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Water Resources Data Iowa Water Year 1999

Volume 1. Surface Water—Mississippi River Basin

Water-Data Report IA-99-1

U.S. Department of the Interior
U.S. Geological Survey

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

CALENDAR FOR WATER YEAR 1999

1998

OCTOBER

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1999

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U.S. Department of the Interior
U.S. Geological Survey

Water Resources Data Iowa Water Year 1999

Volume 1. Surface Water—Mississippi River Basin

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

Water-Data Report IA-99-1

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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P.O. Box 1230
Iowa City, Iowa 52244

2000

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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This report was prepared in cooperation with the State of Iowa and with other agencies under the general supervision of Greg M. Nalley, Chief Hydrologic Surveillence Section, and Robin G. Middlemis-Brown, District Chief, Iowa.

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13. ABSTRACT *(Maximum 200 words)*
Water resources data for Iowa for the 1999 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 90 gaging stations; stage or contents for 6 lakes and reservoirs and 3 streams; water quality for 1 stream-gaging station; sediment records for 9 stream-gaging stations; and precipitation record for 7 precipitation stations. Also included are data for 61 crest-stage partial record stations. 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, *Hydrologic 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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ILLUSTRATIONS

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

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

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]

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

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
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
Unnamed Creek near Luana, Ia. (d)	05412056	1.15	1986-92
Silver Creek near Luana, Ia (d)	05412060	4.39	1986-98
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 near Tripoli, Ia (d)	05420860	343	1996-98
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
Flood Creek near Powersville, Ia (d)	05461390	127	1996-98
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
Wolf Creek near Dysart, Ia (d)	05464220	299	1996-98

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

Station name	Station number	Drainage area (mi^2)	Period of record
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
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	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

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

Station name	Station number	Drainage area (mi^2)	Period of record
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.–biolcgical; *, periodic data available subsequent to period of daily record]

Discontinued Surface-Water Quality Stations—Continued

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.	1978-82; 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 near Tripoli, Ia	05420860	343	Chem.	1996-98
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.* Chem.	1957-62 1996-98
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
Flood Creek near Powersville, Ia	05461390	127	Chem.	1996-98
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
Wolf Creek near Dysart, Ia	05464220	299	Chem.	1996-98
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

Discontinued Surface-Water Quality Stations—Continued

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
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
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 this data readily available to interested parties outside of the Geological Survey, the data is 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 1999 for Iowa consists 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 123 gaging stations; stage or contents records for 10 lakes and reservoirs; water-quality records for 4 gaging stations; sediment records for 12 gaging stations; and water levels for 175 ground-water observation wells. Also included are peak-flow data for 93 crest-stage partial-record stations, water-quality data from 67 municipal wells, and precipitation data collected at 6 gaging stations and 2 precipitation sites. 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 is 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-99-1." 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 1999 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
Freemont County Board of Supervisors
Van Buren County Board of Supervisors

City of Ames
City of Bettendorf
City of Bloomfield
City of Burlington
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 Milford
City of Mt. Pleasant
City of Ottumwa Water and Hydro Plant
City of Sioux City
City of Waterloo Water Pollution Control 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 72 stream gaging stations. Assistance also was furnished by NOAA-National Weather Service, U.S. Department of Commerce, and Biological Resources Division (BRD) of U.S. Geological Survey.

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

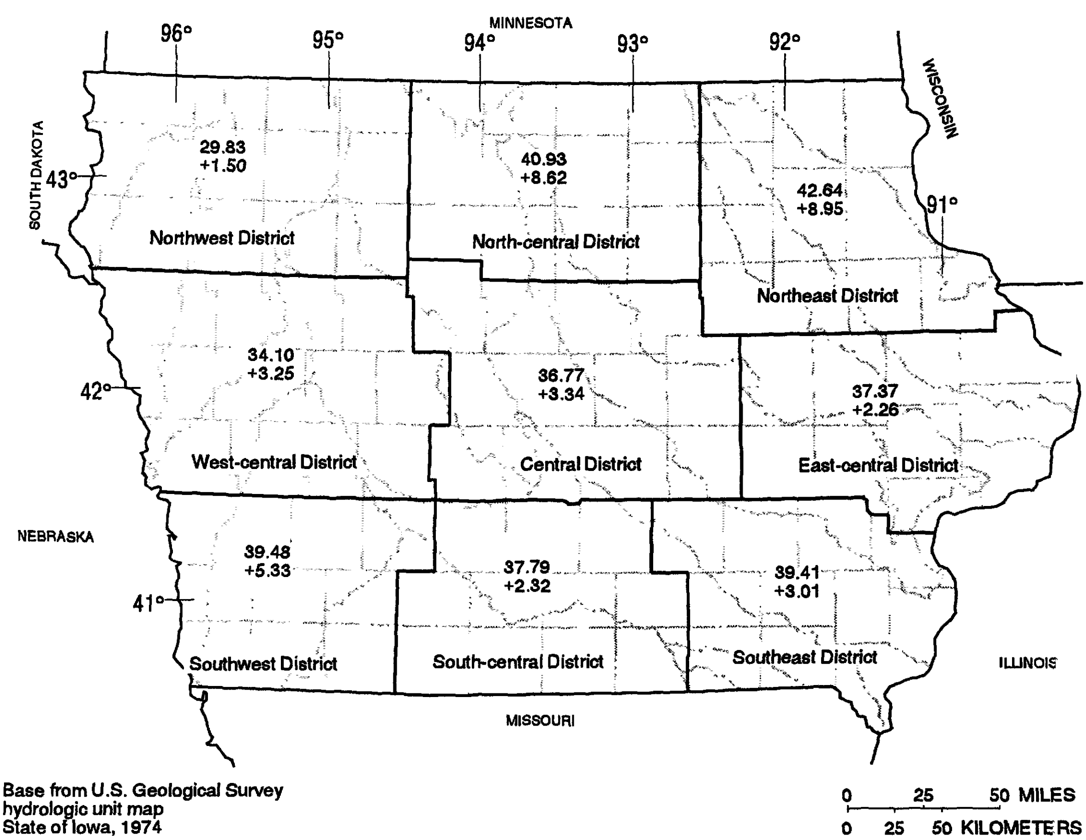
Organizations that supplied data are acknowledged in the station descriptions.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

For water year 1999 (October 1, 1998 to September 30, 1999) climatological conditions were wetter than normal and warmer than normal. Recorded precipitation for the year ranged from 1.50 inches above normal in the Northwest Iowa Climatological District to 8.95 inches greater than normal in the Northeast Iowa Climatological District (fig. 1). Precipitation recorded for the State averaged 37.38 inches, which was 4.27 inches greater than normal, or 113 percent of the normal 33.11 inches for 1961-90 (table 1). Overall, water year 1999 was the 17th wettest and the 21st warmest for 126 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., 1999)]

October was the wettest in 126 years of record. Statewide average precipitation was 4.98 inches, which was 197 percent of normal. Climatological Districts reported above average precipitation, ranging from 261 percent of normal in the East-central District to 150 percent of normal in the West-central District. For the three index surface-water stations in Iowa, mean monthly discharge for 05464500 Cedar River at Cedar Rapids was above normal (East-central District), while 05480500



EXPLANATION

29.83 Precipitation during water year 1999,in inches
+1.50 Precipitation deviation from long-term average (1961-90),in inches

Figure 1. Precipitation record for the National Weather Service's designated Climatological Districts for water year 1999 (source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 1999).

Table 1. Monthly and annual precipitation during the 1999 water year as a percentage of normal precipitation (1961-90).
[Source: Harry Hillaker, State Climatologist, Iowa Department of Agriculture and Land Stewardship, written commun., 1999]

National Weather Service Climatological District	1998			1999									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Annual
Northwest	211	155	36	179	63	44	202	84	150	125	26	26	105
North-central	186	55	23	181	77	45	230	172	130	212	53	39	127
Northeast	210	64	18	201	89	38	187	162	96	247	93	38	127
West-central	150	82	34	147	137	46	246	88	136	122	94	32	110
Central	200	67	24	147	78	50	182	133	131	102	94	40	110
East-central	261	59	39	175	106	48	173	102	105	116	71	54	106
Southwest	122	142	26	94	159	42	170	157	116	90	103	58	116
South-central	190	139	46	82	158	57	167	130	104	65	86	67	106
Southeast	231	124	67	201	101	54	159	100	102	61	79	88	108
Statewide	197	96	35	159	105	147	198	125	121	129	78	49	113

Des Moines River at Fort Dodge (Central District) and 06810000 Nishnabotna River above Hamburg (Southwest District) was in the normal range (fig. 2). For the remainder of this section, these stations will be referred to as "Cedar Rapids," "Fort Dodge," and "Hamburg," respectively. The location of all active continuous-record gaging stations in Iowa is shown in figure 3, and the location of all active crest-stage gaging stations is shown in figure 4.

Precipitation for November averaged 96 percent of normal. Climatological District reports ranged from 155 percent of normal in the Northwest District to 55 percent of normal in the North-central District. Mean monthly discharge at Cedar Rapids and Fort Dodge was above normal, but was in the normal range for Hamburg.

December was the 11th driest reported for 126 years of record. Precipitation for the month was 35 percent of normal at 0.45 inches. All Climatological Districts reported precipitation below normal. Average snowfall for the month was 5.5 inches. Cedar Falls and Fort Dodge index stations had a mean monthly discharge above normal, but Hamburg experienced normal mean monthly discharge.

Increases of precipitation during January were 159 percent of normal, with total precipitation of 1.37 inches. This was the 8th consecutive January with precipitation at or above normal. Precipitation ranged from 201 percent of normal in the Northeast Climatological District to 82 percent of normal in the South-central District. Snowfall for the month was 12.5 inches, making this the 12th snowiest January in 112 years of record. Index stations reported mean daily discharge above normal for the month at Cedar Rapids and within the normal range at Fort Dodge and Hamburg.

Near normal precipitation was experienced during February with the average precipitation of 0.97 inches, being 105 percent of normal. Average precipitation was 159 percent of normal in the Southwest and 63 percent of normal in the Northwest Climatological District. Snowfall for the month was 6.3 inches, while above average temperatures made this the 9th warmest February for 127 years of record. Above normal monthly mean discharge was experienced at Cedar Rapids and Fort Dodge, while Hamburg reported a monthly mean discharge in the normal range.

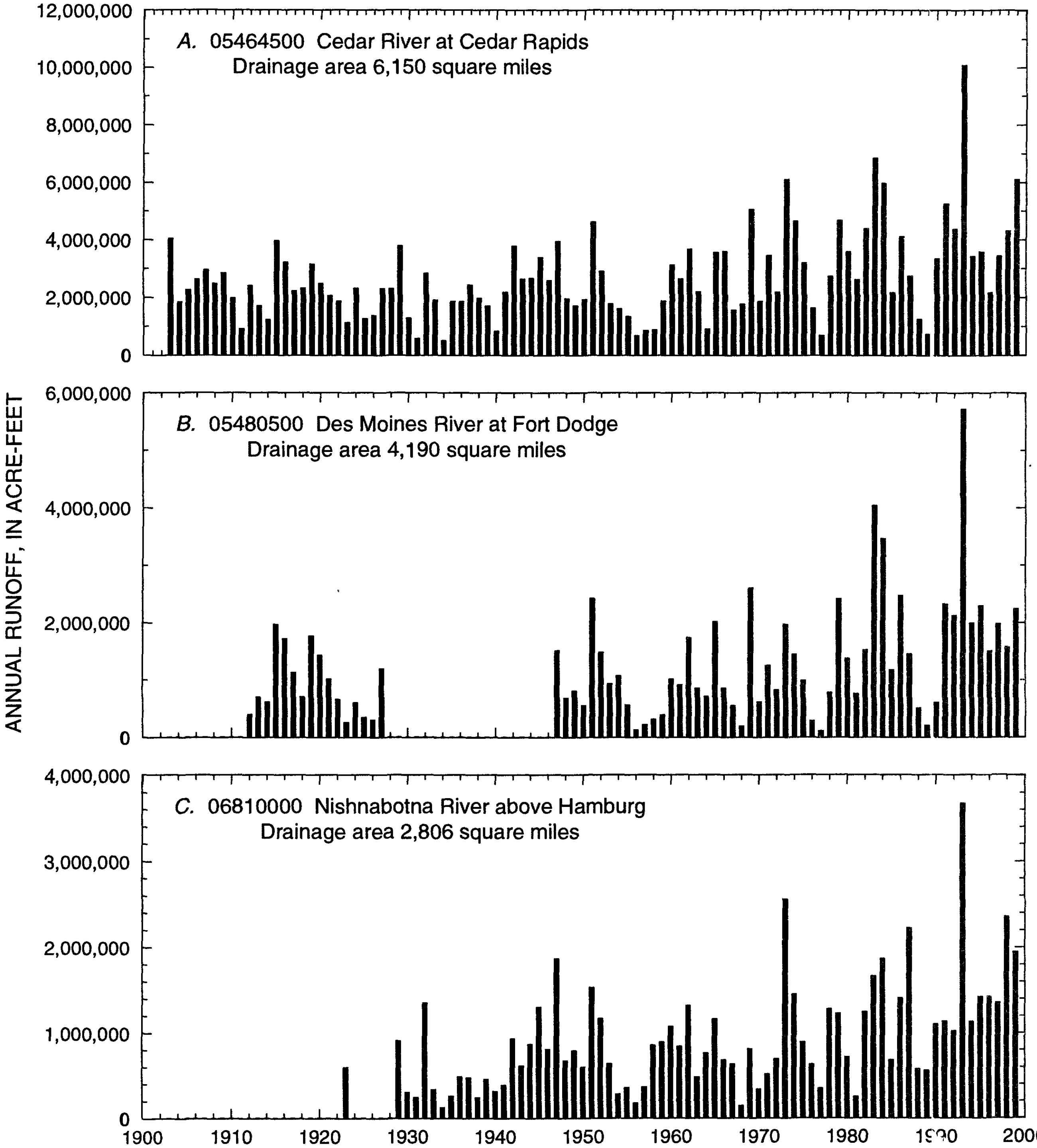


Figure 2. Annual runoff for period of record at index stations.

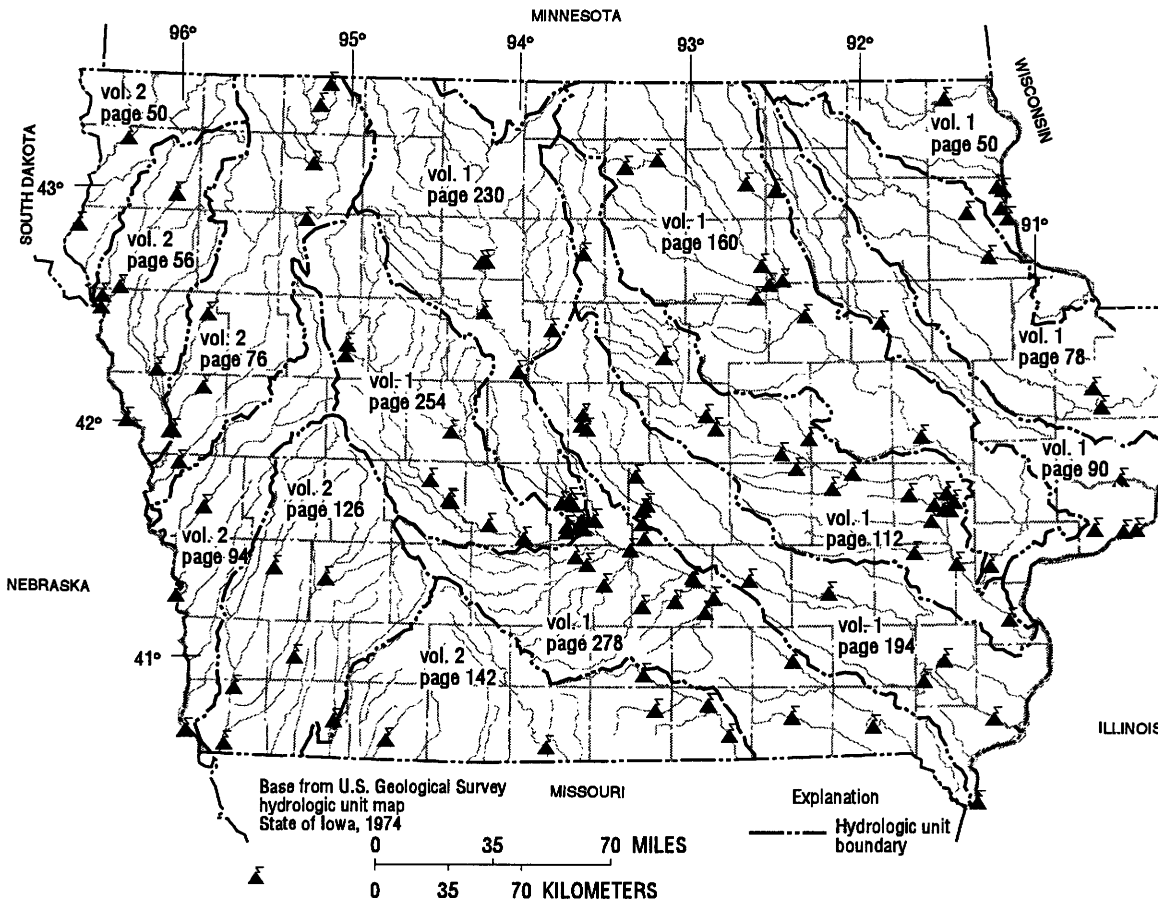


Figure 3. Location of active continuous-record gaging stations in Iowa, water year 1999. [See indicated volume and page number for gaging-station identification.]

Statewide average precipitation fell below normal for March, with 1.04 inches that was 47 percent of normal. All Climatological Districts reported precipitation below normal. For the month snowfall was 9.0 inches. This month, index stations at Fort Dodge and Hamburg had normal mean monthly discharge, but mean monthly discharge for Cedar Rapids was above normal.

April precipitation rebounded to 198 percent of normal, after the average statewide precipitation of 6.25 inches was recorded. This resulted in April being the wettest for 127 years of record. Precipitation ranged from 246 percent of normal in the West-central District to 159 percent of normal in the Southeast District. Average snowfall for the state was 0.2 inches. Mean monthly discharge for the index station at Cedar Rapids was in the normal range and in the above normal range for Fort Dodge and Hamburg.

The statewide average precipitation for May was 4.96 inches, which was 125 percent of normal. Range of precipitation was 172 percent in the North-central District to 84 percent of normal in the Northwest District. Mean monthly discharge was above normal at index stations Cedar Rapids and Hamburg and normal at Fort Dodge.

For June, statewide average precipitation was 5.33 inches or 121 percent of normal. Differences for Climatological Districts were 150 percent of normal in the Northwest District to 96 percent of normal in the Northeast District. All index stations were in the above normal range for the month.

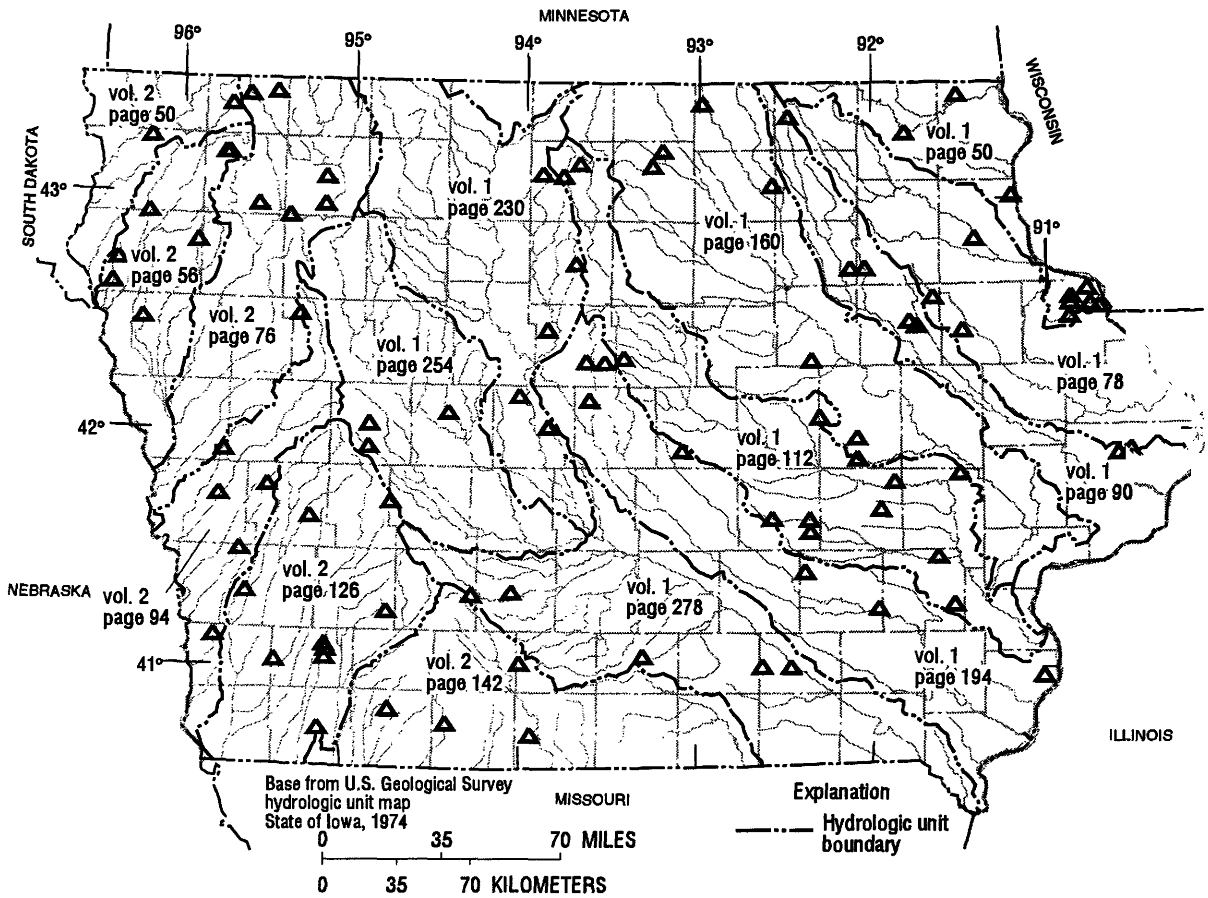


Figure 4. Location of active crest-stage gaging stations in Iowa, water year 1999. [See indicated volume and page number for gaging-station identification.]

Total July statewide precipitation averaged 5.33 inches or 121 percent of normal. However, heavy rains in the North-central and Northeast Climatological Districts resulted in record flooding, while all other reporting Districts experienced below normal or slightly above normal precipitation. Range of precipitation was 247 percent of normal in the Northeast District and 61 percent of normal in the Southeast District. This was the warmest July in 127 years of record. Index stations at Cedar Rapids, Fort Dodge, and Hamburg all reported a mean monthly discharge above normal.

The Southwest Climatological District reported monthly mean precipitation 103 percent of normal for August, but the remaining eight districts ranged from 94 percent of normal in the West-central and Central Districts to 26 percent of normal in the Northwest District. Average statewide precipitation in the state was 4.03 inches. Mean monthly discharge at index stations Cedar Rapids and Hamburg was above normal, while Fort Dodge experienced mean monthly discharge in the normal range.

Dry conditions continued into September, with average statewide precipitation of 1.87 inches, which was 49 percent of normal. Climatological District precipitation ranged from 88 percent of normal in the Southeast District to 26 percent of normal in the Northwest District. This was the 19th driest September for 127 years of record. Above average mean monthly discharge was experienced at Cedar Rapids and Hamburg and in the normal range at Fort Dodge.

The water-year 1999 runoff at Cedar Rapids was 6,119,000 acre-feet, which is greater than the mean annual runoff for the period of record, 2,724,000 acre-feet. The water-year 1999 runoff at Fort Dodge was 2,238,000 acre-feet, which is greater than the mean for the period of record, 1,293,000 acre-feet. The water-year 1999 runoff at Hamburg was 1,947,000 acre-feet, which is greater than the mean for the period of record, 926,500 acre-feet.

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 1999 water year. Four stations have 21 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 13 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 8 years of record: 05389400 Bloody Run Creek near Marquette and 05411400 Sny Magill Creek near Clayton; and three stations in central Iowa have 4 years of record: 05471040 Squaw Creek near Colfax, 05487540 Walnut Creek near Prairie City, and 05487550 Walnut Creek near Vandalia. 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 April 16-24, after a significant rain event. Four others peaked between May 12-17.

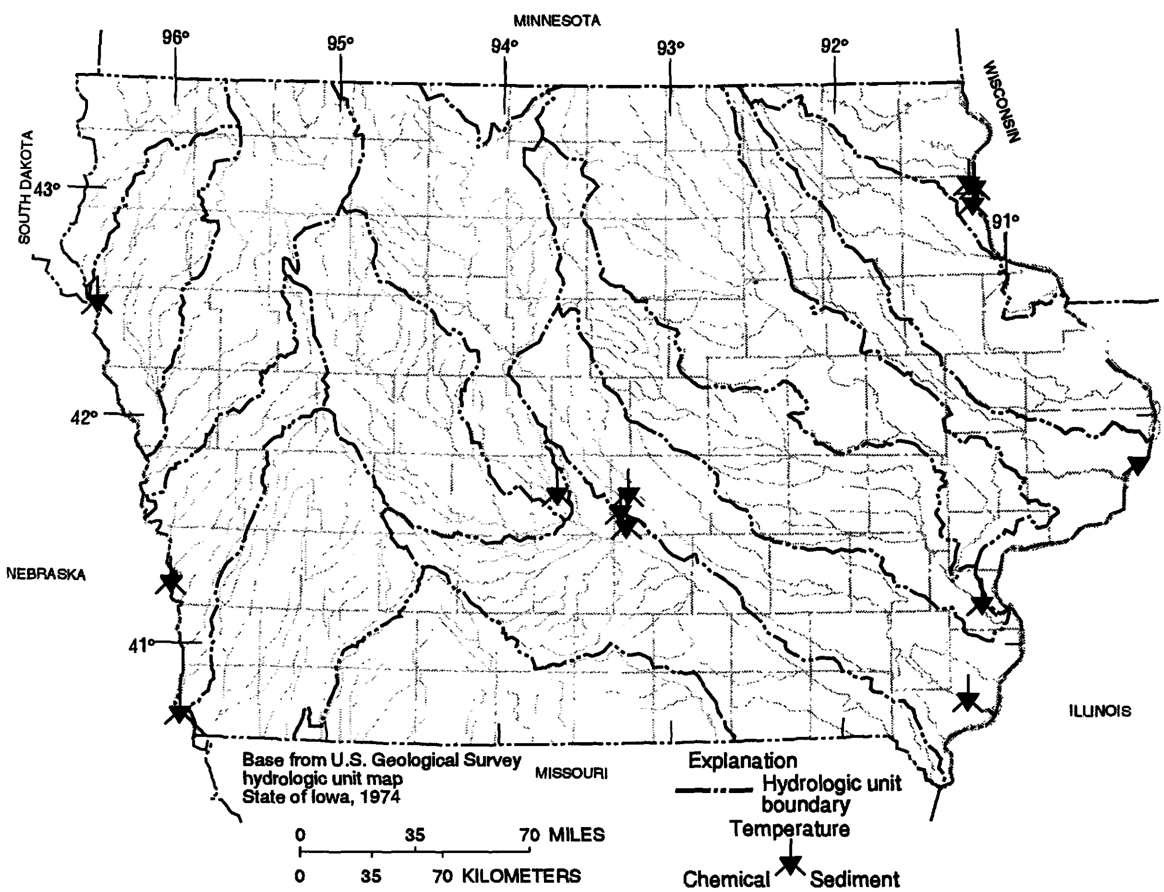


Figure 5. Location of active sediment and surface-water quality stations in Iowa, water year 1999.

Mississippi River at McGregor, which has most of its drainage basin in Minnesota and Wisconsin, had an annual sediment discharge of 878,000 tons, which was the fifth lowest sediment discharge in 24 years of record, and 51.1 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 1999 was 294,000 tons. This represents 115 percent of the 22-year mean sediment discharge. The mean annual sediment discharge since dam completion is 256,000 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 116 percent of normal precipitation. Wapello had an annual sediment discharge of 2.47 million tons. This represents 89 percent of the 21-year mean sediment discharge of 2.77 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 111 percent of normal for water year 1999. The 1999 annual sediment discharge for Skunk River at Augusta was 2.74 million tons, which is 97 percent of the 24-year mean sediment discharge of 2.83 million tons (fig. 6).

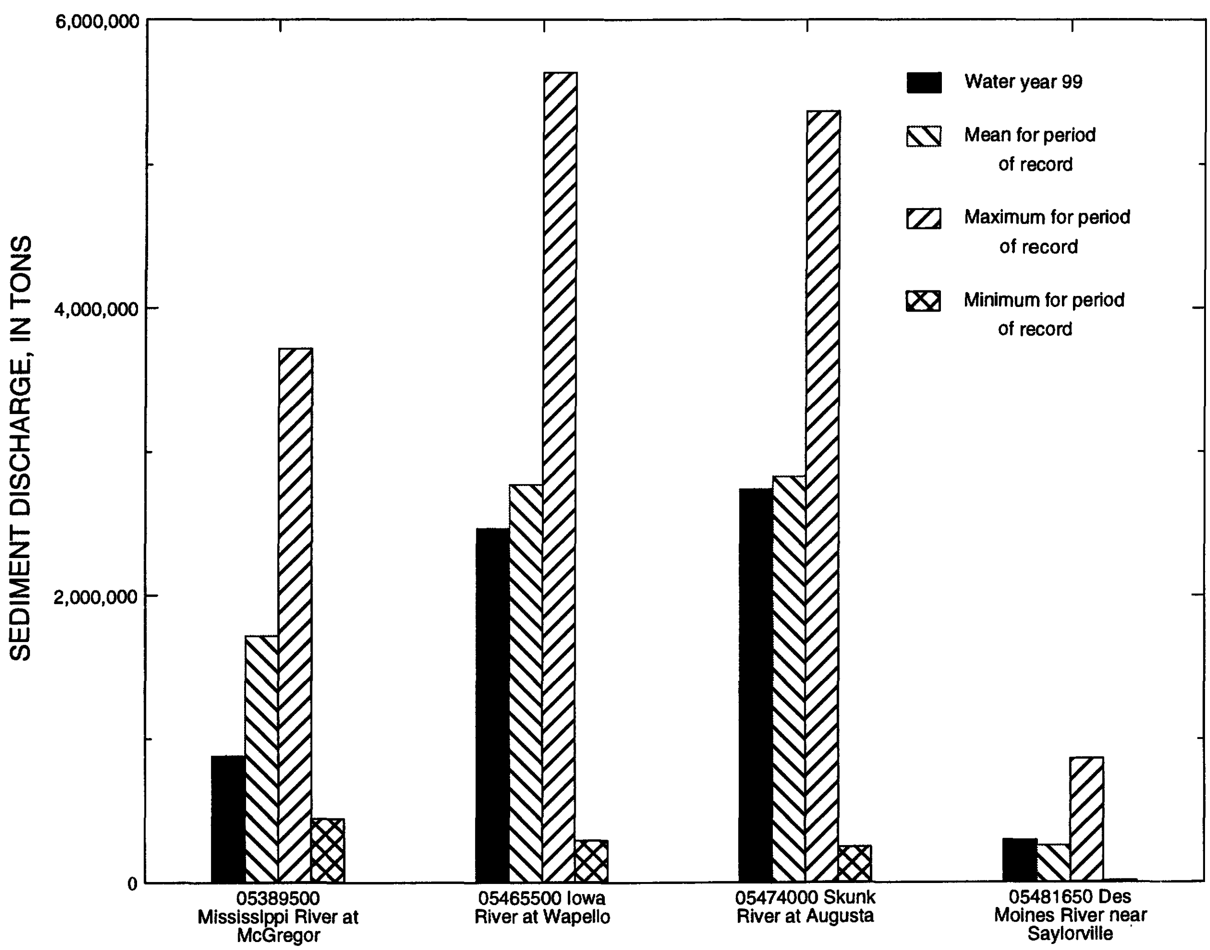


Figure 6. Comparison of annual sediment discharge for water year 1999 with mean, previous maximum, and previous minimum annual sediment discharges for periods of record at four long-term daily sediment stations in Iowa.

The 1999 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 2,635 tons, of which approximately 59 percent was measured during the month of May. The annual runoff was 56 percent of the 8-year mean sediment discharge of 4,726 tons. The annual sediment discharge for Sny Magill Creek near Clayton (05411400) was 6,028 tons. This runoff represents 119 percent of the 8-year mean sediment discharge of 5,062 tons. Sixty-seven percent of Sny Magill's annual sediment discharge was measured in May, and approximately 65 percent of the yearly total was measured on May 16-17. 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 1999 sediment discharge for Squaw Creek near Colfax (05471040) was 8,007 tons. The 1999 sediment discharge for Walnut Creek near Prairie City (05487540) was 1,688 tons, while Walnut Creek near Vandalia (05487550) was 8,779 tons of annual sediment discharge. Vandalia has a drainage area approximately three times the size of Prairie City, but had about 5.2 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 9.5 million tons, which was 75 percent of the 13-year mean of 12.8 million tons. The sediment discharge at Omaha was 17.4 million tons, which was 77 percent of the 13-year mean of 22.6 million tons. The annual sediment discharge at Nebraska City was 31.5 million tons, which was 90 percent of the 13-year mean of 35.1 million tons.

Ground-Water-Level Observation Network

The ground-water monitoring network in Iowa provides a historical record of the water-level changes in the Nation's most important aquifers. The locations of the 175 wells monitored on a quarterly, monthly, or intermittent basis in Iowa during water year 1999 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, or via the world wide web using the following universal resource locator address: <URL: `http://ia.water.usgs.gov/`>.

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

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

Water-level records are obtained from direct measurements with a steel tape or from 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 provided 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 were formed in areas where coarse sand and gravel were deposited in bedrock valleys and overlain by a thick layer of glacial drift.

Six wells completed in an unconsolidated aquifer recorded a new historic water levels during the 1999 water year. Three wells recorded new historic high water levels (table 2) and three wells recorded new historic low water levels (table 3).

Table 2. Historical high-water levels measured during water year 1999 in wells completed in unconsolidated aquifers.
[Values in feet below land surface]

County	Well number	Aquifer type	New historical high water level	Date measured	Previous historical high water level	Date measured
Johnson	414221091361103	Buried Channel	121.61	01/20/1999	123.39	11/20/1996
Pottawattamie	411359095171901	Buried Channel	123.19	08/11/1999	124.45	05/05/1994
Washington	421829091304701	Glacial-drift	1.29	04/16/1999	1.53	05/23/1984

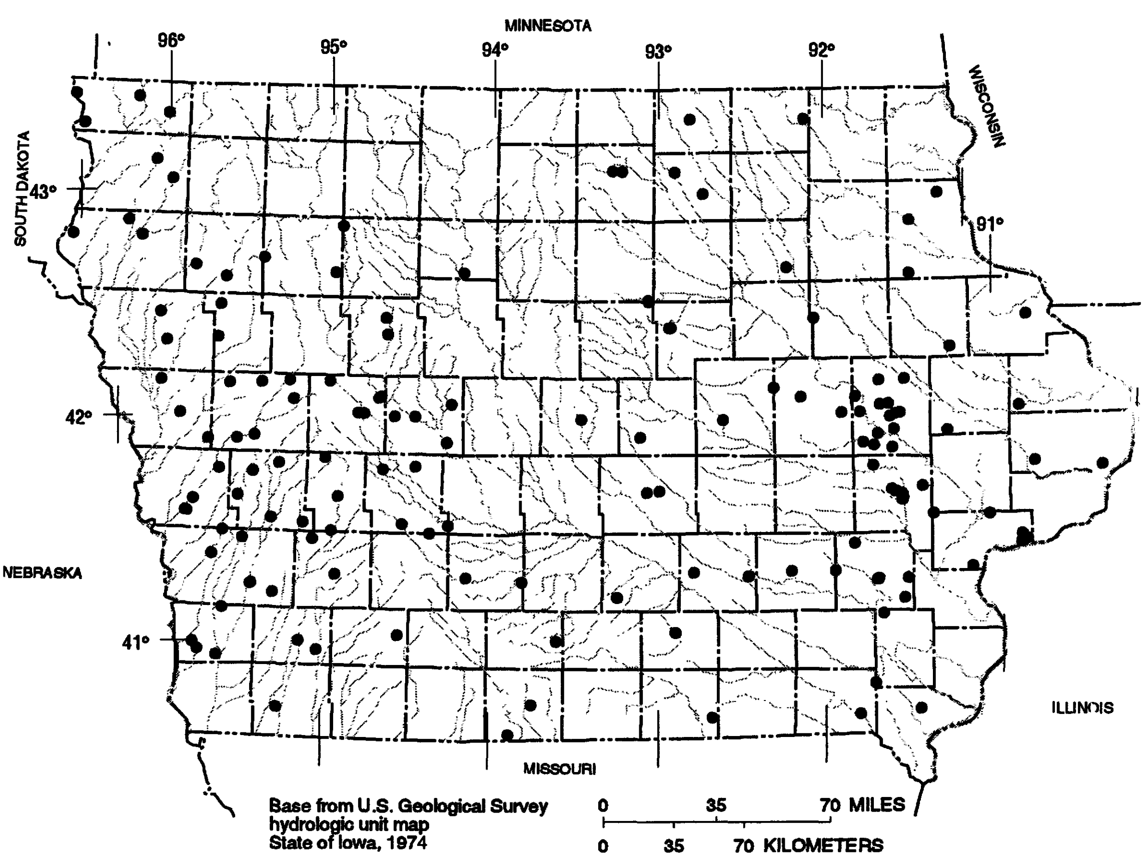


Figure 7. Location of wells in the ground-water-level observation network in Iowa, water year 1999.

Table 3. Historical low-water levels measured during water year 1999 in wells completed in unconsolidated aquifers.
[Values in feet below land surface]

County	Well number	Aquifer type	New historical low water level	Date measured	Previous historical low water level	Date measured
Crawford	420608095111701	Buried Channel	217.70	02/11/1999	212.90	01/09/1991
Crawford	421106095125501	Buried Channel	66.41	08/09/1999	65.18	08/05/1997
Shelby	413953095302601	Glacial Drift	19.38	11/04/1998	19.28	11/06/1992

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.

Forty wells completed in bedrock aquifers recorded new historical water levels during the 1999 water year. Twelve wells recorded historical high water levels (table 4), and 28 wells recorded historical low water levels (table 5).

Table 4. Historical high water levels measured during water year 1999 in wells completed in bedrock aquifers.
{Values in feet below land surface; readings above land surface indicated by "+"]

County	Well number	Aquifer type	New historical high water level	Date measured	Previous historical high water level	Date measured
Bremer	424224092133901	Silurian-Devonian	86	10/05/1998	89	08/07/1997
Clinton	414806090212301	Silurian-Devonian	19.99	02/09/1999	27.67	08/06/1997
Ida	423108095383201	Mississippian	180.25	08/09/1999	180.97	07/27/1994
Jackson	420433090502401	Silurian-Devonian	59.74	05/03/1999	62.89	08/06/1997
Linn	420730091490401	Silurian-Devonian	20.73	05/03/1999	84.17	04/05/1976
Linn	421207091312201	Silurian-Devonian	10	08/09/1999	12	05/04/1998
Plymouth	424833096324701	Dakota	135.73	02/10/1999	136.54	05/05/1998
Story	420129093273701	Cambrian-Ordovician	295	02/08/1999	370	05/08/1997
Washington	412750091495201	Mississippian	+.59	11/04/1998	+.57	05/05/1997
Washington	411822091411001	Cambrian-Ordovician	249	05/10/1999	304	04/24/1997
Washington	411812091412601	Cambrian-Ordovician	240	11/04/1998	247	04/25/1997
Woodbury	422830096000511	Dakota	198.70	08/10/1999	199.06	05/11/1995

Table 5. Historical low-water level measured during water year 1999 in wells completed in bedrock aquifers.
[Values in feet below land surface]

County	Well number	Aquifer type	New historical low water level	Date measured	Previous historical low water level	Date measured
Appanoose	404103092404001	Cambrian-Ordovician	389.00	02/08/1999	382.42	08/06/1997
Buena Vista	424023095571401	Dakota	96.16	08/04/1999	95.30	12/12/1978
Calhoun	422339094375101	Cambrian-Ordovician	287	02/10/1999	237	08/06/1997
Cherokee	424348095231601	Cambrian-Ordovician	196.17	10/02/1998	194.73	02/03/1993
Clayton	425433091285002	Cambrian-Ordovician	10.86	08/25/1999	10.38	07/20/1989
Clinton	414806090212301	Silurian-Devonian	30.50	05/03/1999	27.67	08/06/1997
Decatur	404422093445602	Cambrian-Ordovician	442.66	08/12/1999	441.28	10/04/1997
Dubuque	422901090471901	Cambrian-Ordovician	248.02	05/04/1999	242.45	08/05/1997
Floyd	430800092540301	Cambrian-Ordovician	198	08/03/1999	186	05/05/1997, 02/12/1997
Grundy	422611092552501	Cambrian-Ordovician	296	08/02/1999	297	08/04/1997
Howard	432158092065801	Cambrian-Ordovician	340	08/02/1999	320	02/12/1997, 08/02/1997
Ida	422215095390811	Dakota	206.69	10/03/1998	206.50	05/07/1982
Jackson	420433090502401	Silurian-Devonian	64.22	02/09/1999	63.19	08/04/1998
Johnson	414132091345503	Silurian-Devonian	309	07/28/1999	301	08/16/1996
Johnson	414145091350101	Cambrian-Ordovician	411	07/08/1999, 08/12/1999, 09/09/1999	395	07/03/1996
Johnson	413950091322402	Cambrian-Ordovician	360	05/12/1999	340	04/30/1998
Lee	404306091270201	Cambrian-Ordovician	266.61	08/06/1999	264.74	08/06/1998
Linn	420200091363001	Cambrian-Ordovician	325	08/19/1999	293	07/24/1998
Linn	420219091344101	Cambrian-Ordovician	384	08/18/1999	351	08/10/1998
Madison	411727093483001	Mississippian	280.26	08/19/1999	279.45	08/04/1997
Mahaska	411912092273601	Mississippian	107.51	02/08/1999	103.61	03/05/1990-03/08/1990
Mahaska	411914092274701	Mississippian	106.03	05/05/1999	103.20	10/26/1989
Muscatine	412833090482001	Silurian-Devonian	269	07/06/1999, 08/03/1999	260	04/07/1998
Muscatine	412952090501101	Silurian-Devonian	161	08/03/1999	160	09/01/1998
Osceola	431620095250511	Dakota	197.03	05/05/1999	195.05	08/06/1992
Plymouth	425249096125001	Dakota	124.71	11/02/1998	124.25	07/02/1991
Story	420957092181801	Cambrian-Ordovician	367	11/02/1998	350	01/03/1997
Washington	411300091320701	Mississippian	78.09	08/05/1999	77.04	11/27/1990

Surface-Water Quality

Surface-water-quality data were collected in Iowa during water year 1999 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) (fig. 5). 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 13 water samples were collected at Mississippi River at Clinton during the 1999 water year.

Nearly all the samples collected at the two stations contained detectable concentrations of agricultural chemicals. Detections of dissolved nitrite plus nitrate as nitrogen (hereafter referred to as nitrate) were common during the 1999 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 1.21 mg/L on September 9 to 3.88 mg/L, April 28 and at Omaha from 0.285 mg/L September 7 to 3.58 mg/L, April 20 at Omaha. Nitrate concentrations in water 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 analyses were completed for 28 water samples collected at the two 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 nine times at both sites. The largest herbicide concentration was 2.44 ug/L (micrograms per liter) of atrazine in the water sample collected from the Mississippi River on May 21. The largest overall concentration of acetochlor, alachlor, atrazine, cynazine, and metolachlor in a single event was also on the Mississippi River on May 21. This water sample had 1.66 ug/L of acetochlor, 0.105 ug/L of alachlor, 2.44 ug/L of atrazine, 0.172 ug/L of cyanazine, and 1.27 ug/L of metolachlor. No concentrations for any herbicide 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 1999. Water samples collected in September through February had the lowest overall concentrations of the five herbicides during the 1999 water year.

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 1999 water year is the eighth year of this 10-year program to determine possible ground-water-quality trends.

Ground-Water Monitoring Network

During the 1999 water year, a total of 67 ground-water samples were collected from municipal wells located in four vunerable bedrock aquifers and two types of surficial aquifers throughout the State (fig. 8). These wells were sampled as part of the Iowa ground-water-quality monitoring (GWM) program to determine water-quality trends. Aquifer types include: (1)

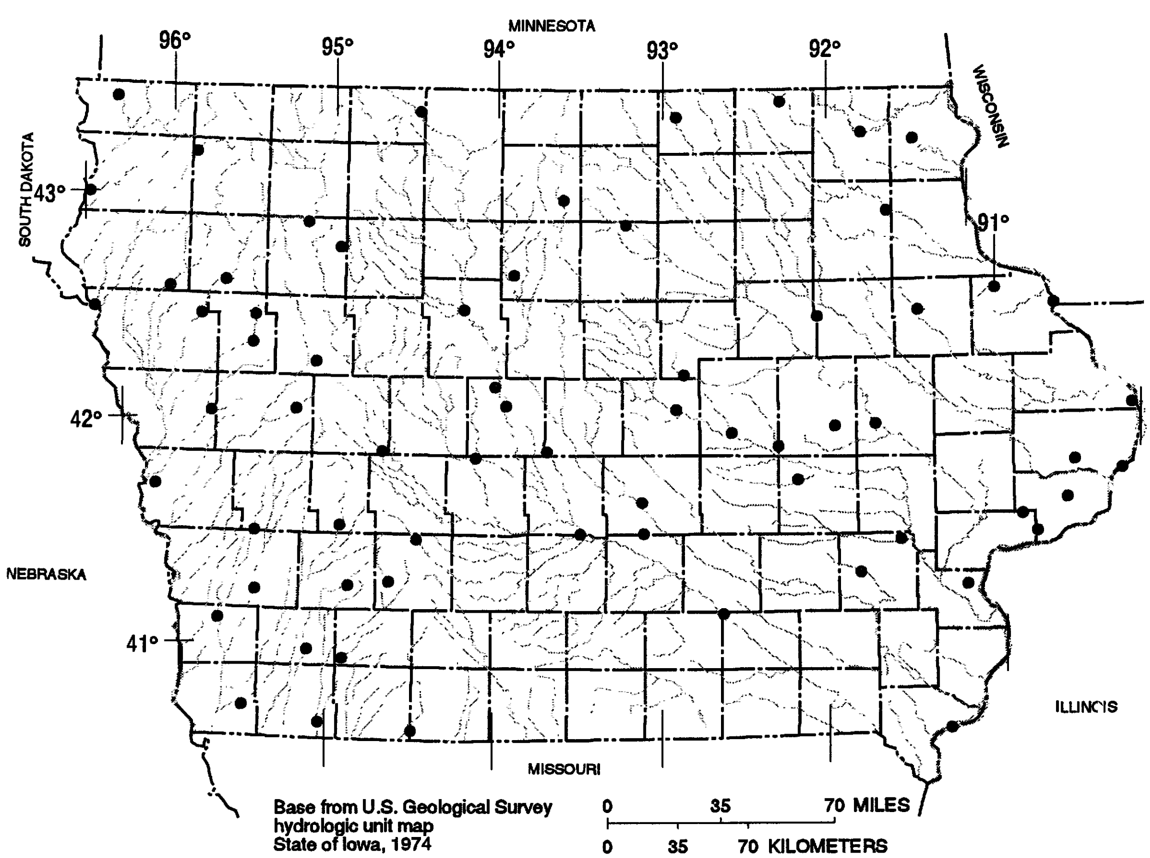


Figure 8. Location of active ground-water-quality monitoring wells in Iowa.

alluvial aquifers comprising sand and gravel associated with present-day fluvial systems; (2) glacial drift and buried-channel aquifers associated with previous glaciation; (3) cretaceous aquifer comprised of fine- to course-grained sandstones of the Dakota group; (4) carboniferous aquifer composed primarily of porous limestones and dolomites of the Mississippian age; (5) Silurian-Devonian aquifer comprised of porous and fractured limestones and dolomites; and (6) Cambrian-Ordovician aquifer comprised of the Jordan sandstone. Samples were collected during June, July, and August 1999. All samples were analyzed by the University of Iowa Hygienic Laboratory. All samples were analyzed for common ions, nutrients, and herbicides. In addition, samples from wells less than 300 feet deep were analyzed for volatile organic compounds (VOC's), and samples from wells greater than 300 feet deep were analyzed for radio chemicals. Results for all constituent analyses 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 6. Nitrate or ammonia was detected in 57 of the 67 samples analyzed for these compounds, and one or more herbicides were detected in 8 of the 66 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 0.10 µg/L. The MRL is the lowest concentration reliably measured by the laboratory.

Table 6. Summary of nitrogen species and herbicides detected in samples from the Ground-Water-Quality Monitoring project, water year 1999
[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	66	0	<0.10 µg/L	<0.10 µg/L
Ammonia	67	28	< .10 mg/L	6.6 mg/L
Alachlor	66	0	< .10 µg/L	< .10 µg/L
Atrazine	66	5	< .10 µg/L	.31 µg/L
Butylate	66	0	< .10 µg/L	< .10 µg/L
Cyanazine	66	0	< .10 µg/L	< .10 µg/L
Deethylatrazine	66	2	< .10 µg/L	.25 µg/L
Deisopropylatrazine	66	1	< .10 µg/L	.19 µg/L
Metolachlor	66	4	< .10 µg/L	1.40 µg/L
Metribuzin	66	0	< .10 µg/L	< .10 µg/L
Nitrate	67	31	< .10 mg/L	18.0 mg/L
Prometone	66	0	< .10 µg/L	< .10 µg/L
Trifluralin	66	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 23 of 67 samples. Concentrations in seven samples exceeded 10 mg/L, which is the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) for public drinking water. Of the 31 samples that contained detectable concentrations of nitrate, 68 percent were from wells completed in alluvial aquifers, 10 percent were from glacial drift and buried-channel aquifers, and 22 percent were from vunerable bedrock aquifers. The median concentration of the 31 samples with detections was 5.5 mg/L. The median concentration of all samples was <0.10 mg/L. However, when all the wells are separated into categories based on well depth, the median nitrate concentrations vary from 3.8 mg/L in wells less than 50 feet deep to 4.0 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 18.0 mg/L. Twenty-eight samples had detectable ammonia concentrations. Of these samples, 25 percent were collected from alluvial aquifers, 36 percent were from glacial drift and buried-channel aquifers, and 39 percent were from vunerable bedrock aquifers.

Nine commonly used herbicides and two atrazine degradation products were sampled for during the 1999 water year. Water from 8 of the 66 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. Six 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. Five samples with detectable herbicide concentrations were from wells completed in alluvial aquifers, one sample was from the glacial drift aquifers, and two were from vulnerable bedrock aquifers.

Trends in Ground-Water Quality

In 1999, the herbicide detection frequency in all wells less than 100 feet deep was 17 percent. The detection frequency in the previous seven years is shown in figure 9. Variance in detection frequency may reflect several factors including changes in agricultural practices concerning use of herbicides, and climatic conditions.

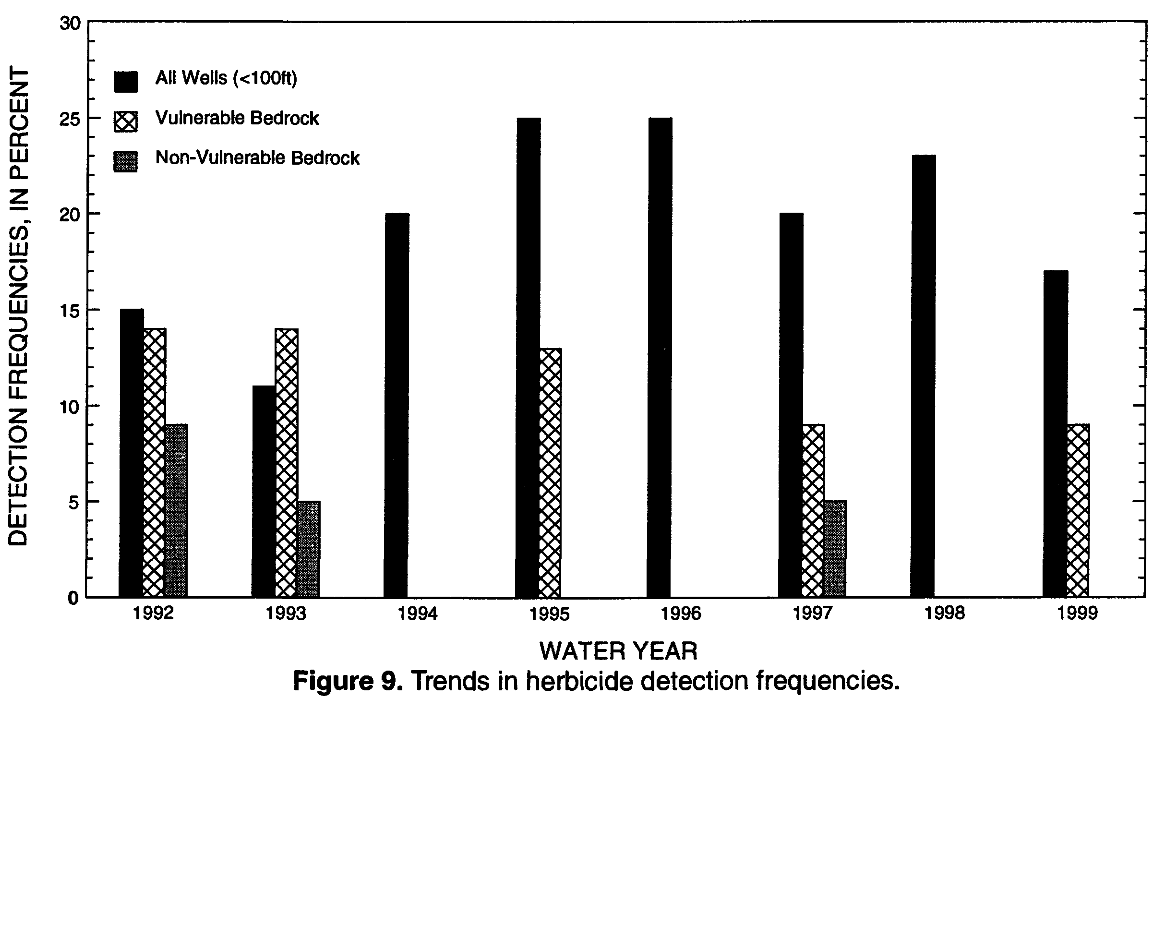


Figure 9. Trends in herbicide detection frequencies.

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 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 opportunities 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 1999 water year that began October 1, 1998, and ended September 30, 1999. 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 was 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 was 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 latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. This site-identification number, once assigned, is a pure number and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description. (See figure below.)

Latitude and longitude coordinates for wells:

1. 414315091252001
2. 414315091252002
3. 414316091251901

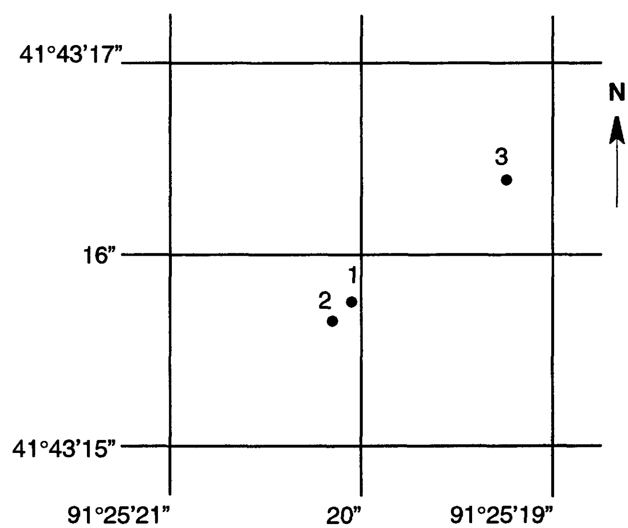


Figure 10. Latitude-longitude well number.

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. 11). 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.

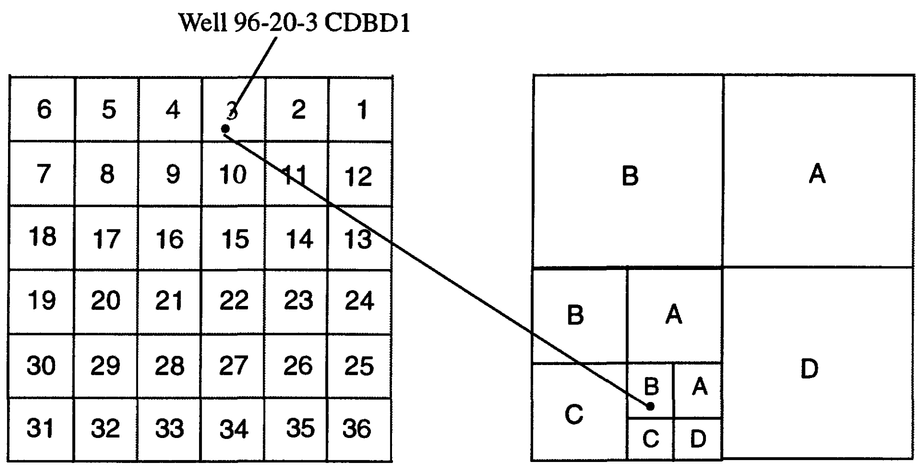


Figure 11. Local well-numbering system.

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 consists 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. This 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 consists of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. This data is 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.

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 not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

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

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 special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified 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 is 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 is 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 is 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 collected in this District are:

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

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

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

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

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

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

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

Reference Samples

Reference material is a solution or material prepared by a laboratory 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 is published in this report. This data provides 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. 7).

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 described 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. This data is 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). This 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. This data may be accessed at:

http://ia.water.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, 325,851 gallons, or 1,233 cubic meters.

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

Annual runoff is the total quantity of water 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, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet, 325,851 gallons, or 1,233 cubic meters

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

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

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

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

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

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

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

Base flow is flow in a channel sustained by ground-water discharge in the absence of direct runoff.

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

Bottom material: See "Bed material."

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

Colloid is any substance with particles in such a fine state of subdivision dispersed in a medium (for example, water) that they do not settle out; but not in so fine a state of subdivision that they can be said to be truly dissolved.

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

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

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

Continuous-record station is a site that meets either of the following conditions:

1. Stage or streamflow are recorded at some interval on a continuous basis. The recording interval is usually 15 minutes, but may be less or more frequent.
2. Water-quality, sediment, or other hydrologic measure-ments are recorded at least daily.

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

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

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

Cubic foot per second-day (CFS-DAY, Cfs-day, [$(ft^3/s)/d$]) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, 646,317 gallons, or 2,447 cubic meters.

Daily record is a summary of streamflow, sediment, or water-quality values computed from data collected with sufficient frequency to obtain reliable estimates of daily mean values.

Daily record station is a site for which daily records of streamflow, sediment, or water-quality values are computed.

Datum, as used in this report, is an elevation above mean sea level to which all gage height readings are referenced.

Discharge, or flow, is the volume of water (or more broadly, volume of fluid including solid- and dissolved-phase material), that passes a given point in a given period of time.

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days in a 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 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 that passes through a 0.45-micrometer 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 oxygen (DO) content of water in equilibrium with air is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved solids, with small temperature changes having the more significant offset. Photosynthesis and respiration may cause diurnal variations in dissolved-oxygen concentration in water from some streams.

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 that 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 0.4926 to reflect the change. Alternatively, alkalinity concentration (as mg/L $CaCO_3$) can be converted to carbonate concentration by multiplying by 0.60.

Drainage area of a site on a stream is that area, measured in a horizontal plane, that has a common outlet at the site for its surface runoff. 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 Earth's surface that is occupied by a drainage system with a common outlet for its surface runoff (see "Drainage area").

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

Gage datum is the elevation of the zero point of the reference gage from which gage height is determined as compared to sea level (see "Datum"). This elevation is established by a system of levels from known benchmarks, by approximation from topographic maps, or by geographical positioning system.

Gage height (G.H.) is the water-surface elevation referenced to the 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 site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is computed.

Ground-water level is the elevation of the water table or another potentiometric surface at a particular location.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

Hydrologic benchmark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a benchmark station may be used to separate effects of natural from human-induced changes in other basins that have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped benchmark basin.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the U.S. Geological Survey. Each hydrologic unit is identified by an 8-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 water surface in a well is measured to obtain water level.

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

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

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

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

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

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

Miscellaneous site, or miscellaneous station, is a site where streamflow, sediment, and/or water-quality data are collected once, or more often on a random or discontinuous basis.

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 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. *See NOAA web site: http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88*

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

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

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

Organism is any living entity.

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

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

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

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

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

Classification	Size (mm)	Method of analysis
Clay	0.00024 - 0.004	Sedimentation
Silt	0.004 - 0.062	Sedimentation
Sand	0.062 - 2.0	Sedimentation/sieve
Gravel	2.0 - 64.0	Sieve

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

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

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

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

pH of water is the negative logarithm of the hydrogen-ion activity. Solutions with pH less than 7 are termed "acidic," and solutions with a pH greater than 7 are termed "basic." Solutions with a pH of 7 are neutral. The presence and concentration of many dissolved chemical constituents found in water are, in part, influenced by the hydrogen-ion activity of water. Biological processes including growth, distribution of organisms, and toxicity of the water to organisms are also influenced, in part, by the hydrogen-ion activity of water.

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

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

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

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

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.

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

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

River mile is the distance of a point on a river measured in miles from the river's mouth along the low-water channel.

River mileage is the linear distance along the meandering path of a stream channel determined in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council.

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

Sea level refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929. *See: http://www.co-ops.nos.noaa.gov/ glossary/gloss_n.html#NGVD*

Sediment is solid material that is transported by, suspended in, or deposited from water. It originates mostly from disintegrated rocks; it also 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 or very close to the bed. In this report, bed load is considered to consist of particles in transit from the bed to an elevation equal to the top of the bed-load sampler nozzle (usually within 0.25 ft of the streambed).

Bed-load discharge (tons per day) is the quantity of sediment moving as bed load, reported as dry weight, that passes a cross section in a given time.

Suspended sediment is the sediment that 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). The entire sample is used for the analysis.

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

Suspended-sediment discharge (tons/day) is the quantity of sediment moving in suspension, reported as dry weight, that passes a cross section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027.

Suspended-sediment load is a term that refers to material in suspension. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with either suspended-sediment discharge or concentration.

Seven-day 10-year low flow (7Q10, $7Q_{10}$) is the minimum flow averaged over 7 consecutive days that is expected to occur on average, once in any 10-year period. The 7Q10 has a 10-percent chance of occurring in any given year.

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 from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage: See "Gage height."

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

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

Surface area of a lake or impoundment is that area encompassed by the boundary of the lake or impoundment as shown on USGS topographic maps, or on other available maps or photographs. The computed surface areas reflect the water levels of the lakes or impoundments at the times when the information for the maps or photographs was obtained.

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 suspended-sediment sample that is retained on a 0.45-micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by 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 suspended-sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. Knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by 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.

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

Tons per acre-foot is 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, tons/d) is the rate representing a mass of 1 ton of a constituent in streamflow passing a cross section in 1 day. It is equivalent to 2,000 pounds per day, or 0.9072 metric tons per day.

Total is the total amount of a given constituent in a representative 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 suspended-sediment mixture and that the analytical method determined all of the constituent in the sample.)

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

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

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

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

Turbidity is a measurement of the collective optical properties of a water sample that cause light to be scattered and absorbed rather than transmitted in straight lines; the higher the intensity of scattered light, the higher the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU) or Formazin turbidity units (FTU) depending on the method and equipment used.

Volatile organic compounds (VOC's) are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and subsequently analyzed by gas chromatography. Many VOC's are manmade chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They are often components of fuels, solvents, hydraulic fluids, paint thinners, and dry cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human health concern because many are toxic and are known or suspected human carcinogens (U.S. Environmental Protection Agency, 1996).

Water level is the water-surface elevation or stage of the free surface of a body of water above or below any datum (see "Gage height"), or the surface of water standing in a well, usually indicative of the position of the water table or other potentiometric surface.

Water table is the surface of a ground-water body at which the water is at atmospheric pressure.

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

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, 1999, is called the "1999 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.

Well is an excavation (pit, hole, tunnel), generally cylindrical in form and often walled in, drilled, dug, driven, bored, or jetted into the ground to such a depth as to penetrate water-yielding geologic material and allow the water to flow or to be pumped to the surface.

Wet weight refers to the weight of animal tissue or other substance including its contained water.

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

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

The U.S.G.S. 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.G.S., 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 made in the form of a 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 mention the "U.S. Geological Survey Techniques of Water-Resources Investigations."

Book 1. Collection of Water Data by Direct Measurement

Section D. Water Quality

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

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W. Wood: USGS–TWRI book 1, chap. D2. 1976. 24 pages.

Book 2. Collection of Environmental Data

Section D. Surface Geophysical Methods

2-D1. *Application of surface geophysics to ground-water investigations,* by A.A. R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS–TWRI book 2, chap. D1. 1974. 116 pages.

2-D2. *Application of seismic-refraction techniques to hydrologic studies,* by F.P. Haeni: USGS–TWRI book 2, chap. D2. 1988. 86 pages.

Section E. Subsurface Geophysical Methods

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

2-E2. *Borehole geophysics applied to ground-water investigations,* by W.S. Keys: USGS–TWRI book 2, chap. E2. 1990. 150 pages.

Section F. Drilling and Sampling Methods

2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W.E. Teasdale: USGS–TWRI book 2, chap. F1. 1989. 97 pages.

Book 3. Applications of Hydraulics

Section A. Surface-Water Techniques

3-A1. *General field and office procedures for indirect discharge measurements,* by M.A. Benson and Tate Dalrymple: USGS–TWRI book 3, chap. A1. 1967. 30 pages.

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

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

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

3-A5. *Measurement of peak discharge at dams by indirect methods,* by Harry Hulsing: USGS–TWRI book 3. chap. A5. 1967. 29 pages.

3-A6. *General procedure for gaging streams,* by R.W. Carter and Jacob Davidian: USGS–TWRI book 3, chap. A6. 1968. 13 pages.

3-A7. *Stage measurement at gaging stations,* by T.J. Buchanan and W.P. Somers: USGS–TWRI book 3, chap. A7. 1968. 28 pages.

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

3-A9. *Measurement of time of travel in streams by dye tracing,* by F.A. Kilpatrick and J.F. Wilson, Jr.: USGS–TWRI book 3, chap. A9. 1989. 27 pages.

3-Al0. *Discharge ratings at gaging stations,* by E.J. Kennedy: USGS–TWRI book 3, chap. A10. 1984. 59 pages.

3-A11. *Measurement of discharge by the moving-boat method,* by G.F. Smoot and C.E. Novak: USGS–TWRI book 3, chap. A11. 1969. 22 pages.

3-A12. *Fluorometric procedures for dye tracing,* Revised, by J.F. Wilson, Jr., E.D. Cobb, and F.A. Kilpatrick: USGS–TWRI book 3, chap. A12. 1986. 34 pages.

3-A13. *Computation of continuous records of streamflow,* by E.J. Kennedy: USGS–TWRI book 3, chap. A13. 1983. 53 pages.

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

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

3-A16. *Measurement of discharge using tracers,* by F.A. Kilpatrick and E.D. Cobb: USGS–TWRI book 3, chap. A16. 1985. 52 pages.

3-A17. *Acoustic velocity meter systems,* by Antonius Laenen: USGS–TWRI book 3, chap. A17. 1985. 38 pages.

3-A18. *Determination of stream reaeration coefficients by use of tracers,* by F.A. Kilpatrick, R.E. Rathbun, Nobuhiro Yotsukura, G.W. Parker, and L.L. DeLong: USGS–TWRI book 3, chap. A18. 1989. 52 pages.

3-A19. *Levels at streamflow gaging stations,* by E.J. Kennedy: USGS–TWRI book 3, chap. A19. 1990. 31 pages.

3-A20. *Simulation of soluable waste transport and buildup in surface waters using tracers,* by F.A. Kilpatrick: USGS–TWRI book 3, chap. A20. 1993. 38 pages.

3-A21 *Stream-gaging cableways,* by C. Russell Wagner: USGS–TWRI book 3, chap. A21. 1995. 56 pages.

Section B. Ground-Water Techniques

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

3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction,* by G.D. Bennett: USGS–TWRI book 3, chap. B2. 1976. 172 pages.

3-B3. *Type curves for selected problems of flow to wells in confined aquifers,* by J.E. Reed: USGS–TWRI book 3, chap. B3. 1980. 106 pages.

3-B4. *Regression modeling of ground-water flow,* by R.L. Cooley and R.L. Naff: USGS–TWRI book 3, chap. B4. 1990. 232 pages.

3-B4. *Supplement 1. Regression modeling of ground-water flow --Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems,* by R.L. Cooley: USGS–TWRI book 3, chap. B4. 1993. 8 pages.

3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems—An introduction,* by O.L. Franke, T.E. Reilly, and G.D. Bennett: USGS–TWRI book 3, chap. B5. 1987. 15 pages.

3-B6. *The principle of superposition and its application in ground-water hydraulics,* by T.E. Reilly, O.L. Franke, and G.D. Bennett: USGS–TWRI book 3, chap. B6. 1987. 28 pages.

3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow,* by E.J. Wexler: USGS–TWRI book 3, chap. B7. 1992. 190 pages.

Section C. Sedimentation and Erosion Techniques

3-C1. *Fluvial sediment concepts,* by H.P. Guy: USGS–TWRI book 3, chap. C1. 1970. 55 pages.

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

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

Book 4. Hydrologic Analysis and Interpretation

Section A. Statistical Analysis

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

4-A2. *Frequency curves,* by H.C. Riggs: USGS–TWRI book 4, chap. A2. 1968. 15 pages.

Section B. Surface Water

4-B1. *Low-flow investigations,* by H.C. Riggs: USGS–TWRI book 4, chap. B1. 1972. 18 pages.

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

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

Section D. Interrelated Phases of the Hydrologic Cycle

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

Book 5. Laboratory Analysis

Section A. Water Analysis

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments,* by M.J. Fishman and L.C. Friedman, editors: USGS–TWRI book 5, chap. A1. 1989. 545 pages.

5-A2. *Determination of minor elements in water by emission spectroscopy,* by P.R. Barnett and E.C. Mallory, Jr.: USGS–TWRI book 5, chap. A2. 1971. 31 pages.

5-A3. *Methods for the determination of organic substances in water and fluvial sediments,* edited by R.L. Wershaw, M.J. Fishman, R.R. Grabbe, and L.E. Lowe: USGS–TWRI book 5, chap. A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples,* by L.J. Britton and P.E. Greeson, editors: USGS–TWRI book 5, chap. A4. 1989. 363 pages.

5-A5. *Methods for determination of radioactive substances in water and fluvial sediments,* by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS–TWRI book 5, chap. A5. 1977. 95 pages.

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments,* by L.C. Friedman and D.E. Erdmann: USGS–TWRI book 5, chap. A6. 1982. 181 pages.

Section C. Sediment Analysis

5-C1. *Laboratory theory and methods for sediment analysis,* by H.P. Guy: USGS–TWRI book 5, chap. C1. 1969. 58 pages.

Book 6. Modeling Techniques

Section A. Ground Water

6-A1. *A modular three-dimensional finite-difference ground-water flow model,* by M.G. McDonald and A.W. Harbaugh: USGS–TWRI book 6, chap. A1. 1988. 586 pages.

6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model,* by S.A. Leake and D.E. Prudic: USGS–TWRI book 6, chap. A2. 1991. 68 pages.

6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual,* by L.J. Torak: USGS–TWRI book 6, chap. A3. 1993. 136 pages.

6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions,* by R.L. Cooley: USGS–TWRI book 6, chap. A4. 1992. 108 pages.

6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details,* by L.J. Torak: USGS–TWRI book 6, chap. A5, 1993. 243 pages.

6-A6. A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction, by Eric D. Swain and Eliezer J. Wexler. 1996. 125 pages.

Book 7. Automated Data Processing and Computations

Section C. Computer Programs

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

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

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

Book 8. Instrumentation

Section A. Instruments for Measurement of Water Level

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

8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J.D. Craig: USGS–TWRI book 8, chap. A2. 1983. 57 pages.

Section B. Instruments for Measurement of Discharge

8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G.F. Smoot and C.E. Novak: USGS–TWRI book 8, chap. B2. 1968. 15 pages.

Book 9. Handbooks for Water-Resources Investigations

Section A. National Field Manual for the Collection of Water-Quality Data

9-A1. *National Field Manual for the Collection of Water-Quality Data: Preparations for Water Sampling*, by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A1. 1998. 47 p.

9-A2. *National Field Manual for the Collection of Water-Quality Data: Selection of Equipment for Water Sampling*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A2. 1998. 94 p.

9-A3. *National Field Manual for the Collection of Water-Quality Data: Cleaning of Equipment for Water Sampling*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A3. 1998. 75 p.

9-A4. *National Field Manual for the Collection of Water-Quality Data: Collection of Water Samples*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A4. 1999. 156 p.

9-A5. *National Field Manual for the Collection of Water-Quality Data: Processing of Water Samples*, edited by F.D. Wilde, D.B. Radtke, Jacob Gibs, and R.T. Iwatsubo: USGS–TWRI book 9, chap. A5. 1999, 149 p.

9-A6. *National Field Manual for the Collection of Water-Quality Data: Field Measurements*, edited by F.D. Wilde and D.B. Radtke: USGS–TWRI book 9, chap. A6. 1998. Variously paginated.

9-A7. *National Field Manual for the Collection of Water-Quality Data: Biological Indicators*,edited by D.N. Myers and F.D. Wilde: USGS–TWRI book 9, chap. A7. 1997 and 1999. Variously paginated.

9-A8. *National Field Manual for the Collection of Water-Quality Data: Bottom-material samples*, by D.B. Radtke: USGS–TWRI book 9, chap. A8. 1998. 48 pages.

9-A9. *National Field Manual for the Collection of Water-Quality Data: Safety in Field Activities*, by S.L. Lane and R.G. Fay: USGS–TWRI book 9, chap. A9. 1998. 60 pages.

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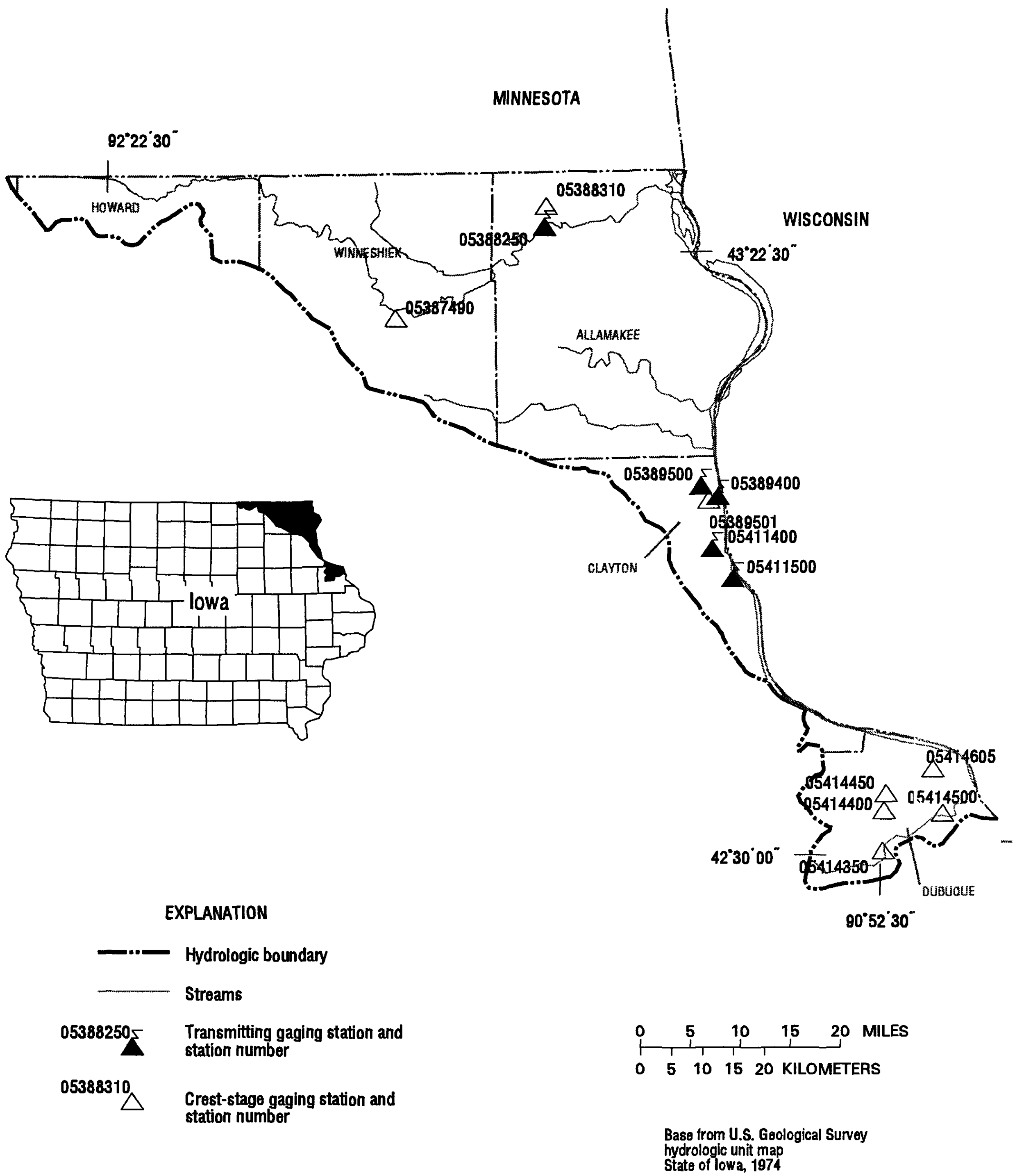
MINNESOTA
WISCONSIN
92°22'30"
HOWARD
WINNESHIEK
ALLAMAKEE
05388310
05388250
05387490
43°22'30"
05389500
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05411400
05411500
CLAYTON
Iowa
05414605
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05414400
05414500
42°30'00"
05414350
DUBUQUE
90°52'30"
EXPLANATION
Hydrologic boundary
Streams
05388250
Transmitting gaging station and station number
05388310
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

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA

LOCATION.--Lat 43°25'16", long 91°30'31", in SW$^1/_4$ NW$^1/_4$ sec.1, T.99 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on right bank at upstream side of bridge on State Highway 76, 650 ft. upstream from Mineral Creek, 0.5 mi upstream from Bear Creek, 3.5 mi south of Dorchester, and 18.1 mi upstream from mouth.

DRAINAGE AREA.--770 mi^2.

PERIOD OF RECORD.--September 1936 to September 1938 and October 1939 to June 1975(discharge measurements only), October 1938 to September 1939, July 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 660.00 ft. above sea level. Prior to Jan. 6, 1938, nonrecording gage on old bridge at site 0.2 mi upstream at datum 5.91 ft. higher. Jan. 6, 1938 to Apr. 26, 1948, nonrecording gage at datum 60.00 ft. lower, Apr. 27, 1948 to August 1963, nonrecording gage on old bridge and August 1963 to June 1975 nonrecording gage on new bridge at same datum.

REMARKS.--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 and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1941, reached a stage of 21.8 ft., from flood profile, discharge, 30,400 ft^3/s on basis of slope-area determination of peak flow.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	341	692	478	e180	e240	796	490	1600	1000	580	3880	929
2	331	643	468	e200	e260	708	490	1480	981	566	2740	872
3	348	604	458	e170	e280	651	521	1400	920	582	2100	824
4	372	574	452	e150	e300	606	658	1330	906	642	1840	774
5	416	546	449	e130	e270	560	1050	1330	993	563	1660	750
6	456	529	436	e140	e290	542	1400	1270	887	541	1490	704
7	441	509	420	e150	e300	505	1670	1210	833	501	1370	673
8	464	496	410	e160	329	482	1880	1150	815	492	1260	675
9	463	488	406	e140	389	479	2100	1080	1010	515	1170	633
10	439	554	397	e130	438	443	2770	1020	1260	499	1110	603
11	426	717	392	e140	831	434	3150	986	1560	497	1020	577
12	417	765	386	e130	1610	452	2630	1080	1520	485	966	570
13	397	829	378	e120	1110	429	2400	1100	1340	467	901	561
14	390	805	374	e130	982	417	2100	1220	1200	449	824	552
15	389	777	374	e120	938	423	1890	1410	1090	431	761	538
16	384	759	370	e140	982	473	1770	1420	1020	422	723	524
17	392	740	365	e160	992	666	1630	1440	971	462	686	501
18	883	709	363	e150	964	875	1500	1560	910	517	647	483
19	842	681	354	e130	879	869	1400	1610	865	816	888	479
20	651	646	e230	e140	755	748	1330	1590	826	2090	1140	467
21	581	622	e160	e150	687	673	1270	1750	796	3820	1070	454
22	533	602	e120	e140	632	629	1370	2110	776	5170	1070	443
23	498	582	e140	e160	603	601	2200	2040	765	4730	1160	436
24	475	559	e190	e180	581	565	3410	1860	741	2800	1690	428
25	454	542	e240	e170	558	535	3280	1700	712	2150	1800	420
26	436	524	e270	e160	543	513	2630	1530	684	2110	1620	416
27	456	510	e240	e170	609	491	2300	1400	656	2480	1400	447
28	525	505	e260	e160	806	492	2080	1290	634	2260	1270	458
29	553	500	e280	e180	---	498	1880	1220	616	1920	1160	422
30	673	494	e220	e200	---	491	1730	1090	592	1710	1060	400
31	760	---	e170	e220	---	492	---	1040	---	2650	993	---
TOTAL	15186	18503	10250	4800	18158	17538	54979	43316	27879	43917	41469	17013
MEAN	490	617	331	155	648	566	1833	1397	929	1417	1338	567
MAX	883	829	478	220	1610	875	3410	2110	1560	5170	3880	929
MIN	331	488	120	120	240	417	490	986	592	422	647	400
AC-FT	30120	36700	20330	9520	36020	34790	109100	85920	55300	87110	82250	33750
CFSM	.64	.80	.43	.20	.84	.73	2.38	1.81	1.21	1.84	1.74	.74
IN.	.73	.89	.50	.23	.88	.85	2.66	2.09	1.35	2.12	2.00	.82

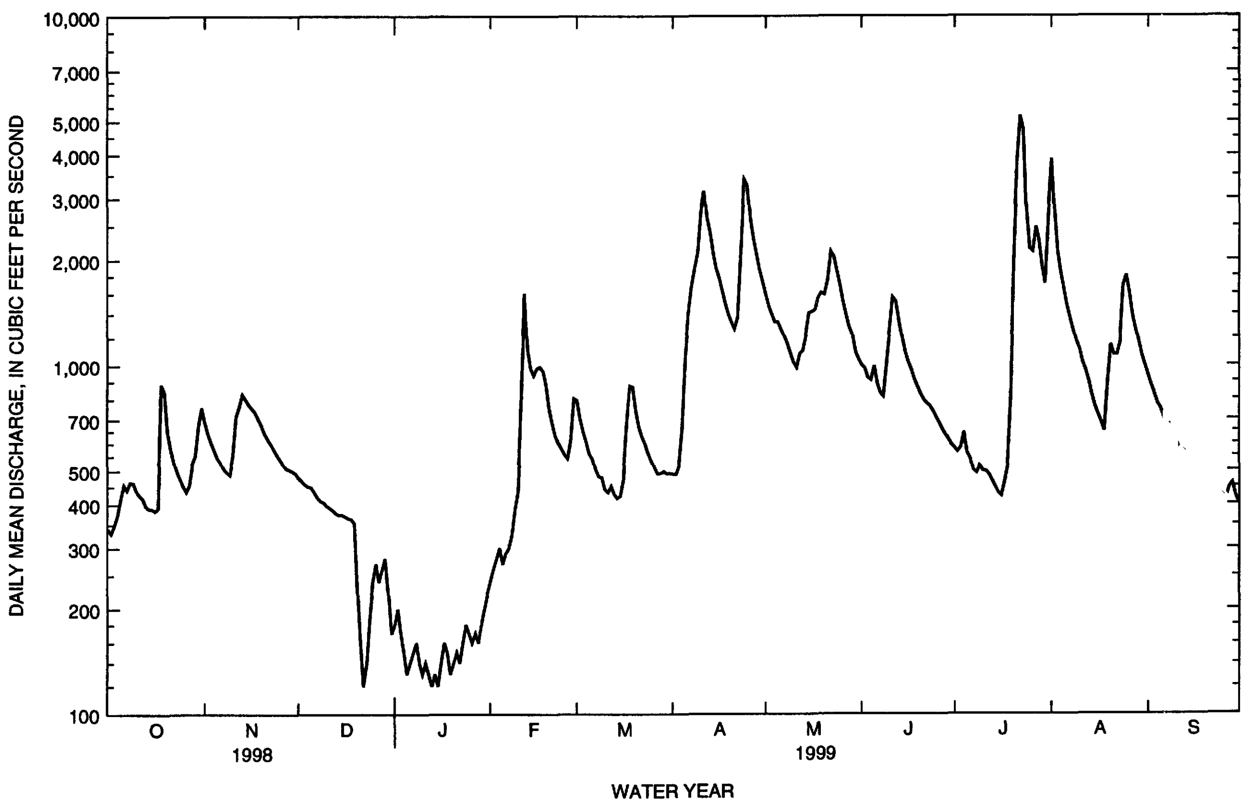
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	424	452	368	271	411	1065	1074	823	802	664	593	461
MAX	2045	1476	1421	836	1400	1922	3973	2066	2765	3318	3702	1334
(WY)	1987	1983	1983	1983	1984	1983	1993	1991	1993	1993	1993	1986
MIN	116	125	99.9	96.7	112	386	225	175	123	92.9	112	77.5
(WY)	1990	1990	1990	1977	1978	1981	1977	1977	1977	1939	1989	1939

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1939 - 1999a	
ANNUAL TOTAL	289443		313008			
ANNUAL MEAN	793		858		621	
HIGHEST ANNUAL MEAN					1726	1993
LOWEST ANNUAL MEAN					178	1977
HIGHEST DAILY MEAN	11100	Jun 29	5170	Jul 22	15100	Aug 17 1993
LOWEST DAILY MEAN	120	Dec 22	120	Dec 22b	30	Sep 23 1939
ANNUAL SEVEN-DAY MINIMUM	174	Feb 3	130	Jan 9	49	Sep 20 1939
INSTANTANEOUS PEAK FLOW			6050	Jul 23	22000	Aug 17 1993
INSTANTANEOUS PEAK STAGE			13.25	Jul 23	20.00	Aug 17 1993
ANNUAL RUNOFF (AC-FT)	574100		620900		449700	
ANNUAL RUNOFF (CFSM)	1.03		1.11		.81	
ANNUAL RUNOFF (INCHES)	13.98		15.12		10.95	
10 PERCENT EXCEEDS	1360		1740		1350	
50 PERCENT EXCEEDS	553		606		376	
90 PERCENT EXCEEDS	202		220		140	

a Revised
b Also Jan 13, 15, ice affected
e Estimated



05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA

LOCATION.--Lat 43°02'27", long 91°12'23", in Basil Giard Claim #1, sec.16, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank 50 ft downstream from State Highway 18 bridge, 1.5 miles upstream from mouth at Mississippi River, and 1.5 miles west of Marquette.

DRAINAGE AREA.--34.1 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 624.818 ft above mean sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

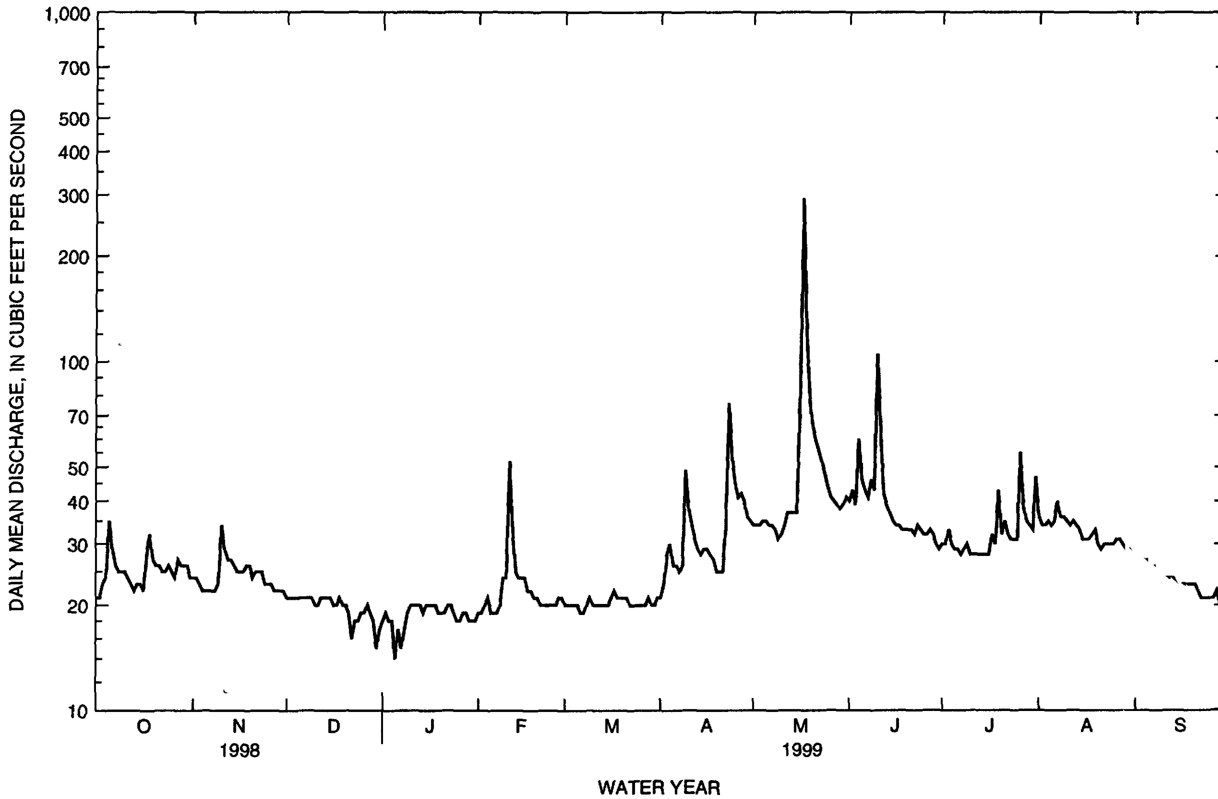
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	24	21	18	19	20	21	34	40	30	36	28
2	21	24	21	19	19	20	23	34	43	30	34	27
3	23	23	21	18	20	20	28	34	39	33	34	27
4	24	22	21	18	21	20	30	35	60	30	35	27
5	35	22	21	e14	19	20	26	35	46	29	34	27
6	29	22	21	e17	19	19	26	34	43	29	35	26
7	26	22	21	e15	19	19	25	34	41	28	40	26
8	25	22	21	e17	20	20	26	33	46	29	36	25
9	25	23	21	e19	24	21	49	31	43	30	36	24
10	25	34	20	20	24	20	38	32	105	28	35	24
11	24	29	20	20	52	20	34	34	64	28	34	24
12	23	27	21	20	33	20	31	37	42	28	35	24
13	22	27	21	20	25	20	29	37	39	28	34	24
14	23	26	21	19	24	20	28	37	37	28	33	23
15	23	25	21	20	24	20	29	37	35	28	31	22
16	22	25	20	20	24	21	29	79	34	28	31	23
17	28	25	20	20	22	22	28	293	34	32	31	23
18	32	26	21	20	22	21	27	128	33	30	32	23
19	27	26	20	19	21	21	25	82	33	43	33	23
20	26	24	20	19	21	21	25	66	33	32	30	23
21	26	25	19	19	20	21	25	60	33	35	29	22
22	25	25	16	20	20	20	33	56	32	32	30	21
23	25	25	18	20	20	20	76	52	34	31	30	21
24	26	23	18	19	20	20	53	48	33	31	30	21
25	25	23	19	18	20	20	45	44	32	31	30	21
26	24	23	19	18	20	20	41	41	32	55	31	21
27	27	22	20	19	21	20	42	40	33	39	31	22
28	26	22	19	19	21	21	40	39	32	35	30	20
29	26	22	e18	18	---	20	36	38	30	34	29	20
30	26	22	e15	18	---	20	35	39	29	33	29	19
31	24	---	e17	18	---	21	---	41	---	47	28	---
TOTAL	784	730	612	578	634	628	1003	1664	1210	1004	1006	701
MEAN	25.3	24.3	19.7	18.6	22.6	20.3	33.4	53.7	40.3	32.4	32.5	23.4
MAX	35	34	21	20	52	22	76	293	105	55	40	28
MIN	21	22	15	14	19	19	21	31	29	28	28	19
AC-FT	1560	1450	1210	1150	1260	1250	1990	3300	2400	1990	2000	1390
CFSM	.74	.71	.58	.55	.66	.59	.98	1.57	1.18	.95	.95	.68
IN.	.85	.80	.67	.63	.69	.68	1.09	1.81	1.32	1.09	1.10	.76

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	20.9	22.6	18.7	17.1	22.9	32.5	29.4	32.0	32.1	29.5	27.1	22.8
MAX	30.9	35.3	26.0	22.3	33.6	87.6	55.3	65.7	55.4	54.2	48.9	36.4
(WY)	1994	1992	1992	1992	1994	1993	1993	1993	1993	1993	1993	1993
MIN	14.9	13.5	11.2	11.3	13.6	20.0	15.2	17.3	16.4	15.9	12.9	13.7
(WY)	1998	1998	1998	1998	1998	1996	1997	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1992 - 1999	
ANNUAL TOTAL	8534.3		10554			
ANNUAL MEAN	23.4		28.9		25.6	
HIGHEST ANNUAL MEAN					42.1	1993
LOWEST ANNUAL MEAN					17.2	1997
HIGHEST DAILY MEAN	189	Mar 31	293	May 17	550	Mar 31 1993
LOWEST DAILY MEAN	9.0	Jan 18	14	Jan 5a	7.3	Feb 17 1997
ANNUAL SEVEN-DAY MINIMUM	10	Jan 13	17	Jan 2	8.3	Feb 11 1997
INSTANTANEOUS PEAK FLOW			849	May 17	1820	Feb 18 1997
INSTANTANEOUS PEAK STAGE			6.88	May 17	7.68	Feb 18 1997
ANNUAL RUNOFF (AC-FT)	16930		20930		18580	
ANNUAL RUNOFF (CFSM)	.69		.85		.75	
ANNUAL RUNOFF (INCHES)	9.30		11.50		10.21	
10 PERCENT EXCEEDS	32		39		38	
50 PERCENT EXCEEDS	21		25		22	
90 PERCENT EXCEEDS	12		19		14	

a Ice affected
e Estimated


1,000
700
500
400
300
200
100
70
50
40
30
20
10
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
O
N
D
J
F
M
A
M
J
J
A
S
1998
1999
WATER YEAR

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1991 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1991 to current year.
WATER TEMPERATURES: October 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: 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, 670 microsiemens Sept. 27, 1994; minimum daily, 140 microsiemens Oct. 14, 1997.
WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 17, 1998; minimum daily, 0.0°C Jan. 7, 18-21, 1994, Jan. 5,7,8, Feb. 21, 1997.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,780 mg/L Mar. 31, 1993; minimum daily mean, 1 mg/L Oct. 30, 1994.
SEDIMENT LOADS: Maximum daily, 4,500 tons Mar. 31, 1993; minimum daily, 0.08 tons Oct. 30, 1994, Nov. 23-24, 1997, and Dec. 8, 1997.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 651 microsiemens July 1; minimum daily, 251 microsiemens Sept. 30.
WATER TEMPERATURES: Maximum daily, 20.0°C June 10, 30 and July 24; minimum daily, 4.0°C Dec. 28.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 927 mg/L May 17; minimum daily mean, 5 mg/L Dec. 7, 8.
SEDIMENT LOADS: Maximum daily, 1,010 tons May 17; minimum daily, 0.29 tons Dec. 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV						
03...	1645	8.2	23	24	1.5	43
DEC						
15...	1300	6.2	20	10	.55	27
FEB						
03...	1410	5.8	20	39	2.1	46
MAR						
16...	1540	10.7	20	24	1.3	62
APR						
20...	1537	9.3	25	18	1.2	63
JUN						
03...	1330	15.3	40	28	3.0	100
JUL						
14...	1315	19.0	27	41	3.0	78
AUG						
26...	0735	14.9	30	35	2.8	60

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	529	---	417	433	528	615	584	---	465	651	---	481
2	531	434	542	---	522	504	471	---	532	504	---	477
3	459	491	475	---	522	495	---	539	517	---	---	571
4	575	432	513	447	498	462	---	530	509	---	---	---
5	606	503	---	425	512	590	524	528	---	537	---	---
6	576	431	---	431	---	---	500	545	---	588	---	467
7	569	---	447	430	---	539	479	549	554	439	---	468
8	609	---	426	430	485	---	459	---	523	529	---	444
9	600	440	453	---	539	581	550	---	604	452	---	439
10	---	493	---	---	525	561	---	465	610	---	---	451
11	---	434	---	430	479	637	---	446	---	---	---	---
12	548	467	---	427	491	615	530	442	---	459	---	---
13	589	430	---	419	---	---	499	506	---	560	---	469
14	592	---	440	424	---	---	457	513	---	508	---	418
15	552	---	422	428	488	582	363	---	---	464	---	491
16	518	456	449	---	553	632	411	---	---	589	---	465
17	---	423	440	---	482	551	---	444	---	---	---	466
18	---	430	466	428	462	534	---	504	619	---	---	---
19	578	429	---	418	515	549	413	511	---	496	---	---
20	431	464	---	424	---	---	428	469	---	291	---	564
21	430	---	436	432	---	---	542	---	612	574	---	506
22	440	---	430	520	542	535	485	---	596	542	---	573
23	431	434	534	---	525	510	442	---	633	556	---	621
24	---	424	436	---	638	533	---	455	630	505	---	580
25	---	435	457	518	492	521	---	409	607	547	---	---
26	433	425	---	526	465	506	401	463	---	---	---	---
27	432	425	---	515	---	---	436	465	---	---	---	568
28	462	---	429	562	---	---	396	475	571	431	---	515
29	442	---	432	560	---	581	430	---	533	308	---	268
30	433	422	429	---	---	586	---	---	569	---	---	251
31	---	---	447	---	---	519	---	618	---	---	---	---

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	---	9	6.0	6.0	6.0	7.0	---	16.0	19.0	---	13.0
2	16	12	10	---	5.0	6.0	13.0	---	15.0	18.0	---	13.0
3	20	14	8	---	5.0	5.0	---	12.0	18.0	---	---	14.0
4	16	14	7	6.0	6.0	5.0	---	13.0	17.0	---	---	---
5	17	13	---	5.0	7.0	6.0	11.0	14.0	---	17.0	---	---
6	17	12	---	5.0	---	---	10.0	15.0	---	17.0	---	13.0
7	16	---	7	6.0	---	---	11.0	16.0	19.0	18.0	---	12.0
8	15	---	8	7.0	5.0	---	13.0	---	20.0	19.0	---	12.0
9	15	12	9	---	6.0	8.0	12.0	---	19.0	18.0	---	11.0
10	---	13	---	---	6.0	7.0	---	14.0	20.0	---	---	12.0
11	---	11	---	11.0	7.0	6.0	---	15.0	---	---	---	---
12	15	10	---	6.0	7.0	7.0	13.0	13.0	---	18.0	---	---
13	16	10	---	7.0	---	---	14.0	---	---	17.0	---	13.0
14	14	---	6	7.0	---	---	14.0	13.0	---	17.0	---	13.0
15	15	---	6.0	5.0	8.0	7.0	15.0	---	---	16.0	---	13.0
16	16	12	6.0	---	7.0	8.0	14.0	---	---	17.0	---	14.0
17	---	11	7.0	---	8	7.0	---	14.0	---	---	---	13.0
18	---	12	6.0	6.0	9.0	6.0	---	12.0	19.0	---	---	---
19	16	12	---	7.0	8.0	7.0	11.0	10.0	---	17.0	---	---
20	15	13	---	6.0	---	---	10.0	12.0	---	18.0	---	12.0
21	15	---	7.0	5.0	---	---	12.0	---	18.0	17.0	---	11.0
22	14	---	7.0	6.0	7.0	8.0	13.0	---	17.0	18.0	---	12.0
23	16	10	8.0	---	7.0	8.0	11.0	---	17.0	19.0	---	12.0
24	---	9	6.0	---	6.0	---	---	16.0	18.0	20.0	---	11.0
25	---	9	5.0	6.0	6.0	8.0	---	15.0	19.0	19.0	---	---
26	15	8	---	7.0	7.0	9.0	12.0	14.0	---	---	---	---
27	15	7	---	7.0	---	---	13.0	15.0	---	---	---	11.0
28	14	---	4.0	6.0	---	---	---	16.0	18.0	18.0	---	10.0
29	13	---	6.0	5.0	---	8.0	11.0	---	19.0	18.0	---	10.0
30	13	8	5.0	---	---	9.0	---	---	20.0	---	---	12.0
31	---	---	7.0	---	---	8.0	---	17.0	---	---	---	---

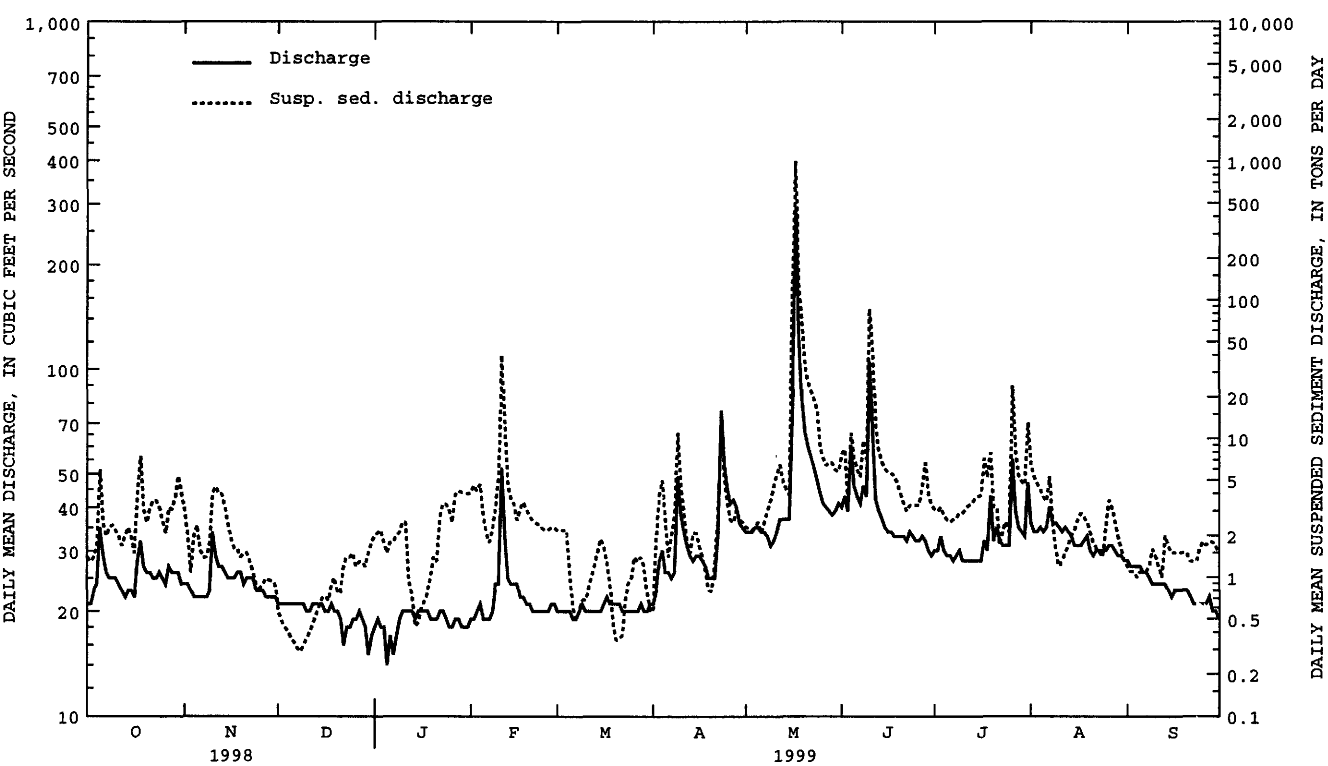
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	25	1.4	47	3.1	10	.57	41	2.0	80	4.1	41	2.2
2	23	1.3	33	2.1	8	.48	42	2.1	89	4.6	41	2.2
3	22	1.4	17	1.1	8	.44	43	2.2	80	4.2	42	2.2
4	26	1.7	34	2.0	7	.40	45	2.2	82	4.7	42	2.2
5	62	6.0	41	2.4	6	.37	44	1.7	53	2.8	20	1.1
6	32	2.5	27	1.6	6	.34	41	1.9	41	2.1	11	.60
7	28	2.0	24	1.4	5	.31	45	1.8	35	1.8	10	.50
8	33	2.3	23	1.4	5	.29	44	2.0	40	2.2	10	.56
9	36	2.4	27	1.7	6	.32	44	2.3	50	3.2	12	.69
10	33	2.2	44	4.1	6	.36	46	2.5	83	5.4	13	.68
11	30	2.0	57	4.5	7	.40	47	2.5	260	40	15	.80
12	27	1.7	55	4.0	8	.46	18	.97	128	12	19	1.0
13	33	2.0	56	4.0	9	.53	14	.72	67	4.6	23	1.2
14	38	2.3	45	3.2	11	.61	8	.44	57	3.7	29	1.5
15	32	2.0	36	2.4	13	.71	9	.47	51	3.4	35	1.9
16	25	1.5	28	1.9	13	.73	11	.60	40	2.6	30	1.7
17	49	4.1	23	1.6	12	.68	13	.67	51	3.1	22	1.3
18	81	7.5	24	1.6	15	.85	14	.77	60	3.5	16	.92
19	42	3.1	21	1.4	19	1.0	20	1.0	54	3.1	8	.46
20	37	2.5	23	1.5	18	.93	27	1.4	50	2.8	6	.35
21	46	3.2	22	1.5	21	1.1	26	1.3	48	2.6	7	.36
22	53	3.6	19	1.3	36	1.7	50	2.7	46	2.5	7	.38
23	53	3.6	17	1.1	40	1.9	65	3.4	45	2.4	13	.71
24	46	3.2	15	.90	36	1.7	67	3.4	43	2.3	17	.90
25	39	2.6	13	.83	35	1.8	68	3.4	41	2.2	19	1.0
26	32	2.1	14	.88	32	1.7	61	2.9	41	2.2	26	1.4
27	43	3.2	16	.98	30	1.6	80	4.2	41	2.3	25	1.3
28	44	3.1	16	.96	28	1.5	81	4.2	41	2.3	25	1.4
29	55	3.8	16	.94	30	1.5	82	4.1	---	---	22	1.2
30	78	5.4	15	.90	40	1.6	84	4.1	---	---	15	.80
31	62	4.1	---	---	42	1.9	82	4.0	---	---	10	.58
TOTAL	---	89.8	---	57.29	---	28.78	---	67.94	---	132.7	---	34.09

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	11	.61	27	2.5	72	7.8	39	3.1	66	6.4	16	1.2
2	31	2.0	26	2.4	72	8.4	37	3.0	58	5.3	15	1.1
3	49	3.9	25	2.3	32	3.4	36	3.2	51	4.7	14	1.1
4	62	5.0	27	2.5	65	11	34	2.8	46	4.3	14	1.0
5	37	2.6	29	2.7	58	7.2	33	2.6	41	3.8	15	1.1
6	21	1.5	25	2.3	52	6.0	32	2.5	37	3.5	15	1.1
7	31	2.0	29	2.7	48	5.3	33	2.6	48	5.3	16	1.1
8	41	2.9	37	3.2	73	9.7	35	2.7	25	2.4	18	1.2
9	80	11	46	3.9	60	7.1	37	2.9	17	1.7	24	1.6
10	45	4.6	57	4.9	168	92	38	2.9	13	1.2	22	1.4
11	31	2.9	63	5.9	246	48	40	3.1	14	1.3	18	1.2
12	22	1.9	70	7.0	118	14	43	3.3	17	1.6	16	1.0
13	19	1.5	54	5.4	86	9.0	45	3.4	20	1.8	31	2.0
14	28	2.1	48	4.7	77	7.7	49	3.7	23	2.1	28	1.7
15	28	2.1	44	4.3	71	6.8	50	3.8	27	2.3	25	1.5
16	23	1.8	196	122	70	6.5	50	3.9	32	2.7	25	1.5
17	18	1.4	927	1010	69	6.3	83	7.2	37	3.1	25	1.5
18	15	1.1	370	126	69	6.2	65	5.2	34	2.9	24	1.5
19	12	.82	318	71	61	5.4	65	7.9	31	2.7	24	1.5
20	12	.82	190	34	51	4.6	37	3.2	28	2.3	24	1.5
21	20	1.4	157	25	43	3.8	34	3.2	25	2.0	22	1.3
22	30	2.8	143	21	39	3.4	20	1.7	22	1.8	23	1.3
23	63	13	130	18	40	3.7	26	2.2	20	1.6	23	1.3
24	37	5.3	118	15	42	3.8	30	2.5	20	1.6	28	1.6
25	30	3.7	71	8.5	43	3.7	25	2.1	31	2.6	31	1.8
26	25	2.7	63	7.0	44	3.8	143	24	45	3.7	30	1.7
27	23	2.6	57	6.2	56	5.1	76	8.1	38	3.2	30	1.8
28	30	3.2	63	6.7	82	7.2	58	5.4	31	2.5	33	1.8
29	29	2.8	63	6.5	50	4.0	54	4.9	26	2.0	32	1.7
30	28	2.6	57	5.9	42	3.3	51	4.6	21	1.6	30	1.5
31	---	---	52	5.8	---	---	100	13	17	1.3	---	---
TOTAL	---	92.65	---	1545.3	---	314.2	---	144.7	---	85.3	---	42.6
YEAR		2635.35										



WATER YEAR

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--December 1991 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Water years 1992-1995 in files at the District office. Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.92 in., June 20, 1994.

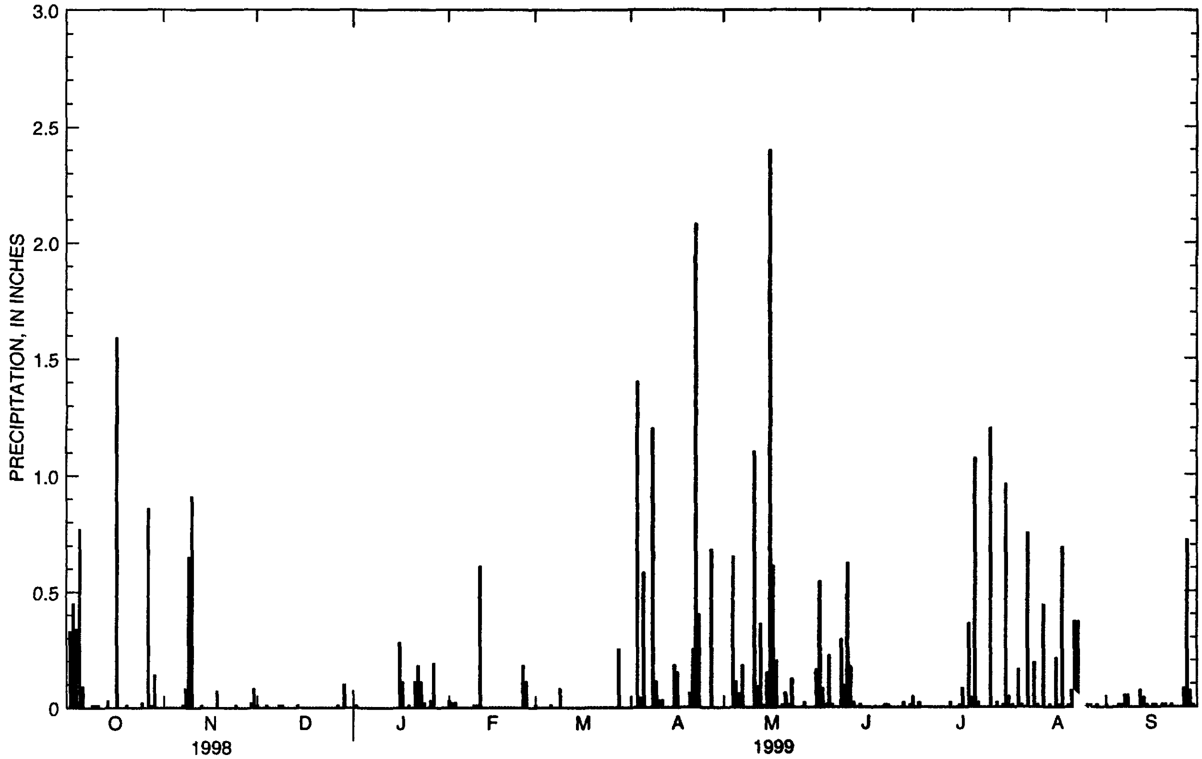
EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.40 in., May 16.

ACCUMULATED PRECIPITATION, IN INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999 DAILY SUMMATION VALUES

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.00	.03	.01	.00	.00	.54	.04	.00	.01
2	.33	.00	.00	.01	.02	.00	.00	.00	.08	.00	.01	.00
3	.45	.00	.00	.00	.02	.00	1.40	.00	.01	.02	.00	.00
4	.34	.00	.01	.00	.00	.00	.04	.65	.22	.00	.16	.00
5	.77	.00	.00	.00	.00	.00	.58	.11	.01	.00	.01	.01
6	.09	.00	.00	.00	.00	.01	.00	.06	.00	.00	.00	.01
7	.00	.01	.00	.00	.00	.00	.00	.18	.00	.00	.75	.05
8	.00	.08	.01	.00	.00	.00	1.20	.00	.29	.00	.00	.05
9	.01	.65	.01	.00	.01	.08	.11	.00	.09	.00	.19	.00
10	.01	.91	.00	.00	.01	.00	.03	.00	.62	.00	.01	.00
11	.01	.00	.00	.00	.61	.00	.03	1.10	.17	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.09	.02	.00	.44	.07
13	.00	.01	.00	.00	.00	.00	.00	.36	.00	.02	.00	.04
14	.03	.00	.01	.00	.00	.00	.00	.01	.01	.00	.01	.01
15	.00	.00	.00	.00	.00	.00	.18	.15	.00	.00	.00	.00
16	.00	.00	.00	.28	.00	.00	.15	2.40	.00	.01	.21	.01
17	1.59	.00	.00	.11	.00	.00	.00	.61	.00	.08	.01	.01
18	.00	.07	.00	.00	.00	.00	.00	.20	.00	.00	.69	.00
19	.00	.00	.00	.01	.00	.00	.00	.00	.00	.36	.00	.01
20	.01	.00	.00	.00	.00	.00	.06	.01	.00	.04	.01	.01
21	.00	.00	.00	.11	.00	.00	.25	.06	.00	1.07	.07	.00
22	.00	.00	.00	.18	.00	.00	2.08	.01	.01	.02	.37	.01
23	.00	.00	.00	.11	.00	.00	.40	.12	.01	.00	.37	.00
24	.00	.01	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
25	.02	.00	.00	.00	.18	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.03	.11	.00	.00	.00	.00	1.20	.01	.08
27	.86	.00	.01	.19	.00	.00	.68	.02	.00	.00	.01	.72
28	.01	.00	.00	.00	.00	.25	.00	.00	.02	.02	.00	.07
29	.14	.02	.10	.00	---	.00	.00	.00	.00	.00	.01	.01
30	.00	.08	.00	.00	---	.00	.00	.00	.01	.01	.00	.00
31	.00	---	.00	.00	---	.00	---	.16	---	.96	.00	---
TOTAL	4.67	1.84	0.16	1.05	0.99	0.35	7.19	6.30	2.11	3.85	3.34	1.18
MEAN	.15	.06	.01	.03	.04	.01	.24	.20	.07	.12	.11	.04
MAX	1.59	.91	.10	.28	.61	.25	2.08	2.40	.62	1.20	.75	.72
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05389400 BLOODY RUN CREEK NEAR MARQUETTE, IA--Continued



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05389500 MISSISSIPPI RIVER AT MCGREGOR, IA

LOCATION.--Lat 43°01'29", long 91°10'21", in SE1/4 SE1/4 sec.22, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank in city park at east end of Main Street in McGregor, 2.6 mi upstream from Wisconsin River, 4.3 mi downstream from Yellow River, and at mile 633.4 upstream from Ohio River.

DRAINAGE AREA.--67,500 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1936 to current year.

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 604.84 ft above sea level. Prior to June 1, 1937, and since June 2, 1939, auxiliary water-stage recorder; June 1, 1937 to June 1, 1939, auxiliary nonrecording gage 14.1 mi upstream in tailwater of dam 9, at datum 5.30 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. U.S. Geological Survey satellite and telephone modem data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1828, that of Apr. 24, 1965.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

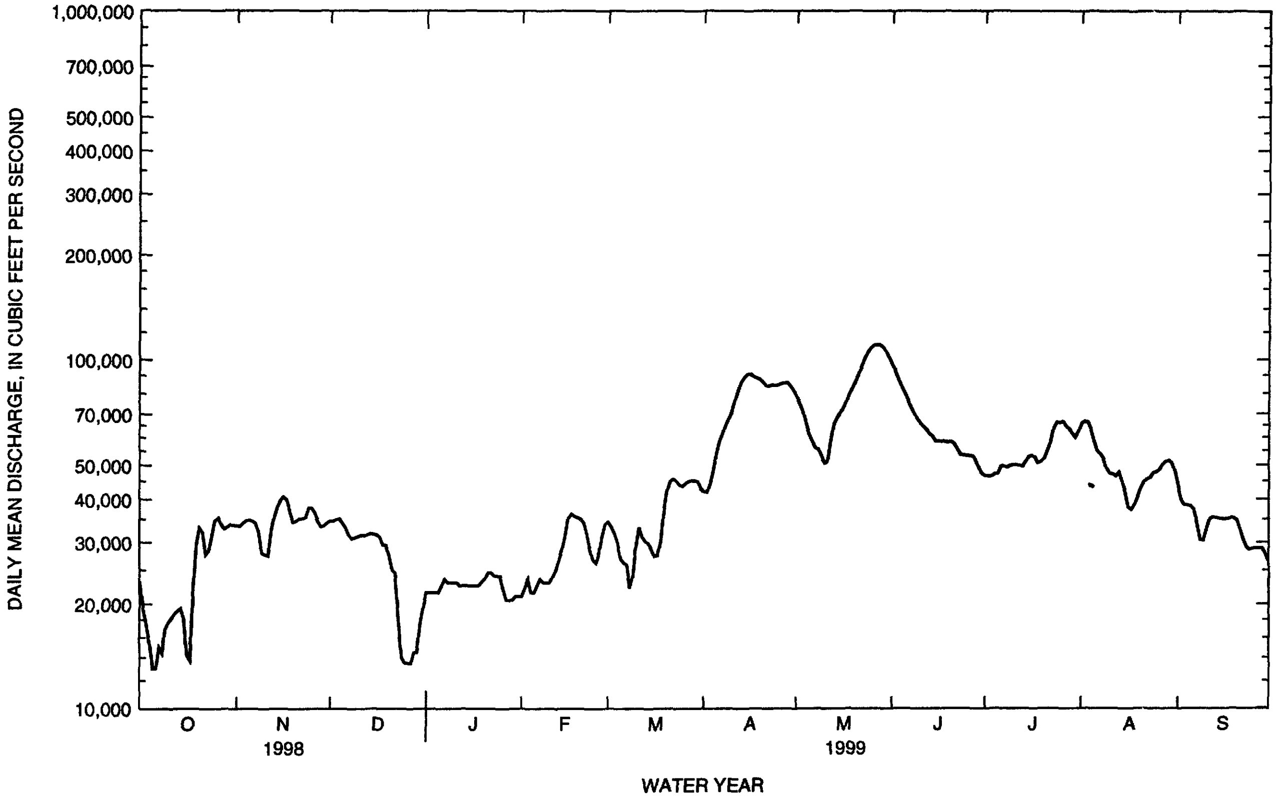
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23200	33600	34600	e21500	e21000	34300	41900	78300	96400	46500	65900	43300
2	19400	33400	34500	e21500	e22000	33200	41800	74900	91800	46500	66700	39700
3	e17500	34100	34900	e21500	e23500	31800	44300	71300	87200	46400	66100	38500
4	e15500	34700	35100	e21500	e21500	29900	48400	65700	83300	47100	62900	38400
5	e13000	34800	34100	e21500	e21500	26900	54000	61300	79900	47200	58700	38200
6	e13000	34600	33100	e22500	e22500	26200	58500	58700	76200	49400	55000	37400
7	e15000	34100	31500	e23500	e23500	25900	61500	56000	72900	49700	53800	33800
8	14400	32200	30800	e23000	e23000	22200	65300	55500	70200	49200	52300	30500
9	16900	28000	31000	e23000	e23000	24000	68300	53200	67700	49800	48900	30400
10	17600	27700	31200	e23000	e23000	29100	71000	50600	65800	50100	47300	32600
11	18100	27500	31500	e23000	23900	33100	76500	51200	64400	50100	47100	34900
12	18700	32400	31400	e22500	25000	31000	81900	58500	63200	49900	46400	35500
13	19100	35600	31500	e22500	26700	30200	86300	65500	61400	49500	47500	35400
14	19400	38100	31800	e22500	28600	29800	88900	68500	60400	51000	44800	35200
15	18200	39600	31700	e22500	31200	28800	90700	70400	58500	52800	41900	35100
16	14200	40600	31500	e22500	35200	27400	90800	72400	58500	53100	37900	35000
17	13700	39900	31100	e22500	36200	27500	89300	75700	58400	52700	37300	35100
18	21600	36400	29500	e22500	35600	30200	88600	79700	58300	50800	38400	35300
19	29500	34300	29500	e23000	35400	37000	87800	82800	58200	51100	40200	35200
20	33000	34500	e27500	e23500	35000	42000	86000	86300	58300	52300	43000	34500
21	32200	35100	e25000	e24500	34300	44900	84100	91200	57500	55000	44700	32500
22	27700	35100	e24500	e24500	31900	45500	84000	95800	55500	58000	45500	30500
23	28400	35400	e18000	e24000	28900	44900	84700	101000	53500	63800	45900	29100
24	31300	37700	e14000	e24000	26800	43900	84300	105000	53400	66100	47500	28600
25	34600	37700	e13500	e24000	26200	43500	84700	108000	53200	65900	47800	28800
26	35300	36500	e13500	e22000	27900	44300	85500	110000	53000	66400	48500	28900
27	33800	34500	e13500	e20500	31300	44900	85800	110000	52900	64300	50000	28900
28	32800	33300	e14500	e20500	33800	45100	85900	110000	51400	63400	51100	28900
29	33200	33500	e14500	e20500	---	45100	83900	108000	48800	61600	51500	28100
30	33700	34100	e17500	e21000	---	44700	81300	105000	47100	60000	50700	26600
31	33600	---	e19500	e21000	---	42800	---	101000	---	62300	47700	---
TOTAL	727600	1039000	825800	696000	778400	1090100	2266000	2481500	1917300	1682000	1533000	1004900
MEAN	23470	34630	26640	22450	27800	35160	75530	80050	63910	54260	49450	33500
MAX	35300	40600	35100	24500	36200	45500	90800	110000	96400	66400	66700	43300
MIN	13000	27500	13500	20500	21000	22200	41800	50600	47100	46400	37300	26600
AC-FT	1443000	2061000	1638000	1381000	1544000	2162000	4495000	4922000	3803000	3336000	3041000	1993000
CFSM	.35	.51	.39	.33	.41	.52	1.12	1.19	.95	.80	.73	.50
IN.	.40	.57	.46	.38	.43	.60	1.25	1.37	1.06	.93	.84	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	28840	29430	22370	19270	20030	39570	75660	61390	49120	41030	28260	28900
MAX	114600	64840	59200	35700	48540	103800	164800	119200	112600	142200	84430	72890
(WY)	1987	1983	1992	1983	1984	1983	1965	1975	1993	1993	1993	1986
MIN	9874	10870	9506	7665	9934	13190	27780	18240	13420	11220	10330	10650
(WY)	1937	1938	1937	1940	1940	1940	1990	1977	1988	1988	1964	1940

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1936 - 1999	
ANNUAL TOTAL	14465600		16041600			
ANNUAL MEAN	39630		43950		37040	
HIGHEST ANNUAL MEAN					64720	1993
LOWEST ANNUAL MEAN					17400	1977
HIGHEST DAILY MEAN	125000	Apr 8	110000	May 26	276000	Apr 24 1965
LOWEST DAILY MEAN	12500	Jan 16	13000	Oct 5,6	6200	Dec 9 1936
ANNUAL SEVEN-DAY MINIMUM	14400	Dec 24	14400	Dec 24	6490	Dec 7 1936
INSTANTANEOUS PEAK FLOW			111000	May 27		
INSTANTANEOUS PEAK STAGE			15.02	May 28	25.38	Apr 24 1965
ANNUAL RUNOFF (AC-FT)	28690000		31820000		26830000	
ANNUAL RUNOFF (CFSM)	.59		.65		.55	
ANNUAL RUNOFF (INCHES)	7.97		8.84		7.46	
10 PERCENT EXCEEDS	77700		80500		75700	
50 PERCENT EXCEEDS	34100		35600		27600	
90 PERCENT EXCEEDS	16000		21500		13200	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
1,000,000
700,000
500,000
400,000
300,000
200,000
100,000
70,000
50,000
40,000
30,000
20,000
10,000
O
N
D
J
F
M
A
M
J
J
A
S
1998
1999
WATER YEAR

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected from right bank dock 0.3 mi downstream from discharge station. Prior to April 1981, ard March 7 to Sept. 30, 1997, samples collected at bridge on U.S. Highway 18, 1.2 mi upstream from gage.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1975 to current year.
WATER TEMPERATURES: July 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1975 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, 633 microsiemens Nov. 3, 1996; minimum daily, 190 microsiemens Sept. 29, 1980.
WATER TEMPERATURES: Maximum daily, 30.0°C July 7, 1977; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,350 mg/L Mar. 19, 1986; minimum daily mean, 1 mg/L on many days in 1977-92 and 1999.
SEDIMENT LOADS: Maximum daily, 363,000 tons Mar. 19, 1986; minimum daily, 31 tons Dec. 25, 1976.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 608 microsiemens Dec. 11; minimum daily, 238 microsiemens July 12.
WATER TEMPERATURES: Maximum daily, 21.0°C, July 5; minimum daily, 4.0°C Jan. 15, Feb. 8, and Mar. 3, and 8.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 58 mg/L May 19; minimum daily mean, 1 mg/L Jan. 13, 14, and 25.
SEDIMENT LOADS: Maximum daily, 13,000 tons May 19; minimum daily, 61 tons Jan. 13, 14.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV						
03...	1345	--	47500	31	3980	99
MAR						
17...	1120	7.9	37700	49	4990	97
APR						
20...	1440	10.0	98400	37	9830	97
JUN						
02...	1320	20.7	111000	37	11100	96
JUL						
13...	1240	25.5	51600	16	2230	99
AUG						
24...	1335	--	52900	44	6280	98

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	564	467	443	---	---	---	---	---	---
2	415	464	497	---	---	---	426	---	374	372	---	297
3	---	460	---	---	466	436	---	---	---	---	---	---
4	---	465	496	605	---	---	---	---	366	---	---	---
5	464	---	---	---	466	446	424	477	---	374	---	---
6	---	466	---	562	---	---	---	---	---	---	---	321
7	469	---	494	---	---	---	---	427	472	369	---	---
8	---	---	---	560	466	442	---	---	---	---	---	390
9	467	466	493	---	---	---	371	---	476	370	---	---
10	---	---	---	---	468	441	---	416	---	---	---	300
11	---	466	608	503	---	---	---	---	---	---	---	---
12	470	---	---	---	468	442	370	446	---	238	---	---
13	---	462	---	500	---	---	---	---	---	---	---	384
14	472	---	602	---	---	---	450	428	---	373	---	---
15	---	---	---	500	464	423	---	---	---	---	---	380
16	467	465	600	---	---	---	399	---	---	370	---	---
17	---	---	---	---	467	423	---	---	---	---	---	306
18	---	469	561	504	---	---	---	364	474	---	---	---
19	467	---	---	---	437	423	361	382	---	372	---	---
20	---	469	---	505	---	---	376	---	---	---	---	390
21	466	---	564	---	---	---	---	409	473	---	---	---
22	---	---	---	502	442	422	---	---	---	---	---	380
23	466	486	568	---	---	---	376	---	473	---	---	---
24	---	---	---	---	446	420	---	420	---	---	350	380
25	---	486	562	504	---	---	---	---	470	---	---	---
26	466	---	---	---	446	422	370	404	---	---	---	---
27	---	487	---	470	---	---	---	---	---	---	---	392
28	465	---	564	---	---	---	386	364	273	---	---	---
29	---	---	---	468	---	427	---	---	---	---	---	392
30	463	494	560	---	---	---	370	---	376	---	---	---
31	---	---	---	---	---	426	---	376	---	---	---	---

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	8.0	5.0	5.0	---	---	---	---	---	---
2	20	13	12	---	---	---	6.0	---	19.0	20.0	---	15.0
3	---	---	---	---	6.0	4.0	---	---	---	---	---	---
4	---	15	10	5.0	---	---	---	---	17.0	---	---	---
5	18	---	---	---	5.0	5.0	7.0	13.0	---	21.0	---	---
6	---	13	---	6.0	---	---	---	---	---	---	---	16.0
7	17	---	9	---	---	---	---	14.0	19.0	20.0	---	---
8	---	---	---	7.0	4.0	4.0	---	---	---	---	---	15.0
9	16	14	10	---	---	---	14.0	---	20.0	19.0	---	---
10	---	---	---	---	5.0	5.0	---	15.0	---	---	---	14.0
11	---	12	10.0	5.0	---	---	---	---	---	---	---	---
12	17	---	---	---	6.0	6.0	15.0	14.0	---	20.0	---	---
13	---	13	---	6.0	---	---	---	---	---	---	---	15.0
14	15	---	9.0	---	---	---	14.0	15.0	---	19.0	---	---
15	---	---	---	4.0	7.0	6.0	---	---	---	---	---	16.0
16	17	16	9.0	---	---	---	13.0	---	---	18.0	---	---
17	---	---	---	---	6.0	7.0	---	---	---	---	---	14.0
18	---	13	8.0	5.0	---	---	---	16.0	18.0	---	---	---
19	---	---	---	---	7.0	6.0	14.0	14.0	---	20.0	---	---
20	---	12	---	5.0	---	---	15.0	---	---	---	---	14.0
21	15	---	6.0	---	---	---	---	16.0	19.0	---	---	---
22	---	---	---	5.0	6.0	7.0	---	---	---	---	---	15.0
23	12	13	6.0	---	---	---	15.0	---	20.0	---	---	---
24	---	---	---	---	5.0	8.0	---	17.0	---	---	---	14.0
25	---	15	5.0	5.0	---	---	---	---	19.0	---	---	---
26	16	---	---	---	6.0	7.0	14.0	16.0	---	---	---	---
27	---	12	---	5.0	---	---	---	---	---	---	---	---
28	15	---	8.0	---	---	---	15.0	16.0	19.0	---	---	---
29	---	---	---	6.0	---	8.0	---	---	---	---	---	---
30	16	11	7.0	---	---	---	13.0	---	18.0	---	---	---
31	---	---	---	---	---	7.0	---	17.0	---	---	---	---

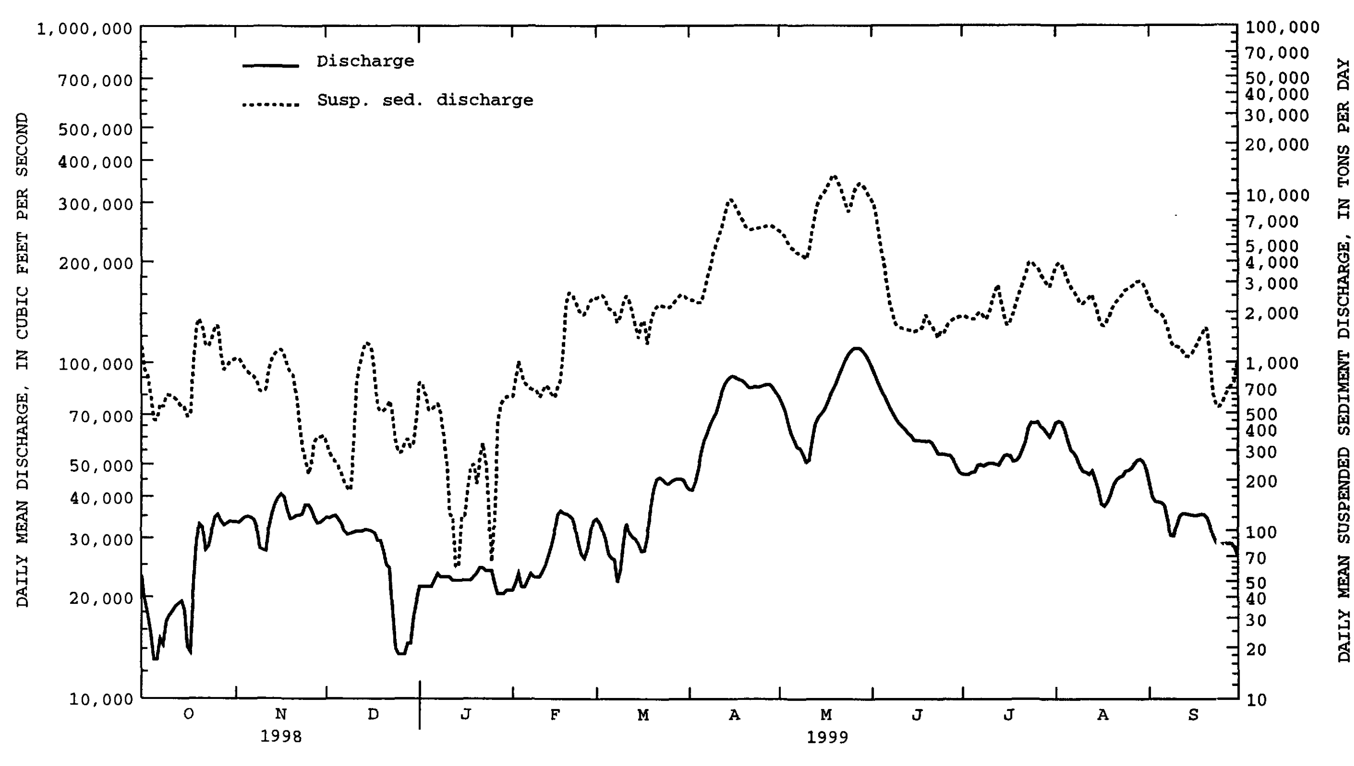
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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	20	1250	12	1060	4	337	13	755	11	624	26	2430
2	20	904	12	1060	3	292	13	755	13	772	27	2450
3	18	850	11	990	3	272	11	639	16	1020	29	2520
4	15	628	10	928	3	257	9	522	15	871	30	2390
5	13	456	9	882	3	236	9	522	13	755	29	2110
6	13	456	9	844	2	216	9	547	12	729	29	2060
7	14	567	9	828	2	194	9	571	11	698	29	2020
8	14	545	9	782	2	179	8	497	11	683	29	1730
9	14	640	9	678	2	174	6	373	11	683	29	1860
10	13	640	9	673	4	320	4	248	10	621	28	2230
11	13	624	9	689	9	725	2	124	10	667	28	2500
12	12	612	10	896	11	964	2	122	11	729	28	2340
13	11	579	11	1060	13	1130	1	61	10	709	25	2040
14	10	540	11	1130	15	1310	1	61	8	654	21	1700
15	11	540	11	1180	15	1300	2	122	7	617	18	1400
16	13	477	11	1200	14	1210	2	122	7	699	23	1700
17	13	489	10	1130	10	874	3	182	8	774	24	1780
18	16	953	10	971	7	548	4	243	13	1220	16	1290
19	20	1640	9	878	6	512	4	248	23	2240	17	1680
20	20	1820	9	842	7	520	3	190	28	2620	17	1960
21	18	1600	7	659	8	540	4	265	27	2540	18	2130
22	17	1280	5	457	9	595	5	331	27	2330	18	2200
23	16	1250	3	322	10	486	4	259	27	2100	18	2180
24	17	1400	3	265	9	340	2	130	27	1960	18	2140
25	17	1600	2	218	8	292	1	65	27	1930	18	2110
26	18	1670	3	255	8	292	2	119	28	2100	18	2160
27	13	1180	4	335	9	328	8	443	27	2320	19	2270
28	10	903	4	360	9	352	10	554	27	2450	20	2400
29	11	950	4	362	8	313	11	609	---	---	21	2520
30	11	1010	4	367	7	331	11	624	---	---	21	2530
31	11	1030	---	---	9	474	11	624	---	---	21	2430
TOTAL	---	29083	---	22301	---	15913	---	10927	---	36115	---	65260

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	21	2380	29	6040	35	9100	15	1880	21	3730	21	2400
2	21	2360	29	5810	33	8150	15	1880	22	3900	20	2150
3	19	2330	29	5560	26	6210	15	1850	21	3740	20	2040
4	17	2280	29	5140	22	4840	14	1830	20	3440	19	1990
5	16	2280	29	4830	18	3790	14	1800	20	3110	19	1940
6	16	2600	29	4650	14	2950	14	1920	19	2820	18	1850
7	19	3110	30	4460	12	2300	15	1990	18	2670	18	1610
8	21	3750	30	4440	10	1940	14	1900	18	2510	16	1350
9	24	4450	30	4280	9	1700	13	1800	17	2280	15	1240
10	26	5020	30	4110	9	1610	14	1960	17	2220	14	1240
11	28	5740	33	4590	9	1600	17	2280	18	2320	13	1230
12	30	6540	38	5990	9	1580	20	2650	19	2400	12	1160
13	33	7760	43	7630	9	1560	22	2900	20	2530	11	1080
14	38	9190	49	9070	10	1550	17	2300	19	2260	11	1080
15	38	9330	52	9840	10	1520	13	1920	18	1990	12	1120
16	36	8740	53	10300	10	1540	12	1660	16	1690	13	1200
17	33	8020	54	11000	10	1550	12	1740	16	1640	14	1310
18	31	7420	55	11800	10	1640	14	1930	17	1760	15	1430
19	29	6860	58	13000	12	1920	16	2240	18	1900	16	1540
20	27	6320	54	12600	11	1760	18	2550	18	2110	17	1610
21	27	6160	47	11500	10	1620	20	2910	19	2280	13	1120
22	27	6190	40	10200	10	1530	21	3330	20	2400	8	663
23	27	6270	33	8980	10	1400	23	3910	20	2510	7	550
24	28	6280	28	7850	11	1530	22	3920	21	2690	7	543
25	28	6340	30	8720	10	1490	21	3750	21	2740	7	579
26	28	6430	35	10400	12	1640	20	3620	21	2800	8	632
27	28	6490	37	11100	12	1740	19	3360	22	2920	9	686
28	28	6530	39	11600	13	1800	19	3170	22	3010	9	729
29	28	6410	39	11300	14	1820	18	2950	22	3040	10	762
30	28	6240	37	10500	15	1870	17	2800	22	2940	14	1010
31	---	---	35	9650	---	---	19	3180	21	2700	---	---
TOTAL	---	169820	---	256940	---	75250	---	77880	---	81050	---	37844
YEAR		878383										



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05411400 SNY MAGILL CREEK NEAR CLAYTON, IA

LOCATION.--Lat 42°56'55", long 91°11'10", in $SW^1/_4$ $NE^1/_4$ $NW^1/_4$ sec. 22, T.94 N., R.3 W. Clayton County, Hydrologic Unit 07060003, on right bank 130 ft downstream from bridge on county highway, 4.9 mi northwest of Clayton, and 0.9 mi upstream of county highway X56.

DRAINAGE AREA.--27.6 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 622.704 ft.

