	24600	28700	29600	30500	35700	31300	33100	33100	34500
20	68900	72000	31400	24700	28400	29200	30900	37000	30600	33000	33100	34800
21	69500	72800	30900	24900	28400	29000	30900	36700	29800	32800	33700	34600
22	69700	73000	30600	25800	28500	29800	31500	37000	29600	33100	33400	34500
23	69500	73200	30500	26400	28600	30800	31500	36900	29400	32700	32200	34500
24	69600	72600	30300	e26900	29000	30900	31300	35700	32500	32300	31700	34500
25	70100	e72500	30300	27100	29500	31100	31500	34900	33700	32300	31700	34800
26	70200	e72000	30200	27800	29600	31400	35200	35000	32900	32700	32400	34800
27	70300	e72800	29900	27900	29900	32300	38300	36700	33900	33400	32400	34900
28	70400	72600	30000	28400	29800	34300	36400	37000	35400	33200	32700	34900
29	71100	72700	30300	29100	---	34400	34600	37400	35800	32900	32500	34700
30	71400	71900	30300	28400	---	34000	33100	37300	36000	32900	32200	34500
31	71400	---	30200	28300	---	34000	---	38900	---	33000	32500	---
TOTAL	2174800	2170600	1282000	832200	800100	921500	964500	1064600	1057000	1041900	1020100	1034700
MEAN	70150	72350	41350	26850	28580	29730	32150	34340	35230	33610	32910	34490
MAX	72300	73200	71000	30000	29900	34400	38300	38900	39400	36600	34200	35000
MIN	68300	71300	29900	23600	27800	27000	30300	31400	29400	32300	31700	33100
AC-FT	4314000	4305000	2543000	1651000	1587000	1828000	1913000	2112000	2097000	2067000	2023000	2052000
CFSM	.22	.23	.13	.08	.09	.09	.10	.11	.11	.11	.10	.11
IN.	.26	.26	.15	.10	.09	.11	.11	.13	.12	.12	.12	.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1998, BY WATER YEAR (WY)

MEAN	38360	31260	21150	18490	20300	25580	37260	38760	39490	39920	37840	39050
MAX	70150	72350	41350	26850	32380	49450	90050	80690	67970	66520	66170	67290
(WY)	1998	1998	1998	1998	1997	1997	1997	1997	1997	1997	1997	1997
MIN	24250	10470	12070	12360	12210	11580	24410	26130	28240	27680	25700	26750
(WY)	1993	1991	1991	1990	1991	1991	1991	1991	1991	1991	1993	1993

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1988 - 1998	
ANNUAL TOTAL	22241700		14364000			
ANNUAL MEAN	60940		39350		32330	
HIGHEST ANNUAL MEAN					57440	1997
LOWEST ANNUAL MEAN					21450	1991
HIGHEST DAILY MEAN	99900	Apr 15	73200	Nov 23	99900	Apr 15 1997
LOWEST DAILY MEAN	23200	Jan 1	23600	Jan 11	7130	Dec 22 1990
ANNUAL SEVEN-DAY MINIMUM	24700	Jan 1	24700	Jan 10	9660	Dec 12 1990
INSTANTANEOUS PEAK FLOW			74700	Nov 27	100000	Apr 15 1997
INSTANTANEOUS PEAK STAGE			30.28	Oct 7,8	32.31	Jul 18 1996
INSTANTANEOUS LOW FLOW			23300	Jan 11		
ANNUAL RUNOFF (AC-FT)	44120000		28490000		23420000	
ANNUAL RUNOFF (CFSM)	.19		.12		.10	
ANNUAL RUNOFF (INCHES)	2.62		1.69		1.39	
10 PERCENT EXCEEDS	84300		71000		57300	
50 PERCENT EXCEEDS	66900		33200		30200	
90 PERCENT EXCEEDS	29400		28300		13700	

e Estimated


100,000
70,000
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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
O
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1997
1998
WATER YEAR

06602020 WEST FORK DITCH AT HORNICK, IA

LOCATION.--Lat 42°13'37", long 96°04'40", in $SW^1/_4$ $SW^1/_4$ sec.27, T.86 N., R.45 W., Woodbury County, Hydrologic Unit 10230004, on left bank at upstream side of State Highway 141 bridge, 1.0 mi east of Hornick, 9.2 mi upstream from Wolf Creek, and 13.5 mi north of Onawa.

DRAINAGE AREA.--403 mi^2.

PERIOD OF RECORD.-- April 1939 to September 1969 (published as "Holly Springs"), July 1974 to current year (revised).

GAGE.--Water-stage recorder. Datum of gage is 1,045.82 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 16-18, Dec. 4-14, 24-31, Jan. 3 to Feb. 5, Mar. 9-19, and Sept. 13-23. Records good except those for estimated daily discharges, which are poor. West Fork ditch is a dredged channel which diverts flow of West Fork Little Sioux River at Hornick 5.5 mi south, then southeast 6.5 mi to a point 1.2 mi west of Kennebec, where Wolf Creek enters from left. From this point, ditch roughly parallels the Little Sioux River and is known as Monona-Harrison ditch. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	74	59	70	e70	74	257	269	338	259	128	104
2	76	72	58	78	e60	80	256	260	273	239	126	104
3	75	72	57	e70	e55	84	230	255	242	237	133	102
4	74	70	e50	e44	e50	73	215	249	224	239	135	100
5	72	79	e27	e85	e65	80	204	240	226	254	145	97
6	72	81	e40	e90	75	87	198	230	218	313	140	96
7	74	80	e80	e80	69	85	217	221	217	420	169	94
8	75	80	e84	e70	72	78	265	213	255	381	267	92
9	72	81	e75	e55	76	e50	333	208	383	285	233	91
10	73	80	e65	e50	80	e34	345	234	329	254	193	90
11	75	77	e55	e55	86	e32	321	245	349	241	171	90
12	80	77	e50	e50	78	e30	298	218	317	222	158	90
13	90	80	e55	e44	78	e40	285	211	268	210	152	e91
14	90	81	e60	e50	79	e34	264	198	298	199	151	e91
15	83	77	77	e53	77	e36	290	196	803	278	189	e90
16	81	e50	80	e55	82	e40	315	207	844	315	162	e90
17	79	e46	75	e50	84	e44	294	191	526	244	142	e91
18	79	e55	77	e51	83	e50	277	179	467	212	135	e94
19	76	61	80	e55	106	e55	266	176	415	197	130	e91
20	76	67	77	e56	107	87	268	172	366	194	125	e87
21	75	65	78	e57	97	111	268	166	335	181	144	e91
22	76	61	74	e56	93	114	253	169	310	186	154	e80
23	77	57	77	e55	88	124	245	170	381	183	141	e79
24	77	57	e65	e60	88	125	240	166	1310	167	127	78
25	77	62	e70	e65	88	123	234	178	592	160	120	82
26	76	64	e65	e60	85	142	259	171	334	156	115	79
27	76	61	e50	e65	85	187	312	163	297	151	113	76
28	76	59	e60	e65	81	230	299	208	273	148	114	75
29	77	59	e55	e70	---	315	283	678	290	141	111	72
30	76	58	e65	e80	---	251	276	235	309	136	108	73
31	75	---	e60	e85	---	229	---	853	---	132	106	---
TOTAL	2387	2043	2000	1929	2237	3124	8067	7529	11789	6934	4537	2660
MEAN	77.0	68.1	64.5	62.2	79.9	101	269	243	393	224	146	88.7
MAX	90	81	84	90	107	315	345	853	1310	420	267	104
MIN	72	46	27	44	50	30	198	163	217	132	106	72
AC-FT	4730	4050	3970	3830	4440	6200	16000	14930	23380	13750	9000	5280
CFSM	.19	.17	.16	.15	.20	.25	.67	.60	.98	.56	.36	.22
IN.	.22	.19	.18	.18	.21	.29	.74	.69	1.09	.64	.42	.25

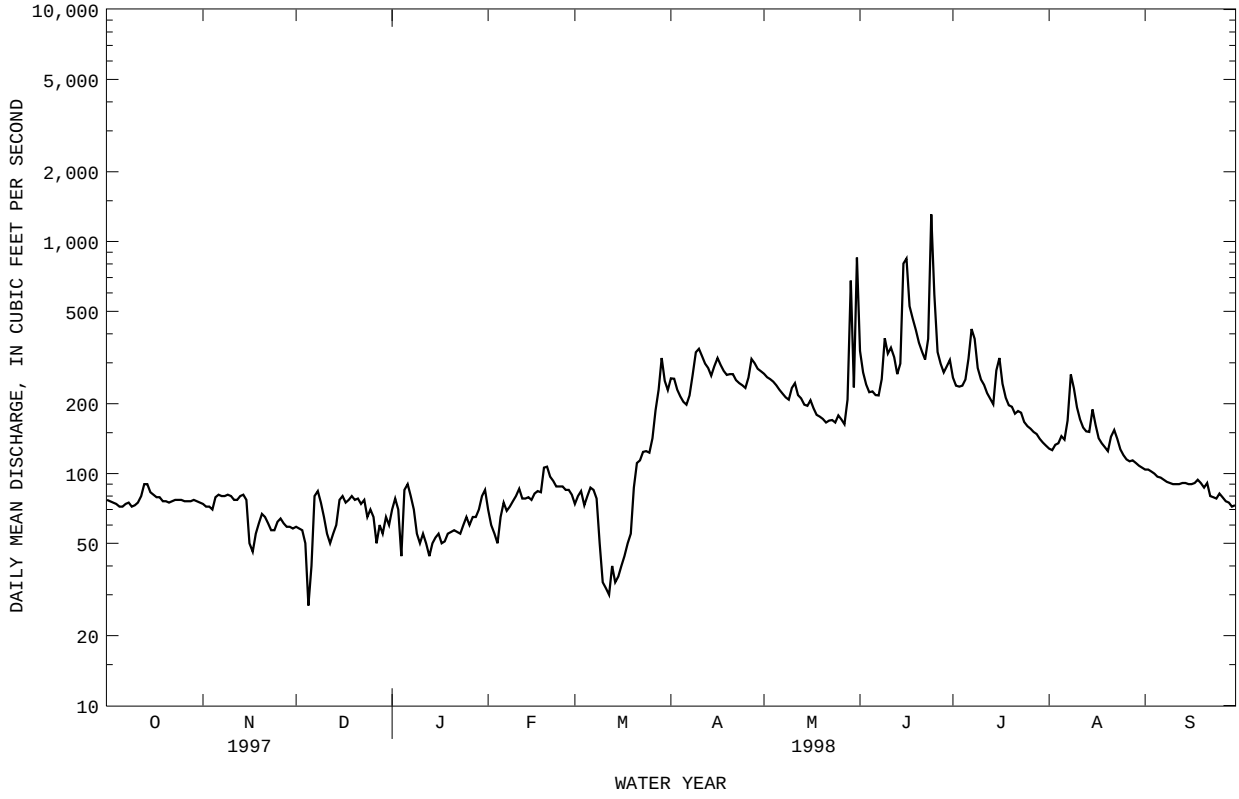
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1998, BY WATER YEAR (WY)

MEAN	61.5	54.4	44.2	35.1	109	228	180	156	281	150	105	71.3
MAX	369	281	199	127	522	813	837	585	2131	561	605	422
(WY)	1993	1980	1985	1952	1994	1962	1969	1983	1984	1993	1951	1951
MIN	2.08	4.06	2.60	2.26	2.41	8.41	9.80	11.5	7.71	11.5	2.92	2.23
(WY)	1957	1959	1959	1959	1940	1957	1957	1943	1956	1956	1956	1956

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1940 - 1998a	
ANNUAL TOTAL	64721		55236			
ANNUAL MEAN	177		151		123	
HIGHEST ANNUAL MEAN					367	1984
LOWEST ANNUAL MEAN					9.28	1956
HIGHEST DAILY MEAN	2000	Feb 19	1310	Jun 24	9000	Mar 28 1962
LOWEST DAILY MEAN	27	Dec 5	27	Dec 5	.20	Jul 30 1956b
ANNUAL SEVEN-DAY MINIMUM	50	Nov 30	35	Mar 10	.53	Aug 23 1956
INSTANTANEOUS PEAK FLOW			1770	Jun 24	12400	Mar 28 1962
INSTANTANEOUS PEAK STAGE			14.40	Jun 24	25.87	Jun 22 1996
ANNUAL RUNOFF (AC-FT)	128400		109600		89140	
ANNUAL RUNOFF (CFSM)	.44		.38		.31	
ANNUAL RUNOFF (INCHES)	5.97		5.10		4.15	
10 PERCENT EXCEEDS	290		290		250	
50 PERCENT EXCEEDS	134		91		45	
90 PERCENT EXCEEDS	62		55		10	

a Revised
b Also Aug 17, 1956
e Estimated

06602020 WEST FORK DITCH AT HORNICK, IA--Continued



06602400 MONONA-HARRISON DITCH NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°59'30", in NW$^1/_4$ NE$^1/_4$ sec.32, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230004, on left bank at upstream side of bridge on county highway E54, 1.0 mi west of gaging station on Little Sioux River near Turin, 4 mi southwest of Turin, 5.2 mi northeast of Blencoe, and 12.5 mi upstream from mouth.

DRAINAGE AREA.--900 mi^2.

PERIOD OF RECORD.--May 1942 to current year. Records for May 1942 to January 1958 not equivalent owing to diversion from Little Sioux River through equalizer ditch 1.5 mi upstream. Records prior to 1950 not equivalent owing to diversion to Little Sioux River through diversion ditch 10.2 mi upstream.

REVISED RECORDS: WSP 1440: Drainage area. WSP 1560: Drainage area. WDR IA-95-1: Period of record.

GAGE.--Water-stage recorder. Datum of gage is 1,015.00 ft above sea level (U.S. Army Corps of Engineers bench mark). May 7, 1942 to Oct. 13, 1953, nonrecording gage and Oct. 14, 1953 to Sept. 30, 1975, recording gage at same site at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 11-14, Jan. 7-14, Mar. 10-19, June 25 to July 6 and Aug. 31 to Sept. 3. Records good except those for estimated daily discharges, which are poor. Monona-Harrison ditch is a dug channel and is a continuation of West Fork ditch, paralleling the Little Sioux River, and discharging into the Missouri River 1.5 mi upstream from the mouth of the Little Sioux River. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	166	176	178	121	209	133	481	431	690	e450	251	e230
2	175	174	171	146	204	141	435	412	463	e520	245	e210
3	190	178	147	125	158	156	372	419	417	e730	260	e190
4	189	171	119	84	118	135	347	403	399	e550	289	173
5	195	167	75	75	132	139	325	381	405	e600	273	168
6	214	173	82	125	136	151	311	362	415	e1200	278	166
7	248	185	142	e110	127	143	634	343	392	2030	355	163
8	278	185	156	e95	125	127	836	329	600	1130	527	158
9	231	176	147	e85	142	120	746	317	1950	665	431	148
10	236	181	136	e75	153	e70	586	316	1150	554	346	150
11	267	177	e120	e80	159	e68	512	368	1090	526	305	147
12	274	171	e100	e75	150	e65	486	339	1970	470	282	145
13	271	174	e110	e70	148	e85	447	330	878	450	271	147
14	253	177	e130	e95	150	e70	422	312	1040	434	272	145
15	201	144	141	103	146	e80	995	312	3540	616	454	148
16	189	125	149	105	164	e90	1120	345	3050	609	492	148
17	195	94	141	105	170	e100	625	328	1660	498	298	148
18	191	136	140	106	172	e112	485	295	1060	430	260	148
19	133	142	147	103	205	e125	451	278	876	393	242	150
20	138	154	141	107	231	141	450	315	737	369	230	159
21	151	166	111	108	203	176	451	321	635	356	507	178
22	182	145	114	106	192	199	418	518	577	350	478	164
23	176	139	144	104	182	209	399	420	553	354	334	155
24	161	135	133	110	177	218	396	348	4240	327	264	158
25	149	170	138	111	182	216	391	334	e3400	316	240	168
26	149	179	128	107	176	264	903	323	e1500	309	224	170
27	165	193	104	114	163	368	802	313	e680	302	226	158
28	142	170	113	114	153	467	541	305	e490	296	232	150
29	147	163	114	121	---	543	477	2030	e400	279	233	146
30	169	169	117	127	---	436	448	1120	e500	266	260	149
31	153	---	128	159	---	422	---	1100	---	259	e260	---
TOTAL	5978	4889	4016	3271	4627	5769	16292	14067	35757	16638	9619	4837
MEAN	193	163	130	106	165	186	543	454	1192	537	310	161
MAX	278	193	178	159	231	543	1120	2030	4240	2030	527	230
MIN	133	94	75	70	118	65	311	278	392	259	224	145
AC-FT	11860	9700	7970	6490	9180	11440	32320	27900	70920	33000	19080	9590
CFSM	.21	.18	.14	.12	.18	.21	.60	.50	1.32	.60	.34	.18
IN.	.25	.20	.17	.14	.19	.24	.67	.58	1.48	.69	.40	.20

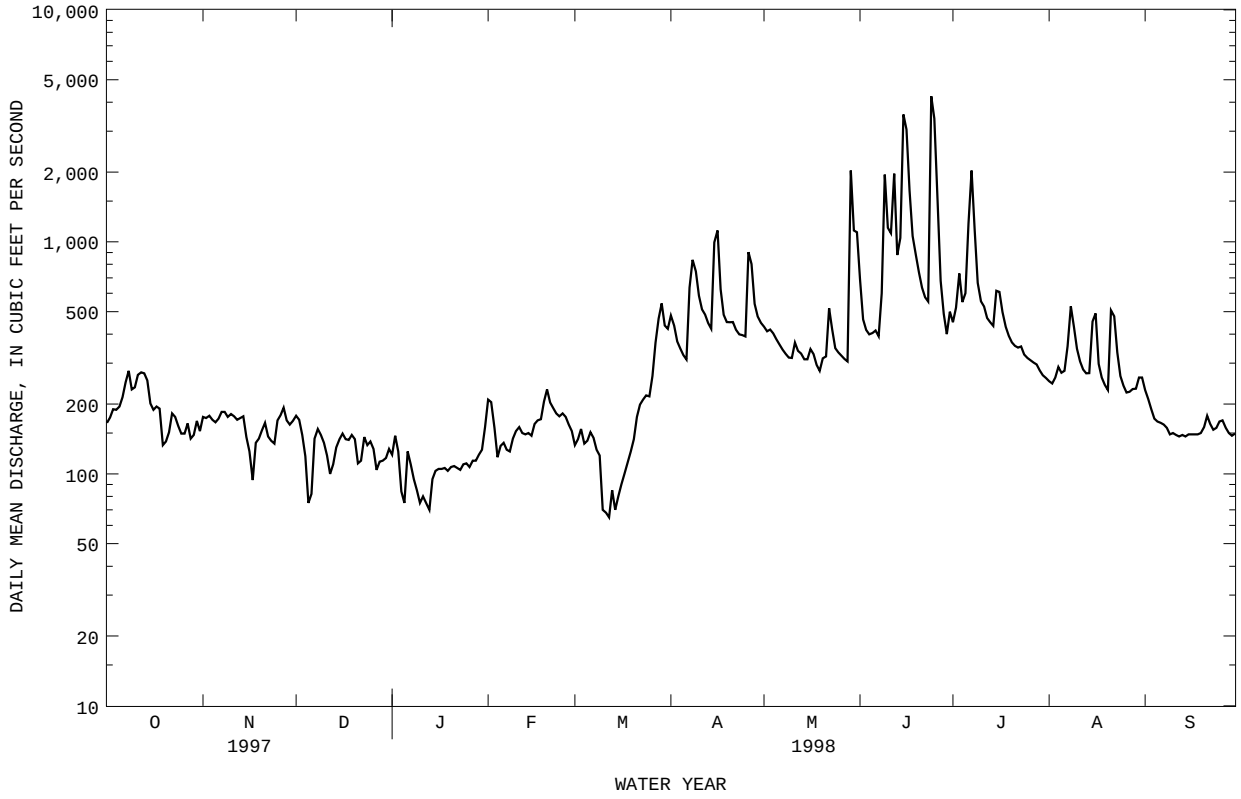
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

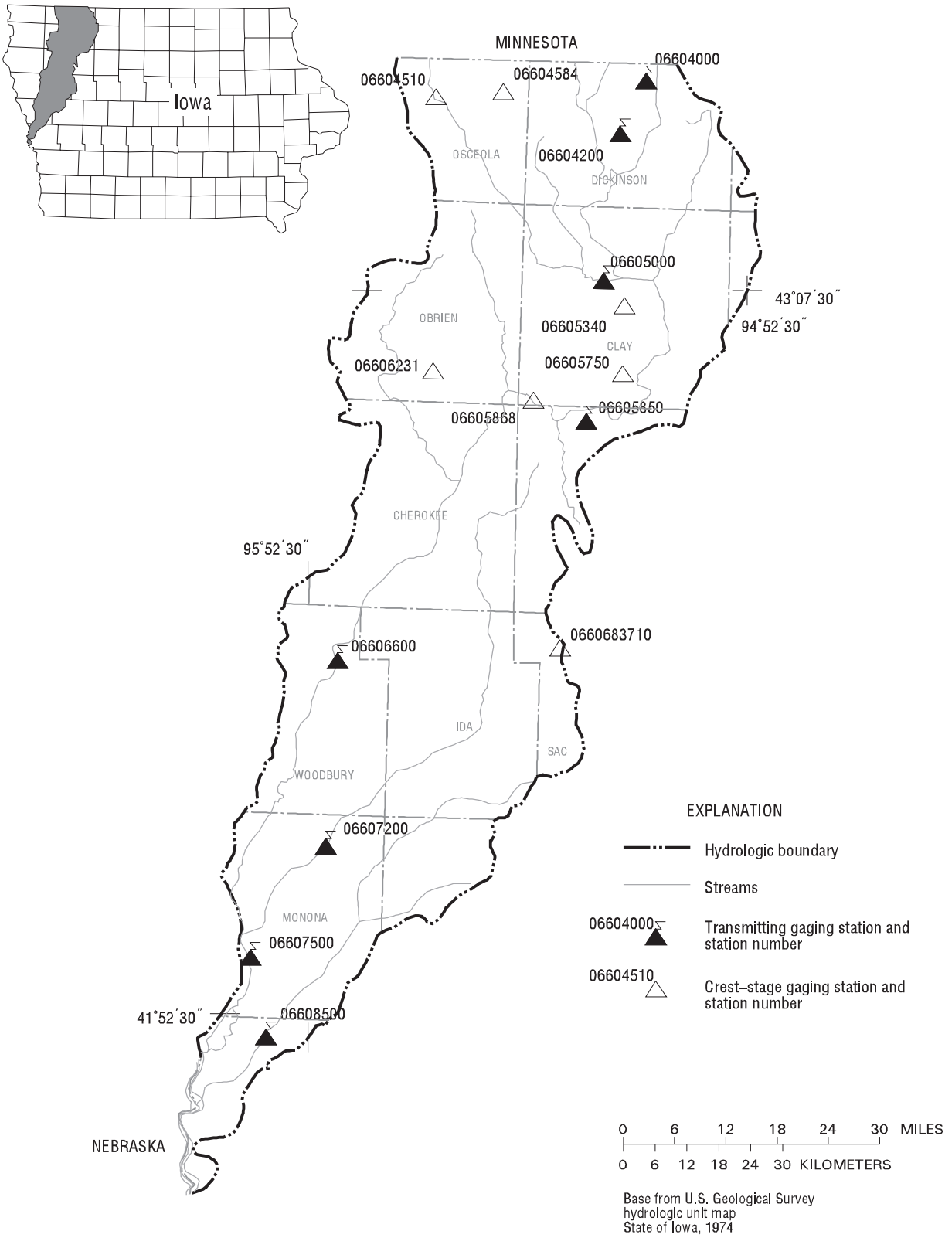
MEAN	153	134	113	93.7	230	496	449	390	598	351	191	143
MAX	831	415	421	398	1963	1707	1588	1157	3833	2107	883	576
(WY)	1993	1980	1985	1973	1971	1962	1965	1995	1984	1993	1996	1993
MIN	16.0	18.0	11.4	10.5	13.9	46.9	41.1	43.7	71.8	46.1	30.6	30.8
(WY)	1959	1959	1959	1959	1959	1968	1968	1968	1989	1976	1976	1981

06602400 MONONA-HARRISON DITCH NEAR TURIN, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998a	
ANNUAL TOTAL	121178		125760			
ANNUAL MEAN	332		345		278	
HIGHEST ANNUAL MEAN					798	1993
LOWEST ANNUAL MEAN					55.5	1968
HIGHEST DAILY MEAN	3460	Feb 19	4240	Jun 24	18000	Feb 19 1971
LOWEST DAILY MEAN	74	Jan 17	65	Mar 12	8.5	Jan 3 1959b
ANNUAL SEVEN-DAY MINIMUM	120	Dec 25	75	Mar 10	8.5	Jan 3 1959
INSTANTANEOUS PEAK FLOW			5340	Jun 24	19900	Feb 19 1971
INSTANTANEOUS PEAK STAGE			17.89	Jun 24	28.03	Feb 19 1971
INSTANTANEOUS LOW FLOW			3.8	Dec 5		
ANNUAL RUNOFF (AC-FT)	240400		249400		201600	
ANNUAL RUNOFF (CFSM)	.37		.38		.31	
ANNUAL RUNOFF (INCHES)	5.01		5.20		4.20	
10 PERCENT EXCEEDS	564		604		520	
50 PERCENT EXCEEDS	265		193		124	
90 PERCENT EXCEEDS	136		111		38	

a Post closure of diversion from Little Sioux River
b Also Jan 4-11, 1959
e Estimated




Iowa
MINNESOTA
06604000
06604584
06604510
OSCEOLA
06604200
DICKINSON
06605000
43°07′30″
94°52′30″
O'BRIEN
06605340
CLAY
06606231
06605750
06605868
06605850
CHEROKEE
95°52′30″
06606600
0660683710
IDA
SAC
WOODBURY
06607200
MONONA
06607500
41°52′30″
06608500
NEBRASKA
EXPLANATION
Hydrologic boundary
Streams
06604000 Transmitting gaging station and station number
06604510 Crest–stage gaging station and station number
0 6 12 18 24 30 MILES
0 6 12 18 24 30 KILOMETERS
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

06604000 SPIRIT LAKE NEAR ORLEANS, IA

LOCATION.--Lat 43°28'11", long 95°07'25", in NE$^{1}/_{4}$ NW$^{1}/_{4}$ sec.20, T.100N., R.36W., Dickinson County, Hydrologic Unit 10230003, 2.3 mi upstream from lake outlet, and 2.3 mi northwest of Orleans.

DRAINAGE AREA.--75.6 mi^{2}.

PERIOD OF RECORD.--May 1933 to September 1975 (fragmentary prior to 1951), April 1990 to current year. Prior to October 1949, published as "at Orleans".

GAGE.--Water-stage recorder. Datum of gage is 1,387.25 ft above sea level, 90.0 ft above Iowa Lake Survey datum, and 14.2 ft below crest of spillway. Prior to July 6, 1950, non-recording gage or water-stage recorder at various sites near outlet, all at present datum.

REMARKS.--Lake formed by concrete dam with ungated spillway at elevation 1,401.4 ft. above sea level. Dam constructed in 1969. A previous outlet works had been constructed in 1944. Lake is used for conservation and recreation.

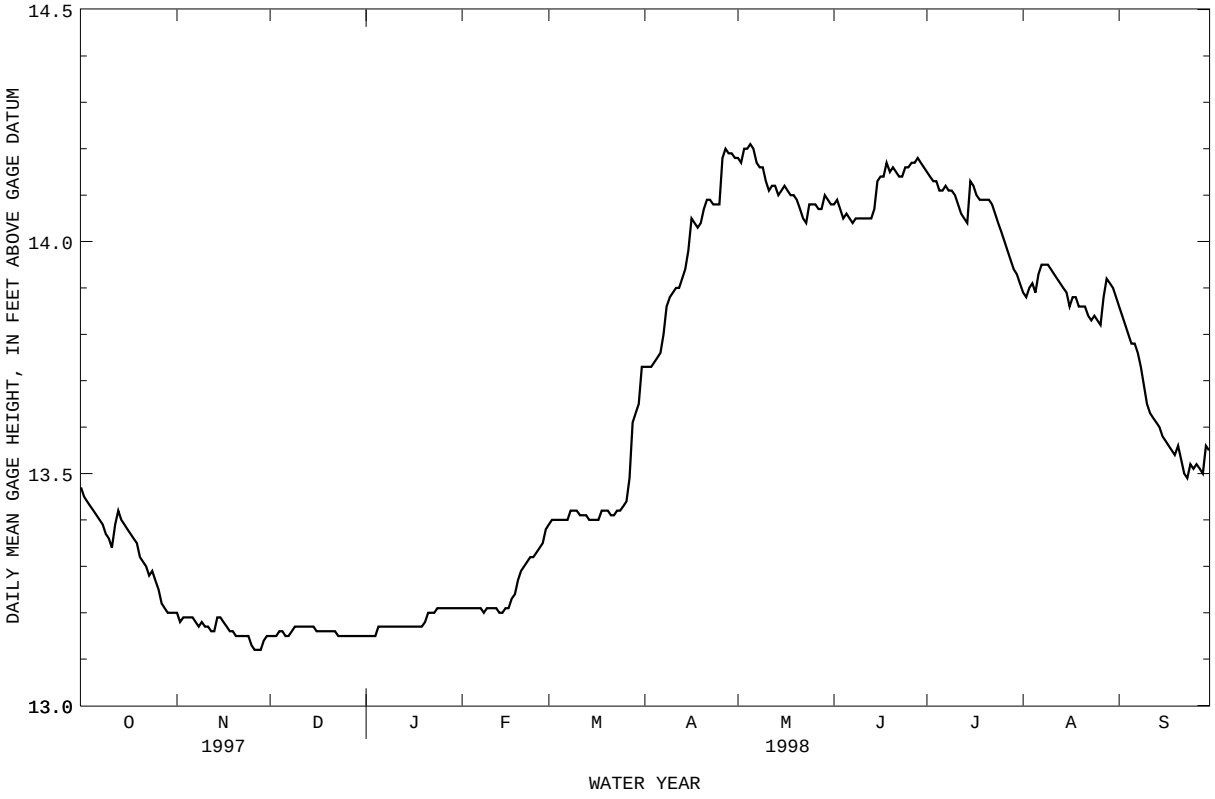
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 18.79 ft. July 17-20, 1993; minimum observed, 6.75 ft. Oct. 20, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 14.24 ft. June 18; minimum, 13.12 ft. Nov. 25-29.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.47	13.20	13.15	13.15	13.21	13.39	13.73	14.18	14.08	14.15	13.89	13.86
2	13.45	13.18	13.15	13.15	13.21	13.40	13.73	14.17	14.09	14.14	13.88	13.84
3	13.44	13.19	13.15	13.15	13.21	13.40	13.73	14.20	14.07	14.13	13.90	13.82
4	13.43	13.19	13.16	13.15	13.21	13.40	13.74	14.20	14.05	14.13	13.91	13.80
5	13.42	13.19	13.16	13.17	13.21	13.40	13.75	14.21	14.06	14.11	13.89	13.78
6	13.41	13.19	13.15	13.17	13.21	13.40	13.76	14.20	14.05	14.11	13.93	13.78
7	13.40	13.18	13.15	13.17	13.21	13.40	13.80	14.17	14.04	14.12	13.95	13.76
8	13.39	13.17	13.16	13.17	13.20	13.42	13.86	14.16	14.05	14.11	13.95	13.73
9	13.37	13.18	13.17	13.17	13.21	13.42	13.88	14.16	14.05	14.11	13.95	13.69
10	13.36	13.17	13.17	13.17	13.21	13.42	13.89	14.13	14.05	14.10	13.94	13.65
11	13.34	13.17	13.17	13.17	13.21	13.41	13.90	14.11	14.05	14.08	13.93	13.63
12	13.39	13.16	13.17	13.17	13.21	13.41	13.90	14.12	14.05	14.06	13.92	13.62
13	13.42	13.16	13.17	13.17	13.20	13.41	13.92	14.12	14.05	14.05	13.91	13.61
14	13.40	13.19	13.17	13.17	13.20	13.40	13.94	14.10	14.07	14.04	13.90	13.60
15	13.39	13.19	13.17	13.17	13.21	13.40	13.98	14.11	14.13	14.13	13.89	13.58
16	13.38	13.18	13.16	13.17	13.21	13.40	14.05	14.12	14.14	14.12	13.86	13.57
17	13.37	13.17	13.16	13.17	13.23	13.40	14.04	14.11	14.14	14.10	13.88	13.56
18	13.36	13.16	13.16	13.17	13.24	13.42	14.03	14.10	14.17	14.09	13.88	13.55
19	13.35	13.16	13.16	13.17	13.27	13.42	14.04	14.10	14.15	14.09	13.86	13.54
20	13.32	13.15	13.16	13.18	13.29	13.42	14.07	14.09	14.16	14.09	13.86	13.56
21	13.31	13.15	13.16	13.20	13.30	13.41	14.09	14.07	14.15	14.09	13.86	13.53
22	13.30	13.15	13.16	13.20	13.31	13.41	14.09	14.05	14.14	14.08	13.84	13.50
23	13.28	13.15	13.15	13.20	13.32	13.42	14.08	14.04	14.14	14.06	13.83	13.49
24	13.29	13.15	13.15	13.21	13.32	13.42	14.08	14.08	14.16	14.04	13.84	13.52
25	13.27	13.13	13.15	13.21	13.33	13.43	14.08	14.08	14.16	14.02	13.83	13.51
26	13.25	13.12	13.15	13.21	13.34	13.44	14.18	14.08	14.17	14.00	13.82	13.52
27	13.22	13.12	13.15	13.21	13.35	13.49	14.20	14.07	14.17	13.98	13.88	13.51
28	13.21	13.12	13.15	13.21	13.38	13.61	14.19	14.07	14.18	13.96	13.92	13.50
29	13.20	13.14	13.15	13.21	---	13.63	14.19	14.10	14.17	13.94	13.91	13.56
30	13.20	13.15	13.15	13.21	---	13.65	14.18	14.09	14.16	13.93	13.90	13.55
31	13.20	---	13.15	13.21	---	13.73	---	14.08	---	13.91	13.88	---
MEAN	13.34	13.16	13.16	13.18	13.25	13.44	13.97	14.12	14.11	14.07	13.89	13.62
MAX	13.47	13.20	13.17	13.21	13.38	13.73	14.20	14.21	14.18	14.15	13.95	13.86
MIN	13.20	13.12	13.15	13.15	13.20	13.39	13.73	14.04	14.04	13.91	13.82	13.49

06604000 SPIRIT LAKE NEAR ORLEANS, IA--Continued



06604200 WEST OKOBOJI LAKE AT LAKESIDE LABORATORY NEAR MILFORD, IA

LOCATION.--Lat 43°22'43", long 95°10'52", in NE$^1/_4$ SW$^1/_4$ sec.23, T.99 N., R.37 W., Dickinson County, Hydrologic Unit 10230003, at pumping station of Lakeside Laboratory on west shore, 2.3 mi upstream from lake outlet, and 3.8 mi northwest of Milford.

DRAINAGE AREA.--125 mi^2.

PERIOD OF RECORD.--May 1933 to current year. Published as "Okoboji Lake at Arnold's Park" 1933-37 and as "Okoboji Lake at Lakeside Laboratory near Milford" 1937-66.

GAGE.--Water-stage recorder. Datum of gage is 1,391.76 ft above sea level, 94.51 ft above Iowa Lake Survey datum. Prior to June 17, 1938, nonrecording gage at State Pier at Arnolds Park at same datum.

REMARKS.--A reliable record of stage was obtained for the year. Lake formed by concrete dam with ungated spillway at elevation 1,395.8 ft above sea level. Lake is used for conservation and recreation. Area of lake is approximately 3,900 acres. U.S. Geological Survey satellite data collection platform at station.

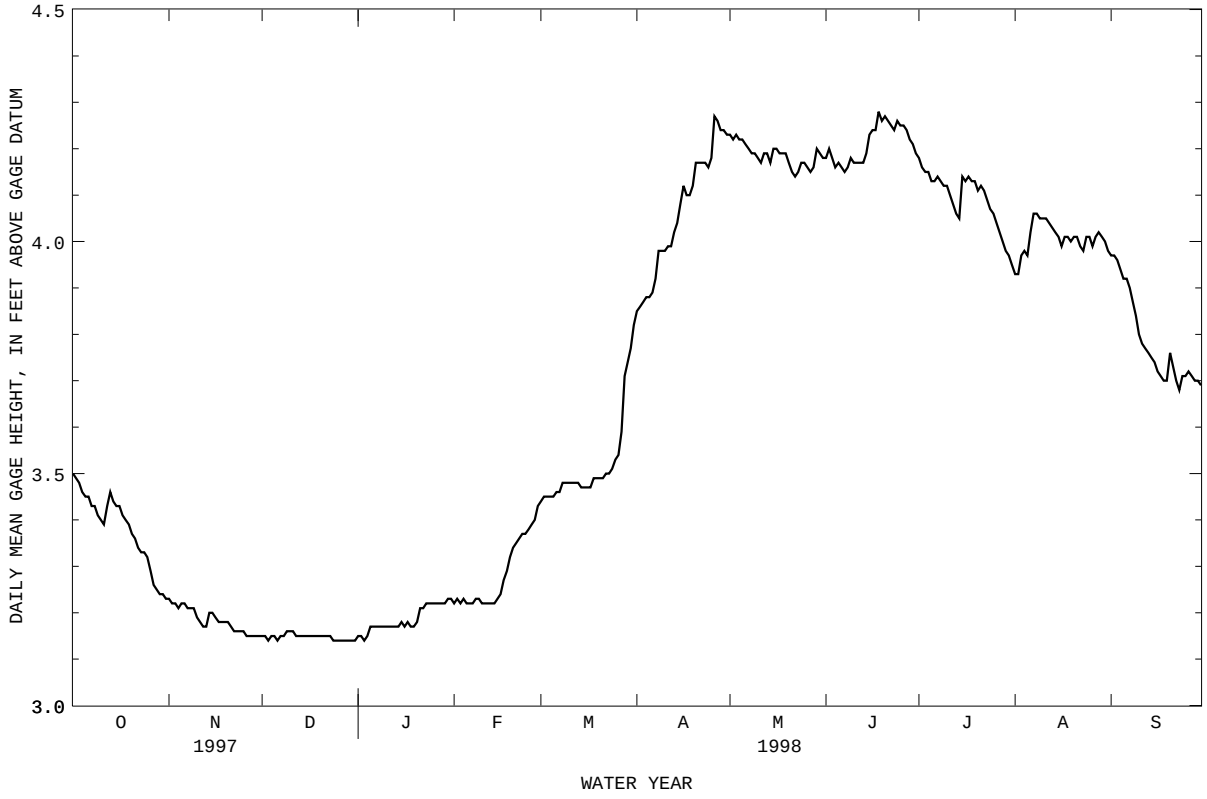
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 8.70 ft July 17, 1993; minimum observed, 0.20 ft Sept. 20, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 4.30 ft June 18; minimum, 3.14 ft Dec. 3, 6, 24-31, and Jan. 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.50	3.23	3.15	3.15	3.22	3.44	3.85	4.23	4.18	4.18	3.93	3.97
2	3.49	3.22	3.15	3.15	3.23	3.45	3.86	4.22	4.20	4.16	3.93	3.97
3	3.48	3.22	3.14	3.14	3.22	3.45	3.87	4.23	4.18	4.15	3.97	3.96
4	3.46	3.21	3.15	3.15	3.23	3.45	3.88	4.22	4.16	4.15	3.98	3.94
5	3.45	3.22	3.15	3.17	3.22	3.45	3.88	4.22	4.17	4.13	3.97	3.92
6	3.45	3.22	3.14	3.17	3.22	3.46	3.89	4.21	4.16	4.13	4.02	3.92
7	3.43	3.21	3.15	3.17	3.22	3.46	3.92	4.20	4.15	4.14	4.06	3.90
8	3.43	3.21	3.15	3.17	3.23	3.48	3.98	4.19	4.16	4.13	4.06	3.87
9	3.41	3.21	3.16	3.17	3.23	3.48	3.98	4.19	4.18	4.12	4.05	3.84
10	3.40	3.19	3.16	3.17	3.22	3.48	3.98	4.18	4.17	4.12	4.05	3.80
11	3.39	3.18	3.16	3.17	3.22	3.48	3.99	4.17	4.17	4.10	4.05	3.78
12	3.43	3.17	3.15	3.17	3.22	3.48	3.99	4.19	4.17	4.08	4.04	3.77
13	3.46	3.17	3.15	3.17	3.22	3.48	4.02	4.19	4.17	4.06	4.03	3.76
14	3.44	3.20	3.15	3.17	3.22	3.47	4.04	4.17	4.19	4.05	4.02	3.75
15	3.43	3.20	3.15	3.18	3.23	3.47	4.08	4.20	4.23	4.14	4.01	3.74
16	3.43	3.19	3.15	3.17	3.24	3.47	4.12	4.20	4.24	4.13	3.99	3.72
17	3.41	3.18	3.15	3.18	3.27	3.47	4.10	4.19	4.24	4.14	4.01	3.71
18	3.40	3.18	3.15	3.17	3.29	3.49	4.10	4.19	4.28	4.13	4.01	3.70
19	3.39	3.18	3.15	3.17	3.32	3.49	4.12	4.19	4.26	4.13	4.00	3.70
20	3.37	3.18	3.15	3.18	3.34	3.49	4.17	4.17	4.27	4.11	4.01	3.76
21	3.36	3.17	3.15	3.21	3.35	3.49	4.17	4.15	4.26	4.12	4.01	3.73
22	3.34	3.16	3.15	3.21	3.36	3.50	4.17	4.14	4.25	4.11	3.99	3.70
23	3.33	3.16	3.15	3.22	3.37	3.50	4.17	4.15	4.24	4.09	3.98	3.68
24	3.33	3.16	3.14	3.22	3.37	3.51	4.16	4.17	4.26	4.07	4.01	3.71
25	3.32	3.16	3.14	3.22	3.38	3.53	4.18	4.17	4.25	4.06	4.01	3.71
26	3.29	3.15	3.14	3.22	3.39	3.54	4.27	4.16	4.25	4.04	3.99	3.72
27	3.26	3.15	3.14	3.22	3.40	3.59	4.26	4.15	4.24	4.02	4.01	3.71
28	3.25	3.15	3.14	3.22	3.43	3.71	4.24	4.16	4.22	4.00	4.02	3.70
29	3.24	3.15	3.14	3.22	---	3.74	4.24	4.20	4.21	3.98	4.01	3.70
30	3.24	3.15	3.14	3.23	---	3.77	4.23	4.19	4.19	3.97	4.00	3.69
31	3.23	---	3.14	3.23	---	3.82	---	4.18	---	3.95	3.98	---
MEAN	3.38	3.18	3.15	3.19	3.28	3.52	4.06	4.19	4.21	4.09	4.01	3.78
MAX	3.50	3.23	3.16	3.23	3.43	3.82	4.27	4.23	4.28	4.18	4.06	3.97
MIN	3.23	3.15	3.14	3.14	3.22	3.44	3.85	4.14	4.15	3.95	3.93	3.68

06604200 WEST OKOBOJI LAKE AT LAKESIDE LABORATORY NEAR MILFORD, IA--Continued



06605000 OCHEYEDAN RIVER NEAR SPENCER, IA

LOCATION.--Lat 43°07'44", long 95°12'37", in SW$^1/_4$ SW$^1/_4$ sec.15, T.96N., R.37W., Clay County, Hydrologic Unit 10230003, on left bank 3 ft upstream from bridge on county highway M38, 3.4 mi west by southwest of Spencer, and at mile 4.1.

DRAINAGE AREA.--426 mi^2.

PERIOD OF RECORD.--October 1977 to current year. Occasional low-flow measurements, water years 1957-61, 1964, 1966-68, 1970, 1971, 1974-77.

GAGE.--Water-stage recorder. Datum of gage is 1,311.66 ft above sea level.

REMARKS.--Estimated daily discharges: Nov. 10-13, Dec. 3 to Feb. 16, Mar. 10-24, and May 8-13. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1953 reached a stage of 12.89 ft, discharge, 26,000 ft^3/s on basis of contracted-opening measurement of peak flow.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

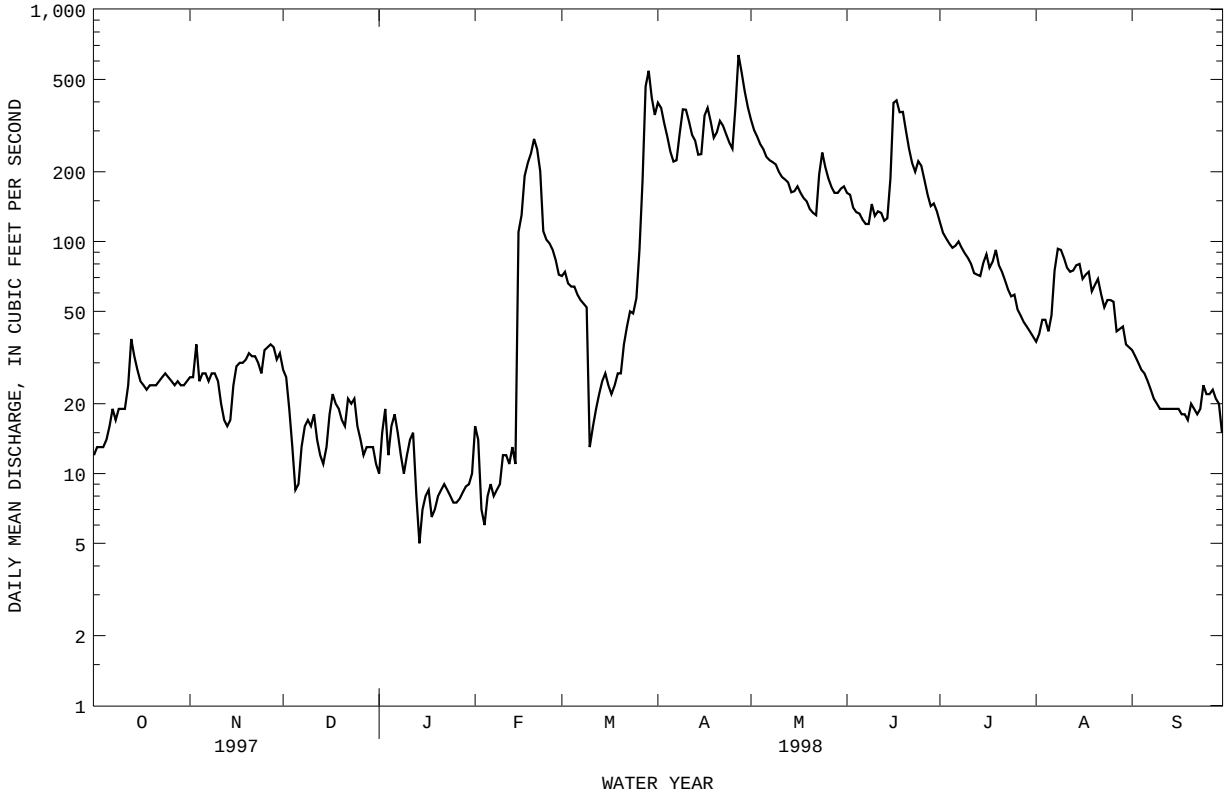
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	26	28	e10	e16	71	397	335	162	121	37	34
2	13	26	26	e15	e14	74	376	302	159	109	40	32
3	13	36	e19	e19	e7.0	66	323	283	140	103	46	30
4	13	25	e13	e12	e6.0	64	283	263	134	98	46	28
5	14	27	e8.5	e16	e8.0	64	244	250	132	94	41	27
6	16	27	e9.0	e18	e9.0	59	221	232	124	96	48	25
7	19	25	e13	e15	e8.0	56	224	224	119	100	75	23
8	17	27	e16	e12	e8.5	54	290	e220	119	94	93	21
9	19	27	e17	e10	e9.0	52	371	e215	145	89	92	20
10	19	e25	e16	e12	e12	e13	370	e200	129	85	85	19
11	19	e20	e18	e14	e12	e16	329	e190	135	80	77	19
12	24	e17	e14	e15	e11	e19	288	e185	133	73	74	19
13	38	e16	e12	e8.0	e13	e22	272	e180	123	72	75	19
14	32	17	e11	e5.0	e11	e25	237	163	126	71	79	19
15	28	24	e13	e7.0	e110	e27	238	165	187	81	80	19
16	25	29	e18	e8.0	e130	e24	349	173	396	88	69	19
17	24	30	e22	e8.5	192	e22	377	162	406	77	72	18
18	23	30	e20	e6.5	219	e24	329	154	361	82	74	18
19	24	31	e19	e7.0	240	e27	280	149	362	92	61	17
20	24	33	e17	e8.0	277	e27	296	138	300	79	65	20
21	24	32	e16	e8.5	250	e36	331	133	251	74	69	19
22	25	32	e21	e9.0	201	e43	316	130	218	68	59	18
23	26	30	e20	e8.5	111	e50	289	195	200	62	52	19
24	27	27	e21	e8.0	102	e49	267	242	222	58	56	24
25	26	34	e16	e7.5	98	57	251	209	212	59	56	22
26	25	35	e14	e7.5	92	92	381	187	183	51	55	22
27	24	36	e12	e7.8	83	182	637	172	159	48	41	23
28	25	35	e13	e8.3	72	467	536	162	142	45	42	21
29	24	31	e13	e8.8	---	545	445	162	146	43	43	20
30	24	33	e13	e9.0	---	417	378	169	135	41	36	15
31	25	---	e11	e10	---	351	---	173	---	39	35	---
TOTAL	691	843	499.5	318.9	2321.5	3095	9925	6117	5760	2372	1873	649
MEAN	22.3	28.1	16.1	10.3	82.9	99.8	331	197	192	76.5	60.4	21.6
MAX	38	36	28	19	277	545	637	335	406	121	93	34
MIN	12	16	8.5	5.0	6.0	13	221	130	119	39	35	15
AC-FT	1370	1670	991	633	4600	6140	19690	12130	11420	4700	3720	1290
CFSM	.05	.07	.04	.02	.19	.23	.78	.46	.45	.18	.14	.05
IN.	.06	.07	.04	.03	.20	.27	.87	.53	.50	.21	.16	.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1998, BY WATER YEAR (WY)

MEAN	136	150	83.4	46.9	84.8	358	494	383	492	340	152	142
MAX	492	796	305	180	402	1019	1463	912	1973	2243	706	597
(WY)	1983	1980	1983	1983	1983	1983	1983	1993	1993	1993	1993	1979
MIN	9.23	8.11	1.91	.51	.000	14.0	20.5	54.9	33.8	33.4	15.3	14.2
(WY)	1990	1990	1990	1979	1979	1990	1990	1981	1989	1989	1989	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1978 - 1998	
ANNUAL TOTAL	66019.5		34464.9			
ANNUAL MEAN	181		94.4		239	
HIGHEST ANNUAL MEAN					763	1993
LOWEST ANNUAL MEAN					33.4	1989
HIGHEST DAILY MEAN	3110	Mar 22	637	Apr 27	5620	Jul 1 1993
LOWEST DAILY MEAN	8.5	Dec 5	5.0	Jan 14	.00	Jan 24 1979a
ANNUAL SEVEN-DAY MINIMUM	13	Sep 29	7.1	Jan 13	.00	Jan 24 1979
INSTANTANEOUS PEAK FLOW			685	Apr 27	6450	Jun 21 1983
INSTANTANEOUS PEAK STAGE			5.17	Apr 27	11.28	Jul 1 1993
INSTANTANEOUS LOW FLOW					.00	Jan 24 1979
ANNUAL RUNOFF (AC-FT)	130900		68360		172900	
ANNUAL RUNOFF (CFSM)	.42		.22		.56	
ANNUAL RUNOFF (INCHES)	5.77		3.01		7.61	
10 PERCENT EXCEEDS	479		269		564	
50 PERCENT EXCEEDS	34		39		100	
90 PERCENT EXCEEDS	16		12		15	

a Also Jan 25 to Mar 9, 1979, Dec 22, 1989 to Jan 5, 1990
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

06605850 LITTLE SIOUX RIVER AT LINN GROVE, IA

LOCATION.--Lat 42°53'24", long 95°14'30", in SW$^1/_4$ SW$^1/_4$ sec.5, T.93 N., R.37 W., Buena Vista County, Hydrologic Unit 10230003, on right bank at downstream side of bridge on County Highway M36, in Linn Grove, and at mile 123.7.

DRAINAGE AREA.--1,548 mi^2.

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

REVISED RECORDS.--WDR IA-80-1: 1978-79.

GAGE.--Water-stage recorder. Datum of gage is 1,223.60 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 7-12, Nov. 16, 17, Dec. 5-7, 11-13, 20-23, 26-31, Jan. 4-27, Mar. 11-16, and June 28 to July 7. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, gage height 20.96 ft; discharge, 22,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	65	90	55	53	383	1430	1330	616	e800	155	163
2	51	67	82	62	56	335	1390	1210	585	e700	153	160
3	54	68	85	75	84	325	1370	1110	557	e600	155	154
4	57	63	58	e27	59	287	1240	1040	539	e550	176	150
5	56	63	e23	e37	55	264	1100	979	538	e480	212	145
6	58	68	e36	e54	61	267	1000	921	505	e460	397	137
7	e56	75	e55	e46	60	254	975	867	485	e500	1240	128
8	e54	75	69	e38	57	257	1090	814	477	477	1140	120
9	e53	74	68	e32	55	154	1270	773	477	438	926	113
10	e52	73	66	e36	55	123	1300	741	511	404	751	106
11	e55	69	e60	e42	56	e110	1250	683	549	368	619	100
12	e60	63	e55	e36	58	e100	1160	680	583	339	524	95
13	82	65	e60	e30	61	e110	1080	656	595	310	453	90
14	101	64	66	e32	64	e100	988	619	638	286	399	87
15	95	49	66	e34	73	e120	953	604	876	330	351	85
16	84	e38	70	e34	126	e140	1050	596	1180	354	305	83
17	75	e46	71	e33	276	153	1260	571	1540	349	271	82
18	70	62	74	e34	440	156	1330	565	1580	328	265	81
19	66	74	78	e34	608	164	1210	543	1430	361	255	78
20	61	73	e70	e35	664	161	1170	513	1410	350	232	80
21	61	69	e50	e35	703	191	1380	489	1290	331	224	78
22	62	70	e65	e36	696	224	1450	483	1110	316	221	78
23	59	66	e70	e38	697	245	1340	473	919	294	204	82
24	61	55	78	e39	663	252	1200	626	1550	266	191	93
25	62	59	78	e40	529	248	1100	909	1620	249	180	97
26	61	67	e70	e41	513	310	1100	863	1480	248	185	91
27	59	71	e55	e42	540	460	1300	790	1340	227	182	88
28	61	81	e59	45	462	838	1580	732	e1000	207	177	81
29	64	90	e53	48	---	1360	1610	728	e950	190	178	78
30	65	87	e64	50	---	1600	1470	686	e900	176	175	89
31	65	---	e50	54	---	1570	---	654	---	166	167	---
TOTAL	1975	2009	1994	1274	7824	11261	37146	23248	27830	11454	11063	3092
MEAN	63.7	67.0	64.3	41.1	279	363	1238	750	928	369	357	103
MAX	101	90	90	75	703	1600	1610	1330	1620	800	1240	163
MIN	51	38	23	27	53	100	953	473	477	166	153	78
AC-FT	3920	3980	3960	2530	15520	22340	73680	46110	55200	22720	21940	6130
CFSM	.04	.04	.04	.03	.18	.23	.80	.48	.60	.24	.23	.07
IN.	.05	.05	.05	.03	.19	.27	.89	.56	.67	.28	.27	.07

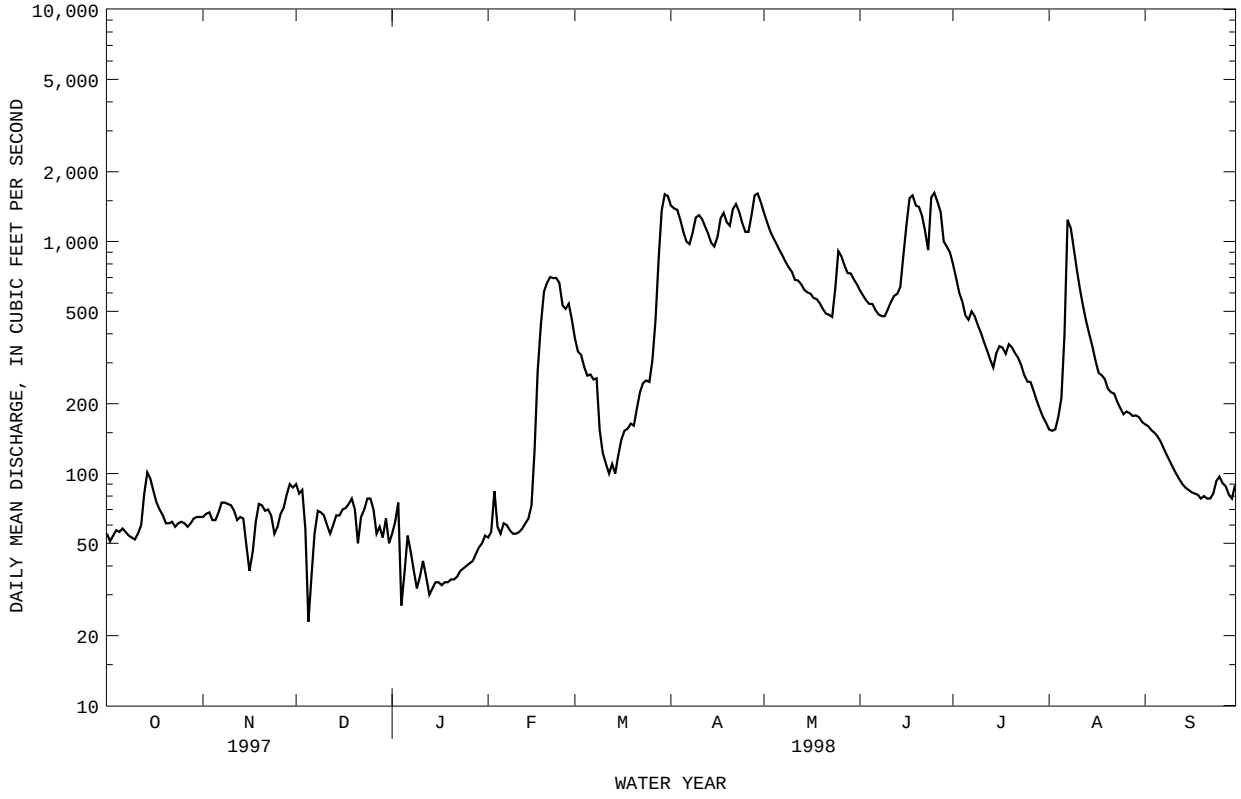
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1998, BY WATER YEAR (WY)

MEAN	436	462	285	188	296	1167	1656	1291	1526	1099	506	430
MAX	2070	2050	1122	859	1161	3894	4952	3233	6898	7905	2906	2171
(WY)	1983	1980	1983	1983	1983	1983	1983	1993	1993	1993	1993	1993
MIN	21.3	22.0	6.08	3.12	5.92	75.9	77.7	69.4	60.3	36.3	26.4	22.7
(WY)	1977	1977	1990	1977	1977	1990	1990	1977	1977	1977	1976	1976

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1973 - 1998	
ANNUAL TOTAL	256922		140170			
ANNUAL MEAN	704		384		780	
HIGHEST ANNUAL MEAN					2763	1993
LOWEST ANNUAL MEAN					56.3	1977
HIGHEST DAILY MEAN	5000	Mar 25	1620	Jun 25	15000	Jul 2 1993
LOWEST DAILY MEAN	23	Dec 5	23	Dec 5	.70	Feb 4 1977
ANNUAL SEVEN-DAY MINIMUM	54	Dec 4	33	Jan 13	1.1	Jan 31 1977
INSTANTANEOUS PEAK FLOW			1700	Jun 24	16100	Jul 2 1993
INSTANTANEOUS PEAK STAGE			9.17	Jun 24	20.63	Jul 2 1993
ANNUAL RUNOFF (AC-FT)	509600		278000		564800	
ANNUAL RUNOFF (CFSM)	.45		.25		.50	
ANNUAL RUNOFF (INCHES)	6.17		3.37		6.84	
10 PERCENT EXCEEDS	2020		1150		2010	
50 PERCENT EXCEEDS	240		163		335	
90 PERCENT EXCEEDS	62		53		41	

e Estimated

06605850 LITTLE SIOUX RIVER AT LINN GROVE, IA--Continued



06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IA

LOCATION.--Lat 42°28'20", long 95°47'49", in NE$^1/_4$ NW$^1/_4$ sec.1, T.88 N., R.43 W., Woodbury County, Hydrologic Unit 10230003 on right bank 50 ft upstream from bridge on State Highway 31, 0.3 mi upstream from Bacon Creek, 0.5 mi west of Correctionville, 0.8 mi downstream from Pierson Creek, and at mile 56.0.

DRAINAGE AREA.--2,500 mi^2.

PERIOD OF RECORD.--May 1918 to July 1925, October 1928 to July 1932, June 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 856: 1919. WSP 1240: 1924-25, 1931, 1932 (M), 1937, 1945 (M), 1947 (M), 1949 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,096.49 ft above sea level. May 28, 1918, to July 1, 1925 and Oct. 29, 1928 to July 15, 1929, nonrecording gage 0.2 mi downstream at datum 1.25 ft lower. July 16, 1929, to July 2, 1932, and June 15, 1936, to Nov. 7, 1938, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Dec. 5-7, 11-14, Jan. 4-15, and Mar. 11-15. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23 or 24, 1891, reached a stage of 29.34 ft, present datum, from levels to floodmark by U.S. Soil Conservation Service (discharge not determined).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	196	214	149	226	822	2260	2110	1310	1610	478	467
2	172	195	216	166	223	749	2160	1950	1270	1470	457	456
3	168	191	220	154	188	681	2050	1830	1200	1380	477	437
4	160	188	155	e55	176	614	1980	1700	1140	1310	556	419
5	156	189	e50	e95	186	595	1870	1600	1130	1240	684	395
6	155	200	e75	e150	177	560	1720	1520	1100	1230	523	382
7	153	202	e110	e120	171	550	1630	1440	1080	1360	754	361
8	150	200	180	e100	170	533	1690	1360	1070	1280	1990	334
9	149	201	188	e80	188	305	1840	1310	1220	1200	2190	312
10	145	202	175	e95	218	272	2060	1300	1170	1120	1810	292
11	148	198	e155	e110	229	e250	2110	1270	1170	1030	1520	274
12	170	183	e140	e90	232	e240	2010	1230	1200	961	1320	259
13	225	187	e155	e75	244	e270	2070	1190	1200	896	1200	246
14	216	197	e170	e85	238	e240	1840	1150	1340	838	1080	234
15	215	191	182	e87	250	e300	1770	1120	2470	992	1110	230
16	227	108	186	88	296	351	1780	1120	2860	1120	936	225
17	230	126	168	89	342	371	1880	1090	2930	1060	834	221
18	223	148	190	89	448	377	2060	1050	2760	994	760	220
19	215	185	199	87	590	394	2100	1020	2730	945	704	221
20	204	216	186	90	723	392	2080	1000	2510	933	681	266
21	196	197	124	91	881	452	2010	959	2360	897	709	236
22	192	195	174	96	1020	468	2070	967	2190	861	686	220
23	191	188	187	101	1020	502	2180	963	2000	816	661	213
24	193	135	198	103	1080	530	2080	983	2530	772	630	223
25	193	171	184	105	1030	548	1930	1140	2690	727	588	241
26	187	203	162	107	958	637	1890	1310	2770	691	546	242
27	181	202	146	112	856	745	1820	1400	2350	655	525	228
28	185	213	167	119	839	1040	1870	1330	2030	630	531	221
29	191	209	142	123	---	1410	2080	1390	1980	585	526	215
30	192	213	162	123	---	1930	2210	1380	1860	547	500	209
31	193	---	127	153	---	2180	---	1540	---	511	479	---
TOTAL	5751	5629	5087	3287	13199	19308	59100	40722	55620	30661	26445	8499
MEAN	186	188	164	106	471	623	1970	1314	1854	989	853	283
MAX	230	216	220	166	1080	2180	2260	2110	2930	1610	2190	467
MIN	145	108	50	55	170	240	1630	959	1070	511	457	209
AC-FT	11410	11170	10090	6520	26180	38300	117200	80770	110300	60820	52450	16860
CFSM	.07	.08	.07	.04	.19	.25	.79	.53	.74	.40	.34	.11
IN.	.09	.08	.08	.05	.20	.29	.88	.61	.83	.46	.39	.13

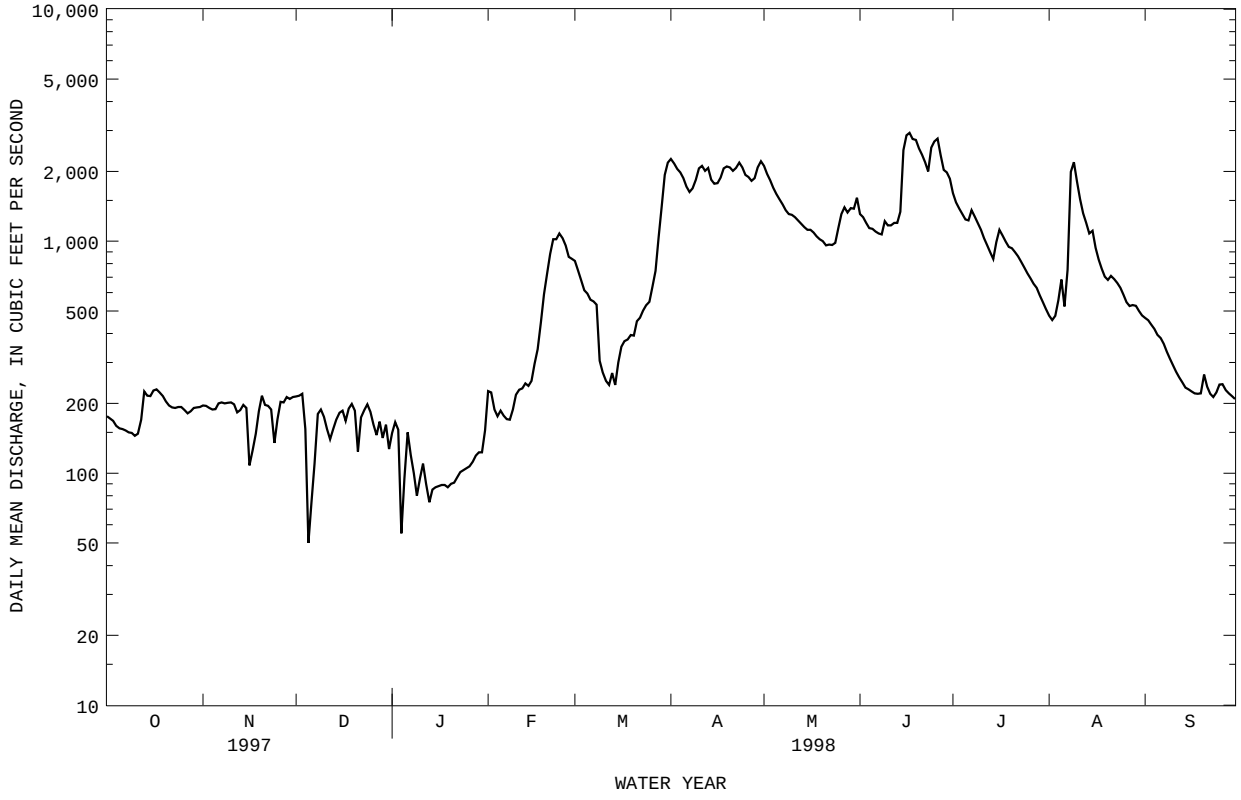
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1998, BY WATER YEAR (WY)

MEAN	441	432	299	219	467	1485	1895	1387	1783	1235	610	515
MAX	2994	3079	1698	1323	2708	7328	8677	5002	10110	11600	4469	3671
(WY)	1983	1980	1983	1983	1971	1983	1983	1993	1993	1993	1993	1938
MIN	8.33	25.3	15.1	8.31	7.08	53.5	61.9	57.3	58.1	43.4	15.0	14.4
(WY)	1957	1959	1959	1959	1959	1931	1931	1931	1956	1956	1931	1958

06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1919 - 1998	
ANNUAL TOTAL	413598		273308			
ANNUAL MEAN	1133		749		910	
HIGHEST ANNUAL MEAN					4304	1993
LOWEST ANNUAL MEAN					53.7	1931
HIGHEST DAILY MEAN	5680	Mar 13	2930	Jun 17	27900	Apr 7 1965
LOWEST DAILY MEAN	50	Dec 5	50	Dec 5	2.6	Jul 17 1936a
ANNUAL SEVEN-DAY MINIMUM	133	Dec 4	86	Jan 13	4.6	Oct 4 1956
INSTANTANEOUS PEAK FLOW			3120	Jun 16	29800	Apr 7 1965
INSTANTANEOUS PEAK STAGE			9.85	Jun 16	25.86	Apr 7 1965
INSTANTANEOUS LOW FLOW			32	Dec 5		
ANNUAL RUNOFF (AC-FT)	820400		542100		659200	
ANNUAL RUNOFF (CFSM)	.45		.30		.36	
ANNUAL RUNOFF (INCHES)	6.15		4.07		4.95	
10 PERCENT EXCEEDS	2720		1960		2200	
50 PERCENT EXCEEDS	450		456		374	
90 PERCENT EXCEEDS	170		144		54	

a Also July 25, 1956, caused by construction dam upstream
e Estimated



06607200 MAPLE RIVER AT MAPLETON, IA

LOCATION.--Lat 42°09'25", long 95°48'35", in SE$^1/_4$ SE$^1/_4$ sec.23, T.85 N., R.43 W., Monona County, Hydrologic Unit 10230005, on right bank at downstream side of bridge on State Highway 175, 1.0 mi downstream from Simmons Creek, 1.1 mi southwest of intersection of State Highways 175 and 141 in Mapleton, 2.1 mi upstream from McCleery Creek, and 16.0 mi upstream from mouth.

DRAINAGE AREA.--669 mi^2.

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

REVISED RECORDS.--WSP 1310: 1942 (M), 1946 (M), 1948 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,085.86 ft above sea level. See WSP 1730 for history of changes prior to Sept. 20, 1956.

REMARKS.--Estimated daily discharges: Dec. 11-14, 24-27, Jan. 4 to Feb. 1, and Mar. 10-19. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	124	114	88	e200	169	506	573	754	1150	351	294
2	102	121	113	113	180	160	481	539	596	974	343	293
3	99	124	111	112	151	162	426	518	539	900	354	284
4	93	124	100	e50	137	145	388	490	502	845	365	269
5	97	137	34	e55	114	146	355	469	498	909	428	259
6	100	140	65	e70	110	146	364	448	475	1110	469	255
7	101	139	108	e100	102	140	676	431	450	1910	765	248
8	102	139	107	e93	104	130	1200	414	541	1230	1220	235
9	97	142	110	e83	116	66	1020	404	889	951	743	226
10	97	138	105	e75	149	e60	879	406	987	857	596	219
11	101	129	e85	e85	187	e57	758	426	982	766	510	211
12	125	129	e80	e75	173	e55	687	428	953	709	458	207
13	170	131	e85	e65	165	e75	638	436	826	665	430	202
14	177	136	e95	e75	147	e60	676	408	1140	621	439	202
15	157	133	119	e80	134	e65	705	412	2430	848	1450	199
16	142	99	119	e83	161	e70	753	433	2620	956	808	199
17	136	81	108	e77	209	e85	883	419	2120	755	548	204
18	132	128	117	e78	229	e95	767	393	1520	682	466	208
19	128	140	120	e83	281	e110	683	386	1270	663	423	209
20	121	145	117	e85	241	139	656	439	1150	648	398	226
21	118	129	74	e87	221	178	691	403	1050	591	446	238
22	118	122	85	e85	213	189	723	447	917	566	443	217
23	120	118	111	e85	211	200	669	434	921	527	393	210
24	125	116	e90	e90	205	205	620	417	6350	499	362	214
25	132	119	e100	e100	198	210	592	412	3400	479	358	218
26	134	125	e83	e94	194	256	759	401	2210	460	330	218
27	125	122	e70	e96	188	435	710	389	1470	445	331	211
28	121	118	80	e100	174	510	737	421	1200	434	346	202
29	124	116	77	e103	---	540	643	891	1110	408	331	201
30	127	115	90	e110	---	562	601	541	1950	387	309	197
31	126	---	81	e120	---	539	---	793	---	367	305	---
TOTAL	3748	3779	2953	2695	4894	5959	20246	14421	41820	23312	15518	6775
MEAN	121	126	95.3	86.9	175	192	675	465	1394	752	501	226
MAX	177	145	120	120	281	562	1200	891	6350	1910	1450	294
MIN	93	81	34	50	102	55	355	386	450	367	305	197
AC-FT	7430	7500	5860	5350	9710	11820	40160	28600	82950	46240	30780	13440
CFSM	.18	.19	.14	.13	.26	.29	1.01	.70	2.08	1.12	.75	.34
IN.	.21	.21	.16	.15	.27	.33	1.13	.80	2.33	1.30	.86	.38

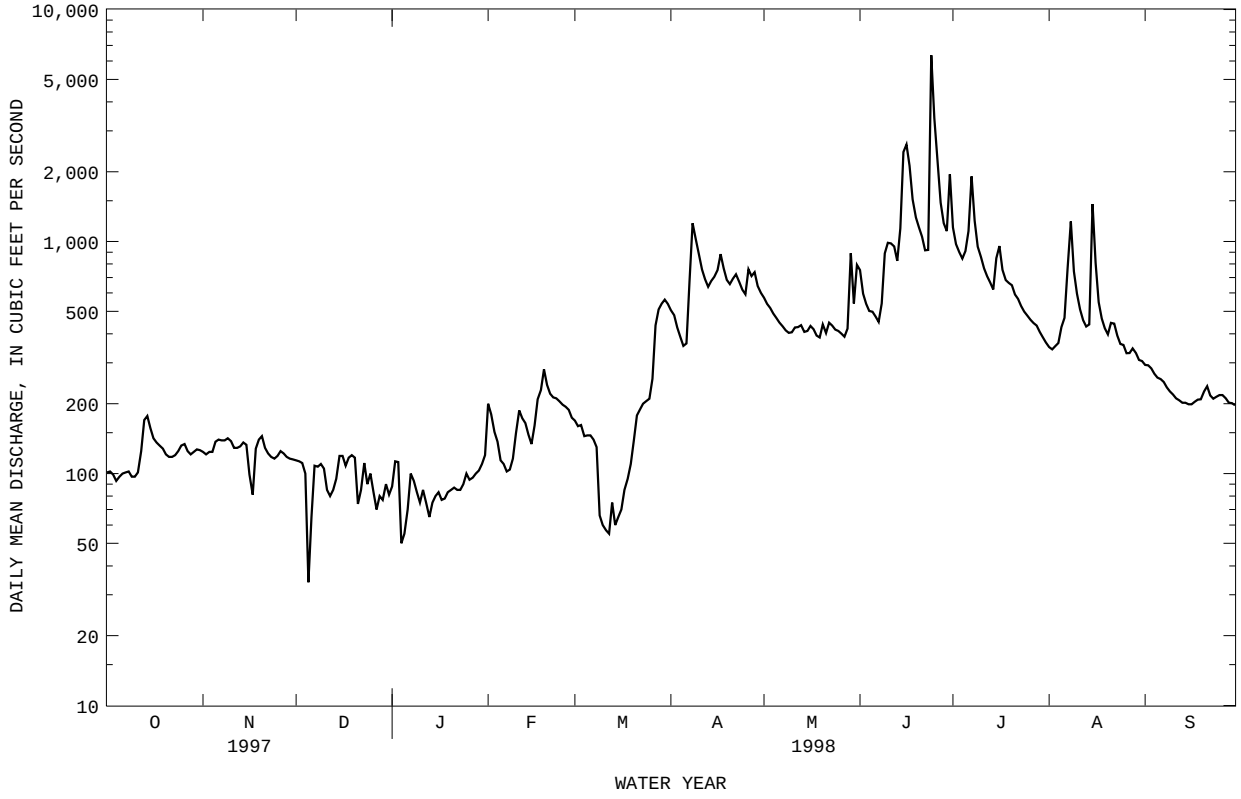
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1998, BY WATER YEAR (WY)

MEAN	159	146	117	96.8	229	496	414	397	648	372	259	184
MAX	634	506	548	330	1016	1588	1889	1345	2856	1588	1230	1034
(WY)	1983	1993	1985	1983	1971	1983	1983	1984	1984	1993	1951	1951
MIN	9.36	14.6	5.74	3.25	3.64	25.6	19.9	35.9	48.5	33.3	12.6	5.48
(WY)	1957	1959	1959	1959	1959	1957	1957	1968	1955	1956	1956	1956

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1942 - 1998	
ANNUAL TOTAL	117822		146120			
ANNUAL MEAN	323		400		293	
HIGHEST ANNUAL MEAN					983	1983
LOWEST ANNUAL MEAN					24.5	1956
HIGHEST DAILY MEAN	2700	Feb 19	6350	Jun 24	14400	Jun 21 1983
LOWEST DAILY MEAN	34	Dec 5	34	Dec 5	.00	Sep 21 1945a
ANNUAL SEVEN-DAY MINIMUM	83	Dec 25	63	Mar 9	2.6	Feb 14 1959
INSTANTANEOUS PEAK FLOW			8590	Jun 24	20800	Sep 12 1978
INSTANTANEOUS PEAK STAGE			10.76	Jun 24	22.10	Jun 12 1950
INSTANTANEOUS LOW FLOW			16	Dec 5		
ANNUAL RUNOFF (AC-FT)	233700		289800		212300	
ANNUAL RUNOFF (CFSM)	.48		.60		.44	
ANNUAL RUNOFF (INCHES)	6.55		8.13		5.95	
10 PERCENT EXCEEDS	560		881		620	
50 PERCENT EXCEEDS	262		211		140	
90 PERCENT EXCEEDS	110		85		29	

a Also Sept 22, 1945; caused by temporary dam upstream
e Estimated

06607200 MAPLE RIVER AT MAPLETON, IA--Continued



06607500 LITTLE SIOUX RIVER NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°58'21", in NW$^1/_4$ NE$^1/_4$ sec.33, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230003, on left bank on downstream side of bridge on county highway E54, 1.0 mi east of gaging station on Monona-Harrison Ditch near Turin, 2.5 mi downstream from Maple River, 3.8 mi south of Turin, 6.2 mi northeast of Blencoe, and at mile 13.5.

DRAINAGE AREA.--3,526 mi^2.