REMARKS.--Records good except those for estimated daily discharges and discharges greater than 600 ft^3/s, which are poor. U.S. Geological Survey rain gage and data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

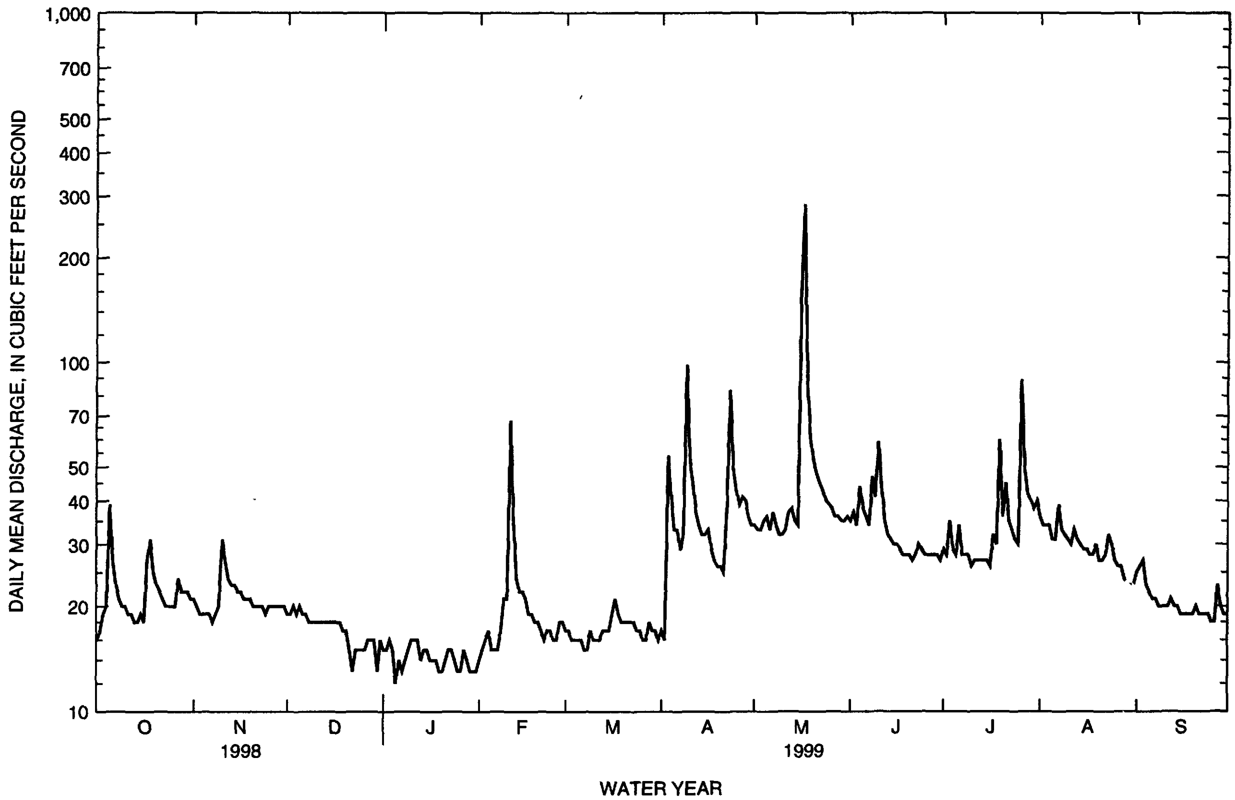
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	21	19	15	14	17	17	34	35	29	36	25
2	17	20	19	15	15	17	16	33	37	28	34	26
3	19	19	20	16	16	16	54	33	34	35	34	27
4	20	19	19	15	17	16	41	35	44	29	34	23
5	39	19	20	e12	15	16	33	36	38	28	31	22
6	27	19	19	e14	15	16	33	33	36	34	31	21
7	23	18	19	e13	15	15	29	37	34	28	39	21
8	21	19	18	e14	17	15	32	34	47	28	33	20
9	20	20	18	15	21	17	98	32	41	28	32	20
10	20	31	18	16	21	16	52	32	59	26	31	20
11	19	27	18	16	68	16	45	33	44	27	30	20
12	19	24	18	16	35	16	37	37	35	27	33	21
13	18	23	18	14	24	17	34	38	32	27	31	20
14	18	23	18	15	22	17	32	35	31	27	30	20
15	19	22	18	15	22	17	32	34	30	27	29	19
16	18	22	18	14	21	19	33	162	30	26	29	19
17	27	21	18	14	19	21	29	284	29	32	28	19
18	31	21	18	14	19	19	27	89	28	30	28	19
19	25	21	17	13	18	18	26	61	28	60	30	19
20	23	20	17	13	18	18	26	52	28	36	27	20
21	22	20	15	14	17	18	25	48	27	45	27	19
22	21	20	13	15	16	18	37	45	28	35	28	19
23	20	20	15	15	17	18	83	43	30	33	32	19
24	20	19	15	14	17	17	50	40	29	31	30	19
25	20	20	15	13	16	17	43	39	28	30	27	18
26	20	20	15	13	16	16	39	38	28	89	26	18
27	24	20	16	15	18	16	41	36	28	50	26	23
28	22	20	16	14	18	18	40	36	28	42	24	20
29	22	20	16	13	---	17	36	35	28	40	23	19
30	22	20	e13	13	---	17	34	35	27	38	23	19
31	21	---	16	13	---	16	---	36	---	40	23	---
TOTAL	673	628	532	441	567	527	1154	1595	1001	1085	919	614
MEAN	21.7	20.9	17.2	14.2	20.2	17.0	38.5	51.5	33.4	35.0	29.6	20.5
MAX	39	31	20	16	68	21	98	284	59	89	39	27
MIN	16	18	13	12	14	15	16	32	27	26	23	18
AC-FT	1330	1250	1060	875	1120	1050	2290	3160	1990	2150	1820	1220
CFSM	.79	.76	.62	.52	.73	.62	1.39	1.86	1.21	1.27	1.07	.74
IN.	.91	.85	.72	.59	.76	.71	1.56	2.15	1.35	1.46	1.24	.83

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	15.6	17.9	14.4	12.4	17.1	25.5	29.8	31.1	31.7	27.5	22.4	17.7
MAX	27.1	27.0	18.1	15.3	29.1	54.7	61.2	68.3	51.3	52.4	46.5	32.4
(WY)	1994	1994	1994	1994	1994	1993	1993	1993	1993	1993	1993	1993
MIN	8.75	11.6	8.97	8.26	10.4	17.0	13.4	14.9	13.8	16.3	12.0	9.36
(WY)	1997	1998	1998	1998	1993	1999	1997	1997	1992	1992	1992	1996

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1992 - 1999	
ANNUAL TOTAL	7809.6		9736			
ANNUAL MEAN	21.4		26.7		21.9	
HIGHEST ANNUAL MEAN					36.6	1993
LOWEST ANNUAL MEAN					14.7	1997
HIGHEST DAILY MEAN	200	Mar 31	284	May 17	313	Mar 31 1993
LOWEST DAILY MEAN	6.8	Jan 10	12	Jan 5	6.3	Sep 30 1996
ANNUAL SEVEN-DAY MINIMUM	7.6	Jan 10	13	Jan 25	7.1	Sep 29 1996
INSTANTANEOUS PEAK FLOW			1160	May 16	1300	Aug 23 1993
INSTANTANEOUS PEAK STAGE			8.32	May 16	8.60	Aug 23 1993
INSTANTANEOUS LOW FLOW			5.4	Jan 26	3.0	Jan 10 1998a
ANNUAL RUNOFF (AC-FT)	15490		19310		15890	
ANNUAL RUNOFF (CFSM)	.78		.97		.79	
ANNUAL RUNOFF (INCHES)	10.53		13.12		10.79	
10 PERCENT EXCEEDS	30		38		36	
50 PERCENT EXCEEDS	19		21		17	
90 PERCENT EXCEEDS	9.4		15		10	

a Result of freeze up
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
1,000
700
500
400
300
200
100
70
50
40
30
20
10
O
N
D
J
F
M
A
M
J
J
A
S
1998
1999
WATER YEAR

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1991 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1991 to current year.
WATER TEMPERATURES: April 1991 to current year.
SUSPENDED-SEDIMENT DISCHARGE: 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, 660 microsiemens Oct. 23, 1996; minimum daily, 266 microsiemens Mar. 16, 1993.
WATER TEMPERATURES: Maximum daily, 33.0°C June 21, 1997; minimum daily, 0.0°C Dec. 22, 1998.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,180 mg/L Mar. 30, 1998; minimum daily mean, 0 mg/L Mar. 21, 22, 1993.
SEDIMENT LOADS: Maximum daily, 3,310 tons Mar. 30, 1998; minimum daily, 0.01 tons Mar. 22, 1993.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 625 microsiemens Sept. 22; minimum daily, 355 microsiemens May 17.
WATER TEMPERATURES: Maximum daily, 31.0°C July 4; minimum daily, 0.0°C Dec. 22.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,940 mg/L May 17; minimum daily mean, 3 mg/L Mar. 8.
SEDIMENT LOADS: Maximum daily, 2,570 tons May 17; minimum daily, 0.14 tons Mar. 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV						
02...	1505	9.3	19	14	.72	52
DEC						
17...	1010	2.7	17	8	.38	71
FEB						
03...	1255	4.5	16	25	1.0	32
MAR						
15...	1630	7.0	17	11	.52	71
APR						
21...	1450	11.4	25	25	1.7	57
JUN						
03...	1625	15.7	34	--	--	--
JUL						
13...	1810	18.9	26	26	1.8	72
AUG						
24...	1632	17.0	29	18	1.4	76

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	402	403	420	---	---	435	---	---	494	---	473	438
2	402	417	---	---	---	425	617	453	474	---	472	437
3	407	415	---	---	550	---	575	486	437	442	452	---
4	---	408	---	466	607	420	499	426	397	516	---	---
5	511	---	---	403	483	---	600	---	443	456	---	480
6	407	404	---	421	432	441	458	498	456	468	422	---
7	---	---	---	405	---	---	466	---	460	545	---	444
8	406	403	413	404	435	440	514	---	556	460	---	---
9	---	---	438	---	555	406	418	413	436	---	440	527
10	---	---	414	461	487	485	558	480	530	555	497	421
11	405	406	425	422	415	---	592	411	564	487	460	---
12	402	---	428	444	508	---	525	451	---	---	420	---
13	---	---	---	---	470	450	553	430	---	410	470	426
14	417	---	---	---	---	445	511	425	---	438	---	522
15	418	---	406	408	---	500	565	436	413	500	---	---
16	---	508	408	424	409	464	481	489	517	407	527	453
17	412	410	---	411	412	464	---	355	409	392	518	---
18	431	409	412	430	449	426	---	529	409	---	488	434
19	408	407	434	475	---	---	494	578	396	426	---	469
20	---	408	424	448	457	415	413	527	525	428	---	433
21	447	---	---	461	---	---	482	---	---	---	---	423
22	405	---	421	420	417	416	460	559	402	481	---	625
23	---	413	411	441	455	462	388	---	---	404	487	518
24	---	412	461	552	---	461	---	592	464	411	424	---
25	---	403	---	415	---	511	---	502	---	439	456	---
26	409	408	421	400	420	---	404	---	410	423	---	---
27	402	414	410	424	414	513	399	523	440	---	484	542
28	---	---	436	416	---	---	576	418	---	---	435	477
29	---	---	429	428	---	488	488	---	435	480	419	---
30	---	---	550	409	---	509	434	482	472	431	---	---
31	409	---	---	---	---	439	---	---	---	449	453	---

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	15	6.5	---	---	9.0	---	---	16.0	---	23.0	20.0
2	15	11	---	---	---	8.0	16.0	17.0	17.0	---	23.0	24.0
3	13	13	---	---	9.0	---	14.0	18.0	15.5	22.0	24.0	---
4	---	9	---	2.0	4.0	6.0	14.0	18.0	15.0	31.0	---	---
5	18	---	---	2.0	6.0	---	11.0	---	23.0	25.0	---	20.0
6	15	10	---	3.0	7.0	8.0	12.0	15.0	22.0	23.0	24.0	---
7	---	---	---	3.0	---	---	15.0	---	24.0	23.0	---	20.0
8	15	10	3.0	3.0	9.0	6.0	12.0	---	20.0	26.0	---	---
9	---	---	10.0	---	8.0	6.0	11.0	15.0	24.0	---	19.0	15.0
10	---	---	8.0	3.0	9.0	7.0	10.0	18.0	21.0	18.0	22.0	20.0
11	16	10	10.0	2.0	6.0	---	10.0	15.0	22.0	23.0	24.0	---
12	16	---	9.0	4.0	4.0	---	13.0	18.0	---	---	21.0	---
13	---	---	---	---	5.0	8.0	14.0	13.0	---	19.0	24.0	14.0
14	12	---	---	---	---	8.0	14.0	16.0	---	23.0	---	14.0
15	16	---	10.0	8.0	---	11.0	12.0	16.0	16.0	25.0	---	---
16	---	8	10.0	9.0	7.0	12.0	13.0	15.0	16.0	24.0	21.0	16.0
17	17	10	---	11.0	7.0	12.0	---	15.0	18.0	25.0	20.0	---
18	13	12	10.0	11.0	7.0	10.0	---	18.0	19.0	---	24.0	16.0
19	15	8	9.0	10.0	---	---	14.0	16.0	20.0	21.0	---	16.0
20	---	6	6.0	10.0	6.0	11.0	13.0	16.0	22.0	24.0	---	17.0
21	12	---	---	11.0	---	---	14.0	---	---	---	---	16.0
22	12	---	.0	10.0	8.0	10.0	12.0	18.0	21.0	24.0	---	16.0
23	---	12	8.0	11.0	6.0	13.0	11.0	---	---	24.0	20.0	16.0
24	---	12	4.0	11.0	---	10.0	---	15.0	23.0	25.0	17.0	---
25	---	12	---	10.0	---	10.0	---	16.0	---	30.0	21.0	---
26	15	11	6.0	.5	6.0	---	16.0	---	23.0	25.0	---	---
27	15	10	6.0	10.0	9.0	12.0	13.0	18.0	24.0	---	28.0	13.0
28	---	---	4.0	11.0	---	---	16.0	20.0	---	---	30.0	12.0
29	---	---	2.0	---	---	13.0	18.0	---	22.0	25.0	24.0	---
30	---	---	2.0	---	---	14.0	16.0	18.0	23.0	28.0	---	---
31	14	---	---	---	---	16.0	---	---	---	24.0	21.0	---

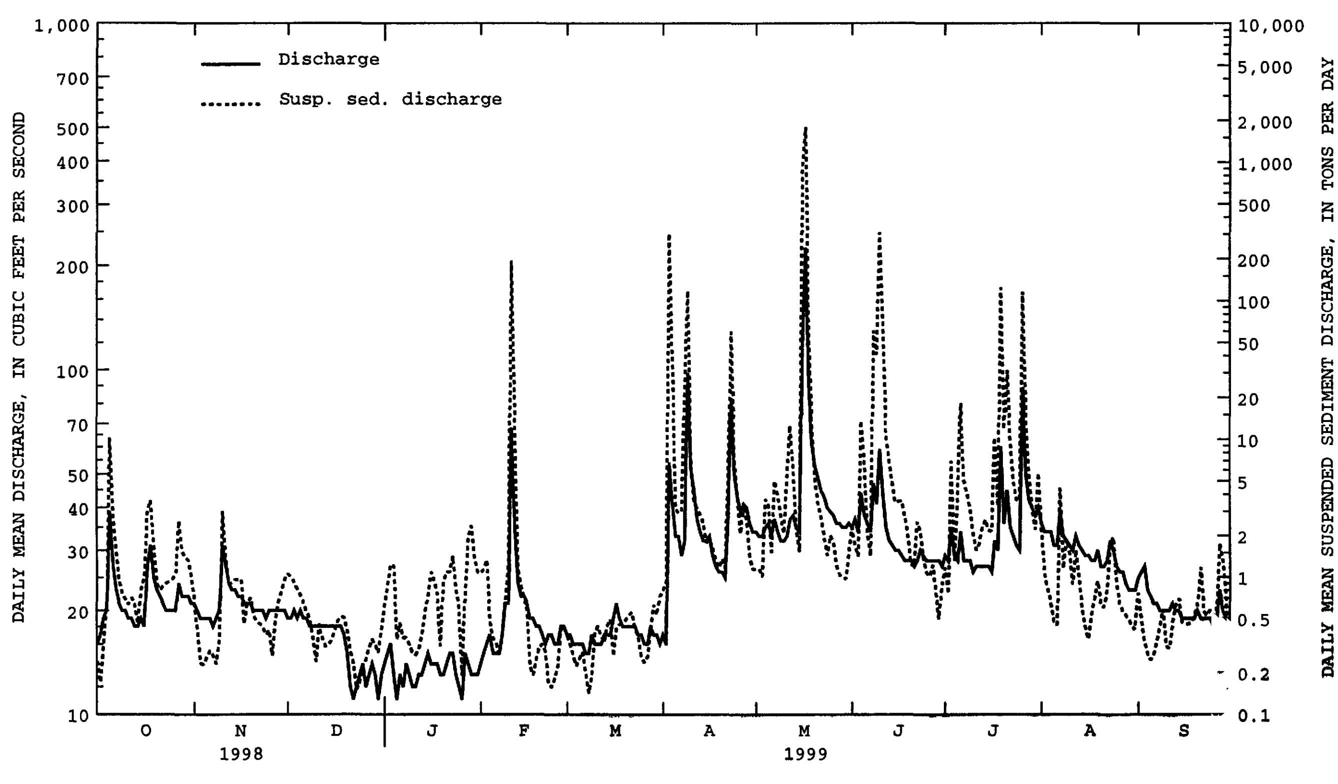
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	6	.24	12	.64	20	1.0	16	.62	28	1.1	8	.38
2	4	.17	7	.41	19	.99	21	.87	28	1.1	7	.32
3	6	.32	4	.23	17	.90	28	1.2	31	1.3	6	.26
4	11	.61	4	.23	15	.80	35	1.4	10	.47	5	.22
5	84	10	5	.26	14	.73	12	.39	9	.36	6	.25
6	38	2.8	6	.29	12	.64	13	.49	8	.33	7	.28
7	25	1.5	5	.27	11	.56	11	.39	7	.27	5	.20
8	16	.92	5	.23	10	.49	10	.38	7	.37	3	.14
9	13	.74	6	.34	7	.36	9	.38	12	.68	4	.19
10	13	.68	34	3.0	5	.24	9	.37	20	1.3	9	.39
11	12	.63	18	1.3	9	.45	8	.36	773	192	10	.44
12	14	.70	14	.88	7	.36	8	.35	140	15	8	.37
13	13	.63	14	.91	6	.31	10	.41	17	1.1	7	.33
14	9	.46	15	.95	7	.32	14	.55	14	.84	10	.44
15	16	.83	16	.95	7	.34	18	.72	12	.71	11	.49
16	20	.99	16	.96	8	.41	29	1.1	10	.57	5	.26
17	36	3.0	8	.45	10	.47	25	.93	4	.22	8	.43
18	42	3.6	11	.65	10	.51	19	.74	4	.19	9	.45
19	25	1.7	12	.70	11	.51	9	.31	5	.25	9	.46
20	14	.89	10	.53	10	.46	25	.92	6	.31	10	.49
21	14	.80	9	.47	9	.37	29	1.1	7	.32	11	.52
22	15	.85	8	.46	8	.27	26	1.1	6	.28	12	.55
23	17	.90	8	.43	5	.19	35	1.4	4	.17	9	.41
24	17	.92	7	.38	5	.19	23	.87	4	.16	8	.37
25	18	.96	8	.41	6	.25	19	.68	4	.18	6	.26
26	20	1.0	5	.27	8	.32	7	.21	5	.22	5	.24
27	38	2.5	9	.48	9	.36	19	.74	9	.41	6	.26
28	25	1.5	13	.67	9	.39	52	2.0	9	.44	9	.42
29	24	1.4	15	.81	10	.41	65	2.3	---	---	14	.63
30	23	1.3	18	.96	9	.32	39	1.4	---	---	12	.53
31	18	1.0	---	---	12	.48	30	1.1	---	---	16	.73
TOTAL	---	44.54	---	19.52	---	14.40	---	25.78	---	220.65	---	11.71

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS/DAY)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS/DAY)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS/DAY)	JULY MEAN CONCEN-TRATION (MG/L)	JULY LOAD (TONS/DAY)	AUGUST MEAN CONCEN-TRATION (MG/L)	AUGUST LOAD (TONS/DAY)	SEPTEMBER MEAN CONCEN-TRATION (MG/L)	SEPTEMBER LOAD (TONS/DAY)
1	18	.81	13	1.1	24	2.3	15	1.2	23	2.2	11	.76
2	21	.92	13	1.1	17	1.7	10	.76	11	1.0	7	.51
3	1390	304	11	1.0	15	1.4	69	7.0	9	.81	5	.34
4	297	37	38	3.7	106	14	17	1.3	7	.67	4	.28
5	35	3.2	34	3.4	65	6.8	48	3.7	6	.47	4	.25
6	33	2.9	17	1.5	21	2.1	182	18	5	.45	5	.27
7	39	3.0	51	5.0	15	1.4	68	5.1	38	4.4	6	.33
8	160	24	42	3.9	294	61	55	4.1	13	1.2	8	.44
9	320	118	32	2.8	354	41	43	3.2	22	1.9	11	.58
10	48	6.8	24	2.1	1480	310	29	2.1	18	1.5	6	.31
11	29	3.6	51	5.3	521	68	22	1.6	11	.89	5	.30
12	31	3.2	120	13	111	11	24	1.8	17	1.6	8	.46
13	31	2.8	60	6.1	80	7.0	32	2.3	12	1.0	11	.62
14	28	2.5	23	2.2	57	4.8	36	2.6	7	.59	13	.69
15	21	1.8	16	1.5	43	3.5	30	2.2	6	.44	9	.47
16	21	1.9	590	1350	44	3.6	30	2.2	4	.35	9	.45
17	21	1.6	1940	2570	45	3.6	117	10	7	.51	9	.45
18	18	1.3	221	54	37	2.8	42	3.3	9	.71	9	.46
19	17	1.2	81	13	26	2.0	577	124	11	.93	10	.52
20	20	1.4	36	5.1	17	1.2	121	12	9	.64	12	.64
21	17	1.2	26	3.4	16	1.2	246	31	8	.60	22	1.2
22	49	5.1	22	2.7	33	2.5	101	9.7	11	.82	11	.56
23	231	60	17	2.0	27	2.2	57	5.1	19	1.7	10	.52
24	55	7.4	13	1.4	17	1.4	43	3.6	24	2.0	11	.57
25	32	3.7	19	2.0	14	1.1	44	3.6	12	.91	10	.52
26	19	2.1	18	1.8	13	1.0	381	115	9	.64	11	.55
27	30	3.4	12	1.2	16	1.2	103	14	8	.57	28	1.7
28	22	2.5	11	1.0	10	.78	46	5.3	8	.53	24	1.3
29	14	1.4	10	.99	7	.49	30	3.2	8	.50	14	.71
30	12	1.1	10	.97	12	.88	22	2.2	7	.44	6	.28
31	---	---	16	1.5	---	---	51	5.7	7	.41	---	---
TOTAL	---	609.83	---	4064.76	---	561.95	---	406.86	---	31.38	---	17.04
YEAR		6028.42										



05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 1992 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Water years 1992-1995 in files at the District office. Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

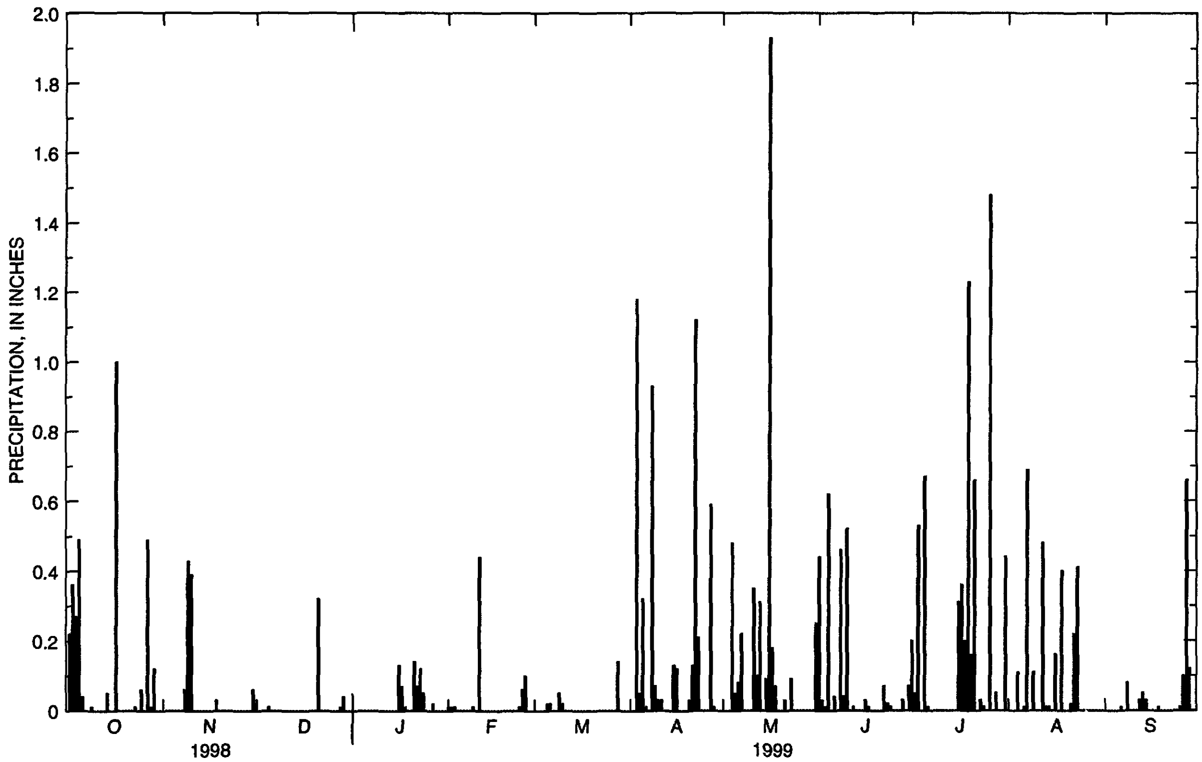
EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.42 in., Mar. 30, 1998.

EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 1.93 in., May 16.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.01	.00	.00	.00	.44	.20	.00	.00
2	.22	.00	.00	.00	.01	.00	.00	.00	.03	.05	.00	.00
3	.36	.00	.00	.00	.01	.00	1.18	.00	.01	.53	.00	.00
4	.27	.00	.00	.00	.00	.00	.05	.48	.62	.00	.11	.00
5	.49	.00	.01	.00	.00	.02	.32	.05	.00	.67	.00	.00
6	.04	.00	.00	.00	.00	.02	.01	.08	.04	.01	.01	.01
7	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.69	.00
8	.00	.06	.00	.00	.00	.00	.93	.00	.46	.00	.00	.08
9	.01	.43	.00	.00	.01	.05	.07	.00	.04	.00	.11	.00
10	.00	.39	.00	.00	.00	.02	.03	.00	.52	.00	.00	.00
11	.00	.00	.00	.00	.44	.00	.03	.35	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.10	.01	.00	.48	.03
13	.00	.00	.00	.00	.00	.00	.00	.31	.00	.00	.01	.05
14	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.03
15	.00	.00	.00	.00	.00	.00	.13	.09	.00	.00	.00	.00
16	.00	.00	.00	.13	.00	.00	.12	1.93	.03	.31	.16	.00
17	1.00	.00	.00	.07	.00	.00	.00	.18	.01	.36	.00	.00
18	.00	.03	.00	.01	.00	.00	.00	.07	.00	.20	.40	.01
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.23	.00	.00
20	.00	.00	.00	.00	.00	.00	.03	.00	.00	.16	.00	.00
21	.00	.00	.32	.14	.00	.00	.13	.03	.00	.66	.02	.00
22	.00	.00	.00	.07	.00	.00	1.12	.00	.07	.00	.22	.00
23	.01	.00	.00	.12	.00	.00	.21	.09	.02	.03	.41	.00
24	.00	.00	.00	.05	.01	.00	.00	.00	.01	.01	.00	.00
25	.06	.00	.00	.00	.06	.00	.00	.00	.00	.00	.00	.01
26	.00	.00	.00	.00	.10	.00	.00	.00	.00	1.48	.00	.10
27	.49	.00	.00	.02	.00	.00	.59	.00	.00	.00	.00	.66
28	.01	.00	.01	.00	.00	.14	.01	.00	.03	.05	.00	.12
29	.12	.00	.04	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.06	.00	.00	---	.00	.00	.00	.07	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.25	---	.44	.00	---
TOTAL	3.13	0.97	0.38	0.61	0.65	0.25	4.96	4.23	2.41	6.39	2.63	1.10
MEAN	.10	.03	.01	.02	.02	.01	.17	.14	.08	.21	.08	.04
MAX	1.00	.43	.32	.14	.44	.14	1.18	1.93	.62	1.48	.69	.66
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05411400 SNY MAGILL CREEK NEAR CLAYTON, IA--Continued



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05411500 MISSISSIPPI RIVER AT CLAYTON, IA

LOCATION.--Lat 42°54'13", long 91°08'45", $NE^1/_4$ $NW^1/_4$ sec.1, T.93 N., R.3 W., Clayton County, Hydrologic Unit 07060003, 6 miles below the Wisconsin River.

DRAINAGE AREA.--79,200 mi^2.

PERIOD OF RECORD.--April 1930 to June 1936, January 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 602.60 ft.

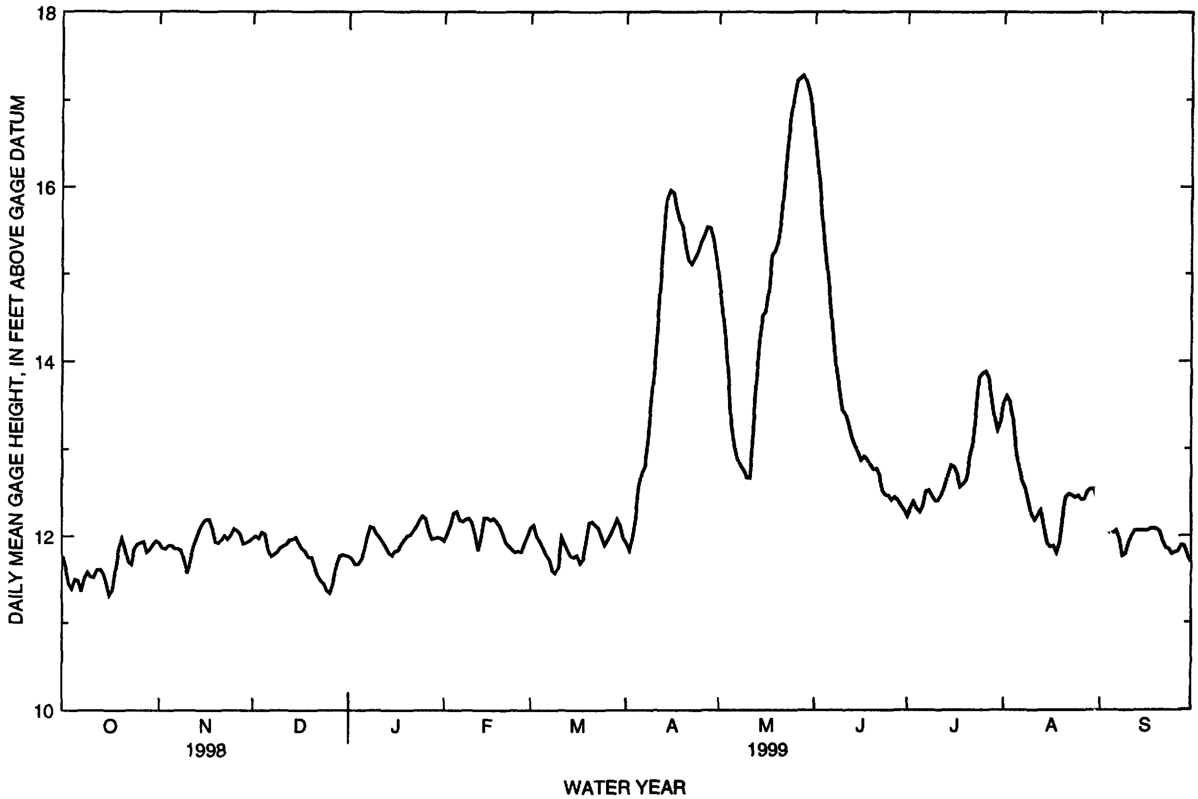
REMARKS.--Records good. U.S. Geological Survey satellite data collection platform with telephone modem at station.

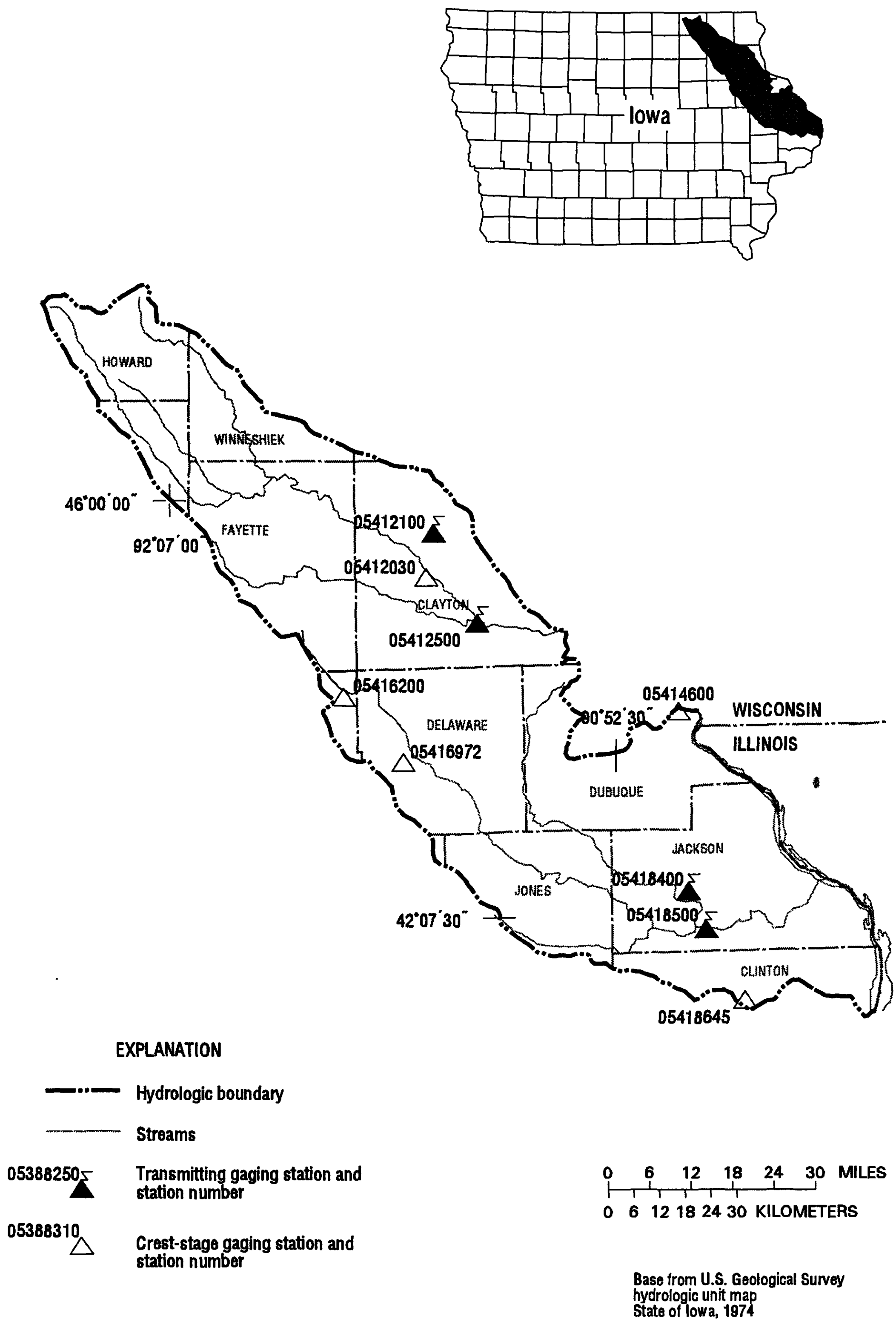
EXTREMES FOR CURRENT WATER YEAR.--Maximum gage height 17.33 ft May 28; minimum gage height 11.28 ft Oct. 16.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.76	11.92	11.97	11.76	11.94	12.09	11.92	14.89	16.52	12.22	13.52	12.21
2	11.63	11.86	12.00	11.73	12.02	12.12	11.83	14.60	16.18	12.31	13.60	12.06
3	11.45	11.85	11.97	11.67	12.12	11.99	11.97	14.27	15.76	12.39	13.54	12.01
4	11.39	11.89	12.04	11.67	12.26	11.93	12.19	13.82	15.33	12.32	13.33	12.02
5	11.50	11.89	12.02	11.72	12.28	11.86	12.56	13.27	14.99	12.27	12.97	12.03
6	11.48	11.85	11.84	11.82	12.18	11.78	12.72	13.03	14.62	12.33	12.77	12.06
7	11.36	11.85	11.76	11.98	12.16	11.72	12.80	12.88	14.21	12.51	12.63	11.97
8	11.51	11.83	11.78	12.10	12.19	11.60	13.09	12.80	13.87	12.52	12.55	11.77
9	11.58	11.70	11.81	12.09	12.20	11.57	13.54	12.75	13.67	12.46	12.40	11.79
10	11.53	11.57	11.86	12.02	12.15	11.63	13.91	12.67	13.44	12.40	12.24	11.92
11	11.52	11.74	11.88	11.98	12.01	11.98	14.39	12.66	13.39	12.41	12.18	12.00
12	11.61	11.88	11.90	11.93	11.83	11.90	14.98	13.14	13.26	12.47	12.24	12.06
13	11.61	11.98	11.95	11.87	11.99	11.83	15.50	13.75	13.12	12.56	12.29	12.06
14	11.57	12.08	11.96	11.80	12.21	11.76	15.87	14.23	13.03	12.70	12.09	12.06
15	11.46	12.15	11.98	11.77	12.21	11.75	15.96	14.51	12.96	12.81	11.91	12.06
16	11.32	12.19	11.91	11.82	12.18	11.77	15.93	14.56	12.87	12.79	11.87	12.06
17	11.38	12.19	11.85	11.83	12.20	11.68	15.77	14.81	12.91	12.71	11.88	12.08
18	11.62	12.09	11.82	11.90	12.16	11.73	15.63	15.21	12.88	12.56	11.80	12.08
19	11.86	11.93	11.75	11.95	12.11	11.93	15.54	15.26	12.81	12.59	11.92	12.08
20	11.97	11.92	11.75	12.00	12.02	12.15	15.31	15.37	12.76	12.64	12.23	12.05
21	11.85	11.95	11.64	12.01	11.92	12.16	15.15	15.64	12.77	12.90	12.44	11.94
22	11.70	12.00	11.55	12.06	11.88	12.12	15.11	16.06	12.69	13.04	12.48	11.86
23	11.67	11.96	11.48	12.11	11.84	12.09	15.18	16.46	12.52	13.37	12.47	11.85
24	11.85	12.01	11.45	12.18	11.81	11.99	15.25	16.80	12.47	13.81	12.44	11.79
25	11.90	12.08	11.37	12.23	11.82	11.89	15.36	17.04	12.46	13.86	12.46	11.81
26	11.92	12.06	11.34	12.20	11.81	11.95	15.44	17.22	12.41	13.88	12.42	11.82
27	11.93	12.02	11.45	12.05	11.91	12.02	15.54	17.25	12.44	13.81	12.42	11.89
28	11.81	11.91	11.66	11.96	11.99	12.10	15.53	17.28	12.41	13.59	12.51	11.88
29	11.84	11.92	11.76	11.97	---	12.19	15.40	17.20	12.35	13.36	12.54	11.78
30	11.90	11.94	11.78	11.98	---	12.12	15.17	17.07	12.30	13.21	12.54	11.69
31	11.94	---	11.77	11.97	---	11.97	---	16.86	---	13.31	12.43	---
MEAN	11.66	11.94	11.78	11.94	12.05	11.92	14.48	14.95	13.45	12.84	12.49	11.96
MAX	11.97	12.19	12.04	12.23	12.28	12.19	15.96	17.28	16.52	13.88	13.60	12.21
MIN	11.32	11.57	11.34	11.67	11.81	11.57	11.83	12.66	12.30	12.22	11.80	11.69

05411500 MISSISSIPPI RIVER AT CLAYTON, IA--Continued




Iowa
HOWARD
WINNESHIEK
FAYETTE
CLAYTON
DELAWARE
DUBUQUE
JACKSON
JONES
CLINTON
WISCONSIN
ILLINOIS
46°00′00″
92°07′00″
42°07′30″
90°52′30″
05412100
05412030
05412500
05416200
05416972
05414600
05418400
05418500
05418645
EXPLANATION
Hydrologic boundary
Streams
05388250
Transmitting gaging station and station number
05388310
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

05412100 ROBERTS CREEK ABOVE SAINT OLAF, IA

LOCATION.--Lat 42°55'49", long 91°23'03", in $SW^1/_4$ $NW^1/_4$ sec.25, T.94 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on left downstream bank at bridge on road X28, 0.1 mi north of county road B65, on north edge of Saint Olaf.

DRAINAGE AREA.--70.7 mi^2.

PERIOD OF RECORD.--September 1957 to July 1977 (operated as a low-flow station only), March 1986 to current year.

GAGE.--Water-stage recorder. Datum of gage is 826.73 ft above sea level.

REMARKS.--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 with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

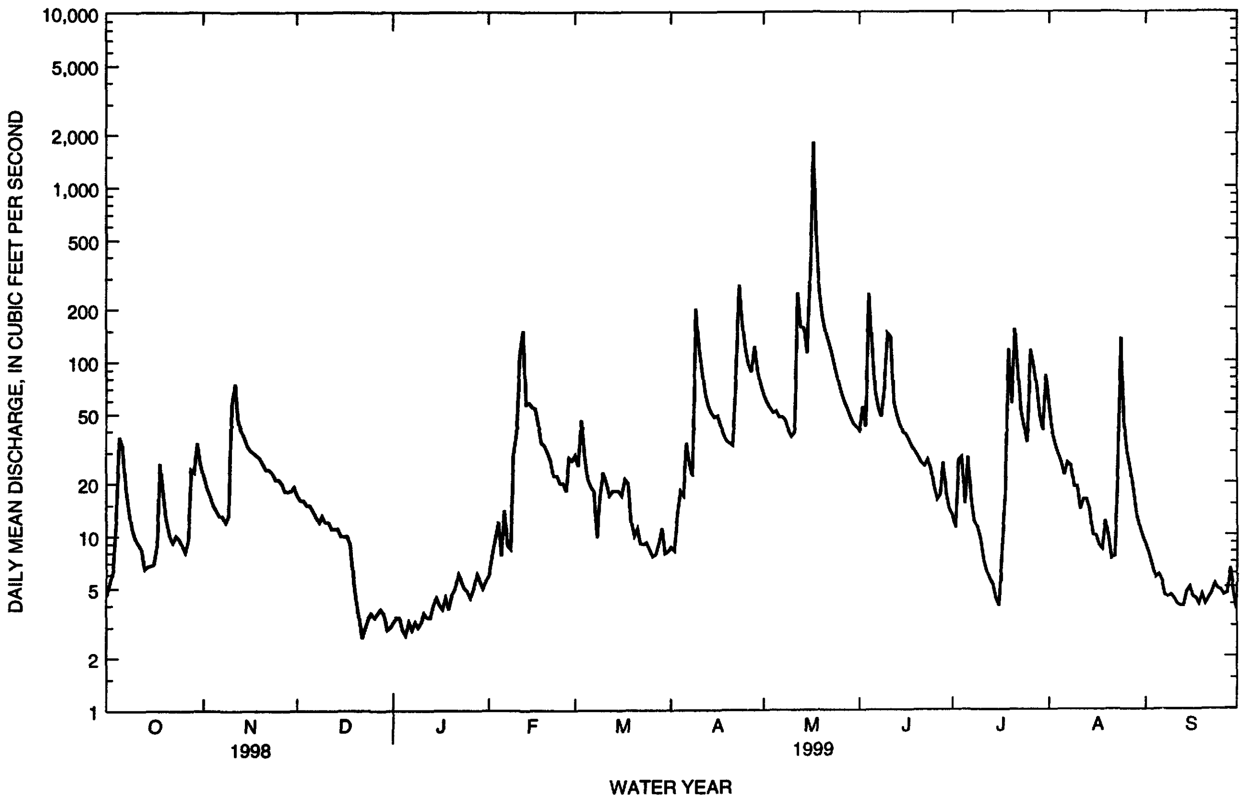
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	22	17	e3.2	e6.0	29	8.6	64	40	13	55	8.7
2	5.4	19	16	e3.4	7.6	25	8.2	58	55	11	39	7.7
3	6.4	17	16	e3.4	9.7	46	13	54	42	27	33	6.6
4	13	15	15	e2.9	12	29	18	51	241	28	29	5.7
5	37	14	15	e2.7	7.7	21	17	52	121	15	26	5.9
6	33	13	14	e3.2	14	19	34	48	67	28	22	5.4
7	19	13	13	e2.9	8.8	18	26	48	54	16	26	4.5
8	14	12	12	e3.2	8.4	9.8	22	46	48	12	25	4.4
9	11	13	13	e3.0	29	17	200	40	71	11	19	4.5
10	9.7	57	12	e3.2	39	23	120	37	144	9.3	19	4.3
11	9.0	75	12	e3.6	110	20	89	39	136	7.1	14	4.0
12	8.4	46	11	e3.4	150	17	66	245	58	6.1	16	3.9
13	6.5	40	11	e3.4	57	18	56	157	49	5.5	16	3.9
14	6.7	37	11	e4.0	58	18	51	155	43	5.2	14	4.7
15	6.8	33	10	e4.4	55	18	48	111	39	4.3	10	5.0
16	6.9	31	10	e4.0	54	17	49	308	38	3.9	9.9	4.4
17	8.9	30	10	e3.8	44	21	43	1800	35	8.8	8.7	4.3
18	26	29	e9.0	e4.4	34	20	38	476	32	18	8.3	4.0
19	17	28	e6.0	e3.8	33	12	35	248	30	116	12	4.5
20	12	26	e4.4	e4.6	30	10	34	179	28	57	9.7	4.0
21	10	24	e3.4	e5.0	27	11	33	146	26	152	7.3	4.3
22	9.2	24	e2.6	e6.0	22	9.0	84	127	25	88	7.5	4.6
23	10	23	e3.0	e5.5	22	8.9	273	110	27	52	22	5.2
24	9.6	21	e3.4	e5.0	20	9.1	167	92	24	42	135	4.9
25	8.9	21	e3.6	e4.8	20	8.3	118	78	19	34	44	4.8
26	8.1	20	e3.4	e4.4	18	7.6	96	67	16	115	30	4.5
27	9.5	18	e3.6	e5.0	28	7.8	87	59	17	94	24	4.6
28	24	18	e3.8	e6.0	27	9.0	121	54	26	72	18	6.4
29	23	18	e3.6	e5.5	---	11	89	48	17	49	13	4.6
30	34	19	e2.9	e5.0	---	7.9	73	44	14	40	11	3.7
31	26	---	e3.0	e5.5	---	8.1	---	42	---	83	9.6	---
TOTAL	433.6	776	273.7	128.2	951.2	505.5	2116.8	5083	1582	1223.2	733.0	148.0
MEAN	14.0	25.9	8.83	4.14	34.0	16.3	70.6	164	52.7	39.5	23.6	4.93
MAX	37	75	17	6.0	150	46	273	1800	241	152	135	8.7
MIN	4.6	12	2.6	2.7	6.0	7.6	8.2	37	14	3.9	7.3	3.7
AC-FT	860	1540	543	254	1890	1000	4200	10080	3140	2430	1450	294
CFSM	.20	.37	.12	.06	.48	.23	1.00	2.32	.75	.56	.33	.07
IN.	.23	.41	.14	.07	.50	.27	1.11	2.67	.83	.64	.39	.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12.6	18.8	14.1	8.34	19.1	57.6	55.6	38.3	54.0	27.2	17.4	14.8
MAX	52.8	82.5	65.7	38.9	63.5	198	167	164	313	192	87.4	49.9
(WY)	1998	1992	1992	1992	1997	1993	1993	1999	1991	1993	1993	1993
MIN	.075	.003	.000	.11	.15	16.3	1.63	.86	.29	.098	.86	.53
(WY)	1990	1990	1990	1991	1991	1999	1989	1989	1989	1989	1988	1989

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1986 - 1999	
ANNUAL TOTAL	15020.5		13954.2			
ANNUAL MEAN	41.2		38.2		28.8	
HIGHEST ANNUAL MEAN					85.6	1993
LOWEST ANNUAL MEAN					4.36	1989
HIGHEST DAILY MEAN	1030	Mar 31	1800	May 17	7090	Jun 15 1991
LOWEST DAILY MEAN	2.6	Dec 22	2.6	Dec 22	.00	Many days
ANNUAL SEVEN-DAY MINIMUM	3.3	Dec 21	3.0	Jan 4	.00	Many days
INSTANTANEOUS PEAK FLOW			2990	May 17	19600	Jun 15 1991
INSTANTANEOUS PEAK STAGE			17.96	May 17	27.88	Jun 15 1991
ANNUAL RUNOFF (AC-FT)	29790		27680		20840	
ANNUAL RUNOFF (CFSM)	.58		.54		.41	
ANNUAL RUNOFF (INCHES)	7.90		7.34		5.53	
10 PERCENT EXCEEDS	95		83		60	
50 PERCENT EXCEEDS	18		17		11	
90 PERCENT EXCEEDS	4.8		4.3		.80	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
10,000
5,000
2,000
1,000
500
200
100
50
20
10
5
2
1
O
N
D
J
F
M
A
M
J
J
A
S
1998
1999
WATER YEAR

05412500 TURKEY RIVER AT GARBER, IA

LOCATION.--Lat 42°44'24", long 91°15'42", in $SE^1/_4$ $NW^1/_4$ sec.36, T.92 N., R.4 W., Clayton County, Hydrologic Unit 07060004, on right bank 10 ft. upstream from bridge on county highway C43, 800 ft. upstream from Wayman Creek, 1,000 ft. southeast of Garber, 2,000 ft. downstream from Elk Creek, 1 mi downstream from Volga River, and 21.2 mi upstream from mouth.

DRAINAGE AREA.--1,545 mi^2.

PERIOD OF RECORD.--August 1913 to November 1916, May 1919 to September 1927, April 1929 to September 1930, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1922-25 (M), 1927 (M). WSP 1438: Drainage area; WDR IA-95-1: location.

GAGE.--Water-stage recorder. Datum of gage is 634.46 ft. above sea level. Prior to Feb. 7, 1935, nonrecording gage at same site and datum.

REMARKS.--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 data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, that of May 17, 1999.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	573	1680	1040	e380	e550	1010	822	2540	2230	1150	3840	1280
2	571	1600	1020	e420	e650	e1050	819	2380	2600	1120	3880	1210
3	600	1490	1000	e340	e700	e950	1280	2250	2720	1210	3240	1150
4	683	1400	984	e300	e750	921	1390	2150	2870	1390	2760	1100
5	1210	1320	969	e250	e700	907	1310	2180	5300	1300	2450	1060
6	1480	1260	953	e270	e650	884	1800	2160	3540	1350	2220	1030
7	1360	1210	916	e300	e700	839	2170	2100	2860	1210	2160	993
8	1210	1180	885	e320	778	820	2350	2020	2770	1110	2120	973
9	1090	1160	861	e290	1110	804	5320	1890	2780	1090	1960	951
10	1010	1540	845	e270	1270	779	4390	1790	2760	1030	1860	919
11	943	2100	828	e290	2260	808	4180	1730	3860	998	1750	895
12	891	2290	822	e270	3560	808	3460	2740	3340	948	1670	877
13	840	e2200	814	e250	2570	788	3010	3150	3080	908	1620	857
14	806	2040	806	e280	2120	781	2730	3410	2620	879	1570	841
15	809	1900	798	e260	1960	803	2500	3000	2320	847	1450	821
16	800	1820	789	e300	1900	862	2400	4000	2140	819	e1450	804
17	984	1760	780	e360	1790	999	2220	43400	2030	875	e1400	783
18	1640	e1600	778	e300	1640	1090	2020	22600	1890	956	e1350	766
19	2620	1460	772	e270	1490	1140	1900	8250	1800	1330	e1500	757
20	2390	1380	e550	e300	1360	1080	1820	5830	1720	3890	e1750	744
21	1910	1310	e400	e340	1240	1020	1750	4610	1660	8980	e1600	731
22	1660	1270	e300	e320	1150	978	2040	5940	1600	14700	e1500	721
23	1470	1240	e340	e360	1120	951	4700	5710	1580	18000	1610	716
24	1340	1190	e400	e400	1080	927	5880	4570	1530	13000	2430	707
25	1280	1160	e460	e380	1040	896	5460	3790	1450	6510	2720	693
26	1210	1130	e550	e360	994	868	4360	3310	1380	8060	2270	685
27	1210	1100	e480	e400	1010	843	3630	2980	1330	8900	1970	738
28	1330	1070	e500	e380	1020	847	3460	2740	1300	6670	1750	759
29	1420	1070	e550	e420	---	868	3100	2560	1220	4880	1590	725
30	1690	1070	e420	e460	---	848	2820	2390	1180	3980	1460	687
31	1680	---	e340	e500	---	831	---	2300	---	3800	1360	---
TOTAL	38710	44000	21950	10340	37162	28000	85091	160470	69460	121890	62260	25973
MEAN	1249	1467	708	334	1327	903	2836	5176	2315	3932	2008	866
MAX	2620	2290	1040	500	3560	1140	5880	43400	5300	18000	3880	1280
MIN	571	1070	300	250	550	779	819	1730	1180	819	1350	685
MED	1210	1350	789	320	1120	868	2450	2740	2180	1300	1750	812
AC-FT	76780	87270	43540	20510	73710	55540	168800	318300	137800	241800	123500	51520
CFSM	.81	.95	.46	.22	.86	.58	1.84	3.35	1.50	2.54	1.30	.56
IN.	.93	1.06	.53	.25	.89	.67	2.05	3.86	1.67	2.93	1.50	.63

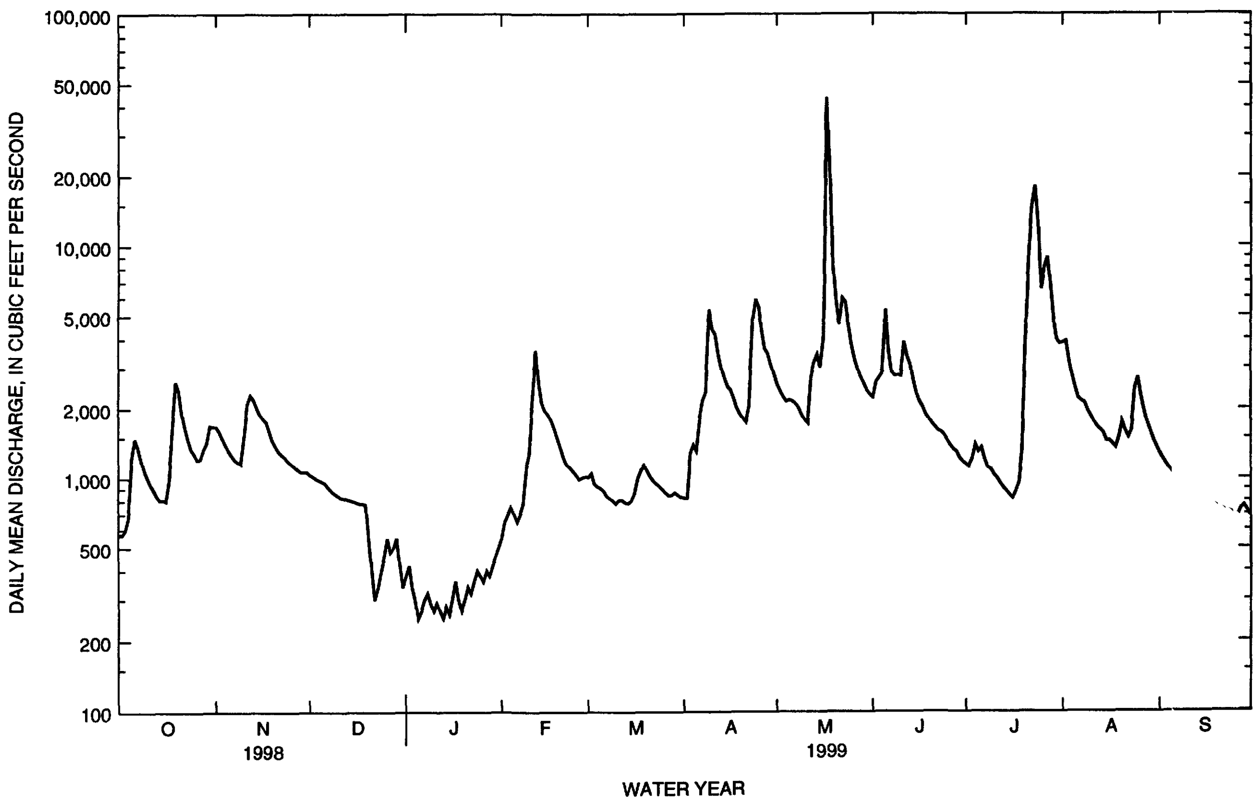
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	577	620	485	515	833	2042	1727	1340	1388	983	859	642
MAX	2527	2834	2889	3306	4265	4832	6382	5176	5316	5772	5119	3011
(WY)	1987	1962	1983	1916	1922	1979	1951	1999	1947	1993	1993	1938
MIN	88.2	92.2	78.5	62.0	60.9	188	288	95.7	103	121	140	108
(WY)	1950	1950	1959	1940	1959	1934	1957	1934	1934	1936	1964	1958

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1913 - 1999	
ANNUAL TOTAL	644002		705306			
ANNUAL MEAN	1764		1932		1004	
HIGHEST ANNUAL MEAN					2905	1993
LOWEST ANNUAL MEAN					249	1934
HIGHEST DAILY MEAN	15100	Apr 1	43400	May 17	43400	May 17 1999
LOWEST DAILY MEAN	300	Dec 22	250	Jan 5,13	49	Jan 28 1940
ANNUAL SEVEN-DAY MINIMUM	377	Jan 13	273	Jan 9	51	Jan 25 1940
INSTANTANEOUS PEAK FLOW			53900	May 17	53900	May 17 1999
INSTANTANEOUS PEAK STAGE			30.91	May 17	30.91	May 17 1999
ANNUAL RUNOFF (AC-FT)	1277000		1399000		727500	
ANNUAL RUNOFF (CFSM)	1.14		1.25		.65	
ANNUAL RUNOFF (INCHES)	15.51		16.98		8.83	
10 PERCENT EXCEEDS	3440		3490		2120	
50 PERCENT EXCEEDS	1220		1210		528	
90 PERCENT EXCEEDS	460		460		170	

e Estimated

05412500 TURKEY RIVER AT GARBER, IA--Continued



05418400 NORTH FORK MAQUOKETA RIVER NEAR FULTON, IA

LOCATION.--Lat 42°09'52", long 90°40'44", in $SW^1/_4$ $SW^1/_4$ $SE^1/_4$ sec.16, T.85 N., R.2 E., Jackson County, Hydrologic Unit 07060006, on right downstream bank at County Highway E17, 0.25 mile upstream from Prairie Creek, and 7.0 mi northeast of Maquoketa.

DRAINAGE AREA.--505 mi^2.

PERIOD OF RECORD.--April 29, 1998 to September 30, 1998.

GAGE.--Water-stage recorder. Datum of gage is 679.00 ft above sea level.

REMARKS.--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.

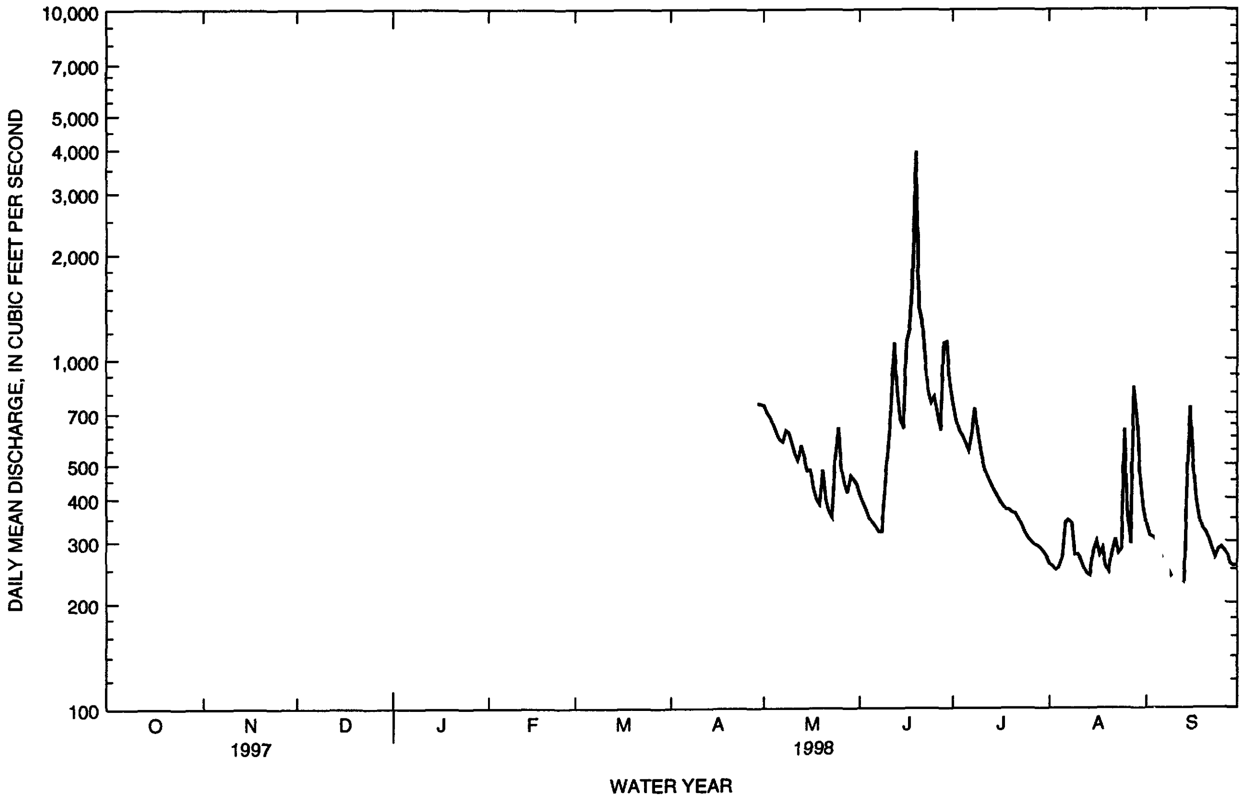
EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, Aug. 18, 1981, reached a stage of 17.26 ft, discharge, 10,700 ft^3/s, at site and datum 3.5 miles downstream, in use prior to Oct. 1, 1991.

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	---	---	---	---	---	---	---	738	408	748	259	336
2	---	---	---	---	---	---	---	702	388	671	255	312
3	---	---	---	---	---	---	---	682	371	624	249	309
4	---	---	---	---	---	---	---	648	351	603	252	303
5	---	---	---	---	---	---	---	615	340	576	267	280
6	---	---	---	---	---	---	---	590	331	548	339	268
7	---	---	---	---	---	---	---	581	320	616	346	261
8	---	---	---	---	---	---	---	625	e320	723	340	249
9	---	---	---	---	---	---	---	616	e420	611	275	237
10	---	---	---	---	---	---	---	574	e550	538	276	231
11	---	---	---	---	---	---	---	536	714	491	267	228
12	---	---	---	---	---	---	---	515	1110	464	253	227
13	---	---	---	---	---	---	---	567	811	443	243	228
14	---	---	---	---	---	---	---	527	673	425	240	448
15	---	---	---	---	---	---	---	480	633	410	283	729
16	---	---	---	---	---	---	---	482	1120	394	300	496
17	---	---	---	---	---	---	---	427	1220	381	275	396
18	---	---	---	---	---	---	---	397	1690	372	287	349
19	---	---	---	---	---	---	---	384	3940	371	255	327
20	---	---	---	---	---	---	---	482	1410	364	246	318
21	---	---	---	---	---	---	---	395	1280	362	280	304
22	---	---	---	---	---	---	---	367	1000	349	305	285
23	---	---	---	---	---	---	---	353	809	335	278	270
24	---	---	---	---	---	---	---	522	751	319	286	285
25	---	---	---	---	---	---	---	637	780	307	630	289
26	---	---	---	---	---	---	---	491	700	300	357	282
27	---	---	---	---	---	---	---	442	625	294	296	274
28	---	---	---	---	---	---	---	416	1110	292	833	259
29	---	---	---	---	---	---	e748	464	1120	287	677	255
30	---	---	---	---	---	---	742	453	854	280	459	257
31	---	---	---	---	---	---	---	438	---	272	375	---
TOTAL	---	---	---	---	---	---	---	16146	26149	13770	10283	9292
MEAN	---	---	---	---	---	---	---	521	872	444	332	310
MAX	---	---	---	---	---	---	---	738	3940	748	833	729
MIN	---	---	---	---	---	---	---	353	320	272	240	227
AC-FT	---	---	---	---	---	---	---	32030	51870	27310	20400	18430
CFSM	---	---	---	---	---	---	---	1.03	1.73	.88	.66	.61
IN.	---	---	---	---	---	---	---	1.19	1.93	1.01	.76	.68

e Estimated

05418400 NORTH FORK MAQUOKETA RIVER NEAR FULTON, IA--Continued



05418400 NORTH FORK MAQUOKETA RIVER NEAR FULTON, IA

LOCATION.--Lat 42°09'52", long 90°40'44", in $SW^1/_4$ $SW^1/_4$ $SE^1/_4$ sec.16, T.85 N., R.2 E., Jackson County, Hydrologic Unit 07060006, on right downstream bank at County Highway E17, 0.25 mile upstream from Prairie Creek, and 7.0 mi northeast of Maquoketa.

DRAINAGE AREA.--505 mi^2.

PERIOD OF RECORD.--April 29, 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 679.00 ft above sea level.

REMARKS.--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.--A flood, Aug. 18, 1981, reached a stage of 17.26 ft, discharge, 10,700 ft^3/s, at site and datum 3.5 miles downstream, in use prior to Oct. 1, 1991.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	264	405	311	e100	e260	345	286	783	584	511	440	305
2	262	393	297	e110	e290	333	285	752	616	456	412	303
3	290	380	302	e120	e340	319	333	725	604	648	381	304
4	320	365	304	e110	e500	304	424	708	558	466	370	310
5	520	353	302	e100	661	306	506	731	683	436	361	317
6	636	351	305	e85	497	302	499	703	643	417	357	324
7	551	345	299	e95	431	281	538	683	613	411	369	330
8	457	344	280	e110	435	287	513	662	545	396	378	342
9	402	348	278	e95	582	286	1050	625	4690	405	359	333
10	374	619	277	e110	628	338	1150	596	1940	405	349	326
11	350	638	274	e120	749	302	951	586	1680	373	350	331
12	334	531	277	e110	1390	285	812	592	2350	363	381	e310
13	318	467	278	e90	913	278	711	733	1610	360	685	e300
14	306	452	279	e100	692	280	660	784	1350	356	465	e300
15	391	438	279	e110	601	285	636	748	1010	352	322	e290
16	380	414	280	e120	560	306	690	710	864	352	307	e280
17	508	396	279	e130	517	396	700	4650	793	350	299	e280
18	1440	376	280	e110	473	481	644	7400	735	351	299	e270
19	1030	370	281	e120	443	397	599	2160	691	372	305	e270
20	759	354	269	e130	414	352	575	1600	656	436	300	e270
21	638	342	e210	e140	384	341	565	1330	623	1550	291	e260
22	560	343	e170	e140	366	328	1040	1170	604	2020	291	e260
23	507	346	e140	e140	363	318	3320	1050	606	862	395	e260
24	478	332	e120	e140	354	316	1890	963	584	676	873	264
25	454	329	e150	e130	348	305	1360	876	552	568	502	261
26	438	327	e170	e150	344	295	1150	809	528	599	404	260
27	433	317	e170	e170	375	290	1050	757	516	685	372	292
28	456	312	e170	e160	369	293	1010	720	511	611	351	332
29	447	318	e140	e160	---	293	918	688	e500	520	332	304
30	446	328	e120	e190	---	284	836	650	e500	476	319	280
31	429	---	e110	e220	---	282	---	619	---	454	308	---
TOTAL	15178	11633	7401	3915	14279	9808	25701	36563	28739	17237	11927	8868
MEAN	490	388	239	126	510	316	857	1179	958	556	385	296
MAX	1440	638	311	220	1390	481	3320	7400	4690	2020	873	342
MIN	262	312	110	85	260	278	285	586	500	350	291	260
AC-FT	30110	23070	14680	7770	28320	19450	50980	72520	57000	34190	23660	17590
CFSM	.97	.77	.47	.25	1.01	.63	1.70	2.34	1.90	1.10	.76	.59
IN.	1.12	.86	.55	.29	1.05	.72	1.89	2.69	2.12	1.27	.88	.65

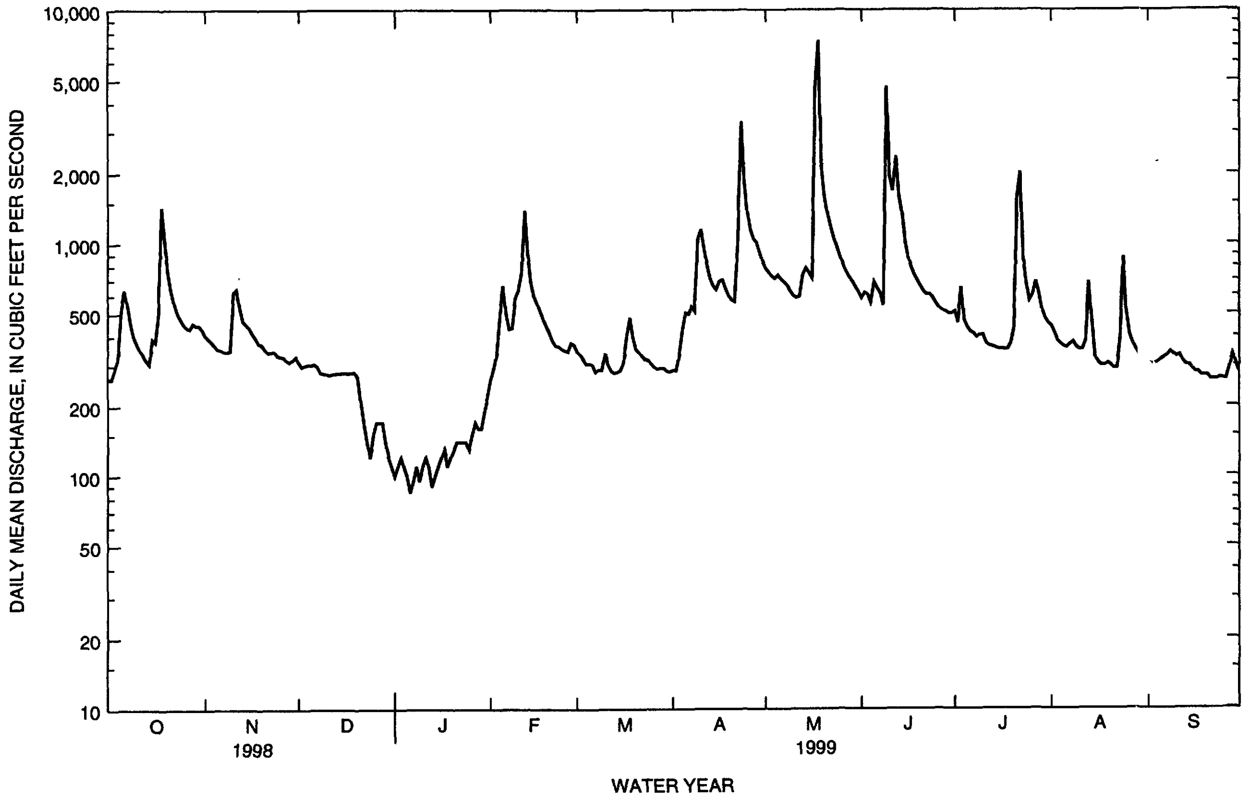
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	490	388	239	126	510	316	857	850	915	500	358	303
MAX	490	388	239	126	510	316	857	1179	958	556	385	310
(WY)	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999	1998
MIN	490	388	239	126	510	316	857	521	872	444	332	296
(WY)	1999	1999	1999	1999	1999	1999	1999	1998	1998	1998	1998	1999

SUMMARY STATISTICS	FOR 1999 WATER YEAR		WATER YEARS 1998 - 1999	
ANNUAL TOTAL	191249			
ANNUAL MEAN	524		524	
HIGHEST ANNUAL MEAN			524	1999
LOWEST ANNUAL MEAN			524	1999
HIGHEST DAILY MEAN	7400	May 18	7400	May 18 1999
LOWEST DAILY MEAN	85	Jan 6	85	Jan 6 1999
ANNUAL SEVEN-DAY MINIMUM	101	Jan 4	101	Jan 4 1999
INSTANTANEOUS PEAK FLOW	10700	May 18	10700	May 18 1999
INSTANTANEOUS PEAK STAGE	16.46	May 18	16.46	May 18 1999
ANNUAL RUNOFF (AC-FT)	379300		379600	
ANNUAL RUNOFF (CFSM)	1.04		1.04	
ANNUAL RUNOFF (INCHES)	14.09		14.10	
10 PERCENT EXCEEDS	846		809	
50 PERCENT EXCEEDS	370		372	
90 PERCENT EXCEEDS	170		249	

e Estimated

05418400 NORTH FORK MAQUOKETA RIVER NEAR FULTON, IA--Continued



05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA

LOCATION.--Lat 42°05'00", long 90°37'58", in SW$^1/_4$ NE$^1/_4$ sec.17, T.84 N., R.3 E., Jackson County, Hydrologic Unit 07060006, on right downstream bank at State Highway 62 bridge, 900 ft. upstream from Prairie Creek, 2.0 mi northeast of Maquoketa, 2.2 mi downstream from North Fork, and 26.7 mi upstream from mouth.

DRAINAGE AREA.--1,553 mi^2.

PERIOD OF RECORD.--September 1913 to current year. Prior to October 1939, published as "below North Fork near Maquoketa". Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 405: 1914. WSP 1438: Drainage area. WSP 1508: 1914-17, 1919-25, 1926 (M), 1929, 1933-34 (M), 1943.

GAGE.--Water-stage recorder. Datum of gage is 625.96 ft. above sea level. Prior to July 14, 1924, nonrecording gage, and July 15, 1924 to Sept. 30, 1972, recording gage at site 300 ft. upstream from State Highway 62 bridge at datum 10.00 ft. higher. On Aug. 3, 1995 the gage was moved to the current location.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation caused by power plant 4 mi upstream of station. 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 data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, probably in 1903, reached a stage of 23.5 ft., discharge, 43,000 ft.3/s, at datum in use prior to Oct. 1, 1972.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	889	2130	1090	e270	e650	1100	941	2260	1930	1420	1370	864
2	874	1960	1050	e300	e700	1160	942	2090	1920	1290	1290	877
3	965	1930	1060	e320	e850	1070	1120	2000	1980	4170	1180	814
4	1070	1500	1060	e270	e1200	1020	1330	1920	2140	4980	1120	835
5	1640	1620	1050	e240	e1500	1040	1310	1950	1940	2030	1060	798
6	2550	1460	1020	e210	e1300	1060	1500	1860	2530	1710	1010	772
7	3090	1400	1090	e240	e1200	953	1560	1820	2270	1540	1000	762
8	2630	1330	1040	e270	1430	947	1550	1760	2020	1350	975	758
9	2170	1310	966	e240	1460	905	3520	1670	4480	1350	980	750
10	1930	2060	939	e270	1690	1040	3670	1610	6060	1300	939	738
11	1720	2110	911	e290	1900	1010	3680	e1500	3940	1210	921	735
12	1620	2110	949	e250	3210	949	2990	e1600	4670	1170	957	735
13	1320	1910	916	e230	3140	942	2640	1920	4950	1130	1290	732
14	1430	1850	901	e260	2400	887	2320	2330	3480	1060	1140	683
15	1600	1670	897	e280	1990	940	2170	2880	2790	1040	956	699
16	1570	1750	926	e300	1880	961	2350	2640	2580	1010	901	662
17	2180	1370	898	e320	1780	1080	2410	5190	2250	1000	870	681
18	5470	e1300	880	e290	1490	1260	2180	13400	2070	970	831	651
19	5040	1350	913	e320	1530	1220	2020	14900	1950	1030	874	660
20	3970	1360	e750	e340	1380	1150	1910	8360	1860	1140	825	662
21	3200	1320	e550	e380	1300	1080	1870	4510	1760	1230	832	633
22	2650	1220	e440	e380	1270	1050	2250	3890	1710	e2000	788	632
23	2350	1180	e320	e380	1230	1030	6930	3510	1700	2430	936	634
24	2070	1270	e380	e380	1190	1010	5680	3080	1670	2030	1710	641
25	1930	1170	e420	e360	1110	994	4540	2890	1600	1650	2410	632
26	1800	1160	e460	e400	1140	973	3650	2540	1530	1460	1950	634
27	1660	1150	e460	e440	1210	953	3250	2200	1470	1610	1540	659
28	1770	1100	e460	e420	1200	957	2930	2080	1330	2360	1180	748
29	1860	1100	e400	e420	---	959	2640	2010	1110	2010	1090	751
30	1810	1120	e320	e500	---	940	2350	1980	1340	1780	963	699
31	2110	---	e270	e600	---	933	---	2000	---	1460	942	---
TOTAL	66938	45270	23786	10170	42330	31573	78203	104350	73030	51920	34830	21531
MEAN	2159	1509	767	328	1512	1018	2607	3366	2434	1675	1124	718
MAX	5470	2130	1090	600	3210	1260	6930	14900	6060	4980	2410	877
MIN	874	1100	270	210	650	887	941	1500	1110	970	788	632
AC-FT	132800	89790	47180	20170	83960	62630	155100	207000	144900	103000	69090	42710
CFSM	1.39	.97	.49	.21	.97	.66	1.68	2.17	1.57	1.08	.72	.46
IN.	1.60	1.08	.57	.24	1.01	.76	1.87	2.50	1.75	1.24	.83	.52

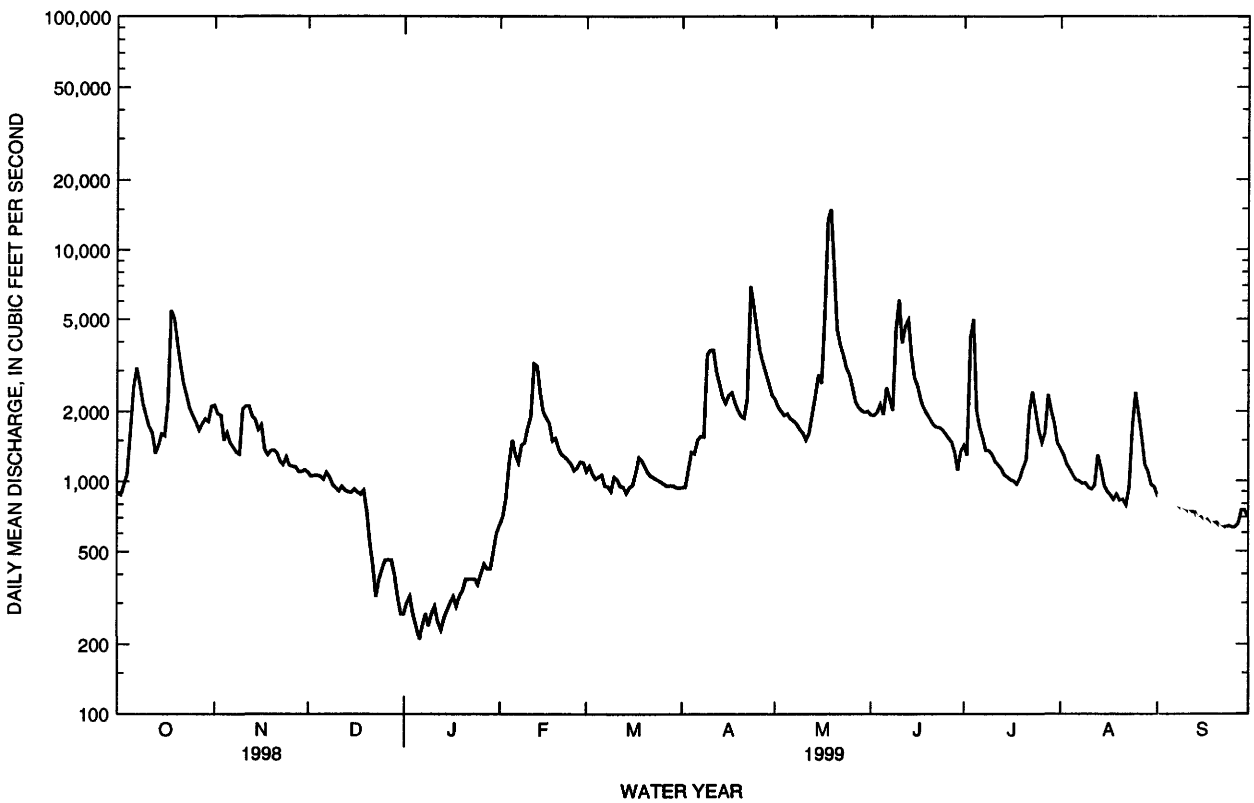
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1999, BY WATER YEAR (WY)

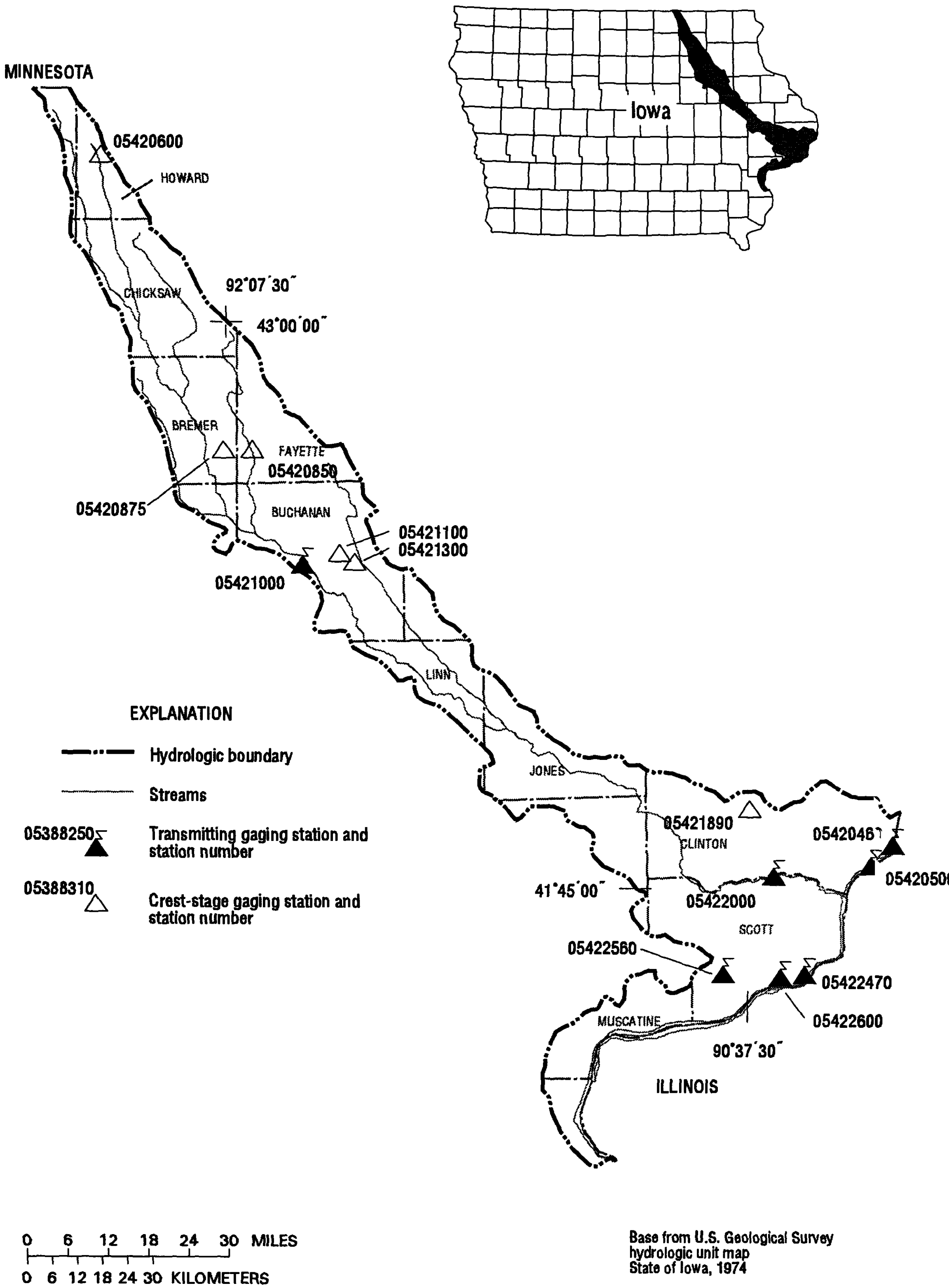
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	737	793	660	688	1110	1858	1388	1258	1469	1067	835	884
MAX	2486	4983	2397	2851	4161	4798	4843	4267	6670	8835	3340	3074
(WY)	1987	1962	1983	1960	1971	1993	1973	1974	1947	1993	1924	1981
MIN	210	198	177	150	196	241	305	198	170	177	227	182
(WY)	1957	1959	1959	1940	1936	1934	1934	1934	1934	1936	1958	1958

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1914 - 1999	
ANNUAL TOTAL	643044		583931			
ANNUAL MEAN	1762		1600		1061	
HIGHEST ANNUAL MEAN					2874	1993
LOWEST ANNUAL MEAN					306	1958
HIGHEST DAILY MEAN	15100	Apr 2	14900	May 19	34800	Jun 27 1944
LOWEST DAILY MEAN	270	Dec 31	210	Jan 6	105	Feb 11 1936
ANNUAL SEVEN-DAY MINIMUM	399	Dec 25	249	Jan 4	105	Feb 11 1936
INSTANTANEOUS PEAK FLOW			16000	May 18	48000	Jun 27 1944
INSTANTANEOUS PEAK STAGE			25.77	May 18	24.70	Jun 27 1944
ANNUAL RUNOFF (AC-FT)	1275000		1158000		768800	
ANNUAL RUNOFF (CFSM)	1.13		1.03		.68	
ANNUAL RUNOFF (INCHES)	15.40		13.99		9.28	
10 PERCENT EXCEEDS	3390		2710		2000	
50 PERCENT EXCEEDS	1350		1230		657	
90 PERCENT EXCEEDS	650		452		300	

e Estimated





Iowa
MINNESOTA
05420600
HOWARD
CHICKSAW
92°07'30"
43°00'00"
BREMER
FAYETTE
05420850
05420875
BUCHANAN
05421100
05421300
05421000
LINN
EXPLANATION
Hydrologic boundary
Streams
05388250
Transmitting gaging station and station number
05388310
Crest-stage gaging station and station number
JONES
05421890
CLINTON
05420461
05420500
41°45'00"
05422000
SCOTT
05422560
05422470
05422600
MUSCATINE
90°37'30"
ILLINOIS
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

05420460 BEAVER SLOUGH AT THIRD STREET CLINTON, IA

LOCATION.--Lat 41°49'38", long 90°11'25", in $SW^1/_4$ $SE^1/_4$ $NW^1/_4$ sec.18, T.81 N., R.7 E., Clinton County, Hydrologic Unit 07080101, at river end of 3rd street, at downstream end of ADM repair dock, 10.3 miles upstream from Wapsipinicon River, 4.8 miles upstream from Camanche gage, 5.9 miles downstream from Lock and Dam 13, and at mile 516.6 upstream from Ohio River.

DRAINAGE AREA.--85,600 mi^2, approximately, at Fulton-Lyons Bridge at Clinton.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. 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 at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

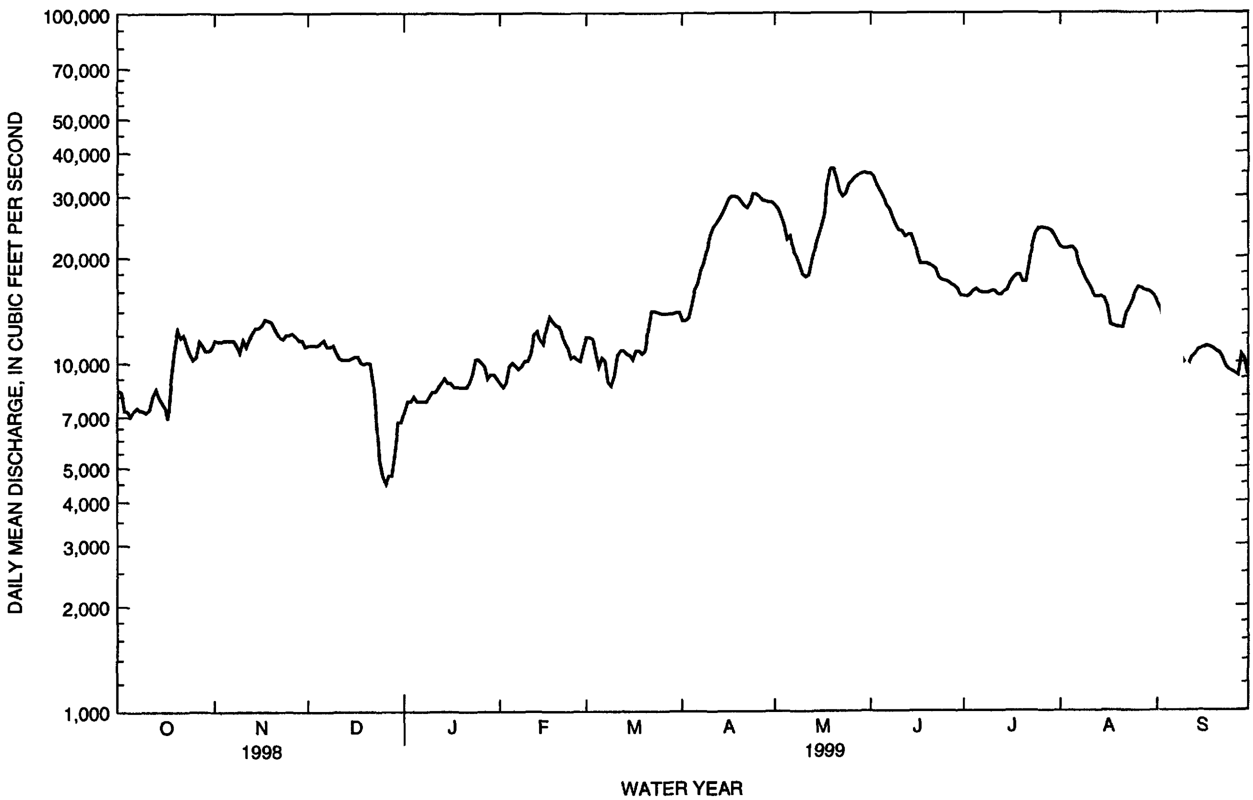
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8350	11600	11200	e7250	e8750	11800	13200	28200	34800	15500	21400	14700
2	8250	11500	11200	e7750	e8500	11800	13200	27500	34200	15400	21200	14100
3	7300	11500	11200	e7750	e8750	11700	13400	26200	32500	15600	21200	13100
4	7280	11600	11200	e8000	9780	10600	14600	24700	31200	16000	21300	12400
5	7050	11600	11400	e7750	9980	9720	16100	22500	30000	16200	21300	12200
6	7300	11600	11600	e7750	9800	10300	16800	23000	28200	15900	20700	11600
7	7450	11600	11100	e7750	9580	10100	18300	20800	27500	15800	19100	11400
8	7320	11200	11100	e7750	9780	8800	19300	20100	26000	15800	18300	10600
9	7280	10700	11200	e8000	10100	8580	21100	19000	24800	15800	17400	10200
10	7200	11600	10700	e8250	10100	9120	23100	17900	23900	16000	16800	9880
11	7350	11100	10300	e8250	10600	10500	24400	17600	23800	16000	16200	9800
12	8050	11700	10200	e8500	12000	10800	25000	17800	23000	15600	15400	10300
13	8400	12100	10200	e8750	12300	10800	25800	19600	23200	15600	15400	10500
14	7950	12600	10200	e9000	11600	10600	26800	21400	23200	15900	15400	10800
15	7700	12600	10300	e8750	11300	10500	28000	22900	21900	16100	15200	10900
16	7450	12800	10400	e8750	12500	10200	29500	24500	20400	16900	14400	11000
17	6920	13300	10400	e8500	13500	10800	30000	26500	19200	17400	12800	11100
18	9000	13200	10000	e8500	13100	10800	30000	32500	19200	17800	12700	11000
19	10900	13100	9920	e8500	12800	10600	29800	36000	19200	17800	12600	10900
20	12400	12600	10000	e8500	12700	10800	29000	36000	19000	17000	12600	10700
21	11800	12200	9950	e8500	12200	12400	28200	33800	18800	17000	12600	10600
22	12000	11800	8700	e8750	11400	14000	27800	31000	18500	19100	13800	10200
23	11200	11700	6850	e9250	11000	14000	28800	30000	17500	21700	14300	9720
24	10600	12000	e5250	e10200	10300	13900	30500	30500	17200	23400	15000	9500
25	10200	12000	e4750	e10200	10400	13800	30500	32500	17100	24200	15800	9400
26	10400	12100	e4500	e10000	10200	13800	30000	33200	17000	24300	16400	9280
27	11500	11900	e4750	e9750	10100	13800	29200	34000	16700	24200	16300	9150
28	11200	11600	e4750	e9000	11000	13800	29000	34500	16500	24100	16100	10500
29	10800	11600	e5500	e9250	---	13800	28800	34800	16200	23800	16000	10200
30	10800	11100	e6750	e9250	---	13900	28800	35000	15500	23100	15800	9180
31	11000	---	e6750	e9000	---	13900	---	34800	---	22200	15500	---
TOTAL	282400	357600	282320	267150	304120	360020	739000	848800	676200	571200	509000	324910
MEAN	9110	11920	9107	8618	10860	11610	24630	27380	22540	18430	16420	10830
MAX	12400	13300	11600	10200	13500	14000	30500	36000	34800	24300	21400	14700
MIN	6920	10700	4500	7250	8500	8580	13200	17600	15500	15400	12600	9150
AC-FT	560100	709300	560000	529900	603200	714100	1466000	1684000	1341000	1133000	1010000	644500
CFSM	.11	.14	.11	.10	.13	.14	.29	.32	.26	.22	.19	.13
IN.	.12	.16	.12	.12	.13	.16	.32	.37	.29	.25	.22	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	11920	13610	10550	9984	10990	16350	30930	26310	20200	21300	15260	12260
MAX	15960	18320	11680	12780	14510	19900	43980	34520	35240	49690	28330	21640
(WY)	1996	1996	1997	1995	1994	1995	1997	1993	1993	1993	1993	1993
MIN	7741	9559	8402	7831	8358	11610	21540	14640	13010	11950	8985	6083
(WY)	1997	1998	1998	1998	1993	1999	1994	1998	1997	1995	1996	1996

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1993 - 1999	
ANNUAL TOTAL	5149140		5522720			
ANNUAL MEAN	14110		15130		16660	
HIGHEST ANNUAL MEAN					23060	1993
LOWEST ANNUAL MEAN					14000	1998
HIGHEST DAILY MEAN	44500	Apr 11	36000	May 19,20	59500	Jul 7 1993
LOWEST DAILY MEAN	4500	Jan 16	4500	Dec 26	4370	Sep 22 1996
ANNUAL SEVEN-DAY MINIMUM	5070	Jan 13	5180	Dec 24	4860	Sep 18 1996
ANNUAL RUNOFF (AC-FT)	10210000		10950000		12070000	
ANNUAL RUNOFF (CFSM)	.16		.18		.19	
ANNUAL RUNOFF (INCHES)	2.24		2.40		2.64	
10 PERCENT EXCEEDS	26200		27900		29000	
50 PERCENT EXCEEDS	11600		12200		13300	
90 PERCENT EXCEEDS	6870		8380		8520	

e Estimated


100,000
70,000
50,000
40,000
30,000
20,000
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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
O
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A
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J
A
S
1998
1999
WATER YEAR

05420500 MISSISSIPPI RIVER AT CLINTON, IA

(National stream-quality accounting network station)

LOCATION.--Lat 41°46'50", long 90°15'07", in $NW^1/_4$ sec.34, T.81 N., R.6 E., Clinton County, Hydrologic Unit 07080101, on right bank at end of Eighth Avenue in Camanche, 5.0 mi upstream from Wapsipinicon River, 6.4 mi downstream from Clinton, 10.6 mi downstream from Lock and Dam 13, and at mile 511.8 upstream from Ohio River.

DRAINAGE AREA.--85,600 mi^2, approximately, at Fulton-Lyons Bridge at Clinton.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to August 1873 (fragmentary), October 1873 to current year (October 1932 to September 1939, published as "at Le Claire")(June 1873 to December 1932 published in the Iowa State Planning Board report "Stream-flow records of Iowa, 1873-1932").

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above sea level. June 6, 1969 to Sept. 16, 1988, water-stage recorder at site 400 ft upstream at same datum. Auxiliary water-stage recorder at Lock and Dam 13 since Oct. 1, 1958. See WSP 1728 for history of changes prior to Oct. 1, 1955.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Minor flow regulation caused by navigation dams. 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 data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1828, that of Apr. 28, 1965.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33400	46200	44600	e29000	e35000	47200	52900	113000	139000	61900	85600	58800
2	33000	45900	44700	e31000	e34000	47300	53000	110000	137000	61800	84700	56300
3	29200	46000	44700	e31000	e35000	46900	53600	105000	130000	62200	84900	52400
4	29100	46500	45000	e32000	39100	42200	58500	98800	125000	64200	85200	49800
5	28200	46600	45500	e31000	39900	38900	64300	90100	120000	64600	85100	48900
6	29200	46500	46300	e31000	39200	41200	67200	91900	113000	63500	82800	46200
7	29800	46400	44400	e31000	38300	40400	73100	83100	110000	63300	76400	45500
8	29300	44800	44300	e31000	39100	35200	77200	80300	104000	63100	73100	42300
9	29100	42900	44900	e32000	40400	34300	84300	75800	99400	63300	69600	40900
10	28800	46400	42900	e33000	40300	36500	92500	71500	95700	63900	67100	39500
11	29400	44300	41300	e33000	42600	42100	97600	70300	95300	63900	64800	39200
12	32200	46800	40900	e34000	48100	43400	100000	71100	92200	62200	61500	41300
13	33600	48300	40900	e35000	49100	43000	103000	78400	92700	62300	61500	41900
14	31800	50600	41000	e36000	46200	42600	107000	85700	92600	63600	61700	43100
15	30800	50600	41100	e35000	45200	42100	112000	91600	87700	64300	60600	43500
16	29800	51400	41400	e35000	50100	40800	118000	98100	81400	67500	57500	43900
17	27700	53100	41800	e34000	53900	43100	120000	106000	77000	69500	51000	44300
18	36000	52800	40100	e34000	52500	43400	120000	130000	76700	71300	50700	44000
19	43600	52500	39700	e34000	51300	42300	119000	144000	76900	71000	50400	43400
20	49500	50400	40000	e34000	50700	43200	116000	144000	75900	68200	50200	42700
21	47400	48800	39800	e34000	48900	49500	113000	135000	75200	68200	50600	42500
22	47800	47400	34800	e35000	45600	56200	111000	124000	73900	76300	55200	40900
23	44600	46800	27400	e37000	43800	56100	115000	120000	70000	86900	57100	38900
24	42300	48000	e21000	e41000	41300	55500	122000	122000	68600	93500	59800	38000
25	40600	48200	e19000	e41000	41800	55400	122000	130000	68400	97000	63200	37600
26	41600	48500	e18000	e40000	41000	55300	120000	133000	67900	97100	65600	37100
27	46000	47500	e19000	e39000	40500	55000	117000	136000	66900	96800	65200	36600
28	45000	46200	e19000	e36000	44200	55200	116000	138000	66000	96400	64500	42100
29	43200	46200	e22000	e37000	---	55100	115000	139000	64600	95300	63900	40800
30	43000	44400	e27000	e37000	---	55500	115000	140000	62000	92400	63100	36700
31	44100	---	e27000	e36000	---	55500	---	139000	---	89000	61900	---
TOTAL	1129100	1431000	1129500	1069000	1217100	1440400	2955200	3394700	2705000	2284500	2034500	1299100
MEAN	36420	47700	36440	34480	43470	46460	98510	109500	90170	73690	65630	43300
MAX	49500	53100	46300	41000	53900	56200	122000	144000	139000	97100	85600	58800
MIN	27700	42900	18000	29000	34000	34300	52900	70300	62000	61800	50200	36600
AC-FT	2240000	2838000	2240000	2120000	2414000	2857000	5862000	6733000	5365000	4531000	4035000	2577000
CFSM	.43	.56	.43	.40	.51	.54	1.15	1.28	1.05	.86	.77	.51
IN.	.49	.62	.49	.46	.53	.63	1.28	1.48	1.18	.99	.88	.56

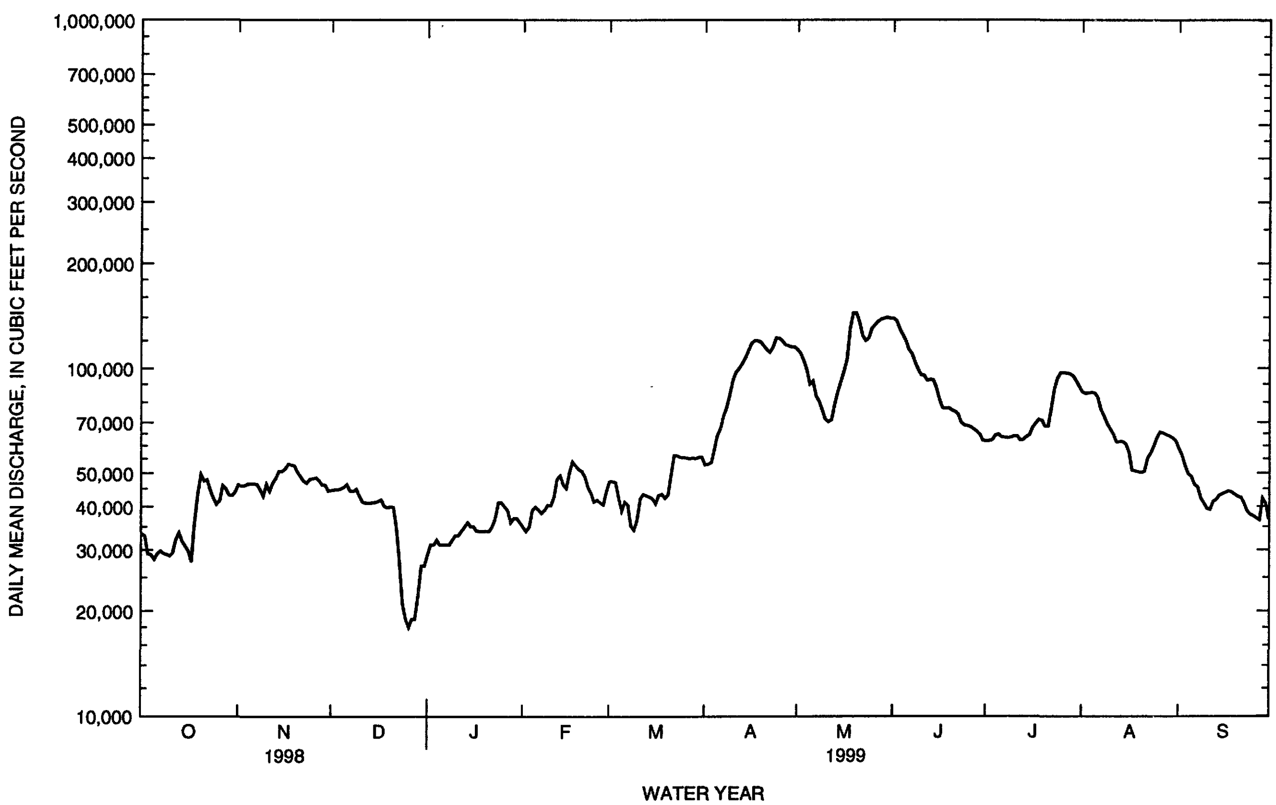
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1874 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	40880	39310	27870	25740	28050	50600	89810	81780	68700	55860	37790	38050
MAX	203600	146800	73590	54100	65680	127500	175900	212400	182100	198900	113400	92380
(WY)	1882	1882	1882	1973	1966	1973	1997	1888	1892	1993	1993	1938
MIN	13490	13760	11120	11390	14000	17600	26040	23190	15420	14690	12460	13870
(WY)	1934	1934	1934	1890	1893	1934	1931	1977	1988	1988	1936	1933

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1874 - 1999	
ANNUAL TOTAL	20584300		22089100			
ANNUAL MEAN	56400		60520		48750	
HIGHEST ANNUAL MEAN					94690	1882
LOWEST ANNUAL MEAN					18870	1934
HIGHEST DAILY MEAN	178000	Apr 11	144000	May 19,20	307000	Apr 28 1965
LOWEST DAILY MEAN	18000	Jan 16	18000	Dec 26	6500	Dec 25 1933
ANNUAL SEVEN-DAY MINIMUM	20300	Jan 13	20700	Dec 24	7430	Dec 24 1933
INSTANTANEOUS PEAK FLOW			146000	May 19		
INSTANTANEOUS PEAK STAGE			16.39	May 20	24.65	Apr 28 1965
ANNUAL RUNOFF (AC-FT)	40830000		43810000		35320000	
ANNUAL RUNOFF (CFSM)	.66		.71		.57	
ANNUAL RUNOFF (INCHES)	8.95		9.60		7.74	
10 PERCENT EXCEEDS	105000		111000		94600	
50 PERCENT EXCEEDS	46200		48900		37500	
90 PERCENT EXCEEDS	27500		33500		19000	

e Estimated



05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
(National stream-quality accounting network station)

WATER QUALITY RECORDS

PERIOD OF RECORD.--October 1974 to September 1987, October 1994 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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												
20...	1130	49800	420	7.8	12.6	15.6	22	8.7	83	755	190	42
NOV												
18...	0915	53400	445	7.8	4.9	9.0	11	12.2	93	746	200	47
FEB												
18...	1115	52300	444	8.1	.7	2.1	6.1	13.6	97	747	200	47
MAR												
24...	1215	55800	407	8.5	6.6	6.9	21	14.0	116	752	190	41
APR												
19...	1115	118000	379	7.6	10.8	16.0	33	9.7	90	746	160	39
28...	1100	116000	407	7.5	11.6	11.3	65	9.5	89	750	180	43
MAY												
11...	0900	70300	470	7.8	16.1	24.6	20	8.0	83	748	210	51
21...	1045	136000	390	7.2	17.9	22.7	120	6.7	72	745	170	41
JUN												
17...	0835	78400	457	7.7	21.1	25.0	28	6.3	70	753	200	49
JUL												
09...	0840	63300	474	7.6	26.2	25.2	16	6.7	85	744	210	51
20...	1300	68000	427	7.7	26.7	28.1	15	6.0	77	748	180	43
AUG												
18...	0830	50500	377	7.8	23.4	19.0	7.0	6.6	79	749	160	39
SEP												
09...	0850	40500	371	8.0	22.0	10.0	10	7.5	88	746	170	39

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												
20...	20	9.4	10	.3	3.6	170	3	201	20	15	.20	5.9
NOV												
18...	20	11	11	.3	2.5	193	0	236	24	18	.18	8.8
FEB												
18...	20	12	11	.4	2.9	163	0	199	29	17	<.10	9.3
MAR												
24...	20	14	14	.4	2.5	135	10	145	31	19	.15	2.5
APR												
19...	15	8.9	11	.3	2.7	132	0	162	26	14	.13	8.4
28...	17	7.7	8	.3	2.5	146	0	178	28	13	.14	9.7
MAY												
11...	21	9.0	8	.3	2.5	183	0	223	42	15	.17	7.5
21...	16	7.2	8	.2	3.0	139	0	170	30	12	.17	8.3
JUN												
17...	20	8.1	8	.2	2.4	143	0	174	35	13	.18	11
JUL												
09...	21	9.4	9	.3	2.3	171	0	209	38	15	.20	12
20...	19	9.4	10	.3	2.2	148	0	181	34	15	.16	8.4
AUG												
18...	16	8.1	10	.3	1.9	158	0	193	21	12	.14	12
SEP												
09...	17	8.6	10	.3	2.1	143	0	175	19	13	<.10	12

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
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WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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												
20...	231	227	.31	31100	.69	1.75	.021	.131	.82	.109	.143	.242
NOV												
18...	268	257	.36	38600	.57	2.27	.014	.086	.66	.041	.056	.138
FEB												
18...	270	246	.37	38100	.39	2.60	.017	.175	.57	.070	.076	--
MAR												
24...	243	218	.33	36600	--	1.31	.024	<.020	1.2	.001	.013	.132
APR												
19...	226	202	.31	72000	--	1.88	.017	<.020	.96	.019	.058	.188
28...	251	226	.34	78600	1.0	3.88	.030	.035	1.0	.027	.067	.211
MAY												
11...	271	273	.37	51400	.72	3.31	.039	.110	.83	.033	.059	.123
21...	230	217	.31	84500	.41	3.37	.063	.163	.57	.090	.100	.100
JUN												
17...	289	238	.39	61200	1.2	3.15	.101	.063	1.3	.110	.116	.262
JUL												
09...	312	266	.42	53300	.77	3.16	.064	.056	.83	.120	.127	.189
20...	256	228	.35	47000	.52	1.91	.030	.041	.56	.101	.116	.190
AUG												
18...	226	214	.31	30800	.78	1.83	.037	.046	.83	.014	.128	.183
SEP												
09...	221	203	.30	24200	--	1.21	.014	<.020	.73	.121	.114	.162

DATE	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	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)
OCT												
20...	87	11700	98	<1	--	--	--	--	--	--	--	<10
NOV												
18...	42	6060	98	<1	<1.0	45	<1.0	<1.0	1.5	<1.0	<1.0	<10
FEB												
18...	15	2120	75	1	--	--	--	--	--	--	--	20
MAR												
24...	54	8140	99	<1	2.6	32	<1.0	<1.0	2.4	<1.0	1.0	15
APR												
19...	103	32800	98	<1	--	--	--	--	--	--	--	22
28...	150	47000	98	1	--	--	--	--	--	--	--	17
MAY												
11...	72	13700	98	1	2.2	52	<1.0	<1.0	<1.0	<1.0	<1.0	<10
21...	281	103000	98	<1	--	--	--	--	--	--	--	E9.8
JUN												
17...	99	21000	100	2	--	--	--	--	--	--	--	E5.8
JUL												
09...	59	10100	99	1	--	--	--	--	--	--	--	<10
20...	44	8080	99	2	--	--	--	--	--	--	--	<10
AUG												
18...	24	3270	98	1	1.9	40	<1.0	<1.0	<1.0	<1.0	<1.0	<10
SEP												
09...	42	4590	98	1	--	--	--	--	--	--	--	E6.4

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	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)
OCT												
20...	--	<6	--	--	--	<1	--	83	<10	--	--	E.056
NOV												
18...	<1.0	E6	2.8	1.2	1.5	1	<1.0	87	<10	2.5	1.2	E.034
FEB												
18...	--	E4	--	--	--	<1	--	88	<10	--	--	E.030
MAR												
24...	<1.0	6	1.7	<1.0	1.4	1	<1.0	90	<10	1.8	1.4	E.028
APR												
19...	--	E5	--	--	--	<1	--	78	<10	--	--	E.026
28...	--	8	--	--	--	<1	--	91	<10	--	--	E.037
MAY												
11...	<1.0	8	4.4	1.3	1.8	<1	<1.0	116	<10	3.0	2.7	E.034
21...	--	E4	--	--	--	<1	--	88	<10	--	--	E.127
JUN												
17...	--	9	--	--	--	<1	--	109	<10	--	--	E.054
JUL												
09...	--	8	--	--	--	<1	--	120	<10	--	--	E.078
20...	--	8	<3.0	--	--	1	--	102	<10	--	--	E.071
AUG												
18...	<1.0	5	5.1	1.1	2.0	<1	<1.0	87	<10	2.6	1.2	E.046
SEP												
09...	--	E3	--	--	--	<1	--	82	E7	--	--	E.034

DATE	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	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												
20...	8.2	2.6	2.3	.46	1.73	.59	.33	4.9	1.4	19	18	--
NOV												
18...	8.1	2.9	2.7	.32	2.25	.41	.13	4.2	.80	4	16	<1.0
FEB												
18...	8.1	3.2	3.2	.38	2.58	.56	.21	4.2	.40	35	25	--
MAR												
24...	7.9	2.5	1.8	--	1.29	.44	.00	4.9	1.7	52	36	<1.0
APR												
19...	8.0	2.8	2.3	--	1.86	.47	.06	6.4	.90	26	23	--
28...	8.0	4.9	4.2	.33	3.85	.37	.08	5.9	2.0	31	27	--
MAY												
11...	8.2	4.1	3.8	.42	3.27	.53	.10	6.2	1.0	31	48	<1.0
21...	7.9	3.9	4.0	.47	3.30	.64	.28	6.0	.50	28	34	--
JUN												
17...	8.0	4.4	3.8	.55	3.05	.62	.34	7.5	2.0	60	39	--
JUL												
09...	8.2	4.0	3.8	.54	3.10	.59	.37	6.5	1.0	43	42	--
20...	8.1	2.5	2.4	.46	1.88	.50	.31	7.0	1.2	35	29	--
AUG												
18...	8.1	2.7	2.3	.45	1.80	.50	.04	7.6	1.0	6	13	<1.0
SEP												
09...	8.0	1.9	1.7	--	1.19	.49	.37	7.8	.80	24	16	--

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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											
20...	<.007	<.002	<.005	E.006	.0122	<.003	170	<.002	<.006	<.004	<.004
NOV											
18...	<.007	<.002	<.005	<.018	<.004	<.003	180	<.002	<.006	<.004	<.004
FEB											
18...	<.007	<.002	E.005	E.002	.005	<.003	170	<.002	<.006	<.004	<.004
MAR											
24...	<.007	<.002	<.005	E.004	<.004	<.003	150	<.002	E.002	<.004	<.004
APR											
19...	<.007	<.002	E.004	<.018	.008	<.003	140	<.002	<.006	<.004	<.004
28...	<.007	<.002	.008	E.002	.015	<.003	150	<.002	<.006	<.004	<.004
MAY											
11...	<.007	<.002	.008	<.018	.009	<.003	170	<.002	<.006	<.004	<.004
21...	<.007	<.002	.026	<.018	.172	<.003	130	<.002	<.006	E.011	<.004
JUN											
17...	<.007	<.002	.022	E.005	.072	<.003	160	<.002	<.006	E.004	<.004
JUL											
09...	<.007	<.002	.011	E.008	.035	<.003	170	<.002	<.006	<.004	<.004
20...	<.007	<.002	<.005	<.018	<.020	<.003	150	<.002	<.006	<.004	<.004
AUG											
18...	<.007	<.002	.007	<.018	.006	<.003	150	<.002	<.006	<.004	<.004
SEP											
09...	<.007	<.002	.006	E.004	<.004	<.003	150	<.002	<.006	<.004	<.004

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											
20...	<.001	.026	<.005	<.004	<.002	.076	<.002	<.002	.17	7.7	.07
NOV											
18...	<.001	.017	<.005	<.004	<.002	.050	<.002	<.002	.11	10	.05
FEB											
18...	<.001	.022	<.005	<.004	<.002	.043	E.003	<.002	.23	11	.06
MAR											
24...	<.001	.136	.011	<.004	<.002	.033	<.002	.014	--	5.7	.08
APR											
19...	<.001	.077	<.005	<.004	<.002	.040	<.002	.010	--	8.2	.06
28...	<.001	.077	<.005	<.004	<.002	.045	<.002	.027	.05	17	.10
MAY											
11...	<.001	.051	<.005	<.004	<.002	.075	.005	.060	.14	14	.13
21...	<.001	1.27	<.005	<.004	<.002	2.44	.105	1.66	.21	15	.21
JUN											
17...	<.001	.291	<.005	<.004	<.002	.850	.035	.253	.08	13	.33
JUL											
09...	<.001	.113	<.005	<.004	<.002	.536	.017	.096	.07	14	.21
20...	<.001	.057	<.005	<.004	<.002	.305	<.010	.024	.05	8.3	.10
AUG											
18...	<.001	.027	<.005	<.004	<.002	.147	<.002	.007	.06	8.0	.12
SEP											
09...	<.001	.009	<.005	<.004	<.002	.067	<.002	<.002	--	5.3	.05

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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											
20...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
NOV											
18...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
FEB											
18...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	E.006
MAR											
24...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
APR											
19...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
28...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	.005	<.004	<.010
MAY											
11...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
21...	.019	<.003	<.002	<.004	<.002	<.007	<.002	<.006	.006	<.004	<.010
JUN											
17...	.005	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
JUL											
09...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
20...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
AUG											
18...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	<.010
SEP											
09...	<.004	<.003	<.002	<.004	<.002	<.007	<.002	<.006	<.002	<.004	E.002

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											
20...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
NOV											
18...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
FEB											
18...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
MAR											
24...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
APR											
19...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
28...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
MAY											
11...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
21...	<.004	<.003	<.002	E.007	<.013	<.003	<.017	<.001	<.004	<.003	<.002
JUN											
17...	<.004	<.003	<.002	E.043	<.013	<.003	<.017	<.001	<.004	<.003	<.002
JUL											
09...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
20...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
AUG											
18...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002
SEP											
09...	<.004	<.003	<.002	<.003	<.013	<.003	<.017	<.001	<.004	<.003	<.002

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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											
20...	<.002	<.004	<.003	<.013	<.001	<.005	424	99.0	110	89.7	27
NOV											
18...	<.002	<.004	<.003	<.013	<.001	<.005	466	97.9	101	85.1	28
FEB											
18...	<.002	<.004	<.003	<.013	<.001	<.005	461	104	104	92.2	20
MAR											
24...	<.002	<.004	<.003	<.013	<.001	<.005	432	96.7	103	96.1	25
APR											
19...	<.002	<.004	<.003	<.013	<.001	<.005	377	104	126	107	20
28...	<.002	<.004	<.003	<.013	<.001	<.005	415	96.6	102	95.9	19
MAY											
11...	<.002	<.004	<.003	<.013	<.001	<.005	469	98.6	109	91.3	29
21...	<.002	<.010	<.003	<.013	<.001	<.005	383	99.0	--	96.6	25
JUN											
17...	<.002	<.004	<.003	<.013	<.001	<.005	444	108	--	104	38
JUL											
09...	<.002	<.004	<.003	<.013	<.001	<.005	470	111	--	116	35
20...	<.002	<.004	<.003	<.013	<.001	<.005	420	108	--	91.5	31
AUG											
18...	<.002	<.004	<.003	--	<.001	<.005	374	108	--	108	27
SEP											
09...	<.002	<.004	<.003	<.013	<.001	<.005	369	98.4	--	101	25

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA

LOCATION.--Lat 42°27'49", long 91°53'42", in SE$^1/_4$ sec.4, T.88 N., R.9 W., Buchanan County, Hydrologic Unit 07080102, on right bank at Sixth Street in Independence, 1,800 ft downstream from dam at abandoned hydroelectric plant, 4.9 mi downstream from Otter Creek, 9.7 mi upstream from Pine Creek, and at mile 142.5.

DRAINAGE AREA.--1,048 mi^2.

PERIOD OF RECORD.--July 1933 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1938-39, 1940 (M), 1947.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 882.85 ft above sea level. Prior to May 24, 1941 nonrecording gage in tailrace of powerplant 1,800 ft upstream at datum 80.00 ft lower.

REMARKS.--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 since at least 1901, that of May 18, 1999.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

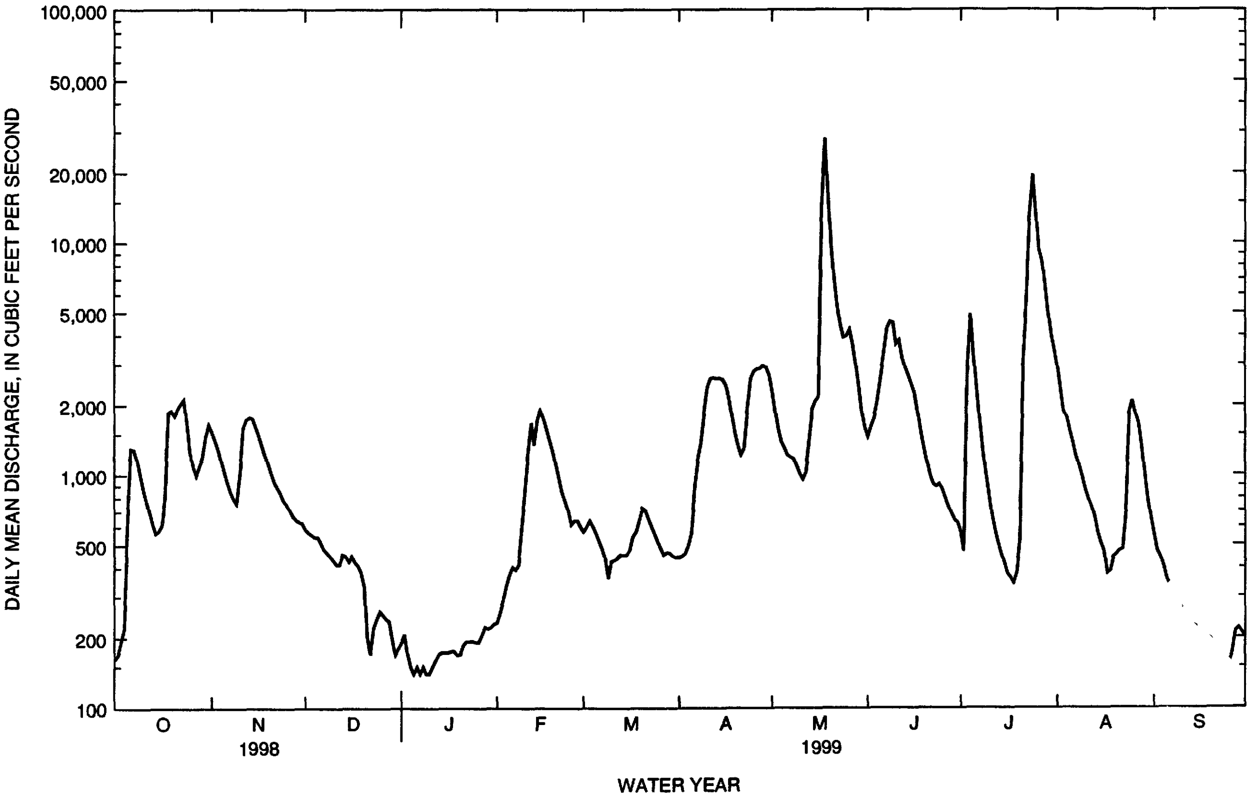
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	163	1540	585	e190	232	572	442	2290	1460	567	2900	553
2	170	1420	569	207	257	600	449	1880	1620	470	2320	470
3	193	1290	556	e170	291	638	460	1580	1760	2750	1870	442
4	221	1150	544	e150	335	603	499	1390	2060	4900	1760	402
5	664	1030	544	e140	374	564	566	1310	2630	3300	1540	356
6	1300	930	515	e150	403	523	882	1220	3290	2400	1370	333
7	1290	850	483	e140	392	486	1160	1190	4260	1740	1200	315
8	1170	794	465	e150	412	440	1360	1170	4570	1310	1080	308
9	1010	758	449	e140	593	361	1860	1090	4530	1020	967	279
10	882	1030	431	e140	827	427	2390	1010	3650	830	857	264
11	781	1610	414	e150	1240	433	2610	959	3790	674	781	249
12	694	1740	414	e160	1680	441	2630	1030	3190	579	729	239
13	620	1780	457	e170	1350	455	2610	1380	2890	512	659	225
14	565	1760	451	173	1750	453	2620	1920	2670	458	564	223
15	580	1620	426	173	1900	455	2580	2080	2450	418	507	219
16	613	1490	449	173	1760	474	2440	2170	2240	375	468	209
17	803	1340	422	175	1580	543	2150	14100	1870	361	377	203
18	1860	1220	409	176	1410	572	1800	28000	1550	342	385	199
19	1900	1120	381	169	1270	640	1520	16700	1310	379	441	197
20	1810	1020	335	170	1110	721	1340	10100	1140	520	454	188
21	1930	936	204	186	971	707	1220	6980	1000	2940	472	176
22	2040	887	170	193	850	650	1300	5410	914	5600	479	170
23	2120	840	221	193	778	604	1930	4430	892	13000	706	161
24	1670	778	241	194	711	563	2610	3920	912	19500	1850	154
25	1260	749	260	192	615	520	2800	3970	869	13400	2090	156
26	1090	709	251	191	640	485	2870	4220	793	9290	1840	170
27	1000	668	242	206	640	454	2890	3690	730	8340	1660	212
28	1100	644	236	222	601	465	2960	3050	682	6500	1340	219
29	1190	631	e200	219	---	462	2920	2410	640	4990	993	211
30	1460	624	e170	222	---	448	2690	1870	622	4010	779	202
31	1650	---	e180	229	---	444	---	1600	---	3460	649	---
TOTAL	33799	32958	11674	5513	24972	16203	56558	134119	60984	114935	34087	7704
MEAN	1090	1099	377	178	892	523	1885	4326	2033	3708	1100	257
MAX	2120	1780	585	229	1900	721	2960	28000	4570	19500	2900	553
MIN	163	624	170	140	232	361	442	959	622	342	377	154
AC-FT	67040	65370	23160	10940	49530	32140	112200	266000	121000	228000	67610	15280
CFSM	1.04	1.05	.36	.17	.85	.50	1.80	4.13	1.94	3.54	1.05	.25
IN.	1.20	1.17	.41	.20	.89	.58	2.01	4.76	2.16	4.08	1.21	.27

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	399	452	306	226	361	1429	1372	969	965	734	559	374
MAX	2306	2280	1962	1411	1698	3201	5578	4326	4721	4836	5443	1940
(WY)	1973	1992	1992	1946	1984	1986	1993	1999	1947	1993	1993	1981
MIN	29.3	42.2	26.9	12.6	19.0	68.4	198	45.3	12.4	18.9	21.5	20.5
(WY)	1989	1977	1977	1977	1956	1934	1957	1934	1934	1936	1934	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1934 - 1999	
ANNUAL TOTAL	447151		533506			
ANNUAL MEAN	1225		1462		680	
HIGHEST ANNUAL MEAN					2304	1993
LOWEST ANNUAL MEAN					74.5	1934
HIGHEST DAILY MEAN	8350	Apr 1	28000	May 18	28000	May 18 1999
LOWEST DAILY MEAN	157	Jan 23	140	Jan 5a	7.0	Oct 1 1933b
ANNUAL SEVEN-DAY MINIMUM	160	Jan 21	144	Jan 4	7.1	Jan 24 1977
INSTANTANEOUS PEAK FLOW			31100	May 18	31100	May 18 1999
INSTANTANEOUS PEAK STAGE			22.35	May 18	22.35	May 18 1999
ANNUAL RUNOFF (AC-FT)	886900		1058000		492700	
ANNUAL RUNOFF (CFSM)	1.17		1.39		.65	
ANNUAL RUNOFF (INCHES)	15.87		18.94		8.82	
10 PERCENT EXCEEDS	2830		2890		1680	
50 PERCENT EXCEEDS	810		711		276	
90 PERCENT EXCEEDS	194		193		52	

a Also Jan 7, 9, 10
b Many days in 1934, when powerplant shut down, Jan 25-30, 1977
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
100,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
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A
M
J
J
A
S
1998
1999
WATER YEAR

05422000 WAPSIPINICON RIVER NEAR DE WITT, IA

LOCATION.--Lat 41°46'01", long 90°32'05", in $SW^1/_4$ $NE^1/_4$ sec.6, T.80 N., R.4 E., Clinton County, Hydrologic Unit 07080103, on left bank 5 ft upstream from bridge on Highway 956, 0.9 mi downstream from Silver Creek, 4.0 mi south of water tower in De Witt, 6.2 mi upstream from Brophy Creek, and 18.2 mi upstream from mouth.

DRAINAGE AREA.--2,330 mi^2.

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

REVISED RECORDS.--WSP 1308: 1937 (M). WSP 1438: Drainage area. WSP 1708: 1951.

GAGE.--Water-stage recorder. Datum of gage is 598.81 ft above sea level.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

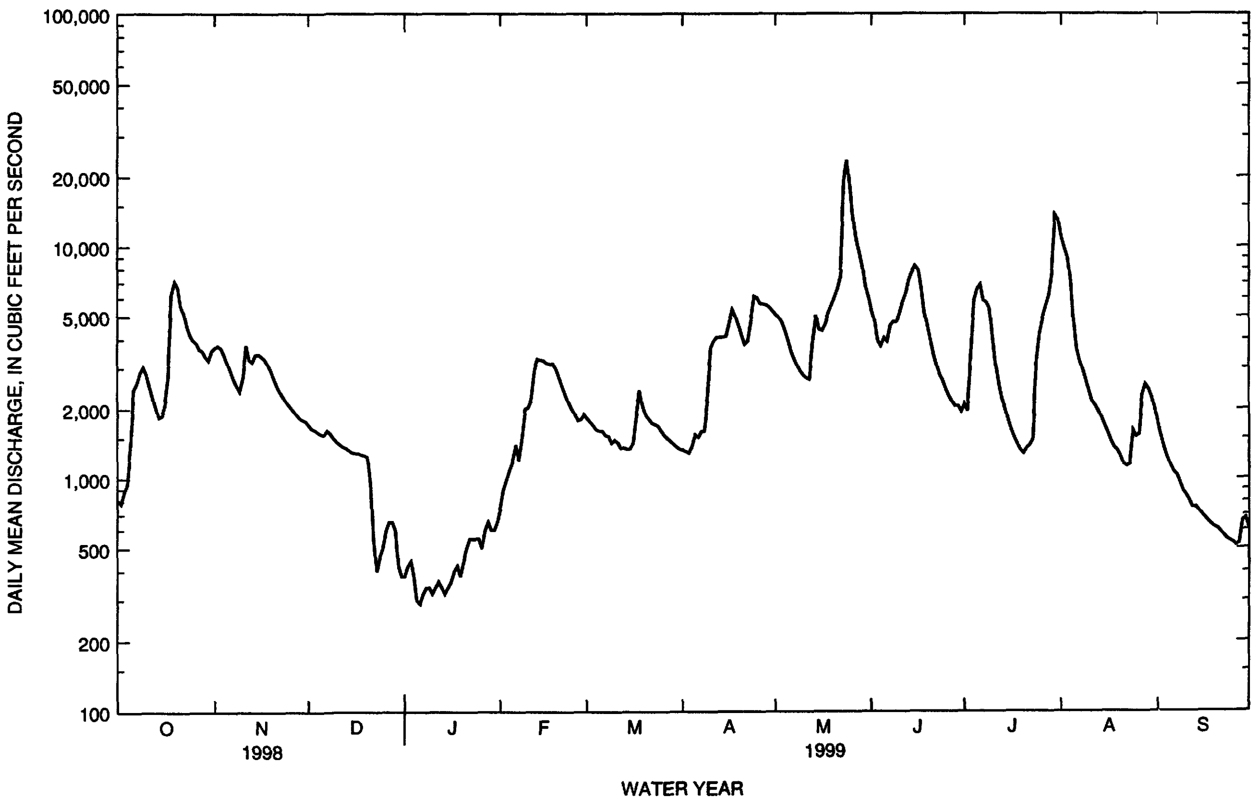
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	811	3690	1710	e380	e750	1820	1330	5080	5300	2090	10900	1700
2	782	3750	1650	e420	e900	1760	1310	4940	4740	1950	9810	1500
3	877	3660	1630	e440	e1000	1700	1290	4720	3930	3370	8970	1340
4	950	3420	1590	e380	e1100	1630	1380	4360	3720	5810	7080	1220
5	1420	3160	1560	e300	e1200	1610	1550	3980	4030	6540	4700	1130
6	2440	2920	1550	e290	e1400	1610	1510	3570	3900	6820	3620	1060
7	2580	2690	1620	e320	e1200	1540	1600	3280	4570	5840	3210	1030
8	2870	2530	1570	e340	e1500	1530	1610	3070	4740	5730	2920	951
9	3040	2390	1500	e340	2000	1430	2230	2900	4730	5370	2640	879
10	2840	2760	1450	e320	2030	1470	3660	2790	5080	3990	2390	844
11	2540	3760	1410	e340	2200	e1430	3920	2720	5720	3090	2160	e800
12	2270	3270	1380	e360	2950	1350	4060	2680	6250	2570	2060	e750
13	2040	3190	1360	e340	3280	1360	4060	3850	7180	2240	1940	e750
14	1850	3430	1330	e320	3250	1340	4080	5020	7770	1980	1820	721
15	1880	3450	1300	e340	3240	1350	4110	4390	8230	1780	1680	696
16	2090	3380	1290	e360	3150	1430	4740	4340	7920	1620	1570	672
17	2770	3270	1290	e400	3120	1880	5330	4610	6570	1500	1450	648
18	6220	e3100	1270	e420	3130	2400	4980	5140	5200	1400	1360	630
19	7070	2910	1260	e380	2960	2060	4560	5540	4500	1320	1320	614
20	6690	2690	1240	e440	2730	1880	4160	6000	3950	1280	1250	605
21	5560	2510	e950	e500	2510	1810	3790	6580	3440	1350	1150	585
22	5200	2370	e550	e550	2320	1740	3910	7460	3080	1390	1130	568
23	4580	2260	e400	e550	2150	1720	4820	19300	2800	1480	1150	547
24	4170	2140	e460	e550	2010	1690	6100	23400	2640	3030	1610	537
25	3980	2060	e500	e550	1900	1610	6000	18100	2440	4200	1520	530
26	3870	1980	e600	e500	1790	1540	5660	13400	2270	4890	1550	514
27	3630	1910	e650	e600	1810	1490	5630	10800	2150	5490	2280	525
28	3570	1840	e650	e650	1900	1450	5590	9460	2050	6100	2540	657
29	3380	1800	e600	e600	---	1410	5460	8220	2050	7580	2420	672
30	3250	1780	e420	e600	---	1370	5260	6730	1940	13600	2240	610
31	3570	---	e380	e650	---	1340	---	6050	---	13000	1990	---
TOTAL	98790	84070	35120	13530	59480	49750	113690	212480	132890	128400	92430	24285
MEAN	3187	2802	1133	436	2124	1605	3790	6854	4430	4142	2982	810
MAX	7070	3760	1710	650	3280	2400	6100	23400	8230	13600	10900	1700
MIN	782	1780	380	290	750	1340	1290	2680	1940	1280	1130	514
AC-FT	195900	166800	69660	26840	118000	98680	225500	421500	263600	254700	183300	48170
CFSM	1.36	1.20	.48	.19	.91	.69	1.62	2.93	1.90	1.77	1.28	.35
IN.	1.57	1.34	.56	.22	.95	.79	1.81	3.38	2.12	2.04	1.47	.39

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	938	1137	927	836	1265	2990	3041	2387	2383	1764	1160	1040
MAX	3549	6435	4945	4086	3798	7137	9768	6854	10950	14280	8550	5647
(WY)	1973	1962	1983	1946	1984	1986	1993	1999	1947	1993	1993	1993
MIN	137	159	104	59.4	104	301	453	323	234	165	103	133
(WY)	1977	1965	1977	1977	1940	1954	1977	1977	1977	1936	1936	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1935 - 1999	
ANNUAL TOTAL	1041135		1044915			
ANNUAL MEAN	2852		2863		1656	
HIGHEST ANNUAL MEAN					5461	1993
LOWEST ANNUAL MEAN					374	1989
HIGHEST DAILY MEAN	10600	Apr 6	23400	May 24	25400	Apr 22 1973
LOWEST DAILY MEAN	380	Dec 31	290	Jan 6	46	Jan 22 1977
ANNUAL SEVEN-DAY MINIMUM	543	Dec 25	321	Jan 5	47	Jan 18 1977
INSTANTANEOUS PEAK FLOW			25200	May 24	31100	Jun 17 1990
INSTANTANEOUS PEAK STAGE			13.66	May 24	14.19	Jun 17 1990
ANNUAL RUNOFF (AC-FT)	2065000		2073000		1200000	
ANNUAL RUNOFF (CFSM)	1.22		1.23		.71	
ANNUAL RUNOFF (INCHES)	16.58		16.64		9.63	
10 PERCENT EXCEEDS	6350		5720		3940	
50 PERCENT EXCEEDS	2140		2030		920	
90 PERCENT EXCEEDS	805		550		230	

e Estimated


100,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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J
A
S
1998
1999
WATER YEAR

05422470 CROW CREEK AT BETTENDORF, IA

LOCATION.--Lat 41°33'03", long 90°27'15", in NW$^1/_4$ NW$^1/_4$ sec.24, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on left bank 200 ft upstream from bridge on Valley Road (old U.S. Highway 67), 3.5 mi east of U.S. Highway 6, and 0.7 mi upstream from mouth.

DRAINAGE AREA.--17.8 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 576.23 ft above sea level.

REMARKS.--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 at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

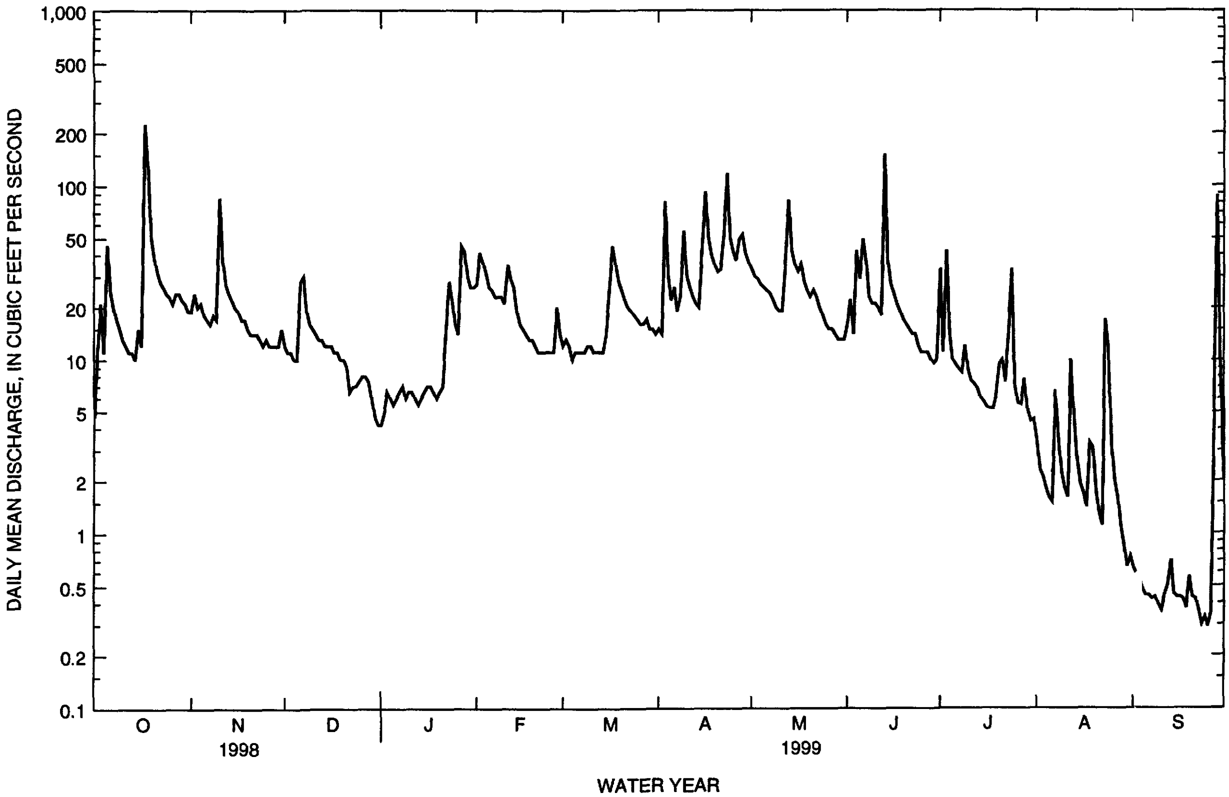
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	19	12	e4.2	27	12	15	33	16	33	3.4	.63
2	11	24	11	e5.0	41	13	14	30	22	11	2.3	.58
3	21	20	11	e6.5	36	12	81	29	14	42	2.1	.54
4	11	21	10	e6.0	31	10	30	27	42	14	1.8	.48
5	46	18	10	e5.5	26	11	22	26	29	10	1.6	.44
6	25	17	28	e6.0	25	11	26	25	49	9.3	1.5	.44
7	20	16	30	e6.5	23	11	19	24	37	8.8	6.6	.42
8	17	18	19	e7.0	23	11	23	22	23	8.4	3.4	.43
9	15	17	16	e6.0	23	12	55	20	21	12	2.2	.39
10	13	85	15	e6.5	21	12	30	19	21	8.6	1.8	.36
11	12	37	14	e6.5	35	11	26	19	20	7.5	1.6	.44
12	11	27	13	e6.0	29	11	23	37	18	7.2	10	.50
13	11	24	13	e5.5	26	11	21	82	150	6.8	4.6	.70
14	10	22	12	e6.0	19	11	20	42	37	6.0	2.6	.45
15	15	20	12	e6.5	16	14	44	35	27	5.7	1.9	.43
16	12	19	12	e7.0	15	25	92	32	24	5.3	1.7	.43
17	225	17	11	e7.0	14	45	50	35	21	5.2	1.4	.42
18	132	17	11	e6.5	13	35	40	28	19	5.2	3.3	.37
19	51	15	10	e6.0	13	28	35	25	17	6.2	3.1	.56
20	39	14	10	e6.5	12	25	32	23	16	9.4	1.8	.43
21	32	14	e9.0	e7.0	11	22	33	25	15	9.9	1.3	.42
22	28	14	e6.5	e15	11	20	51	23	14	7.4	1.1	.36
23	26	13	e7.0	e28	11	19	117	20	14	14	17	.30
24	24	12	e7.0	e22	11	18	50	18	12	33	12	.33
25	23	13	e7.5	e16	11	17	42	16	11	7.1	3.2	.29
26	21	12	e8.0	e14	11	16	37	15	11	5.6	2.0	.35
27	24	12	e8.0	45	20	16	49	15	11	5.5	1.6	5.3
28	24	12	e7.5	42	14	17	52	14	10	7.7	1.1	87
29	22	12	e6.0	30	---	15	41	13	9.5	5.1	.85	11
30	21	15	e4.6	26	---	15	36	13	10	4.4	.64	2.0
31	19	---	e4.2	26	---	14	---	13	---	4.5	.73	---
TOTAL	965.7	596	355.3	393.7	568	520	1206	798	740.5	325.8	100.22	116.79
MEAN	31.2	19.9	11.5	12.7	20.3	16.8	40.2	25.7	24.7	10.5	3.23	3.89
MAX	225	85	30	45	41	45	117	82	150	42	17	87
MIN	4.7	12	4.2	4.2	11	10	14	13	9.5	4.4	.64	.29
AC-FT	1920	1180	705	781	1130	1030	2390	1580	1470	646	199	232
CFSM	1.75	1.12	.64	.71	1.14	.94	2.26	1.45	1.39	.59	.18	.22
IN.	2.02	1.25	.74	.82	1.19	1.09	2.52	1.67	1.55	.68	.21	.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	11.2	12.5	12.7	8.10	13.4	22.1	21.4	24.1	26.2	14.6	16.0	7.30
MAX	50.9	45.4	44.1	25.0	42.1	54.6	61.3	111	157	65.4	99.8	34.7
(WY)	1982	1993	1983	1988	1985	1979	1983	1996	1990	1992	1990	1992
MIN	.67	1.19	.77	1.18	.76	3.45	2.33	1.68	3.17	.74	.85	.49
(WY)	1989	1990	1990	1979	1989	1989	1989	1989	1988	1988	1978	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1978 - 1999	
ANNUAL TOTAL	8078.1		6686.01			
ANNUAL MEAN	22.1		18.3		15.8	
HIGHEST ANNUAL MEAN					31.7	1990
LOWEST ANNUAL MEAN					3.35	1989
HIGHEST DAILY MEAN	225	Oct 17	225	Oct 17	1660	Jun 16 1990
LOWEST DAILY MEAN	1.2	Sep 12	.29	Sep 25	.13	Aug 16 1988
ANNUAL SEVEN-DAY MINIMUM	1.4	Sep 7	.35	Sep 20	.21	Aug 13 1988
INSTANTANEOUS PEAK FLOW			875	Oct 17	7700	Jun 16 1990
INSTANTANEOUS PEAK STAGE			6.58	Oct 17	11.03	Jun 16 1990
INSTANTANEOUS LOW FLOW			.28	Sep 23a		
ANNUAL RUNOFF (AC-FT)	16020		13260		11460	
ANNUAL RUNOFF (CFSM)	1.24		1.03		.89	
ANNUAL RUNOFF (INCHES)	16.88		13.97		12.07	
10 PERCENT EXCEEDS	43		36		33	
50 PERCENT EXCEEDS	16		14		7.5	
90 PERCENT EXCEEDS	4.8		1.6		1.4	

a Also Sep 25
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05422560 DUCK CREEK AT 110th AVENUE, DAVENPORT, IA

LOCATION.--Lat 41°33'24", long 90°41'15", in NW$^{1}/_{4}$ SW$^{1}/_{4}$, sec.13, T.78 N., R.2 E., Scott County, Hydrologic Unit 07080101, on left bank 20 ft. downstream from the bridge on County Road Y48 (110th Street), 0.3 miles downstream from unnamed creek, 3 miles west of Davenport, and 13.95 miles from the mouth.

DRAINAGE AREA.--16.1 mi^2.

PERIOD OF RECORD.--March 1994 to current year.

GAGE.--Water stage recorder. Datum of gage is 659.00 ft above sea level.

REMARKS.--Records good except those for estimated daily discharge, which is poor. Periodic observations of water temperature and specific conductance are published in this report as Miscellaneous Water Quality data. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

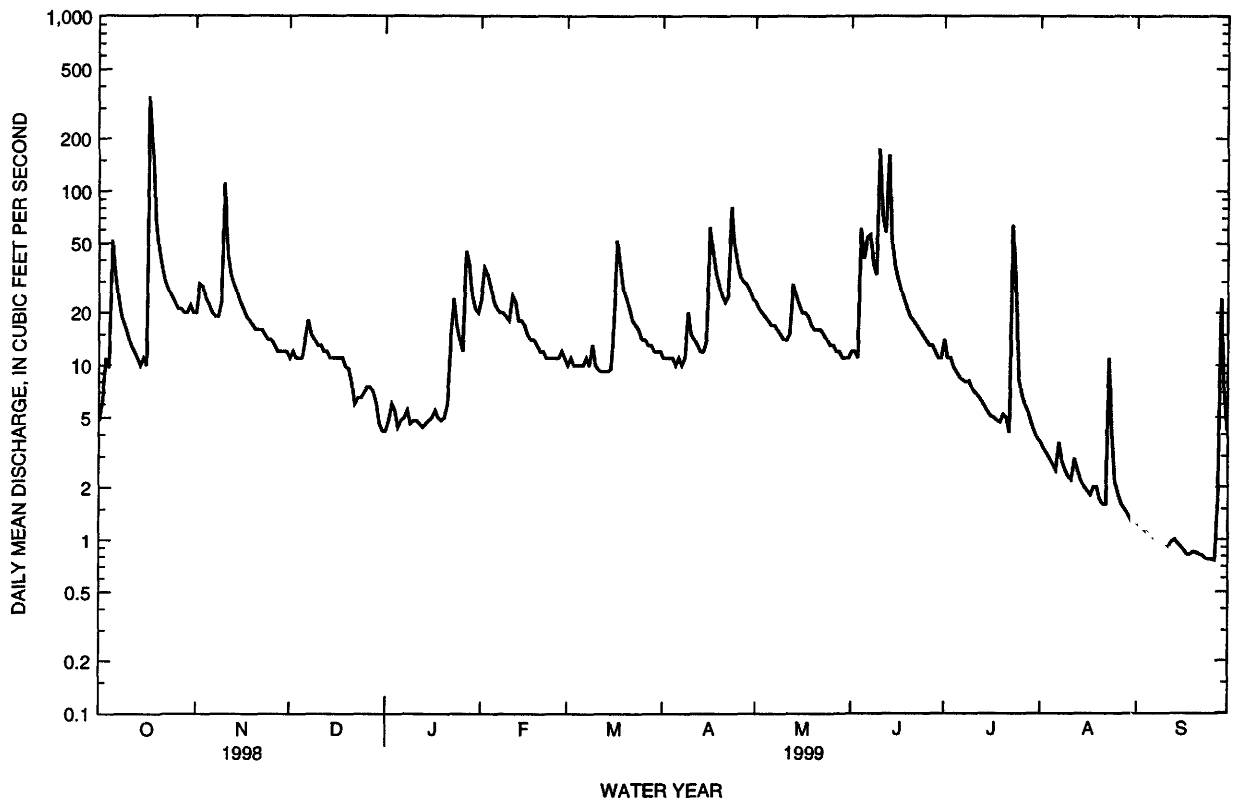
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	20	11	e4.2	24	10	11	23	12	14	3.6	1.2
2	6.4	29	12	e4.8	36	11	11	21	12	11	3.3	1.1
3	11	28	11	e6.0	33	10	11	20	11	11	3.1	1.1
4	9.7	24	11	e5.5	28	10	11	19	61	9.7	2.9	1.1
5	52	22	11	e4.4	23	10	10	18	41	9.1	2.7	1.0
6	33	20	14	e4.8	21	10	11	17	54	8.5	2.5	1.0
7	24	19	18	e5.0	20	11	10	17	56	8.2	3.6	.97
8	19	19	15	e5.5	20	9.9	11	16	38	8.0	2.8	.91
9	17	23	14	e4.6	19	13	20	15	33	8.1	2.5	.91
10	15	111	13	e4.8	18	10	15	14	173	7.3	2.3	.90
11	13	43	13	e4.8	25	9.4	14	14	72	6.9	2.2	.91
12	12	33	12	e4.6	23	9.2	13	15	58	6.6	2.9	.97
13	11	29	12	e4.4	18	9.2	12	29	161	6.2	2.5	1.0
14	10	26	11	e4.6	18	9.2	12	25	51	5.8	2.2	.95
15	11	23	11	e4.8	17	9.5	14	22	37	5.4	2.0	.91
16	10	21	11	e5.0	15	17	62	20	31	5.1	1.9	.87
17	349	19	11	e5.5	14	52	45	20	27	5.0	1.8	.82
18	192	18	11	e5.0	14	37	34	19	24	4.8	2.0	.82
19	67	17	9.8	e4.8	13	27	29	17	21	4.7	2.0	.85
20	46	16	9.6	e5.0	12	24	25	16	19	5.2	1.7	.84
21	36	16	e8.0	e6.0	12	21	23	16	18	5.0	1.6	.82
22	30	16	e6.0	e14	11	18	25	16	17	4.1	1.6	.81
23	27	15	e6.5	e24	11	17	81	15	16	64	11	.78
24	25	14	e6.5	e17	11	16	48	14	15	31	3.7	.77
25	23	14	e7.0	e14	11	14	38	13	14	8.3	2.1	.77
26	21	13	e7.5	e12	11	14	32	13	13	6.7	1.8	.76
27	21	12	e7.5	45	12	13	30	12	13	5.9	1.6	1.7
28	20	12	e7.0	38	11	13	29	12	12	5.4	1.5	24
29	20	12	e6.0	25	---	12	27	11	11	4.7	1.4	7.0
30	22	12	e4.6	21	---	12	24	11	11	4.2	1.3	4.2
31	20	---	e4.2	20	---	12	---	11	---	3.8	1.2	---
TOTAL	1177.9	696	312.2	334.1	501	470.4	738	521	1132	293.7	79.3	60.74
MEAN	38.0	23.2	10.1	10.8	17.9	15.2	24.6	16.8	37.7	9.47	2.56	2.02
MAX	349	111	18	45	36	52	81	29	173	64	11	24
MIN	4.8	12	4.2	4.2	11	9.2	10	11	11	3.8	1.2	.76
AC-FT	2340	1380	619	663	994	933	1460	1030	2250	583	157	120
CFSM	2.36	1.44	.63	.67	1.11	.94	1.53	1.04	2.34	.59	.16	.13
IN.	2.72	1.61	.72	.77	1.16	1.09	1.71	1.20	2.62	.68	.18	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	8.29	5.83	3.10	4.62	15.3	16.2	22.1	35.5	25.6	7.94	2.80	2.72
MAX	38.0	23.2	10.1	10.8	24.8	50.1	39.4	68.8	39.8	11.6	3.94	8.53
(WY)	1999	1999	1999	1999	1997	1998	1998	1996	1998	1998	1998	1998
MIN	.30	.97	.74	.73	4.30	3.28	2.60	14.0	9.13	3.03	1.31	.75
(WY)	1995	1995	1997	1997	1995	1996	1996	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1995 - 1999	
ANNUAL TOTAL	8458.4		6316.34			
ANNUAL MEAN	23.2		17.3		12.5	
HIGHEST ANNUAL MEAN					17.5	1998
LOWEST ANNUAL MEAN					5.60	1997
HIGHEST DAILY MEAN	487	Mar 31	349	Oct 17	648	May 28 1996
LOWEST DAILY MEAN	1.2	Sep 12	.76	Sep 26	.22	Oct 16 1994
ANNUAL SEVEN-DAY MINIMUM	1.4	Sep 7	.79	Sep 20	.24	Oct 11 1994
INSTANTANEOUS PEAK FLOW			1380	Oct 17	1870	May 29 1996
INSTANTANEOUS PEAK STAGE			17.52	Oct 17	18.44	May 29 1996
INSTANTANEOUS LOW FLOW			.72	Sep 26		
ANNUAL RUNOFF (AC-FT)	16780		12530		9030	
ANNUAL RUNOFF (CFSM)	1.44		1.07		.77	
ANNUAL RUNOFF (INCHES)	19.54		14.59		10.52	
10 PERCENT EXCEEDS	42		31		30	
50 PERCENT EXCEEDS	14		12		4.1	
90 PERCENT EXCEEDS	3.5		1.8		.76	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05422600 DUCK CREEK AT DUCK CREEK GOLF COURSE, DAVENPORT, IA

LOCATION.--Lat 41°32'46", long 90°31'26", in $SW^1/_4$ $SE^1/_4$, $NW^1/_4$, sec.20, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on right bank 500 feet upstream from Kimberly Road, 100 feet upstream of golf cart bridge, 0.5 miles downstream from Pheasant Creek, in Davenport, and 4.45 miles from the mouth.