PERIOD OF RECORD.--May 1942 to September 1957, January 1958 to current year. June 1942 to January 1958 at site 1,200 ft east on old river channel; records not equivalent owing to diversion into Monona-Harrison Ditch through equalizer ditch 1.5 mi upstream 1923 to 1958, and diversion with Monona-Harrison Ditch through diversion ditch 8.3 miles upstream since 1958.

REVISED RECORDS: WSP 1440: Drainage area. WSP 1560: Drainage area. WDR IA-95-1: Period of record.

GAGE.--Water-stage recorder. Datum of gage is 1,019.85 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to July 15, 1958, nonrecording gages near present site at different datums. July 15 to Sept. 3, 1958, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Dec. 5 to Feb. 12, Mar. 10-20, Aug. 19-27, and Sept. 19-22. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	348	370	388	e300	e800	1010	3170	3240	2560	3800	1060	869
2	344	362	394	e330	e625	975	3060	3100	2090	3330	1040	838
3	341	361	391	e300	e480	900	2950	2910	1920	3360	1060	810
4	325	365	391	e200	e440	831	2730	2670	1780	2990	1140	762
5	319	373	e110	e360	e500	777	2590	2460	1730	2900	1180	726
6	315	375	e190	e400	e440	757	2420	2290	1680	3860	1420	697
7	315	386	e360	e340	e440	732	2740	2130	1620	3630	1520	661
8	322	392	e380	e300	e480	700	3160	1990	1730	3610	2500	626
9	303	391	e350	e250	e550	623	3210	1880	2430	2920	3520	611
10	299	383	e290	e220	e650	e420	3230	1820	2500	2640	3180	591
11	319	381	e255	e240	e750	e390	3270	1800	2510	2420	2650	565
12	362	378	e220	e220	e800	e360	3150	1800	2770	2230	2310	546
13	426	385	e240	e190	925	e460	3090	1720	2380	2100	2100	534
14	454	377	e260	e215	708	e380	3150	1630	2620	1990	2080	515
15	423	386	e320	e230	504	e410	3100	1590	4920	2540	3100	507
16	397	342	e340	e230	522	e440	3000	1570	6480	2680	2800	496
17	402	312	e300	e220	573	e490	3060	1570	5900	2430	1900	488
18	420	356	e330	e225	620	e525	3210	1490	5210	2200	1640	486
19	399	383	e320	e235	756	e575	3270	1460	4790	2090	e1500	e499
20	377	398	e300	e250	841	e625	3270	1540	4530	2010	e1700	e523
21	371	417	e270	e250	941	705	3230	1470	4330	1940	e2120	e544
22	365	395	e300	e245	1080	710	3200	1460	4030	1860	e2170	e533
23	371	374	e320	e240	1190	731	3300	1430	3760	1770	e1900	505
24	372	369	e280	e260	1190	772	3320	1410	8960	1680	e1300	500
25	388	358	e300	e280	1270	814	3140	1440	7600	1580	e1100	501
26	388	369	e290	e260	1180	844	3400	1610	5910	1490	e1000	520
27	377	389	e240	e275	1100	995	3090	1860	4990	1440	e1000	500
28	372	389	e280	e280	1020	1290	3020	1930	4270	1390	992	488
29	368	391	e260	e300	---	1630	3010	2980	3910	1300	981	480
30	381	388	e300	e420	---	2310	3190	2160	4590	1220	930	467
31	376	---	e280	e600	---	2930	---	2260	---	1150	946	---
TOTAL	11339	11295	9249	8665	21375	26111	92730	60670	114500	72550	53839	17388
MEAN	366	377	298	280	763	842	3091	1957	3817	2340	1737	580
MAX	454	417	394	600	1270	2930	3400	3240	8960	3860	3520	869
MIN	299	312	110	190	440	360	2420	1410	1620	1150	930	467
AC-FT	22490	22400	18350	17190	42400	51790	183900	120300	227100	143900	106800	34490
CFSM	.10	.11	.08	.08	.22	.24	.88	.56	1.08	.66	.49	.16
IN.	.12	.12	.10	.09	.23	.28	.98	.64	1.21	.77	.57	.18

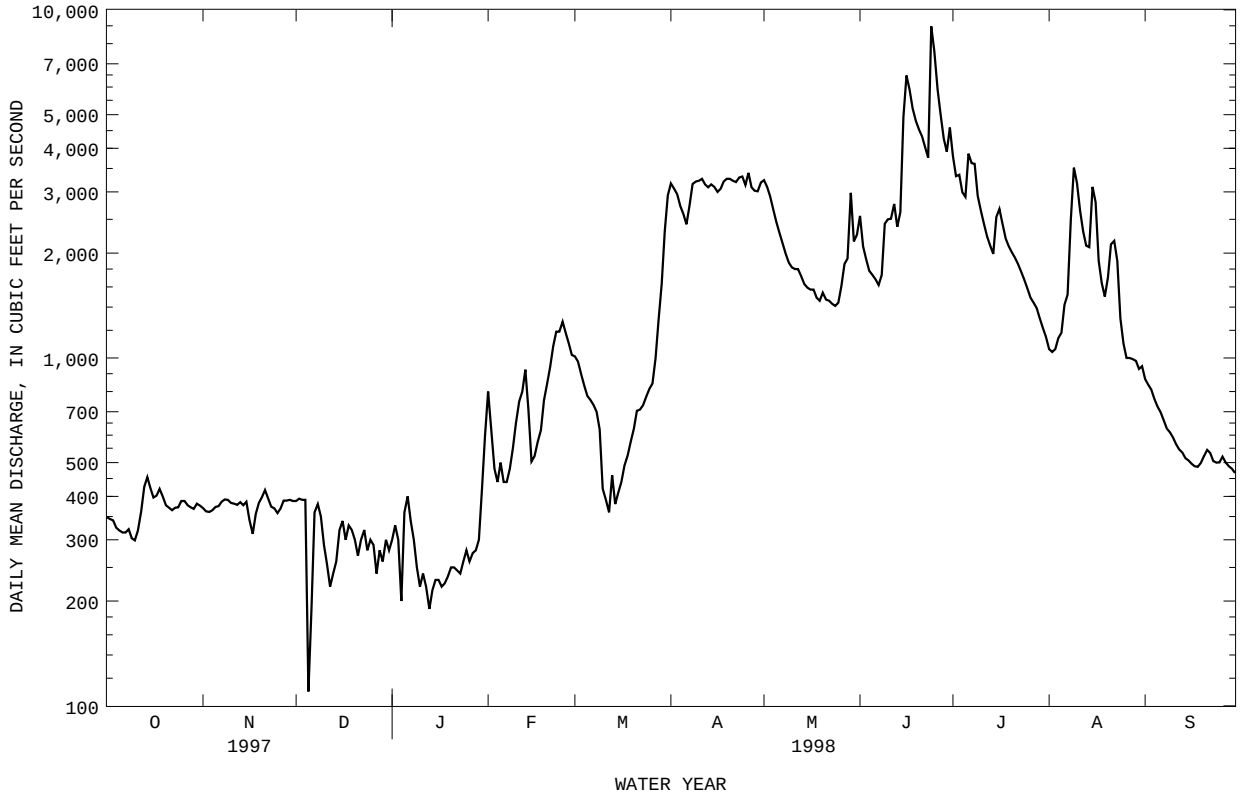
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1998, BY WATER YEAR (WY)

MEAN	838	833	666	486	852	2431	3201	2392	2986	2089	1079	884
MAX	3625	3612	2424	2250	3353	9054	10790	7938	15080	13110	5181	3980
(WY)	1983	1980	1983	1992	1971	1983	1965	1986	1984	1993	1993	1993
MIN	37.5	48.0	31.2	18.5	25.1	171	157	118	315	181	140	90.2
(WY)	1959	1959	1959	1977	1959	1964	1968	1968	1968	1968	1976	1976

06607500 LITTLE SIOUX RIVER NEAR TURIN, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1959 - 1998a	
ANNUAL TOTAL	576938		499711			
ANNUAL MEAN	1581		1369		1562	
HIGHEST ANNUAL MEAN					5261	1993
LOWEST ANNUAL MEAN					167	1968
HIGHEST DAILY MEAN	6340	Mar 12	8960	Jun 24	28700	Jun 22 1996
LOWEST DAILY MEAN	110	Dec 5	110	Dec 5	17	Jan 18 1977b
ANNUAL SEVEN-DAY MINIMUM	275	Dec 10	219	Jan 12	17	Jan 27 1977
INSTANTANEOUS PEAK FLOW			10900	Jun 24	32000	Jun 22 1996
INSTANTANEOUS PEAK STAGE			19.08	Jun 24	27.44	Feb 19 1971c
ANNUAL RUNOFF (AC-FT)	1144000		991200		1132000	
ANNUAL RUNOFF (CFSM)	.45		.39		.44	
ANNUAL RUNOFF (INCHES)	6.09		5.27		6.02	
10 PERCENT EXCEEDS	3550		3180		3710	
50 PERCENT EXCEEDS	911		757		800	
90 PERCENT EXCEEDS	342		300		150	

a Post closure of diversion to Monona-Harrison Ditch
b Also Jan 19, 20, Jan 28 to Feb 1, 1977
c Ice affected
e Estimated



06608500 SOLDIER RIVER AT PISGAH, IA

LOCATION.--Lat 41°49'50", long 95°55'52", in NW$^1/_4$ NE$^1/_4$ sec.14, T.81 N., R.44 W., Harrison County, Hydrologic Unit 10230001, on right bank at upstream side of bridge on county highway F20, at west edge of Pisgah, 0.4 mi downstream from Cobb Creek, 0.5 mi upstream from Mogger Ditch, and 13.1 mi upstream from mouth.

DRAINAGE AREA.--407 mi^2.

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

REVISED RECORDS.--WSP 956: 1940 (M). WSP 1240: 1940, 1941 (M), 1947. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,036.53 ft above sea level. Prior to Oct. 11, 1954, nonrecording gage at same site and datum with supplementary water-stage recorder operating above 8.2 ft gage height Mar. 2, 1946 to Sept. 24, 1953. Prior to Feb. 1954, on left bank at downstream side of bridge. Prior to June 21, 1989, at site 100 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 16-18, Dec. 5-14, 24-31, Jan. 3 to Feb. 2, and Mar. 8-19. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	78	85	75	e180	89	187	207	220	413	205	214
2	66	76	84	84	e130	93	150	208	213	395	204	196
3	66	79	88	e75	98	90	142	214	241	816	363	182
4	61	80	85	e48	85	82	138	198	233	438	541	173
5	59	84	e30	e90	98	85	133	192	225	532	248	167
6	60	84	e50	e100	88	84	138	188	225	2690	233	169
7	60	82	e95	e87	87	85	934	186	223	1190	330	169
8	62	84	e99	e75	93	e75	608	177	436	599	791	162
9	61	83	e86	e60	104	e55	417	177	1120	491	318	158
10	60	84	e75	e55	130	e48	321	185	443	467	267	155
11	63	80	e67	e60	146	e46	280	178	1010	415	240	151
12	92	82	e58	e53	106	e44	264	218	741	387	223	151
13	208	86	e65	e48	105	e60	301	193	456	368	239	155
14	100	85	e70	e53	96	e50	245	168	658	345	218	162
15	78	86	88	e57	97	e55	334	194	1210	850	1240	167
16	75	e70	90	e58	128	e60	312	227	1050	459	425	170
17	75	e65	80	e55	127	e70	252	181	700	354	296	161
18	74	e80	87	e56	139	e80	234	165	807	333	258	154
19	73	90	85	e60	274	e87	229	158	782	311	240	150
20	68	89	78	e61	133	106	254	283	716	292	230	175
21	70	85	72	e63	122	126	270	307	845	282	614	182
22	73	83	81	e61	118	130	235	345	702	298	337	159
23	75	78	88	e60	119	127	229	267	663	277	255	155
24	80	80	e75	e65	112	118	229	214	2600	260	232	155
25	91	85	e80	e70	109	116	225	203	944	249	217	152
26	97	86	e75	e66	109	146	282	197	585	237	206	152
27	90	84	e60	e70	101	190	257	191	487	233	237	147
28	86	83	e70	e70	94	214	224	189	447	239	244	148
29	84	85	e65	e75	---	169	217	948	626	226	198	151
30	84	92	e75	e127	---	200	214	326	677	217	184	150
31	81	---	e70	e210	---	203	---	255	---	210	304	---
TOTAL	2437	2468	2356	2247	3328	3183	8255	7339	20285	14873	10137	4892
MEAN	78.6	82.3	76.0	72.5	119	103	275	237	676	480	327	163
MAX	208	92	99	210	274	214	934	948	2600	2690	1240	214
MIN	59	65	30	48	85	44	133	158	213	210	184	147
AC-FT	4830	4900	4670	4460	6600	6310	16370	14560	40240	29500	20110	9700
CFSM	.19	.20	.19	.18	.29	.25	.68	.58	1.66	1.18	.80	.40
IN.	.22	.23	.22	.21	.30	.29	.75	.67	1.85	1.36	.93	.45

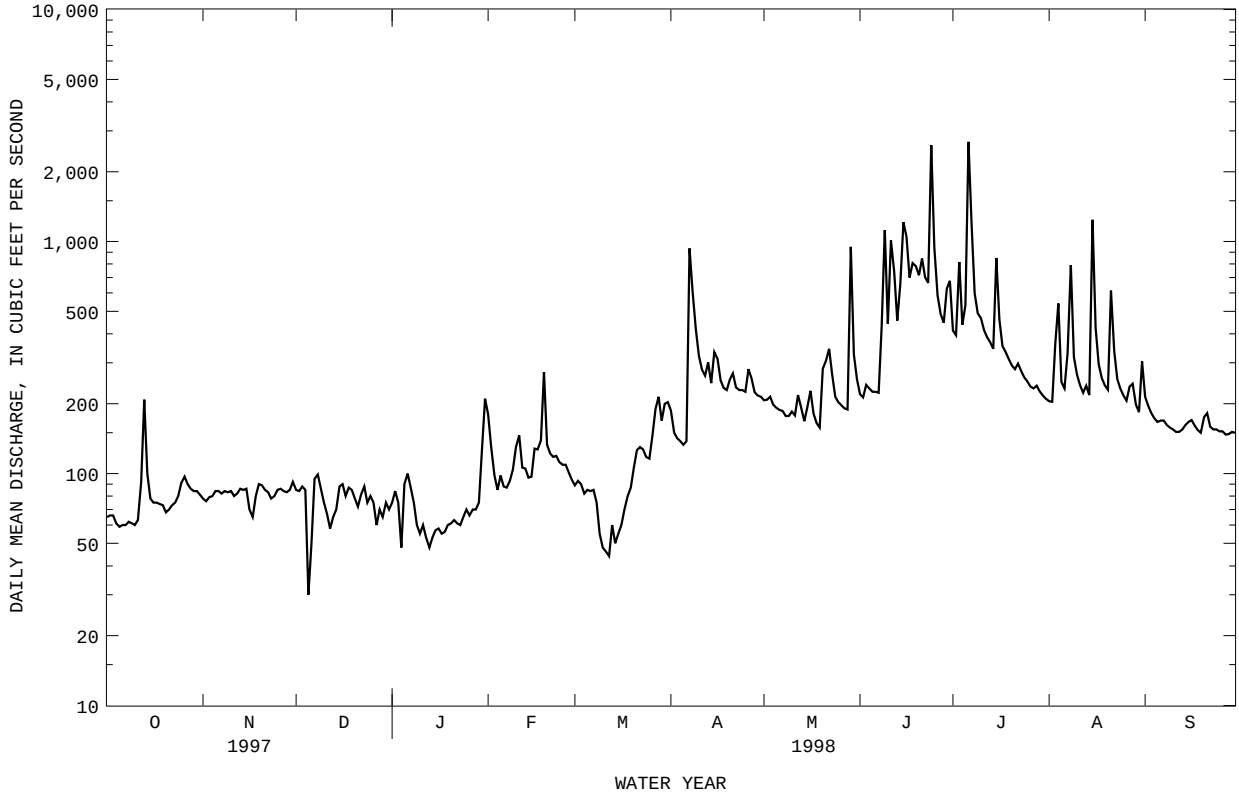
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998, BY WATER YEAR (WY)

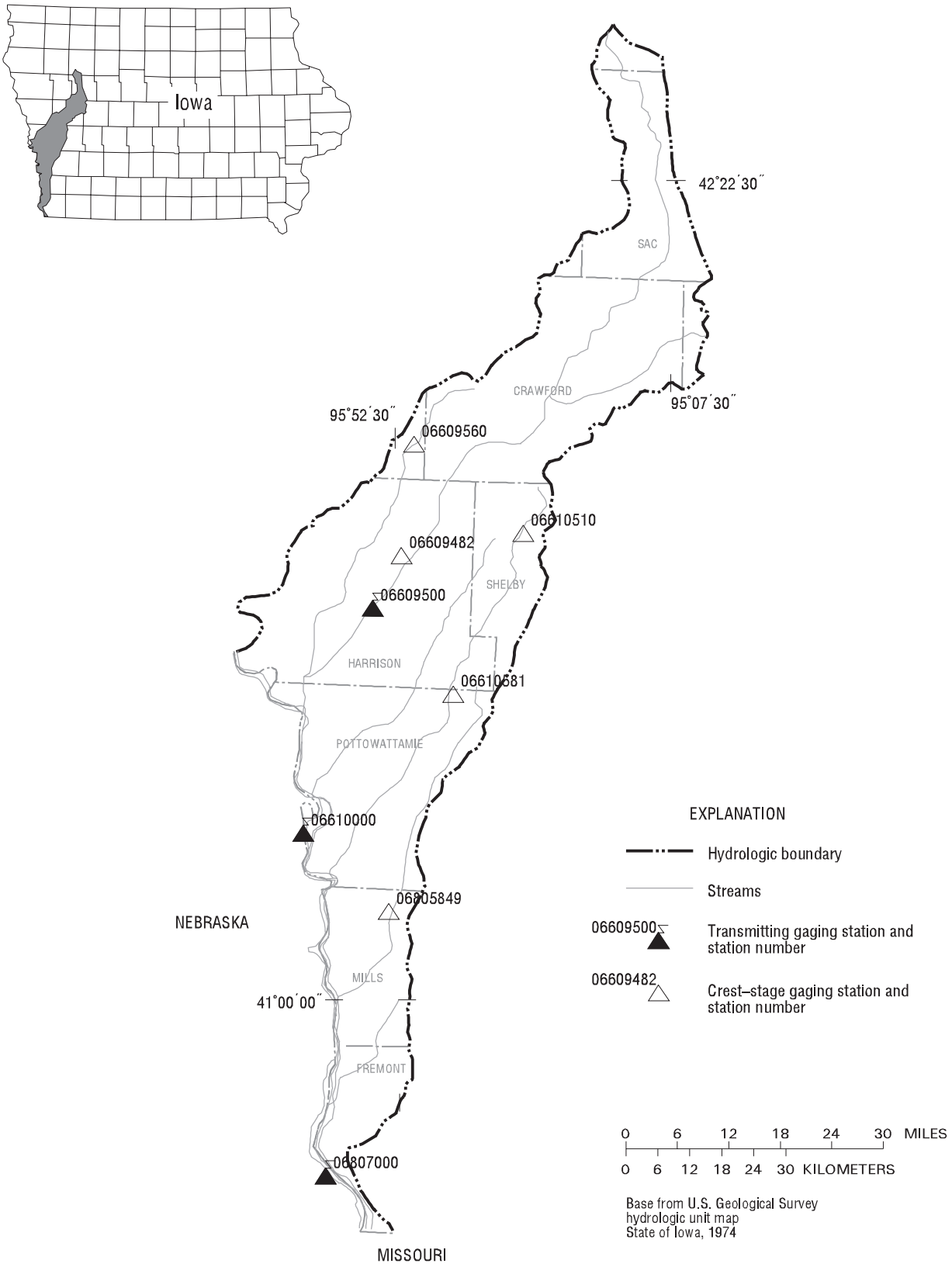
MEAN	79.5	73.5	66.0	65.4	157	269	165	196	310	198	143	112
MAX	330	275	281	431	653	897	623	555	1233	1607	632	482
(WY)	1994	1994	1985	1952	1971	1993	1983	1984	1991	1993	1993	1978
MIN	9.61	12.8	6.05	3.29	9.43	27.8	12.5	13.6	22.1	22.8	14.4	6.70
(WY)	1957	1959	1959	1959	1956	1957	1957	1957	1956	1970	1971	1956

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1941 - 1998	
ANNUAL TOTAL	65534		81800			
ANNUAL MEAN	180		224		153	
HIGHEST ANNUAL MEAN					487	1993
LOWEST ANNUAL MEAN					27.3	1956
HIGHEST DAILY MEAN	5260	Feb 18	2690	Jul 6	20700	Jul 17 1996
LOWEST DAILY MEAN	30	Dec 5	30	Dec 5	2.0	Jan 2 1945a
ANNUAL SEVEN-DAY MINIMUM	60	Oct 4	51	Mar 9	2.0	Jan 2 1945
INSTANTANEOUS PEAK FLOW			5530	Jul 6	34700	Jul 17 1996
INSTANTANEOUS PEAK STAGE			13.65	Jul 6	28.87	Jul 17 1996
ANNUAL RUNOFF (AC-FT)	130000		162300		110600	
ANNUAL RUNOFF (CFSM)	.44		.55		.38	
ANNUAL RUNOFF (INCHES)	5.99		7.48		5.10	
10 PERCENT EXCEEDS	256		451		281	
50 PERCENT EXCEEDS	140		151		70	
90 PERCENT EXCEEDS	73		64		16	

a Also Jan 3-10, 1945
e Estimated

06608500 SOLDIER RIVER AT PISGAH, IA--Continued




Iowa
42°22′30″
SAC
CRAWFORD
95°52′30″
95°07′30″
06609560
06610510
06609482
SHELBY
06609500
HARRISON
06610581
POTTOWATTAMIE
06610000
06805849
NEBRASKA
MILLS
41°00′00″
FREMONT
06807000
MISSOURI
EXPLANATION
Hydrologic boundary
Streams
06609500 Transmitting gaging station and station number
06609482 Crest–stage gaging station and station number
0 6 12 18 24 30 MILES
0 6 12 18 24 30 KILOMETERS
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

06609500 BOYER RIVER AT LOGAN, IA

LOCATION.--Lat 41°38'33", long 95°46'57", in SE$^1/_4$ NW$^1/_4$ sec.19, T.79 N., R.42 W., Harrison County, Hydrologic Unit 10230007, on left bank 9 ft downstream from Chicago Central and Pacific Railroad bridge at Logan, 0.4 mi downstream from Elk Grove Creek, 10.5 mi upstream from Willow Creek, and 15.8 mi upstream from mouth.

DRAINAGE AREA.--871 mi^2.

PERIOD OF RECORD.--May 1918 to November 1924, February 1925 to July 1925, November 1937 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 956: 1938-39. WSP 1240: 1918-19, 1920 (M), 1921, 1922 (M), 1924-25, 1938 (M), 1945. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,009.38 ft above sea level (Chicago and Northwestern Railway Company bench mark). See WSP 1918 for history of changes prior to Oct. 18, 1960.

REMARKS.--Estimated daily discharges: Nov. 16-19, Dec. 5-15, 24-31, Jan. 3 to Feb. 2, and Mar. 8-20. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	154	167	158	e400	269	664	782	947	1530	529	502
2	132	151	161	178	e360	264	597	755	766	1210	512	426
3	129	151	170	e150	319	256	552	744	746	1260	537	404
4	121	149	156	e85	285	238	500	699	742	1160	585	382
5	117	151	e64	e118	281	236	460	664	688	1380	617	366
6	118	151	e85	e170	247	241	445	638	673	2630	606	353
7	119	154	e112	e150	236	236	2880	630	650	3260	681	347
8	115	151	e150	e123	235	e210	2320	604	989	2150	1370	327
9	120	155	e132	e100	255	e150	1830	582	2890	1300	937	314
10	122	152	e115	e95	338	e140	1440	617	1450	1190	723	308
11	122	148	e100	e100	409	e130	1280	603	7460	1050	634	302
12	151	144	e90	e95	305	e120	1170	708	3950	965	577	297
13	264	154	e100	e80	292	e170	1160	664	2070	911	567	289
14	229	155	e110	e92	300	e140	1090	584	1940	854	550	289
15	182	158	e160	e96	286	e160	1030	607	2580	3120	1220	282
16	175	e120	173	e100	682	e170	1330	954	3150	1630	1100	276
17	162	e110	153	e94	592	e200	1260	733	2330	1180	719	275
18	155	e120	163	e95	511	e230	1150	645	2620	1020	615	274
19	149	e150	165	e98	533	e265	1060	612	1710	934	569	274
20	142	166	158	e103	408	e305	1060	705	1420	863	529	336
21	139	163	135	e105	352	366	1160	789	1510	825	808	379
22	134	160	148	e100	332	363	1060	1070	1290	926	850	292
23	142	158	167	e102	330	391	1010	863	1180	798	616	274
24	155	152	e130	e108	313	392	951	1080	4830	727	542	270
25	170	150	e140	e115	293	384	902	838	4920	691	502	274
26	185	164	e130	e110	339	446	1010	715	2760	666	477	266
27	181	158	e100	e113	313	770	1010	679	1590	641	476	258
28	170	144	e140	e118	293	846	838	653	1640	630	519	248
29	166	155	e130	e135	---	720	802	2240	1420	602	474	247
30	161	193	e150	e190	---	681	793	975	2760	569	439	244
31	159	---	e140	e280	---	707	---	816	---	543	520	---
TOTAL	4715	4541	4194	3756	9839	10196	32814	24248	63671	37215	20400	9375
MEAN	152	151	135	121	351	329	1094	782	2122	1200	658	313
MAX	264	193	173	280	682	846	2880	2240	7460	3260	1370	502
MIN	115	110	64	80	235	120	445	582	650	543	439	244
AC-FT	9350	9010	8320	7450	19520	20220	65090	48100	126300	73820	40460	18600
CFSM	.17	.17	.16	.14	.40	.38	1.26	.90	2.44	1.38	.76	.36
IN.	.20	.19	.18	.16	.42	.44	1.40	1.04	2.72	1.59	.87	.40

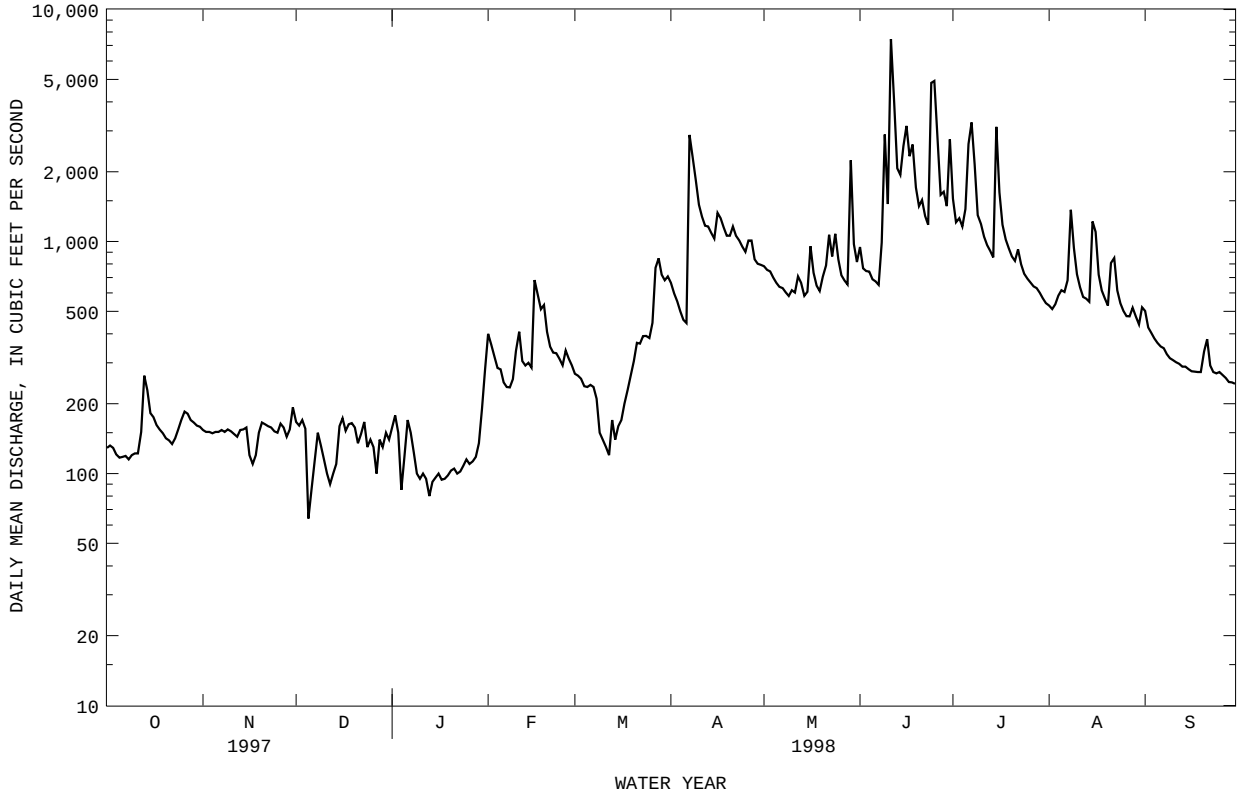
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1998, BY WATER YEAR (WY)

MEAN	185	168	137	129	320	605	443	503	764	465	310	260
MAX	796	558	565	692	1209	2619	1988	1698	2541	3022	1636	1288
(WY)	1974	1974	1973	1973	1971	1979	1983	1984	1990	1993	1951	1978
MIN	11.1	8.33	6.68	3.06	3.55	40.4	23.3	39.9	33.3	51.0	34.5	11.6
(WY)	1957	1940	1938	1940	1940	1981	1957	1968	1956	1977	1976	1939

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1919 - 1998	
ANNUAL TOTAL	147071		224964			
ANNUAL MEAN	403		616		361	
HIGHEST ANNUAL MEAN					1018	1993
LOWEST ANNUAL MEAN					58.7	1956
HIGHEST DAILY MEAN	6000	Feb 19	7460	Jun 11	24600	Jul 9 1993
LOWEST DAILY MEAN	64	Dec 5	64	Dec 5	1.5	Jul 16 1938
ANNUAL SEVEN-DAY MINIMUM	108	Dec 5	93	Jan 12	2.0	Jan 13 1940
INSTANTANEOUS PEAK FLOW			9690	Jun 11	30800	Jun 17 1990
INSTANTANEOUS PEAK STAGE			14.45	Jun 11	25.22	Mar 1 1965a
ANNUAL RUNOFF (AC-FT)	291700		446200		261600	
ANNUAL RUNOFF (CFSM)	.46		.71		.41	
ANNUAL RUNOFF (INCHES)	6.28		9.61		5.63	
10 PERCENT EXCEEDS	681		1280		750	
50 PERCENT EXCEEDS	292		338		163	
90 PERCENT EXCEEDS	134		120		32	

a Ice affected
e Estimated

06609500 BOYER RIVER AT LOGAN, IA--Continued



06610000 MISSOURI RIVER AT OMAHA, NE
(National stream-quality accounting network station)

LOCATION.--Lat 41°15'32", long 95°55'20", in SE$^1/_4$ NW$^1/_4$ sec.23, T.15 N., R.13 E., Douglas County, Hydrologic Unit 10230006, on right bank on left side of concrete floodwall, at foot of Douglas Street, 275 ft downstream from Interstate 480 Highway bridge in Omaha, and at mile 615.9.

DRAINAGE AREA.--322,800 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1928 to current year. April 1872 to December 1899 (gage heights only) in reports of the Missouri River Commission and since January 1875, (gage heights only) in reports of the U.S. Weather Bureau.

REVISED RECORDS.--WSP 761: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 948.24 ft above sea level. See WSP 1730 for history of changes prior to Sept. 30, 1936. Oct. 1, 1936 to Sept. 30, 1982 at datum 10.00 ft higher.

REMARKS.--No estimated daily discharge, records good. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 396,000 ft^3/s Apr. 18, 1952, gage height, 40.20 ft, present datum; minimum, about 2,200 ft^3/s Jan. 6, 1937; minimum gage height, 6.85 ft, present datum, Feb. 5, 1989, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71000	74000	76300	32700	31800	32600	41500	37100	44600	46200	38100	34600
2	70300	75300	74800	32300	31600	32500	40100	36700	42900	42600	37700	35300
3	70600	77000	72500	31400	31100	32400	38200	37600	42400	42600	37900	35900
4	70800	74900	69800	31100	30500	32200	37500	37800	41900	45000	39500	36900
5	71000	74600	65600	30100	30500	31900	37400	36800	41700	47700	39700	37500
6	71400	75100	61700	29900	30800	31900	36900	35700	41900	54000	39100	37500
7	71700	74400	58300	30800	30700	31700	40200	35400	41600	53000	40100	37800
8	72200	74000	55200	30200	29900	31600	45900	34900	43000	50400	41400	38000
9	72800	74500	53000	28600	29500	30900	45700	34200	51300	44300	42800	37700
10	74400	75000	50400	27700	30000	30100	44100	33800	48300	40600	40400	37200
11	74400	75100	47700	25600	30500	29600	41200	33600	49500	41800	40100	36900
12	74900	75500	44500	24900	30700	30000	38800	34800	53300	41600	39200	36600
13	77100	75100	41100	25700	30600	30100	37500	35700	47200	41800	37900	36100
14	78800	74600	37900	25800	31000	30200	36900	36300	48300	41000	37400	36200
15	76700	74900	35500	24900	30700	30300	37700	36800	54200	41700	37200	36000
16	75500	73300	34000	25400	30600	30400	41100	38100	58800	42300	40400	36300
17	75400	74200	33700	26600	31100	31000	42400	39200	49900	38800	36800	36400
18	75100	73900	33800	26600	31100	31700	40600	38700	44600	37300	36300	35600
19	73000	74500	33400	25800	31400	32600	39200	39100	41500	36300	36000	35600
20	73000	74200	32800	25500	31300	32300	39600	41800	40300	35400	35900	36400
21	72700	75000	32800	25800	31000	31400	40500	43400	39100	35400	39000	36400
22	73700	75800	32700	26500	30900	31000	39900	44400	37800	38000	40700	36200
23	74000	75500	32900	27300	31000	31500	39600	44600	36400	37600	38700	36000
24	74900	75400	33100	28000	31100	32100	39100	42800	43300	37100	36800	35800
25	76300	75600	32600	28400	31500	32600	38500	40700	59700	36800	35900	35700
26	78300	75700	32600	28900	32000	33200	39000	38900	52700	37300	35500	35800
27	76400	74800	32600	30100	32400	34400	43600	39400	45100	38100	35900	35700
28	75700	75100	32600	30400	32600	37300	44300	41100	45100	39000	35600	36000
29	75300	76300	32700	30600	---	39500	41900	45800	45000	38500	35500	36000
30	74700	78000	32600	31300	---	40700	39000	48400	46400	38100	34700	35500
31	74000	---	32900	30900	---	41500	---	43800	---	38100	34000	---
TOTAL	2296100	2251300	1372100	879800	867900	1011200	1207900	1207400	1377800	1278400	1176200	1089600
MEAN	74070	75040	44260	28380	31000	32620	40260	38950	45930	41240	37940	36320
MAX	78800	78000	76300	32700	32600	41500	45900	48400	59700	54000	42800	38000
MIN	70300	73300	32600	24900	29500	29600	36900	33600	36400	35400	34000	34600
MED	74400	75000	34000	28400	31000	31900	39800	38100	44800	40600	37900	36200
AC-FT	4554000	4465000	2722000	1745000	1721000	2006000	2396000	2395000	2733000	2536000	2333000	2161000
CFSM	.23	.23	.14	.09	.10	.10	.12	.12	.14	.13	.12	.11
IN.	.26	.26	.16	.10	.10	.12	.14	.14	.16	.15	.14	.13

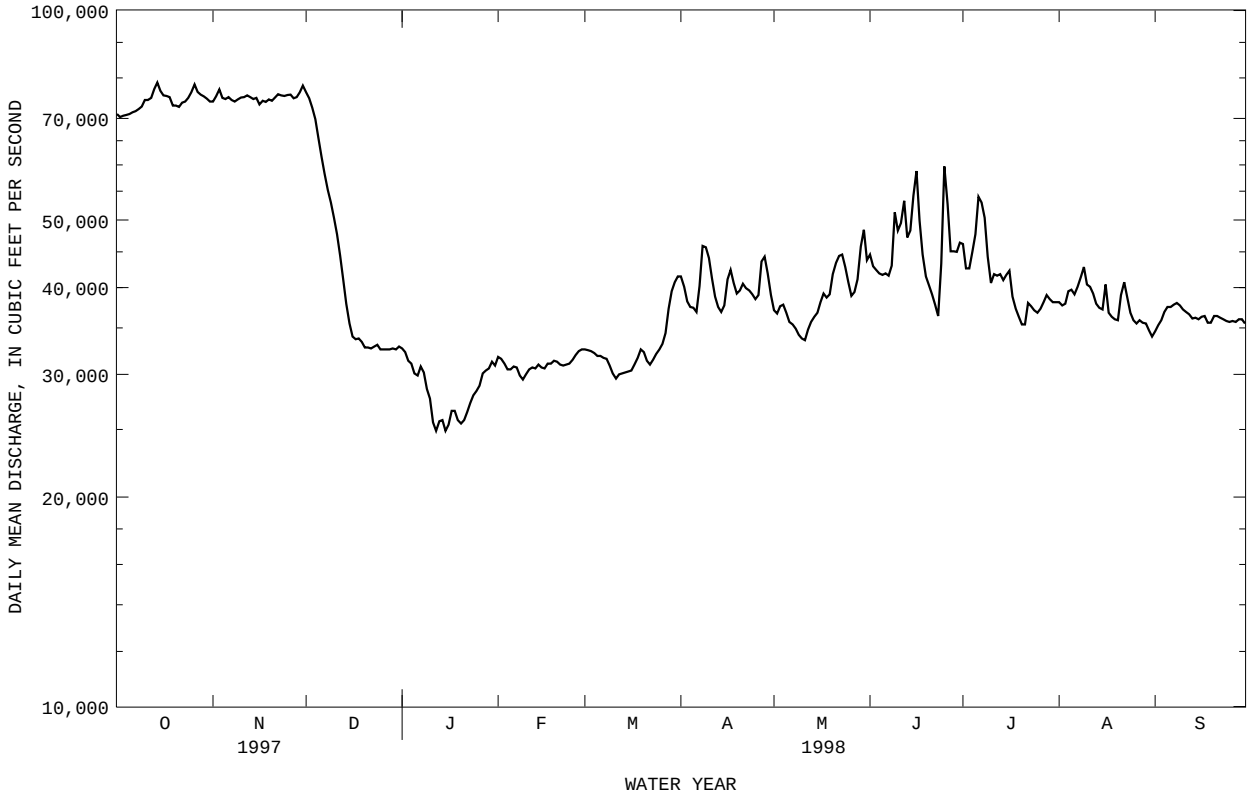
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1998, BY WATER YEAR (WY)

MEAN	38500	33600	20590	17330	19660	28060	38820	38490	41890	40600	39210	39110
MAX	74070	75040	44260	33250	40410	54660	93840	87620	76120	78560	68890	69770
(WY)	1998	1998	1998	1987	1997	1997	1997	1997	1997	1993	1997	1997
MIN	16920	8324	8296	8425	8162	10170	16480	26450	26890	27150	27280	28290
(WY)	1962	1962	1962	1964	1963	1957	1957	1961	1961	1958	1958	1958

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1953 - 1998a	
ANNUAL TOTAL	23945900		16015700			
ANNUAL MEAN	65610		43880		33030	
HIGHEST ANNUAL MEAN					62150	1997
LOWEST ANNUAL MEAN					20490	1957
HIGHEST DAILY MEAN	108000	Apr 16	78800	Oct 14	116000	Apr 4 1960
LOWEST DAILY MEAN	25600	Jan 1	24900	Jan 12	2440	Dec 14 1961
ANNUAL SEVEN-DAY MINIMUM	28300	Jan 8	25600	Jan 11	4300	Nov 28 1955
INSTANTANEOUS PEAK FLOW			79800	Oct 26	120000	Apr 1 1960
INSTANTANEOUS PEAK STAGE			24.13	Oct 14	30.26	Jul 10 1993
ANNUAL RUNOFF (AC-FT)	47500000		31770000		23930000	
ANNUAL RUNOFF (CFSM)	.20		.14		.10	
ANNUAL RUNOFF (INCHES)	2.76		1.85		1.39	
10 PERCENT EXCEEDS	89300		74600		53000	
50 PERCENT EXCEEDS	70500		38000		32400	
90 PERCENT EXCEEDS	32800		30600		13400	

a Post regulation, revised



06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Water quality samples were collected from Interstate 80 highway bridge 2.0 mi downstream from gaging station.

PERIOD OF RECORD.--July 1969 to 1976, 1978 to current year. Daily sediment loads for April 1939 to September 1971 are in reports of U.S. Army Corps of Engineers.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1972 to September 1976, January 1978 to September 1981, October 1991 to current year.
WATER TEMPERATURES: October 1971 to September 1976, January 1978 to September 1981, October 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976, October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens Dec. 4, 5, 1980; minimum daily, 335 microsiemens Mar. 22, 1978.
WATER TEMPERATURES: Maximum daily, 32.0°C July 24, 1972; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,180 mg/L May 19, 1974; minimum daily mean, 71 mg/L Jan. 3, 1993.
SEDIMENT LOADS: Maximum daily, 1,470,000 tons Aug. 6, 1996; minimum daily, 2,560 tons Jan. 3, 1993.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 857 microsiemens Apr. 14 and May 1; minimum daily, 673 microsiemens July 7.
WATER TEMPERATURES: Maximum daily, 29.0°C July 17, 20; minimum daily, 0.0°C Dec. 5.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,550 mg/L June 25; minimum daily mean, 198 mg/L Jan. 7 and Sep. 18.
SEDIMENT LOADS: Maximum daily, 410,000 tons June 25; minimum daily, 13,800 tons Jan. 12.

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

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 WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT												
07...	0800	--	--	--	--	--	--	--	--	--	--	<.002
08...	1030	69000	783	8.3	20.5	22.0	15	7.8	91	730	250	61
08...	1040	69000	784	8.3	20.5	22.0	--	7.8	91	730	--	--
08...	1050	--	--	--	20.5	--	--	--	--	--	--	--
15...	1200	76300	750	--	15.0	19.1	--	--	--	--	--	--
21...	1430	72400	776	--	14.0	10.1	--	--	--	--	--	--
27...	1400	75900	974	--	9.0	.0	--	--	--	--	--	--
NOV												
04...	1330	74800	777	--	8.0	7.0	--	--	--	--	--	--
05...	1000	--	--	--	--	--	--	--	--	--	--	--
07...	0900	--	--	--	7.5	--	--	--	--	--	--	--
10...	1215	75200	797	--	7.0	2.0	--	--	--	--	--	--
17...	1340	77400	766	--	4.0	10.5	--	--	--	--	--	--
24...	1230	75600	767	--	4.5	8.5	--	--	--	--	--	--
DEC												
01...	1240	76400	743	--	4.2	1.5	--	--	--	--	--	--
05...	1000	65600	762	--	.0	-6.2	--	--	--	--	--	--
10...	1345	50700	744	--	.5	-1.5	--	--	--	--	--	--
15...	1030	33600	786	8.3	1.0	1.5	17	13.1	96	735	260	63
15...	1040	33600	786	8.3	1.0	1.5	--	13.1	96	735	--	--
15...	1050	--	--	--	1.0	--	--	--	--	--	--	--
22...	1245	32600	798	--	2.0	.0	--	--	--	--	--	--
31...	1215	32900	796	--	2.4	3.5	--	--	--	--	--	--
JAN												
07...	1310	30700	778	--	1.5	1.3	--	--	--	--	--	--
20...	1250	25400	823	--	1.0	-2.0	--	--	--	--	--	--
27...	1100	27700	824	8.4	.5	-.5	8.5	12.9	93	735	270	66
27...	1110	27700	824	8.4	.5	-.5	--	12.9	93	735	--	--
27...	1145	--	--	--	.5	--	--	--	--	--	--	--
FEB												
02...	1100	31600	775	8.3	2.0	.0	25	12.8	96	738	250	62
02...	1110	31600	775	8.3	2.0	.0	--	12.8	96	738	--	--
09...	1600	28600	766	--	2.6	11.9	--	--	--	--	--	--
17...	1255	31000	873	--	5.4	4.8	--	--	--	--	--	--
25...	1420	31300	760	--	7.0	17.0	--	--	--	--	--	--
MAR												
04...	1150	32200	758	--	7.7	.0	--	--	--	--	--	--
16...	1415	30400	802	--	1.5	2.5	--	--	--	--	--	--
24...	0920	32000	794	--	3.0	2.0	--	--	--	--	--	--
24...	0930	--	--	--	3.0	--	--	--	--	--	--	--
24...	1000	32000	794	8.4	3.0	2.0	17	13.0	100	738	260	65
24...	1010	32000	794	8.4	3.0	2.0	18	13.0	100	738	260	64
31...	1100	41600	780	--	11.5	10.5	--	--	--	--	--	--
APR												
06...	1445	36800	828	--	8.5	15.0	--	--	--	--	--	--
14...	1000	36800	880	8.1	12.5	11.0	88	9.7	95	732	350	82
14...	1008	--	--	--	--	--	--	--	--	--	--	--
14...	1010	39800	880	8.1	12.5	11.5	--	9.7	95	732	--	--
14...	1015	--	--	--	12.5	--	--	--	--	--	--	--
21...	1405	40400	871	--	12.0	20.0	--	--	--	--	--	--
28...	0930	44700	--	--	12.5	8.5	--	--	--	--	--	--
28...	1000	44700	800	8.1	12.5	8.5	94	8.7	84	741	300	73
28...	1008	--	--	--	--	--	--	--	--	--	--	<.002
28...	1010	44700	800	8.1	12.5	8.5	--	8.7	84	741	--	--
MAY												
04...	1240	37900	863	--	16.0	29.0	--	--	--	--	--	--
11...	1015	--	--	--	17.5	--	--	--	--	--	--	--
11...	1100	30900	842	8.2	17.5	18.5	29	9.1	99	732	310	74
11...	1110	30900	842	8.2	17.5	18.5	--	9.1	99	732	--	--
19...	1240	38900	844	--	21.5	35.0	--	--	--	--	--	--
26...	1030	38800	806	8.2	18.5	19.0	41	8.3	92	735	280	68
26...	1040	38800	805	8.2	18.5	19.0	--	8.3	92	735	--	--
26...	1050	38800	805	8.2	18.5	19.0	--	8.3	92	735	--	--
JUN												
02...	1230	43000	796	--	21.0	32.5	--	--	--	--	--	--
10...	0845	--	--	--	16.0	--	--	--	--	--	--	--
10...	0900	48700	735	8.1	16.0	15.0	200	7.8	82	735	250	61
10...	0910	48700	735	8.1	16.0	15.0	--	7.8	82	735	--	--
10...	0930	48700	735	--	19.0	18.0	--	--	--	--	--	--
17...	1205	50100	629	--	20.0	21.0	--	--	--	--	--	--
22...	1245	37900	873	--	22.0	24.0	--	--	--	--	--	--
29...	1400	45100	809	--	27.0	34.5	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

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)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	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												
07...	<.001	<.025	--	--	--	--	--	--	--	--	--	<.020
08...	24	74	39	2	5.3	143	0	--	230	11	.47	7.5
08...	--	--	--	--	--	143	0	174	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
15...	25	66	35	2	5.5	--	--	--	210	11	.42	8.2
15...	--	--	--	--	--	176	0	215	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
07...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
27...	25	66	34	2	5.7	E181	0	221	210	13	.46	8.0
27...	--	--	--	--	--	181	0	221	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
02...	23	60	34	2	5.7	168	0	205	200	13	.48	9.5
02...	--	--	--	--	--	168	0	205	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
04...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	25	62	33	2	5.8	176	0	215	200	13	.39	8.9
24...	25	61	33	2	5.8	177	0	216	200	13	.39	8.9
31...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
06...	--	--	--	--	--	--	--	--	--	--	--	--
14...	34	45	22	1	6.6	205	0	250	220	17	.42	12
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	205	0	250	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	28	48	26	1	6.3	184	0	224	200	15	.40	9.3
28...	<.001	<.025	--	--	--	--	--	--	--	--	--	<.020
28...	--	--	--	--	--	184	0	224	--	--	--	--
MAY												
04...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	30	54	27	1	6.9	180	0	220	220	14	.42	8.2
11...	--	--	--	--	--	180	0	220	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
26...	27	58	30	2	5.9	178	0	217	210	14	.38	8.1
26...	--	--	--	--	--	178	0	217	--	--	--	--
26...	--	--	--	--	--	178	0	217	--	--	--	--
JUN												
02...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	23	51	30	1	6.4	160	0	196	180	12	.41	9.5
10...	--	--	--	--	--	160	0	196	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	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) (00671)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
OCT												
07...	--	--	--	--	--	<.005	.003	.007	--	<.001	--	--
08...	513	498	.70	95600	--	.233	<.010	<.020	.38	.014	<.010	.073
08...	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
15...	512	500	.70	46400	.46	.598	.013	.030	.49	.015	.010	.070
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
07...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
27...	542	510	.74	40500	.44	.570	.012	.089	.53	.008	<.010	.054
27...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
02...	505	477	.69	43100	.73	.792	.011	.146	.88	.023	.011	.183
02...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
04...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	512	492	.70	44200	.36	.852	<.010	.140	.50	.023	.010	.094
24...	512	493	.70	44200	.25	.854	<.010	.144	.39	.023	.012	.044
31...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
06...	--	--	--	--	--	--	--	--	--	--	--	--
14...	585	554	.80	58100	1.2	3.08	.032	.077	1.3	.064	.083	.334
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	520	493	.71	62800	.45	1.04	<.010	.022	.47	.052	.043	.082
28...	--	--	--	--	--	<.005	<.001	<.002	--	<.001	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
04...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	563	525	.77	47000	.66	1.46	<.010	.060	.72	.024	.014	.173
11...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
26...	524	499	.71	54900	.63	1.39	.018	.047	.67	.041	.028	.145
26...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
02...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	469	448	.64	61700	.72	2.02	.023	.106	.83	.066	.074	.206
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)
OCT												
07...	--	--	--	<.30	<.20	<.20	<.30	<.20	<.20	<.20	<3.0	<.30
08...	282	52500	2	2.3	49	<1.0	<1.0	2.1	<1.0	2.0	<3.0	<1.0
08...	302	56300	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
15...	262	23800	2	3.6	50	<1.0	<1.0	2.6	<1.0	1.6	<10	<1.0
15...	280	25400	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
07...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
27...	291	21800	1	1.4	53	<1.0	<1.0	4.7	<1.0	1.5	<10	<1.0
27...	276	20600	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
02...	353	30100	2	1.7	55	<1.0	<1.0	3.8	<1.0	1.8	<10	<1.0
02...	399	34000	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
04...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	542	46800	2	1.3	55	<1.0	<1.0	1.5	<1.0	1.7	<10	<1.0
24...	--	--	1	<1.0	54	<1.0	<1.0	1.7	<1.0	1.6	<10	<1.0
31...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
06...	--	--	--	--	--	--	--	--	--	--	--	--
14...	647	64300	2	1.0	88	<1.0	<1.0	3.8	<1.0	1.8	<10	<1.0
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	644	69200	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	776	93700	2	1.2	74	<1.0	<1.0	3.3	<1.0	1.8	<10	<1.0
28...	--	--	--	<.30	<.20	<.20	<.30	<.20	<.20	<.20	<3.0	<.30
28...	797	96200	--	--	--	--	--	--	--	--	--	--
MAY												
04...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	370	30900	2	1.5	72	<1.0	<1.0	<1.0	<1.0	2.2	<10	<1.0
11...	326	27200	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
26...	384	40200	2	2.4	74	<1.0	<1.0	2.9	<1.0	2.5	<10	<1.0
26...	399	41800	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
02...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	1450	191000	2	1.8	91	<1.0	<1.0	2.0	<1.0	2.1	<10	<1.0
10...	1450	191000	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

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)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)
OCT												
07...	--	<.10	<.20	<.50	--	<.20	<.10	--	<.50	<.20	--	--
08...	55	<1.0	3.0	2.3	2	<1.0	552	<6	<1.0	3.7	E.0039	8.3
08...	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
15...	49	14	2.7	3.1	2	<1.0	550	<10	<1.0	4.0	E.0057	8.1
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
07...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
27...	52	8.0	2.8	2.6	2	<1.0	565	<10	<1.0	4.0	E.0052	8.1
27...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
02...	47	14	2.7	2.8	2	<1.0	525	<10	<1.0	3.9	E.0056	8.1
02...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
04...	--	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
24...	47	8.1	2.8	2.9	2	<1.0	523	<10	1.2	4.4	E.0048	8.1
24...	47	7.8	2.7	2.8	2	<1.0	522	<10	<1.0	4.4	E.0046	8.1
31...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
06...	--	--	--	--	--	--	--	--	--	--	--	--
14...	41	<1.0	3.0	2.7	3	<1.0	538	<10	<1.0	6.9	E.0157	8.1
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
28...	43	<1.0	3.0	2.3	3	<1.0	495	<10	<1.0	5.4	E.0117	8.0
28...	--	<.10	<.20	<.50	--	<.20	<.10	--	<.50	<.20	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
04...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	48	1.1	3.1	2.8	3	<1.0	549	<10	<1.0	5.3	E.0070	8.2
11...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
26...	49	<1.0	3.2	2.7	3	<1.0	538	<10	<1.0	4.9	E.0183	8.2
26...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
02...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	42	<1.0	2.9	2.8	2	<1.0	453	<10	<1.0	4.4	E.0825	8.0
10...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN DIS-SOLVED (MG/L AS N) (00602)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4) (00660)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	HARD-NESS NONCARB DISSOLV LAB AS CACO3 (MG/L) (00905)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)
OCT											
07...	--	--	--	--	--	--	--	--	--	--	<.20
08...	.61	.45	--	--	.22	.04	3.8	.80	110	98	<1.0
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	<.10	<.20	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
15...	1.1	.89	.26	.585	.29	.05	3.5	.90	--	82	<1.0
15...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JAN											
07...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
27...	1.1	.91	.25	.558	.34	.02	3.6	1.2	84	82	<1.0
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	1.7	1.2	.29	.781	.44	.07	3.8	1.7	81	71	<1.0
02...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
04...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	1.4	1.1	.15	--	.29	.07	3.6	1.3	88	83	<1.0
24...	1.2	1.1	.14	--	.28	.07	3.6	1.3	85	80	<1.0
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
06...	--	--	--	--	--	--	--	--	--	--	--
14...	4.3	3.5	.39	3.05	.46	.20	4.7	>5.0	140	140	<1.0
14...	--	--	--	--	--	--	.30	<.20	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	1.5	1.4	.35	--	.37	.16	4.0	>5.0	110	110	<1.0
28...	--	--	--	--	--	--	--	--	--	--	<.20
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
04...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
11...	2.2	1.8	.23	--	.29	.07	3.9	3.4	130	120	<1.0
11...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
26...	2.1	1.7	.25	1.38	.30	.13	3.9	--	100	96	<1.0
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
10...	2.9	2.4	.28	2.00	.38	.20	4.4	>5.0	89	81	<1.0
10...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	ALKA-LINITY WAT.DIS FET LAB CACO3 (MG/L) (29801)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	LINDANE DIS-SOLVED (UG/L) (39341)
OCT											
07...	--	--	--	--	--	--	--	--	--	--	--
08...	<.0070	<.0020	E.0019	E.0045	<.0040	<.0030	150	<.0020	<.0060	<.0040	<.004
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
15...	<.0070	<.0020	<.0050	<.0180	<.0040	<.0030	180	<.0020	<.0060	<.0040	<.004
15...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JAN											
07...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
27...	<.0070	<.0020	<.0050	<.0180	.0069	<.0030	180	<.0020	<.0060	<.0040	<.004
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	<.0070	<.0020	<.0050	E.0028	.0071	<.0030	180	<.0020	<.0060	<.0040	<.004
02...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
04...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	<.0070	<.0020	<.0050	<.0180	<.0100	<.0030	180	<.0020	<.0060	<.0040	<.004
24...	<.0070	<.0020	<.0050	<.0180	<.0040	<.0030	180	<.0020	<.0060	<.0040	<.004
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
06...	--	--	--	--	--	--	--	--	--	--	--
14...	<.0070	<.0020	E.0037	E.0072	.0107	<.0030	210	<.0020	<.0060	<.0040	<.004
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	<.0070	<.0020	E.0046	E.0072	.188	<.0030	190	<.0020	<.0060	<.0040	<.004
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
04...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
11...	<.0070	<.0020	<.0050	E.0044	.330	<.0030	190	<.0020	<.0060	<.0040	<.004
11...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
26...	<.0070	<.0020	E.0036	E.0045	.291	<.0030	180	<.0020	<.0060	<.0040	<.004
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
10...	<.0070	<.0020	.0200	E.0103	.880	<.0030	170	<.0020	<.0060	<.0040	<.004
10...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	MALA-THION, DIS-SOLVED (UG/L) (39532)	PARA-THION, DIS-SOLVED (UG/L) (39542)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS NO2) (71856)
OCT											
07...	--	--	--	--	--	--	--	--	.01	--	.01
08...	<.001	.006	<.005	<.004	<.002	.028	<.002	<.0020	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
15...	<.001	.006	<.005	<.004	<.002	.019	<.002	<.0020	.04	2.6	.04
15...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JAN											
07...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
27...	<.001	.006	<.005	<.004	<.002	.018	<.002	<.0020	.11	2.5	.04
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	<.001	.022	<.005	<.004	<.002	.022	<.002	.0059	.19	3.5	.04
02...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
04...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	<.001	.017	<.005	<.004	<.002	.017	<.002	<.0020	.18	--	--
24...	<.001	.015	<.005	<.004	<.002	.016	<.002	<.0020	.19	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
06...	--	--	--	--	--	--	--	--	--	--	--
14...	<.001	.066	<.005	<.004	<.002	.037	<.002	.0116	.10	13	.11
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	<.001	.839	<.005	<.004	<.002	.234	.009	.362	.03	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
04...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
11...	<.001	.106	<.005	<.004	<.002	.179	.005	.102	.08	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
26...	<.001	.391	<.005	<.004	<.002	.547	.014	.192	.06	6.1	.06
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
10...	<.001	1.06	<.005	<.004	<.002	2.20	.038	.378	.14	8.9	.08
10...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
OCT											
07...	--	--	--	--	--	--	--	--	--	--	--
08...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
15...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	E.0025	<.0040	<.0100
15...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JAN											
07...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
27...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	.0058	<.0040	<.0100
02...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
04...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
24...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
06...	--	--	--	--	--	--	--	--	--	--	--
14...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	.0047	<.0040	<.0100
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	<.004	<.0030	.0072	<.0040	<.0020	<.0070	<.0020	<.0060	.0913	<.0040	<.0100
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
04...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
11...	<.004	<.0030	E.0025	<.0040	<.0020	<.0070	<.0020	<.0060	.0149	<.0040	<.0100
11...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
26...	.008	<.0030	.0044	<.0040	<.0020	<.0070	<.0020	<.0060	.0073	<.0040	<.0100
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
10...	.037	<.0030	.0102	<.0040	<.0020	<.0070	<.0020	<.0060	.0042	<.0040	<.0100
10...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)
OCT											
07...	--	--	--	--	--	--	--	--	--	--	--
08...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
15...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
15...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JAN											
07...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
27...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
02...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
04...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
24...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
06...	--	--	--	--	--	--	--	--	--	--	--
14...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
04...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
11...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
11...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
26...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
10...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
10...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	DIAZ-INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	BORON, DIS-SOLVED (UG/L AS B) (01020)
OCT											
07...	--	--	--	--	--	--	--	--	--	--	<2.0
08...	E.0003	<.0040	<.0030	<.0130	<.0010	<.0050	778	85.5	119	81.8	121
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
15...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	779	107	125	113	112
15...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
JAN											
07...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
27...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	809	100	110	89.5	117
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	741	106	115	112	104
02...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
04...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	785	105	98.1	86.7	108
24...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	784	105	97.1	86.6	104
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
06...	--	--	--	--	--	--	--	--	--	--	--
14...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	863	104	112	91.9	82
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	<.0020	.0087	<.0030	<.0130	<.0010	<.0050	783	103	113	98.1	90
28...	--	--	--	--	--	--	--	--	--	--	<2.0
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
04...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
11...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	798	92.7	98.1	86.4	105
11...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
26...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	775	101	105	83.4	100
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
10...	<.0020	.0152	<.0030	<.0130	<.0010	<.0050	699	106	113	89.4	96
10...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

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 WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
JUL												
07...	1015	--	--	--	25.0	--	--	--	--	--	--	--
07...	1030	52600	666	8.2	25.0	23.0	320	5.9	75	733	240	60
07...	1040	52600	666	8.2	25.0	23.0	--	5.9	75	733	--	--
13...	1400	42100	792	--	28.0	33.0	--	--	--	--	--	--
20...	1005	35300	--	--	29.0	25.0	--	--	--	--	--	--
20...	1100	35400	820	8.3	29.0	25.0	27	6.2	84	731	300	71
20...	1108	35400	820	8.3	29.0	25.0	--	--	--	731	--	<.002
20...	1110	35400	820	8.3	29.0	25.0	--	6.2	84	731	--	--
28...	1105	39200	826	--	26.0	33.0	--	--	--	--	--	--
AUG												
03...	0845	37700	780	--	25.1	30.0	--	--	--	--	--	--
04...	1030	39200	805	8.3	24.5	21.5	17	7.3	91	735	270	64
04...	1032	39200	805	8.3	24.5	21.5	--	7.3	91	735	--	--
04...	1033	39200	805	8.3	24.5	21.5	--	7.3	91	735	--	--
04...	1034	39200	805	8.3	24.5	21.5	--	7.3	91	735	--	--
04...	1040	39200	805	8.3	24.5	21.5	--	7.3	91	735	--	--
10...	1240	40400	805	--	25.4	32.0	--	--	--	--	--	--
17...	1100	36600	685	8.2	26.5	30.0	51	6.7	87	733	250	62
17...	1110	36600	690	8.2	26.5	30.0	59	6.7	87	733	250	61
17...	1120	--	--	--	26.5	--	--	--	--	--	--	--
17...	1145	36600	752	--	27.0	28.0	--	--	--	--	--	--
24...	1330	36800	774	--	27.5	30.0	--	--	--	--	--	--
SEP												
01...	0940	29800	786	--	25.0	26.0	--	--	--	--	--	--
01...	1000	--	--	--	25.0	--	--	--	--	--	--	--
01...	1030	32000	786	8.3	25.0	26.0	15	7.7	97	737	250	60
01...	1040	32000	786	8.3	25.0	26.0	--	7.7	97	737	--	--
08...	1415	39900	643	--	26.5	30.0	--	--	--	--	--	--
14...	1050	36400	810	--	24.0	24.0	--	--	--	--	--	--
22...	1100	36400	818	--	21.0	14.0	--	--	--	--	--	--
29...	1050	36100	797	--	23.0	28.0	--	--	--	--	--	--

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)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	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)
JUL												
07...	--	--	--	--	--	--	--	--	--	--	--	--
07...	21	44	28	1	6.5	161	0	197	160	12	.41	11
07...	--	--	--	--	--	161	0	197	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	28	64	31	2	6.9	182	0	222	210	14	.44	12
20...	<.001	<.025	--	--	--	--	--	--	--	--	--	<.020
20...	--	--	--	--	--	182	0	222	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	25	66	35	2	6.1	167	0	204	210	13	.44	9.3
04...	--	--	--	--	--	167	0	204	--	--	--	--
04...	--	--	--	--	--	167	0	204	--	--	--	--
04...	--	--	--	--	--	167	0	204	--	--	--	--
04...	--	--	--	--	--	167	0	204	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	23	59	33	2	6.5	162	0	198	190	13	.46	11
17...	24	60	34	2	6.7	160	0	195	190	13	.46	11
17...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	24	66	36	2	6.0	178	0	218	210	13	.47	10
01...	--	--	--	--	--	178	0	218	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	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) (00671)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)
JUL												
07...	--	--	--	--	--	--	--	--	--	--	--	--
07...	438	418	.60	62200	.34	1.91	.033	.053	.40	.079	.055	.112
07...	--	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	547	523	.74	52300	.80	1.34	.015	.030	.82	.053	.077	.251
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	520	500	.71	55000	.58	.826	.014	.046	.63	.025	<.010	.184
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	493	468	.67	48700	1.1	1.13	.011	.046	1.1	.059	.054	.316
17...	498	467	.68	49200	.85	1.15	.012	.040	.89	.058	.056	.229
17...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	529	501	.72	45700	--	.599	.010	<.020	.73	.021	.023	.161
01...	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)
JUL												
07...	--	--	--	--	--	--	--	--	--	--	--	--
07...	2190	311000	3	3.2	122	<1.0	<1.0	1.8	<1.0	2.1	<10	<1.0
07...	2180	310000	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	654	62500	3	2.6	94	<1.0	<1.0	3.2	<1.0	1.8	<10	<1.0
20...	--	--	--	<.30	<.20	<.20	<.30	<.20	<.20	<.20	<3.0	<.30
20...	349	33400	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	268	28400	3	2.7	71	<1.0	<1.0	2.3	<1.0	2.0	<10	<1.0
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	360	38100	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	545	53900	3	2.9	75	<1.0	<1.0	1.8	<1.0	2.2	<10	<1.0
17...	563	55600	3	3.0	74	<1.0	<1.0	1.8	<1.0	2.3	<10	<1.0
17...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	226	19500	3	2.0	63	<1.0	<1.0	1.9	<1.0	1.8	<10	<1.0
01...	327	28300	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
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WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

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)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)
JUL												
07...	--	--	--	--	--	--	--	--	--	--	--	--
07...	38	<1.0	3.3	2.6	<1	<1.0	400	<10	<1.0	4.4	E.0921	8.0
07...	--	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
20...	51	<1.0	3.9	2.3	3	<1.0	568	<10	1.6	4.9	E.0255	8.3
20...	--	<.10	<.20	<.50	--	<.20	<.10	--	<.50	<.20	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	50	<1.0	3.5	2.1	2	<1.0	543	<10	<1.0	4.7	E.0141	8.2
04...	--	--	--	--	--	--	--	--	--	--	E.0669	--
04...	--	--	--	--	--	--	--	--	--	--	E1.54	--
04...	--	--	--	--	--	--	--	--	--	--	E2.80	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--
17...	50	<1.0	3.6	2.3	2	<1.0	495	<10	<1.0	4.4	E.0221	8.3
17...	49	<1.0	3.5	2.3	2	<1.0	498	<10	<1.0	4.4	E.0247	8.3
17...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	53	<1.0	3.8	2.0	2	<1.0	516	<10	<1.0	4.3	E.0199	8.3
01...	--	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN DIS-SOLVED (MG/L AS N) (00602)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4) (00660)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	HARD-NESS NONCARB DISSOLV LAB AS CACO3 (MG/L) (00905)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	2.3	2.3	.37	1.88	.43	.24	3.9	>5.0	75	71	<1.0
07...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	2.2	1.7	.33	1.32	.36	.16	3.9	3.0	110	110	<1.0
20...	--	--	--	--	--	--	--	--	--	--	<.20
20...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	1.5	1.0	.17	.812	.22	.08	3.5	1.0	98	87	<1.0
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	2.2	1.5	.28	1.11	.33	.18	3.7	>5.0	89	80	<1.0
17...	2.0	1.5	.28	1.14	.32	.18	3.8	>5.0	89	77	<1.0
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	1.3	.84	--	.589	.24	.06	3.6	1.4	70	76	<1.0
01...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
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WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	ALKA-LINITY WAT.DIS FET LAB CACO3 (MG/L) (29801)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	LINDANE DIS-SOLVED (UG/L) (39341)
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	<.0070	<.0020	.0077	E.0100	.155	<.0030	170	<.0020	<.0060	<.0040	<.004
07...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	<.0070	<.0020	.0068	<.0180	.0398	<.0030	190	<.0020	<.0060	<.0040	<.004
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	<.0070	<.0020	<.0050	<.0180	<.0040	<.0030	180	<.0020	<.0060	<.0040	<.004
04...	.122	.109	.111	.117	.128	.0873	--	.0847	.0607	.0962	.097
04...	<.0070	3.27	3.29	3.24	2.76	<.0030	--	<.0020	<.0060	<.0040	<.004
04...	<.0070	6.57	6.77	6.72	5.14	<.0030	--	<.0020	<.0060	<.0040	<.004
04...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	<.0070	<.0020	E.0039	E.0040	.0181	<.0030	170	<.0020	<.0060	<.0040	<.004
17...	<.0070	<.0020	E.0037	E.0043	.0212	<.0030	170	<.0020	<.0060	<.0040	<.004
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	<.0070	<.0020	<.0050	<.0180	<.0040	<.0030	170	<.0020	<.0060	<.0040	<.004
01...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	MALA-THION, DIS-SOLVED (UG/L) (39532)	PARA-THION, DIS-SOLVED (UG/L) (39542)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS NO2) (71856)
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	<.001	.301	<.005	<.004	<.002	.796	.010	.0639	.07	8.3	.11
07...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	<.001	.044	<.005	<.004	<.002	.171	<.002	<.0080	.04	5.9	.05
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	<.001	.026	<.005	<.004	<.002	.102	<.002	.0134	.06	3.6	.05
04...	.104	.144	.092	.114	.116	.226	.118	.133	--	--	--
04...	<.001	3.33	2.79	<.004	3.44	3.57	3.84	4.00	--	--	--
04...	<.001	6.62	5.33	<.004	7.18	7.11	7.88	7.93	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	<.001	.048	<.005	<.004	<.002	.106	.004	.0084	.06	4.9	.04
17...	<.001	.050	<.005	<.004	<.002	.109	.004	.0092	.05	5.0	.04
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	<.001	.033	<.005	<.004	<.002	.086	<.002	<.0020	--	2.6	.03
01...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	.013	<.0030	.0086	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
07...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
04...	.100	.0927	.105	.0973	.0747	E.101	.106	.0840	.101	.100	.116
04...	3.00	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
04...	5.93	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
04...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
17...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	<.004	<.0030	<.0020	<.0040	<.0020	<.0070	<.0020	<.0060	<.0020	<.0040	<.0100
01...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

DATE	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
07...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
04...	.120	.105	.0870	E.132	.0851	.112	.0769	.104	.110	E.129	.115
04...	<.0040	<.0030	<.0020	E2.48	<.0130	<.0030	<.0170	<.0010	<.0040	E1.58	<.0020
04...	<.0040	<.0030	<.0020	E3.99	<.0130	<.0030	<.0170	<.0010	<.0040	E2.49	<.0020
04...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
17...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	<.0040	<.0030	<.0020	<.0030	<.0130	<.0030	<.0170	<.0010	<.0040	<.0030	<.0020
01...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	DIAZ-INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT (91063)	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT (91064)	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT (91065)	BORON, DIS-SOLVED (UG/L AS B) (01020)
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	<.0020	<.0200	<.0030	<.0130	<.0010	<.0050	656	104	116	93.1	89
07...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	794	105	110	100	126
20...	--	--	--	--	--	--	--	--	--	--	<2.0
20...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	799	94.5	112	91.3	138
04...	.115	.0898	.111	.0903	E.0564	.0482	--	96.9	108	103	--
04...	3.71	<.0040	<.0030	2.50	<.0010	<.0050	--	111	127	103	--
04...	7.50	<.0040	<.0030	5.38	<.0010	<.0050	--	97.8	112	.000	--
04...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
17...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	756	88.1	110	92.7	114
17...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	754	90.2	111	91.0	109
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	<.0020	<.0040	<.0030	<.0130	<.0010	<.0050	793	104	98.8	96.1	121
01...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--

DATE	TIME	NUMBER OF SAM-PLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)
OCT										
08...	1050	3	--	0	21	90	98	100	--	--
NOV										
07...	0900	3	--	0	22	92	99	100	--	--
DEC										
15...	1050	3	0	1	40	96	100	--	--	--
JAN										
27...	1145	3	0	1	48	99	100	--	--	--
MAR										
24...	0930	3	--	0	22	84	95	99	100	--
APR										
14...	1015	3	--	0	22	83	95	99	100	--
MAY										
11...	1015	3	--	0	27	91	99	100	--	--
JUN										
10...	0845	3	--	0	28	99	100	--	--	--
JUL										
07...	1015	3	--	0	25	97	99	99	99	100
AUG										
17...	1120	3	0	1	24	90	98	100	--	--
SEP										
01...	1000	3	0	1	27	89	97	98	99	100

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	784	---	---	---	---	857	---	---	---	779
2	---	---	---	---	765	---	742	---	797	---	---	---
3	805	---	---	---	---	---	---	---	---	---	791	---
4	---	775	---	---	---	762	---	823	---	---	---	---
5	---	---	779	---	---	---	---	---	834	---	---	779
6	---	---	---	---	---	---	830	---	---	---	781	---
7	---	787	---	797	---	---	---	---	---	673	---	---
8	737	---	---	---	---	---	---	823	---	---	---	783
9	---	---	783	---	755	---	---	---	---	708	---	---
10	793	786	---	---	---	---	780	---	730	---	764	---
11	---	---	---	---	---	---	---	826	---	---	---	776
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	782	---	---
14	---	785	---	---	---	---	857	---	---	---	773	781
15	782	---	816	---	---	---	---	803	---	---	---	---
16	---	---	---	---	---	779	---	---	---	---	---	---
17	726	780	---	---	741	---	808	---	712	772	734	---
18	---	---	---	---	---	---	---	---	---	---	---	785
19	---	---	---	---	---	---	---	814	---	---	---	---
20	---	---	---	772	---	---	---	---	---	815	769	---
21	---	787	---	---	---	---	810	---	---	---	---	---
22	---	---	802	---	---	---	---	797	829	---	---	780
23	---	---	---	---	---	---	---	---	---	---	---	---
24	759	757	---	---	---	777	807	---	---	788	769	---
25	---	---	---	---	732	---	---	---	---	---	---	783
26	---	---	---	---	---	---	---	802	---	---	---	---
27	805	---	---	783	---	748	---	---	---	---	---	---
28	---	797	---	---	---	---	790	840	---	799	780	---
29	---	---	---	---	---	---	---	---	795	---	---	776
30	---	---	---	---	---	---	---	---	---	---	---	---
31	777	---	815	---	---	747	---	---	---	792	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	4.0	---	---	---	---	13.5	---	---	---	27.5
2	---	---	---	---	2.0	---	9.0	---	21.0	---	---	---
3	20.0	---	---	---	---	---	---	---	---	---	25.0	---
4	---	8.0	---	---	---	7.0	---	16.0	---	---	---	---
5	---	---	.0	---	---	---	---	---	17.4	---	---	26.0
6	---	---	---	---	---	---	8.5	---	---	---	24.0	---
7	---	7.5	---	1.5	---	---	---	---	---	25.0	---	---
8	20.5	---	---	---	---	---	---	17.0	---	---	---	26.5
9	---	---	.5	---	2.5	---	---	---	---	26.0	---	---
10	19.0	3.0	---	---	---	---	8.5	---	16.0	---	25.0	---
11	---	---	---	---	---	---	---	17.5	---	---	---	23.0
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	28.0	---	---
14	---	5.0	---	---	---	---	12.5	---	---	---	26.0	24.0
15	15.0	---	1.0	---	---	---	---	20.0	---	---	---	---
16	---	---	---	---	---	1.5	---	---	---	---	---	---
17	15.0	4.0	---	---	5.5	---	10.5	---	20.0	29.0	26.5	---
18	---	---	---	---	---	---	---	---	---	---	---	24.5
19	---	---	---	---	---	---	---	22.0	---	---	---	---
20	---	---	---	1.0	---	---	---	---	---	29.0	28.5	---
21	---	3.5	---	---	---	---	---	---	---	---	---	---
22	---	---	2.0	---	---	---	---	21.0	22.0	---	---	21.0
23	---	---	---	---	---	---	---	---	---	---	---	---
24	12.5	4.5	---	---	---	3.0	13.0	---	---	27.0	27.5	---
25	---	---	---	---	7.0	---	---	---	---	---	---	23.0
26	---	---	---	---	---	---	---	18.5	---	---	---	---
27	10.0	---	---	.5	---	11.0	---	---	---	---	---	---
28	---	4.0	---	---	---	---	12.5	20.0	---	26.0	23.0	---
29	---	---	---	---	---	---	---	---	27.0	---	---	23.0
30	---	---	---	---	---	---	---	---	---	---	---	---
31	9.0	---	2.5	---	---	1.5	---	---	---	---	---	---

06610000 MISSOURI RIVER AT OMAHA, NE--Continued
(National stream-quality accounting network station)

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	405	77700	441	88100	524	108000	232	20400	360	30900	363	31900
2	327	62100	458	93100	554	112000	225	19600	373	31800	370	32500
3	269	51300	476	98900	583	114000	219	18600	371	31200	376	33000
4	272	52000	492	99400	612	115000	214	17900	366	30100	382	33100
5	290	55600	494	99500	628	111000	208	16900	360	29700	378	32500
6	310	59700	494	100000	582	97000	203	16400	355	29500	373	32000
7	330	64000	488	98100	534	84100	198	16400	350	29000	368	31400
8	348	67700	461	92200	490	73100	199	16200	346	27900	363	30900
9	342	67300	434	87300	450	64400	200	15500	342	27300	358	29900
10	339	68200	414	83800	416	56500	202	15100	356	28800	353	28700
11	358	71800	424	85900	384	49500	204	14100	376	31000	348	27900
12	379	76700	438	89300	355	42600	206	13800	397	32900	343	27800
13	402	83600	453	91900	328	36400	207	14400	419	34600	339	27500
14	426	90500	471	95000	303	31000	209	14500	442	36900	334	27300
15	451	93300	522	106000	284	27200	211	14200	466	38700	330	27000
16	478	97300	587	116000	284	26100	213	14600	492	40700	327	26800
17	498	102000	649	130000	287	26100	215	15400	512	43000	333	27800
18	492	99800	632	126000	290	26500	216	15500	492	41300	341	29300
19	484	95300	602	121000	294	26500	218	15200	466	39600	347	30500
20	475	93600	573	115000	297	26300	221	15200	442	37300	333	29000
21	467	91700	553	112000	300	26600	229	15900	418	35000	318	26900
22	459	91300	563	115000	302	26600	237	17000	397	33100	303	25300
23	451	90100	576	117000	295	26200	246	18200	376	31400	288	24500
24	443	89600	578	118000	287	25600	256	19400	356	29900	283	24500
25	433	89300	524	107000	279	24600	266	20300	340	28900	312	27500
26	424	89700	468	95600	272	23900	276	21500	343	29700	349	31300
27	416	85900	417	84300	265	23300	287	23300	350	30600	396	36800
28	417	85200	388	78700	258	22700	300	24600	356	31400	476	48100
29	419	85100	426	87700	251	22100	314	25900	---	---	576	61500
30	420	84700	474	99900	244	21500	328	27700	---	---	697	76700
31	425	85000	---	---	238	21100	344	28700	---	---	835	93400
TOTAL	---	2497100	---	3031700	---	1517500	---	562400	---	922200	---	1073300

DAY	MEAN CONC TRAT (MG/	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	931	104000	652	65300	869	105000	968	121000	268	27500	233	21800
2	997	108000	599	59400	684	79300	904	104000	268	27300	238	22700
3	896	92400	551	55900	565	64700	886	102000	268	27400	250	24200
4	780	78900	506	51600	471	53300	1480	179000	311	33300	262	26100
5	680	68600	463	46100	404	45500	1630	213000	307	32900	271	27500
6	663	66100	425	41000	391	44300	2330	341000	280	29500	264	26800
7	1080	119000	389	37200	384	43100	2140	306000	311	33600	256	26100
8	1380	171000	356	33600	589	68900	1460	199000	350	39200	247	25300
9	1140	140000	326	30100	1350	189000	1020	122000	394	45500	233	23700
10	949	113000	299	27300	1470	191000	811	88800	428	46700	220	22100
11	879	97900	280	25400	1620	218000	658	74200	380	41100	211	21000
12	827	86800	291	27300	1740	251000	534	59900	326	34500	215	21200
13	779	78900	304	29300	1440	184000	442	49900	279	28600	220	21400
14	776	77200	319	31300	1520	199000	412	45500	250	25200	222	21700
15	992	101000	335	33300	2110	310000	499	56600	301	30300	216	21000
16	1310	145000	355	36500	2020	321000	591	67400	638	69600	209	20400
17	1550	178000	376	39700	1310	177000	546	57200	590	58600	202	19800
18	1280	140000	398	41500	1120	135000	472	47500	453	44400	198	19000
19	1010	107000	418	44200	1010	113000	405	39700	319	31000	202	19500
20	797	85100	422	47600	906	98600	353	33700	249	24200	208	20500
21	643	70300	423	49500	814	85800	334	31900	314	33200	214	21100
22	578	62300	424	50700	734	74800	319	32700	389	42700	222	21600
23	528	56400	422	50800	677	66600	306	31100	380	39700	234	22700
24	504	53200	420	48600	1450	184000	294	29400	362	36000	248	24000
25	565	58700	419	46000	2550	410000	287	28500	335	32500	259	33900
26	642	67700	414	43500	1770	253000	280	28200	310	29700	259	36800
27	730	86000	396	42200	1230	150000	274	28100	286	27700	258	37000
28	794	95000	460	51100	856	104000	269	28300	267	25600	257	35000
29	748	84600	1040	130000	613	74500	268	27800	258	24800	424	59800
30	700	73600	1430	187000	664	83600	268	27600	251	23500	410	57200
31	---	---	1110	132000	---	---	268	27600	244	22500	---	---
TOTAL	---	2865700	---	1635000	---	4377000	---	2628600	---	1068300	---	800900
YEAR		22979700										

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE

LOCATION.--Lat 40°40'55", long 95°50'48", in NW$^1/_4$ NE$^1/_4$ sec.9, T.8 N., R.14 E., Otoe County, Hydrologic Unit 10240001, on right bank 1.0 mi upstream from Highway 2 Bridge at Nebraska City, and at mile 562.6.

DRAINAGE AREA.--410,000 mi^2, approximately. The 3,959 mi^2 in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1929 to current year. Gage-height records collected in this vicinity from August 1878 to December 1899 are contained in reports of Missouri River Commission.

REVISED RECORDS.--WSP 761: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 905.36 ft above sea level, supplementary adjustment of 1954. See WSP 1918 or 1919 for history of changes prior to Apr. 1, 1963.

REMARKS.--Records good. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 414,000 ft^3/s Apr. 19, 1952; maximum gage height, 27.66 ft Apr. 18, 1952; minimum discharge, 1,600 ft^3/s Dec. 31, 1946 (discharge measurement); minimum gage height observed, -0.28 ft Dec. 24, 1960, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75200	78300	81300	38000	46400	39400	58300	48800	52700	55300	43100	39000
2	74000	79800	79100	38100	46100	39600	56900	47600	52000	53800	42800	39400
3	74300	81000	77600	38400	42800	38500	54800	47700	50800	52500	43700	39300
4	73800	81600	75100	38700	41000	38400	52400	47800	50300	56000	43700	39400
5	73300	81000	72100	38400	39600	38000	50700	47200	49600	70100	45400	40300
6	73000	80800	69100	37500	39200	37800	49800	46400	49400	85600	44900	40300
7	73200	81100	65800	37300	39300	38200	54600	45000	49900	83600	44900	40200
8	74200	80500	62700	37300	39000	38900	65900	44000	51500	78200	45500	40300
9	75500	79300	59800	36300	38900	37300	72300	43300	66600	68700	46900	39600
10	76500	79800	57200	35500	39200	35300	69700	43400	73000	59000	45800	39400
11	76800	80200	55100	32400	41200	33600	64200	41800	66300	55100	44500	39100
12	77200	80000	52500	30000	40400	33200	60200	43100	75200	52900	44000	38800
13	79800	79000	49500	28200	40100	33600	57200	43000	70900	49400	43100	38600
14	80800	78100	47000	26300	39700	34000	55000	43500	79200	48100	43200	38400
15	81700	77900	43100	26000	39300	35300	53900	44200	93900	47500	43100	38500
16	81200	77400	41500	25900	39000	35600	55500	46400	85700	49300	44600	38800
17	79300	76800	40800	27000	38700	40600	58900	46700	77700	47100	44700	39000
18	78100	77400	40900	28200	39100	41500	56800	45700	70700	45200	43200	38900
19	76700	77000	40400	28700	39500	42700	54400	45100	67300	43300	42200	38800
20	75400	77700	40900	27600	40200	43000	52300	46800	66700	42600	41200	40200
21	75000	78800	40800	28900	40100	43800	51800	49300	62000	42100	46700	40400
22	74700	79500	39900	30300	40100	44300	50400	55200	56600	45300	52500	40100
23	75300	80800	39000	30800	40200	44400	49900	60200	52500	45600	54500	39700
24	75300	81000	39400	32100	40600	44700	49600	53600	50100	45100	47300	39400
25	77400	80700	39100	33600	39800	45900	48400	52500	65100	43900	43800	39200
26	79000	80000	38700	34300	40400	47200	47900	52400	64900	43600	41800	39700
27	79900	78600	38100	35100	40200	48500	49100	51500	58200	43900	41500	39700
28	79300	77800	38000	36600	40300	51600	51900	51300	57700	43400	40900	39600
29	78400	78500	37600	37700	---	55800	52100	62100	55300	43200	40800	39800
30	77700	81800	37700	39500	---	60000	50600	64000	54700	43200	40000	40000
31	77700	---	37800	40800	---	59500	---	54800	---	43100	39000	---
TOTAL	2379700	2382200	1577600	1035500	1130400	1300200	1655500	1514400	1876500	1625700	1369300	1183900
MEAN	76760	79410	50890	33400	40370	41940	55180	48850	62550	52440	44170	39460
MAX	81700	81800	81300	40800	46400	60000	72300	64000	93900	85600	54500	40400
MIN	73000	76800	37600	25900	38700	33200	47900	41800	49400	42100	39000	38400
AC-FT	4720000	4725000	3129000	2054000	2242000	2579000	3284000	3004000	3722000	3225000	2716000	2348000
CFSM	.19	.19	.12	.08	.10	.10	.13	.12	.15	.13	.11	.10
IN.	.22	.22	.14	.09	.10	.12	.15	.14	.17	.15	.12	.11

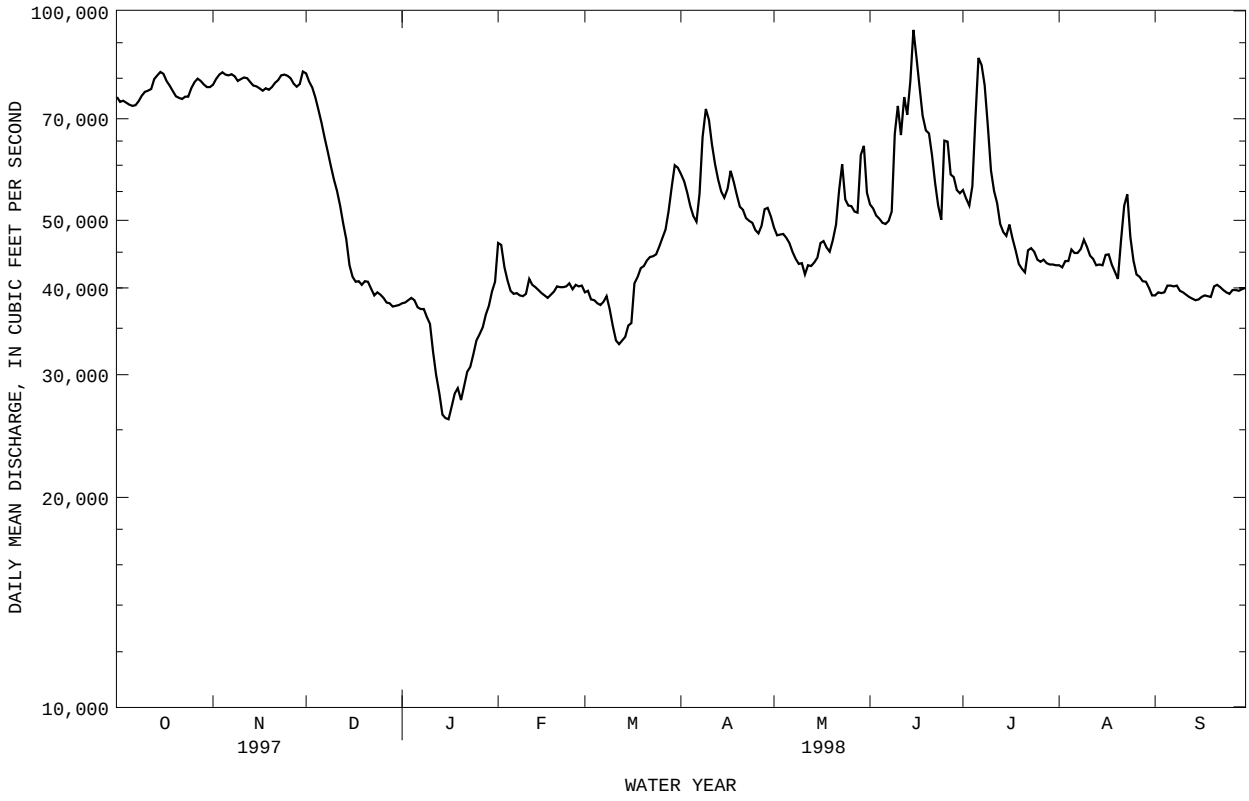
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1998, BY WATER YEAR (WY)

MEAN	42840	38370	25070	21000	26360	38110	47810	47500	52430	46530	42870	42760
MAX	76760	79410	52410	39970	48630	66730	98960	90280	117500	116700	71540	73410
(WY)	1998	1998	1987	1987	1983	1983	1997	1997	1984	1993	1996	1997
MIN	22420	14380	10510	10160	12780	15310	21850	32470	33530	32760	29870	32560
(WY)	1962	1962	1956	1957	1957	1957	1957	1955	1958	1961	1955	1958

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1953 - 1998a	
ANNUAL TOTAL	25573600		19030900			
ANNUAL MEAN	70060		52140		39330	
HIGHEST ANNUAL MEAN					66450	1997
LOWEST ANNUAL MEAN					25370	1957
HIGHEST DAILY MEAN	113000	Apr 18	93900	Jun 15	188000	Jul 25 1993
LOWEST DAILY MEAN	27800	Jan 2	25900	Jan 16	4320	Jan 11 1957
ANNUAL SEVEN-DAY MINIMUM	30900	Jan 13	27100	Jan 14	5590	Nov 29 1955
INSTANTANEOUS PEAK FLOW			97300	Jun 15	196000	Jul 23 1993
INSTANTANEOUS PEAK STAGE			20.34	Jun 15	27.19	Jul 23 1993
INSTANTANEOUS LOW FLOW			25700	Jan 15		
ANNUAL RUNOFF (AC-FT)	50730000		37750000		28500000	
ANNUAL RUNOFF (CFSM)	.17		.13		.096	
ANNUAL RUNOFF (INCHES)	2.32		1.73		1.30	
10 PERCENT EXCEEDS	93800		78400		62100	
50 PERCENT EXCEEDS	73000		46400		37100	
90 PERCENT EXCEEDS	38100		37900		17400	

a Post regulation, revised



06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.--Continued

WATER-QUALITY RECORDS

LOCATION.--Water quality samples were collected from Highway 2 bridge, 2.0 miles downstream of gage.

PERIOD OF RECORD.--May 1951 to current year. Daily sediment loads August 1957 to September 1971 in reports of U.S. Army Corps of Engineers.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1951 to December 1977, October 1991 to current year.
WATER TEMPERATURES: May 1951 to December 1977, October 1991 to current year.
SUSPENDED SEDIMENT DISCHARGE: October 1971 to September 1976, October 1991 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 994 microsiemens Dec. 17, 1962; minimum daily, 273 microsiemens June 17, 1964.
WATER TEMPERATURES: Maximum daily, 31°C July 26, 1977, and July 25, 1997; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,420 mg/L Aug. 7, 1996; minimum daily mean, 115 mg/L Jan. 3, 1993.
SEDIMENT LOADS: Maximum daily, 3,120,000 tons June 24, 1996; minimum daily, 4,050 tons Jan. 17, 1972.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 817 microsiemens Jan. 22; minimum daily, 539 microsiemens July 7.
WATER TEMPERATURES: Maximum daily, 30.0°C July 20; minimum daily, 0.0°C Dec. 29.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,810 mg/L June 15; minimum daily, 221 mg/L Sep. 28.
SEDIMENT LOADS: Maximum daily, 971,000 tons June 15; minimum daily, 21,200 tons Jan. 16.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	NUMBER OF SAMPLING POINTS (COUNT) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
OCT										
06...	1200	3	0	15	68	80	90	96	100	--
NOV										
03...	1040	2	0	3	17	50	73	90	98	100
JAN										
07...	1040	3	0	11	38	48	70	91	99	100
MAR										
02...	1045	3	0	21	85	90	95	98	99	100
APR										
06...	1110	3	0	13	45	68	83	94	99	100
MAY										
01...	1040	3	0	9	52	86	97	100	--	--
JUN										
02...	0935	3	0	33	67	79	91	97	99	100
SEP										
02...	1333	3	0	17	55	84	94	98	100	--

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	807	---	---	---	---
2	---	---	769	---	725	754	---	---	750	---	---	783
3	812	798	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	810	---	---	784	---
5	---	---	790	---	---	---	---	---	809	---	---	---
6	803	---	---	---	---	---	772	---	---	---	756	---
7	---	785	---	815	---	---	---	---	---	539	---	---
8	---	---	---	---	---	---	---	808	784	---	---	776
9	---	---	793	---	---	---	---	---	---	---	---	---
10	793	814	---	---	---	---	669	---	---	661	---	---
11	---	---	---	---	739	---	---	802	---	---	---	795
12	---	---	---	---	---	---	---	---	---	---	745	---
13	---	789	---	---	---	---	---	---	---	735	---	---
14	---	---	---	---	---	---	787	---	---	---	766	787
15	---	---	811	---	---	---	---	784	752	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	769	814	---	---	---	---	752	---	---	743	721	---
18	---	---	---	---	750	---	---	766	---	---	---	776
19	---	---	---	---	---	783	---	---	---	---	---	---
20	---	---	---	---	---	---	790	---	---	804	778	---
21	783	778	---	---	---	---	---	---	---	---	---	758
22	---	---	---	817	---	---	---	737	---	---	---	---
23	---	---	---	---	---	758	---	---	---	---	---	---
24	808	---	---	---	751	---	802	---	---	767	668	---
25	---	800	---	---	---	---	---	---	---	---	---	767
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	725	804	741	---	---	---	---
28	---	784	---	810	---	---	---	764	---	788	775	768
29	---	---	815	---	---	---	---	---	745	---	---	---
30	---	---	---	---	---	675	---	---	---	---	---	---
31	800	---	---	---	---	---	---	---	---	783	---	---

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	13.5	---	---	---	---
2	---	---	4.0	---	1.5	3.0	---	---	22.0	---	---	26.5
3	20.0	9.0	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	17.0	---	---	25.0	---
5	---	---	1.5	---	---	---	---	---	18.0	---	---	---
6	21.0	---	---	---	---	---	10.5	---	---	---	23.0	---
7	---	7.5	---	1.0	---	---	---	---	---	25.0	---	---
8	---	---	---	---	---	---	---	18.0	18.0	---	---	26.0
9	---	---	.5	---	---	---	---	---	---	---	---	---
10	19.0	7.0	---	---	---	---	9.5	---	---	27.0	---	---
11	---	---	---	---	2.0	---	---	19.0	---	---	---	23.0
12	---	---	---	---	---	---	---	---	---	---	26.0	---
13	---	5.5	---	---	---	---	---	---	---	28.5	---	---
14	---	---	---	---	---	---	14.5	---	---	---	26.5	---
15	---	---	2.0	---	---	---	---	20.0	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	15.0	3.0	---	---	---	---	7.0	---	---	28.5	27.0	---
18	---	---	---	---	6.5	---	---	21.5	---	---	---	24.5
19	---	---	---	---	---	2.0	---	---	---	---	---	---
20	---	---	---	---	---	---	13.0	---	---	30.0	29.0	---
21	14.0	3.5	---	---	---	---	---	---	---	---	---	23.0
22	---	---	---	.5	---	---	---	22.0	---	---	---	---
23	---	---	---	---	---	3.5	---	---	---	---	---	---
24	12.5	---	---	---	5.5	---	15.0	---	---	27.0	28.0	---
25	---	4.5	---	---	---	---	---	---	---	---	---	23.0
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	8.5	14.5	19.5	---	---	---	---
28	---	4.0	---	4.0	---	---	---	21.5	---	26.5	26.0	23.0
29	---	---	.0	---	---	---	---	---	28.0	---	---	---
30	---	---	---	---	---	11.0	---	---	---	---	---	---
31	9.0	---	---	---	---	---	---	---	---	25.0	---	---

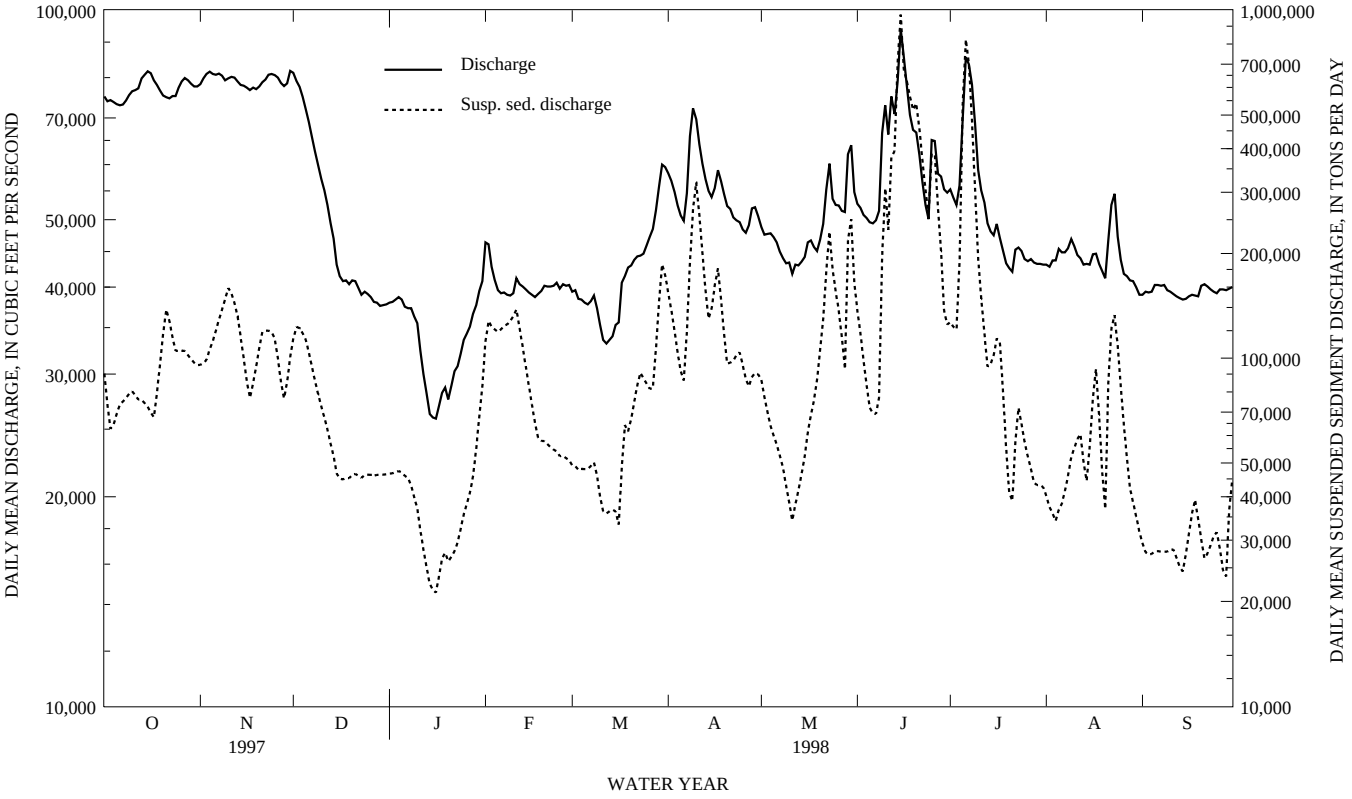
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	445	90400	452	95700	518	114000	454	46600	890	112000	463	49200
2	369	73700	450	96900	577	123000	454	46700	1030	128000	458	49000
3	313	62700	452	98900	583	122000	454	47100	1070	123000	461	47800
4	323	64400	480	106000	583	118000	454	47400	1090	121000	464	48100
5	349	69100	513	112000	579	113000	453	47000	1120	119000	468	48000
6	373	73600	549	120000	556	104000	453	45900	1140	121000	471	48100
7	380	75100	588	129000	532	94500	449	45300	1170	124000	475	49000
8	384	76900	637	138000	509	86100	428	43100	1190	125000	478	50200
9	387	79000	691	148000	487	78700	406	39900	1220	128000	457	46000
10	389	80300	740	159000	471	72700	386	37000	1240	132000	419	39900
11	378	78300	710	154000	455	67700	366	32000	1240	138000	400	36300
12	365	76000	665	144000	441	62400	347	28100	1120	122000	400	35800
13	353	76000	620	132000	426	56900	329	25100	994	108000	400	36300
14	341	74300	546	115000	412	52300	316	22500	884	94800	400	36700
15	329	72600	473	99600	401	46600	308	21600	786	83400	380	36300
16	318	69700	411	85800	403	45100	304	21200	699	73600	347	33300
17	316	67700	371	76900	407	44800	324	23600	622	65000	442	48700
18	378	79700	405	84700	411	45300	349	26600	560	59100	575	64300
19	467	96700	454	94500	414	45200	356	27600	543	57900	535	61600
20	578	118000	509	107000	418	46200	350	26100	533	57800	574	66700
21	683	138000	561	119000	422	46500	344	26900	522	56600	634	74900
22	635	128000	560	120000	426	45900	341	27900	512	55500	699	83700
23	567	115000	551	120000	430	45300	355	29500	502	54600	757	90800
24	514	105000	543	119000	434	46200	373	32300	493	54000	726	87600
25	501	105000	525	114000	438	46300	392	35600	487	52300	683	84600
26	493	105000	463	100000	443	46200	412	38200	481	52500	642	81700
27	485	105000	403	85600	447	46000	433	41100	474	51600	626	82000
28	477	102000	365	76700	451	46200	462	45800	468	51000	761	106000
29	470	99500	403	85400	455	46200	539	54800	---	---	959	145000
30	462	97000	457	101000	455	46300	637	68000	---	---	1150	186000
31	456	95500	---	---	455	46400	753	83100	---	---	1080	173000
TOTAL	---	2749200	---	3337700	---	2046000	---	1183600	---	2520700	---	2126600

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE.--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAY	MEAN CONC TRAT (MG/	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN TRATIO (MG/L)	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)	MEAN CONCE TRATI (MG/L	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	979	154000	660	86900	962	137000	847	127000	345	40100	279	29400
2	891	137000	603	77400	838	118000	848	123000	324	37400	261	27700
3	810	120000	544	70100	719	98600	852	121000	303	35800	258	27300
4	737	104000	494	63800	617	83800	1260	191000	289	34100	257	27400
5	671	91900	470	59900	538	72000	2730	537000	299	36700	257	27900
6	643	86400	450	56400	520	69500	3570	824000	315	38200	256	27900
7	809	120000	432	52500	513	69100	3100	701000	343	41600	256	27800
8	1060	189000	408	48500	552	77000	2280	482000	374	46000	256	27800
9	1380	269000	368	43100	1060	195000	1640	305000	409	51800	260	27800
10	1700	320000	330	38600	1560	308000	1210	193000	447	55200	265	28200
11	1490	259000	304	34200	1310	234000	993	148000	488	58600	267	28200
12	1230	201000	327	38000	1860	378000	827	118000	509	60500	255	26700
13	1020	157000	360	41800	2060	394000	709	94600	431	50300	242	25200
14	878	130000	396	46500	3160	701000	739	96000	381	44400	235	24400
15	957	139000	437	52200	3810	971000	796	102000	480	55900	262	27300
16	1080	162000	487	61100	2920	676000	858	114000	635	76600	299	31400
17	1140	181000	544	68600	2970	623000	873	111000	772	93100	341	35900
18	962	148000	612	75500	2950	564000	659	80600	589	68800	374	39200
19	799	117000	713	86800	2850	517000	475	55600	416	47400	328	34400
20	683	96500	834	106000	3000	540000	358	41100	331	36900	277	30100
21	693	97000	975	130000	2740	459000	342	38900	662	85600	243	26600
22	724	98500	1190	179000	2420	371000	464	57600	858	122000	254	27500
23	755	102000	1420	231000	2140	304000	585	72100	903	133000	271	29000
24	780	104000	1250	181000	1900	257000	531	64600	848	109000	289	30800
25	733	95800	1100	156000	2190	387000	485	57400	701	83000	298	31600
26	674	87100	971	137000	2190	384000	443	52200	569	64300	264	28300
27	626	83000	824	115000	1740	273000	406	48100	462	51700	230	24600
28	630	88400	671	93000	1300	203000	375	43900	383	42200	221	23600
29	644	90600	1270	218000	913	137000	371	43200	350	38500	341	36600
30	658	89900	1450	251000	845	125000	370	43200	325	35100	415	44800
31	---	---	1120	166000	---	---	366	42600	301	31700	---	---
TOTAL	---	4118100	---	3064900	---	9726000	---	5128700	---	1805500	---	885400
YEAR		38692400										


Discharge
Susp. sed. discharge
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
DAILY MEAN SUSPENDED SEDIMENT DISCHARGE, IN TONS PER DAY
100,000
70,000
50,000
40,000
30,000
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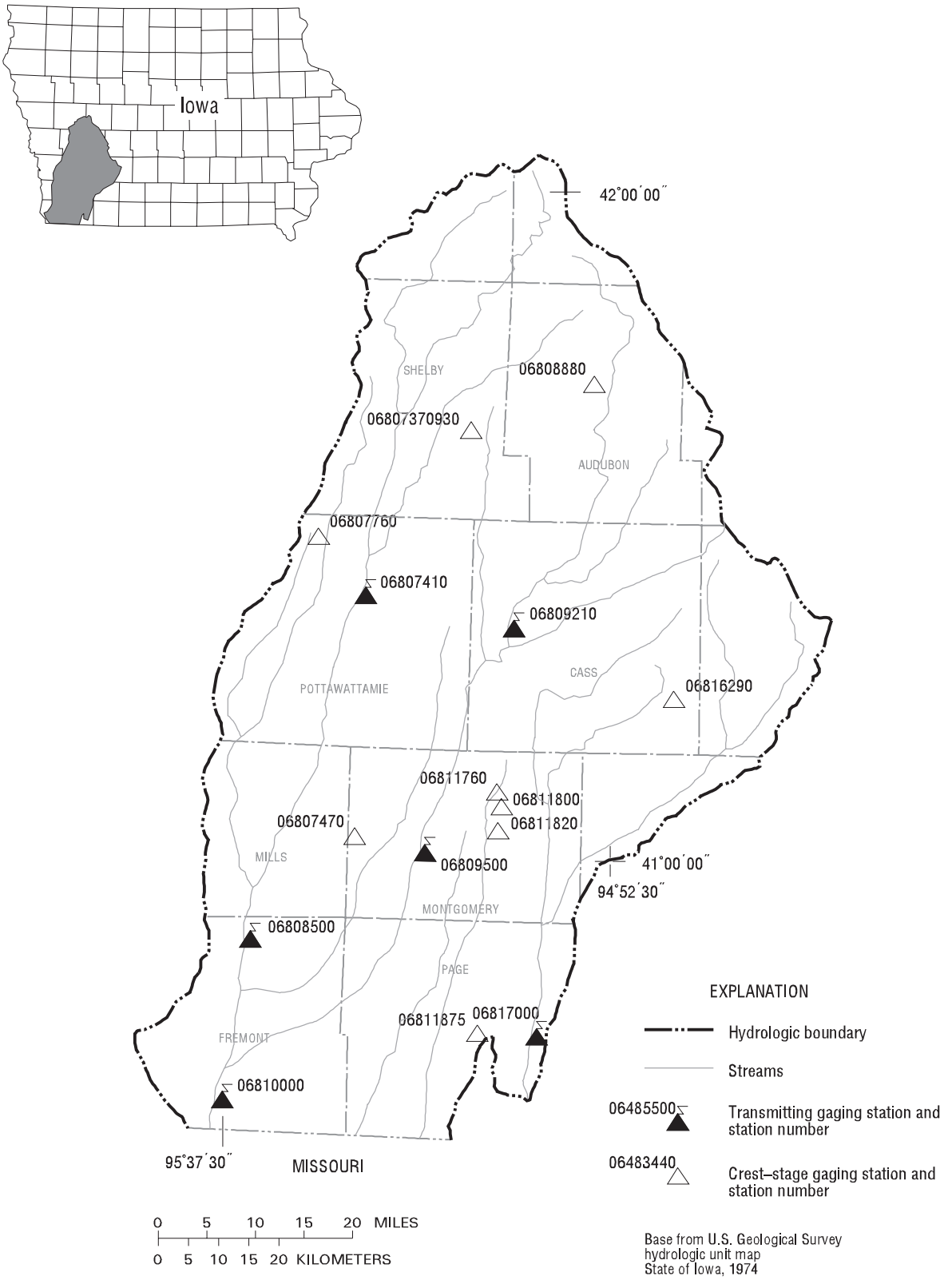
1998
WATER YEAR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MONTGOMERY
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06810000
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MISSOURI
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0 5 10 15 20 KILOMETERS
EXPLANATION
Hydrologic boundary
Streams
06485500 Transmitting gaging station and station number
06483440 Crest–stage gaging station and station number
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IA

LOCATION.--Lat 41°23'24",long 95°22'17",in NW$^{1}/_{4}$ NE$^{1}/_{4}$ sec.18, T.76 N., R.39 W., Pottawattamie County, Hydrologic Unit 10240002, on right bank at upstream side of bridge on county highway G30, 0.6 mi west of Hancock school, 3.0 mi downstream from Jim Creek, 59.6 mi upstream from confluence with East Nishnabotna River, and at mile 75.1 mi upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--609 mi^{2}.

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,085.83 ft above sea level. Prior to Sept. 15, 1980, on downstream end of right pier at same datum.

REMARKS.--Estimated daily discharges: Dec. 2-5, 11-14, Dec. 27 to Jan. 30, and Mar. 9-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	131	170	235	e110	1380	313	682	561	908	711	571	530
2	135	164	e180	e130	720	306	614	551	839	665	558	390
3	133	160	e140	e110	384	298	578	550	834	800	576	357
4	127	161	e110	e85	277	286	547	515	906	752	570	336
5	125	162	e100	e110	279	283	524	499	759	2700	909	325
6	126	161	122	e150	242	281	534	489	713	3690	630	317
7	125	157	180	e130	226	278	2060	663	689	2270	732	309
8	129	156	196	e110	223	255	1800	528	1170	1380	686	301
9	130	157	180	e95	261	e130	1390	491	4220	1100	588	389
10	128	157	167	e90	492	e170	1180	474	1570	1000	544	395
11	127	151	e150	e95	652	e250	1060	462	8210	891	520	376
12	151	150	e130	e80	346	e320	980	471	4690	807	494	364
13	229	153	e110	e75	314	e380	920	460	2110	757	485	342
14	192	153	e130	e85	302	e420	851	435	7840	708	499	327
15	154	152	156	e95	401	357	815	2030	7140	850	486	304
16	145	140	167	e90	1690	318	942	2930	3830	865	513	259
17	141	134	153	e85	715	319	853	1080	3210	668	455	257
18	137	152	162	e90	591	333	785	892	3080	634	434	253
19	135	160	160	e95	567	342	744	791	2070	604	423	259
20	132	156	157	e100	486	310	773	833	1690	568	411	312
21	134	148	135	e95	447	350	812	795	1510	543	536	295
22	133	145	145	e95	433	391	731	1750	1320	2110	620	255
23	135	139	166	e90	430	409	701	1020	1160	972	458	244
24	156	137	160	e95	413	399	675	3580	1120	828	420	244
25	195	143	150	e100	390	413	649	1320	996	765	398	246
26	196	143	144	e90	379	613	638	1070	913	731	376	241
27	186	142	e120	e95	354	1060	613	956	857	702	417	233
28	179	139	e130	e110	331	896	571	871	833	682	433	224
29	178	167	e125	e130	---	740	571	3880	755	650	386	223
30	183	303	e130	e200	---	703	573	1440	885	611	367	219
31	178	---	e110	268	---	691	---	1050	---	592	356	---
TOTAL	4685	4712	4600	3378	13725	12614	25166	33437	66827	31606	15851	9126
MEAN	151	157	148	109	490	407	839	1079	2228	1020	511	304
MAX	229	303	235	268	1690	1060	2060	3880	8210	3690	909	530
MIN	125	134	100	75	223	130	524	435	689	543	356	219
AC-FT	9290	9350	9120	6700	27220	25020	49920	66320	132600	62690	31440	18100
CFSM	.25	.26	.24	.18	.80	.67	1.38	1.77	3.66	1.67	.84	.50
IN.	.29	.29	.28	.21	.84	.77	1.54	2.04	4.08	1.93	.97	.56

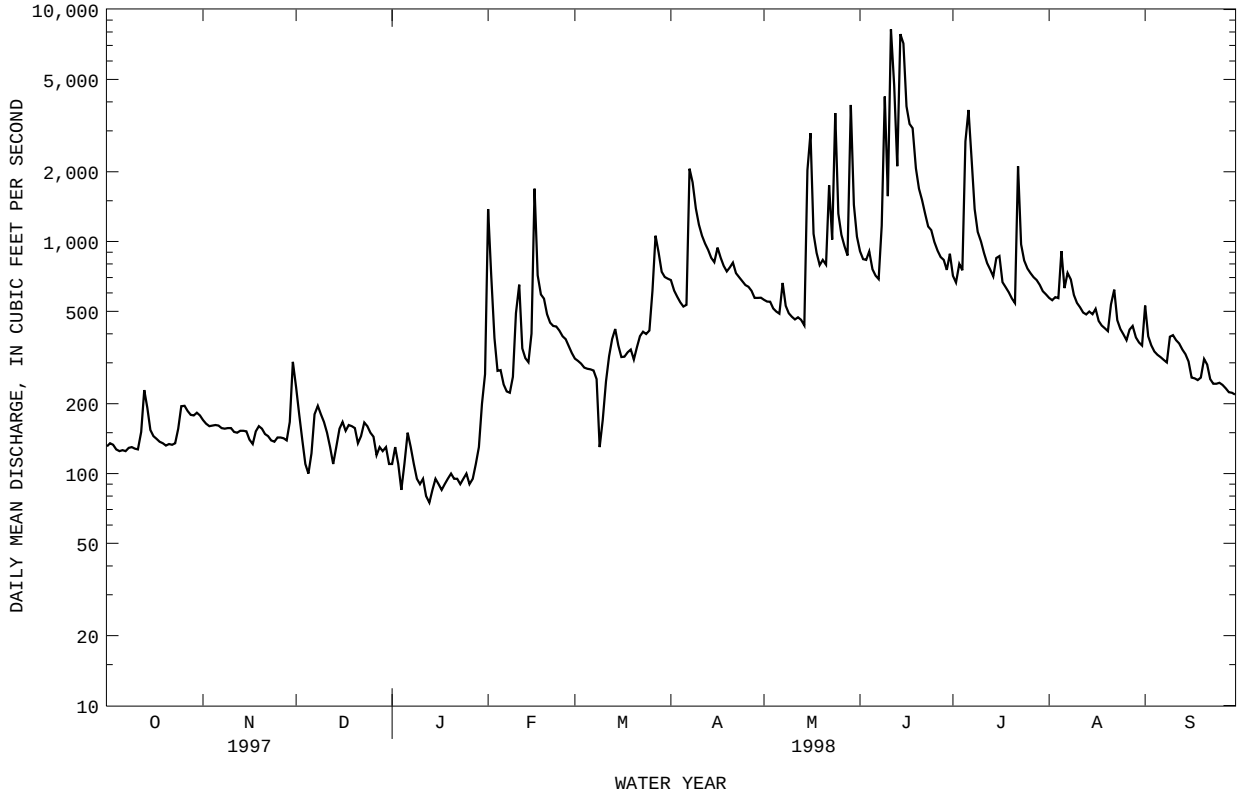
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1998, BY WATER YEAR (WY)

MEAN	196	185	160	125	286	540	426	506	609	423	247	306
MAX	998	910	628	625	993	1946	1295	1586	2228	2925	1073	2412
(WY)	1987	1973	1973	1973	1983	1979	1983	1973	1998	1993	1996	1972
MIN	35.3	32.1	17.9	4.58	27.2	40.3	45.6	30.1	26.7	38.4	26.4	14.7
(WY)	1972	1971	1971	1971	1967	1968	1968	1967	1977	1970	1968	1971

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1960 - 1998	
ANNUAL TOTAL	143934		225727			
ANNUAL MEAN	394		618		334	
HIGHEST ANNUAL MEAN					966	1993
LOWEST ANNUAL MEAN					42.4	1968
HIGHEST DAILY MEAN	6200	Feb 19	8210	Jun 11	23300	Sep 12 1972
LOWEST DAILY MEAN	100	Dec 5	75	Jan 13	2.2	Feb 8 1971a
ANNUAL SEVEN-DAY MINIMUM	127	Oct 4	86	Jan 12	2.5	Feb 4 1971
INSTANTANEOUS PEAK FLOW			15000	Jun 15	30100	Jul 10 1993
INSTANTANEOUS PEAK STAGE			17.53	Jun 15	23.52	Jul 10 1993
ANNUAL RUNOFF (AC-FT)	285500		447700		242000	
ANNUAL RUNOFF (CFSM)	.65		1.02		.55	
ANNUAL RUNOFF (INCHES)	8.79		13.79		7.45	
10 PERCENT EXCEEDS	699		1090		731	
50 PERCENT EXCEEDS	298		379		162	
90 PERCENT EXCEEDS	141		127		36	

a Also Feb 9, 1971
e Estimated

06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IA--Continued



06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IA

LOCATION.--Lat 40°52'23", long 95°34'48", in NE$^1/_4$ NE$^1/_4$ sec.17, T.70 N., R.41 W., Fremont County, Hydrologic Unit 10240002, on right bank at upstream side of bridge on State Highway 184, 0.3 mi downstream from Deer Creek, 0.5 mi west of Randolph, and 16.0 mi upstream from confluence with East Nishnabotna River, and at mile 31.5 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--1,326 mi^2.

PERIOD OF RECORD.--June 1948 to current year.

REVISED RECORDS.--WSP 1440: Drainage area. WDR IA-74-1: 1973 (M). WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 932.99 ft above sea level, unadjusted. Prior to Aug. 26, 1955, nonrecording gage with supplementary water-stage recorder operating above 8.4 ft. June 30, 1949 to Aug. 25, 1955 at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 27 to Jan. 29, Feb. 25, and Mar. 11-14. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey satellite data collection platform and rain gage at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 24 ft, discharge not determined, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	412	708	e252	2330	847	2430	1450	2380	2250	1360	724
2	251	367	527	e254	3210	821	2100	1390	2130	1950	1390	848
3	252	341	459	e231	1380	810	1870	1360	2010	1870	1510	733
4	246	326	420	e206	905	794	1730	1290	2200	2400	1380	685
5	239	323	357	e250	758	777	1640	1220	2060	5630	1350	658
6	236	320	367	e320	725	767	1570	1220	1840	9410	1650	642
7	236	318	313	e300	682	767	4910	1310	1740	4730	1350	626
8	251	317	342	e270	663	745	5780	1470	1940	3970	1470	593
9	300	315	391	e250	684	468	4300	1240	5550	3140	1360	589
10	261	308	379	e220	862	498	3710	1170	4580	2830	1220	637
11	253	304	333	e240	1470	e565	3450	1140	4620	2610	1150	650
12	301	302	310	e230	1350	e691	3280	1100	9290	2330	1100	636
13	437	302	298	e210	979	e846	3020	1080	4390	2160	1060	622
14	407	303	298	e240	948	e965	2650	1050	13000	2010	1070	607
15	370	293	311	e250	931	779	2400	1460	25800	2590	1040	591
16	317	286	330	e240	1590	784	2300	5340	16000	2710	1010	571
17	296	273	331	e230	2720	856	2380	3110	6230	2220	1010	531
18	283	275	335	e240	1480	925	2200	2140	5910	1840	932	519
19	276	285	337	e270	1350	936	2020	1850	5060	1730	896	511
20	271	297	352	e290	1300	922	2020	2390	4030	1620	854	590
21	273	293	352	e280	1150	1050	2020	3100	3800	1490	1100	606
22	279	283	347	e260	1100	1220	1980	4910	3490	4330	1230	581
23	285	271	346	e240	1070	1280	1840	3730	3300	3400	1090	526
24	306	265	372	e380	1030	1280	1720	3560	3150	2260	901	513
25	395	260	370	e500	e1010	1370	1630	4120	2840	1950	845	511
26	511	265	350	e440	962	1780	1560	2770	2580	1850	809	502
27	465	265	e237	e380	924	2280	1560	2420	2380	1730	828	486
28	407	263	e310	e420	888	2780	1570	2190	3960	1640	965	481
29	395	344	e276	e460	---	2230	1520	4460	2460	1560	859	473
30	432	788	e262	483	---	2380	1470	4870	2200	1490	779	462
31	479	---	e265	575	---	2520	---	2890	---	1400	740	---
TOTAL	9968	9564	10985	9411	34451	35733	72630	72800	150920	83100	34308	17704
MEAN	322	319	354	304	1230	1153	2421	2348	5031	2681	1107	590
MAX	511	788	708	575	3210	2780	5780	5340	25800	9410	1650	848
MIN	236	260	237	206	663	468	1470	1050	1740	1400	740	462
AC-FT	19770	18970	21790	18670	68330	70880	144100	144400	299300	164800	68050	35120
CFSM	.24	.24	.27	.23	.93	.87	1.83	1.77	3.79	2.02	.83	.45
IN.	.28	.27	.31	.26	.97	1.00	2.04	2.04	4.23	2.33	.96	.50

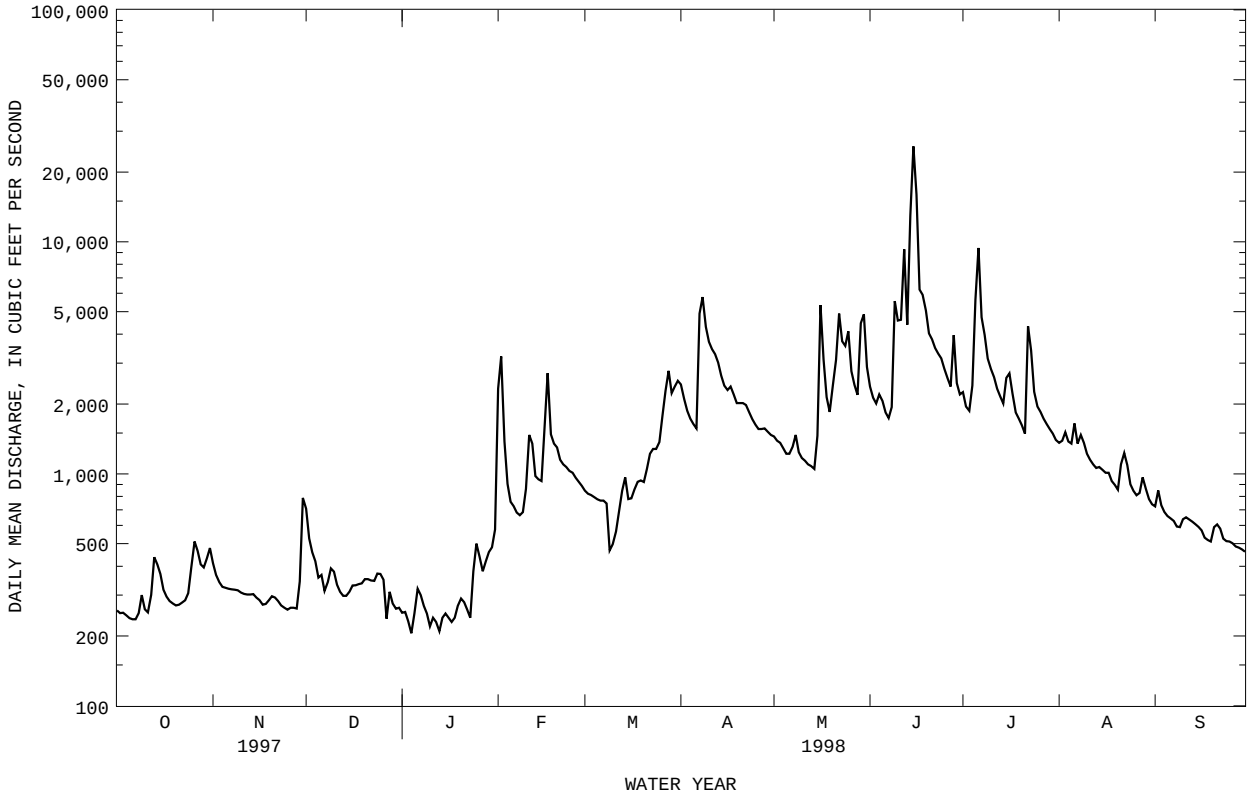
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1998, BY WATER YEAR (WY)

MEAN	383	349	303	268	555	974	794	1037	1262	883	571	540
MAX	2002	1277	1140	1201	1777	3877	2867	3227	5031	6357	2610	2531
(WY)	1987	1973	1973	1973	1973	1979	1973	1973	1998	1993	1993	1972
MIN	27.1	33.6	20.6	17.4	19.4	67.8	42.7	97.3	65.6	71.2	30.1	41.0
(WY)	1956	1956	1956	1956	1956	1956	1956	1967	1956	1954	1955	1955

06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1949 - 1998	
ANNUAL TOTAL	283335		541574			
ANNUAL MEAN	776		1484		660	
HIGHEST ANNUAL MEAN					1985	1993
LOWEST ANNUAL MEAN					111	1968
HIGHEST DAILY MEAN	6870	Feb 19	25800	Jun 15	25800	Jun 15 1998
LOWEST DAILY MEAN	170	Jan 10	206	Jan 4	10	Dec 17 1955a
ANNUAL SEVEN-DAY MINIMUM	244	Oct 2	233	Jan 10	11	Dec 16 1955
INSTANTANEOUS PEAK FLOW			28700	Jun 15	40800	May 26 1987
INSTANTANEOUS PEAK STAGE			23.92	Jun 15	24.80	Mar 5 1949b
INSTANTANEOUS LOW FLOW			206	Jun 15		
ANNUAL RUNOFF (AC-FT)	562000		1074000		478000	
ANNUAL RUNOFF (CFSM)	.59		1.12		.50	
ANNUAL RUNOFF (INCHES)	7.95		15.19		6.76	
10 PERCENT EXCEEDS	1460		3170		1410	
50 PERCENT EXCEEDS	600		888		343	
90 PERCENT EXCEEDS	273		270		90	

a Also Dec 18-21, 1955
b From graph based on gage readings, backwater from ice
e Estimated



06809210 EAST NISHNABOTNA RIVER NEAR ATLANTIC, IA

LOCATION.--Lat 41°20'46", long 95°04'36", in NW$^1/_4$ NW$^1/_4$ sec.35, T.76 N., R.37 W., Cass County, Hydrologic Unit 10240003, on left bank at downstream side of bridge on county highway, 1.6 mi upstream from Turkey Creek, 5.2 mi southwest of junction of U.S. Highway 6 and State Highway 83 in Atlantic, 69.1 mi upstream from confluence with West Nishnabotna River, and at mile 84.6 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--436 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 1,105.83 ft above sea level. Prior to Oct. 1, 1970, at site 2.2 mi upstream at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 3-7, Jan. 3-30, and Mar. 9-16. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 2, 1958 reached a stage of 22.49 ft, from floodmark, discharge, 34,200 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

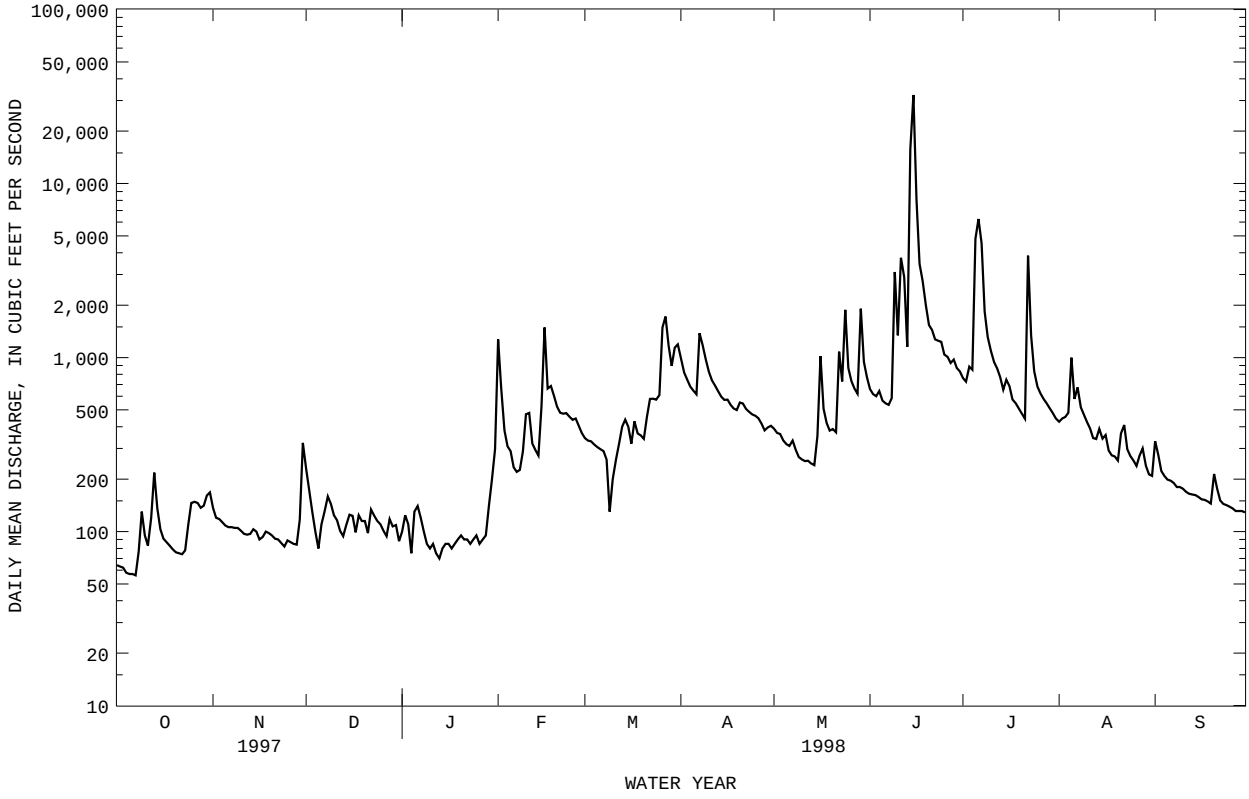
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	137	230	100	1270	344	994	390	659	763	428	331
2	63	120	173	124	669	333	820	369	616	727	446	277
3	62	118	e130	e110	381	330	745	363	600	887	455	223
4	58	113	e100	e75	309	316	681	334	642	852	482	209
5	57	108	e80	e130	290	306	645	318	566	4810	1000	199
6	57	106	e110	e140	234	297	615	310	545	6260	578	196
7	56	106	e130	e120	220	290	1380	333	534	4540	673	190
8	77	105	159	e100	226	259	1180	295	584	1840	517	180
9	130	105	144	e85	288	e130	972	268	3100	1310	470	180
10	95	101	124	e80	472	e200	825	260	1340	1090	426	176
11	83	97	116	e85	481	e260	739	254	3740	943	391	169
12	120	96	101	e75	321	e320	690	255	2900	867	344	165
13	218	97	94	e70	294	e400	640	246	1150	770	340	163
14	136	103	109	e80	273	e440	597	241	15800	653	389	162
15	103	100	125	e85	526	e400	571	354	32300	745	342	158
16	91	90	123	e85	1490	e320	572	1020	8090	686	359	153
17	87	93	99	e80	663	430	535	508	3450	574	292	152
18	83	100	124	e85	685	366	509	421	2760	545	274	149
19	79	98	115	e90	602	357	499	380	1990	510	270	145
20	76	95	115	e95	522	341	551	388	1540	476	256	214
21	75	91	98	e90	482	455	544	372	1440	445	366	176
22	74	90	134	e90	476	578	507	1080	1270	3850	409	151
23	78	86	123	e85	479	580	486	728	1250	1340	297	144
24	109	82	115	e90	458	573	471	1880	1230	836	271	142
25	146	89	110	e95	439	608	463	870	1040	680	256	139
26	148	87	101	e85	446	1490	448	733	1010	621	238	136
27	146	85	94	e90	405	1720	417	664	931	578	273	131
28	137	84	118	e95	368	1170	381	619	974	545	300	131
29	141	117	107	e140	---	896	396	1910	871	511	238	131
30	161	323	109	e200	---	1140	405	944	831	479	213	129
31	168	---	88	297	---	1190	---	771	---	446	209	---
TOTAL	3178	3222	3698	3251	13769	16839	19278	17878	93753	40179	11802	5201
MEAN	103	107	119	105	492	543	643	577	3125	1296	381	173
MAX	218	323	230	297	1490	1720	1380	1910	32300	6260	1000	331
MIN	56	82	80	70	220	130	381	241	534	445	209	129
AC-FT	6300	6390	7330	6450	27310	33400	38240	35460	186000	79700	23410	10320
CFSM	.24	.25	.27	.24	1.13	1.25	1.47	1.32	7.17	2.97	.87	.40
IN.	.27	.27	.32	.28	1.17	1.44	1.64	1.53	8.00	3.43	1.01	.44

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1998, BY WATER YEAR (WY)

MEAN	145	137	113	92.6	210	417	366	413	514	346	181	221
MAX	1069	757	529	529	812	1378	1139	1208	3125	2747	1394	1855
(WY)	1987	1973	1993	1973	1971	1965	1973	1986	1998	1993	1993	1972
MIN	21.0	20.3	10.6	7.68	18.7	28.4	27.9	15.0	23.5	15.6	13.4	14.8
(WY)	1967	1969	1964	1971	1968	1968	1981	1967	1977	1968	1968	1971

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1961 - 1998	
ANNUAL TOTAL	109535		232048			
ANNUAL MEAN	300		636		263	
HIGHEST ANNUAL MEAN					842	1993
LOWEST ANNUAL MEAN					23.7	1968
HIGHEST DAILY MEAN	4840	Feb 18	32300	Jun 15	32300	Jun 15 1998
LOWEST DAILY MEAN	56	Oct 7	56	Oct 7	2.5	Jul 10 1977
ANNUAL SEVEN-DAY MINIMUM	60	Oct 1	60	Oct 1	7.0	Dec 17 1963
INSTANTANEOUS PEAK FLOW			41400	Jun 15	41400	Jun 15 1998
INSTANTANEOUS PEAK STAGE			22.36	Jun 15	22.81	Sep 12 1972
INSTANTANEOUS LOW FLOW			54	Oct 6		
ANNUAL RUNOFF (AC-FT)	217300		460300		190500	
ANNUAL RUNOFF (CFSM)	.69		1.46		.60	
ANNUAL RUNOFF (INCHES)	9.35		19.80		8.20	
10 PERCENT EXCEEDS	617		1060		574	
50 PERCENT EXCEEDS	181		297		110	
90 PERCENT EXCEEDS	81		89		24	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
100,000
50,000
20,000
10,000
5,000
2,000
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1997
1998
WATER YEAR

06809500 EAST NISHNABOTNA RIVER AT RED OAK, IA

LOCATION.--Lat 41°00'31", long 95°14'29", in NW$^1/_4$ SE$^1/_4$ sec.29, T.72 N., R.38 W., Montgomery County, Hydrologic Unit 10240003, on upstream side of Coolbaugh Street and 200 ft left of left end of Coolbaugh Street bridge in Red Oak, 0.2 mi upstream from Red Oak Creek, 38.0 mi upstream from confluence with West Nishnabotna River, and at mile 53.6 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--894 mi^2.

PERIOD OF RECORD.--May 1918 to November 1924, February 1925 to July 1925, May 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1921, 1922-23 (M), 1924, 1942 (M), 1944 (M), 1946. WSP 1440: Drainage area. WSP 1710: 1957.

GAGE.--Water-stage recorder. Datum of gage is 1,005.45 ft above sea level. Prior to July 5, 1925, nonrecording gage at present site at datum 4.60 ft higher. May 29, 1936 to Nov. 13, 1952, nonrecording gage with supplementary water-stage recorder in operation above 3.2 ft gage height. July 30, 1939 to Nov. 13, 1952, and Nov. 14, 1952 to June 13, 1966, water-stage recorder, all at site 0.5 mi upstream at datum 5.00 ft higher. June 14, 1966 to Sept. 30, 1969, at present site at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Jan. 4-31. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	307	515	188	2140	622	2580	677	1240	1510	767	359
2	128	264	356	234	2310	595	2070	635	1070	1410	759	459
3	126	235	323	287	1070	584	1740	632	989	1390	821	380
4	123	227	309	e250	696	571	1560	586	1090	1780	790	340
5	120	217	250	e190	650	553	1410	550	951	4630	1070	320
6	122	206	202	e270	584	544	1320	528	850	11300	1050	309
7	120	203	248	e260	553	542	2330	539	799	6990	1070	300
8	129	199	305	e240	544	523	3790	539	1030	3630	1180	289
9	247	198	286	e220	572	312	2690	495	6340	2420	876	274
10	220	191	253	e210	783	338	2180	480	3280	2010	742	266
11	171	182	234	e190	1290	404	1880	465	3900	1790	678	257
12	198	179	218	e200	846	509	1680	470	5620	1580	631	247
13	296	180	180	e190	695	625	1520	466	2850	1440	608	239
14	339	179	152	e170	674	701	1380	437	13000	1320	613	235
15	232	178	194	e180	687	646	1300	456	45100	1280	612	229
16	191	167	238	e190	2710	625	1230	1920	31200	1390	573	221
17	175	154	222	e200	1840	620	1160	1270	7070	1160	540	216
18	169	160	215	e190	1350	681	1040	777	4770	1080	497	212
19	165	180	240	e210	1380	734	970	672	4050	1010	471	210
20	160	182	233	e220	1130	707	987	714	3220	930	469	237
21	156	175	218	e230	990	829	1110	909	2920	863	778	316
22	153	168	203	e220	893	1140	961	2720	2650	5660	718	257
23	157	164	253	e210	881	1280	876	2470	2470	2960	575	223
24	172	161	237	e200	835	1220	825	2500	2360	1690	465	219
25	239	159	227	e220	759	1280	785	2290	2190	1320	424	224
26	314	167	216	e230	751	2190	761	1480	1980	1180	385	227
27	301	165	199	e210	725	3800	723	1250	1830	1100	380	223
28	287	162	188	e220	665	2740	662	1100	1770	1020	475	216
29	283	213	211	e250	---	2190	644	3110	1740	942	428	217
30	312	397	206	e290	---	2390	678	2680	1580	885	376	222
31	328	---	208	e260	---	3360	---	1580	---	810	343	---
TOTAL	6262	5919	7539	6829	29003	33855	42842	35397	159909	68480	20164	7943
MEAN	202	197	243	220	1036	1092	1428	1142	5330	2209	650	265
MAX	339	397	515	290	2710	3800	3790	3110	45100	11300	1180	459
MIN	120	154	152	170	544	312	644	437	799	810	343	210
AC-FT	12420	11740	14950	13550	57530	67150	84980	70210	317200	135800	40000	15750
CFSM	.23	.22	.27	.25	1.16	1.22	1.60	1.28	5.96	2.47	.73	.30
IN.	.26	.25	.31	.28	1.21	1.41	1.78	1.47	6.65	2.85	.84	.33

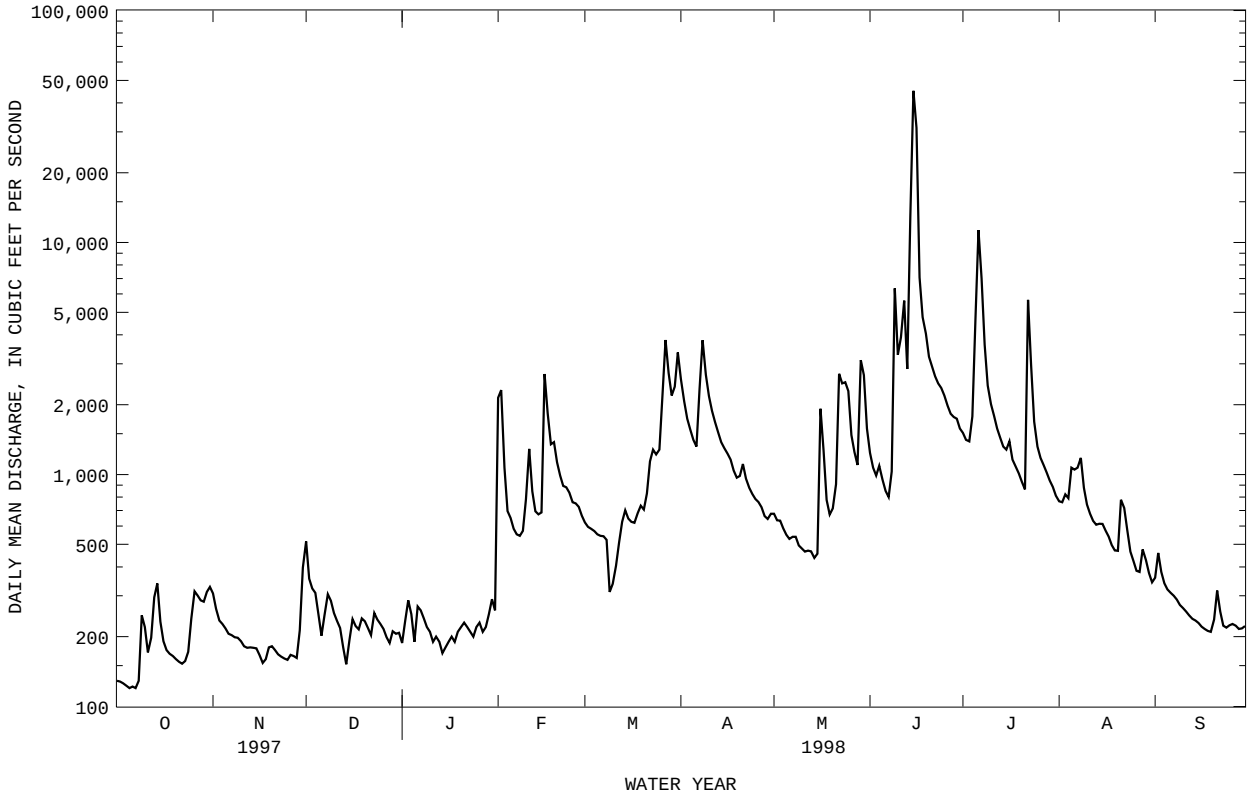
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1998, BY WATER YEAR (WY)

MEAN	228	216	171	159	373	686	569	703	909	562	359	367
MAX	1816	1335	1038	1078	1438	2596	2194	2440	5330	6971	2821	3074
(WY)	1987	1973	1993	1973	1973	1965	1973	1973	1998	1993	1993	1972
MIN	16.5	19.9	14.6	12.3	17.2	32.3	30.4	35.2	40.5	24.5	17.0	14.9
(WY)	1938	1940	1938	1940	1940	1938	1956	1939	1968	1936	1936	1937

06809500 EAST NISHNABOTNA RIVER AT RED OAK, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1919 - 1998	
ANNUAL TOTAL	215009		424142			
ANNUAL MEAN	589		1162		446	
HIGHEST ANNUAL MEAN					1842	1993
LOWEST ANNUAL MEAN					54.9	1968
HIGHEST DAILY MEAN	6500	Feb 19	45100	Jun 15	45100	Jun 15 1998
LOWEST DAILY MEAN	120	Oct 5	120	Oct 5	6.0	Aug 18 1936
ANNUAL SEVEN-DAY MINIMUM	124	Oct 1	124	Oct 1	8.1	Dec 15 1937
INSTANTANEOUS PEAK FLOW			60500	Jun 15	60500	Jun 15 1998
INSTANTANEOUS PEAK STAGE			29.39	Jun 15	29.39	Jun 15 1998
INSTANTANEOUS LOW FLOW			120	Oct 5		
ANNUAL RUNOFF (AC-FT)	426500		841300		323000	
ANNUAL RUNOFF (CFSM)	.66		1.30		.50	
ANNUAL RUNOFF (INCHES)	8.95		17.65		6.78	
10 PERCENT EXCEEDS	1300		2340		960	
50 PERCENT EXCEEDS	392		544		182	
90 PERCENT EXCEEDS	160		180		41	

e Estimated



06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA

LOCATION.--Lat 40°37'57", long 95°37'32", in $SW^1/_4$ $SE^1/_4$ sec.11, T.67 N., R.42 W., Fremont County, Hydrologic Unit 10240004, on left bank 1.7 mi downstream from confluence of East Nishnabotna and West Nishnabotna Rivers, 2 mi northeast of Hamburg, and at mile 13.8.

DRAINAGE AREA.--2,806 mi^2.

PERIOD OF RECORD.--March 1922 to September 1923, October 1928 to current year. Monthly discharge only for some periods published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1923, 1929-37, 1938-40 (M), 1943 (M). WSP 1440: Drainage area. WDR IA-74-1: 1973.

GAGE.--Water-stage recorder. Datum of gage is 894.17 ft above sea level. See WSP 1730 for history of changes prior to Nov. 16, 1950.

REMARKS.--Estimated daily discharges: Jan. 4-30 and Mar. 9-17. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	456	1030	1870	798	2460	1930	5980	2850	4170	5790	2890	1340
2	452	933	1610	842	5330	1820	5070	2780	3770	5290	2790	1400
3	448	866	1360	980	3570	1770	4470	2710	3500	4930	2920	1440
4	431	822	1250	e800	2280	1710	4080	2660	3560	5250	2820	1330
5	431	795	1090	e700	1730	1660	3840	2550	3570	6280	2690	1250
6	427	778	1090	e900	1580	1630	3640	2460	3250	10300	3260	1220
7	427	761	1440	e850	1440	1600	5580	2470	3120	14400	2930	1190
8	446	755	2420	e750	1350	1610	10200	2490	3340	14600	3020	1140
9	571	740	1910	e700	1340	e1000	8280	2450	8800	12600	3080	1090
10	579	727	1190	e650	1730	e1100	6560	2330	10500	9890	2650	1090
11	549	724	980	e650	2730	e1300	5750	2250	7030	8080	2440	1120
12	563	713	874	e650	2930	e1600	5210	2280	15400	6740	2320	1150
13	819	709	856	e550	2240	e2000	4860	2200	10100	5990	2230	1120
14	776	705	842	e580	2000	e2300	4550	2130	16700	5410	2180	1070
15	765	696	875	e600	1950	e2000	4410	2260	23900	5160	2180	1030
16	638	674	881	e600	2240	e1900	4150	5460	27200	5320	2100	1030
17	573	663	885	e600	4770	e2000	4050	5450	53700	5120	2020	1010
18	553	659	876	e620	3370	2350	3880	3580	33900	4420	1890	974
19	541	669	850	e700	2970	2300	3690	3170	24800	4100	1780	948
20	527	694	889	e750	2940	2300	3620	3560	20100	3840	1690	1060
21	521	692	909	e750	2670	2560	3590	4210	17100	3560	1810	1130
22	520	682	884	e700	2520	2880	3600	6950	15100	5040	2600	1170
23	536	663	850	e820	2450	3150	3400	7250	13000	7630	2310	1020
24	572	654	910	e1000	2400	3190	3280	5120	11100	6620	1860	939
25	632	644	908	e1200	2340	3230	3170	7080	9650	5200	1650	924
26	1060	637	857	e1050	2280	3860	3050	4720	8380	4500	1560	924
27	1140	644	809	e900	2190	5120	2970	4140	7320	4050	1560	887
28	950	641	824	e950	2090	5950	2960	3830	7720	3710	1700	872
29	932	858	798	e1010	---	4950	2950	5180	7010	3450	1740	862
30	978	1840	800	e1100	---	5620	2890	9320	6240	3360	1550	837
31	1070	---	789	1170	---	6140	---	5060	---	3090	1430	---
TOTAL	19883	23068	33376	24920	69890	82530	133730	120950	383030	193720	69650	32567
MEAN	641	769	1077	804	2496	2662	4458	3902	12770	6249	2247	1086
MAX	1140	1840	2420	1200	5330	6140	10200	9320	53700	14600	3260	1440
MIN	427	637	789	550	1340	1000	2890	2130	3120	3090	1430	837
AC-FT	39440	45760	66200	49430	138600	163700	265300	239900	759700	384200	138200	64600
CFSM	.23	.27	.38	.29	.89	.95	1.59	1.39	4.55	2.23	.80	.39
IN.	.26	.31	.44	.33	.93	1.09	1.77	1.60	5.08	2.57	.92	.43

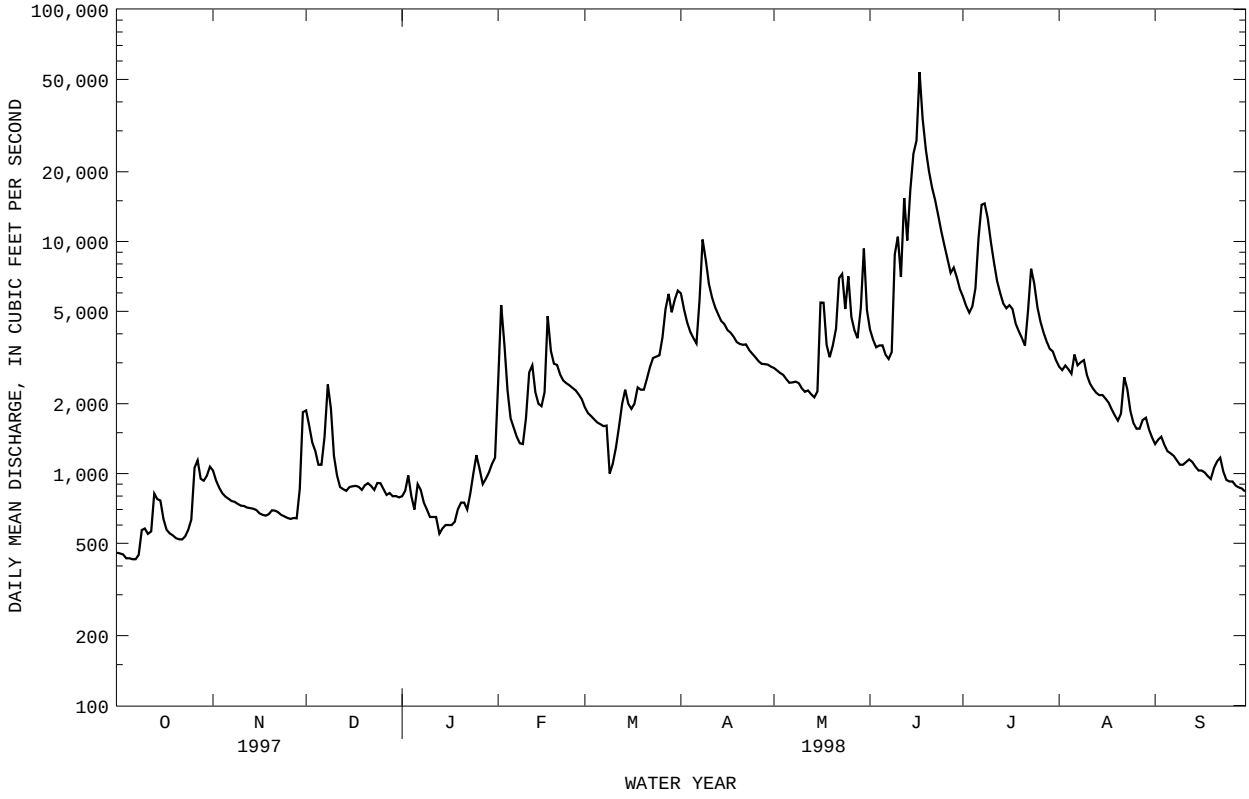
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 1998, BY WATER YEAR (WY)

MEAN	675	671	561	563	1057	1848	1482	1865	2578	1676	1081	1016
MAX	5004	3083	2557	3585	4720	7229	5866	6621	16430	17780	6266	7385
(WY)	1987	1973	1973	1973	1973	1979	1973	1995	1947	1993	1993	1993
MIN	39.5	42.9	27.1	21.3	30.3	115	89.7	68.2	151	52.8	16.8	44.1
(WY)	1938	1938	1938	1940	1940	1931	1956	1934	1956	1936	1934	1937

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1922 - 1998	
ANNUAL TOTAL	622228		1187314			
ANNUAL MEAN	1705		3253		1259	
HIGHEST ANNUAL MEAN					5062	1993
LOWEST ANNUAL MEAN					170	1934
HIGHEST DAILY MEAN	13200	Feb 19	53700	Jun 17	53700	Jun 17 1998
LOWEST DAILY MEAN	400	Jan 11	427	Oct 6,7	4.5	Aug 30 1934
ANNUAL SEVEN-DAY MINIMUM	437	Oct 2	437	Oct 2	9.9	Aug 24 1934
INSTANTANEOUS PEAK FLOW			65100	Jun 17	65100	Jun 17 1998
INSTANTANEOUS PEAK STAGE			33.18	Jun 17	33.18	Jun 17 1998
INSTANTANEOUS LOW FLOW			419	Oct 6		
ANNUAL RUNOFF (AC-FT)	1234000		2355000		912100	
ANNUAL RUNOFF (CFSM)	.61		1.16		.45	
ANNUAL RUNOFF (INCHES)	8.25		15.74		6.10	
10 PERCENT EXCEEDS	3350		6580		2880	
50 PERCENT EXCEEDS	1340		1930		594	
90 PERCENT EXCEEDS	572		657		120	

e Estimated

06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA--Continued



06813500 MISSOURI RIVER AT RULO, NE

LOCATION.--Lat 40°03'13", long 95°25'19", in NW$^{1}/_{4}$ NW$^{1}/_{4}$ sec.17, T.1 N., R.18 E., Richardson County, Hydrologic Unit 10240005, on right bank at downstream side of bridge on U.S. Highway 159 at Rulo, 3.2 mi upstream from Big Nemaha River, and at mile 498.0.

DRAINAGE AREA.--414,900 mi^{2}, approximately. The 3,959 mi^{2} in Great Divide basin are not included.

PERIOD OF RECORD.--October 1949 to current year in reports of U.S. Geological Survey. Gage- height record collected at site 80 ft upstream January 1886 to December 1899 published in reports of Missouri River Commission; September 1929 to September 1950 in files of Kansas City office of U.S. Army Corps of Engineers.

GAGE.--Water-stage recorder. Datum of gage is 837.23 ft above sea level. Oct. 1949 to Sept. 12, 1950, nonrecording gage at site 80 ft upstream and Sept. 13, 1950 to Apr. 19, 1983, recording gage on downstream end of middle pier, all at same datum.