DRAINAGE AREA.--53.0 mi^2.

PERIOD OF RECORD.--November 1993 to current year.

GAGE.--Water stage recorder. Datum of gage is 597.00 ft above sea level.

REMARKS.--Records good except those for periods of estimated daily discharges, which are poor. Periodic observations of water temperature and conductance are published in this report as miscellaneous water quality data. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

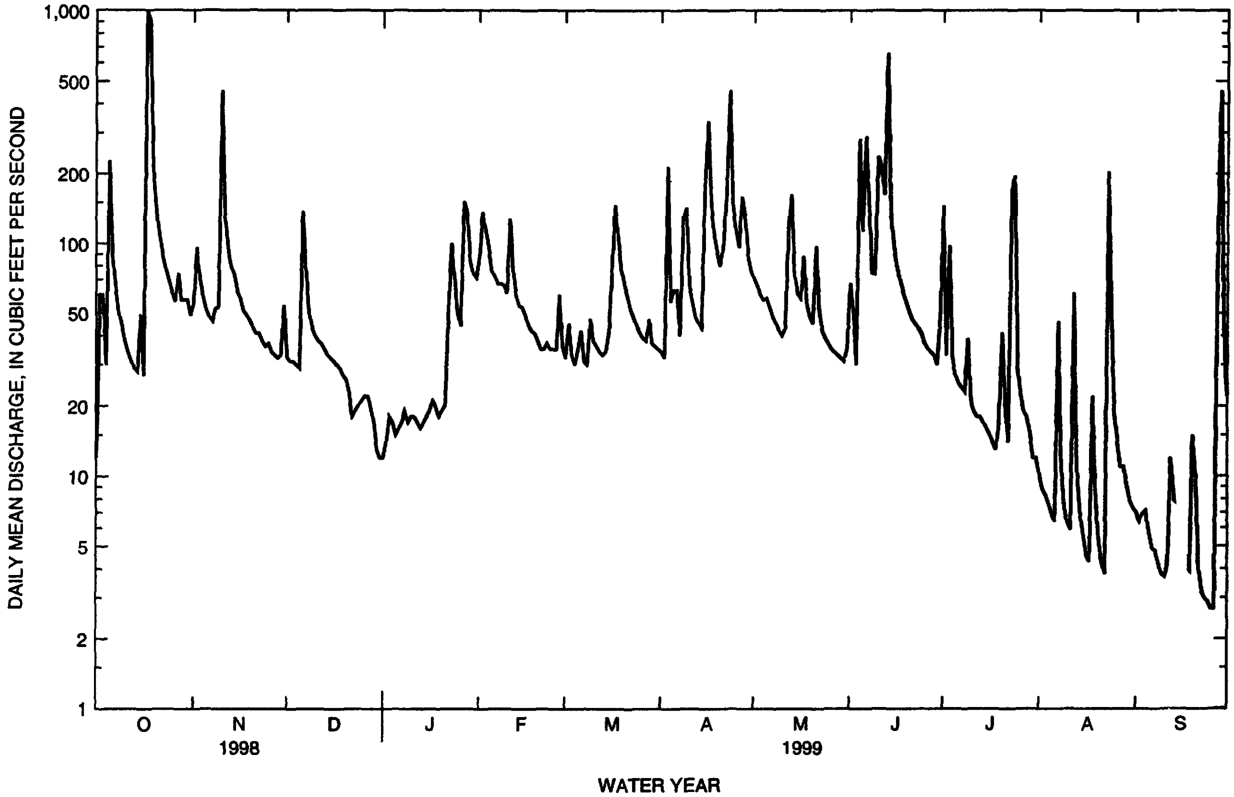
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	55	32	e12	84	32	34	70	67	145	10	7.0
2	60	96	31	e14	136	45	32	65	52	33	8.8	6.4
3	60	69	31	e18	114	33	214	60	30	98	8.3	6.9
4	30	59	30	e17	96	30	56	57	282	32	7.6	7.1
5	227	52	29	e15	76	35	63	58	113	27	6.9	5.8
6	89	48	137	e16	72	42	63	53	290	25	6.4	4.9
7	64	46	78	e17	67	31	40	48	147	24	46	4.8
8	50	52	50	e19	67	30	128	45	75	23	11	4.3
9	44	53	43	e17	66	47	142	42	74	39	7.3	3.8
10	38	455	40	e18	61	38	65	40	237	21	6.3	3.7
11	34	130	38	e18	127	36	56	43	217	19	5.9	4.1
12	31	94	37	e17	75	34	48	114	162	18	61	12
13	29	80	35	e16	59	33	45	162	656	18	11	8.4
14	28	73	33	e17	54	34	43	72	139	17	7.1	4.6
15	49	62	32	e18	53	41	175	61	97	16	5.6	3.9
16	27	58	31	e19	49	78	337	58	81	15	4.6	3.8
17	992	51	30	e21	44	146	149	88	70	14	4.3	3.7
18	916	49	29	e20	42	104	108	55	62	13	22	3.4
19	200	46	27	e18	41	77	91	48	56	17	8.5	15
20	137	43	26	e19	38	66	80	45	51	41	5.3	10
21	108	41	e23	e20	35	59	100	97	47	21	4.3	4.0
22	90	41	e18	e50	35	52	161	52	45	14	3.8	3.2
23	78	38	e19	e100	37	48	455	42	43	170	204	3.0
24	69	36	e20	e70	35	44	147	39	41	196	50	2.9
25	62	37	e21	e50	35	41	114	37	37	29	19	2.7
26	56	34	e22	e44	35	39	96	35	35	22	14	2.7
27	74	33	e22	151	60	38	158	34	34	19	11	98
28	57	32	e20	136	36	47	131	33	33	18	11	453
29	57	33	e17	85	---	37	89	32	30	15	9.1	46
30	57	54	e13	74	---	36	76	31	48	12	7.8	22
31	49	---	e12	71	---	35	---	35	---	12	7.3	---
TOTAL	3874	2050	1026	1197	1729	1488	3496	1751	3351	1183	595.2	761.1
MEAN	125	68.3	33.1	38.6	61.8	48.0	117	56.5	112	38.2	19.2	25.4
MAX	992	455	137	151	136	146	455	162	656	196	204	453
MIN	12	32	12	12	35	30	32	31	30	12	3.8	2.7
AC-FT	7680	4070	2040	2370	3430	2950	6930	3470	6650	2350	1180	1510
CFSM	2.36	1.29	.62	.73	1.17	.91	2.20	1.07	2.11	.72	.36	.48
IN.	2.72	1.44	.72	.84	1.21	1.04	2.45	1.23	2.35	.83	.42	.53

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	30.4	24.1	12.1	17.9	51.1	52.6	86.3	125	85.5	31.0	26.8	16.6
MAX	125	68.3	33.1	38.6	77.8	143	141	250	153	38.8	34.6	35.1
(WY)	1999	1999	1999	1999	1997	1998	1998	1996	1998	1998	1995	1998
MIN	3.26	6.52	3.74	4.78	13.8	16.0	16.5	56.3	41.0	10.4	19.2	4.96
(WY)	1995	1997	1997	1996	1995	1996	1996	1997	1997	1997	1999	1995

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1995 - 1999	
ANNUAL TOTAL	28820.8		22501.3			
ANNUAL MEAN	79.0		61.6		46.5	
HIGHEST ANNUAL MEAN					61.8	1998
LOWEST ANNUAL MEAN					25.3	1997
HIGHEST DAILY MEAN	1350	Mar 31	992	Oct 17	2250	May 28 1996
LOWEST DAILY MEAN	3.8	Sep 13	2.7	Sep 25	.86	Oct 4 1994
ANNUAL SEVEN-DAY MINIMUM	4.2	Sep 7	4.1	Sep 20	1.0	Oct 11 1994
INSTANTANEOUS PEAK FLOW			2930	Oct 17	5320	May 28 1996
INSTANTANEOUS PEAK STAGE			12.58	Oct 17	14.94	May 28 1996
INSTANTANEOUS LOW FLOW			2.5	Sep 25a		
ANNUAL RUNOFF (AC-FT)	57170		44630		33720	
ANNUAL RUNOFF (CFSM)	1.49		1.16		.88	
ANNUAL RUNOFF (INCHES)	20.23		15.79		11.93	
10 PERCENT EXCEEDS	158		129		101	
50 PERCENT EXCEEDS	48		40		18	
90 PERCENT EXCEEDS	13		7.7		3.5	

a Also Sep 26
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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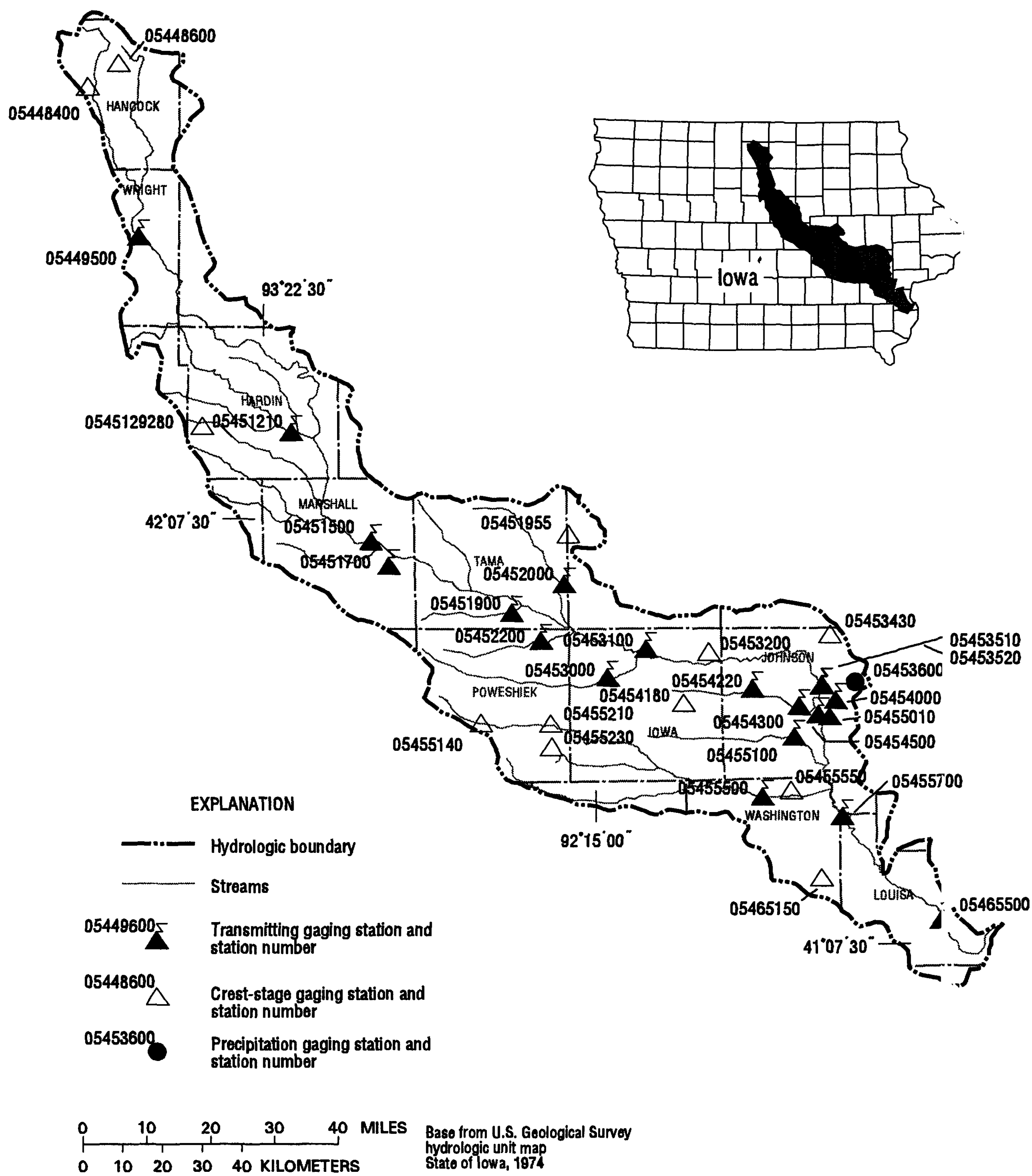
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TAMA
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JOHNSON
05453430
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05453600
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POWESHIEK
05454180
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05454300
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IOWA
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05455550
05455700
05455500
WASHINGTON
92°15'00"
05465150
LOUISA
05465500
41°07'30"
Iowa
EXPLANATION
Hydrologic boundary
Streams
05449600
Transmitting gaging station and station number
05448600
Crest-stage gaging station and station number
05453600
Precipitation gaging station and station number
0 10 20 30 40 MILES
0 10 20 30 40 KILOMETERS
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05449500 IOWA RIVER NEAR ROWAN, IA

LOCATION.--Lat 42°45'36", long 93°37'23", in NW$^1/_4$ NE$^1/_4$ sec.25, T.92 N., R.24 W., Wright County, Hydrologic Unit 07080207, on left bank 10 ft downstream from bridge on county highway C38, 0.9 mi downstream from drainage ditch 123, 3.8 mi northwest of Rowan, 10.7 mi downstream from confluence of East and West Branches, and at mile 316.4.

DRAINAGE AREA.--429 mi^2.

PERIOD OF RECORD.--October 1940 to September 1976, June 1977 to current year.

REVISED RECORDS.--WSP 1308: 1942-43 (M). WSP 1438: Drainage area. WDR IA-80-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,143.35 ft above sea level. Prior to Oct. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--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 Corp of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

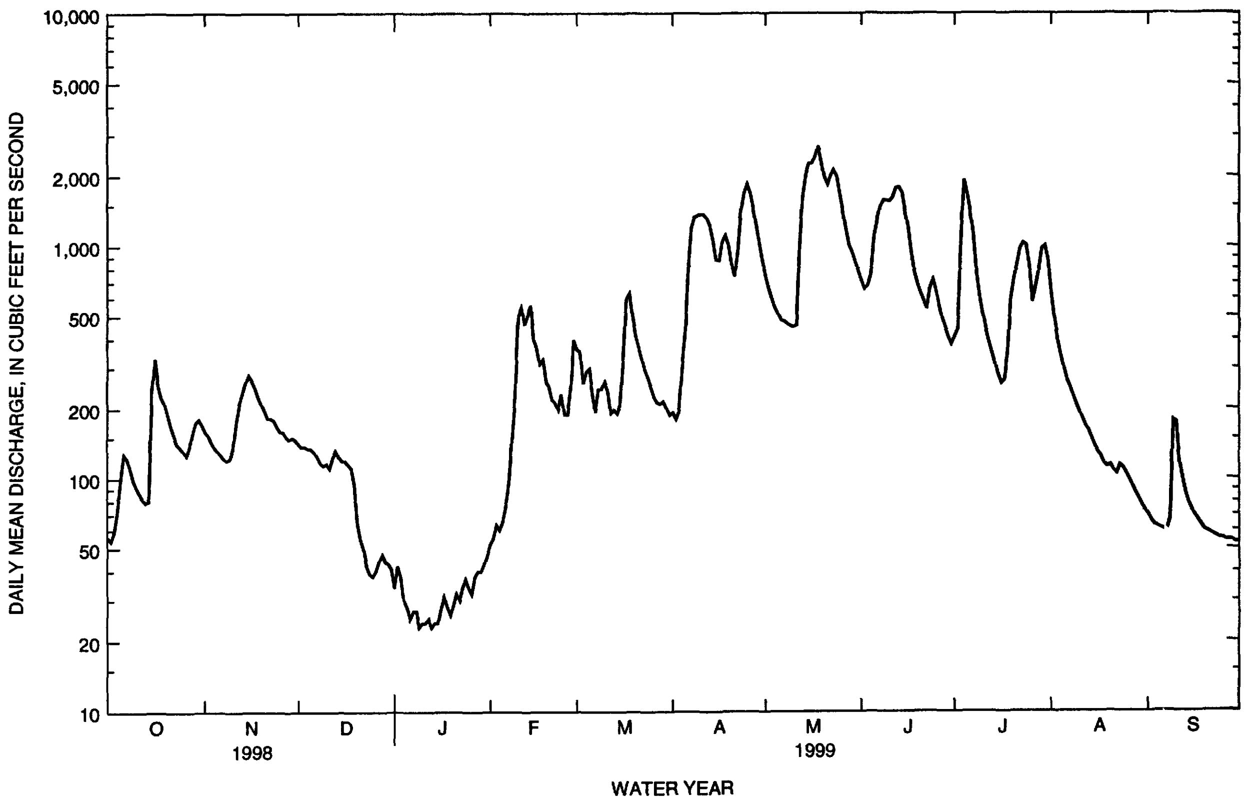
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	160	142	e34	e52	362	193	742	710	406	629	70
2	54	154	137	e42	e55	353	e180	659	656	438	488	66
3	59	145	138	e38	e63	258	196	596	675	1080	397	63
4	72	137	135	e30	e60	290	302	545	752	1920	344	62
5	100	132	135	e28	e65	298	418	513	1100	1670	301	61
6	127	127	131	e25	e76	235	e790	481	1290	1410	266	60
7	122	122	125	e27	e97	194	e1200	476	1480	1130	248	60
8	111	120	117	e27	e145	243	1330	463	1570	782	230	67
9	99	122	114	e23	e220	244	1350	455	1570	615	211	178
10	92	134	116	e24	e500	262	1370	450	1560	512	195	175
11	87	175	111	e24	546	239	1370	459	1620	437	181	118
12	82	209	123	e25	463	192	1320	966	1780	388	168	100
13	79	233	132	e23	509	198	1230	1620	1790	348	161	86
14	80	259	124	e24	558	191	1060	2030	e1700	311	149	78
15	240	280	119	e24	402	208	876	2260	1410	280	138	73
16	329	267	119	e28	369	333	870	2270	1210	257	130	69
17	255	249	115	e31	313	594	1050	2410	946	266	125	66
18	226	227	111	e28	326	627	1110	2680	780	345	116	63
19	211	211	e95	e26	261	492	1010	2330	686	588	112	60
20	189	198	e65	e29	252	413	842	1980	629	721	114	59
21	168	183	e55	e32	220	371	744	1840	584	830	108	58
22	154	182	e50	e30	213	329	933	2020	538	976	105	57
23	142	179	e42	e34	199	293	1410	2120	662	1030	114	56
24	137	168	e39	e37	231	271	1690	1980	714	1010	111	55
25	132	160	e38	e34	189	248	1840	1660	645	814	105	55
26	126	159	e40	e32	189	225	1690	1410	553	576	99	54
27	135	152	e44	e38	244	213	1460	1180	487	670	93	54
28	156	148	e47	e40	396	210	1230	1010	444	788	87	54
29	175	150	e44	e40	---	215	1030	937	406	977	82	53
30	180	147	e43	e43	---	202	862	853	379	1000	77	53
31	171	---	e41	e47	---	188	---	779	---	873	73	---
TOTAL	4346	5289	2887	967	7213	8991	30956	40174	29326	23448	5757	2183
MEAN	140	176	93.1	31.2	258	290	1032	1296	978	756	186	72.8
MAX	329	280	142	47	558	627	1840	2680	1790	1920	629	178
MIN	54	120	38	23	52	188	180	450	379	257	73	53
AC-FT	8620	10490	5730	1920	14310	17830	61400	79690	58170	46510	11420	4330
CFSM	.34	.42	.22	.07	.62	.69	2.47	3.10	2.34	1.81	.44	.17
IN.	.39	.47	.26	.09	.64	.80	2.75	3.58	2.61	2.09	.51	.19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	137	135	87.0	55.8	115	402	490	365	488	304	161	143
MAX	720	695	588	298	931	1415	2439	1793	2452	1922	1684	1213
(WY)	1987	1993	1983	1983	1984	1973	1965	1991	1984	1993	1979	1965
MIN	8.14	9.49	5.62	3.63	3.54	23.9	32.4	44.3	19.2	14.9	14.3	8.83
(WY)	1990	1990	1990	1959	1959	1968	1957	1989	1989	1989	1948	1958

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	119479		161537			
ANNUAL MEAN	327		443		241	
HIGHEST ANNUAL MEAN					869	1993
LOWEST ANNUAL MEAN					30.4	1956
HIGHEST DAILY MEAN	2730	Jun 24	2680	May 18	7640	Jun 21 1954
LOWEST DAILY MEAN	25	Jan 14	23	Jan 9,13	2.8	Dec 22 1989
ANNUAL SEVEN-DAY MINIMUM	29	Jan 10	24	Jan 9	3.0	Jan 19 1959
INSTANTANEOUS PEAK FLOW			2770	May 18	8460	Jun 21 1954
INSTANTANEOUS PEAK STAGE			11.81	May 18	14.88	Jun 21 1954
ANNUAL RUNOFF (AC-FT)	237000		320400		174700	
ANNUAL RUNOFF (CFSM)	.78		1.06		.58	
ANNUAL RUNOFF (INCHES)	10.63		14.38		7.84	
10 PERCENT EXCEEDS	811		1300		615	
50 PERCENT EXCEEDS	154		208		86	
90 PERCENT EXCEEDS	50		44		17	

e Estimated


10,000
5,000
2,000
1,000
500
200
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10
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1998
1999
WATER YEAR

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA

LOCATION.--Lat 42°18'55", long 93°09'07", in SE$^1/_4$ NW$^1/_4$ SW$^1/_4$ sec.26, T.87 N., R.20 W., Hardin County, Hydrologic Unit 07080207, located 15 ft from the left bank downstream side of the bridge on County Road, 4.0 miles upstream of the confluence with the Iowa River, and 2.0 miles NE of New Providence.

DRAINAGE AREA.--230 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1995 to current year.

GAGE.--Water stage recorder. Datum of gage is 945 ft above sea level, from map.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

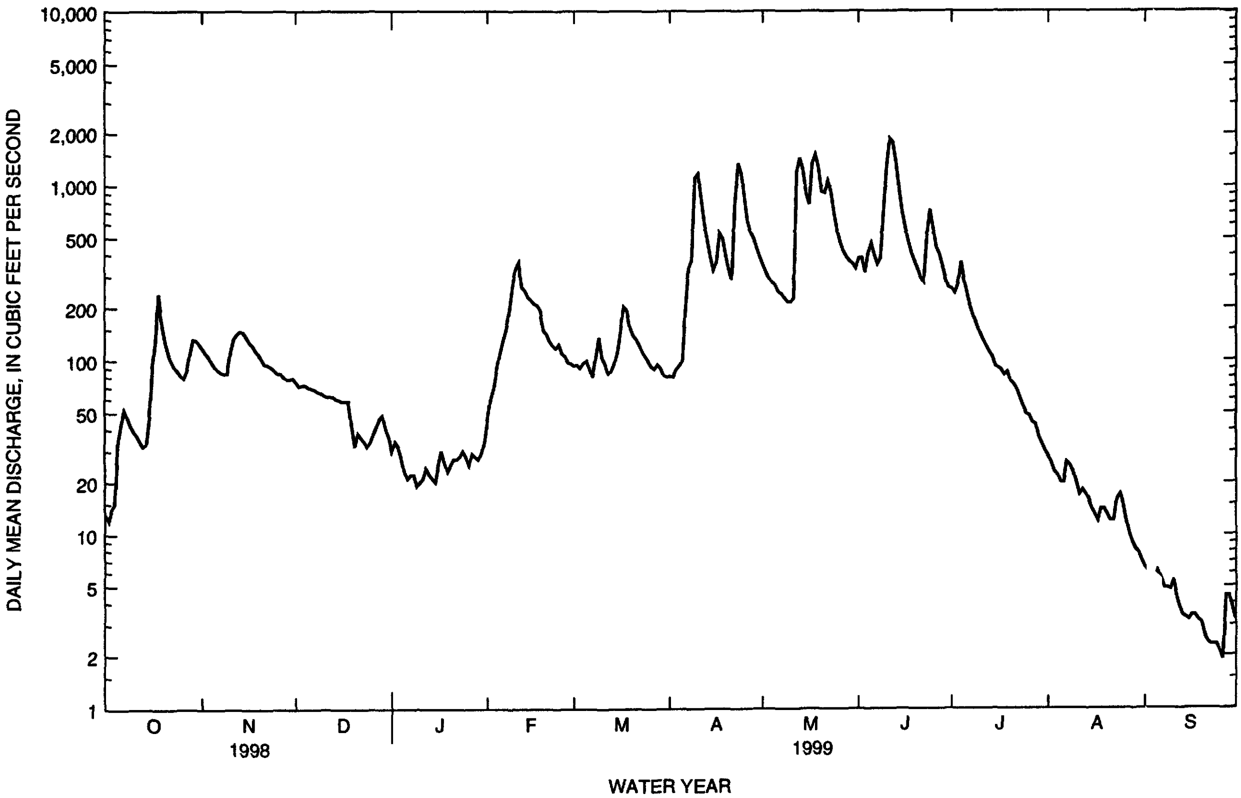
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	117	75	e30	e46	93	81	348	379	255	28	6.4
2	12	110	71	e34	e60	94	80	316	382	242	26	6.1
3	14	105	72	e32	e70	90	88	293	316	272	23	5.7
4	15	98	72	e28	e90	96	92	277	405	361	22	5.5
5	35	92	70	e23	e110	99	98	269	461	282	20	6.1
6	44	88	69	e21	e130	90	196	246	397	236	20	5.5
7	52	85	68	e22	e150	80	334	239	352	197	26	4.9
8	47	84	66	e22	e190	104	371	226	381	175	25	4.9
9	42	84	65	e19	e260	135	1110	215	709	161	23	4.8
10	39	112	63	e20	e330	103	1170	214	1270	143	20	5.4
11	37	133	62	e21	e360	96	869	225	1860	130	17	4.4
12	34	141	62	e24	e260	84	625	1200	1760	120	18	3.8
13	32	146	62	e22	e250	86	488	1440	1360	111	17	3.4
14	33	145	60	e21	e230	95	390	1230	953	104	16	3.3
15	47	137	59	e20	e220	112	326	894	703	92	14	3.2
16	91	127	58	e25	e210	147	363	780	569	90	13	3.4
17	130	121	58	e30	206	202	531	1340	472	88	12	3.4
18	239	113	58	e26	193	193	493	1500	407	82	14	3.2
19	160	108	e42	e23	148	155	393	1270	362	85	14	3.1
20	128	102	e32	e25	141	139	326	925	327	75	13	2.6
21	110	95	e38	e27	128	132	289	909	294	72	12	2.4
22	100	94	e36	e27	121	122	786	1060	278	67	12	2.3
23	92	92	e34	e28	117	112	1340	923	505	60	16	2.3
24	87	88	e32	e30	123	105	1180	695	724	54	17	2.3
25	82	84	e34	e28	109	98	868	556	570	49	15	2.1
26	79	84	e38	e25	105	92	626	470	438	48	12	1.9
27	87	80	e42	e29	97	89	543	420	401	44	10	4.4
28	108	78	e46	e28	96	94	497	389	343	43	8.9	4.4
29	131	78	e48	e27	---	90	437	366	289	36	8.2	3.8
30	130	79	e40	e29	---	82	386	353	258	33	7.8	3.2
31	124	---	e36	e34	---	80	---	332	---	30	7.0	---
TOTAL	2374	3100	1668	800	4550	3389	15376	19920	17925	3837	506.9	118.2
MEAN	76.6	103	53.8	25.8	162	109	513	643	598	124	16.4	3.94
MAX	239	146	75	34	360	202	1340	1500	1860	361	28	6.4
MIN	12	78	32	19	46	80	80	214	258	30	7.0	1.9
AC-FT	4710	6150	3310	1590	9020	6720	30500	39510	35550	7610	1010	234
CFSM	.34	.46	.24	.12	.73	.49	2.29	2.87	2.67	.55	.07	.02
IN.	.39	.51	.28	.13	.76	.56	2.55	3.31	2.98	.64	.08	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	37.7	83.0	49.5	31.5	166	179	272	334	649	215	35.1	9.51
MAX	76.6	199	119	65.7	250	334	513	643	1173	414	73.7	15.1
(WY)	1999	1997	1997	1997	1997	1997	1999	1999	1998	1998	1998	1998
MIN	14.5	12.4	11.0	13.6	110	77.3	51.0	145	353	59.9	16.4	3.94
(WY)	1998	1998	1998	1996	1996	1996	1996	1996	1996	1996	1999	1999

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1996 - 1999	
ANNUAL TOTAL	85545.8		73564.1			
ANNUAL MEAN	234		202		203	
HIGHEST ANNUAL MEAN					218	1998
LOWEST ANNUAL MEAN					188	1997
HIGHEST DAILY MEAN	2920	Jun 30	1860	Jun 11	2920	Jun 30 1998
LOWEST DAILY MEAN	7.5	Jan 1	1.9	Sep 26	1.9	Sep 26 1999
ANNUAL SEVEN-DAY MINIMUM	9.6	Sep 19	2.3	Sep 20	2.3	Sep 20 1999
INSTANTANEOUS PEAK FLOW			1960	Jun 11	3550	Jun 21 1998
INSTANTANEOUS PEAK STAGE			9.06	Jun 11	11.59	Jun 21 1998
INSTANTANEOUS LOW FLOW			1.7	Sep 26	1.7	Sep 26 1999
ANNUAL RUNOFF (AC-FT)	169700		145900		146800	
ANNUAL RUNOFF (CFSM)	1.05		.90		.90	
ANNUAL RUNOFF (INCHES)	14.21		12.22		12.29	
10 PERCENT EXCEEDS	507		500		408	
50 PERCENT EXCEEDS	94		90		71	
90 PERCENT EXCEEDS	17		12		9.9	

e Estimated


10,000
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2,000
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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1998
1999
WATER YEAR

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1995 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)
JAN 14...	1045	21	692	7.9	.1	-10.5	10.6	74	370	302	458	428
FEB 10...	1040	328	572	8.0	.1	--	13.3	94	290	216	376	360
MAR 03...	1015	87	701	8.3	.1	2.0	13.5	95	360	278	452	419
APR 08...	1000	261	722	8.4	10.0	9.0	10.5	97	380	273	460	456
MAY 05...	1020	270	690	8.2	14.4	17.0	9.1	95	340	235	479	393
JUN 03...	1223	318	692	8.0	17.1	31.0	10.2	109	340	228	441	405
JUL 07...	1053	196	714	8.2	22.4	26.0	8.7	103	350	221	478	414
AUG 04...	1013	22	533	8.0	24.1	27.0	8.5	104	260	185	323	289
SEP 02...	1014	6.3	545	8.1	22.2	26.0	9.4	119	260	210	302	291

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
JAN 14...	96	31	9.5	1.7	369	0	27	19	.32	18	.046	9.80
FEB 10...	78	23	7.1	2.3	264	0	20	17	.30	18	.071	14.2
MAR 03...	97	28	8.3	1.4	317	11	26	21	.36	17	.028	11.8
APR 08...	100	30	6.7	8.3	333	0	24	22	.35	19	.030	18.1
MAY 05...	91	28	5.6	1.0	272	7	23	19	.33	16	.016	15.2
JUN 03...	92	27	5.3	1.2	278	0	19	18	.35	19	.025	19.5
JUL 07...	94	29	5.6	1.3	250	10	21	18	.40	21	.023	20.4
AUG 04...	57	28	8.2	2.2	211	7	25	17	.31	20	.072	4.42
SEP 02...	59	28	9.1	2.8	227	14	27	18	.30	19	.010	.558

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)
JAN 14...	.429	.33	.85	.76	.043	.040	.054	14	85	.30	2.8	<.003
FEB 10...	.309	1.5	.73	1.8	.150	.155	.412	<10	59	>5.0	3.8	<.003
MAR 03...	.066	.42	.41	.48	.062	.058	.090	<10	31	.30	2.7	<.003
APR 08...	.029	1.1	.44	1.1	.050	.051	.190	<10	10	4.3	3.0	<.003
MAY 05...	.034	.56	.34	.60	.042	.045	.095	<10	7.9	1.7	2.7	<.003
JUN 03...	.027	.69	.34	.72	.067	.079	.137	<10	8.5	1.9	3.0	--
JUL 07...	.036	.78	1.2	.82	.076	.072	.137	<10	7.1	2.4	3.6	<.003
AUG 04...	.046	.51	.50	.56	.022	.016	.053	E6.1	41	1.0	3.7	<.003
SEP 02...	<.020	--	.44	.61	.025	.011	.081	<10	57	1.6	4.5	<.003

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DI-AZINON, DIS-SOLVED (UG/L) (39572)
JAN 14...	<.002	<.002	.064	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002
FEB 10...	.032	E.003	.109	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002
MAR 03...	.014	<.002	.070	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002
APR 08...	.022	<.002	.075	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002
MAY 05...	.094	E.004	.120	<.001	<.002	<.002	<.003	<.003	<.004	.006	<.002	<.002
JUN 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	.027	<.002	.428	<.001	<.002	<.002	<.003	<.003	<.004	.006	<.002	<.002
AUG 04...	<.010	<.002	.160	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002
SEP 02...	<.002	<.002	.113	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002

DATE	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)
JAN 14...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.054	<.004	<.004
FEB 10...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	1.39	<.004	<.004
MAR 03...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.262	<.004	<.004
APR 08...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.210	<.004	<.004
MAY 05...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.269	<.004	<.004
JUN 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.268	<.004	<.004
AUG 04...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.126	<.004	<.004
SEP 02...	<.001	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.080	<.004	<.004

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
JAN 14...	<.003	<.004	<.006	<.004	<.004	<.002	E.006	<.007	<.004	<.013	<.003
FEB 10...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
MAR 03...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
APR 08...	<.003	<.004	<.006	<.004	<.010	<.002	<.018	<.007	<.004	<.013	<.003
MAY 05...	<.003	<.004	<.006	<.004	<.010	<.002	E.006	<.007	<.004	<.013	<.003
JUN 03...	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
AUG 04...	<.003	<.004	<.006	<.004	<.004	<.002	E.006	<.007	<.004	<.013	<.003
SEP 02...	<.003	<.004	<.006	<.004	<.004	<.002	E.008	<.007	<.004	<.013	<.003

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	P,P' DDE DISSOLV (UG/L) (34653)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
JAN											
14...	.008	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	54
FEB											
10...	.007	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	270
MAR											
03...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	69
APR											
08...	E.004	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	161
MAY											
05...	E.004	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	114
JUN											
03...	--	--	--	--	--	--	--	--	--	--	86
JUL											
07...	.007	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	122
AUG											
04...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	17
SEP											
02...	.011	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	21

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA

PRECIPITATION RECORDS

PERIOD OF RECORD.-- October 1995 to current year.

INSTRUMENTATION.-- Tipping bucket rain gage.

REMARKS.-- Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

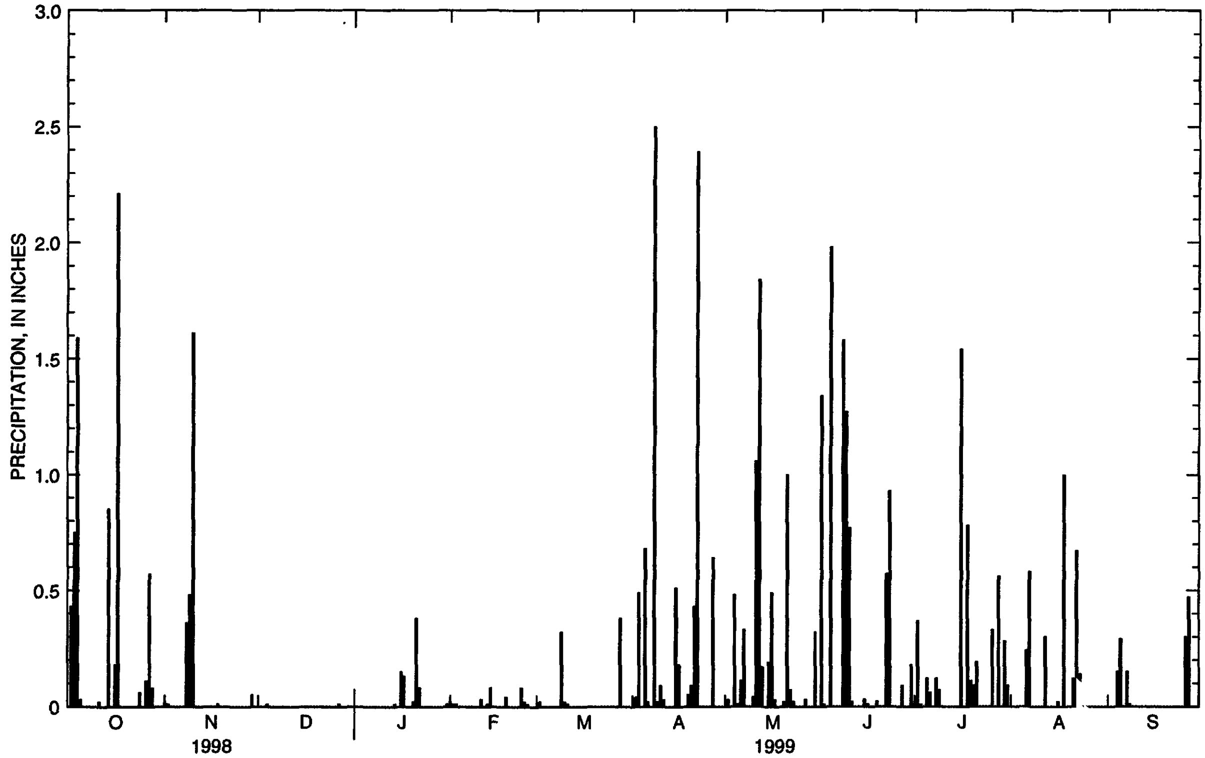
EXTREME FOR PERIOD OF RECORD.-- Maximum daily accumulation, 5.37 in., June 21, 1997.

EXTREME FOR CURRENT YEAR.-- Maximum daily accumulation 2.50 in., Apr. 8.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.02	.00	.00	.02	.00	.00	.00	1.34	.01	.00	.00
2	.43	.01	.00	.00	.01	.02	.04	.03	.01	.37	.00	.00
3	.75	.00	.00	.00	.01	.00	.49	.00	.00	.01	.00	.00
4	1.59	.00	.01	.00	.00	.00	.00	.48	1.98	.00	.00	.15
5	.03	.00	.00	.00	.00	.00	.68	.01	.00	.12	.00	.29
6	.00	.00	.00	.00	.00	.00	.02	.11	.00	.06	.24	.00
7	.00	.00	.00	.00	.00	.00	.00	.33	.00	.00	.58	.15
8	.00	.36	.00	.00	.00	.00	2.50	.00	1.58	.12	.00	.01
9	.00	.48	.00	.00	.00	.32	.02	.00	1.27	.07	.00	.00
10	.00	1.61	.00	.00	.00	.02	.09	.04	.77	.00	.00	.00
11	.02	.00	.00	.00	.03	.01	.03	1.06	.02	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	1.84	.00	.00	.30	.00
13	.00	.00	.00	.00	.01	.00	.00	.17	.00	.00	.00	.00
14	.85	.00	.00	.01	.08	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.51	.19	.03	.00	.00	.00
16	.18	.00	.00	.15	.00	.00	.18	.49	.01	1.54	.02	.00
17	2.21	.00	.00	.13	.00	.00	.00	.03	.00	.00	.00	.00
18	.00	.01	.00	.00	.00	.00	.00	.00	.00	.78	1.00	.00
19	.00	.00	.00	.00	.04	.00	.05	.00	.02	.11	.00	.00
20	.00	.00	.00	.02	.00	.00	.09	.02	.00	.09	.00	.00
21	.00	.00	.00	.38	.00	.00	.43	1.00	.00	.19	.12	.00
22	.00	.00	.00	.08	.00	.00	2.39	.07	.57	.00	.67	.00
23	.00	.00	.00	.00	.00	.00	.00	.02	.93	.00	.14	.00
24	.06	.00	.00	.00	.08	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00
26	.11	.00	.00	.00	.01	.00	.00	.00	.00	.33	.00	.30
27	.57	.00	.01	.00	.00	.00	.64	.03	.09	.00	.00	.47
28	.08	.00	.00	.00	.00	.38	.00	.00	.00	.56	.00	.00
29	.00	.05	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.32	.18	.28	.00	.00
31	.00	---	.00	.01	---	.00	---	.00	---	.09	.00	---
TOTAL	6.88	2.54	0.02	0.78	0.31	0.75	8.16	6.24	8.80	4.73	3.07	1.37
MEAN	.22	.08	.00	.03	.01	.02	.27	.20	.29	.15	.10	.05
MAX	2.21	1.61	.01	.38	.08	.38	2.50	1.84	1.98	1.54	1.00	.47
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05451210 SOUTH FORK IOWA RIVER NORTHEAST OF NEW PROVIDENCE, IA--Continued



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05451500 IOWA RIVER AT MARSHALLTOWN, IA

LOCATION.--Lat 42°03'57", long 92°54'27", in $SE^1/_4$ $SE^1/_4$ sec.23, T.84 N., R.18 W., Marshall County, Hydrologic Unit 07080208, on right bank 10 ft downstream from bridge on State Highway 14, 1,500 ft upstream from Burnett Creek, 2.2 mi upstream from Linn Creek, and at mile 222.8.

DRAINAGE AREA.--1,532 mi^2.

PERIOD OF RECORD.--October 1902 to September 1903, October 1914 to September 1927, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1915-18, 1919 (M), 1920, 1921-23 (M), 1924-27, 1933, 1934 (M), 1936, 1938, 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 853.10 ft above sea level. See WSP 1728 for history of changes prior to Sept. 21, 1934.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	281	823	587	e270	e340	723	634	3120	2980	1830	1130	185
2	288	796	570	e340	e380	797	614	2750	3690	1740	1170	174
3	306	754	556	e320	e440	839	607	2440	2950	1810	1090	163
4	335	720	549	e280	e420	814	645	2250	3040	2820	873	167
5	671	677	534	e240	e380	790	659	2210	4140	2740	733	176
6	711	653	533	e200	e480	721	769	2020	3410	3440	646	166
7	664	632	523	e210	e670	707	1210	1920	3100	3500	644	157
8	e630	623	511	e230	e1000	692	1640	1850	3060	3170	622	145
9	e590	617	501	e200	e1400	626	3710	1790	5640	2760	567	142
10	e550	794	488	e220	1760	619	4580	1730	7150	2240	520	137
11	e510	942	473	e230	1820	598	4250	1760	9560	1770	485	137
12	e465	909	469	e220	1720	624	3690	4080	9320	1500	480	201
13	e440	926	467	e200	1490	659	3260	7060	8210	1320	457	214
14	427	936	459	e220	1430	652	2960	6710	7010	1190	425	198
15	530	931	460	e200	1420	665	2740	6010	5910	1080	403	177
16	e850	912	463	e230	1550	739	2670	5720	5280	997	376	168
17	e1300	886	454	e260	1450	881	2770	6050	4760	1050	368	163
18	1620	e866	450	e240	1260	1020	2760	7500	4170	944	352	150
19	1530	829	e340	e220	1120	1130	2550	8540	3530	965	332	141
20	1190	786	e280	e240	1040	1150	2410	8990	3030	960	302	139
21	1030	746	e380	e270	e820	1090	2390	8420	2640	1080	272	134
22	905	725	e360	e250	e710	984	3190	8120	2370	1150	262	136
23	823	706	e320	e270	e600	905	5210	7440	3100	1150	287	133
24	785	676	e300	e290	e750	857	5530	6500	4050	1190	315	128
25	e750	665	e290	e270	e700	805	5190	5820	3700	1240	303	123
26	e720	645	e300	e250	e680	748	4800	5370	3230	1270	281	120
27	690	626	e340	e300	759	711	4650	4880	2820	1240	256	150
28	754	611	e380	e270	736	703	4470	4410	2580	1090	242	145
29	827	602	e360	e290	---	685	4080	3940	2200	986	225	134
30	873	604	e340	e300	---	648	3560	3780	1960	998	207	126
31	845	---	e320	e320	---	637	---	3220	---	1040	194	---
TOTAL	22890	22618	13357	7850	27325	24219	88198	146400	128590	50260	14819	4629
MEAN	738	754	431	253	976	781	2940	4723	4286	1621	478	154
MAX	1620	942	587	340	1820	1150	5530	8990	9560	3500	1170	214
MIN	281	602	280	200	340	598	607	1730	1960	944	194	120
AC-FT	45400	44860	26490	15570	54200	48040	174900	290400	255100	99690	29390	9180
CFSM	.48	.49	.28	.17	.64	.51	1.92	3.08	2.80	1.06	.31	.10
IN.	.56	.55	.32	.19	.66	.59	2.14	3.55	3.12	1.22	.36	.11

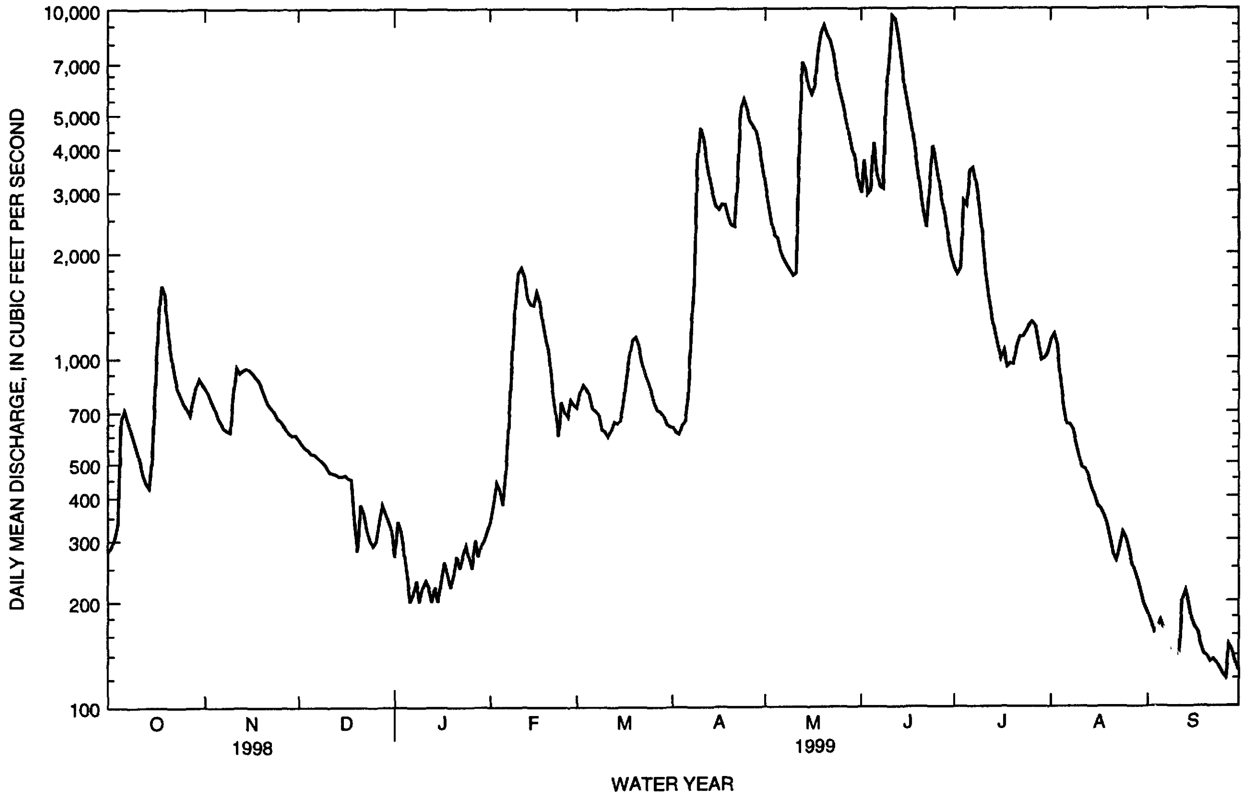
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	502	501	363	306	640	1583	1512	1344	1800	1033	564	497
MAX	2721	2593	2139	2231	3424	4206	6796	5559	7619	8389	7062	3362
(WY)	1987	1973	1983	1973	1915	1973	1965	1991	1918	1993	1993	1993
MIN	39.2	46.2	31.0	10.2	20.9	98.4	99.3	49.9	16.0	41.8	35.9	27.5
(WY)	1940	1940	1990	1977	1940	1934	1934	1934	1934	1977	1934	1939

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1903 - 1999	
ANNUAL TOTAL	522185		551155			
ANNUAL MEAN	1431		1510		887	
HIGHEST ANNUAL MEAN					3456	1993
LOWEST ANNUAL MEAN					77.3	1934
HIGHEST DAILY MEAN	12100	Jun 22	9560	Jun 11	39400	Jun 4 1918
LOWEST DAILY MEAN	80	Jan 14	120	Sep 26	4.7	Jan 25 1977
ANNUAL SEVEN-DAY MINIMUM	94	Jan 10	130	Sep 20	5.2	Jan 20 1977
INSTANTANEOUS PEAK FLOW			9790	Jun 11	42000	Jun 4 1918
INSTANTANEOUS PEAK STAGE			18.22	Jun 11	20.77	Aug 17 1993
INSTANTANEOUS LOW FLOW			116	Sep 25,26		
ANNUAL RUNOFF (AC-FT)	1036000		1093000		642400	
ANNUAL RUNOFF (CFSM)	.93		.99		.58	
ANNUAL RUNOFF (INCHES)	12.68		13.38		7.86	
10 PERCENT EXCEEDS	2850		4080		2180	
50 PERCENT EXCEEDS	794		733		400	
90 PERCENT EXCEEDS	205		212		74	

e Estimated

05451500 IOWA RIVER AT MARSHALLTOWN, IA--Continued



05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA

LOCATION.--Lat 42°00'32", long 92°51'08", in SE$^1/_4$ SW$^1/_4$ sec.8, T.83 N., R.17 W., Marshall County, Hydrologic Unit 07080208, on left bank 20 ft upstream from bridge on Shady Oaks Road, 3.0 mi upstream from mouth, and 3.0 mi southeast of Marshalltown.

DRAINAGE AREA.--118 mi^2.

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

REVISED RECORDS.--WSP 1708: 1950-55, 1957-59.

GAGE.--Water stage recorder. Datum of gage is 849.44 ft above sea level. Prior to Oct. 1, 1991 at site 1/8 mile upstream at same datum.

REMARKS.--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 1947 reached a stage of 16.8 ft, discharge, 5,700 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

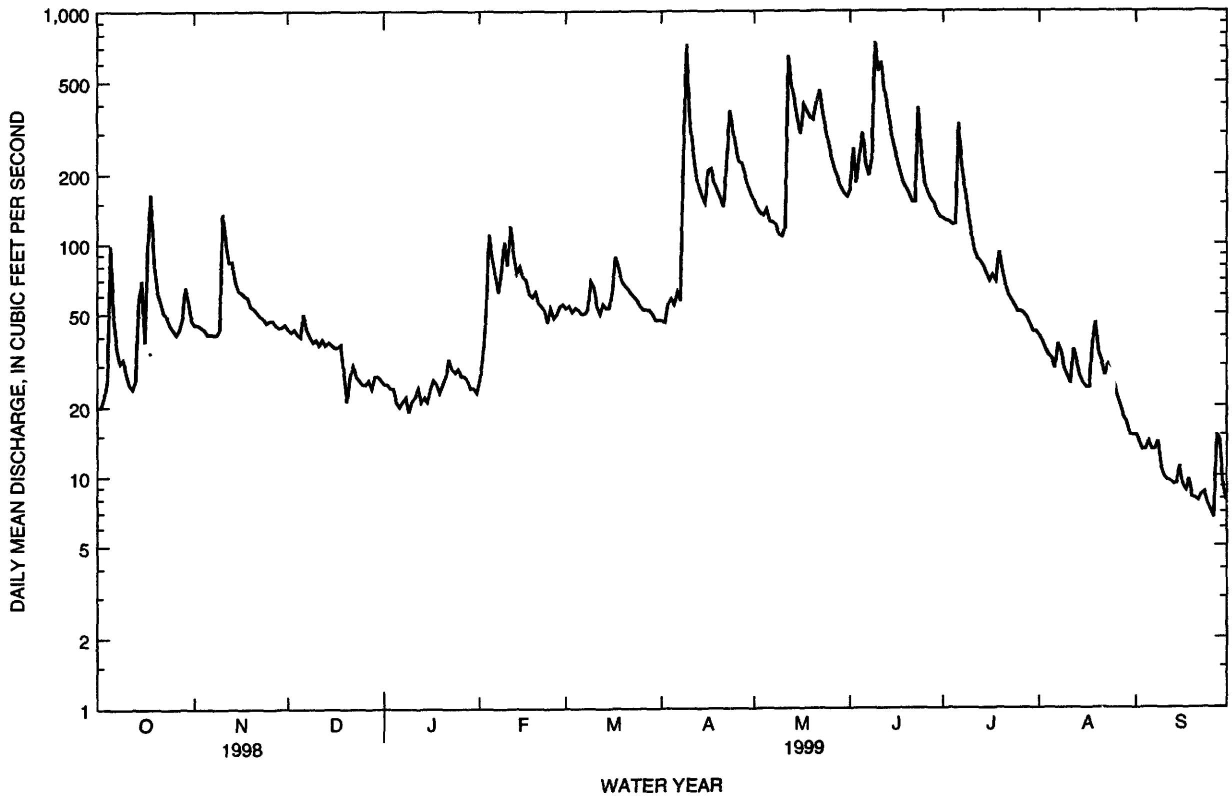
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	45	43	e25	e26	53	47	153	172	129	40	15
2	20	45	42	e25	e32	54	46	143	259	126	38	14
3	22	44	43	e24	e50	51	55	136	184	125	35	13
4	26	43	41	e24	e110	53	58	133	242	121	33	13
5	99	41	40	e21	88	52	55	141	300	122	32	14
6	48	41	50	e20	74	50	62	125	222	329	29	13
7	36	41	43	e21	62	50	57	124	197	e218	37	13
8	31	41	40	e22	75	52	227	121	231	e174	34	14
9	32	43	38	e19	102	69	726	110	736	e139	29	11
10	28	136	39	e21	81	65	348	108	554	e113	27	10
11	25	103	37	e22	e120	54	261	117	607	e93	25	9.6
12	24	84	39	e24	e90	50	202	644	464	86	35	9.5
13	26	84	37	e21	e75	55	177	488	390	84	31	9.2
14	55	69	38	e22	e80	53	161	408	323	80	27	9.3
15	70	63	37	e21	72	53	151	339	268	74	25	11
16	38	62	36	e24	70	63	208	298	237	69	24	9.1
17	97	60	36	e26	61	88	212	398	209	73	24	8.7
18	165	59	37	e25	59	79	183	375	188	69	37	9.7
19	83	54	e28	e23	62	69	169	351	176	92	46	8.1
20	63	53	e21	e25	56	66	156	343	164	78	34	8.0
21	57	51	e27	e27	54	64	145	405	152	67	31	7.8
22	51	49	e30	e32	e52	61	221	458	152	60	27	8.3
23	49	48	e27	e29	e46	59	375	373	385	57	30	8.5
24	45	46	e26	e28	e53	57	315	316	246	54	28	7.6
25	43	47	e25	e29	e48	54	261	270	187	51	e25	7.1
26	41	47	e25	e27	e50	52	227	234	166	51	e22	6.6
27	43	45	e26	e27	54	52	223	209	156	50	e20	15
28	48	44	e24	e26	55	52	199	193	150	48	e18	14
29	65	44	e27	e24	---	50	177	175	138	45	e17	8.9
30	57	45	e27	e24	---	47	162	165	131	42	15	7.8
31	47	---	e26	e23	---	47	---	160	---	42	15	---
TOTAL	1554	1677	1055	751	1857	1774	5866	8013	7986	2961	890	313.8
MEAN	50.1	55.9	34.0	24.2	66.3	57.2	196	258	266	95.5	28.7	10.5
MAX	165	136	50	32	120	88	726	644	736	329	46	15
MIN	20	41	21	19	26	47	46	108	131	42	15	6.6
AC-FT	3080	3330	2090	1490	3680	3520	11640	15890	15840	5870	1770	622
CFSM	.42	.47	.29	.21	.56	.48	1.66	2.19	2.26	.81	.24	.09
IN.	.49	.53	.33	.24	.59	.56	1.85	2.53	2.52	.93	.28	.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	37.5	40.2	36.2	36.6	87.5	143	111	131	155	95.0	58.9	38.7
MAX	286	265	183	200	351	597	385	447	704	866	635	341
(WY)	1987	1984	1984	1973	1971	1979	1993	1974	1998	1993	1993	1986
MIN	.76	1.11	.60	.054	3.07	5.11	2.84	3.08	1.09	1.03	1.16	1.21
(WY)	1951	1951	1956	1977	1954	1956	1956	1977	1977	1956	1956	1950

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1950 - 1999	
ANNUAL TOTAL	56376		34697.8			
ANNUAL MEAN	154		95.1		80.8	
HIGHEST ANNUAL MEAN					299	1993
LOWEST ANNUAL MEAN					2.84	1956
HIGHEST DAILY MEAN	2550	Jun 21	736	Jun 9	6570	Aug 16 1977
LOWEST DAILY MEAN	15	Jan 14	6.6	Sep 26	.00	Jul 24 1956a
ANNUAL SEVEN-DAY MINIMUM	16	Sep 19	7.7	Sep 20	.00	Oct 4 1956
INSTANTANEOUS PEAK FLOW			1180	Apr 9	12000	Aug 16 1977
INSTANTANEOUS PEAK STAGE			11.38	Apr 9	17.69	Aug 16 1977
INSTANTANEOUS LOW FLOW			6.3	Sep 26		
ANNUAL RUNOFF (AC-FT)	111800		68820		58540	
ANNUAL RUNOFF (CFSM)	1.31		.81		.68	
ANNUAL RUNOFF (INCHES)	17.77		10.94		9.30	
10 PERCENT EXCEEDS	333		229		176	
50 PERCENT EXCEEDS	58		51		33	
90 PERCENT EXCEEDS	22		20		3.2	

a Several days in July, Oct 1956; Jan, Feb, July 1977
e Estimated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05451900 RICHLAND CREEK NEAR HAVEN, IA

LOCATION.--Lat 41°53'58", long 92°28'27", in SE$^1/_4$ NE$^1/_4$ sec.21, T.82 N., R.14 W., Tama County, Hydrologic Unit 07080208, on right bank 5 ft upstream from bridge on county highway, 0.5 mi northeast of Haven, and 3.0 mi upstream from mouth.

DRAINAGE AREA.--56.1 mi^2.

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

REVISED RECORDS.--WSP 1708: 1950-55, 1956 (M), 1957, 1958 (M), 1959.

GAGE.--Water-stage recorder. Datum of gage is 788.69 ft above sea level. Prior to Oct. 1, 1971, at datum 10.00 ft higher.

REMARKS.--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 1918 reached a stage of 24.3 ft present datum, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	47	29	e11	29	26	24	73	70	48	15	6.9
2	10	47	29	e12	63	27	23	70	67	45	13	6.7
3	13	44	28	e14	75	26	25	68	60	45	13	6.3
4	24	42	28	e12	92	26	24	70	68	41	13	6.1
5	277	40	27	e11	45	26	26	151	69	38	12	6.2
6	88	39	28	e13	43	25	30	102	58	38	11	6.0
7	56	38	28	e15	37	24	27	92	53	35	13	5.9
8	44	38	27	e17	46	21	32	83	55	34	12	5.7
9	38	40	27	e14	54	41	100	75	337	35	11	5.6
10	33	119	26	e15	45	29	70	70	230	31	11	5.6
11	30	82	26	e15	91	25	60	72	203	30	10	5.6
12	27	67	26	e15	69	24	52	288	227	29	13	5.5
13	25	60	26	e13	63	24	48	201	130	28	12	5.5
14	25	55	25	e13	45	25	45	166	110	26	11	5.4
15	25	49	25	e13	42	27	45	141	97	25	10	5.3
16	23	48	25	e14	38	34	56	127	89	24	9.9	5.1
17	103	44	25	e15	35	48	57	142	81	27	9.6	5.0
18	145	e42	25	e16	34	39	52	131	74	24	16	4.9
19	78	41	23	e15	32	34	51	114	69	28	24	5.0
20	61	40	e18	e14	31	32	49	104	64	27	13	4.9
21	53	38	e16	e18	29	31	48	141	60	22	11	4.7
22	47	37	e15	e22	29	30	107	158	74	21	11	4.8
23	44	35	e13	e32	30	29	188	128	144	20	11	4.7
24	41	34	e15	e29	28	28	137	113	89	19	10	4.7
25	38	33	e18	e23	29	27	114	102	70	18	9.3	4.5
26	36	32	e20	e22	28	27	101	93	63	18	8.7	4.5
27	48	31	e18	e24	28	27	101	86	78	18	8.3	6.6
28	49	30	e20	e25	28	28	93	80	64	18	8.0	6.1
29	64	30	e17	e23	---	25	84	74	53	16	7.5	4.8
30	55	30	e14	e21	---	25	77	69	50	15	7.3	4.5
31	49	---	e12	23	---	25	---	69	---	17	7.2	---
TOTAL	1658.4	1352	699	539	1238	885	1946	3453	2956	860	351.8	163.1
MEAN	53.5	45.1	22.5	17.4	44.2	28.5	64.9	111	98.5	27.7	11.3	5.44
MAX	277	119	29	32	92	48	188	288	337	48	24	6.9
MIN	9.4	30	12	11	28	21	23	68	50	15	7.2	4.5
AC-FT	3290	2680	1390	1070	2460	1760	3860	6850	5860	1710	698	324
CFSM	.95	.80	.40	.31	.79	.51	1.16	1.99	1.76	.49	.20	.10
IN.	1.10	.90	.46	.36	.82	.59	1.29	2.29	1.96	.57	.23	.11

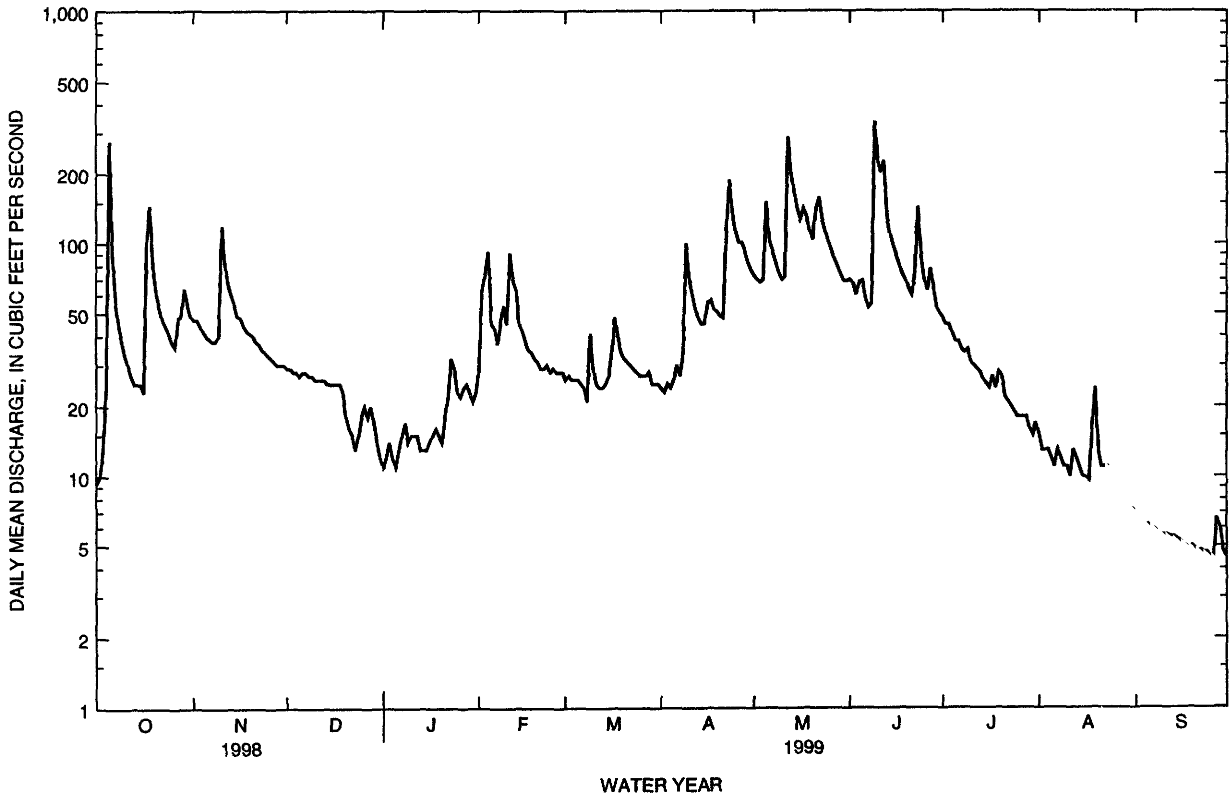
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.7	23.2	17.6	19.9	43.8	67.1	58.6	62.4	67.5	45.6	31.9	19.9
MAX	105	122	85.8	104	165	270	323	337	270	463	427	159
(WY)	1987	1984	1983	1960	1965	1979	1991	1974	1990	1993	1993	1993
MIN	.24	.31	.25	.020	.32	1.05	.85	2.04	.25	.66	.76	.58
(WY)	1957	1951	1957	1977	1989	1956	1956	1956	1956	1977	1955	1950

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1950 - 1999	
ANNUAL TOTAL	25665.6		16101.3			
ANNUAL MEAN	70.3		44.1		39.6	
HIGHEST ANNUAL MEAN					162	1993
LOWEST ANNUAL MEAN					2.49	1956
HIGHEST DAILY MEAN	580	Mar 31	337	Jun 9	2880	Aug 16 1977
LOWEST DAILY MEAN	8.5	Sep 28	4.5	Sep 25a	.00	Jan 22 1977b
ANNUAL SEVEN-DAY MINIMUM	9.2	Sep 22	4.7	Sep 20	.00	Jan 22 1977b
INSTANTANEOUS PEAK FLOW			687	Jun 9	12200	Apr 12 1991
INSTANTANEOUS PEAK STAGE			16.15	Jun 9	26.71	Apr 12 1991
INSTANTANEOUS LOW FLOW			3.7	Sep 12		
ANNUAL RUNOFF (AC-FT)	50910		31940		28700	
ANNUAL RUNOFF (CFSM)	1.25		.79		.71	
ANNUAL RUNOFF (INCHES)	17.02		10.68		9.59	
10 PERCENT EXCEEDS	146		93		81	
50 PERCENT EXCEEDS	44		29		15	
90 PERCENT EXCEEDS	15		9.1		1.1	

a Also Sep 26 and 30
b Also Jan 23 to Feb 2, 1977; July 9 and 10, 1989
e Estimated

05451900 RICHLAND CREEK NEAR HAVEN, IA--Continued



05452000 SALT CREEK NEAR ELBERON, IA

LOCATION.--Lat 41°57'51", long 92°18'47", in $NW^1/_4$ $NW^1/_4$ sec.36, T.83 N., R.13 W., Tama County, Hydrologic Unit 07080208, on left bank 20 ft upstream from bridge on U.S. Highway 30, 2.0 mi upstream from Hog Run, 3.0 mi south of Elberon, and 9.0 mi upstream from mouth.

DRAINAGE AREA.--201 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946.

GAGE.--Water-stage recorder. Datum of gage is 781.58 ft above sea level (Iowa Highway Commission bench mark). Prior to Oct. 15, 1945 and June 14, 1947 to Feb. 10, 1949, nonrecording gage on upstream side of bridge at present datum.

REMARKS.--Records good except those for 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 rain gage and satellite data collection platform at station

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1944 reached a stage of 19.9 ft, from floodmark at downstream side of bridge, discharge, about 30,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	234	110	e44	73	92	73	201	227	176	60	27
2	40	211	110	e48	131	91	71	192	261	165	54	26
3	49	190	109	e50	248	80	76	181	230	175	53	25
4	52	175	106	e46	446	88	77	176	306	164	52	24
5	361	166	104	e42	282	84	75	192	433	146	48	24
6	229	157	101	e48	179	79	89	173	290	157	46	24
7	143	150	98	e55	152	76	80	169	256	142	52	23
8	113	150	97	e65	194	52	85	160	236	131	50	22
9	101	150	95	e55	282	67	410	152	1310	136	45	21
10	91	354	94	e60	198	106	276	148	802	119	43	20
11	82	312	93	e60	339	92	220	161	563	112	40	20
12	75	241	93	e60	325	83	184	748	594	108	48	21
13	71	220	92	e50	245	82	171	543	417	102	45	20
14	81	208	89	e50	207	83	159	467	354	96	41	20
15	372	187	89	e50	161	89	151	367	307	90	38	19
16	199	181	87	e55	151	105	155	326	284	86	37	19
17	396	164	86	e60	130	145	146	516	264	90	36	19
18	789	e160	88	e65	122	126	136	545	244	82	39	19
19	371	154	81	e60	115	105	136	383	229	138	45	19
20	288	144	e65	e55	108	101	133	334	216	136	38	19
21	241	141	e55	e65	102	96	128	332	204	109	35	18
22	208	142	e50	e81	100	90	244	440	e200	106	35	17
23	192	136	e46	e95	99	88	658	368	367	96	38	17
24	178	128	e60	e85	101	85	459	325	278	93	38	17
25	165	129	e70	e75	95	80	355	296	222	89	36	17
26	155	124	e75	e70	98	79	302	272	202	90	33	18
27	163	123	e65	e70	98	78	280	257	242	89	31	25
28	184	119	e75	e75	98	83	254	246	323	99	30	29
29	205	119	e70	e70	---	79	225	233	203	87	28	22
30	448	117	e60	e65	---	76	211	223	186	72	27	20
31	278	---	e55	69	---	74	---	218	---	68	27	---
TOTAL	6359	5186	2568	1898	4879	2734	6019	9344	10250	3549	1268	631
MEAN	205	173	82.8	61.2	174	88.2	201	301	342	114	40.9	21.0
MAX	789	354	110	95	446	145	658	748	1310	176	60	29
MIN	39	117	46	42	73	52	71	148	186	68	27	17
AC-FT	12610	10290	5090	3760	9680	5420	11940	18530	20330	7040	2520	1250
CFSM	1.02	.86	.41	.30	.87	.44	1.00	1.50	1.70	.57	.20	.10
IN.	1.18	.96	.48	.35	.90	.51	1.11	1.73	1.90	.66	.23	.12

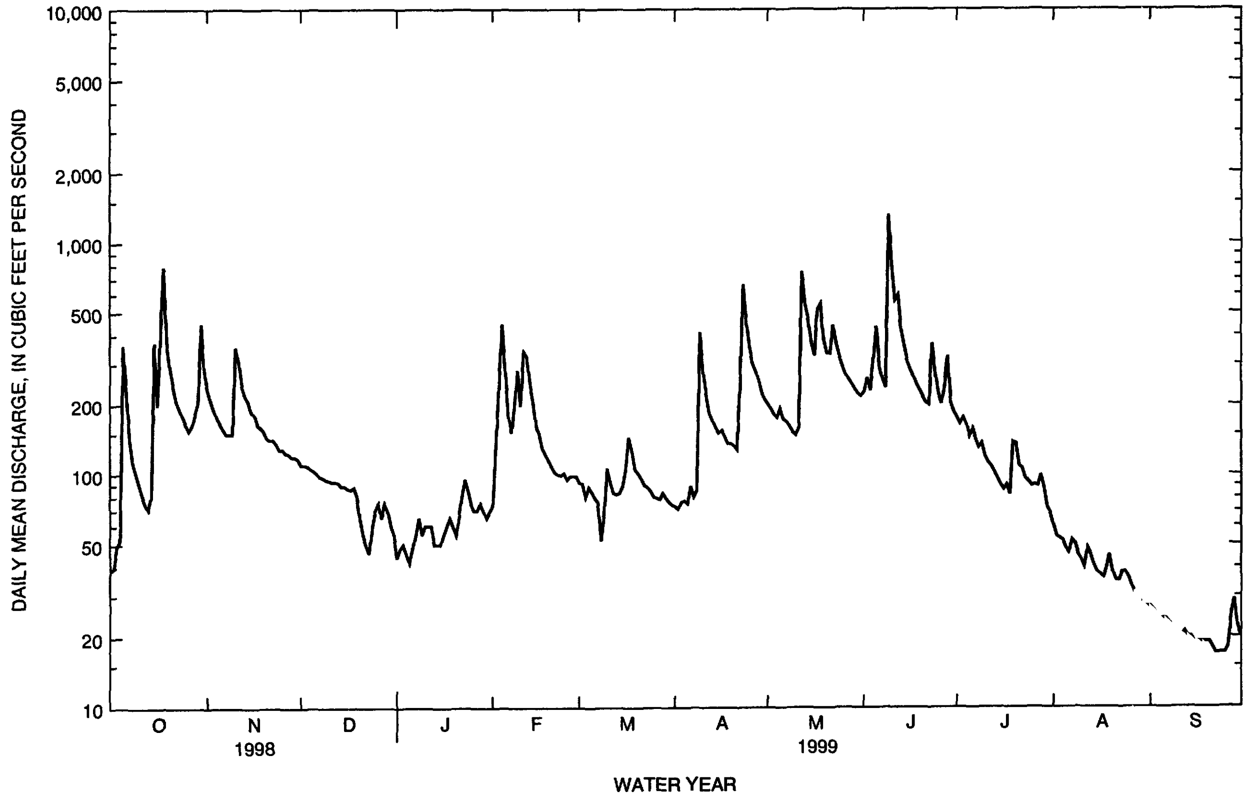
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	67.5	82.2	65.6	73.3	143	266	196	197	267	194	103	67.8
MAX	250	425	314	337	607	844	652	573	1826	1803	1157	440
(WY)	1978	1983	1983	1973	1982	1993	1983	1982	1947	1993	1993	1993
MIN	4.85	4.08	2.29	1.14	7.02	11.7	11.0	5.75	7.79	3.84	5.65	5.43
(WY)	1951	1951	1977	1977	1977	1954	1989	1977	1977	1989	1949	1950

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1946 - 1999	
ANNUAL TOTAL	83104		54685			
ANNUAL MEAN	228		150		143	
HIGHEST ANNUAL MEAN					569	1993
LOWEST ANNUAL MEAN					23.2	1989
HIGHEST DAILY MEAN	2190	Jun 19	1310	Jun 9	14000	Jul 9 1993
LOWEST DAILY MEAN	37	Sep 23	17	Sep 22	.85	Jan 31 1977
ANNUAL SEVEN-DAY MINIMUM	39	Sep 22	18	Sep 20	.95	Jan 25 1977
INSTANTANEOUS PEAK FLOW			1650	Jun 9	41800	Jul 9 1993
INSTANTANEOUS PEAK STAGE			14.49	Jun 9	20.85	Jul 9 1993
INSTANTANEOUS LOW FLOW			16	Sep 25		
ANNUAL RUNOFF (AC-FT)	164800		108500		103900	
ANNUAL RUNOFF (CFSM)	1.13		.75		.71	
ANNUAL RUNOFF (INCHES)	15.38		10.12		9.69	
10 PERCENT EXCEEDS	482		316		282	
50 PERCENT EXCEEDS	143		101		56	
90 PERCENT EXCEEDS	51		34		9.1	

e Estimated

05452000 SALT CREEK NEAR ELBERON, IA--Continued



05452200 WALNUT CREEK NEAR HARTWICK, IA

LOCATION.--Lat 41°50'06", long 92°23'10", in SE$^1/_4$ SW$^1/_4$ sec.8, T.81 N, R.13 W., Poweshiek County, Hydrologic Unit 07080208, on right bank 5 ft downstream from bridge on county highway V21, 1.2 mi downstream from North Walnut Creek, 4.0 mi northwest of Hartwick, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--70.9 mi^2.

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

REVISED RECORDS.--WSP 1558: 1950 (P), 1951-57.

GAGE.--Water-stage recorder. Datum of gage is 786.59 ft above sea level.

REMARKS.--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 1947 reached a stage of 17.7 ft, from information by local residents, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

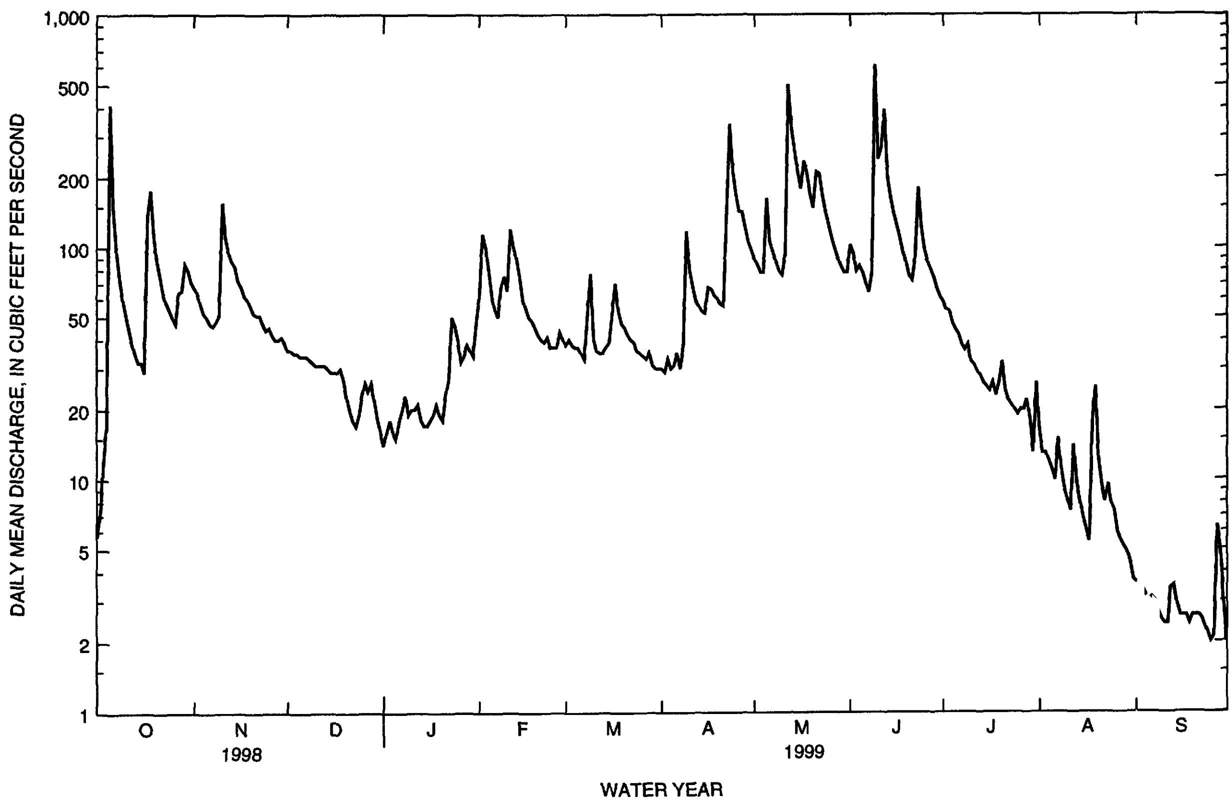
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	67	36	e14	61	38	30	89	102	58	16	3.6
2	7.4	64	36	e16	114	40	29	84	94	54	13	3.6
3	12	57	35	e18	100	38	33	78	79	53	13	3.4
4	17	52	35	e16	e80	37	30	78	83	47	12	3.2
5	412	50	34	e15	62	37	31	162	78	44	11	3.0
6	147	47	34	e18	54	35	35	106	70	42	9.9	3.1
7	99	46	34	e20	50	33	30	95	64	38	15	3.0
8	75	48	33	e23	68	52	36	87	78	36	11	2.7
9	61	51	32	e19	e75	77	117	79	608	38	9.1	2.5
10	52	156	31	e20	e65	40	80	76	240	32	8.2	2.4
11	45	110	31	e20	e120	36	68	93	265	31	7.3	2.4
12	39	95	31	e21	e100	35	59	502	391	29	14	3.4
13	35	87	31	e18	e90	35	56	330	201	28	9.6	3.5
14	32	83	30	e17	e75	37	53	260	164	26	8.1	2.9
15	32	72	29	e17	e60	39	52	211	140	25	6.8	2.6
16	29	68	29	e18	e55	52	67	179	124	24	6.0	2.6
17	137	62	29	e19	50	70	66	235	110	26	5.4	2.6
18	177	e60	30	e21	48	53	62	208	95	23	18	2.4
19	111	56	27	e19	45	47	60	170	86	26	25	2.6
20	88	52	e23	e18	42	45	57	148	75	32	12	2.6
21	75	51	e20	e23	40	42	56	211	72	24	9.4	2.6
22	64	51	e18	e27	39	40	140	207	e90	22	8.0	2.5
23	58	47	e17	e50	41	39	339	167	e180	21	9.5	2.3
24	54	44	e19	e46	37	36	212	142	122	20	7.9	2.2
25	50	45	e23	e40	37	35	169	125	98	19	7.3	2.0
26	47	42	e26	e32	37	34	143	110	86	20	5.9	2.1
27	64	40	e24	e34	43	33	142	99	80	20	5.5	6.3
28	65	40	e26	e38	40	35	122	90	74	22	5.2	5.1
29	85	41	e22	e36	---	31	106	83	66	18	4.9	3.0
30	80	39	e18	e34	---	30	97	78	61	13	4.4	2.0
31	71	---	e16	48	---	30	---	78	---	26	3.7	---
TOTAL	2326.1	1823	859	775	1728	1261	2577	4660	4076	937	302.1	88.2
MEAN	75.0	60.8	27.7	25.0	61.7	40.7	85.9	150	136	30.2	9.75	2.94
MAX	412	156	36	50	120	77	339	502	608	58	25	6.3
MIN	5.7	39	16	14	37	30	29	76	61	13	3.7	2.0
AC-FT	4610	3620	1700	1540	3430	2500	5110	9240	8080	1860	599	175
CFSM	1.06	.86	.39	.35	.87	.57	1.21	2.12	1.92	.43	.14	.04
IN.	1.22	.96	.45	.41	.91	.66	1.35	2.45	2.14	.49	.16	.05

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	20.0	28.1	23.4	26.4	51.3	82.9	77.2	80.7	82.6	54.9	35.7	24.7
MAX	137	171	109	179	191	300	365	452	450	461	498	185
(WY)	1987	1984	1993	1960	1971	1993	1991	1974	1990	1993	1993	1993
MIN	.003	.29	.060	.006	1.40	1.64	1.03	1.62	.76	1.01	.38	.28
(WY)	1957	1956	1977	1956	1954	1954	1957	1977	1956	1954	1955	1953

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1950 - 1999	
ANNUAL TOTAL	29426.7		21412.4			
ANNUAL MEAN	80.6		58.7		48.9	
HIGHEST ANNUAL MEAN					200	1993
LOWEST ANNUAL MEAN					4.76	1956
HIGHEST DAILY MEAN	707	Mar 31	608	Jun 9	4840	Jul 2 1983
LOWEST DAILY MEAN	5.7	Oct 1	2.0	Sep 25a	.00	Jul 31 1954
ANNUAL SEVEN-DAY MINIMUM	6.7	Sep 26	2.3	Sep 20	.00	Aug 27 1955
INSTANTANEOUS PEAK FLOW			1720	Jun 9	7900	Apr 29 1991
INSTANTANEOUS PEAK STAGE			12.45	Jun 9	16.93	Apr 29 1991
INSTANTANEOUS LOW FLOW			1.5	Sep 26		
ANNUAL RUNOFF (AC-FT)	58370		42470		35450	
ANNUAL RUNOFF (CFSM)	1.14		.83		.69	
ANNUAL RUNOFF (INCHES)	15.44		11.23		9.38	
10 PERCENT EXCEEDS	171		122		103	
50 PERCENT EXCEEDS	54		39		17	
90 PERCENT EXCEEDS	15		5.8		1.2	

a Also Sep 30
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05453000 BIG BEAR CREEK AT LADORA, IA

LOCATION.--Lat 41°44'58", long 92°10'55", in $SW^1/_4$ $SW^1/_4$ sec.7, T.80 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 10 ft downstream from bridge on county highway V52, 0.4 mi south of Ladora, 1.2 mi downstream from Coats Creek, 2.8 mi upstream from Little Bear Creek, and 8.1 mi upstream from mouth.

DRAINAGE AREA.--189 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as "Bear Creek at Ladora".

REVISED RECORDS.--WSP 1308: 1947 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.94 ft above sea level. Oct. 1945 to June 26, 1946, non-recording gage and June 27, 1946 to Sept. 30, 1980, water-stage recorder at datum 10.00 ft higher.

REMARKS.--Records good except those for 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 rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	126	88	e36	e120	168	94	229	257	168	54	19
2	27	128	89	e40	e170	166	91	214	419	156	41	18
3	35	131	88	e46	344	158	95	199	226	150	39	18
4	46	117	87	e42	400	149	108	194	232	139	37	17
5	710	110	87	e38	253	143	96	400	236	127	35	16
6	308	105	88	e42	182	131	109	272	197	122	33	16
7	183	99	83	e48	159	119	100	241	180	116	38	16
8	135	101	80	e55	170	112	104	219	177	108	40	16
9	110	105	80	e46	197	129	249	199	1830	104	33	e15
10	92	329	77	e48	156	143	216	188	611	96	32	15
11	82	293	77	e48	232	115	190	215	754	89	30	15
12	74	218	78	e48	331	110	162	1630	1850	86	122	16
13	68	198	77	e44	207	111	154	1000	643	83	86	16
14	66	187	75	e44	183	115	148	728	477	79	45	15
15	64	166	74	e44	153	125	147	562	400	73	38	14
16	61	159	73	e46	138	163	182	459	355	70	33	14
17	187	143	72	e48	122	240	193	498	327	71	31	14
18	517	e140	74	e50	116	194	172	580	293	67	41	13
19	246	131	69	e46	112	160	164	430	266	65	100	13
20	187	121	e60	e50	107	153	154	371	240	90	51	13
21	162	118	e55	e55	98	143	145	368	213	75	40	12
22	139	119	e50	e60	98	132	221	390	207	62	35	12
23	125	114	e44	e110	102	127	796	329	621	57	36	12
24	116	107	e50	e100	98	121	512	293	387	54	34	12
25	110	108	e60	e90	94	111	400	264	272	51	29	12
26	102	102	e65	e80	97	108	346	241	237	50	27	11
27	108	99	e60	e85	295	107	349	223	219	50	25	15
28	122	97	e65	e95	208	110	324	208	206	51	23	20
29	131	99	e48	e90	---	104	277	194	187	46	22	16
30	167	96	e40	e90	---	97	250	182	174	43	20	13
31	137	---	e38	e100	---	95	---	181	---	44	20	---
TOTAL	4644	4166	2151	1864	4942	4159	6548	11701	12693	2642	1270	444
MEAN	150	139	69.4	60.1	176	134	218	377	423	85.2	41.0	14.8
MAX	710	329	89	110	400	240	796	1630	1850	168	122	20
MIN	27	96	38	36	94	95	91	181	174	43	20	11
AC-FT	9210	8260	4270	3700	9800	8250	12990	23210	25180	5240	2520	881
CFSM	.79	.73	.37	.32	.93	.71	1.15	2.00	2.24	.45	.22	.08
IN.	.91	.82	.42	.37	.97	.82	1.29	2.30	2.50	.52	.25	.09

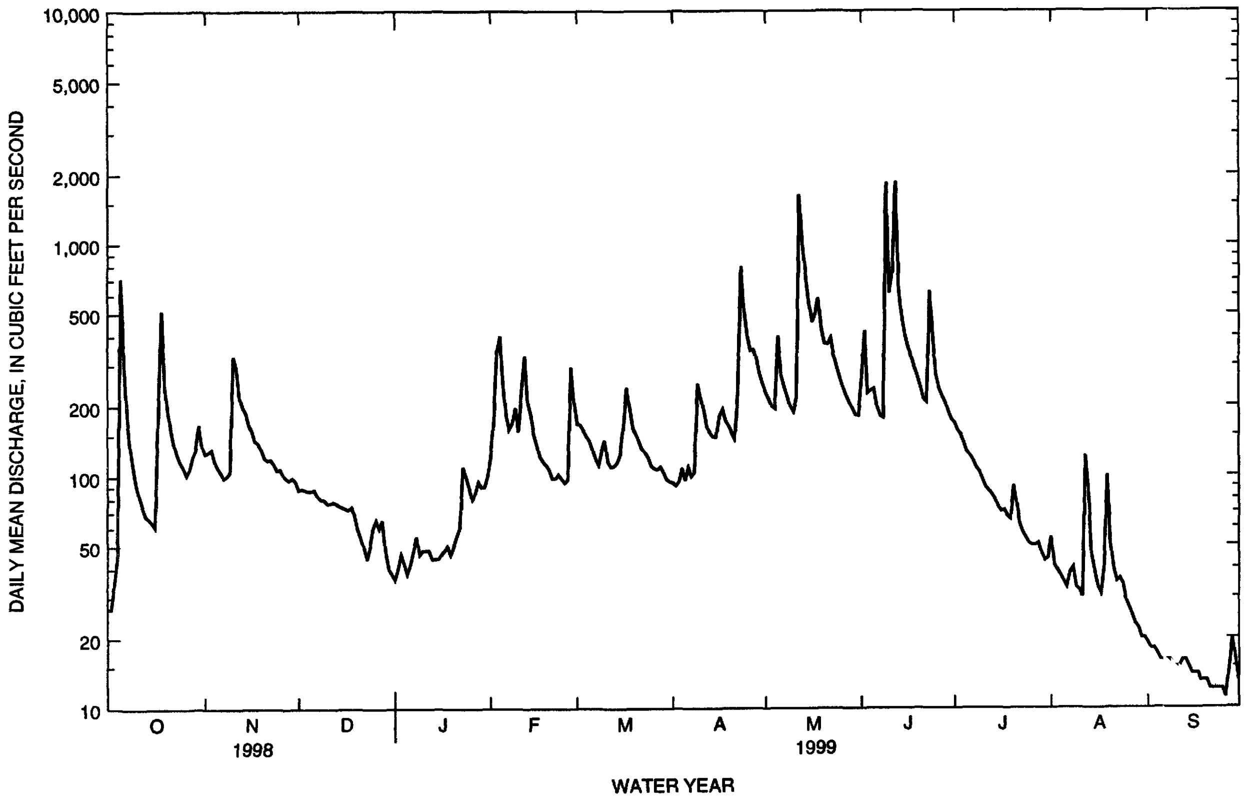
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	58.8	75.1	63.5	74.8	124	236	201	216	229	140	92.0	74.5
MAX	375	341	294	432	543	895	704	1185	1136	1011	1537	559
(WY)	1987	1993	1983	1960	1971	1979	1973	1974	1947	1993	1993	1993
MIN	.49	1.68	.33	.021	2.07	5.99	4.17	2.25	2.94	5.00	2.36	1.34
(WY)	1957	1956	1956	1977	1977	1957	1956	1956	1956	1988	1955	1956

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1946 - 1999	
ANNUAL TOTAL	79323		57224			
ANNUAL MEAN	217		157		132	
HIGHEST ANNUAL MEAN					516	1993
LOWEST ANNUAL MEAN					8.26	1956
HIGHEST DAILY MEAN	2690	Mar 31	1850	Jun 12	9480	Mar 30 1960
LOWEST DAILY MEAN	26	Sep 28	11	Sep 26	.00	Jan 22 1956a
ANNUAL SEVEN-DAY MINIMUM	28	Sep 26	12	Sep 20	.00	Jan 22 1956
INSTANTANEOUS PEAK FLOW			3590	Jun 9	10500	Mar 30 1960
INSTANTANEOUS PEAK STAGE			21.50	Jun 9	15.32b	Sep 8 1977
INSTANTANEOUS LOW FLOW			11	Sep 26		
ANNUAL RUNOFF (AC-FT)	157300		113500		95580	
ANNUAL RUNOFF (CFSM)	1.15		.83		.70	
ANNUAL RUNOFF (INCHES)	15.61		11.26		9.48	
10 PERCENT EXCEEDS	507		325		280	
50 PERCENT EXCEEDS	130		107		47	
90 PERCENT EXCEEDS	38		27		5.3	

a Jan 22 to Feb 8, 1956; Jan 19 to Feb 3, 1977
b Datum in use prior to Oct 1, 1980
e Estimated

05453000 BIG BEAR CREEK AT LADORA, IA--Continued



05453100 IOWA RIVER AT MARENGO, IA

LOCATION.-- Lat 41°48'48", long 92°03'51", in $SE^1/_4$ $NE^1/_4$ sec.24, T.81 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 5 ft upstream from bridge on county highway V66, 1.0 mi downstream from Big Bear Creek, 0.8 mi north of Marengo, 4.6 mi upstream from Hilton Creek, and at mile 139.1.

DRAINAGE AREA.--2,794 mi^2.

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WSP 1558: 1957.

GAGE.--Water-stage recorder. Datum of gage is 720.52 ft above sea level.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	391	2420	1380	e280	e800	1580	1200	6330	6900	3930	1540	533
2	396	2260	1360	e280	e850	1510	e1200	5770	6600	3590	1510	517
3	459	2140	1340	e300	e950	1480	1180	5080	5850	3390	1540	490
4	543	1990	1310	e290	e850	1510	1210	4500	5430	3240	1560	464
5	2140	1860	1280	e270	e950	1550	1220	4470	5330	3400	1450	447
6	2760	1780	1240	e290	e1100	1510	1300	4410	5330	3750	1330	440
7	2250	1680	1200	e320	e1300	1430	1340	4070	5400	4040	1290	442
8	1880	1650	1160	e340	e1600	1360	1450	3770	5250	4380	1210	434
9	1620	1640	1140	e320	e1900	1270	2400	3540	6740	4350	1150	416
10	1460	2110	1100	e340	2220	1320	4540	3370	6820	4150	1070	393
11	1330	2710	1080	e360	2650	1330	5080	3270	7180	3740	978	374
12	1210	2730	1070	e380	3290	1280	5280	5330	9390	3240	1060	374
13	1100	2580	1040	e360	2960	1230	5360	6610	8810	2810	1030	366
14	1050	2460	1030	e360	2600	1250	5230	6890	8470	2490	938	360
15	1090	2360	1010	e380	2610	1310	4870	6920	8900	2280	843	386
16	1740	2280	997	e400	2410	1410	4650	6940	10400	2080	790	382
17	1920	2200	985	e420	2330	1670	4490	7110	11400	1920	760	372
18	3720	e2100	991	e420	2360	1840	4360	7520	11300	1850	777	367
19	4130	2030	956	e400	2190	1840	4270	7900	10400	1830	916	366
20	3910	1930	e650	e440	2010	1880	4140	8380	9220	1960	938	363
21	3330	1860	e440	e500	1820	1930	3940	8760	7950	1990	851	354
22	2800	1800	e300	e600	1700	1900	4050	9130	6510	1790	766	344
23	2460	1730	e320	e650	1590	1810	5410	9050	5640	1790	728	336
24	2220	1660	e340	e700	1540	1680	5940	9740	5560	1790	703	328
25	2050	1620	e380	e650	1460	1570	6130	10800	5480	1790	692	320
26	1930	1560	e400	e600	1480	1490	6310	11100	5510	1800	695	313
27	1880	1510	e420	e650	1730	1410	6500	10900	5530	1840	689	338
28	1960	1480	e420	e600	1710	1370	6670	10400	5450	1880	671	358
29	2030	1460	e400	e650	---	1350	6730	9570	4990	1850	625	387
30	2370	1420	e320	e700	---	1300	6640	8680	4400	1670	587	359
31	2670	---	e290	e750	---	e1300	---	7820	---	1550	552	---
TOTAL	60799	59010	26349	14000	50960	46670	123090	218130	212140	82160	30239	11723
MEAN	1961	1967	850	452	1820	1505	4103	7036	7071	2650	975	391
MAX	4130	2730	1380	750	3290	1930	6730	11100	11400	4380	1560	533
MIN	391	1420	290	270	800	1230	1180	3270	4400	1550	552	313
AC-FT	120600	117000	52260	27770	101100	92570	244100	432700	420800	163000	59980	23250
CFSM	.70	.70	.30	.16	.65	.54	1.47	2.52	2.53	.95	.35	.14
IN.	.81	.79	.35	.19	.68	.62	1.64	2.90	2.82	1.09	.40	.16

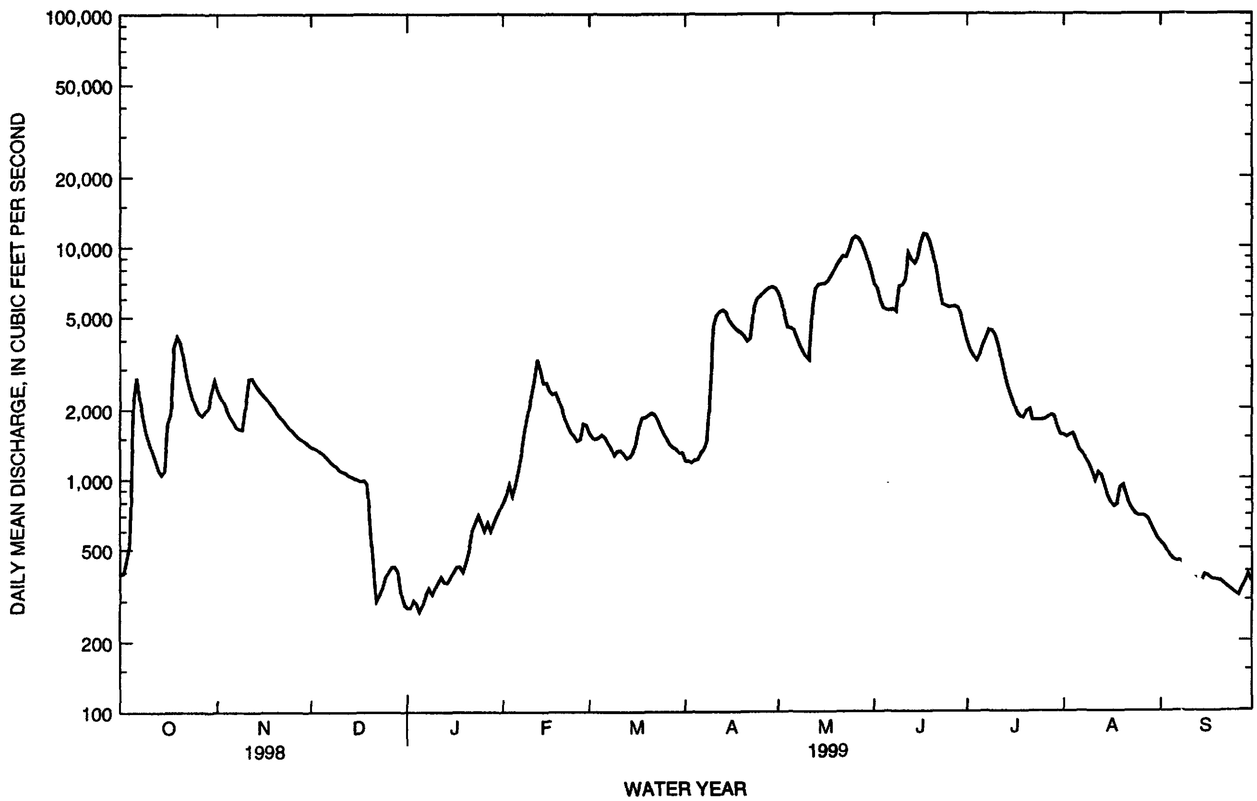
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1043	1182	983	849	1425	3204	3407	3065	3396	2731	1523	1032
MAX	5078	3878	3633	4194	5424	8227	11310	9340	9287	19620	15290	7901
(WY)	1987	1973	1983	1973	1984	1979	1993	1991	1998	1993	1993	1993
MIN	80.8	90.0	63.0	31.3	79.0	256	259	179	114	116	108	123
(WY)	1957	1957	1990	1977	1977	1964	1977	1977	1977	1977	1989	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1957 - 1999	
ANNUAL TOTAL	1133749		935270			
ANNUAL MEAN	3106		2562		1988	
HIGHEST ANNUAL MEAN					7192	1993
LOWEST ANNUAL MEAN					283	1989
HIGHEST DAILY MEAN	19000	Jun 30	11400	Jun 17	35600	Jul 12 1993
LOWEST DAILY MEAN	290	Dec 31	270	Jan 5	24	Jan 29 1977
ANNUAL SEVEN-DAY MINIMUM	369	Dec 22	286	Dec 31	25	Jan 28 1977
INSTANTANEOUS PEAK FLOW			11600	Jun 17	38000	Jul 19 1993
INSTANTANEOUS PEAK STAGE			17.09	Jun 17	20.31	Jul 19 1993
ANNUAL RUNOFF (AC-FT)	2249000		1855000		1440000	
ANNUAL RUNOFF (CFSM)	1.11		.92		.71	
ANNUAL RUNOFF (INCHES)	15.10		12.45		9.67	
10 PERCENT EXCEEDS	6410		6600		4940	
50 PERCENT EXCEEDS	1960		1620		1030	
90 PERCENT EXCEEDS	538		380		205	

e Estimated

05453100 IOWA RIVER AT MARENGO, IA--Continued



05453510 CORALVILLE LAKE NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'29", long 91°31'40", in SW$^1/_4$ NE$^1/_4$ sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at outlet works at left end of Coralville Dam on Iowa River, 2.3 mi upstream from Rapid Creek, 4.3 mi northeast of Coralville post office, and at mile 83.3.

DRAINAGE AREA.--3,115 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1957. Storage began in September 1958. Releases controlled by three gates, 8.33 ft wide and 20 ft high, into forechamber of 23-ft diameter concrete conduit through dam. Inlet invert elevation at 646.0 ft. No dead storage. Maximum design discharge through gates is 20,000 ft^3/s. Ungated spillway is concrete overflow section 500 ft in length at elevation 712 ft above sea level, contents, 469,000 acre-ft, surface area, 24,800 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will lower the elevation from 683 ft. (surface area 5,430 acres) on Feb. 15 to 679 ft (surface area 3,270 acres) on Mar 1, maintaining 679 ft. Mar. 1 to June 15, 683 ft June 15 to Sept. 15, 686 ft. (surface area 7,000 acres) Sept. 15 to Dec. 15, and 683 ft Dec. 15 to Feb. 15, with a minimum release of 150 ft^3/s and maximum release of 10,000 ft^3/s Dec. 15 to May 1 and 6,000 ft^3/s May 1 to Dec. 15.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 586,000 acre-ft July 20, 1993, maximum elevation, 716.75 ft July 24, 1993; minimum daily contents, 456 acre-ft Jan. 15, 1975; minimum elevation, 658.77 ft Mar. 10, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 263,000 acre-ft June 23,24; maximum elevation, 702.67 ft June 24; minimum daily contents, 23,900 acre-ft Mar. 18; minimum elevation, 678.32 ft Mar. 18,19.

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

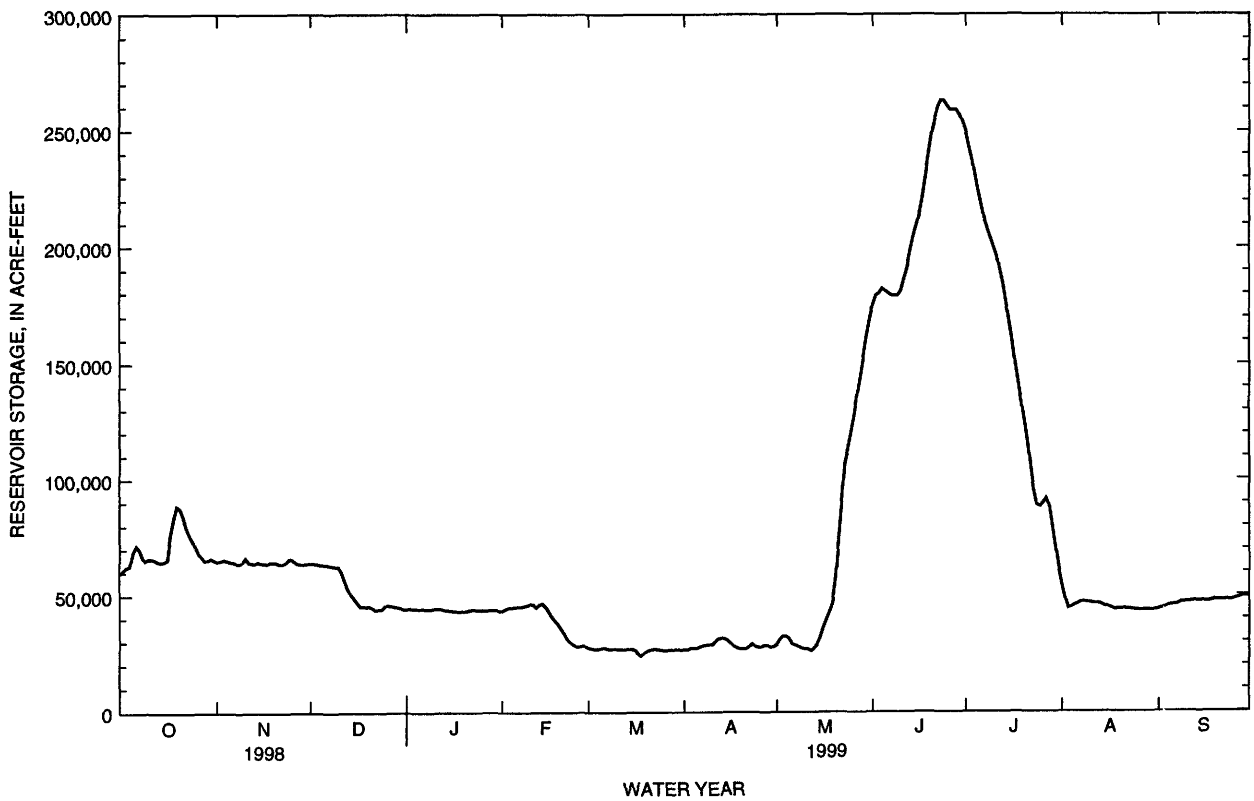
655	55	675	15,100	692	115,000	704	287,000	712	461,000
660	621	680	29,600	696	160,000	706	327,000	714	512,000
665	2,770	684	52,800	700	215,000	708	370,000	716	566,000
670	7,230	688	81,200	702	251,000	710	413,000	718	622,000

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59800	64900	64000	44100	43300	27300	26500	28800	175000	250000	54200	43700
2	61100	65100	64000	44500	44100	27100	26500	31000	179000	244000	48600	44200
3	62500	65600	63900	44400	44700	26700	27200	32400	180000	238000	44200	44500
4	62800	65400	63500	44300	44700	26700	27200	32300	182000	231000	44700	45200
5	69200	64900	63400	44200	45000	27200	27200	31400	181000	224000	45500	45500
6	71600	64600	63500	44300	45200	27400	27700	29000	180000	218000	46000	45700
7	69900	64200	63200	44200	45100	27000	28200	28400	179000	212000	46800	45800
8	66600	64000	62900	44200	45400	26800	28500	27800	179000	208000	46900	46600
9	65300	64400	62700	44200	45800	27000	28700	27100	179000	204000	46700	46700
10	66000	66400	62500	44400	46200	26900	28600	26800	181000	200000	46600	46900
11	66000	64600	60400	44400	46100	26800	30000	26800	186000	196000	46300	46900
12	65600	64200	56700	44400	44800	26700	31200	25900	191000	190000	46200	47200
13	64900	64000	53200	43900	46000	26700	31500	27100	198000	184000	46200	47300
14	64600	64600	50700	43700	46400	26800	31300	28700	204000	176000	45700	47300
15	64900	64200	48800	43500	45200	26800	30600	31800	209000	168000	44900	47300
16	65800	64200	47100	43400	43300	26400	29300	36000	214000	160000	44700	47100
17	76200	63900	45400	43200	41000	24900	28000	39400	221000	150000	44200	47100
18	83100	64600	45400	43200	39200	23900	27200	42600	230000	141000	43600	47300
19	88700	64600	45300	43200	37700	25100	26800	46300	240000	133000	43900	47800
20	87900	64400	45400	43200	35800	26100	26900	56600	249000	125000	43900	47700
21	84600	63800	44800	43500	33800	26500	27000	74200	255000	116000	44000	47600
22	79900	63800	43800	43900	31400	26700	27900	90400	260000	105000	43900	47600
23	76700	64400	44100	43900	29900	26700	29000	107000	263000	95300	43800	47800
24	74200	66000	44100	43700	28800	26500	27800	113000	263000	88800	43500	47700
25	71300	65600	45700	43700	28000	26200	27500	120000	261000	88200	43300	47800
26	68100	64600	45800	43500	27900	26200	27900	127000	259000	89600	43300	48300
27	66800	63900	45600	43500	28300	26300	28400	136000	259000	91500	43400	48700
28	65200	63700	45300	43800	28000	26600	28300	144000	259000	88100	43500	49200
29	65500	63800	45100	43800	---	26600	27500	153000	257000	79300	43400	49200
30	66100	64000	44800	43700	---	26500	27800	162000	254000	70300	43300	49400
31	65400	---	44100	43400	---	26400	---	169000	---	61500	43400	---
MEAN	69900	64500	52400	43800	39700	26500	28300	66200	218000	156000	45100	47000
MAX	88700	66400	64000	44500	46400	27400	31500	169000	263000	250000	54200	49400
MIN	59800	63700	43800	43200	27900	23900	26500	25900	175000	61500	43300	43700

CAL YR 1998 MEAN 80700 MAX 410000 MIN 26100
WTR YR 1999 MEAN 71500 MAX 263000 MIN 23900

05453510 CORALVILLE LAKE NEAR CORALVILLE, IA--Continued



05453520 IOWA RIVER BELOW CORALVILLE DAM NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'23", long 91°31'47", in SW1/4 NE1/4 sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, on left bank about 500 ft downstream of Coralville Dam control house, 2.3 miles upstream from Rapid Creek, 4.3 miles northeast of Coralville post office, and at mile 83.2.

DRAINAGE AREA.--3,115 mi^2.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except those for estimated daily discharges, which are fair. Periodic observations of water temperatures 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.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	177	2800	1530	711	1060	2410	1500	6110	5830	5910	4550	360
2	182	2450	1530	602	1130	2160	1500	5860	5780	6050	4130	278
3	319	2340	1520	604	1420	1940	1550	5790	5740	6020	3390	278
4	570	2340	1520	607	1850	1750	1750	5810	5750	5990	1070	279
5	1700	2340	1520	616	1990	1650	1630	5830	5760	5970	1100	289
6	2260	2150	1510	602	2140	1710	1510	5580	5740	5940	1160	282
7	3500	2050	1520	605	2240	1760	1510	4990	5720	5960	e1200	279
8	3710	1960	1480	600	2270	1670	1790	4590	5700	5940	e1200	274
9	2450	1890	1370	605	2330	1600	e3000	4260	5720	5920	e1200	284
10	1520	2360	1310	605	2670	1600	e3350	3790	5920	5910	1200	284
11	1620	2940	2070	605	3330	1600	e3850	3440	5590	5910	1200	314
12	1690	3090	2630	680	3740	1590	3960	4050	5880	5860	1230	345
13	1570	2900	2600	747	3200	1480	4780	5350	5580	5840	1210	357
14	1280	2670	2370	739	3150	1390	5080	5730	5900	5800	1200	350
15	1020	2570	2080	720	3520	1490	5560	5740	5900	5740	1100	346
16	1030	2540	1950	718	3620	1870	5960	5730	5910	5860	1030	347
17	2000	2490	1760	713	3590	2820	5650	5750	5920	5990	1010	328
18	1750	e2300	1390	698	3470	2570	5190	5760	5930	5930	1020	297
19	1650	2130	1090	659	3310	1680	4740	5740	5960	5960	927	280
20	4380	2110	1090	659	3130	1730	4320	3730	5990	5970	856	309
21	5490	2130	1080	653	2960	1900	4150	1190	6020	5900	855	324
22	5340	2050	680	710	2860	2030	4310	1220	6030	5970	854	289
23	4410	1760	282	1220	2540	2130	5530	1880	6060	6030	854	283
24	3640	1030	278	1310	2220	2120	6110	5750	6060	5230	851	270
25	3530	2110	272	1140	2080	2010	5860	5720	6040	1980	673	256
26	3500	2110	706	1090	1970	1810	5760	5700	6040	1180	547	244
27	3100	1880	959	1000	2050	1660	5960	5730	6180	1180	547	254
28	2830	1740	952	976	2340	1590	6480	5780	6240	3170	543	293
29	2580	1620	917	1010	---	1610	6710	5760	6090	6120	541	321
30	2560	1520	940	1040	---	1640	6440	5760	6060	5740	504	307
31	2980	---	897	1030	---	1580	---	5790	---	5320	445	---
TOTAL	74338	66370	41803	24274	72180	56550	125490	153910	177040	166290	38197	9001
MEAN	2398	2212	1348	783	2578	1824	4183	4965	5901	5364	1232	300
MAX	5490	3090	2630	1310	3740	2820	6710	6110	6240	6120	4550	360
MIN	177	1030	272	600	1060	1390	1500	1190	5580	1180	445	244
AC-FT	147400	131600	82920	48150	143200	112200	248900	305300	351200	329800	75760	17850
CFSM	.77	.71	.43	.25	.83	.59	1.34	1.59	1.89	1.72	.40	.10
IN.	.89	.79	.50	.29	.86	.68	1.50	1.84	2.11	1.99	.46	.11

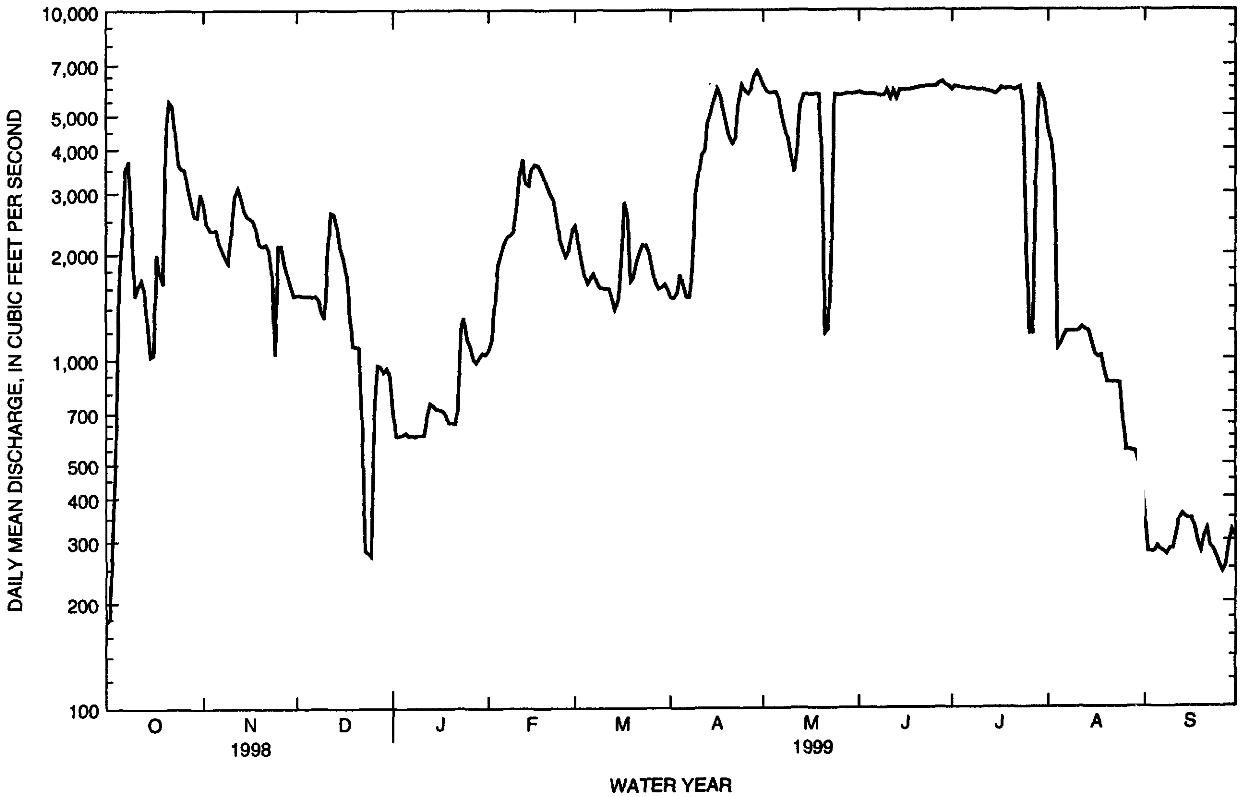
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1404	1475	1630	915	2172	3429	4022	4408	4930	6442	3848	2256
MAX	4012	2771	4229	1723	3006	6587	7776	9347	7203	20610	18500	13050
(WY)	1994	1993	1993	1993	1997	1993	1993	1993	1993	1993	1993	1993
MIN	331	636	643	311	1424	1105	965	1305	2362	2318	581	275
(WY)	1997	1998	1996	1996	1995	1996	1996	1994	1994	1995	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1993 - 1999	
ANNUAL TOTAL	1207780		1005443			
ANNUAL MEAN	3309		2755		3084	
HIGHEST ANNUAL MEAN					7910	1993
LOWEST ANNUAL MEAN					1541	1996
HIGHEST DAILY MEAN	9380	Apr 9	6710	Apr 29	25000	Jul 21 1993
LOWEST DAILY MEAN	177	Oct 1	177	Oct 1	136	Sep 3 1995
ANNUAL SEVEN-DAY MINIMUM	308	Sep 27	270	Sep 22	146	Oct 16 1996
INSTANTANEOUS PEAK FLOW			6770	Jun 28	25800	Jul 19 1993
INSTANTANEOUS PEAK STAGE			54.66	Jun 28	63.95	Jul 19 1993
ANNUAL RUNOFF (AC-FT)	2396000		1994000		2234000	
ANNUAL RUNOFF (CFSM)	1.06		.88		.99	
ANNUAL RUNOFF (INCHES)	14.42		12.01		13.45	
10 PERCENT EXCEEDS	7570		5920		6630	
50 PERCENT EXCEEDS	2580		2030		1620	
90 PERCENT EXCEEDS	656		411		402	

e Estimated

05453520 IOWA RIVER BELOW CORALVILLE DAM NEAR CORALVILLE, IA--Continued



05453600 RAPID CREEK BELOW MORSE, IA

LOCATION.--Lat 41°43'45", long 91°25'38", in NE corner of sec.21, T.80 N., R.5 W., Johnson County, Hydrologic Unit 07080209, at bridge on county highway, 1.5 miles southwest of Morse.

DRAINAGE AREA.--8.12 mi^2.

PERIOD OF RECORD.--March 1994 to current year. Operated May 1951 to September 1992 as a crest-stage partial record station.

GAGE.--Tipping bucket rain gage.

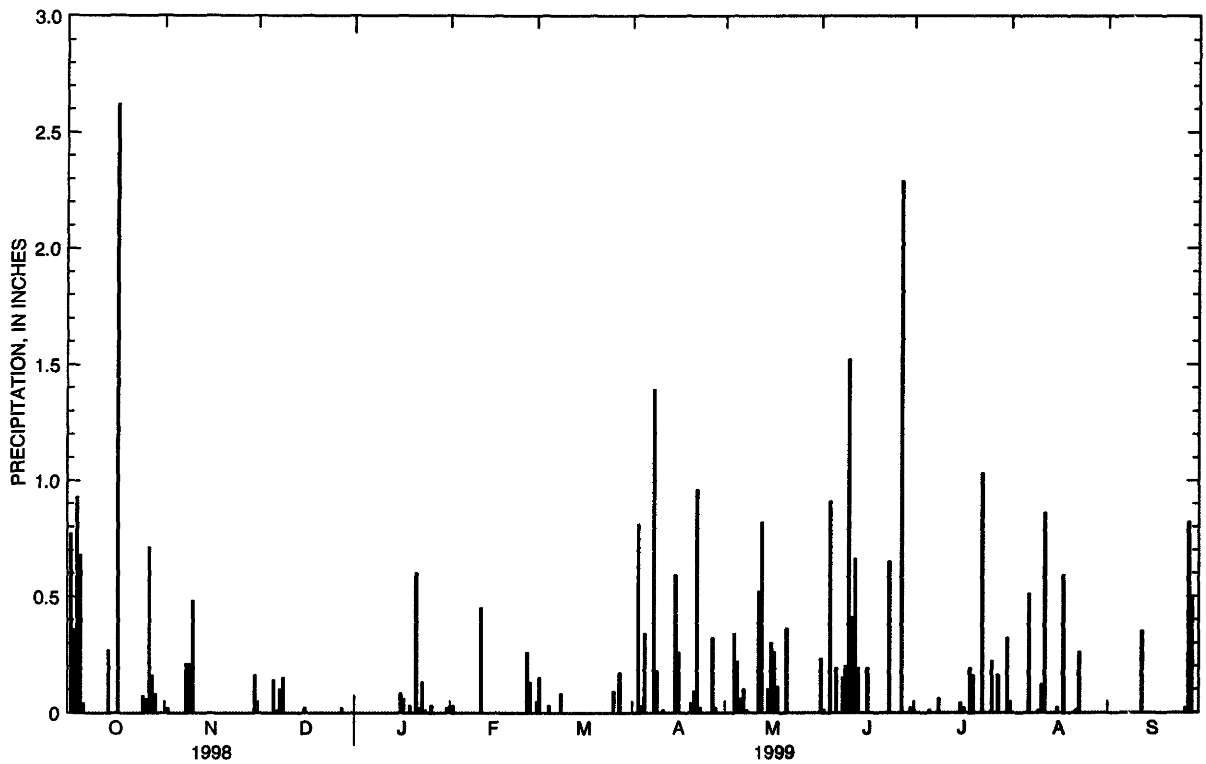
REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

EXTREME FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.65 in., May 9, 1996.

EXTREME FOR CURRENT YEAR.--Maximum daily accumulation, 2.62 in., Oct. 17.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.02	.00	.00	.00	.23	.01	.00	.00
2	.77	.02	.00	.00	.03	.15	.00	.00	.01	.00	.00	.00
3	.36	.00	.00	.00	.00	.00	.81	.00	.00	.00	.00	.00
4	.93	.00	.00	.00	.00	.00	.03	.34	.91	.00	.00	.00
5	.68	.00	.00	.00	.00	.03	.34	.22	.00	.00	.00	.00
6	.04	.00	.14	.00	.00	.00	.00	.06	.19	.01	.00	.00
7	.00	.00	.01	.00	.00	.00	.00	.10	.00	.00	.51	.00
8	.00	.21	.10	.00	.00	.00	1.39	.01	.15	.00	.00	.00
9	.00	.21	.15	.00	.00	.08	.18	.00	.20	.06	.00	.00
10	.00	.48	.00	.00	.00	.00	.00	.00	1.52	.00	.01	.00
11	.00	.00	.00	.00	.45	.00	.01	.00	.41	.00	.12	.00
12	.00	.00	.00	.00	.00	.00	.00	.52	.66	.00	.86	.35
13	.00	.00	.00	.00	.00	.00	.00	.82	.19	.00	.00	.00
14	.27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.59	.10	.00	.00	.00	.00
16	.00	.00	.02	.08	.00	.00	.26	.30	.19	.04	.02	.00
17	2.62	.00	.00	.06	.00	.00	.00	.26	.00	.02	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.59	.00
19	.00	.00	.00	.03	.00	.00	.00	.00	.00	.19	.00	.00
20	.00	.00	.00	.00	.00	.00	.04	.00	.00	.16	.00	.00
21	.00	.00	.00	.60	.00	.00	.09	.36	.00	.00	.00	.00
22	.00	.00	.00	.02	.00	.00	.96	.00	.00	.00	.01	.00
23	.00	.00	.00	.13	.00	.00	.02	.00	.65	1.03	.26	.00
24	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
25	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.06	.00	.00	.03	.26	.09	.00	.00	.00	.22	.00	.02
27	.71	.00	.00	.00	.13	.00	.32	.00	2.29	.00	.00	.82
28	.16	.00	.02	.00	.00	.17	.02	.00	.00	.16	.00	.50
29	.08	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.16	.00	.00	---	.00	.00	.00	.02	.00	.00	.00
31	.00	---	.00	.02	---	.00	---	.00	---	.32	.00	---
TOTAL	6.75	1.08	0.44	0.98	0.89	0.52	5.06	3.20	7.62	2.22	2.38	1.69
MEAN	.22	.04	.01	.03	.03	.02	.17	.10	.25	.07	.08	.06
MAX	2.62	.48	.15	.60	.45	.17	1.39	.82	2.29	1.03	.86	.82
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00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05454000 RAPID CREEK NEAR IOWA CITY, IA

LOCATION.--Lat 41°41'19", long 91°29'15", in $NE^1/_4$ $NE^1/_4$ sec.36. T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 80 ft upstream from bridge on State Highway 1, 3.5 mi northeast of Iowa City, and 4.7 mi upstream from mouth.

DRAINAGE AREA.--25.3 mi^2.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1558: 1941 (M), 1943 (P), 1944 (M), 1946. WSP 1708: 1951 (P), 1952. WDR IA-67-1: Drainage area.

GAGE.--Water-stage recorder and concrete control with sharp-crested weir. Datum of gage is 673.72 ft above sea level.

REMARKS.--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 with telephone modem, and U.S. Army Corps of Engineers rain gage and data collection platform.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	38	15	e6.0	38	16	16	33	17	35	4.6	.80
2	13	38	16	e6.2	89	17	15	30	16	29	3.6	.75
3	29	34	15	e6.5	74	16	36	28	15	26	3.5	.82
4	36	31	15	e6.0	66	15	34	28	25	23	3.3	.77
5	337	30	15	e5.0	38	16	30	32	27	20	2.8	.63
6	102	28	15	e6.0	32	15	37	27	22	18	2.3	.62
7	69	26	15	e6.5	31	14	30	27	19	16	3.7	.62
8	54	27	14	e7.0	41	13	118	24	17	15	3.5	.60
9	45	27	14	e6.0	42	17	211	23	26	14	2.5	.55
10	39	95	14	e6.5	38	15	98	22	243	13	2.1	.46
11	34	56	14	e6.6	82	14	71	20	92	12	1.8	.42
12	30	46	14	e6.5	57	14	57	22	166	12	7.5	.54
13	28	40	13	e6.0	39	14	49	85	156	11	4.1	.68
14	26	37	13	e6.0	32	15	44	57	76	10	2.8	.66
15	26	32	13	e6.5	29	17	48	46	56	9.7	2.0	.56
16	24	31	13	e7.0	26	28	99	42	47	8.9	1.6	.51
17	715	27	12	e6.5	23	57	68	46	40	8.9	1.4	.49
18	309	26	13	e6.5	21	46	55	43	35	8.7	2.6	.36
19	93	24	11	e6.0	20	36	48	37	31	8.7	3.1	.30
20	67	23	11	e6.5	18	31	43	34	27	8.9	1.8	.20
21	55	22	e8.5	e7.0	17	28	40	35	24	7.7	1.4	.14
22	46	22	e7.0	e21	16	25	65	33	23	6.8	1.2	.14
23	42	20	e8.0	e50	16	23	149	29	30	6.5	1.3	.15
24	38	19	9.6	e32	15	21	76	26	25	13	1.7	.14
25	35	19	10	e21	15	19	61	24	21	7.5	1.2	.17
26	32	18	10	e17	16	19	52	22	19	6.8	1.1	.20
27	53	17	10	e20	19	18	51	20	408	7.1	.92	.47
28	50	17	9.6	e26	17	18	45	19	111	6.6	.82	1.2
29	59	17	9.6	e23	---	17	39	18	52	5.5	.73	.88
30	49	17	e6.5	19	---	16	35	17	40	4.7	.61	.58
31	42	---	e5.5	17	---	16	---	17	---	5.0	.56	---
TOTAL	2587	904	369.3	378.8	967	646	1820	966	1906	385.0	72.14	15.41
MEAN	83.5	30.1	11.9	12.2	34.5	20.8	60.7	31.2	63.5	12.4	2.33	.51
MAX	715	95	16	50	89	57	211	85	408	35	7.5	1.2
MIN	10	17	5.5	5.0	15	13	15	17	15	4.7	.56	.14
AC-FT	5130	1790	733	751	1920	1280	3610	1920	3780	764	143	31
CFSM	3.30	1.19	.47	.48	1.37	.82	2.40	1.23	2.51	.49	.09	.02
IN.	3.80	1.33	.54	.56	1.42	.95	2.68	1.42	2.80	.57	.11	.02

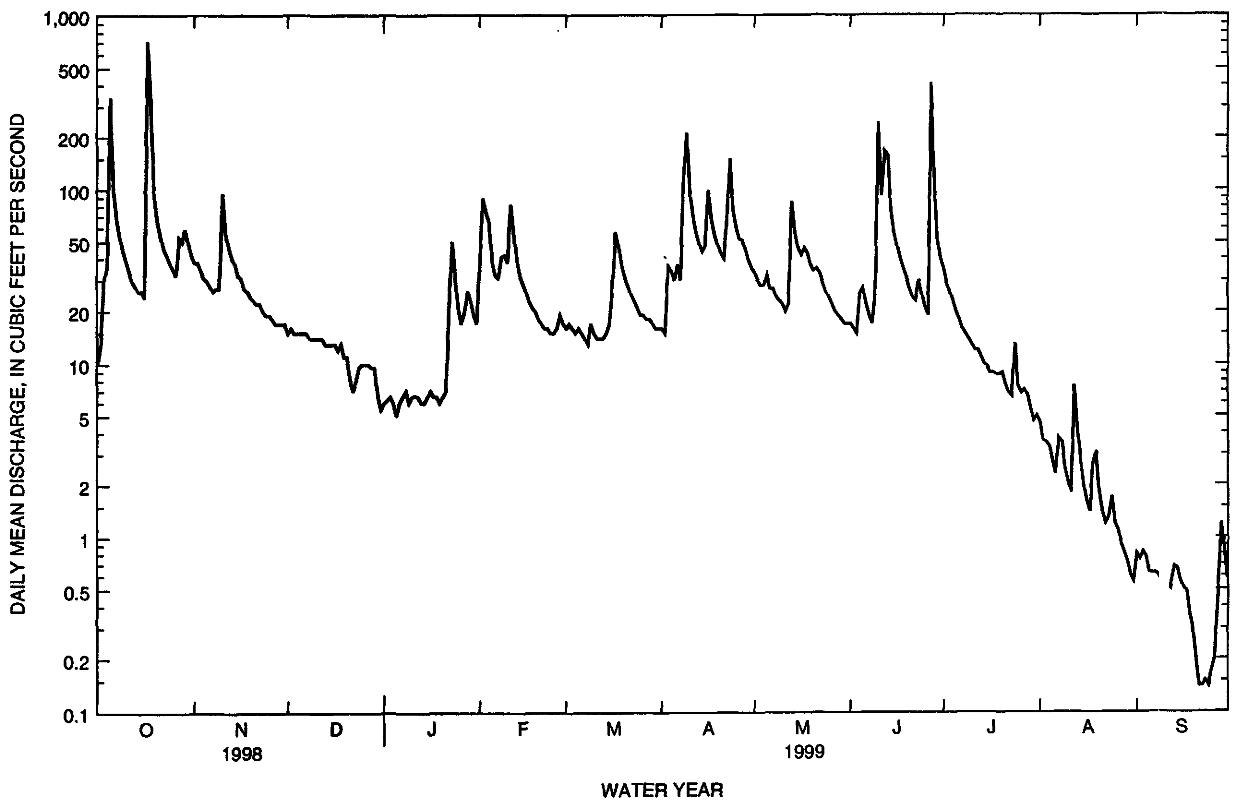
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	7.75	10.4	9.15	9.78	22.6	29.2	24.7	27.2	25.1	15.9	11.9	8.06
MAX	83.5	84.0	66.6	56.8	77.5	106	98.6	167	134	105	176	66.6
(WY)	1999	1993	1983	1946	1953	1979	1973	1974	1990	1969	1993	1965
MIN	.000	.000	.000	.000	.22	.42	1.25	1.13	.21	.000	.032	.000
(WY)	1954	1956	1956	1940	1989	1956	1956	1977	1956	1957	1955	1955

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1938 - 1999	
ANNUAL TOTAL	10959.65		11016.65			
ANNUAL MEAN	30.0		30.2		16.8	
HIGHEST ANNUAL MEAN					63.8	1993
LOWEST ANNUAL MEAN					1.09	1957
HIGHEST DAILY MEAN	715	Oct 17	715	Oct 17	1720	May 17 1986
LOWEST DAILY MEAN	.70	Jan 1	.14	Sep 21	.00	Many days
ANNUAL SEVEN-DAY MINIMUM	1.9	Aug 21	.16	Sep 20	.00	Jan 1 1940
INSTANTANEOUS PEAK FLOW			2170	Jun 27	6700	Aug 10 1993
INSTANTANEOUS PEAK STAGE			12.27	Jun 27	15.61	Aug 10 1993
INSTANTANEOUS LOW FLOW			.12	Sep 22a		
ANNUAL RUNOFF (AC-FT)	21740		21850		12160	
ANNUAL RUNOFF (CFSM)	1.19		1.19		.66	
ANNUAL RUNOFF (INCHES)	16.11		16.20		9.01	
10 PERCENT EXCEEDS	57		56		35	
50 PERCENT EXCEEDS	18		18		5.0	
90 PERCENT EXCEEDS	3.4		1.2		.10	

a Also Sep 24, 25
e Estimated

05454000 RAPID CREEK NEAR IOWA CITY, IA--Continued



05454220 CLEAR CREEK NEAR OXFORD, IA

LOCATION.--Lat 41°43'06", long 91°44'24", in $SW^1/_4$ $SE^1/_4$ $SE^1/_4$ sec.23, T.80 N., R.8 W., Johnson County, Hydrologic Unit 07080209, on left bank 15 ft. downstream of bridge on NW Eagle Avenue, 0.2 miles west of Kent Park, 2.6 miles upstream of Buffalo Creek, 2.8 miles east of Oxford, and 4.2 miles west of Tiffin.

DRAINAGE AREA.--58.4 mi^2.

PERIOD OF RECORD.--November 1993 to current year.

GAGE.--Water stage recorder. Datum of gage is 696.50 ft., above sea level.

REMARKS.--Records good except for 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 rain gage and data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	92	38	e14	45	51	36	78	57	30	6.1	1.5
2	20	92	38	e15	102	52	35	73	60	28	5.1	1.4
3	35	89	38	e16	109	50	70	68	53	27	4.9	1.3
4	47	81	36	e14	113	47	81	66	51	25	4.9	1.3
5	550	76	36	e13	67	47	67	77	51	23	e4.0	1.2
6	257	72	36	e15	58	44	90	69	47	22	e3.6	1.2
7	145	67	37	e18	54	39	76	66	45	22	6.1	1.2
8	107	68	34	e21	61	35	110	61	43	21	5.5	1.1
9	89	73	34	e19	69	56	127	57	136	20	3.5	.99
10	77	200	34	e20	61	51	99	55	68	18	3.5	.92
11	67	134	33	e20	118	38	86	55	86	18	2.9	.93
12	61	108	32	e20	116	37	75	78	96	17	12	1.3
13	56	95	31	e19	74	37	69	298	107	16	7.1	1.7
14	53	88	30	e19	62	36	66	183	69	15	4.4	1.3
15	52	78	30	e20	58	39	70	126	60	14	3.7	1.2
16	48	74	29	e21	53	55	127	121	56	13	3.4	1.1
17	506	67	28	e23	48	136	114	156	53	13	3.2	1.1
18	961	66	29	e22	45	120	95	156	48	13	5.4	1.1
19	269	63	26	e22	43	85	85	118	46	14	11	1.0
20	173	59	24	e24	40	73	77	100	43	13	5.0	.93
21	140	56	e20	e26	37	65	73	126	41	12	3.7	.81
22	116	56	e16	e60	36	58	122	156	41	10	3.4	.89
23	104	54	e18	e95	37	54	349	116	45	9.3	3.8	.89
24	94	50	e21	e85	35	50	181	99	41	8.7	3.4	.90
25	85	51	e23	e55	33	46	137	88	37	7.8	3.3	.95
26	78	47	e24	e47	44	44	113	79	35	7.4	2.9	.94
27	95	45	e23	e49	70	43	112	73	36	8.1	2.6	2.6
28	102	44	e24	e55	60	44	105	68	37	10	2.6	4.1
29	116	44	e19	e45	---	40	92	64	33	7.7	2.3	2.7
30	121	42	e15	39	---	38	83	61	31	6.4	1.8	1.9
31	103	---	e14	35	---	37	---	59	---	6.5	1.6	---
TOTAL	4743	2231	870	966	1748	1647	3022	3050	1652	475.9	136.7	40.45
MEAN	153	74.4	28.1	31.2	62.4	53.1	101	98.4	55.1	15.4	4.41	1.35
MAX	961	200	38	95	118	136	349	298	136	30	12	4.1
MIN	16	42	14	13	33	35	35	55	31	6.4	1.6	.81
AC-FT	9410	4430	1730	1920	3470	3270	5990	6050	3280	944	271	80
CFSM	2.62	1.27	.48	.53	1.07	.91	1.72	1.68	.94	.26	.08	.02
IN.	3.02	1.42	.55	.62	1.11	1.05	1.92	1.94	1.05	.30	.09	.03

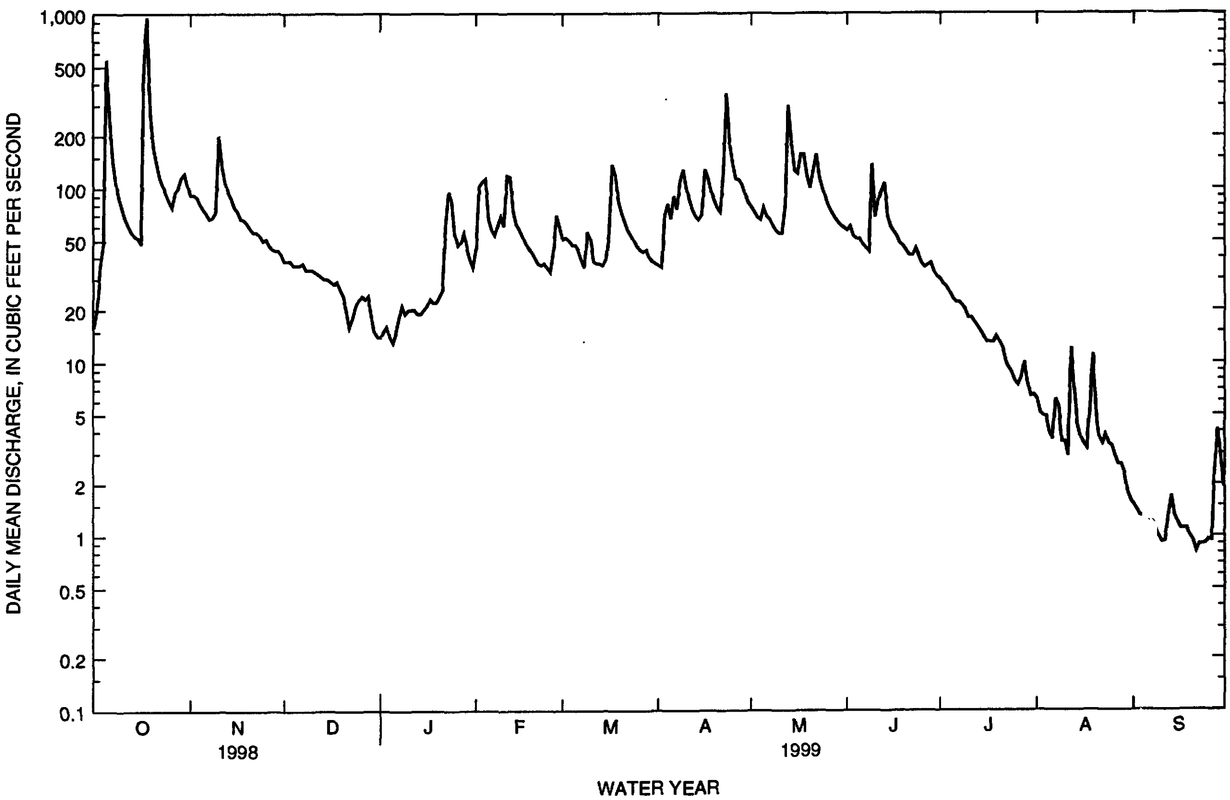
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	35.5	22.6	12.2	17.7	51.7	44.9	69.1	133	70.5	25.4	13.0	8.15
MAX	153	74.4	28.1	35.2	104	95.5	113	269	115	56.4	44.5	29.4
(WY)	1999	1999	1999	1998	1997	1998	1998	1996	1998	1998	1998	1998
MIN	1.74	4.28	3.07	4.02	18.4	11.6	8.16	49.1	32.0	10.4	4.14	1.35
(WY)	1996	1997	1996	1996	1995	1996	1996	1997	1997	1997	1996	1999

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1995 - 1999	
ANNUAL TOTAL	26568.0		20582.05			
ANNUAL MEAN	72.8		56.4		42.0	
HIGHEST ANNUAL MEAN					56.4	1999
LOWEST ANNUAL MEAN					23.4	1997
HIGHEST DAILY MEAN	961	Oct 18	961	Oct 18	2400	May 10 1996
LOWEST DAILY MEAN	7.0	Jan 1	.81	Sep 21	.74	Dec 11 1995
ANNUAL SEVEN-DAY MINIMUM	12	Aug 21	.90	Sep 20	.90	Sep 20 1999
INSTANTANEOUS PEAK FLOW			1190	Oct 18	4230	May 10 1996
INSTANTANEOUS PEAK STAGE			12.83	Oct 18	14.89	May 10 1996
INSTANTANEOUS LOW FLOW			.64	Sep 21		
ANNUAL RUNOFF (AC-FT)	52700		40820		30390	
ANNUAL RUNOFF (CFSM)	1.25		.97		.72	
ANNUAL RUNOFF (INCHES)	16.92		13.11		9.76	
10 PERCENT EXCEEDS	120		113		96	
50 PERCENT EXCEEDS	56		44		17	
90 PERCENT EXCEEDS	18		3.1		2.3	

e Estimated

05454220 CLEAR CREEK NEAR OXFORD, IA--Continued



05454300 CLEAR CREEK NEAR CORALVILLE, IA

LOCATION.--Lat 41°40'36", long 91°35'55", in NE$^1/_4$ SE$^1/_4$ sec.1, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank about 15 ft upstream from bridge on county highway, 1.1 mi west of post office in Coralville, 1.5 mi downstream from Deer Creek, and 2.7 mi upstream from mouth.

DRAINAGE AREA.--98.1 mi^2.

PERIOD OF RECORD.--October 1952 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WDR IA-93-1: 1974 (M), 1982 (M), 1990 (M).

GAGE.--Water-stage recorder. Datum of gage is 647.48 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Jan. 7, 1957, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. 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 with telephone modem and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	163	69	e26	88	80	77	127	93	50	13	5.4
2	36	164	67	e28	166	80	74	120	97	48	11	5.1
3	65	157	66	e32	176	78	103	114	87	46	11	4.8
4	82	142	64	e30	173	73	142	111	88	43	11	4.6
5	896	136	62	e25	118	74	107	124	86	40	10	4.6
6	479	127	65	e30	103	72	131	115	87	38	9.7	4.6
7	242	120	68	e35	97	63	115	111	79	36	16	4.5
8	168	116	63	e37	104	65	124	103	72	35	13	4.5
9	131	120	62	e32	119	79	285	96	161	34	11	3.9
10	115	296	62	e33	107	76	182	92	249	31	10	3.7
11	101	214	61	e34	166	71	154	88	156	29	9.9	3.8
12	90	162	60	e34	195	63	135	139	269	29	27	5.0
13	81	148	59	e33	124	65	125	510	253	27	20	4.4
14	77	138	58	e33	102	63	117	343	134	26	12	4.4
15	76	123	61	e34	94	67	124	217	109	25	11	4.2
16	70	118	56	e36	87	88	211	194	96	23	10	3.8
17	988	107	56	e38	79	190	189	225	87	24	9.5	3.6
18	1540	102	56	e36	78	204	155	252	79	21	17	3.5
19	503	99	53	e36	71	148	140	183	74	25	24	3.5
20	284	93	50	e39	67	131	130	159	70	23	15	3.5
21	223	90	e39	e43	62	120	124	190	66	20	10	3.4
22	185	90	e32	e110	61	110	183	243	64	18	9.7	3.5
23	165	88	e36	e170	62	103	432	177	71	16	11	3.7
24	153	80	e41	e150	61	98	304	148	65	15	10	3.4
25	144	81	e42	e110	56	92	229	132	57	13	9.4	3.3
26	133	75	e46	e80	65	88	188	120	54	14	8.6	3.6
27	174	73	e44	e90	102	86	182	111	93	14	7.9	12
28	189	72	e45	e95	92	88	172	103	73	19	7.5	14
29	215	71	e38	e87	---	81	152	96	57	16	7.3	7.6
30	267	72	e29	e80	---	78	139	90	52	14	6.5	5.9
31	186	---	e27	75	---	76	---	88	---	16	5.4	---
TOTAL	8085	3637	1637	1751	2875	2850	4925	4921	3078	828	364.4	145.8
MEAN	261	121	52.8	56.5	103	91.9	164	159	103	26.7	11.8	4.86
MAX	1540	296	69	170	195	204	432	510	269	50	27	14
MIN	27	71	27	25	56	63	74	88	52	13	5.4	3.3
AC-FT	16040	7210	3250	3470	5700	5650	9770	9760	6110	1640	723	289
CFSM	2.66	1.24	.54	.58	1.05	.94	1.67	1.62	1.05	.27	.12	.05
IN.	3.07	1.38	.62	.66	1.09	1.08	1.87	1.87	1.17	.31	.14	.06

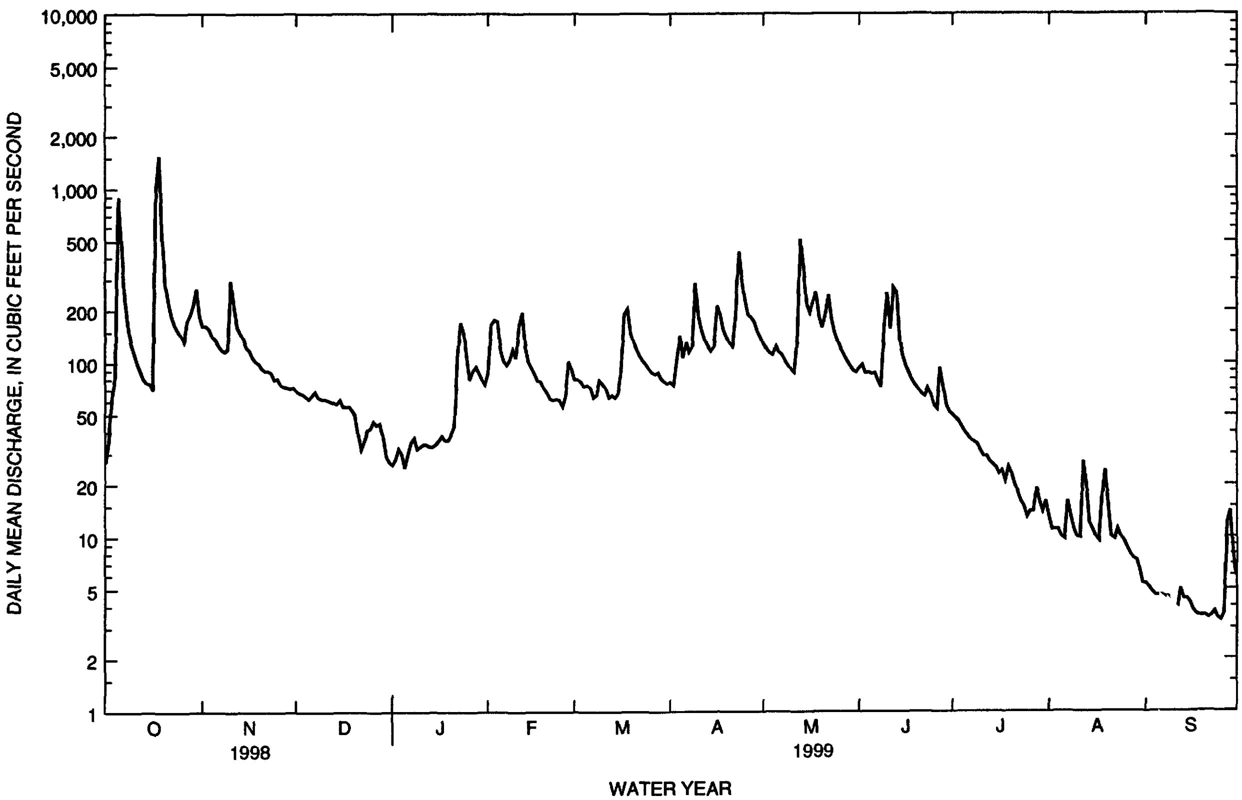
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	34.1	45.6	39.3	40.2	71.8	112	104	114	104	91.2	60.8	44.0
MAX	261	246	162	206	229	402	452	589	566	991	759	337
(WY)	1999	1962	1993	1960	1959	1979	1973	1974	1990	1993	1993	1965
MIN	.55	.95	.54	.10	2.79	4.49	4.15	3.79	.83	1.69	1.94	.69
(WY)	1958	1956	1956	1977	1954	1954	1956	1956	1956	1954	1953	1953

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1953 - 1999	
ANNUAL TOTAL	41232		35097.2			
ANNUAL MEAN	113		96.2		71.8	
HIGHEST ANNUAL MEAN					327	1993
LOWEST ANNUAL MEAN					6.57	1957
HIGHEST DAILY MEAN	1540	Oct 18	1540	Oct 18	7310	Jun 17 1990
LOWEST DAILY MEAN	11	Aug 26	3.3	Sep 25a	.00	Jan 18 1977
ANNUAL SEVEN-DAY MINIMUM	15	Aug 21	3.5	Sep 19	.00	Jan 18 1977
INSTANTANEOUS PEAK FLOW			2900	Oct 17	10200	Jun 17 1990
INSTANTANEOUS PEAK STAGE			12.22	Oct 17	16.36	Jun 17 1990
INSTANTANEOUS LOW FLOW			1.5	Sep 25a		
ANNUAL RUNOFF (AC-FT)	81780		69620		52020	
ANNUAL RUNOFF (CFSM)	1.15		.98		.73	
ANNUAL RUNOFF (INCHES)	15.64		13.31		9.94	
10 PERCENT EXCEEDS	203		184		150	
50 PERCENT EXCEEDS	80		74		27	
90 PERCENT EXCEEDS	31		9.6		2.9	

a From pumping
e Estimated

05454300 CLEAR CREEK NEAR CORALVILLE, IA--Continued



05454500 IOWA RIVER AT IOWA CITY, IA

LOCATION.--Lat 41°39'24", long 91°32'27", in SE$^1/_4$ SE$^1/_4$ sec.9, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 25 ft downstream from Hydraulics Laboratory of University of Iowa in Iowa City, 175 ft downstream from University Dam, 0.8 mi upstream from Ralston Creek, 3.6 mi downstream from Clear Creek, and at mile 74.2.

DRAINAGE AREA.--3,271 mi^2.

PERIOD OF RECORD.--June 1903 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 29.00 ft above Iowa City datum, and 617.27 ft above sea level. Oct. 1, 1934 to Sept. 30, 1972, at datum 10.00 ft higher. See WSP 1708 for history of changes prior to Oct. 1, 1934.

REMARKS.--No estimated daily discharge. Records good. Slight fluctuation at low stages caused by powerplant above station. Flow regulated by Coralville Lake (station 05453510), 9.1 mi upstream, since Sept. 17, 1958. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers raingage and satellite data collection platform and U.S. Geological Survey data collection platform with telephone modem backup at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,500 ft^3/s June 8, 1918, gage height, 19.6 ft, from graph based on gage readings, site and datum then in use; minimum daily discharge, 29 ft^3/s Oct. 21, 22, 1916, regulated.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 17, 1881, reached a stage of 21.1 ft, from floodmarks at site and datum in use 1913-21, from information by local resident, discharge, 51,000 ft^3/s. Maximum stage known since at least 1850, about 3 ft higher than that of July 17, 1881, occurred in June 1851, discharge, 70,000 ft^3/s, estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	173	3140	1610	807	1140	2510	1490	6520	6060	6100	4670	428
2	219	2790	1600	696	1320	2320	1480	6220	6040	6220	4120	342
3	390	2620	1600	680	1580	2090	1560	6060	5940	6190	3660	344
4	640	2590	1600	687	2040	1850	1800	6080	5980	6150	1230	344
5	2280	2570	1590	689	2150	1760	1760	6180	5980	6120	1150	340
6	2770	2430	1600	687	2230	1800	1610	5940	5980	6060	1230	333
7	3580	2280	1610	682	2370	1850	1580	5280	5940	6020	1280	321
8	4220	2210	1550	681	2380	1790	1830	4810	5910	5980	1250	318
9	3130	2120	1440	679	2460	1680	3070	4440	6040	5970	1240	319
10	1750	2560	1370	679	2650	1700	3420	3980	6550	5920	1240	320
11	1810	3150	1910	679	3230	1700	3880	3530	6330	5910	1240	340
12	1880	3330	2720	743	3870	1690	4200	3930	6470	5880	1340	385
13	1760	3170	2700	820	3350	1600	4790	5790	6240	5860	1270	376
14	1440	2910	2550	799	3090	1480	5340	6330	6310	5820	1250	376
15	1160	2770	2220	768	3420	1530	5700	6140	6230	5780	1150	375
16	1090	2720	2110	768	3600	1920	6530	6100	6210	5810	1060	376
17	2210	2670	1840	767	3570	2630	6230	6130	6200	6010	1050	361
18	4210	2500	1530	743	3470	3000	5620	6190	6200	5960	1090	327
19	2130	2330	1160	710	3320	1950	5090	6080	6210	6000	1020	315
20	4120	2320	1150	714	3120	1830	4620	4700	6220	6060	909	334
21	6090	2320	1130	737	2980	2060	4350	1430	6250	5960	897	360
22	5890	2240	815	844	2850	2160	4550	1470	6260	5960	893	318
23	5080	2020	412	1330	2650	2270	6120	1630	6360	6050	898	308
24	3980	938	397	1550	2330	2250	6800	5370	6310	5600	891	296
25	3800	2250	393	1250	2160	2150	6460	6010	6270	2180	766	281
26	3750	2290	675	1170	2090	1900	6160	5960	6250	1180	625	252
27	3490	2070	1010	1090	2150	1710	6290	5970	6420	1180	622	294
28	3130	1830	1000	1080	2410	1650	6760	6020	6690	2030	624	334
29	3020	1730	997	1090	---	1630	7150	6010	6310	5880	622	344
30	2850	1630	982	1110	---	1630	6940	5970	6270	5840	595	326
31	3210	---	947	1100	---	1570	---	6010	---	5400	512	---
TOTAL	85252	72498	44218	26829	73980	59660	133180	162280	186430	167080	40394	10087
MEAN	2750	2417	1426	865	2642	1925	4439	5235	6214	5390	1303	336
MAX	6090	3330	2720	1550	3870	3000	7150	6520	6690	6220	4670	428
MIN	173	938	393	679	1140	1480	1480	1430	5910	1180	512	252
AC-FT	169100	143800	87710	53220	146700	118300	264200	321900	369800	331400	80120	20010
CFSM	.84	.74	.44	.26	.81	.59	1.36	1.60	1.90	1.65	.40	.10
IN.	.97	.82	.50	.31	.84	.68	1.51	1.85	2.12	1.90	.46	.11

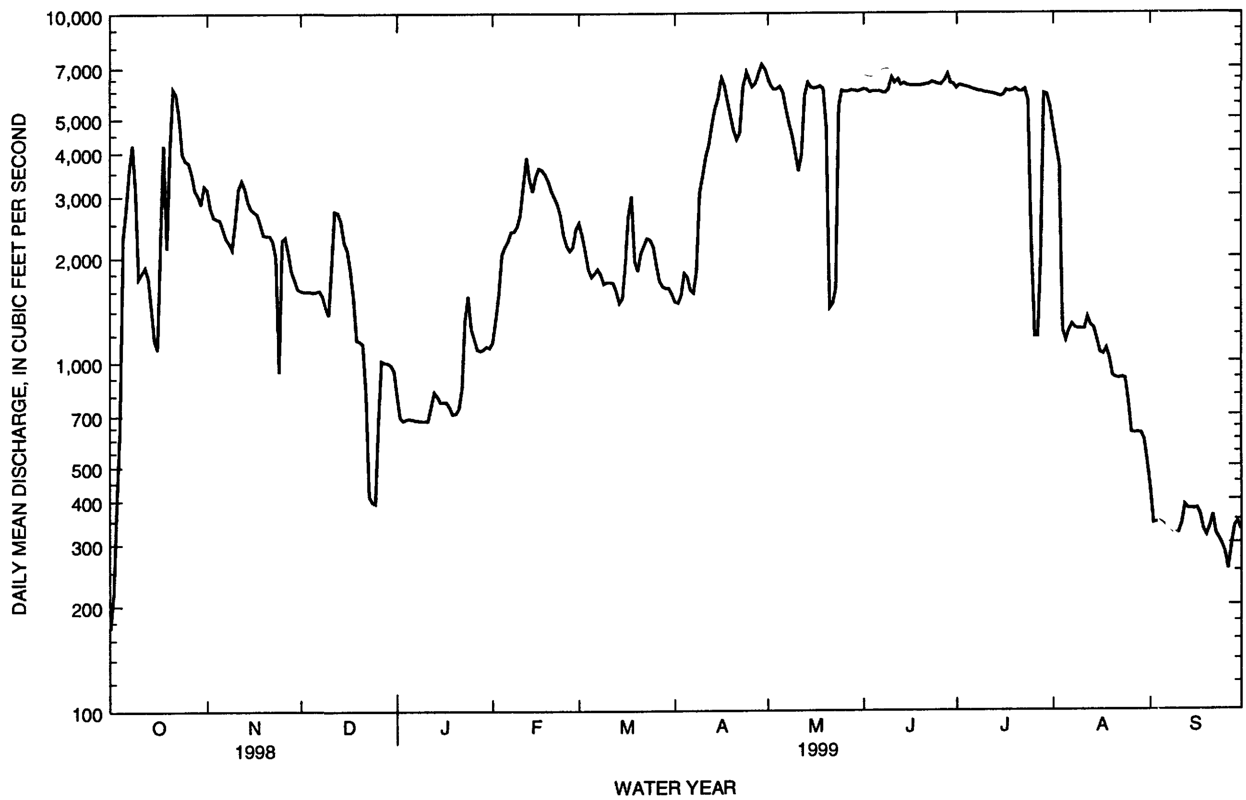
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1190	1508	1469	1098	1819	3436	3876	3295	3620	3544	2256	1494
MAX	4277	5395	4580	5381	5789	7988	9764	9763	11590	22220	20060	13760
(WY)	1994	1987	1983	1973	1973	1971	1979	1993	1991	1993	1993	1993
MIN	135	121	130	141	125	366	348	184	99.1	72.8	162	147
(WY)	1990	1967	1989	1990	1977	1977	1989	1977	1977	1977	1989	1976

05454500 IOWA RIVER AT IOWA CITY, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1959 - 1999a	
ANNUAL TOTAL	1259946		1061888			
ANNUAL MEAN	3452		2909		2385	
HIGHEST ANNUAL MEAN					8502	1993
LOWEST ANNUAL MEAN					304	1989
HIGHEST DAILY MEAN	9870	Apr 9	7150	Apr 29	26200	Jul 21 1993
LOWEST DAILY MEAN	173	Oct 1	173	Oct 1	49	Aug 1 1977b
ANNUAL SEVEN-DAY MINIMUM	350	Sep 27	298	Sep 22	50	Jul 31 1977
INSTANTANEOUS PEAK FLOW			7760	Jun 10	28200	Aug 10 1993
INSTANTANEOUS PEAK STAGE			18.41	Jun 10	28.52	Aug 10 1993
ANNUAL RUNOFF (AC-FT)	2499000		2106000		1728000	
ANNUAL RUNOFF (CFSM)	1.06		.89		.73	
ANNUAL RUNOFF (INCHES)	14.33		12.08		9.91	
10 PERCENT EXCEEDS	7760		6170		6010	
50 PERCENT EXCEEDS	2780		2180		1340	
90 PERCENT EXCEEDS	710		478		217	

a Post regulation
b Also Aug 2, 1977



05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'05", long 91°30'27", in $SW^1/_4$ $NE^1/_4$ sec.14, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 60 ft downstream from bridge on Muscatine Avenue in Iowa City, and 1.2 mi upstream from mouth.

DRAINAGE AREA.--2.94 mi^2.

PERIOD OF RECORD.--Discharge records from October 1963 to September 1995. Stage-only records from October 29, 1996 to present year.

REVISED RECORDS.--WDR IA-66-1: Drainage area.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 678.03 ft above sea level.

REMARKS.--Minor regulation from retention dam 2 miles upstream may affect peaks. U.S. Geological Survey data collection platform with telephone modem at station.

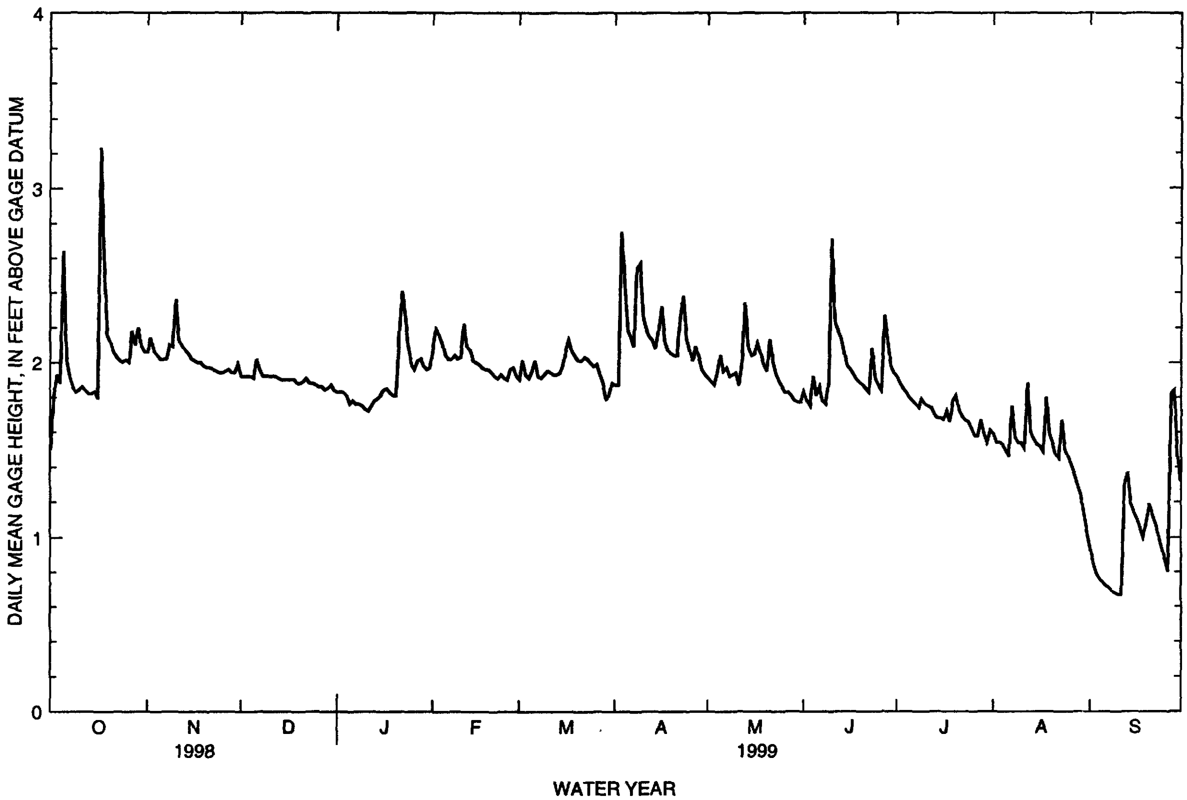
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 14, 1962, reached a stage of 10.5 ft, from flood profile, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum instantaneous gage height 7.24 ft on April 8. Minimum gage height of .66 ft. on Sept. 11-12.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.50	2.06	1.92	1.83	2.08	1.90	1.87	1.91	1.83	1.92	1.59	.94
2	1.81	2.14	1.92	1.83	2.19	2.01	1.87	1.89	1.78	1.88	1.54	.85
3	1.93	2.06	1.92	1.83	2.16	1.93	2.75	1.87	1.75	1.85	1.54	.79
4	1.88	2.04	1.92	1.81	2.11	1.91	2.48	1.94	1.92	1.83	1.53	.76
5	2.64	2.02	1.91	1.76	2.04	1.95	2.19	2.04	1.81	1.80	1.50	.74
6	2.02	2.02	2.02	1.78	2.02	2.01	2.15	1.95	1.86	1.78	1.46	.72
7	1.92	2.02	1.96	1.76	2.02	1.92	2.09	1.97	1.78	1.76	1.75	.71
8	1.86	2.10	1.92	1.76	2.04	1.91	2.54	1.92	1.76	1.74	1.57	.69
9	1.83	2.09	1.92	1.75	2.02	1.93	2.57	1.93	1.88	1.79	1.54	.68
10	1.84	2.36	1.92	1.73	2.03	1.95	2.26	1.94	2.71	1.76	1.54	.67
11	1.86	2.13	1.92	1.72	2.22	1.94	2.19	1.87	2.23	1.75	1.51	.67
12	1.84	2.09	1.92	1.75	2.09	1.93	2.15	2.00	2.18	1.74	1.88	1.30
13	1.82	2.07	1.91	1.78	2.07	1.93	2.13	2.34	2.14	1.70	1.60	1.37
14	1.82	2.05	1.90	1.79	2.01	1.94	2.08	2.09	2.05	1.68	1.56	1.19
15	1.83	2.02	1.90	1.81	2.00	1.98	2.18	2.04	1.98	1.68	1.53	1.14
16	1.79	2.01	1.90	1.84	1.99	2.07	2.32	2.05	1.96	1.67	1.52	1.10
17	3.23	2.00	1.90	1.85	1.97	2.13	2.12	2.11	1.93	1.72	1.49	1.05
18	2.59	2.00	1.90	1.83	1.96	2.06	2.07	2.05	1.90	1.66	1.80	1.00
19	2.16	1.98	1.88	1.81	1.96	2.03	2.05	1.99	1.88	1.78	1.59	1.09
20	2.12	1.97	1.88	1.81	1.94	2.01	2.04	1.95	1.87	1.81	1.54	1.19
21	2.06	1.97	1.89	2.17	1.92	2.01	2.04	2.13	1.85	1.72	1.47	1.12
22	2.03	1.96	1.91	2.41	1.91	2.03	2.26	2.00	1.83	1.69	1.45	1.07
23	2.01	1.95	1.88	2.26	1.93	2.02	2.38	1.93	2.08	1.67	1.67	1.01
24	2.00	1.94	1.88	2.08	1.91	2.00	2.14	1.89	1.91	1.66	1.50	.94
25	2.01	1.94	1.87	1.99	1.90	1.98	2.07	1.86	1.87	1.62	1.46	.87
26	2.00	1.95	1.86	1.96	1.96	1.99	2.01	1.83	1.84	1.58	1.41	.80
27	2.18	1.96	1.86	2.01	1.97	1.93	2.09	1.83	2.27	1.58	1.36	1.82
28	2.10	1.94	1.84	2.02	1.92	1.88	2.03	1.81	2.13	1.67	1.30	1.84
29	2.20	1.94	1.85	1.98	---	1.79	1.96	1.78	1.98	1.59	1.24	1.47
30	2.09	1.99	1.87	1.96	---	1.81	1.93	1.77	1.94	1.54	1.13	1.32
31	2.06	---	1.84	1.97	---	1.88	---	1.77	---	1.61	1.03	---
MEAN	2.03	2.03	1.90	1.89	2.01	1.96	2.17	1.95	1.96	1.72	1.50	1.03
MAX	3.23	2.36	2.02	2.41	2.22	2.13	2.75	2.34	2.71	1.92	1.88	1.84
MIN	1.50	1.94	1.84	1.72	1.90	1.79	1.87	1.77	1.75	1.54	1.03	.67

05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA--Continued



05455100 OLD MANS CREEK NEAR IOWA CITY, IA

LOCATION.--Lat. 41°36'23", long. 91°36'56", in SE 1/4 SW 1/4 NW 1/4 sec.36, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank 10 ft downstream from bridge on county highway W62, 5 miles southwest of Iowa City, 5.9 miles upstream of Dirty Face Creek, and 8.6 miles upstream from mouth.

DRAINAGE AREA.--201 mi^2.

PERIOD OF RECORD.--October 1950 to September 1964, published in WSP 1914. Annual maximum, water years 1965-84. Occasional low-flow measurements, water years 1964-77; October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 637.49 ft above sea level. Prior to Nov. 16, 1984, nonrecording gage at same site at datum 2.00 ft higher. Prior to Oct. 1, 1987, at datum 2.00 ft higher.

REMARKS.--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.

COOPERATION.--Gage height record and discharge measurements for water years 1951-64 were collected by the U.S. Army Corps of Engineers and computed by the U.S. Geological Survey.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 13,500 ft^3/s, on the basis of contracted-opening of peak flow, June 15, 1982, gage height, 17.25 ft, present datum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	270	119	e50	155	157	124	281	164	107	27	8.0
2	51	305	117	e55	313	155	e120	258	174	102	22	7.5
3	109	360	117	e60	362	161	130	236	156	98	20	7.4
4	155	285	113	e55	378	152	273	222	154	95	19	7.0
5	2290	249	109	e48	242	149	178	309	173	93	17	12
6	1260	230	108	e55	199	144	286	267	152	91	16	7.8
7	506	212	112	e61	184	127	231	233	142	85	19	6.5
8	351	214	105	e65	193	127	200	211	133	82	24	6.0
9	275	225	104	e60	228	114	515	194	363	80	18	5.8
10	247	683	105	e65	193	161	347	186	422	74	15	5.6
11	217	532	103	e65	275	131	283	176	243	70	14	5.6
12	190	351	103	e65	409	122	235	e380	390	68	35	6.0
13	168	300	101	e60	228	124	215	822	728	67	68	6.2
14	152	276	98	e60	203	123	204	671	320	65	27	6.5
15	145	243	96	e65	189	132	197	413	233	e55	20	5.7
16	136	231	95	e68	175	190	383	348	204	45	17	5.7
17	1440	209	93	e70	156	494	401	388	184	44	14	5.7
18	3400	e200	93	e67	147	463	308	576	168	42	17	5.7
19	1640	189	89	e65	139	294	268	370	156	43	55	5.3
20	614	174	82	e75	132	246	244	313	147	46	33	5.1
21	436	164	77	e85	122	218	231	335	137	39	20	5.1
22	343	163	e60	e190	120	192	300	435	132	34	17	4.9
23	297	155	e65	e340	119	178	1300	333	143	30	16	5.0
24	268	144	e75	e300	121	167	687	285	156	26	17	5.0
25	248	144	e80	e210	111	153	474	255	127	24	15	5.1
26	232	137	e85	e150	120	146	394	231	118	22	13	4.9
27	235	131	e80	e170	166	142	379	213	124	22	12	7.0
28	293	130	e85	191	193	142	432	199	195	127	10	13
29	322	131	e70	169	---	137	357	186	124	78	9.5	13
30	387	130	e55	144	---	129	312	175	111	33	9.0	8.7
31	314	---	e50	124	---	127	---	168	---	27	8.4	---
TOTAL	16770	7167	2844	3307	5572	5497	10008	9669	6173	1914	643.9	202.8
MEAN	541	239	91.7	107	199	177	334	312	206	61.7	20.8	6.76
MAX	3400	683	119	340	409	494	1300	822	728	127	68	13
MIN	49	130	50	48	111	114	120	168	111	22	8.4	4.9
AC-FT	33260	14220	5640	6560	11050	10900	19850	19180	12240	3800	1280	402
CFSM	2.69	1.19	.46	.53	.99	.88	1.66	1.55	1.02	.31	.10	.03
IN.	3.10	1.33	.53	.61	1.03	1.02	1.85	1.79	1.14	.35	.12	.04

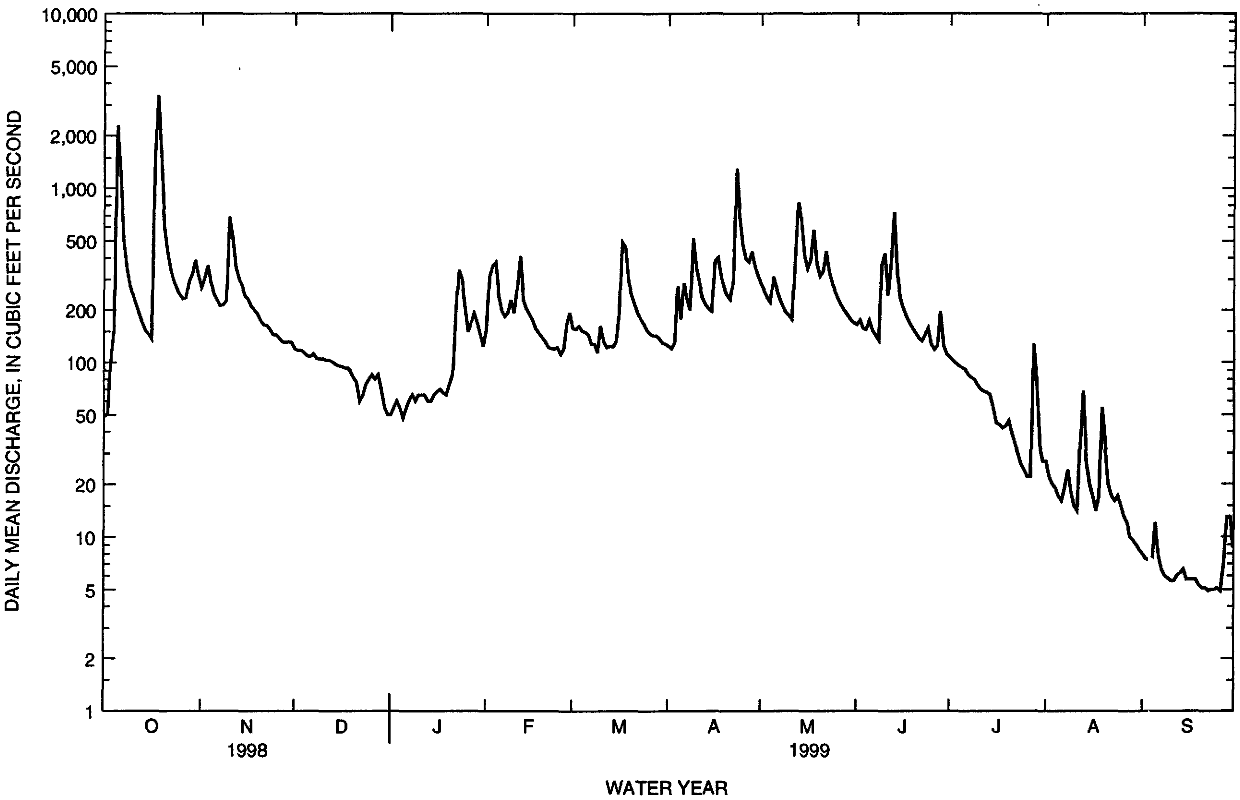
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	64.6	97.1	57.6	64.6	121	244	174	237	182	155	109	63.7
MAX	541	636	337	436	346	793	625	1071	907	1515	1190	598
(WY)	1999	1962	1993	1960	1953	1962	1993	1996	1990	1993	1993	1993
MIN	.21	.39	.35	.26	2.50	2.12	1.29	4.97	5.34	1.43	2.97	.36
(WY)	1958	1956	1956	1956	1954	1954	1956	1956	1956	1954	1988	1957

05455100 OLD MANS CREEK NEAR IOWA CITY, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1951 - 1999	
ANNUAL TOTAL	85174		69767.7			
ANNUAL MEAN	233		191		131	
HIGHEST ANNUAL MEAN					607	1993
LOWEST ANNUAL MEAN					10.3	1954
HIGHEST DAILY MEAN	3400	Oct 18	3400	Oct 18	8780	Jul 6 1993
LOWEST DAILY MEAN	24	Jan 1	4.9	Sep 22,26	.10	Sep 6 1957
ANNUAL SEVEN-DAY MINIMUM	36	Aug 21	5.0	Sep 20	.10	Sep 6 1957
INSTANTANEOUS PEAK FLOW			4300	Oct 17	13000	Jul 6 1993
INSTANTANEOUS PEAK STAGE			14.89	Oct 17	17.61	Jul 6 1993
INSTANTANEOUS LOW FLOW			4.8	Sep 20a		
ANNUAL RUNOFF (AC-FT)	168900		138400		94850	
ANNUAL RUNOFF (CFSM)	1.16		.95		.65	
ANNUAL RUNOFF (INCHES)	15.76		12.91		8.85	
10 PERCENT EXCEEDS	438		362		286	
50 PERCENT EXCEEDS	156		137		41	
90 PERCENT EXCEEDS	53		14		1.7	

a Also Sep 21-26
e Estimated



05455500 ENGLISH RIVER AT KALONA, IA

LOCATION.--Lat 41°28'11", long 91°42'52",(revised) in $SE^1/_4$ $SE^1/_4$ sec.13, T.77 N., R.8 W., Washington County, Hydrologic Unit 07080209, on right bank 30 ft upstream from bridge on State Highway 1, 0.8 mi south of Kalona, 1.1 mi upstream from Camp Creek, 4.5 mi downstream from Smith Creek, and 14.5 mi upstream from mouth.

DRAINAGE AREA.--573 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1940 (M), 1941. WSP 1708: 1956, 1957 (P), 1958 (P).

GAGE.--Water-stage recorder. Datum of gage is 633.45 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Dec. 27, 1939, nonrecording gage 30 ft downstream at same datum.

REMARKS.--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 1930 reached a stage of 19.9 ft, from floodmark, from information by local residents, discharge, 18,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	709	245	e100	e460	466	276	943	420	299	68	30
2	75	963	230	e110	e600	407	267	820	463	279	60	28
3	159	1500	231	e130	980	410	272	734	631	260	53	28
4	261	1110	225	e120	1140	382	625	669	496	241	50	26
5	4180	819	217	e110	900	372	412	1060	1040	216	47	27
6	3620	695	214	e130	633	362	654	1370	787	196	43	24
7	1830	617	224	e140	576	317	515	892	580	181	48	23
8	965	600	221	e150	550	296	444	759	484	174	55	22
9	615	678	214	e140	623	248	1870	674	1880	165	58	21
10	484	1750	222	e150	575	381	1220	612	2300	155	47	20
11	397	2010	222	e150	635	367	835	566	1750	139	40	19
12	334	1080	218	e150	1180	313	658	1140	3040	129	166	20
13	291	832	214	e140	710	310	561	3030	3570	123	697	21
14	264	730	205	e140	577	311	515	2450	1870	115	270	21
15	273	639	197	e150	520	338	496	1450	1050	104	127	20
16	273	567	196	e155	460	537	1160	1150	832	96	87	19
17	1880	509	193	e160	407	1510	1290	1400	701	93	69	19
18	6590	459	191	e155	369	1430	901	2240	603	87	66	18
19	4980	421	185	e145	351	824	733	1380	529	85	85	17
20	3150	377	166	e140	336	648	652	1040	462	87	139	18
21	1560	347	e110	e160	309	568	607	980	411	81	107	17
22	935	338	e100	e190	285	498	841	1250	432	80	74	16
23	749	329	e120	e400	284	445	3660	989	658	68	64	16
24	658	300	e140	e900	291	410	2680	819	1250	63	64	16
25	589	291	e145	e500	280	371	1460	710	724	60	60	15
26	532	283	e150	e420	287	346	1100	632	533	57	53	15
27	494	266	e140	e460	355	334	1070	570	452	53	47	18
28	547	260	e150	e500	531	333	2480	521	414	217	43	30
29	641	258	e120	e480	---	332	1720	478	363	283	39	31
30	1120	259	e110	e460	---	306	1160	439	324	112	35	28
31	974	---	e100	e440	---	287	---	415	---	78	32	---
TOTAL	39487	19996	5615	7675	15204	14459	31134	32182	29049	4376	2893	643
MEAN	1274	667	181	248	543	466	1038	1038	968	141	93.3	21.4
MAX	6590	2010	245	900	1180	1510	3660	3030	3570	299	697	31
MIN	67	258	100	100	280	248	267	415	324	53	32	15
MED	615	584	196	150	526	371	784	892	617	115	60	20
AC-FT	78320	39660	11140	15220	30160	28680	61750	63830	57620	8680	5740	1280
CFSM	2.22	1.16	.32	.43	.95	.81	1.81	1.81	1.69	.25	.16	.04
IN.	2.56	1.30	.36	.50	.99	.94	2.02	2.09	1.88	.28	.19	.04

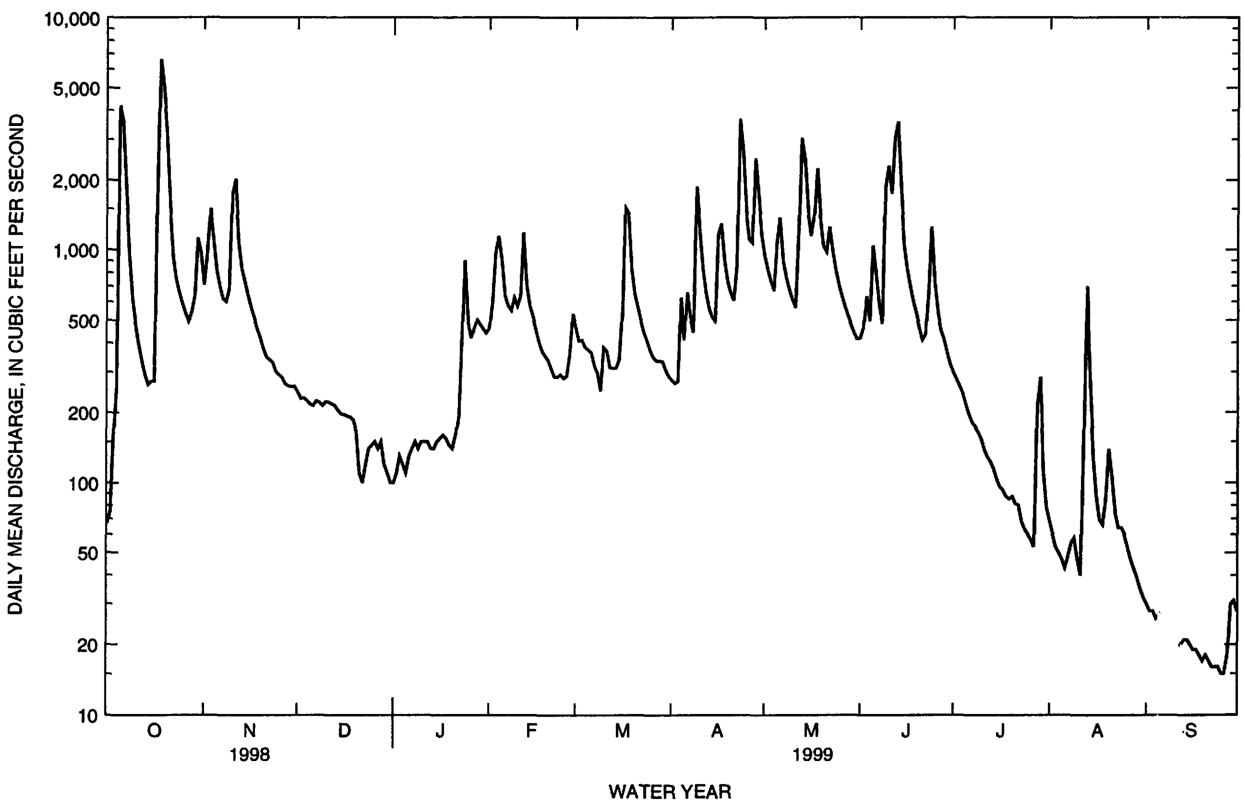
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	166	254	190	213	368	694	653	686	593	415	276	235
MAX	1274	2060	1085	1429	1066	2957	2736	3529	2570	4207	3696	3169
(WY)	1999	1962	1983	1946	1984	1979	1973	1974	1990	1993	1993	1965
MIN	2.98	2.38	2.19	.76	13.8	10.8	5.35	9.62	21.7	7.31	6.34	3.10
(WY)	1954	1956	1956	1977	1954	1954	1956	1956	1940	1954	1955	1955

05455500 ENGLISH RIVER AT KALONA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1940 - 1999	
ANNUAL TOTAL	253755		202713			
ANNUAL MEAN	695		555		395	
HIGHEST ANNUAL MEAN					1721	1993
LOWEST ANNUAL MEAN					41.7	1954
HIGHEST DAILY MEAN	6590	Oct 18	6590	Oct 18	22300	Jul 6 1993
LOWEST DAILY MEAN	33	Sep 13	15	Sep 25,26	.66	Feb 5 1977
ANNUAL SEVEN-DAY MINIMUM	38	Aug 21	16	Sep 20	.68	Feb 1 1977
INSTANTANEOUS PEAK FLOW			7270	Oct 18	36100	Jul 6 1993
INSTANTANEOUS PEAK STAGE			17.01	Oct 18	22.55	Jul 6 1993
INSTANTANEOUS LOW FLOW			14	Sep 26,27		
ANNUAL RUNOFF (AC-FT)	503300		402100		286200	
ANNUAL RUNOFF (CFSM)	1.21		.97		.69	
ANNUAL RUNOFF (INCHES)	16.45		13.14		9.35	
10 PERCENT EXCEEDS	1470		1200		876	
50 PERCENT EXCEEDS	481		336		122	
90 PERCENT EXCEEDS	75		45		12	

e Estimated



05455700 IOWA RIVER NEAR LONE TREE, IA

LOCATION.--Lat 41°25'15", long 91°28'25", in $NW^1/_4$ $NE^1/_4$ sec.6, T.76 N., R.5 W., Louisa County, Hydrologic Unit 07080209, on left bank 2,000 ft downstream from tri-county bridge on county highway W66, 5 mi southwest of Lone Tree, 6.2 mi downstream from English River, and at mile 47.2.

DRAINAGE AREA.--4,293 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 588.16 ft above sea level. Prior to Dec. 28, 1956, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Coralville Lake (station 05453510), 36.1 mi upstream, since Sept. 17, 1958. 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 May 25, 1944, reached a stage of 19.94 ft, discharge not determined. from information by U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	718	4800	2430	e1200	e1800	3380	2210	8200	6830	7060	5190	757
2	730	4580	2400	e1100	2670	3180	2170	7680	6870	6850	4460	646
3	992	4960	2390	e1000	3360	2980	2210	7310	6850	6880	4170	589
4	1430	4680	2380	e950	3890	2720	2590	7200	6850	6810	2780	572
5	7070	4160	2360	e1000	3840	2560	2880	7420	7150	6740	1640	558
6	9990	3920	2360	e1100	3380	2530	2640	8030	7240	6670	1780	551
7	7270	3550	2400	e1000	3410	2530	2840	7070	7120	6600	2020	526
8	6650	3470	2350	e950	3410	2490	2600	6310	6780	6530	1810	508
9	5250	3430	2250	e950	3530	2320	5170	5830	6820	6490	1630	488
10	3390	4830	2150	e950	3640	2370	5660	5380	9090	6450	1620	484
11	2950	6600	2170	e1000	4120	2480	5410	4840	10300	6380	1590	473
12	2930	5580	3160	e1100	5550	2390	5310	4810	9310	6340	1760	515
13	2810	4930	3280	e1200	5160	2340	5530	8790	11100	6290	2050	529
14	2560	4440	3240	e1300	4060	2200	6080	10700	9830	6240	2040	498
15	2260	4130	2870	e1200	4280	2200	6270	8830	8170	6190	1720	488
16	2030	3930	2770	e1100	4510	2610	7920	8080	7570	6140	1500	481
17	3710	3810	2550	e1100	4390	4240	8630	8180	7360	6190	1450	473
18	13800	e3600	2430	e1100	4270	6120	7500	9420	7240	6250	1440	435
19	13300	3340	1950	e1000	4090	4030	6660	8700	7110	6240	1550	406
20	10000	3240	1830	e1000	3860	3060	6070	7740	7040	6320	1370	396
21	9380	3160	1780	e1100	3710	3150	5600	e3400	6990	6300	1350	420
22	7790	3120	e1200	e1400	3450	3060	5780	e3400	6970	6210	1280	403
23	7100	3000	e650	e2100	3380	3120	9840	e3200	7070	6230	1250	380
24	5570	2290	e600	e2400	3030	3060	11700	5560	7470	6230	1230	372
25	5110	2630	e600	e2100	2770	2980	9620	7290	7570	e3400	1200	362
26	4920	3020	e1100	e1700	2710	2750	8250	7090	7150	e1600	1000	344
27	4800	2950	e1500	e1600	2710	2520	8010	7000	6970	e1500	936	369
28	4410	2650	e1500	e1700	3090	2420	9520	6960	7300	e1800	921	450
29	4550	2600	e1400	e1700	---	2390	10000	6920	7190	4120	903	447
30	4650	2500	e1400	e1600	---	2340	9010	6800	7080	6100	e850	418
31	4980	---	e1300	e1600	---	2310	---	6800	---	5650	813	---
TOTAL	163100	113900	62750	40300	102070	88830	183680	214940	228390	178800	55303	14338
MEAN	5261	3797	2024	1300	3645	2865	6123	6934	7613	5768	1784	478
MAX	13800	6600	3280	2400	5550	6120	11700	10700	11100	7060	5190	757
MIN	718	2290	600	950	1800	2200	2170	3200	6780	1500	813	344
AC-FT	323500	225900	124500	79940	202500	176200	364300	426300	453000	354600	109700	28440
CFSM	1.23	.88	.47	.30	.85	.67	1.43	1.62	1.77	1.34	.42	.11
IN.	1.41	.99	.54	.35	.88	.77	1.59	1.86	1.98	1.55	.48	.12

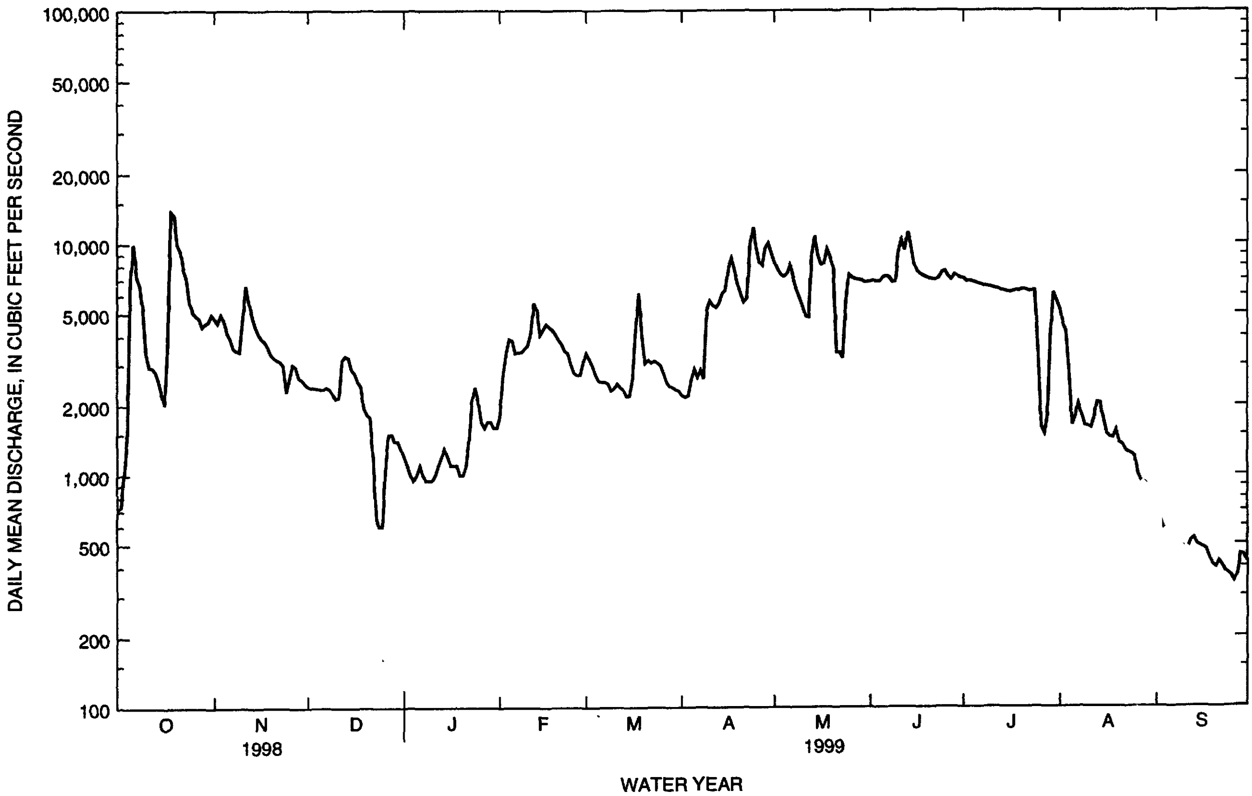
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1999, BY WATER YEAR (WY)

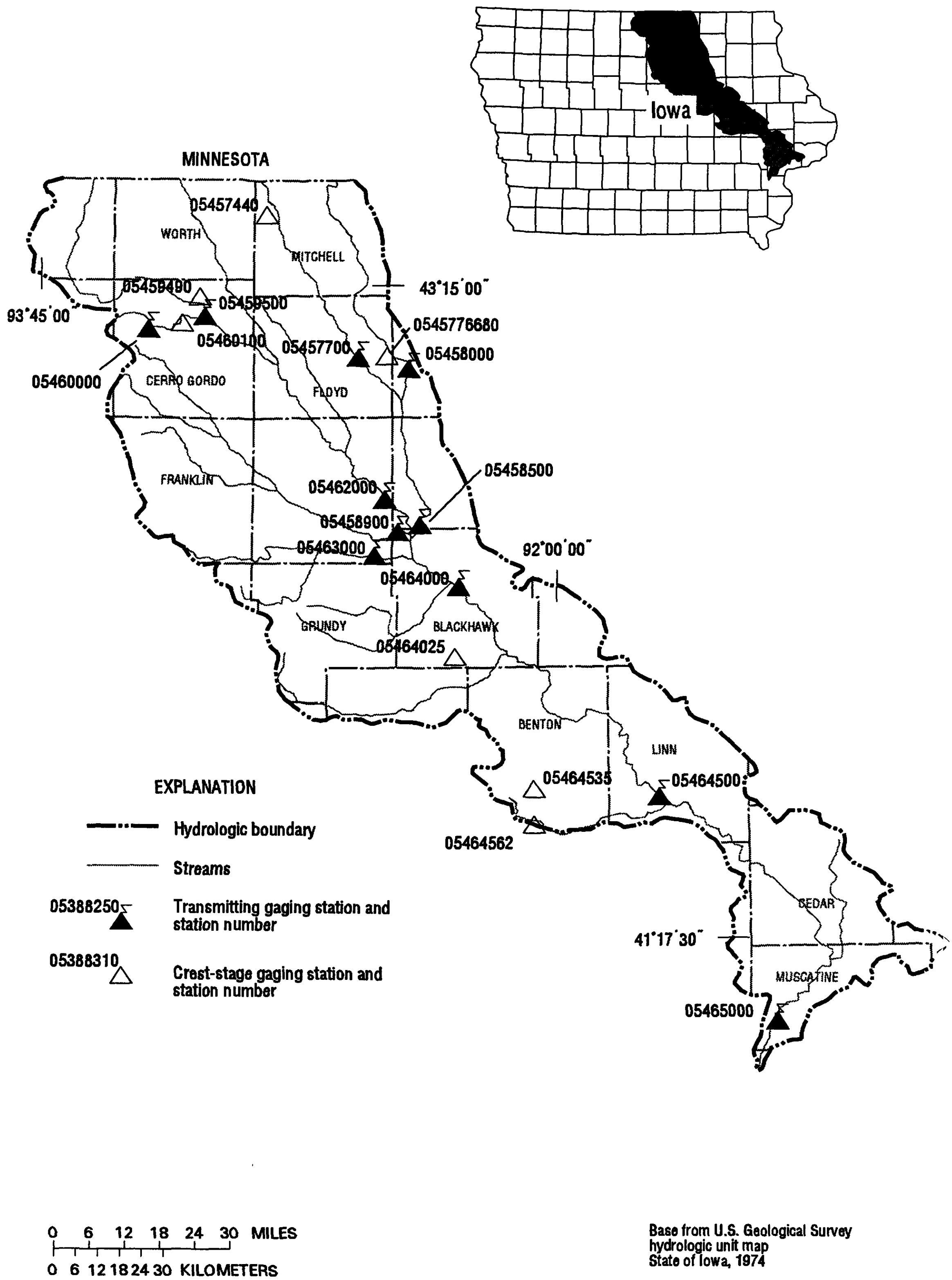
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1601	2065	1939	1548	2523	4757	5243	4696	4732	4487	2904	2107
MAX	6115	6347	6678	7814	7205	10410	12230	14030	13150	30320	26150	18150
(WY)	1994	1962	1983	1973	1973	1993	1979	1993	1974	1993	1993	1993
MIN	192	190	168	154	158	539	533	282	147	180	186	210
(WY)	1989	1967	1989	1977	1977	1977	1989	1977	1977	1977	1989	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1959 - 1999a	
ANNUAL TOTAL	1748234		1446401			
ANNUAL MEAN	4790		3963		3218	
HIGHEST ANNUAL MEAN					11900	1993
LOWEST ANNUAL MEAN					483	1989
HIGHEST DAILY MEAN	13800	Oct 18	13800	Oct 18	55100	Jul 7 1993
LOWEST DAILY MEAN	600	Jan 1	344	Sep 26	69	Aug 4 1977
ANNUAL SEVEN-DAY MINIMUM	949	Sep 27	379	Sep 21	75	Jul 30 1977
INSTANTANEOUS PEAK FLOW			14500	Oct 18	57100	Jul 7 1993
INSTANTANEOUS PEAK STAGE			14.40	Oct 18	22.94	Jul 7 1993
ANNUAL RUNOFF (AC-FT)	3468000		2869000		2332000	
ANNUAL RUNOFF (CFSM)	1.12		.92		.75	
ANNUAL RUNOFF (INCHES)	15.15		12.53		10.19	
10 PERCENT EXCEEDS	9290		7480		7660	
50 PERCENT EXCEEDS	4310		3180		1840	
90 PERCENT EXCEEDS	1300		835		325	

a Post regulation
e Estimated

05455700 IOWA RIVER NEAR LONE TREE, IA--Continued




Iowa
MINNESOTA
05457440
WORTH
MITCHELL
43°15'00"
05459490
05459500
93°45'00"
0545776680
05460100
05457700
05458000
05460000
CERRO GORDO
FLOYD
FRANKLIN
05458500
05462000
05458900
05463000
92°00'00"
05464000
GRUNDY
BLACKHAWK
05464025
BENTON
LINN
EXPLANATION
05464535
05464500
Hydrologic boundary
05464562
Streams
05388250
Transmitting gaging station and station number
CEDAR
41°17'30"
05388310
Crest-stage gaging station and station number
MUSCATINE
05465000
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

05457700 CEDAR RIVER AT CHARLES CITY, IA

LOCATION.--Lat 43°03'45", long 92°40'23", in $SE^1/_4$ $NE^1/_4$, sec.12, T.95 N., R.16 W., Floyd County, Hydrologic Unit 07080201, on right bank 800 ft downstream from bridge on U.S. Highway 18 (Brantingham Street) in Charles City, 10.6 mi upstream from Gizzard Creek, and at mile 252.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,054 mi^2.

PERIOD OF RECORD.--Discharge records from October 1964 to September 1995. Stage-only records from October 1995 to current year.

GAGE.--Water-stage recorder. Datum of gage is 973.02 ft above sea level.

REMARKS.--Occasional minor regulation by dam 0.2 mi upstream from gage. Daily wire-weight gage readings available in district office for period Sept. 13, 1945 to June 30, 1954, at same site and datum. Discharge not published for this period because of extreme regulation of streamflow by power dam 0.2 mi upstream. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum instantaneous discharge 31,200 ft^3/s, July 21, 1999; maximum gage height, 22.81 ft July 21, 1999; minimum daily discharge, 60 ft^3/s Nov. 23, 1977 and Jan. 7, 1978.

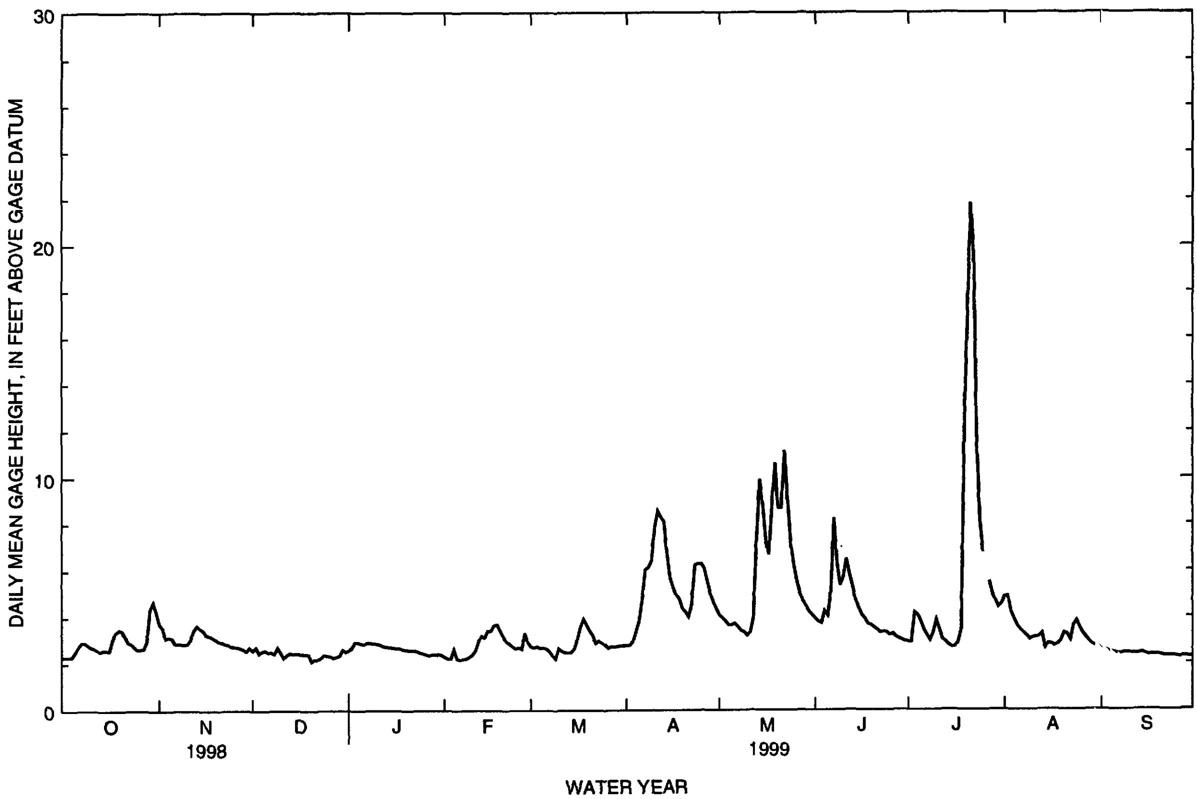
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 27, 1961, reached a stage of 21.6 ft, from flood marks, discharge, 29,200 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum gage height 22.81 ft. on July 21, minimum gage height 2.04 ft. on Dec. 20.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.30	3.75	2.59	2.58	2.30	2.74	2.79	4.09	3.94	2.93	4.85	2.58
2	2.30	3.57	2.72	2.70	2.23	2.70	2.80	3.97	3.81	2.91	4.88	2.52
3	2.30	3.12	2.47	2.94	2.22	2.74	2.95	3.83	3.74	4.19	4.22	2.52
4	2.32	3.16	2.56	2.94	2.62	2.67	3.38	3.66	4.26	4.08	3.91	2.47
5	2.52	3.13	2.59	2.88	2.23	2.69	3.85	3.67	4.06	3.81	3.60	2.46
6	2.74	2.88	2.51	2.86	2.18	2.65	4.75	3.73	5.09	3.45	3.45	2.42
7	2.91	2.87	2.51	2.92	2.19	2.53	6.06	3.58	8.23	3.21	3.32	2.41
8	2.93	2.87	2.44	2.90	2.22	2.35	6.14	3.42	6.35	3.00	3.19	2.44
9	2.83	2.84	2.71	2.89	2.29	2.23	6.44	3.37	5.36	3.29	3.03	2.44
10	2.73	2.87	2.49	2.86	2.38	2.66	7.86	3.21	5.70	3.86	3.09	2.44
11	2.69	3.06	2.26	2.83	2.57	2.54	8.56	3.34	6.48	3.45	3.13	2.42
12	2.61	3.46	2.38	2.77	2.97	2.49	8.29	3.96	5.82	3.02	3.14	2.38
13	2.55	3.64	2.47	2.73	3.20	2.48	8.10	7.27	5.30	2.92	3.27	2.42
14	2.61	3.53	2.43	2.72	3.14	2.49	6.78	9.91	4.71	2.79	2.66	2.44
15	2.59	3.47	2.44	2.70	3.43	2.64	5.71	8.77	4.39	2.69	2.85	2.38
16	2.58	3.28	2.43	2.68	3.42	3.02	5.26	7.26	4.10	2.70	2.81	2.33
17	3.08	3.22	2.43	2.67	3.66	3.57	4.97	6.69	3.92	2.87	2.73	2.36
18	3.37	3.16	2.42	2.65	3.69	3.93	4.78	8.84	3.70	3.46	2.82	2.34
19	3.48	3.08	2.41	2.62	3.43	3.68	4.38	10.61	3.65	12.09	2.97	2.37
20	3.44	2.99	2.11	2.60	3.19	3.43	4.24	8.69	3.54	17.08	3.29	2.34
21	3.21	2.94	2.20	2.58	2.99	3.24	4.02	8.69	3.45	21.83	3.25	2.31
22	2.94	2.87	2.19	2.58	2.87	2.88	4.53	11.13	3.33	19.67	3.00	2.30
23	2.87	2.84	2.26	2.54	2.75	2.98	6.24	9.11	3.35	11.66	3.63	2.30
24	2.75	2.76	2.38	2.48	2.66	2.89	6.31	7.25	3.34	8.13	3.83	2.30
25	2.62	2.74	2.35	2.45	2.71	2.82	6.31	6.28	3.22	6.78	3.54	2.29
26	2.64	2.72	2.33	2.40	2.63	2.67	6.12	5.56	3.28	---	3.30	2.27
27	2.66	2.69	2.26	2.36	3.32	2.74	5.59	5.05	3.13	5.52	3.11	2.28
28	3.00	2.62	2.30	2.41	2.92	2.72	5.06	4.68	3.05	4.99	2.94	2.28
29	4.38	2.55	2.35	2.38	---	2.75	4.65	4.46	2.99	4.69	2.80	2.26
30	4.66	2.71	2.61	2.42	---	2.76	4.35	4.24	2.94	4.42	2.74	2.26
31	4.25	---	2.52	2.38	---	2.77	---	4.09	---	4.56	2.67	---
MEAN	2.93	3.05	2.42	2.66	2.80	2.82	5.38	5.88	4.27	---	3.29	2.38
MAX	4.66	3.75	2.72	2.94	3.69	3.93	8.56	11.13	8.23	---	4.88	2.58
MIN	2.30	2.55	2.11	2.36	2.18	2.23	2.79	3.21	2.94	---	2.66	2.26

05457700 CEDAR RIVER AT CHARLES CITY, IA--Continued



05458000 LITTLE CEDAR RIVER NEAR IONIA, IA

LOCATION.--Lat 43°02'05", long 92°30'05", in $SW^1/_4$ $NE^1/_4$ sec.21, T.95 N., R.14 W., Chickasaw County, Hydrologic Unit 07080201, on left bank 12 ft downstream from bridge on county highway B57, 2.4 mi west of Ionia, 6.4 mi upstream from mouth, and 7.6 mi downstream from Beaver Creek.

DRAINAGE AREA.--306 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1959.

GAGE.--Water-stage recorder. Datum of gage is 973.35 ft above sea level.

REMARKS.--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 with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1954, reached a stage of 11.37 ft, discharge, 4,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	182	120	62	63	261	146	359	308	161	893	139
2	61	171	116	58	66	219	144	330	287	153	579	129
3	63	160	114	55	69	186	212	307	263	641	443	122
4	69	150	114	e48	62	164	271	288	670	452	365	115
5	96	142	112	e42	72	164	366	284	451	287	309	111
6	114	135	110	e46	68	146	589	270	364	229	268	107
7	127	129	106	e50	71	127	746	255	337	193	244	103
8	126	125	102	54	83	97	730	239	504	171	217	110
9	115	124	100	e50	116	78	1150	222	649	169	201	109
10	107	167	98	e46	136	123	1320	207	744	167	195	103
11	100	215	95	e50	212	146	1360	218	913	165	181	99
12	95	245	95	57	204	123	1010	540	690	148	174	98
13	91	248	94	58	194	116	825	1060	546	135	168	100
14	89	237	94	59	212	127	645	1220	460	126	157	99
15	105	222	92	58	233	172	530	1010	398	119	148	96
16	106	211	91	59	263	251	470	835	354	115	148	93
17	153	199	90	59	274	311	417	1070	320	174	143	91
18	171	187	90	57	268	303	369	967	289	190	143	89
19	163	178	79	57	226	250	335	928	266	2130	201	88
20	154	168	e44	58	194	212	311	777	249	2600	200	87
21	140	157	e34	58	166	195	291	1300	233	8940	188	85
22	128	153	e30	59	151	184	495	1240	218	8710	171	84
23	121	149	e40	61	153	172	1180	894	229	6190	342	83
24	117	143	e48	61	136	163	1560	691	222	2700	374	80
25	113	139	e55	59	127	153	1380	564	209	1220	293	80
26	110	135	64	60	131	146	836	481	196	1270	266	79
27	120	131	66	60	209	141	645	429	184	930	226	81
28	151	128	64	61	410	145	553	394	174	736	198	79
29	188	125	68	63	---	148	468	349	165	569	179	76
30	204	124	64	63	---	146	402	317	158	474	162	74
31	194	---	63	62	---	145	---	325	---	574	149	---
TOTAL	3754	4979	2552	1750	4569	5314	19756	18370	11050	40838	7925	2889
MEAN	121	166	82.3	56.5	163	171	659	593	368	1317	256	96.3
MAX	204	248	120	63	410	311	1560	1300	913	8940	893	139
MIN	61	124	30	42	62	78	144	207	158	115	143	74
AC-FT	7450	9880	5060	3470	9060	10540	39190	36440	21920	81000	15720	5730
CFSM	.40	.54	.27	.18	.53	.56	2.15	1.94	1.20	4.31	.84	.31
IN.	.46	.61	.31	.21	.56	.65	2.40	2.23	1.34	4.96	.96	.35

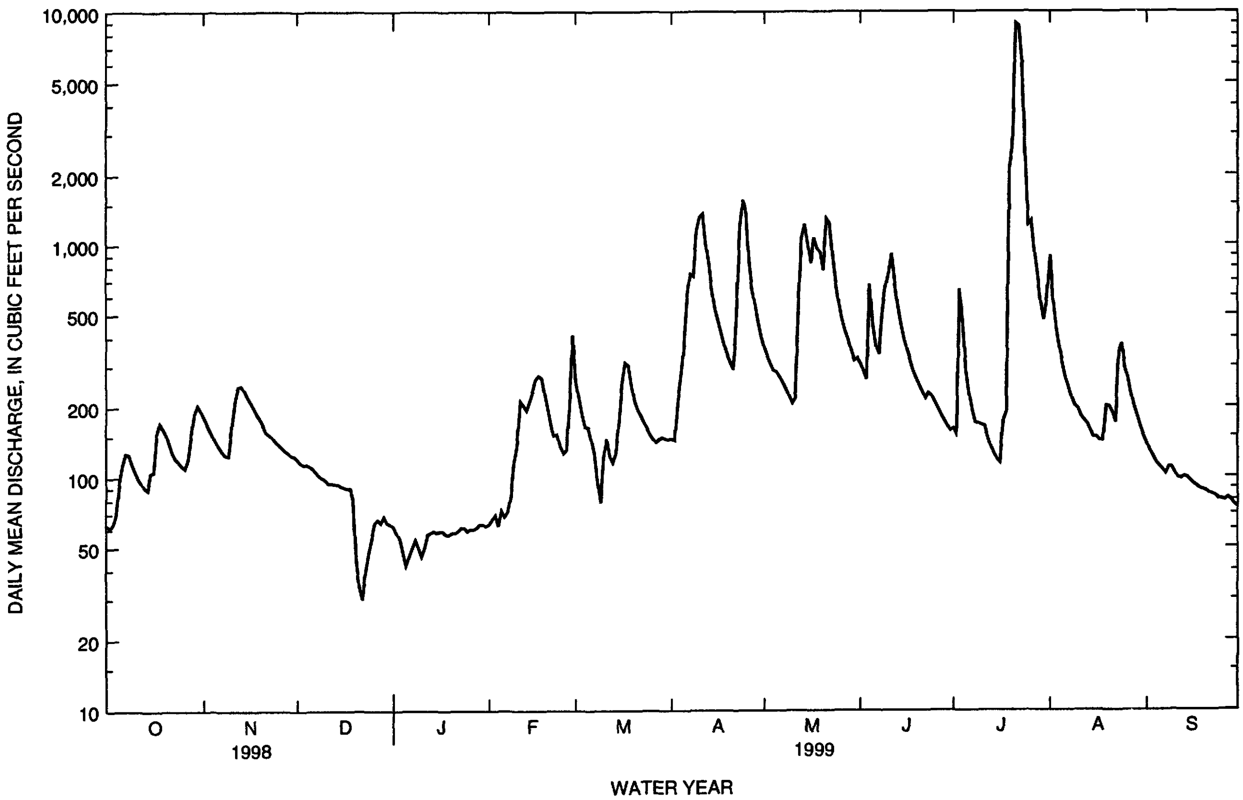
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	146	124	79.1	49.1	86.7	375	363	241	272	198	175	137
MAX	902	632	503	265	644	1056	1466	906	1136	1317	1744	807
(WY)	1987	1983	1983	1973	1984	1961	1965	1991	1969	1999	1993	1965
MIN	9.64	12.4	4.93	4.20	3.40	34.5	47.3	30.5	18.4	14.2	7.23	12.7
(WY)	1990	1990	1990	1959	1959	1964	1957	1958	1989	1964	1989	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1955 - 1999	
ANNUAL TOTAL	85224		123746			
ANNUAL MEAN	233		339		187	
HIGHEST ANNUAL MEAN					584	1993
LOWEST ANNUAL MEAN					32.0	1977
HIGHEST DAILY MEAN	3270	Jun 30	8940	Jul 21	9930	Mar 27 1961
LOWEST DAILY MEAN	30	Dec 22	30	Dec 22	3.0	Feb 4 1959a
ANNUAL SEVEN-DAY MINIMUM	38	Jan 14	45	Dec 20	3.0	Feb 3 1959
INSTANTANEOUS PEAK FLOW			12200	Jul 21	14000	Aug 16 1993
INSTANTANEOUS PEAK STAGE			17.52	Jul 21	18.99	Aug 16 1993
ANNUAL RUNOFF (AC-FT)	169000		245500		135800	
ANNUAL RUNOFF (CFSM)	.76		1.11		.61	
ANNUAL RUNOFF (INCHES)	10.36		15.04		8.32	
10 PERCENT EXCEEDS	475		690		393	
50 PERCENT EXCEEDS	137		162		74	
90 PERCENT EXCEEDS	50		62		19	

a Also Feb 5-9, 1959
e Estimated

05458000 LITTLE CEDAR RIVER NEAR IONIA, IA--Continued



05458500 CEDAR RIVER AT JANESVILLE, IA

LOCATION.--Lat 42°38'54", long 92°27'54", in NE$^1/_4$ SW$^1/_4$ sec.35, T.91 N., R.14 W., Bremer County, Hydrologic Unit 07080201, on left bank 300 ft downstream from bridge on county highway at Janesville, 3.6 mi upstream from West Fork Cedar River, and at mile 207.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,661 mi^2.

PERIOD OF RECORD.--October 1904 to Sept. 1906, October 1914 to September 1927, October 1932 to September 1942, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "Red Cedar River at Janesville", 1905-06.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1906 (M), 1915-16 (M), 1917, 1918-19 (M), 1920-27, 1933-37 (M), 1940-42 (M), WDR IA-97-1:1996.

GAGE.--Water-stage recorder. Datum of gage is 868.26 ft above sea level. Prior to July 26, 1919, nonrecording gage at site 1,000 ft downstream at datum 4.0 ft lower. July 26, 1919 to Sept. 30, 1927, Nov. 14, 1932 to Sept 30, 1942, and Apr. 26, 1946 to Nov. 10, 1949, nonrecording gage at county bridge 300 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation during low water caused by powerplant at Waverly, 10 mi upstream. 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 with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1945, reached a stage of 16.2 ft, from floodmark at site 300 ft upstream, discharge, 34,300 ft^3/s. Flood of Mar. 16, 1929, reached a stage of about 16 ft, from information by City of Waterloo, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	500	2110	933	e360	467	1360	987	2710	2840	1350	3640	1120
2	467	1780	925	e400	475	1170	938	2500	2980	1400	3650	1080
3	538	1620	926	e460	480	1040	1020	2320	2650	3410	3570	1030
4	583	1280	902	e400	582	976	1210	2250	2880	2590	2920	979
5	685	1380	747	e320	609	944	1440	2110	6480	2830	2680	987
6	820	1250	843	e360	519	917	1960	2030	4020	2260	2250	886
7	935	1160	822	e400	505	879	2670	2100	3310	1840	2270	859
8	1060	1070	869	e360	522	819	3440	1970	6070	1600	2060	855
9	991	1090	727	e400	621	618	4180	1730	5310	1460	1780	876
10	952	1150	926	e340	745	754	5100	1670	4600	1490	1730	841
11	893	1480	682	e360	948	633	5870	1570	5220	1890	1660	833
12	845	1460	704	e400	877	743	7020	2060	5880	1670	1630	816
13	778	1720	729	e460	826	746	6690	2650	4940	1370	1590	805
14	737	1810	721	e550	1110	733	6370	4640	4120	1240	1570	761
15	747	1750	709	e600	1530	728	5260	7930	3410	1180	1270	827
16	803	1680	700	e750	1620	806	3930	8680	3070	1060	1280	740
17	851	1560	691	e650	1610	955	3510	18900	2530	1070	1290	732
18	1780	1450	682	e700	1640	1610	3110	11300	2550	1230	1210	722
19	2100	1420	684	e650	1690	1810	2880	8610	2250	1910	1480	722
20	1790	1320	639	e600	1600	1570	2600	9980	2200	6910	1540	727
21	1640	1250	e380	e550	1390	1450	2460	9340	2030	19200	1580	719
22	1420	1180	e300	e600	1230	1280	2460	9100	2000	38800	1580	688
23	1290	1160	e200	e550	1140	1340	3060	10800	1920	35500	1520	669
24	1140	1120	e230	528	1040	1020	5130	9570	1870	20200	2350	656
25	1100	1010	e280	507	990	1040	7510	6860	1840	11100	2590	639
26	1060	1050	e360	534	952	999	7310	5320	1610	7270	2140	646
27	952	1040	e460	517	922	915	5130	4250	1670	6330	1860	672
28	981	1000	e550	476	1090	932	4180	3660	1510	5870	1640	671
29	1310	950	e480	461	---	975	3520	3290	1450	4590	1450	660
30	2070	927	e460	465	---	914	3040	2990	1360	3880	1260	651
31	2440	---	e420	462	---	931	---	2810	---	3660	1200	---
TOTAL	34258	40227	19681	15170	27730	31607	113985	165700	94570	196160	60240	23869
MEAN	1105	1341	635	489	990	1020	3800	5345	3152	6328	1943	796
MAX	2440	2110	933	750	1690	1810	7510	18900	6480	38800	3650	1120
MIN	467	927	200	320	467	618	938	1570	1360	1060	1200	639
AC-FT	67950	79790	39040	30090	55000	62690	226100	328700	187600	389100	119500	47340
CFSM	.67	.81	.38	.29	.60	.61	2.29	3.22	1.90	3.81	1.17	.48
IN.	.77	.90	.44	.34	.62	.71	2.55	3.71	2.12	4.39	1.35	.53

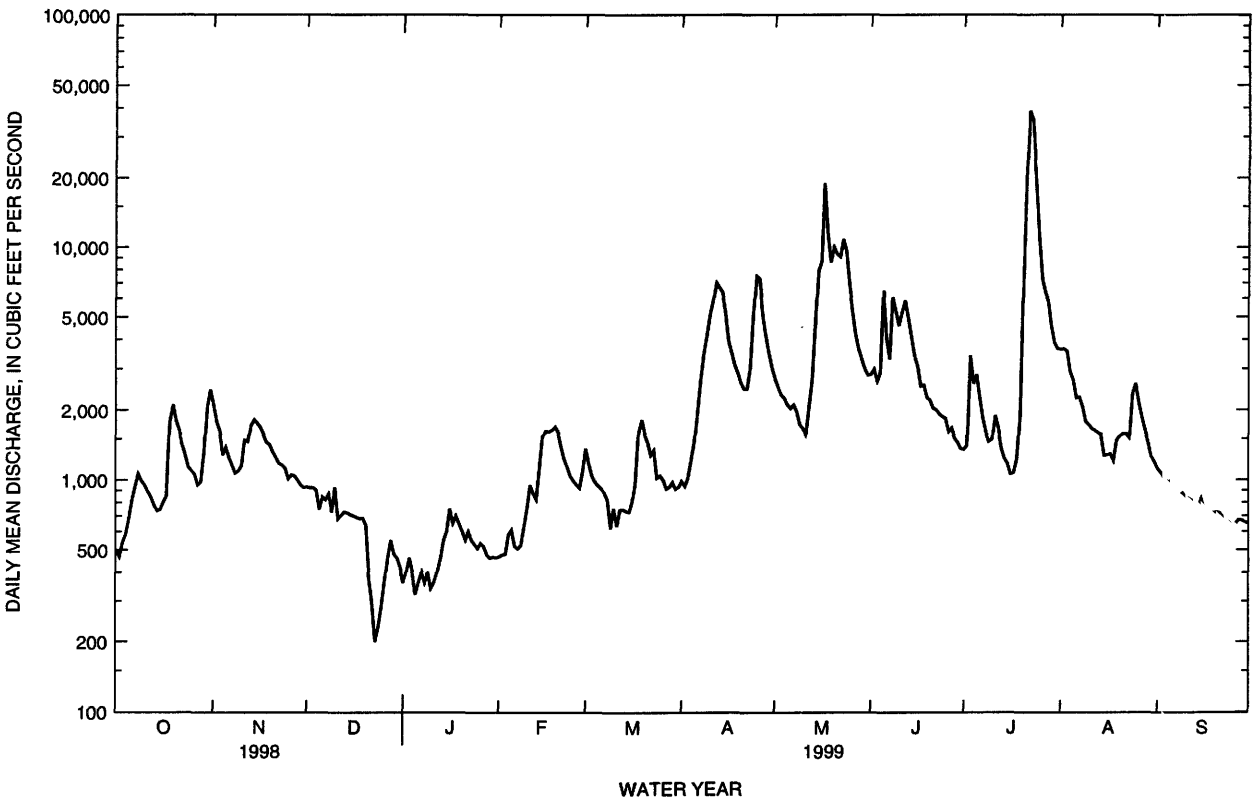
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	624	590	437	346	553	1855	1851	1266	1312	1044	795	631
MAX	3793	2672	2404	1293	3393	4851	8966	5668	6223	6328	7762	2805
(WY)	1987	1983	1983	1983	1984	1973	1993	1991	1993	1999	1993	1993
MIN	101	121	75.2	80.3	61.2	124	247	134	95.2	84.7	83.6	117
(WY)	1935	1934	1934	1917	1959	1934	1957	1934	1934	1934	1934	1934

05458500 CEDAR RIVER AT JANESVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1905 - 1999	
ANNUAL TOTAL	513144		823197			
ANNUAL MEAN	1406		2255		943	
HIGHEST ANNUAL MEAN					3454	1993
LOWEST ANNUAL MEAN					187	1934
HIGHEST DAILY MEAN	10400	Jul 1	38800	Jul 22	38800	Jul 22 1999
LOWEST DAILY MEAN	180	Jan 14	200	Dec 23	28	Oct 21 1922
ANNUAL SEVEN-DAY MINIMUM	247	Jan 13	316	Dec 21	50	Feb 1 1918
INSTANTANEOUS PEAK FLOW			42200	Jul 22	42200	Jul 22 1999
INSTANTANEOUS PEAK STAGE			17.15	Jul 22	17.15	Jul 22 1999
ANNUAL RUNOFF (AC-FT)	1018000		1633000		683400	
ANNUAL RUNOFF (CFSM)	.85		1.36		.57	
ANNUAL RUNOFF (INCHES)	11.49		18.44		7.72	
10 PERCENT EXCEEDS	2620		5000		2080	
50 PERCENT EXCEEDS	1030		1240		476	
90 PERCENT EXCEEDS	359		521		160	

e Estimated



05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA

LOCATION.--Lat 42°37'50", long 92°32'24", in SW$^1/_4$ SE$^1/_4$ sec.6, T.90 N., R.14 W., Black Hawk County, Hydrologic Unit 07080204, on left bank 100 ft downstream from bridge on county highway C55 at Finchford, 3.2 mi upstream from Shell Rock River, and 5.0 mi upstream from mouth.

DRAINAGE AREA.--846 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1955, published as "West Fork Shell Rock River at Finchford."

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946 (M), 1947.

GAGE.--Water-stage recorder. Datum of gage is 867.54 ft above sea level. Prior to June 10, 1955, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. An authorized diversion of 2,100 acre-ft is made into Big Marsh, 16 mi upstream from gage, each year between September 1 and November 15. Net effect on daily flows at gage is unknown. 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 with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of about 14 ft, from information by local resident, discharge, about 12,800 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	240	863	641	e290	e280	609	509	1690	1710	1270	2240	355
2	248	823	633	e340	e270	587	502	1500	1840	1310	e1900	335
3	253	786	622	e400	e280	567	500	1370	1940	4040	1600	320
4	275	758	615	e300	e340	550	e550	1250	1720	2460	1330	307
5	474	726	625	e250	e380	542	e650	1190	1970	2390	1150	299
6	747	702	632	e270	e340	517	850	1250	1990	2820	1010	286
7	887	681	621	e300	e320	493	1070	1280	2080	3270	1030	277
8	827	664	605	e270	e360	465	1370	1210	2210	2920	1060	280
9	733	650	616	e300	e460	401	1670	1130	2410	2140	966	265
10	666	661	637	e250	e600	403	1940	1060	2780	1650	954	253
11	613	721	636	e270	e800	493	2050	1010	3830	1470	856	237
12	570	797	640	e300	e750	485	1940	1150	3970	1350	786	224
13	531	865	635	e340	e700	451	1890	1640	4290	1210	729	215
14	498	922	611	e380	e1000	439	1980	2250	3990	1100	678	211
15	595	958	589	e440	1240	443	1920	2920	3450	998	625	193
16	834	982	567	e480	1210	478	1650	3700	2850	920	586	181
17	1070	1000	551	e420	1220	581	1520	11100	2420	915	553	175
18	1720	1000	540	e460	1100	765	1460	14200	2050	873	540	172
19	2200	969	537	e420	959	960	1420	9670	1780	918	673	168
20	1510	922	520	e400	854	868	1340	7690	1610	1040	563	165
21	1250	871	e360	e360	780	755	1260	6190	1530	1670	514	160
22	1060	830	e280	e400	718	700	1260	5350	1480	2460	506	153
23	928	792	e190	e380	687	654	1490	4710	e1450	2670	723	150
24	857	759	e220	e340	655	616	1870	4260	e1400	1710	755	149
25	811	725	e280	e320	631	588	e2200	3770	e1300	1690	650	146
26	775	696	e320	e360	598	557	e2650	3420	e1200	1610	569	143
27	764	673	e380	e320	586	532	3110	2970	e1300	e1400	509	153
28	804	655	e440	e300	587	522	2900	2610	e1200	e1500	465	151
29	870	649	e400	e270	---	519	2430	2280	e1150	1800	428	149
30	904	644	e360	e280	---	518	1980	2000	1100	2380	398	143
31	899	---	e320	e290	---	514	---	1820	---	2420	374	---
TOTAL	25413	23744	15623	10500	18705	17572	47931	107640	64000	56374	25720	6415
MEAN	820	791	504	339	668	567	1598	3472	2133	1819	830	214
MAX	2200	1000	641	480	1240	960	3110	14200	4290	4040	2240	355
MIN	240	644	190	250	270	401	500	1010	1100	873	374	143
AC-FT	50410	47100	30990	20830	37100	34850	95070	213500	126900	111800	51020	12720
CFSM	.97	.94	.60	.40	.79	.67	1.89	4.10	2.52	2.15	.98	.25
IN.	1.12	1.04	.69	.46	.82	.77	2.11	4.73	2.81	2.48	1.13	.28

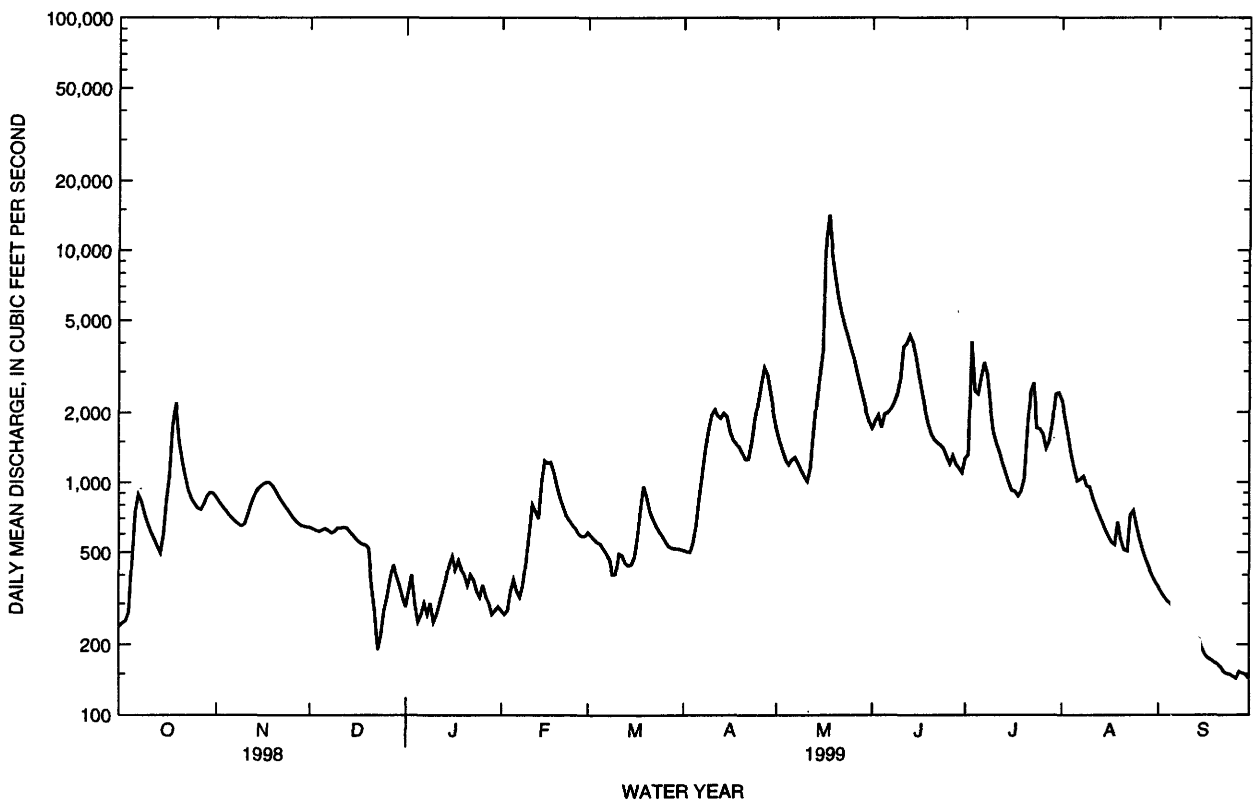
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	324	324	253	173	316	1017	1054	843	1000	738	389	313
MAX	1412	1502	1165	995	2303	2456	4170	3472	3358	3995	3023	2149
(WY)	1973	1973	1983	1973	1984	1961	1965	1999	1984	1993	1993	1965
MIN	14.9	22.3	14.2	9.35	6.37	86.2	81.8	80.1	39.5	26.6	15.2	16.9
(WY)	1990	1959	1959	1959	1959	1954	1957	1957	1977	1977	1989	1989

05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1946 - 1999	
ANNUAL TOTAL	296408		419637			
ANNUAL MEAN	812		1150		563	
HIGHEST ANNUAL MEAN					1800	1993
LOWEST ANNUAL MEAN					65.5	1956
HIGHEST DAILY MEAN	5990	Jun 23	14200	May 18	25100	Jun 27 1951
LOWEST DAILY MEAN	85	Jan 14	143	Sep 26,30	5.9	Feb 26 1959a
ANNUAL SEVEN-DAY MINIMUM	114	Jan 13	148	Sep 24	6.1	Feb 23 1959
INSTANTANEOUS PEAK FLOW			15200	May 17	31900	Jun 27 1951
INSTANTANEOUS PEAK STAGE			16.09	May 17	18.45	Jul 29 1990
INSTANTANEOUS LOW FLOW			140	Sep 30		
ANNUAL RUNOFF (AC-FT)	587900		832400		407500	
ANNUAL RUNOFF (CFSM)	.96		1.36		.66	
ANNUAL RUNOFF (INCHES)	13.03		18.45		9.03	
10 PERCENT EXCEEDS	1630		2380		1370	
50 PERCENT EXCEEDS	611		726		247	
90 PERCENT EXCEEDS	166		279		46	

a Also Feb 27, 1959
e Estimated



05459500 WINNEBAGO RIVER AT MASON CITY, IA

LOCATION.--Lat 43°09'54", long 93°11'33", in NE$^1/_4$ NW$^1/_4$ sec.3, T.96 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, on right bank 650 ft upstream from Thirteenth Street Bridge in Mason City, 0.1 mi downstream from Calmus Creek, 1.0 mi upstream from Willow Creek, and at mile 275.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--526 mi^2.

PERIOD OF RECORD.--October 1932 to current year. Prior to December 1932, monthly discharge only, published in WSP 1308. Prior to October 1959, published as "Lime Creek at Mason City".

REVISED RECORDS.--WSP 825: 1935-36. WSP 1438: Drainage area. WSP 1558: 1933-37, 1943 (M), 1945, 1948.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,069.59 ft above sea level. Prior to Oct. 15, 1934, nonrecording gage at datum 6.47 ft lower. Oct. 15 to Nov. 6, 1934, nonrecording gage at different datum, and Nov. 7, 1934, to Mar. 22, 1935, nonrecording gage at present datum.

REMARKS.--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 with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116	477	257	e118	100	360	324	1070	840	542	886	171
2	120	454	250	e117	103	378	314	983	783	540	785	163
3	140	428	247	e116	109	328	386	904	723	935	705	161
4	176	403	242	e110	109	324	509	849	1060	1330	638	154
5	235	381	240	e109	112	310	581	894	1170	1190	571	153
6	284	363	233	e110	128	296	1270	849	1270	1080	510	145
7	277	340	224	e111	130	259	1250	802	1590	961	471	139
8	263	327	216	e112	146	268	1150	749	1900	832	437	274
9	251	327	212	e113	253	278	1760	699	1850	730	411	266
10	238	407	206	e112	366	309	1650	661	2090	622	425	195
11	223	502	201	e110	553	312	1600	741	2380	549	391	169
12	212	511	198	e109	474	280	1520	2110	2230	493	376	159
13	197	510	197	e102	507	271	1400	3100	1880	450	360	159
14	198	503	194	e100	461	269	1330	2380	1650	407	330	152
15	258	491	190	e99	507	289	1310	2070	1500	370	309	146
16	345	477	188	e97	535	488	1410	1960	1380	360	296	138
17	376	448	187	e98	457	761	1420	2270	1270	408	279	133
18	437	426	187	e100	431	649	1350	2570	1170	479	271	127
19	485	410	154	108	387	557	1310	1970	1100	2710	272	123
20	471	380	112	110	368	489	1240	1820	1030	2130	262	119
21	443	356	65	105	331	444	1170	2840	955	5120	255	117
22	413	349	152	97	304	406	1630	2470	881	3510	262	116
23	388	337	166	88	284	382	2140	2080	951	2740	305	114
24	364	316	151	84	291	363	1950	1790	909	2110	386	110
25	343	310	145	84	285	341	1750	1550	803	1740	352	106
26	325	298	139	89	366	327	1600	1380	721	1560	313	104
27	395	286	142	93	559	317	1470	1260	662	1410	276	103
28	515	277	142	96	430	335	1410	1170	618	1340	251	102
29	534	275	141	96	---	343	1290	1070	581	1200	234	98
30	534	271	e120	98	---	337	1170	982	554	1050	212	97
31	501	---	e118	99	---	332	---	908	---	983	183	---
TOTAL	10057	11640	5616	3190	9086	11402	38664	46951	36501	39881	12014	4313
MEAN	324	388	181	103	324	368	1289	1515	1217	1286	388	144
MAX	534	511	257	118	559	761	2140	3100	2380	5120	886	274
MIN	116	271	65	84	100	259	314	661	554	360	183	97
AC-FT	19950	23090	11140	6330	18020	22620	76690	93130	72400	79100	23830	8550
CFSM	.62	.74	.34	.20	.62	.70	2.45	2.88	2.31	2.45	.74	.27
IN.	.71	.82	.40	.23	.64	.81	2.73	3.32	2.58	2.82	.85	.31

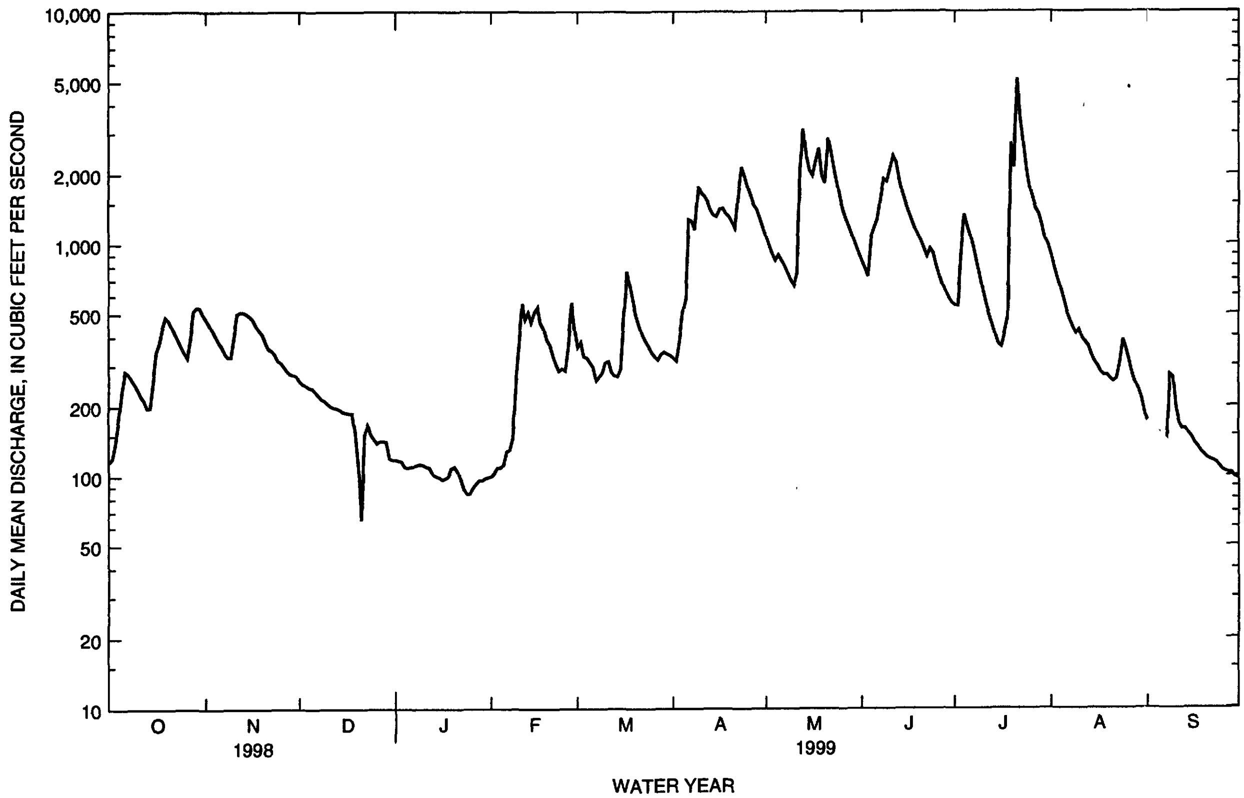
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	175	170	113	75.9	122	525	607	421	485	316	217	181
MAX	840	811	724	378	1002	1707	2880	1807	2160	1915	2054	1073
(WY)	1966	1942	1983	1983	1984	1973	1965	1991	1993	1993	1979	1938
MIN	11.3	12.7	7.45	6.61	7.50	17.6	61.0	16.1	21.9	7.29	4.89	12.6
(WY)	1935	1934	1934	1977	1959	1934	1957	1934	1934	1934	1934	1933

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1933 - 1999	
ANNUAL TOTAL	148302		229315			
ANNUAL MEAN	406		628		284	
HIGHEST ANNUAL MEAN					947	1993
LOWEST ANNUAL MEAN					28.1	1934
HIGHEST DAILY MEAN	2550	Jun 21	5120	Jul 21	9370	Mar 27 1961
LOWEST DAILY MEAN	62	Jan 25	65	Dec 21	1.2	Aug 19 1989
ANNUAL SEVEN-DAY MINIMUM	64	Jan 23	90	Jan 23	3.1	Dec 29 1933
INSTANTANEOUS PEAK FLOW			6100	Jul 21	10800	Mar 30 1933
INSTANTANEOUS PEAK STAGE			11.84	Jul 21	15.70	Mar 30 1933
INSTANTANEOUS LOW FLOW			58	Dec 21	.86	Aug 18 1988a
ANNUAL RUNOFF (AC-FT)	294200		454800		206000	
ANNUAL RUNOFF (CFSM)	.77		1.19		.54	
ANNUAL RUNOFF (INCHES)	10.49		16.22		7.34	
10 PERCENT EXCEEDS	871		1570		722	
50 PERCENT EXCEEDS	300		366		114	
90 PERCENT EXCEEDS	82		111		20	

a Also Aug 19, 1988
e Estimated

05459500 WINNEBAGO RIVER AT MASON CITY, IA--Continued



05460000 CLEAR LAKE AT CLEAR LAKE, IA

LOCATION.--Lat 43°08'01", long 93°22'57", in $SE^1/_4$ $NE^1/_4$ sec.13, T.96 N., R.22 W., Cerro Gordo County, Hydrologic Unit 07080203, at the public bathing beach in the town of Clear Lake, near dam across Clear Creek.

DRAINAGE AREA.--22.6 mi^2.

PERIOD OF RECORD.--May 1933 to current year. No winter records 1933-52. Record fragmentary November 1952 to June 1959.

GAGE.--Water-stage recorder. Datum of gage is 1,222.24 ft above sea level, and 4.60 ft below crest of spillway of dam at outlet. See WSP 1708 for history of changes prior to June 25, 1959.

REMARKS.--Lake is formed by concrete dam on Clear Creek with ungated overflow spillway 50 ft long at elevation 1,226.84 ft above sea level. Dam constructed in 1903. A previous outlet works had been constructed in 1887. Lake is used for conservation and recreation. Area of lake is approximately 3,600 acres. U.S. Geological Survey satellite data collection platform at station.

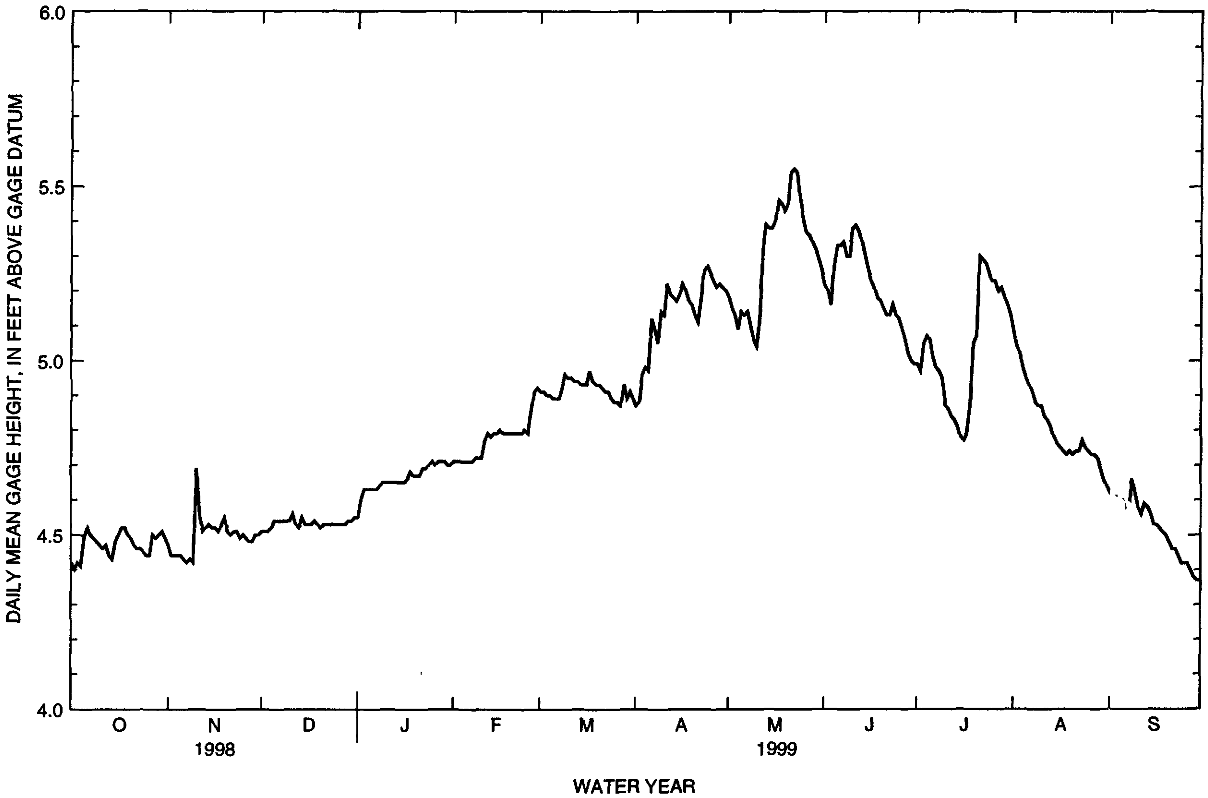
EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.94 ft July 3, 1951; minimum observed, 0.76 ft Oct. 26, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.58 ft May 22; minimum, 4.33 ft Sept 30.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.42	4.47	4.51	4.55	4.71	4.91	4.87	5.18	5.22	4.99	5.08	4.62
2	4.40	4.44	4.51	4.60	4.71	4.91	4.88	5.15	5.20	4.97	5.04	4.61
3	4.42	4.44	4.51	4.63	4.71	4.90	4.96	5.13	5.16	5.05	5.02	4.61
4	4.41	4.44	4.52	4.63	4.71	4.90	4.98	5.09	5.27	5.07	4.98	4.60
5	4.49	4.44	4.54	4.63	4.71	4.89	4.97	5.14	5.33	5.06	4.95	4.60
6	4.52	4.43	4.54	4.63	4.71	4.89	5.12	5.13	5.33	5.01	4.93	4.57
7	4.50	4.42	4.54	4.63	4.71	4.89	5.09	5.14	5.34	4.98	4.91	4.57
8	4.49	4.43	4.54	4.64	4.72	4.92	5.05	5.10	5.30	4.97	4.88	4.66
9	4.48	4.42	4.54	4.65	4.72	4.96	5.14	5.06	5.30	4.95	4.87	4.62
10	4.47	4.69	4.54	4.65	4.72	4.95	5.13	5.04	5.38	4.87	4.87	4.58
11	4.46	4.56	4.56	4.65	4.77	4.95	5.22	5.12	5.39	4.86	4.84	4.56
12	4.47	4.51	4.53	4.65	4.79	4.94	5.19	5.32	5.37	4.84	4.83	4.59
13	4.44	4.52	4.52	4.65	4.78	4.94	5.18	5.39	5.34	4.83	4.81	4.58
14	4.43	4.53	4.55	4.65	4.79	4.93	5.17	5.38	5.30	4.81	4.78	4.56
15	4.48	4.52	4.53	4.65	4.79	4.93	5.19	5.38	5.26	4.78	4.76	4.53
16	4.50	4.52	4.53	4.65	4.80	4.93	5.22	5.40	5.23	4.77	4.75	4.53
17	4.52	4.51	4.53	4.66	4.79	4.97	5.20	5.46	5.21	4.79	4.74	4.52
18	4.52	4.53	4.54	4.68	4.79	4.94	5.17	5.45	5.18	4.87	4.73	4.51
19	4.50	4.55	4.53	4.67	4.79	4.93	5.16	5.43	5.17	5.05	4.74	4.50
20	4.49	4.51	4.52	4.67	4.79	4.93	5.13	5.45	5.15	5.07	4.73	4.48
21	4.47	4.50	4.53	4.67	4.79	4.92	5.11	5.54	5.13	5.30	4.74	4.46
22	4.46	4.51	4.53	4.69	4.79	4.91	5.18	5.55	5.13	5.29	4.74	4.46
23	4.46	4.51	4.53	4.69	4.79	4.91	5.26	5.54	5.16	5.28	4.77	4.44
24	4.45	4.49	4.53	4.70	4.80	4.89	5.27	5.46	5.13	5.25	4.75	4.42
25	4.44	4.50	4.53	4.71	4.79	4.88	5.25	5.41	5.12	5.23	4.74	4.42
26	4.44	4.49	4.53	4.70	4.85	4.88	5.23	5.37	5.09	5.23	4.73	4.42
27	4.50	4.48	4.53	4.71	4.91	4.87	5.21	5.36	5.06	5.20	4.73	4.40
28	4.49	4.48	4.53	4.71	4.92	4.93	5.22	5.34	5.02	5.21	4.72	4.38
29	4.50	4.50	4.54	4.71	---	4.89	5.21	5.32	5.00	5.18	4.69	4.37
30	4.51	4.50	4.54	4.70	---	4.91	5.20	5.29	4.99	5.16	4.66	4.37
31	4.49	---	4.55	4.70	---	4.89	---	5.26	---	5.13	4.64	---
MEAN	4.47	4.49	4.53	4.66	4.77	4.92	5.14	5.30	5.21	5.03	4.81	4.52
MAX	4.52	4.69	4.56	4.71	4.92	4.97	5.27	5.55	5.39	5.30	5.08	4.66
MIN	4.40	4.42	4.51	4.55	4.71	4.87	4.87	5.04	4.99	4.77	4.64	4.37

05460000 CLEAR LAKE AT CLEAR LAKE, IA--Continued



05462000 SHELL ROCK RIVER AT SHELL ROCK, IA

LOCATION.--Lat 42°42'43", long 92°34'58", in NW$^1/_4$ NE$^1/_4$ sec.11, T.91 N., R.15 W., Butler County, Hydrologic Unit 07080202 on right bank 400 ft upstream from bridge on county highway C45 in Shell Rock, 2.2 mi downstream from Curry Creek, and 10.4 mi upstream from mouth.

DRAINAGE AREA.--1,746 mi^2.

PERIOD OF RECORD.--June 1953 to current year. Prior to July 1953, monthly discharge only, published in WSP 1728.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Rockfill dam since Oct. 19, 1957. Datum of gage is 885.34 ft above sea level.

REMARKS.--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 with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1856 reached a stage of 17.7 ft at bridge 400 ft downstream, from information provided by U.S. Army Corps of Engineers, discharge, about 45,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	554	1660	1020	543	e380	1350	967	3220	3250	1650	3560	844
2	565	1600	1010	e491	e410	1200	946	2890	3830	1620	2980	812
3	607	1530	982	e442	e448	1160	983	2620	2810	2460	2570	796
4	645	1450	961	e380	e500	1060	1340	2380	3940	5190	2250	781
5	895	1380	947	e390	e470	1080	1660	2270	6760	4680	2000	767
6	1220	1310	933	e398	e500	1020	2170	2390	5770	3540	1800	760
7	1250	1250	905	e380	e530	969	3530	2340	5360	2850	1760	754
8	1180	1210	888	e370	587	884	3620	2190	5770	2450	1570	770
9	1090	1170	867	e340	697	737	4110	2040	5480	2120	1420	914
10	1020	1250	846	e355	934	669	5340	1900	5630	1920	1670	914
11	949	1510	826	e310	1380	811	5300	1790	6490	1750	1600	829
12	899	1820	818	e315	1520	1010	5040	2220	6770	1560	1460	767
13	855	1870	807	e360	1490	913	4810	5260	6380	1400	1350	773
14	826	1820	793	e380	1470	864	4460	7980	5580	1280	1270	740
15	854	1770	787	e410	1670	882	4170	8030	4960	1170	1180	726
16	1000	1730	777	e460	1780	988	3980	7850	4420	1080	1120	704
17	1250	1650	785	e420	1740	1480	3960	15400	3950	1100	1060	643
18	2180	1560	797	e450	1650	2020	3930	9440	3540	1190	1050	652
19	1520	1510	771	e430	1480	1790	3660	9360	3200	2600	1150	642
20	1500	1430	641	e400	1410	1580	3420	7840	2970	9480	1100	625
21	1440	1360	435	e360	1280	1450	3180	7070	2730	18100	1020	612
22	1350	1300	412	e380	1190	1350	3230	8970	2540	25100	1010	604
23	1280	1270	520	e370	1140	1260	5060	9160	2550	19700	1050	597
24	1220	1220	612	e360	1060	1190	6460	7550	2820	10700	1370	588
25	1160	1190	634	e360	1020	1120	6180	6400	2620	7670	1330	574
26	1110	1150	622	e380	1030	1060	5410	5580	2350	6140	1200	566
27	1100	1110	616	e360	1160	1000	4890	4960	2120	5620	1100	577
28	1280	1080	607	e350	1610	990	4500	4550	1940	5690	1030	559
29	1650	1060	599	e350	---	1010	4100	4260	1800	5470	964	545
30	1740	1060	550	e350	---	1020	3620	3780	1680	4100	917	544
31	1710	---	547	e360	---	1000	---	3470	---	3640	879	---
TOTAL	35899	42280	23315	12004	30536	34917	114026	165160	120010	163020	45790	20979
MEAN	1158	1409	752	387	1091	1126	3801	5328	4000	5259	1477	699
MAX	2180	1870	1020	543	1780	2020	6460	15400	6770	25100	3560	914
MIN	554	1060	412	310	380	669	946	1790	1680	1080	879	544
AC-FT	71210	83860	46250	23810	60570	69260	226200	327600	238000	323400	90820	41610
CFSM	.66	.81	.43	.22	.62	.65	2.18	3.05	2.29	3.01	.85	.40
IN.	.76	.90	.50	.26	.65	.74	2.43	3.52	2.56	3.47	.98	.45

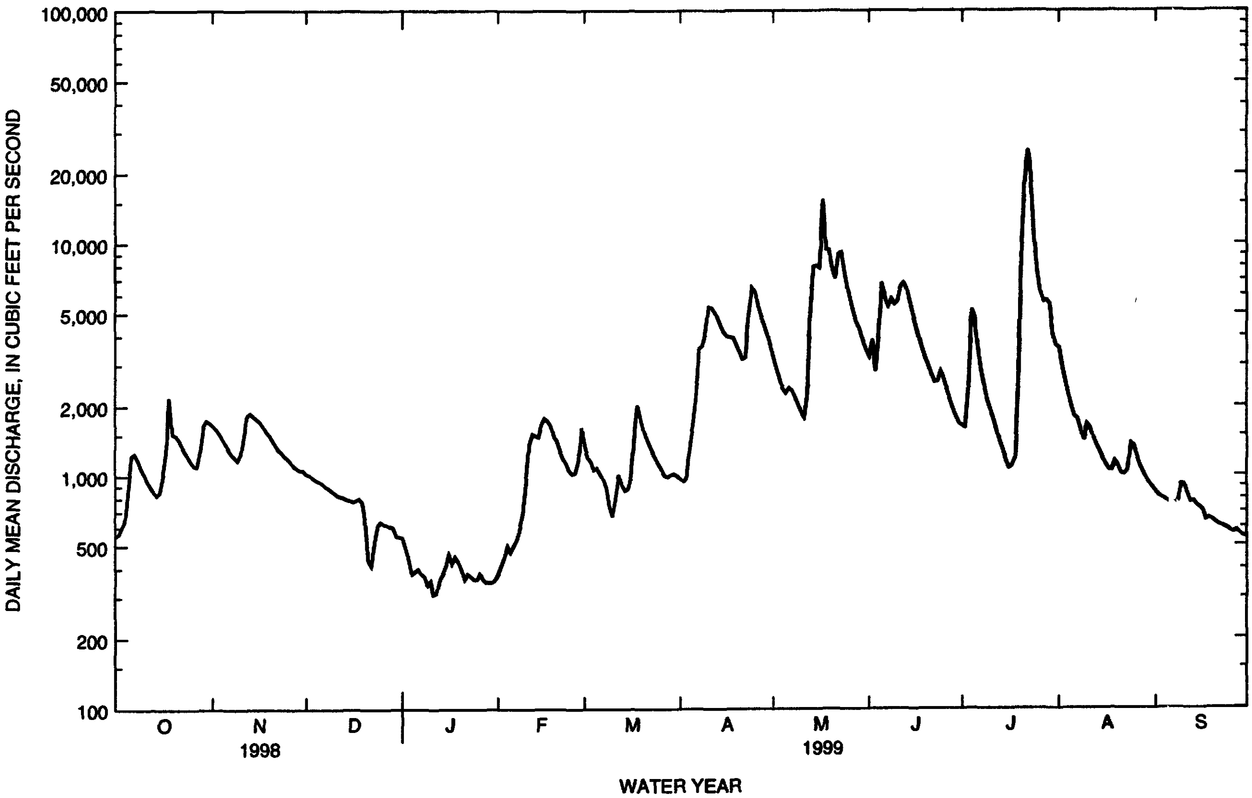
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	753	703	530	353	508	1686	2065	1637	1741	1337	906	718
MAX	2544	2326	2381	1375	2833	5426	8540	5889	6239	6461	5637	2816
(WY)	1987	1983	1983	1983	1984	1992	1965	1991	1993	1993	1979	1993
MIN	74.1	77.7	39.8	45.6	44.7	193	226	243	138	114	66.7	96.6
(WY)	1990	1990	1990	1959	1959	1968	1957	1958	1977	1977	1989	1989

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1954 - 1999	
ANNUAL TOTAL	528061		807936			
ANNUAL MEAN	1447		2214		1080	
HIGHEST ANNUAL MEAN					3231	1993
LOWEST ANNUAL MEAN					171	1977
HIGHEST DAILY MEAN	7680	Jun 29	25100	Jul 22	32100	Mar 28 1961
LOWEST DAILY MEAN	210	Jan 14	310	Jan 11	27	Dec 22 1989
ANNUAL SEVEN-DAY MINIMUM	252	Jan 14	347	Jan 7	29	Dec 16 1989
INSTANTANEOUS PEAK FLOW			27500	Jul 22	33500	Mar 28 1961
INSTANTANEOUS PEAK STAGE			16.73	Jul 22	16.73	Jul 22 1999
ANNUAL RUNOFF (AC-FT)	1047000		1603000		782500	
ANNUAL RUNOFF (CFSM)	.83		1.27		.62	
ANNUAL RUNOFF (INCHES)	11.25		17.21		8.40	
10 PERCENT EXCEEDS	2980		5350		2530	
50 PERCENT EXCEEDS	1120		1250		550	
90 PERCENT EXCEEDS	320		496		153	

e Estimated

05462000 SHELL ROCK RIVER AT SHELL ROCK, IA--Continued



05463000 BEAVER CREEK AT NEW HARTFORD, IA

LOCATION.--Lat 42°34'22", long 92°37'04", in SE$^1/_4$ SE$^1/_4$ sec.28, T.90 N., R.15 W., Butler County, Hydrologic Unit 07080205, on right bank 5 ft. from right end of bridge on county highway T55, 0.2 mi north of New Hartford, and 8 mi upstream from mouth.

DRAINAGE AREA.--347 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to April 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1948-49. WSP 1708: 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 882.44 ft. above sea level. Prior to July 14, 1959, nonrecording gage at same site and datum.

REMARKS.--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 with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	304	164	e85	e98	172	128	480	632	462	572	139
2	64	286	161	e90	e115	172	125	452	1100	591	458	132
3	73	268	162	e90	e125	158	133	427	854	9990	396	125
4	88	252	158	e85	e140	165	156	406	888	6030	354	118
5	208	237	155	e82	e180	162	162	499	1480	2690	314	113
6	363	226	151	e80	e210	153	220	628	1190	1400	285	107
7	269	217	145	e75	e290	143	277	581	881	1050	316	103
8	209	213	141	e78	423	e140	270	640	796	858	324	101
9	179	212	139	e75	823	e140	e779	593	2240	744	278	95
10	159	285	135	e70	892	e140	1240	531	5200	643	259	91
11	145	426	133	e72	778	e145	863	492	5900	576	238	88
12	134	415	132	e75	606	153	664	900	4150	526	229	86
13	123	406	131	e72	514	149	561	2170	2050	483	218	82
14	120	379	128	e70	487	153	500	2920	1290	445	203	80
15	181	337	126	e75	399	162	454	1810	1050	408	192	79
16	456	311	125	e70	377	188	434	1400	937	377	182	77
17	397	287	125	e85	332	240	419	6080	850	399	e175	75
18	1030	267	127	e80	296	247	394	6100	755	377	e178	73
19	1530	256	120	e75	268	208	368	3030	684	395	182	72
20	857	235	e75	e80	246	192	345	1770	633	387	e175	70
21	616	223	e110	e85	221	181	331	1430	584	1170	e175	68
22	504	223	e100	e90	216	169	630	1800	553	1430	e177	67
23	436	213	e95	e85	201	161	1350	1830	914	e672	342	67
24	389	198	e82	e89	202	153	1490	1350	1250	e431	385	65
25	356	195	e85	e90	188	143	1110	1100	935	403	301	63
26	324	188	e90	e80	183	138	863	943	750	488	244	63
27	327	180	e95	e90	181	135	740	839	641	484	211	69
28	387	176	e95	e85	179	138	667	772	603	1320	186	70
29	398	177	e90	e80	---	134	585	710	531	1510	e167	65
30	374	175	e85	e90	---	128	522	651	485	807	e155	62
31	331	---	e80	e95	---	126	---	633	---	694	147	---
TOTAL	11098	7767	3740	2523	9170	4988	16780	43967	40806	38240	8018	2565
MEAN	358	259	121	81.4	328	161	559	1418	1360	1234	259	85.5
MAX	1530	426	164	95	892	247	1490	6100	5900	9990	572	139
MIN	64	175	75	70	98	126	125	406	485	377	147	62
AC-FT	22010	15410	7420	5000	18190	9890	33280	87210	80940	75850	15900	5090
CFSM	1.03	.75	.35	.23	.94	.46	1.61	4.09	3.92	3.55	.75	.25
IN.	1.19	.83	.40	.27	.98	.53	1.80	4.71	4.37	4.10	.86	.27

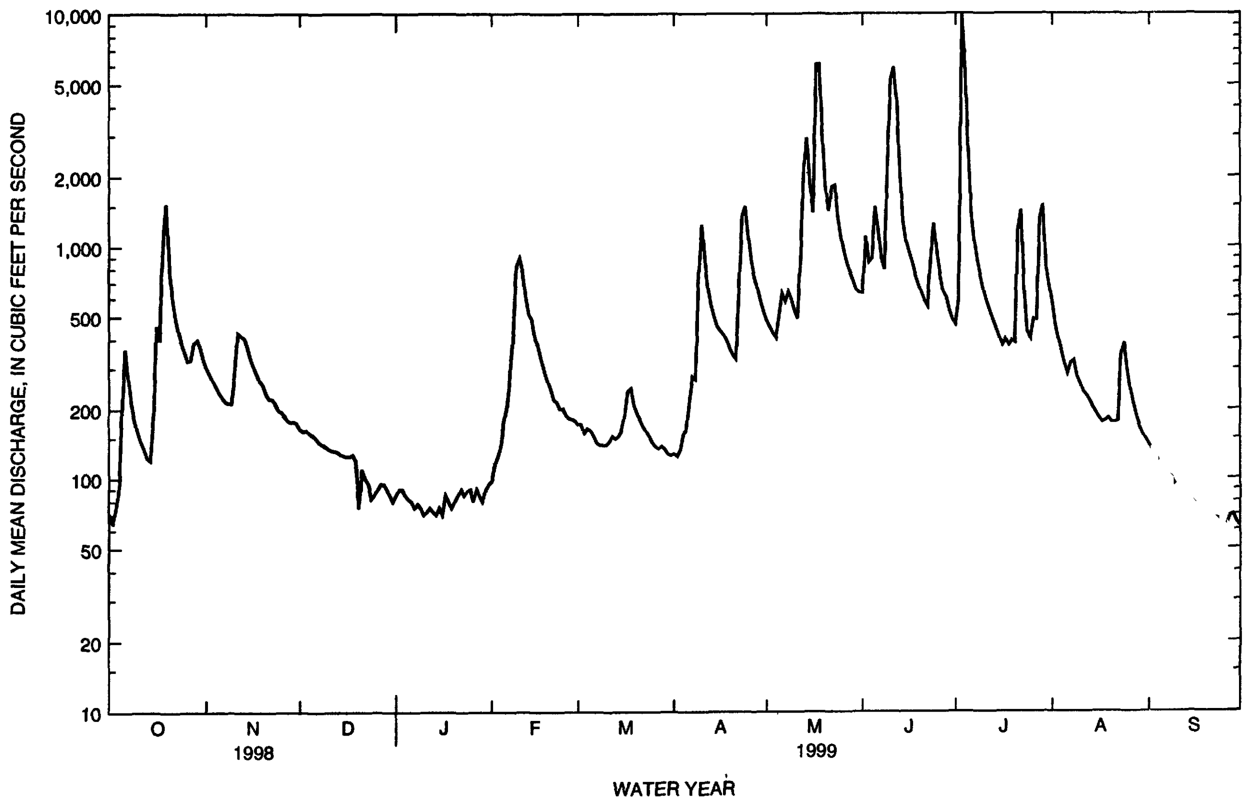
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	122	128	88.0	74.7	157	462	392	341	427	281	147	109
MAX	495	673	514	403	651	1606	1578	1606	2213	1686	1368	1028
(WY)	1987	1973	1983	1946	1983	1993	1993	1991	1947	1993	1993	1965
MIN	4.98	8.80	7.13	2.88	3.84	28.1	33.8	23.2	12.5	4.47	4.22	6.02
(WY)	1957	1957	1990	1956	1956	1954	1954	1977	1956	1956	1989	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1946 - 1999	
ANNUAL TOTAL	137854		189662			
ANNUAL MEAN	378		520		227	
HIGHEST ANNUAL MEAN					874	1993
LOWEST ANNUAL MEAN					21.8	1956
HIGHEST DAILY MEAN	6030	Jun 22	9990	Jul 3	16300	Jun 13 1947
LOWEST DAILY MEAN	32	Jan 14	62	Sep 30	2.0	Sep 30 1989
ANNUAL SEVEN-DAY MINIMUM	39	Jan 13	65	Sep 24	2.3	Jan 19 1956
INSTANTANEOUS PEAK FLOW			13100	Jul 3	18000	Jun 13 1947
INSTANTANEOUS PEAK STAGE			13.33	Jul 3	13.50	Jun 13 1947
INSTANTANEOUS LOW FLOW			56	Oct 2		
ANNUAL RUNOFF (AC-FT)	273400		376200		164800	
ANNUAL RUNOFF (CFSM)	1.09		1.50		.66	
ANNUAL RUNOFF (INCHES)	14.78		20.33		8.91	
10 PERCENT EXCEEDS	811		1070		492	
50 PERCENT EXCEEDS	222		226		90	
90 PERCENT EXCEEDS	55		80		17	

e Estimated

05463000 BEAVER CREEK AT NEW HARTFORD, IA--Continued



05464000 CEDAR RIVER AT WATERLOO, IA

LOCATION.--Lat 42°29'44", long 92°20'03", in $NW^1/_4$ $NW^1/_4$ sec.25, T.89 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, on left bank at foot of East Seventh Street, 0.3 mi upstream from Eleventh Avenue bridge in Waterloo, 1.1 mi downstream from Black Hawk Creek, and at mile 187.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--5,146 mi^2.

PERIOD OF RECORD.--October 1940 to current year. Prior to April 1941, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1950.

GAGE.--Water-stage recorder. Datum of gage is 824.14 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Slight diurnal fluctuation during low flow caused by powerplant upstream from station. 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) and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 16, 1929, reached a stage of about 20 ft, determined by U. S. Army Corps of Engineers, from information by City of Waterloo, discharge, 65,000 ft^3/s. Flood of Apr. 2, 1933, reached a stage of about 19.5 ft from information by City of Waterloo, discharge, 61,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1460	5470	3090	e1100	1830	4160	3160	9360	9870	6030	11200	3320
2	1350	5010	3060	e1200	1890	3950	e2920	8530	10700	6070	10400	3180
3	1500	4670	3020	e1350	1970	3670	3180	7820	10800	19400	9440	3080
4	1620	4210	3020	e1200	2050	3470	3460	7390	9730	23000	8190	2960
5	2280	4040	2880	e1000	2180	3370	4220	7000	14000	17800	7030	2930
6	3060	3970	2840	e1050	2400	3320	5190	7060	17700	13900	6400	2820
7	3500	3780	2810	e1300	2450	3140	6690	7310	13800	11500	6310	2710
8	3640	3590	2750	e1100	2600	2970	8550	7160	14600	10300	6070	2640
9	3370	3530	2730	e1150	3300	2610	10200	6940	17800	8920	5540	2710
10	3210	3900	2980	e1000	4180	2420	12400	6450	18800	7590	5490	2740
11	3040	4400	2490	e1100	5030	2530	13800	6210	23200	7020	5260	2670
12	2850	4950	2480	e1200	5710	2840	14400	6630	25300	6540	5150	2570
13	2680	5270	2550	e1400	4980	2960	14800	9270	24500	5800	4880	2470
14	2550	5470	2490	e1600	4970	2820	14100	14200	20300	5390	4610	2390
15	2550	5330	2460	e1800	5390	2810	13000	19400	16700	5040	4420	2380
16	2920	5170	2420	2100	5530	2920	11300	22300	14300	4690	3940	2310
17	3610	5040	2400	1970	5640	3440	10000	31900	12500	4370	3910	2250
18	5110	e4720	2410	1960	5420	4620	9580	53000	10900	4630	3950	2110
19	7150	4540	2370	1980	5250	5510	8940	38000	9920	5190	4300	2090
20	6560	4360	2170	1870	4920	5250	8530	30800	9190	9030	4430	2070
21	5580	4130	e1400	1850	4580	4710	8090	28000	8460	23100	4080	2050
22	4690	3970	e800	1910	4200	4240	8300	25000	8140	48100	4140	2010
23	4410	3840	e600	1850	3970	4180	9890	26700	8160	67000	4680	1980
24	4080	3730	e650	1850	3780	3740	13000	27300	8820	55200	5330	1940
25	3860	3580	e850	1850	3550	3660	15800	22700	9090	31600	6070	1890
26	3710	3420	e1100	1710	3370	3500	17100	18800	8530	20800	5390	1860
27	3630	3400	e1450	1820	3410	3300	15600	16100	7910	15700	4690	2000
28	3560	3320	e1700	1780	3700	3240	13400	14000	7330	16100	4380	1960
29	4160	3260	e1500	1750	---	3210	11900	12500	6820	16000	3980	1880
30	5210	3200	e1400	1780	---	3190	10500	11100	6240	13900	3670	1870
31	5590	---	e1200	1800	---	3180	---	10200	---	11800	3440	---
TOTAL	112490	127270	66070	48380	108250	108930	302000	519130	384110	501510	170770	71840
MEAN	3629	4242	2131	1561	3866	3514	10070	16750	12800	16180	5509	2395
MAX	7150	5470	3090	2100	5710	5510	17100	53000	25300	67000	11200	3320
MIN	1350	3200	600	1000	1830	2420	2920	6210	6240	4370	3440	1860
AC-FT	223100	252400	131000	95960	214700	216100	599000	1030000	761900	994700	338700	142500
CFSM	.71	.82	.41	.30	.75	.68	1.96	3.25	2.49	3.14	1.07	.47
IN.	.81	.92	.48	.35	.78	.79	2.18	3.75	2.78	3.63	1.23	.52

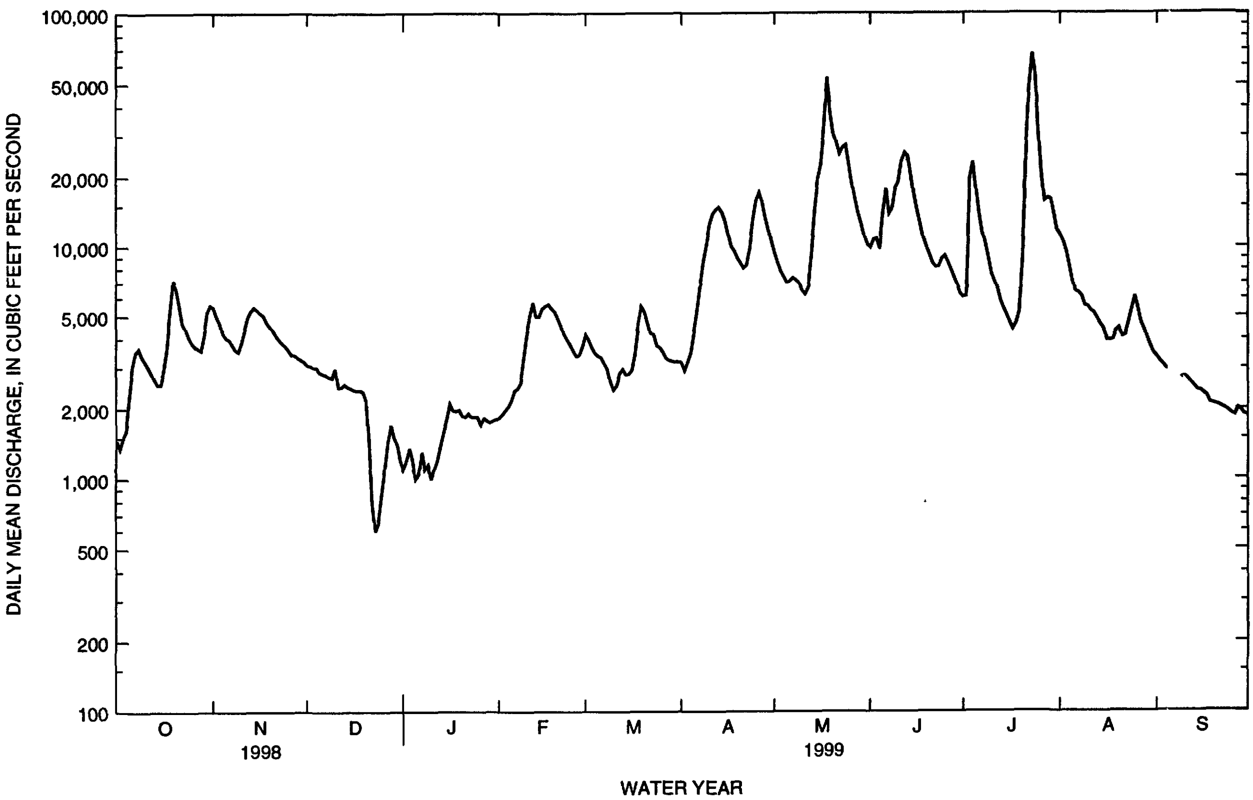
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2145	2092	1569	1247	1814	5673	6307	4735	5258	4075	2728	2073
MAX	8499	7434	6891	5479	9448	13760	24940	19010	18320	21210	18770	9258
(WY)	1987	1973	1983	1973	1984	1973	1993	1991	1993	1993	1993	1993
MIN	364	370	266	252	188	687	741	732	474	455	328	387
(WY)	1990	1990	1990	1959	1959	1964	1957	1977	1977	1989	1989	1955

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	1724541		2520750			
ANNUAL MEAN	4725		6906		3314	
HIGHEST ANNUAL MEAN					10580	1993
LOWEST ANNUAL MEAN					636	1977
HIGHEST DAILY MEAN	23200	Jul 1	67000	Jul 23	74000	Mar 29 1961
LOWEST DAILY MEAN	600	Dec 23	600	Dec 23	152	Jan 28 1959
ANNUAL SEVEN-DAY MINIMUM	977	Jan 10	979	Dec 21	173	Feb 13 1959
INSTANTANEOUS PEAK FLOW			69300	Jul 23	76700	Mar 29 1961
INSTANTANEOUS PEAK STAGE			20.78	Jul 23	21.86	Mar 29 1961
ANNUAL RUNOFF (AC-FT)	3421000		5000000		2401000	
ANNUAL RUNOFF (CFSM)	.92		1.34		.64	
ANNUAL RUNOFF (INCHES)	12.47		18.22		8.75	
10 PERCENT EXCEEDS	9870		15100		7570	
50 PERCENT EXCEEDS	3640		4160		1810	
90 PERCENT EXCEEDS	1130		1830		558	

e Estimated

05464000 CEDAR RIVER AT WATERLOO, IA--Continued



05464500 CEDAR RIVER AT CEDAR RAPIDS, IA

LOCATION.--Lat 41°58'14", long 91°40'01", in SE$^1/_4$ NW$^1/_4$ sec.28, T.83 N., R.7 W., Linn County, Hydrologic Unit 07080205, on right bank 400 ft upstream from bridge on Eighth Avenue in Cedar Rapids, 2.7 mi upstream from Prairie Creek, and at mile 112.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--6,510 mi^2.

PERIOD OF RECORD.--October 1902 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: 1924. WSP 1308: 1904, 1906-13, 1915, 1917, 1919-24, 1928, 1930,. WSP 1438: Drainage area. WSP 1558: 1915-18 (M), 1920 (M), 1922 (M), 1929, 1933, 1943.

GAGE.--Water-stage recorder. Datum of gage is 700.47 ft above sea level. Prior to Aug. 20, 1920, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow affected by city hydroelectric dam 0.5 mile upstream since June 1979. 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 and U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1851 reached a stage of about 20 ft, discharge, 65,000 ft^3/s, estimated.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1950	7470	4410	e1500	2390	4280	3300	14100	13700	8430	16700	4720
2	2190	7340	4380	e1700	2790	4720	3350	12500	13200	8050	14500	4510
3	2250	6870	4310	e2100	3470	4720	3460	11100	13000	11600	13500	4350
4	2280	6420	4260	e1800	3840	4410	3420	10300	13400	16600	12400	4270
5	4290	6080	4200	e1400	3930	4280	3550	9920	13500	24600	11200	4330
6	4890	5630	4140	e1600	3730	4120	4280	9540	13800	24900	9760	4010
7	5090	5530	4010	e1800	3960	4000	5110	9170	16000	21000	8930	3720
8	5240	5330	3960	e1700	4140	3870	6420	9250	18200	17300	8410	3570
9	5200	5120	3880	e1900	4680	3630	8520	9110	17800	14200	8070	3460
10	4980	5500	3810	e1600	5490	3660	11000	8850	20200	12100	7610	3410
11	4630	6170	3820	e1800	6970	3200	12600	8410	22600	10200	7420	3430
12	4390	6530	3920	e2000	7010	3300	13800	8840	24400	9010	7300	3440
13	4130	6780	3500	e2200	7230	3370	14900	10200	26300	8450	6910	3310
14	3980	6870	3580	e2400	6600	3590	15600	11700	28100	7680	6610	3210
15	4680	7040	3530	e2600	6380	3550	16100	13600	27300	7010	6280	3070
16	4530	6900	3460	3130	6420	3560	15900	15900	23800	6590	6030	3010
17	5520	6760	3420	2930	6490	3740	14900	18900	19800	6190	5610	3020
18	8140	6600	3360	2880	6480	3920	13100	22800	17400	5830	5470	2890
19	8190	6360	3360	2580	6340	4410	11800	33700	15400	5960	5490	2840
20	8980	6120	3280	2490	6130	5280	11200	49800	13800	6440	5790	2770
21	8960	5900	e1500	2900	5830	5300	10500	45800	12300	8150	5830	2690
22	7910	5690	e1100	2780	5550	4870	10500	37600	11500	12300	5540	2640
23	7000	5510	e750	2740	5190	4500	11700	32700	10800	20300	5540	2610
24	6350	5320	e850	3030	4900	4260	12800	28700	10600	39800	6110	2560
25	5970	5150	e1100	2560	4660	4060	13800	28000	10800	58700	6680	2490
26	5600	5010	e1500	2340	4540	3810	15300	28900	11200	58200	7200	2440
27	5530	4830	e1900	2320	4430	3640	17200	26100	11100	41700	6890	2700
28	5510	4730	e2400	2320	4250	3570	18500	21700	10700	27100	6230	2770
29	5450	4630	e2100	2440	---	3480	18100	18900	10100	20100	5710	2680
30	6320	4600	e1800	2360	---	3450	16100	16800	9170	18900	5350	2520
31	7010	---	e1600	2350	---	3300	---	15000	---	18400	5010	---
TOTAL	167140	178790	93190	70250	143820	123850	336810	597890	479970	555790	240080	97440
MEAN	5392	5960	3006	2266	5136	3995	11230	19290	16000	17930	7745	3248
MAX	8980	7470	4410	3130	7230	5300	18500	49800	28100	58700	16700	4720
MIN	1950	4600	750	1400	2390	3200	3300	8410	9170	5830	5010	2440
MED	5240	5990	3460	2340	5040	3870	12200	15000	13800	12300	6680	3040
AC-FT	331500	354600	184800	139300	285300	245700	668100	1186000	952000	1102000	476200	193300
CFSM	.83	.92	.46	.35	.79	.61	1.72	2.96	2.46	2.75	1.19	.50
IN.	.96	1.02	.53	.40	.82	.71	1.92	3.42	2.74	3.18	1.37	.56

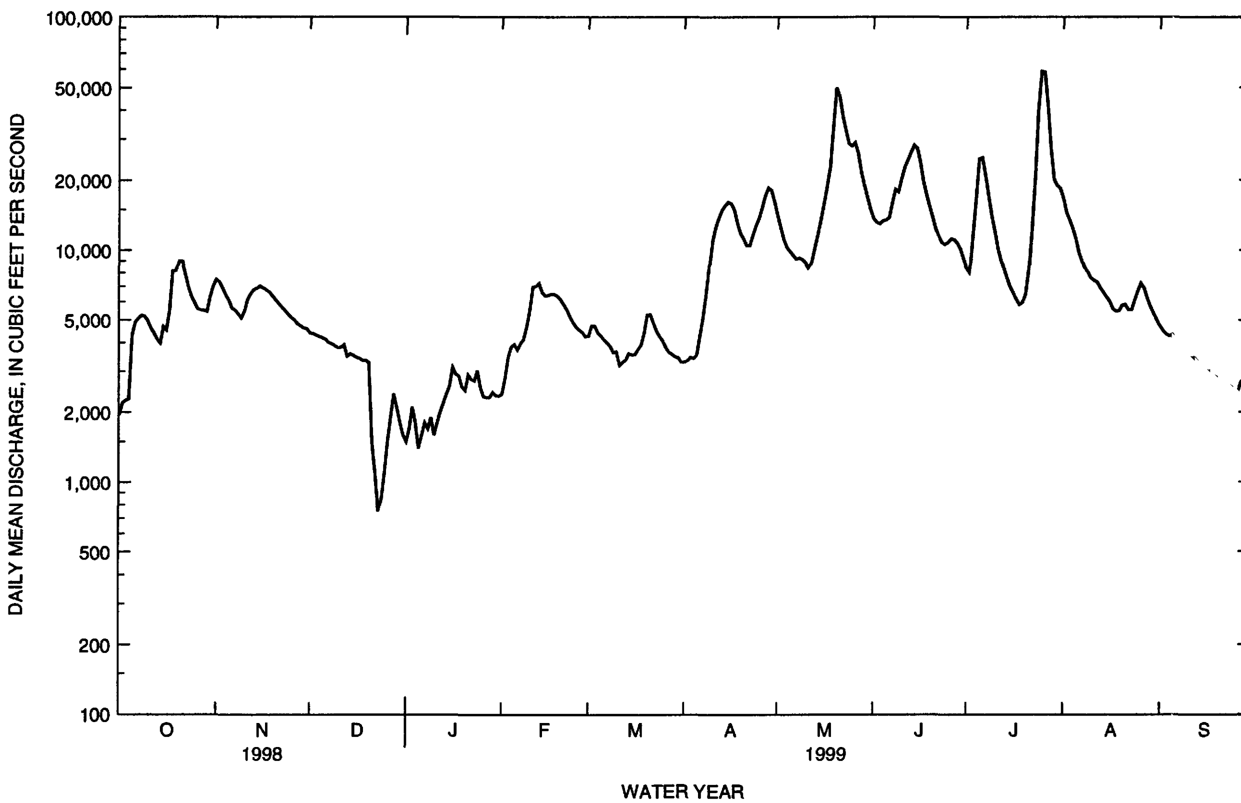
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2368	2443	1880	1594	2510	6730	6857	5275	5769	4240	3004	2414
MAX	10570	9327	8675	8529	12230	17420	35320	24500	23420	33910	28700	13990
(WY)	1987	1973	1983	1973	1984	1929	1993	1991	1947	1993	1993	1993
MIN	463	410	290	299	304	664	1045	527	350	533	377	466
(WY)	1990	1990	1990	1911	1940	1934	1957	1934	1934	1989	1934	1934

05464500 CEDAR RIVER AT CEDAR RAPIDS, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1903 - 1999	
ANNUAL TOTAL	2388720		3085020			
ANNUAL MEAN	6544		8452		3760	
HIGHEST ANNUAL MEAN					15130	1993
LOWEST ANNUAL MEAN					689	1934
HIGHEST DAILY MEAN	27900	Jun 26	58700	Jul 25	71500	Mar 31 1961
LOWEST DAILY MEAN	750	Dec 23	750	Dec 23	140	Nov 18 1989
ANNUAL SEVEN-DAY MINIMUM	1240	Dec 21	1240	Dec 21	224	Dec 20 1989
INSTANTANEOUS PEAK FLOW			62300	Jul 25	73000	Mar 31 1961
INSTANTANEOUS PEAK STAGE			18.31	Jul 25	20.00	Mar 18 1929
ANNUAL RUNOFF (AC-FT)	4738000		6119000		2724000	
ANNUAL RUNOFF (CFSM)	1.01		1.30		.58	
ANNUAL RUNOFF (INCHES)	13.65		17.63		7.85	
10 PERCENT EXCEEDS	13500		17900		8350	
50 PERCENT EXCEEDS	5200		5540		2160	
90 PERCENT EXCEEDS	2030		2440		678	

e Estimated



05465000 CEDAR RIVER NEAR CONESVILLE, IA

LOCATION.--Lat 41°24'36", long 91°17'06", in $SW^1/_4$ $SW^1/_4$ sec.2, T.76 N., R.4 W., Muscatine County, Hydrologic Unit 07080206, on right bank 10 ft downstream from bridge on county highway G28, 3.4 mi northeast of Conesville, 5.2 mi downstream from Wapsinonoc Creek, 10.7 mi upstream from mouth, and at mile 39.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--7,785 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 581.95 ft above sea level. Prior to Feb. 2, 1940, and Apr. 11, 1952, to July 1, 1954, nonrecording gage, Feb. 2, 1940, to Apr. 10, 1952, and July 2, 1954, to Sept. 16, 1963, water-stage recorder, at site 150 ft downstream on left bank at same datum.