REMARKS.--Estimated Daily Discharges: Aug. 29-31 and Sept. 13, 14. Records good, except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. Fort Randall Dam was completed in July 1952, with storage beginning in December 1952. Gavins Point Dam was completed in July 1955, with storage beginning in December 1955. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 358,000 ft^{3}/s Apr. 22, 1952, gage height, 25.60 ft; minimum daily discharge, 4,420 ft^{3}/s Jan. 13, 1957; minimum gage height, -0.19 ft Dec. 25, 1990, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1881 reached a stage of 22.9 ft, from floodmark, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77800	85900	94200	43000	51400	45300	69200	55700	61200	64300	50400	41300
2	77200	85100	90500	43300	61100	45100	63700	54600	58800	61400	49700	41500
3	76400	84700	88100	43500	51700	45200	61300	54400	56300	58700	50300	41500
4	76200	85100	84800	43500	46800	44100	60700	54800	55100	58300	50600	41500
5	76200	84500	80200	43200	44600	44000	58500	54000	54400	68300	50400	41900
6	75800	83500	76100	42600	43300	43500	57800	53400	53200	93000	50800	42400
7	75500	84000	72100	41700	43600	43100	61500	51800	53000	102000	50400	41800
8	75800	84100	67700	41500	43500	43800	82800	50500	53600	99100	50300	41800
9	76600	83600	65200	40200	43200	42700	99200	49800	65700	92700	51100	41800
10	77900	83000	62200	39100	43600	40400	93200	49700	91900	89500	51300	42000
11	77700	83600	60000	37200	48100	38600	82700	48600	87200	82700	48500	42400
12	78100	84100	57400	34500	47800	38000	75500	48400	97500	70000	48000	42600
13	80400	83800	55000	33400	45900	37900	70500	48700	95600	63900	47800	e42600
14	81300	83700	52400	30800	45300	38600	66800	48900	114000	59800	47300	e42900
15	82600	83300	49500	30200	45100	39300	63800	49400	129000	58200	47700	42800
16	83900	83400	47800	29800	44900	40200	63800	52300	129000	59400	48100	43200
17	82100	83100	46600	30000	46000	42800	68100	58400	123000	59400	50200	43600
18	80500	82700	46700	31200	47200	47200	67100	54200	121000	55700	48800	44000
19	80400	82100	46200	31900	46100	48900	63000	52300	113000	52700	47400	43500
20	79300	82400	46400	31500	46300	48800	60000	52100	102000	51600	46000	44300
21	78600	82300	46500	31200	46200	50200	58800	55600	96300	50500	45700	46600
22	78100	82400	45700	32900	45300	52300	57300	61700	84700	50200	56900	46100
23	78700	82700	44900	33400	44600	52400	55400	76900	73900	58700	61900	45300
24	78800	83100	44600	34200	44400	51300	54500	67500	67200	56500	55700	44500
25	81100	82100	45400	35800	44200	52000	52900	63000	70000	53500	48500	44100
26	84300	82300	44600	36900	44500	55600	51400	62200	81600	51000	45900	43500
27	87300	82500	44000	37500	45100	57800	51800	59500	74100	51100	45200	43700
28	85900	82900	43600	39000	45500	62600	56500	57800	68500	49900	46900	43300
29	85100	85600	43600	40700	---	66600	59800	64100	72400	49600	e45500	43600
30	85600	94700	43300	41800	---	80600	58700	83700	67800	51500	e44000	43100
31	86300	---	43500	43300	---	76900	---	69900	---	52200	e42000	---
TOTAL	2481500	2516300	1778800	1148800	1295300	1515800	1946300	1763900	2471000	1975400	1523300	1293200
MEAN	80050	83880	57380	37060	46260	48900	64880	56900	82370	63720	49140	43110
MAX	87300	94700	94200	43500	61100	80600	99200	83700	129000	102000	61900	46600
MIN	75500	82100	43300	29800	43200	37900	51400	48400	53000	49600	42000	41300
AC-FT	4922000	4991000	3528000	2279000	2569000	3007000	3860000	3499000	4901000	3918000	3021000	2565000
CFSM	.19	.20	.14	.09	.11	.12	.16	.14	.20	.15	.12	.10
IN.	.22	.23	.16	.10	.12	.14	.17	.16	.22	.18	.14	.12

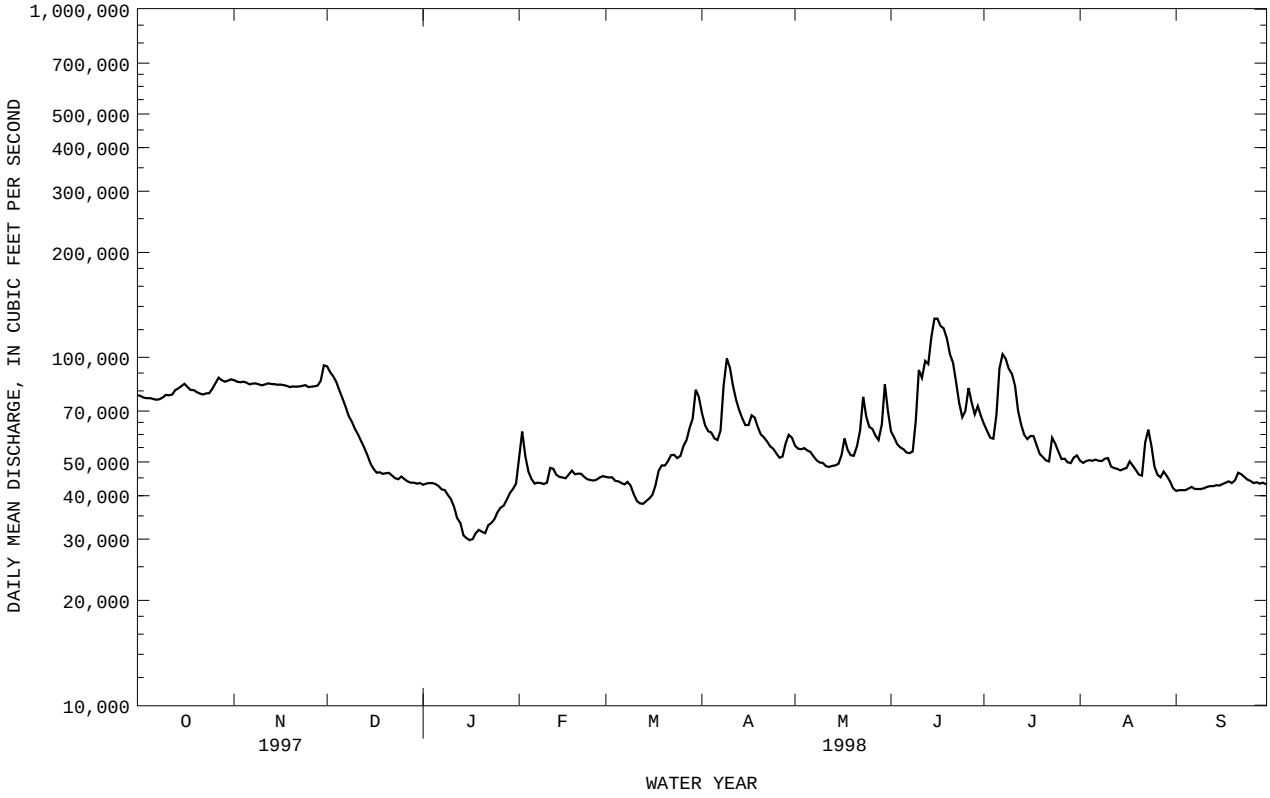
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1998, BY WATER YEAR (WY)

MEAN	44800	40410	26740	22300	28390	41390	51350	51600	56780	50990	45130	45380
MAX	80050	83880	57380	42280	53140	79590	106100	97280	130600	164800	78730	76410
(WY)	1998	1998	1998	1973	1997	1979	1997	1997	1984	1993	1996	1997
MIN	25580	17000	9953	10800	13230	15380	21820	33790	33710	33860	29820	34140
(WY)	1962	1962	1956	1957	1957	1957	1957	1956	1956	1963	1955	1991

06813500 MISSOURI RIVER AT RULO, NE--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1953 - 1998a	
ANNUAL TOTAL	27331900		21709600			
ANNUAL MEAN	74880		59480		42140	
HIGHEST ANNUAL MEAN					71880	1997
LOWEST ANNUAL MEAN					26340	1957
HIGHEST DAILY MEAN	121000	Apr 15	129000	Jun 15,16	289000	Jul 24 1993
LOWEST DAILY MEAN	33400	Jan 2	29800	Jan 16	4420	Jan 13 1957
ANNUAL SEVEN-DAY MINIMUM	35400	Jan 13	30800	Jan 14	5560	Nov 30 1955
INSTANTANEOUS PEAK FLOW			133000	Jun 16	307000	Jul 24 1993
INSTANTANEOUS PEAK STAGE			22.27	Jun 16	25.37	Jul 24 1993
INSTANTANEOUS LOW FLOW			29600	Jan 16		
ANNUAL RUNOFF (AC-FT)	54210000		43060000		30530000	
ANNUAL RUNOFF (CFSM)	.18		.14		.10	
ANNUAL RUNOFF (INCHES)	2.45		1.95		1.38	
10 PERCENT EXCEEDS	102000		84400		67000	
50 PERCENT EXCEEDS	77200		52700		38600	
90 PERCENT EXCEEDS	42400		41800		18400	

a Post regulation, revised
e Estimated



06817000 NODAWAY RIVER AT CLARINDA, IA

LOCATION.--Lat 40°44'19", long 95°00'47", in SW$^1/_4$ NE$^1/_4$ sec.32, T.69 N., R.36 W., Page County, Hydrologic Unit 10240009, near left abutment on downstream side of bridge on State Highway 2 (city route), 0.5 mi downstream from North Branch, 1.2 mi east of city square of Clarinda, and 7.5 mi upstream from East Nodaway River.

DRAINAGE AREA.--762 mi^2.

PERIOD OF RECORD.--May 1918 to July 1925, May 1936 to current year. Monthly discharge only for some periods, published in WSP 1310. No winter records 1918-1925.

REVISED RECORDS.--WSP 1240: 1918-20 (M), 1921, 1922-25 (M), 1936-38, 1942, 1943-45 (M), 1948. WSP 1440: Drainage area. WSP 1710: 1958, 1959 (P).

GAGE.--Water-stage recorder. Datum of gage is 955.36 ft above sea level. Prior to July 5, 1925, and May 28, 1936 to Mar. 26, 1957, nonrecording gage at same site, and prior to Oct. 1, 1987, at datum 5.00 ft. higher.

REMARKS.--Estimated daily discharges: Nov. 16-17, Dec. 5-7, 12, Jan. 4, 5, 9-29, Feb. 3, 4, and Mar. 9-15. Records good except those for estimated daily discharges, which are poor. Clarinda municipal water supply is taken from Nodaway River, 500 ft upstream from station. Average daily pumpage was 1.59 ft^3/s. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey and satellite data collection platform at station.

COOPERATION.--Average pumpage provided by City of Clarinda water works.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1903 reached a stage of 25.4 ft, from floodmarks, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	186	244	121	1040	351	2860	358	722	717	236	173
2	39	173	180	153	1420	324	2010	324	601	642	240	165
3	40	155	151	219	e520	312	1620	316	510	662	268	156
4	35	135	131	e130	e240	305	1410	302	557	1450	323	138
5	36	95	e65	e160	310	281	1260	279	488	1550	282	129
6	38	69	e80	175	281	267	1180	273	446	5010	309	125
7	38	68	e95	167	254	272	1200	290	412	3870	273	118
8	39	71	99	147	245	263	1910	290	573	2000	302	106
9	43	68	120	e100	242	e180	1670	255	3730	1280	246	103
10	47	64	115	e70	419	e160	1370	243	2220	1090	223	105
11	46	61	115	e75	922	e150	1150	230	3180	1370	204	105
12	68	66	e100	e55	525	e150	1070	237	4530	1090	192	105
13	111	68	105	e46	400	e200	969	237	1860	757	185	103
14	91	65	109	e70	383	e180	854	217	13100	623	191	101
15	79	61	123	e80	437	e320	966	227	20000	617	224	104
16	59	e50	122	e85	621	395	831	300	7210	886	193	103
17	49	e44	116	e70	621	435	719	297	3660	723	177	101
18	49	51	119	e75	609	966	633	229	3070	541	169	101
19	47	61	121	e85	705	1150	588	214	2670	493	163	103
20	44	62	122	e90	592	1060	578	255	2050	451	159	112
21	45	58	97	e85	514	1500	552	480	1770	409	159	101
22	40	60	121	e85	479	1670	500	3100	1600	417	271	108
23	46	57	124	e80	443	1510	462	2390	1490	643	272	97
24	56	57	116	e80	414	1300	437	1290	1450	452	181	104
25	57	61	107	e95	388	1350	424	1080	1320	360	159	105
26	88	61	106	e90	400	2590	388	801	1170	337	144	108
27	94	62	78	e100	399	2530	357	675	1060	323	146	104
28	85	64	106	e110	377	1690	335	600	1080	307	167	99
29	88	180	109	e130	---	1380	350	2250	900	291	188	101
30	175	375	141	179	---	5230	363	2220	817	298	157	96
31	185	---	116	198	---	4440	---	1050	---	251	140	---
TOTAL	1993	2708	3653	3405	14200	32911	29016	21309	84246	29910	6543	3379
MEAN	64.3	90.3	118	110	507	1062	967	687	2808	965	211	113
MAX	185	375	244	219	1420	5230	2860	3100	20000	5010	323	173
MIN	35	44	65	46	240	150	335	214	412	251	140	96
AC-FT	3950	5370	7250	6750	28170	65280	57550	42270	167100	59330	12980	6700
CFSM	.08	.12	.15	.14	.67	1.39	1.27	.90	3.69	1.27	.28	.15
IN.	.10	.13	.18	.17	.69	1.61	1.42	1.04	4.11	1.46	.32	.16

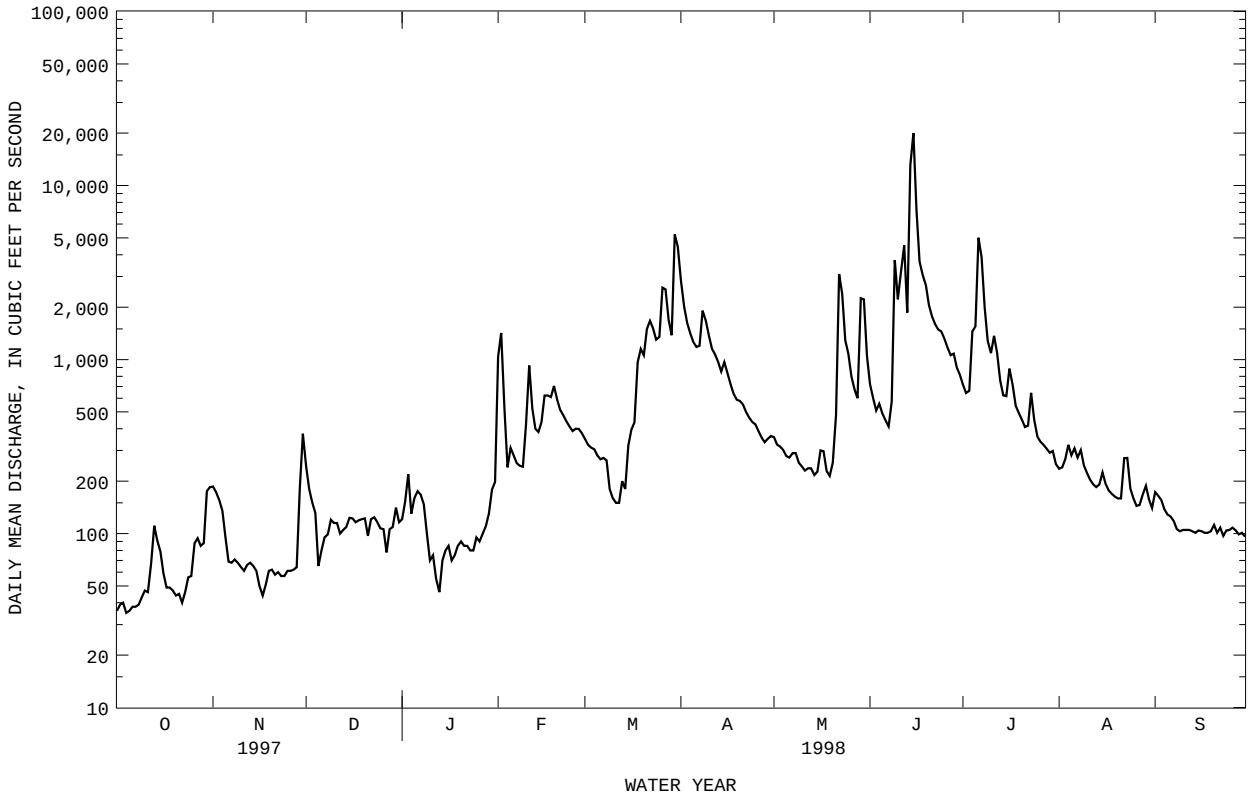
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1998, BY WATER YEAR (WY)

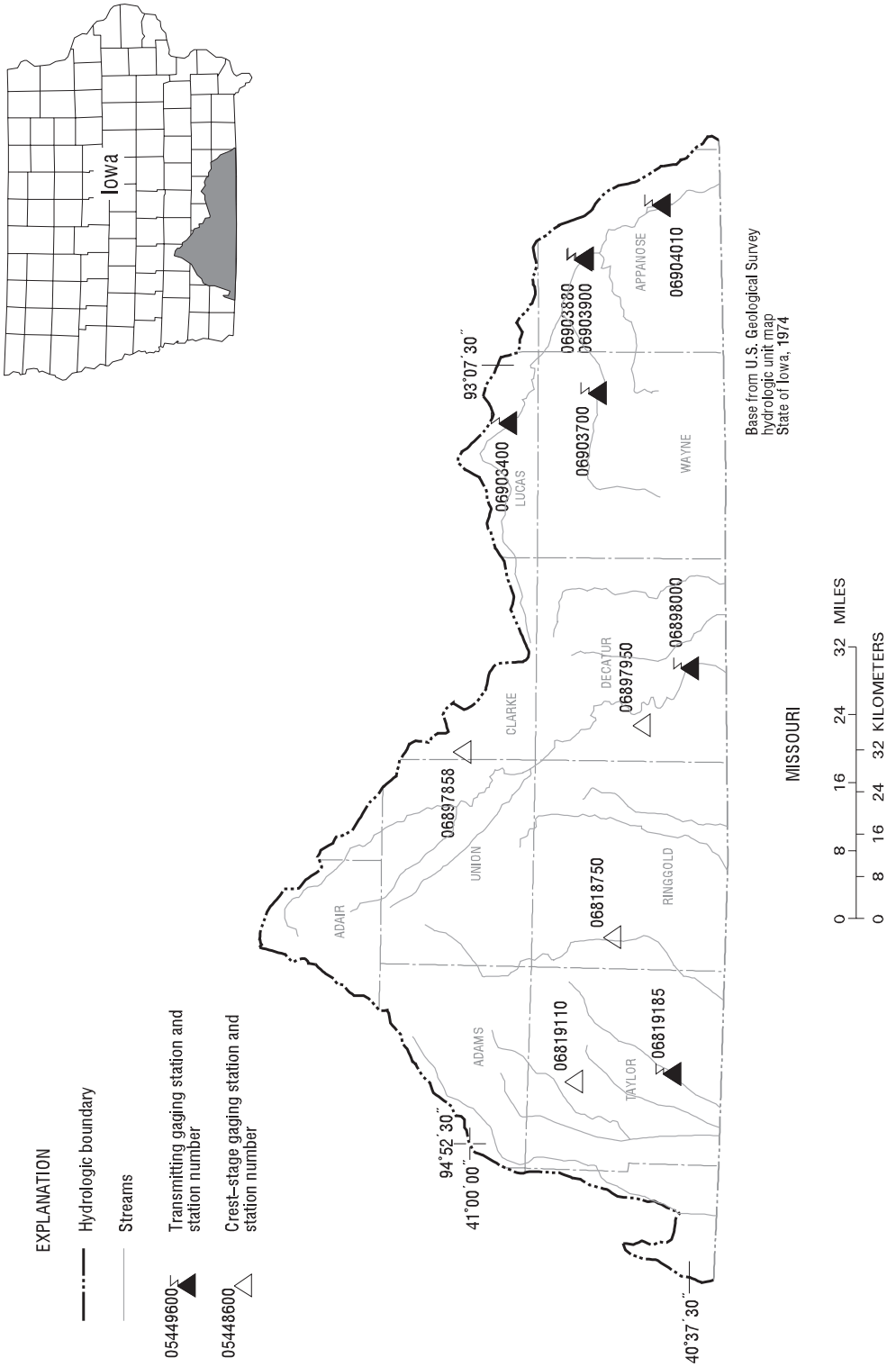
MEAN	178	177	141	136	323	574	561	680	773	443	235	325
MAX	1658	1602	1090	853	1857	2456	2450	2489	4779	6778	1953	3019
(WY)	1974	1973	1993	1974	1973	1979	1973	1996	1947	1993	1987	1972
MIN	7.52	8.27	2.10	6.52	11.3	14.0	14.4	10.3	20.0	17.3	9.81	6.83
(WY)	1938	1938	1924	1940	1940	1938	1956	1939	1968	1954	1936	1937

06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1919 - 1998	
ANNUAL TOTAL	154985		233273			
ANNUAL MEAN	425		639		389	
HIGHEST ANNUAL MEAN					1577	1993
LOWEST ANNUAL MEAN					36.8	1968
HIGHEST DAILY MEAN	5670	Feb 18	20000	Jun 15	25500	Sep 13 1972
LOWEST DAILY MEAN	35	Sep 30	35	Oct 4	1.0	Dec 9 1923a
ANNUAL SEVEN-DAY MINIMUM	37	Sep 29	37	Oct 1	1.3	Dec 25 1923
INSTANTANEOUS PEAK FLOW			30200	Jun 15	31100	Jun 13 1947b
INSTANTANEOUS PEAK STAGE			23.89	Jun 15	25.30	Jun 13 1947c
INSTANTANEOUS LOW FLOW			30	Oct 1,4		
ANNUAL RUNOFF (AC-FT)	307400		462700		281900	
ANNUAL RUNOFF (CFSM)	.56		.84		.51	
ANNUAL RUNOFF (INCHES)	7.57		11.39		6.94	
10 PERCENT EXCEEDS	1010		1470		844	
50 PERCENT EXCEEDS	210		236		103	
90 PERCENT EXCEEDS	49		62		20	

a Also Dec 27-31, 1923
b From rating curve extended above 15,000 ft^3/s on basis of an overflow profile and extended channel rating
c From floodmark
e Estimated




Iowa
EXPLANATION
Hydrologic boundary
Streams
05449600 Transmitting gaging station and station number
05448600 Crest–stage gaging station and station number
94°52′30″
41°00′00″
40°37′30″
93°07′30″
ADAIR
ADAMS
UNION
CLARKE
LUCAS
DECATUR
RINGGOLD
TAYLOR
WAYNE
APPANOOSE
06897858
06819110
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06903880
06903900
06904010
06903400
MISSOURI
Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974
0 8 16 24 32 MILES
0 8 16 24 32 KILOMETERS

Gaging Stations

Crest Stage Gaging Stations

06819185 EAST FORK ONE HUNDRED AND TWO RIVER AT BEDFORD, IA

LOCATION.--Lat 40°39'38", long 94°42'59", in NE$^{1}/_{4}$ sec.35, T.68 N., R.34 W., Taylor County, Hydrologic Unit 10240013, on left bank at downstream side of bridge of county highway N44, 0.1 mi south of Bedford, 0.4 mi upstream from concrete stablization dam, and 3.0 mi upstream from Daugherty creek.

DRAINAGE AREA.--85.4 mi^{2}.

PERIOD OF RECORD.--October 1983 to current year. September 1959 to September 1983, at site 2 mi downstream published as "near Bedford" (station 06819190) not equivalent because of difference in drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,069.16 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 1-11, Dec. 5-7, Jan. 10-13, and Mar. 9-15. Records fair except those for estimated daily discharges, which are poor. Slight regulation at low flow by low dam used for water supply in Bedford. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geolocial Survey satellite data collection platform and a U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.2	14	70	32	184	35	439	48	23	22	4.1	2.6
2	e1.3	9.3	44	198	117	33	260	42	21	18	4.5	1.8
3	e1.5	7.8	56	214	71	33	214	38	17	28	5.4	1.3
4	e1.3	6.4	54	81	55	27	191	32	17	330	5.6	1.2
5	e1.3	6.4	e21	83	48	23	157	30	16	62	4.6	1.2
6	e1.4	6.9	e26	113	41	21	139	37	15	39	3.9	1.2
7	e1.3	6.6	e24	98	38	25	413	61	13	82	3.8	1.2
8	e1.8	5.7	26	68	35	18	1090	38	150	31	3.7	1.1
9	e3.0	5.4	26	59	36	e15	663	31	122	20	3.4	1.1
10	e2.6	5.6	27	e44	127	e12	237	28	53	161	3.3	1.1
11	e2.5	5.4	23	e48	137	e11	157	24	672	52	2.8	1.1
12	112	6.5	20	e32	71	e10	117	74	238	24	1.9	1.1
13	77	4.9	21	e22	60	e15	105	36	77	17	2.9	1.1
14	7.1	4.8	23	26	55	e22	88	29	1900	12	3.5	1.2
15	2.8	4.8	24	28	55	e32	209	32	758	11	2.9	1.3
16	2.9	4.2	35	26	58	41	107	28	796	11	2.8	1.6
17	2.5	4.0	42	26	123	171	72	19	170	12	2.4	1.8
18	2.4	4.6	43	20	193	480	55	18	572	9.0	1.2	1.7
19	2.4	5.4	58	15	110	349	47	17	302	7.4	1.1	1.7
20	2.6	6.4	74	17	85	401	64	69	83	6.5	1.0	3.0
21	2.7	5.4	46	18	73	569	50	303	52	5.8	.93	2.8
22	2.2	5.1	43	16	71	537	43	801	42	6.4	.85	2.3
23	2.3	4.4	38	15	65	410	38	167	39	6.1	.81	1.8
24	7.8	4.1	42	14	55	260	36	112	228	5.5	.79	1.8
25	25	5.5	41	14	52	454	33	65	72	4.8	.78	1.7
26	66	4.4	33	16	50	490	30	49	40	5.8	.77	1.4
27	68	3.7	23	29	42	250	24	42	31	5.8	.82	1.4
28	62	5.3	35	53	38	215	69	37	46	4.9	.95	1.6
29	93	172	26	53	---	150	109	45	51	4.3	1.0	2.2
30	58	270	26	39	---	2420	65	39	34	5.0	1.1	2.3
31	31	---	21	38	---	1020	---	32	---	4.2	1.1	---
TOTAL	648.9	605.0	1111	1555	2145	8549	5321	2423	6650	1013.5	74.70	48.7
MEAN	20.9	20.2	35.8	50.2	76.6	276	177	78.2	222	32.7	2.41	1.62
MAX	112	270	74	214	193	2420	1090	801	1900	330	5.6	3.0
MIN	1.2	3.7	20	14	35	10	24	17	13	4.2	.77	1.1
AC-FT	1290	1200	2200	3080	4250	16960	10550	4810	13190	2010	148	97
CFSM	.25	.24	.42	.59	.90	3.23	2.08	.92	2.60	.38	.03	.02
IN.	.28	.26	.48	.68	.93	3.72	2.32	1.06	2.90	.44	.03	.02

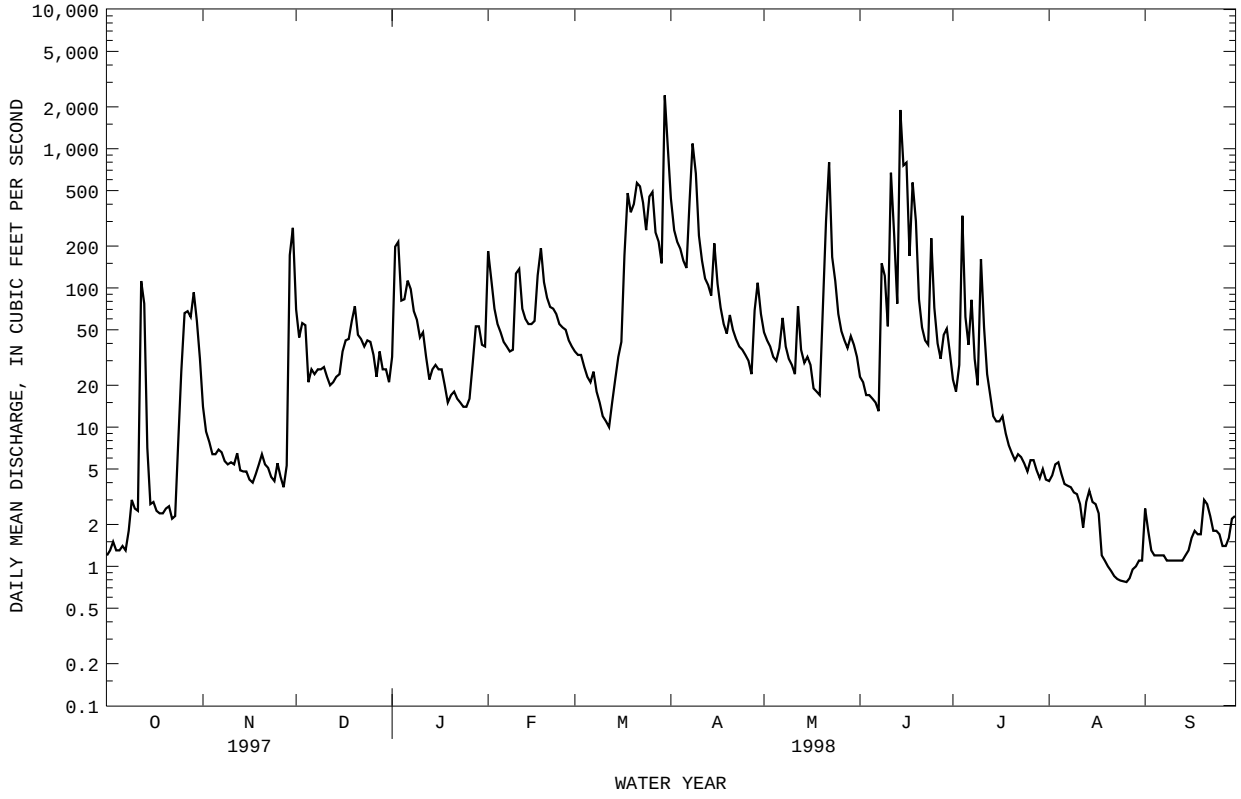
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1998, BY WATER YEAR (WY)

MEAN	27.8	33.6	31.1	12.9	44.5	80.2	104	160	107	130	22.9	58.7
MAX	159	202	181	50.2	149	276	289	488	255	889	173	260
(WY)	1987	1993	1993	1998	1997	1998	1984	1995	1995	1993	1987	1993
MIN	.26	.78	.47	.50	.17	2.13	.82	.67	1.90	1.97	.63	.31
(WY)	1992	1991	1989	1991	1989	1989	1989	1989	1988	1988	1991	1991

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1984 - 1998	
ANNUAL TOTAL	19950.12		30144.80			
ANNUAL MEAN	54.7		82.6		67.8	
HIGHEST ANNUAL MEAN					200	1993
LOWEST ANNUAL MEAN					12.0	1985
HIGHEST DAILY MEAN	1800	Feb 18	2420	Mar 30	7600	Jul 5 1993
LOWEST DAILY MEAN	.96	Aug 10	.77	Aug 26	.00	Jul 6 1989a
ANNUAL SEVEN-DAY MINIMUM	1.1	Aug 6	.82	Aug 21	.00	Aug 3 1989
INSTANTANEOUS PEAK FLOW			4270	Mar 30	9570	Jul 14 1986
INSTANTANEOUS PEAK STAGE			19.00	Mar 30	23.85	Jul 5 1993
INSTANTANEOUS LOW FLOW			.76	Aug 26		
ANNUAL RUNOFF (AC-FT)	39570		59790		49090	
ANNUAL RUNOFF (CFSM)	.64		.97		.79	
ANNUAL RUNOFF (INCHES)	8.69		13.13		10.78	
10 PERCENT EXCEEDS	102		192		113	
50 PERCENT EXCEEDS	13		26		9.0	
90 PERCENT EXCEEDS	1.5		1.6		.70	

a Many days between July 6 and Dec 24, 1989
e Estimated

06819185 EAST FORK ONE HUNDRED AND TWO RIVER AT BEDFORD, IA--Continued



06898000 THOMPSON RIVER AT DAVIS CITY, IA

LOCATION.--Lat 40°38'25", long 93°48'29", in $SE^1/_4$ $SE^1/_4$ sec.35, T.68 N., R.26 W., Decatur County, Hydrologic Unit 10280102, on right bank 15 ft downstream from bridge on U.S. Highway 69 at Davis City, 3.1 mi. upstream from Dickersons Branch, and 5.8 mi. upstream from Iowa-Missouri State line.

DRAINAGE AREA.--701 mi^2.

PERIOD OF RECORD.--May 1918 to July 1925, July 1941 to current year. Monthly discharge only for some periods, published in WSP 1310. No winter records 1921-25. Prior to October 1918, published as "Grand River".

REVISED RECORDS.--WSP 1240: 1918, 1920-21 (M), 1922-24, 1925 (M), 1946-47 (M). WSP 1440: Drainage area. WSP 1710: 1957.

GAGE.--Water-stage recorder. Datum of gage is 874.04 ft above sea level. May 14, 1918 to July 2, 1925, July 14, 1941 to Feb. 24, 1942, nonrecording gage, and Feb. 25, 1942 to Feb. 8, 1967, water-stage recorder at same site at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 5-7, 12, 13, 21, Jan. 4, 10-28, Feb. 3-5, Mar. 9-14, Mar. 31 to Apr. 1, and Aug. 21-23. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 8, 1885, reached a stage of 22.8 ft, datum in use prior to Feb. 9, 1967, from floodmark, discharge, 30,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	186	306	151	270	257	e7670	366	466	279	135	92
2	15	123	166	311	400	242	2010	319	338	258	129	78
3	17	94	160	692	e300	235	1290	274	272	239	127	87
4	15	88	220	e500	e170	228	1080	249	242	247	126	91
5	15	80	e65	586	e210	217	881	229	230	440	134	81
6	16	72	e90	703	249	206	666	309	221	1630	131	67
7	15	68	e85	503	220	202	771	2060	199	3300	128	58
8	21	66	106	372	209	604	2640	1380	216	2990	137	54
9	35	62	113	271	192	e240	2340	766	367	1720	128	52
10	30	58	112	e100	259	e100	1520	443	608	979	129	51
11	29	59	127	e110	611	e90	954	329	815	776	115	49
12	58	55	e110	e90	504	e70	732	359	1040	665	103	48
13	606	54	e110	e50	448	e120	1130	405	1730	599	100	48
14	140	55	123	e65	412	e200	1450	277	2120	488	103	61
15	85	52	137	80	355	373	2150	243	2700	416	109	55
16	76	47	151	e85	326	395	1310	218	2160	365	105	51
17	61	45	217	e80	443	1130	767	193	1260	346	103	49
18	52	48	249	e65	857	2570	574	178	1260	346	106	49
19	45	51	237	e70	705	2620	476	174	2230	299	104	49
20	36	55	282	e80	574	2180	458	175	1820	277	85	53
21	30	51	e180	e90	470	2420	631	273	908	251	e72	55
22	27	52	194	e95	439	2320	473	1420	687	228	e70	51
23	31	52	195	e80	459	2050	388	2360	572	212	e80	50
24	35	50	210	e75	417	1720	339	2850	1220	200	89	53
25	36	53	193	e80	377	1510	316	1380	679	227	78	62
26	115	54	192	e85	344	1880	296	877	546	196	67	56
27	263	57	140	e90	308	2050	271	576	412	179	68	52
28	182	68	176	e130	283	1670	398	470	337	167	77	53
29	296	85	185	195	---	1310	709	399	468	157	79	50
30	300	446	160	232	---	4130	444	483	334	155	91	49
31	274	---	143	237	---	e11900	---	752	---	159	109	---
TOTAL	2970	2386	5134	6353	10811	45239	35134	20786	26457	18790	3217	1754
MEAN	95.8	79.5	166	205	386	1459	1171	671	882	606	104	58.5
MAX	606	446	306	703	857	11900	7670	2850	2700	3300	137	92
MIN	14	45	65	50	170	70	271	174	199	155	67	48
AC-FT	5890	4730	10180	12600	21440	89730	69690	41230	52480	37270	6380	3480
CFSM	.14	.11	.24	.29	.55	2.08	1.67	.96	1.26	.86	.15	.08
IN.	.16	.13	.27	.34	.57	2.40	1.86	1.10	1.40	1.00	.17	.09

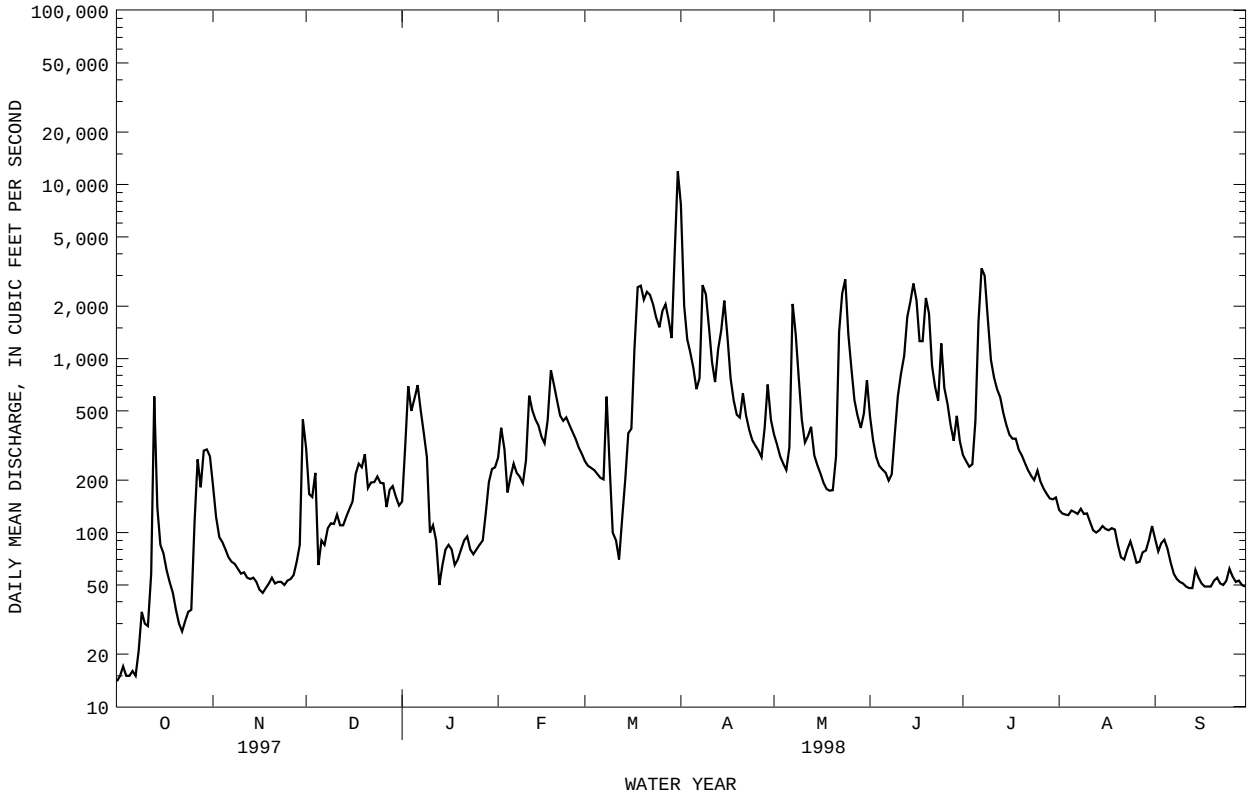
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1998, BY WATER YEAR (WY)

MEAN	193	220	156	165	345	658	696	706	666	443	192	347
MAX	2138	1462	1299	1292	1849	2375	2586	3364	4750	7239	2255	5178
(WY)	1974	1962	1983	1960	1973	1979	1973	1996	1947	1993	1987	1992
MIN	1.41	2.07	.94	.62	1.14	10.7	2.55	1.19	3.08	1.98	9.35	4.13
(WY)	1957	1956	1956	1956	1956	1954	1956	1956	1956	1977	1955	1953

06898000 THOMPSON RIVER AT DAVIS CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1919 - 1998	
ANNUAL TOTAL	114773		179031			
ANNUAL MEAN	314		490		402	
HIGHEST ANNUAL MEAN					1469	1993
LOWEST ANNUAL MEAN					52.3	1956
HIGHEST DAILY MEAN	5000	Feb 21	11900	Mar 31	52900	Sep 16 1992
LOWEST DAILY MEAN	10	Sep 11	14	Oct 1	.10	Jun 25 1956
ANNUAL SEVEN-DAY MINIMUM	15	Oct 1	15	Oct 1	.36	Jun 19 1956
INSTANTANEOUS PEAK FLOW			14500	Mar 31	57000	Sep 16 1992
INSTANTANEOUS PEAK STAGE			11.80	Mar 31	24.29	Sep 16 1992
INSTANTANEOUS LOW FLOW			9.7	Oct 1		
ANNUAL RUNOFF (AC-FT)	227700		355100		291200	
ANNUAL RUNOFF (CFSM)	.45		.70		.57	
ANNUAL RUNOFF (INCHES)	6.09		9.50		7.79	
10 PERCENT EXCEEDS	774		1340		864	
50 PERCENT EXCEEDS	130		209		84	
90 PERCENT EXCEEDS	22		51		9.7	

e Estimated



06903400 CHARITON RIVER NEAR CHARITON, IA

LOCATION.--Lat 40°57'12", long 93°15'37", in SW$^1/_4$ NE$^1/_4$ sec.15, T.71 N., R.21 W., Lucas County, Hydrologic Unit 10280201, on right bank 15 ft downstream from bridge on County Highway S43, 0.1 mi downstream from Wolf Creek, and 5.0 mi southeast of Chariton.

DRAINAGE AREA.--182 mi^2.

PERIOD OF RECORD.--October 1965 to current year. Occasional low-flow measurements, water years 1958-60, 1962, 1964.

GAGE.--Water stage recorder. Datum of gage is 917.90 ft above sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Dec. 12-14, Dec. 24 to Jan. 3, Jan 10-30, Mar. 10-17, and Mar. 31 to Apr. 1. Records fair except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1960 reached a stage of about 23 ft, discharge, about 15,000 ft^3/s and flood of June 5, 1947 reached a stage of 21.65 ft, from floodmark, discharge, 11,000 ft^3/s. A discharge of 0.08 ft^3/s was measured on Oct. 30, 1963.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

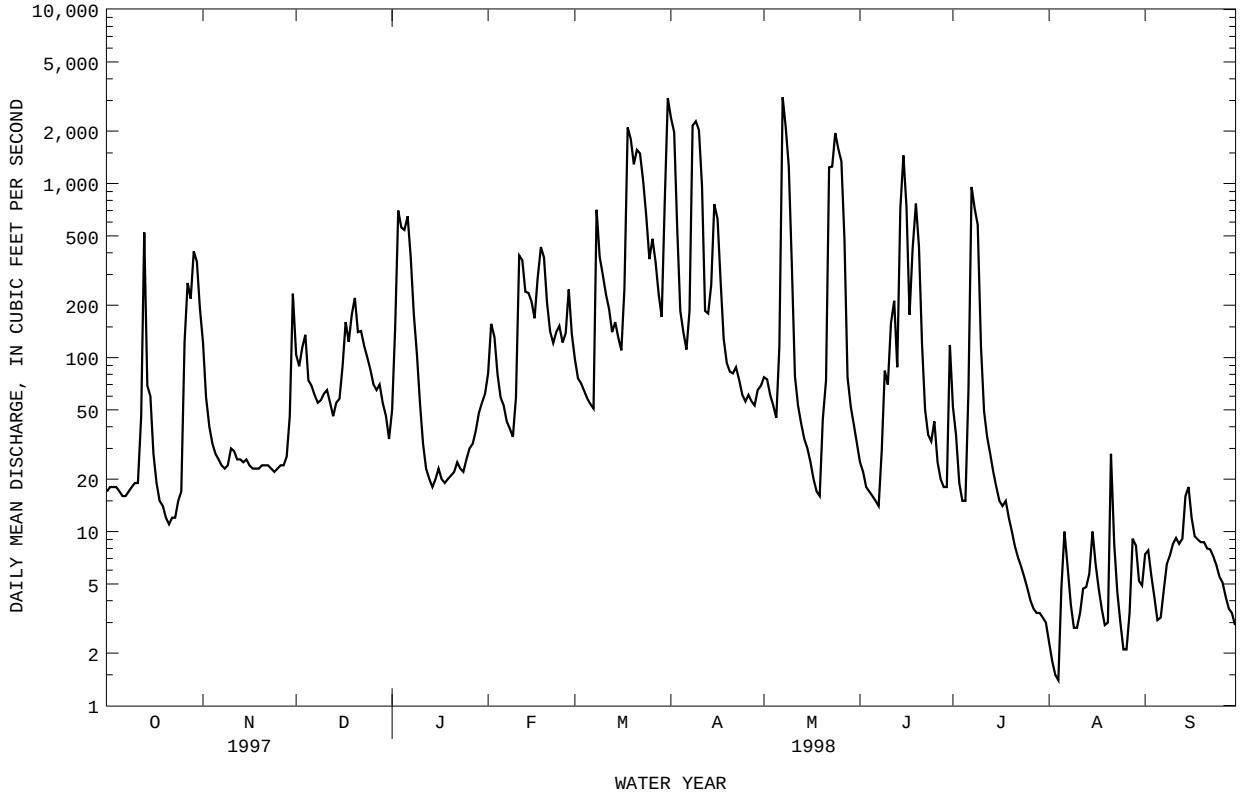
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	122	104	e50	81	98	e2400	77	25	52	2.3	7.4
2	18	59	89	e150	156	76	1970	75	22	36	1.8	7.8
3	18	40	114	e700	131	71	550	61	18	19	1.5	5.6
4	18	32	135	559	80	64	185	53	17	15	1.4	4.2
5	17	28	74	541	59	58	140	45	16	15	4.8	3.1
6	16	26	69	648	53	54	111	116	15	66	10	3.2
7	16	24	61	376	43	51	186	3130	14	955	6.3	4.6
8	17	23	55	177	39	707	2150	2110	29	719	3.8	6.5
9	18	24	57	105	35	380	2280	1250	84	579	2.8	7.3
10	19	30	62	e55	59	e300	2030	338	70	116	2.8	8.5
11	19	29	65	e32	386	e230	969	78	157	49	3.4	9.2
12	46	26	e55	e23	363	e190	185	53	212	35	4.7	8.5
13	523	26	e46	e20	239	e140	179	42	88	28	4.8	9.1
14	69	25	e55	e18	235	e160	261	34	716	22	5.7	16
15	60	26	58	e20	210	e130	760	30	1450	18	10	18
16	28	24	89	e23	168	e110	626	25	734	15	6.5	12
17	19	23	160	e20	287	e250	274	20	176	14	4.7	9.4
18	15	23	123	e19	431	2100	128	17	422	15	3.6	9.0
19	14	23	177	e20	376	1800	93	16	767	12	2.9	8.7
20	12	24	220	e21	206	1290	83	44	433	10	3.0	e8.7
21	11	24	140	e22	141	1560	81	74	119	8.2	28	e8.0
22	12	24	142	e25	121	1490	88	1240	50	7.1	8.5	e7.9
23	12	23	116	e23	140	1050	74	1250	36	6.3	4.5	e7.2
24	15	22	e100	e22	152	663	61	1950	33	5.5	3.0	e6.4
25	17	23	e85	e26	122	368	56	1580	43	4.7	2.1	e5.5
26	123	24	e70	e30	138	481	61	1340	25	4.0	2.1	e5.1
27	268	24	e65	e32	246	356	56	476	20	3.6	3.4	e4.2
28	218	27	e70	e38	136	233	53	77	18	3.4	9.1	e3.6
29	408	46	e55	e48	---	171	65	52	18	3.4	8.3	e3.4
30	356	233	e46	e55	---	788	69	41	118	3.2	5.2	e2.9
31	191	---	e34	62	---	e3100	---	32	---	3.0	4.9	---
TOTAL	2610	1127	2791	3960	4833	18519	16224	15726	5945	2842.4	165.9	221.0
MEAN	84.2	37.6	90.0	128	173	597	541	507	198	91.7	5.35	7.37
MAX	523	233	220	700	431	3100	2400	3130	1450	955	28	18
MIN	11	22	34	18	35	51	53	16	14	3.0	1.4	2.9
CFSM	.46	.21	.49	.70	.95	3.28	2.97	2.79	1.09	.50	.03	.04
IN.	.53	.23	.57	.81	.99	3.79	3.32	3.21	1.22	.58	.03	.05

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1998, BY WATER YEAR (WY)

MEAN	80.8	57.8	64.5	37.7	89.0	185	246	237	158	172	73.2	134
MAX	568	294	408	340	403	761	1093	1097	856	1711	618	1704
(WY)	1974	1993	1983	1974	1997	1979	1991	1995	1967	1993	1987	1992
MIN	.005	.003	.000	.23	.22	6.40	.068	3.91	.38	.000	.10	.086
(WY)	1990	1990	1990	1977	1989	1989	1989	1977	1988	1988	1989	1991

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1966 - 1998	
ANNUAL TOTAL	42119.5		74964.3			
ANNUAL MEAN	115		205		128	
HIGHEST ANNUAL MEAN					345	1993
LOWEST ANNUAL MEAN					9.71	1989
HIGHEST DAILY MEAN	2540	Feb 21	3130	May 7	24600	Sep 15 1992
LOWEST DAILY MEAN	2.1	Sep 10	1.4	Aug 4	.00	Aug 1 1977
ANNUAL SEVEN-DAY MINIMUM	2.4	Sep 4	2.4	Jul 29	.00	Jun 21 1988
INSTANTANEOUS PEAK FLOW			4240	May 7	37700	Sep 15 1992
INSTANTANEOUS PEAK STAGE			17.83	May 7	29.32	Sep 15 1992
INSTANTANEOUS LOW FLOW			1.3	Aug 4		
ANNUAL RUNOFF (CFSM)	.63		1.13		.70	
ANNUAL RUNOFF (INCHES)	8.61		15.32		9.56	
10 PERCENT EXCEEDS	270		554		288	
50 PERCENT EXCEEDS	24		46		13	
90 PERCENT EXCEEDS	4.6		5.0		.61	

e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IA

LOCATION.--Lat 40°48'02", long 93°11'32", in $SW^1/_4$ $SW^1/_4$ sec.5, T.69 N., R.20 W., Wayne County, Hydrologic Unit 10280201, on right bank 20 ft downstream from bridge on County Highway S50, 1.3 mi downstream from Jordan Creek, and 4.3 mi northwest of Promise City.

DRAINAGE AREA.--168 mi^2.

PERIOD OF RECORD.--October 1967 to current year. Occasional low-flow measurements, water years 1958-66, published as "near Bethlehem". Monthly discharge measurements for March 1965 to September 1967 available in files of Iowa City District Office.

GAGE.--Water-stage recorder. Datum of gage is 913.70 ft above sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Dec. 13-15, Dec. 26 to Jan. 3, Jan. 10 to Feb. 2, Mar. 12, 13, and July 31 to Aug. 4. Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 21, 1965, reached a stage of 25.5 ft, from floodmarks, discharge, about 18,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	96	110	e65	e55	93	624	68	31	92	e2.5	4.0
2	3.0	64	63	e170	e85	81	252	54	25	67	e2.3	3.8
3	2.9	52	154	e650	65	82	173	47	21	54	e2.1	2.7
4	2.7	43	202	292	49	71	217	41	21	51	e2.6	1.9
5	2.9	37	103	761	47	61	142	35	19	49	3.7	1.5
6	3.1	34	85	686	43	55	108	203	16	167	6.7	1.3
7	3.1	32	57	199	40	53	453	5810	15	335	4.9	1.3
8	4.0	30	58	124	38	1590	2980	697	34	81	4.4	1.1
9	6.1	30	63	90	37	439	1310	195	105	43	3.3	1.2
10	5.3	40	71	e65	81	312	318	111	50	33	2.8	1.7
11	3.2	38	71	e46	605	229	168	74	135	29	3.1	1.3
12	195	31	73	e40	383	e200	118	66	192	24	2.3	1.2
13	1490	30	e60	e31	155	e170	272	57	57	19	2.4	1.2
14	156	29	e55	e28	123	166	301	41	1610	16	3.6	23
15	57	25	e70	e30	105	133	658	33	868	13	3.9	24
16	35	23	115	e32	101	110	226	27	245	11	2.2	5.9
17	24	29	184	e29	296	847	118	22	89	13	2.0	2.9
18	15	25	133	e27	397	2530	86	19	2140	12	1.8	2.1
19	12	21	192	e25	232	1280	72	18	1620	9.2	1.6	1.7
20	12	21	233	e27	155	636	89	55	239	7.5	1.5	1.9
21	11	20	105	e26	112	637	101	59	177	6.2	1.4	2.2
22	10	19	102	e29	109	745	91	2470	157	5.7	1.4	2.0
23	9.5	17	123	e27	119	444	69	644	148	5.6	1.4	2.1
24	16	17	172	e26	97	244	56	1290	344	5.0	1.4	2.6
25	34	17	142	e30	80	268	53	445	379	4.5	1.2	2.3
26	307	17	e90	e30	226	388	51	307	140	4.7	1.2	1.8
27	597	17	e75	e34	383	163	44	128	114	4.3	2.1	1.3
28	503	22	e55	e40	133	240	48	77	104	4.1	3.6	1.3
29	857	50	e65	e48	---	128	93	74	121	3.4	2.6	1.3
30	562	243	e60	e46	---	764	86	75	237	3.0	2.2	1.1
31	180	---	e50	e44	---	4770	---	45	---	e2.8	2.9	---
TOTAL	5121.4	1169	3191	3797	4351	17929	9377	13287	9453	1175.0	81.1	103.7
MEAN	165	39.0	103	122	155	578	313	429	315	37.9	2.62	3.46
MAX	1490	243	233	761	605	4770	2980	5810	2140	335	6.7	24
MIN	2.6	17	50	25	37	53	44	18	15	2.8	1.2	1.1
MED	12	30	85	40	107	240	118	68	128	13	2.3	1.8
AC-FT	10160	2320	6330	7530	8630	35560	18600	26350	18750	2330	161	206
CFSM	.98	.23	.61	.73	.92	3.44	1.86	2.55	1.88	.23	.02	.02
IN.	1.13	.26	.71	.84	.96	3.97	2.08	2.94	2.09	.26	.02	.02

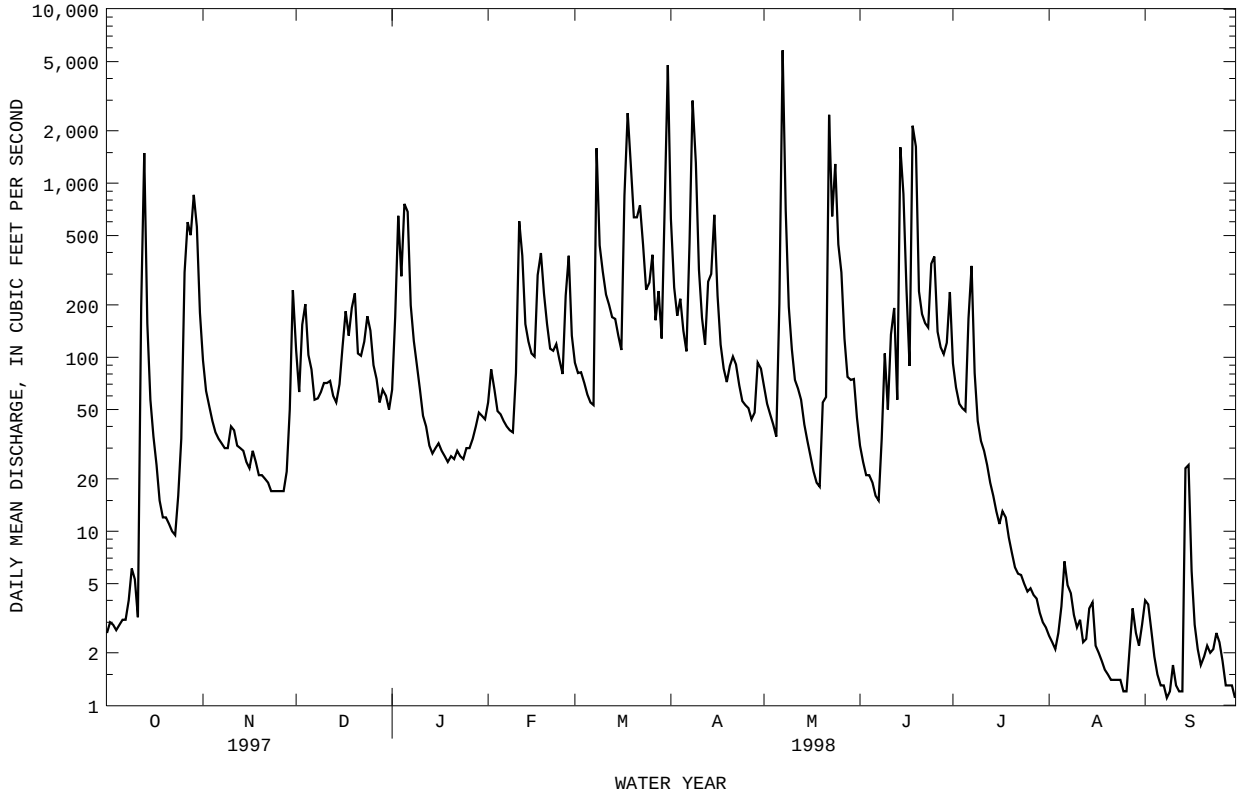
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1998, BY WATER YEAR (WY)

MEAN	98.3	57.1	67.0	38.6	92.3	186	243	230	152	198	51.1	151
MAX	498	357	440	335	360	853	730	1043	580	2351	300	2227
(WY)	1978	1993	1983	1974	1997	1979	1991	1995	1980	1993	1993	1992
MIN	.15	.39	.40	.19	.88	3.21	1.21	5.14	1.18	.24	.76	.53
(WY)	1989	1990	1977	1977	1989	1989	1989	1980	1988	1977	1984	1991

06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1968 - 1998	
ANNUAL TOTAL	40664.13		69035.2			
ANNUAL MEAN	111		189		130	
HIGHEST ANNUAL MEAN					446	1993
LOWEST ANNUAL MEAN					10.7	1989
HIGHEST DAILY MEAN	5330	Feb 21	5810	May 7	34700	Sep 15 1992
LOWEST DAILY MEAN	.62	Aug 8	1.1	Sep 8	.00	Jul 6 1977a
ANNUAL SEVEN-DAY MINIMUM	.71	Aug 4	1.3	Sep 7	.00	Aug 16 1989
INSTANTANEOUS PEAK FLOW			8000	May 7	70600	Sep 15 1992
INSTANTANEOUS PEAK STAGE			20.65	May 7	34.84	Sep 15 1992
INSTANTANEOUS LOW FLOW			.87	Sep 30		
ANNUAL RUNOFF (AC-FT)	80660		136900		94530	
ANNUAL RUNOFF (CFSM)	.66		1.13		.78	
ANNUAL RUNOFF (INCHES)	9.00		15.29		10.55	
10 PERCENT EXCEEDS	199		392		208	
50 PERCENT EXCEEDS	21		51		14	
90 PERCENT EXCEEDS	1.8		2.3		.96	

a Also July 7, 21-24, 28 to Aug 1, 1977, July 9-10, Aug 14, 18-22, 1989
e Estimated



06903880 RATHBUN LAKE NEAR RATHBUN, IA

LOCATION.--Lat 40°49'30", long 92°53'33", in NW$^1/_4$ NE$^1/_4$ sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, at control tower of Rathbun Dam, 1.8 mi north of Rathbun, 3.9 mi upstream from Walnut Creek, and at mile 142.3.

DRAINAGE AREA.--549 mi^2.

PERIOD OF RECORD.--October 1969 to current year.

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

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in November 1969. Release is controlled by two hydraulically controlled slide gages, 6 ft wide and 12 ft high, into forechamber of an 11-ft diameter horseshoe conduit through the dam. No dead storage. Maximum design discharge through gates is 5,000 ft^3/s. Uncontrolled notch spillway is concrete overflow section 500 ft in length, located about 3,000 ft west of the right abutment of the dam and provides emergency discharge into the adjacent drainage area of Little Walnut Creek. Uncontrolled notch spillway is at elevation 926 ft, contents 545,621 acre-ft, surface area, 20,974 acres. Conservation pool level is at elevation 904.0 ft, contents 199,830 acre-ft, surface area, 10,989 acres. Reservoir is used for flood control, low-flow augumentation, conservation and recreation.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 570,000 acre-ft July 28, 1993; maximum elevation, 927.16 ft July 28, 1993; minimum daily contents, 100 acre-ft Oct. 1- 15, Nov. 17-21, 1969; minimum elevation, 855.40 ft Oct. 6-10, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 399,000 acre-ft June 21-23; maximum elevation 918.32 ft June 21; minimum daily contents, 196,000 acre-ft Oct. 11, 12; minimum elevation, 903.63 ft Oct. 12.

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

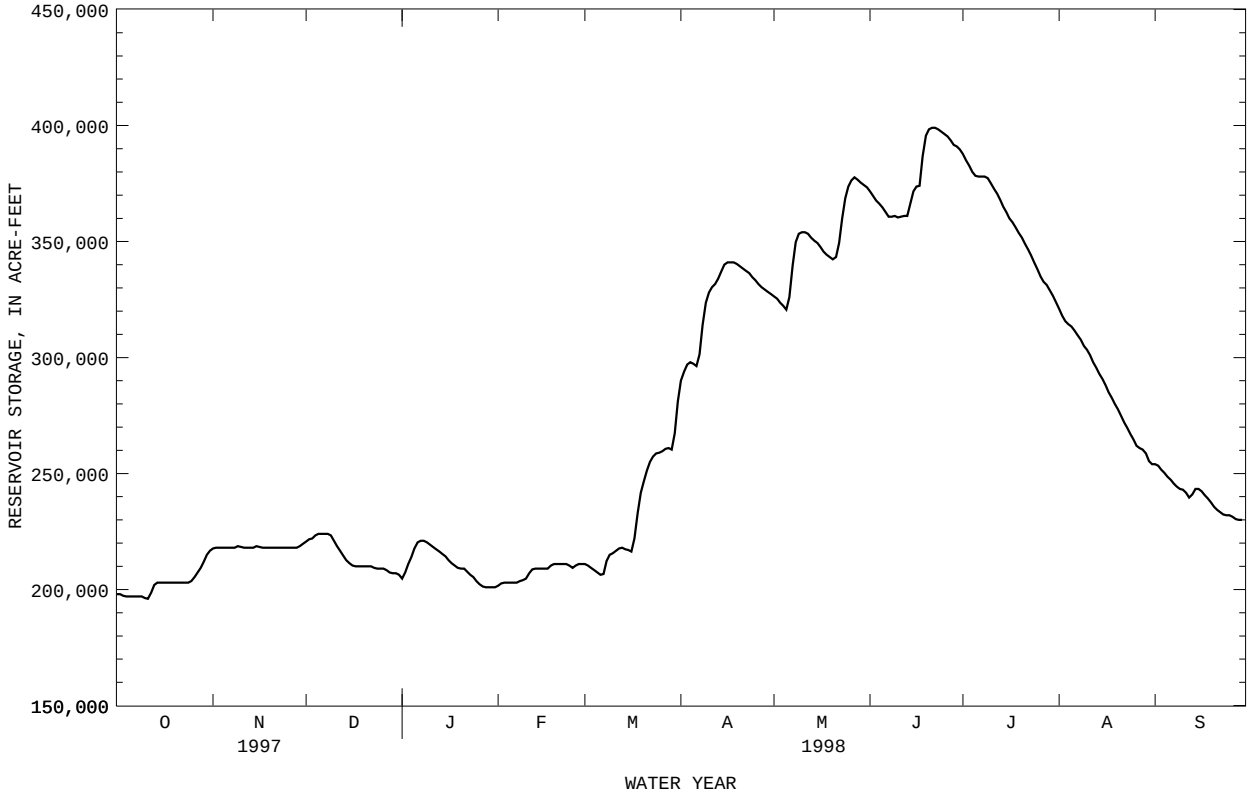
860	150	870	5,870	885	52,700	900	158,800	915	345,000
862	226	875	17,000	890	80,300	905	211,000	920	428,900
865	950	880	31,900	895	115,600	910	272,600	925	524,900

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY OBSERVATION AT 0800 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	198000	217000	220000	206000	201000	211000	286000	327000	373000	389000	323000	254000
2	198000	218000	221000	204000	202000	211000	292000	326000	371000	387000	320000	254000
3	198000	218000	222000	209000	203000	210000	295000	325000	369000	384000	317000	253000
4	197000	218000	222000	212000	203000	209000	298000	323000	367000	382000	315000	251000
5	197000	218000	224000	215000	203000	208000	298000	322000	366000	379000	314000	250000
6	197000	218000	224000	219000	203000	207000	297000	320000	364000	378000	313000	248000
7	197000	218000	224000	221000	203000	206000	296000	329000	362000	378000	311000	247000
8	197000	218000	224000	221000	203000	207000	304000	345000	360000	378000	309000	245000
9	197000	218000	224000	221000	204000	215000	319000	352000	361000	378000	307000	244000
10	197000	219000	223000	220000	204000	215000	326000	354000	361000	377000	304000	243000
11	196000	218000	220000	219000	205000	216000	329000	354000	360000	374000	303000	243000
12	196000	218000	218000	218000	208000	217000	331000	354000	361000	372000	300000	241000
13	200000	218000	216000	217000	209000	218000	332000	353000	361000	370000	297000	239000
14	203000	218000	214000	216000	209000	218000	335000	351000	361000	367000	295000	242000
15	203000	218000	212000	215000	209000	217000	338000	350000	369000	364000	292000	244000
16	203000	219000	211000	214000	209000	217000	341000	349000	373000	362000	290000	243000
17	203000	218000	210000	212000	209000	216000	341000	347000	374000	359000	287000	242000
18	203000	218000	210000	211000	209000	225000	341000	345000	374000	358000	284000	240000
19	203000	218000	210000	210000	211000	237000	341000	344000	393000	355000	282000	239000
20	203000	218000	210000	209000	211000	244000	340000	343000	397000	353000	279000	237000
21	203000	218000	210000	209000	211000	248000	339000	342000	399000	351000	277000	235000
22	203000	218000	210000	209000	211000	253000	338000	344000	399000	348000	274000	234000
23	203000	218000	210000	207000	211000	256000	337000	352000	399000	346000	271000	233000
24	203000	218000	209000	206000	211000	258000	336000	364000	398000	343000	269000	232000
25	203000	218000	209000	205000	210000	259000	334000	371000	397000	340000	266000	232000
26	204000	218000	209000	203000	209000	259000	333000	375000	396000	337000	264000	232000
27	206000	218000	209000	202000	211000	260000	331000	377000	395000	334000	261000	231000
28	208000	218000	208000	201000	211000	261000	330000	378000	393000	332000	261000	230000
29	210000	218000	207000	201000	---	261000	329000	376000	391000	331000	260000	230000
30	213000	219000	207000	201000	---	260000	328000	375000	391000	328000	258000	230000
31	216000	---	207000	201000	---	271000	---	374000	---	326000	254000	---
MEAN	202000	218000	215000	211000	207000	231000	324000	350000	378000	360000	289000	241000
MAX	216000	219000	224000	221000	211000	271000	341000	378000	399000	389000	323000	254000
MIN	196000	217000	207000	201000	201000	206000	286000	320000	360000	326000	254000	230000

CAL YR 1997 MEAN 213000 MAX 260000 MIN 196000
WTR YR 1998 MEAN 269000 MAX 399000 MIN 196000

06903880 RATHBUN LAKE NEAR RATHBUN, IA--Continued



06903900 CHARITON RIVER NEAR RATHBUN, IA

LOCATION.--Lat 40°49'22", long 92°53'22", in SE$^1/_4$ NE$^1/_4$ sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, on left bank 600 ft downstream from outlet of Rathbun Dam, 1.8 mi north of Rathbun, 3.7 mi upstream from Walnut Creek, and at mile 142.1.

DRAINAGE AREA.--549 mi^2.

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1730.

REVISED RECORDS.--WSP 1560: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 847.92 ft above sea level. Prior to Nov. 16, 1960, nonrecording gage and Nov. 17, 1960 to Sept. 30, 1969, recording gage, at site 3.1 mi downstream at datum 4.65 ft lower.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,800 ft^3/s Mar. 31, 1960, gage height, 25.3 ft from floodmark, site and datum then in use.

REMARKS.--Estimated daily discharges: Aug. 2-10. Records good except for those periods of estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers data collection platform with telephone modem at station. Flow regulated by Rathbun Lake (station 06903880) since Nov. 21, 1969. Records of discharge include diversion of:

Diversions

Oct 1 to Nov 27	12.0 ft^3/s	Nov 28 to Jun 13	8.0 ft^3/s	Jun 14 to Sep 30	10.0 ft^3/s

The diversion goes from the reservoir through fish ponds on left bank downstream from dam. Diverted flow returns to stream 0.1 mi downstream from gage. Rathbun Regional Water Association permit No. 0400900 allows withdrawal from Rathbun Dam discharge immediately downstream from gage for maximum rate of 4,200 gpm (9.36 ft^3/s). In the 1998 water year 1.44 billion gallons or 4,443 acre-ft were used.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	24	26	610	60	623	92	807	879	1120	1200	188
2	22	23	27	555	60	621	223	806	878	1210	e1210	93
3	23	23	28	447	63	621	431	804	877	1200	e1210	667
4	23	24	28	434	68	620	540	803	876	1200	e1010	843
5	23	25	27	440	68	620	605	805	874	1200	e410	842
6	22	25	29	541	68	619	678	758	873	1200	e1110	843
7	21	25	30	639	68	618	617	520	871	1240	e1210	842
8	22	25	485	636	68	686	413	237	827	1200	e1210	451
9	21	25	1040	636	68	645	196	241	223	1190	e1210	28
10	200	25	1250	635	68	310	114	553	592	1190	e1210	147
11	262	26	1240	633	69	48	334	620	677	1190	1200	684
12	22	27	1240	634	285	152	330	639	677	1190	1200	851
13	22	27	1230	639	520	495	243	808	661	1180	1190	777
14	21	27	1230	631	607	599	328	808	64	1180	1190	208
15	21	27	1100	630	606	598	125	808	49	1170	1190	141
16	21	31	577	629	606	598	321	808	379	1170	1180	644
17	21	32	612	628	608	512	536	806	600	1170	1190	848
18	21	30	611	627	611	335	619	808	642	1160	1210	848
19	21	29	614	627	612	72	618	807	266	1160	1200	851
20	21	29	615	627	610	233	705	808	48	1180	1200	855
21	21	29	613	626	608	613	811	810	249	1200	1200	853
22	23	29	614	625	609	616	812	236	498	1200	1190	490
23	24	29	613	625	609	692	810	177	612	1200	1200	119
24	25	29	615	624	608	787	808	473	691	1190	1200	220
25	25	29	613	625	608	787	808	160	814	1180	1200	220
26	27	29	612	621	544	790	808	356	813	1180	1200	226
27	25	29	610	620	626	790	806	658	813	1170	1120	223
28	24	26	609	446	624	790	807	884	822	944	705	223
29	23	26	609	208	---	788	807	884	822	430	939	225
30	22	26	608	60	---	696	809	882	892	1200	1140	226
31	23	---	609	60	---	439	---	881	---	1200	977	---
TOTAL	1114	810	18764	17018	10629	17413	16154	20455	18859	35794	35011	14676
MEAN	35.9	27.0	605	549	380	562	538	660	629	1155	1129	489
MAX	262	32	1250	639	626	790	812	884	892	1240	1210	855
MIN	21	23	26	60	60	48	92	160	48	430	410	28
AC-FT	2210	1610	37220	33760	21080	34540	32040	40570	37410	71000	69440	29110

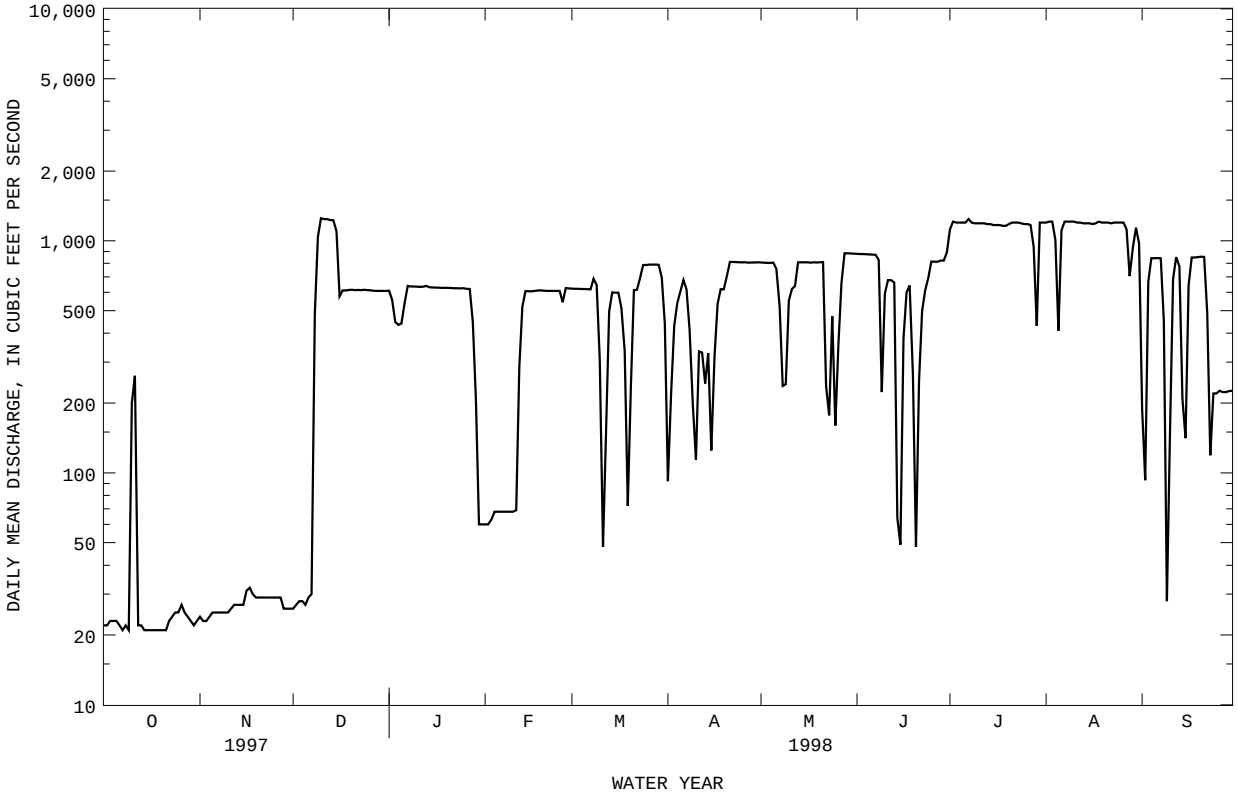
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1998, BY WATER YEAR (WY)

MEAN	283	291	421	259	342	452	358	427	479	565	518	341
MAX	1790	1828	1364	1546	1550	1271	1132	1281	1573	1162	1826	1707
(WY)	1994	1994	1993	1993	1993	1993	1993	1973	1973	1991	1993	1993
MIN	11.5	9.97	5.54	8.98	5.60	9.40	6.74	19.3	16.6	6.53	9.10	11.0
(WY)	1975	1975	1970	1970	1970	1970	1970	1977	1988	1970	1970	1974

06903900 CHARITON RIVER NEAR RATHBUN, IA--Continued

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1970 - 1998a	
ANNUAL TOTAL	116792		206697			
ANNUAL MEAN	320		566		395	
HIGHEST ANNUAL MEAN					1164	1993
LOWEST ANNUAL MEAN					20.4	1989
HIGHEST DAILY MEAN	1600	Mar 11	1250	Dec 10	1950	Oct 17 1993
LOWEST DAILY MEAN	21	Aug 5	21	Oct 7b	.00	Oct 26 1977
ANNUAL SEVEN-DAY MINIMUM	21	Sep 11	21	Oct 14	1.0	Apr 1 1970
INSTANTANEOUS PEAK FLOW			1280	Jul 7	2780	Dec 14 1993
INSTANTANEOUS PEAK STAGE			10.72	Jul 7	14.94	Dec 14 1993
ANNUAL RUNOFF (AC-FT)	231700		410000		286400	
10 PERCENT EXCEEDS	809		1190		1200	
50 PERCENT EXCEEDS	36		613		66	
90 PERCENT EXCEEDS	22		25		15	

a Post regulation
b Many days Oct
e Estimated



06904010 CHARITON RIVER NEAR MOULTON, IA

LOCATION.--Lat 40°41'30", long 92°46'15", in SE$^1/_4$ NE$^1/_4$ sec.14, T.68 N., R.17 W., Appanoose County, Hydrologic Unit 10280201, on right bank 6 ft downstream from bridge on County Highway J45 (543rd St.), 0.7 mi downstream from Hickory Creek, 5.0 mi west of Moulton, 8.0 mi upstream from Iowa-Missouri border, 20.8 mi downstream from Rathbun Dam, and at mile 121.5.

DRAINAGE AREA.--740 mi^2.

PERIOD OF RECORD--August 1979 to current year.