REMARKS.--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 March 1929 reached a stage of 15.8 ft, from information by local residents to U.S. Army Corps of Engineers.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2760	8790	5320	e1900	e3400	5270	4750	19600	18200	10800	20700	4830
2	2550	9190	5190	e2100	4130	5170	4720	17500	16600	9730	18800	4510
3	2710	9100	5050	e2400	5510	5410	4720	15500	15800	9440	16400	4290
4	3090	8540	4980	e2100	5550	5550	5030	14000	15600	14200	15000	4120
5	4430	7920	4930	e1900	5400	5350	5250	13100	15900	16100	13900	3960
6	8070	e7500	4900	e2100	5160	5210	5260	12300	15800	19200	12700	3990
7	7730	e7000	4950	e2200	4820	4980	5680	11500	15700	23100	11400	3810
8	6850	e6500	4780	e2100	4660	4850	6330	11000	16600	24800	10200	3630
9	6470	e6000	4610	e2200	4990	4750	8530	10900	18400	21700	9330	3500
10	6170	e6500	4500	e2000	5330	4560	11200	10600	19900	17100	8780	3400
11	5850	e7000	4430	e2200	5980	4580	13100	10300	20600	14400	8190	3320
12	5450	e7500	4380	e2400	8530	4380	14300	9920	22800	12400	8100	3310
13	5130	e8000	4470	e2600	8870	4180	15100	11000	25200	10700	7840	3340
14	4820	e8500	4220	e2800	8530	4210	15900	13700	28400	9750	7300	3250
15	4650	e9000	4120	e3000	7840	4370	16600	14600	29400	8930	6800	3150
16	5370	e9000	4120	e3400	7480	4540	17700	15200	29900	8160	6350	3060
17	6170	e8500	4070	e3200	7290	5040	18600	16700	29200	7660	6010	2980
18	14700	e8000	4010	e3000	7300	5960	17900	18400	25900	7190	5720	2940
19	17100	7670	3950	e2900	7230	5720	16600	21100	21100	6860	5460	2900
20	13000	7400	3870	e2800	7120	5730	14900	24600	17700	6740	5420	2870
21	11900	7010	e2300	e3200	6900	6480	13900	32800	15800	7120	5500	2750
22	11600	6770	e1500	e3000	6600	6920	13500	47700	14300	8320	5570	2720
23	10300	6550	e1000	e2900	6310	6600	15200	49600	13400	11800	5460	2670
24	9080	6270	e1100	e3400	6030	6180	17000	44600	12800	16800	5380	2640
25	8060	6030	e1300	e3000	5680	5800	16700	39700	12100	21500	5660	2590
26	7430	5870	e1700	e2900	5460	5650	16600	36200	11900	33600	6340	2550
27	6990	5700	e2200	e2900	5420	5340	17300	34300	12300	52900	6780	2610
28	7170	5550	e2700	e3000	5600	5210	18400	34400	12800	57700	6810	2990
29	7180	5430	e2500	e3200	---	5090	19800	32400	12300	45900	6160	2940
30	7410	5430	e2200	e3000	---	4940	20500	27100	11400	32900	5540	2850
31	8050	---	e2000	e3200	---	4810	---	21700	---	23700	5180	---
TOTAL	228240	218220	111350	83000	173120	162830	391070	692020	547800	571200	268780	98470
MEAN	7363	7274	3592	2677	6183	5253	13040	22320	18260	18430	8670	3282
MAX	17100	9190	5320	3400	8870	6920	20500	49600	29900	57700	20700	4830
MIN	2550	5430	1000	1900	3400	4180	4720	9920	11400	6740	5180	2550
AC-FT	452700	432800	220900	164600	343400	323000	775700	1373000	1087000	1133000	533100	195300
CFSM	.95	.93	.46	.34	.79	.67	1.67	2.87	2.34	2.37	1.11	.42
IN.	1.09	1.04	.53	.40	.83	.78	1.87	3.31	2.62	2.73	1.28	.47

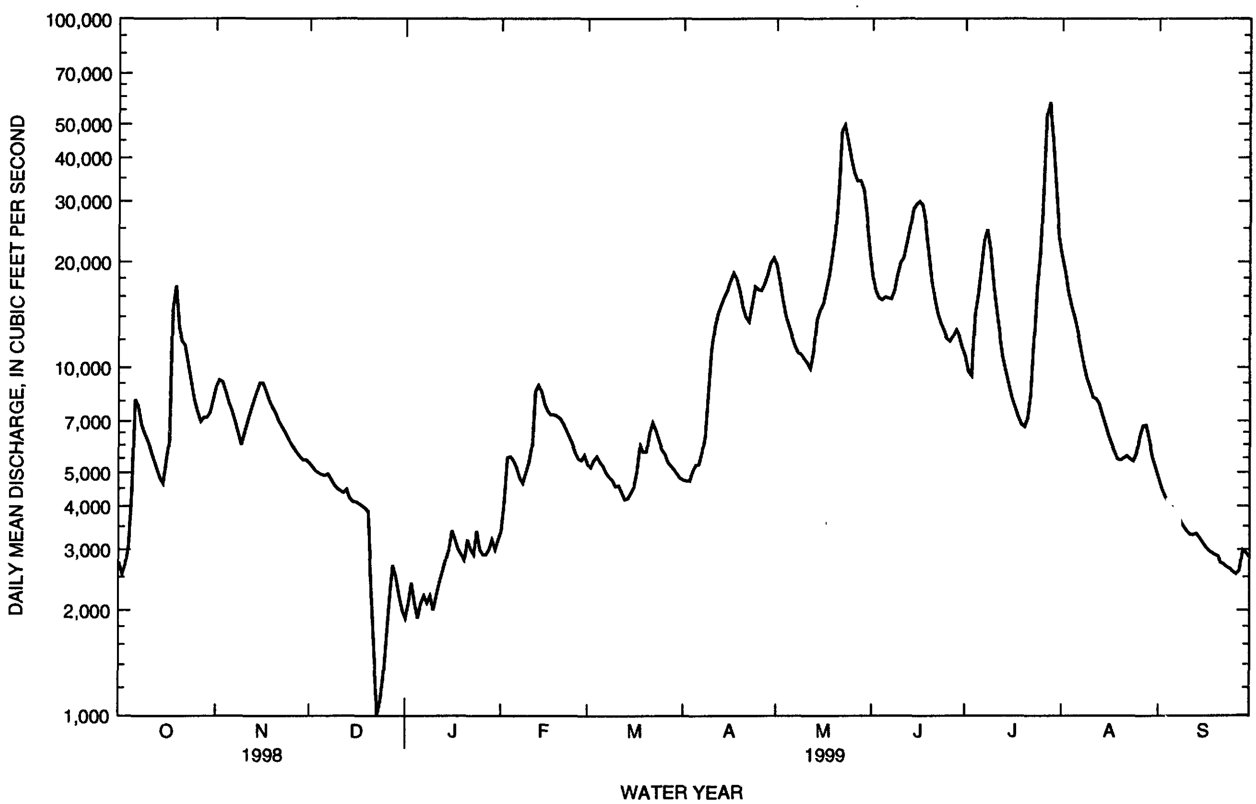
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3159	3362	2632	2422	3297	8127	9608	7604	8073	6454	4251	3325
MAX	12380	10240	11110	11860	12000	17590	36790	24440	27780	42110	34190	19530
(WY)	1987	1973	1983	1973	1984	1948	1993	1991	1993	1993	1993	1993
MIN	599	590	429	365	359	1056	1244	1219	768	815	700	620
(WY)	1957	1956	1990	1977	1940	1954	1957	1940	1977	1989	1989	1955

05465000 CEDAR RIVER NEAR CONESVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1940 - 1999	
ANNUAL TOTAL	2895290		3546100			
ANNUAL MEAN	7932		9715		5197	
HIGHEST ANNUAL MEAN					18710	1993
LOWEST ANNUAL MEAN					1176	1956
HIGHEST DAILY MEAN	31200	Jun 30	57700	Jul 28	69800	Apr 6 1993
LOWEST DAILY MEAN	1000	Dec 23	1000	Dec 23	250	Nov 28 1955a
ANNUAL SEVEN-DAY MINIMUM	1590	Dec 21	1590	Dec 21	329	Jan 30 1940
INSTANTANEOUS PEAK FLOW			60900	Jul 28	74000	Apr 6 1993
INSTANTANEOUS PEAK STAGE			16.80	Jul 28	17.11	Apr 6 1993
INSTANTANEOUS LOW FLOW			2500	Sep 26		
ANNUAL RUNOFF (AC-FT)	5743000		7034000		3765000	
ANNUAL RUNOFF (CFSM)	1.02		1.25		.67	
ANNUAL RUNOFF (INCHES)	13.83		16.94		9.07	
10 PERCENT EXCEEDS	16400		19700		11900	
50 PERCENT EXCEEDS	6170		6500		3200	
90 PERCENT EXCEEDS	2300		2830		920	

a Result of freeze-up
e Estimated



05465500 IOWA RIVER AT WAPELLO, IA

LOCATION.--Lat 41°10'41", long 91°10'55", in $NW^1/_4$ $SE^1/_4$ sec.27, T.74 N., R.3 W., Louisa County, Hydrologic Unit 07080209, on right bank, 1200 ft. downstream from bridge on State Highway 99 at east edge of Wapello, 13.2 mi downstream from Cedar River, and at mile 15.8.

DRAINAGE AREA.--12,499 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1917, 1923-30, 1932. WSP 1438: Drainage area. WSP 1558: 1918, 1923-25 (M), 1929. WSP 1708: 1955(P), 1956. WDR IA-95-1:location.

GAGE.--Water-stage recorder. Datum of gage is 538.17 ft above sea level; Oct. 1, 1914 to Apr. 15, 1934, nonrecording gage and Apr. 16, 1934 to Sept. 30, 1972, water-stage recorder at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Coralville Lake (station 05453510) 67.3 mi upstream, since Sept. 17, 1958. U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum instantaneous discharge, 111,000 ft^3/s, July 8, 1993, gage height, 29.53 ft; minimum daily discharge, 300 ft^3/s, Nov. 28, 1955.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4570	14600	8760	e3400	e6000	9350	7540	33500	30100	19200	e31000	6210
2	4210	15000	8490	e3200	e7500	9140	7420	31700	26500	18000	e27000	5850
3	4280	16100	8380	e3400	e9500	8940	7400	28500	23900	17100	23100	5490
4	4940	15200	8240	e3200	10700	8990	7560	25300	23300	19100	19400	5260
5	8830	13900	8170	e3000	10500	8730	8420	23200	23700	22500	15600	5060
6	19800	12900	8130	e3400	9900	8470	8520	22300	23900	24200	13900	4940
7	19700	12100	8450	e3400	9330	8220	8650	21500	23800	27300	12900	4920
8	15700	11400	8280	e3200	9040	8070	9040	19500	23700	30800	11700	4670
9	14100	11300	7950	e3400	9180	7900	11400	18400	24900	32400	10800	4490
10	12300	13000	7710	e3200	9650	7620	16800	17700	28000	29500	10200	4340
11	10500	16800	7530	e3400	10300	7550	18000	16800	31900	23700	9770	4200
12	9840	16300	7750	e3600	12700	7580	19400	16000	32700	20500	e11000	4110
13	9360	14900	8550	e4000	15200	7260	20700	18000	35100	18400	e11000	4200
14	8860	14200	8580	e4200	13900	7110	22200	25400	38600	17100	9890	4150
15	8380	13800	8180	e4400	13000	7080	23900	27200	39900	16100	9110	3990
16	8220	13400	7810	e4600	12700	7510	27200	26100	39800	15100	8470	3860
17	9380	13200	7730	e4400	12500	9030	30000	26700	40000	14500	7990	3750
18	24600	12800	7440	e4200	12300	11700	30200	29200	39200	14100	7720	3640
19	35100	12200	7160	e4000	12200	12000	28200	31700	36100	13700	7490	3540
20	33700	11800	6680	e3800	11900	9940	25000	33200	30700	13500	7340	3430
21	25900	11300	6500	e4600	11400	9670	22000	35300	26100	13700	7160	3330
22	22900	11000	e3600	e5000	11000	10400	20300	41500	23400	14100	7250	3300
23	20300	10700	e2400	e5500	10500	10400	25600	57000	22000	16300	7200	3210
24	17400	10200	e2200	e6000	10000	9980	31200	56600	21500	20500	7000	3140
25	15000	9130	e2800	e5500	9380	9510	32000	53000	21000	23800	7050	3060
26	13900	9790	e3200	e5000	8940	9100	29400	49000	20100	25900	7470	2970
27	13300	9690	e4200	e4800	8850	8660	28200	44900	20100	36200	7680	3050
28	13200	9350	e4400	e4800	9080	8270	31000	42600	20900	56000	7980	3900
29	13000	8970	e4000	e5000	---	8060	33100	41900	20900	59900	7630	3870
30	13500	8890	e3800	e4800	---	7900	33700	39700	19700	53100	7050	3540
31	13800	---	e3600	e5000	---	7690	---	35100	---	41100	6610	---
TOTAL	448570	373920	200670	129400	297150	271830	624050	988500	831500	767400	345460	123470
MEAN	14470	12460	6473	4174	10610	8769	20800	31890	27720	24750	11140	4116
MAX	35100	16800	8760	6000	15200	12000	33700	57000	40000	59900	31000	6210
MIN	4210	8890	2200	3000	6000	7080	7400	16000	19700	13500	6610	2970
AC-FT	889700	741700	398000	256700	589400	539200	1238000	1961000	1649000	1522000	685200	244900
CFSM	1.16	1.00	.52	.33	.85	.70	1.66	2.55	2.22	1.98	.89	.33
IN.	1.33	1.11	.60	.39	.88	.81	1.86	2.94	2.47	2.28	1.03	.37

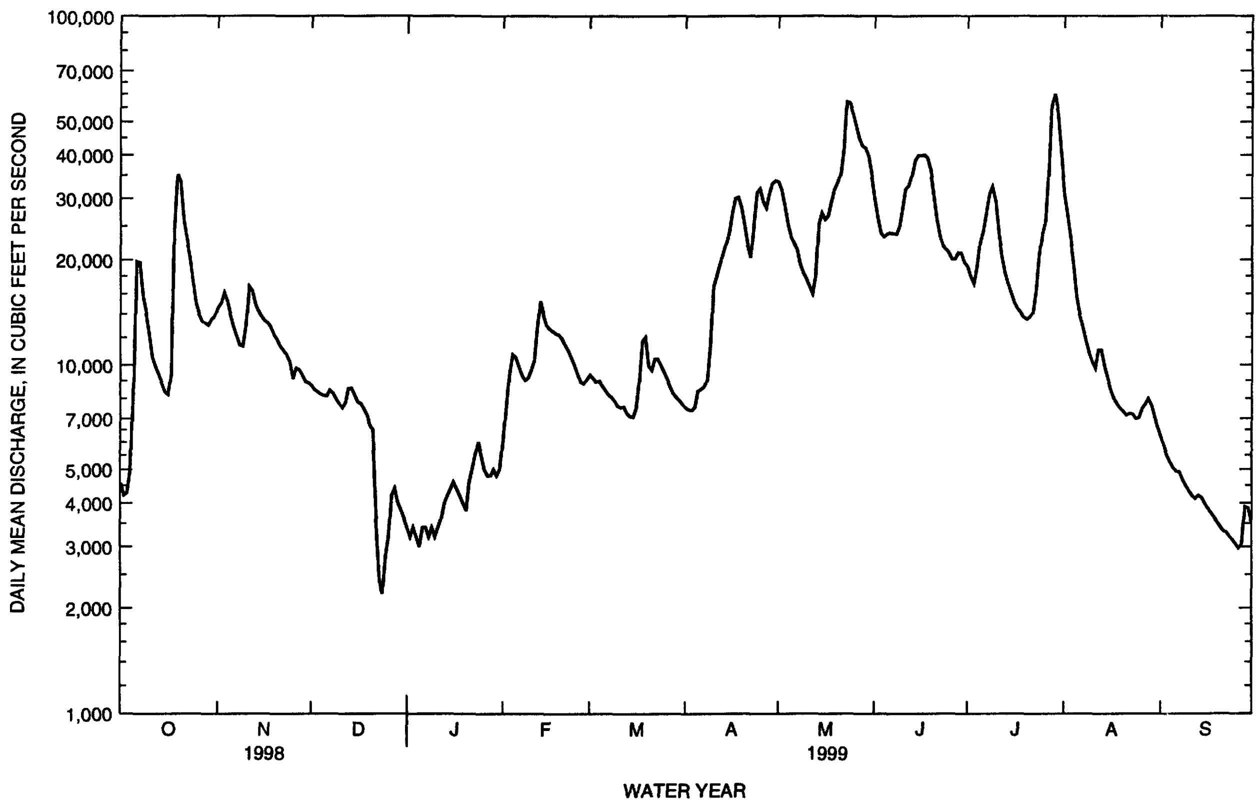
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5598	6254	5420	4581	6389	13740	16610	13950	13730	12460	8072	6171
MAX	17200	16080	18150	20420	17080	26130	45840	33030	36630	77320	61750	37270
(WY)	1987	1993	1983	1973	1984	1982	1993	1993	1993	1993	1993	1993
MIN	926	882	664	533	661	2273	2536	1709	1022	1019	873	982
(WY)	1990	1990	1990	1977	1977	1977	1977	1977	1977	1989	1989	1988

05465500 IOWA RIVER AT WAPELLO, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1959 - 1999a	
ANNUAL TOTAL	5189220		5401920			
ANNUAL MEAN	14220		14800		9424	
HIGHEST ANNUAL MEAN					30550	1993
LOWEST ANNUAL MEAN					1908	1989
HIGHEST DAILY MEAN	48000	Jul 2	59900	Jul 29	106000	Jul 8 1993
LOWEST DAILY MEAN	2200	Dec 24	2200	Dec 24	460	Jan 21 1977
ANNUAL SEVEN-DAY MINIMUM	3260	Dec 22	3150	Sep 21	470	Jan 20 1977
INSTANTANEOUS PEAK FLOW			61000	Jul 29	111000	Jul 8 1993
INSTANTANEOUS PEAK STAGE			25.09	Jul 29	29.53	Jul 7 1993
ANNUAL RUNOFF (AC-FT)	10290000		10710000		6827000	
ANNUAL RUNOFF (CFSM)	1.14		1.18		.75	
ANNUAL RUNOFF (INCHES)	15.44		16.08		10.24	
10 PERCENT EXCEEDS	32400		31100		21200	
50 PERCENT EXCEEDS	12000		10500		6160	
90 PERCENT EXCEEDS	4280		4000		1740	

a Post regulation
e Estimated



05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY RECORDS

LOCATION -- Samples collected at bridge on State Highway 99, 1200 ft. upstream of gage.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1978 to current year.
WATER TEMPERATURE: January 1978 to current year.
SUSPENDED-SEDIMENT DISCHARGE: April 1978 to current year.

REMARKS.--During periods of ice effect samples are collected in open water channel or through ice cover. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 920 microsiemens Dec. 17, 1988; minimum daily, 168 microsiemens June 21, 1990.
WATER TEMPERATURES: Maximum daily, 33.0°C July 25, 1987; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,970 mg/L June 25, 1981; minimum daily mean, 1 mg/L Jan. 21, 22, 1981.
SEDIMENT LOADS: Maximum daily 604,000 tons June 20, 1990; minimum daily, 4.7 tons Dec. 23, 24, 1989.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 622 microsiemens Mar. 15; minimum daily, 260 microsiemens July 27.
WATER TEMPERATURES: Maximum daily, 30.0°C, July 22; minimum daily, 0.0°C Jan 13.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 761 mg/L Oct. 6; minimum daily mean, 13 mg/L Jan. 15.
SEDIMENT LOADS: Maximum daily, 55,400 tons Apr. 24; minimum daily, 154 tons Jan. 15.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	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)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT 06...	0922	392	7.8	15.2	14.5	7.8	79	140	108	213	187	33
NOV 09...	0933	594	8.5	5.8	7.0	11.9	97	280	215	360	346	75
DEC 01...	0900	609	8.2	8.9	11.0	10.4	91	290	211	376	346	76
JAN 13...	0920	674	8.0	.1	-8.0	12.5	86	310	241	430	402	80
FEB 09...	0927	547	8.1	3.6	7.5	12.3	94	250	195	335	321	66
MAR 02...	0905	593	8.2	4.4	6.0	11.8	94	270	216	360	342	72
APR 07...	0925	502	8.4	12.4	18.0	12.4	118	230	--	307	--	56
MAY 04...	0905	569	8.2	17.0	20.1	9.8	104	270	194	--	323	72
JUN 07...	0924	527	7.9	21.6	25.0	8.3	95	240	169	322	289	64
JUL 06...	0932	400	8.0	25.9	26.5	7.2	90	190	137	273	228	51
AUG 03...	0930	515	8.0	26.0	26.0	7.9	99	240	186	296	287	67
SEP 01...	0917	502	8.3	22.3	20.0	9.0	106	220	162	286	275	56

DATE	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)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
OCT 06...	13	11	5.3	132	0	21	16	.12	9.5	.034	2.83	.102
NOV 09...	23	13	2.3	262	0	33	24	.29	15	.012	7.23	.042
DEC 01...	24	15	1.9	257	0	33	25	.20	13	.012	7.51	.035
JAN 13...	26	25	2.0	294	0	46	36	.25	13	.028	6.75	.167
FEB 09...	20	16	2.6	236	0	35	26	.17	11	.017	5.89	.170
MAR 02...	22	16	2.3	244	7	34	25	.21	12	.020	7.02	.079
APR 07...	21	15	2.0	--	--	34	27	.23	2.8	.014	4.46	<.020
MAY 04...	21	9.6	2.1	237	0	27	20	.23	12	.017	9.41	.036
JUN 07...	19	8.5	2.5	206	0	24	17	.23	12	.047	9.22	.063
JUL 06...	14	6.8	2.9	167	0	18	13	.22	10	.034	6.64	<.020
AUG 03...	18	8.1	2.9	227	0	24	15	.24	15	.028	5.70	<.020
SEP 01...	20	17	2.8	146	25	33	27	.22	6.3	.015	3.81	<.020

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO- CHLOR, WATER FLTRD REC (UG/L) (49260)
OCT												
06...	1.4	.71	1.5	.232	.213	.536	26	E2.9	>5.0	5.5	<.003	.012
NOV												
09...	.44	.31	.48	.118	.114	.231	<10	5.4	1.8	3.1	<.003	.005
DEC												
01...	.50	.25	.54	.099	.101	.116	<10	4.9	1.6	2.7	<.003	E.004
JAN												
13...	.40	.44	.56	.111	.096	.147	<10	17	.30	2.5	<.003	<.002
FEB												
09...	.52	<.10	.69	.147	.138	.220	<10	7.9	.70	2.8	<.003	<.002
MAR												
02...	.63	.36	.71	.127	.111	.240	<10	5.9	1.2	3.3	<.003	.030
APR												
07...	--	.30	1.6	.049	.032	.322	<10	<3.0	>5.0	3.3	<.003	.026
MAY												
04...	1.1	.50	1.2	.096	.090	.241	<10	<3.0	1.8	3.8	<.003	.084
JUN												
07...	1.4	.43	1.5	.137	.133	.400	E5.4	<3.0	4.4	3.8	<.003	1.11
JUL												
06...	--	.36	1.5	.149	.124	.420	<10	<3.0	>5.0	3.9	<.003	.141
AUG												
03...	--	.32	1.0	.173	.146	.296	<10	<3.0	1.8	4.2	<.003	.028
SEP												
01...	--	.29	1.8	.010	<.010	.266	<10	<3.0	3.2	3.0	<.003	.012

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)
OCT												
06...	<.002	.129	<.001	<.002	<.002	<.003	<.003	<.004	.017	<.002	.012	<.001
NOV												
09...	.005	.089	<.001	<.002	<.002	<.003	<.003	<.004	.007	<.002	<.002	<.001
DEC												
01...	<.002	.077	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002	<.001
JAN												
13...	<.002	.069	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002	<.001
FEB												
09...	<.002	.083	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002	<.001
MAR												
02...	<.002	.077	<.001	<.002	<.002	<.003	<.003	<.004	.008	<.002	<.002	<.020
APR												
07...	E.003	.129	<.001	<.002	<.002	<.003	<.003	<.004	.016	<.002	<.002	<.001
MAY												
04...	E.004	.184	<.001	<.002	<.002	<.003	<.003	<.004	<.010	<.002	<.002	<.001
JUN												
07...	.061	3.17	<.001	<.002	<.002	<.003	<.003	<.010	.088	<.002	<.002	<.001
JUL												
06...	.016	1.64	<.001	<.002	<.002	<.003	E.054	<.004	.019	<.002	.005	<.001
AUG												
03...	E.003	.506	<.001	<.002	<.002	<.003	<.003	<.004	.006	<.002	<.002	<.001
SEP												
01...	<.002	.178	<.001	<.002	<.002	<.003	<.003	<.004	<.004	<.002	<.002	<.001

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)
OCT											
06...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.102	<.004	<.004
NOV											
09...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.046	<.004	<.004
DEC											
01...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.036	<.004	<.004
JAN											
13...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.027	<.004	<.004
FEB											
09...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.119	<.004	<.004
MAR											
02...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.433	<.004	<.004
APR											
07...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.147	<.004	<.004
MAY											
04...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.260	<.004	<.004
JUN											
07...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	1.20	<.004	<.004
JUL											
06...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.407	<.004	<.004
AUG											
03...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.145	<.004	<.004
SEP											
01...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.054	<.004	<.004

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
OCT											
06...	<.003	<.004	<.006	<.004	<.004	<.002	E.004	<.007	<.004	<.013	<.003
NOV											
09...	<.003	<.004	<.006	<.004	<.004	<.002	E.004	<.007	<.004	<.013	<.003
DEC											
01...	<.003	<.004	<.006	<.004	<.004	<.002	E.004	<.007	<.004	<.013	<.003
JAN											
13...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.020	<.003
FEB											
09...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
MAR											
02...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
APR											
07...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
MAY											
04...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003
JUN											
07...	<.003	<.004	<.006	<.004	<.004	<.002	E.007	<.007	<.004	<.013	<.003
JUL											
06...	<.003	<.004	<.006	<.004	.009	<.002	E.010	<.007	<.004	<.013	<.003
AUG											
03...	<.003	<.004	<.006	<.004	<.004	<.002	E.012	<.007	<.004	<.013	<.003
SEP											
01...	<.003	<.004	<.006	<.004	<.004	<.002	<.018	<.007	<.004	<.013	<.003

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	P,P' DDE DISSOLV (UG/L) (34653)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT											
06...	E.003	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	825
NOV											
09...	E.004	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	47
DEC											
01...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	72
JAN											
13...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	24
FEB											
09...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	57
MAR											
02...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	89
APR											
07...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	121
MAY											
04...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	170
JUN											
07...	.017	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	255
JUL											
06...	E.008	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	291
AUG											
03...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	168
SEP											
01...	<.005	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	95

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
05...	1115	14.8	6670	274	4930	96
NOV						
23...	1310	6.1	10400	75	2110	64
FEB						
08...	1130	3.6	9240	80	2000	81
MAR						
29...	1315	11.4	8120	62	1360	88
MAY						
11...	1310	17.8	16000	2530	109000	4
JUN						
21...	1345	22.7	25200	173	11800	81
JUL						
28...	1225	28.0	53600	122	17700	60
SEP						
16...	1115	17.7	3880	79	828	97

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	NUMBER OF SAM-PLING POINTS (COUNT) (00063)	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	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)
OCT							
05...	1115	3	--	1	1	4	13
NOV							
23...	1310	3	--	1	5	34	86
FEB							
08...	1130	2	--	--	0	1	37
MAR							
29...	1315	4	--	0	1	4	40
MAY							
11...	1310	3	--	--	0	27	85
SEP							
16...	1115	2	0	2	7	15	33

DATE	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
OCT						
05...	24	34	48	67	86	100
NOV						
23...	99	100	--	--	--	--
FEB						
08...	91	98	100	--	--	--
MAR						
29...	72	87	95	99	100	--
MAY						
11...	97	99	100	--	--	--
SEP						
16...	74	93	96	98	100	--

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	536	---	499	---	---	---	535	530	---	517	473	504
2	509	552	514	---	---	572	---	544	---	---	482	---
3	537	---	520	505	---	---	---	551	---	---	510	---
4	533	---	518	506	---	---	---	559	---	523	---	---
5	384	---	---	---	---	---	---	564	---	465	---	---
6	321	---	531	---	---	---	---	559	---	396	---	---
7	---	582	---	---	---	---	521	558	506	370	---	---
8	519	---	540	---	549	---	---	---	511	---	---	---
9	---	529	549	---	565	---	---	---	474	---	562	---
10	---	---	508	---	545	592	459	504	451	474	563	---
11	---	---	---	---	545	587	523	---	---	505	567	---
12	---	---	528	520	---	---	---	508	437	527	---	---
13	---	---	535	---	513	---	---	515	---	---	547	---
14	---	---	---	---	509	---	---	---	408	552	537	---
15	583	532	---	589	---	622	524	---	---	---	555	---
16	---	507	496	589	538	---	---	497	---	557	569	---
17	---	491	498	511	536	---	542	476	---	---	---	480
18	---	494	523	---	---	---	535	---	506	---	---	---
19	313	---	478	---	---	---	---	466	---	---	545	---
20	376	---	485	---	555	---	---	458	---	---	---	477
21	---	---	490	---	560	---	566	403	529	556	484	---
22	---	---	535	---	---	572	---	362	---	551	475	---
23	---	502	---	---	---	567	469	381	530	547	516	---
24	---	---	---	---	---	569	---	423	---	393	488	482
25	535	---	531	---	---	566	501	---	516	---	---	---
26	553	---	---	516	---	---	517	---	---	278	486	---
27	---	---	---	518	---	576	---	---	---	260	---	476
28	---	---	523	551	---	573	486	---	---	271	---	---
29	---	---	---	---	---	571	495	---	518	469	---	512
30	---	---	529	---	---	---	515	---	---	---	---	---
31	---	---	---	---	---	553	---	523	---	472	---	---

05465500 IOWA RIVER AT WAPELLO, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	---	9.0	---	---	---	---	18.0	---	---	25.0	22.5
2	14.0	12.0	10.0	---	---	4.5	---	18.0	---	---	25.0	---
3	12.0	---	10.0	1.5	---	---	---	20.0	---	---	26.0	---
4	11.0	---	10.0	2.0	---	---	---	17.0	---	---	---	---
5	18.0	---	---	---	---	---	---	21.0	---	---	---	---
6	16.0	---	9.0	---	---	---	---	---	---	26.0	---	---
7	---	11.0	---	---	---	---	10.0	---	21.5	---	---	---
8	16.0	---	9.0	---	3.5	---	---	---	25.0	---	---	---
9	---	6.0	8.0	---	---	---	---	---	24.0	---	---	---
10	---	---	4.0	---	---	---	11.0	21.0	24.0	---	---	---
11	---	---	---	---	---	---	11.0	---	---	---	25.0	---
12	---	---	3.0	---	---	---	---	18.0	25.0	---	---	---
13	---	---	---	.0	---	---	---	16.0	---	---	24.0	---
14	---	---	---	---	---	---	---	---	24.0	---	24.0	---
15	17.0	9.0	---	.5	---	7.0	11.0	---	---	---	---	---
16	---	10.0	3.0	.5	3.0	---	---	21.0	---	---	24.0	---
17	---	9.0	3.0	1.0	3.0	---	12.0	21.0	---	---	---	24.0
18	---	10.0	2.0	---	---	---	11.0	---	25.0	---	---	---
19	14.0	---	1.0	---	---	---	---	21.0	---	---	23.0	---
20	17.0	---	.5	---	---	---	---	20.0	---	---	---	24.0
21	---	---	.5	---	---	---	13.0	18.0	---	---	24.0	---
22	---	---	.5	---	---	9.0	---	22.0	---	30.0	24.0	---
23	---	---	---	---	---	9.0	14.0	20.0	---	28.0	24.0	---
24	---	---	---	---	---	8.0	---	21.0	---	29.0	24.0	22.0
25	16.0	---	.5	---	---	8.0	18.0	---	---	---	---	---
26	17.0	---	---	.5	---	---	18.0	---	---	27.0	24.0	---
27	---	---	---	1.0	---	9.0	---	---	---	28.0	---	24.0
28	---	---	.5	1.0	---	9.0	14.0	---	---	23.0	---	---
29	---	---	---	---	---	---	13.0	---	---	28.0	---	18.0
30	---	---	.5	---	---	---	18.0	---	---	---	---	---
31	---	---	---	---	---	---	---	23.0	---	26.0	---	---

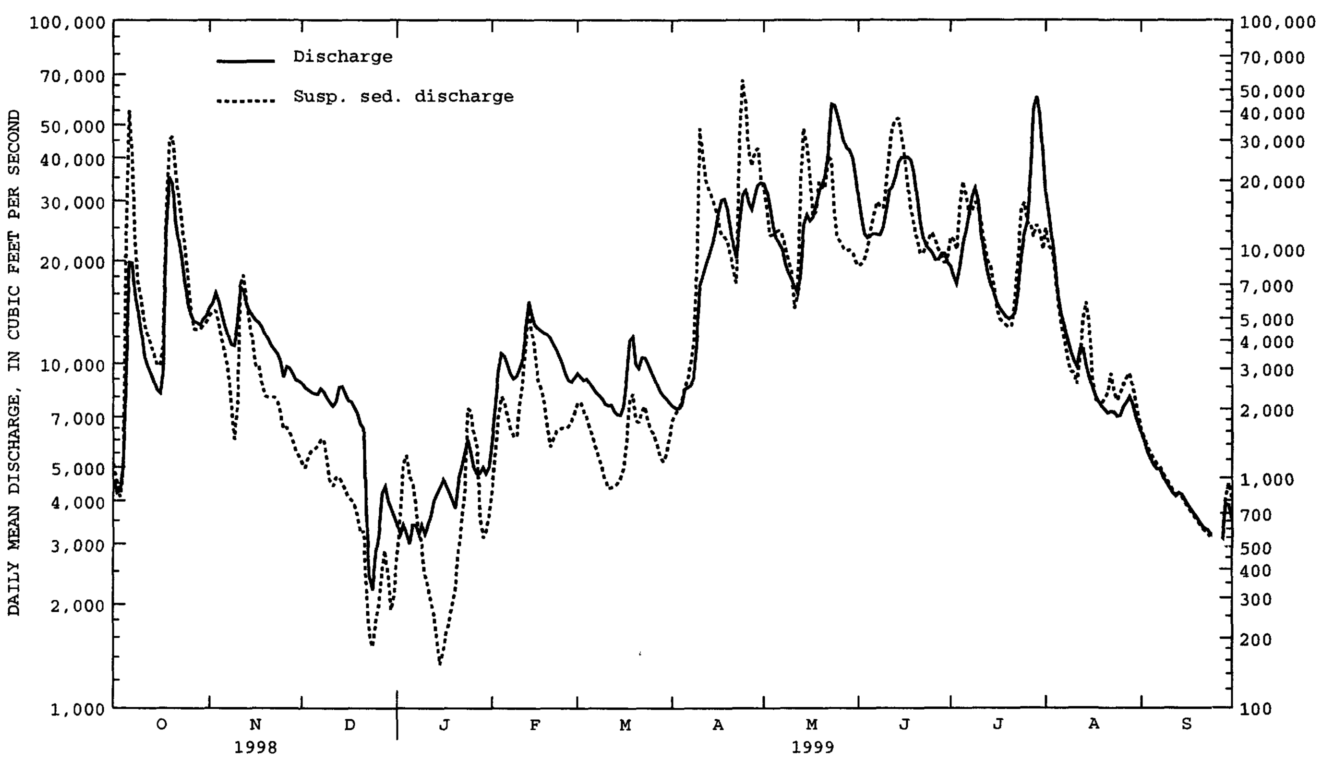
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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	97	1150	130	5150	50	1170	51	468	57	923	84	2130
2	85	963	131	5330	48	1110	81	700	64	1300	87	2150
3	72	829	125	5410	55	1240	126	1160	72	1850	82	1970
4	77	1040	115	4740	59	1320	146	1260	78	2270	76	1840
5	362	10700	107	3990	61	1340	127	1030	75	2130	70	1650
6	761	40700	99	3430	63	1380	103	946	70	1870	65	1490
7	467	25200	91	2960	65	1470	84	771	65	1640	60	1340
8	240	10200	68	2090	66	1480	68	588	62	1520	56	1220
9	185	7030	48	1480	57	1210	56	514	61	1520	52	1110
10	176	5840	57	2050	47	972	45	389	83	2150	48	988
11	168	4750	152	6980	46	928	37	340	96	2670	44	903
12	160	4240	176	7760	48	1010	30	292	114	3940	45	914
13	152	3840	149	5980	44	1020	24	259	133	5470	47	923
14	144	3460	126	4820	41	957	17	193	116	4340	50	954
15	138	3110	106	3940	40	890	13	154	101	3540	52	999
16	140	3110	85	3080	39	830	14	174	77	2660	54	1100
17	152	3870	87	3110	39	807	18	214	72	2430	60	1460
18	213	14600	74	2570	38	765	21	238	64	2130	70	2200
19	317	30200	69	2270	35	684	26	281	52	1700	72	2330
20	344	31300	71	2260	32	578	32	328	43	1370	67	1790
21	308	21600	74	2250	34	592	39	484	48	1490	67	1750
22	273	16900	76	2260	34	330	48	648	54	1600	69	1950
23	242	13200	75	2170	32	207	59	876	57	1630	74	2060
24	214	10100	70	1920	31	184	124	2010	61	1660	66	1770
25	189	7620	66	1640	31	234	132	1960	65	1650	63	1620
26	142	5330	63	1670	32	276	116	1570	70	1680	62	1530
27	125	4500	60	1580	34	386	106	1370	74	1770	60	1390
28	126	4470	57	1450	41	487	54	700	79	1940	56	1240
29	127	4470	55	1320	36	389	41	554	---	---	54	1180
30	128	4670	52	1250	26	267	46	596	---	---	60	1270
31	129	4810	---	---	32	311	51	688	---	---	73	1520
TOTAL	---	303802	---	96910	---	24824	---	21755	---	60843	---	46741

05465500 IOWA RIVER AT WAPELLO, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	88	1780	201	18200	104	8440	219	11300	148	12400	95	1600
2	95	1910	170	14600	121	8660	227	11000	142	10200	93	1470
3	100	2000	150	11500	141	9120	215	9970	159	9930	91	1350
4	105	2150	170	11600	164	10400	297	15600	152	7920	89	1270
5	110	2510	190	11900	192	12300	326	19800	138	5800	88	1200
6	116	2660	200	12100	223	14400	262	17100	126	4700	86	1150
7	136	3170	199	11600	250	16100	192	14100	114	3990	84	1120
8	164	4010	190	10000	241	15400	179	14800	104	3320	83	1040
9	242	7780	180	8950	224	15100	184	16100	98	2890	81	985
10	738	33900	170	8090	253	19200	190	15000	103	2890	80	932
11	530	25700	122	5520	314	27000	205	13100	97	2560	78	885
12	383	20100	148	6390	386	34000	187	10400	119	3360	77	851
13	327	18200	394	20000	390	37000	179	8860	169	4790	75	852
14	279	16700	494	33900	360	37500	184	8450	220	5880	74	826
15	238	15300	386	28300	295	31800	164	7140	192	4720	72	780
16	187	13700	301	21200	231	24800	136	5540	122	2790	71	739
17	144	11700	194	13900	180	19400	127	4950	101	2180	70	708
18	140	11500	187	14700	142	15000	126	4820	103	2150	69	678
19	142	10800	231	19800	133	13000	126	4660	105	2130	68	650
20	140	9430	211	18900	135	11200	126	4570	112	2220	67	622
21	138	8150	193	18400	136	9590	126	4650	123	2370	66	595
22	130	7130	225	25300	151	9550	162	6170	146	2860	65	581
23	431	31600	161	24600	175	10400	207	9150	121	2360	64	556
24	659	55400	94	14400	193	11200	270	15000	115	2170	63	538
25	502	43500	78	11200	208	11800	250	16000	123	2340	63	521
26	339	27000	81	10700	200	10900	187	13000	126	2540	64	509
27	304	23200	83	10100	183	9920	135	13000	130	2700	64	529
28	322	27000	86	9840	168	9440	75	11300	133	2860	78	831
29	311	27700	88	9940	154	8710	79	12800	123	2540	91	950
30	229	20800	91	9690	175	9280	84	12000	113	2150	86	822
31	---	---	93	8840	---	---	90	9950	103	1840	---	---
TOTAL	---	486480	---	454160	---	480610	---	340280	---	123550	---	26140
YEAR		2466095										



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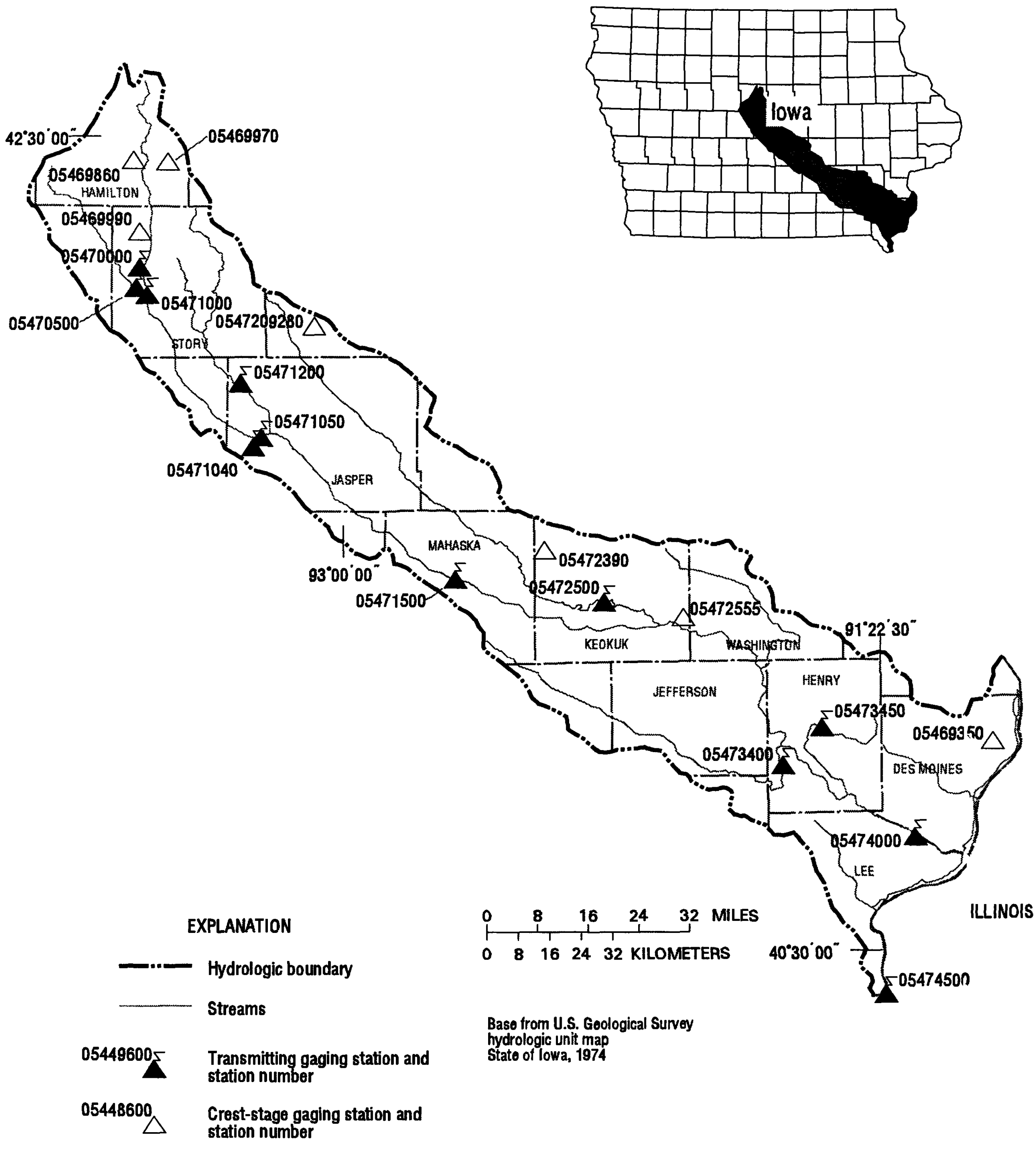

Iowa
42°30'00"
05469970
05469860
HAMILTON
05469990
05470000
05471000
05470500
0547209280
STORY
05471200
05471050
05471040
JASPER
MAHASKA
05472390
93°00'00"
05472500
05471500
05472555
91°22'30"
KEOKUK
WASHINGTON
HENRY
JEFFERSON
05473450
05469350
05473400
DES MOINES
05474000
LEE
ILLINOIS
0 8 16 24 32 MILES
0 8 16 24 32 KILOMETERS
40°30'00"
05474500
EXPLANATION
Hydrologic boundary
Streams
05449600
Transmitting gaging station and station number
05448600
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

05470000 SOUTH SKUNK RIVER NEAR AMES, IA

LOCATION.--Lat 42°04'06", long 93°37'09", in $NW^1/_4$ $SW^1/_4$ sec.23, T.84 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 2.5 mi north of Ames, 3.5 mi downstream from Keigley Branch, 5.2 mi upstream from Squaw Creek, and at mile 228.1 upstream from mouth of Skunk River.

DRAINAGE AREA.--315 mi^2.

PERIOD OF RECORD.--July 1920 to September 1927, October 1932 to September 1995, October 1, 1996 to current year. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1966, published as "Skunk River near Ames".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1921, 1925-26, 1934-35 (M), 1937 (M), 1939 (M), 1947-50 (M). WDR IA-67-1: 1965. WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder. Concrete control since July 21, 1934. Datum of gage is 893.61 ft above sea level (Iowa Highway Commission benchmark). Prior to Aug. 25, 1921, nonrecording gage at same site and datum.

REMARKS.--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 with phone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 17, 1996 reached about 14,000 ft^3/s, from rating curve extension, gage height 15.89 ft, from highwater mark.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	146	e80	37	e44	169	101	400	406	326	44	11
2	9.6	134	e75	37	e46	167	98	381	459	320	40	11
3	10	124	e75	36	50	165	111	358	383	450	36	11
4	20	117	e80	e34	54	162	116	340	680	408	33	13
5	36	110	e75	e32	66	161	134	325	813	328	29	15
6	55	104	e70	e29	90	157	475	303	579	292	27	14
7	65	98	72	e30	131	151	525	297	482	255	44	11
8	65	97	66	e34	218	142	578	295	422	234	36	20
9	61	97	59	e30	375	128	2170	293	466	225	30	12
10	55	113	57	e32	434	130	1840	290	1100	199	25	7.5
11	55	152	56	e34	466	132	1190	310	3390	184	23	6.6
12	53	154	56	e36	395	133	893	1500	2860	171	23	5.8
13	50	146	56	e32	342	134	721	1610	1490	156	21	5.6
14	48	145	55	e34	343	139	593	1100	988	144	19	5.4
15	49	135	53	e32	298	153	515	844	760	129	17	5.9
16	50	128	53	e34	309	177	742	759	636	123	16	5.6
17	52	121	53	e38	274	212	1020	1510	551	131	15	5.2
18	96	114	53	e36	254	201	806	1480	480	117	42	5.1
19	116	112	51	e34	228	167	635	1030	431	119	33	4.0
20	94	103	27	37	213	155	530	796	391	177	23	4.1
21	85	98	34	39	201	143	474	1150	358	146	18	4.0
22	80	98	43	39	193	132	1410	1430	332	114	18	4.1
23	75	98	43	40	183	124	1890	1010	678	111	33	3.7
24	73	91	39	41	182	119	1410	772	1030	97	48	3.6
25	72	87	39	41	182	111	981	630	694	86	37	3.4
26	70	85	39	e38	179	106	756	543	527	84	25	3.6
27	77	87	40	e40	175	106	637	487	458	72	21	4.8
28	162	87	41	e42	172	113	563	452	501	65	18	7.2
29	182	83	41	e40	---	108	491	418	394	59	15	8.0
30	175	87	38	e40	---	100	434	395	348	53	13	5.3
31	158	---	37	e42	---	99	---	413	---	52	11	---
TOTAL	2258.6	3351	1656	1120	6097	4396	22839	21921	23087	5427	833	226.5
MEAN	72.9	112	53.4	36.1	218	142	761	707	770	175	26.9	7.55
MAX	182	154	80	42	466	212	2170	1610	3390	450	48	20
MIN	9.6	83	27	29	44	99	98	290	332	52	11	3.4
AC-FT	4480	6650	3280	2220	12090	8720	45300	43480	45790	10760	1650	449
CFSM	.23	.35	.17	.11	.69	.45	2.42	2.24	2.44	.56	.09	.02
IN.	.27	.40	.20	.13	.72	.52	2.70	2.59	2.73	.64	.10	.03

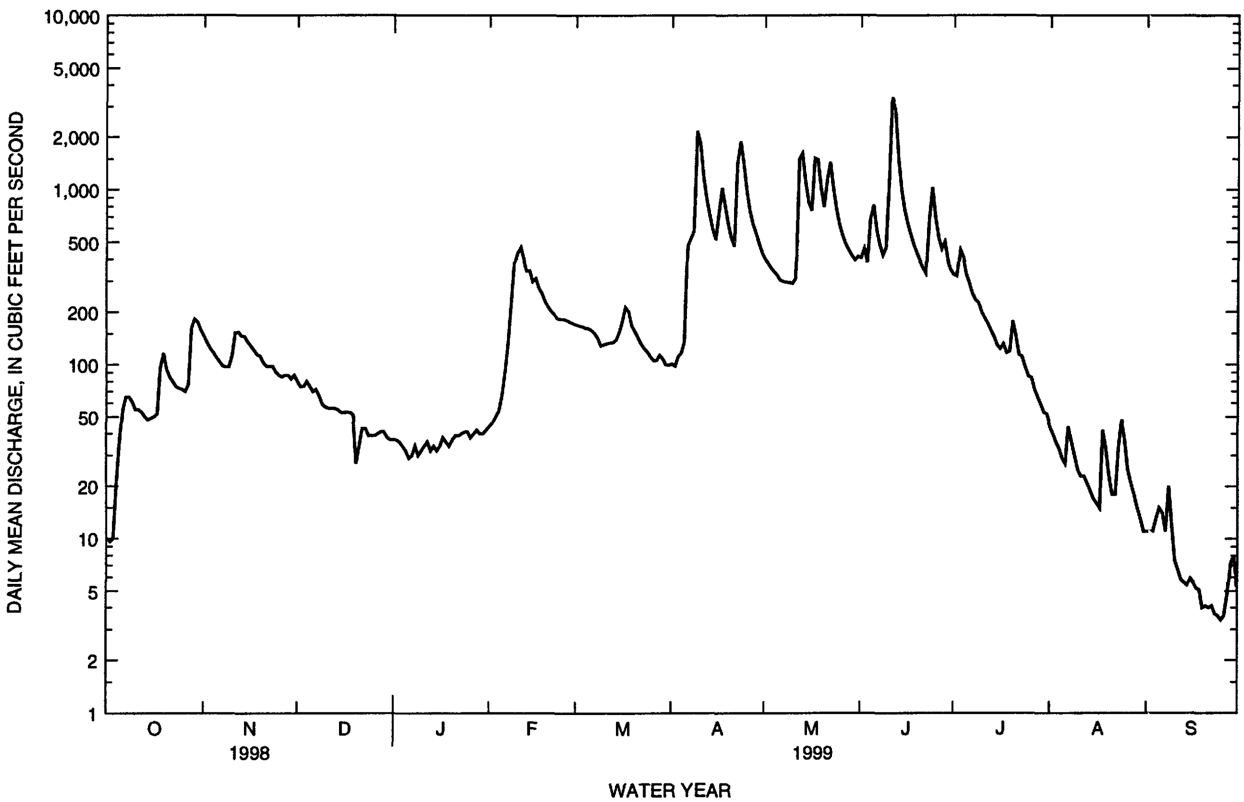
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	96.2	100	71.6	50.6	121	316	286	281	393	227	115	96.3
MAX	723	726	537	315	623	1034	1208	1193	1900	2628	1782	577
(WY)	1987	1973	1983	1973	1984	1979	1965	1944	1947	1993	1993	1926
MIN	.12	.14	.000	.000	.31	6.35	6.67	2.28	.011	.017	.087	.081
(WY)	1954	1956	1977	1977	1956	1981	1956	1934	1977	1977	1934	1976

05470000 SOUTH SKUNK RIVER NEAR AMES, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1921 - 1999	
ANNUAL TOTAL	112883.6		93212.1			
ANNUAL MEAN	309		255		179	
HIGHEST ANNUAL MEAN					752	1993
LOWEST ANNUAL MEAN					5.58	1956
HIGHEST DAILY MEAN	4040	Jun 19	3390	Jun 11	8980	Jul 9 1993
LOWEST DAILY MEAN	9.6	Oct 2	3.4	Sep 25	.00	Jun 2[illegible] 1934a
ANNUAL SEVEN-DAY MINIMUM	11	Sep 27	3.8	Sep 20	.00	Jun 2[illegible] 1934
INSTANTANEOUS PEAK FLOW			3630	Jun 11	11200	Aug 16 1993
INSTANTANEOUS PEAK STAGE			6.98	Jun 11	14.23	Aug 16 1993
INSTANTANEOUS LOW FLOW			3.1	Sep 25		
ANNUAL RUNOFF (AC-FT)	223900		184900		130000	
ANNUAL RUNOFF (CFSM)	.98		.81		.57	
ANNUAL RUNOFF (INCHES)	13.33		11.01		7.74	
10 PERCENT EXCEEDS	682		679		439	
50 PERCENT EXCEEDS	142		106		59	
90 PERCENT EXCEEDS	32		16		2.3	

a Many days in 1934, 1953-56, 1976-1977
e Estimated



05470500 SQUAW CREEK AT AMES, IA

LOCATION.--Lat 42°01'21", long 93°37'45", in $NE^1/_4$ $NW^1/_4$ sec.10, T.83 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 65 ft downstream from Lincoln Way Bridge in Ames, 0.2 mi downstream from College Creek, and 2.4 mi upstream from mouth.

DRAINAGE AREA.--204 mi^2.

PERIOD OF RECORD.--May 1919 to September 1927, May 1965 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: Drainage area, 1920-22 (M), 1923, 1924-25 (M), 1926, 1927 (M), WDR IA-66-1: 1965, WDR IA-71-1: 1970 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 881.00 ft. above sea level (levels by Iowa State University). Prior to Mar. 11, 1925, nonrecording gage at site 0.6 mi upstream at different datum. Mar. 11, 1925 to Apr. 30, 1927, nonrecording gage at site 65 ft. upstream at datum about 4 ft. higher.

REMARKS.--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 with phone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 4, 1918 reached a stage of 14.5 ft. from floodmarks, site and datum used 1919-25, discharge, 6,900 ft^3/s. Flood of Mar. 1, 1965 reached a stage of 10.7 ft. from graph based on gage readings, at present site and datum, discharge, 4,200 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	51	33	20	25	75	68	356	254	220	45	22
2	10	48	32	20	29	80	64	324	232	226	37	18
3	15	45	34	19	36	77	80	298	207	1100	34	15
4	25	42	33	e18	50	77	80	276	683	671	32	18
5	29	39	34	e17	117	70	142	254	752	415	29	18
6	24	37	33	e15	141	63	739	234	417	333	26	13
7	21	37	32	e16	132	57	718	226	310	241	137	13
8	18	40	29	e17	145	61	1100	236	279	211	60	38
9	16	40	30	e15	192	84	2480	243	386	205	39	15
10	15	69	29	e16	167	80	1470	224	1560	155	32	12
11	14	65	28	e17	183	62	1040	237	2500	140	29	10
12	14	61	30	e18	101	59	799	1800	1260	130	37	8.4
13	14	58	29	e16	89	62	645	1180	932	120	26	7.4
14	19	59	28	e17	121	70	542	812	696	109	23	7.4
15	16	55	29	e16	123	90	504	583	501	97	20	6.9
16	18	53	28	e18	116	131	882	497	419	105	18	6.5
17	43	51	28	e20	100	160	953	1490	363	109	16	6.2
18	35	48	29	e19	94	130	733	1220	320	94	284	6.5
19	31	48	21	e18	84	108	577	768	293	113	169	6.8
20	26	44	15	e19	76	101	618	538	264	114	83	7.0
21	25	42	e23	21	69	94	742	1340	243	94	57	7.0
22	23	43	e25	25	70	87	1920	1350	226	77	64	7.8
23	23	41	e24	23	58	84	1940	838	1010	76	204	8.2
24	23	38	e23	23	78	79	1260	582	1140	67	108	7.9
25	23	39	22	23	62	73	981	451	684	57	72	7.1
26	23	37	22	23	67	71	775	375	450	70	55	9.3
27	40	36	22	24	68	70	635	330	363	59	45	22
28	71	35	20	24	73	80	534	300	313	53	37	11
29	70	37	22	23	---	68	456	272	266	47	31	9.7
30	64	37	22	23	---	64	397	256	239	43	26	8.1
31	55	---	21	23	---	66	---	243	---	104	22	---
TOTAL	848.9	1375	830	606	2666	2533	23874	18133	17562	5655	1897	353.2
MEAN	27.4	45.8	26.8	19.5	95.2	81.7	796	585	585	182	61.2	11.8
MAX	71	69	34	25	192	160	2480	1800	2500	1100	284	38
MIN	5.9	35	15	15	25	57	64	224	207	43	16	6.2
AC-FT	1680	2730	1650	1200	5290	5020	47350	35970	34830	11220	3760	701
CFSM	.13	.22	.13	.10	.47	.40	3.90	2.87	2.87	.89	.30	.06
IN.	.15	.25	.15	.11	.49	.46	4.35	3.31	3.20	1.03	.35	.06

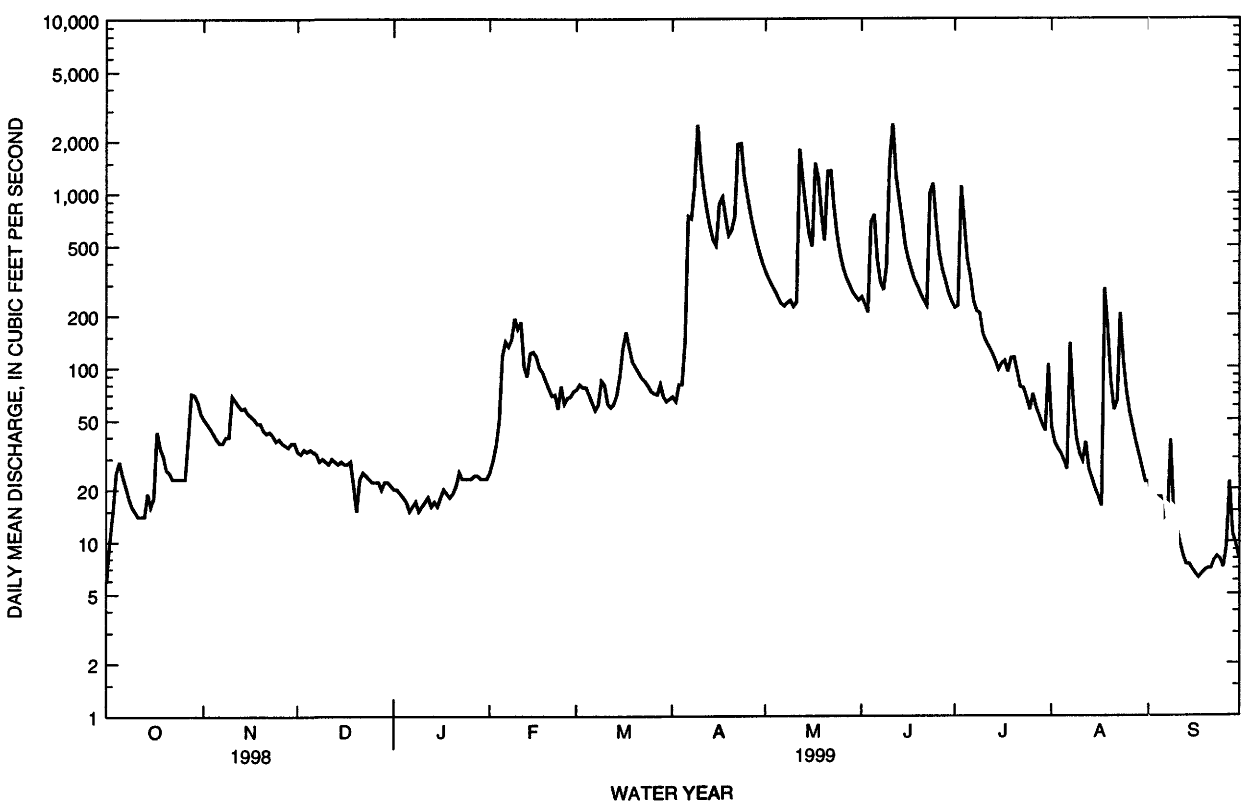
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	82.6	87.5	62.7	41.4	102	212	229	237	329	179	87.6	82.7
MAX	505	491	372	275	465	777	796	817	1107	2128	1177	568
(WY)	1974	1973	1983	1973	1973	1979	1999	1990	1975	1993	1993	1926
MIN	.36	.63	.001	.000	.093	2.51	4.32	1.42	2.97	3.61	.95	.071
(WY)	1989	1967	1977	1977	1977	1981	1977	1981	1977	1927	1989	1971

05470500 SQUAW CREEK AT AMES, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1920 - 1999	
ANNUAL TOTAL	73714.4		76333.1			
ANNUAL MEAN	202		209		145	
HIGHEST ANNUAL MEAN					528	1993
LOWEST ANNUAL MEAN					13.6	1981
HIGHEST DAILY MEAN	3810	Jun 15	2500	Jun 11	12200	Jul 9 1993
LOWEST DAILY MEAN	5.9	Oct 1	5.9	Oct 1	.00	Jul 31 1925a
ANNUAL SEVEN-DAY MINIMUM	7.2	Sep 17	6.7	Sep 15	.00	Oct 7 1971
INSTANTANEOUS PEAK FLOW			3160	Jun 11	24300	Jul 9 1993
INSTANTANEOUS PEAK STAGE			7.53	Jun 11	18.54	Jul 9 1993
INSTANTANEOUS LOW FLOW			5.4	Oct 1		
ANNUAL RUNOFF (AC-FT)	146200		151400		104800	
ANNUAL RUNOFF (CFSM)	.99		1.03		.71	
ANNUAL RUNOFF (INCHES)	13.44		13.92		9.64	
10 PERCENT EXCEEDS	486		676		355	
50 PERCENT EXCEEDS	59		61		48	
90 PERCENT EXCEEDS	18		16		1.9	

a Many days in 1925, 1971, 1972, 1976, 1977, 1988
e Estimated



05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA

LOCATION.--Lat 42°00'24", long 93°35'43", in $NE^1/_4$ $NW^1/_4$ sec.13, T.83 N., R.24 W., Story County, Hydrologic Unit 07080105, on right bank 500 ft downstream from bridge on county highway, 0.2 mi downstream from Squaw Creek, 200 ft upstream from bridge on U.S. Highway 30, 2 mi southeast of Ames, and at mile 222.6 upstream from mouth of Skunk River.

DRAINAGE AREA.--556 mi^2.

PERIOD OF RECORD.--October 1952 to December 1979, October 1991 to current year. Prior to October 1966, published as "Skunk River below Squaw Creek near Ames".

REVISED RECORDS.--WDR IA-95-1: Location.

GAGE.--Water-stage recorder. Datum of gage is 857.10 ft above sea level. Prior to Oct. 1, 1973, at datum 10.00 ft higher. Prior to Oct. 1991, at site 500 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Low flows are affected by pumpage by City of Ames from surficial aquifer and do not represent the natural flow of the stream. Several observations of water temperature were made during the year. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1944, reached a stage of 13 ft, from floodmarks, discharge, 10,000 ft^3/s, datum then in use.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	178	92	e58	e70	189	156	783	699	571	111	33
2	23	165	88	e55	e80	195	148	734	723	550	87	28
3	36	151	89	e53	e100	174	187	689	626	1290	76	25
4	40	140	90	e50	e130	184	177	652	1070	977	66	31
5	89	130	89	e46	e200	176	238	621	1620	713	59	34
6	76	123	89	e42	e360	161	842	584	987	667	54	26
7	81	117	86	e44	e340	149	943	568	790	535	213	23
8	72	121	82	e48	e320	126	1100	561	667	482	106	64
9	67	118	80	e42	e380	138	4590	565	741	490	76	35
10	62	175	78	e44	e460	188	3690	545	2080	404	60	23
11	59	191	77	e46	538	162	2260	557	5900	371	51	19
12	55	189	79	e50	378	153	1670	3180	4410	348	61	16
13	53	181	78	e44	306	158	1370	3130	2580	325	46	14
14	58	179	75	e48	372	174	1170	2050	1830	303	41	13
15	56	168	74	e44	353	211	1060	1520	1390	278	38	13
16	58	157	72	e50	349	275	1550	1300	1170	284	38	12
17	111	e150	71	e55	312	346	2020	2870	1010	291	33	11
18	126	e140	72	e53	284	328	1560	2990	887	258	328	11
19	130	e135	64	e50	252	275	1250	1900	799	276	261	11
20	106	e130	40	e53	230	251	1060	1420	726	307	144	10
21	97	e125	e65	e55	198	234	950	2420	655	280	111	9.3
22	90	e120	e70	e70	203	216	3020	3090	604	234	93	8.7
23	84	116	e65	e65	195	204	4100	1940	1340	221	250	8.6
24	81	108	e65	e62	212	193	2850	1440	2170	202	173	8.4
25	80	105	e60	e65	179	178	1930	1180	1320	176	138	7.3
26	78	103	e60	e60	187	171	1490	1010	973	187	111	6.2
27	109	99	e58	e65	185	168	1240	896	823	158	94	25
28	193	95	e55	e68	188	185	1080	823	818	143	e70	10
29	226	96	e60	e65	---	170	953	758	690	125	e52	9.4
30	215	100	e63	e63	---	155	851	706	616	109	40	8.9
31	193	---	e60	e65	---	152	---	699	---	208	34	---
TOTAL	2821	4105	2246	1678	7361	6039	45505	42181	40714	11763	3115	553.8
MEAN	91.0	137	72.5	54.1	263	195	1517	1361	1357	379	100	18.5
MAX	226	191	92	70	538	346	4590	3180	5900	1290	328	64
MIN	17	95	40	42	70	126	148	545	604	109	33	6.2
AC-FT	5600	8140	4450	3330	14600	11980	90260	83670	80760	23330	6180	1100
CFSM	.16	.25	.13	.10	.47	.35	2.73	2.45	2.44	.68	.18	.03
IN.	.19	.27	.15	.11	.49	.40	3.04	2.82	2.72	.79	.21	.04

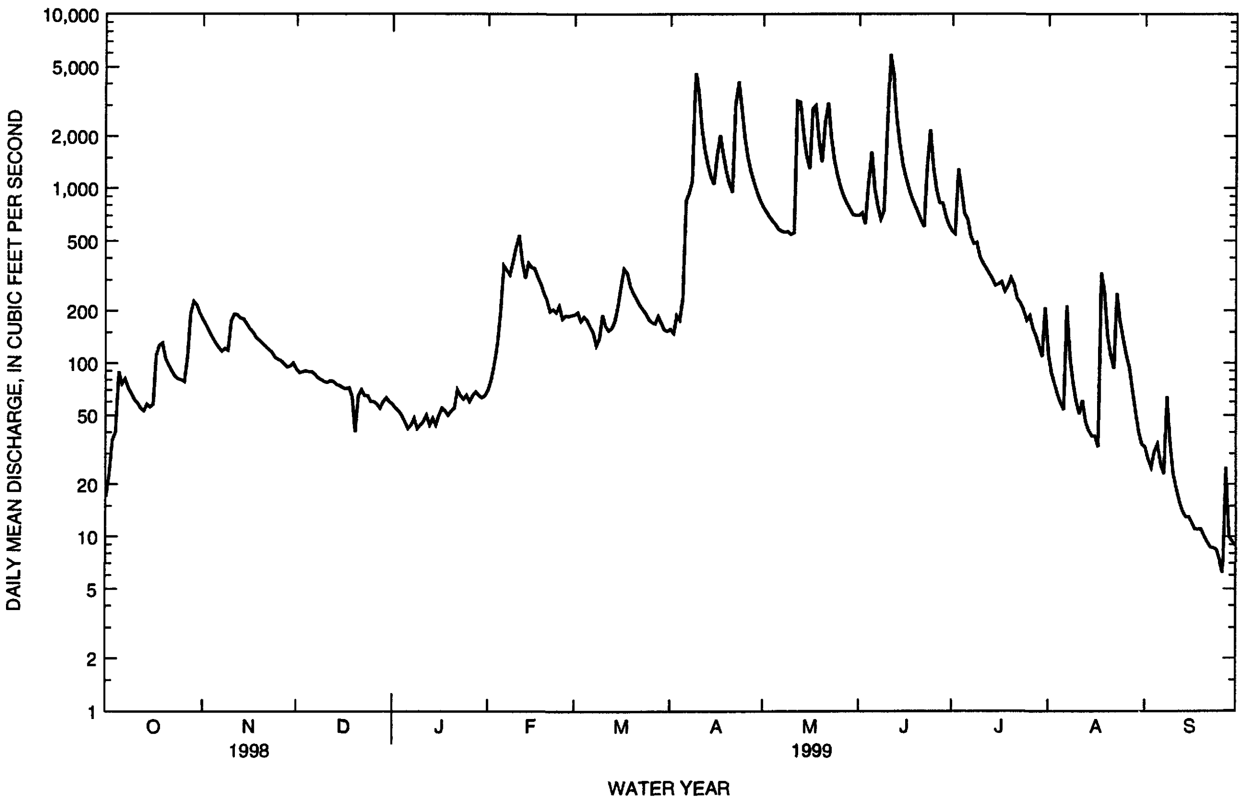
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	173	187	127	86.0	192	547	565	538	840	516	297	167
MAX	1079	1270	438	599	919	2026	2037	1421	2818	5220	3921	1157
(WY)	1974	1973	1997	1973	1973	1979	1965	1974	1998	1993	1993	1993
MIN	.000	.005	.003	.000	.000	8.71	3.62	6.71	.000	.000	.032	.16
(WY)	1957	1977	1977	1956	1956	1956	1956	1967	1977	1956	1956	1976

05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1953 - 1999	
ANNUAL TOTAL	197980		168081.8			
ANNUAL MEAN	542		460		353	
HIGHEST ANNUAL MEAN					1475	1993
LOWEST ANNUAL MEAN					5.95	1956
HIGHEST DAILY MEAN	8240	Jun 15	5900	Jun 11	20500	Jul 9 1993
LOWEST DAILY MEAN	17	Oct 1	6.2	Sep 26	.00	Dec 17 1953a
ANNUAL SEVEN-DAY MINIMUM	21	Sep 25	8.4	Sep 20	.00	Jan 11 1954
INSTANTANEOUS PEAK FLOW			6480	Jun 11	26500	Jul 9 1993
INSTANTANEOUS PEAK STAGE			21.16	Jun 11	25.57	Jun 27 1975
INSTANTANEOUS LOW FLOW			5.4	Sep 26		
ANNUAL RUNOFF (AC-FT)	392700		333400		255500	
ANNUAL RUNOFF (CFSM)	.98		.83		.63	
ANNUAL RUNOFF (INCHES)	13.25		11.25		8.62	
10 PERCENT EXCEEDS	1190		1290		848	
50 PERCENT EXCEEDS	188		158		116	
90 PERCENT EXCEEDS	55		39		1.5	

a Many days in 1956-56, 1963-68, 1976-77
e Estimated



05471040 SQUAW CREEK NEAR COLFAX, IA

LOCATION.--Lat 41°39'33", long 93°16'14", in $NE^1/_4$ $NE^1/_4$ sec.15, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on right bank at downstream side of bridge on county road S44 Ave. W.

DRAINAGE AREA.--18.4 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Datum of gage is 785.96 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	6.6	8.1	e3.6	5.3	5.2	8.6	13	29	14	4.5	5.2
2	2.9	9.2	8.2	e3.6	10	5.5	8.4	13	23	13	4.4	5.2
3	3.4	8.8	8.1	e3.6	12	6.0	8.4	12	20	12	4.2	4.9
4	4.1	8.1	8.0	e3.0	10	5.2	8.0	13	72	11	3.9	4.9
5	28	7.7	7.8	e3.4	7.9	5.2	8.7	13	37	10	3.5	5.1
6	11	7.5	7.7	e4.2	7.5	5.0	8.5	12	28	11	3.3	4.5
7	8.7	7.4	7.5	e4.0	6.9	5.3	7.9	12	25	9.6	4.0	4.3
8	8.2	7.7	7.4	e4.2	8.2	7.2	11	12	22	9.1	3.4	4.0
9	7.9	8.6	7.3	e3.6	6.9	15	20	10	21	8.7	3.1	3.8
10	7.7	49	7.2	e3.8	7.2	8.5	14	10	70	7.9	2.9	3.7
11	7.4	20	7.2	e4.0	8.1	8.0	12	54	115	7.5	2.8	3.6
12	7.1	16	7.0	e3.8	e6.5	8.1	11	233	48	7.1	211	3.5
13	7.0	14	7.0	e3.6	e5.5	8.2	11	75	38	6.7	15	3.4
14	6.8	13	6.9	e3.8	5.7	8.9	11	50	33	6.2	10	3.3
15	6.9	12	6.9	e4.2	5.5	11	12	42	30	5.8	8.0	3.2
16	6.8	12	6.9	4.3	5.2	17	35	42	28	6.6	7.6	3.0
17	17	11	6.9	4.3	5.1	17	28	80	26	7.3	7.3	2.9
18	14	11	6.8	3.9	5.1	13	20	52	24	5.8	50	2.9
19	9.9	10	6.5	e3.8	4.9	12	17	43	22	5.8	16	2.9
20	8.9	9.9	6.4	4.0	4.8	12	15	38	21	7.8	8.5	2.9
21	8.5	9.7	e5.0	4.0	e4.4	11	14	48	19	5.8	6.8	2.9
22	7.8	9.5	e4.6	4.6	e4.2	11	19	43	19	5.5	6.1	2.9
23	7.6	9.1	e5.0	4.5	e4.4	10	32	37	39	5.4	47	2.8
24	7.3	8.9	e5.5	4.1	4.5	9.7	25	33	24	5.2	12	2.7
25	7.1	8.9	e6.0	3.9	4.8	9.3	22	30	20	4.9	8.6	2.7
26	6.9	8.5	6.4	3.9	4.7	9.2	20	27	19	4.9	7.0	2.8
27	6.9	8.5	6.4	4.0	5.4	9.1	19	25	18	4.9	6.2	4.6
28	6.8	8.4	6.2	4.0	5.5	9.3	17	23	17	4.5	5.8	3.4
29	7.1	8.5	5.5	3.8	---	8.7	15	21	15	4.1	5.6	3.1
30	6.8	8.4	e4.6	3.7	---	8.6	14	20	15	3.8	5.5	3.0
31	6.5	---	e3.4	3.7	---	8.7	---	21	---	12	5.3	---
TOTAL	255.6	337.9	204.4	120.9	176.2	287.9	472.5	1157	937	233.9	489.3	108.1
MEAN	8.25	11.3	6.59	3.90	6.29	9.29	15.8	37.3	31.2	7.55	15.8	3.60
MAX	28	49	8.2	4.6	12	17	35	233	115	14	211	5.2
MIN	2.6	6.6	3.4	3.0	4.2	5.0	7.9	10	15	3.8	2.8	2.7
AC-FT	507	670	405	240	349	571	937	2290	1860	464	971	214
CFSM	.45	.61	.36	.21	.34	.50	.86	2.03	1.70	.41	.86	.20
IN.	.52	.68	.41	.24	.36	.58	.96	2.34	1.89	.47	.99	.22

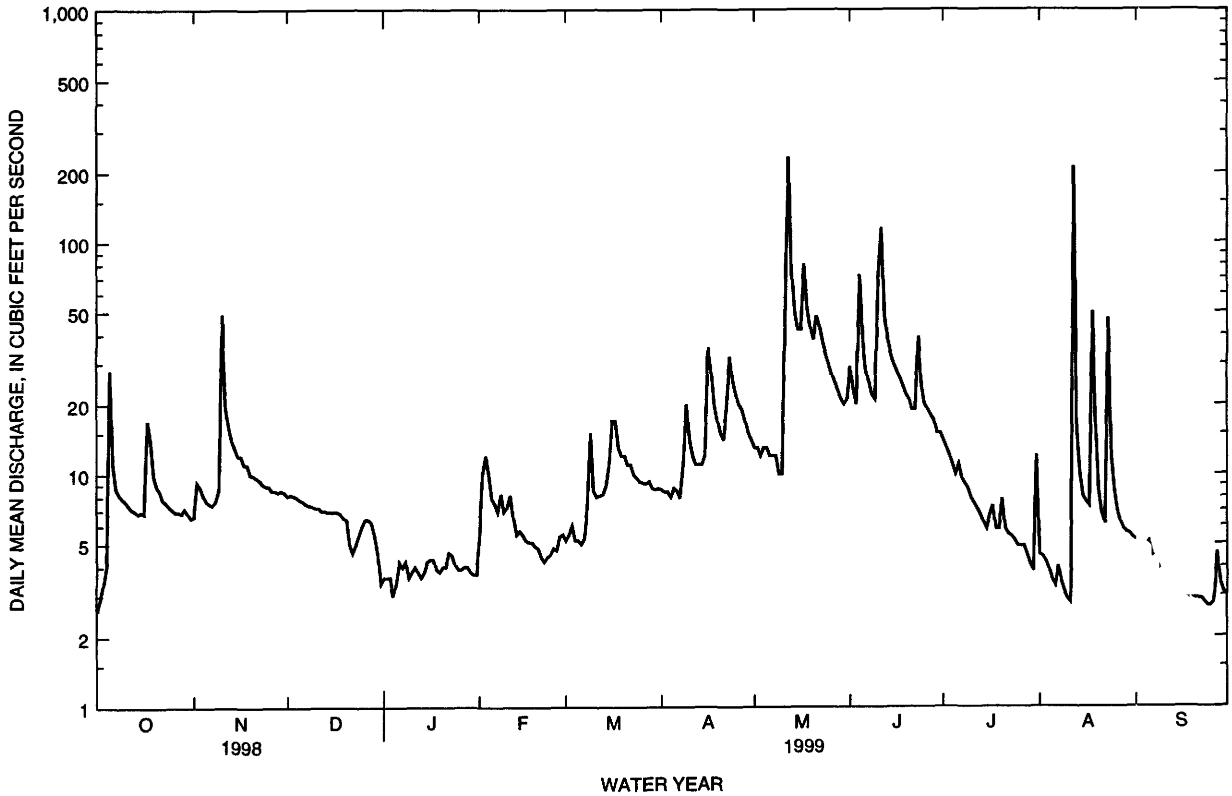
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4.97	6.29	5.01	4.89	28.2	13.9	18.6	43.6	35.7	14.4	7.40	2.20
MAX	8.91	11.3	9.33	9.52	65.0	32.1	45.4	65.7	83.0	34.3	15.8	3.80
(WY)	1998	1999	1998	1998	1996	1998	1998	1996	1998	1998	1999	1998
MIN	.90	1.44	1.31	1.72	6.29	5.14	4.40	25.9	12.5	7.55	2.90	1.03
(WY)	1996	1996	1996	1996	1999	1996	1996	1997	1997	1999	1997	1995

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1995 - 1999	
ANNUAL TOTAL	9228.2		4780.7			
ANNUAL MEAN	25.3		13.1		15.9	
HIGHEST ANNUAL MEAN					25.4	1998
LOWEST ANNUAL MEAN					8.76	1997
HIGHEST DAILY MEAN	847	Jun 18	233	May 12	847	Jun 18 1998
LOWEST DAILY MEAN	2.6	Sep 30	2.6	Oct 1	.30	Jan 7 1996
ANNUAL SEVEN-DAY MINIMUM	2.7	Sep 25	2.8	Sep 20	.54	Jan 3 1996
INSTANTANEOUS PEAK FLOW			1080	Aug 12	7020	Jun 18 1998
INSTANTANEOUS PEAK STAGE			11.05	Aug 12	13.94	Jun 18 1998
INSTANTANEOUS LOW FLOW			1.5	Mar 8		
ANNUAL RUNOFF (AC-FT)	18300		9480		11500	
ANNUAL RUNOFF (CFSM)	1.37		.71		.86	
ANNUAL RUNOFF (INCHES)	18.66		9.67		11.73	
10 PERCENT EXCEEDS	49		26		37	
50 PERCENT EXCEEDS	12		7.8		7.3	
90 PERCENT EXCEEDS	5.0		3.7		1.2	

e Estimated

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued



05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1995 to current year.
WATER TEMPERATURES: May 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1995 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, 620 microsiemens Oct. 2, 1995; minimum daily, 170 microsiemens May 24, 1996.
WATER TEMPERATURES: Maximum daily, 32.0°C July 29, 1999; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,270 mg/L May 24, 1996; minimum daily mean, 6.0 mg/L Apr. 22, 1996.
SEDIMENT LOADS: Maximum daily, 11,400 tons June 18, 1998; minimum daily, 0.01 tons Jan. 6, 7, 1996.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 581 microsiemens July 25; minimum daily, 250 microsiemens May 11.
WATER TEMPERATURES: Maximum daily, 32.0°C July 29, 30; minimum daily, 0.0°C Dec. 20-25, Dec. 29 to Jan. 10, Feb. 12 and Mar. 5.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,820 mg/L May 12; minimum daily mean, 11.0 mg/L Sept. 17.
SEDIMENT LOADS: Maximum daily, 2,290 tons May 12; minimum daily, 0.08 tons Sept. 17.

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	480	507	523	494	499	434	---	290	448	554	489
2	---	537	496	475	456	512	476	480	535	426	530	551
3	---	504	501	534	466	540	467	518	484	551	520	514
4	---	517	508	578	524	509	478	455	296	542	552	---
5	---	527	559	524	524	470	499	511	528	504	554	---
6	---	508	471	533	527	---	496	546	534	532	563	538
7	---	505	500	526	521	475	486	434	527	456	---	532
8	---	509	571	494	488	508	499	---	528	546	---	520
9	---	532	513	555	506	496	538	467	538	437	487	544
10	---	---	479	529	519	482	538	500	461	---	491	---
11	---	534	434	529	490	475	553	250	501	---	496	---
12	440	509	---	565	532	497	512	450	---	---	304	---
13	474	---	475	561	---	---	534	513	524	---	546	539
14	493	---	485	536	468	498	516	523	537	---	---	416
15	443	506	474	537	492	469	518	---	535	---	543	465
16	440	467	524	539	475	514	524	522	531	---	531	475
17	---	502	545	513	499	500	---	464	528	---	536	530
18	572	495	519	515	465	451	520	524	527	534	389	520
19	542	505	501	513	459	443	493	528	---	487	552	534
20	483	461	493	506	473	---	487	527	---	558	468	539
21	575	491	541	466	458	523	453	448	443	542	---	458
22	505	554	559	---	427	449	529	525	529	512	469	---
23	501	519	550	---	506	417	532	529	507	473	538	---
24	461	514	504	536	511	425	522	528	538	548	542	---
25	536	511	534	514	484	434	517	533	532	581	491	---
26	444	509	482	435	491	401	509	505	---	---	540	469
27	483	456	443	475	---	---	484	466	523	517	475	536
28	462	516	544	495	---	511	510	510	535	554	538	575
29	517	521	502	484	---	503	504	---	420	554	518	520
30	496	527	543	467	---	453	486	---	475	519	411	512
31	---	---	541	500	---	482	---	519	---	524	507	---

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	10.5	10.0	.0	3.0	9.0	15.0	---	19.5	20.5	25.0	24.0
2	---	10.0	10.5	.0	4.5	4.0	14.5	17.5	18.5	19.5	24.0	26.0
3	---	8.5	12.0	.0	4.5	4.0	---	19.5	18.5	24.0	27.0	24.0
4	---	8.0	14.5	.0	9.0	5.5	14.0	16.0	18.5	24.0	26.0	---
5	---	6.5	11.5	.0	6.5	.0	10.0	13.5	21.5	28.0	26.0	---
6	---	7.0	5.5	.0	4.5	---	15.0	15.0	20.0	25.0	25.0	24.0
7	---	4.5	5.0	.0	8.0	4.0	19.0	11.5	22.0	24.0	---	25.0
8	---	6.0	5.0	---	9.5	.5	10.5	---	23.5	26.0	---	24.0
9	---	7.0	6.0	---	8.0	1.0	9.0	17.0	23.5	24.0	26.0	19.0
10	---	---	5.0	.0	9.0	4.5	11.0	20.0	18.5	---	29.0	---
11	---	9.0	5.0	.5	2.0	7.0	9.0	16.0	19.0	---	24.0	---
12	---	9.5	---	.0	.0	4.5	15.5	11.0	---	---	23.0	---
13	13.5	---	4.5	.0	---	---	13.0	11.5	16.5	---	20.0	16.0
14	12.5	---	5.5	.5	7.0	8.0	11.5	15.5	19.5	---	---	19.0
15	15.0	9.0	5.5	.5	9.5	9.0	7.0	---	15.0	---	25.0	16.0
16	18.0	9.0	5.5	.5	3.0	12.0	4.5	19.0	18.0	---	25.0	19.0
17	---	10.0	4.0	.5	4.5	10.0	---	14.5	19.0	---	25.0	19.0
18	14.5	10.0	6.0	.5	3.0	9.5	13.5	16.5	18.5	27.0	21.0	19.0
19	14.0	6.5	1.0	.5	5.0	10.0	15.0	17.0	---	27.0	22.0	18.0
20	10.5	5.0	.0	.5	3.5	---	14.5	15.0	---	29.0	23.0	16.0
21	13.0	6.0	.0	.5	4.0	9.0	13.0	15.5	21.5	30.0	---	10.5
22	11.5	6.5	.0	---	1.0	7.5	10.0	18.5	21.0	31.0	23.0	---
23	12.5	9.5	.0	---	1.5	10.0	10.0	15.0	21.5	27.0	23.0	---
24	12.5	8.5	.0	.5	4.5	9.5	15.0	16.0	23.0	30.0	21.0	---
25	14.5	10.0	.0	1.0	6.5	9.5	12.5	16.5	22.5	26.0	24.0	---
26	15.5	8.0	.5	1.0	3.5	10.0	12.5	18.0	---	---	25.0	16.0
27	16.5	10.0	1.0	1.0	---	---	12.5	19.0	20.5	29.0	26.0	16.0
28	15.0	12.0	1.0	2.0	---	11.0	13.0	19.5	19.0	31.0	27.0	16.0
29	17.0	15.5	.0	2.0	---	12.0	16.5	---	18.5	32.0	22.0	15.0
30	13.5	10.5	.0	2.0	---	14.5	17.5	---	20.5	32.0	24.0	17.0
31	---	---	.0	1.0	---	11.5	---	18.0	---	26.0	24.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

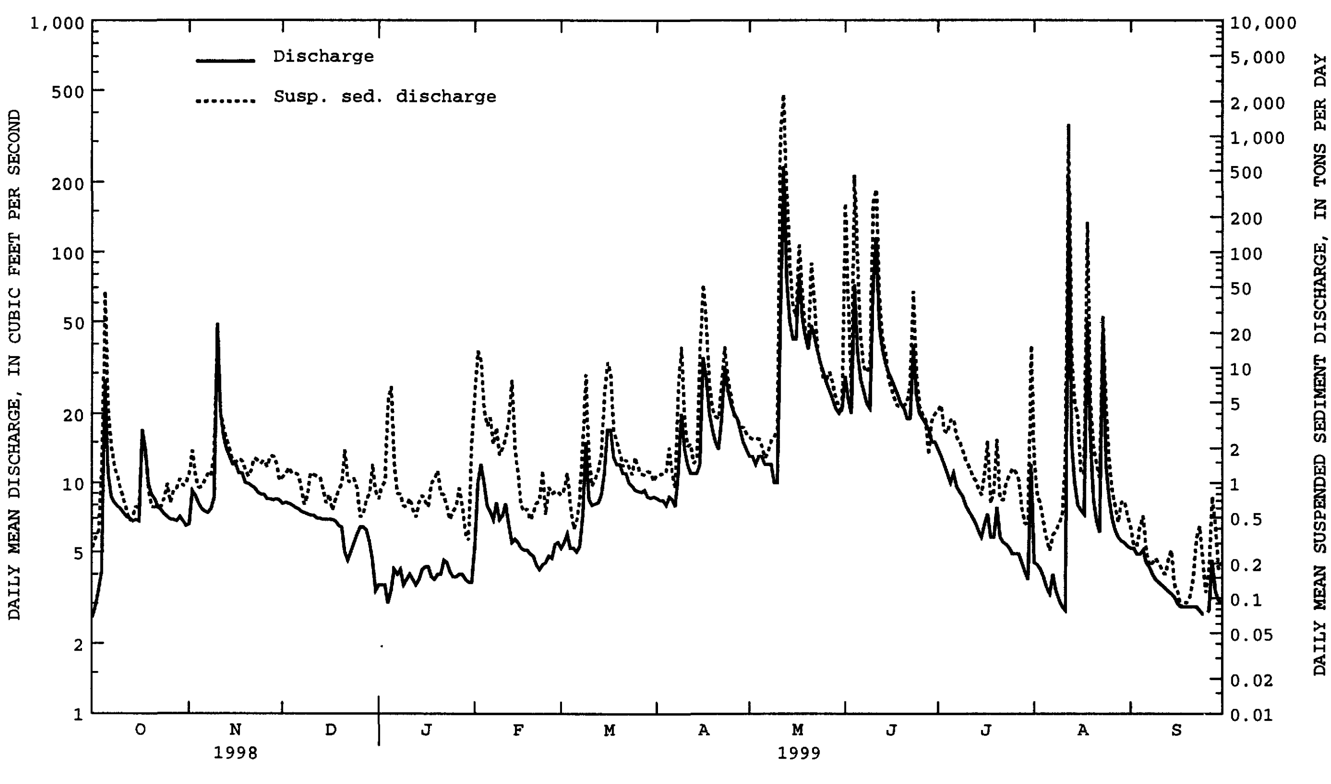
DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	40	.27	67	1.2	51	1.1	43	.42	396	5.8	56	.78
2	41	.33	76	1.9	54	1.2	50	.49	504	14	59	.87
3	41	.38	47	1.1	59	1.3	49	.48	348	11	73	1.2
4	71	1.4	42	.91	57	1.2	132	1.1	139	4.3	46	.64
5	472	45	44	.92	54	1.2	125	1.1	141	3.1	28	.40
6	154	4.4	52	1.1	57	1.2	74	.84	178	3.7	34	.46
7	91	2.2	60	1.2	45	.90	60	.65	116	2.2	51	.72
8	64	1.4	55	1.1	32	.64	61	.69	132	3.0	104	2.2
9	53	1.1	70	1.8	40	.79	50	.49	93	1.7	209	8.7
10	44	.90	143	22	60	1.2	51	.52	99	2.0	75	1.7
11	36	.72	77	4.1	61	1.2	59	.64	110	2.4	43	.94
12	30	.57	70	3.0	60	1.1	47	.49	141	2.5	49	1.1
13	25	.46	62	2.4	59	1.1	43	.42	242	3.6	58	1.3
14	28	.51	54	1.9	47	.87	59	.60	127	1.9	72	1.8
15	33	.62	47	1.5	36	.67	65	.74	83	1.2	182	5.8
16	32	.58	49	1.5	43	.80	59	.68	46	.64	229	11
17	46	2.4	54	1.6	31	.57	53	.62	41	.56	192	9.2
18	47	1.8	53	1.5	39	.72	94	.99	43	.60	83	2.9
19	33	.88	48	1.3	49	.86	92	.95	36	.48	69	2.2
20	26	.62	41	1.1	56	.97	117	1.3	43	.55	58	1.8
21	27	.61	49	1.3	70	.94	73	.80	52	.61	47	1.4
22	30	.63	60	1.6	60	.74	64	.79	52	.59	56	1.6
23	30	.61	63	1.6	56	.75	51	.62	80	.95	50	1.4
24	37	.73	61	1.5	59	.88	43	.48	44	.53	45	1.2
25	51	.97	65	1.5	49	.79	53	.57	70	.91	66	1.7
26	36	.67	59	1.4	29	.50	59	.62	63	.80	55	1.4
27	45	.85	73	1.7	31	.54	82	.90	57	.83	48	1.2
28	48	.89	75	1.7	43	.73	57	.62	56	.84	47	1.2
29	56	1.1	65	1.5	54	.80	36	.37	---	---	54	1.3
30	51	.94	46	1.0	77	.96	32	.32	---	---	53	1.2
31	56	.99	---	---	46	.43	226	2.3	---	---	44	1.0
TOTAL	---	75.53	---	67.93	---	27.65	---	22.60	---	71.29	---	70.31

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	APRIL MEAN CONCENTRATION (MG/L)	APRIL LOAD (TONS/DAY)	MAY MEAN CONCENTRATION (MG/L)	MAY LOAD (TONS/DAY)	JUNE MEAN CONCENTRATION (MG/L)	JUNE LOAD (TONS/DAY)	JULY MEAN CONCENTRATION (MG/L)	JULY LOAD (TONS/DAY)	AUGUST MEAN CONCENTRATION (MG/L)	AUGUST LOAD (TONS/DAY)	SEPTEMBER MEAN CONCENTRATION (MG/L)	SEPTEMBER LOAD (TONS/DAY)
1	51	1.2	69	2.5	2290	262	111	4.2	128	1.6	30	.42
2	52	1.2	68	2.4	536	35	138	4.7	67	.79	21	.29
3	53	1.2	72	2.4	111	6.0	86	2.8	56	.64	21	.28
4	57	1.2	70	2.4	1380	456	92	2.7	43	.45	32	.42
5	85	2.0	59	2.1	697	76	126	3.5	34	.32	37	.51
6	51	1.2	50	1.6	232	18	116	3.6	29	.26	21	.25
7	42	.91	57	1.8	152	10	97	2.5	33	.35	16	.19
8	164	7.2	71	2.3	151	9.1	92	2.3	41	.38	19	.20
9	247	15	88	2.5	191	10	80	1.9	52	.44	21	.22
10	95	3.6	104	2.9	739	267	73	1.6	65	.51	20	.20
11	63	2.1	2550	1020	813	342	68	1.4	186	1.6	18	.18
12	71	2.2	2820	2290	310	41	63	1.2	1430	1260	17	.16
13	49	1.5	1620	334	177	18	58	1.0	271	12	23	.21
14	54	1.6	547	77	154	14	54	.90	186	5.0	29	.26
15	424	14	299	34	98	7.9	50	.78	167	3.6	15	.13
16	579	52	242	27	86	6.5	58	1.2	58	1.2	14	.11
17	318	25	506	114	77	5.3	108	2.3	62	1.2	11	.08
18	128	7.1	307	45	71	4.6	42	.66	1200	180	12	.09
19	96	4.5	183	21	76	4.6	53	.84	114	5.0	12	.09
20	92	3.8	163	17	85	4.7	106	2.4	91	2.1	13	.10
21	96	3.6	528	80	95	5.0	46	.72	77	1.4	19	.15
22	140	7.4	302	36	144	7.4	47	.70	66	1.1	43	.33
23	171	15	140	14	392	45	69	1.0	216	28	55	.42
24	121	8.1	119	11	137	8.9	81	1.1	144	5.0	30	.22
25	97	5.7	98	7.9	84	4.6	99	1.3	68	1.6	15	.11
26	71	3.8	108	8.0	78	3.9	95	1.2	46	.87	22	.17
27	71	3.7	135	9.2	73	3.5	81	1.1	37	.63	59	.76
28	68	3.0	112	7.1	38	1.7	49	.60	29	.45	47	.43
29	76	3.1	95	5.5	83	3.4	39	.44	44	.67	21	.18
30	71	2.7	84	4.6	100	4.0	44	.45	47	.70	24	.20
31	---	---	74	4.1	---	---	314	16	36	.51	---	---
TOTAL	---	204.61	---	4189.3	---	1685.1	---	67.09	---	1518.37	---	7.36

YEAR 8007.14



05471040 SQUAW CREEK NEAR COLFAX, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--July 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

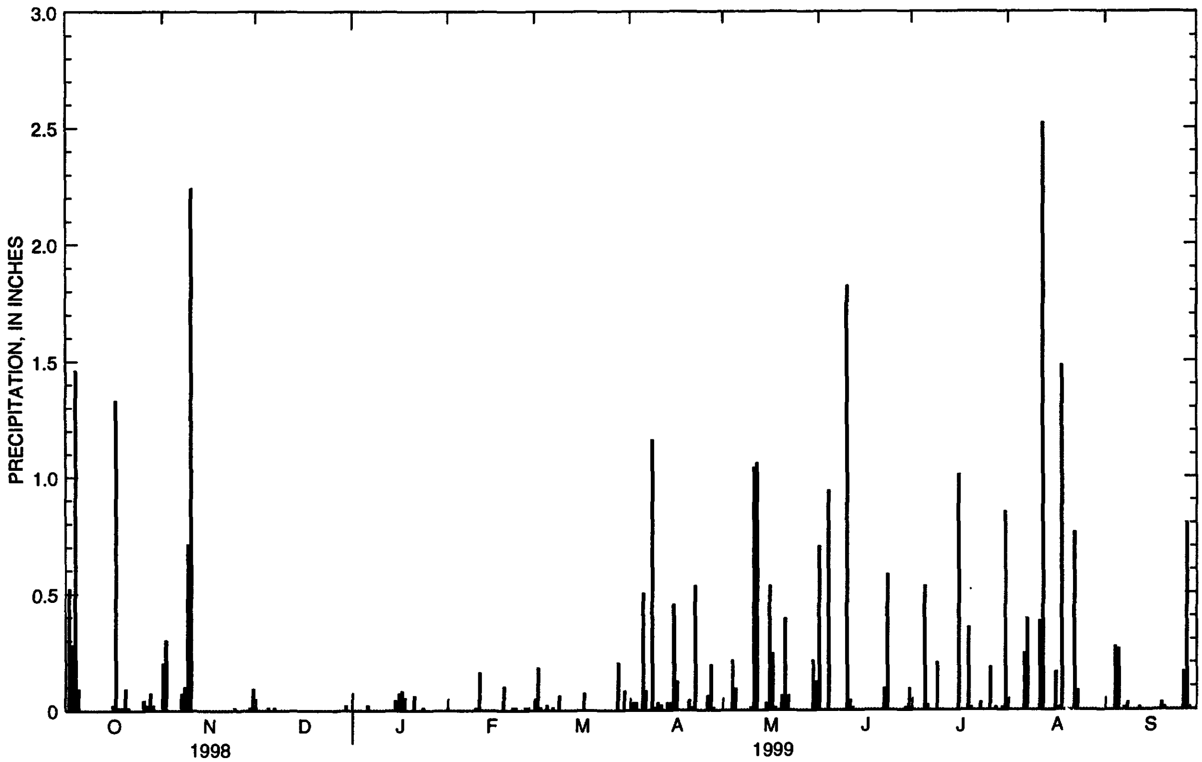
EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.69 in., July 17, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.52 in., Aug. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.20	.01	.00	.01	.00	.00	.00	.70	.01	.00	.00
2	.52	.30	.00	.00	.00	.18	.03	.00	.00	.00	.00	.00
3	.28	.00	.00	.00	.00	.01	.03	.00	.00	.00	.00	.00
4	1.46	.00	.00	.00	.00	.00	.00	.21	.94	.00	.00	.27
5	.09	.00	.01	.00	.00	.02	.50	.09	.00	.53	.00	.26
6	.00	.00	.00	.02	.00	.00	.08	.00	.00	.02	.24	.00
7	.00	.07	.01	.00	.00	.01	.00	.00	.00	.00	.39	.01
8	.00	.10	.00	.00	.00	.00	1.16	.00	.00	.00	.00	.03
9	.00	.71	.00	.00	.00	.06	.01	.00	.00	.20	.00	.00
10	.00	2.24	.00	.00	.01	.00	.03	.01	1.82	.00	.00	.00
11	.00	.00	.00	.00	.16	.00	.02	1.04	.04	.00	.38	.00
12	.00	.00	.00	.00	.00	.00	.00	1.06	.01	.00	2.52	.01
13	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00
15	.00	.00	.00	.04	.00	.00	.45	.03	.00	.00	.00	.00
16	.02	.00	.00	.07	.00	.00	.12	.53	.00	1.01	.16	.00
17	1.33	.00	.00	.08	.00	.07	.00	.24	.00	.00	.01	.00
18	.01	.00	.00	.05	.00	.00	.00	.01	.00	.00	1.48	.00
19	.01	.00	.00	.00	.10	.00	.00	.00	.00	.35	.00	.03
20	.09	.00	.00	.00	.00	.00	.04	.06	.00	.01	.00	.01
21	.01	.00	.00	.06	.00	.00	.01	.39	.00	.00	.00	.00
22	.00	.00	.00	.00	.01	.00	.53	.06	.09	.00	.76	.00
23	.00	.00	.00	.00	.01	.00	.00	.00	.58	.03	.08	.00
24	.00	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.04	.00	.00	.00	.01	.00	.06	.00	.00	.18	.00	.16
27	.02	.00	.00	.00	.01	.00	.19	.00	.00	.00	.00	.80
28	.07	.00	.00	.00	.00	.20	.01	.00	.00	.01	.00	.01
29	.02	.01	.00	.00	---	.00	.00	.00	.01	.00	.00	.00
30	.00	.09	.02	.00	---	.08	.00	.21	.09	.01	.00	.00
31	.00	---	.00	.00	---	.00	---	.12	---	.85	.00	---
TOTAL	3.97	3.73	0.05	0.33	0.32	0.63	3.33	4.06	4.28	3.21	6.02	1.59
MEAN	.13	.12	.00	.01	.01	.02	.11	.13	.14	.10	.19	.05
MAX	1.46	2.24	.02	.08	.16	.20	1.16	1.06	1.82	1.01	2.52	.80
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05471040 SQUAW CREEK NEAR COLFAX, IA--Continued



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05471050 SOUTH SKUNK RIVER AT COLFAX, IA

LOCATION.--Lat 41°40'55", long 93°14'47", in NE$^1/_4$ NE$^1/_4$ SW$^1/_4$ sec.1, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on left bank 15 ft downstream of bridge on State Highway 117 at north edge of Colfax, 1 mi downstream from Sugar Creek, 2.8 mi upstream from Indian Creek, and at mile 191 upstream from mouth of Skunk River.

DRAINAGE AREA.--803 mi^2.

PERIOD OF RECORD.--June 1974 to June 1977, (operated as a partial-record low-flow measurement site), October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 770.00 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published as miscellaneous water quality data in this report. U.S. Geological Survey data collection platform with telephone modem at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

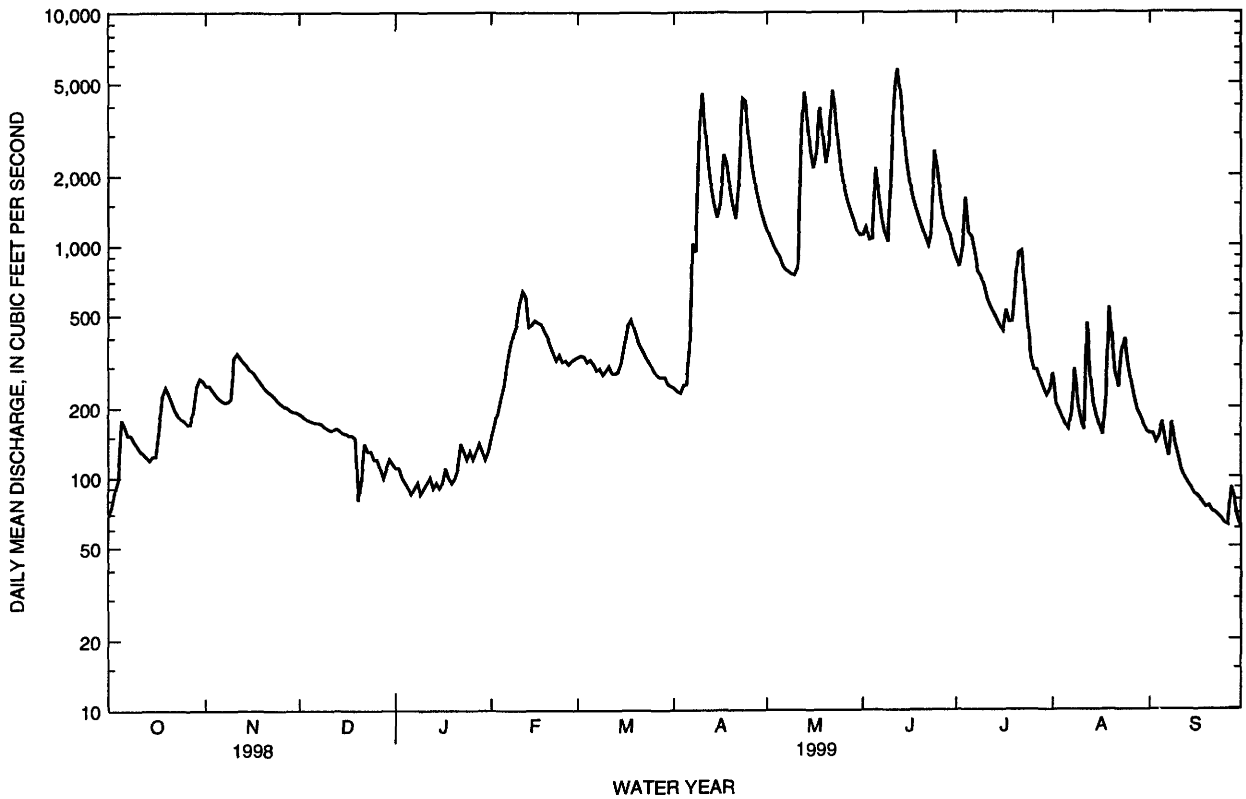
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	250	189	e110	e150	330	243	1160	1110	877	279	154
2	75	250	185	e110	e170	335	235	1080	1190	809	207	154
3	88	239	180	e100	e190	332	231	1000	1060	993	194	142
4	99	229	177	e95	e220	314	250	943	1070	1600	190	150
5	178	221	175	e90	e250	322	252	898	2150	1130	170	173
6	167	216	173	e85	304	309	357	827	1660	1080	162	140
7	153	212	173	e90	363	290	1020	790	1320	927	189	123
8	153	213	171	e95	416	295	941	773	1130	770	293	172
9	144	219	166	e85	451	278	2780	755	1040	734	206	140
10	138	329	163	e90	559	288	4530	747	1890	664	177	124
11	131	343	160	e95	637	302	3270	800	4400	582	160	108
12	127	329	161	e100	602	282	2290	2710	5730	542	462	100
13	123	316	163	e90	446	281	1780	4560	4550	511	275	94
14	119	307	160	e95	457	286	1500	3540	3130	480	207	90
15	124	293	156	e90	476	313	1320	2570	2300	451	181	85
16	124	287	155	e95	466	375	1530	2150	1880	427	167	83
17	161	273	152	e110	459	452	2460	2520	1630	523	152	80
18	226	262	152	e100	425	479	2250	3910	1450	468	221	77
19	245	251	148	e95	403	436	1760	3030	1310	470	540	74
20	230	242	e80	e100	371	396	1490	2260	1190	677	389	75
21	212	235	e100	e110	343	370	1310	2740	1090	e928	285	71
22	196	230	e140	e140	320	350	1930	4640	1000	e945	244	70
23	187	223	e130	e130	338	329	4310	3790	1150	e666	348	68
24	180	214	e130	e120	315	313	4190	2720	2550	e453	395	66
25	177	209	e120	e130	319	297	2970	2110	2130	e328	310	63
26	171	204	e120	e120	307	281	2260	1770	1580	291	260	62
27	170	201	e110	e130	318	271	1880	1560	1320	290	222	90
28	195	196	e100	e140	325	270	1630	1410	1210	263	195	82
29	248	193	e110	e130	---	270	1430	1290	1110	241	183	68
30	268	192	e120	e120	---	253	1280	1160	961	225	170	61
31	262	---	e115	e130	---	247	---	1110	---	238	158	---
TOTAL	5140	7378	4534	3320	10400	9946	53679	61323	55291	19583	7581	3039
MEAN	166	246	146	107	371	321	1789	1978	1843	632	245	101
MAX	268	343	189	140	637	479	4530	4640	5730	1600	540	173
MIN	69	192	80	85	150	247	231	747	961	225	152	61
AC-FT	10200	14630	8990	6590	20630	19730	106500	121600	109700	38840	15040	6030
CFSM	.21	.31	.18	.13	.46	.40	2.23	2.46	2.30	.79	.30	.13
IN.	.24	.34	.21	.15	.48	.46	2.49	2.84	2.56	.91	.35	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	344	317	286	183	368	819	957	1152	1485	1087	576	327
MAX	1807	981	626	451	849	2094	2435	2481	3844	5640	3549	1911
(WY)	1987	1997	1993	1992	1997	1993	1991	1991	1998	1993	1993	1993
MIN	11.9	17.5	12.4	12.3	16.2	168	62.1	182	96.7	31.8	12.6	6.75
(WY)	1989	1989	1989	1989	1990	1989	1989	1989	1988	1988	1988	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1986 - 1999	
ANNUAL TOTAL	296629		241214			
ANNUAL MEAN	813		661		659	
HIGHEST ANNUAL MEAN					1831	1993
LOWEST ANNUAL MEAN					69.6	1989
HIGHEST DAILY MEAN	8180	Jun 20	5730	Jun 12	13100	Jul 12 1993
LOWEST DAILY MEAN	69	Oct 1	61	Sep 30	1.4	Aug 18 1988
ANNUAL SEVEN-DAY MINIMUM	76	Sep 26	68	Sep 20	3.2	Sep 8 1988
INSTANTANEOUS PEAK FLOW			6070	Jun 12	14200	Jul 12 1993
INSTANTANEOUS PEAK STAGE			16.42	Jun 12	21.53	Jul 12 1993
INSTANTANEOUS LOW FLOW			59	Sep 26,30	1.2	Aug 18 1988a
ANNUAL RUNOFF (AC-FT)	588400		478400		477700	
ANNUAL RUNOFF (CFSM)	1.01		.82		.82	
ANNUAL RUNOFF (INCHES)	13.74		11.17		11.16	
10 PERCENT EXCEEDS	1730		1820		1590	
50 PERCENT EXCEEDS	329		270		296	
90 PERCENT EXCEEDS	120		100		42	

a Also Aug 19, 1988
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05471200 INDIAN CREEK NEAR MINGO, IA

LOCATION.--Lat 41°48'17", long 93°18'36", in $NW^1/_4$ $NW^1/_4$ sec.28, T.81 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on right bank 30 ft downstream from bridge on State Highway 117, 0.7 mi downstream from Wolf Creek, 2.2 mi upstream from Byers Branch, 2.9 mi northwest of Mingo, and 11.3 mi upstream from South Skunk River.

DRAINAGE AREA.--276 mi^2.

PERIOD OF RECORD.--May 1958 to September 1975; October 1985 to current year.

REVISED RECORDS.--WSP 1728: 1958 (M), 1959 (M).

GAGE.--Water-stage recorder. Datum of gage is 810.47 ft above sea level.

REMARKS.--Records good except those for 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. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 20, 1944, reached a stage of 21.4 ft, from information by local resident, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

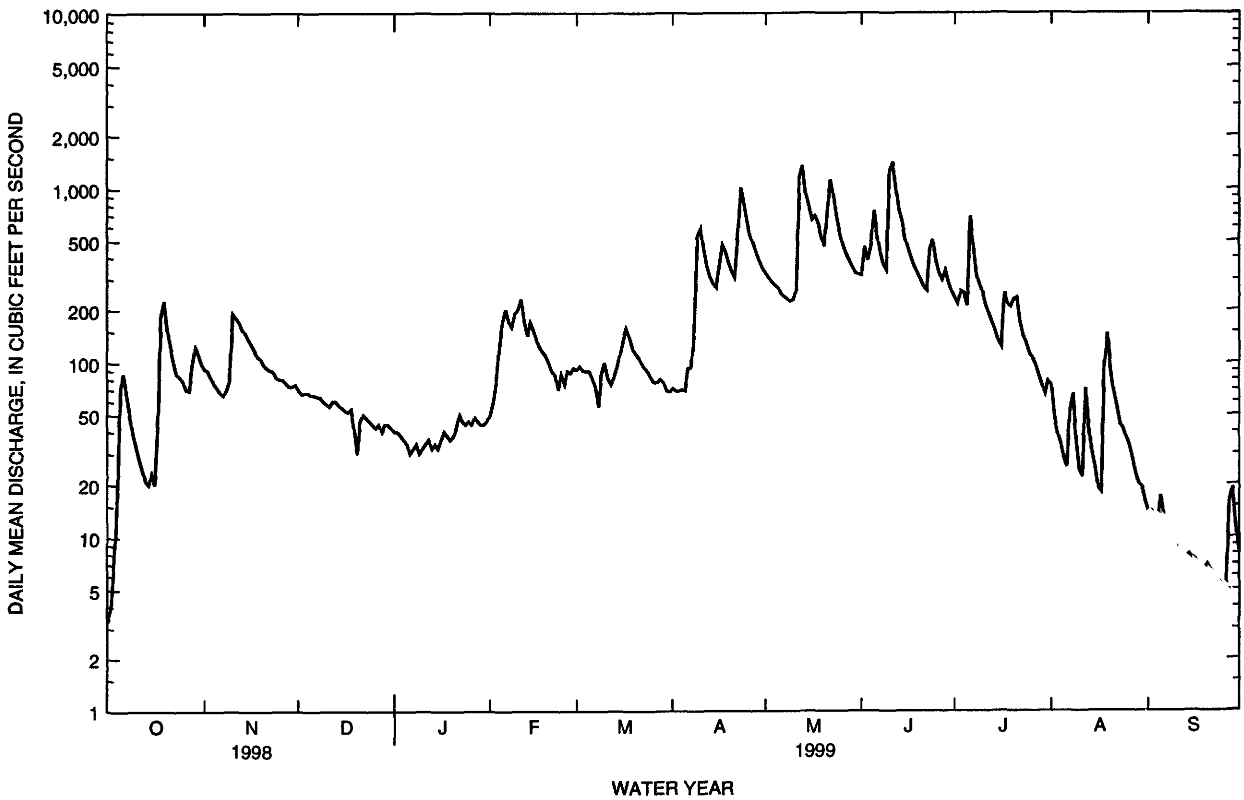
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	92	70	e40	e50	91	71	325	316	236	74	14
2	3.9	90	66	e40	e60	95	69	307	460	217	48	14
3	7.1	82	67	e38	e80	90	69	291	386	256	39	13
4	15	75	67	e36	e130	89	70	278	461	249	34	12
5	72	71	65	e34	e170	89	69	269	739	211	28	17
6	86	67	65	e30	201	82	93	248	535	690	25	13
7	64	65	64	e32	172	72	94	239	426	457	53	11
8	50	e70	63	e34	160	56	155	232	365	315	66	10
9	39	e80	60	e30	191	86	532	224	339	281	35	9.7
10	33	e190	58	e32	201	100	589	229	1240	248	24	8.7
11	28	e180	56	e34	231	82	446	265	1410	210	22	8.2
12	24	171	60	e36	175	75	356	1160	1020	189	71	7.5
13	21	155	60	e32	142	82	310	1340	748	169	43	7.5
14	20	147	57	e34	169	94	285	e920	643	151	31	7.9
15	23	135	55	e32	153	112	269	e780	514	132	25	7.6
16	20	126	53	e36	133	136	356	e660	450	122	19	7.4
17	47	116	52	e40	121	156	473	690	395	249	18	6.8
18	185	108	54	e38	114	138	431	631	353	215	95	6.5
19	225	105	e42	e36	109	119	374	531	322	208	146	6.5
20	152	97	e30	e38	99	112	334	465	298	230	e91	6.9
21	123	93	e46	e42	89	107	307	784	272	235	68	6.4
22	102	91	e50	e50	e85	99	523	1120	258	170	55	6.1
23	86	89	e48	e46	e70	93	1010	892	448	143	e44	5.5
24	83	82	e46	e44	e85	89	815	676	502	127	e42	5.5
25	78	80	e44	e46	e75	82	636	552	381	111	e37	5.0
26	70	80	e42	e44	89	77	537	472	324	105	33	5.1
27	69	76	e44	e48	87	77	480	421	297	97	28	16
28	96	73	e40	e46	93	80	423	385	335	85	23	19
29	122	73	e44	e44	---	77	381	351	285	75	20	12
30	112	75	e44	e44	---	69	346	325	253	66	19	8.2
31	99	---	e42	e46	---	68	---	320	---	78	16	---
TOTAL	2158.3	3034	1654	1202	3534	2874	10903	16382	14775	6327	1372	284.0
MEAN	69.6	101	53.4	38.8	126	92.7	363	528	492	204	44.3	9.47
MAX	225	190	70	50	231	156	1010	1340	1410	690	146	19
MIN	3.3	65	30	30	50	56	69	224	253	66	16	5.0
AC-FT	4280	6020	3280	2380	7010	5700	21630	32490	29310	12550	2720	563
CFSM	.25	.37	.19	.14	.46	.34	1.32	1.91	1.78	.74	.16	.03
IN.	.29	.41	.22	.16	.48	.39	1.47	2.21	1.99	.85	.18	.04

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	111	100	81.3	62.3	125	313	289	384	509	324	159	86.3
MAX	689	549	319	289	619	816	834	936	1732	2809	1500	678
(WY)	1987	1973	1973	1973	1971	1993	1965	1974	1998	1993	1993	1993
MIN	1.11	4.12	2.05	1.87	2.25	10.9	8.07	5.58	10.9	3.49	1.44	.91
(WY)	1972	1968	1990	1968	1967	1968	1989	1967	1989	1988	1988	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1959 - 1999	
ANNUAL TOTAL	114326.2		64499.3			
ANNUAL MEAN	313		177		212	
HIGHEST ANNUAL MEAN					751	1993
LOWEST ANNUAL MEAN					11.9	1989
HIGHEST DAILY MEAN	4800	Jun 19	1410	Jun 11	12000	Jul 10 1993
LOWEST DAILY MEAN	3.3	Oct 1	3.3	Oct 1	.01	Aug 18 1989
ANNUAL SEVEN-DAY MINIMUM	5.4	Sep 27	5.8	Sep 20	.15	Aug 16 1989
INSTANTANEOUS PEAK FLOW			1880	Jun 10	23500	Jun 4 1991
INSTANTANEOUS PEAK STAGE			9.94	Jun 10	19.16	Jun 4 1991
INSTANTANEOUS LOW FLOW			3.2	Oct 1		
ANNUAL RUNOFF (AC-FT)	226800		127900		153800	
ANNUAL RUNOFF (CFSM)	1.13		.64		.77	
ANNUAL RUNOFF (INCHES)	15.41		8.69		10.45	
10 PERCENT EXCEEDS	699		458		498	
50 PERCENT EXCEEDS	102		85		75	
90 PERCENT EXCEEDS	23		19		4.8	

e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA

LOCATION.--Lat 41°21'21", long 92°39'24", in $NW^1/_4$ $SW^1/_4$ sec.25, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080105, on left bank downstream from bridge on U.S. Highway 63, 0.3 mi downstream from Painter Creek, 4.0 mi north of Oskaloosa, 52.0 mi upstream from confluence with North Skunk River, and at mile 147.3 upstream from mouth of Skunk River. Gage was moved to the left bank on downstream side of the Highway 63 bridge on May 3, 1995.

DRAINAGE AREA.--1,635 mi^2.

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as "Skunk River near Oskaloosa." Prior to October 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WDR IA-95-1: Location.

GAGE.--Water-stage recorder. Datum of gage is 685.50 ft above sea level. Prior to Nov. 21, 1947, nonrecording gage at site 400 ft downstream at same datum. Accubar pressure sensor installed at site on May 3, 1995.

REMARKS.--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 May 1944 reached a stage of 25.8 ft, from floodmarks, discharge, 37,000 ft^3/s, from rating curve extended above 18,000 ft^3/s on basis of velocity-area study.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	204	651	463	e180	e340	777	585	2490	e2390	e1530	552	270
2	210	815	460	e190	e400	773	580	2300	e2720	e1440	528	251
3	258	850	441	e210	e550	767	605	2190	e2520	e1410	444	240
4	358	714	431	e190	e850	734	756	2100	e2530	e1350	408	227
5	2200	643	422	e180	e750	716	689	2110	e3060	e1300	381	222
6	1180	604	412	e190	e700	711	733	1940	e3710	e1250	360	229
7	821	577	410	e210	e800	648	832	1820	3030	e1200	371	224
8	665	586	407	e230	972	606	1840	1780	e2700	e1150	396	207
9	592	613	413	e210	1050	560	2850	1710	e2420	e1300	465	201
10	530	1160	409	e220	1010	646	4860	1650	2490	e1150	399	199
11	491	1270	412	e220	1260	674	5400	1730	5240	e1100	346	198
12	457	1140	408	e220	1400	657	4120	2720	6780	e1050	1130	202
13	426	1020	410	e210	1160	629	3300	6200	7110	e1000	1280	185
14	409	953	404	e210	969	639	2830	6940	6410	e1000	643	171
15	389	885	399	e210	944	696	2560	5970	4870	e950	470	165
16	386	840	397	e220	953	866	2890	5100	3770	902	401	157
17	2050	785	391	e230	889	1100	3340	5350	3230	905	364	151
18	1730	e750	390	e220	860	1110	3940	6160	2860	1030	367	147
19	1160	701	376	e250	825	1060	3520	6540	2580	e1010	918	149
20	1060	652	356	e280	782	965	3050	5430	2380	e1200	964	145
21	891	616	e270	e340	713	887	2700	e4860	2210	e1160	725	142
22	772	599	e210	e380	652	836	2610	5400	e2210	e1070	548	139
23	685	586	e180	e480	613	792	4670	6580	e2360	e901	610	136
24	634	557	e200	e380	654	755	6170	5730	e2780	e799	581	133
25	589	546	e230	e340	627	719	5780	4400	e3630	e732	603	126
26	537	523	e250	e290	639	677	4530	3590	e2870	e667	508	125
27	528	500	e230	e320	926	652	3930	3120	e2270	e627	444	146
28	527	491	e250	e360	838	652	3570	2790	e1920	e637	393	213
29	593	484	e230	e340	---	645	3070	e2620	e1790	e571	350	188
30	663	475	e210	e300	---	628	2720	e2460	e1610	523	316	160
31	676	---	e190	e320	---	595	---	e2350	---	488	286	---
TOTAL	22671	21586	10661	8130	23126	23172	89030	116130	96450	31402	16551	5448
MEAN	731	720	344	262	826	747	2968	3746	3215	1013	534	182
MAX	2200	1270	463	480	1400	1110	6170	6940	7110	1530	1280	270
MIN	204	475	180	180	340	560	580	1650	1610	488	286	125
AC-FT	44970	42820	21150	16130	45870	45960	176600	230300	191300	62290	32830	10810
CFSM	.45	.44	.21	.16	.51	.46	1.82	2.29	1.97	.62	.33	.11
IN.	.52	.49	.24	.18	.53	.53	2.03	2.64	2.19	.71	.38	.12

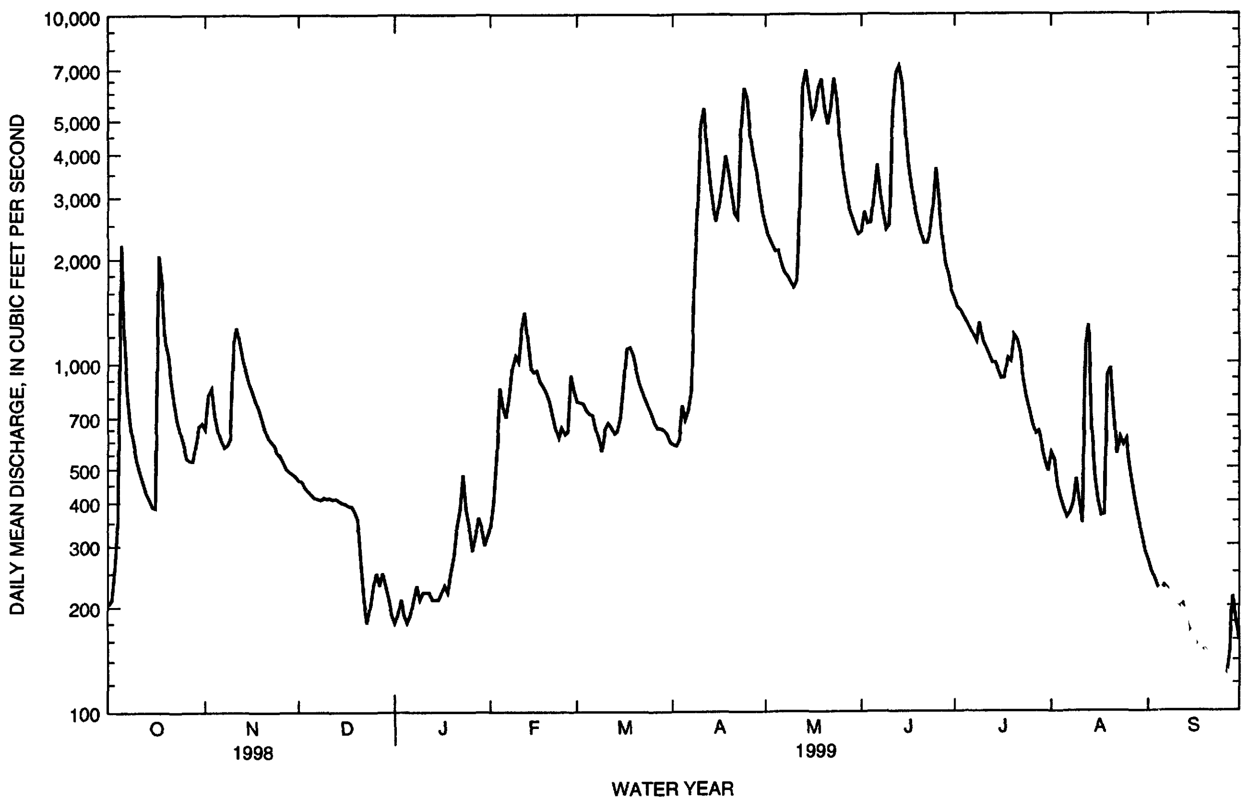
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	512	562	463	468	834	1625	1668	1735	2174	1446	672	479
MAX	3646	3576	2322	3906	3587	4841	5366	6168	9222	11770	7772	5140
(WY)	1987	1984	1983	1973	1973	1979	1983	1974	1947	1993	1993	1993
MIN	8.47	14.5	7.55	5.30	42.9	45.9	42.1	74.2	39.4	27.3	43.3	27.8
(WY)	1957	1957	1956	1956	1954	1954	1956	1956	1977	1977	1988	1956

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1946 - 1999	
ANNUAL TOTAL	709286		464357			
ANNUAL MEAN	1943		1272		1053	
HIGHEST ANNUAL MEAN					3884	1993
LOWEST ANNUAL MEAN					40.1	1956
HIGHEST DAILY MEAN	11700	Jun 24	7110	Jun 13	20400	Jul 15 1993
LOWEST DAILY MEAN	180	Dec 23	125	Sep 26	1.8	Oct 11 1956a
ANNUAL SEVEN-DAY MINIMUM	218	Sep 26	135	Sep 20	2.0	Oct 7 1956
INSTANTANEOUS PEAK FLOW			7220	Jun 13	20700	Jul 15 1993
INSTANTANEOUS PEAK STAGE			19.09	Jun 13	24.78	Jul 15 1993
INSTANTANEOUS LOW FLOW			119	Sep 25		
ANNUAL RUNOFF (AC-FT)	1407000		921100		762800	
ANNUAL RUNOFF (CFSM)	1.19		.78		.64	
ANNUAL RUNOFF (INCHES)	16.14		10.57		8.75	
10 PERCENT EXCEEDS	4600		3160		2610	
50 PERCENT EXCEEDS	1030		665		462	
90 PERCENT EXCEEDS	366		210		56	

a Also Oct 12-13, 1956
e Estimated



05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA

LOCATION.--Lat 41°18'03", long 92°12'16", in NE$^{1}/_{4}$ SE$^{1}/_{4}$ sec.14, T.75 N., R.12 W., Keokuk County, Hydrologic Unit 07080106, on right bank 10 ft downstream from bridge on State Highway 149, 1.2 mi downstream from Cedar Creek, 2.2 mi south of Sigourney, 4.0 mi upstream from Bridge Creek, and 16.2 mi upstream from confluence with South Skunk River.

DRAINAGE AREA.--730 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946-47 (M).

GAGE.--Water stage recorder. Datum of gage is 651.53 ft above sea level. Prior to June 10, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those 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 May 1944 reached a stage of 22.8 ft, from floodmark, discharge, 14,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	111	551	378	e110	e310	655	345	1110	682	530	148	37
2	116	922	361	e120	e380	522	e335	996	946	504	149	35
3	169	1350	356	e140	e480	490	346	912	1350	e460	157	36
4	203	1000	350	e130	e600	479	370	978	996	e440	142	36
5	3360	745	342	e110	e550	450	393	2300	1050	e420	138	35
6	4390	634	338	e120	e500	442	430	1590	1350	e400	134	33
7	2790	567	340	e150	e550	402	440	1130	977	e380	136	31
8	1060	566	329	e170	644	375	430	1000	821	e360	135	35
9	709	661	321	e150	682	358	1220	932	1000	397	144	34
10	578	1320	325	e160	688	337	1660	856	1530	353	142	31
11	484	1670	321	e160	711	431	1360	1030	2170	303	128	30
12	419	1250	316	e160	995	419	1010	1680	1880	280	264	30
13	371	953	311	e150	888	401	850	2540	2850	262	689	31
14	334	832	311	e150	596	395	759	2640	2650	252	399	31
15	310	749	300	e150	585	421	729	1980	1490	239	176	32
16	298	677	295	e160	551	642	1150	1610	1150	224	113	32
17	1250	626	297	e170	488	1290	1470	1980	991	213	82	31
18	5420	e577	298	e160	439	1090	1280	2370	864	211	64	29
19	4900	550	295	e180	417	795	1050	2290	781	226	70	30
20	3950	514	e210	e200	406	641	922	1650	727	255	250	30
21	1390	478	e170	e230	382	568	868	1420	683	249	155	29
22	955	462	e130	e260	353	518	998	1390	681	231	89	29
23	804	458	e110	e410	338	480	2430	1430	829	206	75	28
24	682	439	e120	e340	331	450	2370	1280	1300	196	69	29
25	608	420	e140	e290	351	422	1740	1120	1210	187	69	29
26	558	409	e170	e250	351	396	1400	995	881	177	63	28
27	531	391	e160	e290	396	381	1590	909	738	169	57	33
28	553	381	e170	e320	735	382	2410	832	653	165	52	40
29	577	382	e150	e300	---	387	1690	753	624	183	48	41
30	808	404	e130	e290	---	374	1310	700	573	171	43	55
31	637	---	e120	e300	---	354	---	680	---	155	40	---
TOTAL	39325	20938	7964	6280	14697	15747	33355	43083	34427	8798	4420	990
MEAN	1269	698	257	203	525	508	1112	1390	1148	284	143	33.0
MAX	5420	1670	378	410	995	1290	2430	2640	2850	530	689	55
MIN	111	381	110	110	310	337	335	680	573	155	40	28
AC-FT	78000	41530	15800	12460	29150	31230	66160	85460	68290	17450	8770	1960
CFSM	1.74	.96	.35	.28	.72	.70	1.52	1.90	1.57	.39	.20	.05
IN.	2.00	1.07	.41	.32	.75	.80	1.70	2.20	1.75	.45	.23	.05

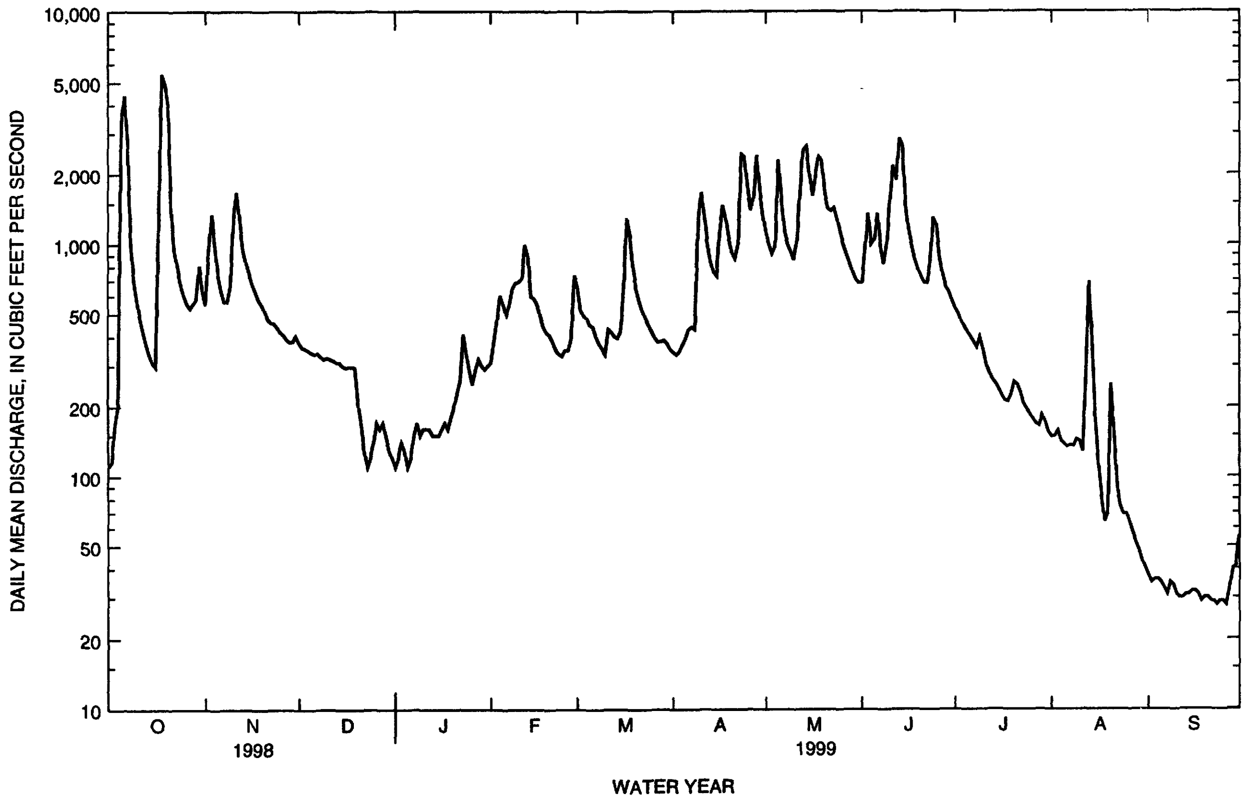
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	232	297	233	265	426	853	793	836	791	559	296	289
MAX	1603	1890	1208	1767	1311	2996	2826	4170	4145	5098	3668	2708
(WY)	1987	1962	1983	1946	1973	1979	1993	1974	1947	1993	1993	1993
MIN	.13	3.38	2.58	2.26	12.8	17.0	11.2	14.4	20.1	11.2	7.90	4.35
(WY)	1957	1957	1956	1954	1954	1954	1956	1956	1977	1977	1955	1956

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1946 - 1999	
ANNUAL TOTAL	355608		230024			
ANNUAL MEAN	974		630		489	
HIGHEST ANNUAL MEAN					2041	1993
LOWEST ANNUAL MEAN					27.7	1956
HIGHEST DAILY MEAN	5420	Oct 18	5420	Oct 18	23200	Mar 31 1960
LOWEST DAILY MEAN	103	Sep 13	28	Sep 23	.10	Oct 7 1956a
ANNUAL SEVEN-DAY MINIMUM	115	Sep 7	29	Sep 20	.10	Oct 7 1956
INSTANTANEOUS PEAK FLOW			6320	Oct 18	27500	Mar 31 1960
INSTANTANEOUS PEAK STAGE			18.88	Oct 18	25.33	Mar 31 1960
INSTANTANEOUS LOW FLOW			27	Sep 23,26		
ANNUAL RUNOFF (AC-FT)	705300		456300		354300	
ANNUAL RUNOFF (CFSM)	1.33		.86		.67	
ANNUAL RUNOFF (INCHES)	18.12		11.72		9.10	
10 PERCENT EXCEEDS	2430		1390		1200	
50 PERCENT EXCEEDS	697		401		175	
90 PERCENT EXCEEDS	161		64		18	

a Also Oct 7, 8 to Nov 15, 1956
e Estimated

05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA--Continued



05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA

LOCATION.--Lat. 40°55'20", long 91°40'10", in SE$^1/_4$ NW$^1/_4$ sec.28, T.71 N., R.7 W., Henry County, Hydrologic Unit 07080107, on left bank 30 ft upstream from bridge on county highway H46, 3.0 mi west of Oakland Mills, 2.9 mi upstream from Wolf Creek, and 4.3 mi upstream from mouth.

DRAINAGE AREA.--530 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. July 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 565.07 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional high-water measurements were made by U.S. Army Corps of Engineers in 1965, 1966, 1970, and 1974 and by U.S. Geological Survey in 1966 and 1967. 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 April 22, 1973 reached a stage of 24.09 ft, discharge not determined. Flood of June 1905 reached a stage approximately 2 feet higher from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	106	264	205	e42	e600	410	145	780	216	91	12	5.1
2	102	1170	191	e48	e850	278	e150	581	291	92	11	4.5
3	86	3270	158	e55	1130	244	143	481	237	78	11	4.5
4	236	2100	153	e65	838	218	319	435	268	65	9.6	4.5
5	2340	934	146	e75	589	191	414	1590	546	56	8.0	4.4
6	4490	583	306	e95	406	199	423	3170	694	49	7.7	4.1
7	4820	435	972	e90	392	195	606	993	562	43	8.9	3.8
8	5000	419	439	e110	350	157	308	625	465	40	9.2	4.4
9	1250	1160	288	e100	328	168	501	470	442	39	13	3.9
10	630	3080	252	e110	307	206	984	383	266	38	12	3.2
11	488	2600	258	e120	316	214	492	326	862	56	14	3.2
12	400	883	228	e120	639	210	353	346	664	46	22	3.9
13	343	605	205	e110	516	247	259	789	1110	31	14	4.8
14	301	535	183	e110	314	282	221	1110	1310	28	18	4.0
15	275	460	162	e110	281	365	330	683	475	27	19	4.0
16	253	372	147	e110	270	776	2900	810	269	25	17	5.4
17	1460	329	143	e120	231	1620	3610	3180	218	e24	12	4.4
18	4400	e280	141	e110	193	1620	1360	4130	187	e22	10	4.0
19	4100	250	133	e120	182	711	796	1800	160	e20	9.5	3.9
20	1710	235	125	e140	180	462	590	846	138	19	8.5	3.6
21	917	202	e80	e170	172	394	482	724	129	24	8.9	3.4
22	578	187	e65	e250	153	337	604	2350	113	21	7.6	3.2
23	457	184	e55	e550	147	289	3680	1420	152	30	7.8	3.1
24	387	176	e65	e440	150	257	3550	732	254	23	7.7	3.0
25	352	159	e75	e380	169	227	1220	514	371	18	7.1	2.9
26	323	154	e85	e340	165	204	764	410	178	15	7.4	2.8
27	290	149	e80	e380	279	190	973	341	129	14	6.7	7.4
28	309	135	e85	e440	529	189	2820	295	109	15	6.3	98
29	306	131	e70	e400	---	194	2520	260	100	14	5.8	136
30	349	150	e60	e380	---	176	1240	232	92	12	5.4	41
31	325	---	e50	e460	---	153	---	210	---	12	5.5	---
TOTAL	37383	21591	5605	6150	10676	11383	32757	31016	11007	1087	322.6	384.4
MEAN	1206	720	181	198	381	367	1092	1001	367	35.1	10.4	12.8
MAX	5000	3270	972	550	1130	1620	3680	4130	1310	92	22	136
MIN	86	131	50	42	147	153	143	210	92	12	5.4	2.8
AC-FT	74150	42830	11120	12200	21180	22580	64970	61520	21830	2160	640	762
CFSM	2.26	1.35	.34	.37	.72	.69	2.05	1.88	.69	.07	.02	.02
IN.	2.61	1.51	.39	.43	.75	.79	2.29	2.16	.77	.08	.02	.03

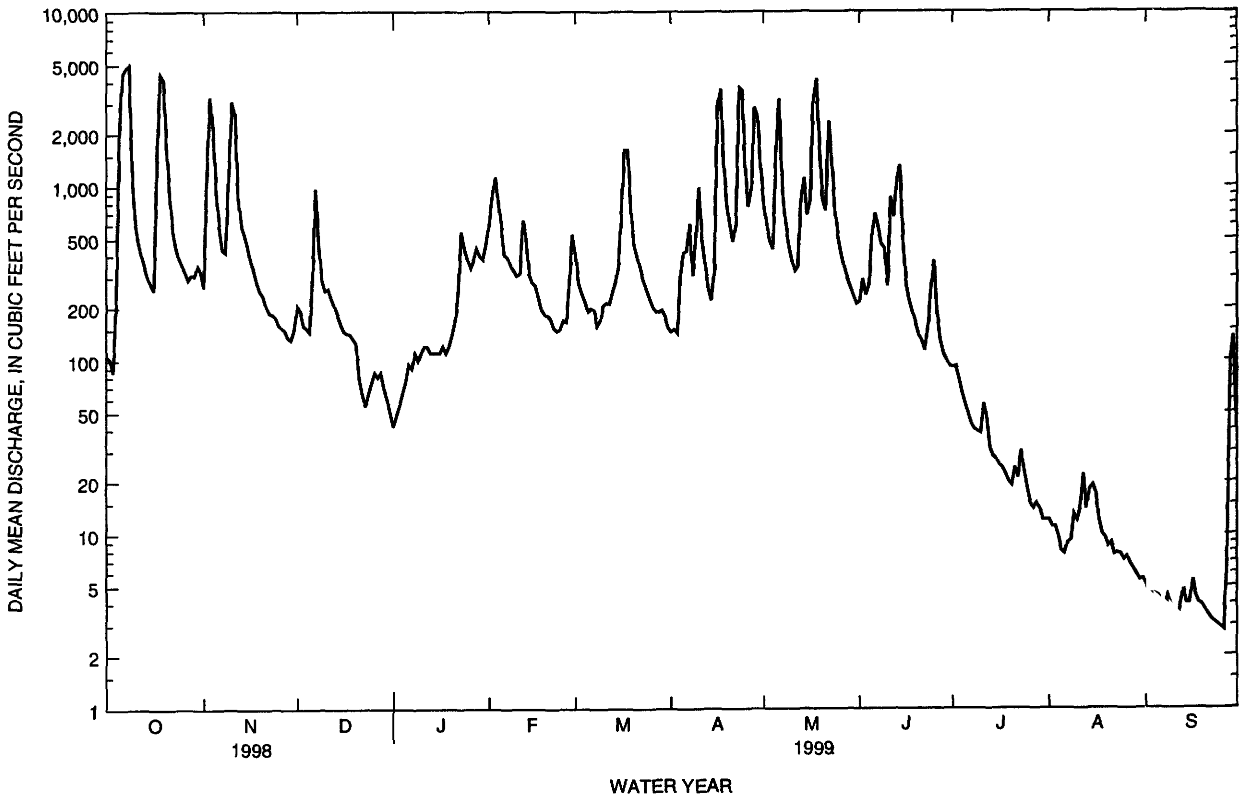
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	256	321	252	108	333	621	667	743	529	582	203	239
MAX	1711	1340	1364	545	1091	1987	1863	3116	2199	4565	2186	1245
(WY)	1987	1993	1983	1993	1985	1979	1983	1996	1990	1993	1993	1986
MIN	5.93	10.2	4.43	9.42	6.36	32.3	37.7	33.3	14.6	3.52	5.35	6.28
(WY)	1989	1990	1990	1997	1989	1989	1989	1988	1988	1988	1983	1991

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1978 - 1999	
ANNUAL TOTAL	295764		169362.0			
ANNUAL MEAN	810		464		405	
HIGHEST ANNUAL MEAN					1424	1993
LOWEST ANNUAL MEAN					73.0	1989
HIGHEST DAILY MEAN	6740	Apr 1	5000	Oct 8	11500	May 28 1996
LOWEST DAILY MEAN	10	Aug 26	2.8	Sep 26	.42	Sep 17 1988
ANNUAL SEVEN-DAY MINIMUM	12	Aug 21	3.1	Sep 20	.55	Sep 14 1988
INSTANTANEOUS PEAK FLOW			5490	Oct 8	12300	May 28 1996
INSTANTANEOUS PEAK STAGE			16.43	Oct 8	21.27	Jul 9 1993
INSTANTANEOUS LOW FLOW			2.5	Sep 26		
ANNUAL RUNOFF (AC-FT)	586600		335900		293300	
ANNUAL RUNOFF (CFSM)	1.52		.87		.76	
ANNUAL RUNOFF (INCHES)	20.64		11.82		10.32	
10 PERCENT EXCEEDS	2620		1110		960	
50 PERCENT EXCEEDS	343		205		86	
90 PERCENT EXCEEDS	55		7.7		8.7	

e Estimated

05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA--Continued



05473450 BIG CREEK NEAR MT. PLEASANT, IA

LOCATION.--Lat. 45°00'26", long 91°33'05", in $NW^1/_4$ $SE^1/_4$ sec.28, T.72 N., R.6 W., Henry County, Hydrologic Unit 07080107, on right bank 20 ft upstream from bridge on old U.S. highway 218 (Mt. Pleasant business route) about 2 miles north of Mt. Pleasant, 1.6 miles upstream from Brandy Wine Creek, and 2.3 miles upstream from Lynn Creek.

DRAINAGE AREA.--58 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. Oct. 1, 1997 to Sept. 30, 1998.

GAGE.--Water-stage recorder. Datum of gage is 643.00 ft above sea level.

REMARKS.--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.

EXTREMES OUTSIDE PERIOD OF RECORD.--None are known at this time.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	40	13	e5.5	e90	18	19	101	38	11	.68	.29
2	2.8	121	13	e6.0	206	18	17	79	178	10	.56	.29
3	3.6	159	15	e6.5	171	16	18	65	75	6.7	.42	.29
4	3.9	106	14	e7.5	131	14	17	56	66	5.3	.45	.27
5	365	74	13	e8.5	85	16	15	67	70	3.9	.39	.27
6	156	57	50	e11	74	17	27	60	48	3.2	.37	.27
7	65	45	183	e10	72	12	20	48	108	2.9	.48	.24
8	38	58	84	e12	64	15	21	39	46	2.5	.74	.22
9	27	133	54	e11	59	14	41	33	41	2.7	.49	.19
10	21	538	40	e12	49	14	35	32	34	2.5	.41	.20
11	16	272	33	e12	67	15	30	31	36	2.1	.41	.19
12	13	111	30	e12	96	14	22	31	71	1.8	1.2	.25
13	9.8	96	26	e11	50	16	19	69	192	1.6	.93	.28
14	9.3	85	21	e11	41	19	20	119	78	1.4	.56	.26
15	8.0	62	19	e12	42	32	41	76	49	1.3	.44	.25
16	7.8	57	18	e13	38	96	449	61	38	1.2	.43	.21
17	398	42	17	e14	31	117	265	184	32	1.1	.42	.19
18	1130	38	18	e13	29	65	142	158	26	.97	.44	.17
19	447	36	15	e13	26	41	100	86	24	1.1	.64	.17
20	144	28	9.7	e15	23	36	76	65	22	3.1	.55	.20
21	101	25	e10	e22	20	34	64	81	20	2.3	.43	.20
22	74	25	e9.0	e32	19	28	82	171	19	1.2	.39	.19
23	58	24	e10	e65	22	25	350	97	20	1.9	.62	.20
24	49	19	e11	e50	21	24	166	69	18	4.1	.98	.17
25	41	21	e12	e42	20	20	107	53	14	1.6	.68	.14
26	35	19	e13	e38	19	19	81	43	13	1.0	.53	.11
27	33	17	e11	e42	24	19	253	37	12	.88	.45	1.0
28	42	16	e9.5	e46	23	21	710	34	11	1.1	.42	31
29	40	16	e8.5	e42	---	19	291	31	10	1.0	.39	12
30	43	19	e7.5	e40	---	16	145	28	8.1	.71	.35	1.2
31	39	---	e6.5	e55	---	19	---	29	---	.63	.30	---
TOTAL	3424.8	2359	793.7	690.0	1612	849	3643	2133	1417.1	82.79	16.55	50.91
MEAN	110	78.6	25.6	22.3	57.6	27.4	121	68.8	47.2	2.67	.53	1.70
MAX	1130	538	183	65	206	117	710	184	192	11	1.2	31
MIN	2.8	16	6.5	5.5	19	12	15	28	8.1	.63	.30	.11
AC-FT	6790	4680	1570	1370	3200	1680	7230	4230	2810	164	33	101
CFSM	1.90	1.36	.44	.38	.99	.47	2.09	1.19	.81	.05	.01	.03
IN.	2.20	1.51	.51	.44	1.03	.54	2.34	1.37	.91	.05	.01	.03

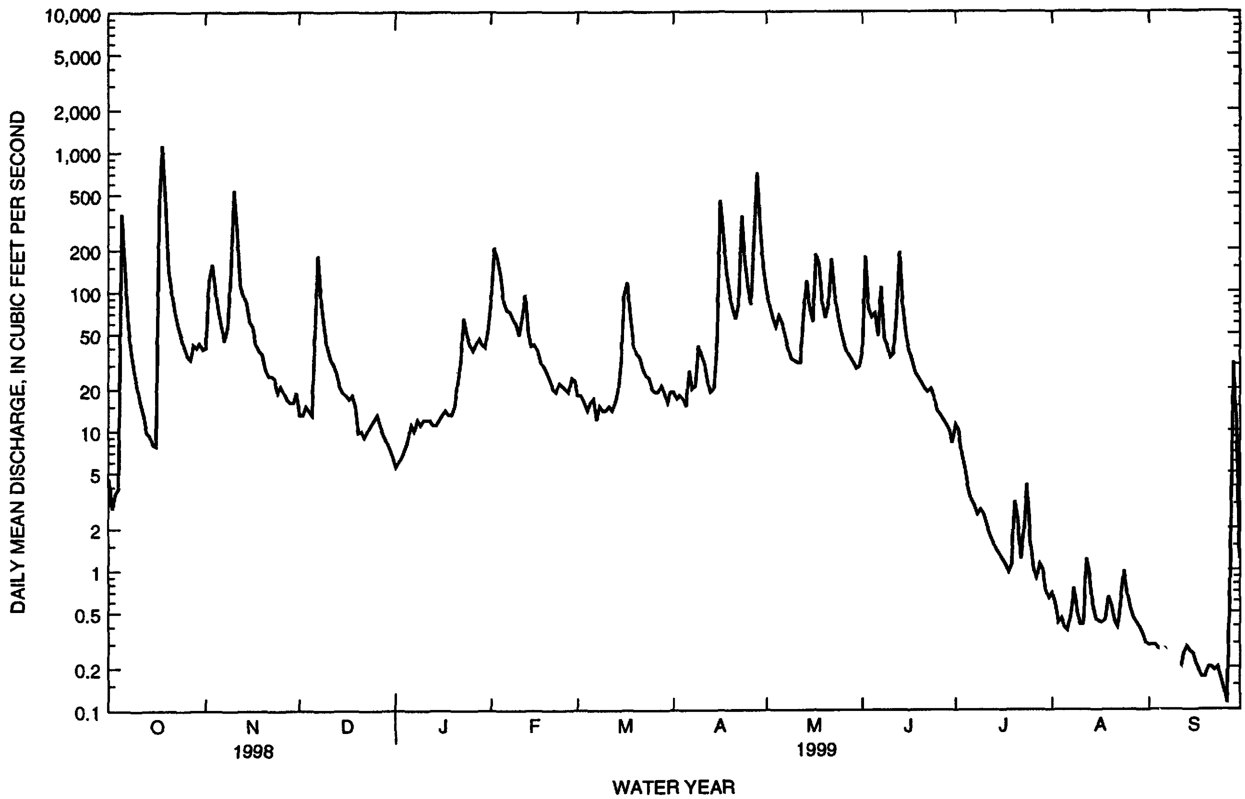
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	57.4	43.5	20.0	52.6	93.4	102	161	73.0	72.5	9.51	4.57	5.05
MAX	110	78.6	25.6	83.0	129	176	201	77.3	97.8	16.3	8.61	8.41
(WY)	1999	1999	1999	1998	1998	1998	1998	1998	1998	1998	1998	1998
MIN	4.31	8.36	14.4	22.3	57.6	27.4	121	68.8	47.2	2.67	.53	1.70
(WY)	1998	1998	1998	1999	1999	1999	1999	1999	1999	1999	1999	1999

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1997 - 1999	
ANNUAL TOTAL	30616.64		17071.85			
ANNUAL MEAN	83.9		46.8		57.5	
HIGHEST ANNUAL MEAN					68.1	1998
LOWEST ANNUAL MEAN					46.8	1999
HIGHEST DAILY MEAN	1600	Mar 31	1130	Oct 18	1600	Mar 31 1998
LOWEST DAILY MEAN	.81	Sep 10	.11	Sep 26	.11	Sep 26 1999
ANNUAL SEVEN-DAY MINIMUM	.88	Sep 7	.17	Sep 20	.17	Sep 20 1999
INSTANTANEOUS PEAK FLOW			1390	Oct 18	2280	Mar 31 1998
INSTANTANEOUS PEAK STAGE			9.98	Oct 18	11.97	Mar 31 1998
INSTANTANEOUS LOW FLOW			.09	Sep 26		
ANNUAL RUNOFF (AC-FT)	60730		33860		41620	
ANNUAL RUNOFF (CFSM)	1.45		.81		.99	
ANNUAL RUNOFF (INCHES)	19.64		10.95		13.46	
10 PERCENT EXCEEDS	174		101		131	
50 PERCENT EXCEEDS	39		19		20	
90 PERCENT EXCEEDS	1.8		.42		.60	

e Estimated

05473450 BIG CREEK NEAR MT. PLEASANT, IA--Continued



05474000 SKUNK RIVER AT AUGUSTA, IA

LOCATION.--Lat 40°45'13", long 91°16'40", in NE$^1/_4$ NE$^1/_4$ sec.26, T.69 N., R.4 W., Des Moines County, Hydrologic Unit 07080107, on left bank 300 ft upstream from bridge on State Highway 394 at Augusta, 2.0 mi upstream from Long Creek, and at mile 12.5.

DRAINAGE AREA.--4,303 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September to November 1913, October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1915 (M), 1919-27 (M), 1932-34 (M), 1936, 1937-38 (M), 1942 (M). WSP 1438: Drainage area. WDR IA-71-1: 1966 (M).

GAGE.--Water-stage recorder. Datum of gage is 521.24 ft above NGVD. Prior to Nov. 15, 1913, nonrecording gage at site 400 ft upstream at datum about 0.7 ft higher. May 27, 1915 to Jan. 14, 1935, nonrecording gage at site 400 ft upstream at present datum.

REMARKS.--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.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1903, reached a stage of about 21 ft, discharge, about 45,000 ft^3/s. Stage and discharge for flood of April 1973 are believed to be the greatest since 1851.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	825	3480	1850	e460	e2200	2350	1750	11400	4910	3660	963	630
2	853	4340	1860	e500	e3000	2580	e1700	8590	4930	3370	818	582
3	823	8200	1720	e600	5110	2370	1660	6790	4760	3040	745	539
4	821	9060	1640	e700	4610	2150	1760	5760	5210	2770	745	495
5	5200	6310	1610	e550	4120	2070	2610	5540	5680	2560	753	473
6	14900	4440	1980	e600	3590	2060	2480	9770	5580	2430	708	454
7	15800	3580	3790	e700	3440	1980	2800	8580	6250	2760	666	423
8	15900	3220	3060	e850	3230	1910	2660	5820	6320	2620	677	396
9	10900	3970	2420	e750	3050	1790	2830	4840	6310	2490	688	375
10	4750	10000	2080	e800	3030	1840	4880	4380	5580	2790	636	373
11	3420	11600	1930	e800	3220	1840	5840	4100	5720	2510	625	369
12	2800	7650	1870	e800	3870	1810	6070	3910	6890	2230	728	367
13	2380	5890	1770	e750	4200	2020	5810	4800	8110	2020	1420	353
14	2090	4840	1680	e750	3920	2130	5610	8010	9260	1820	1720	347
15	1870	4150	1590	e750	3350	2270	5800	8970	8840	1660	2100	344
16	1720	3680	1520	e800	2870	2870	11400	8640	7960	1540	1810	332
17	5880	3320	1470	e850	2660	4550	14800	12500	7430	1420	1210	324
18	15500	e3000	1430	e800	2530	7070	10900	15100	7410	1310	918	313
19	16700	2800	1430	e850	2370	6070	8070	13800	7210	1220	793	315
20	14800	2610	1360	e900	2240	4260	6870	10900	6490	1270	732	335
21	12600	2440	e1000	e950	2130	3490	6340	9950	5200	1650	706	286
22	9070	2280	e700	e1400	1990	3060	6160	11200	4290	1550	1100	272
23	5270	2180	e550	e2700	1900	2730	13700	11200	3940	1580	1360	266
24	3910	2100	e650	e2200	1810	2490	16900	9330	4080	1650	1140	261
25	3320	2030	e750	e1800	1750	2300	13200	8450	4750	1380	949	254
26	2960	1940	e850	e1500	1720	2140	9720	7830	4710	1210	887	253
27	2740	1870	e800	e1700	1840	2010	8690	7590	4810	1100	873	297
28	2710	1800	e850	e1900	2150	1950	16500	7500	4750	1040	866	1150
29	2820	1730	e750	e1700	---	1920	17800	7240	4280	1050	812	1100
30	3410	1740	e650	e1600	---	1860	14300	6550	3720	1120	728	714
31	3760	---	e550	e1800	---	1790	---	5550	---	1080	671	---
TOTAL	190502	126250	46160	33810	81900	81730	229610	254590	175380	59900	29547	12992
MEAN	6145	4208	1489	1091	2925	2636	7654	8213	5846	1932	953	433
MAX	16700	11600	3790	2700	5110	7070	17800	15100	9260	3660	2100	1150
MIN	821	1730	550	460	1720	1790	1660	3910	3720	1040	625	253
AC-FT	377900	250400	91560	67060	162400	162100	455400	505000	347900	118800	58610	25770
CFSM	1.43	.98	.35	.25	.68	.61	1.77	1.90	1.36	.45	.22	.10
IN.	1.64	1.09	.40	.29	.71	.71	1.98	2.20	1.51	.52	.25	.11

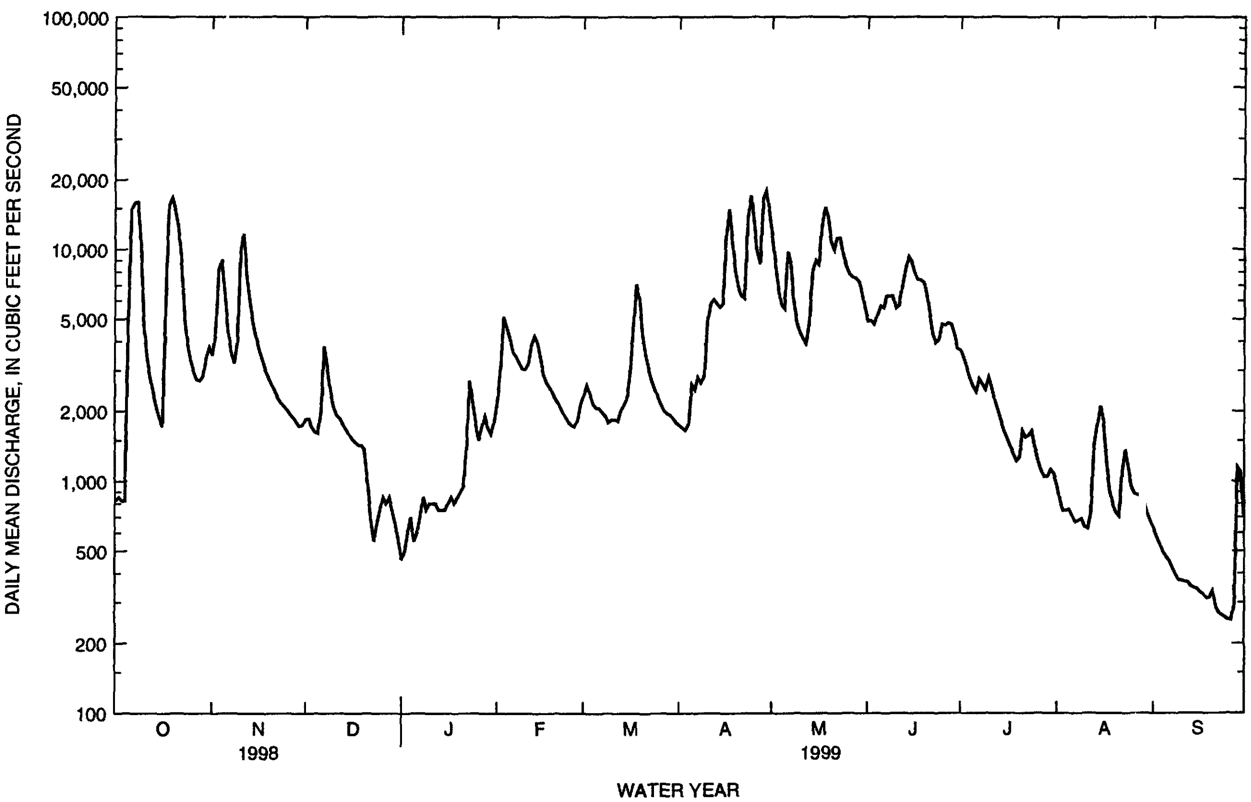
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1915 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1395	1579	1295	1326	2372	4349	4189	4109	4334	2864	1699	1632
MAX	11560	10020	8387	8090	7306	16560	18770	16780	19800	26860	18550	15460
(WY)	1987	1962	1983	1946	1984	1979	1973	1996	1947	1993	1993	1926
MIN	15.5	20.5	21.2	21.3	56.5	191	104	92.5	130	122	25.8	71.4
(WY)	1957	1957	1957	1940	1940	1957	1956	1934	1977	1988	1934	1953

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1915 - 1999	
ANNUAL TOTAL	2037548		1322371			
ANNUAL MEAN	5582		3623		2593	
HIGHEST ANNUAL MEAN					10200	1993
LOWEST ANNUAL MEAN					152	1934
HIGHEST DAILY MEAN	24800	Apr 1	17800	Apr 29	62600	Apr 23 1973
LOWEST DAILY MEAN	550	Dec 23	253	Sep 26	7.0	Aug 27 1934a
ANNUAL SEVEN-DAY MINIMUM	736	Dec 22	270	Sep 21	7.4	Aug 26 1934
INSTANTANEOUS PEAK FLOW			18900	Apr 28	66800	Apr 23 1973
INSTANTANEOUS PEAK STAGE			14.79	Apr 28	27.05	Apr 23 1973
INSTANTANEOUS LOW FLOW			238	Sep 26		
ANNUAL RUNOFF (AC-FT)	4041000		2623000		1879000	
ANNUAL RUNOFF (CFSM)	1.29		.84		.60	
ANNUAL RUNOFF (INCHES)	17.58		11.41		8.17	
10 PERCENT EXCEEDS	14300		8660		6800	
50 PERCENT EXCEEDS	3720		2200		1090	
90 PERCENT EXCEEDS	1000		644		149	

a Also Aug 28 to Sep 1, 1934
e Estimated



05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER QUALITY RECORDS

LOCATION.--Samples collected at bridge on State Highway 394, 300 ft downstream from gage.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to current year.
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1975 to current year.

REMARKS.--During periods of ice effect, sediment samples are collected in open water channel. 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. 20, 1979, Feb. 12, 1980; minimum daily, 149 microsiemens Mar. 6, 1993.
WATER TEMPERATURES: Maximum daily, 34.0°C July 20, 1980, Aug. 15-17, 1988, July 10-13, 1989, and July 15, 1995, and July 30, 1999; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,550 mg/L June 25, 1981; minimum daily mean, 1 mg/L Mar. 8, 9, 12, 1978, Jan. 5, 6, 1984.
SEDIMENT LOADS: Maximum daily, 499,000 tons Mar. 21, 1978; minimum daily, 1.4 tons Dec. 11, 1989.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 630 microsiemens July 19; minimum daily, 248 microsiemens Oct. 20.
WATER TEMPERATURES: Maximum daily, 34.0°C July 30; minimum daily, 0.0°C Dec. 22-24 and Jan. 4.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,770 mg/L Mar. 18; minimum daily mean, 17 mg/L Jan. 4.
SEDIMENT LOADS: Maximum daily, 100,000 tons Apr. 24; minimum daily, 27 tons Jan. 5.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
06...	1030	15.1	15200	1220	50100	93
NOV						
24...	1115	6.4	2110	43	245	87
JAN						
04...	1230	.0	690	--	--	--
FEB						
09...	0945	3.6	3190	106	913	94
MAR						
30...	1150	12.2	1920	54	280	94
MAY						
12...	1120	18.2	3990	193	2080	95
JUN						
22...	0950	22.3	4330	298	3480	97
AUG						
03...	0925	25.8	751	138	280	99
SEP						
15...	1030	18.5	349	93	88	96

DATE	TIME	NUMBER OF SAMPLING 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)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
OCT											
06...	1030	2	0	1	12	65	94	99	99	100	--
NOV											
24...	1115	3	0	1	9	51	88	95	97	98	100
FEB											
09...	0945	3	--	0	4	45	72	81	85	88	100
MAR											
30...	1150	3	4	7	20	44	74	93	97	100	--
MAY											
12...	1120	3	0	1	13	83	93	94	94	98	100

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	458	472	444	---	428	540	558	371	575	571	541	418
2	477	431	513	---	424	---	549	518	561	576	488	390
3	511	395	---	---	404	548	554	359	555	593	451	382
4	531	390	524	498	422	491	543	553	563	570	455	420
5	424	418	460	---	420	542	496	549	469	483	407	450
6	301	462	535	---	447	547	495	397	501	520	407	460
7	---	494	487	---	448	555	498	400	491	618	403	484
8	252	521	444	---	458	---	475	469	488	581	464	491
9	309	507	510	---	475	494	493	511	444	526	420	499
10	396	359	517	---	---	546	468	542	484	574	396	505
11	437	332	525	---	---	557	451	551	483	542	431	519
12	---	394	532	---	497	563	463	549	515	556	423	524
13	500	439	---	---	480	558	451	542	398	541	456	563
14	524	471	497	---	462	544	506	454	379	520	385	542
15	528	492	453	---	479	535	534	438	361	520	357	540
16	536	538	437	---	517	527	437	413	411	---	394	546
17	257	534	476	---	515	484	412	393	480	510	331	546
18	275	548	432	---	536	398	455	382	513	534	343	558
19	263	555	432	---	544	400	499	406	540	630	388	573
20	248	556	474	---	559	439	528	472	548	608	432	551
21	293	552	433	---	565	478	557	486	565	535	494	593
22	342	540	458	---	---	522	563	467	569	570	531	589
23	412	540	492	---	550	---	371	434	521	597	581	557
24	476	468	470	---	551	543	336	518	566	524	475	562
25	---	458	---	---	592	550	411	499	528	528	477	575
26	516	471	536	---	515	550	454	509	513	570	468	---
27	524	507	491	---	535	557	479	540	513	569	497	572
28	546	453	---	---	502	549	323	552	510	542	546	376
29	544	451	---	345	---	564	385	564	533	543	546	433
30	513	441	---	394	---	549	439	570	567	536	465	462
31	491	---	---	418	---	568	---	571	---	561	447	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.0	14.0	12.0	---	3.0	7.0	17.0	15.0	22.0	24.0	28.0	27.0
2	17.0	13.0	12.0	---	4.0	---	14.0	18.0	20.0	26.0	26.0	29.0
3	16.0	11.0	---	---	5.0	5.0	19.0	19.0	21.0	27.0	27.0	27.0
4	15.0	10.0	12.0	.0	4.0	5.0	17.0	20.0	20.0	29.0	29.0	29.0
5	18.0	9.0	14.0	---	4.0	5.0	17.0	20.0	25.0	29.0	28.0	---
6	16.0	10.0	9.0	---	4.0	4.0	16.0	16.0	23.0	29.0	26.0	---
7	---	7.0	7.0	---	4.0	4.0	19.0	15.0	24.0	28.0	27.0	---
8	17.0	8.0	7.0	---	6.0	---	17.0	14.0	24.0	28.0	24.0	---
9	16.0	7.0	7.0	---	---	7.0	14.0	14.0	26.0	27.0	26.0	---
10	17.0	8.0	5.0	---	---	5.0	14.0	19.0	24.0	26.0	29.0	---
11	17.0	9.0	4.0	---	---	5.0	10.0	19.0	25.0	25.0	25.0	---
12	---	8.0	4.0	---	3.0	5.0	14.0	19.0	24.0	26.0	28.0	---
13	17.0	9.0	---	---	4.0	3.0	13.0	16.0	24.0	26.0	23.0	---
14	16.0	10.0	5.0	---	6.0	5.0	13.0	18.0	22.0	26.0	21.0	---
15	16.0	8.0	6.0	---	7.0	8.0	11.0	17.0	19.0	28.0	22.0	---
16	17.0	8.0	5.0	---	7.0	8.0	8.0	16.0	21.0	---	25.0	---
17	19.0	9.0	5.0	---	7.0	10.0	9.0	18.0	20.0	29.0	28.0	---
18	17.0	9.0	6.0	---	4.0	9.0	13.0	19.0	20.0	27.0	25.0	---
19	18.0	8.0	4.0	---	5.0	9.0	12.0	19.0	21.0	29.0	24.0	---
20	15.0	7.0	6.0	---	4.0	11.0	12.0	20.0	19.0	31.0	26.0	---
21	15.0	7.0	3.0	---	4.0	9.0	14.0	19.0	23.0	31.0	26.0	---
22	14.0	8.0	.0	---	---	9.0	16.0	20.0	24.0	32.0	25.0	---
23	14.0	8.0	.0	---	4.0	---	12.0	18.0	22.0	32.0	26.0	---
24	14.0	9.0	.0	---	4.0	10.0	14.0	18.0	24.0	28.0	24.0	---
25	---	9.0	---	---	5.0	10.0	13.0	18.0	27.0	30.0	25.0	23.0
26	16.0	10.0	1.0	---	5.0	10.0	13.0	20.0	27.0	30.0	27.0	---
27	17.0	10.0	3.0	---	6.0	10.0	14.0	20.0	26.0	32.0	29.0	17.0
28	17.0	11.0	---	---	5.0	10.0	12.0	21.0	26.0	32.0	30.0	14.0
29	18.0	12.0	---	2.0	---	13.0	14.0	22.0	23.0	33.0	25.0	16.0
30	17.0	10.0	---	2.0	---	16.0	17.0	20.0	24.0	34.0	25.0	18.0
31	15.0	---	---	1.0	---	17.0	---	20.0	---	30.0	25.0	---

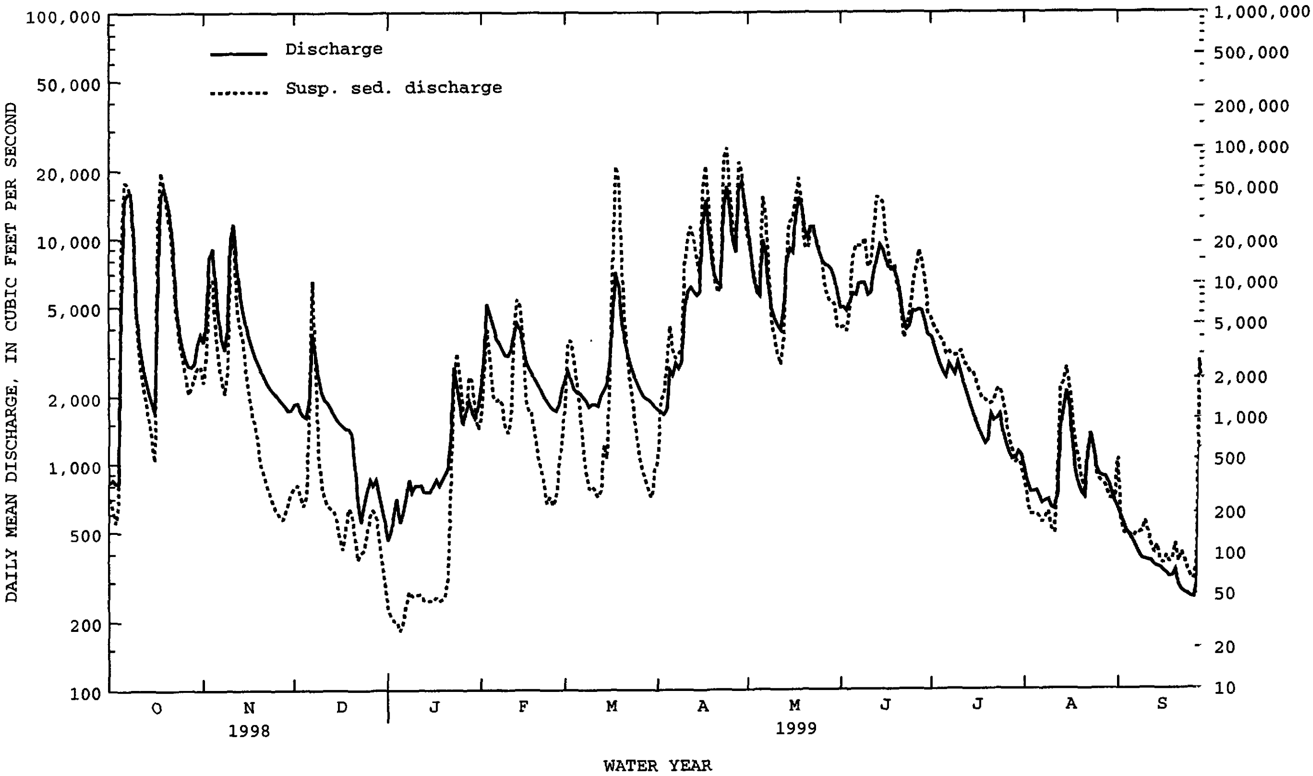
05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	118	260	200	1880	63	313	33	41	166	986	190	1210
2	96	222	257	3110	65	324	26	35	268	2170	536	3750
3	77	171	433	9800	58	272	20	32	328	4530	587	3760
4	103	233	442	10800	51	227	17	32	219	2740	472	2750
5	1060	19900	264	4560	61	266	18	27	130	1450	332	1860
6	1400	56200	224	2680	197	1270	19	31	140	1350	218	1210
7	1270	54200	200	1930	1040	10600	21	40	152	1410	118	630
8	1040	45000	177	1540	299	2570	23	53	147	1280	80	411
9	668	20300	208	2280	82	544	24	49	107	878	62	300
10	421	5460	592	17100	58	324	23	50	96	790	63	314
11	303	2800	690	21800	50	262	23	50	115	1020	60	297
12	249	1880	367	7730	45	227	23	50	428	4510	54	264
13	214	1370	292	4640	46	219	22	45	677	7690	53	292
14	183	1030	308	4020	47	213	22	45	650	6880	111	642
15	136	688	206	2320	40	172	22	45	446	4070	82	505
16	106	489	151	1510	32	133	21	45	179	1400	270	2210
17	1290	26500	128	1150	27	108	21	48	157	1120	1140	14900
18	1620	67500	110	891	40	156	21	45	162	1110	3770	73200
19	1140	51200	85	641	56	218	20	46	116	748	3440	57300
20	883	35200	65	455	54	200	20	49	87	527	1150	13600
21	746	25300	56	372	50	135	27	69	76	438	546	5170
22	588	14500	51	318	48	91	99	374	60	323	322	2670
23	439	6270	47	277	69	102	261	1900	46	236	226	1670
24	377	3970	42	236	61	107	521	3090	54	264	171	1150
25	326	2930	38	210	69	140	413	2010	48	227	112	700
26	276	2200	37	192	84	193	288	1170	55	257	88	510
27	208	1540	36	180	98	212	229	1050	86	431	75	408
28	237	1730	42	203	84	193	401	2060	121	710	64	338
29	273	2080	51	238	66	134	416	1910	---	---	55	284
30	264	2430	61	288	52	91	272	1180	---	---	52	260
31	246	2500	---	---	41	61	172	836	---	---	88	423
TOTAL	---	456053	---	103351	---	20077	---	16507	---	49545	---	192988

DAY	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	102	479	707	21800	354	4680	564	5570	135	350	297	506
2	307	1410	724	16800	359	4780	531	4830	112	247	112	176
3	338	1510	678	12400	343	4400	541	4430	97	195	96	140
4	528	2540	596	9270	437	6240	522	3910	97	195	108	144
5	688	4860	543	8180	1030	15600	541	3740	97	197	107	137
6	474	3180	1560	43000	1270	19100	458	3000	97	186	107	131
7	371	2810	1310	31000	1110	18800	421	3140	94	169	126	144
8	429	3060	788	12500	1100	18700	410	2890	101	185	133	142
9	417	3250	399	5230	1260	21400	433	2920	110	204	142	144
10	1030	14100	322	3800	867	13100	389	2920	88	152	171	172
11	1380	21700	269	2980	924	14300	468	3160	83	141	144	143
12	1600	26200	239	2520	1220	23000	427	2570	170	341	116	115
13	1360	21300	308	4090	1980	43300	451	2460	406	1670	105	100
14	1000	15200	752	16800	1680	41800	449	2200	395	1830	123	115
15	772	12100	1170	28400	1630	38800	489	2190	421	2400	94	87
16	1510	49300	1290	30100	1030	22300	467	1940	366	1800	94	84
17	1850	73900	1260	42800	786	15800	413	1590	320	1050	110	96
18	1210	36100	1470	59900	601	12000	391	1380	246	612	102	86
19	872	19100	979	36900	705	13700	417	1380	232	497	108	92
20	572	10600	634	18800	520	9110	378	1290	181	358	130	118
21	501	8570	672	18000	518	7260	287	1280	151	288	112	86
22	579	9840	813	24600	336	3890	326	1370	195	587	140	102
23	2110	82900	814	24600	454	4820	383	1630	204	752	125	90
24	2200	100000	794	20000	545	6020	373	1660	188	582	108	76
25	1330	48000	728	16600	744	9580	358	1340	152	389	98	67
26	1000	26400	646	13700	971	12300	313	1020	145	348	93	64
27	766	18100	430	8810	1340	17500	228	677	141	332	114	94
28	1680	78300	372	7540	1130	14400	205	573	132	308	716	2690
29	1400	67300	374	7310	971	11200	163	464	117	257	509	1590
30	857	33200	393	6960	596	6000	160	487	128	250	184	377
31	---	---	311	4650	---	---	151	443	148	268	---	---
TOTAL	---	795309	---	560040	---	453880	---	68454	---	17140	---	8108
YEAR		2741452										

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued



05474500 MISSISSIPPI RIVER AT KEOKUK, IA

LOCATION.--Lat 40°23'37", long 91°22'27", in SE$^1/_4$ SW$^1/_4$ sec.30, T.65 N., R.4 W., Lee County, Hydrologic Unit 07080104, near right bank in tailwater of dam and powerplant of Union Electric Co. at Keokuk, 0.2 mi upstream from bridge on U.S. Highway 136, 2.7 mi upstream from Des Moines River, and at mile 364.2 upstream from Ohio River.

DRAINAGE AREA.--119,000 mi^2, approximately.

PERIOD OF RECORD.--January 1878 to current year.

GAGE.--Water-stage recorder. Datum of gage is 477.41 ft above sea level (levels by U.S. Army Corps of Engineers). Jan. 1, 1878 to May 1913, nonrecording gage at Galland (formerly Nashville), 8 mi upstream; zero of gage was set to low-water mark of 1864, or 496.52 ft above sea level.

REMARKS.--Discharge computed from records of operation of turbines in powerplant and spillway gates in dam. Minor flow regulation caused by powerplant since 1913 and navigation dams. Records for May 1913 to September 1937 adjusted for change in contents in Keokuk Reservoir, those after September 1937 unadjusted.

COOPERATION.--Records provided by Union Electric Co.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 6, 1851, reached a stage of 21.0 ft, present site and datum, estimated as 13.5 ft at Galland, discharge, 360,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

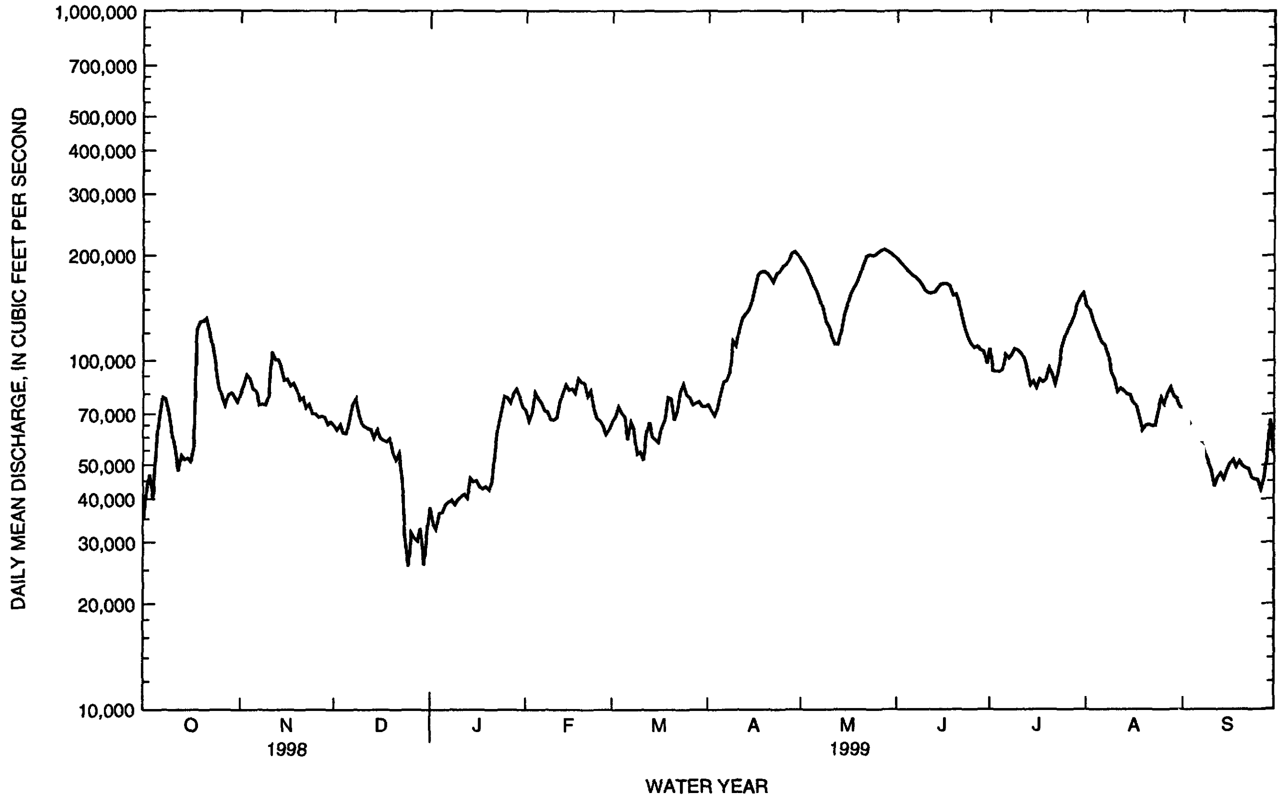
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35200	80100	64700	37700	71900	66600	74400	192800	195400	108100	143600	73200
2	43000	84600	63100	33900	66900	68800	71600	187100	190000	93100	139700	68900
3	46900	90900	65200	32700	70900	73600	69400	180700	186400	92700	130100	66100
4	39800	88700	61800	36300	80700	70500	73000	173800	182400	92900	123700	64000
5	57600	82700	61600	36500	77500	68900	79900	164400	178900	94000	118000	56300
6	68400	81500	67500	38500	75600	59200	86700	158400	175500	104200	112800	57400
7	78200	74300	74500	39200	71800	66400	87700	148600	173300	101600	110700	57800
8	77100	74700	77500	39600	71100	63300	92300	142100	169600	103900	103700	54200
9	70600	74200	69700	38400	67400	53800	114100	129300	165100	108000	92600	50900
10	62100	79000	65500	39800	67400	54600	110600	124900	158800	107100	88600	48400
11	55800	105900	64200	40500	68400	51600	123200	117400	156200	104800	81100	43400
12	48100	100600	63600	41200	76200	61400	132200	111500	155900	100900	83200	46000
13	53200	100600	63200	40200	80400	66400	135700	111000	156100	93700	81700	47200
14	51800	95600	59800	45800	85100	60300	139500	122000	160700	84800	80000	45500
15	52300	87700	63100	44800	82100	59300	146900	136200	165000	87100	79600	48200
16	51200	88400	59800	45100	82800	58200	161000	144900	165900	83400	75900	50500
17	56700	84400	58900	43400	80400	64200	175700	154900	165900	88400	74200	51700
18	122700	85800	58300	42700	88600	67600	179600	161300	163600	86800	68500	49300
19	129000	82100	59400	43300	86400	78200	179900	166900	153500	88100	62900	51200
20	129500	77000	53900	42400	85900	77600	177900	176100	155000	95400	65000	49700
21	132300	78300	51700	44800	78900	67300	173000	188300	146200	91600	65400	49000
22	121400	73100	54100	55600	81800	71400	167400	198000	132700	85400	64700	48600
23	111000	74700	45500	65000	72800	81000	176800	200300	122200	92600	64900	46000
24	97500	70200	30000	71100	68000	85500	180000	199200	116600	108100	71400	45500
25	84000	70200	25600	78800	66900	79600	186600	200800	111700	116700	78100	45400
26	78400	68500	31900	78000	64500	78300	188900	204300	109000	123000	74900	42600
27	74200	69000	30800	75500	61200	74500	194500	207300	110000	128200	80400	46100
28	79600	68400	30200	80200	63200	75500	203100	208000	107300	134300	83700	53800
29	80400	65200	32800	82500	---	76100	205200	205400	106200	144700	78700	67400
30	78200	66400	25800	78100	---	73800	200000	202800	97800	152000	77700	54100
31	76000	---	31700	73300	---	73600	---	199000	---	155800	73300	---
TOTAL	2342200	2422800	1665400	1584900	2094800	2127100	4286800	5217700	4532900	3251400	2728800	1578400
MEAN	75550	80760	53720	51130	74810	68620	142900	168300	151100	104900	88030	52610
MAX	132000	106000	77500	82500	88600	85500	205000	208000	195000	156000	144000	73200
MIN	35200	65200	25600	32700	61200	51600	69400	111000	97800	83400	62900	42600
AC-FT	4646000	4806000	3303000	3144000	4155000	4219000	8503000	10350000	8991000	6449000	5413000	3131000
CFSM	.63	.68	.45	.43	.63	.58	1.20	1.41	1.27	.88	.74	.44
IN.	.73	.76	.52	.50	.65	.66	1.34	1.63	1.42	1.02	.85	.49

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1879 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	51100	51290	38630	36090	42580	80600	120000	108100	93160	74400	49730	47430
MAX	221100	211300	125600	101600	95620	185400	250100	260700	227300	385800	223000	163300
(WY)	1882	1882	1983	1973	1984	1973	1993	1888	1892	1993	1993	1993
MIN	16060	16020	13450	14650	15790	21780	32930	27600	17400	16280	13030	15530
(WY)	1934	1934	1934	1940	1899	1934	1895	1934	1934	1988	1936	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1879 - 1999	
ANNUAL TOTAL	33281000		33833200			
ANNUAL MEAN	91180		92690		66140	
HIGHEST ANNUAL MEAN					162500	1993
LOWEST ANNUAL MEAN					21540	1934
HIGHEST DAILY MEAN	253000	Apr 15	208000	May 28	434000	Jul 10 1993
LOWEST DAILY MEAN	22600	Jan 1	25600	Dec 25	5000	Dec 27 1933
ANNUAL SEVEN-DAY MINIMUM	29600	Dec 24	29600	Dec 24	8270	Dec 25 1933
INSTANTANEOUS PEAK FLOW					446000	Jul 10 1993
INSTANTANEOUS PEAK STAGE					27.58	Jul 10 1993a
ANNUAL RUNOFF (AC-FT)	66010000		67110000		47920000	
ANNUAL RUNOFF (CFSM)	.77		.78		.56	
ANNUAL RUNOFF (INCHES)	10.40		10.58		7.55	
10 PERCENT EXCEEDS	171000		171000		133000	
50 PERCENT EXCEEDS	77500		78200		50800	
90 PERCENT EXCEEDS	38200		45500		23000	

a From floodmark


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
1,000,000
700,000
500,000
400,000
300,000
200,000
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70,000
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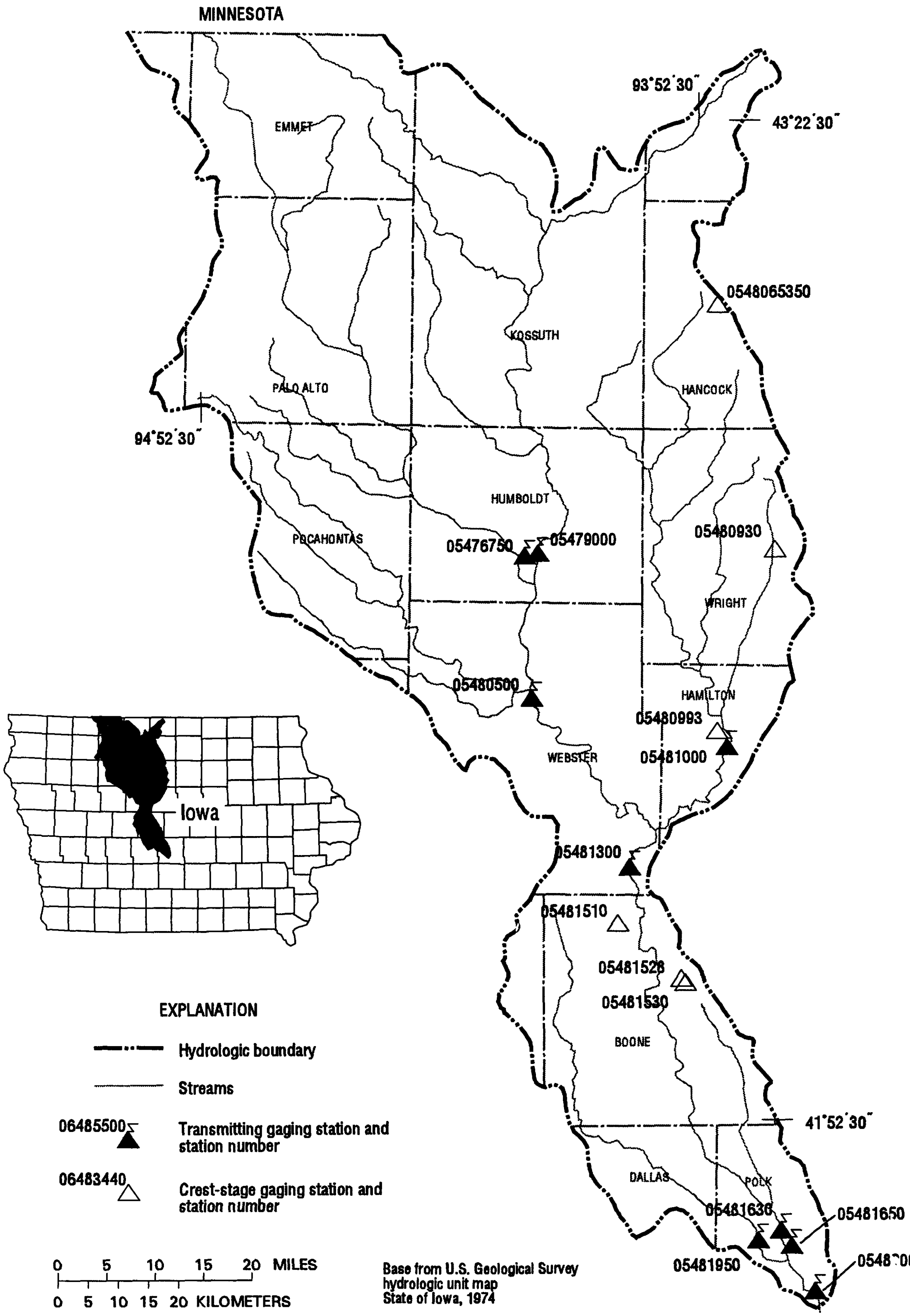
WATER YEAR


MINNESOTA
93°52'30"
43°22'30"
94°52'30"
41°52'30"
EMMET
KOSSUTH
PALO ALTO
HANCOCK
HUMBOLDT
POCAHONTAS
WRIGHT
HAMILTON
WEBSTER
BOONE
DALLAS
POLK
Iowa
0548065350
05480930
05476750
05479000
05480500
05480993
05481000
05481300
05481510
05481530
05481630
05481650
05481950
EXPLANATION
Hydrologic boundary
Streams
06485500
Transmitting gaging station and station number
06483440
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

05476750 DES MOINES RIVER AT HUMBOLDT, IA

LOCATION.--Lat 42°43'12", long 94°13'06", in SE$^1/_4$ SW$^1/_4$ sec.1, T.91 N., R.29 W., Humboldt County, Hydrologic Unit 07100002 on left bank 5 ft downstream from First Avenue in city of Humboldt, .84 mi downstream of Reasoner Dam, about 700 ft downstream from City of Humboldt water plant, 3.2 mi upstream from Indian Creek, 3.9 mi upstream from East Fork Des Moines River, and at mile 334.3 upstream from mouth of Des Moines River.

DRAINAGE AREA.--2,256 mi^2.

PERIOD OF RECORD.--October 1964 to current year. Prior to October 1970, published as "West Fork Des Moines River at Humboldt."

GAGE.--Water stage recorder. Datum of gage is 1,053.54 ft above sea level. Prior to Oct. 3, 1966, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor Daily nonrecording gage readings made from Mar. 7, 1940 to Sept. 30, 1964, but discharge not published for this period because of extreme regulation at dam 700 ft upstream from gage. Power generation and streamflow regulation discontinued August 1964. Low-flow discharges occasionally affected by minor regulation at Reasoner Dam. 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, 1947, reached a stage of 12.2 ft, discharge, 11,000 ft^3/s at present site and datum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	111	1180	1470	e650	287	1010	1050	3580	2400	2960	909	169
2	111	1120	1430	e625	296	1090	1060	3420	2380	2730	827	166
3	131	1050	1390	621	305	992	1150	3300	2610	2610	748	159
4	140	998	1360	606	526	992	1120	3210	2600	2530	693	158
5	186	947	1320	615	319	1020	1240	3130	2700	2510	649	160
6	189	908	1270	576	325	928	2150	3140	2600	2440	620	158
7	198	874	1220	e560	336	852	2960	3250	2860	2380	591	167
8	199	852	1180	554	395	683	3090	3430	3180	2300	545	158
9	190	852	1140	556	507	620	3110	3770	2970	2180	507	137
10	204	914	1110	530	775	1040	3490	3920	3080	2010	475	132
11	247	1150	1060	519	1040	930	3790	3840	3480	1840	452	135
12	249	1530	1050	492	1250	759	3800	3660	4190	1690	431	138
13	245	1610	1020	471	1310	745	3700	3470	4800	1550	411	126
14	254	1590	988	480	1170	761	3660	3320	5020	1450	389	124
15	260	1570	961	447	1210	790	3770	3170	4850	1340	368	121
16	285	1600	953	390	1170	853	4080	3100	4270	1280	349	123
17	325	1590	933	371	1130	1230	4460	3140	3710	1260	329	132
18	695	1560	924	349	1090	2000	4630	3190	3300	1290	307	129
19	970	1540	811	317	1030	1900	4600	3450	2990	1420	288	131
20	858	1520	710	290	1010	1660	4460	3460	2780	1370	282	127
21	754	1510	583	283	971	1600	4270	3350	2680	1870	268	121
22	672	1510	385	278	915	1590	4480	3310	2570	2660	285	123
23	619	1510	301	262	857	1520	4980	3240	2510	2790	316	128
24	592	1560	426	255	824	1400	5320	3090	2370	2450	265	122
25	578	1560	614	263	862	1310	5120	2940	2220	2030	252	123
26	559	1550	763	260	917	1230	4660	2840	2020	1730	238	118
27	560	1520	706	272	1020	1170	4270	2790	2290	1510	224	115
28	773	1510	e650	271	1010	1150	4050	2810	3030	1350	212	111
29	1150	1510	e600	271	---	1110	3910	2640	3380	1220	198	104
30	1300	1490	e600	275	---	1090	3750	2500	3200	1090	184	106
31	1320	---	e620	278	---	1070	---	2420	---	993	175	---
TOTAL	14924	40185	28548	12987	22857	35095	106180	99880	93040	58833	12787	4021
MEAN	481	1340	921	419	816	1132	3539	3222	3101	1898	412	134
MAX	1320	1610	1470	650	1310	2000	5320	3920	5020	2960	909	169
MIN	111	852	301	255	287	620	1050	2420	2020	993	175	104
AC-FT	29600	79710	56620	25760	45340	69610	210600	198100	184500	116700	25360	7980
CFSM	.21	.59	.41	.19	.36	.50	1.57	1.43	1.37	.84	.18	.06
IN.	.25	.66	.47	.21	.38	.58	1.75	1.65	1.53	.97	.21	.07

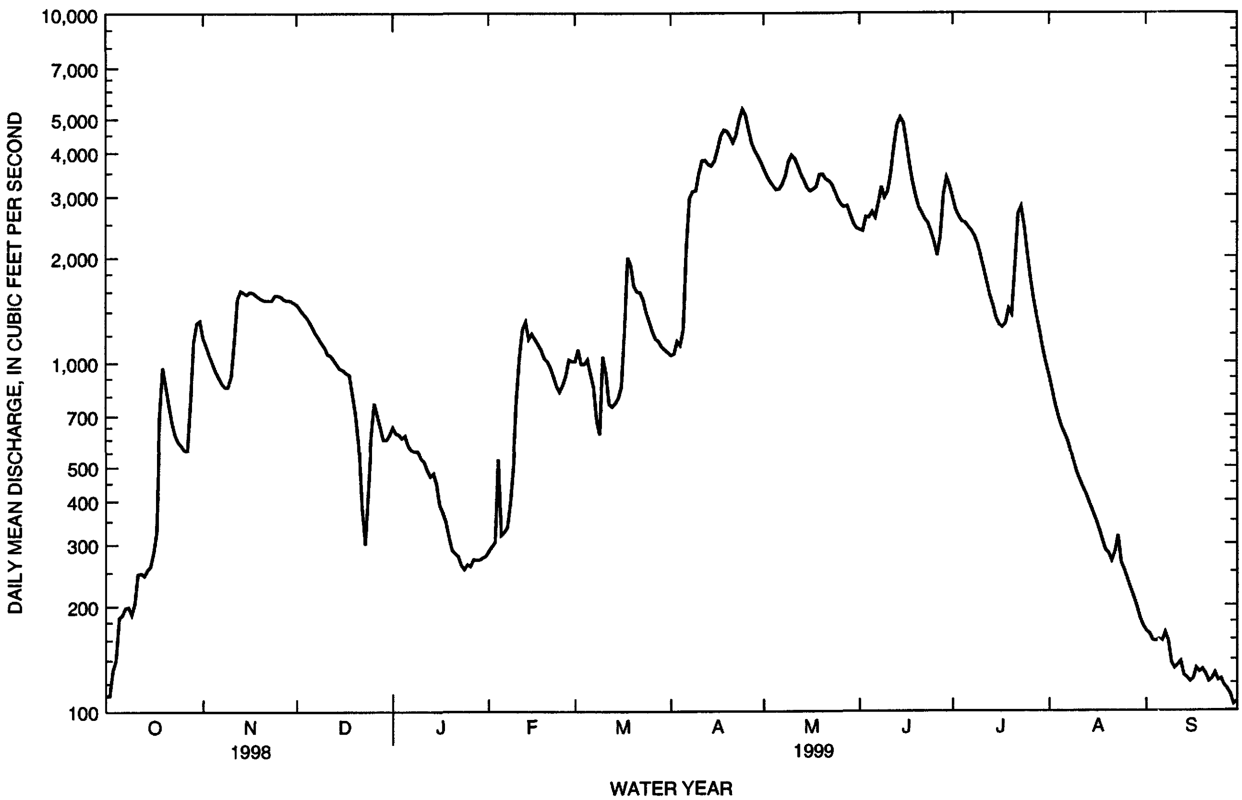
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	655	681	433	243	349	1323	2754	1951	1974	1612	718	537
MAX	3768	2656	1675	1078	1570	5110	8454	6261	9126	11540	4477	3097
(WY)	1987	1980	1983	1983	1983	1983	1969	1993	1993	1993	1993	1979
MIN	20.4	28.8	19.9	13.5	19.8	78.9	94.4	77.6	72.3	81.0	42.4	30.1
(WY)	1977	1977	1977	1977	1977	1968	1968	1968	1977	1976	1976	1976

05476750 DES MOINES RIVER AT HUMBOLDT, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1965 - 1999	
ANNUAL TOTAL	392162		529337			
ANNUAL MEAN	1074		1450		1104	
HIGHEST ANNUAL MEAN					4136	1993
LOWEST ANNUAL MEAN					74.3	1977
HIGHEST DAILY MEAN	3920	Apr 17	5320	Apr 24	17800	Apr 14 1969
LOWEST DAILY MEAN	91	Jan 22	104	Sep 29	13	Nov 12 1976
ANNUAL SEVEN-DAY MINIMUM	95	Jan 17	114	Sep 24	13	Jan 12 1977
INSTANTANEOUS PEAK FLOW			5390	Apr 24	19000	Jul 13 1993
INSTANTANEOUS PEAK STAGE			8.69	Apr 24	15.40	Apr 14 1969
INSTANTANEOUS LOW FLOW			95	Sep 30		
ANNUAL RUNOFF (AC-FT)	777900		1050000		799800	
ANNUAL RUNOFF (CFSM)	.48		.64		.49	
ANNUAL RUNOFF (INCHES)	6.47		8.73		6.65	
10 PERCENT EXCEEDS	2380		3440		2900	
50 PERCENT EXCEEDS	852		1040		480	
90 PERCENT EXCEEDS	133		185		68	

e Estimated



05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA

LOCATION.--Lat 42°43'26", long 94°11'30", in NW1/4 SE1/4 sec.6, T.91 N., R.28 W., Humboldt County, Hydrologic Unit 07100003, on right bank 50 ft upstream from old mill dam, in city park at east edge of Dakota City, 500 ft upstream from bridge on county highway P56, 0.6 mi downstream from bridge on State Highway 3, 3.4 mi upstream from confluence with Des Moines River, and at mile 333.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,308 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Prior to October 1954, published as "near Hardy".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1944, 1945-47 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,038.71 ft above sea level. Prior to Oct. 1, 1954, nonrecording gage at site 8 mi upstream at different datum.

REMARKS.--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 September 1938 reached a stage of 17.4 ft, discharge, about 22,000 ft^3/s, site and datum in use during the period 1940-54.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	851	521	e125	e112	e460	465	3140	1780	2340	1210	83
2	56	882	505	e150	e110	e530	460	2850	1660	2230	1000	78
3	62	857	486	e140	e110	482	501	2610	1550	2290	853	74
4	63	818	476	e125	e110	561	610	2400	1620	2260	725	74
5	74	768	461	e110	e110	544	779	2220	2100	2170	630	72
6	77	716	509	e85	e112	481	1960	2090	2500	2130	559	67
7	81	669	504	e90	e118	431	2490	1980	2660	2190	498	65
8	76	630	431	e85	e125	346	2520	1900	2650	2200	444	66
9	75	597	410	e85	e130	227	2680	1870	3090	2050	394	64
10	72	587	407	e85	e180	368	3140	1800	4440	1820	357	62
11	75	588	392	e90	e240	369	3560	1730	5740	1610	323	92
12	78	632	378	e88	e330	364	3760	1820	6060	1430	297	90
13	79	734	370	e85	e480	368	3760	1980	6190	1270	255	75
14	81	814	361	e88	e870	396	3680	2010	6100	1120	219	67
15	116	865	351	e85	e1050	397	3690	2070	5720	996	202	62
16	119	902	341	e90	e1150	477	3880	2260	5290	892	188	59
17	150	902	328	e110	e980	742	4120	2620	4870	926	178	56
18	205	884	319	e105	e900	980	4050	2760	4410	1050	168	53
19	253	842	306	e100	e760	1080	3900	2630	3960	1300	149	51
20	450	786	188	e115	e720	1100	3840	2550	3560	1320	134	47
21	559	746	e175	e115	e600	979	3710	2640	3220	1370	129	46
22	559	723	e160	e110	e550	817	4060	2720	2970	1540	129	44
23	511	690	e150	e120	e500	712	4730	2680	2800	1770	131	45
24	464	668	e135	e135	e440	648	4930	2740	2620	2110	127	43
25	429	641	e130	e130	e350	597	4920	2830	2440	2610	116	39
26	405	607	e140	e120	e400	529	5050	2820	2300	2990	113	40
27	388	590	e160	e118	e500	483	4850	2680	2350	3010	105	39
28	388	575	e170	e120	e520	523	4410	2520	2420	2690	101	37
29	467	556	e160	e122	---	535	3940	2270	2370	2250	98	37
30	619	539	e160	e120	---	496	3510	2060	2350	1820	91	35
31	747	---	e150	e115	---	455	---	1920	---	1480	85	---
TOTAL	7833	21659	9734	3361	12557	17477	97955	73170	101790	57234	10008	1762
MEAN	253	722	314	108	448	564	3265	2360	3393	1846	323	58.7
MAX	747	902	521	150	1150	1100	5050	3140	6190	3010	1210	92
MIN	55	539	130	85	110	227	460	1730	1550	892	85	35
AC-FT	15540	42960	19310	6670	24910	34670	194300	145100	201900	113500	19850	3490
CFSM	.19	.55	.24	.08	.34	.43	2.50	1.80	2.59	1.41	.25	.04
IN.	.22	.62	.28	.10	.36	.50	2.79	2.08	2.89	1.63	.28	.05

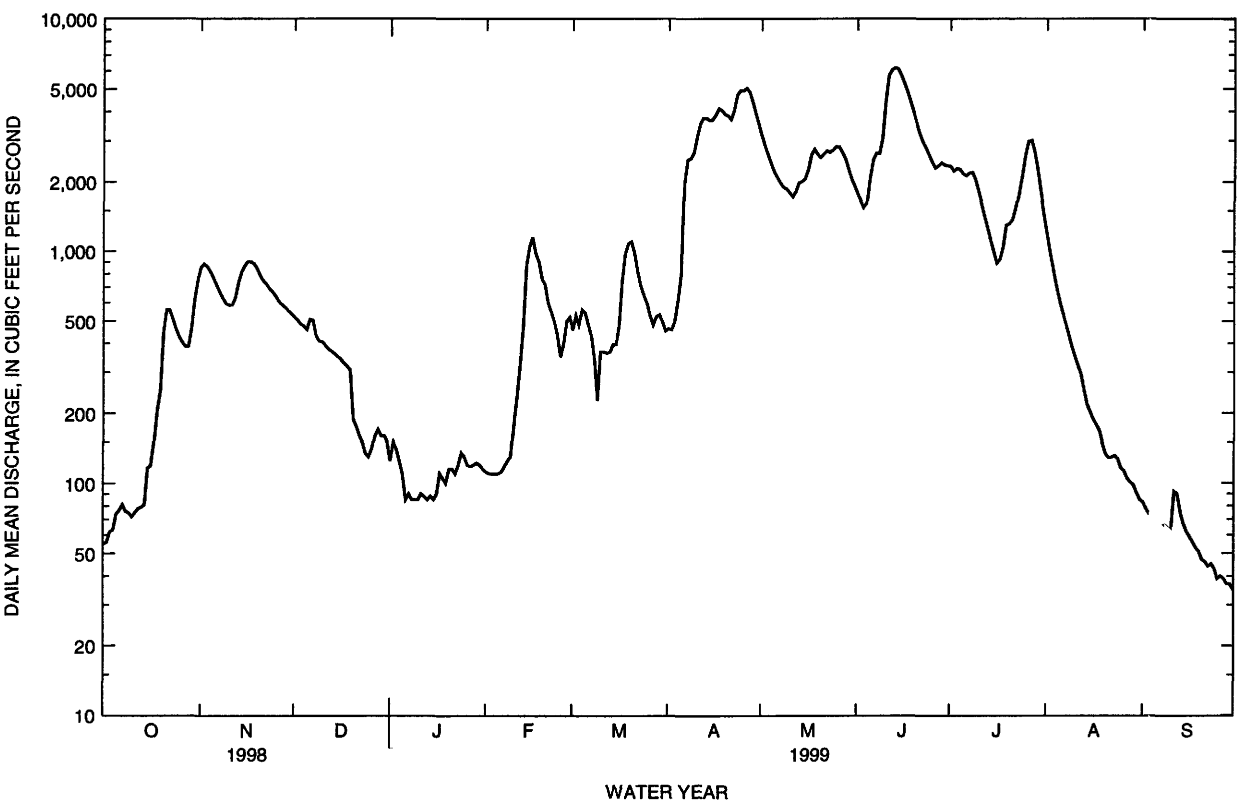
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	319	323	225	128	241	915	1430	1050	1297	865	391	329
MAX	1713	2042	1340	836	1602	4033	7004	5031	5908	6777	4114	2666
(WY)	1983	1942	1992	1992	1984	1983	1993	1991	1993	1993	1979	1979
MIN	12.0	14.2	8.45	5.12	10.4	39.4	58.8	75.7	36.3	13.7	15.5	7.40
(WY)	1959	1959	1977	1977	1959	1968	1977	1977	1977	1977	1976	1976

05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	285120		414540			
ANNUAL MEAN	781		1136		627	
HIGHEST ANNUAL MEAN					2744	1993
LOWEST ANNUAL MEAN					29.7	1977
HIGHEST DAILY MEAN	3950	Jun 26	6190	Jun 13	17800	Jun 21 1954
LOWEST DAILY MEAN	55	Jan 15	35	Sep 30	4.8	Jan 11 1977a
ANNUAL SEVEN-DAY MINIMUM	59	Feb 5	39	Sep 24	4.8	Jan 8 1977
INSTANTANEOUS PEAK FLOW			6210	Jun 13	18800	Jun 21 1954
INSTANTANEOUS PEAK STAGE			16.09	Jun 13	24.02	Jun 21 1954
INSTANTANEOUS LOW FLOW			33	Sep 30		
ANNUAL RUNOFF (AC-FT)	565500		822200		453900	
ANNUAL RUNOFF (CFSM)	.60		.87		.48	
ANNUAL RUNOFF (INCHES)	8.11		11.79		6.51	
10 PERCENT EXCEEDS	2280		3000		1710	
50 PERCENT EXCEEDS	448		523		218	
90 PERCENT EXCEEDS	65		78		24	

a Also Jan 12-14, 1977
e Estimated



05480500 DES MOINES RIVER AT FORT DODGE, IA

LOCATION.--Lat 42°30'22", long 94°12'04", in $NW^1/_4$ $SW^1/_4$ sec.19, T.89 N., R.28 W., Webster County, Hydrologic Unit 07100004, on right bank 400 ft upstream from Soldier Creek, 1,800 ft downstream from Illinois Central Railroad bridge in Fort Dodge, 2,000 ft downstream from Lizard Creek, and at mile 314.6.

DRAINAGE AREA.--4,190 mi^2.

PERIOD OF RECORD.--April 1905 to July 1906 (no winter records), October 1913 to September 1927 (published as "at Kalo"), October 1946 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1924, 1925 (M).

GAGE.--Water-stage recorder. Datum of gage is 969.38 ft above sea level. See WSP 1728 for history of changes prior to Dec. 8, 1949.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam 0.8 mi upstream from gage. 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, U.S. National Weather Service Limited Automatic Remote Collector (LARC) and City of Fort Dodge gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

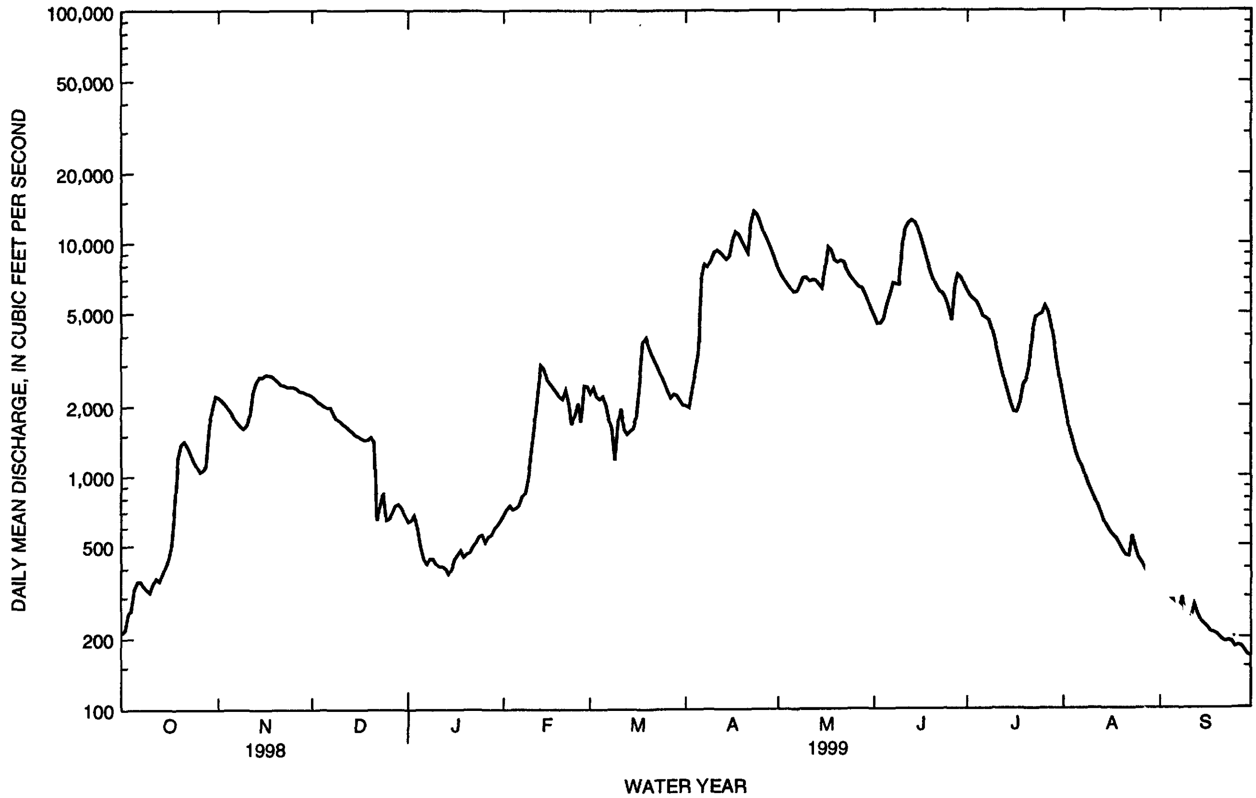
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	212	2190	2220	e640	e680	2280	2020	7750	4840	6230	2110	303
2	219	2130	2160	e650	e720	2410	1980	7280	4500	5900	1790	293
3	257	2050	2090	e680	e750	2210	2380	6910	4520	5740	1570	283
4	264	1970	2050	e600	e720	2150	2800	6590	4730	5600	1420	288
5	327	1890	2000	e500	e730	2210	3350	6350	5460	5250	1260	291
6	352	1790	1980	e440	e750	2040	7000	6170	6010	4850	1160	272
7	352	1710	1980	e420	e820	1780	8080	6220	6730	4770	1100	260
8	336	1650	1850	e440	e850	1610	7920	6660	6640	4660	994	299
9	325	1610	1770	e440	e1000	1180	8400	7100	6600	4210	911	250
10	317	1670	1740	e420	e1300	1690	9130	7140	10000	3740	849	243
11	346	1830	1680	e410	e1700	1950	9320	6890	11500	3270	789	244
12	363	2320	1650	e410	e2300	1590	9110	6940	12200	2870	753	276
13	354	2550	1600	e400	e3000	1520	8830	6940	12500	2540	697	251
14	380	2680	1560	e380	e2900	1570	8530	6650	12300	2280	640	235
15	413	2670	1510	e400	e2600	1610	8800	6410	11600	2050	602	228
16	441	2740	1490	e440	e2500	1810	10400	7620	10500	1890	571	221
17	510	2740	1460	e460	e2400	2500	11200	9600	9430	1880	550	212
18	731	2700	1440	e480	e2300	3770	10900	9290	8440	2070	534	210
19	1210	2630	1440	e450	e2200	3930	10200	8460	7640	2470	503	207
20	1380	2560	1480	e465	2150	3580	9620	8270	7010	2590	475	201
21	1420	2480	1420	e470	2350	3320	9100	8420	6550	2960	454	195
22	1350	2470	e650	e500	2070	3110	12100	8300	6200	4140	451	192
23	1260	2430	e750	e520	1680	2910	13700	7730	6070	4810	551	194
24	1170	2440	e850	e550	1820	2700	13300	7280	5760	4890	489	191
25	1110	2430	e650	e560	2060	2510	12300	6990	5270	4980	442	182
26	1050	2390	e660	e520	1720	2330	11200	6710	4640	5370	424	184
27	1070	2330	e700	e550	2450	2180	10500	6470	6570	5060	400	183
28	1120	2320	e750	e560	2440	2260	9790	6410	7300	4410	377	176
29	1640	2280	e760	e600	---	2230	9080	5980	7110	3680	356	168
30	1970	2260	e730	e620	---	2120	8290	5580	6640	3000	333	166
31	2220	---	e680	e650	---	2030	---	5190	---	2510	315	---
TOTAL	24469	67910	43750	15625	48960	71090	259330	220300	225260	120670	23870	6898
MEAN	789	2264	1411	504	1749	2293	8644	7106	7509	3893	770	230
MAX	2220	2740	2220	680	3000	3930	13700	9600	12500	6230	2110	303
MIN	212	1610	650	380	680	1180	1980	5190	4500	1880	315	166
MED	441	2320	1490	480	1940	2210	9100	6940	6640	4140	571	224
AC-FT	48530	134700	86780	30990	97110	141000	514400	437000	446800	239300	47350	13680
CFSM	.19	.54	.34	.12	.42	.55	2.06	1.70	1.79	.93	.18	.05
IN.	.22	.60	.39	.14	.43	.63	2.30	1.96	2.00	1.07	.21	.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	938	887	617	393	775	2612	4170	2989	3452	2397	1101	910
MAX	6120	4447	3698	2257	4352	11070	17530	10540	16150	21530	9264	6206
(WY)	1987	1983	1983	1983	1984	1983	1993	1991	1993	1993	1993	1979
MIN	32.8	54.5	34.7	24.0	35.5	141	238	149	138	75.2	69.0	49.9
(WY)	1957	1959	1977	1977	1959	1968	1968	1926	1977	1926	1976	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1914 - 1999	
ANNUAL TOTAL	896768		1128132			
ANNUAL MEAN	2457		3091		1784	
HIGHEST ANNUAL MEAN					7882	1993
LOWEST ANNUAL MEAN					143	1977
HIGHEST DAILY MEAN	9730	Jun 26	13700	Apr 23	35100	Apr 8 1965
LOWEST DAILY MEAN	160	Jan 14	166	Sep 30	14	Nov 3 1955
ANNUAL SEVEN-DAY MINIMUM	194	Jan 13	179	Sep 24	23	Jan 13 1977
INSTANTANEOUS PEAK FLOW			14000	Apr 23	35600	Apr 8 1965
INSTANTANEOUS PEAK STAGE			9.70	Apr 23	19.62	Jun 23 1947
INSTANTANEOUS LOW FLOW			165	Sep 29a		
ANNUAL RUNOFF (AC-FT)	1779000		2238000		1293000	
ANNUAL RUNOFF (CFSM)	.59		.74		.43	
ANNUAL RUNOFF (INCHES)	7.96		10.02		5.79	
10 PERCENT EXCEEDS	6420		8280		4710	
50 PERCENT EXCEEDS	1610		2000		661	
90 PERCENT EXCEEDS	250		322		104	

a Also Sep 30
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
100,000
50,000
20,000
10,000
5,000
2,000
1,000
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1998
1999
WATER YEAR

05481000 BOONE RIVER NEAR WEBSTER CITY, IA

LOCATION.--Lat 42°26'01", long 93°48'12", in $NW^1/_4$ $SE^1/_4$ sec.18, T.88 N., R.25 W., Hamilton County, Hydrologic Unit 07100005, on right bank 100 ft upstream from bridge on State Highway 17, 2.5 mi south of Webster City, and 3.2 mi downstream from Brewers Creek.

DRAINAGE AREA.--844 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1940 (M), WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 989.57 ft above sea level. Prior to June 26, 1940, nonrecording gage at same site and datum.

REMARKS.--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 since 1896, 19.1 ft about June 10, 1918, from floodmarks, from information by local resident, discharge, 21,500 ft^3/s. Flood of June 18, 1932, reached a stage of 16.0 ft, discharge, 15,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	246	181	e60	e100	610	285	1510	1090	841	337	37
2	45	231	173	e75	e110	516	281	1360	1010	810	306	34
3	59	213	171	e70	e130	437	321	1260	1000	1080	290	32
4	61	196	169	e55	e160	399	575	1170	1210	1680	232	31
5	87	180	167	e50	e150	439	1050	1100	1930	1760	193	30
6	107	167	161	e44	e180	368	2830	1040	1950	1540	166	29
7	116	160	153	e46	e190	265	3370	1010	2080	1160	192	28
8	111	158	143	e46	e240	165	3270	1010	2300	933	148	34
9	101	154	135	e40	e300	131	3920	1040	2210	901	124	29
10	92	185	125	e42	e900	194	3710	1060	4590	e709	114	30
11	84	245	127	e44	e1000	374	3320	1050	5320	596	103	27
12	79	318	136	e44	e900	274	2930	2450	4800	532	98	28
13	74	403	133	e40	884	262	2500	4050	4180	475	91	30
14	71	427	133	e42	863	292	2120	4040	3430	e423	85	26
15	120	411	126	e40	805	339	1910	3690	2560	e375	80	24
16	274	389	120	e46	717	463	2600	3990	1980	329	76	23
17	328	356	119	e55	595	782	3350	7180	1670	319	73	22
18	313	324	120	e50	512	914	3190	8130	1420	380	75	21
19	309	307	e80	e46	455	824	2830	5390	1260	574	68	20
20	285	277	e60	e48	412	695	2350	4050	1140	731	61	21
21	251	254	e85	e55	e310	610	1960	3840	1040	767	57	20
22	213	240	e80	e53	e240	548	3740	4020	968	797	65	19
23	188	241	e75	e55	e190	494	5350	4080	1980	825	97	17
24	169	228	e65	e65	e260	450	5290	3610	1640	738	76	17
25	159	216	e65	e60	e250	406	4670	2710	1190	570	66	17
26	154	210	e70	e55	e240	364	3980	2070	996	468	57	16
27	176	197	e75	e75	251	341	3080	1720	932	398	50	17
28	210	193	e85	e70	376	339	2400	1510	1230	408	46	15
29	247	194	e80	e75	---	318	2000	1370	1090	453	43	14
30	263	194	e75	e85	---	294	1730	1250	920	410	39	13
31	261	---	e70	e90	---	273	---	1170	---	418	38	---
TOTAL	5055	7514	3557	1721	11720	13180	80912	82930	59116	22400	3546	721
MEAN	163	250	115	55.5	419	425	2697	2675	1971	723	114	24.0
MAX	328	427	181	90	1000	914	5350	8130	5320	1760	337	37
MIN	45	154	60	40	100	131	281	1010	920	319	38	13
MED	154	230	120	53	280	374	2830	1720	1530	596	80	24
AC-FT	10030	14900	7060	3410	23250	26140	160500	164500	117300	44430	7030	1430
CFSM	.19	.30	.14	.07	.50	.50	3.20	3.17	2.33	.86	.14	.03
IN.	.22	.33	.16	.08	.52	.58	3.57	3.66	2.61	.99	.16	.03

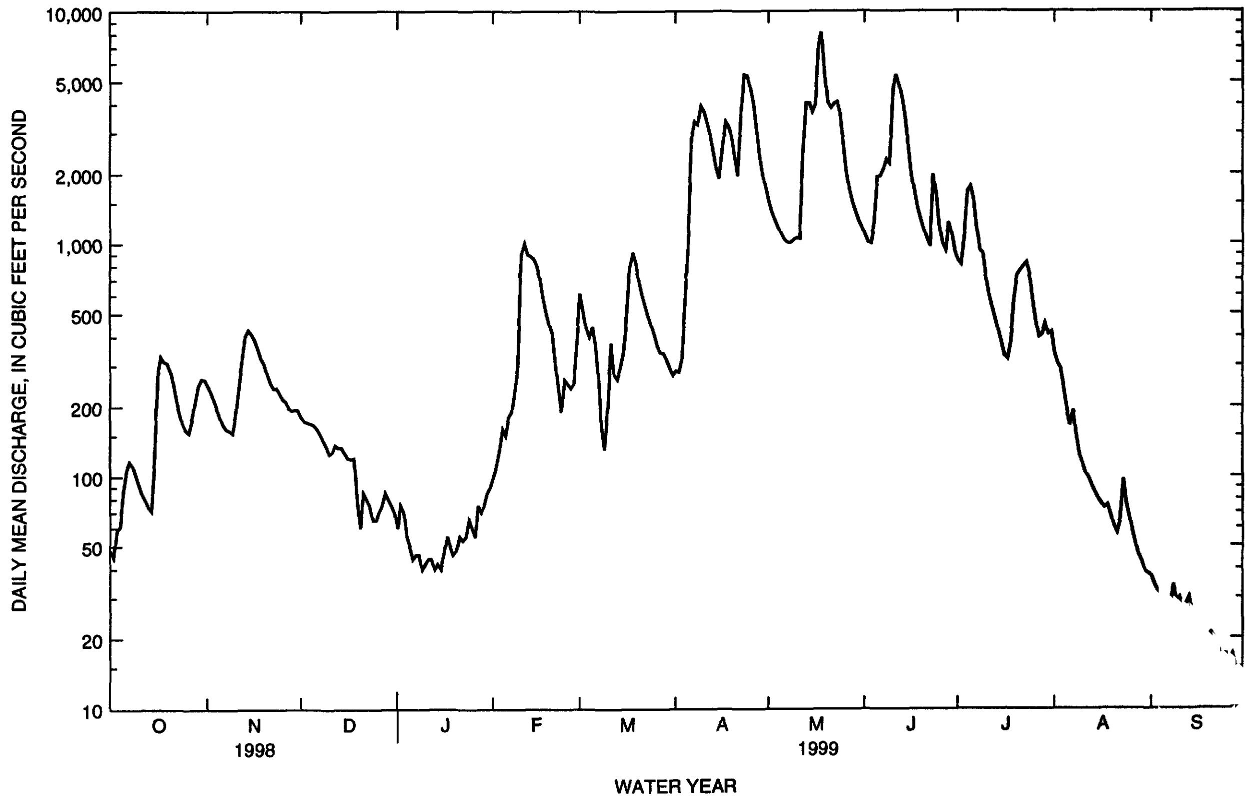
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	241	222	146	99.7	257	809	945	812	1071	580	252	216
MAX	1771	1395	1181	568	1847	2826	4307	4315	4239	4715	2942	2501
(WY)	1987	1993	1983	1983	1984	1973	1965	1991	1984	1993	1993	1965
MIN	6.66	11.0	4.62	.32	3.60	32.5	33.7	46.0	14.1	8.66	9.79	6.48
(WY)	1950	1950	1977	1977	1950	1968	1957	1968	1977	1977	1949	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	258375		292372			
ANNUAL MEAN	708		801		471	
HIGHEST ANNUAL MEAN					1861	1993
LOWEST ANNUAL MEAN					36.1	1956
HIGHEST DAILY MEAN	6730	Jun 29	8130	May 18	19500	Jun 22 1954
LOWEST DAILY MEAN	16	Jan 14	13	Sep 30	.00	Feb 7 1977
ANNUAL SEVEN-DAY MINIMUM	22	Jan 13	16	Sep 24	.01	Feb 1 1977
INSTANTANEOUS PEAK FLOW			9070	May 18	20300	Jun 22 1954
INSTANTANEOUS PEAK STAGE			12.10	May 18	18.55	Jun 22 1954
ANNUAL RUNOFF (AC-FT)	512500		579900		341300	
ANNUAL RUNOFF (CFSM)	.84		.95		.56	
ANNUAL RUNOFF (INCHES)	11.39		12.89		7.58	
10 PERCENT EXCEEDS	1880		2520		1210	
50 PERCENT EXCEEDS	251		261		140	
90 PERCENT EXCEEDS	44		42		16	

e Estimated

05481000 BOONE RIVER NEAR WEBSTER CITY, IA--Continued



05481300 DES MOINES RIVER NEAR STRATFORD, IA

LOCATION.--Lat 42°15'04", long 93°59'52", in NW$^1/_4$ NE$^1/_4$ sec.21, T.86 N., R.27 W., Webster County, Hydrologic Unit 07100004, on right bank 6 ft downstream from bridge on State Highway 175, 0.1 mi downstream from Skillet Creek, 4.0 mi southwest of Stratford, 7.3 mi downstream from Boone River, and at mile 276.7.

DRAINAGE AREA.--5,452 mi^2.

PERIOD OF RECORD.--October 1967 (revised) to current year in reports of U.S. Geological Survey. Replacement station for 05481500 "near Boone", which operated April 1920 to September 1968. Records not necessarily equivalent.

GAGE.--Water-stage recorder. Datum of gage is 894.00 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam at Fort Dodge. 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 May 30, 1903, reached a stage of 25.4 ft, from high-water mark, site and datum then in use, discharge, 43,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	321	2320	2230	e800	e860	2850	2250	10800	6740	8440	3000	372
2	327	2280	2190	e850	e850	2870	2240	9840	6410	8490	2540	363
3	362	2250	2120	e900	e950	2850	2390	9150	6140	8440	2270	355
4	407	2170	2060	e800	e950	2480	2880	8600	6470	8370	2040	346
5	421	2080	2010	e700	e960	2600	3680	8150	7420	8290	1780	348
6	472	1990	1970	e550	e970	2550	8090	7800	8330	7740	1590	342
7	499	1910	1950	e580	e1000	2250	11900	7680	9020	7130	1560	327
8	501	1860	1910	e611	e1230	2060	12600	8000	9720	6670	1440	324
9	486	1810	1790	e550	e1500	1680	14000	8710	9520	6420	1250	343
10	469	1820	1720	e520	e2100	1490	14200	8920	14900	5780	1130	308
11	456	1870	1680	e550	e2300	2190	14000	8710	20300	5140	1050	307
12	469	2130	1640	e550	e2400	2110	13500	9770	20900	4610	979	305
13	479	2570	1620	e530	2680	1850	12600	12400	20300	4150	910	322
14	475	2780	1590	e520	3150	1830	11700	12400	19300	3740	837	312
15	508	2840	1540	e500	e3450	1900	11300	11500	17600	3390	774	297
16	588	2840	1500	e550	e3800	2060	13600	11100	15500	3050	720	284
17	721	2870	1490	e650	e3100	2600	16200	17300	13500	2930	672	276
18	761	2820	1460	e650	e2900	3770	16500	21800	11800	3170	649	268
19	974	2760	1430	e640	2860	4620	15200	18700	10500	3540	625	262
20	1290	2680	1240	e600	2700	4300	13900	15100	9460	4040	578	258
21	1410	2590	735	e650	2500	3950	12700	14700	8670	4030	541	251
22	1430	2520	e1000	e660	2310	3680	16100	14800	8060	4700	527	246
23	1370	2500	e900	e680	2130	3440	22100	14000	10300	5560	572	243
24	1300	2460	e850	e770	2060	3210	22800	12900	9550	5780	603	240
25	1240	2440	e900	e800	2120	2970	21100	11400	8000	5630	539	242
26	1200	2420	e950	e730	2150	2760	19000	10200	7090	5710	493	233
27	1250	2370	e1020	e740	2200	2570	16600	9350	8950	5660	469	233
28	1270	2310	e1030	e800	2850	2500	14700	8880	10400	5270	444	227
29	1430	2280	e1010	e840	---	2550	13300	8370	10100	4820	421	221
30	1860	2270	e950	e850	---	2450	11900	7680	9160	4100	403	216
31	2160	---	e850	e860	---	2330	---	7180	---	3570	386	---
TOTAL	26906	70810	45335	20981	59030	83320	383030	345890	334110	168360	31792	8671
MEAN	868	2360	1462	677	2108	2688	12770	11160	11140	5431	1026	289
MAX	2160	2870	2230	900	3800	4620	22800	21800	20900	8490	3000	372
MIN	321	1810	735	500	850	1490	2240	7180	6140	2930	386	216
AC-FT	53370	140500	89920	41620	117100	165300	759700	686100	662700	333900	63060	17200
CFSM	.16	.43	.27	.12	.39	.49	2.34	2.05	2.04	1.00	.19	.05
IN.	.18	.48	.31	.14	.40	.57	2.61	2.36	2.28	1.15	.22	.06

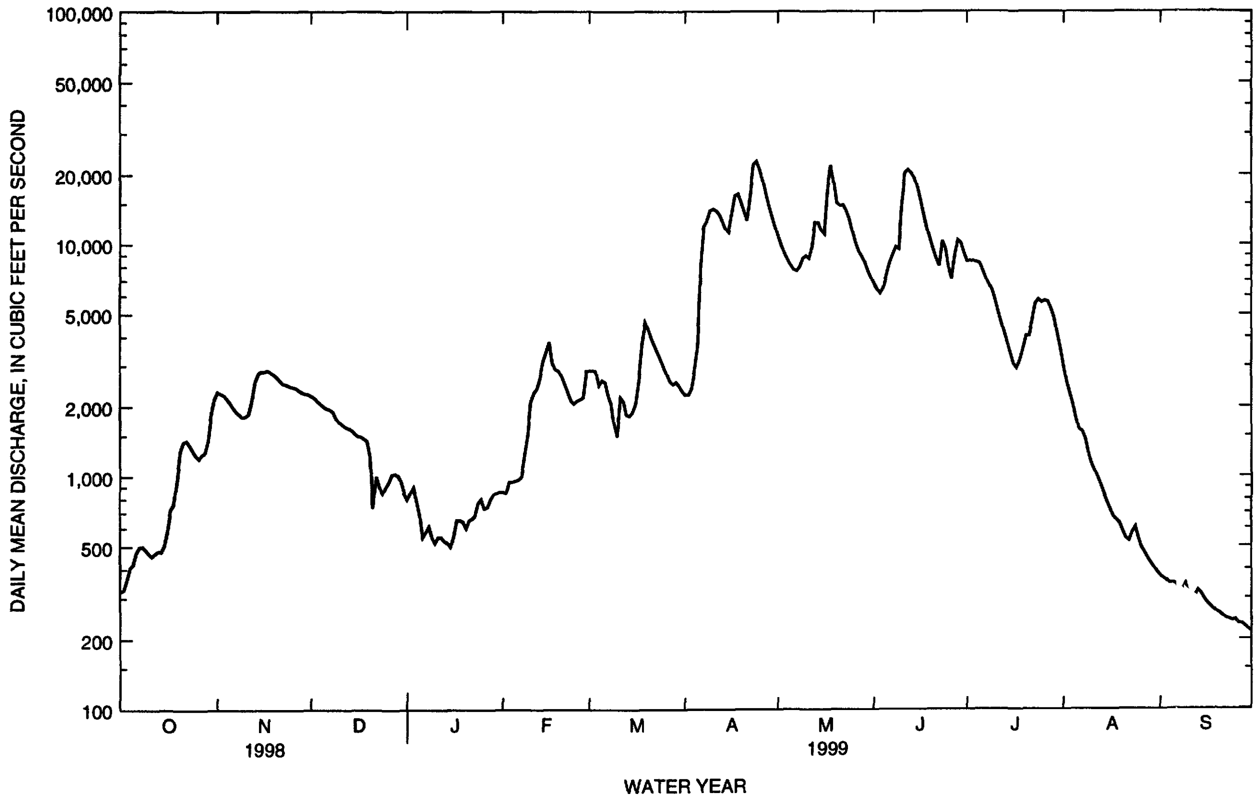
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1703	1772	1291	775	1340	4404	6711	5542	6114	4465	2023	1377
MAX	8763	5745	5267	3267	7061	13920	22020	16010	21310	27250	13500	7546
(WY)	1987	1993	1983	1992	1984	1983	1993	1991	1993	1993	1993	1993
MIN	69.4	96.3	44.4	18.7	57.7	204	355	296	177	156	122	69.5
(WY)	1977	1977	1977	1977	1977	1968	1968	1968	1977	1977	1976	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1968 - 1999	
ANNUAL TOTAL	1205247		1578235			
ANNUAL MEAN	3302		4324		3130	
HIGHEST ANNUAL MEAN					10400	1993
LOWEST ANNUAL MEAN					254	1977
HIGHEST DAILY MEAN	18000	Jun 30	22800	Apr 24	41400	Apr 2 1993
LOWEST DAILY MEAN	180	Jan 14	216	Sep 30	13	Jan 23 1977a
ANNUAL SEVEN-DAY MINIMUM	217	Jan 13	230	Sep 24	14	Jan 22 1977
INSTANTANEOUS PEAK FLOW			23100	Apr 24	423000	Apr 2 1993
INSTANTANEOUS PEAK STAGE			18.35	Apr 24	25.68	Apr 2 1993
INSTANTANEOUS LOW FLOW			213	Sep 30	13	Jan 23 1977
ANNUAL RUNOFF (AC-FT)	2391000		3130000		2268000	
ANNUAL RUNOFF (CFSM)	.61		.79		.57	
ANNUAL RUNOFF (INCHES)	8.22		10.77		7.80	
10 PERCENT EXCEEDS	8330		12500		8490	
50 PERCENT EXCEEDS	1870		2200		1410	
90 PERCENT EXCEEDS	321		415		190	

a Also Jan 24, 1977
e Estimated

05481300 DES MOINES RIVER NEAR STRATFORD, IA--Continued



05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°42'13", long 93°41'21", in SE 1/4 SW 1/4 sec.30, T.80 N., R.24 W., Polk County, Hydrologic Unit 07100004, in control tower of Saylorville Dam, 3.2 mi northwest of Saylorville, 4.2 mi upstream from Beaver Creek, and at mile 213.7.

DRAINAGE AREA.--5,823 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1976. Storage began in April 1977. Release controlled at intake structure to forechamber of 22 ft diameter concrete conduit through dam. Ungated chute spillway 430 ft in length at right end of dam at elevation 884 ft, contents, 570,000 acre-ft. Conservation pool at elevation 836 ft, contents, 90,000 acre-ft, surface area, 5,950 acres. Flood pool elevation at 890 ft, contents, 586,000 acre-ft, surface area, 16,700 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 717,000 acre-ft July 13, 1993; maximum elevation, 892.00 ft July 14, 1993; minimum daily contents, 45,000 acre-ft May 15, 1985; minimum elevation, 832.61 ft Jan. 19, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 369,000 acre-ft June 17,18; maximum elevation, 869.57 June 18; minimum daily contents, 81,000 acre-ft Aug. 14; minimum elevation, 835.93 ft Aug. 15.

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

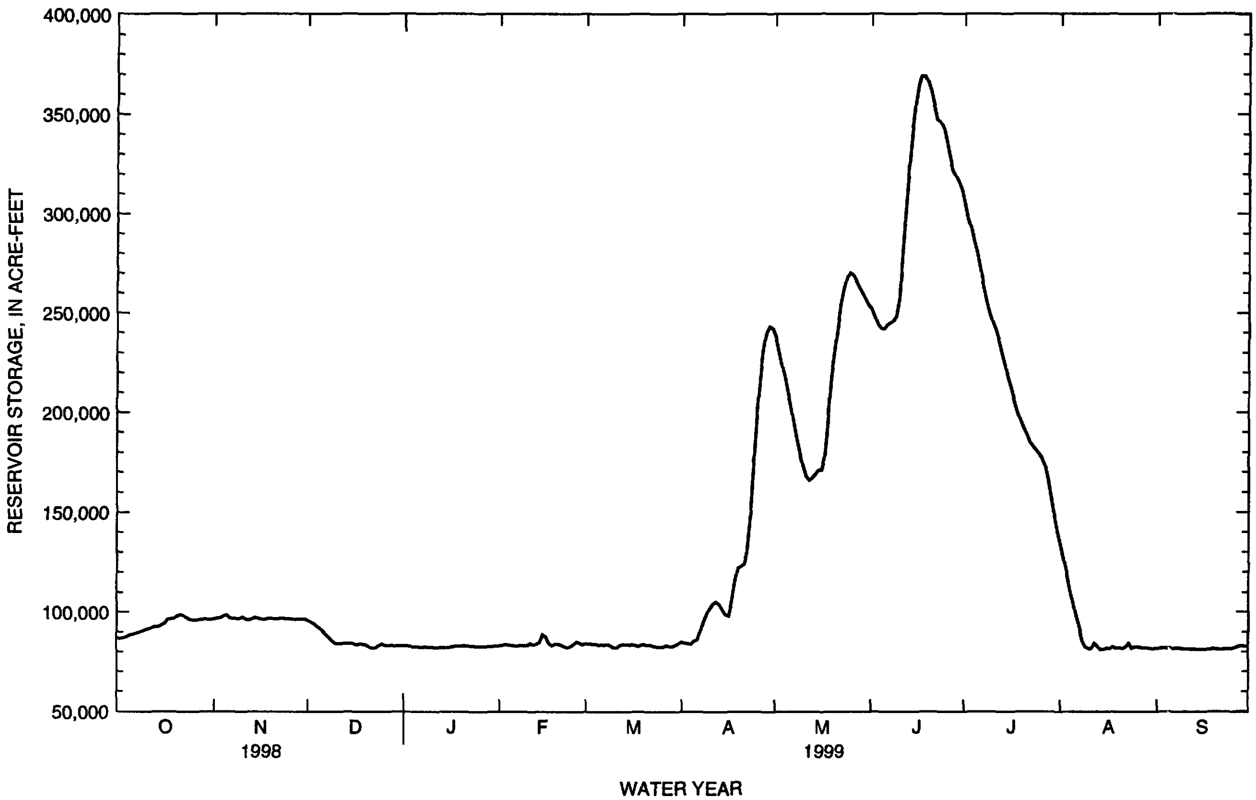
800	0	820	18,500	840	112,000	860	274,000	880	507,000
805	260	825	34,300	845	14[illegible],000	865	324,000	885	582,000
810	2,140	830	55,600	850	186,000	870	380,000	890	672,000
815	7,460	835	80,500	855	229,000	875	440,000		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86700	96400	95600	82900	82900	83900	84800	238000	252000	305000	133000	81600
2	86700	96800	94800	82900	83100	84000	84300	231000	248000	297000	126000	81700
3	87000	97000	93800	82600	83600	83900	84100	224000	244000	293000	119000	81700
4	87500	98000	92600	82400	83300	83900	83800	218000	242000	286000	111000	81800
5	88400	98500	91500	82300	83000	83300	85300	210000	242000	280000	105000	81800
6	88700	96800	90000	82200	82900	83500	85900	203000	244000	272000	98000	81500
7	89300	96700	88400	82200	82800	83300	90600	194000	245000	263000	92500	81800
8	89800	96700	86800	82300	83200	83700	95300	186000	246000	256000	85400	81800
9	90400	96700	85200	82200	83000	83000	99500	179000	248000	250000	82300	81400
10	91000	97400	84100	82200	83000	82100	102000	173000	257000	245000	81500	81300
11	91500	96400	84000	82000	84200	82000	104000	168000	281000	241000	81500	81200
12	92000	96000	84200	82000	83500	83300	105000	166000	304000	236000	84100	81200
13	92500	96400	84200	82000	83900	83700	104000	167000	324000	230000	82600	81200
14	92500	97100	84200	82000	84600	83700	101000	169000	341000	224000	81000	81100
15	93300	96800	84100	82000	88500	83500	98800	171000	355000	217000	81100	81100
16	94100	96300	83900	82100	87600	83500	97900	171000	365000	212000	81700	81100
17	96200	96200	83400	82500	84300	83200	105000	178000	369000	206000	81500	81100
18	96400	96600	83900	82700	83000	82600	115000	196000	369000	200000	82300	81100
19	96600	96700	83600	82700	83800	83500	122000	217000	366000	196000	81800	81500
20	97800	96500	83300	82800	83900	83500	123000	229000	361000	192000	82000	81200
21	98800	96400	82200	82900	83300	83400	124000	242000	354000	189000	81500	81100
22	98100	96600	81700	82900	82500	83300	130000	254000	347000	185000	82300	81100
23	97200	96700	82000	82600	82000	82700	148000	262000	346000	183000	84100	81300
24	96200	96500	83000	82600	82400	82400	174000	268000	344000	181000	81600	81300
25	96000	96400	83800	82400	83600	82200	198000	270000	337000	179000	82300	81500
26	95900	96300	83100	82500	84900	82400	216000	269000	329000	177000	82200	82000
27	96100	96300	83000	82500	84400	83100	231000	266000	322000	173000	82000	82700
28	96000	96300	83100	82500	83500	82600	240000	263000	319000	166000	82000	83000
29	96400	96400	82700	82500	---	82500	243000	260000	316000	157000	81800	82800
30	96200	96300	82800	82600	---	83300	242000	257000	312000	148000	81500	82900
31	96100	---	82800	82800	---	84100	---	254000	---	140000	81500	---
MEAN	93300	96700	85500	82400	83700	83200	131000	218000	308000	219000	88900	81600
MAX	98800	98500	95600	82900	88500	84100	243000	270000	369000	305000	133000	83000
MIN	86700	96000	81700	82000	82000	82000	83800	166000	242000	140000	81000	81100

CAL YR 1998 MEAN 125000 MAX 386000 MIN 81600
WTR YR 1999 MEAN 131000 MAX 369000 MIN 81000

05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA--Continued



05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°40'50", long 93°40'05", $SW^1/_4$ $NE^1/_4$ $NE^1/_4$ sec.5, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on left bank 5 ft upstream of Fisher Bridge on county highway R6F, 2.0 mi west of Saylorville, 2.1 mi downstream from Rock Creek, 2.3 mi downstream from Saylorville Dam, 2.3 mi upstream from Beaver Creek, and at mile 211.4.

DRAINAGE AREA.--5,841 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 787.42 ft above NGVD (levels by U. S. Army Corps of Engineers). Prior to Aug. 6, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Lake (Station 05481630) 2.3 mi upstream since Apr. 12, 1977. U.S. Army Corps of Engineers satellite data collection platform and U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft^3/s Apr. 10, 1965, gage height, 24.02 ft; minimum daily discharge, 13 ft^3/s Jan. 25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, 24.5 ft June 24, 1954, from floodmarks, discharge, 60,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246	2260	2560	793	599	2830	2220	13700	8560	12600	6810	485
2	249	2390	2680	814	606	3010	2550	13600	8390	12300	5970	486
3	257	2460	2670	830	620	3010	2560	13000	8110	12100	5900	486
4	261	1980	2660	777	873	2900	2410	12400	7930	12200	5690	481
5	271	1990	2650	731	1040	2880	2720	12300	7510	12200	4890	544
6	267	2880	2630	739	1040	2690	4240	12100	7080	12200	4840	515
7	246	2170	2620	689	1040	2550	7220	12000	7760	12100	4780	392
8	234	2000	2620	655	1050	2550	10200	11800	8680	10900	4720	429
9	235	2020	2610	661	1310	2530	12400	11700	9000	9810	3030	500
10	236	2110	2250	659	1710	2270	13600	11800	8600	8850	1810	445
11	243	2150	1810	657	2350	1800	13900	12000	8190	7550	1420	365
12	243	2200	1670	656	2520	1850	13800	12300	10800	7080	1700	337
13	243	2170	1670	664	2250	2070	13700	12200	12200	7040	1870	334
14	246	2530	1670	664	2630	2080	13600	12200	12100	6990	1710	337
15	250	2880	1660	612	3340	1840	13600	12000	12100	6910	1050	342
16	257	3080	1660	577	4640	1970	13300	11800	12000	6340	838	347
17	272	2960	1600	580	5150	2330	12400	11900	12300	5900	968	330
18	519	e2820	1500	585	4030	2670	12700	12000	12500	5850	1830	299
19	720	2810	1490	591	3010	3160	13700	12100	12500	5820	1700	289
20	597	2810	1270	593	2880	3940	14500	12100	12400	5810	1120	325
21	931	2690	962	592	2880	3810	13700	11200	12300	5760	1100	315
22	1630	2600	543	641	2720	3460	12800	10100	12200	5730	922	284
23	1740	2590	363	670	2290	3440	11500	11800	12300	6050	2110	256
24	1750	2590	239	670	1940	3170	11800	11700	12500	6330	1710	225
25	1490	2590	293	677	1870	2870	12300	11600	12800	6300	864	223
26	1310	2580	801	623	2120	2530	12200	11600	12700	6740	965	222
27	1320	2490	710	580	2600	2240	12000	11500	12300	7460	954	231
28	1320	2410	763	584	2820	2610	11700	11000	12300	8340	776	220
29	1340	2420	1010	588	---	2360	12500	10200	12800	8940	692	216
30	1570	2410	880	587	---	2250	13100	9560	12900	8570	636	216
31	2080	---	770	594	---	2240	---	8940	---	8030	531	---
TOTAL	22573	74040	49284	20333	61928	81910	318920	364200	323810	258800	73906	10476
MEAN	728	2468	1590	656	2212	2642	10630	11750	10790	8348	2384	349
MAX	2080	3080	2680	830	5150	3940	14500	13700	12900	12600	6810	544
MIN	234	1980	239	577	599	1800	2220	8940	7080	5730	531	216
AC-FT	44770	146900	97750	40330	122800	162500	632600	722400	642300	513300	146600	20780
CFSM	.12	.42	.27	.11	.38	.45	1.82	2.01	1.85	1.43	.41	.06
IN.	.14	.47	.31	.13	.39	.52	2.03	2.32	2.06	1.65	.47	.07

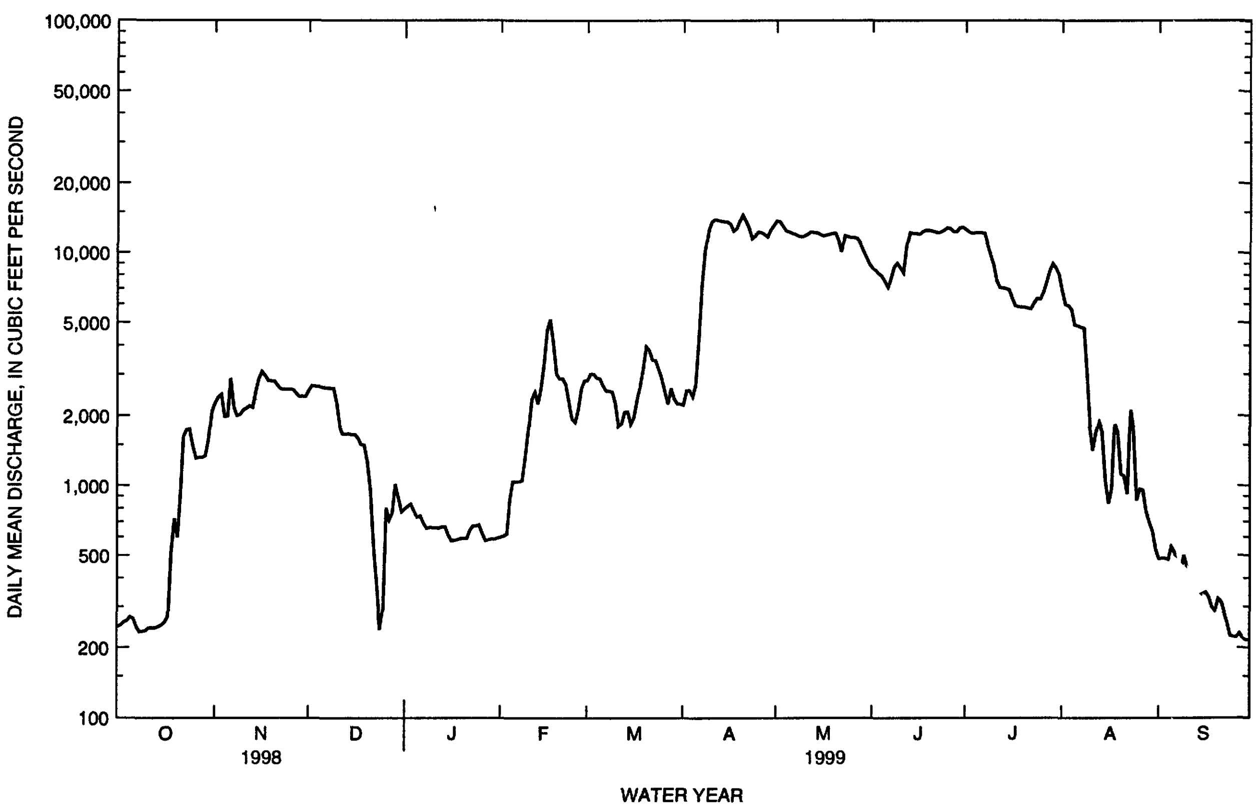
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1916	2226	1791	994	1679	4587	7127	6633	7262	6689	3287	2207
MAX	7161	6210	5345	3605	6591	13800	17790	18170	19540	32820	15440	13450
(WY)	1987	1987	1983	1983	1984	1983	1993	1993	1991	1993	1993	1993
MIN	194	190	205	190	208	362	623	1305	877	254	212	225
(WY)	1990	1990	1990	1991	1978	1981	1989	1989	1988	1988	1989	1988

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1978 - 1999a	
ANNUAL TOTAL	1360877		1660180			
ANNUAL MEAN	3728		4548		3874	
HIGHEST ANNUAL MEAN					11320	1993
LOWEST ANNUAL MEAN					487	1989
HIGHEST DAILY MEAN	14800	Apr 11	14500	Apr 20	44300	Jul 21 1993
LOWEST DAILY MEAN	152	Sep 29	216	Sep 29,30	144	Nov 29 1977
ANNUAL SEVEN-DAY MINIMUM	197	Sep 24	222	Sep 24	165	Mar 5 1978
INSTANTANEOUS PEAK FLOW			14600	Apr 20,21	45700	Jul 21 1993
INSTANTANEOUS PEAK STAGE			13.81	Apr 20,21	24.22	Jul 21 1993
ANNUAL RUNOFF (AC-FT)	2699000		3293000		2806000	
ANNUAL RUNOFF (CFSM)	.64		.78		.66	
ANNUAL RUNOFF (INCHES)	8.67		10.57		9.01	
10 PERCENT EXCEEDS	10000		12300		11100	
50 PERCENT EXCEEDS	2600		2520		2080	
90 PERCENT EXCEEDS	299		340		273	

a Post regulation
e Estimated



05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD: October 1961 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1967 to current year.
WATER TEMPERATURES: October 1961 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1961 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. During periods of partial ice cover, sediment samples are collected in open water channel.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,400 microsiemens Feb. 18, 1977; minimum daily, 90 microsiemens Feb. 19, 1971.
WATER TEMPERATURES: Maximum daily, 36.0°C June 29, 1971; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 5,400 mg/L May 14, 1970; minimum daily mean, 1 mg/L Jan. 8, 1965, Sept. 1, 1988, Feb. 9, July 8, 1990.
SEDIMENT LOADS: Maximum daily, 148,000 tons June 12, 1966; minimum daily, 0.56 tons Sept. 1, 1988.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 997 microsiemens Jan. 21; minimum daily, 456 microsiemens June 30 and July 5.
WATER TEMPERATURES: Maximum daily, 27.0°C Aug. 17, 27; minimum daily, 0.5°C and Jan. 8.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 185 mg/L Feb. 8; minimum daily mean, 11 mg/L June 25.
SEDIMENT LOADS: Maximum daily, 5,300 tons Apr. 11; minimum daily, 8.7 tons Oct. 15.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV						
10...	0855	8.6	2170	35	205	85
FEB						
17...	0830	2.3	5230	21	297	71
APR						
01...	0815	9.5	2280	152	936	62
MAY						
19...	1510	17.0	11700	100	3160	61
JUN						
28...	1505	22.9	12100	30	980	57
AUG						
10...	0900	26.1	1820	33	162	93
SEP						
14...	0810	17.5	336	42	38	99

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	596	---	579	---	712	534	501	---	477	467	592	586
2	---	624	---	---	698	522	501	536	556	---	---	571
3	---	---	---	---	693	536	502	535	478	466	563	569
4	592	---	602	---	---	---	502	599	---	---	563	570
5	579	624	639	---	716	---	499	485	---	456	613	---
6	593	637	587	---	694	---	649	606	488	561	611	573
7	592	---	---	---	698	578	525	531	571	609	---	569
8	599	646	600	693	678	---	509	---	483	514	---	568
9	608	563	597	---	678	521	502	503	640	580	---	559
10	---	578	624	---	750	524	583	561	518	475	518	560
11	---	---	---	701	---	529	484	606	514	485	625	---
12	615	---	609	---	---	---	473	578	497	493	508	---
13	618	---	638	---	---	---	527	509	577	471	482	565
14	621	---	641	---	694	---	473	703	487	494	---	568
15	612	---	655	701	698	---	---	514	476	573	---	569
16	617	---	---	709	---	---	---	512	510	---	613	571
17	---	---	---	740	660	---	491	504	552	---	549	572
18	---	533	639	708	---	---	490	524	575	575	587	---
19	---	547	---	715	---	---	526	514	572	561	605	---
20	---	555	---	705	---	---	495	515	583	636	557	---
21	---	---	---	997	---	---	513	483	500	499	530	---
22	---	571	---	703	---	523	530	559	602	513	601	---
23	---	552	---	539	---	568	585	568	502	590	589	---
24	608	---	640	733	---	532	503	489	600	---	574	---
25	611	---	---	---	---	525	491	542	590	---	573	---
26	611	---	---	694	---	512	516	487	---	509	---	590
27	619	---	---	---	523	---	531	507	471	615	593	574
28	617	565	652	712	537	501	590	589	475	577	---	583
29	620	577	---	---	---	569	590	---	464	---	585	---
30	618	579	---	702	---	502	545	501	456	597	570	---
31	---	---	---	---	---	689	---	570	---	570	---	---

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	---	10.0	---	3.5	6.0	12.0	---	20.0	24.5	---	23.5
2	---	13.5	---	---	5.5	3.5	12.0	15.5	20.0	---	---	26.0
3	---	---	---	---	7.0	2.5	14.0	15.0	21.0	25.0	---	26.0
4	17.5	---	10.5	---	---	---	13.0	15.5	---	---	---	26.0
5	19	11.5	10.0	---	6.0	---	12.0	15.0	---	25.5	---	---
6	17	10	8.0	---	4.0	---	10.5	15.0	23.0	25.5	---	23.5
7	17	---	---	---	5.0	4.0	15.0	15.0	22.5	26.0	---	23.0
8	16.5	10	9.0	.5	7.0	---	13.0	---	24.0	26.5	---	20.5
9	15.5	10	9.0	---	6.0	3.5	12.5	16.5	23.5	26.5	---	23.0
10	---	10.0	8.0	---	6.0	3.5	12.0	17.0	23.5	26.0	---	24.0
11	---	---	---	3.0	---	3.0	11.5	16.5	24.0	26.0	---	---
12	18.5	---	7.0	---	---	---	11.5	16.0	24.0	26.0	---	---
13	17.5	---	7.0	---	---	---	10.5	16.0	24.5	26.5	---	20.5
14	16	---	8.0	---	6.0	---	12.0	17.0	24.0	---	---	19.5
15	18	---	7.5	4.0	6.0	---	---	16.5	22.5	---	---	19.5
16	17	---	---	5.0	---	---	---	18.0	22.5	---	26.5	20.5
17	---	---	---	3.0	2.5	---	9.0	16.5	23.0	---	27.0	20.0
18	---	9.0	7.0	3.5	---	---	10.5	17.0	21.0	---	25.5	---
19	---	6.5	---	3.5	---	---	10.0	17.0	21.0	---	23.0	---
20	---	7.0	---	3.0	---	---	10.0	17.5	22.0	---	24.5	---
21	---	---	---	3.5	---	---	12.0	19.0	22.5	---	26.0	---
22	---	9.0	---	3.5	---	7.0	11.5	19.0	23.0	---	25.5	---
23	---	8.5	---	3.0	---	9.0	11.5	19.0	22.0	---	24.5	---
24	16	---	3.0	3.0	---	10.0	11.0	19.0	25.0	---	23.0	---
25	17	---	---	---	---	10.0	12.5	19.0	24.0	---	23.0	---
26	16	---	---	4.0	---	8.5	13.0	18.5	---	---	---	20.0
27	15	---	---	---	4.5	---	12.0	19.5	23.0	---	27.0	19.0
28	15	8.5	3.5	4.0	3.5	9.5	12.0	19.5	23.5	---	---	17.5
29	16.5	10.0	---	---	---	11.5	13.0	---	23.5	---	24.5	---
30	16	9.0	---	3.5	---	12.0	14.5	21.0	23.5	---	23.0	---
31	---	---	---	---	---	11.5	---	20.0	---	---	---	---

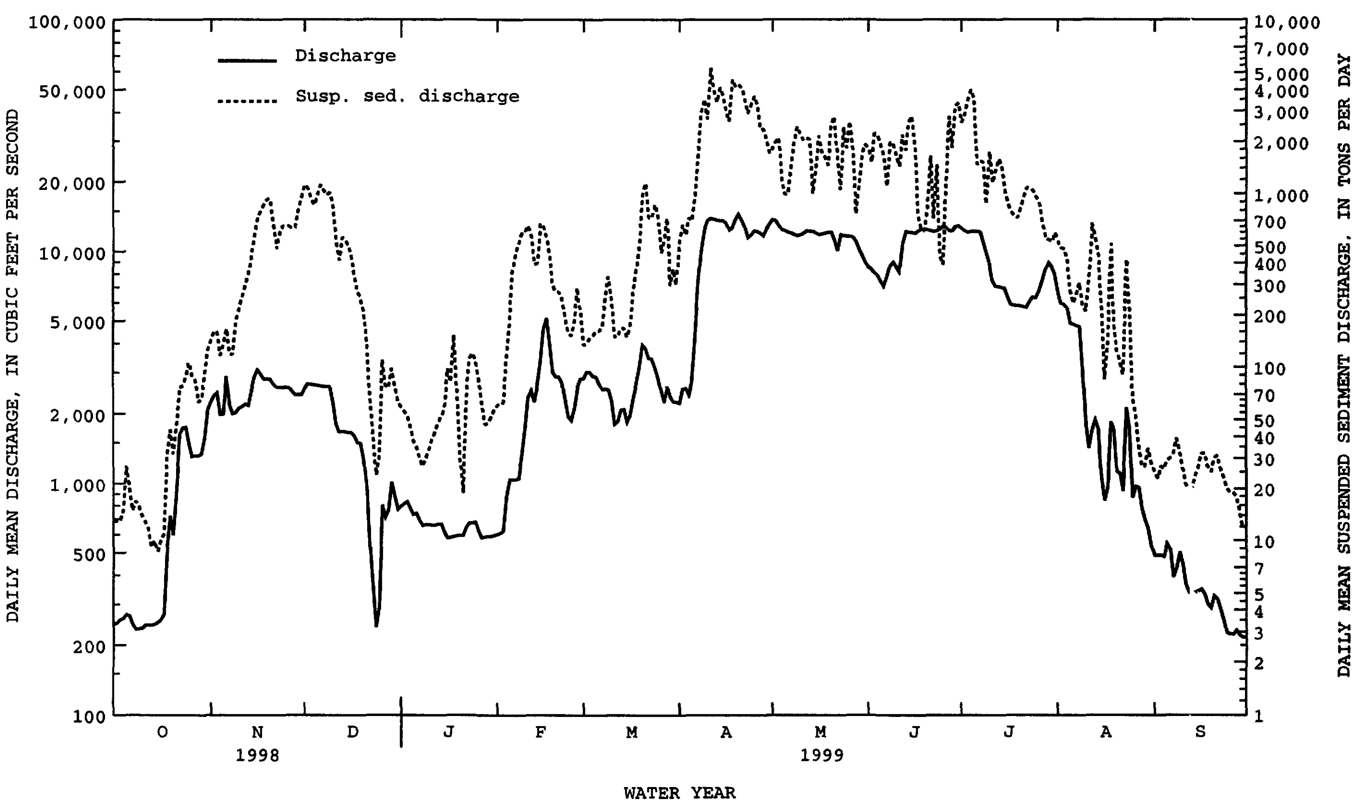
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	19	13	24	144	162	1120	28	59	38	61	18	134
2	19	13	25	160	148	1070	25	56	38	61	17	138
3	19	13	24	160	130	940	23	52	38	63	18	147
4	21	15	22	117	120	859	21	45	47	113	19	152
5	38	27	24	135	134	962	19	38	65	183	21	162
6	28	20	21	166	157	1120	18	35	133	373	22	162
7	23	15	20	120	148	1050	16	30	163	459	25	172
8	26	17	22	118	139	980	15	27	185	524	36	247
9	25	16	34	184	144	1010	17	30	172	605	49	332
10	22	14	38	216	144	872	19	34	132	609	41	256
11	20	13	43	251	109	535	22	39	104	654	31	149
12	18	12	50	294	92	413	24	43	82	561	30	150
13	14	9.2	57	336	125	560	27	48	65	393	30	168
14	15	10	66	452	119	536	30	53	56	398	30	168
15	13	8.7	76	592	112	503	35	58	74	672	30	149
16	15	10	87	727	95	426	63	98	52	647	32	172
17	16	11	100	801	79	343	53	82	40	552	41	262
18	20	31	115	872	67	272	97	153	40	437	50	363
19	22	44	122	931	63	252	45	72	37	298	60	515
20	19	32	122	928	58	200	19	31	35	272	90	984
21	18	46	93	679	53	138	12	19	35	272	111	1150
22	18	77	69	481	42	66	39	68	34	252	78	728
23	17	78	87	606	42	42	62	111	31	191	78	722
24	18	87	93	651	37	24	67	120	30	157	102	868
25	27	107	93	652	38	30	60	109	30	152	97	756
26	25	89	94	652	47	110	51	86	32	188	67	457
27	24	87	94	630	39	79	39	61	41	288	92	555
28	18	63	98	640	36	76	30	47	27	206	105	725
29	18	67	124	810	36	98	30	48	---	---	46	297
30	21	89	147	958	33	78	33	52	---	---	60	368
31	22	125	---	---	30	63	35	57	---	---	50	300
TOTAL	---	1258.9	---	14463	---	14827	---	1861	---	9641	---	11908

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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 (TON DAY)	MEAN CONCE TRATI (MG/L	LOA (TO DAY
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	92	553	49	1830	80	1840	75	2570	29	532	19	25
2	96	661	54	1990	67	1510	86	2850	30	484	18	23
3	84	577	60	2090	102	2220	106	3470	30	482	20	27
4	112	728	35	1180	101	2160	120	3960	26	405	20	26
5	95	697	30	988	95	1930	108	3570	21	280	20	29
6	80	979	30	996	84	1610	45	1470	18	233	21	30
7	89	1730	47	1530	52	1100	47	1540	20	262	30	32
8	106	2950	63	2000	84	1970	51	1510	24	306	34	39
9	105	3500	77	2420	81	1970	33	874	28	226	24	33
10	73	2690	69	2200	70	1620	74	1740	43	209	21	26
11	141	5300	63	2020	64	1440	57	1150	86	318	21	21
12	106	3940	63	2080	75	2190	72	1370	145	675	22	20
13	91	3370	63	2060	54	1780	83	1580	107	542	22	20
14	111	4070	30	994	80	2600	74	1400	95	440	26	24
15	100	3660	44	1410	86	2800	56	1040	76	228	29	27
16	83	2960	67	2150	59	1920	52	883	38	85	34	32
17	78	2610	53	1700	23	749	49	786	53	139	35	32
18	132	4540	50	1620	19	637	47	746	104	516	34	27
19	112	4120	44	1450	18	608	46	723	36	171	32	25
20	108	4240	78	2520	24	794	52	820	40	122	34	30
21	110	4090	92	2770	50	1650	61	956	36	108	36	31
22	102	3520	58	1590	22	723	70	1080	37	90	34	26
23	93	2900	33	1050	44	1460	66	1080	72	417	33	23
24	101	3230	76	2400	13	440	61	1040	43	213	33	20
25	110	3650	58	1820	11	391	56	956	29	68	32	19
26	99	3250	83	2590	34	1160	50	900	19	51	31	19
27	73	2370	58	1790	84	2780	35	700	14	35	29	18
28	74	2350	26	760	56	1840	24	549	13	27	25	15
29	61	2070	40	1110	93	3220	22	543	14	27	21	12
30	48	1700	67	1730	95	3330	23	529	20	34	21	12
31	---	---	79	1910	---	---	28	595	20	28	---	---
TOTAL	---	83005	---	54748	---	50442	---	42980	---	7753	---	743
YEAR		293629.9										



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05481950 BEAVER CREEK NEAR GRIMES, IA

LOCATION.--Lat 41°41'18", long 93°44'06", in $SW^1/_4$ $SW^1/_4$ sec.35, T.80 N., R.25 W., Polk County, Hydrologic Unit 07100004, on left bank 10 ft upstream from bridge on Northwest 70th Avenue, 0.5 mi downstream from Little Beaver Creek, 2.5 mi east of Grimes, and 6 mi upstream from mouth.

DRAINAGE AREA.--358 mi^2.

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

REVISED RECORDS.--WDR IA-77-1: 1974 (P), WDR IA-95-1:location.

GAGE.--Water stage recorder. Datum of gage is 806.98 ft above sea level. Prior to Aug. 31, 1966, nonrecording gage at same site and datum.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

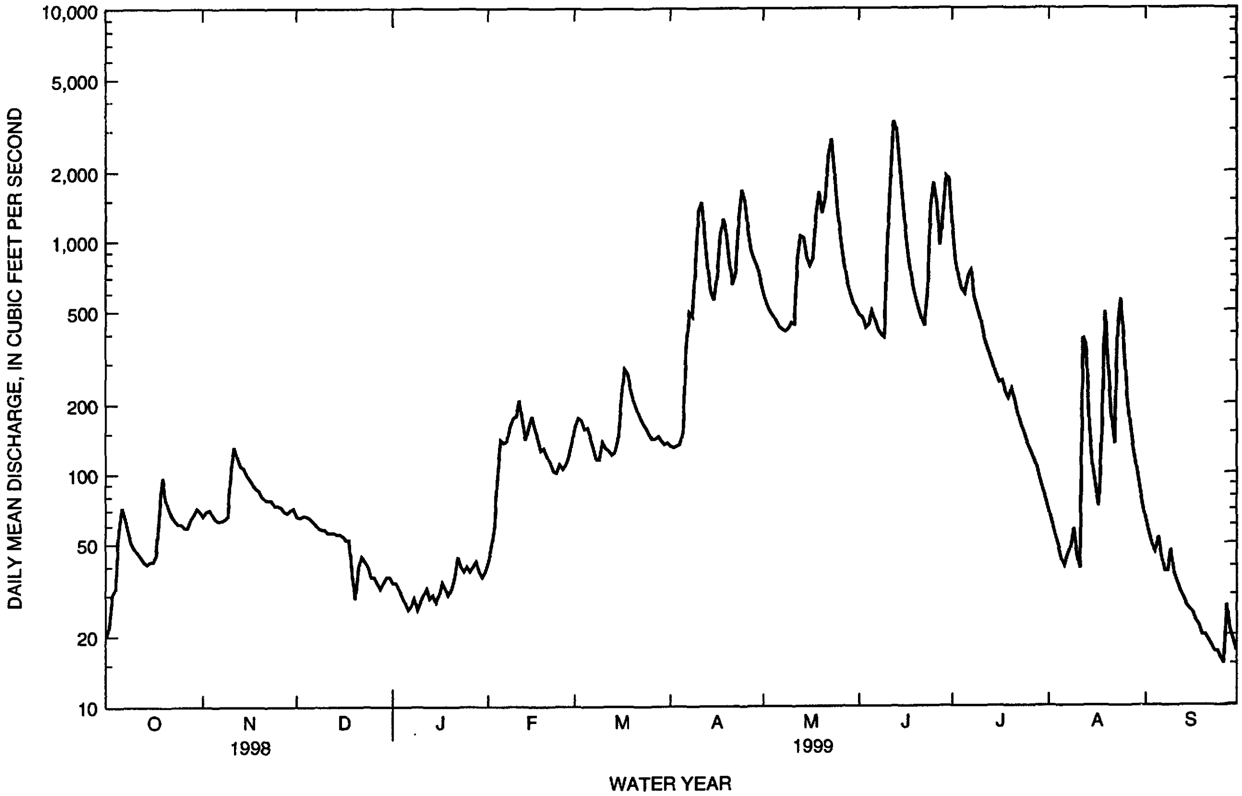
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	66	66	e34	e42	160	132	595	481	1170	69	63
2	22	69	65	e34	e48	174	130	542	471	822	61	55
3	30	70	66	e32	e60	171	132	504	424	682	54	49
4	32	67	66	e30	e100	156	134	480	437	619	49	46
5	57	64	65	e28	e140	158	152	456	499	592	43	53
6	72	63	63	e26	136	144	343	429	455	709	40	44
7	65	63	61	e27	138	130	494	417	414	745	44	38
8	57	64	59	e29	161	116	474	410	396	576	48	38
9	51	66	58	e26	174	116	793	421	385	516	58	47
10	48	107	58	e28	177	137	1360	446	929	459	45	37
11	46	131	56	e30	207	129	1470	440	1760	392	39	34
12	44	117	56	e32	167	126	1040	836	3270	354	382	31
13	42	108	56	e29	140	121	751	1050	3040	323	354	29
14	41	106	55	e30	159	124	605	1030	2120	294	157	27
15	42	99	55	e28	177	140	559	851	1490	e266	107	26
16	42	95	54	e30	156	203	715	784	1050	246	86	25
17	45	90	52	e34	143	283	1060	840	811	250	72	23
18	67	e87	52	e32	126	270	1240	1300	665	224	157	22
19	97	85	e36	e30	129	232	1070	1630	579	210	493	20
20	78	80	e29	e32	119	207	e800	1320	519	230	299	20
21	71	78	e40	e36	112	191	e650	1530	467	209	178	19
22	66	77	e44	e44	103	176	740	2370	431	181	134	18
23	63	77	e42	e40	101	165	1250	2760	596	162	418	17
24	61	73	e40	e38	110	157	1670	1950	1390	149	561	17
25	61	73	e36	e40	105	147	1490	1340	1790	135	360	16
26	59	72	e36	e38	110	141	1110	1020	1460	126	218	15
27	59	69	e34	e40	118	141	912	812	957	117	163	27
28	64	68	e32	e42	135	145	833	675	1310	108	129	21
29	67	70	e34	e38	---	139	775	597	1910	95	106	19
30	71	71	e36	e36	---	134	673	542	1840	85	87	17
31	69	---	e36	e38	---	136	---	514	---	78	73	---
TOTAL	1709	2425	1538	1031	3593	4969	23557	28891	32346	11124	5084	913
MEAN	55.1	80.8	49.6	33.3	128	160	785	932	1078	359	164	30.4
MAX	97	131	66	44	207	283	1670	2760	3270	1170	561	63
MIN	20	63	29	26	42	116	130	410	385	78	39	15
AC-FT	3390	4810	3050	2040	7130	9860	46730	57310	64160	22060	10080	1810
CFSM	.15	.23	.14	.09	.36	.45	2.19	2.60	3.01	1.00	.46	.09
IN.	.18	.25	.16	.11	.37	.52	2.45	3.00	3.36	1.16	.53	.09

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	103	123	103	63.3	127	355	393	431	482	292	114	74.9
MAX	724	655	486	305	526	1171	1275	1419	1434	2160	695	654
(WY)	1974	1973	1983	1974	1973	1979	1965	1974	1998	1993	1993	1993
MIN	.058	.63	.77	.002	.35	3.98	3.26	1.11	1.41	.24	.73	.26
(WY)	1989	1967	1977	1977	1977	1981	1981	1981	1977	1977	1988	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1961 - 1999	
ANNUAL TOTAL	124570		117180			
ANNUAL MEAN	341		321		222	
HIGHEST ANNUAL MEAN					575	1993
LOWEST ANNUAL MEAN					17.3	1981
HIGHEST DAILY MEAN	4070	Jun 17	3270	Jun 12	11500	Jul 10 1993
LOWEST DAILY MEAN	16	Jan 14	15	Sep 26	.00	Sep 8 1970a
ANNUAL SEVEN-DAY MINIMUM	22	Jan 13	17	Sep 20	.00	Oct 7 1971
INSTANTANEOUS PEAK FLOW			3820	Jun 12	14300	Jul 10 1993
INSTANTANEOUS PEAK STAGE			12.36	Jun 12	16.58	Jul 10 1993
INSTANTANEOUS LOW FLOW			15	Sep 25		
ANNUAL RUNOFF (AC-FT)	247100		232400		160800	
ANNUAL RUNOFF (CFSM)	.95		.90		.62	
ANNUAL RUNOFF (INCHES)	12.94		12.18		8.42	
10 PERCENT EXCEEDS	781		919		568	
50 PERCENT EXCEEDS	127		116		77	
90 PERCENT EXCEEDS	28		32		2.2	

a Also Sep 11-13, 1970, Sep 17, 18, Oct 7-17, 1971; many days during 1977
e Estimated


10,000
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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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1998
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WATER YEAR

05482000 DES MOINES RIVER AT SECOND AVENUE AT DES MOINES, IA

LOCATION.--Lat 41°36'45", long 93°37'15", in $NE^1/_4$ $NE^1/_4$ sec.34, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on right bank 5 ft upstream from 2nd Avenue or State Highway 60 bridge in Des Moines, 1.8 miles upstream from Des Moines Electric Company dam, 2.8 miles upstream from Raccoon River, and 4.5 miles downstream from Beaver Creek.

DRAINAGE AREA.--6,245 mi^2.

PERIOD OF RECORD.--October 1902 to August 1903, October 1914 to February 1915 (gage heights and discharge measurements only); March 1915 to September 1961, October 1996 to current year.

REVISED RECORDS-- WSP 1308: 1915-19, 1921, 1923, 1933, 1943(M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 773.68 ft above sea level and at city datum. Prior to August 21, 1941, staff, chain, or recording gages at several sites within 3 mi of present site at various datums.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Dam 6.8 mi. upstream, since Apr. 12, 1977. 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, and U.S. Weather Service Limited Automated Remote Collector (LARC) at station.

EXTREMES FOR PERIOD OF RECORD--Maximum discharge 60,200 ft^3/sec on June 24, 1954, gage height 30.16; minimum unregulated daily discharge 24 ft^3/sec Jan. 29, 30, 1940.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e270	2440	2640	e825	e660	2980	2470	14800	9150	14200	7000	523
2	e280	2630	2820	e850	e680	3190	2660	14700	8890	13600	5870	510
3	e290	e2600	2820	e850	e700	3280	2790	14000	8600	13300	5810	500
4	e300	e2100	2820	e800	e1000	3120	2690	13200	8390	13300	5660	520
5	e320	e2100	2820	e775	e1200	3080	2870	13000	8010	13300	4710	699
6	e340	3100	2800	e750	e1200	2900	3960	12800	7430	13300	4620	615
7	e320	2330	2800	e725	e1200	2690	7000	12700	8030	13300	4630	495
8	e300	2110	2800	e700	e1300	2700	10500	12500	9060	12100	4530	460
9	e290	2100	2780	e700	e1500	2630	13400	12300	9480	10600	3310	550
10	e290	2330	2470	e700	e1900	2450	15100	12400	9590	9610	1930	509
11	e290	2240	1980	e700	2350	1910	15600	12800	9060	7960	1620	425
12	e290	2280	1800	e700	2720	1910	15300	13600	12100	7320	2360	394
13	e290	2280	1780	e700	2230	2180	15000	13400	14200	7260	2380	387
14	e290	2540	1780	e700	2630	2180	14700	13400	13900	7190	1970	383
15	e300	2960	1780	e650	3370	2200	14700	13200	13700	7090	1390	378
16	e300	3210	1780	e610	4680	2390	14500	12900	13300	6560	e1000	376
17	e320	3160	1740	e620	5300	2790	13400	13100	13400	6000	e1100	366
18	606	2980	1610	e630	4400	3070	13800	13300	13600	5930	1920	340
19	925	2960	1580	e630	3190	3370	14700	13700	13500	5890	2370	326
20	735	2960	1400	e630	2980	4060	15600	13500	13400	5940	1480	340
21	1370	2860	1090	e650	2950	4100	14900	13100	13300	5830	1330	347
22	e1800	2730	808	687	2820	3640	13900	11800	13200	5740	1170	309
23	e1900	2710	408	699	2390	3620	12800	13600	13300	6030	2590	297
24	1880	2710	e300	699	1990	3450	12700	13600	e13800	6380	2800	260
25	1510	2700	340	699	1890	3230	13800	13000	14400	6360	1230	258
26	e1400	2690	747	688	2090	2990	13300	12800	14300	6750	1210	264
27	e1400	2620	e900	e650	2620	2780	13300	12600	13600	7560	1130	361
28	e1400	2530	845	e650	2920	2950	12500	12000	13700	8520	984	283
29	e1400	2530	e1100	e650	---	2890	13500	11100	14400	9270	838	261
30	1760	2520	e900	e650	---	2490	13900	10300	14700	8910	778	263
31	2190	---	e850	e650	---	2490	---	9630	---	8320	629	---
TOTAL	25356	78010	53088	21617	64860	89710	345340	398830	355490	273420	80349	11999
MEAN	818	2600	1713	697	2316	2894	11510	12870	11850	8820	2592	400
MAX	2190	3210	2820	850	5300	4100	15600	14800	14700	14200	7000	699
MIN	270	2100	300	610	660	1910	2470	9630	7430	5740	629	258
AC-FT	50290	154700	105300	42880	128600	177900	685000	791100	705100	542300	159400	23800
CFSM	.13	.42	.27	.11	.37	.46	1.84	2.06	1.90	1.41	.42	.06
IN.	.15	.46	.32	.13	.39	.53	2.06	2.38	2.12	1.63	.48	.07

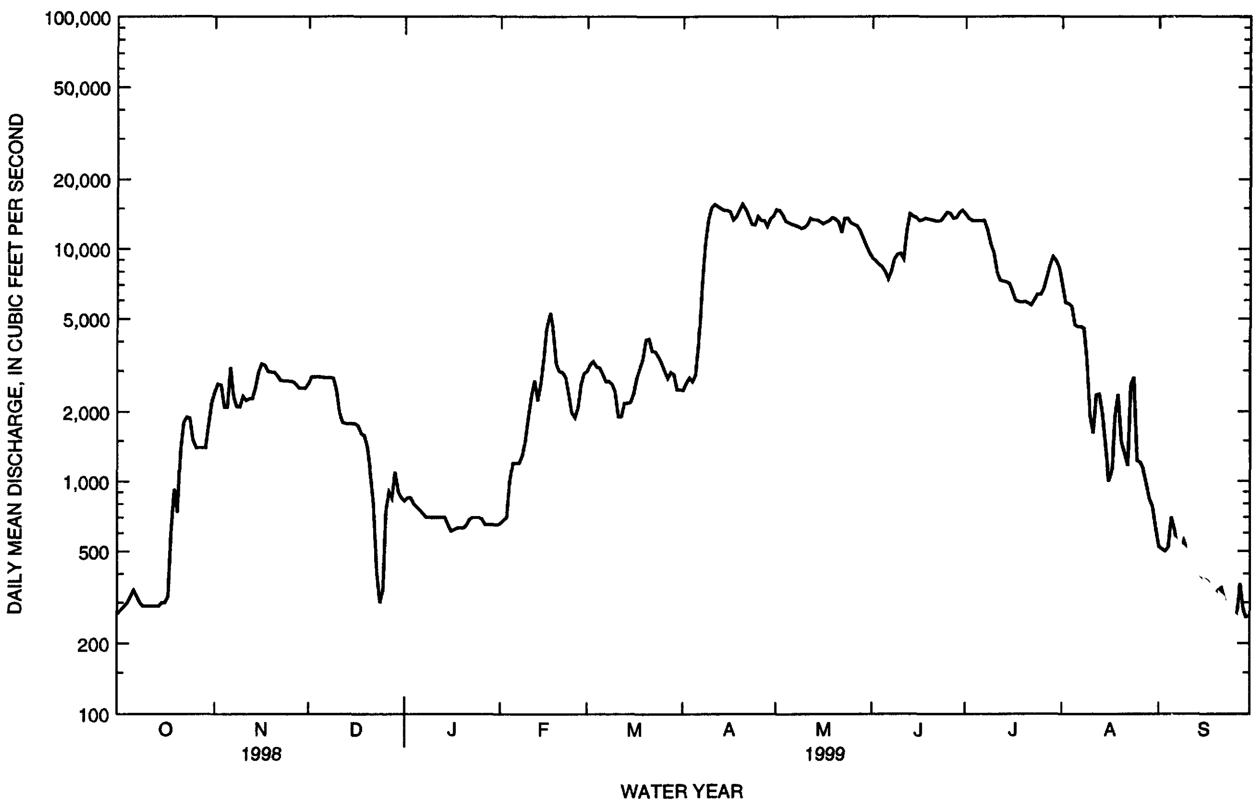
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1999, BY WATER YEAR (WY)

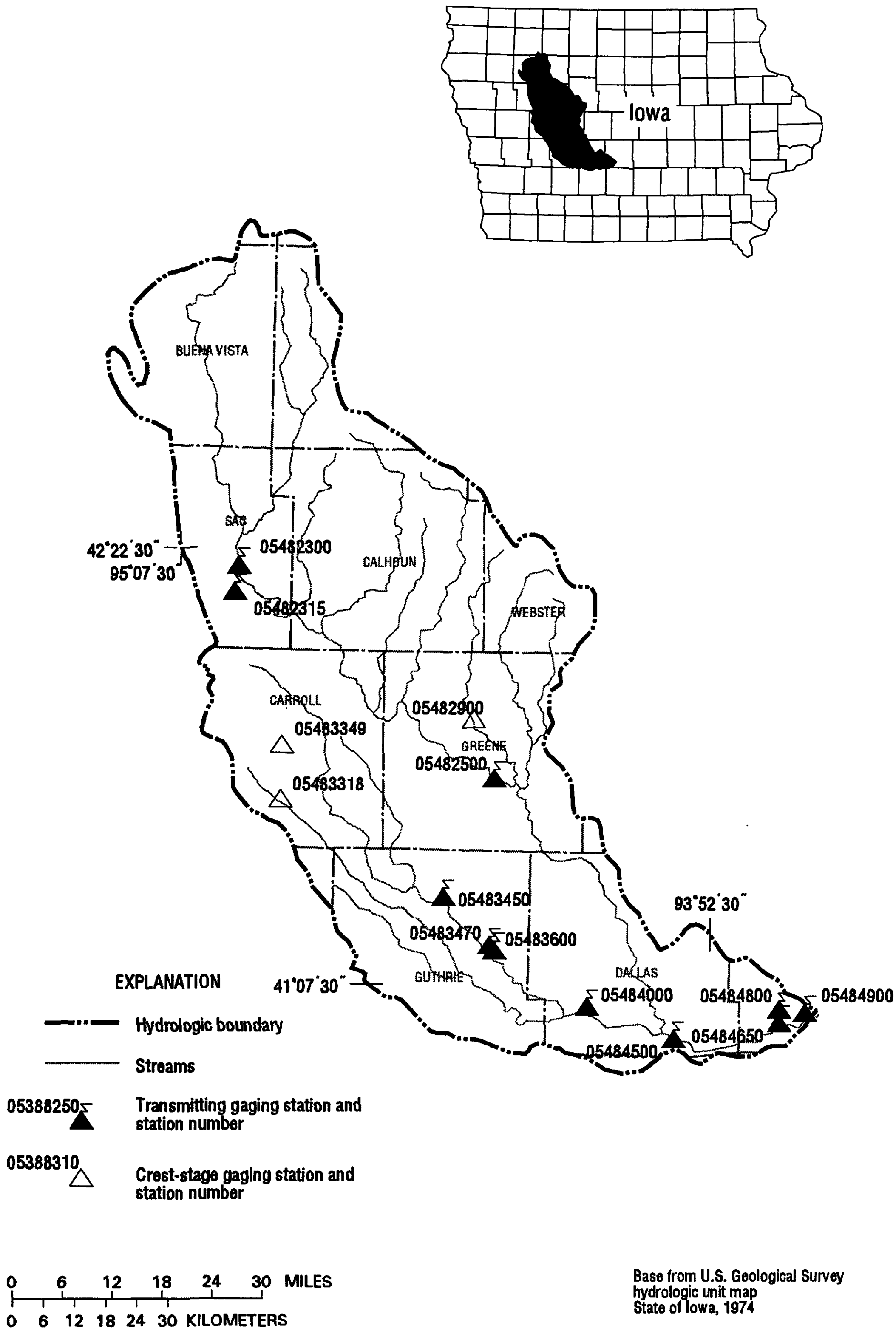
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	715	1975	1685	781	2618	5263	10530	8980	8378	7355	2570	446
MAX	818	2871	2696	1231	2775	9385	11510	12870	11850	8820	3490	630
(WY)	1999	1997	1997	1997	1997	1997	1999	1999	1999	1999	1998	1998
MIN	548	453	648	416	2316	2894	9045	6535	4952	4913	1627	308
(WY)	1998	1998	1998	1998	1999	1999	1997	1998	1997	1997	1997	1997

05482000 DES MOINES RIVER AT SECOND AVENUE AT DES MOINES, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1997 - 1999	
ANNUAL TOTAL	1524884		1798069			
ANNUAL MEAN	4178		4926		4277	
HIGHEST ANNUAL MEAN					4926	1999
LOWEST ANNUAL MEAN					3888	1998
HIGHEST DAILY MEAN	16000	Apr 10	15600	Apr 11	16000	Apr 10 1998
LOWEST DAILY MEAN	180	Sep 29	258	Sep 25	180	Sep 29 1998
ANNUAL SEVEN-DAY MINIMUM	230	Sep 24	279	Sep 24	229	Sep 16 1997
INSTANTANEOUS PEAK FLOW			15700	Apr 20	16000	Apr 10 1998a
INSTANTANEOUS PEAK STAGE			19.49	Apr 20	19.59	Apr 10 1998a
ANNUAL RUNOFF (AC-FT)	3025000		3566000		3099000	
ANNUAL RUNOFF (CFSM)	.67		.79		.68	
ANNUAL RUNOFF (INCHES)	9.08		10.71		9.31	
10 PERCENT EXCEEDS	11000		13500		12200	
50 PERCENT EXCEEDS	2820		2660		2640	
90 PERCENT EXCEEDS	340		385		370	

a Also Apr 11
e Estimated





Base from U.S. Geological Survey
hydrologic unit map
State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA

LOCATION.--Lat 42°21'16", long 94°59'26", in $NW^1/_4$ $NW^1/_4$ sec.13, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on right bank 5 ft downstream from bridge on county highway, 2.1 mi upstream from Indian Creek, 0.3 mi upstream from Drainage Ditch 73, 4.6 mi south of Sac City, 167.1 miles upstream of mouth of Raccoon River, and at mile 367.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--700 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 1,146.03 ft above sea level. Prior to Oct. 1, 1987 at site 1.7 miles downstream at datum 1.43 ft lower.

REMARKS.--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 data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 15.61 ft, from floodmark, discharge, 7,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	255	196	e80	e130	564	301	1470	696	817	134	32
2	44	234	198	e100	e150	597	282	1330	683	789	119	30
3	62	217	200	e90	e170	577	319	1220	686	724	109	29
4	69	202	198	e70	e210	503	356	1130	684	662	102	29
5	97	192	193	e65	e200	445	461	1070	697	585	93	32
6	96	184	186	e60	e240	388	2090	1050	672	531	93	29
7	89	178	178	e60	e250	352	2010	1080	626	482	112	29
8	80	175	171	e59	e340	311	1600	1370	583	446	87	24
9	75	176	172	e53	e410	297	2670	1500	575	415	77	23
10	74	203	170	e55	e525	412	2590	1290	2900	375	72	22
11	72	360	166	e58	e550	319	1980	1150	3630	335	70	22
12	69	412	175	e58	547	292	1590	1040	2980	316	67	25
13	66	405	167	e53	465	282	1340	963	2270	296	63	23
14	67	387	160	e55	505	278	1220	909	1780	277	60	21
15	68	354	156	e53	477	285	1530	870	1380	263	56	21
16	71	331	155	e60	410	376	2120	1050	1190	290	52	21
17	93	304	151	e70	340	e600	2180	2020	1050	304	50	20
18	258	e288	155	e65	334	e900	1850	1670	947	353	51	20
19	261	272	e100	e60	294	719	1540	1330	876	454	47	20
20	208	253	e80	e63	281	616	1330	1160	819	400	44	20
21	185	244	e110	e73	247	558	1220	1180	765	376	42	20
22	167	245	e100	e70	230	502	3020	1120	741	369	39	21
23	153	234	e95	e73	132	455	3990	1100	710	321	40	22
24	146	218	e85	e85	262	421	3370	1120	663	288	46	20
25	142	219	e85	e80	328	380	2630	1010	611	250	50	20
26	134	212	e95	e72	296	360	2110	898	571	262	41	20
27	150	207	e100	e100	398	346	1980	817	644	296	e38	21
28	167	207	e110	e90	522	343	2320	774	1240	242	e35	22
29	248	213	e100	e100	---	320	2070	749	1140	209	e33	21
30	323	211	e95	e110	---	296	1690	719	e868	184	e31	21
31	290	---	e90	e120	---	300	---	706	---	157	30	---
TOTAL	4065	7592	4392	2260	9243	13394	53759	34865	33677	12068	1983	700
MEAN	131	253	142	72.9	330	432	1792	1125	1123	389	64.0	23.3
MAX	323	412	200	120	550	900	3990	2020	3630	817	134	32
MIN	41	175	80	53	130	278	282	706	571	157	30	20
AC-FT	8060	15060	8710	4480	18330	26570	106600	69150	66800	23940	3930	1390
CFSM	.19	.36	.20	.10	.47	.62	2.56	1.61	1.60	.56	.09	.03
IN.	.22	.40	.23	.12	.49	.71	2.86	1.85	1.79	.64	.11	.04

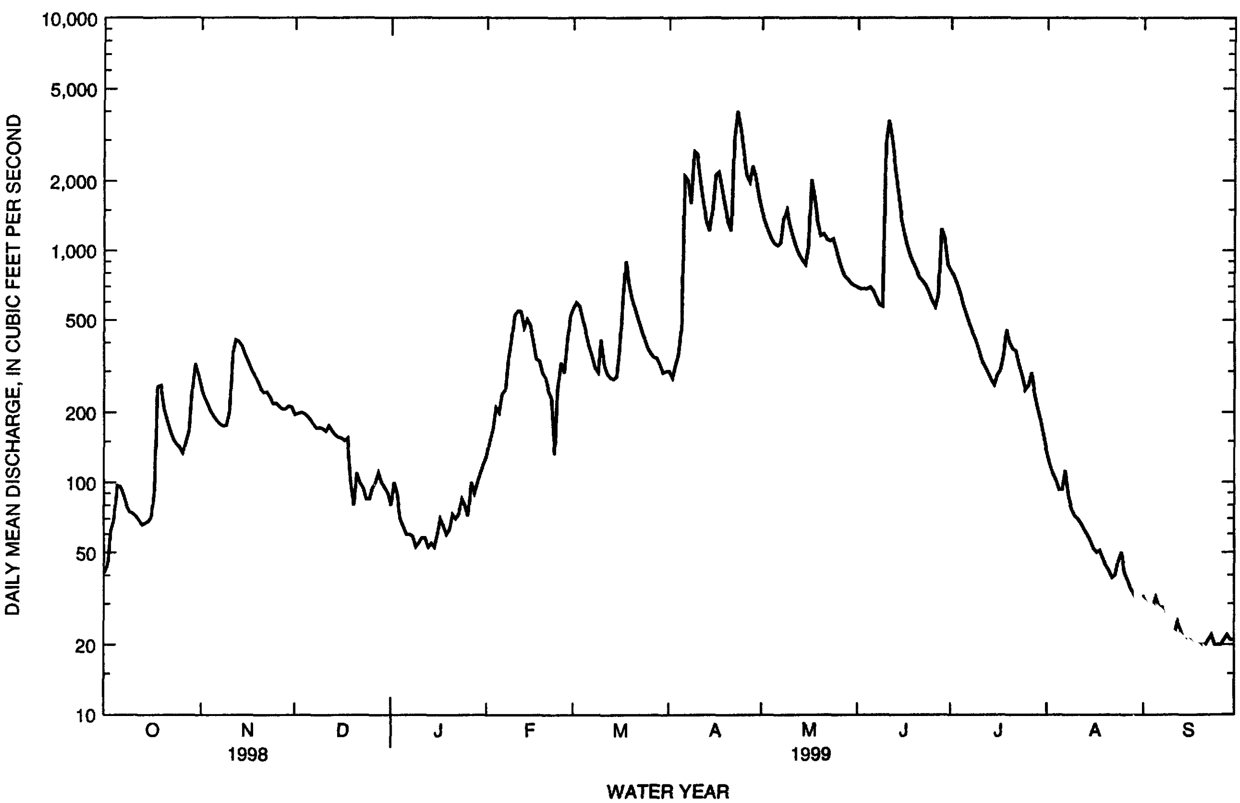
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	247	220	139	94.7	185	646	813	657	865	505	232	234
MAX	1782	1005	641	498	1038	2723	2726	2077	3344	3096	1188	1966
(WY)	1983	1984	1983	1983	1984	1983	1983	1991	1984	1993	1993	1962
MIN	6.39	9.44	4.39	.87	1.16	27.2	25.6	31.9	24.7	23.0	9.29	7.80
(WY)	1959	1959	1959	1977	1959	1968	1967	1967	1977	1977	1976	1976

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1959 - 1999	
ANNUAL TOTAL	203758		177998			
ANNUAL MEAN	558		488		403	
HIGHEST ANNUAL MEAN					1331	1983
LOWEST ANNUAL MEAN					25.3	1977
HIGHEST DAILY MEAN	5450	Jun 25	3990	Apr 23	12400	Mar 23 1979
LOWEST DAILY MEAN	13	Jan 14	20	Sep 17a	.00	Jan 30 1977c
ANNUAL SEVEN-DAY MINIMUM	19	Jan 13	20	Sep 15	.01	Jan 29 1977
INSTANTANEOUS PEAK FLOW			4200	Apr 23	13100	Mar 23 1979
INSTANTANEOUS PEAK STAGE			15.65	Apr 23	20.14	Jun 17 1990
INSTANTANEOUS LOW FLOW			19	Sep 17b		
ANNUAL RUNOFF (AC-FT)	404200		353100		292200	
ANNUAL RUNOFF (CFSM)	.80		.70		.58	
ANNUAL RUNOFF (INCHES)	10.83		9.46		7.83	
10 PERCENT EXCEEDS	1490		1310		1040	
50 PERCENT EXCEEDS	240		250		140	
90 PERCENT EXCEEDS	46		40		16	

a Also Sep 18-21, 24-26
b Also Sep 18-21, 24-27
c Also Jan 31 to Feb 4, 1977
e Estimated



05482315 BLACK HAWK LAKE AT LAKE VIEW, IA

LOCATION.--Lat 42°18'15", long 95°02'30", in NW$^1/_4$ SE$^1/_4$ sec.33, T.87 N., R.36 W., Sac County, Hydrologic Unit 071C0006, on south shore across from swimming beach at Lake View and 2 mi. upstream from lake outlet.