GAGE--Water stage recorder. Datum of gage is 800.00 ft above sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Jan. 11-22, Mar 10-14, June 13-15, 21, and July 16, 17, 28, 29. Records good except those for estimated daily discharges, which are poor. Flow regulated by Rathbun Reservoir (station 06903880) 20.8 mi upstream. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey satellite and telephone modem data collection platform and U.S. Army Corps of Engineers rain gage at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 45 ft, discharge unknown, from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	55	62	741	79	744	1910	901	935	1190	1250	677
2	24	38	57	1000	104	720	634	887	939	1290	1250	124
3	24	29	43	1440	97	706	672	877	943	1270	1260	307
4	23	25	71	989	88	700	876	865	946	1260	1190	853
5	23	23	87	1340	99	693	867	858	950	1260	597	873
6	23	22	57	1030	83	687	794	875	945	1280	1140	874
7	23	22	44	931	78	688	1120	2070	950	1720	1230	874
8	25	23	40	803	76	1590	3330	2950	984	1440	1210	845
9	31	23	814	754	76	1670	2700	743	768	1290	1210	206
10	27	22	1200	734	86	e650	1140	635	610	1260	1220	43
11	381	22	1230	e700	121	e270	588	770	865	1250	1210	354
12	157	22	1230	e650	395	e170	660	747	920	1250	1210	852
13	277	22	1220	e700	633	e260	892	871	e2500	1240	1210	872
14	244	23	1220	e650	716	e600	1150	902	e3000	1240	1210	1490
15	78	22	1220	e650	712	769	664	896	e700	1240	1220	1300
16	39	22	873	e700	706	752	660	895	308	e1230	1210	563
17	25	25	673	e750	735	1370	656	881	726	e1230	1210	924
18	19	20	732	e650	844	3140	764	877	1760	1240	1230	919
19	18	19	733	e650	888	1940	750	874	3490	1230	1230	906
20	17	19	741	e700	826	961	745	897	1130	1220	1230	905
21	15	21	710	e650	760	921	887	943	e300	1260	1230	902
22	15	20	710	e650	738	1010	935	1730	601	1270	1240	876
23	15	19	697	679	735	937	902	1300	770	1270	1230	248
24	17	18	710	673	724	967	889	2780	810	1280	1240	221
25	17	18	710	672	708	940	885	1000	949	1270	1240	277
26	51	18	719	673	677	979	880	787	979	1280	1230	275
27	236	17	699	674	802	951	869	714	963	1310	1230	274
28	181	18	698	657	840	933	870	952	955	e1340	974	270
29	226	20	690	385	---	925	905	964	958	e590	908	268
30	184	32	685	149	---	1010	899	950	1020	984	1070	266
31	91	---	682	75	---	3060	---	942	---	1250	1230	---
TOTAL	2550	699	20057	22499	13426	31713	30493	33333	32674	38734	36549	18638
MEAN	82.3	23.3	647	726	480	1023	1016	1075	1089	1249	1179	621
MAX	381	55	1230	1440	888	3140	3330	2950	3490	1720	1260	1490
MIN	15	17	40	75	76	170	588	635	300	590	597	43
MED	25	22	710	679	692	925	878	895	946	1260	1220	761
AC-FT	5060	1390	39780	44630	26630	62900	60480	66120	64810	76830	72490	36970
CFSM	.11	.03	.87	.98	.65	1.38	1.37	1.45	1.47	1.69	1.59	.84
IN.	.13	.04	1.01	1.13	.67	1.59	1.53	1.68	1.64	1.95	1.84	.94

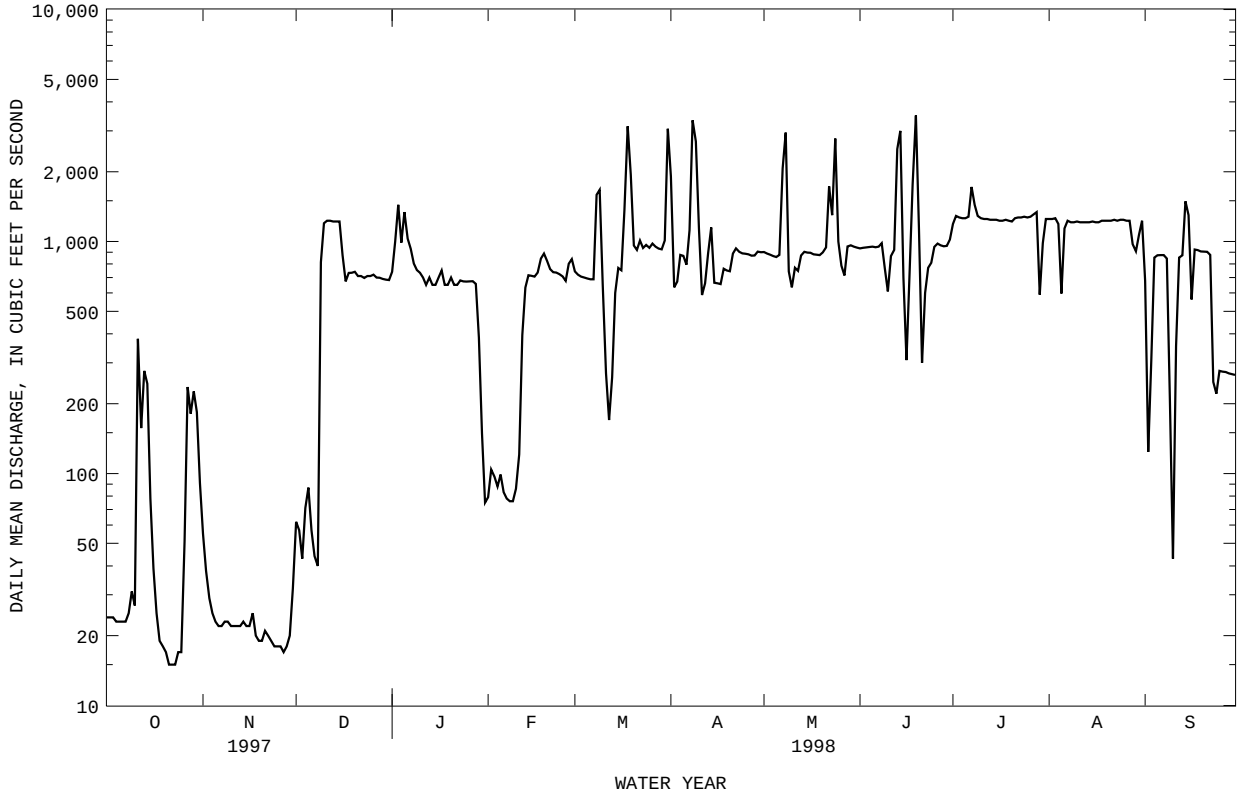
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1998, BY WATER YEAR (WY)

MEAN	416	414	544	352	484	705	649	705	666	944	725	530
MAX	1874	1931	1557	1696	1773	1831	1481	1421	1341	2849	2004	1976
(WY)	1994	1994	1983	1993	1983	1993	1993	1995	1980	1982	1993	1993
MIN	24.2	23.0	20.1	22.2	20.6	24.3	22.7	33.0	20.3	17.9	21.0	26.6
(WY)	1989	1989	1990	1989	1989	1989	1989	1980	1988	1988	1988	1988

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1980 - 1998	
ANNUAL TOTAL	157470		281365			
ANNUAL MEAN	431		771		596	
HIGHEST ANNUAL MEAN					1555	1993
LOWEST ANNUAL MEAN					43.6	1989
HIGHEST DAILY MEAN	3480	Apr 16	3490	Jun 19	8720	Jul 17 1982
LOWEST DAILY MEAN	15	Oct 21	15	Oct 21,22,23	14	Jun 22 1988a
ANNUAL SEVEN-DAY MINIMUM	16	Oct 19	16	Oct 19	15	Jun 22 1988
INSTANTANEOUS PEAK FLOW			4330	Jun 19	11200	Jul 16 1982
INSTANTANEOUS PEAK STAGE			32.36	Jun 19	36.83	Jul 16 1982
ANNUAL RUNOFF (AC-FT)	312300		558100		431600	
ANNUAL RUNOFF (CFSM)	.58		1.04		.80	
ANNUAL RUNOFF (INCHES)	7.92		14.14		10.94	
10 PERCENT EXCEEDS	1190		1260		1400	
50 PERCENT EXCEEDS	81		769		349	
90 PERCENT EXCEEDS	23		24		26	

a Also June 23, 27, and July 9, 1988
e Estimated

06904010 CHARITON RIVER NEAR MOULTON, IA--Continued



CREST-STAGE PARTIAL-RECORD STATIONS

The following table contains annual maximum discharge for crest-stage stations. A crest-stage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but 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 up to the current year for which the annual maximum has been determined.

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS

[+--Not determined, a--peak stage did not reach bottom of gage, b--ice affected, c--old gage datum, d--estimate, e--peak affected by backwater]

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
BIG SIOUX RIVER BASIN								
Dawson Creek near Sibley, IA (06483440)	Lat 43°23'23", long 95°42'53", near NW corner sec.20, T.99 N., R.41 W., Osceola County, Hydrologic Unit 10170204, at culvert on county highway A30, 2 mi southeast of Sibley. Drainage area is 4.35 mi^2.	1952-	04-27-98	4.43	(+)	06-29-93	8.84	(+)
Burr Oak Creek near Perkins, IA (06483495)	Lat 43°14'43", long 96°10'38", in SE1/4, sec.5, T.97 N., R.45 W., Sioux County, Hydrologic Unit 10170204, at bridge on U.S. Highway 75, 4 mi north of Perkins. Drainage area is 30.9 mi^2.	1966-	04-27-98	83.57	(+)	06-20-83	88.37	(+)
PERRY CREEK BASIN								
Perry Creek near Merrill, IA (06599800)	Lat 42°43'15", long 96°20'33", in NW1/4, sec.12, T.91, N., R.47 W., Plymouth County, Hydrologic Unit 10230001, at bridge on county highway C44, 5 mi west of Merrill. Drainage area is 8.17 mi^2.	1953-1995 1996-	07-10-98	5.42	52.3	03-27-62	12.22	(+)
Perry Creek near Hinton, IA (06599950)	Lat 42°37'11", long 96°22'20", in NE1/4, sec.15, T.90 N., R.47 W., Plymouth County, Hydrologic Unit 10230001, at bridge on county highway, 4 mi west of Hinton. Drainage area is 33.1 mi^2.	1953-	07-09-98	25.77	208	06-14-81	38.68	d5,500
FLOYD RIVER BASIN								
Little Floyd River near Sanborn, IA (06600030)	Lat 43°11'10", long 95°43'30", in NE1/4, sec.31, T.97 N., R.41 W., O'Brien County, Hydrologic Unit 10230002, at bridge on U.S. Highway 18, 3.5 mi west of Sanborn. Drainage area is 8.44 mi^2.	1966-	1998	(a)	<104	03-02-70	89.04	(+)
Sweeney Creek tributary near Sheldon, IA (06600036)	Lat 43°11'10", long 95°44'38", in SW1/4, sec.25, T.97 N., R.42 W., O'Brien County, Hydrologic Unit 10230002, at culvert on U.S. Highway 18, 4.8 mi east of Sheldon. Drainage area is 0.62 mi^2.	1991-	1998	(a)	(+)	07-14-93	99.27	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
FLOYD RIVER BASIN								
West Branch Floyd River near Struble, IA (06600300)	Lat 42°55'26", long 96°10'36", in SE1/4, sec.29, T.94 N., R.45 W., Sioux County, Hydrologic Unit 10230002, at bridge on county highway B62, 0.1 mi west of U.S. Highway 75, 2.2 mi northeast of Struble. Drainage area is 180 mi^2	1996-07-06-	989.96	1,060	03-04-94	15.86	8,920	
MONONA-HARRISON DITCH BASIN								
Big Whiskey Slough near Remsen, IA (06601480)	Lat 42°48'28", long 95°53'21", in NW1/4, sec.11, T.92 N., R.43 W., Plymouth County, Hydrologic Unit 10230004, at bridge on State Highway 3, 4.2 mi east of Remsen. Drainage area is 12.9 mi^2.	1966-	1998	(a)	(+)	03-22-79	94.87	(+)
Elliott Creek at Lawton, IA (06602190)	Lat 42°28'30", long 96°11'22", in NW1/4, sec.3, T.88 N., R.46 W. Woodbury County, Hydrologic Unit 10230004, at bridge on U.S. Highway 20, at west edge of Lawton. Drainage area is 34.8 mi^2.	1966-	1998	(a)	<1200	06-12-84	86.14	3,150
LITTLE SIOUX RIVER BASIN								
Ocheyedan River near Ocheyedan, IA (06604510)	Lat 43°25'58", long 95°36'41", in NE1/4, sec.6, T.99 N., R.40 W., Osceola County, Hydrologic Unit 10230003, at bridge on State Highway 9, 4 mi northwest of Ocheyedan. Drainage area is 73.5 mi^2.	1966-	1998	(a)	<350	06-29-93	86.79	2,200
Dry Run Creek near Harris, IA (06604584)	Lat 43°26'42", long 95°27'21", in NE1/4, sec.33, T.100 N., R.39 W., Osceola County, Hydrologic Unit 10230003, at culvert on county highway M12, 1 mi west of Harris. Drainage area is 4.30 mi^2.	1990-	07-05-98	10.27	10.1	06-29-93	16.44	419
Prairie Creek near Spencer, IA (06605340)	Lat 43°05'16", long 95°09'40", in SE1/4, sec.36, T.96 N., R.37 W., Clay County, Hydrologic Unit 10230003, at bridge on U.S. Highway 71, 4 mi south of Spencer. Drainage area is 22.3 mi^2.	1966-	1998	(a)	<119	07-04-71	90.77	2,200
Willow Creek near Cornell, IA (06605750)	Lat 42°58'21", long 95°09'40", in SE1/4, sec.12, T.94 N., R.37 W., Clay County, Hydrologic Unit 10230003, at bridge on U.S. Highway 71, 2 mi northwest of Cornell. Drainage area is 78.6 mi^2.	1966-	1998	(a)	<340	03-22-79	91.49	4,200
Little Sioux River tributary near Peterson, IA (06605868)	Lat 42°55'25", long 95°21'55", in NW1/4, sec.32, T.94 N., R.38 W., Clay County, Hydrologic Unit, 10230003, at culvert on State Highway 10, 1.2 mi northwest of Peterson. Drainage area is 0.29 mi^2.	1991-	1998	(a)	(+)	05-31-93	91.81	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			LITTLE SIOUX RIVER BASIN--Continued					
Willow Creek near Calumet, IA (06606231)	Lat 42°58'05", long 95°32'56" in NE1/4, sec. 15, T.94 N., R.40 W., Sac County, Hydrologic Unit 10230003, at culvert on State Highway10, 1.2 mi north of Calumet, Drainage are is 4.13 mi^2.	1991-	03-30-98	95.24	(+)	07-14-93	100.92	(+)
Halfway Creek at Schaller, IA (0660683710)	Lat 42°30'18", long 95°17'19", in SW1/4, sec.24, T.89 N., R.38 W., Sac County, Hydrologic Unit 10230005, at culvert on State Highway 110, 0.1 mi north of Schaller. Drainage area is 1.74 mi^2.	1990-	06-24-98	(+)	(+)	07-14-92	94.11	(+)
			BOYER RIVER BASIN					
Boyer River tributary at Woodbine, IA (06609482)	Lat 41°43'58", long 95°43'19", in SE1/4, sec.15, T.80 N., R.42 W., Harrison County, Hydrologic Unit 10230007, at culvert on county highway F32, 0.5 mi west of Woodbine, Drainage area is 0.67 mi^2.	1990-	05-22-98	86.31	(+)	05-18-91	90.84	(+)
Willow Creek near Soldier, IA (06609560)	Lat 41°55'17", long 95°42'05", near S1/4 corner sec.11, T.82 N., R.42 W., Monona County, Hydrologic Unit 10230001, at bridge on State Highway 37, 6 mi southeast of Soldier, Drainage area is 29.1 mi^2.	1966-	06-14-98 Revised Record 07-17-96	73.56 83.02	1,170 5,660	07-09-93	84.66	6,840
			MOSQUITO CREEK BASIN					
Moser Creek near Earling, IA (06610510)	Lat 41°46'35", long 95°26'55", in NE1/4, sec.1, T.80 N., R.40 W., Shelby County, Hydrologic Unit 10230006, at bridge on State Highway 37, 1.5 mi west of Earling. Drainage area is 21.6 mi^2.	1966-	06-14-98	81.33	4,340	06-15-84	87.89	(+)
Mosquito Creek tributary near Neola, IA (06610581)	Lat 41°30'06", long 95°35'44", in NE1/4, sec.6, T.77 N., R.41 W., Pottawattamie County, Hydrologic Unit 10230006, at culvert on State Highway 191, 3.8 mi north of Neola. Drainage area is 3.22 mi^2.	1991-	06-14-98	80.66	(+)	07-09-93	81.06	(+)
Keg Creek tributary near Mineola, IA (06805849)	Lat 41°07'53", long 95°43'31", in SW1/4, sec.7, T.73 N., R.42 W., Mills County, Hydrologic Unit 10240001, at culvert on county highway H12, 2.4 mi southwest of Mineola. Drainage area is 2.01 mi^2.	1991-	06-14-98	85.31	897	08-29-93	81.53	d437
			NISHNABOTNA RIVER BASIN					
Elm Creek near Jacksonville, IA (0680737930)	Lat 41°38'44", long 95°12'18", in SW1/4, sec.18, T.79 N., R.37 W., Shelby County, Hydrologic Unit 10240002, at culvert on State Highway 44, 2.8 mi west of Jacksonville. Drainage area is 9.43 mi^2.	1990-	05-15-98	93.73	(+)	06-17-90	95.01	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
NISHNABOTNA RIVER BASIN--Continued								
Indian Creek near Emerson, IA (06807470)	Lat 41°01'50", long 95°22'51", in NW1/4, sec.19, T.72 N., R.39 W., Montgomery County, Hydrologic Unit 10240002, at bridge on U.S. State Highway 34, 1 mi east of Emerson. Drainage area is 37.3 mi^2.	1966-	06-14-98	92.18	9,100	06-15-82	92.63	15,800
Middle Silver Creek near Oakland, IA (06807760)	Lat 41°19'28", long 95°33'19", in E1/4 corner, sec.4, T.75 N., R.41 W., Pottawattamie County, Hydrologic Unit 10240002, at bridge on county highway, 8.5 mi northwest of Oakland. Drainage area is 25.7 mi^2.	1953-	07-14-98	15.63	2,540	07-04-73	14.73	2,110
Bluegrass Creek at Audubon, IA (06808880)	Lat 41°42'46", long 94°44'46", in NW1/4, sec.28, T.80 N., R.35 W., Audubon County, Hydrologic Unit 10240003, at bridge on U.S. Highway 71, near south edge of Audubon. Drainage area is 15.4 mi^2.	1966-	06-14-98	83.27	1,940	07-09-93	88.55	(+)
TARKIO RIVER BASIN								
Tarkio River near Elliott, IA (06811760)	Lat 41°06'06", long, 95°06'09", near NE corner sec.28, T.73 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, at bridge on county highway, 4.5 mi southeast of Elliott. Drainage area is 10.7 mi^2.	1952-	06-14-98	14.68	5,000	08-29-93	12.98	4,640
East Tarkio Creek near Stanton, IA (06811800)	Lat 41°04'48", long 95°05'34", in W1/2 sec.34, T.73 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, at bridge on county highway H24, 7 mi north of Stanton. Drainage area is 4.66 mi^2.	1952-	06-14-98	12.33	2,800	06-09-67	13.74	4,790
Tarkio River tributary near Stanton, IA (06811820)	Lat 41°02'38", long 95°05'55", in NE1/4 sec.16, T.72 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, at box culvert on county highway H63, 4 mi north of Stanton. Drainage area is 0.67 mi^2.	1952-	06-14-98	3.16	(+)	06-09-67	5.18	835
Snake Creek near Yorktown, IA (06811875)	Lat 40°44'33", long 95°07'46", in NW1/4, sec.32, T.69 N., R.37 W., Page County, Hydrologic Unit 10240005, at bridge on State Highway 2, 1.5 mi northeast of Yorktown. Drainage area is 9.10 mi^2.	1966-1991 1997-	06-14-98	93.33	(+)	07-09-87	95.24	3,080
NODAWAY RIVER BASIN								
West Nodaway River at Massena, IA (06816290)	Lat 41°14'44", long 94°45'27", in SE1/4, sec.33, T.75 N., R.34 W., Cass County, Hydrologic Unit 10240009, at bridge on State Highway 148, at southeast corner of Massena. Drainage area is 23.4 mi^2.	1966-	06-14-98	76.44	1,010	02-01-73	82.39	(+)

MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS-Continued

Station name and number	Location and drainage area	Period of record	Water year 1998 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			PLATTE RIVER BASIN					
Platte River near Diagonal, IA (06818750)	Lat 40°46'02", long 94°24'46", in NW1/4, sec. 22, T.69 N., R.31 W., Ringgold County, Hydrologic Unit 10240012, at bridge on county highway, 2.2 mi upstream from Turkey Creek, 4.6 mi. southwest of Diagonal, and 4.9 mi downstream from Gard Creek. Drainage area is 217 mi^2.	1968-1991	03-30-98	15.95	3,170	09-09-89	23.60	8,630
Middle Branch 102 River near Gravity, IA (06819110)	Lat 40°49'40", long 94°44'18", in SE1/4, sec.27, T.70 N., R.34 W., Taylor County, Hydrologic Unit 10240013, at bridge on State Highway 148, 4.8 mi north of Gravity. Drainage area is 34.5 mi^2.	1966-	03-30-98	63.48	846 07-05-93	02-01-73 76.83	c83.65 d4,790	(+)
			GRAND RIVER BASIN					
Sevenmile Creek near Thayer, IA (06897858)	Lat 41°01'37", long 94°00'03", in SE1/4, sec.18, T.72 N., R.27 W., Clarke County, Hydrologic Unit 10280102, at culvert on U.S. Highway 34, 2.6 mi east of Thayer. Drainage area is 6.61 mi^2.	1991-	03-30-98	21.50	(+)	09-15-92	24.92	d1,330
Elk Creek near Decatur City, IA (06897950)	Lat 40°43'18", long 93°56'12", in SE1/4, sec. 34, T.69 N., R.27 W., Decatur County, Hydrologic Unit 10280102, at bridge on county Highway, 1,000 ft. downstream from West Elk Creek, 5.8 mi. upstream from mouth, and 5.5 mi. (Revised) west of Decatur City. Drainage area is 52.5 mi^2.	1968-	03-30-98	22.34	6,970	07-05-93	29.93	32,800

+)--Not determined
(a)--peak stage did not reach bottom of gage
b--ice affected
c--old gage datum
d--estimate
e--peak affected by backwater

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06483500 Rock River near Rock Valley, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
02...	1020	115	16.4	849
NOV				
12...	1350	142	.6	793
DEC				
16...	1505	146	.4	866
JAN				
29...	1200	74	.5	890
MAR				
18...	1655	207	.0	885
APR				
29...	1020	1400	11.0	656
JUN				
09...	1505	445	14.6	848
JUL				
21...	1310	348	25.4	600
SEP				
01...	1450	240	24.6	707

06486000 Missouri River at Sioux City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
03...	0815	69200	19.8	785
07...	1440	66900	25.0	790
10...	0920	70400	18.0	766
14...	0905	68600	13.8	773
17...	1205	72500	13.2	766
20...	1215	69000	13.8	750
24...	0805	68300	12.8	768
27...	0820	70900	8.0	788
31...	0915	70300	9.9	770
NOV				
03...	1125	71700	7.4	762
07...	1200	70200	6.0	759
10...	0945	73300	6.1	750
14...	0950	72200	5.0	761
17...	1000	71200	2.6	741
21...	0920	68400	4.1	742
24...	0900	71700	3.7	--
28...	1210	73200	4.5	758
DEC				
01...	1215	70100	4.0	752
05...	1145	59200	.0	743
08...	0830	51000	-.5	802
16...	0830	30600	.6	813
22...	0915	29100	.1	821
30...	0945	30900	1.3	774
JAN				
05...	1315	28800	.6	741
16...	1230	21400	.5	845
23...	1050	26100	.0	817
26...	1330	28100	1.9	815
FEB				
02...	1145	27800	5.0	1200
10...	1235	28100	1.3	741
17...	0908	28200	1.2	742
23...	1150	28600	10.0	910
MAR				
02...	1350	30400	.5	840
16...	1115	26800	.0	819
20...	0905	28500	.1	834
23...	1210	30800	2.3	805
27...	1210	30300	5.0	760
30...	1305	33600	6.0	786
APR				
03...	0850	30300	6.3	830
06...	1000	31000	9.5	880
13...	0925	28800	13.0	566
17...	0800	30800	7.5	831
17...	0845	30800	3.6	831
21...	1145	30700	11.0	854
24...	1200	30600	12.9	798
27...	0845	34000	9.6	840
MAY				
01...	0855	30600	13.3	818
04...	0820	32500	14.3	858
06...	1040	31900	16.0	834
08...	1210	31100	14.5	849
11...	0830	31700	16.5	826
15...	1150	31500	19.0	781
18...	1040	36200	20.9	809
22...	0910	35500	18.0	573
26...	0835	32900	16.8	784
29...	0915	35600	18.5	770
JUN				
01...	1315	35900	19.0	805
05...	0920	37100	15.4	587
08...	1010	37900	14.7	835
12...	0825	39400	16.9	812
15...	0915	35000	17.4	505
19...	0840	29200	19.8	859
23...	0815	27200	23.7	860
26...	0925	31200	24.0	809
29...	0915	33900	25.3	795
JUL				
02...	0820	33400	25.5	791
06...	0840	33800	24.4	806
10...	0835	33200	24.7	802
13...	0845	33800	25.7	799
17...	0925	32300	26.5	805
21...	0800	30900	24.0	822
24...	0915	32500	25.4	684
27...	1030	33500	24.3	810
31...	0845	32400	19.0	790
AUG				
03...	0845	34000	22.7	792
07...	1030	32700	22.0	786
10...	0925	31900	24.0	687
14...	1055	31300	25.0	787
17...	1200	32600	25.0	784
21...	0930	32600	25.6	772
24...	1200	31400	27.0	680
28...	0935	32900	23.8	780
31...	0910	32100	24.5	798
SEP				
04...	1120	35400	24.2	728
08...	1255	33200	23.8	765
11...	1130	33500	24.0	764
14...	0855	33100	23.3	806
18...	1110	33700	23.0	815
21...	1030	32400	18.6	810
25...	0950	33300	19.8	772
28...	1100	34100	21.0	761

06600000 Perry Creek at 38th Street, Sioux City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
02...	1335	9.4	17.5	965
NOV				
18...	0830	9.3	.0	239
DEC				
17...	1350	17	1.0	774
JAN				
30...	0935	15	.4	733
MAR				
20...	1105	23	4.0	880
APR				
28...	0925	47	8.6	789
JUN				
08...	1500	54	12.8	769
JUL				
20...	1100	24	23.0	777
SEP				
03...	1140	15	19.5	789

06600100 Floyd River at Alton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	1530	13	19.0	876
NOV				
14...	0900	31	.0	1210
DEC				
17...	0850	20	.0	770
JAN				
29...	1435	14	.5	990
MAR				
19...	0950	22	1.9	849
APR				
28...	1230	295	11.0	890
JUN				
09...	1205	112	13.5	814
JUL				
21...	0850	45	25.9	786
SEP				
01...	1815	11	24.8	864

06600500 Floyd River at James, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	0950	133	13.7	960
NOV				
14...	1230	137	.1	1040
DEC				
17...	1200	118	.3	953
JAN				
29...	1630	109	.5	971
MAR				
19...	1500	154	3.0	1010
APR				
27...	1615	1380	12.1	878
JUN				
08...	1350	484	14.2	901
JUL				
20...	1315	342	28.7	863
SEP				
02...	1120	148	21.5	905

06601200 Missouri River at Decatur, NE

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	1145	66500	20.0	780
21...	1130	66700	14.0	775
30...	1255	66500	8.7	775
NOV				
12...	1130	71500	5.5	783
24...	1210	67400	4.0	762
DEC				
10...	1245	46700	.5	770
22...	1150	30600	1.6	777
JAN				
06...	1210	29600	.7	772
26...	1330	26200	.5	794
FEB				
13...	1130	28800	4.0	830
24...	1225	29100	8.2	847
MAR				
26...	1405	31600	4.0	1020
APR				
01...	1230	33200	7.0	812
15...	0945	30400	6.0	720
30...	1410	33100	14.0	891
MAY				
06...	1205	32300	16.5	867
11...	1020	30500	--	--
28...	1300	37100	20.5	824
JUN				
11...	1405	38700	22.0	920
22...	1510	29700	24.0	936
JUL				
08...	0945	36900	25.0	--
22...	1145	33200	27.0	810
AUG				
05...	1045	33300	23.7	801
19...	1230	33200	27.5	789
SEP				
03...	1500	34900	26.0	786
14...	1350	34100	24.0	767
29...	1300	34700	21.5	774

06602020 West Fork Ditch at Hornick, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1115	78	5.0	763
DEC				
08...	1030	84	.0	818
JAN				
21...	1530	57	2.5	828
MAR				
03...	1630	83	1.5	749
APR				
16...	1115	314	8.0	750
MAY				
27...	1635	161	21.5	783
JUL				
09...	1000	283	24.0	760
AUG				
09...	1620	129	29.5	764

06602400 Monona-Harrison Ditch near Turin, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1355	135	7.0	760
DEC				
09...	1400	143	.0	808
JAN				
20...	1340	110	.0	796
MAR				
06...	1345	154	4.5	805
APR				
15...	1345	1260	9.5	430
MAY				
27...	1150	316	19.0	803
JUL				
06...	1450	1160	25.0	421
AUG				
17...	1310	298	25.0	690
SEP				
28...	1420	149	21.0	758

06605000 Ocheyedan River near Spencer, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
02...	0905	12	13.0	703
NOV				
13...	0930	16	.0	381
DEC				
16...	0915	18	.2	837
JAN				
29...	0815	8.8	.0	873
MAR				
18...	1030	24	.0	848
APR				
29...	1425	437	13.0	627
JUN				
10...	1030	131	16.4	788
JUL				
22...	0830	72	21.3	740
SEP				
01...	0935	36	18.2	702

06605850 Little Sioux River at Linn Grove, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	1605	52	18.0	667
NOV				
13...	1150	62	1.2	695
DEC				
15...	1505	66	1.2	780
JAN				
28...	1530	46	.5	845
MAR				
17...	1650	154	1.5	758
APR				
30...	1130	1480	12.3	696
JUN				
10...	1440	521	16.5	682
JUL				
22...	1210	317	25.8	652
AUG				
31...	1700	167	24.3	597

06606600 Little Sioux River at Correctionville, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	1305	173	16.0	645
NOV				
18...	1150	125	.7	758
DEC				
15...	1220	169	.6	825
JAN				
28...	1300	116	.5	909
MAR				
17...	1200	360	1.9	794
APR				
27...	1320	1850	13.5	683
MAY				
27...	1030	1400	18.5	642
JUN				
11...	0915	1110	21.0	739
18...	1400	2760	22.0	678
JUL				
23...	1135	833	25.6	687
AUG				

06607200 Maple River at Mapleton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1320	127	7.0	750
DEC				
09...	0925	110	.0	760
JAN				
21...	1345	87	.0	823
MAR				
03...	1435	164	2.0	703
APR				
16...	1400	748	9.0	655
MAY				
27...	1410	395	21.0	704
29...	1045	554	21.5	514
JUN				
09...	1020	650	14.0	574
JUL				
09...	1245	914	24.5	658
AUG				
19...	1420	425	29.0	698
SEP				
30...	1745	190	20.5	708
30...	1746	199	20.5	--

06607500 Little Sioux River near Turin, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1030	371	3.5	727
DEC				
09...	1225	353	.0	806
JAN				
20...	1200	248	.0	874
MAR				
06...	1230	756	2.0	683
APR				
15...	1120	2980	11.0	652
JUN				
01...	1350	2450	20.0	503
JUL				
06...	1225	4080	25.5	499
AUG				
19...	0945	1440	27.0	673
SEP				
28...	1135	490	21.0	640

06608500 Soldier River at Pisgah, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1430	86	8.0	745
DEC				
05...	1110	30	.0	787
08...	1315	99	.0	741
12...	1020	58	.0	264
19...	1030	86	.0	708
22...	1000	82	.0	750
29...	0905	65	.4	761
JAN				
02...	1240	82	1.0	918
05...	1355	90	.0	760
09...	1045	60	-.5	32
12...	0935	53	.0	--
16...	1250	58	2.0	256
20...	0950	61	.0	771
23...	1345	60	.0	744
26...	1040	67	.0	760
30...	1215	127	.5	651
FEB				
17...	1420	125	3.5	635
MAR				
02...	1205	93	2.5	712
12...	1235	44	.0	384
APR				
13...	1450	307	15.5	638
MAY				
26...	1235	200	18.0	698
JUN				
24...	1350	3250	21.0	262
JUL				
16...	1215	444	26.0	591
AUG				
18...	1105	265	25.0	659
SEP				
29...	1205	148	21.0	705

06609500 Boyer River at Logan, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
29...	1640	166	8.0	722
DEC				
05...	1400	64	.0	788
JAN				
22...	1045	100	.0	837
MAR				
02...	1605	269	3.0	699
APR				
13...	1030	1130	14.0	664
MAY				
22...	0930	1270	15.5	471
26...	1600	706	20.5	654
JUN				
09...	1330	3010	14.0	384
24...	1535	5850	22.0	241
JUL				
07...	1310	4450	23.0	449
AUG				
18...	1420	620	28.0	658
SEP				
29...	1450	257	24.0	691

06610000 Missouri River at Omaha, NE

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
08...	1030	69000	20.5	783
15...	1200	76300	15.0	750
21...	1430	72400	14.0	776
27...	1400	75900	9.0	974
NOV				
04...	1330	74800	8.0	777
10...	1215	75200	7.0	797
17...	1340	77400	4.0	766
24...	1230	75600	4.5	767
DEC				
01...	1240	76400	4.2	743
05...	1000	65600	.0	762
10...	1345	50700	.5	744
15...	1030	33600	1.0	786
22...	1245	32600	2.0	798
31...	1215	32900	2.4	796
JAN				
07...	1310	30700	1.5	778
20...	1250	25400	1.0	823
27...	1100	27700	.5	824
FEB				
02...	1100	31600	2.0	775
09...	1600	28600	2.6	766
17...	1255	31000	5.4	873
25...	1420	31300	7.0	760
MAR				
04...	1150	32200	7.7	758
16...	1415	30400	1.5	802
24...	0920	32000	3.0	794
24...	1000	32000	3.0	794
31...	1100	41600	11.5	780
APR				
06...	1445	36800	8.5	828
14...	1000	36800	12.5	880
21...	1405	40400	12.0	871
28...	0930	44700	12.5	--
28...	1000	44700	12.5	800
MAY				
04...	1240	37900	16.0	863
11...	1100	30900	17.5	842
19...	1240	38900	21.5	844
26...	1030	38800	18.5	806
JUN				
02...	1230	43000	21.0	796
10...	0900	48700	16.0	735
10...	0930	48700	19.0	735
17...	1205	50100	20.0	629
22...	1245	37900	22.0	873
29...	1400	45100	27.0	809
JUL				
07...	1030	52600	25.0	666
13...	1400	42100	28.0	792
20...	1005	35300	29.0	--
20...	1100	35400	29.0	820
28...	1105	39200	26.0	826
AUG				
03...	0845	37700	25.1	780
04...	1030	39200	24.5	805
10...	1240	40400	25.4	805
17...	1100	36600	26.5	685
17...	1145	36600	27.0	752
24...	1330	36800	27.5	774
SEP				
01...	0940	29800	25.0	786
01...	1030	32000	25.0	786
08...	1415	39900	26.5	643
14...	1050	36400	24.0	810
22...	1100	36400	21.0	818
29...	1050	36100	23.0	797

06807000 Missouri River at Nebraska City, NE

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
06...	1240	69400	21.0	779
07...	1625	61000	16.5	804
14...	1210	80700	17.0	781
21...	1240	73400	14.0	752
31...	1225	77400	9.0	764
NOV				
03...	1150	81000	9.0	785
10...	1505	80000	7.0	771
17...	1145	76600	3.0	772
25...	1130	80400	4.5	765
DEC				
02...	0850	78900	4.1	735
09...	0850	60200	.6	767
15...	1230	43000	2.0	792
29...	1230	37700	1.0	774
JAN				
07...	1135	37300	1.0	825
22...	1230	30300	.7	854
28...	1300	36600	4.0	815
FEB				
02...	1230	46400	1.7	722
11...	1045	41300	2.1	728
18...	1250	39000	6.3	855
24...	1230	40700	5.5	770
MAR				
02...	1145	39700	3.0	793
19...	1405	42800	2.0	790
23...	1300	44300	3.5	770
30...	1120	61000	11.0	520
APR				
06...	1235	49700	10.5	738
14...	1315	55100	14.5	808
20...	1345	52300	13.0	816
27...	1405	48900	14.5	820
MAY				
04...	1320	47800	17.0	825
11...	1230	41500	19.0	812
18...	1200	45700	21.5	766
26...	1200	52400	19.7	745
JUN				
02...	1040	52000	22.0	764
08...	1400	51100	18.0	798
15...	1650	91900	22.0	555
23...	1345	52400	25.0	721
29...	1615	54800	28.0	675
JUL				
07...	0925	85900	25.0	700
13...	1330	49200	28.5	645
20...	1215	42600	30.0	795
28...	1250	43600	26.5	774
AUG				
04...	1215	43600	25.2	774
10...	1115	46100	26.0	750
17...	1230	44800	27.0	700
24...	1200	47700	28.0	640
SEP				
02...	1415	39500	26.5	641
08...	1420	40600	26.0	760
14...	1115	38400	--	--
21...	1105	40600	23.0	802
28...	1110	39600	23.0	781

06807410 West Nishnabotna River at Hancock, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
13...	1255	155	3.0	706
DEC				
10...	1305	171	1.0	613
JAN				
22...	1355	95	.0	691
MAR				
18...	1020	331	3.0	370
APR				
23...	1010	718	12.0	345
JUN				
05...	1115	735	13.0	533
15...	1100	4450	17.0	346
15...	1101	4840	17.0	341
JUL				
14...	0950	711	22.0	598
AUG				
31...	0910	356	20.0	644

06808500 West Nishnabotna River at Randolph, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	1255	264	18.0	627
NOV				
14...	1315	296	2.0	629
DEC				
12...	1250	300	.0	682
JAN				
26...	1045	440	2.0	663
MAR				
20...	1440	953	4.5	585
APR				
24...	1035	1660	14.0	496
JUN				
03...	1415	1800	16.0	515
12...	1135	11700	18.0	--
14...	2010	22100	18.0	464
15...	1850	28700	--	--
15...	2000	27000	--	--
JUL				
17...	1135	2050	30.0	534
AUG				
27...	1030	844	22.0	602

06809210 East Nishnabotna River near Atlantic, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
13...	1100	94	2.0	540
DEC				
10...	1455	120	1.0	507
JAN				
28...	0900	93	2.0	596
MAR				
18...	1240	355	1.0	342
APR				
23...	1050	488	14.5	316
JUN				
05...	0915	566	12.0	336
15...	1400	38100	17.5	140
JUL				
14...	1245	651	--	--
AUG				

06809500 East Nishnabotna River at Red Oak, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
01...	0945	128	15.0	535
NOV				
13...	0900	185	2.0	517
DEC				
10...	1045	245	.0	499
JAN				
27...	1250	215	2.0	570
MAR				
20...	1130	696	2.0	454
APR				
24...	1325	804	--	--
JUN				
04...	1225	1080	15.0	315
12...	1405	3920	23.0	280
14...	1805	21500	17.0	138
JUN				
15...	1700	64900	18.4	124
15...	1701	60500	18.4	124
15...	1702	56500	18.4	124
16...	1000	32500	19.0	438
16...	1035	16900	--	--
18...	1535	4800	20.6	387
JUL				
16...	1120	1430	27.0	408
AUG				
25...	1245	418	27.0	510

06810000 Nishnabotna River above Hamburg, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
02...	1055	458	18.0	529
NOV				
14...	1100	698	2.0	534
DEC				
12...	1020	855	.0	352
JAN				
23...	1030	820	.0	516
MAR				
19...	1210	2260	--	--
APR				
22...	1355	3590	14.0	292
JUN				
03...	1005	3350	--	--
12...	0845	16700	18.0	--
15...	1800	16000	22.0	355
15...	1845	17400	22.0	355
16...	0950	28400	--	--
16...	1030	30000	--	--
16...	1725	33900	--	--
16...	1805	27700	--	--
16...	2040	24000	23.0	226
16...	2250	34100	--	--
JUN				
17...	0200	48500	19.0	186
17...	0300	55200	--	--
17...	0700	65200	19.5	172
17...	0925	61200	--	--
17...	1200	65000	19.5	172
17...	1710	48700	20.5	153
18...	1015	32600	21.5	219
19...	1315	21000	--	--
20...	1400	20000	28.1	560
22...	1130	15300	23.0	397
25...	1045	9660	25.0	438
JUL				
23...	1115	7800	23.0	244
AUG				
27...	1330	1530	24.0	538

06813500 Missouri River at Rulo, NE

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
07...	1245	74900	21.5	773
15...	1310	81400	17.0	775
29...	1300	89100	9.0	751
NOV				
05...	1140	84500	8.0	759
13...	1030	83500	5.5	780
19...	1310	83000	3.5	770
24...	0945	83100	4.0	768
DEC				
03...	1015	88400	4.3	739
09...	1020	65300	.5	751
11...	0950	59900	1.2	773
16...	1330	47800	1.5	780
23...	0945	45000	2.8	796
30...	1320	43100	2.0	771
JAN				
08...	1235	41700	1.2	797
23...	1005	33500	1.6	832
29...	1240	40900	10.0	1900
FEB				
12...	1200	47800	6.0	910
20...	1230	46400	7.0	718
24...	1240	44400	6.0	730
MAR				
03...	1220	47700	4.0	780
16...	1200	40300	3.8	880
23...	1225	52400	4.5	746
31...	1145	76500	11.0	480
APR				
06...	1220	57900	10.5	779
13...	1220	70600	13.5	756
20...	1150	59900	12.0	782
27...	1130	51100	14.5	796
MAY				
04...	1240	54900	16.5	788
12...	1000	47900	18.0	700
18...	1250	54500	23.0	705
27...	1145	59400	20.5	724
JUN				
01...	1110	61400	23.1	673
09...	0945	61900	--	--
17...	1615	123000	20.0	440
23...	1235	73400	25.5	683
JUL				
01...	1210	64300	27.0	730
06...	1030	94800	28.0	--
13...	1230	64300	30.0	717
21...	1030	50400	--	--
27...	1200	51400	23.0	766
AUG				
03...	1115	50300	25.0	763
11...	1105	48600	25.7	726
18...	1230	48700	27.9	714
25...	1030	48500	--	--
SEP				
02...	1135	39600	28.0	767
09...	1240	41700	26.0	772
14...	1400	42900	24.5	761
23...	1440	45300	22.1	761
30...	1215	43000	23.5	748

06817000 Nodaway River at Clarinda, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
12...	1615	69	4.0	424
DEC				
11...	1520	118	.0	232
JAN				
26...	1315	89	2.0	447
MAR				
17...	1155	409	2.0	270
APR				
21...	0950	570	11.0	248
JUN				
04...	0920	560	15.0	260
12...	0920	4280	21.0	265
12...	0925	3800	21.0	265
15...	1045	28600	32.0	320
16...	1445	5100	18.0	214
16...	1550	5240	18.0	--
JUL				
16...	0740	532	26.0	388
AUG				

06819185 East Fork 102 River at Bedford, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
03...	1100	.01	--	--
NOV				
12...	1430	6.4	6.0	414
DEC				
11...	1320	21	1.5	398
JAN				
26...	1545	17	4.0	478
MAR				
16...	1515	41	1.0	250
APR				
21...	1215	51	11.0	221
JUN				
02...	1325	21	25.0	236
JUL				
15...	1430	12	28.0	344
AUG				
24...	1240	.80	31.0	412

06898000 Thompson River at Davis City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
NOV				
12...	1130	57	2.0	545
DEC				
11...	1005	123	.0	491
JAN				
27...	0830	88	1.0	584
MAR				
20...	1255	2110	2.0	247
APR				
21...	1550	626	14.0	240
MAY				
28...	1430	450	25.0	371
JUL				
15...	1105	418	27.0	384
AUG				
24...	1555	87	31.0	416

06903400 Chariton River near Chariton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1600	140	4.2	262
DEC				
10...	0925	60	.0	407
JAN				
21...	0950	23	.0	507
MAR				
03...	1230	67	2.4	--
MAY				
19...	1400	17	23.5	421
22...	1515	1550	16.5	156
JUN				
23...	0935	36	21.3	313
JUL				
08...	0730	708	24.2	157
21...	0930	8.2	27.2	411
AUG				
17...	0930	6.6	22.0	423
19...	0930	3.1	25.2	493
SEP				
15...	0940	18	19.7	371
30...	0901	2.9	20.0	421

06903700 South Fork Chariton River near Promise City, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1335	321	4.7	263
DEC				
09...	1315	64	.8	432
JAN				
21...	0845	26	.0	488
MAR				
03...	1100	83	2.3	410
MAY				
19...	1050	19	22.3	448
22...	1345	3680	15.0	155
JUN				
24...	1430	193	24.4	356
JUL				
07...	1525	294	25.4	242
22...	0951	5.7	25.7	478
AUG				
18...	1000	2.0	25.0	478
19...	0800	1.6	25.5	481
SEP				
14...	1637	32	20.9	366
30...	1105	1.1	21.2	469

06903900 Chariton River near Rathbun, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT				
28...	1045	11	12.0	254
DEC				
09...	1000	1200	2.3	351
JAN				
20...	1245	560	.7	260
MAR				
02...	1550	618	3.7	264
MAY				
18...	1440	834	16.0	250
JUN				
04...	1030	850	18.0	240
29...	1200	800	20.8	234
JUL				
07...	1230	1190	23.9	235
AUG				
19...	0937	1200	24.4	238
SEP				
30...	1452	215	23.2	234

06904010 Chariton River near Moulton, IA

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT					JUN				
28...	0835	184	3.2	467	19...	0900	4040	20.0	174
DEC					JUL				
09...	0955	800	1.9	289	07...	0900	1860	23.3	294
MAR					AUG				
03...	0905	702	3.0	295	19...	1030	1230	24.7	239
MAY					SEP				
19...	0740	870	16.6	265	10...	1040	43	20.9	297

ADAMS COUNTY

410247094324801. Local number, 72-32-09 CBCC.
LOCATION.--Lat 41°02'48", long 94°32'48", Hydrologic Unit 10240010, on the east side of county road, approximately 4 mi northeast of the City of Prescott. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age (might be in Albany buried-channel).
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 276 ft, screened 266-276 ft, gravel packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,220 ft above sea level, from topographic map. Measuring point: Top of casing, 1.40 ft above land-surface datum.
REMARKS.--Well SW-78.
PERIOD OF RECORD.--October 1987 to November 1987, June 1990, and November 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured,1.38 feet below land-surface datum, May 09, 1996; lowest measured, 3.08 ft below land-surface datum, December 06, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM,WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	2.54	FEB 17	2.18	MAY 07	2.15	AUG 06	2.43

WATER YEAR 1998 HIGHEST 2.15 MAY 07, 1998 LOWEST 2.54 NOV 04, 1997

410248094324801. Local number, 72-32-09 CCBB.
LOCATION.--Lat 41°02'48", long 94°32'48", Hydrologic Unit 10240010, on the east side of county road, approximately 4 mi northeast of the City of Prescott. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 136 ft, screened 130-136 ft, gravel packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,220 ft abovMve sea level, from topographic map. Measuring point: Top of casing, 2.65 ft above land-surface datum.
REMARKS.--Well SW-83.
PERIOD OF RECORD.--August 1988, June 1990, and November 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.72 feet below land-surface datum, February 3, 1994; lowest measured, 5.30 ft below land-surface datum, August 4, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	5.19	FEB 17	4.85	MAY 07	4.81	AUG 06	5.01

WATER YEAR 1998 HIGHEST 4.81 MAY 07, 1998 LOWEST 5.19 NOV 04, 1997

APPANOOSE COUNTY

404103092404001. Local number, 68-16-15 DDAD.
LOCATION.--Lat 40°41'03", long 92°40'40", Hydrologic Unit 10280201, located approximately 4 mi south of State Highway 2 on State Highway 202 beneath water tower in the Town of Moulton. Owner: Town of Moulton.
AQUIFER.--Cambrian/Ordovician.
WELL CHARACTERISTICS.-- Drilled observation water-table well, diameter unknown, depth 2380 ft, casing information unknown.
INSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 992.00 ft above sea level, by unknown method. Measuring point: Top of well cover, 1.07 ft above land-surface datum.
REMARKS.-- Moulton Town Well.
PERIOD OF RECORD.--October 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 381.37 feet below land surface datum, October 10, 1996; lowest measured, 382.42 feet below land-surface datum August 6, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	382.86	FEB 11	382.49	MAY 06	382.73	AUG 05	383.50

AUDUBON COUNTY

413044094565601. Local number, 78-36-35 ADCC1.
LOCATION.--Lat 41°30'44", long 94°56'56", Hydrologic Unit 10240003, 2.5 mi south of the Town of Brayton on Highway 71, and 0.3 mi west on the north side of County Road F-67. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 115 ft, screened 94-101 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,230 ft above sea level, from topographic map. Measuring point: Top of casing, 2.37 ft above land-surface datum.
REMARKS.--Well WC-69.
PERIOD OF RECORD.--June 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.43 ft below land-surface datum, August 11, 1993; lowest measured, 53.55 ft below land-surface datum, April 12, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	47.03	FEB 09	48.21	MAY 06	46.80	AUG 05	34.16

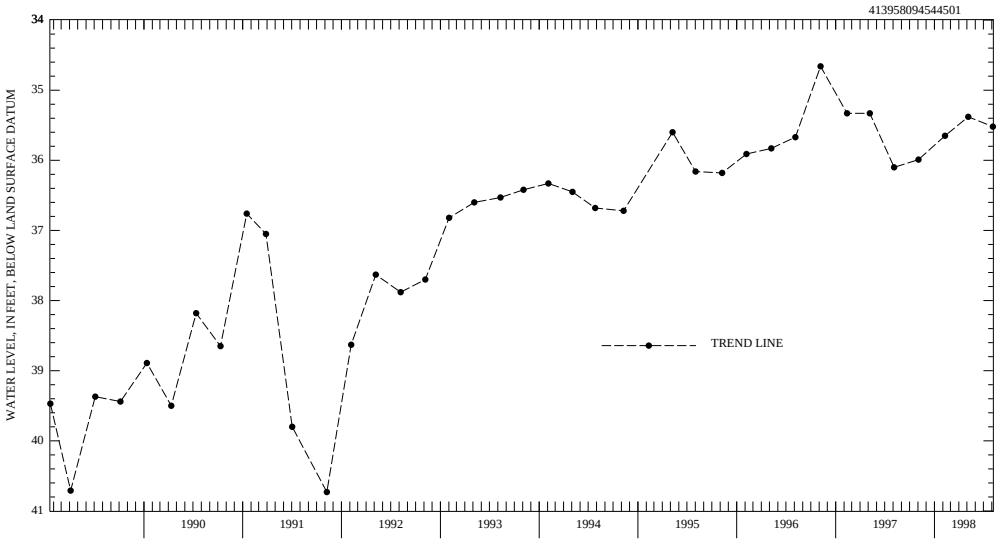
WATER YEAR 1998 HIGHEST 34.16 AUG 05, 1998 LOWEST 48.21 FEB 09, 1998

413958094544501. Local number, 79-35-10 CABB.
LOCATION.--Lat 41°39'58", long 94°54'45", Hydrologic Unit 10240003, approximately 0.3 mi west of the Town of Hamlin, on the south side of Highway 44. Owner: Geological Survey Bureau/DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 221 ft, screened 168-188 ft, open hole 210-221 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,280 ft above sea level, from topographic map. Measuring point: Top of casing, 5.37 ft above land-surface datum.
REMARKS.--Well WC-17.
PERIOD OF RECORD.--August 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.66 ft below land-surface datum, November 6, 1997 and May 09, 1995; lowest measured, 42.40 ft below land-surface datum, November 8, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	35.99	FEB 09	35.65	MAY 06	5.38	AUG 05	35.52

WATER YEAR 1998 HIGHEST 35.38 MAY 06, 1998 LOWEST 35.99 NOV 03, 1997



AUDUBON COUNTY--Continued

415023094593801. Local number, 81-36-12 CBCA
LOCATION.--Lat 41°50'23", long 94°59'38", Hydrologic Unit 10240002, approximately 0.5 mi west of the Town of Gray on the east side
of County Road N-14, south of the Gray Cemetery. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 315 ft, screened 279-295 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,393 ft above sea level, from topographic map. Measuring point: Top of casing, 1.40 ft above land-surface datum.
REMARKS.--Well WC-18.
PERIOD OF RECORD.--August 1981 to current year.
REVISION.--Measuring point revised February 13, 1990 to August 4, 1992.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 159 ft below land-surface datum, August 05, 1998; lowest measured, 168.52 ft below land-surface datum, October 6, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	160.18	FEB 10	159.80	MAY 06	159.63	AUG 05	159

WATER YEAR 1998 HIGHEST 159 AUG 05, 1998 LOWEST 160.18 NOV 05, 1997

BENTON COUNTY

420731092083801. Local number, 85-11-33 CCBC1.
LOCATION.--Lat 42°07'31", long 92°08'38", Hydrologic Unit 07080205, approximately 1 mi south of the Town of Garrison, just east of County Road V-56. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Devonian: Cedar Valley limestone of Middle Devonian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 0.75 in., depth 237 ft, cement plug 97-100 ft, screened below cement plug, open hole 170-237 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 905 ft above sea level, from topographic map. Measuring point: Top of 6 in. casing, 2.20 ft above land-surface datum.
REMARKS.--Garrison 170 well; Garrison wells 109 and 340 also in this hole.
PERIOD OF RECORD.--June 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 60.18 ft below land-surface datum, April 19, 1983; lowest measured, 87.50 ft below land-surface datum, August 2, 1994.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	64.26	FEB 09	63.59	MAY 04	62.20	AUG 03	62.19

WATER YEAR 1998 HIGHEST 62.19 AUG 03, 1998 LOWEST 64.26 NOV 18, 1997

420731092083803. Local number, 85-11-33 CCBC3.
LOCATION.--Lat 42°07'31", long 92°08'38", Hydrologic Unit 07080205, approximately 1 mi south of the Town of Garrison, just east of County Road V-56. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Devonian: Cedar Valley limestone of Middle Devonian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in., depth 97 ft, open hole 90-97 ft, cement plug 97-100 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 905 ft above sea level, from topographic map. Measuring point: Top of 6 in. casing, 2.20 ft above land-surface datum.
REMARKS.--Garrison 109 well; Garrison wells 170 and 340 also in this hole.
PERIOD OF RECORD.--June 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 60.63 ft below land-surface datum, March 23, 1979; lowest measured, 66.87 ft below land-surface datum, August 4, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	63.47	FEB 09	63.65	MAY 04	62.24	AUG 03	62.87

WATER YEAR 1998 HIGHEST 62.24 MAY 04, 1998 LOWEST 63.65 FEB 09, 1998

420731092083802. Local number 85-11-33 CCBC.
LOCATION.--Lat 42°07'31", long 92°08'38", Hydrologic Unit 07080205, approximately 1 mi south of the Town of Garrison, just east of County Road V-56. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian
WELL CHARACTERISTCS.-- Drilled observation artesian water well, diameter 6in., depth 538 ft, casing information unknown
IINSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 905 ft above sea level, from topographic map. Measuring point: Top of 6 in. casing, 2.20 ft above
land-surface datum.
REMARKS.--Garrison 340 well; Garrison wells 170 and 109 also in this hole.
PERIOD OF RECORD.--October 1975 to March 1981; November 1982 to November 1990; November 1993 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 67.50 ft below land-surface datum, August 4 1997; lowest measured, 104.94 ft below land-surface datum, August 21, 1985.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	71.4	FEB 09	90.97	MAY 04	90.75	AUG 03	82.55

WATER YEAR 1998 HIGHEST 71.4 NOV 18, 1997 LOWEST 90.97 FEB 09, 1998

BREMER COUNTY

424224092133901. Local number, 91-12-11 DBB.
LOCATION.--Lat 42°42'15", long 92°13'29", Hydrologic Unit 07080102, located in the town of Readlyn, approximately 0.5 mi south of State Highway 3, in the northwest corner of town limits. Owner: Town of Readlyn.
AQUIFER.--Silurian, Alexanderian Series dolomite.
WELL CHARACTERISTICS.--Drilled public-use well, diameter 16 in, depth 154 ft, casing open from 99-154 ft.
INSTRUMENTATION.--Quarterly measurement with airline by USGS personnel
DATUM.--Elevation of land-surface is 1038 feet above sea level, by topographic map.
REMARKS.--Readlyn No. 2
PERIOD OF RECORD.--August 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 89 feet below land-surface datum, August 07, 1997, lowest measured, 92 feet below land-surface datum, May 05, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	90.00	FEB 11	86.00	MAY 05	92	AUG 04	88

WATER YEAR 1998 HIGHEST 86.00 FEB 11, 1998 LOWEST 92 MAY 05, 1998

BUENA VISTA COUNTY

424023095571401. Local number, 91-35-26 BCCC
LOCATION.--Lat 42°40'09", long 94°57'15", Hydrologic Unit 07100006, approximately 2.7 mi west and 0.5 mi north of the village of Varina. Owner: GEological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: in sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in., depth 357 ft, cased tp 357 ft. screened interval 338-347 ft. Paleozoic rock present at 347 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by U.S.G.S. personnel.
DATUM.--Elevation of land-surface datum is 1,291 ft above sea level, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.
REMARKS.--Well D-24.
PERIOD OF RECORD.--December 1978 to August 1994, November 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.04 ft below land-surface datum, January 7,1980; lowest measured, 95.30 ft below land-surface datum, December 12, 1978.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	97.30	FEB 10	95.40	MAY 06	95.29	AUG 05	95.96

WATER YEAR 1998 HIGHEST 95.29 MAY 06, 1998 LOWEST 97.30 NOV 05, 1997

425233094545001. Local number, 93-35-13 ADAA.
LOCATION.--Lat 42°52'33", long 94°54'50", Hydrologic Unit 07100006, south of the Chicago, Rock Island and Pacific Railroad track, approximately 3.5 mi east and 0.75 mi north of the Town of Marathon. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 1.50 in., depth 381 ft, screened 350-360 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,330 ft above sea level, from topographic map. Measuring point: Top of casing, 3.00 ft above land-surface datum.
REMARKS.--Well D-36.
PERIOD OF RECORD.--February 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 115.06 ft below land-surface datum, January 31, 1994; lowest measured, 137.37 ft below land-surface datum, August 10, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	133.43	FEB 10	133.48	MAY 06	133.15	AUG 05	133.59

WATER YEAR 1998 HIGHEST 133.15 MAY 06, 1998 LOWEST 133.59 AUG 05, 1998

CALHOUN COUNTY

422812094383501. Local number, 88-33-01 BACD.
LOCATION.--Lat 42°28′12″, long 94°38′35″, Hydrologic Unit 07100006, located approximately 4.5 mi north of Rockwell City, in a trailer park at the south end of North Twin Lake in Twin Lakes State Park. Owner: Pauline Goins.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Dug unused water-table well, diameter 24 in., depth 35 ft, casing interval unknown.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,222 ft above sea level, from topographic map. Measuring point: Top of casing, 1.12 ft above land-surface datum.
REMARKS.--Twin Lakes (33F2) well.
PERIOD OF RECORD.--May 1989 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.86 ft below land-surface datum, April 19, 1991; lowest measured, 16.96 ft below land-surface datum, February 28, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 07	11.44	FEB 10	10.74	MAY 07	5.91	AUG 05	8.07

WATER YEAR 1998 HIGHEST 5.91 MAY 07, 1998 LOWEST 11.44 NOV 07, 1997

422339094375101. Local number, 88-33-36 ADAA.
LOCATION.-- Lat 42°23′47″, long 94°37′57″, Hydrologic Unit 07100006, located at the corner of main and 3rd street, three blocks south of U.S. Highway 20. Owner: City of Rockwell.
AQUIFER.-- Cambrian/Ordovician: Prairie du Chen Formation dolomite
WELL CHARACTERISTICS.-- Drilled public supply well, diameter 16 in., depth 1970 ft., casing interval 1590-1970? ft, gravel packed.
INSTRUMENTATION.-- Quarterly measurements with airline by USGS personnel.
DATUM.-- Elevation of land-surface datum is 1,227 ft above sea level, from topographic map.
REMARKS.--Rockwell City Well No. 4
PERIOD OF RECORD.--February 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 199 ft below land-surface datum, Oct. 07, 1997 and Feb. 10, 1998; lowest measured, 237 ft below land-surface datum, August 6, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 07	199.00	FEB 10	199.00	MAY 07	202	AUG 05	202

WATER YEAR 1998 HIGHEST 199.00 NOV 07, 1997 FEB 10, 1998 LOWEST 202 MAY 07, 1998 AUG 05, 1998

CARROLL COUNTY

420230094455101. Local number, 84-34-35 DAAA.
LOCATION.--Lat 42°02'30", long 94°45'51", Hydrologic Unit 07100007, on the south side of county road, approximately 1 mi east of Arthur N. Neu County Airport. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Alluvial and glacial drift: Middle Raccoon River sand and gravel and glacial drift of Quaternary age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 40 ft, screened 28-40 ft, gravel packed. Glacial till 31-36 ft and 37-40 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,185 ft above sea level, from topographic map. Measuring point: Top of casing, 2.35 ft above land-surface datum.
REMARKS.--Well WC-146.
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.50 feet below land-surface datum, May 10, 1995; lowest measured, 8.27 ft below land-surface datum, November 07, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	6.55	FEB 09	5.41	MAY 06	3.85	AUG 06	4.43

WATER YEAR 1998 HIGHEST 3.85 MAY 06, 1998 LOWEST 6.55 NOV 06, 1997

420233094475901. Local number, 83-35-34 BCDC.
LOCATION.--Lat 42°02'33", long 94°47'59", Hydrologic Unit 07100007, approximately 3.5 mi west and 1.5 mi south of the Town of Glidden near the airport, west of County Road N-38. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 100 ft, screened 72-76 ft; gravel packed, open hole 99-100 ft. Pennsylvanian rock 80-100 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,225 ft above sea level, from topographic map. Measuring point: Top of casing, 2.85 ft above land-surface datum.
REMARKS.--Well WC-148.
PERIOD OF RECORD.--October 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.56 ft below land-surface datum, May 4, 1983; lowest measured, 23.72 ft below land-surface datum, November 07, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	21.74	FEB 09	21.37	MAY 06	19.11	AUG 06	19.07

WATER YEAR 1998 HIGHEST 19.07 AUG 06, 1998 LOWEST 21.74 NOV 06, 1997

420643094403701. Local number, 84-33-03 CADA.
LOCATION.--Lat 42°06'43", long 94°40'37", Hydrologic Unit 07100006, 3.5 mi north and 2.5 mi east of the Town of Glidden, on the west side of County Road N-50. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Alluvial: North Raccoon River sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth15 ft, screened 13-15 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,090 ft above sea level, from topographic map. Measuring point: Top of casing, 2.31 ft above land-surface datum.
REMARKS.--Well WC-131.
PERIOD OF RECORD.--September 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.06 ft below land-surface datum, July 10, 1990; lowest measured, 11.99 ft below land-surface datum, May 07, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	11.12	FEB 09	11.40	MAY 06	7.89	AUG 06	8.77

WATER YEAR 1998 HIGHEST 7.89 MAY 06, 1998 LOWEST 11.40 FEB 09, 1998

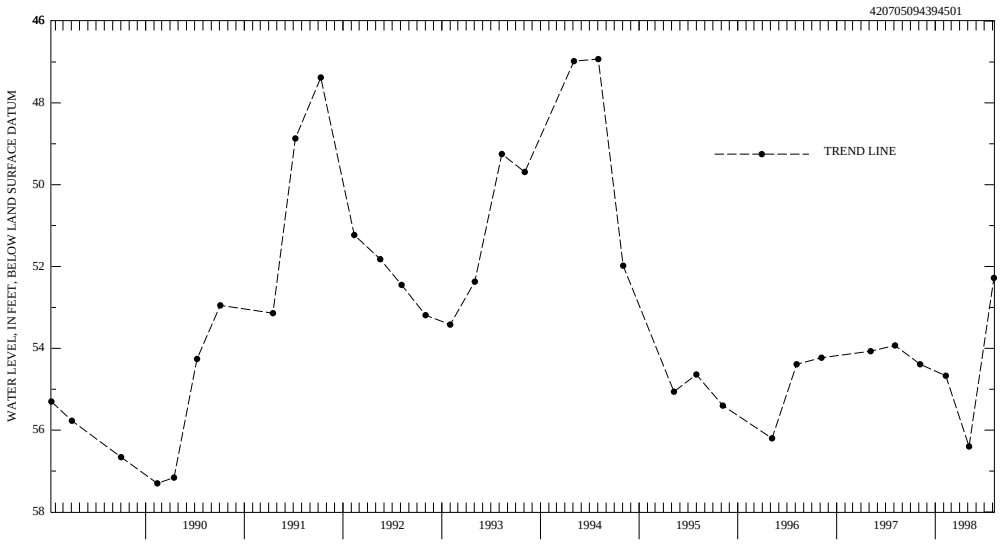
CARROLL COUNTY--Continued

420705094394501. Local number, 84-33-02 BDBA.
LOCATION.--Lat 42°07'05", long 94°39'45", Hydrologic Unit 07100006, 3.75 mi north and 3.25 mi east of the Town of Glidden, east of County Road N-50 and the Kendal Bridge. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 76 ft., screened 73-76 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,110 ft above sea level, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.
REMARKS.--Well WC-132.
PERIOD OF RECORD.--September 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 46.93 ft below land-surface datum, August 3, 1994; lowest measured, 57.30 ft below land-surface datum, February 13, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	54.39	FEB 09	54.67	MAY 06	56.40	AUG 06	52.28

WATER YEAR 1998 HIGHEST 52.28 AUG 06, 1998 LOWEST 56.40 MAY 06, 1998



421058094582701. Local number, 85-35-07 CCCC.
LOCATION.--Lat 42°10'58", long 94°58'27", Hydrologic Unit 07100006, approximately 1 block north of Iowa Highway 217, next to the town maintenance building, Breda. Owner: Town of Breda.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled municipal artesian water well, diameter 10 in., depth 340 ft, screened 320-340 ft. Original depth 349 ft.
INSTRUMENTATION.--Quarterly measurement with chalked taped by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,362 ft above sea level, from topographic map. Measuring point: Vent pipe, 1.60 ft above land-surface datum.
REMARKS.--City of Breda Well No. 3, previously referred to as Town Well No. 2.
PERIOD OF RECORD.--March 1942 to August 1966, March 1968 to November 1971, June 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 187.70 ft below land-surface datum, March 25, 1948; lowest measured, 250.40 ft below land-surface datum, May 24, 1977.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	204.30	FEB 10	199.85	MAY 06	211.69	AUG 06	206.29

WATER YEAR 1998 HIGHEST 199.85 FEB 10, 1998 LOWEST 211.69 MAY 06, 1998

CASS COUNTY

411900094530101. Local number, 75-35-07 BBAB.
LOCATION.--Lat 41°19'00", long 94°55'30", Hydrologic Unit 10240003, approximately 3 mi north and 2.9 mi west of the Town of Cumberland, 2 mi south of County Road G-35 and 2.9 mi west of County Road N-28. Owner: Geological Survey Bureau/DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in., depth 218 ft, screened 189-209 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,295 ft above sea level, from topographic map. Measuring point: Top of casing, 2.35 ft above land-surface datum.
REMARKS.--Well SW-17.
PERIOD OF RECORD.--July 1986 to October 1987, February 1990 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 111.65 ft below land-surface datum, August 5, 1993; lowest measured, 125.75 ft below land-surface datum, March 14, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	114.74	FEB 09	117.82	MAY 07	116.32	AUG 06	114.30

WATER YEAR 1998 HIGHEST 114.30 AUG 06, 1998 LOWEST 117.82 FEB 09, 1998

412832095033501. Local number, 77-37-13 BBBB.
LOCATION.--Lat 41°28'32", long 95°03'35", Hydrologic Unit 10240003, approximately 1 mi south of U.S. Interstate 80, and east of Highway 173. Approximately 2 mi north and 3 mi east of the Town of Marne. Owner: Geological Survey Bureau/DNR and U.S. Geological Survey.
AQUIFER.--Pennsylvanian: limestone of Pennsylvanian age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in., depth 201 ft, screened 196-201 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,298 ft above sea level, from topographic map. Measuring point: Top of casing, 2.20 ft above land-surface datum.
REMARKS.--Well SW-18.
PERIOD OF RECORD.--July 1986 to October 1987, February 1990 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 113.50 ft below land-surface datum, November 4, 1993; lowest measured, 128.40 ft below land-surface datum, March 14, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	120.95	FEB 09	120.75	MAY 06	118.67	AUG 05	115.58

WATER YEAR 1998 HIGHEST 115.58 AUG 05, 1998 LOWEST 120.95 NOV 03, 1997

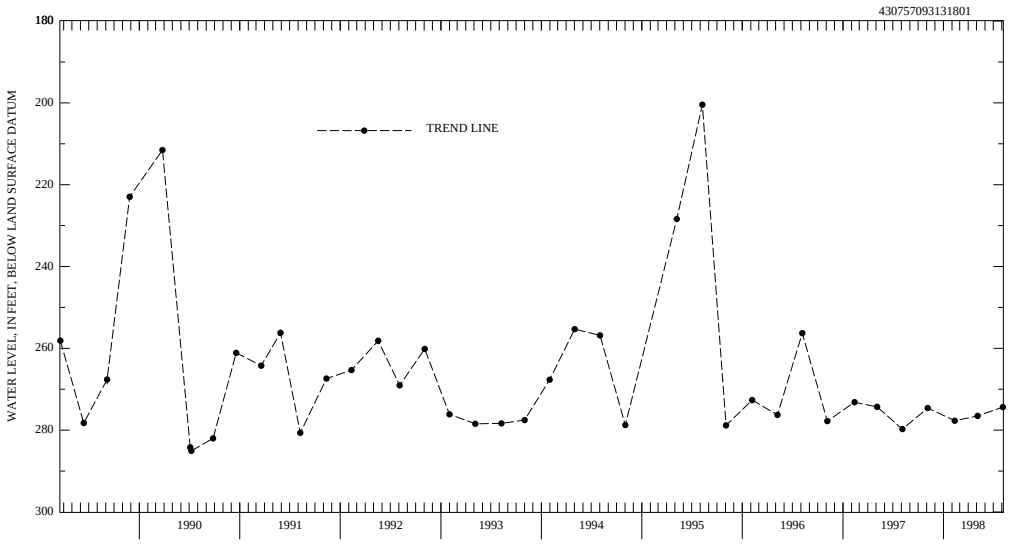
CERRO GORDO COUNTY

430757093131801. Local number,96-20-17 DAAD.
LOCATION.--Lat 43°07'57", long 93°13'18", Hydrologic Unit 07080203, in southwest Mason City, 1 mi west of Highway 65 and south of the Iowa Terminal Rail-yard. Owner: AMPI Creamery (formerly State Brand Creameries).
AQUIFER.--Cambrian-Ordovician: sandstone of Late Cambrian age and sandy dolomite of Early Ordovician age.
WELL CHARACTERISTICS.--Unused drilled industrial artesian water well, diameter 10 to 6 in. from 0-1080 ft, depth 1,336 ft, open hole from 1,080-1,336 ft.
INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,162 ft above sea level, from topographic map. Measuring point: Top of casing, 1.50 ft above land-surface datum.
REMARKS.--State Brand Creameries Well #1. Records for 1968-1971 and 1973-1989 are unpublished and available in the files of the Iowa District Office.
PERIOD OF RECORD.--October 1968 to March 1971, and March 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 170.80 ft below land-surface datum, August 4, 1977; lowest measured, 298.80 ft below land-surface datum, October 22, 1968.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	274.60	FEB 11	277.70	MAY 05	276.53	AUG 05	274.36

WATER YEAR 1998 HIGHEST 274.36 AUG 05, 1998 LOWEST 277.70 FEB 11, 1998



430806093164501. Local number, 96-21-13 BCCB.
LOCATION.--Lat 43°08'06", long 93°16'45", Hydrologic Unit 07080203, south of the County Home, just north of Iowa Highway 106, east of the City of Clear Lake. Owner: Mason City and Clear Lake Railroad.
AQUIFER.--Devonian: Cedar Valley limestone of Middle Devonian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 198 ft. Casing information is not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,165 ft above sea level, from topographic map. Measuring point: Top of well curb, 1.30 ft above land-surface datum.
PERIOD OF RECORD.--November 1940 to August 1971, March 1973 to current year.
REMARKS:--Mason City and Clear Lake Railroad well.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.44 ft below land-surface datum, February 12, 1982; lowest measured, 17.26 ft below land-surface datum, November 18, 1955.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	6.72	FEB 11	7.38	MAY 05	5.36	AUG 05	7.58

WATER YEAR 1998 HIGHEST 5.36 MAY 05, 1998 LOWEST 7.58 AUG 05, 1998

CHEROKEE COUNTY

423833095365701. Local number, 90-40-06 BDCD.
LOCATION.--Lat 42°38′33″, long 95°36′57″, Hydrologic Unit 10230003, approximately 3.1 mi west of U.S. Highway 59 and 0.55 mi north of Iowa Highway 31 along the Illinois Central Railroad track. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 1.25 in., depth 253 ft, sandpoint 252-253 ft.
INSTRUMENTATION.--Quarterly measurements with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,182 ft above sea level, from topographic map. Measuring point: Top of casing, 3.93 ft above land-surface datum.
REMARKS.--Well D-6.
PERIOD OF RECORD.--December 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.38 ft below land-surface datum, August 27, 1983; lowest measured, 40.85 ft below land-surface datum, January 15, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	36.24	FEB 10	36.37	MAY 05	35.26	AUG 04	34.44

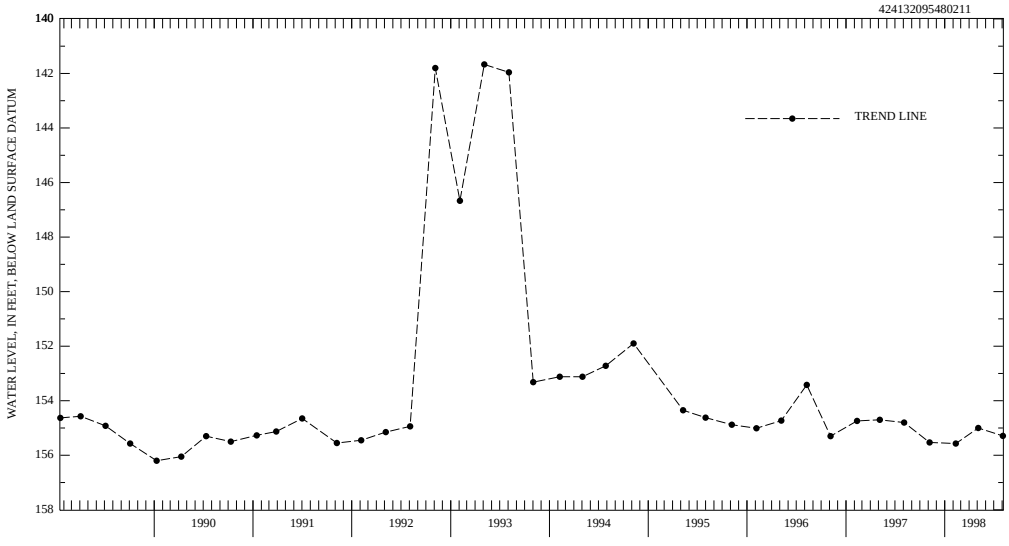
WATER YEAR 1998 HIGHEST 34.44 AUG 04, 1998 LOWEST 36.37 FEB 10, 1998

424132095480211. Local number, 91-42-16 DDDD11.
LOCATION.--Lat 42°41′32″, long 95°48′02″, Hydrologic Unit 10230004, approximately 2 mi north of the Village of Fielding at the junction of County Roads L-36 and C-44. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 390 ft, screened 386-390 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,320 ft above sea level, from topographic map. Measuring point: Top of casing, 1.50 ft above land-surface datum.
REMARKS.--Well D-11.
PERIOD OF RECORD.--March 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 141.67 ft below land-surface datum, May 5, 1993; lowest measured, 156.20 ft below land-surface datum, January 10, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	155.53	FEB 11	155.57	MAY 05	155.00	AUG 04	155.29

WATER YEAR 1998 HIGHEST 155.00 MAY 05, 1998 LOWEST 155.57 FEB 11, 1998



CHEROKEE COUNTY--Continued

424348095231601. Local number, 91-39-01 ADAD1.
LOCATION.--Lat 42°43'48", long 95°23'16", Hydrologic Unit 10230005, approximately 2 mi east and 0.5 mi north of the Town of Aurelia at the Larson Lake County Park. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Cambrian-Ordovician: sandstone of Cambrian age and dolomite of Ordovician age.
WELL CHARACTERISITICS.--Drilled observation artesian water well, diameter 6 in. to 236 ft, 5 in. to 486 ft, 2 in. to 1,126 ft, depth 1,545 ft, open hole 1,126 to 1,545 ft.
INSTRUMENTATION.--Quarterly measurement with electric line or chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,370 ft above sea level, from topographic map. Measuring point: Top of casing, 1.55 ft above land-surface datum.
REMARKS.--Well D-28.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 189.65 ft below land-surface datum, December 19, 1984; lowest measured, 194.73 ft below land-surface datum, February 3, 1993.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATE LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	194.75	FEB 10	194.41	MAY 05	194.34	AUG 04	195.84

WATER YEAR 1998 HIGHEST 194.34 MAY 05, 1998 LOWEST 195.84 AUG 04, 1998

424348095231602. Local number, 91-39-01 ADAD2.
LOCATION.--Lat 42°43'48", long 95°23'16", Hydrologic Unit 10230005, approximately 2 mi east and 0.5 mi north of the Town of Aurelia at the Larson Lake County Park. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 4 in., depth 340 ft, screened 235-240 ft.
INSTRUMENTATION.--Quarterly measurement with electric line or chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,370 ft above sea level, from topographic map. Measuring point: Top of casing, 1.75 ft above land-surface datum.
REMARKS.--Well D-29.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 188.65 ft below land-surface datum, April 20, 1988; lowest measured, 194.15 ft below land-surface datum, August 24, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	191.92	FEB 10	191.51	MAY 05	191.47	AUG 04	192.84

WATER YEAR 1998 HIGHEST 191.47 MAY 05, 1998 LOWEST 192.84 AUG 04, 1998

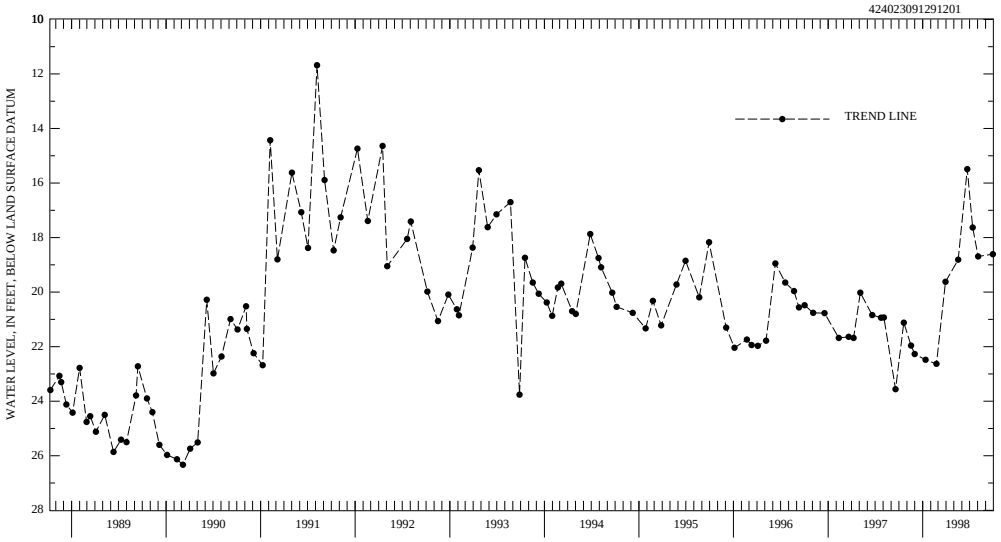
CLAYTON COUNTY

424023091291201. Local number, 91-05-30 BBBB.
LOCATION.--Lat 42°40'23", long 91°29'12", Hydrologic Unit 07060006, 5 mi northwest of the City of Edgewood, or 2 mi northwest of the junction of Iowa Highways 3 and 13, east of Strawberry Point. Owner: Harold Knight.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Dug unused water-table well, diameter 36 in., depth 36 ft. Casing information not available.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,233 ft above sea level, from topographic map. Measuring point: Hole in pump base at land-surface datum.
PERIOD OF RECORD.--June 1957 to current year.
REMARKS:--Harold Knight well.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.68 ft below land-surface datum, August 7, 1991; lowest measured, 30.68 ft below land-surface datum, January 12, 1959.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	21.12	JAN 12	22.48	MAY 18	18.81	AUG 03	18.69
NOV 17	21.96	FEB 23	22.63	JUN 22	15.49	SEP 29	18.61
DEC 01	22.27	MAR 30	19.62	JUL 13	17.63		

WATER YEAR 1998 HIGHEST 15.49 JUN 22, 1998 LOWEST 22.63 FEB 23, 1998



425433091285002. Local number, 94-05-31 DACC2.
LOCATION.--Lat 42°54'33", long 91°28'50", Hydrologic Unit 07060004, located at entrance to Big Spring Fish Hatchery 4.5 mi west and 1.25 mi south of the Town of St. Olaf. Owner: Geological Survey Bureau, DNR, and U.S. Geological Survey.
AQUIFER.--Cambrian-Ordovician: Galena dolomite of Middle Ordovician age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in., depth 85 ft, open hole 61-85 ft.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 855 ft above sea level, from topographic map. Measuring point: Top of recorder platform, 2.23 ft above land-surface datum.
REMARKS.--Well BS1-B. Historical water-level data published in OFR 91-63 and OFR 92-67.
PERIOD OF RECORD.--December 1988 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.62 ft above land-surface datum, August 20, 1993 (revised); lowest water level recorded 10.38 ft below land-surface datum, July 20, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	6.43	FEB 23	5.65	MAY 18	3.95	AUG 03	5.30