DRAINAGE AREA.--23.3 mi^2.

PERIOD OF RECORD.--April 1970 to September 1975; April 1978 to September 1992, October 1994 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,218.50 ft above sea level and 2.00 ft below crest of spillway of dam at outlet. Prior to June 25, 1970, nonrecording gage at lake outlet.

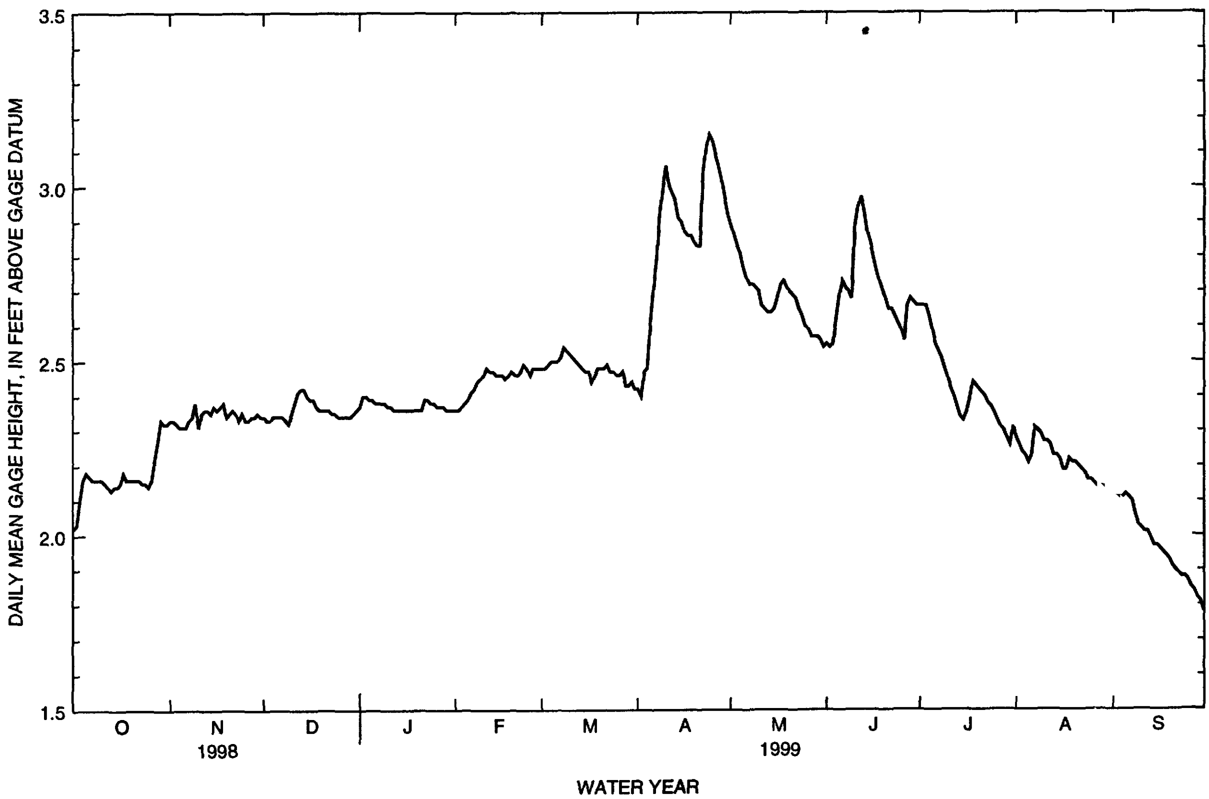
REMARKS.--Gage height was considered reliable for the year. Lake is formed by concrete dam with ungated overflow spillway at elevation 1,220.50 ft. above sea level. Lake is used for conservation and recreation. Area of lake is approximately 957 acres. U.S. Geological Survey satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.34 ft June 22, 1996; minimum, 0.02 ft Sept. 26, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 3.17 ft Apr. 24; minimum, 1.75 ft Sept. 30.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.02	2.33	2.34	2.37	2.36	2.48	2.42	2.89	2.55	2.66	2.28	2.11
2	2.03	2.33	2.33	2.40	2.36	2.48	2.40	2.86	2.54	2.66	2.26	2.11
3	2.10	2.32	2.33	2.40	2.37	2.49	2.47	2.83	2.55	2.66	2.24	2.11
4	2.16	2.31	2.34	2.39	2.38	2.50	2.48	2.81	2.62	2.63	2.23	2.11
5	2.18	2.31	2.34	2.39	2.39	2.50	2.61	2.77	2.69	2.59	2.21	2.12
6	2.17	2.31	2.34	2.38	2.41	2.50	2.71	2.74	2.73	2.55	2.23	2.11
7	2.16	2.33	2.34	2.38	2.42	2.51	2.79	2.72	2.71	2.53	2.31	2.10
8	2.16	2.34	2.33	2.38	2.44	2.54	2.92	2.72	2.70	2.51	2.30	2.06
9	2.16	2.38	2.32	2.38	2.45	2.53	3.00	2.71	2.68	2.48	2.29	2.03
10	2.16	2.31	2.35	2.37	2.46	2.52	3.06	2.70	2.88	2.45	2.27	2.02
11	2.15	2.35	2.38	2.37	2.48	2.51	3.00	2.66	2.94	2.42	2.27	2.01
12	2.14	2.36	2.41	2.36	2.47	2.50	2.98	2.65	2.97	2.40	2.26	2.01
13	2.13	2.36	2.42	2.36	2.47	2.49	2.96	2.64	2.93	2.37	2.23	1.99
14	2.14	2.35	2.42	2.36	2.46	2.48	2.91	2.64	2.87	2.34	2.23	1.97
15	2.14	2.37	2.40	2.36	2.46	2.47	2.90	2.65	2.84	2.33	2.22	1.97
16	2.15	2.36	2.39	2.36	2.46	2.47	2.87	2.68	2.80	2.35	2.19	1.96
17	2.18	2.37	2.39	2.36	2.45	2.44	2.86	2.72	2.76	2.39	2.19	1.95
18	2.16	2.38	2.37	2.36	2.46	2.46	2.86	2.73	2.73	2.44	2.22	1.94
19	2.16	2.34	2.36	2.36	2.47	2.48	2.84	2.71	2.70	2.43	2.21	1.93
20	2.16	2.35	2.36	2.36	2.46	2.48	2.83	2.70	2.68	2.42	2.21	1.91
21	2.16	2.36	2.36	2.36	2.46	2.48	2.83	2.69	2.65	2.41	2.20	1.90
22	2.16	2.35	2.36	2.39	2.47	2.49	3.04	2.68	2.65	2.40	2.19	1.89
23	2.15	2.33	2.35	2.39	2.49	2.47	3.12	2.65	2.63	2.38	2.18	1.88
24	2.15	2.35	2.35	2.38	2.48	2.47	3.15	2.63	2.61	2.37	2.16	1.88
25	2.14	2.33	2.34	2.38	2.46	2.46	3.13	2.60	2.59	2.35	2.16	1.87
26	2.16	2.33	2.34	2.37	2.48	2.46	3.09	2.59	2.56	2.33	2.15	1.85
27	2.22	2.34	2.34	2.37	2.48	2.47	3.06	2.57	2.66	2.31	2.14	1.84
28	2.27	2.34	2.34	2.37	2.48	2.43	3.02	2.57	2.68	2.30	2.14	1.82
29	2.33	2.35	2.34	2.36	---	2.43	2.97	2.57	2.67	2.28	2.14	1.81
30	2.32	2.34	2.35	2.36	---	2.44	2.92	2.56	2.66	2.26	2.13	1.78
31	2.32	---	2.36	2.36	---	2.42	---	2.54	---	2.31	2.11	---
MEAN	2.17	2.34	2.36	2.37	2.45	2.48	2.87	2.68	2.71	2.43	2.21	1.97
MAX	2.33	2.38	2.42	2.40	2.49	2.54	3.15	2.89	2.97	2.66	2.31	2.12
MIN	2.02	2.31	2.32	2.36	2.36	2.42	2.40	2.54	2.54	2.26	2.11	1.78



DAILY MEAN GAGE HEIGHT, IN FEET ABOVE GAGE DATUM
3.5
3.0
2.5
2.0
1.5
O
N
D
J
F
M
A
M
J
J
A
S
1998
1999
WATER YEAR

05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA

LOCATION.--Lat 41°59'17", long 94°22'36", in $SW^1/_4$ $NW^1/_4$ sec.20, T.83 N., R.30 W., Greene County, Hydrologic Unit 07100006, on right bank 20 ft downstream from bridge on State Highway 4, 0.1 mi downstream from Drainage Ditch 33 and 40, 1.9 mi south of Jefferson, 4.7 mi(revised) upstream from Hardin Creek, 92.0 miles upstream of mouth of Raccoon River, and at mile 292.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,619 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Prior to April 1940, monthly discharge only, published in WSP 1308. Prior to October 1955, published as "Raccoon River near Jefferson".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1950-51.

GAGE.--Water-stage recorder. Datum of gage is 967.09 ft above sea level. Prior to Apr. 22, 1946, nonrecording gage at site 4 mi upstream at different datum. Apr. 22 to June 25, 1946, nonrecording gage, June 26, 1946 to Sept. 30, 1955, water-stage recorder, Oct. 1, 1955 to Apr. 30, 1958, nonrecording gage, at present site and datum.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

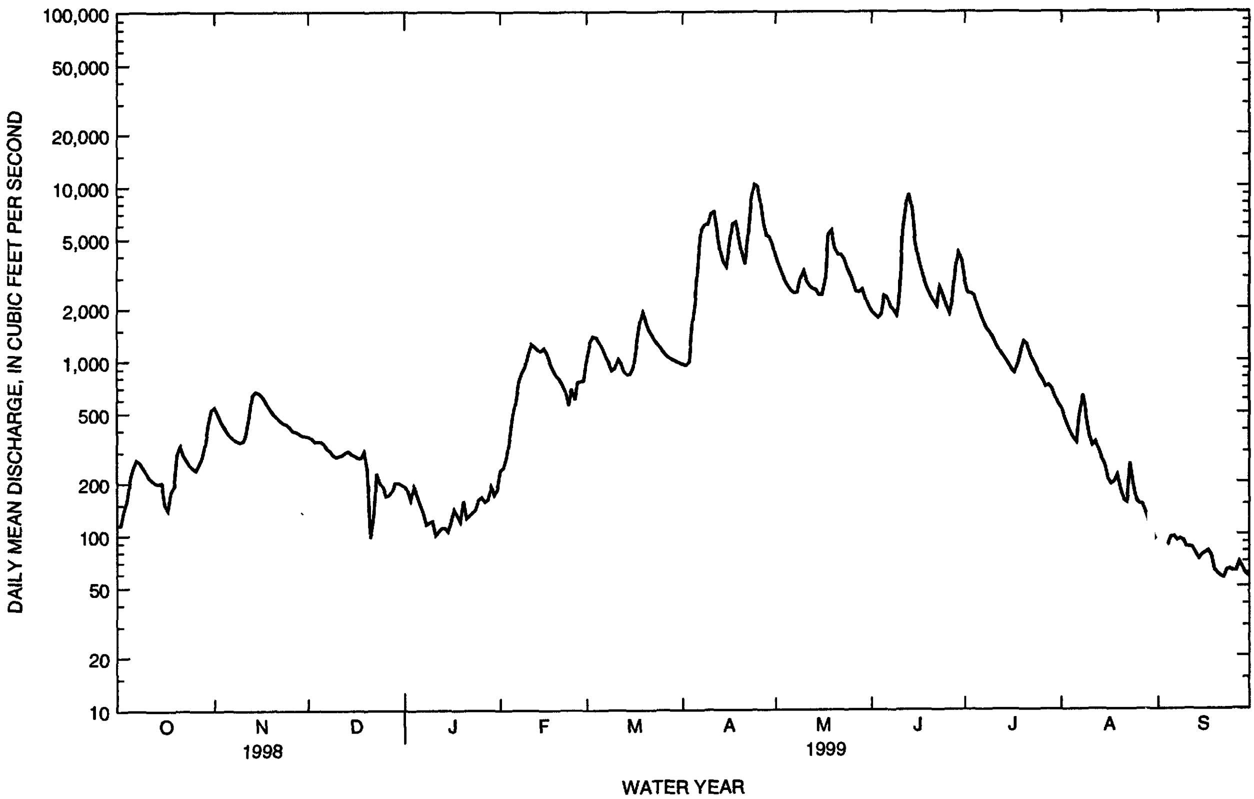
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	114	544	369	e190	e235	1060	e954	3930	1900	2840	526	90
2	115	501	361	e180	244	1280	e943	3500	1830	2440	469	88
3	140	452	344	e160	282	1380	984	3160	1760	2420	422	83
4	159	421	346	e190	362	1360	1620	2890	1840	2360	385	86
5	213	392	346	e170	484	1270	2190	2680	2350	2060	356	96
6	247	370	334	e150	593	1170	3930	2530	2290	1830	338	97
7	271	357	316	e135	761	1060	5650	2440	2040	1650	519	92
8	263	349	306	e115	855	976	6020	2470	1950	1530	632	94
9	246	343	290	e118	e920	879	6040	2980	1820	1450	476	92
10	232	349	282	e120	e1100	904	6970	3260	2360	1350	372	84
11	216	382	286	e100	e1250	1020	7140	2870	5720	1230	324	84
12	207	478	290	e105	e1200	965	5550	2680	7780	1140	340	83
13	200	638	299	e110	e1150	866	4290	2580	8970	1070	304	77
14	199	669	304	e110	1140	837	3690	2550	7350	1010	272	72
15	201	658	293	e105	1180	842	3460	2390	4730	944	250	76
16	151	634	287	e120	1100	917	4620	2380	3810	885	209	78
17	140	594	280	e140	975	1220	6110	2850	3280	846	195	80
18	177	558	279	e130	890	1630	6240	5320	2880	963	201	75
19	193	523	302	e120	825	1900	5130	5570	2560	1130	219	62
20	295	493	240	e158	791	1690	4160	4460	2350	1280	183	59
21	325	474	97	e125	734	1510	3590	4050	2190	1240	158	57
22	290	455	127	e130	670	1410	4990	4030	2050	1060	153	56
23	271	443	227	e135	558	1310	8220	3810	2630	979	257	62
24	254	435	e200	e140	692	1240	10200	3380	2390	904	196	63
25	245	420	e190	e160	601	1160	10000	3090	2070	823	157	61
26	237	398	e168	e165	753	1100	8280	2810	1860	771	150	61
27	257	395	e170	e155	761	1050	6080	2490	2230	705	149	69
28	281	386	e180	e160	773	1030	5210	2470	3480	719	134	64
29	336	375	e200	e190	---	1010	5110	2560	4110	685	117	59
30	439	373	e200	e170	---	e987	4600	2260	3710	611	104	57
31	527	---	e195	e185	---	e971	---	2050	---	560	94	---
TOTAL	7441	13859	8108	4441	21879	36004	151971	96490	96290	39485	8661	2257
MEAN	240	462	262	143	781	1161	5066	3113	3210	1274	279	75.2
MAX	527	669	369	190	1250	1900	10200	5570	8970	2840	632	97
MIN	114	343	97	100	235	837	943	2050	1760	560	94	56
AC-FT	14760	27490	16080	8810	43400	71410	301400	191400	191000	78320	17180	4480
CFSM	.15	.29	.16	.09	.48	.72	3.13	1.92	1.98	.79	.17	.05
IN.	.17	.32	.19	.10	.50	.83	3.49	2.22	2.21	.91	.20	.05

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	436	391	273	204	420	1285	1559	1424	1889	1058	499	396
MAX	3654	2011	1228	1045	2407	4990	5650	4702	6827	7584	3007	2823
(WY)	1974	1974	1974	1973	1984	1983	1983	1984	1984	1993	1993	1962
MIN	5.04	19.8	13.4	3.58	6.89	68.5	46.3	54.7	61.9	18.1	12.1	16.6
(WY)	1957	1956	1977	1977	1977	1956	1956	1967	1977	1956	1956	1955

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	515892		486886			
ANNUAL MEAN	1413		1334		820	
HIGHEST ANNUAL MEAN					2615	1993
LOWEST ANNUAL MEAN					32.8	1956
HIGHEST DAILY MEAN	11200	Jun 27	10200	Apr 24	23200	Jun 24 1947
LOWEST DAILY MEAN	55	Jan 13	56	Sep 22	.60	Oct 5 1956
ANNUAL SEVEN-DAY MINIMUM	59	Jan 13	60	Sep 20	.91	Oct 4 1956
INSTANTANEOUS PEAK FLOW			10500	Apr 24	29100	Jun 23 1947
INSTANTANEOUS PEAK STAGE			14.92	Apr 24	22.30	Jun 23 1947
INSTANTANEOUS LOW FLOW			51	Dec 21,22		
ANNUAL RUNOFF (AC-FT)	1023000		965700		594000	
ANNUAL RUNOFF (CFSM)	.87		.82		.51	
ANNUAL RUNOFF (INCHES)	11.85		11.19		6.88	
10 PERCENT EXCEEDS	3930		3750		2070	
50 PERCENT EXCEEDS	547		558		296	
90 PERCENT EXCEEDS	115		108		42	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
100,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
O
N
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A
S
1998
1999
WATER YEAR

05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA

LOCATION.--Lat 41°46'43", long 94°29'33", in $SW^1/_4$ $SW^1/_4$ sec.32, T.81 N., R.31 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on State Highway 25, 0.2 mi downstream from Battle Run Creek, 1.8 mi upstream from Springbrook Creek, 5.8 mi southeast of Bayard, 10.3 mi upstream from dam at Lake Panorama, at mile 78.0 mi. upstream from mouth of Raccoon River, and at mile 279.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--375 mi^2.

PERIOD OF RECORD.--March 1979 to current year. Occasional low-flow measurements, water years 1976, 1977.

GAGE.--Water-stage recorder. Datum of gage is 1,040.00 ft above sea level. Prior to June 23, 1979, nonrecording gage at present site and datum.

REMARKS.--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 with telephone modem and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 3, 1973 reached a stage of 21.63 ft, from contracted-opening measurement, discharge, 14,600 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	111	76	e75	e112	136	121	640	347	628	186	98
2	69	110	74	e65	130	184	e117	e596	331	1060	176	96
3	92	107	73	e63	159	205	134	557	311	2560	168	90
4	98	100	71	e60	197	189	422	528	530	1040	162	92
5	115	96	71	e60	196	173	487	512	1280	701	156	107
6	128	95	71	e62	172	157	1910	481	717	580	150	93
7	98	95	70	e64	153	141	1210	458	1210	496	215	e84
8	86	98	69	e60	148	284	1150	444	e670	445	328	84
9	81	100	68	e55	159	141	1790	422	599	568	205	79
10	79	118	68	e56	135	188	1310	416	1830	458	172	74
11	76	141	67	e58	137	144	978	409	1990	377	162	74
12	75	125	67	e54	98	128	771	450	1130	342	1120	73
13	73	117	69	e55	149	124	683	438	846	319	576	72
14	74	114	68	e53	119	121	652	413	696	291	312	70
15	75	109	67	e55	128	126	857	402	638	274	249	69
16	77	106	65	e64	107	184	1480	499	637	272	220	68
17	106	100	64	e68	92	336	1310	842	554	273	195	67
18	105	98	64	e64	98	321	1010	799	496	335	223	68
19	88	95	62	e61	92	246	817	667	465	511	219	67
20	85	91	e60	e67	95	218	706	584	435	2080	183	65
21	88	90	e46	e74	86	197	e640	874	410	1110	167	64
22	84	89	e68	e73	116	181	1760	790	396	696	155	65
23	78	88	e70	e80	276	169	1770	762	1330	497	149	65
24	77	84	e65	e82	181	159	1220	642	1040	412	160	64
25	77	84	e61	e75	102	146	965	566	731	352	142	64
26	77	82	e65	e90	107	140	818	506	578	313	133	63
27	86	80	e70	e100	99	136	928	468	975	283	127	65
28	115	79	e80	e98	111	137	1010	435	1450	255	119	63
29	126	78	e85	e105	---	127	823	397	928	232	113	61
30	155	78	e65	e110	---	118	707	372	711	207	107	63
31	120	---	e60	e110	---	119	---	363	---	207	102	---
TOTAL	2827	2958	2099	2216	3754	5375	28556	16732	24261	18174	6851	2227
MEAN	91.2	98.6	67.7	71.5	134	173	952	540	809	586	221	74.2
MAX	155	141	85	110	276	336	1910	874	1990	2560	1120	107
MIN	64	78	46	53	86	118	117	363	311	207	102	61
AC-FT	5610	5870	4160	4400	7450	10660	56640	33190	48120	36050	13590	4420
CFSM	.24	.26	.18	.19	.36	.46	2.54	1.44	2.16	1.56	.59	.20
IN.	.28	.29	.21	.22	.37	.53	2.83	1.66	2.41	1.80	.68	.22

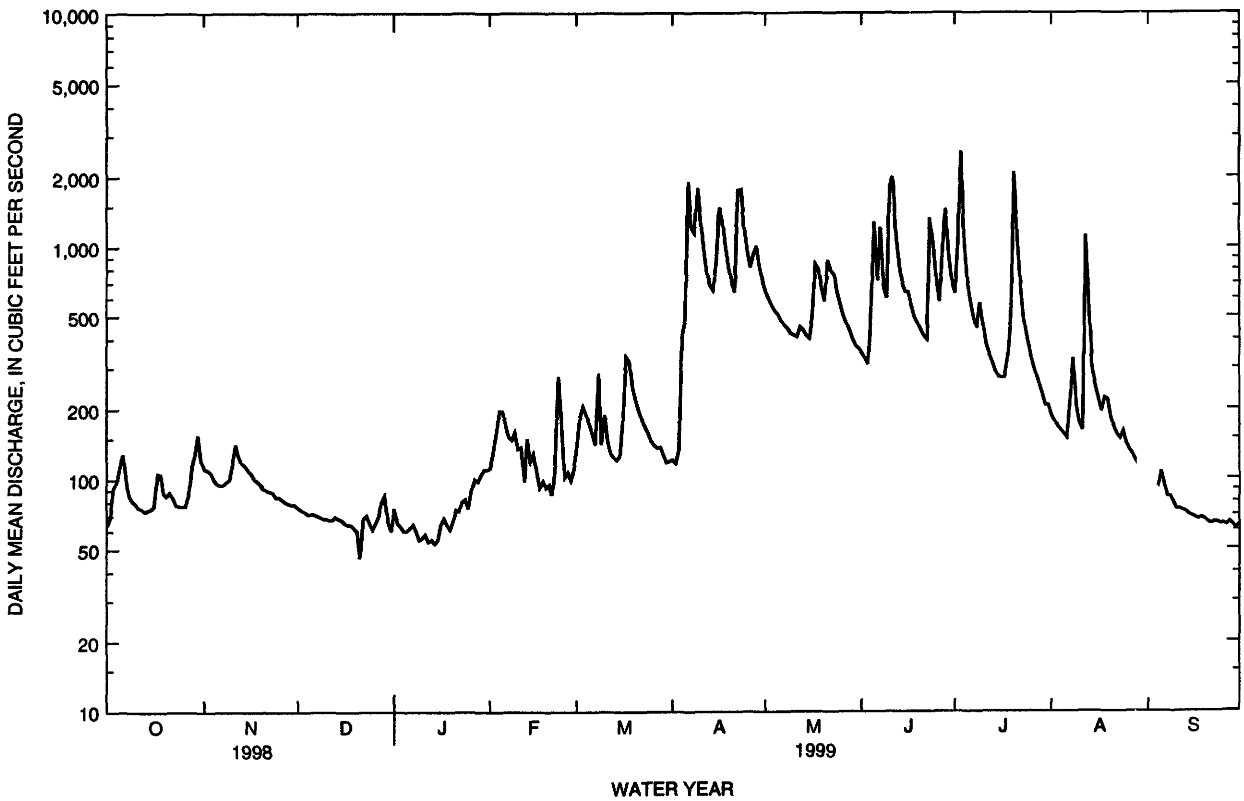
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	119	126	125	93.5	201	296	419	465	562	448	194	116
MAX	587	376	347	175	645	907	1035	993	1667	2653	673	466
(WY)	1987	1993	1993	1993	1983	1993	1991	1984	1990	1993	1993	1993
MIN	20.1	18.3	12.5	13.8	27.4	23.3	22.9	51.6	106	40.2	35.6	18.8
(WY)	1981	1981	1981	1981	1990	1981	1981	1981	1981	1980	1985	1980

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1980 - 1999	
ANNUAL TOTAL	147914		116030			
ANNUAL MEAN	405		318		264	
HIGHEST ANNUAL MEAN					677	1993
LOWEST ANNUAL MEAN					54.1	1981
HIGHEST DAILY MEAN	5960	Jun 15	2560	Jul 3	18100	Jul 9 1993
LOWEST DAILY MEAN	46	Jan 15	46	Dec 21	5.5	Jun 13 1981
ANNUAL SEVEN-DAY MINIMUM	61	Dec 15	55	Jan 9	7.3	Jun 8 1981
INSTANTANEOUS PEAK FLOW			3450	Jul 3	27500	Jul 9 1993
INSTANTANEOUS PEAK STAGE			19.12	Jul 3	29.02	Jul 9 1993
INSTANTANEOUS LOW FLOW			60	Oct 1,2		
ANNUAL RUNOFF (AC-FT)	293400		230100		191000	
ANNUAL RUNOFF (CFSM)	1.08		.85		.70	
ANNUAL RUNOFF (INCHES)	14.67		11.51		9.55	
10 PERCENT EXCEEDS	904		820		583	
50 PERCENT EXCEEDS	160		134		122	
90 PERCENT EXCEEDS	68		65		35	

e Estimated

05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA--Continued



05483470 LAKE PANORAMA AT PANORA, IOWA

LOCATION.--Lat 41°41'44", long 94°22'53", in SW 1/4 NE 1/4 sec.31, T.80 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, in gate control building of dam on Middle Raccoon River, 0.5 mi upstream from State Highway 44, 1.0 mi west of Panora, 4.4 mi upstream from Bay Branch, 67.7 mi. upstream from mouth of Raccoon River, and at mile 268.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--433 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above sea level.

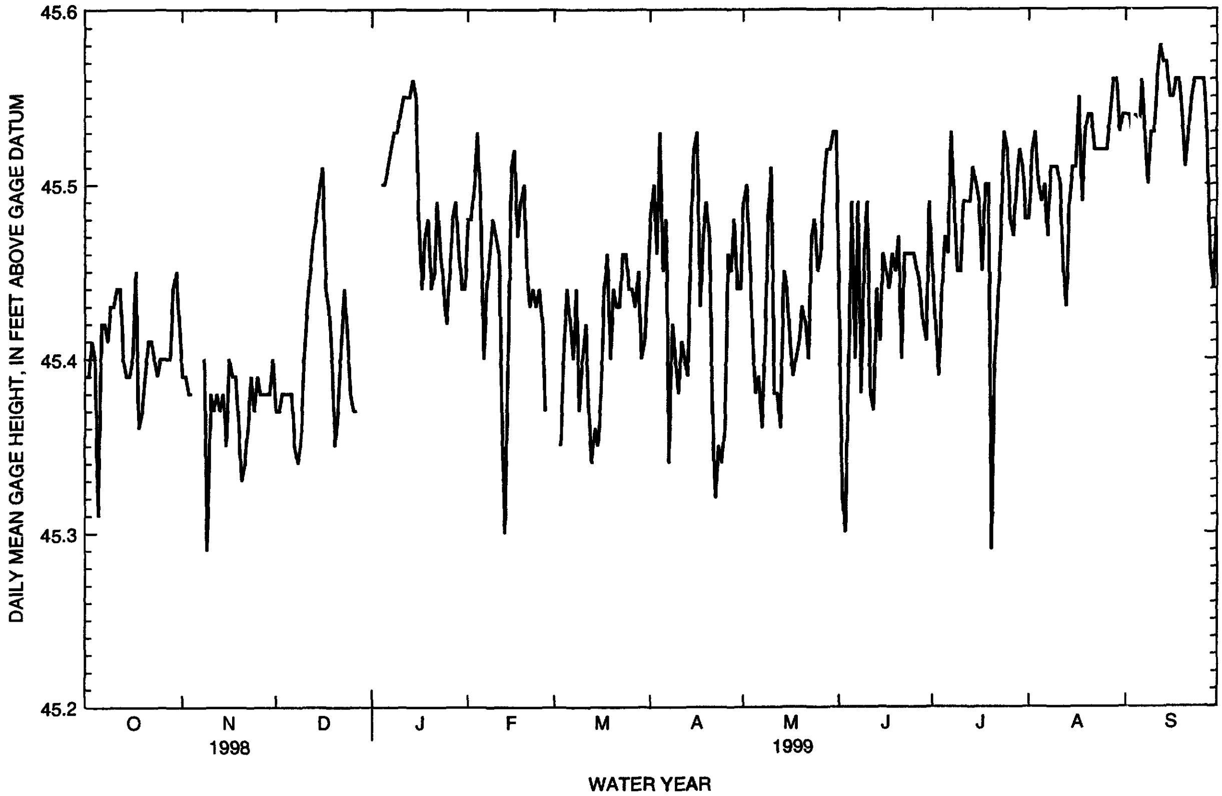
REMARKS.--Lake is formed by earthfill dam with 100 ft bascule gate and concrete chute spillway, and 300 ft earthen emergency spillway. Low-flow outlet is 30-inch conduit and gate valve through dam. Dam was completed in August, 1970 and began filling April 27, 1971. Total storage, 60,000 acre-ft, surface area, 2,900 acres, at top of dam, elevation 1,068 ft. Storage unknown at top of spillway, elevation 1,048 ft. Normal storage, 19,700 acre-ft, surface area, 1,270 acres with bascule gate closed, elevation 1,045 ft. Dead storage unknown with bascule gate open, elevation 1,036 ft. Present lake classification is utility (industrial) but is also used for recreation. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height,50.68 ft July 9, 1993; minimum, 41.56 ft Oct. 15, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 45.73 ft July 19; minimum recorded, 45.13 ft May 17.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45.39	45.39	45.37	---	45.48	---	45.48	45.49	45.42	45.45	45.48	45.54
2	45.39	45.39	45.37	---	45.48	---	45.50	45.50	45.32	45.42	45.52	45.54
3	45.41	45.38	45.38	---	45.50	45.35	45.46	45.46	45.30	45.39	45.53	45.53
4	45.40	45.38	45.38	45.50	45.53	45.41	45.53	45.41	45.40	45.44	45.50	45.54
5	45.31	---	45.38	45.50	45.49	45.44	45.45	45.38	45.49	45.47	45.49	45.52
6	45.42	---	45.38	45.51	45.40	45.42	45.48	45.39	45.40	45.46	45.50	45.56
7	45.42	---	45.35	45.52	45.44	45.40	45.34	45.36	45.49	45.53	45.47	45.53
8	45.41	45.40	45.34	45.53	45.46	45.44	45.42	45.41	45.38	45.49	45.51	45.50
9	45.43	45.29	45.35	45.53	45.48	45.37	45.40	45.48	45.46	45.45	45.51	45.53
10	45.43	45.38	45.40	45.54	45.47	45.40	45.38	45.51	45.49	45.45	45.51	45.53
11	45.44	45.37	45.43	45.55	45.46	45.42	45.41	45.38	45.38	45.49	45.50	45.56
12	45.44	45.38	45.45	45.55	45.36	45.37	45.40	45.38	45.37	45.49	45.45	45.58
13	45.40	45.37	45.47	45.55	45.30	45.34	45.39	45.36	45.44	45.49	45.43	45.57
14	45.39	45.38	45.48	45.56	45.41	45.36	45.47	45.45	45.41	45.51	45.49	45.57
15	45.39	45.35	45.50	45.55	45.51	45.35	45.52	45.44	45.46	45.50	45.51	45.55
16	45.40	45.40	45.51	45.48	45.52	45.38	45.53	45.41	45.45	45.49	45.51	45.55
17	45.45	45.39	45.44	45.44	45.47	45.44	45.43	45.39	45.44	45.45	45.55	45.56
18	45.36	45.39	45.43	45.47	45.49	45.46	45.47	45.40	45.46	45.50	45.49	45.56
19	45.37	45.36	45.40	45.48	45.50	45.40	45.49	45.41	45.45	45.50	45.53	45.54
20	45.39	45.33	45.35	45.44	45.45	45.44	45.47	45.43	45.47	45.29	45.54	45.51
21	45.41	45.34	45.37	45.45	45.43	45.43	45.37	45.42	45.40	45.40	45.54	45.53
22	45.41	45.36	45.41	45.49	45.44	45.43	45.32	45.40	45.46	45.43	45.52	45.55
23	45.40	45.39	45.44	45.46	45.43	45.46	45.35	45.47	45.46	45.47	45.52	45.56
24	45.39	45.37	45.41	45.44	45.44	45.46	45.34	45.48	45.46	45.53	45.52	45.56
25	45.40	45.39	45.38	45.42	45.42	45.44	45.36	45.45	45.46	45.52	45.52	45.56
26	45.40	45.38	45.37	45.45	45.37	45.44	45.46	45.46	45.45	45.48	45.52	45.56
27	45.40	45.38	45.37	45.48	---	45.43	45.45	45.50	45.44	45.47	45.54	45.53
28	45.40	45.38	---	45.49	---	45.45	45.48	45.52	45.42	45.50	45.56	45.46
29	45.44	45.38	---	45.46	---	45.40	45.44	45.52	45.41	45.52	45.56	45.44
30	45.45	45.40	---	45.44	---	45.41	45.44	45.53	45.49	45.51	45.53	45.48
31	45.42	---	---	45.44	---	45.44	---	45.53	---	45.48	45.54	---
MEAN	45.41	---	---	---	---	---	45.43	45.44	45.43	45.47	45.51	45.54
MAX	45.45	---	---	---	---	---	45.53	45.53	45.49	45.53	45.56	45.58
MIN	45.31	---	---	---	---	---	45.32	45.36	45.30	45.29	45.43	45.44


DAILY MEAN GAGE HEIGHT, IN FEET ABOVE GAGE DATUM
45.6
45.5
45.4
45.3
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1998
1999
WATER YEAR

05483600 MIDDLE RACCOON RIVER AT PANORA, IA

LOCATION.--Lat 41°41'14", long 94°22'15", in NE$^1/_4$ NW$^1/_4$ sec.5, T.79 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on Soldier Trail, 0.2 mi southwest of Panora, 1.5 mi upstream from Andy's Branch, 1.6 mi downstream from Lake Panorama, 18.1 mi upstream from mouth, 66.1 mi. upstream from mouth of Raccoon River, and at mile 267.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--440 mi^2.

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

REVISED RECORDS.--WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 991.20 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. City of Panora diverts approximately 100 acre-ft/yr upstream of station. Flow regulated by dam on Lake Panorama since August 1970. 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 data collection platform at station. U.S. Geological Survey data collection platform with telephone modem at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, reached a stage of 14.3 ft, from floodmark, discharge, about 14,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	112	94	59	76	173	158	649	475	772	175	129
2	77	114	95	53	96	196	181	620	379	1080	179	126
3	142	108	96	e58	116	181	206	598	351	2780	193	121
4	91	90	96	e60	157	182	417	564	792	1260	198	118
5	217	84	98	e63	231	200	681	559	1370	802	160	173
6	85	85	97	e64	186	182	1900	544	739	883	171	101
7	118	87	91	e60	156	150	1370	464	1240	494	258	134
8	75	137	88	e58	164	180	1110	435	676	451	313	162
9	77	123	70	e57	165	172	1310	409	581	668	229	75
10	81	124	63	e59	168	166	1280	486	1640	481	190	90
11	83	124	70	e60	206	191	1150	504	2350	382	175	78
12	89	129	73	e58	148	177	879	541	1250	370	1360	103
13	83	129	76	e58	76	152	766	449	935	326	643	87
14	72	130	81	e60	82	142	779	396	741	310	345	85
15	73	102	86	e96	122	165	951	519	706	304	190	82
16	78	102	106	94	140	215	1400	520	702	314	294	82
17	137	102	101	72	119	380	1140	1540	613	289	169	84
18	134	116	98	57	107	378	760	912	556	251	569	85
19	81	126	91	79	131	295	654	742	528	862	302	121
20	78	91	56	78	130	262	538	638	509	2080	214	74
21	85	82	36	64	105	244	455	1620	490	1250	243	65
22	85	90	40	85	93	208	1420	973	434	794	208	71
23	83	96	62	90	93	207	1540	827	2130	471	200	73
24	82	92	73	84	106	207	882	769	1260	472	178	73
25	83	97	68	75	147	192	830	585	985	397	174	75
26	82	96	65	62	136	171	893	527	682	389	161	90
27	93	96	64	69	113	173	1220	468	1400	305	150	125
28	95	96	66	77	165	210	1090	466	1810	275	154	102
29	114	98	69	86	---	175	916	443	1140	259	158	58
30	150	100	68	83	---	139	759	418	816	242	137	62
31	120	---	68	70	---	147	---	458	---	277	127	---
TOTAL	3012	3158	2405	2148	3734	6212	27635	19643	28280	20290	8217	2904
MEAN	97.2	105	77.6	69.3	133	200	921	634	943	655	265	96.8
MAX	217	137	106	96	231	380	1900	1620	2350	2780	1360	173
MIN	69	82	36	53	76	139	158	396	351	242	127	58
AC-FT	5970	6260	4770	4260	7410	12320	54810	38960	56090	40250	16300	5760
CFSM	.22	.24	.18	.16	.30	.46	2.09	1.44	2.14	1.49	.60	.22
IN.	.25	.27	.20	.18	.32	.53	2.34	1.66	2.39	1.72	.69	.25

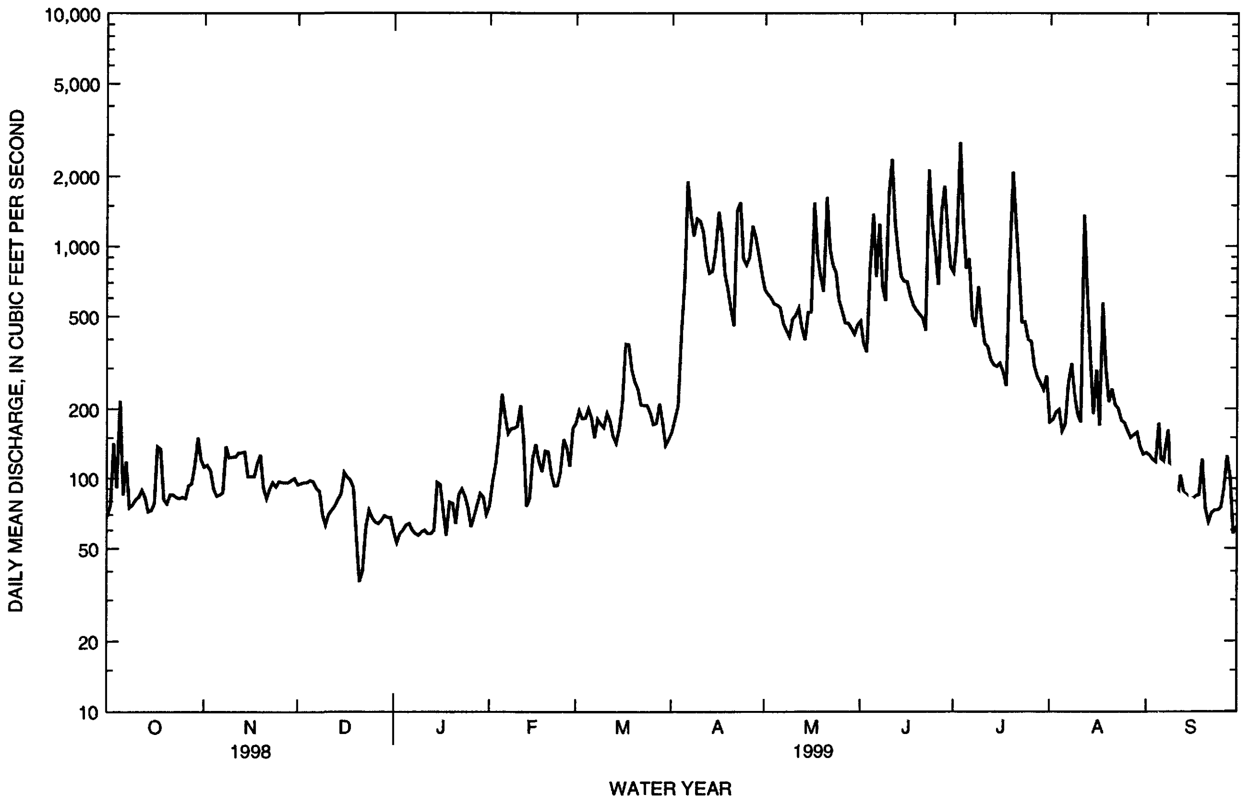
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	129	149	128	104	229	379	407	499	508	409	175	143
MAX	670	588	356	439	838	1479	1222	1458	1646	2731	668	528
(WY)	1987	1973	1993	1973	1971	1979	1984	1974	1990	1993	1996	1973
MIN	19.5	12.8	7.60	6.95	27.8	20.2	26.4	20.0	9.40	5.56	22.2	19.3
(WY)	1981	1971	1971	1971	1972	1981	1977	1977	1977	1977	1971	1980

05483600 MIDDLE RACCOON RIVER AT PANORA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1971 - 1999	
ANNUAL TOTAL	149111		127638			
ANNUAL MEAN	409		350		272	
HIGHEST ANNUAL MEAN					701	1973
LOWEST ANNUAL MEAN					38.6	1977
HIGHEST DAILY MEAN	6760	Jun 15	2780	Jul 3	17500	Jul 10 1993
LOWEST DAILY MEAN	36	Dec 21	36	Dec 21	.00	Jun 9 1977
ANNUAL SEVEN-DAY MINIMUM	57	Dec 20	57	Dec 20	3.1	Jul 8 1977
INSTANTANEOUS PEAK FLOW			4410	Jun 23	22400	Jul 9 1993
INSTANTANEOUS PEAK STAGE			9.28	Jun 23	20.04	Jul 9 1993
INSTANTANEOUS LOW FLOW			34	Dec 20,21		
ANNUAL RUNOFF (AC-FT)	295800		253200		196700	
ANNUAL RUNOFF (CFSM)	.93		.79		.62	
ANNUAL RUNOFF (INCHES)	12.61		10.79		8.39	
10 PERCENT EXCEEDS	845		901		605	
50 PERCENT EXCEEDS	154		160		115	
90 PERCENT EXCEEDS	72		70		31	

e Estimated



05484000 SOUTH RACCOON RIVER AT REDFIELD, IA

LOCATION.--Lat 41°35'22", long 94°09'04", in $SW^1/_4$ $NE^1/_4$ sec.2, T.78 N., R.29 W., Dallas County, Hydrologic Unit 07100007, on right bank 20 ft upstream from bridge on H Avenue, 3.4 mi.(revised) downstream from bridge on U.S. Highway 6, 3.4 mi. downstream from Middle Raccoon River, 14.3 mi. upstream from mouth, 44.6 miles upstream of mouth of Raccoon River, and at mile 245.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--994 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940, WDR IA-87-1:datum.

GAGE.--Water-stage recorder. Datum of gage is 888.88 ft above sea level. Prior to June 12, 1946, nonrecording gage, June 12, 1946 to Sept. 30, 1986, water-stage recorder at site 2.4 mi upstream at datum 7.55 ft higher.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	192	294	268	e130	e230	511	381	1690	1120	1730	496	274
2	205	338	270	e150	330	609	390	1590	1040	2170	442	266
3	310	370	273	e170	414	603	485	1520	931	6390	448	254
4	355	311	273	e140	580	501	583	1430	1930	3010	467	249
5	552	282	270	e125	619	496	1200	1390	3250	1900	424	368
6	355	272	265	e135	674	452	3270	1330	1950	5990	407	267
7	351	274	246	e160	481	382	2570	1270	2040	1960	566	262
8	297	312	233	e140	485	341	2330	1190	1670	1570	639	363
9	268	387	232	e130	451	400	5790	1080	1480	3280	503	249
10	272	466	203	e120	431	471	3450	1060	4050	2000	445	216
11	272	491	205	e150	460	441	2490	1280	5390	1390	415	201
12	271	425	216	e145	398	407	1900	1600	3010	1230	1550	207
13	282	399	222	e140	277	379	1720	1470	2130	1080	1900	217
14	263	394	222	e130	272	356	1580	1160	1900	966	774	204
15	269	370	232	e140	333	399	2490	1180	1630	910	578	202
16	278	e328	242	e170	334	675	4160	1820	1720	868	582	199
17	376	309	258	e200	309	1100	3410	4760	1510	901	439	198
18	827	314	246	e195	278	936	2540	3470	1290	770	828	197
19	463	334	241	e185	294	763	2140	2370	1220	1170	865	212
20	e376	308	215	e170	315	627	1850	1800	1130	2900	573	233
21	e325	269	e140	e160	284	598	1720	8470	1100	2470	500	169
22	e300	284	e150	e180	230	533	3960	3800	981	1490	444	171
23	e280	291	e180	e195	222	501	4130	2840	5310	1040	417	178
24	e250	278	e170	e200	262	491	2760	2230	3280	893	384	182
25	e230	284	e150	e190	297	466	2200	1830	2090	796	363	177
26	e220	280	e160	e175	350	432	1930	1600	1560	800	341	183
27	e250	275	e170	e200	338	423	3650	1410	3740	700	324	255
28	263	280	e180	e240	459	438	2900	1300	4370	628	310	241
29	299	290	e170	e200	---	446	2290	1180	2670	592	314	200
30	341	291	e150	e190	---	376	1930	1120	1970	559	301	150
31	334	---	e140	e210	---	359	---	1120	---	572	274	---
TOTAL	9926	9800	6592	5165	10407	15912	72199	61360	67462	52725	17313	6744
MEAN	320	327	213	167	372	513	2407	1979	2249	1701	558	225
MAX	827	491	273	240	674	1100	5790	8470	5390	6390	1900	368
MIN	192	269	140	120	222	341	381	1060	931	559	274	150
AC-FT	19690	19440	13080	10240	20640	31560	143200	121700	133800	104600	34340	13380
CFSM	.32	.33	.21	.17	.37	.52	2.42	1.99	2.26	1.71	.56	.23
IN.	.37	.37	.25	.19	.39	.60	2.70	2.30	2.52	1.97	.65	.25

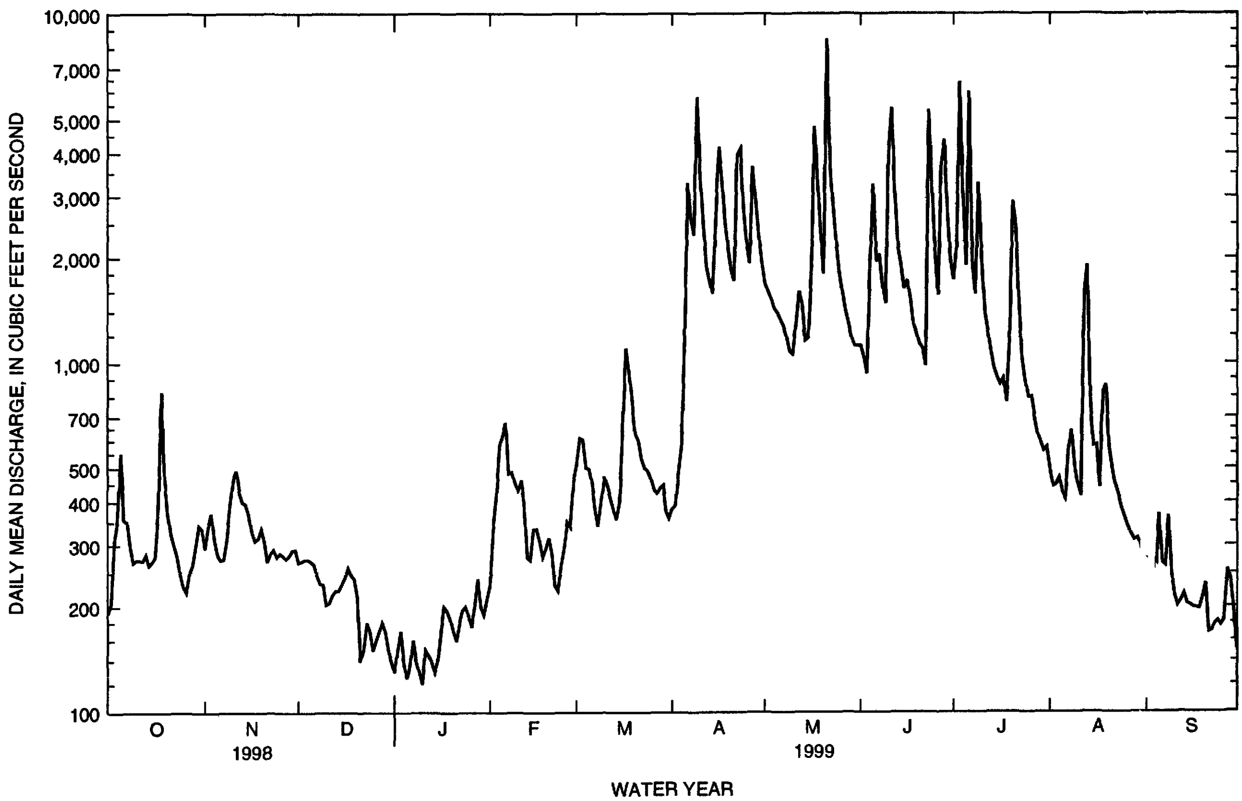
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	237	240	196	178	404	836	779	885	1055	664	379	290
MAX	1501	1162	826	565	1785	3112	2474	3005	5017	5494	2745	1385
(WY)	1987	1973	1993	1983	1971	1979	1984	1974	1947	1993	1993	1993
MIN	28.6	36.2	32.4	30.4	35.5	74.2	50.0	62.9	43.2	57.4	37.8	36.0
(WY)	1941	1956	1956	1950	1956	1981	1956	1967	1977	1954	1955	1955

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	351717		335605			
ANNUAL MEAN	964		919		512	
HIGHEST ANNUAL MEAN					1632	1993
LOWEST ANNUAL MEAN					91.4	1968
HIGHEST DAILY MEAN	26000	Jun 15	8470	May 21	33600	Jul 10 1993
LOWEST DAILY MEAN	140	Dec 21	120	Jan 10	17	Aug 4 1977
ANNUAL SEVEN-DAY MINIMUM	156	Jan 13	136	Jan 4	20	Jan 24 1954
INSTANTANEOUS PEAK FLOW			13900	May 21	44000	Jul 10 1993
INSTANTANEOUS PEAK STAGE			16.33	May 21	29.04	Jul 2 1958
ANNUAL RUNOFF (AC-FT)	697600		665700		370700	
ANNUAL RUNOFF (CFSM)	.97		.93		.51	
ANNUAL RUNOFF (INCHES)	13.16		12.56		6.99	
10 PERCENT EXCEEDS	1880		2310		1130	
50 PERCENT EXCEEDS	442		400		212	
90 PERCENT EXCEEDS	202		181		60	

e Estimated

05484000 SOUTH RACCOON RIVER AT REDFIELD, IA--Continued



05484500 RACCOON RIVER AT VAN METER, IA

LOCATION.--Lat 41°32'02", long 93°56'59", in SW$^1/_4$ SW$^1/_4$ sec.22, T.78 N., R.27 W., Dallas County, Hydrologic Unit 07100006, on right bank 10 ft downstream from bridge on county highway R16, 0.3 mi northeast of Van Meter, 0.7 mi upstream from small left bank tributary, 1.1 mi downstream from confluence of North and South Raccoon Rivers, 29.1 mi upstream from mouth, and at mile 230.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--3,441 mi^2.

PERIOD OF RECORD.--April 1915 to current year. Prior to October 1934, monthly discharge only, published in WSP 1309.

REVISED RECORDS.--WSP 1308: 1927 (M), WSP 1438: Drainage area, WSP 1508: 1915 (M), 1925 (M), 1926, 1933 (M), 1939 (M), 1947 (M), 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 841.16 ft above sea level. See WSP 1308 for history of changes prior to Aug. 8, 1934.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in the 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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	350	943	815	e300	e480	1630	1380	8080	4120	7330	1310	517
2	348	1030	801	e380	e550	1880	1340	7070	3900	6360	1120	510
3	436	1070	796	e360	e800	2170	1440	6370	3570	10500	1100	508
4	589	970	792	e300	e1200	2170	1480	5850	4980	7880	1070	467
5	841	883	773	e280	e1600	2140	2290	5430	7030	6620	983	586
6	799	835	737	e390	e1700	2030	5770	5170	5800	9820	919	536
7	677	807	705	e360	e1600	1830	8070	5000	5020	5780	1070	425
8	660	840	692	e300	e1500	1710	8930	4760	5320	4680	1250	505
9	604	914	689	e270	e1500	e1600	12900	4690	4410	5930	1370	502
10	598	1150	652	e280	e1600	e1500	11600	5150	8670	5050	1200	387
11	579	1170	628	e400	e1700	e1470	11000	5560	13400	4060	1040	405
12	548	1070	635	e380	e2100	1490	10400	6490	11300	3470	2200	375
13	525	1050	631	e340	e2000	1460	9220	6330	10900	2960	3440	369
14	510	1180	646	e340	e1800	1340	7390	5730	11300	2700	1650	349
15	515	1230	653	e380	e1800	1360	7930	5440	11000	2440	1280	351
16	523	1190	649	e500	e1800	1760	10200	6800	8710	2260	1110	344
17	547	1160	649	e440	1660	2390	10700	9290	6930	2250	1090	343
18	1160	1130	648	e420	1480	2520	10700	10500	5850	2050	1370	348
19	830	1070	615	e400	1390	2630	10400	10100	5290	2340	2360	344
20	681	1010	e480	e400	1320	2720	9120	9510	4910	4400	1650	370
21	671	961	e380	e440	1230	2530	7620	15800	4680	4990	1210	303
22	727	960	e300	e500	1120	2240	9720	12900	4160	3580	1010	294
23	724	932	e340	e480	1060	2070	11600	10100	9340	2820	840	311
24	704	896	e320	e480	1070	1940	11700	8730	9750	2390	990	314
25	685	897	e340	e460	1080	1810	12500	7500	7480	2290	1070	313
26	670	867	e360	e480	1140	1700	13000	6500	5660	2130	834	306
27	669	830	e400	e440	1290	1620	14500	5820	6790	1960	737	386
28	681	838	e460	e440	1500	1570	12200	5270	10700	1800	677	394
29	754	878	e500	e460	---	1560	9940	4830	9170	1660	655	322
30	801	843	e440	e460	---	1470	9000	4730	8420	1480	610	274
31	888	---	e380	e460	---	1390	---	4350	---	1360	550	---
TOTAL	20294	29604	17906	12320	39070	57700	264040	219850	218560	125340	37765	11758
MEAN	655	987	578	397	1395	1861	8801	7092	7285	4043	1218	392
MAX	1160	1230	815	500	2100	2720	14500	15800	13400	10500	3440	586
MIN	348	807	300	270	480	1340	1340	4350	3570	1360	550	274
AC-FT	40250	58720	35520	24440	77500	114400	523700	436100	433500	248600	74910	23320
CFSM	.19	.29	.17	.12	.41	.54	2.56	2.06	2.12	1.18	.35	.11
IN.	.22	.32	.19	.13	.42	.62	2.85	2.38	2.36	1.36	.41	.13

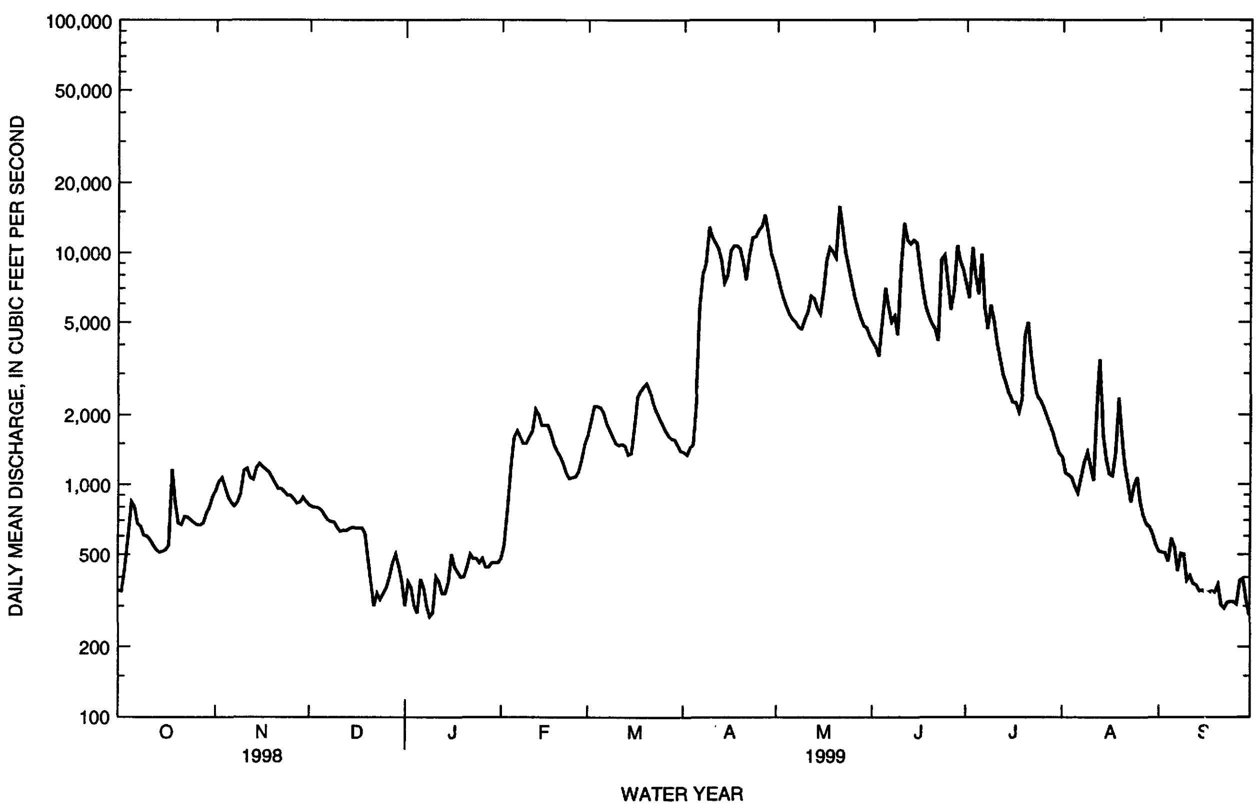
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	833	781	575	494	1008	2625	2679	2637	3335	1916	1002	869
MAX	6840	4774	3085	3461	5438	10480	10630	9257	13970	17260	7414	6692
(WY)	1974	1973	1983	1932	1984	1979	1983	1984	1947	1993	1993	1926
MIN	48.6	51.5	31.0	17.2	31.5	146	125	121	112	68.1	28.1	43.1
(WY)	1940	1938	1938	1940	1940	1931	1956	1934	1977	1936	1936	1939

05484500 RACCOON RIVER AT VAN METER, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1916 - 1999	
ANNUAL TOTAL	1115941		1054207			
ANNUAL MEAN	3057		2888		1563	
HIGHEST ANNUAL MEAN					5717	1993
LOWEST ANNUAL MEAN					166	1956
HIGHEST DAILY MEAN	35700	Jun 15	15800	May 21	57500	Jul 10 1993
LOWEST DAILY MEAN	220	Jan 13	270	Jan 9	10	Jan 22 1940a
ANNUAL SEVEN-DAY MINIMUM	283	Jan 10	311	Jan 4	10	Jan 22 1940
INSTANTANEOUS PEAK FLOW			20400	May 21	70100	Jul 10 1993
INSTANTANEOUS PEAK STAGE			17.97	May 21	26.34	Jul 10 1993
INSTANTANEOUS LOW FLOW			239	Sep 30		
ANNUAL RUNOFF (AC-FT)	2213000		2091000		1132000	
ANNUAL RUNOFF (CFSM)	.89		.84		.45	
ANNUAL RUNOFF (INCHES)	12.06		11.40		6.17	
10 PERCENT EXCEEDS	8240		9050		3960	
50 PERCENT EXCEEDS	1230		1230		611	
90 PERCENT EXCEEDS	426		380		115	

a Also Jan 23-31, 1940
e Estimated



05484650 RACCOON RIVER AT 63RD STREET, DES MOINES, IA

LOCATION.--Lat 41°33'49", long 93°42'13", in $SW^1/_4$ $NE^1/_4$ sec.14, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, at upstream side of bridge on State Highway 28, 2.9 mi. upstream from Walnut Creek, 8.6 mi. upstream from mouth of Raccoon River, and at mile 210.0 upstream from mouth of Des Moines River.

DRAINAGE AREA.-- 3529 mi^2.

PERIOD OF RECORD.-- October 1991 to current year. October 1991 to September 1996 gage height record only.

GAGE.--Water-stage recorder. Datum of gage is 773.91 ft above sea level.

REMARKS.--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) and U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	471	937	798	e320	e550	1550	1560	9090	4920	7710	1620	620
2	506	1050	790	e380	e600	1740	1520	e8100	4680	6530	1420	602
3	565	1100	811	e380	e750	2110	1560	e7200	4300	10700	1330	587
4	703	1030	805	e320	e1000	2170	1650	e6400	4340	8600	1250	577
5	844	952	793	e280	1330	2150	2050	e5900	e8000	7180	1190	643
6	1050	912	788	e400	1620	2110	4540	e5600	e6300	10200	1090	664
7	818	886	774	e380	1810	1910	7020	e5400	e5200	7070	1100	546
8	815	885	695	e320	1570	1750	7880	e5200	e5700	5310	1230	544
9	745	934	678	e260	1570	1620	14000	e5000	4840	5660	1400	637
10	710	1240	666	e280	1620	1630	13300	e5700	7410	5860	1300	503
11	689	1230	634	e400	1960	1610	11900	6420	15200	4280	1130	475
12	661	1140	634	e400	2220	1620	11200	6820	13700	3760	1540	448
13	640	1090	648	e360	2090	1650	9820	6610	11800	3480	3360	444
14	626	1150	680	e340	1810	1550	7700	6090	12200	3230	2140	429
15	599	1240	e700	e360	1830	1500	7570	5810	12200	3040	1470	413
16	596	1230	e700	e550	1830	1720	10600	6500	9610	e2800	1150	407
17	671	1190	e700	e500	1710	2380	12000	7790	7290	e2700	1150	399
18	992	1120	e700	e480	1560	2700	11900	12200	6340	e2500	1050	399
19	1050	1050	e650	e460	1450	2780	11500	10200	5810	e2300	2030	395
20	808	1030	e500	e480	1390	2880	9970	9740	5390	3890	1710	413
21	767	972	e400	e550	1300	2840	8100	15600	5070	5150	1250	410
22	785	949	e320	e600	1220	2600	9300	20200	4770	3930	1100	361
23	761	934	e340	e550	1110	2390	13400	11600	e8000	3320	1010	352
24	734	914	e320	e550	1050	2260	13700	9460	e11700	e2800	951	371
25	709	898	e340	e500	1020	2130	14400	7970	e8500	e2600	1110	374
26	700	895	e380	e550	1080	2000	15400	6830	6330	e2400	995	369
27	689	831	e420	e500	1210	1880	16900	6530	5840	2260	876	454
28	699	809	e480	e500	1410	1840	15900	6350	11800	2080	796	465
29	735	814	e500	e480	---	1790	11300	5850	9530	1900	744	425
30	815	813	e460	e500	---	1730	10100	5440	8680	1810	703	379
31	885	---	e420	e500	---	1610	---	5140	---	1680	665	---
TOTAL	22838	30225	18524	13430	39670	62200	287740	242740	235450	136730	39860	14105
MEAN	737	1008	598	433	1417	2006	9591	7830	7848	4411	1286	470
MAX	1050	1240	811	600	2220	2880	16900	20200	15200	10700	3360	664
MIN	471	809	320	260	550	1500	1520	5000	4300	1680	665	352
AC-FT	45300	59950	36740	26640	78690	123400	570700	481500	467000	271200	79060	27980
CFSM	.21	.29	.17	.12	.40	.57	2.72	2.22	2.22	1.25	.36	.13
IN.	.24	.32	.20	.14	.42	.66	3.03	2.56	2.48	1.44	.42	.15

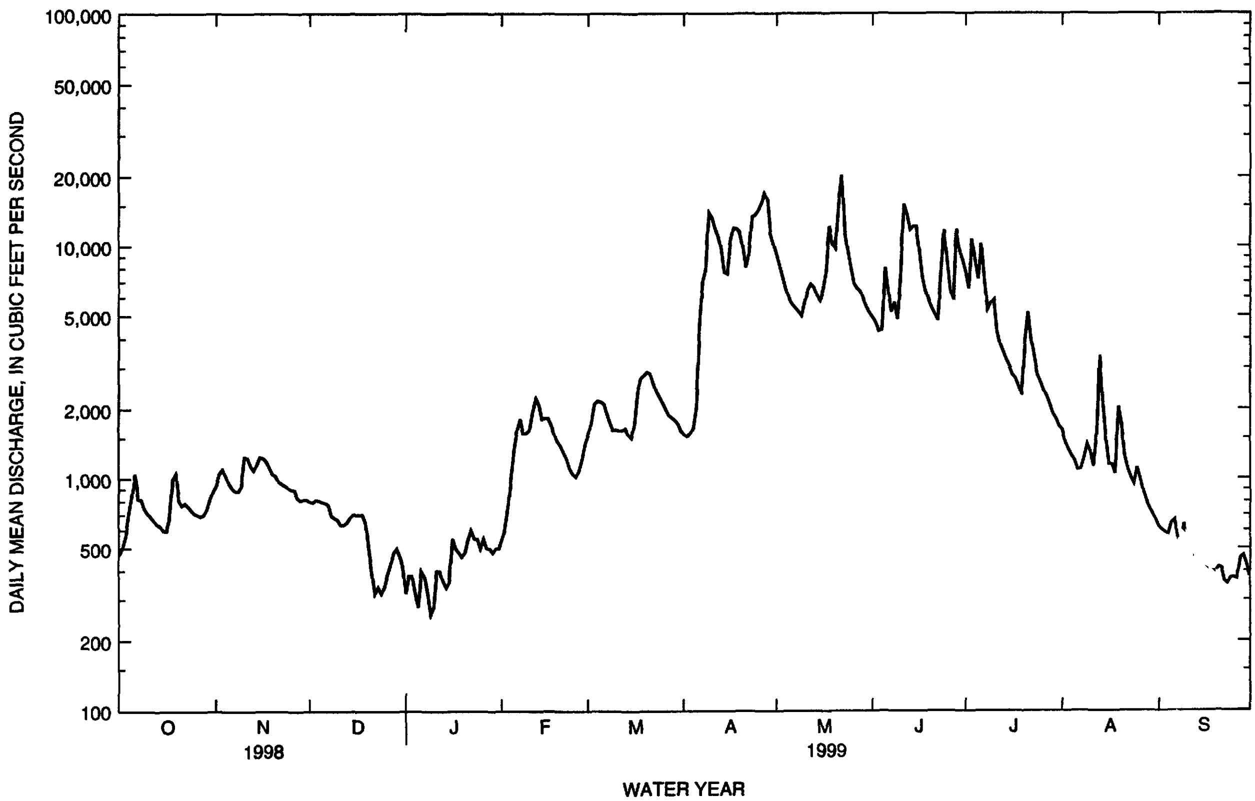
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	735	1292	984	693	2120	2688	6740	5471	7702	4473	1372	498
MAX	1142	2484	1873	1236	3205	3528	9591	7830	12460	7560	2220	694
(WY)	1997	1997	1997	1997	1997	1997	1999	1999	1998	1998	1998	1998
MIN	327	384	481	408	1417	2006	3660	4057	2792	1447	609	331
(WY)	1998	1998	1998	1998	1999	1999	1997	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1997 - 1999	
ANNUAL TOTAL	1258611		1143512			
ANNUAL MEAN	3448		3133		2891	
HIGHEST ANNUAL MEAN					3352	1998
LOWEST ANNUAL MEAN					2188	1997
HIGHEST DAILY MEAN	36300	Jun 16	20200	May 22	36300	Jun 16 1998
LOWEST DAILY MEAN	250	Jan 13	260	Jan 9	234	Oct 7 1997
ANNUAL SEVEN-DAY MINIMUM	319	Jan 10	320	Jan 4	242	Oct 4 1997
INSTANTANEOUS PEAK FLOW			25300	May 22	40300	Jun 16 1998
INSTANTANEOUS PEAK STAGE			35.87	May 22	40.77	Jul 11 1993
ANNUAL RUNOFF (AC-FT)	2496000		2268000		2094000	
ANNUAL RUNOFF (CFSM)	.98		.89		.82	
ANNUAL RUNOFF (INCHES)	13.27		12.05		11.13	
10 PERCENT EXCEEDS	8330		9360		7010	
50 PERCENT EXCEEDS	1520		1250		1570	
90 PERCENT EXCEEDS	476		423		380	

e Estimated

05484650 RACCOON RIVER AT 63RD STREET, DES MOINES, IA--Continued



05484800 WALNUT CREEK AT DES MOINES, IA

LOCATION.--Lat 41°35'14", long 93°42'11", in $SW^1/_4$ $SE^1/_4$ sec.2, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, 25 ft downstream from bridge on 63rd Street in Des Moines, and 2.2 mi upstream from Raccoon River.

DRAINAGE AREA.--78.4 mi^2.

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

REVISED RECORDS.--WDR IA-73-1: 1972. WDR IA-75-1: 1973-74.

GAGE.--Water-stage recorder. Datum of gage is 801.04 ft above sea level (levels by Iowa Natural Resources Council).

REMARKS.--Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance published in this report as miscellaneous water quality data. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

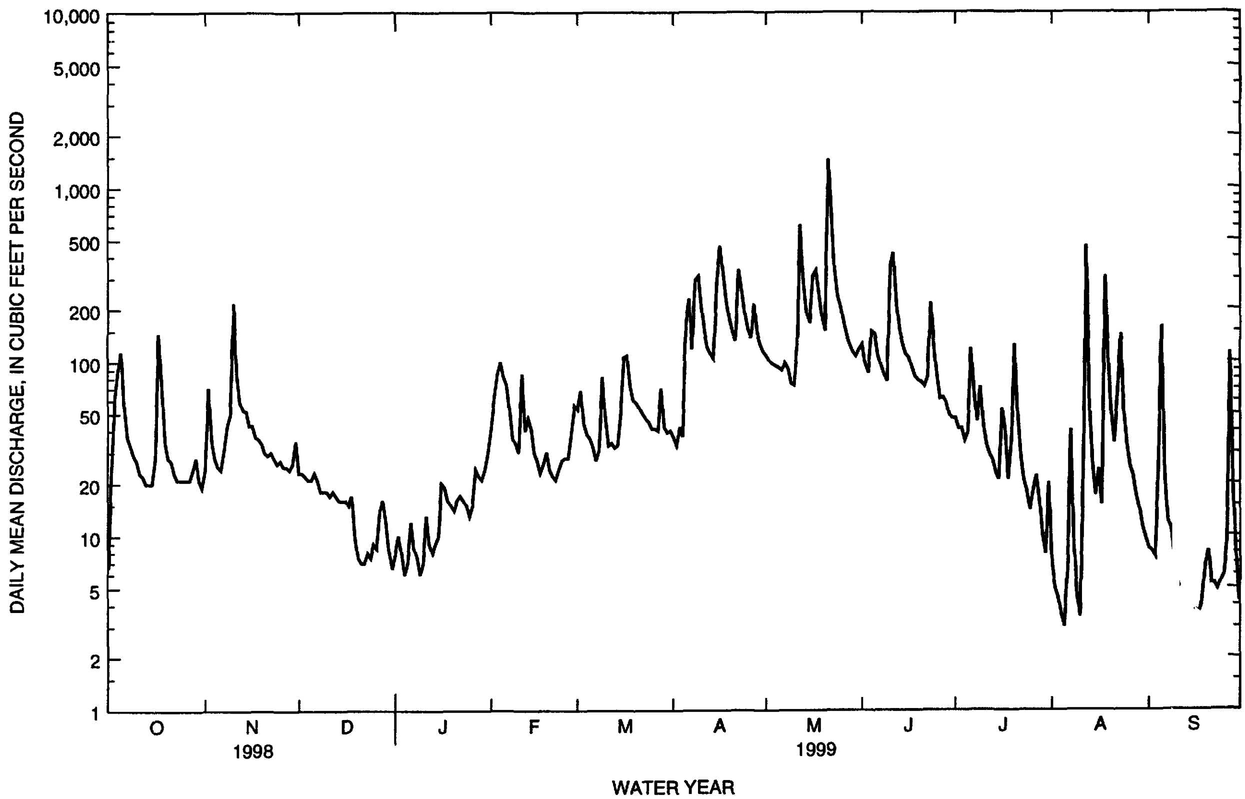
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	24	23	e8.0	41	53	37	108	125	47	6.7	8.4
2	23	71	23	e10	61	68	33	101	96	41	5.0	8.1
3	60	35	22	e8.0	85	44	42	97	86	41	4.4	7.5
4	89	28	21	e6.0	99	38	37	95	148	35	3.5	24
5	114	25	21	e7.0	82	36	168	92	143	39	3.0	159
6	55	24	23	e12	74	32	229	89	109	118	6.4	23
7	37	31	21	e8.5	53	27	118	98	95	67	40	12
8	33	43	18	e7.5	36	31	293	91	84	45	8.8	11
9	29	50	18	e6.0	34	82	309	75	77	71	4.6	7.7
10	27	217	18	e7.0	30	47	204	73	343	42	3.4	5.5
11	23	85	17	e13	85	33	148	122	419	33	22	4.9
12	22	59	18	e9.0	40	34	120	612	210	29	462	4.3
13	20	53	17	e8.0	47	32	111	286	149	27	53	4.0
14	20	52	16	e9.0	41	33	104	188	126	23	26	3.8
15	20	43	16	e10	30	52	283	167	110	21	17	3.6
16	28	43	16	e20	27	106	461	310	105	53	24	3.7
17	145	37	15	e19	23	108	325	333	92	40	15	3.6
18	75	36	17	e16	26	72	225	245	82	21	308	4.1
19	35	34	e10	e15	30	60	175	179	78	35	106	6.8
20	28	30	e7.5	e14	24	58	148	150	76	125	50	8.1
21	27	29	e7.0	e16	22	54	132	1450	72	49	34	5.3
22	23	30	e7.0	e17	21	50	337	713	81	29	67	5.3
23	21	28	e8.0	e16	24	47	255	338	216	21	143	4.9
24	21	26	e7.5	e15	27	45	187	237	125	18	50	5.4
25	21	27	e9.0	e13	28	41	152	205	84	14	33	5.9
26	21	25	e8.5	e15	28	41	137	166	61	18	25	9.3
27	21	25	e14	e24	39	40	213	140	62	22	22	112
28	24	24	e16	e22	56	70	147	125	58	16	17	18
29	28	26	e12	e21	---	42	126	113	49	10	14	7.0
30	21	35	e8.0	e24	---	39	114	107	47	7.8	11	4.2
31	19	---	e6.5	e30	---	40	---	117	---	20	9.6	---
TOTAL	1136.6	1295	461.0	426.0	1213	1555	5370	7222	3608	1177.8	1594.4	490.4
MEAN	36.7	43.2	14.9	13.7	43.3	50.2	179	233	120	38.0	51.4	16.3
MAX	145	217	23	30	99	108	461	1450	419	125	462	159
MIN	6.6	24	6.5	6.0	21	27	33	73	47	7.8	3.0	3.6
AC-FT	2250	2570	914	845	2410	3080	10650	14320	7160	2340	3160	973
CFSM	.47	.55	.19	.18	.55	.64	2.28	2.97	1.53	.48	.66	.21
IN.	.54	.61	.22	.20	.58	.74	2.55	3.43	1.71	.56	.76	.23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	32.7	38.9	32.2	23.3	46.0	75.0	103	126	125	84.8	49.3	31.3
MAX	166	147	119	123	172	214	310	390	385	427	329	214
(WY)	1974	1973	1983	1974	1973	1990	1973	1996	1990	1993	1993	1993
MIN	1.33	.88	.17	.001	.48	3.17	2.71	6.36	7.62	2.96	4.37	.57
(WY)	1972	1977	1977	1977	1977	1981	1981	1977	1977	1985	1976	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1972 - 1999	
ANNUAL TOTAL	32622.2		25549.2			
ANNUAL MEAN	89.4		70.0		64.0	
HIGHEST ANNUAL MEAN					158	1993
LOWEST ANNUAL MEAN					10.3	1989
HIGHEST DAILY MEAN	1720	Jun 18	1450	May 21	4280	Jul 1 1973
LOWEST DAILY MEAN	5.0	Jan 14	3.0	Aug 5	.00	Jan 3 1977a
ANNUAL SEVEN-DAY MINIMUM	7.1	Jan 12	3.9	Sep 12	.00	Jan 3 1977a
INSTANTANEOUS PEAK FLOW			3140	May 21	12500	May 10 1986
INSTANTANEOUS PEAK STAGE			12.64	May 21	18.32	May 10 1986
INSTANTANEOUS LOW FLOW			2.4	Aug 11		
ANNUAL RUNOFF (AC-FT)	64710		50680		46350	
ANNUAL RUNOFF (CFSM)	1.14		.89		.82	
ANNUAL RUNOFF (INCHES)	15.48		12.12		11.09	
10 PERCENT EXCEEDS	170		155		150	
50 PERCENT EXCEEDS	45		33		26	
90 PERCENT EXCEEDS	13		7.5		2.6	

a Many days in 1977, and Aug 21, 1994
e Estimated


10,000
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1
DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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A
S
1998
1999
WATER YEAR

05484900 RACCOON RIVER AT FLEUR DRIVE, DES MOINES, IA

LOCATION.--Lat 41°34'54", long 93°38'34", in NW$^1/_4$ NE$^1/_4$ sec.8, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100006, on downstream side of Fleur Drive bridge(SW 18th St.) attached to handrail 465 ft. from right edge of bridge, 3.0 miles downstream from Walnut Creek, 2.6 miles upstream from mouth, and at mile 204.1 above mouth of Des Moines River.

DRAINAGE AREA.-- 3,625 mi^2.

PERIOD OF RECORD.-- June 1984 to current year; June 1984 to September 1996 gage-height record only.

GAGE.--Water-stage recorder. Datum of gage is 780.70 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Periodic observations of water temperature and specific conductance are published in the report as miscellaneous water quality data. Discharges are affected by withdrawal by Des Moines Water Works. U.S. National Weather Service Limited Automatic Remote Collector (LARC) at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

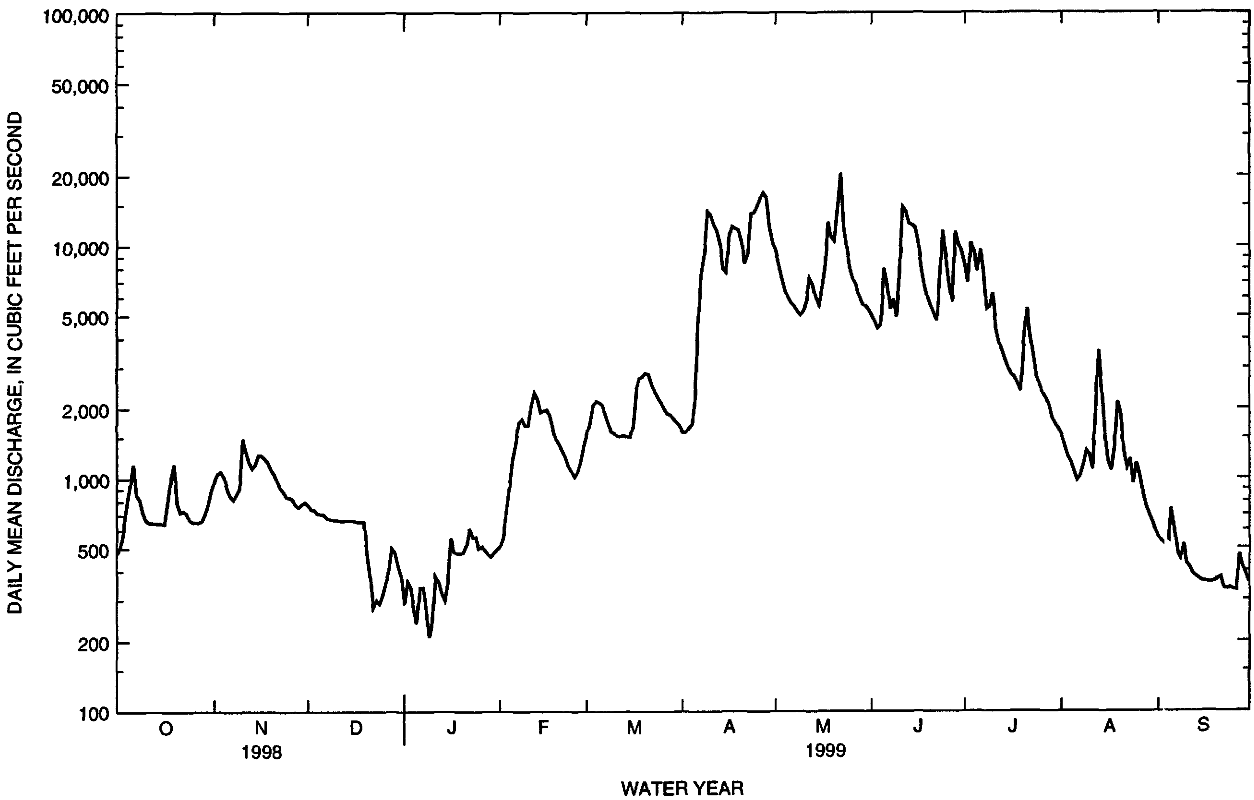
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	478	985	771	e290	510	1550	1580	9480	5010	8380	1540	e555
2	513	1050	738	e360	561	1730	e1580	8280	4750	6960	1370	533
3	620	1070	736	e340	728	2070	e1650	7280	4410	10300	1240	519
4	777	1020	709	e280	929	2150	e1700	6480	4560	9320	1170	489
5	946	908	706	e240	1210	2120	e2200	5980	7970	7780	1070	741
6	1150	843	703	e340	1410	2070	e4800	5680	6800	9600	978	610
7	855	815	680	e340	1740	1870	e7500	5490	5350	7900	1020	479
8	818	858	671	e280	1800	1710	9130	5220	5880	5350	1140	450
9	723	909	667	e210	1690	1590	14100	5040	4950	5480	1310	519
10	667	1480	666	e240	1690	1570	13600	5260	7470	6250	1260	429
11	649	1310	662	e380	2070	1520	12400	5800	14700	4390	1090	412
12	645	1180	659	e360	2340	1520	11700	7270	14100	3840	2010	387
13	645	1110	662	e320	2200	1540	10400	6830	12500	3510	3550	376
14	643	1150	662	e300	1930	1510	7990	5980	12300	3200	2400	368
15	642	1260	662	e360	1960	1510	7710	5560	12000	2960	1510	e360
16	641	1260	659	552	1980	1670	11100	6560	10400	2790	1170	357
17	796	1220	654	483	1870	2400	12100	8020	8030	2720	1080	356
18	998	1180	654	478	1640	2700	11900	12600	6760	2550	1360	355
19	1150	1100	651	475	1480	2740	11700	10900	5940	2370	2130	358
20	786	1050	e480	481	1410	2840	10500	10500	5460	3930	1870	368
21	719	974	e380	516	1320	2810	8400	14500	5090	5370	1300	374
22	727	916	e280	610	1240	2560	9310	20400	4770	4110	1110	334
23	710	887	e300	558	1130	2370	13800	12000	7360	3370	1210	333
24	669	838	e290	560	1080	2230	13900	9800	11600	2740	951	336
25	654	831	e320	e500	1020	2110	14800	8010	8850	2540	1160	331
26	650	815	e360	511	1070	1990	16000	7190	6780	2310	1030	329
27	648	771	e400	492	1180	1900	16900	6840	5750	2200	871	468
28	660	754	e500	474	1380	1880	16200	6050	11500	2050	766	415
29	707	777	e480	e460	---	1800	12100	5580	10200	1810	701	386
30	780	793	e420	e480	---	1740	10400	5520	9360	1710	652	355
31	893	---	e380	494	---	1680	---	5280	---	1630	596	---
TOTAL	22959	30114	17562	12764	40568	61450	297150	245380	240600	139420	40615	12682
MEAN	741	1004	567	412	1449	1982	9905	7915	8020	4497	1310	423
MAX	1150	1480	771	610	2340	2840	16900	20400	14700	10300	3550	741
MIN	478	754	280	210	510	1510	1580	5040	4410	1630	596	329
AC-FT	45540	59730	34830	25320	80470	121900	589400	486700	477200	276500	80560	25150
CFSM	.20	.28	.16	.11	.40	.55	2.73	2.18	2.21	1.24	.36	.12
IN.	.24	.31	.18	.13	.42	.63	3.05	2.52	2.47	1.43	.42	.13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	724	1298	962	676	2156	2703	6908	5547	7821	4418	1368	450
MAX	1139	2527	1873	1235	3280	3525	9905	7915	12570	7266	2252	664
(WY)	1997	1997	1997	1997	1997	1997	1999	1999	1998	1998	1998	1998
MIN	291	363	448	382	1449	1982	3688	4151	2872	1489	540	263
(WY)	1998	1998	1998	1998	1999	1999	1997	1997	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1997 - 1999	
ANNUAL TOTAL	1259690		1161264			
ANNUAL MEAN	3451		3182		2912	
HIGHEST ANNUAL MEAN					3350	1998
LOWEST ANNUAL MEAN					2205	1997
HIGHEST DAILY MEAN	40100	Jun 16	20400	May 22	40100	Jun 16 1998
LOWEST DAILY MEAN	220	Jan 13	210	Jan 9	140	Oct 7 1997
ANNUAL SEVEN-DAY MINIMUM	286	Jan 10	276	Jan 4	167	Oct 4 1997
INSTANTANEOUS PEAK FLOW			23600	May 22		
INSTANTANEOUS PEAK STAGE			16.02	May 22	26.80	Jul 11 1993
INSTANTANEOUS LOW FLOW			304	Sep 22		
ANNUAL RUNOFF (AC-FT)	2499000		2303000		2110000	
ANNUAL RUNOFF (CFSM)	.95		.88		.80	
ANNUAL RUNOFF (INCHES)	12.93		11.92		10.92	
10 PERCENT EXCEEDS	8460		9530		7070	
50 PERCENT EXCEEDS	1520		1300		1600	
90 PERCENT EXCEEDS	465		380		349	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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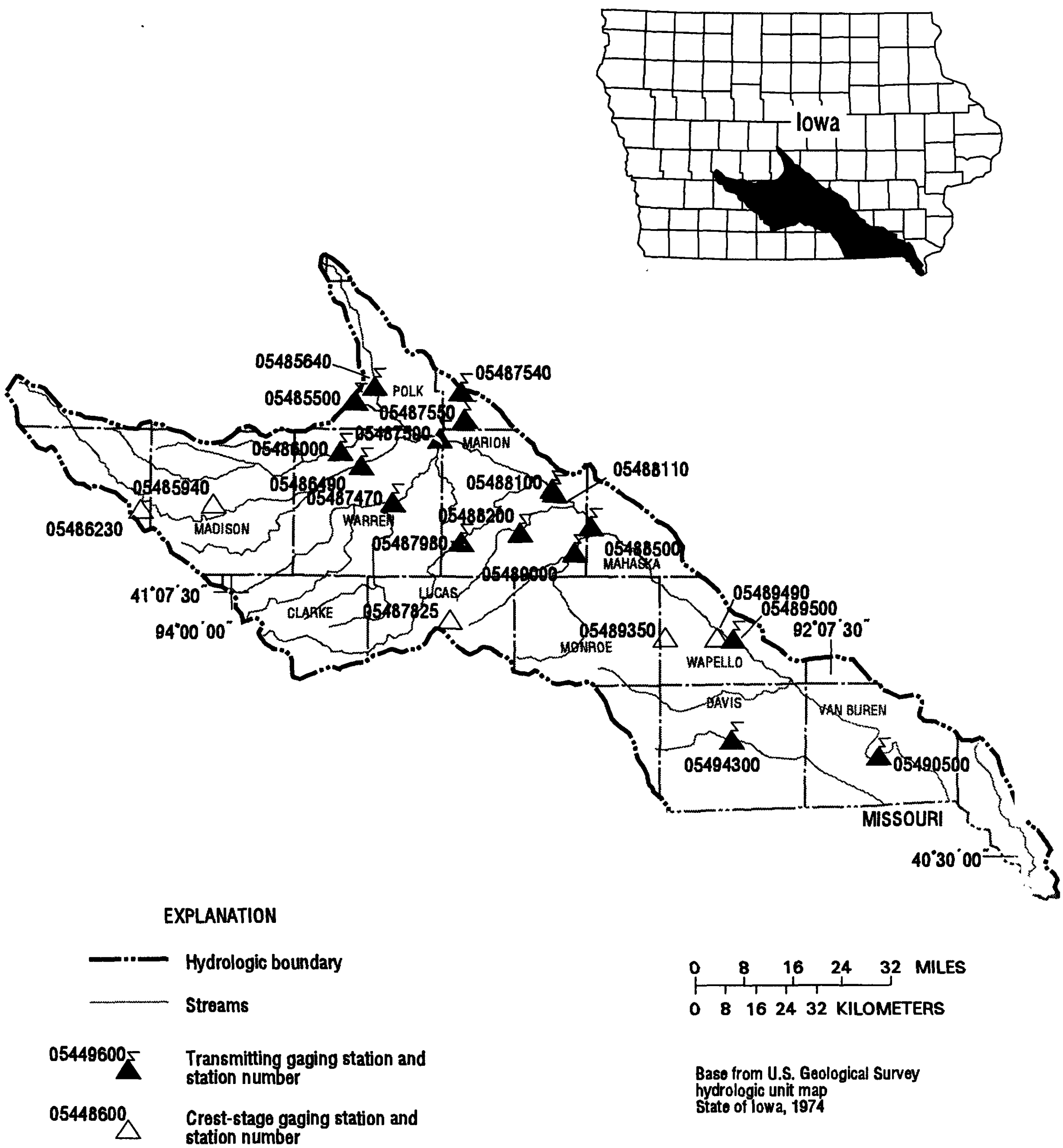
1998
1999
WATER YEAR


Iowa
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05485500
05487540
POLK
05487550
05487590
MARION
05486000
05488110
05486490
05488100
05485940
05487470
05486230
MADISON
WARREN
05488200
05487980
05488500
MAHASKA
05489000
41°07'30"
94°00'00"
CLARKE
LUCAS
05487825
05489490
05489500
92°07'30"
05489350
MONROE
WAPELLO
DAVIS
VAN BUREN
05494300
05490500
MISSOURI
40°30'00"
EXPLANATION
Hydrologic boundary
Streams
05449600
Transmitting gaging station and station number
05448600
Crest-stage gaging station and station number
0 8 16 24 32 MILES
0 8 16 24 32 KILOMETERS
Base from U.S. Geological Survey hydrologic unit map State of Iowa, 1974

Gaging Stations

Crest Stage Gaging Stations

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA

LOCATION.--Lat 41°34'40", long 93°36'19", in SW $^1/_4$ NE $^1/_4$ sec.10, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100008, on left bank 40 ft downstream from bridge on Southeast 6th Street at Des Moines, 0.5 mi downstream from Raccoon River and Scott Street Dam, and at mile 201.0 (revised).

DRAINAGE AREA.--9,879 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1943 (P).

GAGE.--Water-stage recorder. Datum of gage is 762.52 ft above sea level. Prior to Oct. 1, 1951, and Oct. 1, 1953 to Sept. 30, 1959, water-stage recorder upstream of Scott Street Dam, 0.8 mi upstream at datum 11.16 ft higher. Oct. 1, 1951 to Sept. 30, 1953, Oct. 1, 1959 to April 24, 1997 water-stage recorder .3 mi downstream at current datum, and Oct. 1, 1959 to Sept. 30, 1961, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi upstream from station. Average daily pumpage was about 44 ft^3/s. At times, water is pumped from Raccoon River into recharge basins, or into Waterworks Reservoir, capacity 4,800 acre-ft. Effluent from sewage treatment plant enters the river 2.3 mi downstream from station. Net effect diversions not know. Flow regulated by Saylorville Lake (station 05481630) 12.7 mi upstream, since Apr. 12, 1977. 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 data collection platform, U.S. National Weather Service Limited Automatic Remote Collector (LARC), and U.S. Geological Survey data logger at station.

COOPERATION.--Average monthly pumpage from galleries provided by Des Moines Water Works.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 116,000 ft^3/s July 11,1993, gage height, 34.29; minimum daily discharge, 26 ft^3/s Jan. 16-29, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, that of June 26, 1947, site and datum then in use. Flood of May 31, 1903, reached a stage of 20.9 ft, from flood profile, at Scott Street site and datum, by office of Des Moines City Engineer.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	791	3260	3530	1950	1190	4400	3830	22900	15600	21600	8470	1250
2	850	3560	3660	1790	1230	4720	4080	22000	15100	19900	7250	1210
3	1040	3810	3650	1750	1380	5120	4240	20900	14500	22300	7060	1160
4	1180	3360	3620	e1600	1700	5060	4170	19700	14300	21900	6860	1160
5	1650	2980	3600	e1550	2100	5010	4720	19200	17100	20300	5980	1530
6	1660	4050	3570	e1650	2220	4830	8570	18700	15600	21700	5800	1310
7	1350	3320	3530	e1750	2480	4450	15000	18400	14700	20800	5830	1060
8	1270	3120	3500	e1800	2660	4310	19000	17900	16100	17300	5810	981
9	1170	3180	3470	e1800	2780	4130	25000	17500	15600	15900	4750	1180
10	1140	3840	3220	e1800	3170	4020	27300	17600	17600	16100	3180	1030
11	1080	3670	2740	e1800	4060	3480	27300	18700	23000	12800	2790	869
12	1010	3620	2550	e1750	4730	3390	26300	20500	25500	11400	4140	788
13	988	3520	2550	e1700	e4050	3700	25300	20100	25700	11000	5390	749
14	971	3790	2540	e1600	e3880	3610	22900	19500	25500	10500	4140	748
15	927	4270	2540	e1550	4720	3590	22500	19000	25500	10200	2860	697
16	948	4480	2540	e1500	6180	3920	25200	19600	23600	9610	2350	711
17	1360	4400	2490	e1450	6820	4950	25300	20800	21200	8920	1950	686
18	1770	4170	2380	e1400	5780	5730	25300	25100	20300	8620	3120	635
19	2210	4120	2370	e1400	4520	6260	25700	23900	19500	8390	4090	622
20	1710	4090	2110	e1350	4270	7200	25800	23400	18900	9820	3230	664
21	1880	3940	1540	e1300	4170	7300	23600	26100	18400	11400	2620	689
22	2760	3770	1230	1390	3970	6530	23300	32700	18000	9970	2310	563
23	2910	3740	725	1330	3500	6290	26100	26700	20000	9370	3300	537
24	2910	3690	849	1330	3070	5900	25000	24500	24800	9050	3440	488
25	2670	3670	814	1330	2930	5420	26300	22400	22600	8790	2400	484
26	2380	3660	1300	1280	3150	4910	26800	21100	20600	8900	2280	498
27	2360	3560	1870	1180	3730	4460	27700	20200	19100	9550	2070	884
28	2380	3460	1610	1150	4200	4700	26800	19100	23900	10300	1860	662
29	2410	3470	1980	1200	---	4640	24100	17900	23500	10800	1670	565
30	2620	3480	2090	1190	---	3960	22900	17100	22900	10300	1580	504
31	3000	---	1870	1190	---	3860	---	16300	---	9690	1410	---
TOTAL	53355	111050	76038	46810	98640	149850	620110	649500	598700	407180	119990	24914
MEAN	1721	3702	2453	1510	3523	4834	20670	20950	19960	13130	3871	830
MAX	3000	4480	3660	1950	6820	7300	27700	32700	25700	22300	8470	1530
MIN	791	2980	725	1150	1190	3390	3830	16300	14300	8390	1410	484
AC-FT	105800	220300	150800	92850	195700	297200	1230000	1288000	1188000	807600	238000	49420
CFSM	.17	.37	.25	.15	.36	.49	2.09	2.12	2.02	1.33	.39	.08
IN.	.20	.42	.29	.18	.37	.56	2.34	2.45	2.25	1.53	.45	.09

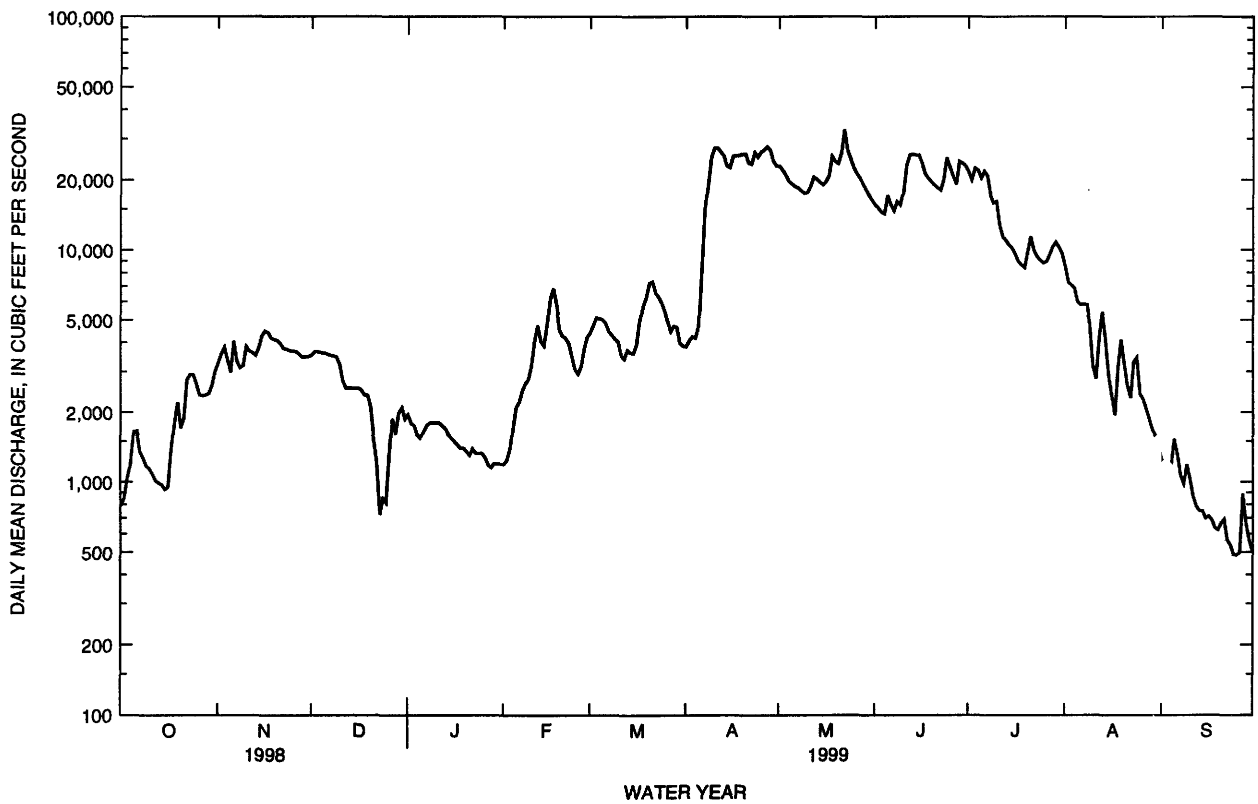
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3286	3690	3135	1912	3410	8419	12140	12100	13420	11450	5412	3688
MAX	15060	10610	9045	6439	12400	23530	27620	28190	35250	55960	26050	21430
(WY)	1987	1993	1983	1983	1984	1983	1993	1993	1984	1993	1993	1993
MIN	474	363	342	310	343	560	1082	1794	1716	739	441	434
(WY)	1990	1990	1990	1981	1978	1981	1981	1981	1988	1988	1988	1988

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1978 - 1999a	
ANNUAL TOTAL	2865336		2956137			
ANNUAL MEAN	7850		8099		6849	
HIGHEST ANNUAL MEAN					19180	1993
LOWEST ANNUAL MEAN					1036	1989
HIGHEST DAILY MEAN	45000	Jun 16	32700	May 22	113000	Jul 11 1993
LOWEST DAILY MEAN	550	Jan 13	484	Sep 25	200	Mar 12 1978b
ANNUAL SEVEN-DAY MINIMUM	643	Jan 12	560	Sep 20	236	Mar 7 1978
INSTANTANEOUS PEAK FLOW			35500	May 22	116000	Jul 11 1993
INSTANTANEOUS PEAK STAGE			26.11	May 22	34.29	Jul 11 1993
ANNUAL RUNOFF (AC-FT)	5683000		5863000		4962000	
ANNUAL RUNOFF (CFSM)	.79		.82		.69	
ANNUAL RUNOFF (INCHES)	10.79		11.13		9.42	
10 PERCENT EXCEEDS	20200		22900		18500	
50 PERCENT EXCEEDS	4170		3830		3600	
90 PERCENT EXCEEDS	869		1150		660	

a Post regulation
b Also Mar 13, 1978
e Estimated



05485640 FOURMILE CREEK AT DES MOINES, IA

LOCATION.--Lat 41°36'50", long 93°32'43", in NE$^1/_4$ NE$^1/_4$ sec.32, T.79 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank 20 ft downstream from bridge on Easton Blvd., 4.4 mi downstream from Muchikinock Creek, and 5.0 mi upstream from Des Moines River.

DRAINAGE AREA.--92.7 mi^2.

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

REVISED RECORDS.--WDR IA-75-1: 1974 (P).

GAGE.--Water-stage recorder. Datum of gage is 795.87 ft above sea level.

REMARKS.--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.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	22	25	e8.5	e27	62	35	109	94	59	16	18
2	8.5	39	25	e10	e42	65	35	103	90	55	13	18
3	23	28	25	e8.5	107	48	34	98	78	53	11	15
4	28	23	24	e7.0	150	45	35	94	133	46	9.1	16
5	91	22	23	e6.5	118	44	50	91	124	39	9.6	50
6	38	21	23	e11	73	39	58	83	91	69	10	19
7	28	21	23	e8.5	56	34	50	88	80	65	30	14
8	25	28	22	e8.0	58	28	100	88	71	48	17	12
9	23	33	21	e6.5	72	55	364	72	67	56	11	12
10	22	173	21	e8.5	65	42	239	73	394	39	9.4	11
11	22	108	20	e12	85	34	170	141	658	33	14	11
12	23	75	21	e8.5	54	36	126	993	371	30	509	11
13	22	64	21	e8.0	50	41	109	639	247	27	115	9.7
14	22	59	20	e8.5	48	49	99	392	195	24	50	10
15	22	50	19	e9.5	45	68	131	276	155	22	29	8.7
16	23	48	19	e17	41	100	355	285	136	23	26	9.1
17	83	42	19	e16	38	98	350	418	120	49	16	8.7
18	117	39	19	e14	38	71	231	291	106	27	188	9.3
19	59	38	e13	e13	39	61	179	209	98	33	151	9.2
20	40	34	e9.0	e13	35	58	151	170	90	112	89	9.5
21	e34	32	e8.0	e15	32	54	135	1100	84	86	62	8.1
22	e26	32	e9.5	e16	32	50	235	704	81	51	53	7.4
23	e25	31	e10	e15	34	47	375	465	144	36	455	6.4
24	e23	28	e8.5	e15	37	44	267	299	114	30	177	6.5
25	e23	29	e9.0	e13	33	41	202	213	89	25	111	6.2
26	e21	28	e9.5	e15	38	39	171	165	79	22	78	7.2
27	e23	26	e12	e20	47	39	204	138	73	21	60	50
28	e24	26	e14	e18	64	45	152	121	70	20	46	18
29	26	27	e15	e17	---	37	129	107	65	e20	35	10
30	23	30	e12	e20	---	34	116	99	61	e17	31	8.5
31	21	---	e8.0	e23	---	35	---	99	---	32	23	---
TOTAL	994.5	1256	527.5	389.5	1558	1543	4887	8223	4258	1269	2454.1	409.5
MEAN	32.1	41.9	17.0	12.6	55.6	49.8	163	265	142	40.9	79.2	13.6
MAX	117	173	25	23	150	100	375	1100	658	112	509	50
MIN	6.0	21	8.0	6.5	27	28	34	72	61	17	9.1	6.2
AC-FT	1970	2490	1050	773	3090	3060	9690	16310	8450	2520	4870	812
CFSM	.35	.45	.18	.14	.60	.54	1.76	2.86	1.53	.44	.85	.15
IN.	.40	.50	.21	.16	.63	.62	1.96	3.30	1.71	.51	.98	.16

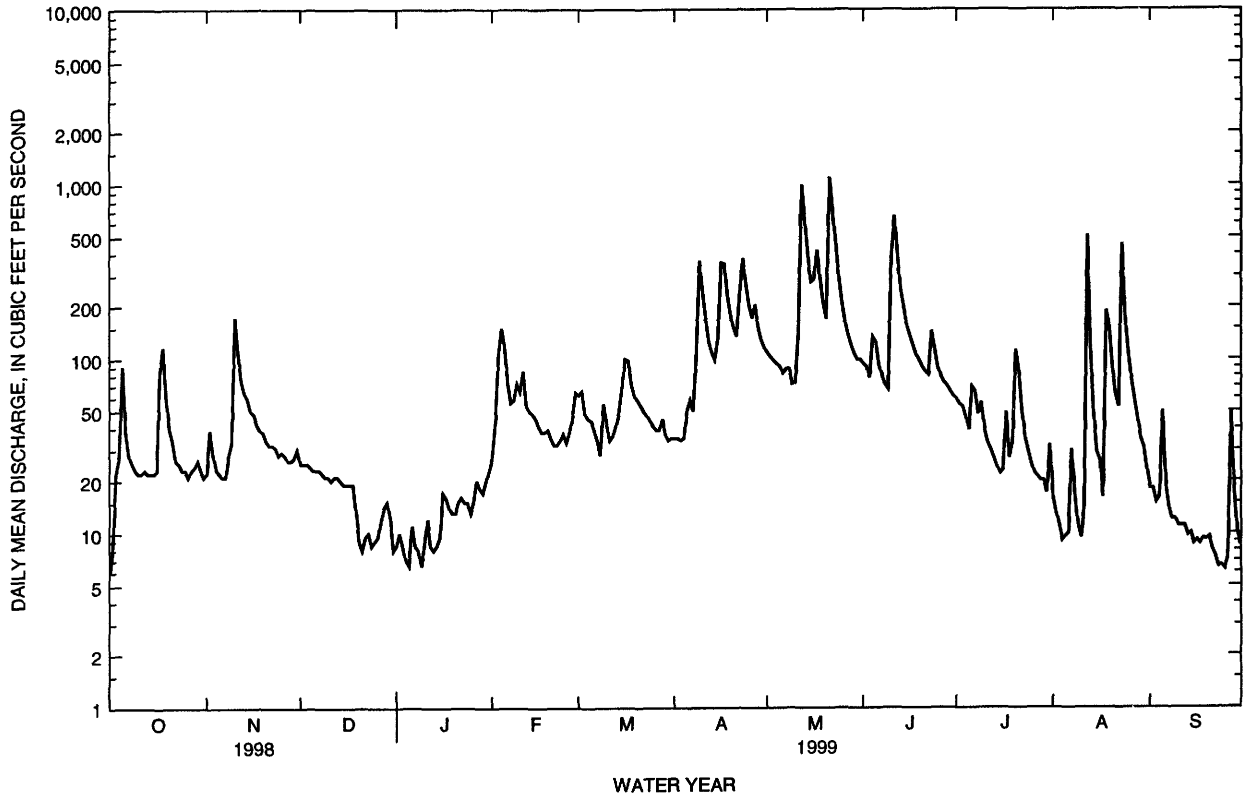
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	41.7	46.9	35.8	24.5	51.1	100	126	149	160	105	51.0	37.6
MAX	258	317	124	118	206	292	354	462	505	607	363	270
(WY)	1987	1984	1983	1974	1973	1979	1973	1974	1998	1993	1993	1993
MIN	1.36	1.57	.25	.001	.55	4.04	3.67	6.67	.73	.074	1.66	1.37
(WY)	1989	1977	1977	1977	1977	1981	1981	1977	1977	1977	1988	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1972 - 1999	
ANNUAL TOTAL	43386.3		27769.1			
ANNUAL MEAN	119		76.1		77.5	
HIGHEST ANNUAL MEAN					204	1993
LOWEST ANNUAL MEAN					7.97	1981
HIGHEST DAILY MEAN	2600	Jul 7	1100	May 21	3570	Jun 9 1974
LOWEST DAILY MEAN	6.0	Oct 1	6.0	Oct 1	.00	Jan 2 1977a
ANNUAL SEVEN-DAY MINIMUM	7.5	Sep 25	7.3	Sep 20	.00	Jan 2 1977a
INSTANTANEOUS PEAK FLOW			2440	May 21	5600	Jun 18 1998
INSTANTANEOUS PEAK STAGE			12.39	May 21	15.00	Jun 18 1998
INSTANTANEOUS LOW FLOW			5.0	Oct 1		
ANNUAL RUNOFF (AC-FT)	86060		55080		56150	
ANNUAL RUNOFF (CFSM)	1.28		.82		.84	
ANNUAL RUNOFF (INCHES)	17.41		11.14		11.36	
10 PERCENT EXCEEDS	239		170		183	
50 PERCENT EXCEEDS	47		36		29	
90 PERCENT EXCEEDS	11		9.6		2.8	

a No flow many days in 1977
e Estimated

05485640 FOURMILE CREEK AT DES MOINES, IA--Continued



05486000 NORTH RIVER NEAR NORWALK, IA

LOCATION.--Lat 41°27'25", long 93°39'10", in NW$^1/_4$ SW$^1/_4$ sec.20, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on county highway R57, 1.7 mi southeast of Norwalk, 5.2 mi upstream from Middle Creek, and 6.2 mi downstream from Badger Creek.

DRAINAGE AREA.--349 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1946. WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 788.45 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to June 12, 1946, nonrecording gage at same site and datum. Jan. 7 to Oct. 11, 1960, nonrecording gage at site 2.1 mi upstream at different datum.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	52	110	e36	e95	312	130	573	438	330	65	9.4
2	27	66	103	e42	109	305	129	499	404	306	57	7.8
3	36	121	98	e38	135	293	125	447	341	284	50	7.5
4	57	153	98	e34	190	265	132	414	372	362	46	7.5
5	106	132	96	e30	223	218	141	400	1600	255	44	9.5
6	157	108	94	e40	216	190	507	374	1000	211	40	17
7	154	96	92	e36	177	168	629	358	533	195	49	20
8	105	98	91	e32	161	150	427	355	417	178	62	12
9	84	130	86	e29	145	122	817	333	351	166	79	12
10	74	450	84	e32	131	189	941	301	359	642	57	10
11	68	681	84	e42	122	197	604	291	1330	468	42	8.2
12	63	422	84	e40	136	153	452	941	1990	246	53	6.9
13	59	299	79	e34	121	150	366	1080	1740	196	51	6.1
14	54	254	78	e38	97	151	331	726	775	168	61	6.5
15	52	227	76	e55	136	170	626	564	555	150	56	5.8
16	51	191	76	e65	120	279	1950	974	468	138	39	5.1
17	68	171	75	e70	107	601	2230	1850	417	136	31	4.7
18	131	159	71	e65	99	640	2370	1990	359	131	40	4.5
19	163	149	72	e60	96	411	1220	1380	317	122	42	4.6
20	159	141	56	e55	101	325	739	820	288	175	48	5.0
21	110	132	45	e60	95	283	603	1220	264	153	38	5.1
22	94	127	e38	e65	89	247	694	2170	241	130	29	4.8
23	82	126	e46	e65	63	218	1500	2840	512	104	27	4.6
24	74	123	43	e65	91	198	1070	2870	1580	92	20	4.5
25	67	117	42	e55	99	179	748	1180	808	85	17	4.4
26	63	113	46	e60	106	163	613	723	476	80	15	4.8
27	58	110	53	e75	132	156	955	601	382	77	15	8.4
28	57	107	58	e70	207	154	1570	520	461	77	13	9.5
29	58	106	62	e65	---	155	1030	462	565	74	12	11
30	58	110	e55	e75	---	144	707	417	375	67	11	11
31	54	---	e40	e85	---	134	---	418	---	75	10	---
TOTAL	2471	5271	2231	1613	3599	7320	24356	28091	19718	5873	1219	238.2
MEAN	79.7	176	72.0	52.0	129	236	812	906	657	189	39.3	7.94
MAX	163	681	110	85	223	640	2370	2870	1990	642	79	20
MIN	27	52	38	29	63	122	125	291	241	67	10	4.4
AC-FT	4900	10460	4430	3200	7140	14520	48310	55720	39110	11650	2420	472
CFSM	.23	.50	.21	.15	.37	.68	2.33	2.60	1.88	.54	.11	.02
IN.	.26	.56	.24	.17	.38	.78	2.60	2.99	2.10	.63	.13	.03

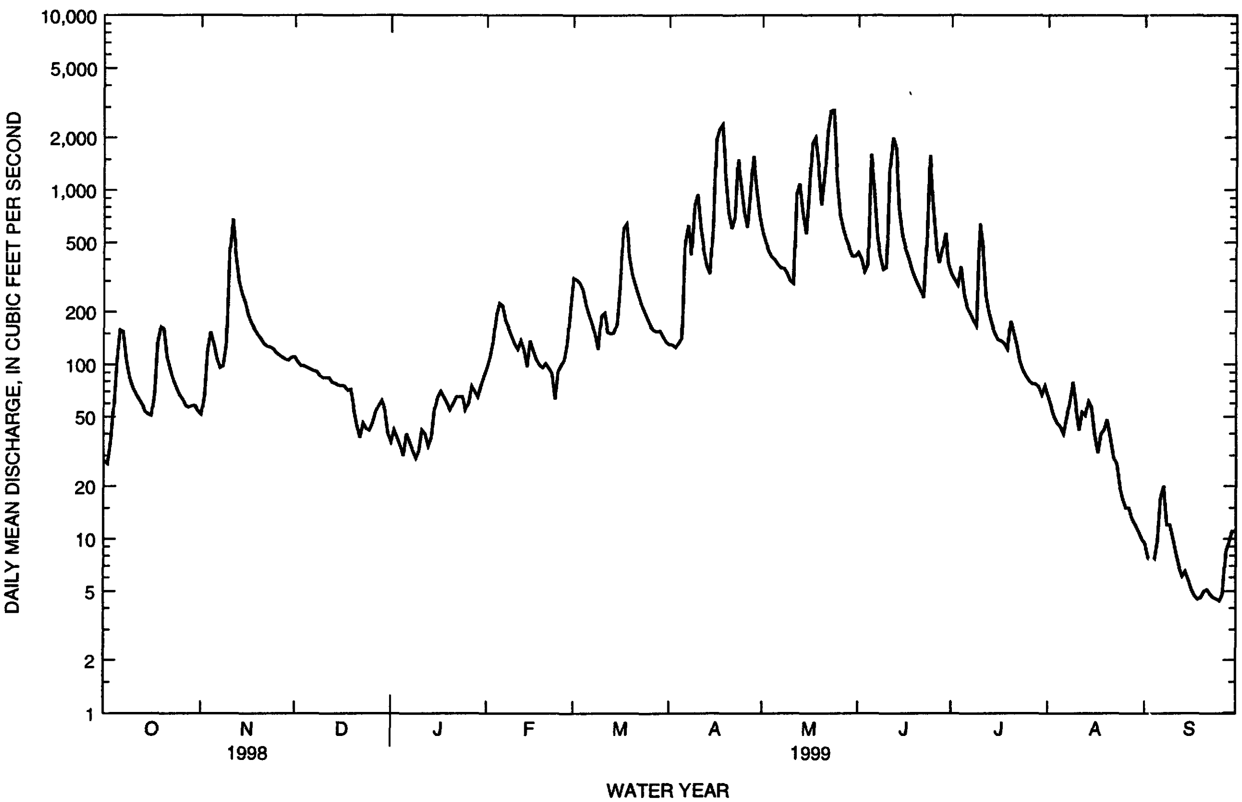
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	79.2	104	76.4	79.3	164	338	357	365	388	197	116	93.7
MAX	593	747	567	739	911	1041	1401	1699	3260	1722	1185	1007
(WY)	1987	1973	1993	1973	1973	1965	1973	1996	1947	1993	1993	1993
MIN	.20	.37	.36	.38	3.21	3.90	1.22	3.71	1.58	1.10	.21	.26
(WY)	1950	1956	1956	1954	1956	1954	1956	1967	1977	1977	1968	1957

05486000 NORTH RIVER NEAR NORWALK, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	92784		102000.2			
ANNUAL MEAN	254		279		196	
HIGHEST ANNUAL MEAN					709	1993
LOWEST ANNUAL MEAN					8.08	1968
HIGHEST DAILY MEAN	2970	Jun 20	2870	May 24	21600	Jun 13 1947
LOWEST DAILY MEAN	15	Jan 13	4.4	Sep 25	.00	Jul 2[illegible] 1954a
ANNUAL SEVEN-DAY MINIMUM	18	Jan 13	4.7	Sep 19	.00	Jul 2[illegible] 1954a
INSTANTANEOUS PEAK FLOW			3200	May 23	32000	Jun 13 1947b
INSTANTANEOUS PEAK STAGE			20.34	May 23	25.30	Jun 13 1947c
INSTANTANEOUS LOW FLOW			4.4	Sep 18	.00	Jul 2[illegible] 1954
ANNUAL RUNOFF (AC-FT)	184000		202300		142100	
ANNUAL RUNOFF (CFSM)	.73		.80		.56	
ANNUAL RUNOFF (INCHES)	9.89		10.87		7.64	
10 PERCENT EXCEEDS	530		699		450	
50 PERCENT EXCEEDS	131		120		46	
90 PERCENT EXCEEDS	40		19		2.3	

a Many days 1954-58
b From rating curve extended above 9,100 ft^3/s on basis of velocity-area studies
c From floodmark
e Estimated



05486490 MIDDLE RIVER NEAR INDIANOLA, IA

LOCATION.--Lat 41°25'27", long 93°35'09", in SW$^1/_4$ SE$^1/_4$ sec.35, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on right bank 10 ft downstream from bridge on county highway, 0.4 mi upstream from Cavitt Creek, 1.5 mi upstream from bridge on U.S. Highway 69, and 4.6 mi northwest of Indianola.

DRAINAGE AREA.--503 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1941, 1944, 1946, 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 776.15 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to June 11, 1946, June 9, 1947 to Nov. 23, 1948, and Sept. 8, 1951 to Oct. 30, 1952, nonrecording gage; and June 11, 1946 to June 8, 1947 (destroyed by flood), Nov. 24, 1948 to Sept. 7, 1951, Oct. 31, 1952 to Sept. 30, 1962, water-stage recorder at site 1.6 mi downstream at datum 2.81 ft lower.

REMARKS.--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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

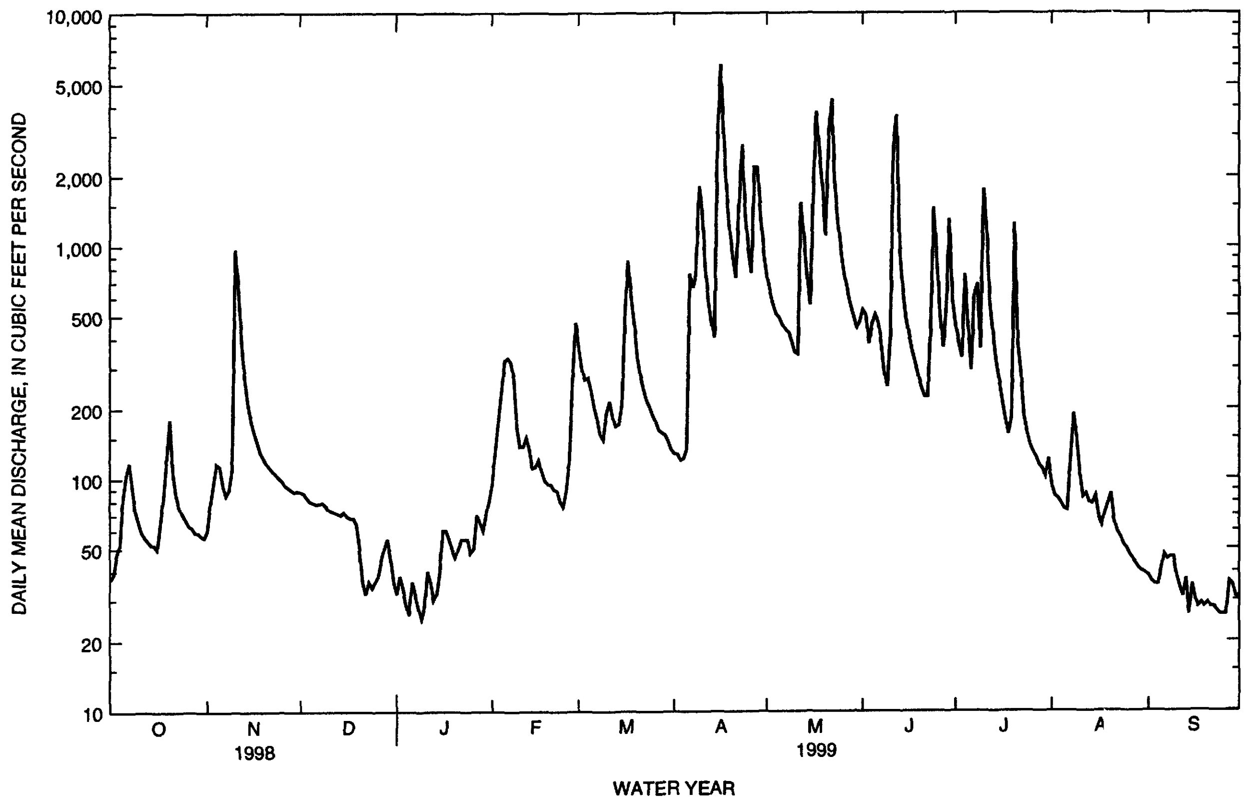
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	60	88	e32	e95	368	128	737	528	453	93	38
2	39	77	87	e38	e130	297	127	632	505	380	84	36
3	47	96	83	e34	e180	267	120	559	379	331	82	35
4	52	116	80	e29	e240	272	122	509	460	752	73	35
5	83	113	79	e26	322	241	134	492	504	444	74	40
6	104	94	78	e36	331	204	761	458	466	293	73	47
7	117	85	78	e32	318	180	664	434	375	622	118	45
8	92	90	79	e28	268	155	756	422	283	687	189	46
9	73	110	77	e25	166	147	1810	389	249	362	148	46
10	65	968	74	e28	137	191	1430	349	408	1760	105	38
11	59	670	73	e40	137	215	812	342	2670	1210	83	34
12	56	390	72	e36	150	183	584	1540	3640	572	86	31
13	54	271	71	e30	134	168	466	1110	980	417	79	37
14	52	213	70	e32	111	171	404	728	645	322	78	26
15	52	179	72	e40	112	207	2740	557	488	265	84	35
16	50	160	69	e60	120	495	e6050	1680	410	e217	69	30
17	65	144	68	e60	108	867	3000	3790	354	e181	63	28
18	82	e130	68	e55	98	609	1650	2570	314	e155	71	29
19	122	123	64	e50	95	459	1140	1830	273	183	78	28
20	180	117	51	e46	95	332	899	1110	245	1250	86	29
21	106	112	e36	e50	90	278	735	3020	225	382	66	28
22	85	108	e32	e55	89	244	1510	4290	224	288	59	28
23	76	105	e36	e55	80	218	2730	1780	461	186	56	27
24	71	101	e34	e55	76	204	1390	1250	1460	158	52	26
25	67	98	e36	e48	90	186	961	950	885	139	50	26
26	63	94	e38	e50	120	175	769	762	494	130	47	26
27	62	92	e44	e70	274	162	2190	643	365	123	45	36
28	59	90	e50	e65	468	158	2180	563	544	114	43	35
29	59	88	e55	e60	---	154	1350	499	1310	110	41	31
30	57	89	e46	e70	---	145	925	445	590	102	40	31
31	56	---	e36	e80	---	133	---	469	---	121	39	---
TOTAL	2242	5183	1924	1415	4634	8085	38537	34909	20734	12709	2359	1007
MEAN	72.3	173	62.1	45.6	166	261	1285	1126	691	410	76.1	33.6
MAX	180	968	88	80	468	867	6050	4290	3640	1760	189	47
MIN	37	60	32	25	76	133	120	342	224	102	39	26
MED	63	109	69	46	125	204	912	643	464	293	74	32
AC-FT	4450	10280	3820	2810	9190	16040	76440	69240	41130	25210	4680	2000
CFSM	.14	.34	.12	.09	.33	.52	2.55	2.24	1.37	.82	.15	.07
IN.	.17	.38	.14	.10	.34	.60	2.85	2.58	1.53	.94	.17	.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	116	137	118	107	235	472	501	521	518	280	171	178
MAX	928	961	1070	646	1415	1417	1983	2053	4094	3121	1419	1460
(WY)	1974	1973	1983	1973	1973	1962	1973	1996	1947	1993	1993	1992
MIN	4.28	2.80	1.62	1.02	4.68	7.35	4.81	10.1	3.81	5.20	4.47	3.92
(WY)	1969	1956	1956	1977	1977	1954	1956	1956	1977	1977	1968	1968

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	140435		133738			
ANNUAL MEAN	385		366		279	
HIGHEST ANNUAL MEAN					1006	1993
LOWEST ANNUAL MEAN					17.8	1968
HIGHEST DAILY MEAN	9990	Jul 7	6050	Apr 16	21400	Jun 13 1947
LOWEST DAILY MEAN	23	Mar 12	25	Jan 9	.11	Jul 2 1977
ANNUAL SEVEN-DAY MINIMUM	33	Jan 12	27	Sep 20	.51	Jun 29 1977
INSTANTANEOUS PEAK FLOW			7420	Apr 16	34000	Jun 13 1947
INSTANTANEOUS PEAK STAGE			18.73	Apr 16	28.27	Jun 13 1947a
INSTANTANEOUS LOW FLOW			24	Sep 14		
ANNUAL RUNOFF (AC-FT)	278600		265300		202200	
ANNUAL RUNOFF (CFSM)	.76		.73		.55	
ANNUAL RUNOFF (INCHES)	10.39		9.89		7.54	
10 PERCENT EXCEEDS	911		909		622	
50 PERCENT EXCEEDS	125		117		73	
90 PERCENT EXCEEDS	46		36		8.8	

a From floodmark
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
10,000
5,000
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1,000
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1998
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WATER YEAR

05487470 SOUTH RIVER NEAR ACKWORTH, IA

LOCATION.--Lat 41°20'14", long 93°29'10", in $SE^1/_4$ $SE^1/_4$ sec.34, T.76 N., R.23 W., Warren County, Hydrologic Unit 07100008, on right bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Otter Creek, and 2.2 mi southwest of Ackworth.

DRAINAGE AREA.--460 mi^2.

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1941, 1945 (M), 1946.

GAGE.--Water-stage recorder. Datum of gage is 769.97 ft above sea level. Prior to June 12, 1946, nonrecording gage, June 13, 1946 to Apr. 13, 1960, water-stage recorder, and Apr. 14, 1960 to Sept. 30, 1961, nonrecording gage, all at site 4.0 mi downstream at datum 8.06 ft lower.

REMARKS.--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 1930 reached a stage of 24.5 ft, from information by local residents, discharge, about 30,000 ft^3/s, at site 4.0 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.4	19	51	e19	e85	e300	99	378	202	67	1960	11
2	13	67	50	e22	e110	e190	e98	309	346	65	281	11
3	41	210	48	e20	e200	e150	96	252	149	60	123	11
4	48	129	49	e18	315	e148	101	216	276	52	83	14
5	250	70	48	e16	268	e134	112	227	434	45	61	26
6	161	50	47	e21	232	e130	586	197	150	41	49	27
7	61	44	49	e19	188	e108	324	184	107	40	532	20
8	37	53	48	e17	135	e89	579	181	88	38	743	17
9	28	103	46	e15	101	e133	1930	159	78	38	164	15
10	21	2670	45	e17	86	e186	657	138	636	38	84	12
11	18	732	43	e23	95	e149	380	144	2120	36	59	11
12	14	271	42	e22	89	e158	250	4850	1010	31	81	11
13	12	165	43	e18	83	e154	198	1760	368	27	140	12
14	11	123	41	e20	82	184	182	706	225	25	73	10
15	11	101	40	e26	87	310	3520	496	153	22	46	9.7
16	12	89	40	e36	71	919	7350	1650	127	21	37	9.0
17	120	81	37	e34	59	1240	3080	6140	109	27	30	8.5
18	505	e75	39	e32	59	444	1080	2470	96	23	36	8.8
19	107	69	36	e30	62	268	643	835	87	19	34	8.6
20	52	64	e27	e29	69	211	472	492	80	75	30	9.0
21	36	61	e20	e30	62	179	387	776	75	30	25	8.5
22	27	62	e18	e33	60	160	3380	920	70	20	22	8.2
23	24	59	e20	e34	60	147	3810	428	246	17	22	8.1
24	23	55	e19	e36	86	138	1020	305	387	14	19	7.8
25	22	54	e20	e32	88	123	598	220	122	13	18	7.8
26	20	52	e22	e35	142	118	452	163	82	14	17	7.3
27	21	50	e25	e42	645	116	3580	136	72	14	16	29
28	21	50	e29	e40	531	112	2180	112	71	37	15	34
29	22	52	32	e38	---	106	840	98	69	48	14	27
30	19	54	e26	e42	---	100	504	89	67	23	13	19
31	18	---	e21	e54	---	98	---	128	---	2400	11	---
TOTAL	1782.4	5734	1121	870	4150	7002	38488	25159	8102	3420	4838	418.3
MEAN	57.5	191	36.2	28.1	148	226	1283	812	270	110	156	13.9
MAX	505	2670	51	54	645	1240	7350	6140	2120	2400	1960	34
MIN	7.4	19	18	15	59	89	96	89	67	13	11	7.3
AC-FT	3540	11370	2220	1730	8230	13890	76340	49900	16070	6780	9600	830
CFSM	.12	.42	.08	.06	.32	.49	2.79	1.76	.59	.24	.34	.03
IN.	.14	.46	.09	.07	.34	.57	3.11	2.03	.66	.28	.39	.03

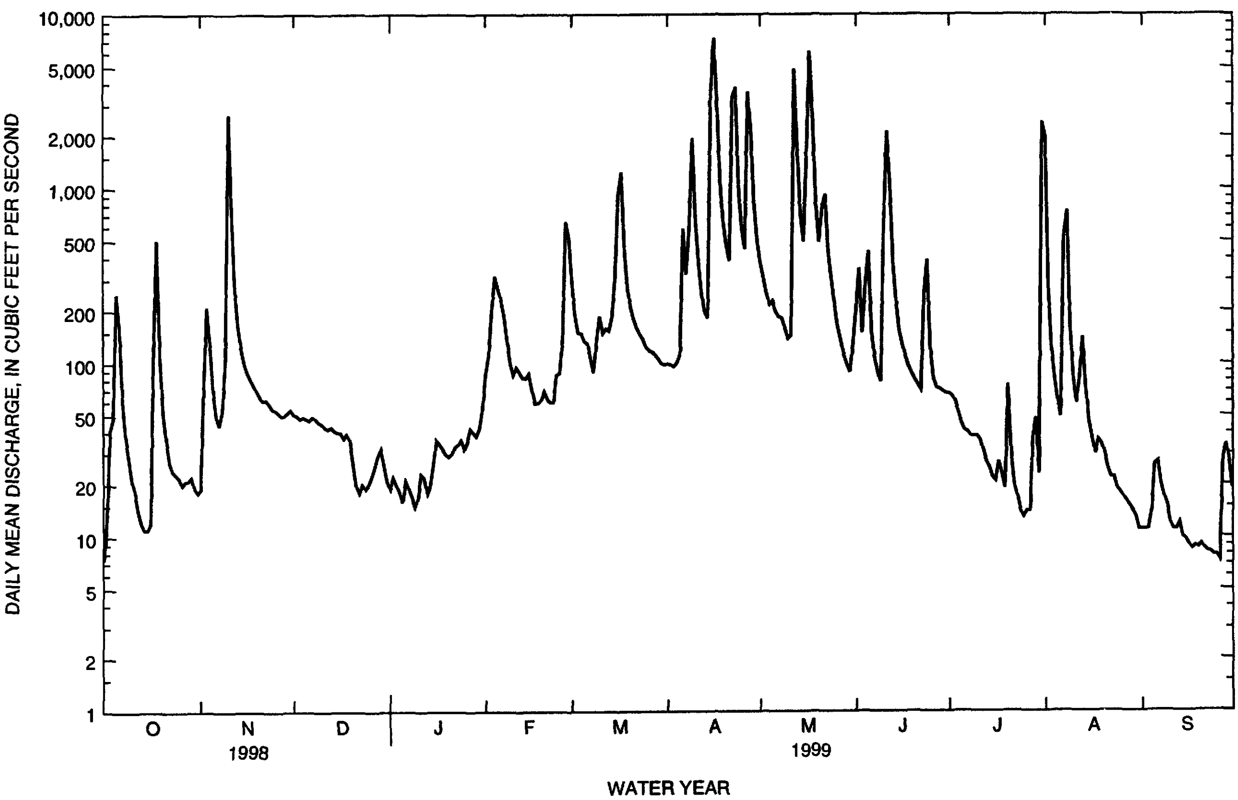
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	113	129	112	105	221	452	469	476	479	264	133	156
MAX	1283	906	1022	901	1209	1568	1937	1962	4305	3870	1546	1332
(WY)	1974	1962	1983	1974	1973	1960	1973	1959	1947	1993	1993	1993
MIN	.35	1.05	.88	1.05	3.70	3.61	1.70	7.14	1.79	1.48	2.02	1.05
(WY)	1957	1957	1956	1956	1989	1957	1956	1980	1977	1977	1957	1957

05487470 SOUTH RIVER NEAR ACKWORTH, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1941 - 1999	
ANNUAL TOTAL	133095.6		101084.7			
ANNUAL MEAN	365		277		259	
HIGHEST ANNUAL MEAN					966	1993
LOWEST ANNUAL MEAN					16.1	1989
HIGHEST DAILY MEAN	11200	Mar 31	7350	Apr 16	31400	Jun 17 1990
LOWEST DAILY MEAN	7.0	Sep 11	7.3	Sep 26	.00	Sep 19 1956a
ANNUAL SEVEN-DAY MINIMUM	8.7	Sep 7	8.1	Sep 20	.00	Sep 19 1956a
INSTANTANEOUS PEAK FLOW			8330	Apr 16	38100	Jun 17 1990
INSTANTANEOUS PEAK STAGE			16.44	Apr 16	32.85	Jul 5 1981
INSTANTANEOUS LOW FLOW			4.8	Oct 1	.00	Sep 19 1956a
ANNUAL RUNOFF (AC-FT)	264000		200500		187400	
ANNUAL RUNOFF (CFSM)	.79		.60		.56	
ANNUAL RUNOFF (INCHES)	10.76		8.17		7.64	
10 PERCENT EXCEEDS	749		551		495	
50 PERCENT EXCEEDS	97		62		42	
90 PERCENT EXCEEDS	18		15		3.2	

a Also Sep 30 to Oct 13, 1956
e Estimated



05487500 DES MOINES RIVER NEAR RUNNELLS, IA

LOCATION.--Lat 41°29'19", long 93°20'17", in SE$^{1}/_{4}$ NW$^{1}/_{4}$ sec.12, T.77 N., R.22 W., Polk County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on State Highway 316, 0.2 mi downstream from South River River, 0.5 mi upstream from Camp Creek, 2.2 mi southeast of Runnells, 37.2 mi upstream from Red Rock Dam, and at mi 179.5.

DRAINAGE AREA.--11,655 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good except those for estimated daily discharge, which are poor. Flow regulated by Saylorville Lake (station 05481630) 34.2 mi upstream. Stage-discharge relation is affected at times by backwater from Lake Red Rock (05488100). U.S. Army Corps of Engineers rain gage and satellite data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 31, 1903; June 14, 1947; June 26, 1947; and June 24, 1954. No gage height or discharge was determined. Gage height and discharge information is available for these floods at other sites on the Des Moines River.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	856	e3600	e4300	e2150	e1650	5880	4570	e28000	e19000	e24000	e12000	1450
2	1050	e4200	e4400	e2000	1910	5900	4530	e27000	e18500	e22000	e10000	1380
3	1250	e4800	e4400	e1950	2010	6380	5000	e25000	e18000	e24000	e8000	1380
4	1620	e4400	e4400	e1800	2280	6420	4900	e24000	e17000	e25000	e7800	1360
5	2580	e4000	e4300	e1700	2830	6310	5150	e23000	e19000	e23000	e7500	1810
6	2280	e4600	e4300	e1850	3140	6110	8210	e22000	e20500	e23000	e6500	1900
7	e2150	e4000	e4200	e1900	3350	5600	15100	e22000	e18000	e23500	e6700	1670
8	e1900	e3800	e4200	e2000	3620	5400	19500	e21000	e18000	e20000	e8000	1260
9	e1700	e4000	e4100	e2000	3750	5010	26200	e20500	e18000	e18000	7470	1410
10	e1600	8350	e4000	e2000	4030	5190	31400	e20000	e19000	e23000	4520	1590
11	e1500	8330	e3400	e1950	4610	4640	32800	e20000	e32000	e19000	3740	1380
12	e1400	6800	e3000	e1900	6070	4190	31200	e25000	e38000	e15000	5370	1260
13	e1350	e5500	e2900	e1850	5290	4430	29400	e32000	e42000	e13000	6580	1120
14	e1300	e5250	2910	e1800	5160	4540	27200	e27000	e32000	e12500	6570	1090
15	e1300	e5500	2940	e1800	5360	4730	27800	e24000	e30000	e11800	4530	1050
16	e1300	e5800	2970	e1850	6570	5720	42900	e25000	e28000	e11000	2890	1010
17	e1500	e5750	2930	e1750	7820	8000	42300	e38000	e25000	e10300	2920	1030
18	e2400	e5400	2780	e1700	7400	8640	35800	e42000	e23000	e9800	2700	1120
19	e3000	e5200	2620	e1650	5700	8510	33800	e31000	e21500	e9500	5830	e1080
20	e3100	e5100	2460	e1600	4970	8950	32300	e29000	e21000	e13000	5120	e954
21	e2700	e5000	e1900	e1600	4790	9680	29800	e36000	e20000	e14000	4000	852
22	e2500	e4800	e1500	e1700	4710	8620	29700	e50000	e19500	e12000	3280	e890
23	e3200	e4600	e950	e1600	4280	8130	36500	e38000	e21000	e10600	4680	e834
24	e3400	e4500	e1050	e1650	3570	7760	34700	e34000	e32000	e10000	5890	832
25	e3350	e4500	e1040	e1600	3300	6930	33000	e30000	e28000	e9800	3680	805
26	e3100	e4400	e1300	e1550	3460	6350	33200	e27000	e24000	e9800	3380	730
27	e2900	e4300	e2100	e1550	4630	5660	37400	e25000	e22000	e10000	2950	1170
28	e2800	e4200	e1900	e1500	5800	5340	41200	e23000	e25000	e11000	2610	1430
29	e2800	e4200	e2300	e1500	---	6000	36600	e22000	e28000	e11500	2180	979
30	e2900	e4200	e2300	e1550	---	4960	e29500	e21000	e26500	e11000	2140	782
31	e3200	---	e2100	e1550	---	4650	---	e20000	---	e13000	1800	---
TOTAL	67986	149080	89950	54550	122060	194630	801660	851500	723500	473100	161330	35608
MEAN	2193	4969	2902	1760	4359	6278	26720	27470	24120	15260	5204	1187
MAX	3400	8350	4400	2150	7820	9680	42900	50000	42000	25000	12000	1900
MIN	856	3600	950	1500	1650	4190	4530	20000	17000	9500	1800	730
AC-FT	134900	295700	178400	108200	242100	386000	1590000	1689000	1435000	938400	320000	70630
CFSM	.19	.43	.25	.15	.37	.54	2.29	2.36	2.07	1.31	.45	.10
IN.	.22	.48	.29	.17	.39	.62	2.56	2.72	2.31	1.51	.51	.11

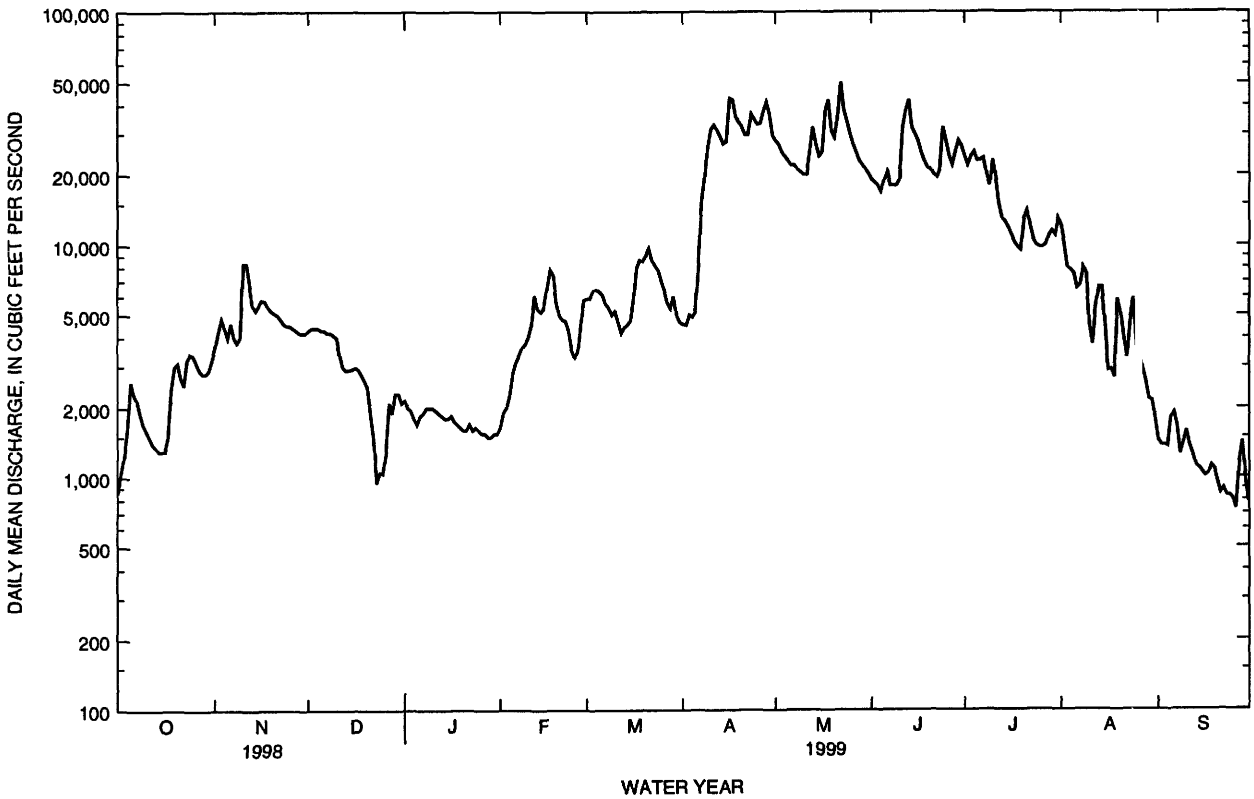
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4062	4290	3856	2170	3779	9712	14340	15540	16960	15240	7374	4407
MAX	18040	12660	10000	6237	8557	18390	30380	32740	40530	68140	32990	26320
(WY)	1987	1993	1992	1992	1997	1993	1993	1993	1991	1993	1993	1993
MIN	621	524	473	450	500	1805	1151	2372	1777	840	534	506
(WY)	1990	1990	1990	1990	1990	1989	1989	1989	1988	1988	1988	1988

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1986 - 1999	
ANNUAL TOTAL	3549258		3724954			
ANNUAL MEAN	9724		10210		8497	
HIGHEST ANNUAL MEAN					22980	1993
LOWEST ANNUAL MEAN					1200	1989
HIGHEST DAILY MEAN	68500	Jun 17	50000	May 22	133000	Jul 11 1993
LOWEST DAILY MEAN	700	Jan 13	730	Sep 26	390	Jan 10 1990
ANNUAL SEVEN-DAY MINIMUM	857	Jan 12	842	Sep 20	407	Jan 6 1990
INSTANTANEOUS PEAK FLOW			55000	May 22	134000	Jul 11 1993
INSTANTANEOUS PEAK STAGE			62.54a	May 26	82.88	Jul 11 1993
ANNUAL RUNOFF (AC-FT)	7040000		7388000		6156000	
ANNUAL RUNOFF (CFSM)	.83		.88		.73	
ANNUAL RUNOFF (INCHES)	11.33		11.89		9.91	
10 PERCENT EXCEEDS	22900		28000		22000	
50 PERCENT EXCEEDS	5400		4800		4440	
90 PERCENT EXCEEDS	1210		1420		748	

a Backwater
e Estimated

05487500 DES MOINES RIVER NEAR RUNNELLS, IA--Continued



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA

LOCATION.--Lat 41°36'05", long 93°16'14", in NE$^1/_4$ NE$^1/_4$ sec.5, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on left bank downstream side of bridge on Highway 163.