WATER YEAR 1998 HIGHEST 3.95 MAY 18, 1998 LOWEST 6.43 NOV 17, 1997

CLAYTON COUNTY--Continued

430156091182901. Local number, 95-04-22 BCBD.
LOCATION.--Lat 43°01'56", long 91°18'29", Hydrologic Unit 07060001, approximately 2 mi north of the junction of U.S. Highway 18 and U.S. Highway 52-Iowa Highway 13, near Spook Cave. Owner: Gerald Mielke.
AQUIFER.--Cambrian-Ordovician: St. Peter sandstone of Middle Ordovician age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 49 ft. Casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 940 ft above sea level, from topographic map. Measuring point: Top of casing, 1.00 ft above land-surface datum.
PERIOD OF RECORD.--October 1957 to current year.
REMARKS.--USGS 22E1
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.98 ft below land-surface datum, December 7, 1983; lowest measured, 27.88 ft below land-surface datum, March 4, 1968.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 24	24.10	MAY 18	22.95	AUG 03	23.37

WATER YEAR 1998 HIGHEST 22.95 MAY 18, 1998 LOWEST 24.10 FEB 24, 1998

425736091260303. Local Number 94-05-03 A.
Location. --Lat 42°57'36", long 91°26'03", Hydrologic Unit 07060004, approximately 100 feet south of Robert's Creek on County Highway X16
Aquifer.--Cambrian-Ordovician: St. Peter Sandstone
Well Characteristics. --Drilled observation well, diameter 4 in.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
Datum. -- Elevation of land-surface datum is 1030 ft above sea level, from topographic map. Measuring point: Top of casing, 2.50 ft above land-surface datum.
PERIOD OF RECORD.--January 1989 to April 1989, May 1997 to current year.
REMARKS.--BS2-G
EXTREMES OF PERIOD OF RECORD.--Highest water level measured, 183.04 ft below land surface datum, May 18, 1998, lowest measured, 185.21 ft below land-surface datum, February 1, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	184.16	FEB 25	184.53	MAY 18	183.04	AUG 03	183.19

WATER YEAR 1998 HIGHEST 183.04 MAY 18, 1997 LOWEST 184.53 FEB 25, 1998

CLINTON COUNTY

414921090450401. Local number 81-02E-17 ACC.
LOCATION.--Lat 41°49′32″, long 90°45′08″, Hydrologic Unit 07080103, located below water tower near sub-station in the Town of Claims. Owner: Town of Calamus.
AQUIFER.--Silurian
WELL CHARACTERISTICS.--Drilled pumping well, depth 278 ft, casing information not available.
INSTRUMENTATION.--Quarterly measurements with airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 712 feet above sea level, by topographic map.
PERIOD OF RECORD.--August 1997 to current year.
REMARKS.--Calamus #1
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43 feet below land-surface datum, August 06, 1997; lowest measured, 95 ft below land-surface datum, August 07, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	57.00	FEB 10	59	MAY 05	83	AUG 07	95

WATER YEAR 1998 HIGHEST 57.00 NOV 20, 1997 LOWEST 95 AUG 07, 1998

414806090212301. Local number 81-05E-22 DDD.
LOCATION.--Lat 41°48′03″, long 90°21′26″, Hydrologic Unit 07080101, approximately 1 mile south of the intersection of U.S. Interstate 30 and county road 36, on the northwest corner of intersection. Owner: Town of Low Moor.
AQUIFER.--Silurian, Alexanderian Series
WELL CHARACTERISTICS.--Drilled public-use well, depth 322 ft, casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 651 feet above sea level, by topographic map.
PERIOD OF RECORD.--August 1997 to current year
REMARKS.--Low Moor #2
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.67 feet below land-surface datum, August 06, 1997; lowest measured, 27.67 ft below land-surface datum, August 06, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	23.47	FEB 10	22.05	MAY 07	19.92	AUG 04	21.84

WATER YEAR 1998 HIGHEST 19.92 MAY 07, 1998 LOWEST 23.47 NOV 20, 1997

CRAWFORD COUNTY

415514095312001. Local number, 82-40-17 AABB.
LOCATION.--Lat 41°55'14", long 95°31'20", Hydrologic Unit 10230007, approximately 1.5 mi west of the Town of Dow City on the south side of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 141 ft, screened 123-141 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,150 ft above sea level, from topographic map. Measuring point: Top of casing, 2.50 ft above land-surface datum.
REMARKS.--Well WC-9.
PERIOD OF RECORD.--June 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 38.15 ft below land-surface datum, May 3, 1983; lowest measured, 43.86 ft below land-surface datum, June 11, 1981.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	43.08	FEB 19	42.36	MAY 06	41.56	AUG 05	41.35

WATER YEAR 1998 HIGHEST 41.35 AUG 05, 1998 LOWEST 43.08 NOV 05, 1997

420608095111701. Local number, 84-37-08 BCCB.
LOCATION.--Lat 42°06'08", long 95°11'17", Hydrologic Unit 10230007, approximately 3 mi north of the Town of Vail on the east side of County Road E-25. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Fremont buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 541 ft, screened 527-541 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,380 ft above sea level, from topographic map. Measuring point: Top of casing, 1.65 ft above land-surface datum.
REMARKS.--Well WC-226.
PERIOD OF RECORD.--August 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 208.35 ft below land-surface datum, July 17, 1988; lowest measured, 212.90 ft below land-surface datum, January 9, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	212.61	FEB 20	212.57	MAY 05	212.27	AUG 04	208.92

WATER YEAR 1998 HIGHEST 208.92 AUG 04, 1998 LOWEST 212.61 NOV 05, 1997

421005095342801. Local number, 85-41-13 CCCC.
LOCATION.--Lat 42°10'05", long 95°34'28", Hydrologic Unit 10230001, approximately 7 mi west of the Town of Schleswig, northeast of the junction of County Roads L-51 and E-16. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota and glacial drift: sandstone of Cretaceous age and sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 361 ft, screened 307-322 ft, gravel-packed. Open to Dakota 320-361 ft.
INSTRUMENTATION.--Quarterly measurement with electric line or chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,375 ft above sea level, from topographic map. Measuring point: Top of casing, 3.49 ft above land-surface datum.
REMARKS.--Well WC-6.
PERIOD OF RECORD.--May 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 244.23 ft below land-surface datum, July 28, 1981; lowest measured, 249.05 ft below land-surface datum, February 5, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	247.24	FEB 20	247.17	MAY 05	247.11	AUG 04	247.13

WATER YEAR 1998 HIGHEST 247.11 MAY 05, 1998 LOWEST 247.24 NOV 05, 1997

CRAWFORD COUNTY--Continued

421031095225601. Local number, 85-39-16 ADDD1.
LOCATION.--Lat 42°10'31", long 95°22'56", Hydrologic Unit 10230007, approximately 2.5 mi east and 0.5 mi north of the Town of Schleswig on the west side of County Road M-27. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in., depth 351 ft, screened 315-330 ft, gravel-packed. Open to Pennsylvanian rock 344-351 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,370 ft above sea level, from topographic map. Measuring point: Top of casing, 3.14 ft above land-surface datum.
REMARKS.--Well WC-7A.
PERIOD OF RECORD.--June 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 232.61 ft below land-surface datum, October 7, 1986; lowest measured, 239.65 ft below land-surface datum, August 2, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	234.79	FEB 20	234.92	MAY 05	234.85	AUG 04	235.52

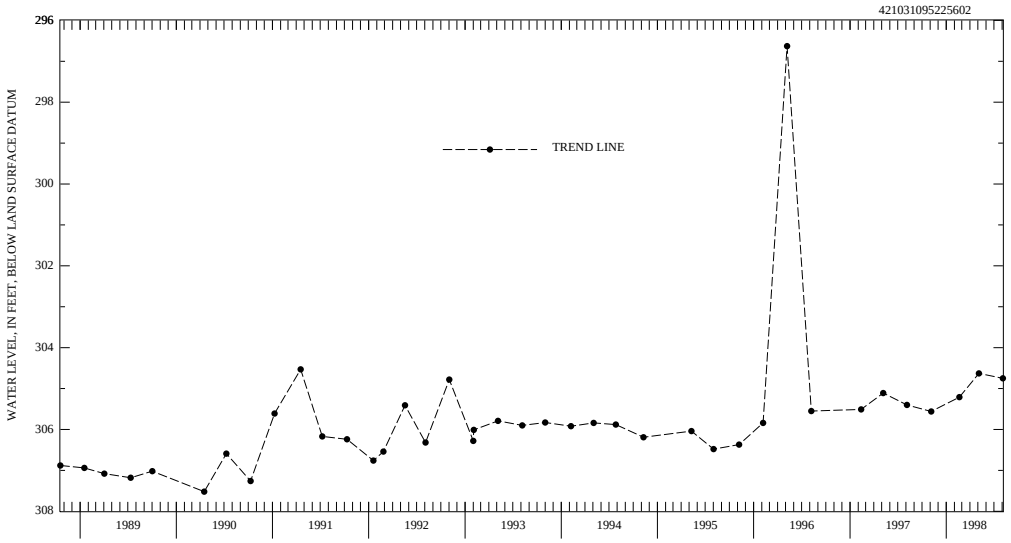
WATER YEAR 1998 HIGHEST 234.79 NOV 05, 1997 LOWEST 235.52 AUG 04, 1998

421031095225602. Local number, 85-39-16 ADDD2.
LOCATION.--Lat 42°10'31", long 95°22'56", Hydrologic Unit 10230007, approximately 2.5 mi east and 0.5 mi north of the Town of Schleswig on the west side of County Road M-27. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Mississippian: limestone of Mississippian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 561 ft, screened 543-561 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,370 ft above sea level, from topographic map. Measuring point: Top of casing, 3.14 ft above land-surface datum.
REMARKS.--Well WC-7B.
PERIOD OF RECORD.--June 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 296.63 ft below land-surface datum, May 07, 1996, lowest measured, 307.64 ft below land-surface datum, October 4, 1983.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	305.56	FEB 20	305.21	MAY 05	304.63	AUG 04	304.75

WATER YEAR 1998 HIGHEST 304.63 MAY 05, 1998 LOWEST 305.56 NOV 05, 1997



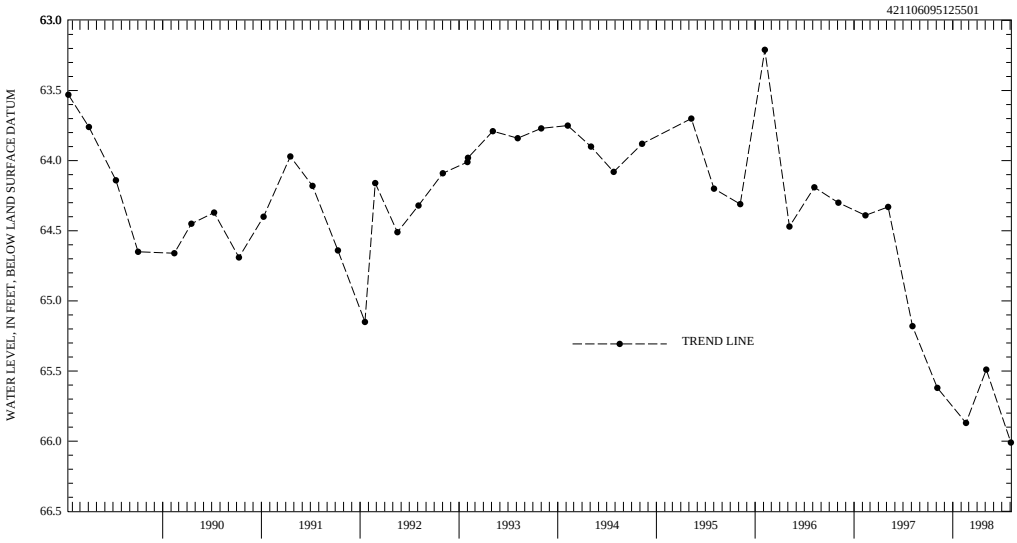
CRAWFORD COUNTY--Continued

421106095125501. Local number, 85-38-12 DCBA.
LOCATION.--Lat 42°11'06", long 95°12'55", Hydrologic Unit 10230007, approximately 5.5 mi east of the Town of Kiron on the south side of County Road E-16 near the Town of Boyer. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Fremont buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 341 ft, screened 300-310 ft, open hole from 315-341 ft., gravel packed. Open to Pennsylvanian limestone and shale 331-341 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,225 ft above sea level, from topographic map. Measuring point: Top of casing, 3.70 ft above land-surface datum.
REMARKS.--Well WC-14.
PERIOD OF RECORD.--July 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.---Highest water level measured, 62.76 ft below land-surface datum, April 16, 1987; lowest measured, 65.18 ft below land-surface datum, August 5, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	65.62	FEB 19	65.87	MAY 05	65.49	AUG 04	66.01

WATER YEAR 1998 HIGHEST 65.49 MAY 05, 1998 LOWEST 66.01 AUG 04, 1998



DALLAS COUNTY

413613093530401. Local number, 79-26-33 CDBA.
LOCATION.-- Lat 40°36'13", long 93°53'04", Hydrologic Unit 07100006, approximately 0.5 miles south of the Town of Waukee on county road R-22, 100 ft east of roadway, well located inside 48 in concrete culvert. Owner: Town of Waukee.
AQUIFER.-- Cambrian/Ordovician, Jordan sandstone.
WEL CHARACTERISTICS.-- Drilled public use well, diameter 16 in., depth 2730 ft, casing interval unknown, gravel packed.
INSTRUMENTATION.-- Quarterly measurement with airline by USGS personnel.
DATUM.-- Elevation of land-surface datum is 1012 ft above sea level, from topographic map.
REMARKS.-- Waukee Well No. 2
PERIOD OF RECORD.--May 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 389 ft below land-surface datum, May 9, 1997; lowest measured 428 ft below land-surface datum, February 09,1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	396.00	FEB 09	428	MAY 07	392	AUG 06	393

WATER YEAR 1998 HIGHEST 392 MAY 07, 1998 LOWEST 428 FEB 09, 1998

DECATUR COUNTY

404422093445602. Local number, 69-25-29 DDDD
LOCATION.-- Lat 40°44'22", long 93°44'56", Hydrologic Unit 10280102, approximately 7 mi east of Interstate 35 in the City of Leon, within open field between Iowa Highway 2 and NW 2nd Ave. on NW School St. Owner: City of Leon.
AQUIFER.-- Cambrian/Ordovician: Jordan sandstone.
WELL CHARCTREISTICS.--Drilled public use well, diameter 8 in, depth 2850 ft, screened 2740-2790 ft, gravel packed.
INSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel.
DATUM.-- Elevation of land-surface datum is 1105.60 ft above sea level, from levels. MEasuring point: Top of casing, 3.70 ft above land-surface datum.
REMARKS.-- Leon City Well No. 4
PERIOD OF RECORD.--May 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 439.80 ft below land-surface datum, May 30, 1996; lowest measured, 441.28 ft below land-surface datum, November 4, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	441.28	FEB 17	441.12	MAY 07	441.29	AUG 11	441.20

WATER YEAR 1998 HIGHEST 441.12 FEB 17, 1998 LOWEST 441.29 MAY 07, 1998

DELAWARE COUNTY

422029091144302. Local number, 87-03-18 CBCD2.
LOCATION.--Lat 42°20'37", long 91°14'47", Hydrologic Unit 07060006, behind the municipal utilities building in downtown Hopkinton. Owner: Town of Hopkinton.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 86 ft. Casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by observer.
DATUM.--Elevation of land-surface datum is 863 ft above sea level, from topographic map. Measuring point: Nipple welded to plate on top of casing, 2.46 ft above land- surface datum.
REMARKS.--Hopkinton #1 well. Water levels affected by pumping of a nearby well.
PERIOD OF RECORD.--December 1984 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.74 ft below land-surface datum, August 10, 1994; lowest measured, 27.19 ft below land-surface datum, December 30, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	17.91	FEB 10	17.56	MAY 04	12.46	AUG 04	12.71

WATER YEAR 1998 HIGHEST 12.46 MAY 04, 1998 LOWEST 17.91 NOV 13, 1997

423648091335701, 90-06-16 BBC.
LOCATION.--Lat 42°36'48", long 91°33'57", Hydrologic Unit 07060006, located in brown building at Backbone Lake Campground on county road C57. Owner: Backbone State Park.
AQUIFER.--Silurian: Kankakee Formation dolomite.
WELL CHARACTERISTICS.--Drilled public supply well, depth 210 ft., casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel
DATUM.--Elevation of land-surface is 1105.00 feet above sea level, by altimeter. Measuring Point: 1.05 ft above land-surface datum.
REMARKS.--Backbone West Campground.
PERIOD OF RECORD.--August 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 81.41 feet below land surface datum, May 18, 1998; lowest measured, 84.32 feet below land surface datum, August 07, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	83.75	FEB 23	88.64	MAY 18	81.41	AUG 03	91.35

WATER YEAR 1998 HIGHEST 81.41 MAY 18, 1998 LOWEST 91.35 AUG 03, 1998

DUBUQUE COUNTY

422901090471901. Local number, 89-01-36 ABC.
LOCATION.--Lat 42°29'01", long 90°47'19", Hydrologic Unit 07060005, located within white shed northeast of Amoco plant main office on Old Fairground Road, 4 mi east of Centralia on County Highway 966. Owner: Julien Standard Oil.
AQUIFER.--Cambrian/Ordovician.
WELL CHARACTERISTICS.-- Drilled observation artesian water well, diameter 13 in., depth 1230 ft, casing open 499-1230 ft, gravel packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 899.00 ft above sea level, from levels. Measuring point: Top of vent cap, 2.90 above land-surface datum.
REMARKS.--Standard Oil No.2
PERIOD OF RECORD.--January 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 240.38 ft below land-surface datum, January 31, 1997; lowest measured, 242.45 ft below land-surface datum, August 5, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	240.1	FEB 10	242.06	MAY 05	241.64	AUG 04	242.14

WATER YEAR 1998 HIGHEST 240.1 NOV 13, 1997 LOWEST 242.14 AUG 04, 1998

FLOYD COUNTY

430200092435301. Local number, 95-16-22 BCA1.
LOCATION.--Lat 43°02'00', long 92°43'53", Hydrologic Unit 07080201, approximately 2 mi southwest of Charles City, 1.7 mi south of Highway 14 on County Road T47. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in., depth 29 ft, screened 10-29 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,105 ft above sea level, from topographic map. Measuring point: Top of casing, 1.92 ft above land-surface datum.
REMARKS.--Well FM-3 (T).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.98 ft above land-surface datum, May 6, 1993; lowest measured, 6.61 ft below land-surface datum, November 4, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	4.65	FEB 11	6.36	MAY 05	3.93	AUG 04	5.67

WATER YEAR 1998 HIGHEST 3.93 MAY 05, 1998 LOWEST 6.36 FEB 11, 1998

FLOYD COUNTY--Continued

430200092435303. Local number, 95-16-22 BCA3.
LOCATION.--Lat 43°02′00', long 92°43′53″, Hydrologic Unit 07080201, approximately 2 mi southwest of Charles City, 1.7 mi south of Highway 14 on County Road T47. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1 in., depth 103 ft, screened 91-103 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,105 ft above sea level, from topographic map. Measuring point: Top of casing, 2.94 ft above land-surface datum.
REMARKS.--Well FM-3 (1).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.01 ft above land-surface datum, November 01, 1994; lowest measured, 82.06 ft below land-surface datum, February 6, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	74.69	FEB 11	76.84	MAY 05	70.77	AUG 04	71.92

WATER YEAR 1998 HIGHEST 70.77 MAY 05, 1998 LOWEST 76.84 FEB 11, 1998

430200092435304. Local number, 95-16-22 BCA4.
LOCATION.--Lat 43°02′00', long 92°43′53″, Hydrologic Unit 07080201, approximately 2 mi southwest of Charles City, 1.7 mi south of Highway 14 on County Road T47. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.5 in., depth 207 ft, screened 167-207 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,105 ft above sea level, from topographic map. Measuring point: Top of casing, 2.77 ft above land-surface datum.
REMARKS.--Well FM-3 (2).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 56.05 ft above land-surface datum, August 23, 1993; lowest measured, 88.43 ft below land-surface datum, February 6, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	78.32	FEB 11	87.63	MAY 05	73.01	AUG 04	75.20

WATER YEAR 1998 HIGHEST 73.01 MAY 05, 1998 LOWEST 87.63 FEB 11, 1998

430200092435305. Local number, 95-16-22 BCA5.
LOCATION.--Lat 43°02′00', long 92°43′53″, Hydrologic Unit 07080201, approximately 2 mi southwest of Charles City, 1.7 mi south of Highway 14 on County Road T47. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.5 in., depth 297 ft, screened 257-297 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,105 ft above sea level, from topographic map. Measuring point: Top of casing, 2.73 ft above land-surface datum.
REMARKS.--Well FM-3 (3).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 55.21 ft above land-surface datum, August 23, 1993; lowest measured, 82.61 ft below land-surface datum, February 6, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	74.84	FEB 11	81.38	MAY 05	70.71	AUG 04	76.60

WATER YEAR 1998 HIGHEST 70.71 MAY 05, 1998 LOWEST 81.38 FEB 11, 1998

FLOYD COUNTY-Continued

430200092435306. Local number, 95-16-22 BCA6.
LOCATION.--Lat 43°02′00', long 92°43′53″, Hydrologic Unit 07080201, approximately 2 mi southwest of Charles City, 1.7 mi south of Highway 14 on County Road T47. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.5 in., depth 360 ft, screened 340-360 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,105 ft above sea level, from topographic map. Measuring point: Top of casing, 2.53 ft above land-surface datum.
REMARKS.--Well FM-3 (4).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 56.23 ft above land-surface datum, August 23, 1993; lowest measured, 88.44 ft below land-surface datum, February 6, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	83.47	FEB 11	87.64	MAY 05	74.03	AUG 04	75.31

WATER YEAR 1998 HIGHEST 74.03 MAY 05, 1998 LOWEST 87.64 FEB 11, 1998

430800092540301. Local number, 96-17-18 CDBA.
LOACATION.--Lat 43°07′45″, long 92°54′07″, Hydrologic Unit 07080202, on the north side of city street approximately 0.5 miles east of county road T-26 in the Town of Rude. Owner: Town of Rude
AQUIFER.-- Cambrian/Ordovician: Jordan sandstone and Prairie du Chien Formation dolomite.
WELL CHARACTERISTICS.--Drilled public well, diameter 8in., depth 1290 ft, screened 846-855 ft, gravel-packed.
INSTRUMENTATION.-- Quarterly measurement by airline by ISGS personnel.
DATUM.--Elevation of land-surface datum is 1,123 ft above sea level, by altimeter.
REMARKS.--Rudd Town Well No.2
PERIOD OF RECORD.-- February 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.-- Highest water level measured, 161 ft below land surface datum, August 5, 1997; lowest measured 186 ft below land-surface datum, May 5, 1997 and February 12, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	187.00	FEB 11	186.00	MAY 04	192	AUG 04	186

WATER YEAR 1998 HIGHEST 186.00 FEB 11, 1998 AUG 04, 1998 LOWEST 192 MAY 04, 1998

GREENE COUNTY

420116094363001. Local number, 83-32-08 BBBC.
LOCATION.--Lat 42°01'16", long 94°36'30", Hydrologic Unit 07100006, approximately 3 mi west of the Town of Scranton, south of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Hardin Creek buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 181 ft, screened 161-171 ft, gravel-packed. Open to Pennsylvanian shale and siltstone 171-181 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,135 ft above sea level, from topographic map. Measuring point: Top of casing, 2.20 ft above land-surface datum.
REMARKS.--Well WC-229.
PERIOD OF RECORD.--September 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.44 ft below land-surface datum, August 19, 1993; lowest measured, 51.03 ft below land-surface datum, July 8, 1985.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	41.58	FEB 09	40.87	MAY 06	40.78	AUG 06	45.51

WATER YEAR 1998 HIGHEST 40.78 MAY 06, 1998 LOWEST 45.51 AUG 06, 1998

420146094272301. Local number, 83-31-04 ADDB.
LOCATION.--Lat 42°01'46", long 94°27'23", Hydrologic Unit 07100006, approximately 4 mi west of the City of Jefferson and 0.5 mi south of U.S. Highway 30, on the west side of County Road P-14. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 54 ft, screened 40-51 ft, gravel-packed. Open to Pennsylvanian shale 51-54 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,000 ft above sea level, from topographic map. Measuring point: Top of casing, 2.10 ft above land-surface datum.
REMARKS.--Well WC-120.
PERIOD OF RECORD.--August 1982 to July 1987, February 1990 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.39 ft below land-surface datum, July 5, 1983; lowest measured, 19.57 ft below land-surface datum, November 06, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	19.57	FEB 09	18.47	MAY 06	13.83	AUG 06	16.06

WATER YEAR 1998 HIGHEST 13.83 MAY 06, 1998 LOWEST 19.57 NOV 06, 1997

415449094155601. Local number, 82-29-18 DBAA.
LOCATION.--Lat 41°54'49", long 94°15'56", Hydrologic Unit 07100006, approximately 3.25 mi west and 1.5 mi south of the Town of Rippey, south of County Road E-57. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 90 ft, screened 65-75 ft, gravel-packed; open hole from 75-90 ft. Pleistocene glacial till 75-86 ft, and Pennsylvanian shale and siltstone 86-90 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,005 ft above sea level, from topographic map. Measuring point: Top of casing, 1.85 ft above land-surface datum.
REMARKS.--Well WC-117.
PERIOD OF RECORD.--August 1982 to November 1995.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 32.20 ft below land-surface datum, August 17, 1993; lowest measured, 40.13 ft below land-surface datum, February 13, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	36.58	FEB 10	36.00	MAY 06	33.71	AUG 06	33.13

WATER YEAR 1998 HIGHEST 33.13 AUG 06, 1998 LOWEST 36.58 NOV 06, 1997

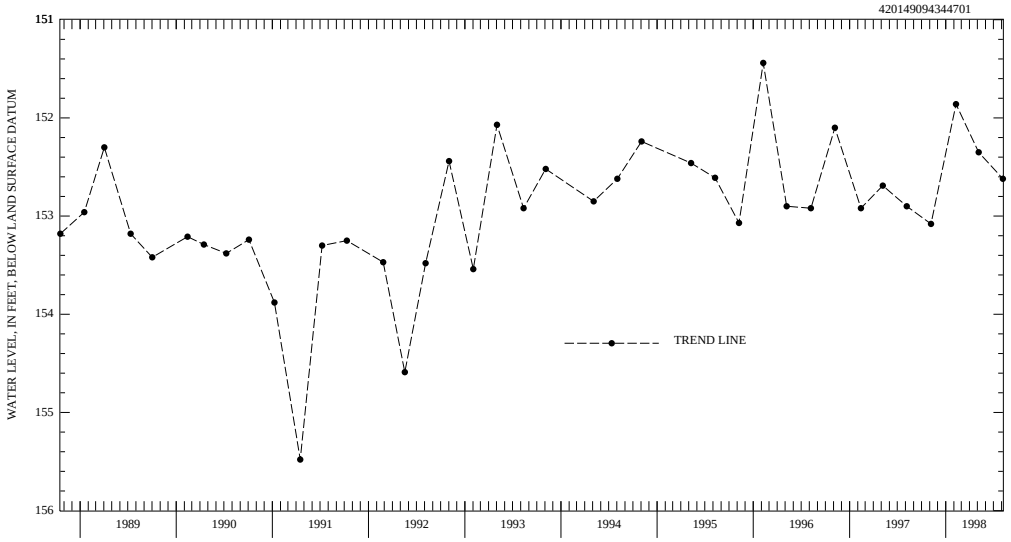
GREENE COUNTY--Continued

420149094344701. Local number, 83-32-04 ACCC.
LOCATION.--Lat 42°01'49", long 94°34'47", Hydrologic Unit 07100006, 1.5 mi west of the Town of Scranton south of U.S. Highway 30, adjacent to the Scranton Cemetery. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 240 ft, screened 220-240 ft, gravel-packed. Open to Pennsylvanian shale 234-240 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,202 ft above sea level, from topographic map. Measuring point: Top of casing, 2.10 ft above land-surface datum.
REMARKS.--Well WC-228.
PERIOD OF RECORD.--July 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 151.44 ft below land-surface datum, February 8, 1996; lowest measured, 155.48 ft below land-surface datum, April 17, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	153.08	FEB 09	151.86	MAY 06	152.35	AUG 06	152.62

WATER YEAR 1998 HIGHEST 151.86 FEB 09, 1998 LOWEST 153.08 NOV 06, 1997



420507094141901. Local number, 84-29-16 CBAB.
LOCATION.--Lat 42°05'07", long 94°14'19", Hydrologic Unit 07100006, approximately 1.5 mi south of the Town of Dana, east of Iowa Highway 144 near the Chicago and Northwestern Railroad. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Beaver buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 181 ft, screened 161-176 ft, gravel-packed. Open to Pennsylvanian shale 177-181 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,075 ft above sea level, from topographic map. Measuring point: Top of casing, 1.80 ft above land-surface datum.
REMARKS.--Well WC-233.
PERIOD OF RECORD.--August 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 38.63 ft below land-surface datum, April 2, 1985; lowest measured, 43.28 ft below land-surface datum, October 2, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	41.55	FEB 09	41.38	MAY 06	40.78	AUG 06	41.29

WATER YEAR 1998 HIGHEST 40.78 MAY 06, 1998 LOWEST 41.55 NOV 06, 1997

GRUNDY COUNTY

422611092552501. Local number, 88-18-14 BCCB.
LOCATION.--Lat 42°26'07", long 92°55'27", Hydrologic Unit 07080205, located on county road T-19 0.5 miles north of county road D-25 in the City of Wellsburg. Owner: City of Wellsburg
AQUIFER.-- Cambrian: Jordan Formation sandstone
WELL CHARACTERISTICS.-- Drilled public artesian water well, diameter 12 in., depth 2050 ft, casing open 1540-2050 ft
INSTRUMENTATION.--Quarterly measurement with airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,094 ft above sea level, from topographic map.
REMARKS.--Wellsburg Well No. 1
PERIOD OF RECORD.--November 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 275 ft below land-surface datum, February 11, 1997; lowest measured, 291 ft below land-surface datum, August 4, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	279.00	FEB 11	285	MAY 04	276

WATER YEAR 1998 HIGHEST 184 AUG 04, 1998 LOWEST 285 FEB 11, 1998

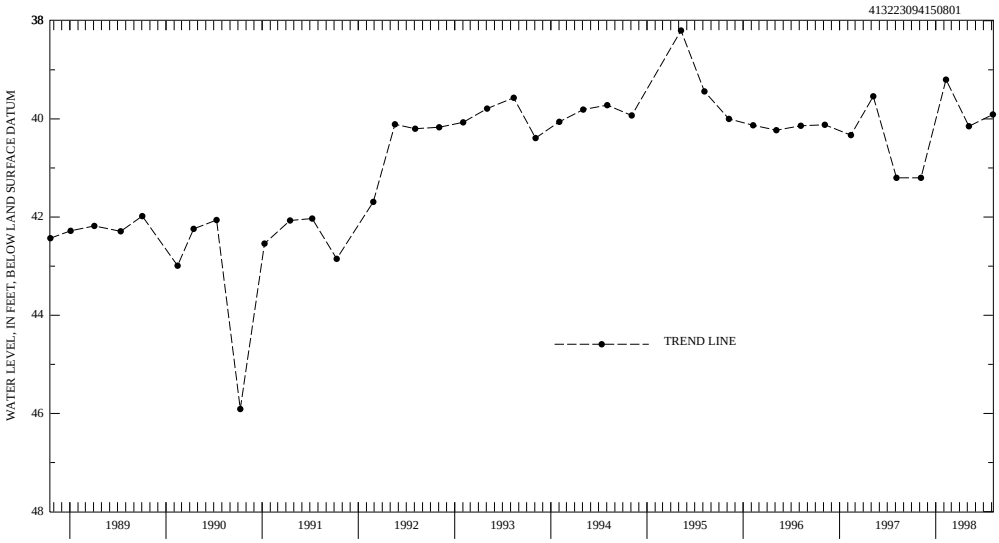
GUTHRIE COUNTY

413223094150801. Local number, 78-30-24 CAAB
LOCATION.--Lat 41°32'23", long 94°15'08", Hydrologic Unit 07100007, approximately 0.5 mi west and 1.5 north of the Town of Dexter. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drill observation artesian water well, diameter 2 in., depth 72 ft, screened 60-68 ft, gravel-packed. Open to Pennsylvanian shale 65-72 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,020 ft above sea level, from topographic map. Measuring point: Top of casing, 2.10 ft above land-surface datum.
REMARKS.--Well WC-238.
PERIOD OF RECORD.--August 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 38.20 ft below land-surface datum, May 10, 1995; lowest measured, 48.82 ft below land-surface datum, April 10, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	41.20	FEB 09	39.20	MAY 07	40.15	AUG 06	39.91

WATER YEAR 1998 HIGHEST 39.20 FEB 09, 1998 LOWEST 41.20 NOV 06, 1997



413248094314301. Local number, 78-32-21 AAAA.
LOCATION.--Lat 41°32'48", long 94°31'43", Hydrologic Unit 07100008, approximately 2.25 mi north of the Town of Casey. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 161 ft, cased to 135 ft, slotted 125-135 ft, gravel-packed. Open to Pennsylvanian shale and siltstone 158-161 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,250 ft above sea level, from topographic map. Measuring point: Top of casing, 1.90 ft above land-surface datum.
REMARKS.--Well WC-239.
PERIOD OF RECORD.--August 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 70.50 ft below land-surface datum, January 12, 1988; lowest measured, 74.38 ft below land-surface datum, January 9, 1985.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	73.60	FEB 09	73.05	MAY 07	72.77	AUG 06	73.01

WATER YEAR 1998 HIGHEST 72.77 MAY 07, 1998 LOWEST 73.60 NOV 06, 1997

GUTHRIE COUNTY--Continued

414728094385301. Local number, 81-33-26 DDDD.
LOCATION.--Lat 41°47'28", long 94°38'53", Hydrologic Unit 07100007, approximately 5 mi south and 1.25 mi east of the Town of Coon Rapids on the north side of County Road F-24. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 80 ft, screened 60-65 ft, gravel-packed, open hole 75-80 ft. Open to Pennsylvanian shale 67-80 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,205 ft above sea level, from topographic map. Measuring point: Top of casing, 2.20 ft above land-surface datum.
REMARKS.--Well WC-93.
PERIOD OF RECORD.--July 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.76 ft below land-surface datum, May 4, 1994; lowest measured, 40.98 ft below land-surface datum, January 3, 1983.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	38.90	FEB 10	39.57	MAY 07	38.99	AUG 06	37.09

WATER YEAR 1998 HIGHEST 37.09 AUG 06, 1998 LOWEST 39.57 FEB 10, 1998

414821094271301. Local number, 81-31-22 CCCC.
LOCATION.--Lat 41°48'21", long 94°27'13", Hydrologic Unit 07100007, approximately 2.5 mi south and 1 mi west of the Town of Bagley, north of Spring Brook State Park. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 153 ft, screened 143-153 ft, gravel-packed. Open to Pennsylvanian shale 149-153 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,190 ft above sea level, from topographic map. Measuring point: Top of casing, 1.45 ft above land-surface datum.
REMARKS.--Well WC-105.
PERIOD OF RECORD.--August 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 46.84 ft below land-surface datum, August 3, 1994; lowest measured, 69.88 ft below land-surface datum, December 9, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	59.62	MAR 30	56.33	MAY 07	60.18	AUG 06	58.45

WATER YEAR 1998 HIGHEST 56.33 MAR 30, 1998 LOWEST 60.18 MAY 07, 1998

HARDIN COUNTY

423310093032802. Local number, 89-19-02 BDAC2.
LOCATION.--Lat 42°33'10", long 93°03'28", Hydrologic Unit 07080205, 0.35 south and 0.10 mi west of the intersection of U.S. Highway 20 and County Road S-56. Well is in a shed at the west end of 2nd Avenue adjacent to railroad tracks. Owner: City of Ackley.
AQUIFER.--Mississippian: limestone and dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused public-supply artesian well, diameter 10 in., depth 134 ft, screened 57-60 ft, open hole 68-134 ft. Open to Devonian rock 131-134 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Analog digital water-level recorder, 60 minute punch, to October, 1992.
DATUM.--Elevation of land-surface datum is 1,085 ft above sea level, from topographic map. Measuring point: Top of recorder base, 0.8 ft above land-surface datum.
REMARKS.--Ackley No. 5 well.
PERIOD OF RECORD.--September 1988 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.79 ft below land-surface datum, February 5, 1996; lowest measured, 24.15 ft below land-surface datum, February 25, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	17.57	FEB 11	17.78	MAY 04	16.97	AUG 03	17.63

WATER YEAR 1998 HIGHEST 16.97 MAY 04, 1998 LOWEST 17.78 FEB 11, 1998

HARRISON COUNTY

413024095353901. Local number, 78-41-31 DDDD.
LOCATION.--Lat 41°30′24″, long 95°35′39″, Hydrologic Unit 10230006, approximately 4.5 mi south of the Town of Persia and west of Iowa Highway 191 to the north of the Tri-County High School. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 129 ft, screened 109-119 ft, gravel-packed. Open to Pennsylvanian shale and limestone 118-129 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,158 ft above sea level, from topographic map. Measuring point: Top of casing, 2.05 ft above land-surface datum.
REMARKS.--Well WC-27.
PERIOD OF RECORD.--January 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 55.26 ft below land-surface datum, July 7, 1982; lowest measured, 60.54, July 5, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	57.20	FEB 19	56.93	MAY 06	56.95	AUG 05	56.71

WATER YEAR 1998 HIGHEST 56.71 AUG 05, 1998 LOWEST 57.20 NOV 03, 1997

413523095483101. Local number, 78-43-05 ACDD.
LOCATION.--Lat 41°35′23″, long 95°48′31″, Hydrologic Unit 10230007, approximately 3.25 mi south of the Town of Logan and 1.5 mi east of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 179 ft, screened 168-175 ft, gravel-packed. Open to Pennsylvanian shale 175-179 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,080 ft above sea level, from topographic map. Measuring point: Top of casing, 2.35 ft above land-surface datum.
REMARKS.--Well WC-33.
PERIOD OF RECORD.--May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 66.20 ft below land-surface datum, March 21, 1990; lowest measured, 74.90 ft below land-surface datum, February 16, 1988.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	72.70	FEB 19	72.15	MAY 06	71.57	AUG 05	70.87

WATER YEAR 1998 HIGHEST 70.87 AUG 05, 1998 LOWEST 72.70 NOV 03, 1997

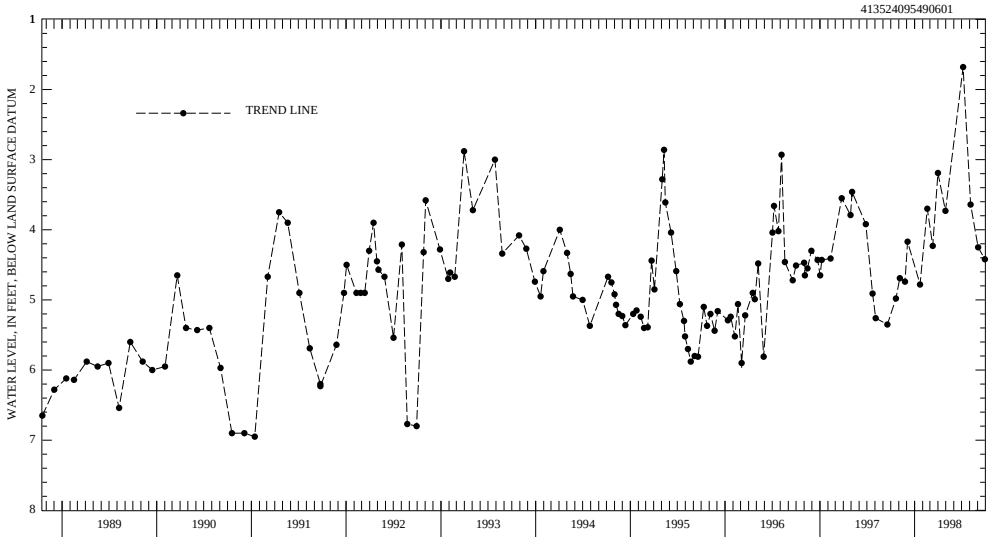
HARRISON COUNTY--Continued

413524095490601. Local number, 78-43-05 BCDD.
LOCATION.--Lat 41°35′24″, long 95°49′06″, Hydrologic Unit 10230007, approximately 2 mi north and 3.5 mi east of the Town of Missouri Valley and 1 mi east of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Alluvial: Boyer River sand and gravel of Holocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 51 ft, screened 48-51 ft, gravel-packed.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,010 ft above sea level, from topographic map. Measuring point: Top of casing, 3.40 ft above land-surface datum.
REMARKS.--Well WC-32.
PERIOD OF RECORD.--May 1982 to current year.
REVISION.--Measuring point revised September 4, 1990 to September 29, 1992.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.68 ft below land-surface datum, July 07, 1998; lowest measured, 7.00 ft below land-surface datum, September 9, 1988, October 18, 1990 and December 5, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	4.98	JAN 22	4.78	APR 01	3.19	AUG 05	3.64
NOV 05	4.69	FEB 19	3.70	APR 30	3.73	SEP 03	4.25
NOV 25	4.74	MAR 12	4.23	JUL 07	1.68	SEP 29	4.42
DEC 05	4.17						

WATER YEAR 1998 HIGHEST 1.68 JUL 07, 1998 LOWEST 4.98 OCT 21, 1997



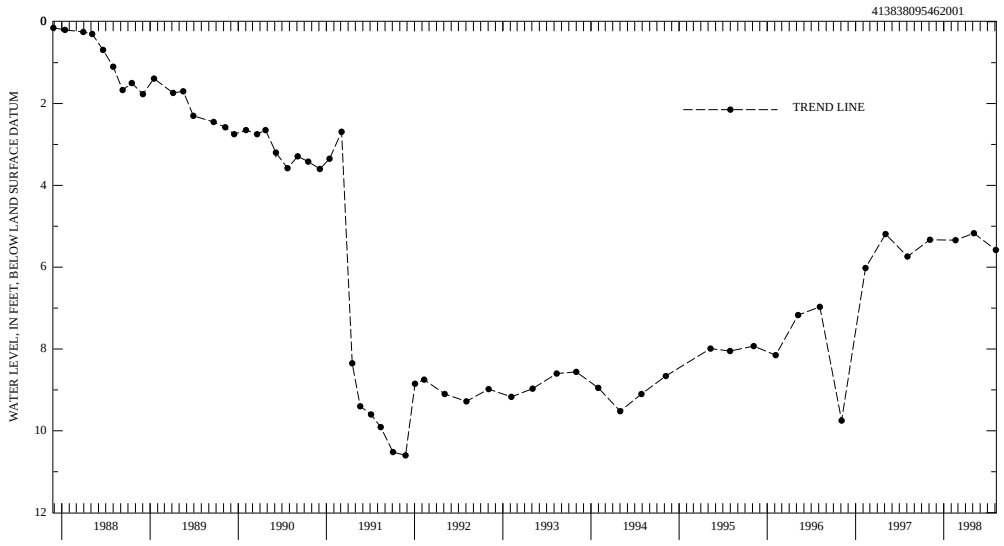
HARRISON COUNTY--Continued

413838095462001. Local number, 79-42-19 AADB.
LOCATION.--Lat 41°38'38", long 95°46'20", Hydrologic Unit 10230007, approximately 0.5 mi east of the Town of Logan, north of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Mississippian: dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 628 ft, screened 588-628 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,045 ft above sea level, from topographic map. Measuring point: Top of casing, 4.40 ft above land-surface datum.
REMARKS.--Well WC-22.
PERIOD OF RECORD.--November 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.33 ft above land-surface datum, June 19, 1987; lowest measured, 16.37 ft below land-surface datum, June 3, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 199
(READINGS ABOVE LAND SURFACE INDICATED BY "+")

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	5.33	FEB 19	5.34	MAY 06	5.17	AUG 05	5.58

WATER YEAR 1998 HIGHEST 5.17 MAY 06, 1998 LOWEST 5.58 AUG 05, 1998



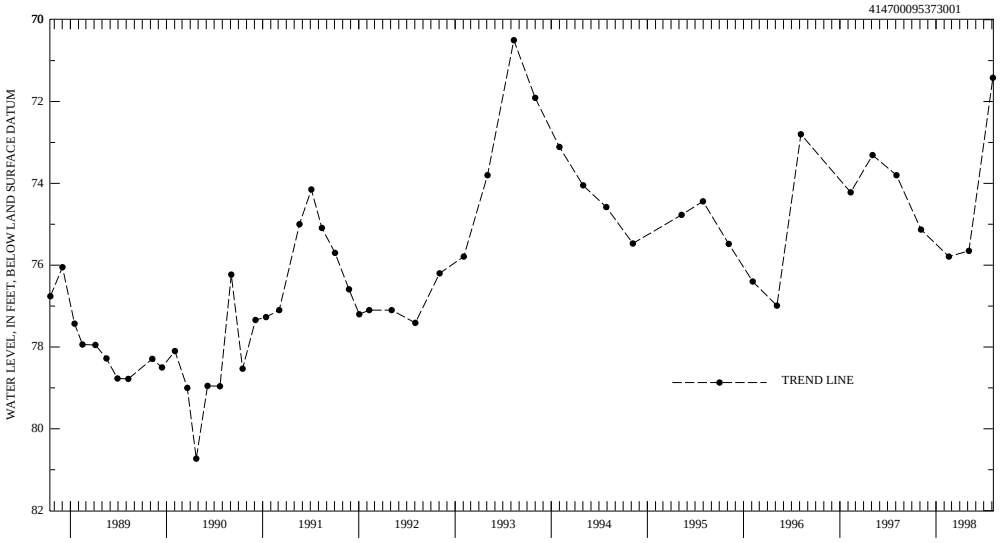
HARRISON COUNTY--Continued

414700095373001. Local number, 81-41-33 CAAA.
LOCATION.--Lat 41°47'00", long 95°37'30", Hydrologic Unit 10230007, approximately 4.5 mi south of the Town of Dunlap, and 2 mi east of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 169 ft, screened 145-154 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,182 ft above sea level, from topographic map. Measuring point: Top of casing, 2.90 ft above land-surface datum.
REMARKS.--Well WC-52.
PERIOD OF RECORD.--June 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 70.50 ft below land-surface datum, August 12, 1993; lowest measured, 85.03 ft below land-surface datum, June 4, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	75.13	FEB 19	75.79	MAY 06	75.65	AUG 05	71.42

WATER YEAR 1998 HIGHEST 71.42 AUG 05, 1998 LOWEST 75.79 FEB 19, 1998



HENRY COUNTY

405010091424901. Local number, 70-07-30 BCDD.
LOCATION.--Lat 40°50'10", long 91°42'49", Hydrologic Unit 07080107, in the Hillsboro City Park adjacent to water tower. Owner: City of Hillsboro.
AQUIFER.--Mississippian: limestone of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused test hole, diameter 6 in., depth 365 ft, cased to 74.8 ft, open hole 74.8-365 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 733 ft above sea level, from topographic map. Measuring point: Hole in top of casing, 1.15 ft above land-surface datum.
REMARKS.--Hillsboro Test 1.
PERIOD OF RECORD.--August 1989 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 70.12 ft below land-surface datum, February 23, 1996, May 6, 1994; lowest measured, 77.21 ft below land-surface datum, October 27, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	72.2	FEB 11	71.36	MAY 07	71.37	AUG 06	72.22

WATER YEAR 1998 HIGHEST 71.36 FEB 11, 1998 LOWEST 72.22 AUG 06, 1998

HENRY COUNTY--Continued

410852091394301. Local number, 73-07-09 AABD.
LOCATION.--Lat 41°08'52", long 91°39'43", Hydrologic Unit 07080107, north of Main Street near the water tower, Wayland. Owner: Town of Wayland.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Dug unused water-table well, diameter 4 ft, depth 52 ft. Casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 735 ft above sea level, from topographic map. Measuring point: Hole in top of casing, 0.21 ft above land-surface datum.
PERIOD OF RECORD.--August 1960 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.30 ft below land-surface datum, September 1, 1965; lowest measured, 14.69 ft below land-surface datum, February 15, 1977.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	2.54	FEB 11	9.19	MAY 06	9.27	AUG 06	10.09

WATER YEAR 1998 HIGHEST 2.54 NOV 21, 1997 LOWEST 10.09 AUG 06, 1998

HOWARD COUNTY

432158092065801. Local number, 99-11-26 BCA.
LOCATION.--Lat 43°21'58", long 92°06'58", Hydrologic Unit 07060004, located approximately 1 mi west of the town of Cresco, 0.5 mi south from state highway 9 on county road V-58. Owner: Town of Cresco.
AQUIFER.-- Cambrian/Ordovician.
WELL CHARACTERISTICS.--Drilled public use artesian well, diameter 16 in, depth 1120 ft., Casing information not available.
INSTRUMENTATION.--Quarterly measurement using an airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 1288 ft above sea level, from topographic map.
PERIOD OF RECORD.--February 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 318 ft below land surface datum, May 20, 1997; lowest measured, 320 ft below land-surface datum, February 12, 1997 and August 5, 1997.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	320	FEB 11	320	MAY 05	320	AUG 04	320

WATER YEAR 1998 HIGHEST 320.00 NOV 04, 1997 FEB 11, 1998 MAY 05, 1998 AUG 04, 1998
LOWEST 320.00 NOV 04, 1997 FEB 11, 1998 MAY 05, 1998 AUG 04, 1998

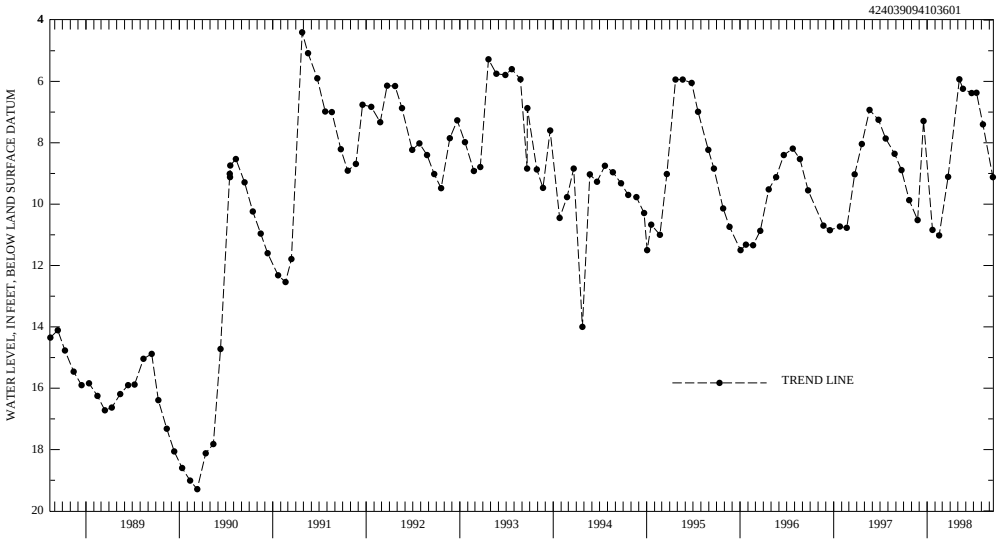
HUMBOLDT COUNTY

424039094103601. Local number, 91-28-20 CAAA.
LOCATION.--Lat 42°40'39", long 94°10'36", Hydrologic Unit 07100004, approximately 3 mi south of the Town of Dakota City, on the west side of County Road P-56. Owner: Elmer Gravdlund.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Unused water-table well, diameter 3 ft, cribbed with field stone, depth 24.5 ft, casing information unavailable.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,135 ft above sea level, from topographic map. Measuring point: Top of casing, 0.30 ft above land-surface datum.
REMARKS: Gravdlund/G-1 well.
PERIOD OF RECORD.--July 1988 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.40 ft below land-surface datum, April 26, 1991; lowest measured, 19.29 ft below land-surface datum, March 12, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	9.87	JAN 22	10.84	MAY 07	5.93	JUL 13	6.37
NOV 25	10.52	FEB 17	11.02	MAY 21	6.24	AUG 07	7.40
DEC 18	7.29	MAR 24	9.11	JUN 24	6.38	SEP 15	9.12

WATER YEAR 1998 HIGHEST 5.93 MAY 07, 1998 LOWEST 11.02 FEB 17, 1998



IDA COUNTY

422215095390811. Local number, 87-41-05 CCCC11.
LOCATION.--Lat 42°22'15", long 95°39'08", Hydrologic Unit 10230005, approximately 0.75 mi east and 6.5 mi south of the Village of Cushing. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 490 ft, screened 301-305 ft. Original depth 510 ft, cemented back to 490 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,344 ft above sea level, from topographic map. Measuring point: Top of casing, 2.18 ft above land-surface datum.
REMARKS.--Well D-10.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 202.55 ft below land-surface datum, June 4, 1980; lowest measured, 206.50 ft below land-surface datum, May 7, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	205.48	FEB 20	206.61	MAY 05	206.42	AUG 04	206.15

WATER YEAR 1998 HIGHEST 205.48 NOV 05, 1997 LOWEST 206.61 FEB 20, 1998

423107095383201. Local number, 89-41-13 CCCC.
LOCATION.--Lat 42°31'07", long 95°38'32", Hydrologic Unit 10230003, at a roadside park on County Road D-15, approximately 1.5 mi east and 3.5 mi north of the Village of Cushing. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Mississippian: limestone of Mississippian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 469 ft, sand point 465-468 ft, open hole 468-469 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,320 ft above sea level, from topographic map. Measuring point: Top of casing, 2.11 ft above land-surface datum.
REMARKS.--Well D-9.
PERIOD OF RECORD.--December 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 180.97 ft below land-surface datum, July 27, 1994; lowest measured, 244.55 ft below land-surface datum, July 9, 1980.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	186.38	FEB 10	185.65	MAY 05	183.63	AUG 04	188.39

WATER YEAR 1998 HIGHEST 183.63 MAY 05, 1998 LOWEST 188.39 AUG 04, 1998

JACKSON COUNTY

420842090165701. Local number, 85-6E-29 ACAD1.
LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Railroad tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.
AQUIFER.--Dresbach: Mt. Simon sandstone of Early Cambrian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 1,804 ft, screened 1,705-1,725 ft, open hole 1,725-1,804 ft.
INSTRUMENTATION.--Quarterly measurement with engineers rule by USGS personnel.
DATUM.--Elevation of land-surface datum is 610 ft above sea level, from topographic map. Measuring point: Mark on angle iron attached to well house, 6.05 ft above land- surface datum.
REMARKS.--Flowing well. Green Island #1.
PERIOD OF RECORD.--May 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.81 ft above land-surface datum, May 16, 1988; lowest measured, 9.23 ft above land-surface datum, September 02, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
(MEASUREMENTS ABOVE LAND SURFACE INDICATED BY "+")

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	4.7	FEB 10	5.05	MAY 05	4.95	SEP 02	9.23

WATER YEAR 1998 HIGHEST 4.7 NOV 13, 1997 LOWEST 9.23 SEP 02, 1998

420842090165702. Local number, 85-06E-29 ACAD2.
LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Railroad tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.
AQUIFER.-- Cambrian-Ordovician, Wonewoc sandstone of Late Cambrian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 1,275 ft, screened 1,204-1,224 ft, open hole 1,224-1,275 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 610 ft above sea level, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum
REMARKS.--Green Island No. 2 well. Well pumped during winter to supply water to goose pond. Water levels water years 1986 to 1989 affected by oil in the well.
PERIOD OF RECORD.--July 1982 to November 1983, September 1986 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.73 ft above land-surface datum, May 23, 1995; lowest measured, 3.88 below land-surface datum, November 4, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	1.09	FEB 10	1.10	MAY 05	0.44	AUG 04	0.79

WATER YEAR 1998 HIGHEST .44 MAY 05, 1998 LOWEST 1.10 FEB 10, 1998

JACKSON COUNTY--Continued

420842090165703. Local number, 85-6E-29 ACAD3
LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Railroad tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.
AQUIFER.--Cambrian-Ordovician: Prairie du Chien dolomite of Early Ordovician age and St. Peter sandstone of Middle Ordovician age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 910 ft, screened 604-624 ft, open hole 624-910 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 610 ft above sea level, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.
REMARKS.--Green Island No. 3.
PERIOD OF RECORD.--May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.19 ft below land-surface datum, January 8, 1986; lowest measured 9.90 ft below land-surface datum, August 31, 1983.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	7.66	FEB 10	7.88	MAY 05	7.30	AUG 04	7.25

WATER YEAR 1998 HIGHEST 7.25 AUG 04, 1998 LOWEST 7.88 FEB 10, 1998

420433090502401. Local number, 84-01E 22
LOCATION.--Lat 42°04'33", long 90°50'24", Hydrologic Unit 07060006, located just east of the water-tower in the Town of Baldwin. Owner: Town of Baldwin.
AQUIFER.--Devonian/Silurian
WELL CHARACTERISTICS.--Drilled public-use well, depth 190 ft., casing information unknown.
INSTRUMENTATION.--Quarterly measurement using airline by USGS personnel.
DATUM.--Elevation of land-surface is 760 feet above sea level, by topographic map.
REMARKS.--Baldwin No. 2
PERIOD OF RECORD.--August 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 62.89 feet below land-surface datum, August 06, 1997; lowest measured, 63.19 feet below land-surface datum, August 04, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	62.95	FEB 10	62.95	MAY 05	60.65	AUG 04	63.19

WATER YEAR 1998 HIGHEST 60.65 MAY 05, 1998 LOWEST 63.19 AUG 04, 1998

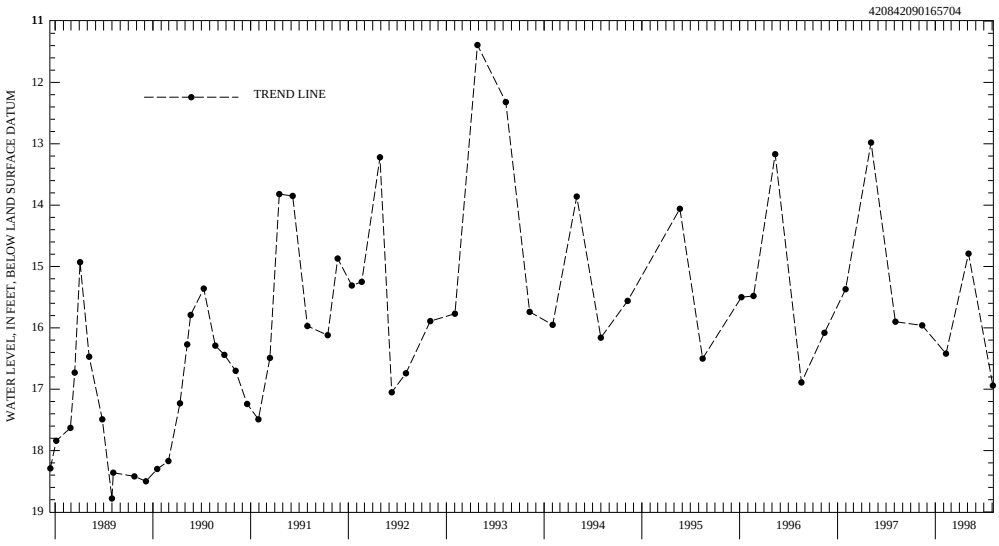
JACKSON COUNTY--Continued

420842090165704. Local number, 85-6E-29 ACAD4.
LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Rail- road tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.
AQUIFER.--Cambrian-Ordovician: Galena dolomite of Middle Ordovician age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 400 ft, screened 300-320 ft, open hole 320-400 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 610 ft above sea level, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.
REMARKS.--Green Island No. 4.
PERIOD OF RECORD.--May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.39 ft below land-surface datum April 27, 1993; lowest measured, 19.46 ft below land-surface datum, September 20, 1988.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	15.96	FEB 10	16.42	MAY 05	14.79	AUG 04	16.94

WATER YEAR 1998 HIGHEST 14.79 MAY 05, 1998 LOWEST 16.94 AUG 04, 1998



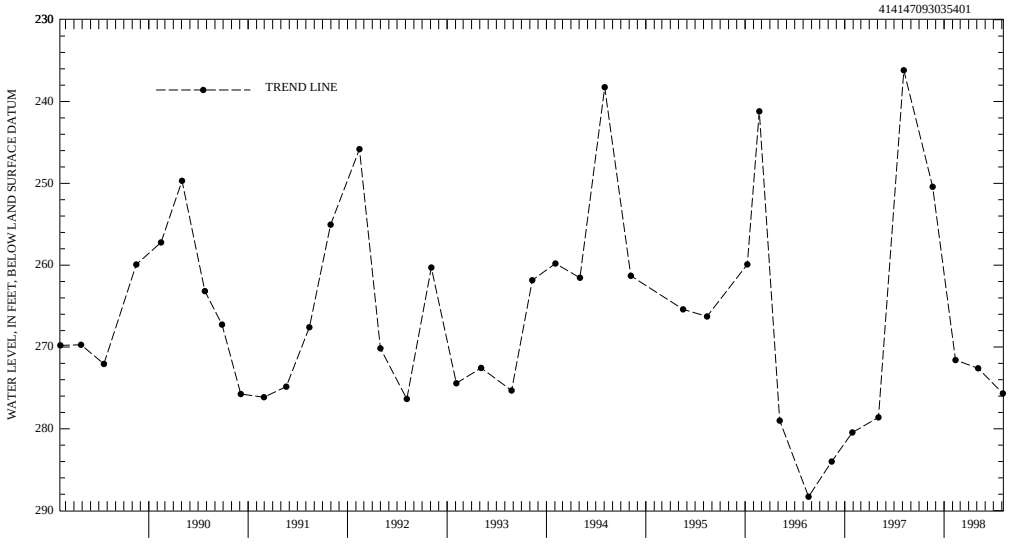
JASPER COUNTY

414147093035401. Local number, 80-19-33 ACAC.
LOCATION.--Lat 41°41'50", long 93°03'53", Hydrologic Unit 07080105, 231 West 10th Street, Newton. Owner: John Coppess.
AQUIFER.--Cambrian-Ordovician: sandstone and sandy dolomite of Late Cambrian and Early Ordovician age.
WELL CHARACTERISTICS.--Drilled unused private artesian water well, diameter 12 to 6 in., depth 2,567 ft, cased to 1,750 ft, open hole 1,750-2,567 ft. Open to 461 ft of Early Ordovician Prairie du Chien formation, 262 ft of Late Cambrian St. Lawrence formation, and 94 ft of Middle Cambrian Franconia formation.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 915 ft above sea level, from topographic map. Measuring point: Plug in cement well cover, 0.50 ft above land-surface datum.
PERIOD OF RECORD.--September 1963 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 98.43 ft below land-surface datum, June 14, 1966; lowest measured, 288.3 ft below land-surface datum, August 21, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	250.42	FEB 12	271.60	MAY 06	272.6	AUG 05	275.68

WATER YEAR 1998 HIGHEST 250.42 NOV 20, 1997 LOWEST 275.68 AUG 05, 1998



414210092592001. Local number, 80-18-31 ABBB.
LOCATION.--Lat 41°42'10", long 92°59'20", Hydrologic Unit 07080105, approximately 3 mi east of the City of Newton just south of U.S. Highway 6. Owner: P.W. Beukema.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Dug stock water-table well, diameter 36 in., depth 37 ft, cribbed with brick.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 940 ft above sea level, from topographic map. Measuring point: Top of cement platform, 0.70 ft above land-surface datum.
PERIOD OF RECORD.--February 1940 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.67 ft below land-surface datum, June 10, 1947; lowest measured, 27.15 ft below land-surface datum, December 18, 1948.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	4.99	FEB 11	4.99	MAY 06	4.50	AUG 05	5.07

WATER YEAR 1998 HIGHEST 4.50 MAY 06, 1998 LOWEST 5.07 AUG 05, 1998

JOHNSON COUNTY

413925091324001. Local number, 79-06-09 DDBC.
LOCATION.--Lat 41°39′34″, long 91°32′42″, Hydrologic Unit 07080209, at the Quadrangle Dormitory, University of Iowa, Iowa City. Owner: University of Iowa.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 12 in., depth 430.5 ft, cased to 225 ft, open hole 225-430.5 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel, measured twice per month as part of project 461908100.
DATUM.--Elevation of land-surface datum is 714 ft above sea level, from topographic map. Measuring point: Nipple welded to plate on top of casing, 1.81 ft above land- surface datum.
REMARKS.--Water levels affected by nearby wells pumping in late spring, summer, and early fall.
PERIOD OF RECORD.--April 1975 to current year.
REVISED RECORDS.--WDR IA-84-1, WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 74.63 ft below land-surface datum, March 21, 1979; lowest measured, 174.62 ft below land-surface datum, September 5, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	179.42	FEB 19	151.24	MAY 28	143.75	AUG 12	150.41
OCT 22	153.53	MAR 19	154.07	JUN 16	150.75	AUG 27	169.44
NOV 13	151.45	APR 15	144.92	JUN 30	136.72	SEP 14	158.08
DEC 08	141.31	APR 30	142.40	JUL 13	123.83	SEP 29	143.86
JAN 07	151.13	MAY 14	138.30	JUL 30	160.21		

WATER YEAR 1998 HIGHEST 123.83 JUL 13, 1998 LOWEST 179.42 OCT 08, 1997

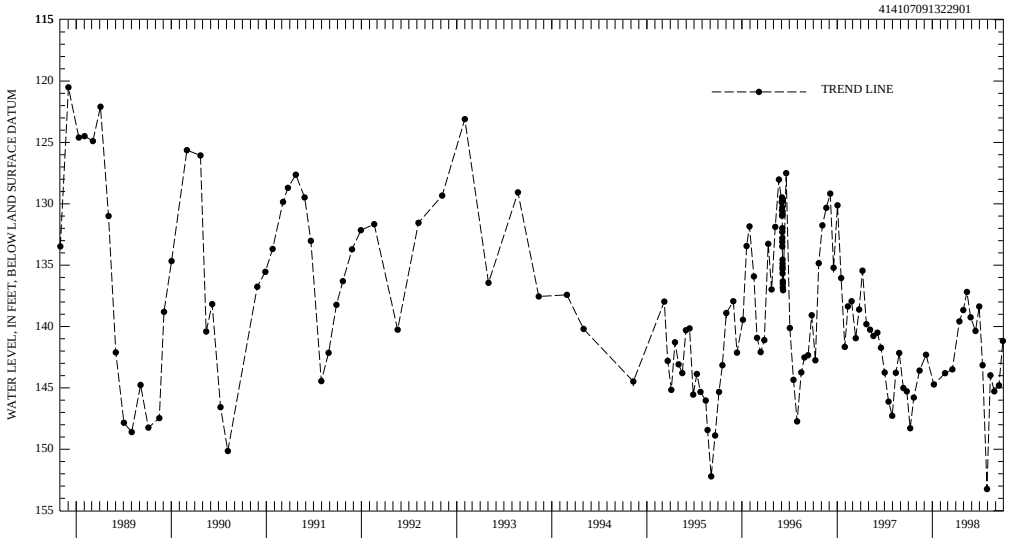
JOHNSON COUNTY--Continued

414107091322901. Local number, 79-06-04 AAAA.
LOCATION.--Lat 41°41'07", long 91°32'29", Hydrologic Unit 07080209, at Forest View Trailer Court, northern edge of Iowa City. Owner: Forest View Trailer Court.
AQUIFER.--Silurian: limestone of Silurian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 280 ft, cased to 96 ft, open hole 96-280 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to October 1995. Graphic water-level recorder May 1971 to October 1986.
DATUM.--Elevation of land-surface datum is 735 ft above sea level, from topographic map. Measuring point: Nipple on plate welded to top of casing, 1.62 ft above land- surface datum.
REMARKS.--Water levels affected by wells in the area pumping in late spring, summer, and early fall. The large number of water-level measurements in June 1996 are a result of the well being used as an observation well for a nearby pump test.
PERIOD OF RECORD.--May 1971 to current year.
REVISED RECORDS.--WDR IA-84-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 96.93 ft below land-surface datum, March 23, 1979; lowest measured, 153.24 ft below land-surface datum, July 30, 1998.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	148.29	FEB 19	143.80	MAY 28	139.25	AUG 12	143.97
OCT 22	145.79	MAR 19	143.49	JUN 16	140.36	AUG 27	145.28
NOV 13	143.59	APR 15	139.58	JUN 30	138.37	SEP 14	144.79
DEC 08	142.30	APR 30	138.66	JUL 13	143.15	SEP 29	141.18
JAN 07	144.72	MAY 14	137.18	JUL 30	153.24		

WATER YEAR 1998 HIGHEST 137.18 MAY 14, 1998 LOWEST 153.24 JUL 30, 1998



JOHNSON COUNTY--Continued

414132091345501. Local number, 80-06-31 ADAC1
LOCATION.--Lat 41°41′44″, long 91°34′52″, Hydrologic Unit 07080209, located in the City of Coralville, north of U.S. Interstate 80. Owner: City of Coralville.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in. to 130 ft, 2 in. to 300 ft, depth 500 ft, open hole 300-500 ft.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 795 ft above sea level, from topographic map. Measuring point: top of casing, 0.70 ft above land-surface datum.
REMARKS.--Coralville Observation No. 2, East.
PERIOD OF RECORD.--June 1988 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 192.75 ft below land-surface datum, March 20, 1990; lowest water level measured, 323.24 ft below land-surface datum, December 18, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	249.31	FEB 19	240.40	JUN 16	239.54	JUL 30	250.26
OCT 22	247.49	MAR 19	231.06	JUN 30	242.66	AUG 27	246.68
NOV 13	233.19	APR 15	229.23	JUL 12	242.43	SEP 14	250.94
DEC 08	240.99	APR 30	240.20	JUL 13	241.79	SEP 29	244.61
JAN 07	233.19	MAY 28	241.89				

WATER YEAR 1998 HIGHEST 229.23 APR 15, 1998 LOWEST 250.94 SEP 14, 1998

414132091345502. Local number, 80-06-31 ADBC1.
LOCATION.--Lat 41°41′45″, long 91°34′58″, Hydrologic Unit 07080209, located in the City of Coralville, north of U.S. Interstate 80. Owner: City of Coralville.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in. to 130 ft, 2 in. to 300 ft, depth 500 ft, open hole 300-500 ft.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to September 1997.
DATUM.--Elevation of land-surface datum is 795 ft above sea level, from topographic map. Measuring point: top of casing, 1.03 ft above land-surface datum.
REMARKS.--Coralville Observation No. 3, North.
PERIOD OF RECORD.--June 1988 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest level measured, 169.04 ft below land-surface datum, June 21, 1988; lowest water level measured, 252.30 ft. below land-surface datum, July 30, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	241.46	FEB 19	232.68	JUN 16	230.29	AUG 12	238.10
OCT 22	239.63	MAR 19	225.91	JUN 30	234.96	AUG 27	239.46
NOV 13	228.05	APR 15	224.15	JUL 13	233.82	SEP 14	242.99
DEC 08	236.21	APR 30	232.39	JUL 30	252.30	SEP 29	236.97
JAN 07	234.23	MAY 28	234.04				

WATER YEAR 1998 HIGHEST 224.15 APR 15, 1998 LOWEST 252.30 JUL 30, 1998

JOHNSON COUNTY--Continued

414132091345503. Local number, 80-06-31 ADBD1.
LOCATION.--Lat 41°41'44", long 91°34'35", Hydrologic Unit 07080209, located in the City of Coralville, north of U.S. Interstate 80. Owner: City of Coralville.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled public-supply water well, 12 in. diameter, depth 500 ft, cased 0-200 ft, open hole 200-500 ft.
INSTRUMENTATION.--Monthly airline measurement by USGS personnel, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 795 ft above sea level, from topographic map. Measuring point: airline gauge, 2.88 ft above land-surface datum.
REMARKS.--Coralville Production No. 9.
PERIOD OF RECORD.--June 1988 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 204 ft below land-surface datum, July 25, 1988; lowest water level measured, 301 ft below land-surface datum, August 16, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	289	MAR 19	238	JUN 16	274	AUG 12	282
NOV 13	244	APR 15	235	JUN 30	282	AUG 12	282
DEC 08	286	APR 30	280	JUL 13	284	SEP 14	288
JAN 07	279	MAY 14	232	JUL 30	288	SEP 29	285
FEB 19	283	MAY 28	280				

WATER YEAR 1998 HIGHEST 232 MAY 14, 1998 LOWEST 289 OCT 22, 1997

414145091350101. Local number, 80-06-31 ADC.
LOCATION.--Lat 41°41'45", long 91°35'01". Hydrologic unit 07080209, located in the city of Coralville., north of U.S. Interstate 80. Owner: City of Coralville.
AQUIFER.--Cambrian- Jordan sandstone.
WELL CHARACTERISTICS.--Drilled public-supply water well, diameter 16 in, depth 1710 ft., casing information not available.
INSTRUMENTATION.--Bi-monthly measurements using airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 740 ft above sea level, from unknown method.
REMARKS.--Coralville No. 10.
PERIOD OF RECORD.--June 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 318 ft below land-surface datum, May 07, 1997; lowest water level measured, 395 ft. below land surface datum, July 03, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	379	JAN 07	366	APR 30	390	JUN 16	381
OCT 22	383	FEB 19	382	MAY 14	375	JUN 30	395
NOV 13	327	MAR 19	321	MAY 28	393	JUL 13	323
DEC 08	382	APR 15	321				

WATER YEAR 1998 HIGHEST 232 JUL 13, 1998 LOWEST 395 JUN 30, 1998

JOHNSON COUNTY--Continued

414221091361101. Local number, 80-07-25 DBAC1.
LOCATION.--Lat 41°42′24″, long 91°36′16″, Hydrologic Unit 07080209, located at the Iowa Department of Natural Resources/ Geological Survey Bureau's Oakdale core repository. Owner: Geological Survey Bureau/DNR.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 164 ft, 5 in. to 319 ft, 4 in. 319-361.5 ft, liner set 310-361.5 ft, depth 532 ft, open hole 361.5-532 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 790 ft above sea level, from topographic map. Measuring point: top of recorder platform, 2.65 ft above land-surface datum.
REMARKS.--Oakdale No. 1 (ODW-1).
PERIOD OF RECORD.--April 1990 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 126.23 ft below land-surface datum, July, 31 1997; lowest water level measured, 245.93 ft below land-surface datum, July 26, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	231.55	FEB 19	222.73	MAY 28	222.94	AUG 12	229.53
OCT 22	230.72	MAR 19	224.71	JUN 16	225.29	AUG 27	232.04
NOV 13	228.01	APR 15	223.11	JUN 30	224.15	SEP 14	231.64
DEC 08	228.11	APR 30	221.64	JUL 13	223.80	SEP 29	228.41
JAN 07	227.27	MAY 14	220.67	JUL 30	231.95		

WATER YEAR 1998 HIGHEST 220.67 MAY 14, 1998 LOWEST 232.04 AUG 27, 1998

414221091361102. Local number, 80-07-25 DBAC2.
LOCATION.--Lat 41°42′24″, long 91°36′16″, Hydrologic Unit 07080209, located at the Iowa Department of Natural Resources/ Geological Survey Bureau's Oakdale core repository. Owner: Geological Survey Bureau/DNR.
AQUIFER.--Devonian: limestone and dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in., depth 301 ft, cased 0-175 ft, open hole 175-301 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 790 ft above sea level, from topographic map. Measuring point: top of recorder platform, 2.55 ft above land-surface datum.
REMARKS.--Oakdale No. 2, (ODW-2).
PERIOD OF RECORD.--April 1990 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 198.65 ft below land-surface datum, June 2 and 7, 1996; lowest water level measured, 227.09 ft below land-surface datum, August 28, 1991.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	218.51	FEB 19	210.53	MAY 28	209.8	AUG 12	217.89
22	215.60	MAR 19	211.79	JUN 16	212.02	AUG 27	217.01
NOV 13	215.89	APR 15	210.43	JUN 30	211.49	SEP 14	217.67
DEC 08	215.66	APR 30	209.05	JUL 13	210.87	SEP 29	214.64
JAN 07	214.77	MAY 14	208.58	JUL 30	216.66		

WATER YEAR 1998 HIGHEST 208.58 MAY 14, 1998 LOWEST 218.51 OCT 08, 1997

JOHNSON COUNTY--Continued

413950091322402. Local number, 79-06-10 BCCD.
LOCATION.--Lat 41°39'57", long 91°32'14", Hydrologic Unit 07080209, located on the northeast corner of the terminal end of North Madison Street just north of the Iowa City water treatment plant, approximately 0.5 miles north of Burlington St. Owner: The city of Iowa City.
AQUIFER.--Cambrian/Ordovician. Dolomite from the Prairie Du Chien Formation
WELL CHARACTERISTICS.--Drilled public use well, diameter 26 in, depth 1570 ft, open interval from 1000-1570 ft.
INSTRUMENTATION.--Bi-weekly measurements using an airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 650 ft above sea level, from topographic map.
REMARKS.--Iowa City Well No. 1
PERIOD OF RECORD.--April 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 154 ft below land-surface datum, September 25, 1996, May 07, 1997, June 18, 1997, July 02,1997; lowest water level measured, 340 ft below land-surface datum, April 30, 1998

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	162	APR 15	303	JUN 16	198	AUG 12	176
OCT 22	292	APR 30	340	JUN 30	276	AUG 27	176
NOV 13	168	MAY 14	194	JUL 13	178	SEP 14	168
FEB 19	320	MAY 28	179	JUL 30	172	SEP 29	172
MAR 19	177						

WATER YEAR 1998 HIGHEST 162 OCT 08, 1997 LOWEST 340 APR 30, 1998

413929091322401. Local number 79-06-10 CCCB.
LOCATION.--Lat 41°39'30", long 91°32'25". Hydrologic Unit 07080209, located at University of Iowa water treatment plant. Owner: University of Iowa.
AQUIFER.--Cambrian-Jordan sandstone.
WELL CHARACTERISTICS.--Drilled artesian well used for withdrawal and testing, diameter 20 in, depth 1550 ft, casing open from 1060-1550 ft.
INSTRUMENTATION.--Bi-weekly measurements using airline by USGS personnel
DATUM.--Elevation of land-surface datum is 654.51 ft. above sea level, by levels run to accuracy of 0.01 ft. Measuring point is airline connection, 0.85 ft. above land surface datum.
REMARKS.--SUI water treatment plant
PERIOD OF RECORD.--May 17, 1995 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 160 ft below land-surface datum, Jun 04, 1997; lowest water level measured, 216 ft. below land-surface datum, April 30, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	176	FEB 19	173	MAY 14	194	JUL 13	177
OCT 22	181	MAR 19	168	MAY 28	178	JUL 30	163
NOV 13	183	APR 15	202	JUN 16	198	AUG 12	172
DEC 08	171	APR 30	216	JUN 30	182	SEP 14	155
JAN 07	165					SEP 29	151

WATER YEAR 1998 HIGHEST 151 SEP 29, 1998 LOWEST 216 APR 30, 1998

JOHNSON COUNTY--Continued

4142210091361103. Local number, 80-07-25 DBAD1.
LOCATION.--Lat 41°42'24", long 91°36'16", Hydrologic Unit 07080209, located at the Iowa Department of Natural Resources/ Geological Survey Bureau's Oakdale core repository. Owner: Geological Survey Bureau/DNR.
AQUIFER.--Buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 4 in., depth 171 ft, screened 153-171. ft.
INSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 790 ft above sea level, from topographic map. Measuring point: top of recorder platform, 2.55 ft above land-surface datum.
REMARKS.--Oakdale No. 3 (ODW-3).
PERIOD OF RECORD.--April 1990 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 123.39 ft below land-surface datum, November 20, 1996; lowest water level measured, 128.74 ft below land-surface datum, April 12, 1992.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	126.81	FEB 19	126.25	MAY 28	125.80	AUG 12	125.27
OCT 22	126.68	MAR 19	126.70	JUN 16	124.94	AUG 27	125.06
NOV 13	126.25	APR 15	125.30	JUN 30	125.01	SEP 14	124.74
DEC 08	126.42	APR 30	125.31	JUL 13	125.04	SEP 29	125.22
JAN 07	126.60	MAY 14	125.28	JUL 30	126.17		

WATER YEAR 1998 HIGHEST 124.74 SEP 14, 1998 LOWEST 126.81 OCT 08, 1997

4143150091252001. Local number, 80-05-22 CBCB1.
LOCATION.--Lat 41°43'15", long 91°25'20", Hydrologic Unit 07080209, along the Chicago, Rock Island and Pacific Railroad track, southeast of the overpass on Rapid Creek Road over the track, approximately 5.5 mi northeast of the junction of Interstate 80 and Iowa Highway 1. Owner: Chicago, Rock Island and Pacific Railroad Co.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 2.25 in., depth 18.43 ft, screened 16.43-18.43 ft. Depth originally 20 ft, depth of 18.43 ft measured June 23, 1989.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel. Graphic water-level recorder February 1942 to October 1965, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 753 ft above sea level, from topographic map. Measuring point: Nipple welded to casing, 4.47 ft above land-surface datum.
REMARKS.--At the site of the former Elmira depot.
PERIOD OF RECORD.--May 1941 to September 1956, January 1958 to current year.
REVISED RECORDS.--WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.84 ft below land-surface datum, April 29, 1947 (revised); lowest measured, dry, November 10, 15, 20, 25, and 30, 1964, December 5, 10, 15, 20, 25 and 31, 1964, December 1 and 10, 1975, October 21, November 23, and December 17, 1976, and January 20 and February 18, 1977.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	13.56	FEB 19	13.60	MAY 28	11.20	JUL 30	10.91
OCT 15	11.23	MAR 19	12.78	JUN 17	11.19	AUG 13	11.04
OCT 29	11.18	APR 15	11.76	JUN 30	11.02	AUG 27	11.25
NOV 13	13.80	APR 16	11.76	JUL 14	10.14	SEP 15	11.23
DEC 08	13.87	MAY 01	11.56	JUL 14	16.02	SEP 29	11.18
JAN 07	13.93	MAY 15	11.26				

WATER YEAR 1998 HIGHEST 10.14 JUL 14, 1998 LOWEST 16.02 JUL 14, 1998

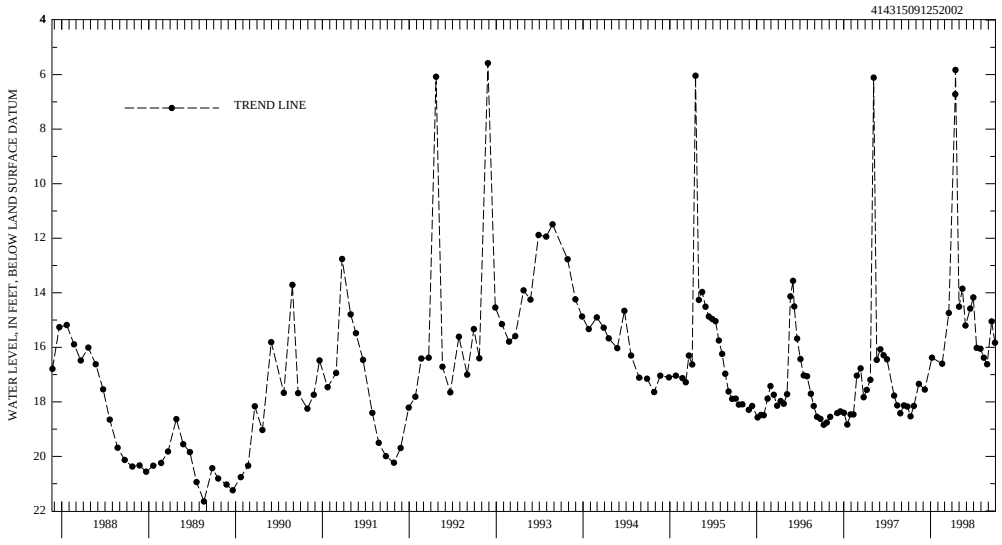
JOHNSON COUNTY--Continued

414315091252002. Local number, 80-05-22 CBCB2.
LOCATION.--Lat 41°43'15", long 91°25'20", Hydrologic Unit 07080209, along the Chicago, Rock Island and Pacific Railroad track, southeast of the overpass on Rapid Creek Road over the track, approximately 5.5 mi northeast of the junction of Interstate 80 and Iowa Highway 1. Owner: Chicago, Rock Island and Pacific Railroad Co.
AQUIFER.--Devonian: Cedar Valley limestone of Middle Devonian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 82 ft. Casing information not available.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel, measured twice per month March 1995 to October 1995.
DATUM.--Elevation of land-surface datum is 753 ft above sea level, from topographic map. Measuring point: Nipple welded to plate on top of casing, 4.01 ft above land- surface datum.
REMARKS.--At the site of the former Elmira depot.
PERIOD OF RECORD.--December 1941 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.58 ft below land-surface datum, November 27, 1992; lowest measured, 21.65 ft below land-surface datum, August 21, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	18.53	FEB 19	16.60	MAY 15	13.85	JUL 30	16.05
OCT 23	18.15	MAR 19	14.74	MAY 28	15.20	AUG 13	16.38
NOV 13	17.34	APR 15	6.72	JUN 17	14.58	AUG 27	16.62
DEC 08	17.55	APR 16	5.83	JUN 30	14.17	SEP 15	15.05
JAN 07	16.38	MAY 01	14.51	JUL 14	16.02	SEP 29	15.83

WATER YEAR 1998 HIGHEST 5.83 APR 16, 1998 LOWEST 18.53 OCT 09, 1997



JONES COUNTY

415808091160501. Local number, 83-04-25 CBBB.
LOCATION.--Lat 41°58′08″, long 91°16′05″, Hydrologic Unit 07080103, 4 mi north of the Town of Mechanicsville and 1 mi west of County Road X-40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 41 ft, 5 in. 41-517 ft, depth 517 ft, open hole 41-517 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 811 ft above sea level, from topographic map. Measuring point: Nipple welded to plate on top of casing, 2.16 ft above land- surface datum.
REMARKS.--White Oak Creek well.
PERIOD OF RECORD.--July 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.78 ft below land-surface datum, May 3, 1993; lowest measured, 6.21 ft below land-surface datum, September 11, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	5.09	FEB 10	4.48	MAY 04	2.15	AUG 07	3.83

WATER YEAR 1998 HIGHEST 2.15 MAY 04, 1998 LOWEST 5.09 NOV 20, 1997

KEOKUK COUNTY

412030092121601. Local number, 76-12-35 DBDC
LOCATION.--Lat 41°20′30″, long 92°12′16″, Hydrologic Unit 07080106, approximately 0.25 mi north of the town of Sigourney, 0.25 mi north of Highway 92. Owner: City of Sigourney.
AQUIFER.--Mississippian: limestone and dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused public-supply artesian well, diameter 14 in., depth 300 ft, cased to 128 ft, open hole 128-300 ft.
INSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel. Analog digital water-level recorder January 1989 to September 1992.
DATUM.--Elevation of land-surface datum is 769 ft above sea level, from topographic map. Measuring point: Top of recorder base, 1.56 ft above land-surface datum.
REMARKS.--Sigourney South Rock Island No. 1 well. Water levels affected by nearby pumping.
PERIOD OF RECORD.--July 1988 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 80.99 ft below land-surface datum, May 17, 1995; lowest measured, 118.29 ft below land-surface datum, August 31, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	90.22	FEB 12	89.43	MAY 06	87.29	AUG 05	93.12

WATER YEAR 1998 HIGHEST 87.29 MAY 06, 1998 LOWEST 93.12 AUG 05, 1998

LEE COUNTY

404306091270201. Local number, 68-05-05 DAAC.
LOCATION.--Lat 40°43′06″, long 91°27′02″, Hydrologic Unit 07080104, located on the south side of State Highway 2 approximately 7 mi east of Donnellson and 6 mi south of West Point.
AQUIFER.--Cambrian-Jordan sandstone
WELL CHARACTERISTICS.--Drilled public-use well, depth 1910 ft., casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 763 ft., from topographic map. Measuring point: Top of casing 3.00 ft above land-surface datum.
REMARKS.--West Point No. 3
PERIOD OF RECORD.--November 15, 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 262.04 ft below land-surface datum, January 28, 1997; lowest measured, 264.74 ft. below land-surface datum, August 06, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	263.46	FEB 11	262.46	MAY 07	263.69	AUG 06	264.74

WATER YEAR 1998 HIGHEST 262.46 FEB 11, 1998 LOWEST 264.74 AUG 06, 1998

LINN COUNTY

415343091360101. Local number, 82-07-25 AAAB.
LOCATION.--Lat 41°53′43″, long 91°36′01″, Hydrologic Unit 07080208, 0.5 mi northwest of the Town of Ely at the southwest corner of the junction of County Roads E-70 and W-6E. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian: limestone and dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in., depth 401 ft, cased to 121.5 ft, open hole 121.5-401 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder April 1978 to October 1979. Intermittent measurement with chalked tape by USGS personnel May 1976 to April 1978.
DATUM.--Elevation of land-surface datum is 772 ft above sea level, from topographic map. Measuring point: Top of casing, 1.76 ft above land-surface datum.
REMARKS.--Ely (Northwest) Railroad well. Records for May 1976 to September 1988 are unpublished and available in the files of the Iowa District Office.
PERIOD OF RECORD.--May 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.03 ft below land-surface datum, August 26, 1993; lowest measured, 19.96 ft below land-surface datum, June 14, 1977.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	15.48	FEB 09	15.22	MAY 04	9.91	AUG 03	10.79

WATER YEAR 1998 HIGHEST 9.91 MAY 04, 1998 LOWEST 15.48 NOV 18, 1997

420200091363001. Local number 83-07-01 BADC.
LOCATION.--Lat 42°02′00″, long 91°36′36″, Hydrologic Unit 07080206, located in the town of Marion. Owner: Town of Marion
AQUIFER.--Cambrian-Trempealeau Group
WEL CHARACTERISTCS.--Drilled public-use well, depth 1570, casing information not available.
INSTRUMENTATION.--Quarterly measurements using airline by an observer.
DATUM.--Elevation of land-surface datum is 793 ft above sea level, from topographic map.
REMARKS.--Marion No.4
PERIOD OF RECORD.--August 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 260 ft below land-surface datum, April 21, 1998; lowest measured 293 ft below land-surface datum, July 24, 1998

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	283	FEB 20	286.00	APR 21	260	JUL 24	293

WATER YEAR 1998 HIGHEST 260 APR 21, 1998 LOWEST 293 JUL 24, 1998

420219091344101. Local number 84-06-32 BCBC.
LOCATION.--Lat 42°02′45″, long 91°34′43″, Hydrologic Unit 07080206, located in the town of Marion near Tauber park on the corner of 31st St. and 23rd Ave. Owner: Town of Marion.
AQUIFER.--Cambrian/Ordovician- Jordan sandstone.
WELL CHARACTERISTICS.--Drilled public-use well, depth 1660, casing information not available.
INSTRUMENTATION.--Quarterly measurements using airline by an observer.
DATUM.--Elevation of land-surface datum is 863 ft above sea level, from topographic map.
REMARKS.--Marion No. 5.
PERIOD OF RECORDS.--January 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 330 ft. below land surface datum, January 28, 1997 and April 21, 1997; lowest measured, 351 ft. below land-surface datum, August 10, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	336	FEB 09	340	APR 27	343	AUG 10	351

WATER YEAR 1998 HIGHEST 336 NOV 25, 1997 LOWEST 351 AUG 10, 1998

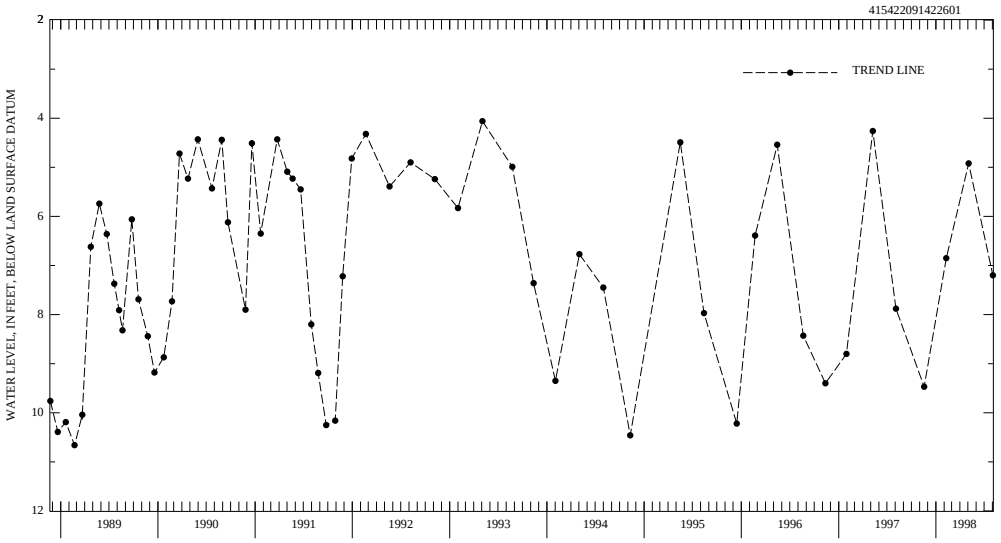
LINN COUNTY--Continued

415422091422601. Local number, 82-07-18 CDCD.
LOCATION.--Lat 41°54'22", long 91°42'26", Hydrologic Unit 07080205, on 76th Avenue SW, approximately 1.5 mi west of U.S. Highway 218, Cedar Rapids. Owner: Edwin J. Hynek.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Dug unused water-table well, diameter 4 ft, depth 13.5 ft, cribbed with brick.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder July 1959 to September 1987.
DATUM.--Elevation of land-surface datum is 835 ft above sea level, from topographic map. Measuring point: Base of recorder shelter, 0.37 ft above land-surface datum.
REMARKS.--Well previously owned by Lester Petrak.
PERIOD OF RECORD.--July 1959 to current year.
REVISED RECORDS.--WDR IA-84-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.09 ft below land-surface datum, August 4, 1968; lowest recorded, 11.75 ft below land-surface datum, February 8, 1977.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	9.47	FEB 09	6.85	MAY 04	4.92	AUG 03	7.2

WATER YEAR 1998 HIGHEST 4.92 MAY 04, 1998 LOWEST 9.47 NOV 18, 1997



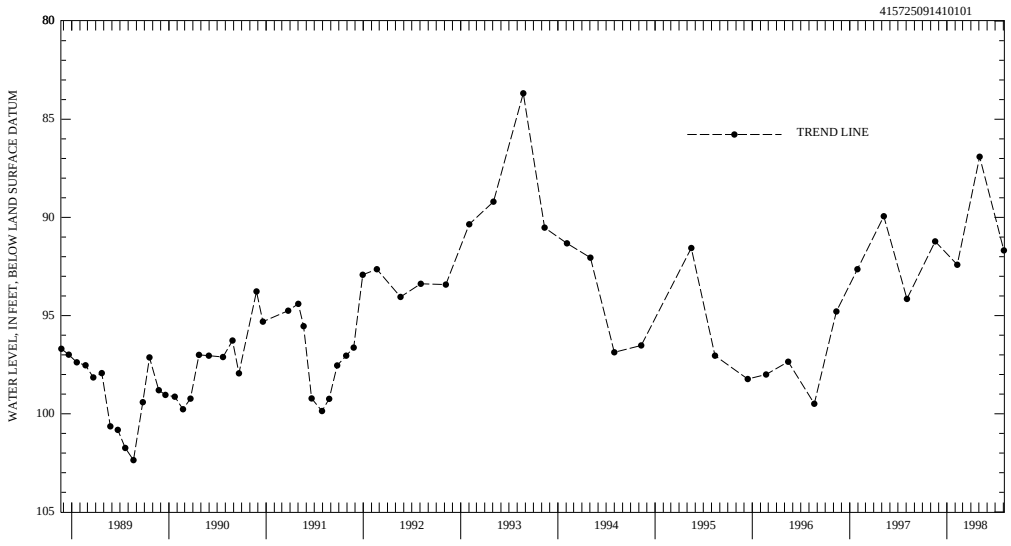
LINN COUNTY--Continued

415725091410101. Local number, 83-07-32 ACDC.
LOCATION.--Lat 41°57'25", long 91°41'01", Hydrologic Unit 07080205, northwest corner of 22nd Avenue SW and 11th Street SW, Cedar Rapids. Owner: Floyd Fetter.
AQUIFER.--Silurian: limestone of Silurian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 282 ft. Casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 805 ft above sea level, from topographic map. Measuring point: Plug in well cover at land-surface datum.
REMARKS.--Water levels may be affected by pumping of near by wells.
PERIOD OF RECORD.--July 1940 to current year.
REVISED RECORDS.--WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 75.88 ft below land-surface datum, January 26, 1942; lowest measured, 107.00 ft below land-surface datum, September 16, 1976.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	91.22	FEB 09	92.41	MAY 04	86.91	AUG 03	91.68

WATER YEAR 1998 HIGHEST 86.91 MAY 04, 1998 LOWEST 92.41 FEB 09, 1998



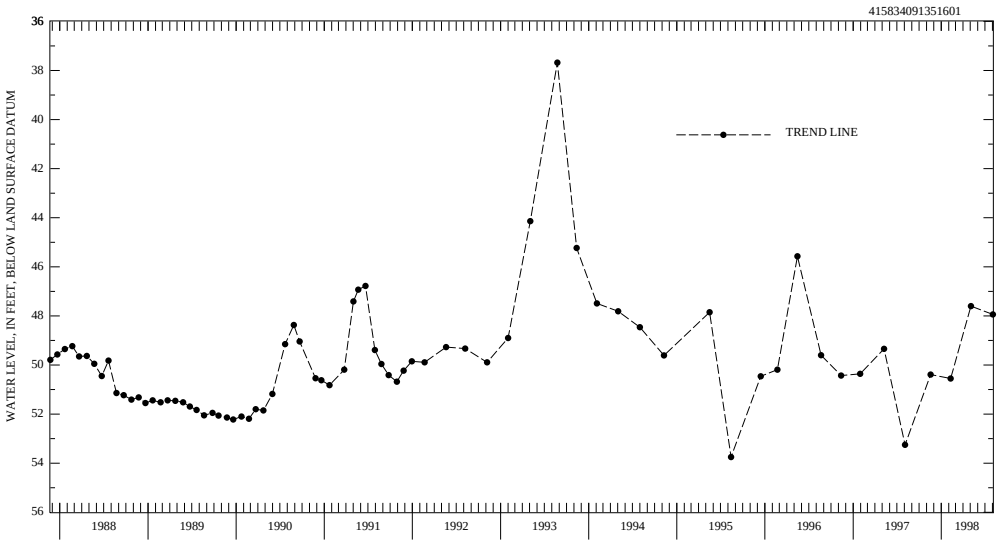
LINN COUNTY--Continued

415834091351601. Local number, 83-06-30 ABBA.
LOCATION.--Lat 41°58'34", long 91°35'16", Hydrologic Unit 07080206, approximately 200 ft west of 5201 Mount Vernon Road SE, Cedar Rapids. Owner: Vulcan Auto Yard. Formerly owned by B.L. Anderson.
AQUIFER.--Silurian-Devonian: dolomite of Silurian and limestone and dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 76.5 ft. Casing information not available.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 755 ft above sea level, from topographic map. Measuring point: Hole in pump base, 0.50 ft above land-surface datum.
REMARKS.--Katz well.
PERIOD OF RECORD.--May 1940 to current year.
EXTREMES OF PERIOD OF RECORD.--Highest water level measured, 37.68 ft below land-surface datum, August 24, 1993; lowest measured, 53.90 ft below land-surface datum, December 21, 1970.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	50.39	FEB 09	50.55	MAY 04	47.6	AUG 03	47.94

WATER YEAR 1998 HIGHEST 47.6 MAY 04, 1998 LOWEST 50.55 FEB 09, 1998



420300091325801. Local number, 84-06-33 ABBB.
LOCATION.--Lat 42°03'00", long 91°32'58", Hydrologic Unit 07080206, near the City of Marion on the east side of Iowa Highway 13, approximately 1 mi north of U.S. Highway 151. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in. to 142 ft, 5 in. 142-161 ft, depth 481 ft, open hole 161-481 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 838 ft above sea level, from topographic map. Measuring point: Top of casing, 0.90 ft above land-surface datum.
REMARKS.--Marion well.
PERIOD OF RECORD.--June 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 42.15 ft below land-surface datum, June 18, 1986; lowest measured, 50.26 ft below land-surface datum, December 1, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	46.97	FEB 09	46.29	MAY 04	43.8	AUG 03	46.97

WATER YEAR 1998 HIGHEST 43.8 MAY 04, 1998 LOWEST 46.97 NOV 18, 1997 AUG 03, 1998

LINN COUNTY--Continued

420508091395811. Local number, 84-07-16 DBBB.
LOCATION.--Lat 42°05'16", long 91°40'02", Hydrologic Unit 07080205, approximately 0.5 mi south of County Road E-34, north of the Town of Robins. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 60.6 ft, 5 in. to 173 ft, depth 520 ft, open hole 173-520 ft. Open to Devonian rock 173-197, Silurian 196.5-510 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder November 1975 to September 1979. Intermittent measurement with chalked tape by USGS personnel April 1975 to November 1975.
DATUM.--Elevation of land-surface datum is 873 ft above sea level, from topographic map. Measuring point: Top of casing, 1.20 ft above land-surface datum.
REMARKS.--Robins well. Records for April 1975 to September 1988 are unpublished and available in the files of the Iowa District Office.
PERIOD OF RECORD.--April 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.33 ft below land-surface datum, August 24, 1993; lowest measured, 57.50 ft below land-surface datum, December 1, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	49.93	DEC 12	48.63	MAR 04	46.13	MAY 04	41.65
OCT 29	48.75	DEC 17	48.44	MAR 23	44.20	MAY 18	43.07
NOV 07	48.51	JAN 05	48.51	APR 03	42.26	JUN 12	43.54
NOV 14	48.04	JAN 26	47.86	APR 06	41.12	AUG 03	47.44
NOV 18	48.22	FEB 09	48.05	APR 29	41.34		

WATER YEAR 1998 HIGHEST 41.12 APR 06, 1998 LOWEST 49.93 OCT 10, 1997

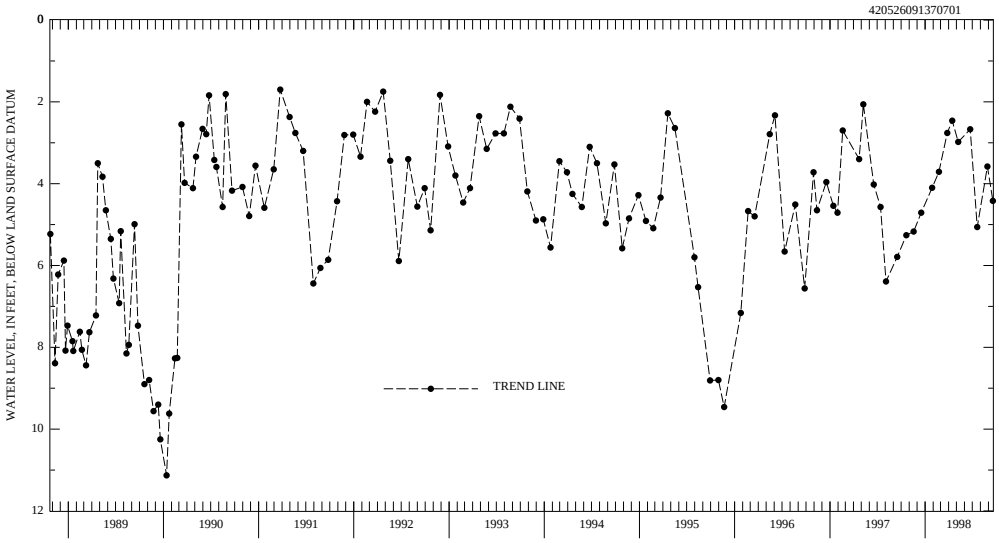
LINN COUNTY--Continued

420526091370701. Local number, 84-07-13 BCBB.
LOCATION.--Lat 42°05'26", long 91°37'07", Hydrologic Unit 07080206, approximately 0.25 mi south of the junction of County Roads W-58 and E-34, on the east side of the road, or approximately 3.75 mi north of the City of Marion. Owner: U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 1.25 in., depth 17 ft, screened 15-17 ft.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 882 ft above sea level, from topographic map. Measuring point: Nipple welded to casing, 1.24 ft above land-surface datum.
REMARKS.--USGS13E2 well.
PERIOD OF RECORD.--September 1948 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.93 ft below land-surface datum, May 18, 1982; lowest measured, 15.19 ft below land-surface datum, January 20, 1977.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	5.26	JAN 28	4.1	APR 15	2.46	JUL 20	5.06
NOV 18	5.17	FEB 23	3.71	MAY 08	2.98	AUG 28	3.58
DEC 17	4.71	MAR 27	2.76	JUN 23	2.67	SEP 18	4.42

WATER YEAR 1998 HIGHEST 2.46 APR 15, 1998 LOWEST 5.26 OCT 21, 1997



420730091490401. Local number, 85-08-31 DDCD1.
LOCATION.--Lat 42°07'30", long 91°49'04", Hydrologic Unit 07080205, at the fenced north end of Pleasant Creek Reservoir near the beach house in the beach area. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian: dolomite of Silurian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 53.5 ft, 5 in. to 214 ft, depth 481 ft, open hole 214-481 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder May 1975 to December 1979.
DATUM.--Elevation of land-surface datum is 833 ft above sea level, from topographic map. Measuring point: Top of casing, 1.17 ft above land-surface datum.
REMARKS.--Pleasant Creek Reservoir/Silurian well. Records for May 1975 to September 1988 are unpublished and available in the files of the Iowa District Office.
PERIOD OF RECORD.--May 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 84.17 ft below land-surface datum, April 5, 1976; lowest measured, 108.49 ft below land-surface datum, August 4, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	104.66	FEB 09	103.11	MAY 04	97.68	AUG 03	107.46

WATER YEAR 1998 HIGHEST 97.68 MAY 04, 1998 LOWEST 107.46 AUG 03, 1998

LINN COUNTY--Continued

420730091490402. Local number, 85-08-31 DDCD2.
LOCATION.--Lat 42°07'30", long 91°49'04", Hydrologic Unit 07080205, at the fenced north end of Pleasant Creek Reservoir near the beach house in the beach area. Owner: Geological Survey Bureau, DNR, and U.S. Geological Survey.
AQUIFER.--Devonian: limestone and dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 5 in., depth 205 ft, cased to 52 ft, open hole 52-205 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder May 1975 to December 1979.
DATUM.--Elevation of land-surface datum is 841 ft above sea level, from topographic map. Measuring point: Top of casing, 2.38 ft above land-surface datum.
REMARKS.--Pleasant Creek Reservoir/Devonian well. Records for May 1975 to September 1989 are unpublished and available in the Iowa District Office.
PERIOD OF RECORD.--May 1975 to May 1980, April 1984 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.60 ft below land-surface datum, May 31, 1991; lowest measured, 48.55 ft below land-surface datum, November 12, 1976.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	16.96	FEB 09	16.85	MAY 04	16.54	AUG 03	20.39

WATER YEAR 1998 HIGHEST 16.54 MAY 04, 1998 LOWEST 20.39 AUG 03, 1998

421149091403301. Local number, 85-07-04 CCCC.
LOCATION.--Lat 42°11'49", long 91°40'33", Hydrologic Unit 07080205, approximately 5 mi east of the Town of Center Point, north side of County Road E-16. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Silurian-Devonian: dolomite of Silurian age and limestone and dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 41 ft, 5 in 129-147 ft, depth 435 ft, open hole 41-129 ft and 147-435 ft. Devonian rock 23-139 ft, Silurian rock 139-431 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder March 1974 to December 1979. Intermittent measurement with chalked tape by USGS personnel July 1973 to March 1974.
DATUM.--Elevation of land-surface datum is 912 ft above sea level, from topographic map. Measuring point: Nipple welded to plate on top of casing, 1.21 ft above land- surface datum.
REMARKS.--Alice well.
PERIOD OF RECORD.--July 1973 to current year.
REVISED RECORDS.--WDR IA-84-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.06 ft below land-surface datum, June 10, 1974; lowest measured, 34.27 ft below land-surface datum, December 1, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	26.94	FEB 09	27.27	MAY 04	23.67	AUG 03	26.07

WATER YEAR 1998 HIGHEST 23.67 MAY 04, 1998 LOWEST 27.27 FEB 09, 1998

421207091312201. Local number, 85-06-03 DABB.
LOCATION.--Lat 42°12'07", long 91°31'24", Hydrologic Unit 07080102, located east of State Highway 13 in the Town of Central City. Owner: Town of Central City.
AQUIFER.--Silurian
WELL CHARCTERISTICS.--Drilled pumping well, depth 106 ft., casing information not available.
INSTRUMENTATION.--Quarterly measurements with airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 825 ft, by topographic map.
REMARKS.--Central City Well
PERIOD OF RECORD.--August 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12 feet below land-surface datum, May 04, 1998 and Aug. 03, 1998; lowest measured, 22 ft below land-surface datum, February 23, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	18	FEB 23	22	MAY 04	12	AUG 03	12

WATER YEAR 1998 HIGHEST 12 MAY 04, 1998 AUG 03, 1998 LOWEST 22 FEB 23, 1998

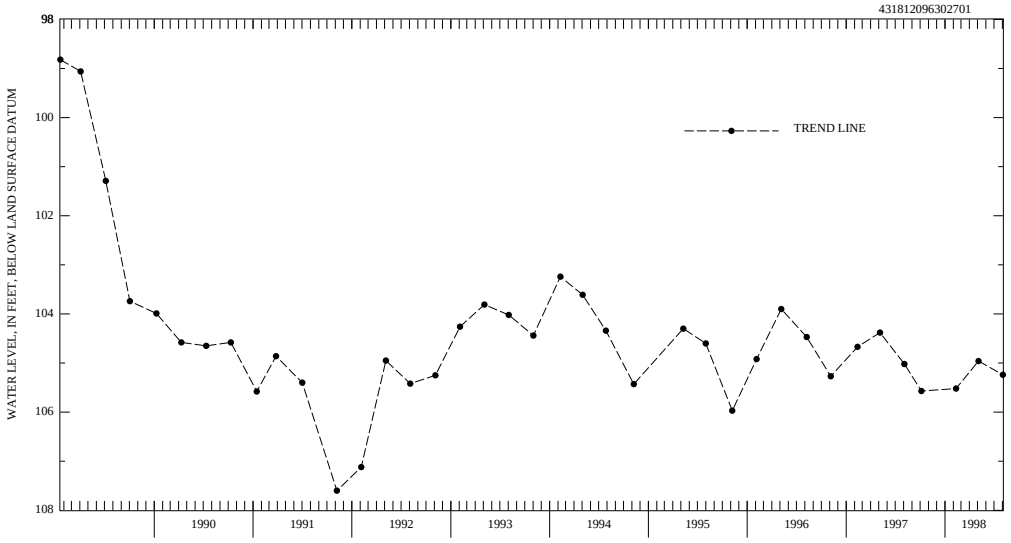
LYON COUNTY

431812096302701. Local number, 98-48-16 DDAD.
LOCATION.--Lat 43°18'12", long 96°30'27", Hydrologic Unit 10170203, approximately 3.5 mi east of the City of Canton, S.D., south of U.S. Highway 18. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 358 ft, screened 335-355 ft. Open to Late Precambrian Sioux quartzite 353-358 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,268 ft above sea level, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.
REMARKS.--Well D-20.
PERIOD OF RECORD.--December 1978 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 91.89 ft below land-surface datum, July 8, 1986; lowest measured, 107.60 ft below land-surface datum, November 7, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	105.57	FEB 11	105.52	MAY 05	104.96	AUG 03	105.24

WATER YEAR 1998 HIGHEST 104.96 MAY 05, 1998 LOWEST 105.57 OCT 06, 1997



LYON COUNTY--Continued

432140095595301. Local number, 99-44-26 DDDD.
LOCATION.--Lat 43°21'40", long 95°59'53", Hydrologic Unit 10170204, 1 mi north of the City of George, west of Iowa Highway 339. Owner: State of Iowa.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 20 in., depth 38 ft, lined with tile.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,400 ft above sea level, from topographic map. Measuring point: Plug in well cover, 2.01 ft above land-surface datum.
REMARKS.--Well No. 26R1.
PERIOD OF RECORD.--October 1940 to June 1943, May 1947 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.07 ft above land-surface datum, May 10, 1995; lowest measured, 9.74 ft below land-surface datum, October 24, 1940.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
(READINGS ABOVE LAND SURFACE INDICATED BY "+")

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	3.53	DEC 16	3.1	MAR 18	2.8	AUG 03	3.43
NOV 06	2.13	JAN 29	2.96	APR 29	0.89	SEP 01	3.56
NOV 12	3.18	FEB 11	3.05	JUN 09	2.43		

WATER YEAR 1998 HIGHEST 0.89 APR 29, 1998 LOWEST 3.56 SEP 01, 1998

432553096105701. Local number, 99-45-05 ABAC.
LOCATION.--Lat 43°25'53", long 96°10'55", Hydrologic Unit 10170204, 0.05 mi south of Iowa Highway 9 on 2nd Street, Rock Rapids. Owner: City of Rock Rapids.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 10 in., depth 375 ft, cased to 296 ft, open hole 296-375 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,368 ft above sea level, from topographic map. Measuring point: Plug in cover over casing, 1.00 ft above land-surface datum.
REMARKS.--City test well No. 3.
PERIOD OF RECORD.--August 1960 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 100.08 ft below land-surface datum, July 27, 1964; lowest measured, 128.62 ft below land-surface datum, November 5, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	115.83	JAN 29	115.72	MAR 18	115.61	JUN 09	115.51
NOV 12	115.59	FEB 11	115.61	APR 29	115.38	AUG 03	115.63

WATER YEAR 1998 HIGHEST 115.38 APR 29, 1998 LOWEST 115.83 NOV 06, 1997

LYON COUNTY --Continued

432601096335511. Local number, 100-48-31 CCCC11.
LOCATION.--Lat 43°26′01″, long 96°33′55″, Hydrologic Unit 10170203, 0.5 mi west and 2.5 mi south of the Village of Granite. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 657 ft, screened 450-455 ft and 630-650 ft. Dakota 437-653 ft, Sioux Quartzite 653-657 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,417 ft above sea level, from topographic map. Measuring point: Top of casing at land-surface datum.
REMARKS.--Well D-19.
PERIOD OF RECORD.--December 1978 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 151.57 ft below land-surface datum, February 11, 1994; lowest measured, 158.25 ft below land-surface datum, April 11, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	154.57	FEB 11	154.33	MAY 05	154.09	AUG 03	154.89

WATER YEAR 1998 HIGHEST 154.09 MAY 05, 1998 LOWEST 154.89 AUG 03, 1998

MADISON COUNTY

411727093483001. Local number, 75-26-23 AAAC.
LOCATION.--Lat 41°17′27″, long 93°48′30″, Hydrologic Unit 07100008, near the shelter house in the city park, St. Charles. Owner: City of St. Charles.
AQUIFER.--Mississippian: limestone of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 867 ft, cased to 657 ft, open hole 657-867 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,067 ft above sea level, from topographic map. Measuring point: Plug in well cover, 1.20 ft above land-surface datum.
REMARKS.--City well No. 1.
PERIOD OF RECORD.--November 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 261.76 ft below land-surface datum, November 20, 1962; lowest measured, 279.45 ft below land-surface datum, August 4, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	279.40	JAN 06	276.68	MAY 21	279.44	AUG 11	279.82
NOV 20	279.07	FEB 20	278.85				

WATER YEAR 1998 HIGHEST 276.68 JAN 06, 1998 LOWEST 279.82 AUG 11, 1998

MAHASKA COUNTY

411912092273601. Local number, 75-14-10 BAAC.
LOCATION.--Lat 41°19'12", long 92°27'30", Hydrologic Unit 07080106, approximately 0.5 mi south of Iowa Highway 92 in the town of Rose Hill. Owner: City of Rose Hill.
AQUIFER.--Mississippian: limestone and dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused public-supply artesian well, diameter 6 in., depth 370 ft, casing information not available.
INSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel. Analog digital water-level recorder July 1990 to October 1992. Intermittent measurement with chalked tape by USGS personnel May 1989 to June 1989.
DATUM.--Elevation of land-surface datum is 815 ft above sea level, from topographic map. Measuring point: Top of recorder platform, 1.63 ft above land-surface datum.
REMARKS.--Rose Hill No. 2 well.
PERIOD OF RECORD.--May 1989 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 100.69 ft below land-surface datum, July 30, 1992; lowest measured, 103.61 ft below land-surface datum, March 5, 6, 7, and 8, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	101.48	FEB 12	101.71	MAY 06	101.09	AUG 05	101.21

WATER YEAR 1998 HIGHEST 101.09 MAY 06, 1998 LOWEST 101.71 FEB 12, 1998

411914092274701. Local number, 75-14-10 BABC.
LOCATION.--Lat 41°19'14", long 92°27'47", Hydrologic Unit 07080106, approximately 0.45 mi south of Iowa Highway 92, behind City Hall in the Town of Rose Hill. Owner: City of Rose Hill.
AQUIFER.--Mississippian: limestone and dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused public-supply artesian well, diameter 5 in., depth 273 ft, cased to 106 ft, open hole 106-273 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 817 ft above sea level, from topographic map. Measuring point: Top of casing, 1.56 ft above land-surface datum.
REMARKS.--Rose Hill No. 4 well.
PERIOD OF RECORD.--September 1988 to current year.
REVISION.--Site identification number. Previously published as 411914092273001.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 99.56 ft below land-surface datum, May 17, 1995; lowest measured, 103.20 ft below land-surface datum, October 26, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	101.12	FEB 12	101.26	MAY 06	100.66	AUG 05	101.66

WATER YEAR 1998 HIGHEST 100.66 MAY 06, 1998 LOWEST 101.66 AUG 05, 1998

412020092471002. Local number, 76-17-35 CADB.
LOCATION.--Lat 41°20'20", long 92°47'10", Hydrologic Unit 07100009, 150 ft east of the old treatment plant near a retirement village on the north end of the Town of Leighton. Owner: Town of Leighton.
AQUIFER.--Cambrian-Ordovician: sandstone of Late Cambrian and sandstone and sandy dolomite of Early Ordovician age.
WELL CHARACTERISTICS.--Drilled unused public-supply artesian well, diameter 8 in. to 383 ft, 5 in. 383-1778 ft, depth 2200 ft, open 1778-2200 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 820 ft above sea level, from topographic map. Measuring point: Top of casing, 5.43 ft above land-surface datum.
REMARKS.--Leighton No. 4 well.
PERIOD OF RECORD.--May 1989 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 215.38 ft below land-surface datum, May 11, 1989; lowest measured, 282.96 ft below land-surface datum, August 20, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	250.22	FEB 12	246.25	MAY 06	239.99	AUG 05	237.83

WATER YEAR 1998 HIGHEST 237.83 AUG 05, 1998 LOWEST 250.22 NOV 20, 1997

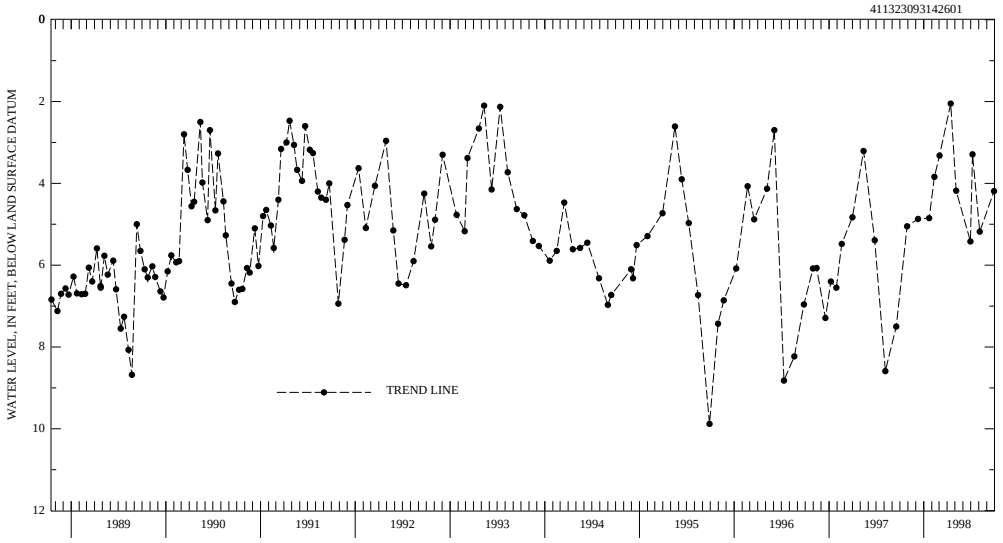
MARION COUNTY

411323093142601. Local number, 74-21-11 DBCB1.
LOCATION.--Lat 41°13'23", long 93°14'26", Hydrologic Unit 07100008, north of the water tower in the town square. Owner: Town of Melcher.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 18 in., depth 9.7 ft, lined with tile. Depth originally 25 ft, depth measured in 1981 and 1991 at 12.2 ft.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 948 ft above sea level, from topographic map. Measuring point: Top of tile casing at land-surface datum.
REMARKS.--Town well No. 2.
PERIOD OF RECORD.--March 1950 to current year.
REVISION.--Highest water level measured, 0.20 ft below land-surface datum, October 10, 1973; lowest measured, 15.27 ft below land-surface datum, October 22, 1953.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.20 ft below land-surface datum, October 10, 1973; lowest measured, 15.27 ft below land-surface datum, October 22, 1953.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	5.05	FEB 11	3.84	MAY 06	4.18	AUG 05	5.18
DEC 10	4.87	MAR 03	3.32	JUN 30	5.42	SEP 29	4.19
JAN 22	4.85	APR 15	2.05	JUL 08	3.29		

WATER YEAR 1998 HIGHEST 2.05 APR 15, 1998 LOWEST 5.42 JUN 30, 1998



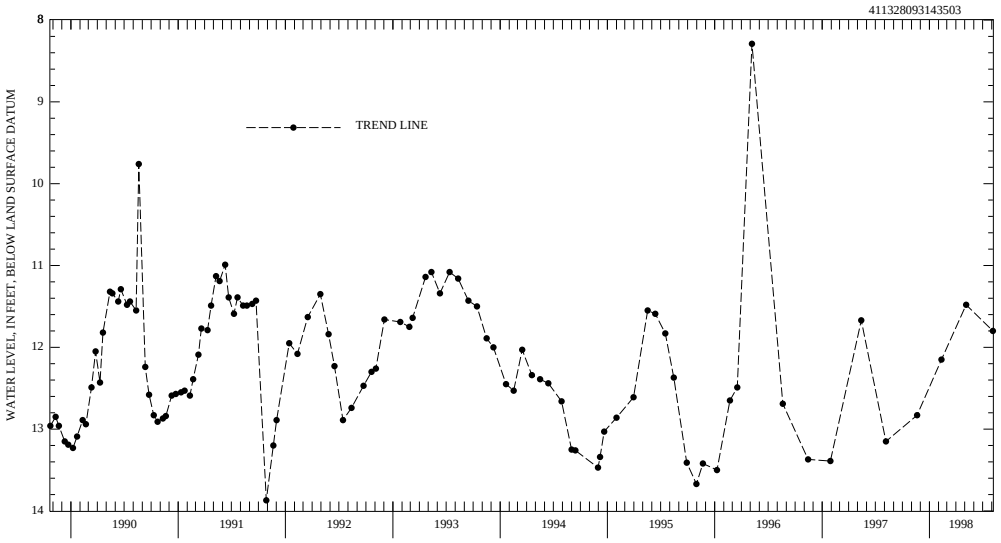
MARION COUNTY--Continued

411328093143503. Local number, 74-21-11 CAAD3.
LOCATION.--Lat 41°13'28", long 93°14'35", Hydrologic Unit 07100008, northeast corner of the junction of West 1st Street and North A Street, Melcher. Owner: Town of Melcher.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 1.25 in., depth 96.5 ft, screened 78-80 ft, open hole 80-96.5 ft.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 944 ft above sea level, from topographic map. Measuring point: Nipple welded to casing, 0.51 ft above land-surface datum.
REMARKS.--Town well No. 5, well 11L1.
PERIOD OF RECORD.--August 1953 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.29 ft below land-surface datum, May 7, 1996; lowest measured (nearby well pumping), 55.16 ft, revised, below land-surface datum, March 4, 1954.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	12.83	FEB 11	12.15	MAY 06	11.48	AUG 05	11.80

WATER YEAR 1998 HIGHEST 11.48 MAY 06, 1998 LOWEST 12.83 NOV 20, 1997



411329093142902. Local number, 74-21-11 DBBB2.
LOCATION.--Lat 41°13'29", long 93°14'29", Hydrologic Unit 07100008, southeast corner of the T junction of North B Street and Main Street, Melcher. Owner: Town of Melcher.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 119 ft, cased to 76 ft, open hole 76-119 ft.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 943 ft above sea level, from topographic map. Measuring point: Nipple welded to plate on top of casing, 1.82 ft above land- surface datum.
REMARKS.--Town well No. 3, well 11K1.
PERIOD OF RECORD.--July 1945 to December 1955, October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.16 ft below land-surface datum, May 07, 1996; lowest measured (nearby well pumping), 108.85 ft below land-surface datum, December 4, 6-7, 1949.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	21.25	FEB 11	21.01	MAY 06	20.83	AUG 05	20.96

WATER YEAR 1998 HIGHEST 20.83 MAY 06, 1998 LOWEST 21.25 NOV 20, 1997

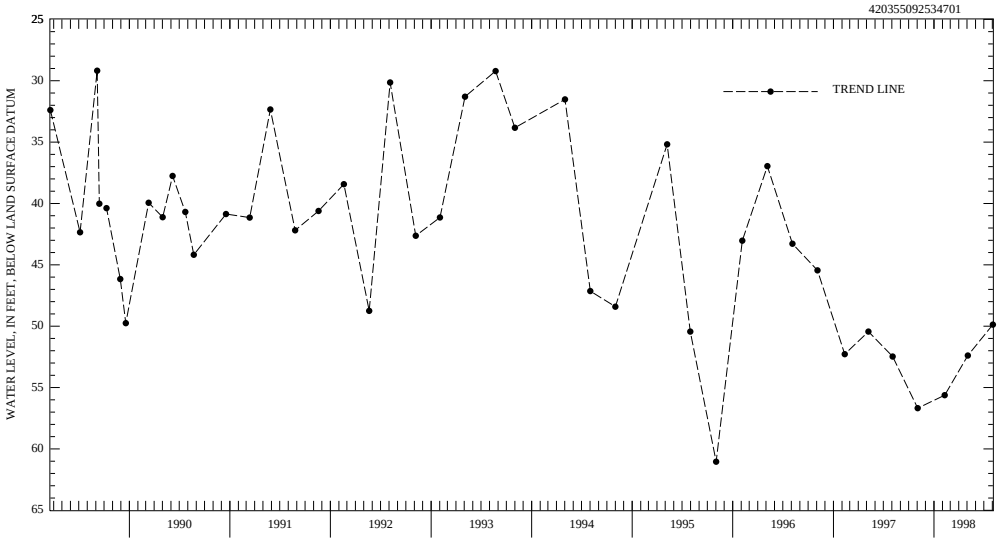
MARSHALL COUNTY

420355092534701. Local number, 84-18-24 CDCA.
LOCATION.--Lat 41°03'55", long 92°53'47", Hydrologic Unit 07080208, east of Riverview Park and south of the sewage treatment plant, Marshalltown. Owner: City of Marshalltown.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 200 ft, screened 190-200 ft.
INSTRUMENTATION.--Quarterly measurement with electric line or chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 871 ft above sea level, from topographic map. Measuring point: Top of casing, 0.22 ft above land-surface datum.
PERIOD OF RECORD.--May 1949 to August 1971, March 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.92 ft below land-surface datum, July 13, 1951; lowest measured, 61.04 ft below land-surface datum, November 2, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	56.68	FEB 09	55.62	MAY 04	52.39	AUG 03	49.87

WATER YEAR 1998 HIGHEST 49.87 AUG 03, 1998 LOWEST 56.68 NOV 03, 1997



421120093003001. Local number, 85-19-12 ADCD.
LOCATION.--Lat 41°11'20", long 93°00'30", Hydrologic Unit 07080207, located behind the old City Hall across the street from the Community Center and Fire Station. Owner: City of Liscomb.
AQUIFER.--Mississippian: limestone and dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused public-supply artesian well, diameter 8 in. to 103 ft, 6 in. 99-159 ft, depth 278 ft, screened 110-159 ft, open hole 159-278 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,008 ft above sea level, from topographic map. Measuring point: Top of casing, 0.56 ft above land-surface datum.
REMARKS.--Liscomb No. 1 well.
PERIOD OF RECORD.--September 1988 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 92.48 ft below land-surface datum, August 23, 1993; lowest measured, 101.50 ft below land-surface datum, November 29, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	99.02	FEB 11	98.74	MAY 04	96.66	AUG 03	96.71

WATER YEAR 1998 HIGHEST 96.66 MAY 04, 1998 LOWEST 99.02 NOV 03, 1997

MILLS COUNTY

405641095365101. Local number, 71-42-24 AAAA.
LOCATION.--Lat 40°56'41", long 95°36'51", Hydrologic Unit 10240002, at the intersection of County Roads M-16 and H-46, approximately 5 mi southeast of the City of Malvern. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Buried channel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 255 ft, screened 240-250 ft, gravel packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,102 ft above sea level, from topographic map. Measuring point: Top of casing, 2.20 ft above land-surface datum.
REMARKS.--Well SW-41.
PERIOD OF RECORD.--June 1990 and August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 135.50 feet below land-surface datum, August 5, 1993; lowest measured, 144.30 ft below land-surface datum, June 13, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	137.92	FEB 17	138.85	MAY 07	136.78	AUG 06	136.27

WATER YEAR 1998 HIGHEST 136.27 AUG 06, 1998 LOWEST 138.85 FEB 17, 1998

405813095433201. Local number, 71-42-07 BBCD.
LOCATION.--Lat 40°58'13", long 95°43'32", Hydrologic Unit 10240001, on the west side of the T-intersection of county roads, approximately 5.5 mi south of the City of Glenwood. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 351 ft, screened 332-342 ft, gravel packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,122 ft above sea level, from topographic map. Measuring point: Top of casing, 1.80 ft above land-surface datum.
REMARKS.--Well SW-40.
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 165.70 feet below land-surface datum, August 5, 1993; lowest measured, 171.94 ft below land-surface datum, November 10, 1994.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	168.42	FEB 23	169.35	MAY 07	166.94	AUG 06	166.85

WATER YEAR 1998 HIGHEST 166.85 AUG 06, 1998 LOWEST 169.35 FEB 23, 1998

MITCHELL COUNTY

432156092484101. Local number, 95-17-23 DAA1.
LOCATION.--Lat 43°21'56', long 98°48'41", Hydrologic Unit 07080201, approximately 4 mi southwest of Staceyville, at the intersection of Highway 218 and County Road T40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.-- Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in., depth 27 ft, screened 10-27 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,210 ft above sea level, from topographic map. Measuring point: Top of casing, 2.41 ft above land-surface datum.
REMARKS.--Well FM-2T.
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.46 ft above land-surface datum, May 6, 1993; lowest measured, 12.69 ft below land-surface datum, February 11, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	3.28	FEB 11	4.09	MAY 04	2.85	AUG 04	3.83

WATER YEAR 1998 HIGHEST 2.85 MAY 04, 1998 LOWEST 4.09 FEB 11, 1998

432156092484102. Local number, 95-17-23 DAA2.
LOCATION.--Lat 43°21'56', long 98°48'41", Hydrologic Unit 07080201, approximately 4 mi southwest of Staceyville, at the intersection of Highway 218 and County Road T40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.-- Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1 in., depth 70 ft, screened 55-70 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,210 ft above sea level, from topographic map. Measuring point: Top of casing, 2.58 ft above land-surface datum.
REMARKS.--Well FM-2 (1).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.89 ft above land-surface datum, August 23, 1993; lowest measured, 11.92 ft below land-surface datum, January 31, 1994.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	10.47	FEB 11	11.89	MAY 04	9.02	AUG 04	10.30

WATER YEAR 1998 HIGHEST 9.02 MAY 04, 1998 LOWEST 11.89 FEB 11, 1998

432156092484103. Local number, 95-17-23 DAA3.
LOCATION.--Lat 43°21'56', long 98°48'41", Hydrologic Unit 07080201, approximately 4 mi southwest of Staceyville, at the intersection of Highway 218 and County Road T40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.-- Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.5 in., depth 150 ft, screened 110-150 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,210 ft above sea level, from topographic map. Measuring point: Top of casing, 2.55 ft above land-surface datum.
REMARKS.--Well FM-2 (2).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.78 ft above land-surface datum, August 23, 1993; lowest measured, 12.65 ft below land-surface datum, May 07, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	11.09	FEB 11	12.69	MAY 04	9.17	AUG 04	10.63

WATER YEAR 1998 HIGHEST 9.17 MAY 04, 1998 LOWEST 12.69 FEB 11, 1998

MITCHELL COUNTY--Continued

432156092484104. Local number, 95-17-23 DAA4.
LOCATION.--Lat 43°21'56', long 98°48'41", Hydrologic Unit 07080201, approximately 4 mi southwest of Staceyville, at the intersection of Highway 218 and County Road T40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.-- Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.5 in., depth 250 ft, screened 188-250 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,210 ft above sea level, from topographic map. Measuring point: Top of casing, 2.44 ft above land-surface datum.
REMARKS.--Well FM-2 (3).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.54 ft above land-surface datum, May 6, 1993; lowest measured, 15.92 ft below land-surface datum, May 7, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	13.49	FEB 11	15.63	MAY 04	10.74	AUG 04	13.26

WATER YEAR 1998 HIGHEST 10.74 MAY 04, 1998 LOWEST 15.63 FEB 11, 1998

432156092484105. Local number, 95-17-23 DAA5.
LOCATION.--Lat 43°21'56', long 98°48'41", Hydrologic Unit 07080201, approximately 4 mi southwest of Staceyville, at the intersection of Highway 218 and County Road T40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.-- Devonian: dolomite of Devonian age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.5 in., depth 348 ft, screened 278-348 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,210 ft above sea level, from topographic map. Measuring point: Top of casing, 2.37 ft above land-surface datum.
REMARKS.--Well FM-2 (4).
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.04 ft above land-surface datum, August 23, 1993; lowest measured, 21.81 ft below land-surface datum, Nov 4, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	18.75	FEB 11	21.29	MAY 04	15.23	AUG 04	16.38

WATER YEAR 1998 HIGHEST 15.23 MAY 04, 1998 LOWEST 21.29 FEB 11, 1998

MONONA COUNTY

415456095414101. Local number, 82-42-14 ADCA.
LOCATION.--Lat 41°54'56", long 95°41'41", Hydrologic Unit 10230007, approximately 6 mi southeast of the Town of Soldier, on the north side of Iowa Highway 37. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 341 ft, screened 311-336 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,340 ft above sea level, from topographic map. Measuring point: Top of casing, 2.02 ft above land-surface datum.
REMARKS.--Well WC-4.
PERIOD OF RECORD.--May 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 240.25 ft below land-surface datum, January 10, 1984; lowest measured, 246.69 ft below land-surface datum, July 28, 1981.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	244.35	FEB 20	244.56	MAY 06	244.22	AUG 05	243.42

WATER YEAR 1998 HIGHEST 243.42 AUG 05, 1998 LOWEST 244.56 FEB 20, 1998

MONONA COUNTY--Continued

420004095451501. Local number, 83-42-17 ACDD.
LOCATION.--Lat 41°00'04", long 95°45'15", Hydrologic Unit 10230001, approximately 1.75 mi northeast of the Town of Soldier, 0.25 mi west of Iowa Highway 183. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 161 ft, screened 149-154 ft. Open to Pennsylvanian shale and limestone 153-161 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,160 ft above sea level, from topographic map. Measuring point: Top of casing, 2.20 ft above land-surface datum.
REMARKS.--Well WC-176.
PERIOD OF RECORD.--May 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 54.50 ft below land-surface datum, November 6, 1991; lowest measured, 64.09 ft below land-surface datum, September 7, 1983.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	60.65	MAY 06	60.15	AUG 05	60.37

WATER YEAR 1998 HIGHEST 60.15 MAY 06, 1998 LOWEST 60.65 NOV 05, 1998

420139095155701. Local number, 83-43-04 CBCB.
LOCATION.--Lat 41°01'39", long 95°51'57", Hydrologic Unit 10230005, approximately 5.5 mi northwest of the Town of Soldier and 1.5 mi north of Iowa Highway 37. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 321 ft, screened 297-315 ft, gravel-packed, open hole 315-321 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,235 ft above sea level, from topographic map. Measuring point: Top of casing, 2.53 ft above land-surface datum.
REMARKS.--Well WC-5.
PERIOD OF RECORD.--May 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 183.60 ft below land-surface datum, November 3, 1993; lowest measured, 189.96 ft below land-surface datum, February 2, 1982.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	185.63	FEB 19	185.73	MAY 05	185.59	AUG 05	184.55

WATER YEAR 1998 HIGHEST 184.55 AUG 05, 1998 LOWEST 185.73 FEB 19, 1998

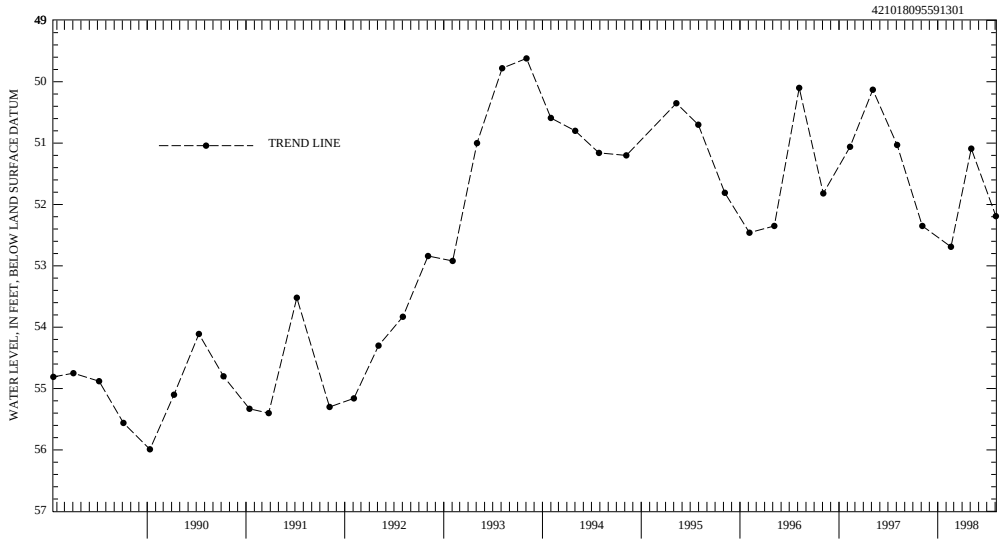
MONONA COUNTY--Continued

421018095591301. Local number, 85-44-17 DCAA.
LOCATION.--Lat 41°10'18", long 95°59'13", Hydrologic Unit 10230003, approximately 2.5 mi southwest of the Town of Rodney on the north side of County Road L-12. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 135 ft, screened 115-125 ft, gravel-packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,110 ft above sea level, from topographic map. Measuring point: Top of casing, 2.70 ft above land-surface datum.
REMARKS.--Well WC-158.
PERIOD OF RECORD.--October 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 49.62 ft below land-surface datum, November 3, 1993; lowest measured, 55.99 ft below land-surface datum, January 11, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	52.35	FEB 19	52.69	MAY 05	51.09	AUG 04	52.19

WATER YEAR 1998 HIGHEST 51.09 MAY 05, 1998 LOWEST 52.69 FEB 19, 1998



MONTGOMERY COUNTY

405841095012702. Local number, 71-36-06 DADA2.
LOCATION.--Lat 40°58'41", long 95°01'27", Hydrologic Unit 10240009, located east of dam at Viking Lake State Park, approximately 0.3 mi south of Iowa Highway 34 on the west side of road. Owner: Geological Survey Bureau, DNR, and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 36 ft, screened 33-36 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by observer and U.S.G.S. personnel.
DATUM.--Elevation of land-surface datum is 1,080 ft above sea level, from topographic map. Measuring point: Top of casing, 2.28 ft above land-surface datum.
REMARKS.--Viking Lake No. 2 (6J2) well.
PERIOD OF RECORD.--June 1989 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.51 ft below land-surface datum, September 9, 1989; lowest measured, 17.15 ft below land-surface datum, August 15, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	13.83	FEB 17	15.37	MAY 07	14.98	AUG 06	14.04

WATER YEAR 1998 HIGHEST 13.83 NOV 04, 1997 LOWEST 15.37 FEB 17, 1998

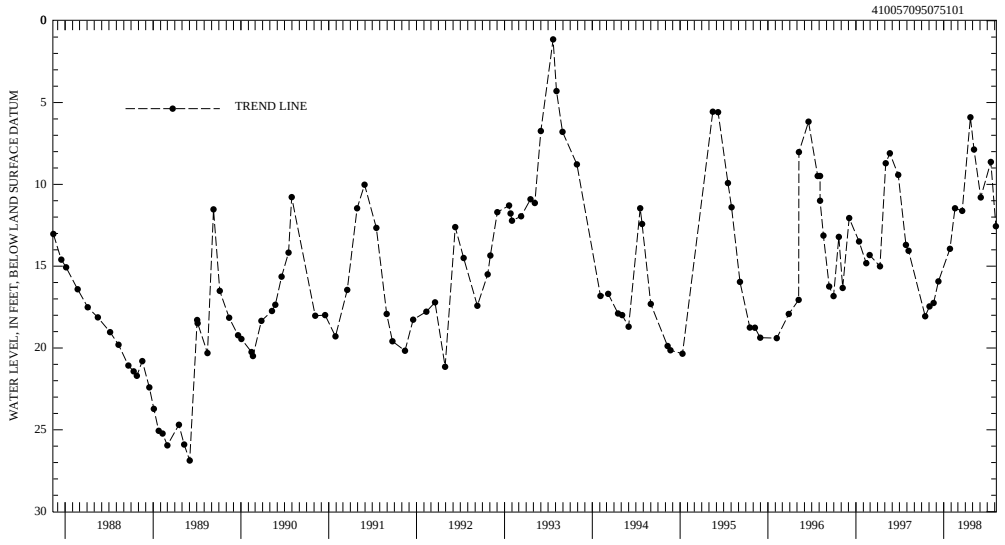
MONTGOMERY COUNTY--continued

410057095075101. Local number, 72-37-29 BABA.
LOCATION.--Lat 41°00'57", long 95°07'51", Hydrologic Unit 10240005, approximately 4.35 mi east of the City of Red Oak, just south of County Road H-34. Owner: John Ogden.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 3 in., depth 40 ft, screened interval unavailable.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,275 ft above sea level, from topographic map. Measuring point: Top of casing, 1.20 ft above land-surface datum.
PERIOD OF RECORD.--June 1937 to current year.
REVISION.--Measuring point revised May 10, 1990 to September 10, 1992.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.14 ft below land-surface datum, July 22, 1993; lowest measured, dry, July 8, 1963 and February 3, 1964.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	18.06	DEC 10	15.93	MAR 19	11.62	JUN 04	10.80
NOV 03	17.46	JAN 27	13.94	APR 22	5.90	JUL 16	8.63
NOV 20	17.25	FEB 17	11.46	MAY 07	7.87	AUG 06	12.56

WATER YEAR 1998 HIGHEST 5.90 APR 22, 1998 LOWEST 18.06 OCT 16, 1997



MUSCATINE COUNTY

412120091080401. Local number, 76-02-30 CBAA1.
LOCATION.--Lat 41°21'20", long 91°08'04", Hydrologic Unit 07080101, west of the Town of Fruitland on an Iowa State University Agricultural Experiment Farm. Owner: U.S. Geological Survey.
AQUIFER.--Alluvial: Mississippi River sand and gravel of Holocene age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 6 in., depth 27 ft, screened 24-27 ft.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel. Graphic water-level recorder May 1966 to October 1987.
DATUM.--Elevation of land-surface datum is 546 ft above sea level, from topographic map. Measuring point: Top of casing, 3.40 ft above land-surface datum.
REMARKS.--Fruitland/30M4 well.
PERIOD OF RECORD.--May 1966 to current year.
REVISED RECORDS.--WDR IA-84-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.15 ft below land-surface datum, September 7, 1993; lowest measured, 17.86 ft below land-surface datum, August 2, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	17.05	FEB 11	6.56	MAY 05	14.40	AUG 04	15.54

WATER YEAR 1998 HIGHEST 14.40 MAY 05, 1998 LOWEST 17.05 NOV 21, 1997

412120091080402. Local number, 76-02-30 CBAA.
LOCATION.--Lat 41°21'20", long 91°08'04", Hydrologic Unit 07080101, west of the Town of Fruitland on an Iowa State University Agricultural Experiment Farm. Owner: U.S. Geological Survey.
AQUIFER.--Silurian-Devonian: limestone of Silurian and Devonian age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 189 ft, screened 169-189 ft.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 546 ft above sea level, from topographic map. Measuring point: Top of casing, 3.01 ft above land-surface datum.
REMARKS.--Fruitland 13B well.
PERIOD OF RECORD.--October 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.12 ft below land-surface datum, August 24, 1993; lowest measured, 16.73 ft below land-surface datum, February 22, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	17.00	FEB 11	16.51	MAY 05	14.37	AUG 04	15.46

WATER YEAR 1998 HIGHEST 14.37 MAY 05, 1998 LOWEST 17.00 NOV 21, 1997

MUSCATINE COUNTY--Continued

412120091080403. Local number, 76-02-30 CBAA.
LOCATION.--Lat 41°21'20", long 91°08'04", Hydrologic Unit 07080101, west of the Town of Fruitland on an Iowa State University Agricultural Experiment Farm. Owner: U.S. Geological Survey.
AQUIFER.--Alluvial: Mississippi River sand and gravel of Quarternary age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 100 ft, screened 90-100 ft.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 546 ft above sea level, from topographic map. Measuring point: Top of casing, 3.13 ft above land-surface datum.
REMARKS.--Fruitland 13C well.
PERIOD OF RECORD.--October 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.20 ft below land-surface datum, September 10, 1993; lowest measured, 16.84 ft below land-surface datum, February 22, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	17.08	FEB 11	16.56	MAY 05	14.45	AUG 04	15.60

WATER YEAR 1998 HIGHEST 14.45 MAY 05, 1998 LOWEST 17.08 NOV 21, 1997

412740090503201. Local number, 77-01-22 BCBC.
LOCATION.--Lat 41°27'40", long 90°50'32", Hydrologic Unit 07080101, located in basement of house along State Highway 22. Owner: Ed Albers.
AQUIFER.--Silurian-Niagran Series
WELL CHARACTERISTICS.--Drilled observation well, depth 411 ft., casing information not available.
INSTRUMENTATION.--Monthly measurements using airline by USGS personnel.
DATUM.--Elevation of land-surface is 645 ft above sea level, by topographic map. Measuring Point: 5.79 ft below land surface datum.
REMARKS.--Albers Farm well.
PERIOD OF RECORD.--May 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 104.79 ft. below land-surface datum, January 06, 1998; lowest measured, 160.79 ft below land-surface datum, September 01, 1998

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07	113.79	JAN 06	104.79	APR 07	111.79	JUL 07	116.79
NOV 04	108.79	FEB 03	104.79	MAY 05	135.79	AUG 04	115.79
DEC 02	107.79	MAR 02	109.79	JUN 02	115.79	SEP 01	160.79

WATER YEAR 1998 HIGHEST 104.79 JAN 06, 1998 FEB 03, 1998 LOWEST 160.79 SEP 01, 1998

412833090482001, Local number, 77-01-14 ADAD.
LOCATION.--Lat 41°28'33". long 90°48'20", Hydrologic Unit 07080101, located I mile north of State Highway 22 on County Road Y36, between driveways at 1824 Zachary Ave. Owner: Everett Nitzel.
AQUIFER.--Devonian/Silurian
WELL CHARACTERISTICS.--Drilled public-use well, depth 400 ft., casing information not available.
INSTRUMENTATION.--Quarterly measurements using airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 700 feet above sea level, from topographic map.
REMARKS.-- E. Nitzel Well.
PERIOD OF RECORD.--May 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 235 ft. below land-surface datum, July 01, 1997; lowest measured, 260 ft below land-surface datum, April 07 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07	249	JAN 06	252	APR 0	260	JUL 07	249
NOV 04	235	FEB 03	243	MAY 05	243	AUG 04	251
DEC 02	230	MAR 02	256	JUN 02	244	SEP 01	256

WATER YEAR 1998 HIGHEST 230 DEC 02, 1997 LOWEST 260 APR 07, 1998

MUSCATINE COUNTY--Continued

412839090472601. Local number, 77-01-13 ABDD.
LOCATION.--Lat 41°28′39″, long 90°47′26″, Hydrologic Unit 07080101, located in front yard of house at 1835 Zieglar Ave. Owner: Walker.
AQUIFER.--Silurian
WELL CHARACTERISTICS.--Drilled public-use well, depth 400 ft., diameter 5 in., depth 400 ft., casing information not available.
INSTRUMENTATION.--Monthly measurements with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 715 ft above sea level, from topographic map. Measuring point: top of casing, 1.66 ft. above land surface datum.
REMARKS.--Walker Well.
PERIOD OF RECORD.--May 1997 to April 1998.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 210.35 ft below land-surface datum, June 10, 1997; lowest measured 236.42 ft below land-surface datum, April 07, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07	221.04	DEC 02	213.11	FEB 03	233.32	APR 07	236.42
NOV 04	214.87	JAN 06	220.32	MAR 02	227.47		

WATER YEAR 1998 HIGHEST 213.11 DEC 02, 1997 LOWEST 236.42 APR 07, 1998

412952090501101. Local number, 77-01-03 CDBD.
LOCATION.--Lat 41°29′52″, long 90°05′11″, Hydrologic Unit 07080101, located in side yard of house at 3714 165th Street in the town of Blue Grass. Owner: Don Massey.
AQUIFER.--Devonian/Silurian
WELL CHARACTERISTICS.--Drilled public-use well, depth 372 ft., casing information not available.
INSTRUMENTATION.--Monthly measurements with airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 720 ft above sea kevek, from topographic map.
REMARKS.--Massey Well
PERIOD OF RECORD.--June 1997 to current year.
EXTREMES FOR PERIOD OF RECORD. --Highest water level measured, 134 ft below land-surface datum, June 10, 1997; lowest measured 160, September 01, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07	138	JAN 06	144	APR 07	149.5	JUL 07	155
NOV 04	135	FEB 03	144.00	MAY 05	149	AUG 04	158
DEC 02	134	MAR 02	149.00	JUN 02	154	SEP 01	160

WATER YEAR 1998 HIGHEST 134 DEC 02, 1997 LOWEST 160 SEP 01, 1998

O'BRIEN COUNTY

425610095250611. Local number, 94-39-26 BADB11.
LOCATION.--Lat 41°56'10", long 95°25'06", Hydrologic Unit 10230003, near a dead-end road just south of the Little Sioux River, 0.9 mi north of Iowa Highway 10, approximately 5 mi southeast of the Town of Sutherland. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2.5 in, depth 352 ft, screened 291-295 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,212 ft above sea level, from topographic map. Measuring point: Top of casing, 2.30 ft above land-surface datum.
REMARKS.--Well D-3.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.94 ft below land-surface datum, May 09, 1995; lowest measured, 36.85 ft below land-surface datum, December 15, 1980.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	36.60	FEB 10	36.51	MAY 06	36.15	AUG 05	36.56

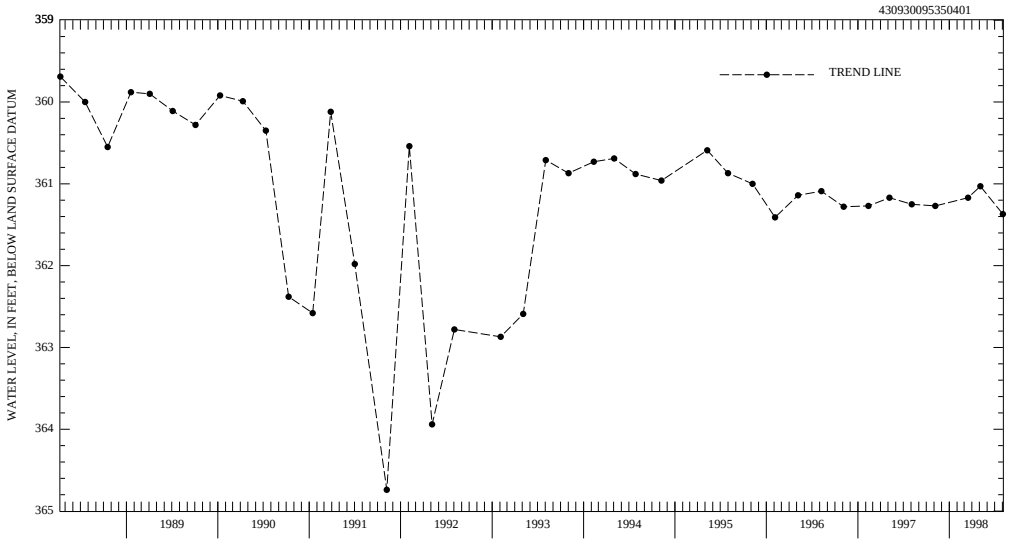
WATER YEAR 1998 HIGHEST 36.15 MAY 06, 1998 LOWEST 36.60 NOV 05, 1997

430930095350401. Local number, 96-40-05 DDDA1.
LOCATION.--Lat 41°09'30", long 95°35'04", Hydrologic Unit 10230003, approximately 3 mi east of the Town of Sanborn and 2 mi south of U.S. Highway 18. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Ordovician and Dakota: sandy shale of Ordovician age and sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 701 ft, screened 661-701 ft. Dakota 487-688 ft, Ordovician 688-701 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,560 ft above sea level, from topographic map. Measuring point: Top of casing, 4.00 ft above land-surface datum.
REMARKS.--Well D-41.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 358.39 ft below land-surface datum, July 8, 1986; lowest measured, 364.74 ft below land-surface datum, November 7, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	361.27	MAR 17	361.17	MAY 05	361.03	AUG 03	361.37

WATER YEAR 1998 HIGHEST 361.03 MAY 05, 1998 LOWEST 361.37 AUG 03, 1998



OSCEOLA COUNTY

431613095251801. Local number, 98-39-26 CDCC.
LOCATION.--Lat 41°16'13", long 95°25'18", Hydrologic Unit 10230003, 3.5 mi south and 2.5 mi east of the Village of May City. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 500 ft, screened 490-500 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,398 ft above sea level, from topographic map. Measuring point: Top of casing, 2.70 ft above land-surface datum.
REMARKS.--Well D-39.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 189.99 ft below land-surface datum, June 17, 1980; lowest measured, 196.85 ft (nearby well pumping) below land-surface datum, September 6, 1984.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	192.74	FEB 10	192.60	MAY 05	192.28	AUG 05	193.36

WATER YEAR 1998 HIGHEST 192.28 MAY 05, 1998 LOWEST 193.36 AUG 05, 1998

431620095250501. Local number, 98-39-26 CDAD1.
LOCATION.--Lat 41°16'20", long 95°25'05", Hydrologic Unit 10230003, 3.5 mi south and 2.5 mi east of the Village of May City. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Cambrian-Ordovician: St. Peter sandstone of Middle Ordovician age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 662 ft, screened 622-662 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,402 ft above sea level, from topographic map. Measuring point: Top of low pipe, 1.47 ft above land-surface datum.
REMARKS.--Well D-38, Deep Hibbing; in same borehole as well D-38 Shallow Hibbing.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 192.96 ft below land-surface datum, November 20, 1989; lowest measured, 202.43 ft below land-surface datum, February 07, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	199.21	FEB 10	198.79	MAY 05	198.53	AUG 05	196.25

WATER YEAR 1998 HIGHEST 196.25 AUG 05, 1998 LOWEST 199.21 NOV 05, 1997

431620095250511. Local number, 98-39-26 CDAD11.
LOCATION.--Lat 41°16'20", long 95°25'05", Hydrologic Unit 10230003, 3.5 mi south and 2.5 mi east of the Village of May City. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 345 ft, screened 335-345 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,402 ft above sea level, from topographic map. Measuring point: Top of high pipe, 2.60 ft above land-surface datum.
REMARKS.--Well D-38, Shallow Hibbing; in same borehole as well D-38 Deep Hibbing.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 192.20 ft below land-surface datum, September 10, 1981; lowest measured, 195.05 ft below land-surface datum, August 6, 1992.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	194.98	FEB 10	195.00	MAY 05	194.77	AUG 05	198.61

WATER YEAR 1998 HIGHEST 194.77 MAY 05, 1998 LOWEST 198.61 AUG 05, 1998

OSCEOLA COUNTY--Continued

432828095283611. Local number, 100-39-17 DCCB11.
LOCATION.--Lat 41°28'28", long 95°28'36", Hydrologic Unit 10230003, approximately 2 mi west and 2 mi north of the Town of Harris, east of County Road M-12. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in. to 461 ft, 4 in. 440-760 ft, depth 760 ft, screened 680-700 ft.
INSTRUMENTATION.--Quarterly measurement with electric line or chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,560 ft above sea level, from topographic map. Measuring point: Top of casing, 3.00 ft above land-surface datum.
REMARKS.--Well D-13.
PERIOD OF RECORD.--July 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 341.80 ft below land-surface datum, August 5, 1980; lowest measured, 350.68 ft below land-surface datum, November 05, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	350.48	FEB 10	345.40	MAY 05	344.66	AUG 05	345.40

WATER YEAR 1998 HIGHEST 344.66 MAY 05, 1998 LOWEST 350.48 NOV 05, 1997

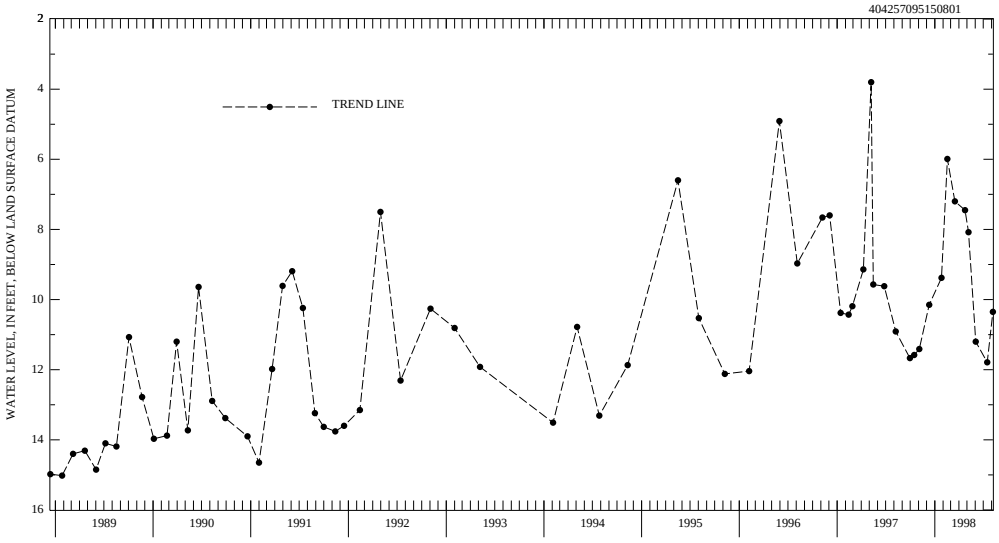
PAGE COUNTY

404257095150801. Local number, 68-38-07 CCAA.
LOCATION.--Lat 40°42'57", long 95°15'08", Hydrologic Unit 10240005, approximately 2 mi south of the Village of Norwich and 1.5 mi west of County Road M-48. Owner: William Brayman.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in., depth 44 ft, lined with tile.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,087 ft above sea level, from topographic map. Measuring point: Top of well, 1.20 ft below original land-surface datum.
REMARKS.--Terracing of the farm land surrounding well has lowered the land surface below the original measuring point.
PERIOD OF RECORD.--January 1938 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.09 ft below land-surface datum, March 26, 1946; lowest measured, 22.76 ft below land-surface datum, June 23, 1947.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	11.58	JAN 26	9.38	APR 24	7.45	JUL 16	11.79
NOV 04	11.41	FEB 17	5.99	MAY 07	8.08	AUG 06	10.35
DEC 11	10.15	MAR 17	7.20	JUN 03	11.20		

WATER YEAR 1998 HIGHEST 5.99 FEB 17, 1998 LOWEST 11.79 JUL 16, 1998



PLYMOUTH COUNTY

424833096324701. Local number, 92-48-06 DDDA.
LOCATION.--Lat 41°48'33", long 96°32'47", Hydrologic Unit 10170203, just south of the curve on Iowa Highway 3, 1 mi south of the Town of Akron. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: in sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 4 in. to 184 ft, 2 in. to 581 ft, depth 581 ft, screened 430-434 ft and 510-515 ft, open hole 576-581 ft. Paleozoic rock 576-581 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel,.
DATUM.--Elevation of land-surface datum is 1,282 ft above sea level, from topographic map. Measuring point: Top of casing, 4.50 ft above land-surface datum.
REMARKS.--Well D-35.
PERIOD OF RECORD.--December 1979 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 136.54 ft below land-surface datum, May 05, 1998; lowest measured, 159.82 ft below land-surface datum, August 6, 1980.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	136.90	FEB 11	137.09	MAY 05	136.54	AUG 03	136.79

WATER YEAR 1998 HIGHEST 136.54 MAY 05, 1998 LOWEST 137.09 FEB 11, 1998

PLYMOUTH COUNTY--Continued

424850096074801. Local number, 92-45-02 CBCB.
LOCATION.--Lat 41°48'50", long 96°07'48", Hydrologic Unit 10230002, approximately 3.8 mi west and 0.6 mi south of the Village of Oyens. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Cambrian-Ordovician: dolomite of Cambrian and Ordovician age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in. to 161 ft, 4 in. to 598 ft, 2 in. to 1,340 ft, depth 1,340 ft, cased to 598 ft, open hole 598-1,340 ft. Well deepened from 1,089 ft to 1,340 ft in May, 1984. Ordovician rock 568-782 ft, Cambrian rock 782-1062 ft, Precambrian 1062-1340 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,245 ft above sea level, from topographic map. Measuring point: Top of casing, 2.80 ft above land-surface datum.
REMARKS.--Well D-21.
PERIOD OF RECORD.--May 1979 to January 1981, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 55.40 ft below land-surface datum, May 06, 1996; Lowest measured, 102.10 ft below land-surface datum, August 6, 1980.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	57.42	FEB 11	57.44	MAY 05	57.16	AUG 04	57.21

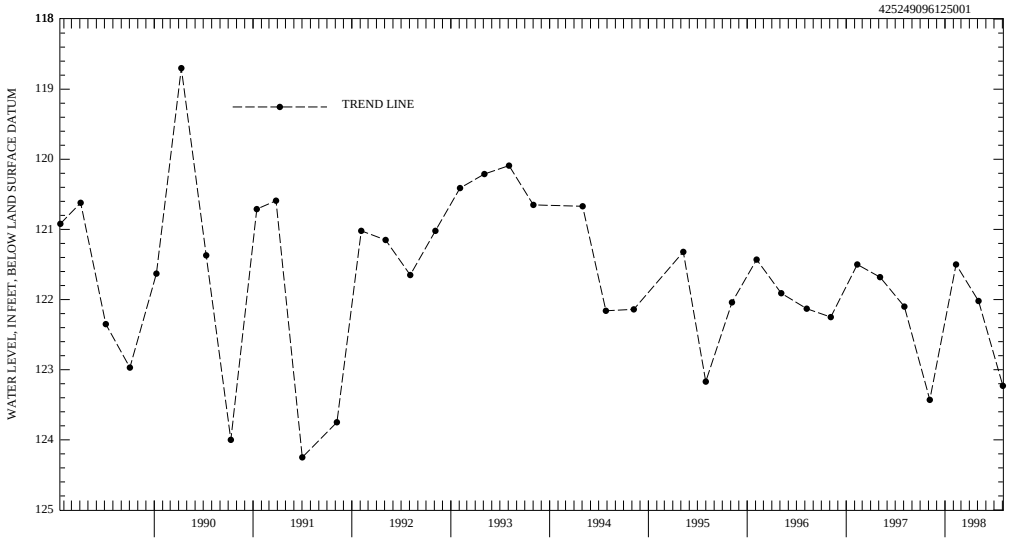
WATER YEAR 1998 HIGHEST 57.16 MAY 05, 1998 LOWEST 57.44 FEB 11, 1998

425249096125001. Local number, 93-46-12 DDDD.
LOCATION.--Lat 41°52'49", long 96°12'50", Hydrologic Unit 10230002, 1 mi west and 1 mi south of the Village of Struble. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2.5 in., depth 570 ft, screened 356-360 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,280 ft above sea level, from topographic map. Measuring point: Top of coupling, 2.25 ft above land-surface datum.
REMARKS.--Well D-2.
PERIOD OF RECORD.--March 1980 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 117.78 ft below land-surface datum, April 9, 1980; lowest measured, 124.25 ft below land-surface datum, July 2, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	123.43	FEB 11	121.50	MAY 05	122.02	AUG 03	123.23

WATER YEAR 1998 HIGHEST 121.50 FEB 11, 1998 LOWEST 123.43 NOV 06, 1997



POTTAWATTAMIE COUNTY

411359095171901. Local number, 74-39-01 CCCC.
LOCATION.--Lat 41°13'59", long 95°17'19", Hydrologic Unit 10240002, approximately 6.5 mi east of the Town of Carson, on the northeast corner of the junction of Iowa Highway 92 and County Road M-41. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in., depth 216 ft, screened 189-206 ft, gravel-packed, open to Pennsylvanian shale 207-216 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,245 ft above sea level, from topographic map. Measuring point: Top of casing, 2.50 ft above land-surface datum.
REMARKS.--Well SW-21.
PERIOD OF RECORD.--July 1986 to current year.
REVISION.--Lowest water level measured, 129.38 ft below land-surface datum, August 20, 1986.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 124.45 ft below land-surface datum, May 5, 1994; lowest measured, 129.38 ft below land-surface datum, August 20, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	124.23	FEB 09	124.45	MAY 07	123.72	AUG 06	124.66

WATER YEAR 1998 HIGHEST 123.72 MAY 07, 1998 LOWEST 124.66 AUG 06, 1998

412407095391201. Local number, 76-42-10 ADBC.
LOCATION.--Lat 41°24'01", long 95°39'17", Hydrologic Unit 10230006, approximately 1 mi east of the Town of Underwood, behind structure at reststop on eastbound Interstate 80. Owner: Iowa Highway Commission
AQUIFER.-- Cambrian: sandstone and dolomite. from the Jordan and Prairie du Chen formations.
WELL CHARACTERISTICS.-- Drilled public use well, diameter 16 in., depth 2520 ft, screened 2420-2460 ft, gravel packed.
INSTRUMENTATION.-- Quarterly measurement with chalked tape by USGS personnel.
DATUM.-- Elevation of land-surface datum is 1,093 ft above sea level, from topographic map. Measuring point: Top of casing, 1.72 ft above land-surface datum.
REMARKS.-- Underwood Well
PERIOD OF RECORD.-- October 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.-- Highest water level measured, 72.86 ft below land surface datum, August 06, 1998; lowest measured, 74.18 ft below land surface datum, October 28, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 07	74.75	FEB 19	73.29	MAY 08	73.10	AUG 06	72.86

WATER YEAR 1998 HIGHEST 72.86 AUG 06, 1998 LOWEST 74.75 NOV 07, 1997

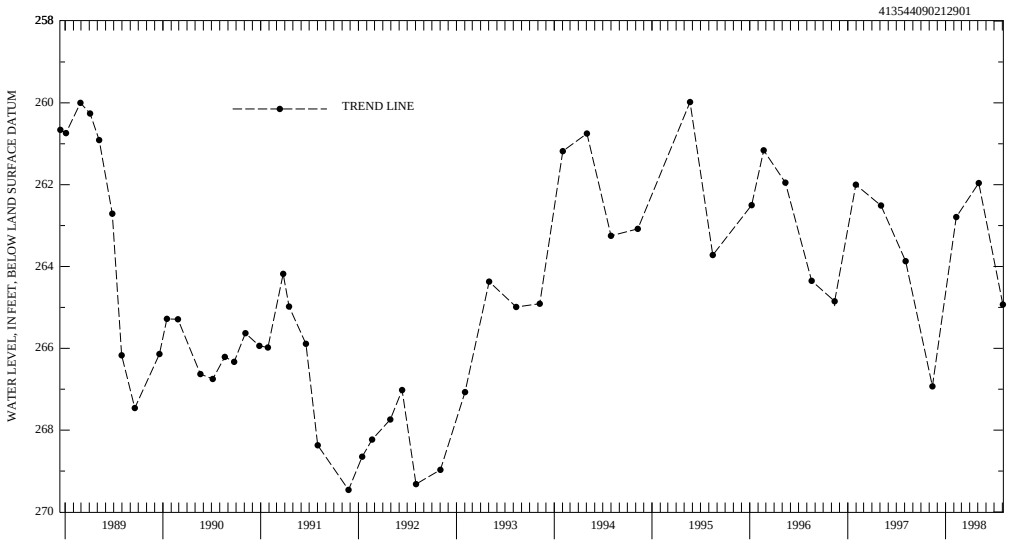
SCOTT COUNTY

413544090212901. Local number, 78-5E-03 AADA.
LOCATION.--Lat 41°35'44", long 41°21'29", Hydrologic Unit 07080101, at the Bridgeview Elementary School corner of 12th and Davenport Streets, Le Claire. Owner: City of Le Claire.
AQUIFER.--Cambrian-Ordovician: sandstone of Late Cambrian and sandstone and sandy dolomite of Early Ordovician age.
WELL CHARACTERISTICS.--Drilled unused municipal artesian water well, diameter 16 to 10 in., depth 1,607 ft, cased to 1,300 ft, open hole 1,300-1,607 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder July 1975 to December 1984.
DATUM.--Elevation of land-surface datum is 703 ft above sea level, from topographic map. Measuring point: Nipple on plate welded to casing, 2.11 ft above land-surface datum.
REMARKS.--Le Claire Well No. 3.
PERIOD OF RECORD.--July 1975 to current year.
REVISED RECORDS.--WRD IA-84-1, WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 247.46 ft below land-surface datum, July 8, 1975; lowest recorded, 276.86 ft below land-surface datum, September 1, 1978.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	266.93	FEB 10	262.79	MAY 05	261.96	AUG 03	264.93

WATER YEAR 1998 HIGHEST 261.96 MAY 05, 1998 LOWEST 266.93 NOV 13, 1997



SHELBY COUNTY

413255095070401. Local number, 78-37-17 DDDD.
LOCATION.--Lat 41°32'55", long 95°07'04", Hydrologic Unit 10240003, 3 mi south and 3 mi west of the Town of Elkhorn on the east side of County Road M-56 near Elkhorn Creek. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota and Pennsylvanian: sandstone of Cretaceous age and shale and limestone of Pennsylvanian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 181 ft, screened 121-179 ft, gravel-packed, open to Dakota 121-140 ft, Pennsylvanian 140-181 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,208 ft above sea level, from topographic map. Measuring point: Top of casing, 2.80 ft above land-surface datum.
REMARKS.--Well WC-16.
PERIOD OF RECORD.--August 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.60 ft below land-surface datum, August 11, 1993; lowest measured, 42.86 ft below land-surface datum, September 24, 1981.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	41.90	FEB 09	41.84	MAY 06	40.38	AUG 05	41.27

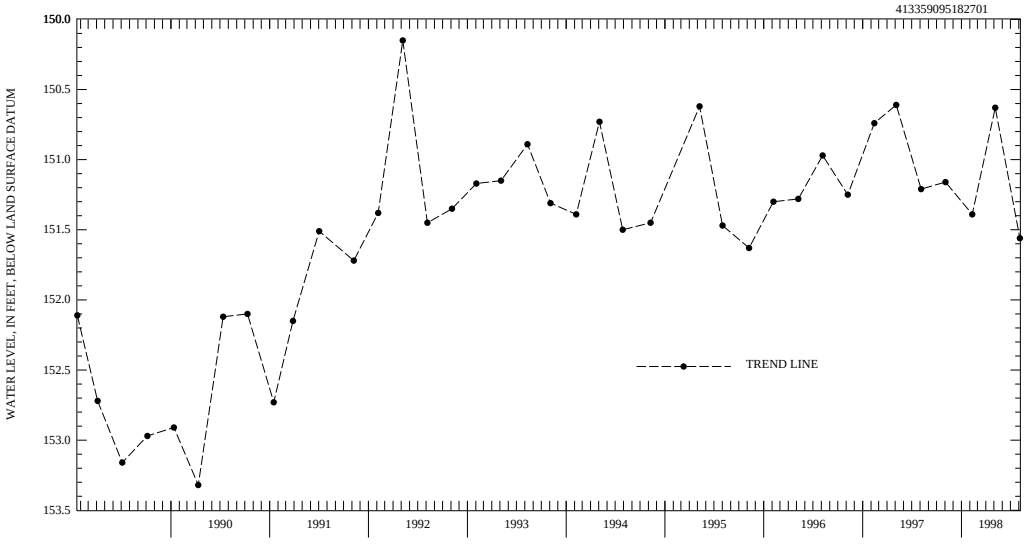
WATER YEAR 1998 HIGHEST 40.38 MAY 06, 1998 LOWEST 41.90 NOV 03, 1997

413359095182701. Local number, 78-39-11 CCBC.
LOCATION.--Lat 41°33'59", long 95°18'27", Hydrologic Unit 10240002, approximately 5.5 mi south of the City of Harlan, 0.75 mi south of County Road F-58, and 1.5 mi east of U.S. Highway 59. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Fremont buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 541 ft, screened 520-535 ft, gravel-packed. Pennsylvanian shale 537-541 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,310 ft above sea level, from topographic map. Measuring point: Top of casing, 1.65 ft above land-surface datum.
REMARKS.--Well WC-227.
PERIOD OF RECORD.--July 1983 to current year.
REVISION.--Lowest water level measured, 153.32 below land-surface datum, April 12, 1990.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 146.61 ft below land-surface datum, September 6, 1983; lowest measured, 153.32 ft below land-surface datum, April 12, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	151.16	FEB 10	151.39	MAY 06	150.63	AUG 05	151.56

WATER YEAR 1998 HIGHEST 150.63 MAY 06, 1998 LOWEST 151.56 AUG 05, 1998



SHELBY COUNTY--Continued

413953095302601. Local number, 79-40-09 DBCA.
LOCATION.--Lat 41°39'53", long 95°30'26", Hydrologic Unit 10230006, east of State Highway 191, approximately 1 mi northeast of the Town of Portsmouth. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 200 ft, screened 160-175 ft, gravel packed.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,205 ft above sea level, from topographic map. Measuring point: Top of casing, 4.10 ft above land-surface datum.
REMARKS.--Well WC-15.
PERIOD OF RECORD.--August 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.29 feet below land-surface datum, May 9, 1995; lowest measured, 19.28 ft below land-surface datum, November 6, 1992.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	19.44	FEB 10	19.24	MAY 06	19.02	AUG 05	19.54

WATER YEAR 1998 HIGHEST 19.02 MAY 06, 1998 LOWEST 19.54 AUG 05, 1998

414624095252301. Local number, 80-39-06 AADC.
LOCATION.--Lat 41°46'24", long 95°25'23", Hydrologic Unit 10230006, west of the Town of Earling on the north side of Iowa Highway 37 near the junction of Iowa Highways 37 and 191. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 370 ft, screened 332-347 ft, open to Pennsylvanian sandstone, shale, and limestone 347-370 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,305 ft above sea level, from topographic map. Measuring point: Top of casing, 2.60 ft above land-surface datum.
REMARKS.--Well WC-10.
PERIOD OF RECORD.--June 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 89.91 ft below land-surface datum, April 10, 1984; lowest measured, 131.70 ft below land-surface datum, April 12, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	108.00	FEB 10	107.20	MAY 06	107.77	AUG 05	107.41

WATER YEAR 1998 HIGHEST 107.20 FEB 10, 1998 LOWEST 108.00 NOV 05, 1997

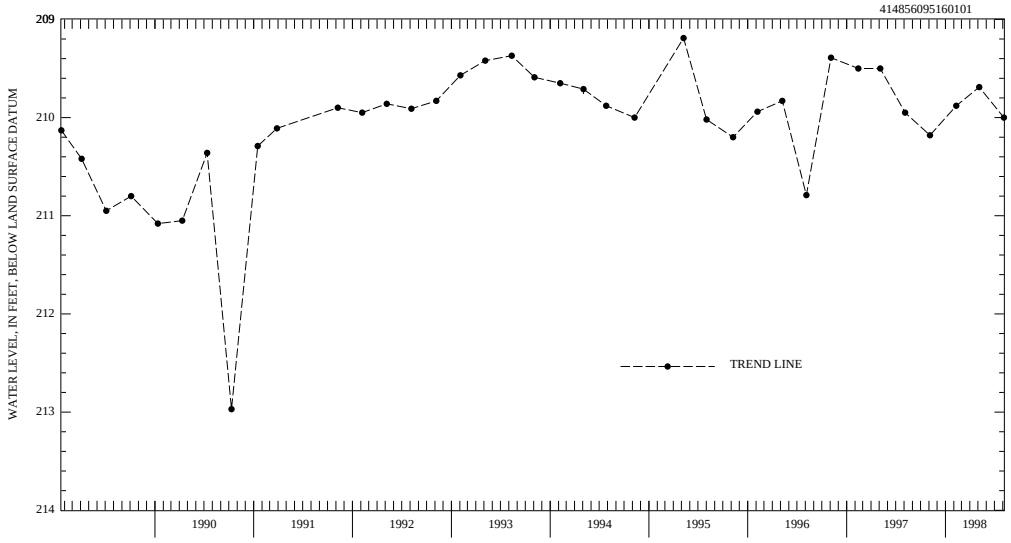
SHELBY COUNTY--Continued

414856095160101. Local number, 81-38-21 ADAD
LOCATION.--Lat 41°48′56″, long 95°16′01″, Hydrologic Unit 10240002, approximately 3.75 mi east of the Town of Defiance on the west side of County Road M-36. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Fremont buried channel: sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 535 ft, screened 525-535 ft, gravel-packed. Open to Pennsylvanian shale 530-535 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,370 ft above sea level, from topographic map. Measuring point: Top of casing, 2.90 ft above land-surface datum.
REMARKS.--Well WC-222.
PERIOD OF RECORD.--August 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 208.09 ft below land-surface datum, April 15, 1987; lowest measured, 212.97 ft below land-surface datum, October 11, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	210.18	FEB 10	209.88	MAY 06	209.69	AUG 05	210.00

WATER YEAR 1998 HIGHEST 209.69 MAY 06, 1998 LOWEST 210.18 NOV 05, 1997



SIOUX COUNTY

430140095573101. Local number, 95-43-07 AAAA.
LOCATION.--Lat 41°04'10", long 95°57'32", Hydrologic Unit 10230002, just south of County Road B-40, 1 mi east of the Village of Newkirk. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 681 ft, screened 641-681 ft. Open to Paleozoic rock from 674-681 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,390 ft above sea level, from topographic map. Measuring point: Top of casing, 3.70 ft above land-surface datum.
REMARKS.--Well D-43.
PERIOD OF RECORD.--July 1980 to December 1980, May 1982 to current year.
REVISED RECORDS.--WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 213.66 ft below land-surface datum, March 13, 1984; lowest measured, 219.57 ft below land-surface datum, February 5, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	218.31	FEB 11	218.11	MAY 05	217.82	AUG 03	218.02

WATER YEAR 1998 HIGHEST 217.82 MAY 05, 1998 LOWEST 218.31 NOV 06, 1997

430913096033201. Local number, 96-44-08 ADAA.
LOCATION.--Lat 41°09'13", long 96°03'32", Hydrologic Unit 10230002, west side of County Road K-64, approximately 2.5 mi west of the Town of Boyden and approximately 2.2 mi south of U.S. Highway 18. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 682 ft, screened 647-667 ft. Open to Paleozoic rock 681-682 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,373 ft above sea level, from topographic map. Measuring point: Top of casing, 3.70 ft above land-surface datum.
REMARKS.--Well D-44.
PERIOD OF RECORD.--August 1980 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 187.85 ft below land-surface datum, October 16, 1984; lowest measured, 196.30 ft below land-surface datum, November 7, 1991.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 06	195.82	FEB 11	195.62	MAY 05	195.38	AUG 03	195.82

WATER YEAR 1998 HIGHEST 195.38 MAY 05, 1998 LOWEST 195.82 NOV 06, 1997 AUG 03, 1998

STORY COUNTY

420129093273701. Local Number, 83-22-06 CDBD.
LOCATION.-- Lat 42°01'30", long 93°27'33", Hydrologic Unit 07080105, approximately one mile north of Highway 30 near 1st and N Ave. Owner: City of Nevada.
AQUIFER.--Cambrian/Ordovician.
WEL CHARACTERISTICS.--Drilled observation public supply well, diameter 8 in, depth 2630 ft,
INSTRUMENTATION.--Quarterly measurement using airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 991 ft above sea level, from topographic map.
REMARKS.--Nevada Well No. 4
PERIOD OF RECORD.--February 1997 to current year
EXTREMES FOR PERIOD OF RECORD.-- Highest water level measured, 370 ft below land-surface datum, May 8, 1997 and August 4, 1997; lowest measured, 373 ft below land surface datum, February 11, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	410	FEB 09	370	MAY 04	340	AUG 03	338

WATER YEAR 1998 HIGHEST 338 AUG 03, 1998 LOWEST 410.00 NOV 03, 1997

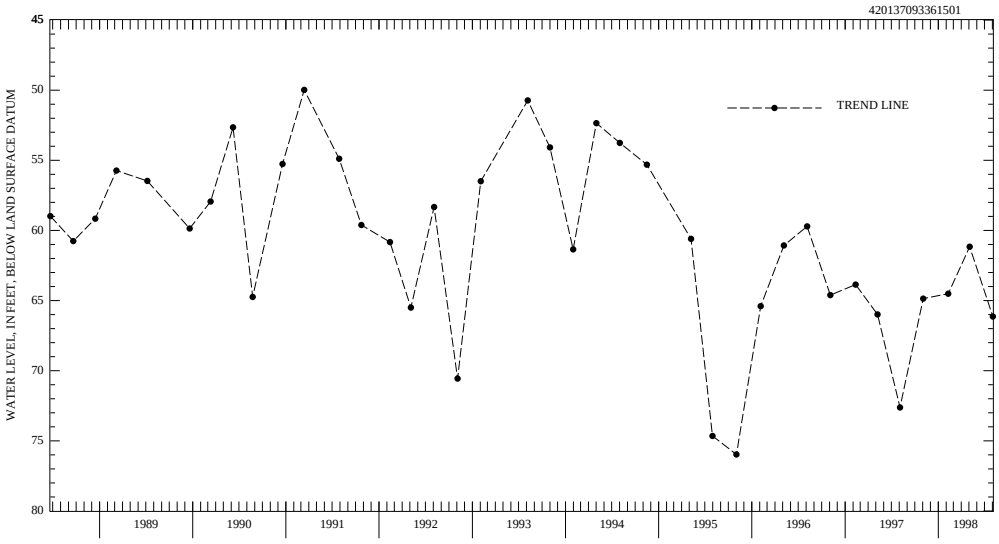
STORY COUNTY-Continued

420137093361501. Local number, 83-24-02 DABC.
LOCATION.--Lat 41°01'37", long 93°36'15", Hydrologic Unit 07080105, in Ames, north of the Chicago and Northwestern Railroad and County Road E-41, approximately 0.75 mi east of U.S. Highway 69. Owner: City of Ames.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled municipal well, depth 124 ft, casing information unavailable.
INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.
DATUM.--Elevation of land-surface datum is 926 ft above sea level, from topographic map. Measuring point: Top of casing, 0.82 ft above land-surface datum.
REMARKS.--Ames city well No. 4.
PERIOD OF RECORD.--September 1987 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 49.98 ft below land-surface datum, March 14, 1991; lowest measured, 75.97 ft below land-surface datum, November 2, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	64.86	FEB 09	64.51	MAY 04	61.16	AUG 03	66.14

WATER YEAR 1998 HIGHEST 61.16 MAY 04, 1998 LOWEST 66.14 AUG 03, 1998



TAMA COUNTY

420957092181801. Local number, 85-13-24 ABAC.
LOCATION.--Lat 42°09'57", long 92°18'21", Hydrologic Unit 07080208, located on county road 0.5 mi east of the Town of Dysart on county road, 1 mi south of State Highway 8. Owner: Town of Dysart.
AQUIFER.--Cambrian/ Ordovician-Prairie Du Chien Formation dolomite
WELL CHARCTERISTICS.--Drilled observation well, diameter 20 in., depth 1880 ft., casing open from 1300-1880.
INSTRUMENTATION.--Quarterly measurements using an airline by USGS personnel.
DATUM.--Elevation of land-surface datum is 961 ft above sea level, from topographic map.
REMARKS.--Dysart Park well.
PERIOD OF RECORD-January 1997 to current year
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 350 feet below land-surface datum, August 4, 1997; lowest measured, 350 ft below land-surface datum, January 3, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL
JUN 15	354	AUG 03	364

WATER YEAR 1998 HIGHEST 354 JUN 15, 1998 LOWEST 364 AUG 03, 1998

VAN BUREN COUNTY

404150091483001. Local number, 68-08-08 CDD.
LOCATION.--Lat 40°41'53", long 91°48'20", Hydrologic Unit 07100009, located at the west end of the park in the City of Bonaparte, south of County Road J-40. Owner: City of Bonaparte.
AQUIFER.--Mississippian: limestone and dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused semi-confined public-supply well, diameter 6 in., depth 205 ft, cased to 18 ft, open hole 18-205 ft.
INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel. Graphic water-level recorder December 1988 to July 1990. Intermittent measurement with chalked tape by USGS personnel August 1988 to December 1988.
DATUM.--Elevation of land-surface datum is 552 ft above sea level, from topographic map. Measuring point: Top of recorder platform, 0.65 ft above land-surface datum.
REMARKS.--Bonaparte No. 1 well. Recorder removed July 17, 1990.
PERIOD OF RECORD.--August 1988 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.08 ft below land-surface datum, August 10, 1993; lowest measured, 32.13 ft below land-surface datum, August 16, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	23.40	FEB 11	22.60	MAY 07	17.61	AUG 05	21.52

WATER YEAR 1998 HIGHEST 17.61 MAY 07, 1998 LOWEST 22.60 FEB 11, 1998

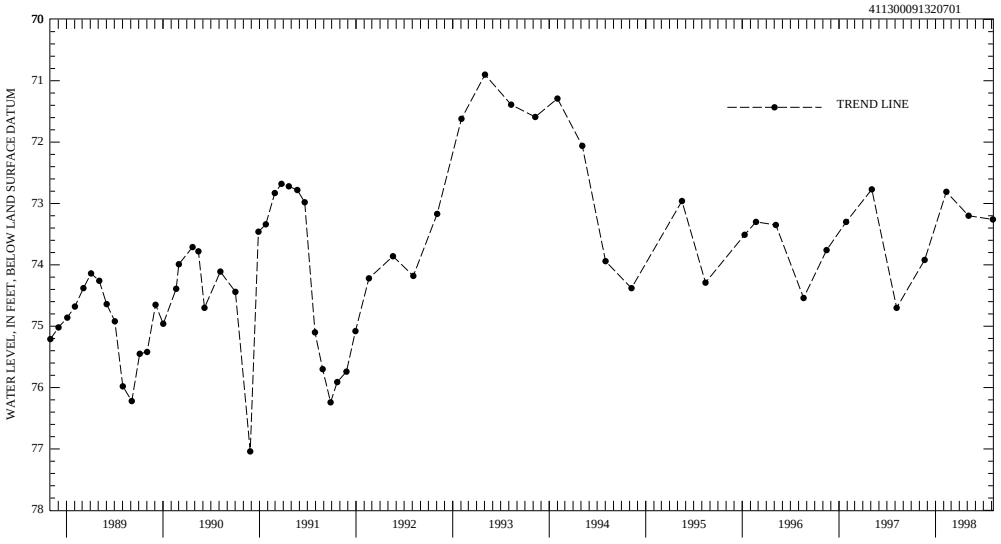
WASHINGTON COUNTY

411300091320701. Local number, 74-06-15 BDAC.
LOCATION.--Lat 41°13′00″, long 91°32′07″, Hydrologic Unit 07080107, in the water treatment plant, beneath the water tower in Crawfordsville. Owner: Town of Crawfordsville.
AQUIFER.--Mississippian: dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused municipal artesian water well, diameter 6.5 in., depth 215 ft, cased to 132 ft, open hole 132-215 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 725 ft above sea level, from topographic map. Measuring point: Nipple on plate welded to casing, 1.10 ft above land-surface datum.
PERIOD OF RECORD.--September 1983, March 1987 to current year.
REMARKS: Crawfordsville North.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 69.23 ft below land-surface datum, March 25, 1987; lowest measured, 77.04 ft below land-surface datum, November 27, 1990.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	73.92	FEB 11	72.81	MAY 06	73.20	AUG 06	73.26

WATER YEAR 1998 HIGHEST 72.81 FEB 11, 1998 LOWEST 73.92 NOV 21, 1997



WASHINGTON COUNTY-Continued

412037091564701. Local number, 76-09-31 CBBC.
LOCATION.--Lat 41°20'37", long 91°56'47", Hydrologic Unit 07080107, at Pepper Quarry on County Road V-15, 1 mi south of the City of Keota. Owner: River Products Co.
AQUIFER.--Mississippian: limestone of Mississippian age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in., depth 136 ft, cased to 19 ft, open hole 19-136 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Graphic water-level recorder August 1979 to December 1989.
DATUM.--Elevation of land-surface datum is 745 ft above sea level, from topographic map. Measuring point: Top of casing, 2.88 ft above land-surface datum.
REMARKS.--Water levels affected by quarrying operations.
PERIOD OF RECORD.--August 1979 to current year.
REVISED RECORDS.--WDR IA-84-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.45 ft below land-surface datum, May 3, 1993; lowest recorded, 25.72 ft below land-surface datum, December 10, 1989.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	12.43	FEB 12	11.34	MAY 06	9.02	AUG 05	12.19

WATER YEAR 1998 HIGHEST 9.02 MAY 06, 1998 LOWEST 12.43 NOV 20, 1997

412750091495201. Local number, 77-09-24 AADA.
LOCATION.--Lat 41°27'54", long 91°49'47", Hydrologic Unit 07080209, north of the city sewage treatment plant and west of First Avenue SE, Wellman. Owner: City of Wellman.
AQUIFER.--Mississippian: dolomite of Mississippian age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 10 in. to 27 ft, 8 in. to 47 ft, depth 110 ft, cased to 47 ft, open hole 47 to 110 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 695 ft above sea level, from topographic map. Measuring point: Nipple on plate welded to casing, 1.87 ft above land-surface datum.
REMARKS.--City test well No. 1.
PERIOD OF RECORD.--May 1963 to October 1971, May 1973 to current year.
REVISED RECORDS.--WDR IA-84-1, WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.57 ft above land-surface datum, May 5, 1997, March 28, 1979, and April 13, 1983; lowest measured, 6.80 ft below land-surface datum, October 20, 1964.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998
(READINGS ABOVE LAND SURFACE INDICATED BY "+")

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	0.81	FEB 12	0.15	MAY 06	+0.61	AUG 05	1.71

WATER YEAR 1998 HIGHEST +.61 MAY 06, 1998 LOWEST 1.71 AUG 05, 1998

421829091304701. Local number, 75-06-14 ABBB.
LOCATION.--Lat 41°18'27", long 91°30'47", Hydrologic Unit 07080209, 1 mi north and 1.5 mi east of the junction of U.S. Highway 218 and Iowa Highway 92. Owner: Mrs. David Armstrong.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Bored unused water-table well, diameter 12 in., depth 45 ft, lined with tile.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 745 ft above sea level, from topographic map. Measuring point: Nipple welded to barrel, 4.08 ft above land-surface datum.
PERIOD OF RECORD.--November 1983 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.53 ft below land-surface datum, May 23, 1984; lowest measured, 12.65 ft below land-surface datum, November 1, 1988.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	5.97	JAN 28	3.28	APR 15	1.72	AUG 28	2.05
NOV 21	3.94	FEB 23	1.97	JUN 23	2.17	SEP 18	2.96
DEC 17	3.79	MAR 27	2.28	JUL 20	3.93		

WATER YEAR 1998 HIGHEST 1.72 APR 15, 1998 LOWEST 5.97 OCT 21, 1997

WASHINGTON COUNTY--Continued

411813091411202. Local number, 75-07-17 ACBC.
LOCATION.--Lat 41°18'13", long 91°41'14", Hydrologic Unit 07080107, located in the Town of Washington just east of the water-tower. Owner: The Town of Washington.
AQUIFER.--Cambrian/Ordovician Jordan sandstone.
WELL CHARACTERISTICS.--Drilled public-use well, diameter 12.3 in, depth 1900 ft., casing open from 1580-1710.
INSTRUMENTATION.--Quarterly measurements using an airline by USGS personnel.
DATUM.--Elevation of land-surface is 755 feet above sea level, by topographic map.
REMARKS.--Washington No. 5
PERIOD OF RECORD.--October 1996 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 248 feet below land-surface datum, April 25, 1997; lowest measured, 256 ft below land-surface datum, May 06, 1998.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	251	FEB 02	252.00	MAY 06	256	AUG 03	252

WATER YEAR 1998 HIGHEST 251 NOV 05, 1997 LOWEST 256 MAY 06, 1998

411822091411001. Local number, 75-07-17 ABCA.
LOCATION.--Lat 41°18'22", long 91°41'13", Hydrologic Unit 07080107, located on north side of railroad tracks on county road within the Town of Washington. Owner: The Town of Washington.
AQUIFER.--Cambrian/Ordovician- Jordan sandstone.
WELL CHARACTERISTICS.--Drilled public-use well, diameter 26 in, depth 1900 ft., casing open from 1400-1900 ft.
INSTRUMENTATION.--Quarterly measurements using an airline by USGS personnel.
DATUM.--Elevation of land-surface 757 feet above sea level, by topographic map.
REMARKS.--Washington No.6
PERIOD OF RECORD.--April 1997 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 304 feet below land-surface datum, April 24, 1997; lowest measured, 304 feet below land-surface datum, April 24, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	250	FEB 02	251.00	MAY 06	250	AUG 03	247

WATER YEAR 1998 HIGHEST 247 AUG 03, 1998 LOWEST 251.00 FEB 02, 1998

411812091412601. Local number, 75-07-17 BCCC
LOCATION.--Lat 41°18'08", long 91°41'49", Hydrologic Unit 07080107, located in the Town of Washington approximately.5 miles east and.10 mile north of Washington Well No. 5. Owner: Town of Washington.
AQUIFER.--Cambrian/Ordovician-Trempealeau Group
WELL CHARACTERISTICS.--Drilled public-use well, depth 1830, casing information not available.
INSTRUMENTATION.--Quarterly measurements using an airline by USGS personnel.
DATUM.--Elevation of land-surface is 748 feet above sea level, by topographic map.
REMARKS.--Washington Well No. 7
PERIOD OF RECORD.--October 1996 to current year
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 247 feet below land-surface datum, April 25, 1997; lowest measured 259 ft below land-surface datum, October 11, 1996.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 04	250	MAY 06	251	AUG 04	252

WATER YEAR 1998 HIGHEST 250 NOV 04, 1997 LOWEST 252 AUG 04, 1998

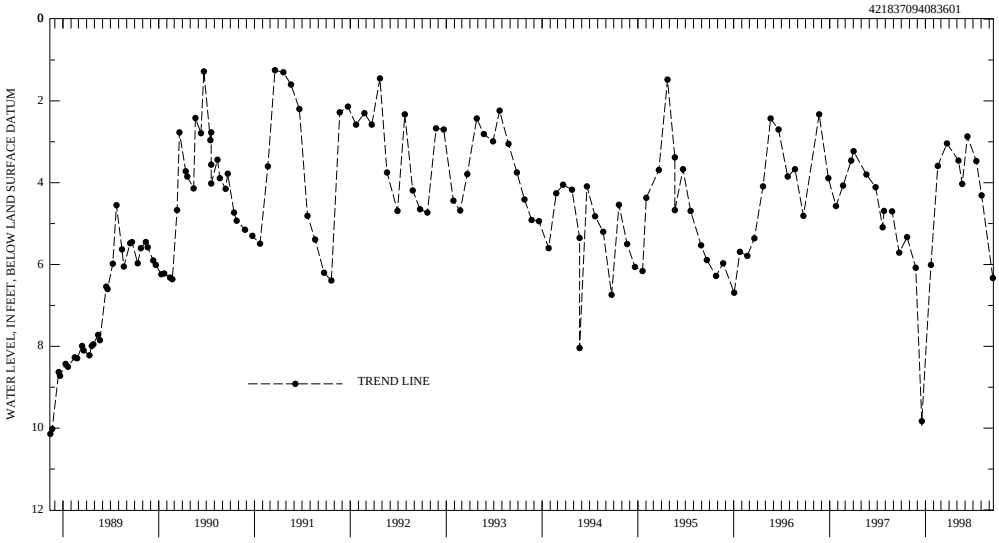
WEBSTER COUNTY

421837094083601. Local number, 87-28-29 CCCD.
LOCATION.--Lat 41°18'37", long 94°08'36", Hydrologic Unit 07100006, 3 mi north and 2 mi east of the Town of Harcourt. Owner: Grace Helms.
AQUIFER.--Glacial drift of Pleistocene age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in., depth 42 ft, lined with tile.
INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel. Graphic water-level recorder October 1942 to December 1976.
DATUM.--Elevation of land-surface datum is 1,165 ft above sea level, from topographic map. Measuring point: Top of casing, 1.29 ft above land-surface datum.
PERIOD OF RECORD.--October 1942 to June 1956, March 1958 to current year.
REMARKS.--Sometimes called Harcourt well.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.05 ft below land-surface datum, August 1, 1972; lowest measured, 13.62 ft below land-surface datum, March 12, 1956.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	5.33	JAN 22	6.01	MAY 07	3.46	JUL 14	3.47
NOV 25	6.08	FEB 17	3.59	MAY 21	4.03	AUG 03	4.31
DEC 18	9.83	MAR 24	3.04	JUN 10	2.87	SEP 15	6.33

WATER YEAR 1998 HIGHEST 2.87 JUN 10, 1998 LOWEST 9.83 DEC 18, 1997



423018094214701. Local number, 89-30-23 CCBB.
LOCATION.--Lat 41°30'18", long 94°21'47", Hydrologic Unit 07100004, 75 ft west of the new school addition, Barnum. Owner: Johnson Township Consolidated School.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 4 in., depth 208 ft, screened 203-208 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,174 ft above sea level, from topographic map. Measuring point: Top of casing at land-surface datum.
PERIOD OF RECORD.--October 1942 to September 1945, May 1947 to current year.
REVISED RECORDS.--WDR IA-88-1.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.36 ft below land-surface datum, October 21, 1942; lowest measured, 45.85 ft below land-surface datum, July 28, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEARS OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 07	44.17	FEB 13	43.89	MAY 07	44.92	AUG 07	42.98

WATER YEAR 1998 HIGHEST 42.98 AUG 07, 1998 LOWEST 44.92 MAY 07, 1998

WOODBURY COUNTY

422058095573701. Local number, 87-44-15 CBBB.
LOCATION.--Lat 41°20'58", long 95°57'37", Hydrologic Unit 10230003, approximately 3.5 mi west and 5.5 mi north of the Village of Oto. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 197 ft, screened 185-189 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,165 ft above sea level, from topographic map. Measuring point: Top of casing, 1.50 ft above land-surface datum.
REMARKS.--Well D-34.
PERIOD OF RECORD.--April 1980 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 51.54 ft below land-surface datum, August 7, 1996; lowest measured, 63.56 ft below land-surface datum, November 2, 1982.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	53.18	FEB 19	63.84	MAY 05	54.80	AUG 04	53.08

WATER YEAR 1998 HIGHEST 53.08 AUG 04, 1998 LOWEST 63.84 FEB 19, 1998

422830096000511. Local number, 88-44-16 BAAB11.
LOCATION.--Lat 41°28'30", long 96°00'05", Hydrologic Unit 10230004, approximately 3 mi east and 0.5 mi south of the Town of Moville. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.
AQUIFER.--Dakota: sandstone of Cretaceous age.
WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 4 in. to 235 ft, 2 in. to 337 ft, depth 337 ft, screened 332-337 ft.
INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.
DATUM.--Elevation of land-surface datum is 1,340 ft above sea level, from topographic map. Measuring point: Top of casing, 3.50 ft above land-surface datum.
REMARKS.--Well D-33. Damaged March 1998
PERIOD OF RECORD.--October 1979 to December 1980, May 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 199.06 ft below land-surface datum, May 11, 1995; lowest measured, 202.90 ft below land-surface datum, October 17, 1979.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 05	198.92	FEB 11	199.18

WATER YEAR 1998 HIGHEST 198.92 NOV 05, 1997 LOWEST 199.18 FEB 11, 1998

GROUND WATER QUALITY MONITORING

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

STATION NUMBER	STATION NAME	COUNTY	DATE	TIME	GEO-LOGIC UNIT*	DEPTH OF WELL, TOTAL (FEET) (72008)
411727094374001075N33W15DDBB	1976Fontanelle 5	Adair	07-23-98	1215	111ALVM	39
412852094275101077N31W07CAAB	1977Menlo 3	Adair	07-29-98	1644	111ALVM	30
405632094534401071N35W20AACB	1990Nodaway 4	Adams	07-23-98	1500	111ALVM	35
413234094552401078N35W19BCDB	1976Brayton 1	Audubon	07-31-98	1415	111ENRV	41
420451093561301084N27W13DCAA	1940Boone 20	Boone	07-25-98	1000	111ALVM	63.7
421025094063001085N28W16DABA	1932Boxholm 2	Boone	07-25-98	1215	112PLSC	43
424708094570801092N35W14BCCC	1949Albert City 1	Buena Vista	06-23-98	1430	112PLSC	190
425344095090401093N37W01DDDD	1977Sioux Rapids 2	Buena vista	06-23-98	1600	111ALVM	54
411622094520901075N35W27BBAB	1921Cumberland 1	Cass	07-27-98	1015	112PLSC	155
414652090153201081N06E33ADA	1956Camanche 2	Clinton	07-21-98	0945	111ALVM	61.2
420336095115601084N37W30BDAD	1936Vail 1	Crawford	06-23-98	1000	111ALVM	32
415057094065301081N28W09ABBB	1987Perry 9R	Dallas	07-27-98	1700	111ALVM	45
423135090383201089N03E18AADD	1969Dubuque 9	Dubuque	08-26-98	1030	111ALVM	125
432349094285201099N31W14BBCD	1995Armstrong 7	Emmet	06-24-98	0900	112PLSC	136
425341093132501093N20W05DDAB	1956Sheffield 2	Franklin	07-29-98	1129	110QRNR	27
404327095284801068N40W07BCAA	1980Farragut 79-2 (North)	Fremont	07-24-98	1000	111ALVM	65
414236096012501080N45W25DABD	1951Mondamin 2, South	Harrison	07-22-98	0900	111ALVM	90
422915095323504089N39W33CDDD	1985Holstein 3	Ida	06-25-98	1300	111ALVM	54
422106095280201087N40W14ACBB	1965Ida Grove 3	Ida	06-25-98	1500	112PLSC	65
414520092112001080N12W12ADDC	1952Ladora 1	Iowa	07-23-98	0930	112PLSC	72
413913093070001079N20W13ADDA	1955Newton 13	Jasper	06-03-98	0919	111ALVM	45
403745091174701067N04W02CBBC	1991Fort Madison 4	Lee	07-22-98	1000	111ALVM	147
420005091431201083N08W13ACDB	1970Cedar Rapids S6	Linn	08-25-98	1200	111ALVM	65
411644091110703075N03W22DCBD	1975Grandview 3	Louisa	07-22-98	1315	112AFNN	174
432608096201503100N47W36DCBD	1988Lester (4) 2	Lyon	06-24-98	1800	111ALVM	32
420405092545601084N18W23CACA	1977Marshalltown 8	Marshall	06-02-98	1509	112PLSC	223
410656095380201073N42W23AAAC	1978Silver City 3	Mills	07-31-98	1000	111ALVM	60
420241095422001084N42W35CABB	1974Ute 3	Monona	07-22-98	1130	111SDRV	58
431157095502901097N42W29BBBC	1949Sheldon 5	O Brian	06-24-98	1245	111ALVM	24
403906095015001067N37W01AAAA	1985Shambaugh 3	Page	07-24-98	0800	111ALVM	30
423537095583901090N43W19CCBB	1956Kingsley 1	Plymouth	06-25-98	0830	110QRNR	37
411501095251301075N40W35CBCA	1975Carson (5) 3	Pottawattamie	07-31-98	1145	111ALVM	25
421617095051001086N36W07CDBB	1971Wall Lake 3	Sac	06-23-98	1200	112PLSC	43
413049095254501078N39W34ACCD	1968Shelby 5	Shelby	07-22-98	1400	111ALVM	48.5
430017096285301095N48W35BDDC	1931Hawarden 2	Sioux	06-24-98	1545	110QRCU	36
415252093411401082N24W30DCBB	1945Slater 1	Story	07-25-98	0730	112PLSC	180
415417092180101082N13W24AAAD	1961Belle Plaine 4	Tama	06-02-98	0914	111ALVM	42
415753092350201083N15W27CDD	1966Tama 5	Tama	06-02-98	1220	111ALVM	43
403659094285301067N32W12CAAD	1960Blockton 1	Taylor	07-23-98	1700	112PLSC	271
410907092375301073N15W06CADA	1995Eddyville 3	Wapello	06-03-98	1230	111ALVM	35
413040093290501078N23W34DDBD	1979Carlisle 5	Warren	07-27-98	1345	111ALVM	30
412850091342901077N06W17BBA	1961Riverside 5	Washington	08-25-98	0900	112PLSC	250
431828091473201098N08W16ACBC	1972Decorah 6	Winneshiek	08-26-98	1445	111ALVM	82
422831095465102089N42W34DDDD	1927Correctionville 1 W	Woodbury	06-25-98	1115	111ALVM	26
423954093535801091N26W27CAAD	1952Eagle Grove 3	Wright	07-29-98	0900	112PLSC	70

*Geologic unit abbreviations used in this table:

Geological Unit Abbrev.	Geological Unit
110QRCU	Quarternary-Cretaceous Undifferentiated
110QRNR	Quarternary System
111ALVM	Holocene Alluvium
111ENRV	East Nishnabotna River Alluvial
111SDRV	Soldier River Alluvial
112AFNN	Aftonian Interglacial Deposits
112PLSC	Pleistocene Series

STATION NUMBER	DATE	FLOW RATE (G/M) (00058)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN) (72004)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	OXYGEN, DIS-SOLVED (MG/L) (00300)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
411727094374001	07-23-98	100	30	11.5	675	7.1	.2	390	280	360
412852094275101	07-29-98	10	>30	10.5	490	7.3	2.2	280	190	300
405632094534401	07-23-98	50	>40	11.5	577	6.9	.3	360	160	370
413234094552401	07-31-98	--	40	11.5	914	7.0	.3	460	310	540
420451093561301	07-25-98	300	>60	11.5	761	7.3	1.7	400	290	450
421025094063001	07-25-98	38	>60	11.0	1070	7.3	.2	490	370	700
424708094570801	06-23-98	150	30	10.5	1410	6.9	1.0	700	390	1030
425344095090401	06-23-98	--	--	9.5	1030	7.3	2.6	500	320	580
411622094520901	07-27-98	30	30	13.5	350	7.0	2.8	180	170	190
414652090153201	07-21-98	210	>60	13.0	377	6.9	6.5	170	100	230
420336095115601	06-23-98	180	30	12.5	899	7.0	1.4	490	280	550
415057094065301	07-27-98	200	>30	11.0	724	7.2	--	390	290	460
423135090383201	08-26-98	625	>30	12.5	414	7.2	.1	270	180	260
432349094285201	06-24-98	250	30	10.5	1180	7.4	--	970	450	790
425341093132501	07-29-98	95	>30	12.0	583	7.4	3.3	300	230	330
404327095284801	07-24-98	165	>30	13.0	640	6.9	.5	350	240	390
414236096012501	07-22-98	120	>30	12.5	1310	7.2	.2	660	520	810
422915095323504	06-25-98	110	>30	10.5	735	7.1	--	420	290	440
422106095280201	06-25-98	125	>60	12.0	1100	6.9	--	540	310	660
414520092112001	07-23-98	120	45	12.0	1040	7.2	.1	370	410	650
413913093070001	06-03-98	--	>30	10.5	692	7.1	6.7	370	280	410
403745091174701	07-22-98	650	>1440	21.5	511	6.9	.3	280	250	270
420005091431201	08-25-98	900	>30	17.0	514	7.1	.4	250	200	320
411644091110703	07-22-98	30	>30	12.5	466	7.1	.3	260	250	250
432608096201503	06-24-98	45	30	9.0	1240	7.5	.3	620	290	890
420405092545601	06-02-98	906	>30	10.5	737	7.3	.4	370	290	430
410656095380201	07-31-98	--	20	11.5	982	7.4	.3	590	320	620
420241095422001	07-22-98	70	30	12.0	929	7.3	3.9	470	340	560
431157095502901	06-24-98	50	>30	11.5	784	7.2	.3	390	270	530
403906095015001	07-24-98	25	>60	11.0	473	6.5	.2	210	130	280
423537095583901	06-25-98	170	30	10.0	884	7.0	3.8	530	320	530
411501095251301	07-31-98	--	40	11.0	742	7.2	.2	380	300	440
421617095051001	06-23-98	300	30	10.5	1040	6.8	.7	470	300	630
413049095254501	07-22-98	15	>60	14.0	527	7.1	4.7	240	170	310
430017096285301	06-24-98	110	30	10.5	905	7.5	7.1	450	290	570
415252093411401	07-25-98	90	30	11.5	819	7.7	.2	280	430	460
415417092180101	06-02-98	225	45	11.0	624	11.1	.2	210	96	350
415753092350201	06-02-98	460	45	12.0	661	7.3	2.8	340	230	400
403659094285301	07-23-98	--	45	13.5	1770	7.9	.1	150	410	1120
410907092375301	06-03-98	210	120	12.5	757	6.9	1.7	420	240	500
413040093290501	07-27-98	40	>60	12.0	600	7.4	--	300	220	360
412850091342901	08-25-98	150	30	13.5	616	7.5	.2	460	360	390
431828091473201	08-26-98	425	30	13.5	624	7.1	2	370	280	380
422831095465102	06-25-98	30	>30	12.0	934	6.9	5.0	450	290	600
423954093535801	07-29-98	350	>30	11.5	753	7.2	.2	380	390	440

STATION NUMBER	DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
411727094374001	07-23-98	22000	1000	90	17	9.2	1.8	.15	23	13
412852094275101	07-29-98	<20	290	74	11	11	<1.0	.25	25	9.0
405632094534401	07-23-98	500	80	70	22	12	<1.0	.20	20	7.0
413234094552401	07-31-98	6200	1200	110	34	26	<1.0	.30	16	64
420451093561301	07-25-98	<20	110	99	34	10	2.0	.30	21	22
421025094063001	07-25-98	3700	140	120	42	30	6.8	.30	30	36
424708094570801	06-23-98	4200	120	170	51	62	6.2	.30	32	2.0
425344095090401	06-23-98	<20	30	130	36	18	2.6	.25	26	98
411622094520901	07-27-98	20	<20	48	12	7.4	1.2	.25	21	<.5
414652090153201	07-21-98	<20	<20	41	15	10	<1.0	.90	19	40
420336095115601	06-23-98	<20	<20	120	27	25	1.4	.20	25	45
415057094065301	07-27-98	1800	390	100	28	5.7	1.3	.30	23	12
423135090383201	08-26-98	2100	2500	49	18	9.3	2.2	.10	16	16
432349094285201	06-24-98	2100	480	140	42	53	3.6	.25	33	1.0
425341093132501	07-29-98	<20	<20	80	26	3.3	<1.0	.10	22	10.0
404327095284801	07-24-98	860	120	76	23	17	2.0	.30	21	14
414236096012501	07-22-98	10000	450	150	50	41	5.4	.30	31	34
422915095323504	06-25-98	<20	<20	100	24	10	1.2	.35	21	19
422106095280201	06-25-98	<20	280	130	26	44	2.5	.25	24	95
414520092112001	07-23-98	1400	<20	82	29	100	2.4	.55	14	6.0
413913093070001	06-03-98	<20	<20	93	34	7.1	1.2	.25	25	15
403745091174701	07-22-98	4000	2800	54	19	9.8	2.6	.15	23	21
420005091431201	08-25-98	50	380	71	20	8.8	2.5	.20	13	26
411644091110703	07-22-98	1900	80	63	17	7.6	<1.0	.25	16	2.0
432608096201503	06-24-98	1500	850	170	55	16.0	2.7	.25	12	120
420405092545601	06-02-98	2300	60	92	34	17	2.7	.40	18	20
410656095380201	07-31-98	4400	540	130	39	24	1.7	.25	23	79
420241095422001	07-22-98	<20	30	120	38	9.6	3.0	.30	24	34
431157095502901	06-24-98	80	140	98	32	16	1.8	.45	21	27
403906095015001	07-24-98	3600	390	53	11	19	<1.0	.20	28	27
423537095583901	06-25-98	<20	30	120	29	15	2.4	.30	27	30
411501095251301	07-31-98	1000	1100	110	30	8.7	1.0	.35	9.0	18
421617095051001	06-23-98	800	570	120	32	36	2.9	.40	23	76
413049095254501	07-22-98	10000	460	160	51	41	5.4	.30	21	18
430017096285301	06-24-98	<20	<20	120	33	17	3.7	.35	28	18
415252093411401	07-25-98	7900	110	72	25	60	4.8	.35	12	4.5
415417092180101	06-02-98	<20	<20	84	<.5	14	2.0	.70	35	36
415753092350201	06-02-98	<20	<20	94	25	13	1.2	.20	28	24
403659094285301	07-23-98	560	40	37	11	320	1.8	.80	14	99
410907092375301	06-03-98	40	100	120	28	14	1.4	2.2	18	30
413040093290501	07-27-98	480	330	79	24	11	1.4	.15	24	24
412850091342901	08-25-98	800	50	60	20	57	2.2	.10	16	6.0
431828091473201	08-26-98	<20	<20	100	20	8.6	2.4	.15	15	24
422831095465102	06-25-98	<20	<20	110	30	26	2.5	.20	21	26
423954093535801	07-29-98	2900	230	100	34	13	2.5	.35	27	<.5

STATION NUMBER	DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	CYAN-AZINE TOTAL (UG/L) (81757)
411727094374001	07-23-98	33	.6	<.1	.3	.8	.5	2.2	<.10	<.10
412852094275101	07-29-98	29	<.1	5.8	<.1	<.1	.2	1.0	.10	<.10
405632094534401	07-23-98	140	<.1	1.1	.2	.2	<.1	<1.0	<.10	<.10
413234094552401	07-31-98	68	.1	<.1	<.1	<.1	.1	1.8	<.10	<.10
420451093561301	07-25-98	54	<.1	5.4	.2	.2	<.1	2.1	.14	<.10
421025094063001	07-25-98	140	1.6	<.1	<.1	1.6	.2	2.0	<.10	<.10
424708094570801	06-23-98	460	1.9	<.1	<.1	1.9	<.1	3.8	<.10	<.10
425344095090401	06-23-98	53	<.1	3.7	.2	.2	<.1	1.4	<.10	<.10
411622094520901	07-27-98	12	<.1	.1	<.1	<.1	<.1	<1.0	<.10	<.10
414652090153201	07-21-98	31	<.1	5.3	<.1	<.1	<.1	<1.0	<.10	<.10
420336095115601	06-23-98	94	<.1	6.3	<.1	<.1	<.1	1.8	<.10	<.10
415057094065301	07-27-98	76	<.1	<.1	.1	.2	<.1	1.8	<.10	<.10
423135090383201	08-26-98	21	.5	<.1	.3	.8	.4	4.6	<.10	<.10
432349094285201	06-24-98	240	1.0	<.1	<.1	1.0	<.1	2.2	<.10	<.10
425341093132501	07-29-98	19	<.1	12.0	<.1	<.1	<.1	<1.0	.22	<.10
404327095284801	07-24-98	71	.2	1.3	.1	.3	.2	1.1	<.10	<.10
414236096012501	07-22-98	150	1.5	<.1	.3	1.8	.4	3.0	<.10	<.10
422915095323504	06-25-98	60	<.1	7.0	<.1	<.1	<.1	<1.0	.12	<.10
422106095280201	06-25-98	94	<.1	1.7	.1	.1	<.1	1.3	<.10	<.10
414520092112001	07-23-98	180	5.1	<.1	.2	5.2	.3	4.1	<.10	<.10
413913093070001	06-03-98	46	<.1	7.9	.1	.1	<.1	<1.0	<.10	<.10
403745091174701	07-22-98	3.3	4.8	<.1	.4	5.2	.5	6.4	<.10	<.10
420005091431201	08-25-98	32	.2	3.0	<.1	.3	<.1	1.4	.34	<.10
411644091110703	07-22-98	<1.0	.8	<.1	.1	.9	.3	1.1	<.10	<.10
432608096201503	06-24-98	400	.2	.2	<.1	.2	<.1	1.4	<.10	<.10
420405092545601	06-02-98	80	1.3	<.1	.2	1.5	<.1	2.9	<.10	<.10
410656095380201	07-31-98	98	.3	<.1	<.1	.3	.2	1.6	<.10	<.10
420241095422001	07-22-98	56	<.1	13.0	<.1	<.1	<.1	<1.0	<.10	<.10
431157095502901	06-24-98	110	<.1	.5	.1	.2	<.1	3.2	<.10	<.10
403906095015001	07-24-98	60	<.1	<.1	.1	.2	.3	1.6	<.10	<.10
423537095583901	06-25-98	87	<.1	9.3	<.1	<.1	.1	1.7	<.10	<.10
411501095251301	07-31-98	61	<.1	1.2	<.1	<.1	<.1	<1.0	<.10	<.10
421617095051001	06-23-98	140	<.1	1.7	.1	.2	<.1	1.4	<.10	<.10
413049095254501	07-22-98	21	<.1	13.0	.2	.2	<.1	<1.0	<.10	<.10
430017096285301	06-24-98	110	<.1	12.0	<.1	<.1	<.1	2.2	<.10	<.10
415252093411401	07-25-98	<1.0	6.8	<.1	1.2	8.0	<.1	19	<.10	<.10
415417092180101	06-02-98	88	.3	5.1	.4	.7	<.1	<1.0	.19	<.10
415753092350201	06-02-98	62	<.1	4.0	.1	.1	<.1	<1.0	<.10	<.10
403659094285301	07-23-98	370	2.7	<.1	.8	3.5	.4	15	<.10	<.10
410907092375301	06-03-98	130	<.1	3.0	.2	.2	.1	1.0	<.10	<.10
413040093290501	07-27-98	51	<.1	.8	<.1	<.1	<.1	1.0	<.10	<.10
412850091342901	08-25-98	16	3.6	<.1	<.1	3.6	.2	<1.0	<.10	<.10
431828091473201	08-26-98	27	<.1	4.1	<.1	.1	<.1	<1.0	.15	<.10
422831095465102	06-25-98	130	<.1	9.5	<.1	<.1	<.1	1.1	<.10	<.10
423954093535801	07-29-98	27	.9	<.1	.1	1.0	<.1	1.4	<.10	<.10

STATION NUMBER	DATE	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	PROME-TONE TOTAL (UG/L) (39056)
411727094374001	07-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
412852094275101	07-29-98	<.10	<.10	<.10	<.10	<.10	<.10	.11	.10	<.10
405632094534401	07-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
413234094552401	07-31-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
420451093561301	07-25-98	.18	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
421025094063001	07-25-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
424708094570801	06-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
425344095090401	06-23-98	.94	<.10	<.10	<.10	<.10	<.10	<.10	<.10	.12
411622094520901	07-27-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
414652090153201	07-21-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
420336095115601	06-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
415057094065301	07-27-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
423135090383201	08-26-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
432349094285201	06-24-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
425341093132501	07-29-98	<.10	<.10	<.10	<.10	<.10	<.10	.22	.19	.13
404327095284801	07-24-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
414236096012501	07-22-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
422915095323504	06-25-98	.39	<.10	<.10	<.20	<.10	<.10	<.10	<.10	<.10
422106095280201	06-25-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
414520092112001	07-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
413913093070001	06-03-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
403745091174701	07-22-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
420005091431201	08-25-98	<.10	<.10	<.10	<.10	<.10	<.10	.11	<.10	<.10
411644091110703	07-22-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
432608096201503	06-24-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
420405092545601	06-02-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
410656095380201	07-31-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
420241095422001	07-22-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
431157095502901	06-24-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
403906095015001	07-24-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
423537095583901	06-25-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
411501095251301	07-31-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
421617095051001	06-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
413049095254501	07-22-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
430017096285301	06-24-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
415252093411401	07-25-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
415417092180101	06-02-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
415753092350201	06-02-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
403659094285301	07-23-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
410907092375301	06-03-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
413040093290501	07-27-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
412850091342901	08-25-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
431828091473201	08-26-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
422831095465102	06-25-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10
423954093535801	07-29-98	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10

STATION NUMBER	DATE	BENZENE TOTAL (UG/L) (34030)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L) (32102)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L) (32103)	ETHYL-BENZENE TOTAL (UG/L) (34371)	METHYL-ENE CHLO-RIDE TOTAL (UG/L) (34423)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE TOTAL (UG/L) (34010)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L) (34506)	XYLENE WATER UNFLTRD REC (UG/L) (81551)
411727094374001	07-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
412852094275101	07-29-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
405632094534401	07-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
413234094552401	07-31-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
420451093561301	07-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
421025094063001	07-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
424708094570801	06-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
425344095090401	06-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
411622094520901	07-27-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
414652090153201	07-21-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
420336095115601	06-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
415057094065301	07-27-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
423135090383201	08-26-98	<.5	<.5	<.5	<.5	<1.0	<.5	1.0	<.5	<.5
432349094285201	06-24-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
425341093132501	07-29-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
404327095284801	07-24-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
414236096012501	07-22-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
422915095323504	06-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
422106095280201	06-25-98	5.4	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
414520092112001	07-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
413913093070001	06-03-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
403745091174701	07-22-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
420005091431201	08-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
411644091110703	07-22-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
432608096201503	06-24-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
420405092545601	06-02-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
410656095380201	07-31-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
420241095422001	07-22-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
431157095502901	06-24-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
403906095015001	07-24-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
423537095583901	06-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
411501095251301	07-31-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
421617095051001	06-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
413049095254501	07-22-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
430017096285301	06-24-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
415252093411401	07-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
415417092180101	06-02-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	1.1
415753092350201	06-02-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
403659094285301	07-23-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
410907092375301	06-03-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
413040093290501	07-27-98	<.5	<.5	<.5	<.5	<1.0	2.7	<.5	<.5	<.5
412850091342901	08-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
431828091473201	08-26-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
422831095465102	06-25-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5
423954093535801	07-29-98	<.5	<.5	<.5	<.5	<1.0	<.5	<.5	<.5	<.5

405747093233201 MCNAY RESEARCH STATION NEAR CHARITON, IOWA

LOCATION.--Lat 40`57'47", long 93`23'34", in SW1/4 NE1/4 sec. 9, T.71 N., R.23 W., Lucas County, Hydrologic Unit 10280201, 3.1 mi east and 2.0 mi north of Derby, Iowa, 3.4 mi west and 2.8 mi south of Chariton, Iowa.

OWNER.--U.S. Geological Survey.

PERIOD OF RECORD.--September 1984 to current year.

INSTRUMENTATION.--Wet/dry precipitation collector, weighing-bucket type recording rain gage with alter wind shield and event recorder. National Weather Service standard 8-inch rain and snow gage (back-up only).

REMARKS.--Samples collected by Jim Secor and Steve Goben.

EXTREMES FOR PERIOD OF RECORD.--Maximum field pH, 7.07, April 19- 26, 1988; minimum field pH, 3.84, February 12-19, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum field pH, 6.96, April 21-28; minimum field pH, 4.28, February 17-24.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)
OCT 01-07	--	--	--	--	--	--	--	--	--	--	--
OCT 07-14	5.2	3	.03	.01	.01	.04	.10	.04	.03	.27	<.001
OCT 14-21	--	--	1.3	.07	.03	.18	.53	.68	.24	1.7	<.003
OCT 21-28	4.6	16	.34	.03	.01	.03	.31	.46	.03	1.6	<.001
OCT 28-NOV 04	--	--	.16	.02	.03	.08	.19	.10	.14	.45	<.001
NOV 04-11	4.5	22	.13	.01	.01	.02	.47	.45	.07	2.1	<.001
NOV 11-18	--	--	--	--	--	--	--	--	--	--	--
NOV 18-25	--	--	--	--	--	--	--	--	--	--	--
NOV 25-DEC 02	4.8	14	.16	.02	.01	.11	.54	.26	.16	1.8	<.001
DEC 02-09	4.7	10	.09	.00	.01	.02	.13	.24	.03	.60	<.001
DEC 09-16	4.5	23	.11	.01	.02	.06	.39	.62	.16	1.4	<.001
DEC 16-23	4.7	12	.08	.01	.01	.02	.22	.32	.05	.86	<.001
DEC 23-30	5.2	5	.05	.01	.00	.01	.25	.18	.03	.50	<.001
DEC 30 1997-JAN 06 1998	4.9	6	.05	.01	.01	.03	.12	.10	.05	.51	<.001
JAN 08-13	--	--	--	--	--	--	--	--	--	--	--
JAN 13-20	5.0	8	.10	.01	.01	.01	.26	.37	.04	.30	<.001
JAN 20-27	--	--	.23	.03	.03	.07	1.17	1.20	.16	3.4	<.001
JAN 27-FEB 03	--	14	.05	.00	.01	.01	.44	.24	<.03	.74	<.001
FEB 03-10	4.3	28	.17	.02	.02	.04	.61	.65	.08	2.6	<.001
FEB 10-17	4.4	31	.25	.03	.02	.06	.90	.99	.14	2.7	<.001
FEB 17-24	4.3	37	.17	.01	.02	.04	.92	.85	.13	3.6	<.001
FEB 24-MAR 03	5.4	7	.42	.03	.02	.07	.28	.18	.10	1.0	<.001
MAR 03-10	4.6	17	.13	.02	.01	.02	.41	.38	.04	1.4	<.001
MAR 10-17	4.6	16	.04	.00	.00	.01	.24	.26	.04	1.4	<.001
MAR 17-24	4.5	17	.08	.01	.01	.01	.15	.27	.03	1.3	<.001
MAR 24-31	5.2	13	.55	.05	.07	.25	.60	.27	.32	2.0	<.001
MAR 31-APR 07	4.6	18	.60	.05	.03	.05	.53	.78	.13	1.9	<.001
APR 07-14	5.2	8	.28	.04	.02	.11	.35	.27	.14	1.2	<.001
APR 14-21	6.2	13	.65	.05	.04	.03	.89	.48	.08	1.7	<.001
APR 21-28	7.0	29	3.9	.15	.13	.14	1.20	.60	.19	2.7	<.001
APR 28-MAY 05	6.4	26	1.2	.15	.06	.05	1.70	.93	.10	2.7	<.001
MAY 05-12	5.4	7	.14	.02	.02	.01	.31	.18	.03	.89	<.001

405747093233201 - McNay Research Station near Chariton, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)
MAY 12-19	5.5	20	1.3	.06	.08	.09	.85	.64	.12	2.1	<.001
MAY 19-26	5.6	15	.63	.05	.07	.06	1.00	.47	.10	2.5	<.001
MAY 26-JUN 02	--	--	8.6	.50	1.1	.71	4.18	4.26	1.3	11	.079
JUN 02-09	5.9	10	.65	.05	.05	.04	.50	.34	.07	1.2	<.001
JUN 09-16	5.3	8	.28	.03	.05	.06	.37	.25	.08	1.0	<.001
JUN 16-23	6.3	18	.93	.08	.10	.32	.88	.42	.36	2.4	<.001
JUN 23-30	5.7	17	.98	.06	.08	.11	.63	.58	.21	2.2	<.001
JUN 30-JUL 07	5.0	12	.38	.04	.05	.13	.48	.46	.19	1.3	<.001
JUL 07-14	--	--	--	--	--	--	--	--	--	--	--
JUL 14-21	6.1	34	.69	.05	.05	.01	.82	.52	.09	1.5	<.001
JUL 21-28	6.0	12	1.2	.09	.02	.05	.32	.50	.13	1.3	<.001
JUL 28-AUG 05	6.0	6	.34	.02	.01	.01	.25	.19	.04	.54	<.001
AUG 05-11	4.4	40	.54	.04	.04	.03	1.62	1.03	.13	5.6	<.001
AUG 11-18	5.1	10	.46	.03	.03	.01	.36	.28	.04	1.4	<.001
AUG 18-25	5.7	19	1.4	.06	.05	.03	1.00	.60	.10	3.6	<.001
AUG 25-SEP 01	5.0	11	.29	.02	.02	.03	.48	.38	.06	1.4	<.001
SEP 01-08	--	--	--	--	--	--	--	--	--	--	--
SEP 08-15	5.3	2	.02	.00	.00	<.003	.02	.03	<.03	.09	<.001
SEP 15-22	5.2	15	.36	.04	.03	.03	.61	.36	.07	2.1	<.001
SEP 22-29	5.5	22	1.5	.13	.09	.13	.81	.88	.21	3.3	<.001
SEP 29-OCT 06	4.8	12	.12	.01	.02	.02	.16	.25	.06	.89	<.001

425435091281101 BIG SPRING FISH HATCHERY NEAR ELKADER, IOWA

LOCATION.--Lat 42`54'35", long 91`28'11", in SE1/4 NE 1/4 SE1/4 sec. 31, T.94 N., R.5 W., Clayton County, Hydrologic Unit 07060004, 3.0 mi north and 2.8 mi west of Elkader, Iowa.

OWNER.--U.S. Geological Survey.

PERIOD OF RECORD.--August 1984 to current year.

INSTRUMENTATION.--Wet/dry precipitation collector, weighing-bucket type recording rain gage with alter wind shield and event recorder and National Weather Service standard 8-inch rain and snow gage (back-up only).

REMARKS.--Samples Collected by Robert Zach.

EXTREMES FOR PERIOD OF RECORD.--Maximum field pH, 6.9, April 2-9 1996; minimum field pH, 3.83, July 30 to August 6, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum field pH, 6.05, August 11-18; minimum field pH, 3.87, February 10-17.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)
OCT 07-14	5.6	7	.45	.17	.22	.07	.08	.09	.17	.79	.042
OCT 14-21	--	--	--	--	--	--	--	--	--	--	--
OCT 21-28	5.4	8	.56	.05	.02	.02	.26	.28	.09	.67	<.001
OCT 28-NOV 04	--	--	.44	.05	.03	.08	.63	.45	.19	1.7	<.001
NOV 04-11	4.8	26	.19	.03	.03	.04	1.33	.98	.13	2.6	<.001
NOV 11-18	5.2	22	.98	.22	.20	.18	.97	1.25	.34	1.1	<.001
NOV 18-25	--	--	--	--	--	--	--	--	--	--	--
NOV 25-DEC 02	--	--	--	--	--	--	--	--	--	--	--
DEC 02-09	4.7	14	.07	.01	.00	.03	.19	.41	.10	.49	<.001
DEC 09-16	--	--	.11	.03	<.01	.18	<.06	.63	.23	.80	<.004
DEC 16-23	4.5	20	.08	.02	.01	.07	.28	.32	.19	1.5	<.001
DEC 23-30	--	--	.09	.02	.02	.03	.16	.32	<.10	.20	<.003
DEC 30 1997-JAN 06 1998	5.1	11	.03	.01	.01	.03	.20	.14	.06	.85	<.001
JAN 06-13	--	--	--	--	--	--	--	--	--	--	--
JAN 13-20	4.6	27	.49	.10	.01	.11	.13	.81	.26	.48	<.001
JAN 20-27	4.2	35	.30	.06	.01	.06	.22	1.04	.20	1.2	<.001
JAN 27-FEB 03	4.6	21	.10	.01	.02	.03	.73	.58	.08	2.0	<.001
FEB 03-10	--	--	--	--	--	--	--	--	--	--	--
FEB 10-17	3.9	67	.13	.03	.04	.05	.99	1.55	.18	4.4	<.001
FEB 17-24	4.4	31	.14	.02	.02	.02	.86	.81	.07	2.8	<.001
FEB 24-MAR 03	4.5	18	.34	.03	.02	.05	.41	.40	.11	1.9	<.001
MAR 03-10	4.7	8	.06	.01	.01	.02	.10	.18	.05	.38	<.001
MAR 10-17	5.6	9	.50	.08	.01	.04	.35	.47	.14	.35	<.001
MAR 17-24	4.1	26	.06	.01	.01	.01	.11	.41	.05	1.9	<.001
MAR 24-31	5.2	6	.34	.03	.05	.08	.20	.17	.10	.80	<.001
MAR 31-APR 07	4.9	7	.17	.01	.01	.01	.16	.18	.03	.57	<.001
APR 07-14	4.9	22	.35	.06	.14	.11	.48	.55	.19	2.1	<.001
APR 14-21	4.5	21	.16	.02	.03	.02	.75	.53	.08	2.4	<.001
APR 21-28	5.6	30	.92	.09	.06	.10	1.72	.60	.13	3.5	<.001
APR 28-MAY 05	5.6	10	.29	.06	.03	.01	.43	.27	.04	1.2	<.001
MAY 05-12	5.2	11	.29	.10	.03	.01	.60	.34	.05	1.8	<.001
MAY 12-19	--	--	--	--	--	--	--	--	--	--	--

425435091281101 BIG SPRING FISH HATCHERY NEAR ELKADER, IOWA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)
MAY 19-26	5.4	13	.47	.09	.07	.03	.71	.37	.07	1.8	<.001
MAY 26-JUN 02	5.8	16	1.1	.14	.06	.05	.83	.53	.10	1.4	<.001
JUN 02-09	5.5	6	.27	.05	.01	.01	.30	.18	.03	.75	<.001
JUN 09-16	5.2	7	.14	.03	.04	.03	.23	.17	.05	.91	<.001
JUN 16-23	5.4	11	.47	.07	.12	.14	.50	.28	.17	1.2	<.001
JUN 23-30	5.3	8	.42	.06	.04	.05	.26	.27	.08	1.1	<.001
JUN 30-JUL 07	5.3	9	.34	.07	.03	.03	.38	.32	.06	1.0	<.001
JUL 07-14	--	--	--	--	--	--	--	--	--	--	--
JUL 14-21	5.7	16	1.0	.39	.63	.02	.43	.33	.06	1.0	<.001
JUL 21-28	5.7	25	1.4	.25	.09	.06	1.44	.86	.16	2.0	<.001
JUL 28-AUG 04	4.6	18	.19	.04	.01	.02	.21	.21	.05	1.6	<.001
AUG 04-11	5.4	9	.09	.01	.02	.01	.26	.22	.03	.91	<.001
AUG 11-18	6.1	16	.84	.12	.04	.01	.85	.43	.07	1.7	<.001
AUG 18-25	5.3	15	.63	.06	.03	.02	.77	.56	.08	2.2	<.001
AUG 25-SEP 01	4.6	18	.12	.02	.02	.02	.44	.35	.05	1.8	<.001
SEP 01-08	--	--	1.9	.20	.12	.04	1.25	.85	.21	2.6	<.001
SEP 08-15	4.9	10	.02	.01	.00	<.003	.17	.08	<.03	.79	<.001
SEP 15-22	--	--	2.2	.15	.11	.04	.65	.78	.12	2.2	<.001
SEP 22-29	5.5	9	.52	.06	.01	.03	.30	.26	.05	1.1	<.001
SEP 29-OCT 06	4.7	12	.07	.01	.01	.01	.23	.24	.03	.98	<.001

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