DRAINAGE AREA.--6.78 mi^2.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1995 to current year.

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 826.33 ft above sea level.

REMARKS.--Records good except those for estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in report as miscellaneous water quality data. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.94	2.6	3.5	e1.7	2.5	2.9	2.7	7.0	13	6.0	3.6	3.6
2	1.1	3.9	3.5	e1.8	5.8	3.1	2.6	6.7	11	5.7	3.0	3.3
3	1.4	3.4	3.4	e1.8	8.3	e3.1	2.8	6.5	9.6	5.6	2.7	3.1
4	3.0	3.1	3.4	e1.5	6.4	3.0	2.6	6.3	34	5.5	2.4	3.0
5	9.9	3.0	3.3	e1.6	5.5	2.9	3.0	6.1	18	5.5	2.2	3.1
6	4.7	2.9	3.3	e1.9	5.3	2.7	2.8	5.9	14	5.5	2.0	2.7
7	3.5	2.9	3.1	e1.7	4.8	2.5	2.6	5.9	12	5.7	2.4	2.5
8	2.8	3.0	3.0	1.8	5.2	2.0	6.3	6.0	11	5.4	1.9	2.2
9	2.5	3.9	3.0	e1.6	4.4	3.3	9.6	5.9	9.9	4.9	1.8	2.1
10	2.4	35	2.9	1.7	4.4	2.5	6.7	5.8	40	4.5	1.6	2.1
11	2.4	11	2.9	1.7	6.1	2.4	5.9	8.3	50	4.1	1.9	2.0
12	2.3	8.9	2.9	1.7	4.7	2.5	5.2	40	22	4.1	107	1.9
13	2.2	7.8	2.9	1.6	3.4	2.7	5.0	20	17	3.8	12	1.8
14	2.1	7.0	2.8	1.5	2.9	3.2	5.4	16	15	3.6	7.3	1.8
15	2.1	6.2	2.8	1.5	2.8	4.7	5.5	14	14	3.5	5.3	1.7
16	1.8	5.8	2.8	1.5	2.6	7.3	18	14	13	3.7	4.6	1.6
17	8.9	5.3	2.7	1.5	2.4	6.4	15	25	12	4.0	4.0	1.5
18	6.8	5.2	2.6	1.5	2.4	4.8	12	17	11	3.6	20	1.5
19	6.0	4.8	2.4	1.5	2.4	4.4	10	13	10	4.8	10	1.5
20	5.2	4.8	2.4	1.5	2.3	4.2	8.9	13	9.5	7.6	6.9	1.4
21	4.2	4.6	e2.2	1.6	2.2	3.9	8.2	16	8.9	4.6	5.5	1.4
22	3.7	4.5	e2.0	1.9	2.0	3.8	10	16	8.5	4.3	7.0	1.4
23	3.6	4.2	e2.1	1.9	2.3	3.6	13	14	11	3.5	55	1.3
24	3.6	4.1	2.1	1.7	2.1	3.3	11	12	8.9	3.3	13	1.3
25	3.4	4.0	2.2	1.6	2.2	3.2	10	11	8.1	3.0	9.4	1.2
26	3.2	3.9	2.1	1.6	2.5	3.1	9.3	10	7.6	3.3	7.4	1.2
27	3.1	3.8	2.1	1.7	3.4	3.0	9.7	9.7	7.3	3.0	6.2	2.5
28	3.0	3.8	2.1	1.8	3.3	3.1	8.4	9.0	7.0	2.5	5.3	1.6
29	2.9	3.8	e2.1	1.7	---	2.9	7.7	8.4	6.4	2.3	4.8	1.4
30	2.5	3.6	e1.8	1.6	---	2.7	7.3	8.0	6.2	2.2	4.2	1.3
31	2.5	---	e1.6	1.7	---	2.8	---	8.1	---	15	3.8	---
TOTAL	107.74	170.8	82.0	51.4	104.6	106.0	227.2	364.6	425.9	144.1	324.2	59.0
MEAN	3.48	5.69	2.65	1.66	3.74	3.42	7.57	11.8	14.2	4.65	10.5	1.97
MAX	9.9	35	3.5	1.9	8.3	7.3	18	40	50	15	107	3.6
MIN	.94	2.6	1.6	1.5	2.0	2.0	2.6	5.8	6.2	2.2	1.6	1.2
AC-FT	214	339	163	102	207	210	451	723	845	286	643	117
CFSM	.51	.84	.39	.24	.55	.50	1.12	1.73	2.09	.69	1.54	.29
IN.	.59	.94	.45	.28	.57	.58	1.25	2.00	2.34	.79	1.78	.32

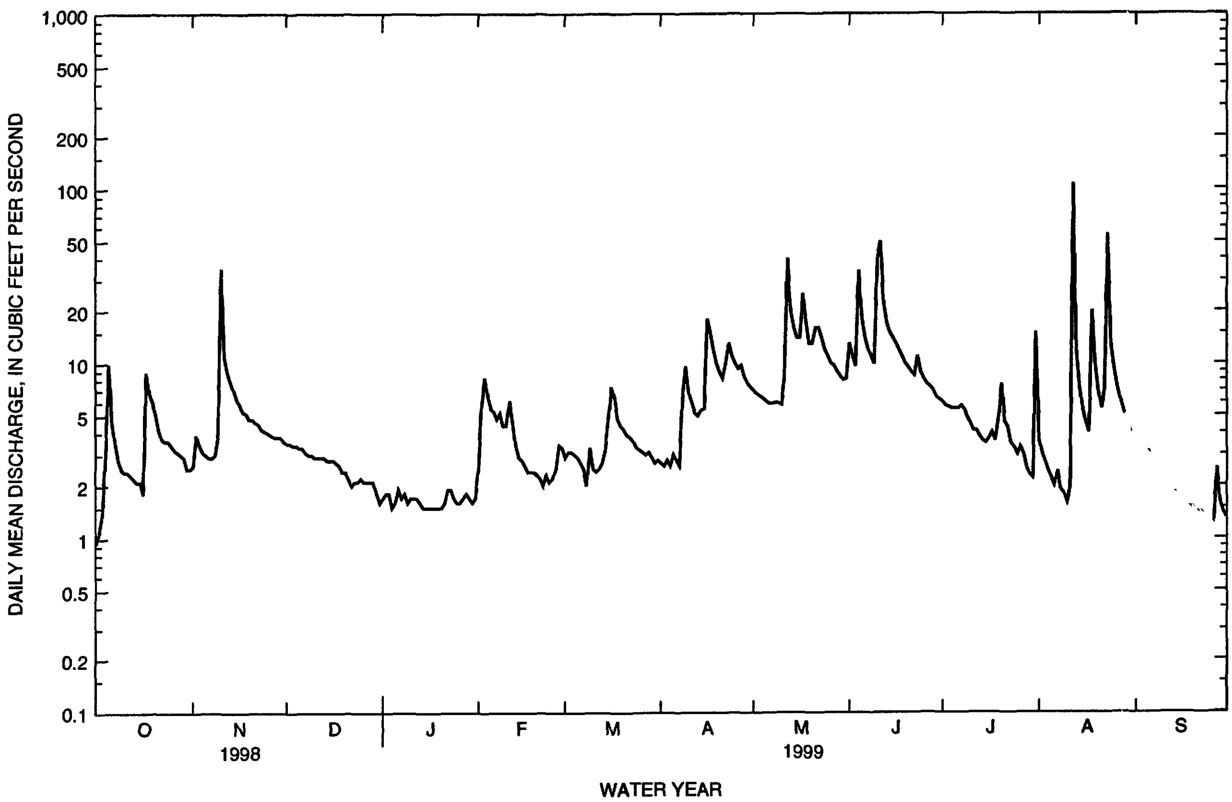
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1.71	2.54	1.82	1.86	8.98	5.04	6.50	16.3	16.3	6.67	4.83	1.20
MAX	3.48	5.69	3.22	3.73	19.8	11.9	13.1	25.0	31.8	13.8	10.5	1.97
(WY)	1999	1999	1998	1998	1996	1998	1998	1996	1998	1998	1999	1999
MIN	.20	.40	.54	.68	3.74	1.59	1.41	11.8	6.61	3.79	1.26	.43
(WY)	1996	1996	1996	1997	1999	1996	1996	1999	1997	1997	1997	1996

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1996 - 1999	
ANNUAL TOTAL	3455.28		2167.54			
ANNUAL MEAN	9.47		5.94		6.11	
HIGHEST ANNUAL MEAN					9.24	1998
LOWEST ANNUAL MEAN					3.56	1997
HIGHEST DAILY MEAN	192	Jun 18	107	Aug 12	210	May 24 1996
LOWEST DAILY MEAN	.94	Oct 1	.94	Oct 1	.04	Jan 7 1996
ANNUAL SEVEN-DAY MINIMUM	1.0	Sep 25	1.3	Sep 20	.16	Oct 20 1995
INSTANTANEOUS PEAK FLOW			850	Aug 12	1350	Jun 18 1998
INSTANTANEOUS PEAK STAGE			8.70	Aug 12	9.66	Jun 18 1998
INSTANTANEOUS LOW FLOW			.28	Dec 29a	.00	Nov 10 1995b
ANNUAL RUNOFF (AC-FT)	6850		4300		4430	
ANNUAL RUNOFF (CFSM)	1.40		.88		.90	
ANNUAL RUNOFF (INCHES)	18.96		11.89		12.25	
10 PERCENT EXCEEDS	18		12		13	
50 PERCENT EXCEEDS	5.3		3.5		3.0	
90 PERCENT EXCEEDS	2.1		1.7		.37	

a Result of freeze-up
b Also Nov 11, 27, and Nov 29
e Estimated

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1995 to current year.
WATER TEMPERATURES: April 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: May 1995 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, 801 microsiemens Feb. 17, 1997; minimum daily, 159 microsiemens May 24, 1996.
WATER TEMPERATURES: Maximum daily, 31.0°C July 29, 1999; minimum daily, 0.0°C many days during winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L July 22, 1998; minimum daily mean, 5 mg/L Dec. 4, 1998.
SEDIMENT LOADS: Maximum daily, 1,080 tons May 24, 1996; minimum daily, 0.003 tons Nov. 28, 1995.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 568 microsiemens Dec. 29; minimum daily, 305 microsiemens June 4.
WATER TEMPERATURES: Maximum daily, 31.0°C July 29; minimum daily, 0.0°C Dec. 21, 29-31, and Jan. 9, 10, 12.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,260 mg/L Aug. 23; minimum daily mean, 5 mg/L Dec. 4.
SEDIMENT LOADS: Maximum daily, 334 tons Aug. 23; minimum daily, 0.05 tons Dec. 4 and Sept. 26, 30.

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	493	469	---	---	---	464	335	416	---	---	---
2	526	543	---	---	428	---	---	---	526	496	---	---
3	---	---	---	---	---	467	451	482	465	---	---	---
4	522	---	404	---	---	---	---	---	305	---	548	---
5	534	---	---	---	---	451	491	---	---	---	547	---
6	---	474	394	---	---	465	---	---	---	404	554	---
7	---	---	---	---	---	---	410	518	530	---	563	---
8	---	479	---	---	402	---	---	---	---	---	---	---
9	---	513	425	389	448	433	---	---	---	---	541	---
10	442	507	411	434	420	451	480	522	---	---	---	---
11	434	525	---	422	431	---	475	425	---	---	513	---
12	544	---	---	416	466	---	467	475	---	511	344	---
13	---	416	---	---	453	---	---	526	---	---	483	---
14	---	---	---	451	---	---	520	526	532	---	---	---
15	---	---	---	403	---	---	528	---	---	476	---	---
16	408	454	---	463	449	---	524	---	---	435	524	---
17	455	---	538	416	446	---	528	442	---	---	480	496
18	561	409	399	416	450	---	---	522	537	---	494	494
19	468	---	---	---	---	---	---	---	---	---	---	---
20	---	400	417	387	---	---	434	525	---	---	470	---
21	530	---	553	415	420	---	384	503	478	---	---	560
22	---	401	---	459	---	451	496	---	503	---	---	---
23	508	---	---	---	---	460	340	---	---	---	---	---
24	---	---	---	---	---	444	---	536	524	---	---	---
25	443	---	---	456	468	---	363	498	---	---	---	---
26	---	---	---	---	---	---	---	483	540	554	---	---
27	---	---	---	463	488	450	355	---	---	---	499	---
28	---	---	448	462	367	---	362	---	522	---	---	---
29	558	---	568	---	---	---	---	---	477	550	---	---
30	524	---	423	---	---	---	---	---	---	---	---	---
31	---	---	396	---	---	466	---	---	---	---	---	---

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	10.5	10	---	---	---	14.5	18.5	19.0	---	---	---
2	11.5	9	---	---	4.0	---	---	---	19.5	20.0	---	---
3	---	---	---	---	---	---	12.0	19.0	19.0	---	---	---
4	13	---	14	---	---	---	---	---	17.0	---	22.0	---
5	17	---	---	---	---	2.5	9.5	---	---	---	25.0	---
6	---	10	5	---	---	3.0	---	---	---	25.0	24.0	---
7	---	---	---	---	---	---	20.0	11.0	21.5	---	23.5	---
8	---	7.5	---	---	7.5	---	---	---	---	---	---	---
9	---	8	8	.0	4.0	1.0	---	---	---	---	21.5	---
10	16.5	7	---	.0	2.5	3.0	6.5	18.0	---	---	---	---
11	16.5	10.5	---	---	.5	---	7.0	17.0	---	---	20.0	---
12	16.5	---	---	.0	3.0	---	16.5	11.0	---	24.5	19.5	---
13	---	11	---	---	2.0	---	---	11.0	---	---	20.0	---
14	---	---	---	1.0	---	---	12.0	16.5	19.0	---	---	---
15	---	---	---	1.0	---	---	7.0	---	---	26.0	---	---
16	19	9.5	---	2.0	3.0	---	13.0	---	---	22.0	18.0	---
17	16	---	5.0	1.5	3.5	---	9.0	13.5	---	---	24.0	19.0
18	13.5	10.5	6.5	1.0	2.0	---	---	17.5	19.0	---	19.0	21.0
19	16	---	---	---	---	---	---	---	---	---	---	---
20	---	7.5	2.5	2.0	---	---	15.5	15.5	---	---	23.0	---
21	14.5	---	.0	1.5	5.0	---	11.5	13.5	22.5	---	---	---
22	---	8.5	---	1.0	---	7.0	9.5	---	18.5	---	---	---
23	15	---	---	---	---	10.0	8.0	---	---	---	---	---
24	---	---	---	---	---	9.0	---	17.0	21.0	---	---	---
25	14	---	---	1.5	---	---	11.0	16.5	---	---	---	---
26	---	---	---	---	---	---	---	19.0	23.0	24.5	---	---
27	---	---	---	1.5	4.5	13.5	11.0	---	---	---	21.5	---
28	---	---	2.0	2.5	5.0	---	10.0	---	19.0	---	---	---
29	15	---	.0	---	---	---	---	---	18.0	31.0	---	---
30	14	---	.0	---	---	---	---	---	---	---	---	---
31	---	---	.0	---	---	12.0	---	---	---	---	---	---

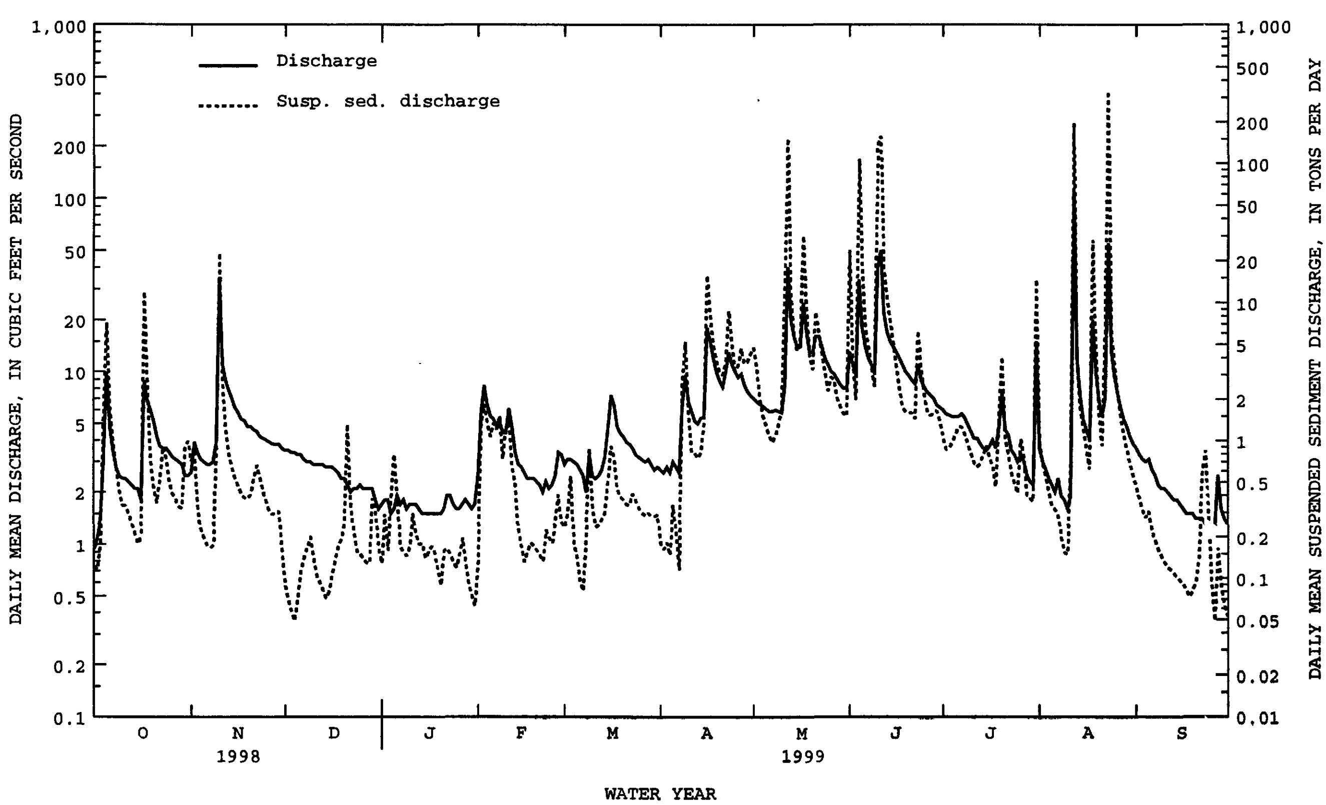
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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	48	.12	102	.71	9	.09	26	.12	17	.13	30	.23
2	38	.12	77	.81	7	.07	35	.17	79	1.3	35	.29
3	47	.18	37	.34	6	.06	32	.16	77	1.8	34	.29
4	77	1.5	27	.22	5	.05	36	.15	77	1.4	22	.18
5	227	7.1	24	.20	8	.07	52	.22	71	1.1	18	.14
6	137	1.8	22	.17	13	.11	42	.22	93	1.3	13	.10
7	107	1.0	22	.17	17	.14	34	.16	93	1.2	12	.08
8	84	.64	21	.17	21	.17	33	.16	108	1.5	36	.22
9	66	.45	63	.84	24	.20	32	.14	61	.74	99	.88
10	52	.34	214	23	18	.14	38	.17	104	1.3	51	.34
11	51	.34	85	2.6	13	.11	64	.30	87	1.4	36	.24
12	48	.30	52	1.2	12	.09	46	.20	51	.64	37	.24
13	42	.25	39	.82	11	.08	41	.18	53	.50	37	.27
14	36	.21	34	.64	9	.07	43	.18	29	.22	34	.29
15	32	.18	32	.54	11	.08	34	.14	23	.17	36	.48
16	42	.21	30	.47	14	.11	38	.16	19	.13	46	.91
17	466	12	29	.41	19	.14	41	.17	24	.16	43	.75
18	131	2.5	27	.39	25	.17	38	.15	28	.18	34	.45
19	45	.73	29	.38	30	.19	28	.12	27	.17	33	.39
20	33	.46	31	.40	40	.26	22	.09	26	.16	33	.37
21	31	.35	42	.53	40	.24	37	.16	25	.15	33	.34
22	53	.52	54	.66	46	.25	32	.16	24	.13	33	.34
23	92	.90	47	.53	35	.20	29	.15	34	.22	43	.41
24	76	.74	38	.42	27	.15	28	.13	34	.20	42	.37
25	54	.50	33	.36	26	.15	28	.12	30	.18	38	.32
26	48	.41	29	.31	24	.14	35	.15	37	.26	37	.30
27	44	.38	29	.29	23	.13	42	.20	44	.40	35	.29
28	41	.33	30	.30	23	.13	27	.13	29	.26	36	.30
29	42	.32	30	.31	62	.35	20	.09	---	---	37	.29
30	135	.91	16	.15	46	.23	17	.07	---	---	38	.28
31	148	.99	---	---	29	.12	14	.06	---	---	39	.29
TOTAL	---	36.78	---	38.34	---	4.49	---	4.78	---	17.30	---	10.67

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	25	.18	251	4.7	435	24	67	1.1	101	1.0	48	.46
2	23	.16	181	3.3	122	3.8	56	.86	86	.69	43	.38
3	24	.18	113	2.0	76	2.0	59	.89	76	.55	38	.32
4	21	.15	89	1.5	590	108	67	.98	66	.43	34	.28
5	40	.34	78	1.3	368	20	75	1.1	58	.34	36	.31
6	27	.21	68	1.1	182	6.8	84	1.3	57	.32	30	.22
7	17	.12	61	.97	149	4.8	82	1.3	45	.30	28	.19
8	73	2.6	68	1.1	117	3.5	77	1.1	38	.20	27	.16
9	191	5.2	83	1.3	92	2.5	71	.94	32	.15	25	.14
10	84	1.5	107	1.7	396	134	67	.81	35	.15	24	.13
11	52	.83	465	12	842	157	62	.69	114	.70	23	.12
12	58	.82	1050	152	295	17	59	.64	437	194	22	.11
13	55	.75	203	11	234	11	67	.68	121	3.9	22	.11
14	56	.82	138	5.8	186	7.5	82	.79	87	1.7	21	.10
15	87	1.4	121	4.5	140	5.1	97	.92	86	1.2	21	.10
16	320	16	136	5.1	104	3.5	73	.75	68	.87	20	.09
17	209	8.4	417	30	77	2.4	60	.66	58	.62	20	.08
18	155	4.9	195	9.2	58	1.7	47	.46	352	28	19	.07
19	142	3.9	116	4.2	58	1.6	60	1.4	177	5.2	21	.08
20	131	3.1	96	3.3	62	1.6	172	4.0	85	1.6	25	.09
21	137	3.0	179	8.5	66	1.6	83	1.0	62	.92	39	.14
22	122	3.7	141	6.0	62	1.4	71	.81	79	6.0	159	.58
23	252	8.7	114	4.3	193	6.2	62	.59	1260	334	238	.84
24	166	5.0	96	3.2	134	3.2	56	.50	176	6.1	86	.29
25	118	3.2	76	2.3	101	2.2	50	.41	139	3.5	27	.09
26	141	3.5	103	2.9	78	1.6	115	1.0	109	2.2	15	.05
27	180	4.7	104	2.7	77	1.5	90	.75	87	1.5	24	.17
28	160	3.6	83	2.0	84	1.6	60	.40	77	1.1	21	.09
29	179	3.7	78	1.8	95	1.6	60	.38	68	.88	17	.06
30	217	4.3	73	1.6	83	1.4	61	.36	61	.69	16	.05
31	---	---	69	1.5	---	---	281	15	54	.56	---	---
TOTAL	---	94.96	---	292.87	---	540.1	---	42.57	---	599.37	---	5.90
YEAR		1688.13										



05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--July 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for winter period, which is poor due to intermittent snow accumulation and subsequent melting.

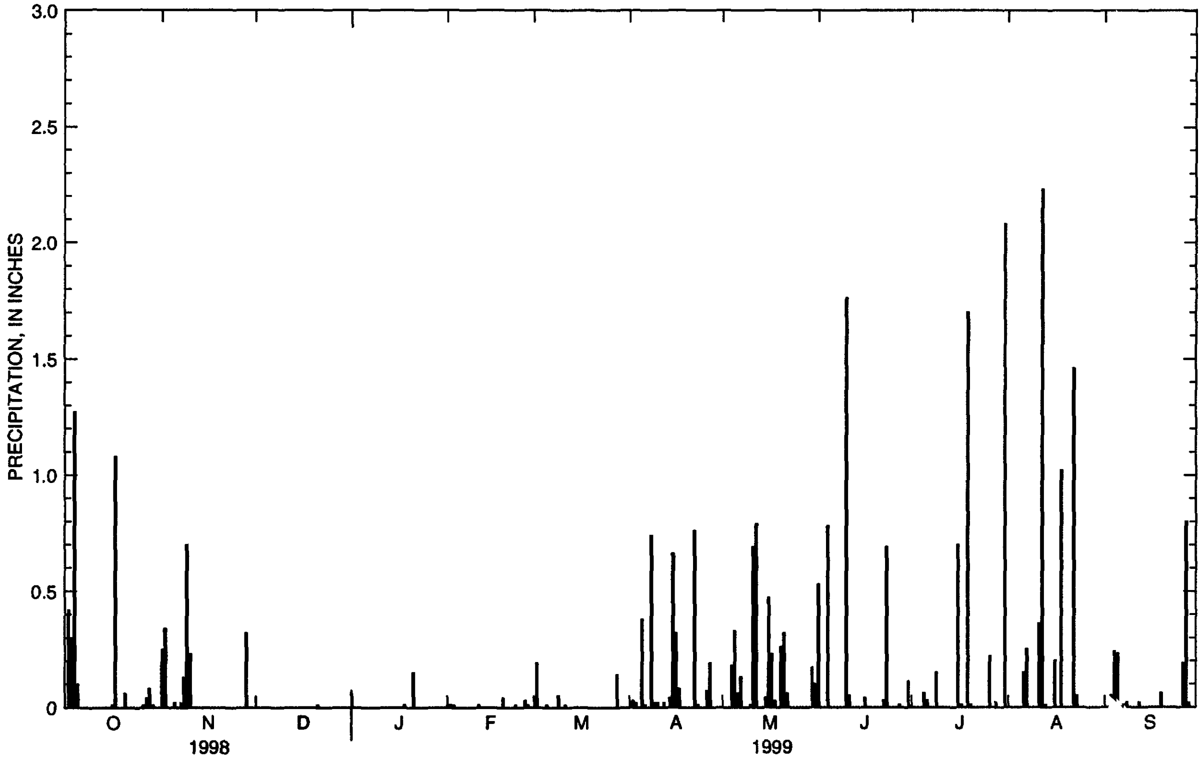
EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 2.53 in., July 17, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.23 in., Aug. 12.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.25	.00	.06	.01	.00	.00	.00	.53	.00	.00	.00
2	.42	.34	.00	.00	.01	.19	.03	.00	.00	.00	.00	.00
3	.30	.00	.00	.00	.01	.00	.02	.00	.00	.00	.00	.05
4	1.27	.00	.00	.00	.00	.00	.00	.18	.78	.00	.00	.24
5	.10	.02	.00	.00	.00	.01	.38	.33	.00	.06	.00	.23
6	.00	.00	.00	.00	.00	.00	.01	.06	.00	.03	.15	.00
7	.00	.02	.00	.00	.00	.00	.00	.13	.00	.00	.25	.01
8	.00	.13	.00	.00	.00	.00	.74	.00	.00	.00	.00	.02
9	.00	.70	.00	.00	.00	.05	.02	.00	.00	.15	.00	.00
10	.00	.23	.00	.00	.00	.00	.02	.01	1.76	.00	.00	.00
11	.00	.00	.00	.00	.01	.01	.00	.69	.05	.00	.36	.00
12	.00	.00	.00	.00	.00	.00	.02	.79	.00	.00	2.23	.02
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
14	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.66	.04	.00	.00	.00	.00
16	.01	.00	.00	.00	.00	.00	.32	.47	.04	.70	.20	.00
17	1.08	.00	.00	.00	.00	.00	.08	.23	.00	.01	.00	.00
18	.00	.00	.00	.01	.00	.00	.00	.03	.00	.00	1.02	.00
19	.00	.00	.00	.00	.04	.00	.00	.00	.00	1.70	.00	.06
20	.06	.00	.00	.00	.00	.00	.00	.26	.00	.01	.00	.00
21	.00	.00	.01	.15	.00	.00	.00	.32	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.76	.06	.03	.00	1.46	.00
23	.00	.00	.00	.00	.01	.00	.01	.00	.69	.00	.05	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.01	.00	.00	.00	.03	.00	.07	.00	.00	.22	.00	.19
27	.04	.00	.00	.00	.01	.00	.19	.00	.01	.00	.00	.80
28	.08	.32	.00	.00	.00	.14	.00	.00	.00	.02	.00	.02
29	.01	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.17	.11	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.10	---	2.08	.00	---
TOTAL	3.38	2.01	0.01	0.22	0.13	0.40	3.37	3.87	4.00	4.98	5.73	1.64
MEAN	.11	.07	.00	.01	.00	.01	.11	.12	.13	.16	.18	.05
MAX	1.27	.70	.01	.15	.04	.19	.76	.79	1.76	2.08	2.23	.80
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05487540 WALNUT CREEK NEAR PRAIRIE CITY, IA--Continued



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05487550 WALNUT CREEK NEAR VANDALIA, IA

LOCATION.--Lat 41°32'13", long 93°15'32", in NW $^1/_4$ NE $^1/_4$ sec.27, T.78 N., R.21 W., Jasper County, Hydrologic Unit 07100008, on right bank downstream side of bridge.

DRAINAGE AREA.--20.3 mi ^{2}.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1994 to current year.

GAGE.--Water-stage recorder. Concrete control. Datum of gage is 785.15 ft above sea level.

REMARKS.--Records good except those for estimated daily discharge, which are poor. Periodic observations of water temperature and specific conductance are published in report as miscellaneous water quality data. U.S. Geological Survey rain gage and satellite data collection platform at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	5.7	9.2	e3.2	6.1	9.5	9.2	14	27	17	21	11
2	2.8	11	8.8	e3.2	14	11	8.8	14	24	16	15	10
3	4.0	9.3	9.0	e3.2	20	9.7	9.1	15	19	15	13	9.6
4	5.9	7.9	8.6	e2.7	19	9.1	8.3	14	62	15	11	11
5	33	7.4	8.6	e3.2	14	9.1	10	14	45	14	9.1	12
6	9.5	7.1	8.3	e4.2	13	8.4	9.9	13	26	14	8.5	9.9
7	7.1	6.9	7.9	e4.0	13	7.8	8.6	13	21	13	12	9.1
8	6.1	7.7	7.7	e4.4	14	5.7	14	14	19	13	9.7	8.3
9	5.6	10	7.6	e3.8	12	10	28	13	17	13	8.9	7.9
10	5.1	82	7.3	e4.0	11	8.5	16	12	82	13	8.4	7.6
11	4.7	24	7.2	e4.4	13	8.3	15	28	191	12	8.5	7.3
12	4.6	17	7.2	e4.0	10	9.3	14	198	74	12	238	7.5
13	4.6	16	7.0	e3.8	9.9	10	14	76	54	12	36	6.6
14	4.4	15	6.8	e4.2	9.5	12	13	49	37	12	19	6.3
15	4.3	13	6.8	4.5	9.5	14	15	47	31	11	17	e6.0
16	4.7	13	6.7	4.6	8.6	17	53	54	28	13	16	e6.0
17	19	11	6.4	4.6	8.0	16	42	121	25	15	13	e5.5
18	15	13	6.6	4.4	8.2	13	28	61	23	12	64	e5.0
19	11	12	5.8	4.3	8.1	14	20	52	22	17	28	e5.0
20	9.4	11	e5.5	4.2	7.7	14	18	40	21	63	19	e5.0
21	8.8	11	e4.6	5.0	7.2	13	17	58	19	16	16	e4.8
22	8.2	11	e4.4	5.4	6.6	12	32	51	19	13	24	e4.8
23	7.9	11	e5.0	5.5	7.7	12	43	43	37	12	207	e4.6
24	7.6	10	5.4	4.8	7.7	11	29	34	21	11	37	e4.6
25	7.4	11	5.7	4.3	7.6	10	22	28	18	10	22	e4.4
26	7.2	9.9	5.6	4.4	9.0	10	20	24	17	10	18	e4.2
27	7.2	9.9	5.6	4.7	11	10	26	23	17	11	17	e11
28	7.0	9.9	5.1	5.3	11	10	18	21	16	12	15	e6.0
29	6.9	9.9	5.0	4.7	---	9.5	16	19	15	10	13	e5.0
30	5.7	10	3.8	4.4	---	9.3	15	18	15	9.7	12	e4.6
31	5.6	---	e3.0	4.4	---	9.3	---	19	---	203	11	---
TOTAL	242.1	403.6	202.2	131.8	296.4	332.5	591.9	1200	1042	639.7	967.1	210.6
MEAN	7.81	13.5	6.52	4.25	10.6	10.7	19.7	38.7	34.7	20.6	31.2	7.02
MAX	33	82	9.2	5.5	20	17	53	198	191	203	238	12
MIN	1.8	5.7	3.0	2.7	6.1	5.7	8.3	12	15	9.7	8.4	4.2
AC-FT	480	801	401	261	588	660	1170	2380	2070	1270	1920	418
CFSM	.38	.66	.32	.21	.52	.53	.97	1.91	1.71	1.02	1.54	.35
IN.	.44	.74	.37	.24	.54	.61	1.08	2.20	1.91	1.17	1.77	.39

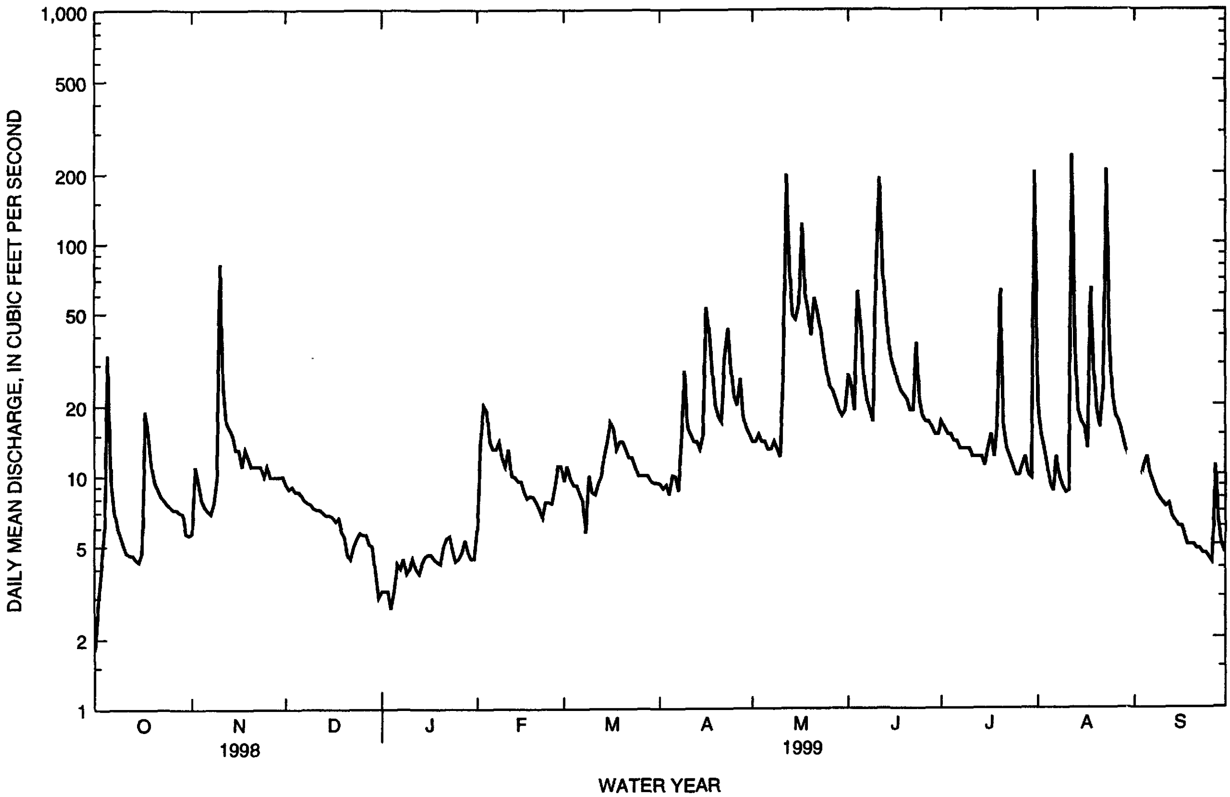
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3.47	5.53	4.38	4.60	24.8	14.9	25.1	57.0	39.0	18.5	10.5	2.71
MAX	7.81	13.5	8.41	10.3	58.8	38.0	47.4	86.1	97.8	42.4	31.2	7.02
(WY)	1999	1999	1998	1998	1996	1998	1995	1996	1998	1998	1999	1999
MIN	.21	.49	1.02	1.47	4.67	6.22	5.62	38.7	15.2	7.12	2.44	.89
(WY)	1995	1995	1995	1995	1995	1996	1996	1999	1995	1997	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1995 - 1999	
ANNUAL TOTAL	10160.0		6259.9			
ANNUAL MEAN	27.8		17.2		17.5	
HIGHEST ANNUAL MEAN					27.5	1998
LOWEST ANNUAL MEAN					12.3	1997
HIGHEST DAILY MEAN	526	Jun 18	238	Aug 12	573	May 24 1996
LOWEST DAILY MEAN	1.8	Oct 1	1.8	Oct 1	.10	Dec 7 1994
ANNUAL SEVEN-DAY MINIMUM	2.2	Sep 25	3.2	Dec 30	.14	Oct 9 1994
INSTANTANEOUS PEAK FLOW			809	Jul 31	1380	Jun 14 1998
INSTANTANEOUS PEAK STAGE			8.72	Jul 31	10.85	Jun 14 1998
INSTANTANEOUS LOW FLOW			1.4	Feb 25	.01	Jan 8 1996a
ANNUAL RUNOFF (AC-FT)	20150		12420		12670	
ANNUAL RUNOFF (CFSM)	1.37		.84		.86	
ANNUAL RUNOFF (INCHES)	18.62		11.47		11.71	
10 PERCENT EXCEEDS	53		28		38	
50 PERCENT EXCEEDS	12		11		7.4	
90 PERCENT EXCEEDS	4.7		4.6		.68	

a Result of freeze up
e Estimated

05487550 WALNUT CREEK NEAR VANDALIA, IA--Continued



05487550 WALNUT CREEK AT VANDALIA, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1995 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1995 to current year.
WATER TEMPERATURES: March 1995 to current year.
SUSPENDED-SEDIMENT DISCHARGE: March 1995 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, 771 microsiemens Oct. 10, 1995; minimum daily, 137 microsiemens Feb. 18, 1997.
WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 13, 1995; minimum daily, 0.0°C many days in winter.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,120 mg/L Mar. 30, 1998; minimum daily mean, 6.0 mg/L Feb. 9, 1997.
SEDIMENT LOADS: Maximum daily, 4,600 tons Mar. 30, 1998; minimum daily, 0.01 tons Feb. 2-3, 1996.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 533 microsiemens Oct. 19; minimum daily, 177 microsiemens Aug. 12.
WATER TEMPERATURES: Maximum daily, 25.5°C Aug. 5; minimum daily, 0.0°C many days.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,630 mg/L May 11; minimum daily mean, 11 mg/L Jan. 27, 30.
SEDIMENT LOADS: Maximum daily, 1,990 tons June 11; minimum daily, 0.13 tons Dec. 31 and Jan. 30.

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	379	---	---	---	434	320	451	---	---	---
2	449	496	---	---	427	---	---	---	499	502	---	---
3	---	---	420	---	---	470	462	484	489	---	480	507
4	521	---	---	---	---	---	---	485	349	---	482	---
5	424	---	---	---	---	459	456	---	---	---	486	---
6	515	---	372	392	456	451	---	---	---	496	490	---
7	476	---	---	371	---	---	---	477	501	---	471	---
8	---	446	431	---	449	---	475	---	---	---	---	---
9	---	---	385	413	459	443	---	---	---	464	493	---
10	488	390	368	447	459	459	466	486	---	---	464	---
11	446	488	436	---	428	---	474	379	---	477	499	---
12	435	---	---	418	471	---	468	297	---	510	177	---
13	---	480	---	418	475	---	467	449	---	---	465	---
14	---	---	---	424	---	---	326	463	495	---	---	---
15	---	---	---	415	---	---	467	---	---	490	---	496
16	465	---	413	408	463	---	414	---	---	427	---	---
17	423	386	415	431	453	---	475	392	---	422	483	500
18	496	389	415	430	425	---	---	456	502	---	298	434
19	533	---	---	389	---	---	---	---	---	---	474	425
20	---	443	418	---	478	---	354	473	---	496	485	428
21	481	397	409	392	450	---	311	464	505	501	---	407
22	---	---	---	469	---	463	268	---	494	354	494	422
23	418	---	---	480	---	454	390	---	---	408	448	434
24	---	---	---	---	---	429	---	479	504	---	505	---
25	472	---	---	456	475	---	270	482	---	---	509	---
26	---	---	---	---	---	466	---	488	505	501	486	504
27	---	---	---	484	472	456	255	---	---	495	266	---
28	---	---	373	482	481	---	346	---	509	483	---	---
29	428	---	389	416	---	---	---	---	485	532	499	524
30	497	---	383	---	---	---	---	---	507	---	493	---
31	456	---	414	---	---	470	---	---	---	492	---	---

05487550 WALNUT CREEK AT VANDALIA, IA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	9	---	---	---	16.0	18.5	19.0	---	---	---
2	---	9.5	---	---	1.5	---	---	---	19.5	21.0	---	---
3	---	---	12	---	---	1.0	12.5	21.0	20.5	---	---	---
4	13	---	---	---	---	---	---	17.5	18.0	---	---	---
5	16.5	---	---	---	---	2.0	10.0	---	---	---	25.5	---
6	15.5	---	5	.0	4.0	1.0	---	---	---	22.0	23.5	---
7	12.5	---	---	.0	---	---	---	12.0	20.0	---	23.5	---
8	---	---	3	---	7.5	---	12.0	---	---	---	---	---
9	---	---	5.5	.0	11.0	1.0	---	---	---	---	24.5	---
10	---	7.5	3	.0	19.0	3.0	7.0	21.0	---	---	---	---
11	15.5	7.5	2.5	---	3.0	---	7.5	18.0	---	---	21.5	---
12	15.5	---	---	.0	1.5	---	15.0	12.0	---	---	20.0	---
13	---	9	---	.0	1.0	---	7.5	11.0	---	---	20.5	---
14	---	---	---	.0	---	---	12.0	13.5	21.0	---	---	---
15	---	---	---	.5	---	---	7.0	---	---	---	---	17.0
16	19	---	5.0	2.0	2.5	---	5.0	---	---	---	---	---
17	16.5	9	3.0	.0	3.0	---	8.5	14.5	---	---	25.5	17.5
18	13	10	6.0	.5	1.5	---	---	18.0	19.5	---	21.5	21.0
19	13.5	---	---	.0	---	---	---	---	---	---	22.0	---
20	---	5.5	1.0	---	2.5	---	16.5	15.5	---	---	23.0	---
21	12.5	5.5	.0	.5	2.5	---	13.0	14.0	23.5	---	---	15.5
22	---	---	---	.5	---	6.5	10.0	---	21.0	---	21.0	17.5
23	12.5	---	---	.0	---	9.5	10.5	---	---	---	22.0	---
24	---	---	---	---	---	8.5	---	18.0	22.0	---	---	---
25	13	---	---	.0	4.0	---	10.5	11.5	---	---	---	23.5
26	---	---	---	---	---	11.0	---	10.0	24.0	---	24.0	---
27	---	---	---	.5	4.0	13.0	12.0	---	---	---	---	---
28	---	---	5.0	.5	4.5	---	13.0	---	21.0	---	---	---
29	17.5	---	.0	.0	---	---	---	---	19.5	---	---	24.0
30	14.5	---	---	---	---	---	---	---	22.0	---	---	---
31	10	---	---	---	---	12.5	---	---	---	---	---	---

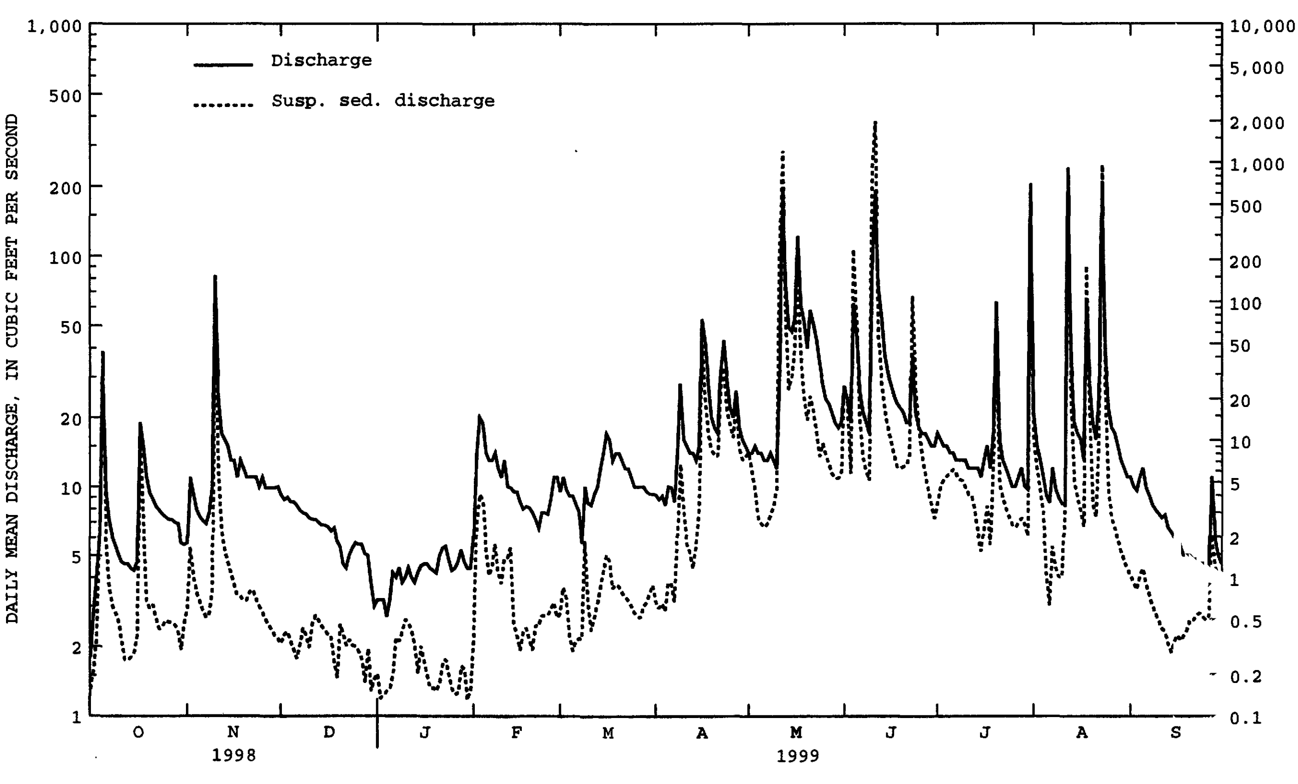
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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	32	.16	39	.61	14	.33	18	.15	21	.38	22	.55
2	28	.22	53	1.7	16	.39	19	.16	65	2.6	30	.85
3	35	.38	42	1.1	17	.41	20	.17	72	4.1	28	.72
4	61	2.5	37	.79	15	.35	21	.15	70	3.7	15	.38
5	331	44	34	.67	13	.30	22	.19	43	1.6	12	.30
6	79	2.1	31	.59	12	.26	24	.27	29	1.0	15	.35
7	47	.89	28	.52	15	.32	20	.22	36	1.2	17	.36
8	39	.64	26	.54	21	.43	21	.25	48	1.8	23	.37
9	38	.57	29	.81	19	.39	23	.24	34	1.1	64	1.9
10	36	.49	298	81	16	.31	26	.28	29	.91	29	.67
11	28	.35	83	5.7	24	.46	25	.30	39	1.4	19	.42
12	20	.26	46	2.2	28	.54	23	.25	50	1.4	21	.52
13	21	.25	38	1.6	26	.49	20	.20	62	1.7	23	.65
14	23	.27	33	1.3	24	.45	16	.18	18	.46	26	.85
15	25	.29	30	1.1	23	.42	27	.32	15	.38	29	1.1
16	30	.38	27	.92	22	.39	20	.25	13	.30	31	1.5
17	149	11	24	.75	22	.38	16	.20	19	.41	30	1.3
18	56	2.5	21	.73	14	.25	14	.16	20	.43	25	.84
19	23	.69	22	.69	12	.19	14	.16	16	.35	24	.90
20	24	.61	24	.69	28	.42	14	.15	15	.30	23	.87
21	27	.64	28	.80	29	.36	13	.17	23	.45	23	.79
22	24	.52	27	.82	25	.30	17	.25	25	.45	22	.74
23	20	.43	24	.72	24	.32	17	.26	25	.53	22	.69
24	22	.45	22	.63	22	.32	15	.20	26	.53	21	.63
25	25	.49	20	.58	21	.32	13	.16	26	.54	20	.56
26	25	.48	19	.50	19	.29	12	.14	25	.60	19	.53
27	24	.47	17	.46	17	.25	11	.15	22	.67	19	.52
28	24	.46	16	.42	13	.17	16	.23	17	.52	22	.62
29	22	.41	14	.38	22	.31	17	.22	---	---	26	.67
30	20	.30	13	.37	15	.15	11	.13	---	---	31	.77
31	32	.47	---	---	16	.13	13	.16	---	---	36	.89
TOTAL	---	73.67	---	109.69	---	10.40	---	6.32	---	29.81	---	22.81

05487550 WALNUT CREEK AT VANDALIA, IA--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	27	.67	212	8.2	287	26	78	3.6	185	10	36	1.1
2	25	.61	159	6.1	266	19	108	4.7	155	6.3	34	.93
3	27	.65	106	4.4	114	5.8	124	5.2	130	4.5	32	.82
4	26	.58	71	2.8	736	239	136	5.5	104	3.0	35	1.0
5	33	.92	67	2.5	581	75	149	5.7	44	1.1	37	1.2
6	34	.92	68	2.4	202	14	162	6.2	28	.63	34	.91
7	29	.67	69	2.5	130	7.5	158	5.7	52	1.7	31	.76
8	36	2.1	80	2.9	116	6.0	150	5.2	46	1.2	29	.64
9	90	6.8	97	3.3	109	5.1	141	5.1	42	1.0	26	.56
10	71	3.1	144	4.5	1540	917	134	4.6	45	1.0	24	.49
11	46	1.8	2630	178	2290	1990	126	4.0	119	3.2	22	.43
12	40	1.5	1940	1220	276	56	118	4.0	894	872	20	.40
13	32	1.2	334	74	189	27	93	3.1	186	20	18	.33
14	50	1.7	176	23	170	17	68	2.2	99	5.2	17	.29
15	83	3.4	225	28	150	12	51	1.6	84	3.8	15	.25
16	327	49	327	49	132	9.9	63	2.3	72	3.1	14	.22
17	176	20	491	163	115	7.9	79	3.3	70	2.4	12	.18
18	148	11	226	38	102	6.4	56	1.6	664	181	14	.18
19	156	8.6	149	21	107	6.3	76	7.0	174	15	15	.20
20	164	7.8	129	14	117	6.5	240	55	65	3.4	16	.21
21	169	7.7	135	21	126	6.6	111	5.0	64	2.8	17	.22
22	248	23	117	16	155	8.0	105	3.8	76	11	18	.24
23	280	34	97	11	983	110	99	3.2	1100	961	20	.24
24	211	17	85	7.7	417	24	93	2.8	258	28	20	.24
25	214	13	128	9.5	249	12	87	2.5	70	4.2	19	.23
26	197	10	118	7.8	169	7.9	83	2.3	55	2.7	21	.24
27	268	19	109	6.7	128	5.8	83	2.5	49	2.3	35	1.0
28	174	8.7	103	5.7	101	4.4	86	2.7	46	1.9	35	.56
29	165	7.2	102	5.3	83	3.4	88	2.5	43	1.6	32	.43
30	191	7.7	107	5.3	65	2.7	77	2.0	41	1.4	29	.36
31	---	---	112	5.9	---	---	408	331	38	1.2	---	---
TOTAL	---	270.32	---	1949.5	---	3638.2	---	496.1	---	2157.63	---	14.86
YEAR		8779.31										



05487550 WALNUT CREEK AT VANDALIA, IA--Continued

PRECIPITATION RECORDS

PERIOD OF RECORD.--April 1995 to current year.

INSTRUMENTATION.--Tipping bucket rain gage.

REMARKS.--Records good except for the winter period, which is poor due to intermittent snow accumulation and subsequent melting.

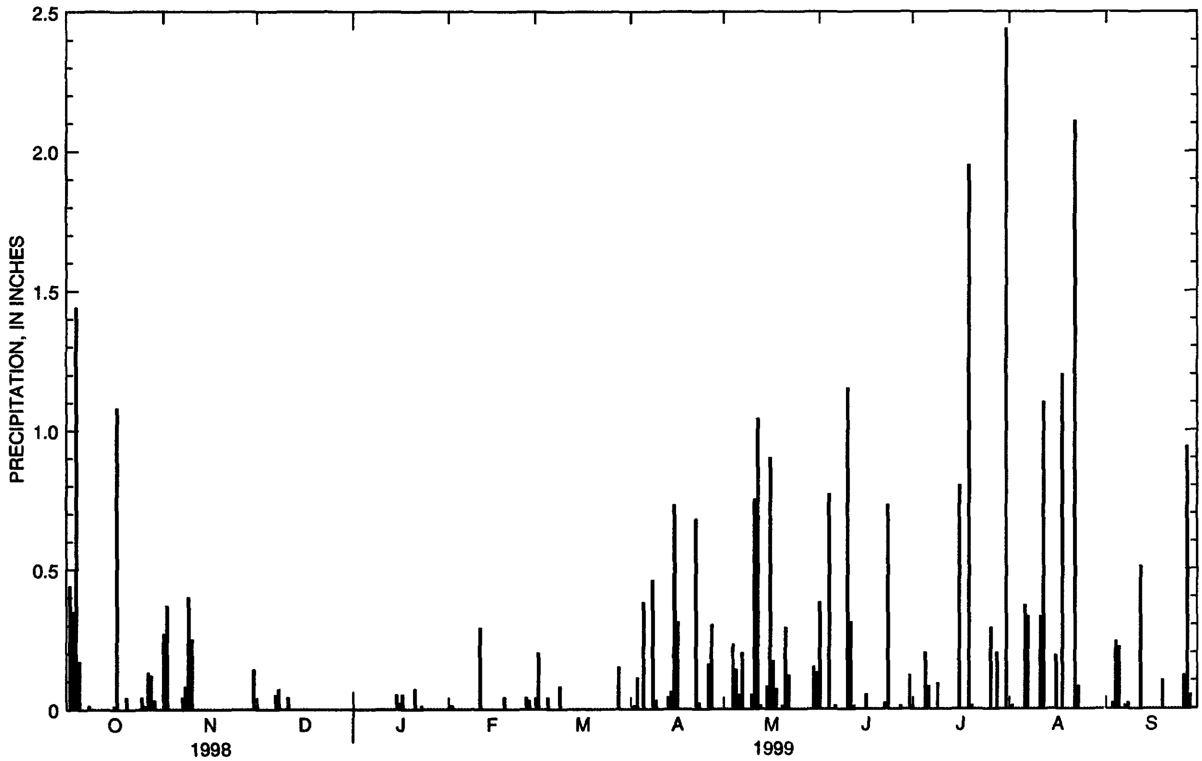
EXTREMES FOR PERIOD OF RECORD.--Maximum daily accumulation, 4.72 in., May 9, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily accumulation, 2.44 in., July 31.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.27	.01	.00	.01	.00	.00	.00	.38	.01	.00	.00
2	.44	.37	.00	.00	.01	.20	.01	.00	.00	.00	.01	.00
3	.35	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.02
4	1.44	.00	.00	.00	.00	.00	.00	.23	.77	.00	.00	.24
5	.17	.00	.00	.00	.00	.04	.38	.14	.00	.20	.00	.22
6	.00	.00	.00	.00	.00	.00	.00	.05	.01	.08	.37	.00
7	.00	.04	.05	.00	.00	.00	.00	.20	.00	.00	.33	.01
8	.01	.08	.07	.00	.00	.00	.46	.00	.00	.00	.00	.02
9	.00	.40	.00	.00	.00	.08	.03	.00	.00	.09	.00	.00
10	.00	.25	.00	.00	.00	.00	.00	.05	1.15	.00	.00	.00
11	.00	.00	.04	.00	.29	.00	.00	.75	.31	.00	.33	.00
12	.00	.00	.00	.00	.00	.00	.00	1.04	.01	.00	1.10	.51
13	.00	.00	.00	.00	.00	.00	.04	.01	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00	.00
15	.00	.00	.00	.05	.00	.00	.73	.08	.00	.00	.00	.00
16	.01	.00	.00	.02	.00	.00	.31	.90	.05	.80	.19	.00
17	1.08	.00	.00	.05	.00	.00	.00	.17	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.07	.00	.00	1.20	.00
19	.00	.00	.00	.00	.04	.00	.00	.00	.00	1.95	.00	.10
20	.04	.00	.00	.00	.00	.00	.00	.01	.00	.01	.00	.00
21	.00	.00	.00	.07	.00	.00	.00	.29	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.68	.12	.02	.00	2.11	.00
23	.00	.00	.00	.01	.00	.00	.02	.00	.73	.00	.08	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.01	.00	.00	.00	.04	.00	.16	.00	.00	.29	.00	.12
27	.13	.00	.00	.00	.03	.00	.30	.00	.01	.00	.00	.94
28	.12	.00	.00	.00	.00	.15	.00	.00	.00	.20	.00	.05
29	.03	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.14	.00	.00	---	.00	.00	.15	.12	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.13	---	2.44	.00	---
TOTAL	3.87	1.55	0.17	0.20	0.42	0.47	3.29	4.39	3.56	6.07	5.72	2.23
MEAN	.12	.05	.01	.01	.01	.02	.11	.14	.12	.20	.18	.07
MAX	1.44	.40	.07	.07	.29	.20	.73	1.04	1.15	2.44	2.11	.94
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

05487550 WALNUT CREEK AT VANDALIA, IA--Continued



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05487980 WHITE BREAST CREEK NEAR DALLAS, IA

LOCATION.--Lat 41°14'41", long 93°16'08", in NW$^1/_4$ NW$^1/_4$ sec.3, T.74 N., R.21 W., Marion County, Hydrologic Unit 07100008, on left bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Kirk Branch, and 1.7 mi northwest of Dallas.

DRAINAGE AREA.--342 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 759.21 ft above sea level.

REMARKS.--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 data collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1962 reached a stage of 28.87 ft, from floodmark, discharge, about 12,000 ft^3/s. Flood of June 6, 1947 may have been slightly higher.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

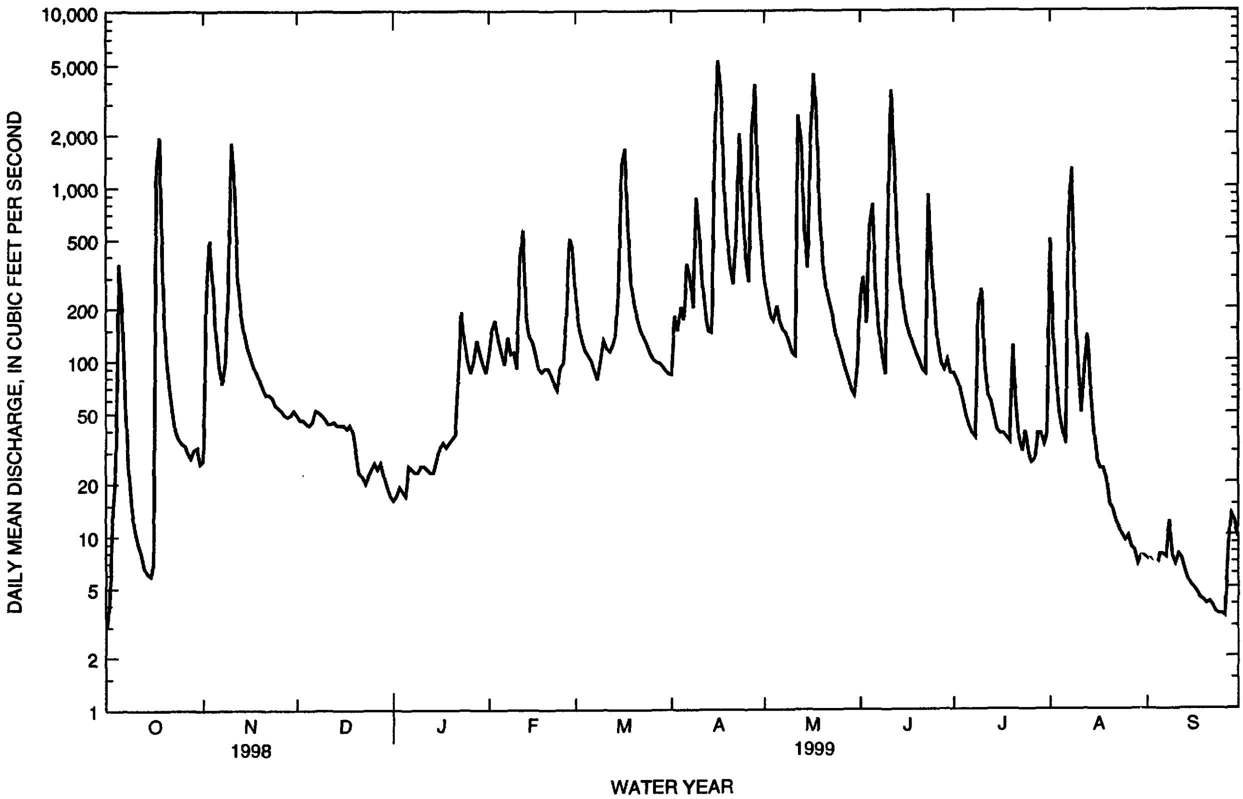
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	27	49	e16	e110	236	83	298	234	84	495	7.2
2	3.9	242	46	e17	e150	164	e180	222	300	77	133	7.2
3	13	495	46	e19	e170	131	149	181	163	69	74	6.6
4	26	280	44	e18	e130	114	203	169	586	58	48	6.2
5	364	145	43	e17	e110	107	172	205	792	48	39	7.7
6	189	93	45	e25	e95	100	360	170	233	42	33	7.7
7	56	74	52	e24	136	88	303	150	149	38	634	7.4
8	25	97	51	e23	109	78	202	144	105	36	1270	12
9	15	270	49	e23	111	100	866	125	83	210	211	7.5
10	11	1800	47	e25	90	130	535	110	694	256	92	6.8
11	9.2	1080	44	e25	389	117	274	106	3540	93	50	7.7
12	8.0	290	44	e24	562	113	185	2550	1380	63	93	7.3
13	6.6	189	45	e23	187	124	148	1910	447	58	139	6.2
14	6.1	147	43	e23	138	144	145	553	275	48	65	5.5
15	5.9	120	43	e27	128	292	1510	341	193	40	38	5.1
16	6.9	106	43	e32	109	1360	5230	1830	160	e38	27	4.9
17	1330	92	41	e34	90	1660	3620	4380	138	38	24	4.6
18	1940	e85	43	e32	86	562	1040	2390	121	e36	24	4.3
19	271	77	39	e34	90	270	520	685	108	e34	21	4.2
20	110	70	e30	e36	90	207	346	359	98	121	15	4.0
21	73	64	e23	e38	83	175	275	255	88	56	14	4.1
22	53	64	e22	e85	74	151	564	213	84	35	12	3.9
23	40	62	e20	e190	68	136	2010	181	e900	30	11	3.6
24	36	56	e22	e130	91	124	777	144	e360	39	10	3.5
25	34	54	e24	e100	97	110	391	122	201	29	9.3	3.5
26	33	52	e26	e85	178	102	283	105	123	e26	9.9	3.4
27	30	49	e24	e100	505	98	1990	90	96	27	8.5	8.8
28	28	48	e26	e130	442	97	3840	79	88	38	8.1	13
29	31	49	e22	e110	---	93	994	68	100	38	6.8	12
30	32	52	e19	e95	---	88	460	63	84	33	7.5	9.6
31	26	---	e17	e85	---	84	---	94	---	38	7.5	---
TOTAL	4815.6	6329	1132	1645	4618	7355	27655	18292	11923	1876	3629.6	195.5
MEAN	155	211	36.5	53.1	165	237	922	590	397	60.5	117	6.52
MAX	1940	1800	52	190	562	1660	5230	4380	3540	256	1270	13
MIN	3.0	27	17	16	68	78	83	63	83	26	6.8	3.4
AC-FT	9550	12550	2250	3260	9160	14590	54850	36280	23650	3720	7200	388
CFSM	.45	.62	.11	.16	.48	.69	2.70	1.73	1.16	.18	.34	.02
IN.	.52	.69	.12	.18	.50	.80	3.01	1.99	1.30	.20	.39	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	124	118	112	66.7	173	345	467	406	277	293	123	190
MAX	1153	756	718	601	718	1056	1592	1823	1146	3641	1202	1902
(WY)	1974	1984	1983	1974	1973	1998	1991	1996	1967	1993	1993	1992
MIN	1.16	1.35	.80	.49	1.82	4.05	3.85	6.44	5.13	1.47	2.09	1.11
(WY)	1990	1977	1964	1977	1964	1964	1989	1980	1977	1988	1971	1968

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1963 - 1999	
ANNUAL TOTAL	129704.2		89465.7			
ANNUAL MEAN	355		245		225	
HIGHEST ANNUAL MEAN					816	1993
LOWEST ANNUAL MEAN					17.1	1989
HIGHEST DAILY MEAN	7090	May 7	5230	Apr 16	24700	Sep 16 1992
LOWEST DAILY MEAN	3.0	Oct 1	3.0	Oct 1	.02	Oct 14 1989
ANNUAL SEVEN-DAY MINIMUM	4.3	Sep 26	3.7	Sep 20	.05	Aug 9 1989
INSTANTANEOUS PEAK FLOW			5860	Apr 16	37300	Jul 16 1982
INSTANTANEOUS PEAK STAGE			17.70	Apr 16	33.45	Jul 16 1982
INSTANTANEOUS LOW FLOW			2.2	Oct 1		
ANNUAL RUNOFF (AC-FT)	257300		177500		162700	
ANNUAL RUNOFF (CFSM)	1.04		.72		.66	
ANNUAL RUNOFF (INCHES)	14.11		9.73		8.92	
10 PERCENT EXCEEDS	908		511		446	
50 PERCENT EXCEEDS	92		84		38	
90 PERCENT EXCEEDS	13		8.3		2.6	

e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
10,000
5,000
2,000
1,000
500
200
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1998
1999
WATER YEAR

05488100 LAKE RED ROCK NEAR PELLA, IA

LOCATION.--Lat 41°22'11", long 92°58'48", in $NE^1/_4$ $NW^1/_4$ sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit 07100008, at outlet works near right end of Red Rock Dam on Des Moines River, 1.4 mi upstream from Lake Creek, 4.5 mi southwest of Pella, and at mile 142.3.

DRAINAGE AREA.--12,323 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is at sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in March 1969. Releases controlled through 14 concrete conduits extending through the concrete ogee spillway section into the stilling basin. Inlet invert elevation at 690 ft above sea level. Maximum design discharge through the conduits is 37,500 ft^3/s but normal flood control operation limits maximum outflow to 30,000 ft^3/s. Spillway section consists of 5 tainter gates, 41 ft wide and 45 ft high, on concrete ogee crest at elevation 736 ft. The storage capacity of the reservoir at full flood-control pool level, 780 ft, is 1,489,900 acre-ft, surface area, 65,440 acres. Conservation pool level, 742 feet, is 265,500 acre-feet, surface area, 19,100 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 742 ft with minimum release of 300 ft^3/s and maximum release of 30,000 ft^3/s during the non-growing season, providing discharges at Ottumwa and Keosauqua do not exceed 30,000 ft^3/s and 35,000 ft^3/s respectively. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,933,000 acre-ft July 12, 13, 1993; maximum elevation, 782.67 ft July 13, 1993; minimum daily contents, 43,900 acre-ft May 24, 1985, minimum elevation, 719.68 ft Feb. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 832,000 acre-ft May 26; maximum elevation, 762.61 ft May 27; minimum daily contents, 246,000 acre-ft Sept. 13,14; minimum elevation, 741.95 ft Sept 14.

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

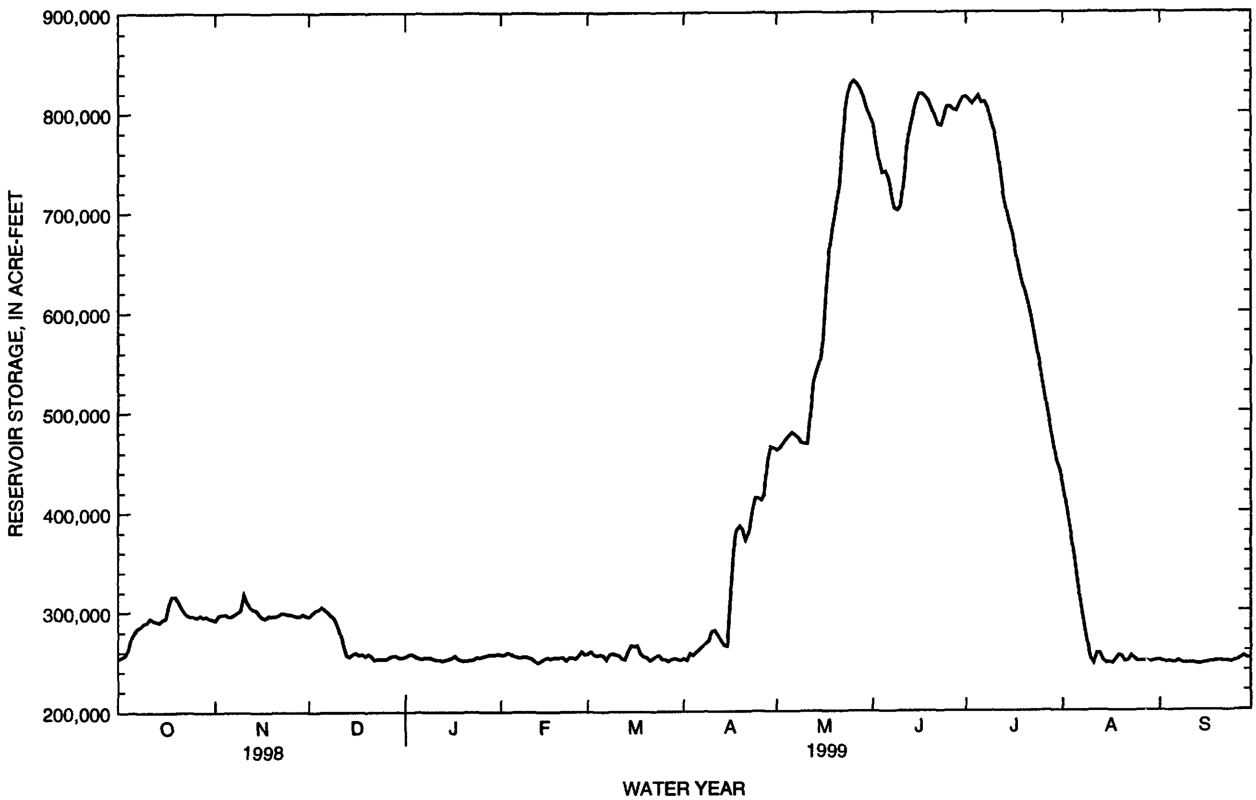
700	300	720	27,700	740	226,000	760	754,000	780	1,751,000
705	1,200	725	50,700	745	324,000	765	948,000	785	2,109,000
710	3,940	730	89,200	750	445,000	770	1,178,000		
715	11,900	735	149,000	755	589,000	775	1,444,000		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	254000	292000	296000	255000	257000	258000	253000	462000	789000	816000	427000	250000
2	255000	297000	299000	257000	257000	260000	251000	464000	772000	813000	408000	249000
3	257000	298000	302000	258000	259000	257000	258000	468000	753000	809000	390000	248000
4	262000	298000	303000	256000	258000	256000	256000	472000	740000	813000	371000	249000
5	275000	296000	305000	254000	256000	257000	259000	476000	741000	817000	349000	248000
6	280000	296000	303000	253000	255000	256000	262000	479000	734000	810000	325000	248000
7	284000	298000	300000	254000	254000	252000	265000	477000	719000	811000	304000	250000
8	286000	300000	297000	254000	255000	257000	268000	474000	704000	805000	284000	248000
9	289000	302000	294000	254000	255000	258000	271000	469000	702000	791000	266000	247000
10	290000	318000	287000	253000	254000	257000	280000	468000	706000	781000	252000	247000
11	294000	310000	278000	252000	253000	256000	281000	468000	731000	765000	247000	247000
12	292000	305000	268000	252000	250000	253000	276000	501000	765000	742000	257000	247000
13	291000	303000	257000	251000	249000	252000	270000	531000	786000	717000	257000	246000
14	290000	302000	255000	252000	251000	260000	266000	542000	799000	702000	250000	246000
15	293000	298000	258000	253000	253000	266000	265000	552000	811000	689000	247000	247000
16	294000	295000	259000	254000	254000	265000	314000	571000	819000	678000	248000	247000
17	308000	294000	257000	256000	253000	266000	361000	622000	819000	660000	247000	248000
18	316000	297000	258000	253000	254000	258000	382000	661000	816000	643000	251000	248000
19	316000	296000	256000	252000	254000	255000	386000	684000	812000	629000	255000	249000
20	311000	296000	258000	251000	254000	254000	382000	702000	804000	620000	254000	249000
21	305000	297000	256000	251000	254000	251000	372000	720000	796000	608000	249000	249000
22	300000	299000	252000	252000	251000	253000	379000	758000	788000	594000	250000	249000
23	297000	299000	253000	252000	254000	255000	401000	800000	787000	577000	255000	249000
24	296000	298000	253000	254000	254000	256000	414000	819000	797000	559000	252000	248000
25	296000	298000	253000	254000	253000	252000	414000	829000	806000	540000	249000	249000
26	295000	297000	253000	255000	256000	252000	412000	832000	806000	521000	249000	250000
27	297000	296000	255000	256000	260000	250000	418000	829000	803000	502000	249000	252000
28	295000	296000	256000	257000	257000	252000	452000	824000	802000	485000	249000	254000
29	296000	298000	256000	257000	---	253000	465000	816000	809000	468000	248000	252000
30	294000	296000	254000	257000	---	252000	464000	805000	815000	450000	249000	252000
31	293000	---	254000	258000	---	251000	---	796000	---	442000	250000	---
MEAN	290000	299000	270000	254000	254000	256000	333000	625000	778000	666000	279000	249000
MAX	316000	318000	305000	258000	260000	266000	465000	832000	819000	817000	427000	254000
MIN	254000	292000	252000	251000	249000	250000	251000	462000	702000	442000	247000	246000

CAL YR 1998 MEAN 362000 MAX 1080000 MIN 249000
WTR YR 1999 MEAN 380000 MAX 832000 MIN 246000

05488100 LAKE RED ROCK NEAR PELLA, IA--Continued



05488110 DES MOINES RIVER NEAR PELLA, IA

LOCATION.--Lat 41°21'38", long 92°58'23", in $SW^1/_4$ $SW^1/_4$ $SE^1/_4$ sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit 07100009, on right bank, 0.4 mile downstream of outlet of Red Rock Reservoir, and 0.75 mile upstream of Lake Creek.

DRAINAGE AREA.--12,330 mi^2.

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above sea level.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Lake Red Rock (station 05488100) 0.4 mi upstream. Periodic observations of water temperature and specific conductance are published as 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 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	488	3250	3910	1360	2180	6130	4380	27500	21300	21600	17600	1660
2	516	3100	2910	1370	2130	6030	4570	24000	21300	21600	17500	1640
3	531	4300	2920	1470	2000	6640	4570	20900	21400	21600	17300	1500
4	575	5160	3530	2850	3100	6550	4850	19700	21400	21600	17200	1400
5	583	4750	4030	e2800	3820	6390	4860	19800	18500	21600	17200	1720
6	501	3890	4520	1760	3820	6370	5800	19700	20100	21600	17000	1590
7	563	3180	5160	1330	3840	6120	11200	19700	21300	21700	16900	1300
8	624	3120	5160	1390	3850	5230	17400	19700	20700	21700	16700	1330
9	590	3330	5280	1550	3980	5090	22000	19300	18900	21900	14000	1390
10	665	5900	6280	1580	4560	5600	25400	19200	18500	21900	9820	1300
11	667	8920	7090	1550	5760	5610	28800	19200	19000	22000	5480	1120
12	1660	8270	7050	1570	7280	5500	30200	17000	19800	21800	3370	1230
13	1370	6280	7020	1560	5840	5220	30200	14600	20500	21700	5680	1190
14	553	5740	3740	1300	4660	2190	28100	18800	20900	19600	8220	848
15	492	6340	2240	1100	5080	2720	28500	17300	21300	17500	5650	647
16	515	6680	2920	1060	6000	7070	22100	17300	21600	17600	3130	648
17	626	5790	2950	1330	7150	9340	19200	12400	21800	17700	2900	651
18	633	e5000	3030	2010	7260	10500	22500	13200	21800	17600	2170	656
19	3320	4490	3000	2070	6190	9100	28600	17900	21800	17500	3110	766
20	5400	4510	2650	2070	5290	9000	31500	18000	21800	16900	4820	857
21	5390	4080	2270	1580	5090	9570	31600	18000	21700	17500	5380	731
22	5390	3770	1460	1480	4890	7780	29200	18700	21700	17500	3770	653
23	4650	4190	1100	1550	4680	6770	22200	19100	21700	17600	4270	646
24	4000	4550	1110	1570	4100	7190	24100	20300	21600	17600	5850	642
25	3660	4520	1100	1680	3620	7340	29300	21400	21700	17500	4430	636
26	3130	4530	1110	1640	3640	6740	31300	21400	21700	17600	2880	627
27	2210	4250	1070	1580	4910	5910	31000	21400	21600	17700	2860	760
28	2900	4010	1620	1710	6630	5440	27200	21400	21600	17800	2460	1040
29	2900	4040	1860	1880	---	5440	26900	21400	21600	17700	1750	1040
30	3270	4420	2300	1870	---	5450	29300	21400	21600	17600	1330	823
31	3510	---	1600	1880	---	5060	---	21300	---	17600	1460	---
TOTAL	61882	144360	101990	51500	131350	199090	656830	601000	630200	600400	242190	31041
MEAN	1996	4812	3290	1661	4691	6422	21890	19390	21010	19370	7813	1035
MAX	5400	8920	7090	2850	7280	10500	31600	27500	21800	22000	17600	1720
MIN	488	3100	1070	1060	2000	2190	4380	12400	18500	16900	1330	627
AC-FT	122700	286300	202300	102200	260500	394900	1303000	1192000	1250000	1191000	480400	61570
CFSM	.16	.39	.27	.13	.38	.52	1.78	1.57	1.70	1.57	.63	.08
IN.	.19	.44	.31	.16	.40	.60	1.98	1.81	1.90	1.81	.73	.09

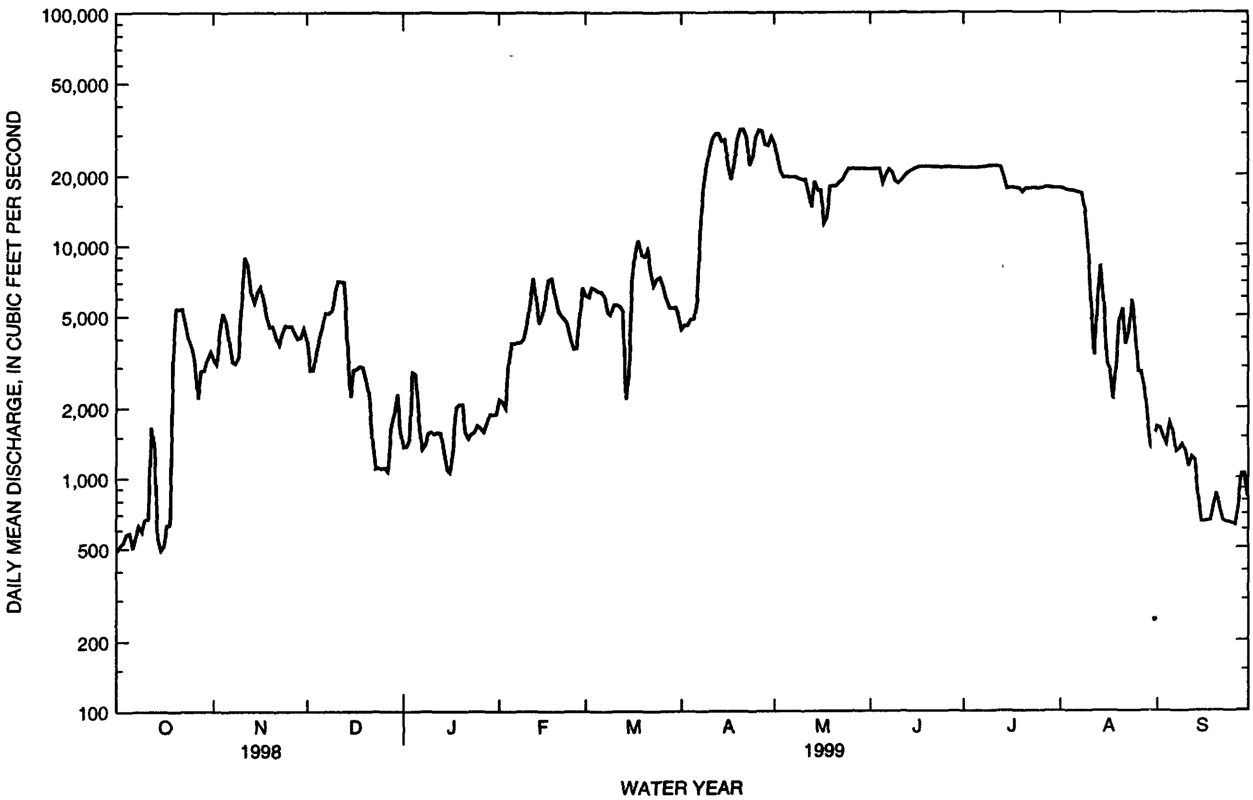
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4031	4721	4815	2305	4947	9912	15290	15890	17910	24620	11800	5960
MAX	11150	11990	12380	3997	8246	17480	22040	28520	27950	79340	44600	33490
(WY)	1994	1993	1993	1993	1997	1993	1998	1993	1993	1993	1993	1993
MIN	915	1180	2395	1410	2310	2892	5051	6361	9395	7039	2412	491
(WY)	1998	1998	1998	1996	1995	1996	1996	1994	1997	1997	1997	1997

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1993 - 1999	
ANNUAL TOTAL	3544204		3451833			
ANNUAL MEAN	9710		9457		10220	
HIGHEST ANNUAL MEAN					24360	1993
LOWEST ANNUAL MEAN					6168	1994
HIGHEST DAILY MEAN	29000	Apr 21	31600	Apr 21	104000	Jul 12 1993
LOWEST DAILY MEAN	413	Sep 30	488	Oct 1	344	Sep 6 1997
ANNUAL SEVEN-DAY MINIMUM	515	Sep 30	537	Oct 1	368	Oct 13 1997
INSTANTANEOUS PEAK FLOW			32100	Apr 20	105000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			97.31	Apr 20	109.71	Jul 12 1993
ANNUAL RUNOFF (AC-FT)	7030000		6847000		7401000	
ANNUAL RUNOFF (CFSM)	.79		.77		.83	
ANNUAL RUNOFF (INCHES)	10.69		10.41		11.26	
10 PERCENT EXCEEDS	22800		21700		22000	
50 PERCENT EXCEEDS	6170		5280		5400	
90 PERCENT EXCEEDS	1110		1100		1290	

e Estimated

05488110 DES MOINES RIVER NEAR PELLA, IA--Continued



05488200 ENGLISH CREEK NEAR KNOXVILLE, IA

LOCATION.--Lat 41°18'02", long 93°02'43", in NE$^1/_4$ SE$^1/_4$ sec.16, T.75 N., R.19 W., Marion County, Hydrologic Unit 07100009, on left bank 30 ft from left upstream abutment of bridge on State Highway 92, 3 mi east of Knoxville, and 11.4 mi upstream from mouth at Des Moines River.

DRAINAGE AREA.--90.1 mi^2.

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

REVISED RECORDS.--WDR IA-97:(M)

GAGE.--Water-stage recorder. Datum of gage is 721.79 ft above sea level.

REMARKS.--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 of July 16, 1982 reached a stage of 30.28 ft, gage datum, discharge 28,000 ft^3/s, from contracted-opening indirect computations.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e4.5	17	18	e4.2	e41	61	30	75	62	27	7.6	e.62
2	e6.3	155	16	e4.4	e80	51	29	63	196	28	6.9	e.65
3	e11	225	16	e5.0	e105	45	170	56	46	26	6.6	e.60
4	e25	87	16	e4.6	e103	39	295	55	36	23	6.4	e.55
5	417	49	16	e4.4	e68	38	81	194	233	20	5.7	e.65
6	80	37	16	e7.0	65	38	124	96	62	18	7.8	e.70
7	23	31	17	e6.5	53	34	68	65	35	16	9.4	e.70
8	11	37	18	e6.0	46	37	148	62	28	14	13	e.85
9	7.4	71	17	e6.0	44	35	736	56	25	16	15	e.75
10	5.7	429	18	e7.0	37	47	195	49	143	20	9.8	e.65
11	4.8	184	17	e7.0	158	44	103	50	1420	19	8.7	e.70
12	4.2	63	16	e6.5	236	42	67	523	885	14	14	e.65
13	3.6	46	16	e6.0	68	47	55	479	116	13	10	e.55
14	3.6	41	16	e6.0	55	49	49	143	70	12	10	e.49
15	3.4	35	15	e7.0	56	83	247	89	53	12	7.7	e.48
16	3.2	30	15	e8.5	46	294	1350	268	45	11	6.4	e.41
17	486	28	15	e9.0	37	520	973	860	41	11	5.7	e.40
18	1200	e25	15	e8.5	35	143	265	541	38	10	e5.0	e.39
19	118	24	14	e9.0	37	76	134	138	35	10	e4.4	e.39
20	43	22	e7.5	e9.5	38	62	94	82	32	e140	e3.2	e.38
21	29	20	e6.0	e10	35	53	79	65	30	64	e2.2	e.39
22	24	20	e5.0	e17	32	45	117	58	30	28	e1.6	e.32
23	24	20	e4.6	e40	29	41	396	48	101	19	e1.3	e.31
24	22	19	e4.4	e34	36	39	149	41	84	14	e1.0	e.31
25	20	18	e4.8	e28	37	34	90	37	40	13	e.85	e.30
26	19	18	e5.5	e25	57	33	75	33	32	14	e.90	e.29
27	18	17	e6.0	e34	130	32	254	30	29	12	e.80	e.41
28	18	17	e6.5	e40	103	34	810	28	28	11	e.70	e.75
29	21	17	e6.0	e36	---	33	227	25	28	11	e.60	e1.1
30	21	18	e6.5	e32	---	30	105	23	29	8.9	e.65	e1.0
31	18	---	e4.8	e29	---	30	---	30	---	8.4	e.65	---
TOTAL	2694.7	1820	374.6	457.1	1867	2189	7515	4362	4032	663.3	174.55	16.74
MEAN	86.9	60.7	12.1	14.7	66.7	70.6	250	141	134	21.4	5.63	.56
MAX	1200	429	18	40	236	520	1350	860	1420	140	15	1.1
MIN	3.2	17	4.4	4.2	29	30	29	23	25	8.4	.60	.29
AC-FT	5340	3610	743	907	3700	4340	14910	8650	8000	1320	346	33
CFSM	.96	.67	.13	.16	.74	.78	2.78	1.56	1.49	.24	.06	.01
IN.	1.11	.75	.15	.19	.77	.90	3.10	1.80	1.66	.27	.07	.01

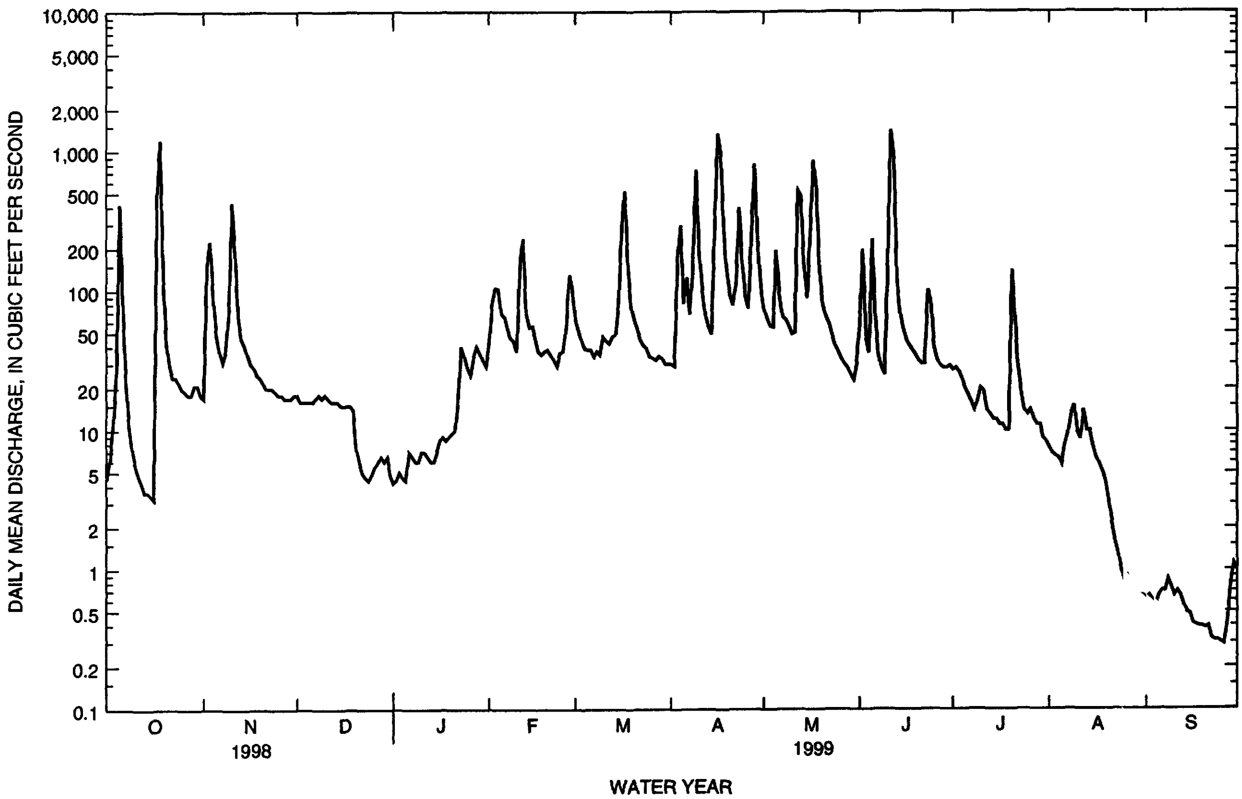
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	28.9	26.1	27.0	15.7	44.8	99.6	132	152	85.9	96.1	33.7	38.1
MAX	161	100	112	51.8	134	335	476	514	258	1039	285	159
(WY)	1987	1993	1993	1998	1997	1993	1991	1996	1998	1993	1993	1992
MIN	.48	.76	.31	.66	.50	2.05	1.03	2.27	2.27	.18	.17	.026
(WY)	1995	1989	1989	1989	1989	1989	1989	1989	1992	1988	1988	1991

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1985 - 1999	
ANNUAL TOTAL	42777.6		26165.99			
ANNUAL MEAN	117		71.7		65.8	
HIGHEST ANNUAL MEAN					214	1993
LOWEST ANNUAL MEAN					6.71	1989
HIGHEST DAILY MEAN	2470	Jun 19	1420	Jun 11	8610	Jul 5 1993
LOWEST DAILY MEAN	1.7	Sep 9	.29	Sep 26	.00	Sep 12 1988a
ANNUAL SEVEN-DAY MINIMUM	2.1	Sep 7	.33	Sep 20	.00	Sep 25 1991
INSTANTANEOUS PEAK FLOW			2200	Jun 12	18900	Jul 5 1993
INSTANTANEOUS PEAK STAGE			20.93	Jun 12	27.88	Jul 5 1993
ANNUAL RUNOFF (AC-FT)	84850		51900		47700	
ANNUAL RUNOFF (CFSM)	1.30		.80		.73	
ANNUAL RUNOFF (INCHES)	17.66		10.80		9.93	
10 PERCENT EXCEEDS	268		143		107	
50 PERCENT EXCEEDS	35		27		11	
90 PERCENT EXCEEDS	4.6		1.0		.36	

a Also Sep 13-17, 1989, Aug 8-13, 1989, Sep 6-10, 21, and Sep 25 to Oct 3, 1991
e Estimated

05488200 ENGLISH CREEK NEAR KNOXVILLE, IA--Continued



05488500 DES MOINES RIVER NEAR TRACY, IA

LOCATION.--Lat 41°16'53", long 92°51'34", in $NW^1/_4$ $SE^1/_4$ sec.19, T.75 N., R.17 W., Mahaska County, Hydrologic Unit 07100009, on right bank 250 ft upstream from abandoned Bellefountaine Bridge, 0.8 mi east of Tracy, 3.1 mi upstream from Cedar Creek, 3.8 mi downstream from bridge on newly located State Highway 92, 6.4 mi downstream from English Creek, and at mile 130.4.

DRAINAGE AREA.--12,479 mi^2.

PERIOD OF RECORD.--March 1920 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1920 (M), 1922 (M), 1933.

GAGE.--Water-stage recorder. Datum of gage is 670.91 ft above sea level. Prior to June 26, 1940 and June 30, 1952 to Nov. 4, 1960 nonrecording gage, and June 27, 1940 to June 29, 1952 water-stage recorder, at site 250 ft downstream at same datum.

REMARKS.--Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Lake Red Rock (station 05488100) 11.9 mi upstream, since March 12, 1969. Periodic observations of water temperature and specific conductance are published in this report as miscellaneous water quality data. U.S. Army Corps of Engineers gage-height telemeter and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 155,000 ft^3/s, June 14, 1947, gage height, 26.5 ft; minimum daily discharge, 40 ft^3/s Jan. 29 to Feb. 2, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1851, that of June 14, 1947. Flood of May 31, 1903, reached a stage of about 25 ft, discharge, about 130,000 ft^3/s. Minimum daily discharge since at least 1910, that of Jan. 29 to Feb. 1, 1940.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	443	3420	4380	e1500	2160	6620	4460	29500	23000	23100	18600	1900
2	468	3330	3120	e1500	2360	5970	4630	26200	23200	23200	18600	1910
3	488	4370	3110	e2200	2190	6810	4670	23000	23000	23100	18400	1810
4	512	5430	3490	e3200	2920	6720	5170	21400	23000	23100	18300	1640
5	1650	5010	4190	e3000	3890	6540	5160	21700	21400	23100	18400	1870
6	762	4170	4520	e2100	3890	6520	5470	21600	21300	23100	18200	1970
7	569	3400	5310	e1500	3900	6330	10700	21500	22800	23100	18100	1550
8	720	3160	5300	e1600	3890	5580	18100	21400	22400	23100	18000	1520
9	658	3440	5420	e1700	3990	5120	23400	21100	20500	23100	15800	1620
10	718	5630	6170	e1700	4390	5710	26500	20800	20100	23000	11200	1560
11	709	9700	7400	e1600	5530	5740	29600	20900	21400	22900	6680	1350
12	1230	8980	7370	e1700	7730	5710	31300	20500	22100	22800	3780	1360
13	1750	6730	7340	e1700	6420	5380	31400	16600	22100	22700	5320	1470
14	662	6120	5000	e1500	4710	3320	29900	20800	22400	21100	8430	1130
15	497	6540	2140	e1200	4950	1850	29700	19000	22700	18400	6940	811
16	509	7150	3140	e1100	5870	7300	28700	19200	23000	18600	3300	804
17	1590	6400	3130	1390	7020	9960	23600	16600	23300	18800	3140	804
18	2810	5090	3250	1940	7480	11200	24100	15100	23300	18700	2570	804
19	2940	4710	3240	2230	6490	9920	29700	19700	23200	18800	2860	870
20	5180	4700	3010	2120	5450	9050	32900	19600	23200	18600	4730	1050
21	5150	4390	2630	1770	5130	9930	33400	19700	23200	19000	5550	965
22	5120	3930	2020	1520	4990	8440	31800	20200	23200	18800	4420	804
23	4620	4230	e1200	1660	4750	6830	26200	20700	23300	18900	4180	800
24	3860	4690	e1050	1690	4390	7130	25800	21600	23300	18900	5960	786
25	3670	4690	e1200	1770	3780	7490	30500	22900	23200	18800	5270	785
26	3230	4680	e1200	1730	3800	6920	33000	23000	23200	18800	3100	785
27	2320	4450	e1300	1670	4750	6040	33000	23000	23200	19000	3100	859
28	2970	4190	e1650	1780	6680	5420	32700	22900	23100	19000	2830	1220
29	3000	4180	e2150	2040	---	5410	29000	22900	23100	18900	2150	1220
30	3260	4490	e2500	1970	---	5400	31000	22900	23100	18800	1570	1070
31	3590	---	e2000	1950	---	5160	---	22900	---	18700	1560	---
TOTAL	65655	151400	108930	56030	133500	205520	705560	658900	679300	640000	261040	37097
MEAN	2118	5047	3514	1807	4768	6630	23520	21250	22640	20650	8421	1237
MAX	5180	9700	7400	3200	7730	11200	33400	29500	23300	23200	18600	1970
MIN	443	3160	1050	1100	2160	1850	4460	15100	20100	18400	1560	785
AC-FT	130200	300300	216100	111100	264800	407600	1399000	1307000	1347000	1269000	517800	73580
CFSM	.17	.40	.28	.14	.38	.53	1.88	1.70	1.81	1.65	.67	.10
IN.	.20	.45	.32	.17	.40	.61	2.10	1.96	2.02	1.91	.78	.11

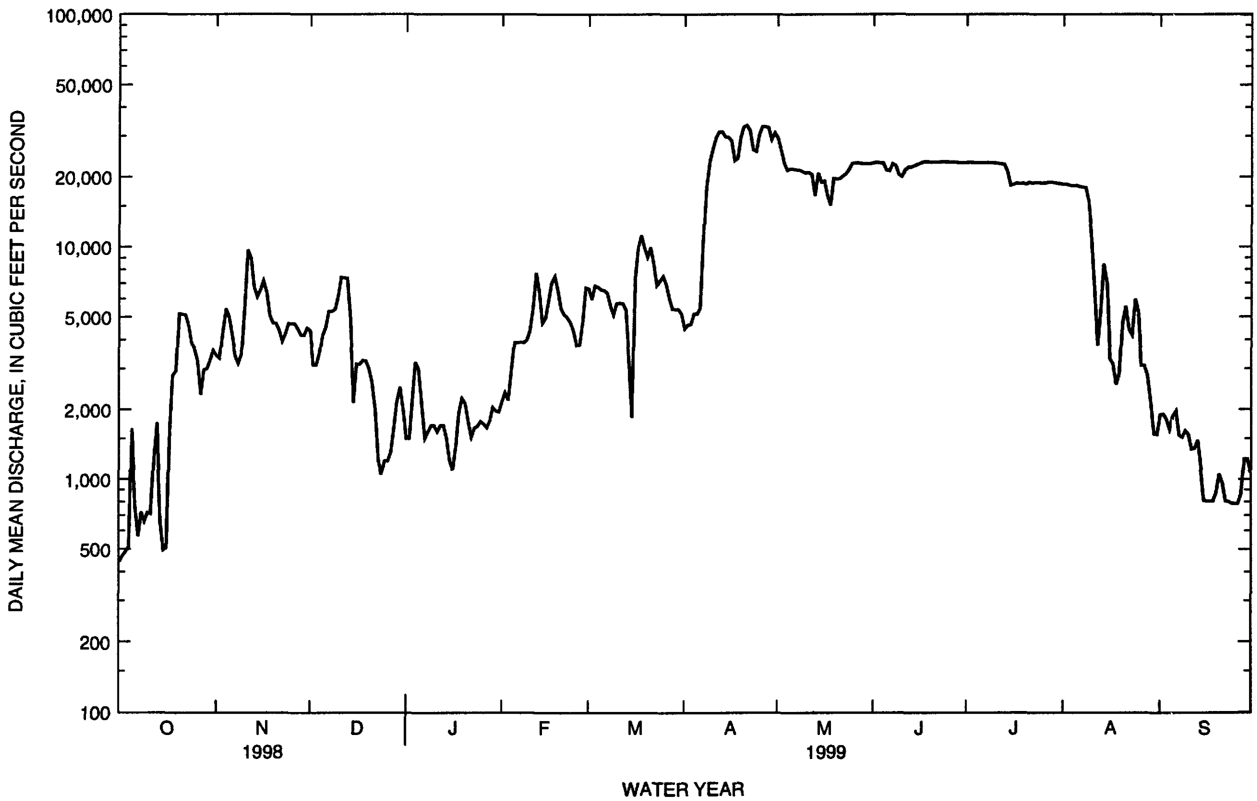
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3748	4801	4001	2647	4592	9414	12340	12210	13420	14040	8256	4403
MAX	17190	19160	12540	11510	15560	21520	24370	28280	30260	80800	45240	33670
(WY)	1974	1987	1983	1973	1973	1983	1998	1993	1984	1993	1993	1993
MIN	318	340	344	305	276	746	866	425	277	220	591	342
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1989	1976

05488500 DES MOINES RIVER NEAR TRACY, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1970 - 1999a	
ANNUAL TOTAL	3741364		3702932			
ANNUAL MEAN	10250		10150		7836	
HIGHEST ANNUAL MEAN					24450	1993
LOWEST ANNUAL MEAN					898	1977
HIGHEST DAILY MEAN	30900	Apr 21	33400	Apr 21	107000	Jul 12 1993
LOWEST DAILY MEAN	393	Sep 30	443	Oct 1	165	Feb 20 1977
ANNUAL SEVEN-DAY MINIMUM	538	Sep 28	699	Oct 1	210	Oct 9 1980
INSTANTANEOUS PEAK FLOW			35200	Apr 28	109000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			14.27	Apr 28	24.16	Jul 12 1993
ANNUAL RUNOFF (AC-FT)	7421000		7345000		5677000	
ANNUAL RUNOFF (CFSM)	.82		.81		.63	
ANNUAL RUNOFF (INCHES)	11.15		11.04		8.53	
10 PERCENT EXCEEDS	23900		23200		19300	
50 PERCENT EXCEEDS	6170		5320		4150	
90 PERCENT EXCEEDS	1250		1230		600	

a Post regulation
e Estimated



05489000 CEDAR CREEK NEAR BUSSEY, IA

LOCATION.--Lat 41°13'09", long 92°54'38", at SW corner sec.11, T.74 N., R.18 W., Marion County, Hydrologic Unit 07100009, on left bank 10 ft downstream from bridge on State Highway 156, 0.8 mi downstream from North Cedar Creek, 1.6 mi northwest of Bussey, 3.0 mi upstream from Honey Creek, and 8.9 mi upstream from mouth.

DRAINAGE AREA.--374 mi^2.

PERIOD OF RECORD.--October 1947 to current year.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water stage recorder. Datum of gage is 682.15 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Feb. 21, 1949, nonrecording gage at same site and datum.

REMARKS.--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 1946 reached a stage of 28.45 ft on upstream side and 28.05 ft on downstream side of bridge, levels to floodmarks by U.S. Army Corps of Engineers, discharge, 31,500 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

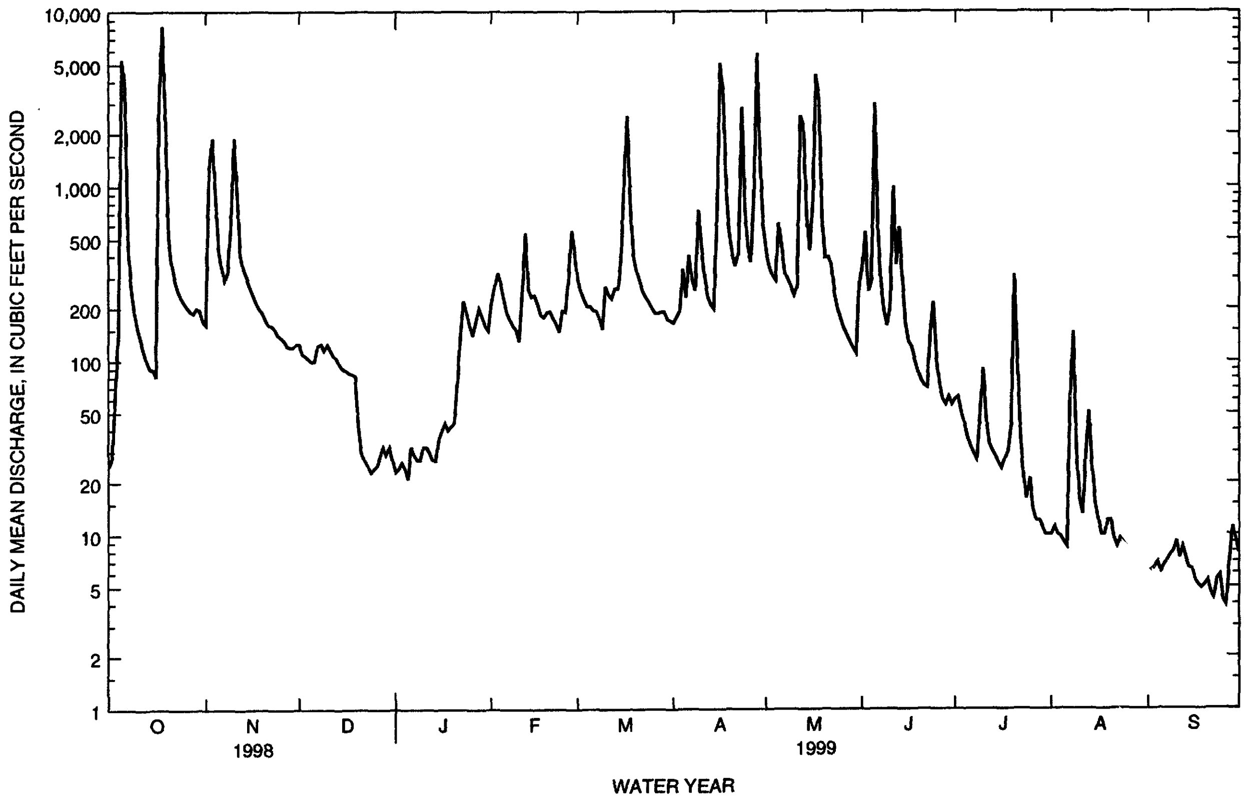
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	162	124	e23	e213	289	165	420	332	60	10	6.1
2	28	1240	110	e24	e260	253	e180	349	549	62	11	6.2
3	65	1890	107	e26	e320	227	194	309	252	50	10	6.4
4	143	917	103	e24	e280	205	336	290	289	43	9.7	6.9
5	5320	454	99	e21	e230	205	231	611	2970	36	9.0	6.1
6	3820	344	100	e32	e190	195	402	451	584	32	8.5	6.6
7	508	291	122	e29	173	193	286	317	280	29	62	7.1
8	272	327	125	e27	160	176	253	290	195	27	146	7.6
9	196	606	115	e27	151	153	729	262	159	49	30	8.0
10	157	1890	124	e32	130	267	451	237	200	90	16	9.1
11	134	895	116	e32	245	240	303	270	988	45	13	7.3
12	115	413	107	e30	542	228	235	2520	355	33	29	8.4
13	100	340	104	e27	259	260	210	2210	583	30	51	7.2
14	91	305	95	e27	233	260	199	677	293	28	25	6.4
15	89	268	90	e36	238	375	646	432	163	26	15	6.3
16	81	243	88	e40	212	1150	5070	796	128	24	12	5.4
17	2870	217	85	e44	184	2530	3350	4350	120	27	10	5.1
18	8300	e200	84	e40	178	736	941	3110	102	30	10	4.9
19	2500	191	82	e42	190	405	533	660	87	42	12	5.1
20	520	173	e42	e44	192	328	405	390	77	311	12	5.4
21	366	161	e30	e75	176	286	350	392	72	105	9.5	4.6
22	295	160	e27	e140	163	251	414	359	70	38	8.5	4.3
23	255	153	e25	e220	147	232	2820	245	145	21	9.4	5.5
24	232	141	e23	e190	194	218	762	199	216	16	8.9	5.8
25	216	136	e24	e160	191	200	453	175	103	21	8.4	4.2
26	203	131	e25	e140	303	188	369	154	71	14	7.8	3.9
27	193	122	e28	e170	559	187	909	141	60	12	7.0	6.8
28	188	120	e32	e200	420	191	5740	129	56	12	6.8	11
29	201	120	e29	e180	---	190	1420	118	62	11	6.8	9.5
30	196	125	e32	e160	---	173	582	110	56	10	6.4	7.8
31	169	---	e27	e150	---	169	---	280	---	10	6.3	---
TOTAL	27848	12735	2324	2412	6733	10960	28938	21253	9617	1344	587.0	195.0
MEAN	898	424	75.0	77.8	240	354	965	686	321	43.4	18.9	6.50
MAX	8300	1890	125	220	559	2530	5740	4350	2970	311	146	11
MIN	25	120	23	21	130	153	165	110	56	10	6.3	3.9
AC-FT	55240	25260	4610	4780	13350	21740	57400	42160	19080	2670	1160	387
CFSM	2.40	1.14	.20	.21	.64	.95	2.58	1.83	.86	.12	.05	.02
IN.	2.77	1.27	.23	.24	.67	1.09	2.88	2.11	.96	.13	.06	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	113	133	93.1	88.7	231	414	429	425	300	287	110	155
MAX	950	1331	844	894	952	1371	1552	1797	1258	3846	1070	1384
(WY)	1974	1962	1983	1974	1949	1960	1973	1996	1967	1982	1993	1992
MIN	.18	.33	.39	.20	2.29	3.78	.79	7.19	2.74	2.26	2.51	.60
(WY)	1957	1956	1956	1956	1954	1954	1956	1956	1977	1988	1953	1953

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1948 - 1999	
ANNUAL TOTAL	185390		124946.0			
ANNUAL MEAN	508		342		231	
HIGHEST ANNUAL MEAN					768	1993
LOWEST ANNUAL MEAN					29.4	1989
HIGHEST DAILY MEAN	9030	Jun 19	8300	Oct 18	42000	Jul 3 1982
LOWEST DAILY MEAN	22	Sep 12	3.9	Sep 26	.00	Sep 6 1955a
ANNUAL SEVEN-DAY MINIMUM	24	Sep 7	4.8	Sep 20	.00	Sep 6 1955
INSTANTANEOUS PEAK FLOW			9790	Oct 18	96000	Jul 3 1982
INSTANTANEOUS PEAK STAGE			22.84	Oct 18	34.61	Jul 3 1982
INSTANTANEOUS LOW FLOW			3.5	Sep 26		
ANNUAL RUNOFF (AC-FT)	367700		247800		167600	
ANNUAL RUNOFF (CFSM)	1.36		.92		.62	
ANNUAL RUNOFF (INCHES)	18.44		12.43		8.40	
10 PERCENT EXCEEDS	1110		582		413	
50 PERCENT EXCEEDS	164		150		38	
90 PERCENT EXCEEDS	36		8.7		2.5	

a Also Sep 7-20, 1955, Oct 11, 12, 1956, Aug 12, 13, 1989
e Estimated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DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
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WATER YEAR

05489500 DES MOINES RIVER AT OTTUMWA, IA

LOCATION.--Lat 41°00'39", long 92°24'40", in $SE^1/_4$ $NE^1/_4$ sec.25, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, on right bank 15 ft downstream from Colorado and Eastern Railroad Bridge at Ottumwa, 0.4 mi downstream from Ottumwa powerplant, 6.5 mi upstream from Village Creek, 9.5 mi downstream from South Avery Creek, and at mile 94.1.

DRAINAGE AREA.--13,374 mi^2.

PERIOD OF RECORD.--March 1917 to current year (published as "at Eldon" October 1930 to March 1935). Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1917-20. WSP 1308: 1917-23 (M), 1925-27 (M), 1931. WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 622.00 ft above sea level. Prior to Sept. 30, 1930, nonrecording gage at Market Street Bridge 1,700 ft upstream at datum 0.83 ft higher. Oct. 1, 1930 to Mar. 31, 1935, nonrecording gage at Eldon 15 mi downstream at different datum. Apr. 1, 1935 to Oct. 25, 1963, water-stage recorder at site 1,100 ft downstream at Vine Street Bridge at datum 0.77 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Prior to Dec. 12, 1958 and since Nov. 30, 1960, diurnal fluctuation at low and medium stages are caused by powerplant upstream of station about $^1/_2$ mile. Flow regulated by Lake Red Rock (station 05488100) 48.2 mi upstream since March 12, 1969. 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, 135,000 ft^3/s June 7, 1947, gage height, 20.2 ft, site and datum then in use; minimum daily discharge, 26 ft^3/s Oct. 25, 1990, when gates at dam in Ottumwa were closed.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1850, that of June 7, 1947. Flood of May 31, 1903, reached a stage of 19.4 ft, former site and datum at Vine Street Bridge or about 22 ft at Market Street Bridge, from information by U.S. Army Corps of Engineers and U.S. National Weather Service, discharge, about 140,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	434	4110	5270	e1600	e2500	7830	5350	30800	23500	22900	18600	1780
2	918	5860	4110	e1700	e2800	6150	4830	28300	23900	22800	18500	1840
3	780	7910	3610	e2200	e2600	6950	5070	24700	23600	22800	18400	1260
4	918	7790	3620	e2500	3440	7120	5400	22800	23700	22800	18200	1770
5	17500	6670	4390	e3000	4210	6890	5800	23600	25300	22800	18300	1550
6	9530	5640	4650	e2400	4540	6790	5550	23000	22200	22600	18200	2960
7	3860	4610	5530	e1700	4420	6760	7990	22400	23000	22600	18300	1700
8	1880	4170	5770	e1800	4400	6420	15400	22200	22900	22700	18100	1520
9	1420	4970	5770	e1900	4410	5290	21600	22100	21500	22800	17900	1590
10	1440	7630	5960	e1900	4540	5840	25000	21500	20800	22600	13100	1590
11	1410	11700	7540	e1700	5370	6130	26900	21900	22000	22500	8990	1450
12	1350	10700	7760	e1900	8000	6140	29000	23300	22700	22400	4220	1250
13	2090	8900	7720	e1900	8070	6000	29900	21600	22700	22300	4270	1470
14	1730	6980	7530	e1700	5630	5700	29900	21500	22800	22000	7010	1290
15	1130	6730	3330	e1300	5170	2480	27700	21100	22600	19100	8810	968
16	838	7550	3060	e1200	5770	7040	33800	20700	22900	18500	4890	249
17	5710	7600	3620	e1600	6670	13100	30400	24900	23100	18900	3480	436
18	18100	6190	3730	e2100	7840	13400	23500	20900	23200	18800	3200	795
19	10800	5340	3600	e2500	7420	11900	26100	20600	23100	18800	2550	761
20	6270	5230	3620	e2300	6200	9390	30100	20900	23100	19300	3880	1440
21	6130	5220	3140	e2000	5490	10400	31900	21200	23000	19300	5250	1090
22	5820	4600	2460	e1700	5400	10300	32200	21600	23100	18900	5370	931
23	5760	4480	1730	e1800	5150	7640	32700	21600	23700	18900	3570	487
24	4710	5040	e1200	e1900	5050	7320	25700	21600	23600	19000	5230	560
25	4420	5190	e1300	e2000	4340	7920	27800	22900	23100	18900	6150	842
26	4110	5150	e1300	e1900	4400	7720	31300	23300	23000	18800	3190	924
27	3620	5200	e1100	e1800	5000	6940	32800	23300	22900	18900	3030	802
28	3000	4700	1740	e2000	6770	6120	36400	23200	22900	19000	3060	701
29	3570	4630	2360	e2200	---	5880	33600	23100	22800	18900	3350	895
30	3660	4750	2430	e2100	---	5850	30600	23100	22800	18800	1840	1330
31	4050	---	e2100	e2300	---	5870	---	23400	---	18700	1610	---
TOTAL	136958	185240	121050	60600	145600	229280	704290	707100	689500	638100	270550	36231
MEAN	4418	6175	3905	1955	5200	7396	23480	22810	22980	20580	8727	1208
MAX	18100	11700	7760	3000	8070	13400	36400	30800	25300	22900	18600	2960
MIN	434	4110	1100	1200	2500	2480	4830	20600	20800	18500	1610	249
AC-FT	271700	367400	240100	120200	288800	454800	1397000	1403000	1368000	1266000	536600	71860
CFSM	.33	.46	.29	.15	.39	.55	1.76	1.71	1.72	1.54	.65	.09
IN.	.38	.52	.34	.17	.40	.64	1.96	1.97	1.92	1.77	.75	.10

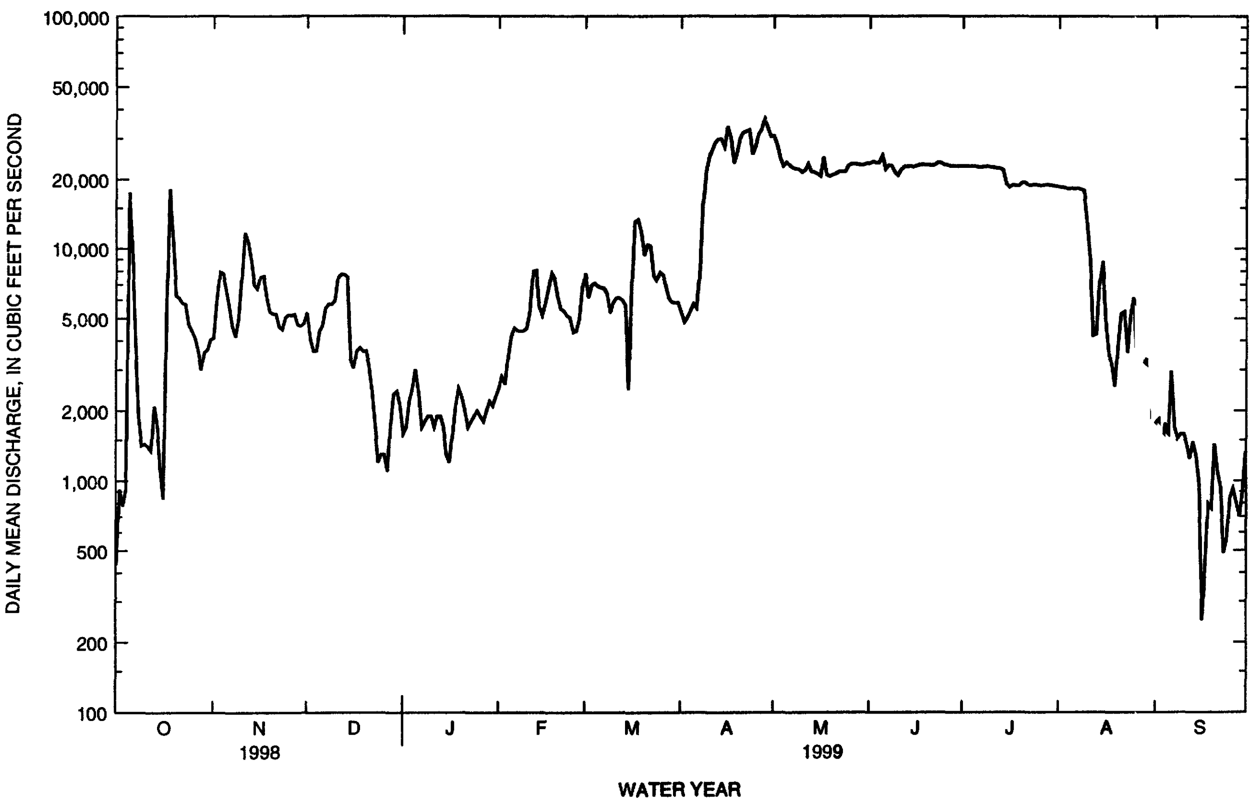
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4155	5218	4463	3013	5028	10270	13170	13220	14070	14810	8690	4830
MAX	18390	19250	13980	12380	16470	21750	25330	29770	31980	85570	47380	34790
(WY)	1974	1987	1993	1973	1973	1983	1983	1993	1984	1993	1993	1993
MIN	353	327	381	290	328	891	962	519	282	238	610	366
(WY)	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1988	1976

05489500 DES MOINES RIVER AT OTTUMWA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1970 - 1999a	
ANNUAL TOTAL	4154543		3924499			
ANNUAL MEAN	11380		10750		8427	
HIGHEST ANNUAL MEAN					26350	1993
LOWEST ANNUAL MEAN					1120	1977
HIGHEST DAILY MEAN	40400	Jul 6	36400	Apr 28	110000	Jul 12 1993
LOWEST DAILY MEAN	434	Oct 1	249	Sep 16	26	Oct 25 1990b
ANNUAL SEVEN-DAY MINIMUM	850	Sep 28	744	Sep 23	182	Jul 7 1977
INSTANTANEOUS PEAK FLOW			37600	Apr 28	112000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			11.68	Apr 28	22.15	Jul 12 1993
ANNUAL RUNOFF (AC-FT)	8241000		7784000		6105000	
ANNUAL RUNOFF (CFSM)	.85		.80		.63	
ANNUAL RUNOFF (INCHES)	11.56		10.92		8.56	
10 PERCENT EXCEEDS	24700		23300		20600	
50 PERCENT EXCEEDS	7650		6000		4700	
90 PERCENT EXCEEDS	1570		1460		700	

a Post regulation
b Gates at dam in Ottumwa closed
e Estimated



05490500 DES MOINES RIVER AT KEOSAUQUA, IA

LOCATION.--Lat 40°43'40", long 91°57'34", in $SE^1/_4$ $SW^1/_4$ sec.36, T.69 N., R.10 W., Van Buren County, Hydrologic Unit 07100009, on right bank 10 ft upstream from bridge on State Highway 1 at Keosauqua, 4.0 mi downstream from Chequest Creek, and at mile 51.3.

DRAINAGE AREA.--14,038 mi^2.

PERIOD OF RECORD.--May 1903 to July 1906, April to December 1910, August 1911 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1913-20. WSP 1438: Drainage area. WSP 1508: 1903, 1905-6, 1915- 18 (M), 1922 (M), 1924-26 (M), 1932-34 (M), 1937, 1942 (M).

GAGE.--Water-stage recorder. Datum of gage is 547.36 ft above sea level. Prior to Dec. 24, 1933, nonrecording gage, and Dec. 25, 1933, to Sept. 30, 1972, water-stage recorder, at same site at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Prior to Dec. 21, 1958, and since Nov. 30, 1960, some diurnal fluctuation at medium and low stages caused by power plant at Ottumwa. Flow regulated by Lake Red Rock (station 05488100) 91.0 mi upstream, since March 12, 1969. 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, 146,000 ft^3/s June 1, 1903, gage height, 27.85 ft, from floodmark, datum then in use; minimum daily discharge, 40 ft^3/s Jan. 30, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1851, reached a stage of 24 ft, discharge not determined.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	870	4430	4970	e1700	e2800	7340	5780	30600	23400	23200	18500	1700
2	669	7100	5190	e1800	e3000	7270	5150	29000	23400	23100	18400	1910
3	758	11500	3900	e2300	e2800	6400	5270	25400	23600	23100	18300	1950
4	923	9490	3680	e2600	e3600	7040	6230	23000	23100	23000	18100	1360
5	16300	7920	3810	e3200	4620	7020	6070	29300	26600	23000	18000	1840
6	20800	6660	4860	e2600	4970	6930	6660	23600	23900	23000	18000	1620
7	8260	5720	5690	e1800	4730	6770	6500	22100	22700	22900	18000	2930
8	3780	4970	6120	e1900	4660	6680	10800	21700	23100	22900	17800	1830
9	2180	5750	6030	e2000	4620	6150	18400	21400	22300	23000	17900	1510
10	1750	9250	6010	e2000	4540	5580	23100	20900	21300	23000	15600	1580
11	1670	10700	6510	e1900	5000	6250	25000	20800	22500	22800	11800	1570
12	1570	11300	7620	e2000	6600	6420	27400	21700	22900	22700	8320	1420
13	1450	9970	7590	e2000	8290	6560	29200	23700	25400	22500	4870	1240
14	2290	7990	7540	e1800	7140	6340	29700	20000	23500	22400	5780	1410
15	1700	6990	6350	e1400	5460	5700	29800	21300	22900	20500	8520	1270
16	1210	7090	2810	e1300	5410	3730	39000	22000	22900	18400	8150	1030
17	2340	7560	3460	e1600	6190	11700	36800	29500	23200	18500	5190	422
18	18600	6970	3720	e2200	7120	13200	27100	27500	23300	18700	4630	257
19	14200	5910	3900	e2700	7550	12000	25600	19900	23200	18600	4230	705
20	7800	5450	3620	e2400	6890	10400	29600	20700	23200	18900	3510	956
21	6740	5320	3600	e2200	5920	9470	32000	20700	23200	19100	4920	1230
22	6330	5160	2730	e1800	5530	10100	33300	21900	23200	18900	5890	1080
23	6090	4620	2210	e1900	5440	8890	39000	21000	23700	18800	5470	976
24	5730	4700	e1300	e2000	5210	7330	29800	21000	24400	18800	4220	520
25	4840	5190	e1400	e2100	5060	7440	27000	21700	23600	18800	6080	513
26	4650	5220	e1400	e2000	4390	7740	30100	22700	23300	18700	6100	763
27	4250	5200	e1200	e1900	5200	7290	33300	22700	23200	18700	3020	1090
28	3730	5080	e1900	e2100	6040	6630	37600	22700	23100	18700	3410	1290
29	3360	4720	e2400	e2300	---	6020	35900	22600	23100	18800	3300	872
30	3910	4850	e2600	e2200	---	5920	30600	22600	23100	18700	3510	904
31	3920	---	e2300	e2500	---	5880	---	22800	---	18600	2010	---
TOTAL	162670	202780	126420	64200	148780	232190	721760	716500	700300	640800	291530	37748
MEAN	5247	6759	4078	2071	5314	7490	24060	23110	23340	20670	9404	1258
MAX	20800	11500	7620	3200	8290	13200	39000	30600	26600	23200	18500	2930
MIN	669	4430	1200	1300	2800	3730	5150	19900	21300	18400	2010	257
AC-FT	322700	402200	250800	127300	295100	460500	1432000	1421000	1389000	1271000	578200	74870
CFSM	.37	.48	.29	.15	.38	.53	1.71	1.65	1.66	1.47	.67	.09
IN.	.43	.54	.34	.17	.39	.62	1.91	1.90	1.86	1.70	.77	.10

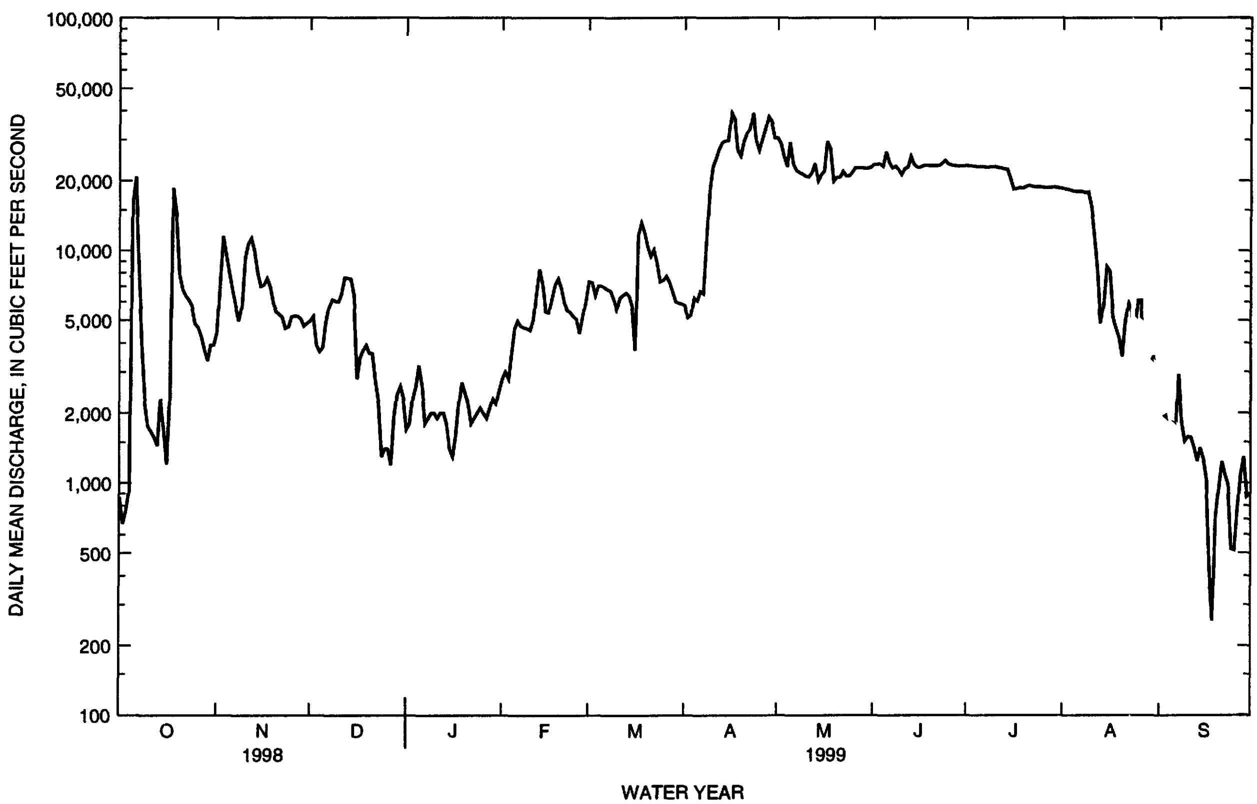
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4371	5369	4684	3187	5338	10740	13840	14050	14380	15310	8911	5226
MAX	19850	19320	14510	13120	17370	22200	30030	31260	30900	86150	47320	35210
(WY)	1974	1987	1983	1973	1973	1983	1973	1993	1984	1993	1993	1993
MIN	383	332	385	291	331	1170	1224	696	300	258	528	362
(WY)	1977	1977	1977	1977	1977	1981	1977	1977	1977	1977	1989	1976

05490500 DES MOINES RIVER AT KEOSAUQUA, IA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1970 - 1999a	
ANNUAL TOTAL	4375780		4045678			
ANNUAL MEAN	11990		11080		8800	
HIGHEST ANNUAL MEAN					26920	1993
LOWEST ANNUAL MEAN					1303	1977
HIGHEST DAILY MEAN	43800	Jul 7	39000	Apr 16,23	108000	Jul 13 1993
LOWEST DAILY MEAN	669	Oct 2	257	Sep 18	115	Oct 27 1990
ANNUAL SEVEN-DAY MINIMUM	956	Sep 28	804	Sep 17	204	Jul 3 1977
INSTANTANEOUS PEAK FLOW			41400	Apr 16	111000	Jul 12 1993
INSTANTANEOUS PEAK STAGE			21.40	Apr 16	32.66	Jul 13 1993
ANNUAL RUNOFF (AC-FT)	8679000		8025000		6375000	
ANNUAL RUNOFF (CFSM)	.85		.79		.63	
ANNUAL RUNOFF (INCHES)	11.60		10.72		8.52	
10 PERCENT EXCEEDS	24400		23400		21500	
50 PERCENT EXCEEDS	9090		6420		4970	
90 PERCENT EXCEEDS	1830		1590		750	

a Post regulation
e Estimated



05494300 FOX RIVER AT BLOOMFIELD, IA

LOCATION.--Lat 40°46'10", long 92°25'05", in $SW^1/_4$ $SE^1/_4$ sec.13, T.69 N., R.14 W., Davis County, Hydrologic Unit 0711000, on left bank 15 ft. downstream from bridge on county road V20, 1.3 miles north of county courthouse at Bloomfield, and 8.6 miles downstream from North Fox Creek.

DRAINAGE AREA.-- 87.7 mi^2

PERIOD OF RECORD.--October 1957 to September 1973, May 1997 to current year.

GAGE.--Water-stage recorder. Datum of gage is 755.57 ft above sea level.

REMARKS.--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.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 9, 1905 and June 18, 1946, exceeded all other known floods at this location, stage and discharge unknown. Also flood of May 6, 1960 reached a stage of 24.02 ft., gage datum; discharge 8,600 cfs (Slope-Area Measurement).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

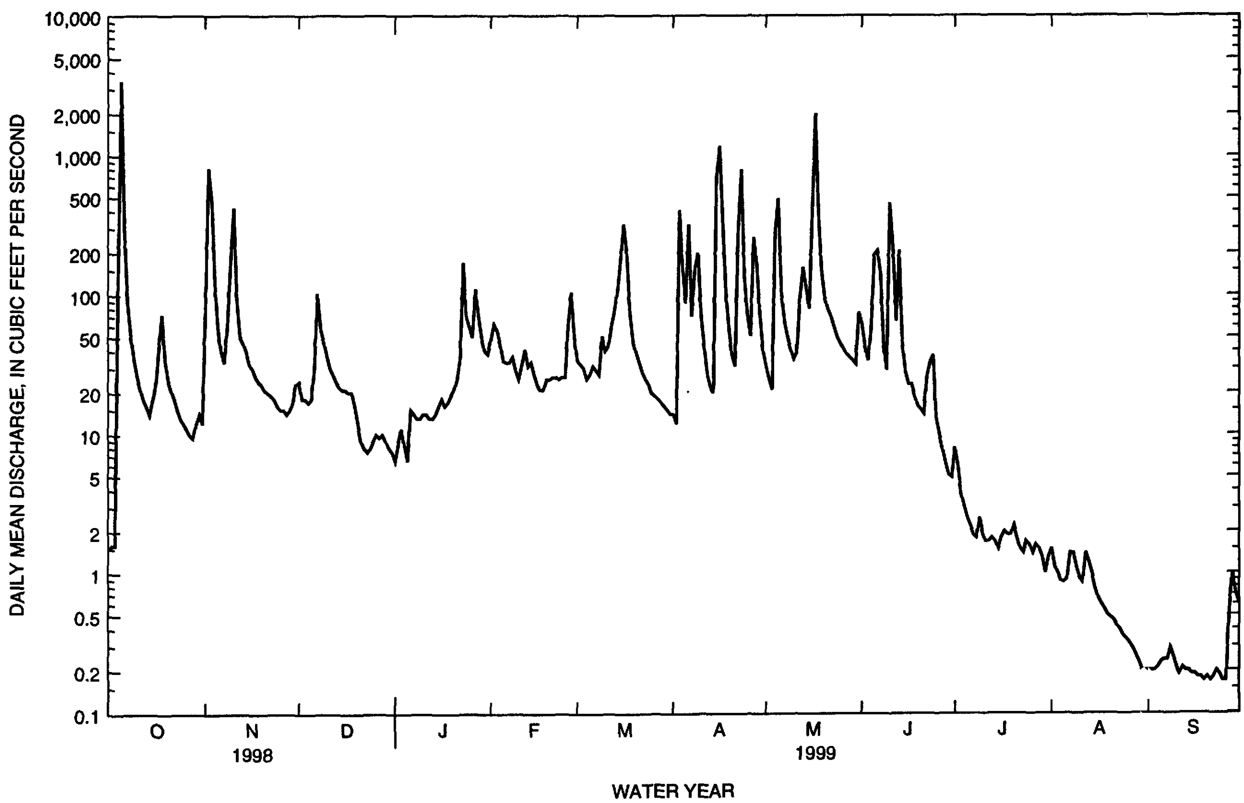
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.5	81	24	e6.5	48	34	14	31	62	8.0	1.5	e.20
2	e1.6	817	18	e8.5	62	32	12	25	43	5.9	1.1	e.20
3	e1.6	464	18	e11	56	30	e405	21	34	3.7	1.0	e.20
4	e120	120	17	e8.5	45	25	e156	287	57	3.0	.88	e.21
5	3440	57	18	e6.5	34	27	e88	489	194	2.5	.86	e.23
6	284	40	31	e15	33	31	e320	106	206	2.2	.90	e.24
7	89	33	103	e14	33	29	71	64	140	1.9	1.4	e.24
8	53	60	57	e13	36	27	156	50	43	1.8	1.4	e.29
9	36	164	47	e13	29	51	200	41	29	2.5	1.1	e.25
10	27	421	37	e14	25	40	70	35	455	1.9	.93	e.21
11	22	93	30	e14	32	43	43	39	225	1.7	.87	e.19
12	18	51	27	e13	41	61	27	95	65	1.7	1.4	e.21
13	16	46	24	e13	31	79	22	157	207	1.8	1.2	e.20
14	14	40	22	e14	33	107	20	e110	46	1.7	1.0	e.20
15	18	32	21	e16	27	181	702	e80	28	1.5	.78	e.19
16	22	30	21	e18	23	321	1170	e420	23	1.8	.66	e.19
17	41	26	20	e16	21	202	326	e2000	23	2.0	e.60	e.18
18	73	24	20	e17	21	73	105	369	19	1.9	e.55	e.18
19	34	23	e16	e19	25	47	57	148	16	1.9	e.50	e.17
20	25	21	e12	e21	25	39	37	96	15	2.2	e.48	e.18
21	e21	20	e9.0	e25	26	33	31	79	14	1.8	e.46	e.17
22	e18	19	e8.0	e36	26	28	284	70	26	1.5	e.42	e.18
23	e15	18	e7.5	e170	25	25	792	59	33	1.4	e.40	e.20
24	e13	16	e8.0	e70	26	23	132	50	37	1.7	e.36	e.19
25	e12	15	e9.0	e60	26	20	71	45	13	1.6	e.34	e.17
26	e11	15	e10	e50	62	19	51	42	10	1.4	e.32	e.17
27	e10	14	e9.5	e110	105	18	258	38	7.8	1.6	e.29	e.55
28	e9.5	15	e10	e70	50	17	168	36	6.2	1.5	e.26	e1.0
29	e12	17	e9.0	e50	---	16	73	34	5.1	1.3	e.23	e.75
30	e14	23	e8.0	e40	---	15	40	32	4.9	1.0	e.20	e.60
31	e12	---	e7.5	e38	---	14	---	75	---	1.3	e.20	---
TOTAL	4484.2	2815	678.5	990.0	1026	1707	5901	5223	2087.0	67.7	22.59	8.14
MEAN	145	93.8	21.9	31.9	36.6	55.1	197	168	69.6	2.18	.73	.27
MAX	3440	817	103	170	105	321	1170	2000	455	8.0	1.5	1.0
MIN	1.5	14	7.5	6.5	21	14	12	21	4.9	1.0	.20	.17
AC-FT	8890	5580	1350	1960	2040	3390	11700	10360	4140	134	45	16
CFSM	1.65	1.07	.25	.36	.42	.63	2.24	1.92	.79	.02	.01	.00
IN.	1.90	1.19	.29	.42	.44	.72	2.50	2.22	.89	.03	.01	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	37.1	26.8	23.6	33.6	60.6	107	110	78.3	34.8	26.5	34.0	44.0
MAX	178	222	115	127	158	291	370	325	179	163	254	377
(WY)	1960	1962	1971	1973	1959	1960	1973	1973	1967	1969	1970	1970
MIN	.21	.53	.32	.59	.67	1.07	8.48	2.35	.73	1.09	.20	.27
(WY)	1964	1965	1964	1964	1964	1964	1971	1964	1963	1972	1961	1999

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1958 - 1999	
ANNUAL TOTAL	34232.5		25010.13			
ANNUAL MEAN	93.8		68.5		51.9	
HIGHEST ANNUAL MEAN					117	1973
LOWEST ANNUAL MEAN					8.40	1964
HIGHEST DAILY MEAN	3440	Oct 5	3440	Oct 5	4370	May 6 1960
LOWEST DAILY MEAN	1.1	Sep 8	.17	Sep 19a	.00	Oct 1 1957
ANNUAL SEVEN-DAY MINIMUM	1.3	Sep 4	.18	Sep 16	.00	Oct 1 1957
INSTANTANEOUS PEAK FLOW			6200	Oct 5	8600	May 6 1960
INSTANTANEOUS PEAK STAGE			20.50	Oct 5	24.02	May 6 1960
ANNUAL RUNOFF (AC-FT)	67900		49610		37570	
ANNUAL RUNOFF (CFSM)	1.07		.78		.59	
ANNUAL RUNOFF (INCHES)	14.52		10.61		8.04	
10 PERCENT EXCEEDS	208		125		80	
50 PERCENT EXCEEDS	21		21		5.2	
90 PERCENT EXCEEDS	2.1		.44		.44	

a Also Sep 21, 25, 26
e Estimated


DAILY MEAN DISCHARGE, IN CUBIC FEET PER SECOND
10,000
5,000
2,000
1,000
500
200
100
50
20
10
5
2
1
0.5
0.2
0.1
O
N
D
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J
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S
1998
1999
WATER YEAR

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but 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 1999 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
UPPER IOWA RIVER BASIN								
Dry Run Creek near Decorah, IA (05387490)	Lat 43°17'29",long 91°48'33"in SE1/4, sec.20, T.98 N., R.8 W., Winneshiek County, Hydrologic Unit 07060002, on State Highway 9, 0.5 mi west of Decorah. Drainage area 21.0 mi^2.	1978-	04-09-99	18.82	2,230	08-16-93	20.80	4,620
Waterloo Creek near Dorchester, IA (05388310)	Lat 43°27'04", long 91°30'18", in NW1/4, sec.25, T.100 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on State Highway 76, 1.4 mi south of Dorchester. Drainage area 46.6 mi^2.	1966-	04-09-99	7.98	<700	07-01-78	14.80	9,380
MISSISSIPPI RIVER BASIN								
Mississippi River tributary at McGregor, IA (05389501)	Lat 43°01'12", long 91°11'25", in N1/4, sec.27, T.95 N., R.3 W., Clayton County, Hydrologic Unit 07060001,at culvert on County Road X50, at intersection with U.S. Highway 18 (Business Route), in McGregor. Drainage area 0.72 mi^2.	1991-	04-09-99	11.17	(+)	03-31-93	13.13	(+)
TURKEY RIVER BASIN								
French Hollow Creek near Elkader, IA (05412030)	Lat 42°50'19", long 91°24'25", in SW1/4, sec.26, T.93 N.,R.5 W., Clayton County, Hydrologic Unit 07060004, at culvert on State Highway 13, 1.1 mi south of Elkader. Drainage area 3.56 mi^2.	1991-	05-17-99	18.30	(+)	05-17-99	18.30	(+)
LITTLE MAQUOKETA RIVER BASIN								
Little Maquoketa River at Graf, IA (05414350)	Lat 42°30'09", long 90°51'50", in SE1/4 NW1/4, sec.20, T.89 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 300 ft downstream from Illinois Central railroad bridge, 0.5 mi northeast of Graf. Drainage area 39.6 mi^2.	1951-	05-17-99	11.83	3,700	07-08-51	15.78	7,220
Middle Fork Little Maquoketa River Rickardsville, IA (05414400	Lat 42°33'38", long 90°51'35", in SE1/4, sec.32, T.90 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 2 mi southeast of Rickardsville. Drainage area 30.2 mi^2.	1951-	05-17-99	20.62	5,040	08-02-72	27.70	23,000
North Fork Little Maquoketa River near Rickardsville, IA (05414450)	Lat 42°35'09", long 90°51'20", near NW corner, sec.28, T.90 N., R.1 E., Dubuque County, Hydrologic Unit 07060003, at bridge on county highway, 1 mi northeast of Rickardsville. Drainage area 21.6 mi^2.	1951-	05-17-99	12.69	5,300	08-02-72	14.02	7,180

Station name and number	Location and drainage area	Period of record	Water year 1999 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record maximum Date	Gage height (ft)	Discharge (ft^3/s)
			LITTLE MAQUOKETA RIVER BASIN--continued					
Little Maquoketa River near Durango, IA (05314500) (Continuous record site Oct. 1934 to Jan. 1982)	Lat 42°33'18", long 90°44'46", in NW1/4 NE1/4, sec. 5, T.89 N., R.2 E., Dubuque County, Hydrologic Unit 07060003, on left bank 10 ft upstream from bridge on county highway 300 ft upstream from Cloie Branch, 1.7 mi. east of Durango, 5.6 mi. northwest of court house at Dubuque, and 6.4 mi. upstream from mouth. Drainage area 130 mi^2.	1934-1993, 1996-	05-17-99	18.18	11,900	08-02-72	23.13	40,000
Little Maquoketa River tributary at Dubuque, IA (05414600)	Lat 42°32'38", long 90°41'38", near NW corner, sec.11, T.89 N., R.2 E, Dubuque County, Hydrologic Unit 07060003, at bridge on State Highway 386, near north city limits of Dubuque. Drainage area 1.54 mi^2.	1951-	05-17-99	15.45	1,320	07-31-57	[c]7.98	[d]1,650
Bloody Run tributary near Sherrill, IA (05414605)	Lat 42°37'13", long 90°45'44", in SE1/4, sec.7, T.90 N., R.2 E., Dubuque County, Hydrologic Unit 07060003, at culvert on county road 1.6 mi northeast of Sherrill. Drainage area 0.59 mi^2	1991-	07-21-99	13.13	148	06-15-91	19.27	[d]692
			LAMONT CREEK BASIN					
Lamont Creek tributary at Lamont, IA (05416200)	Lat 42°35'22", long 91°38'52", in SE1/4, sec.22, T.90 N., R.7 W., Buchanan County, Hydrologic Unit 07060006, at culvert on State Highway 187, 0.8 mi southwest of Lamont. Drainage area 1.78 mi^2.	1991-	05-17-99	19.93	[d]607	06-11-98	19.95	[d]610
			MAQUOKETA RIVER BASIN					
Sand Creek near Manchester, IA (05416972)	Lat 42°26'57", long 91°28'50", in SE1/4, sec.12, T.88 N., R.6 W., Delaware County, Hydrologic Unit 07060006, at culvert on State Highway 13, 2.7 mi southwest of Manchester. Drainage area 11.0 mi^2.	1991-	05-17-99	>12.00	>930	07-11-93	(+)	(+)
Williams Creek near Charlotte, IA (05418645)	Lat 41°55'55", long 90°31'44", in SE1/4, sec.6, T.82 N., R.4 E., Clinton County, Hydrologic Unit 07060006, at culvert on County Road Y70, 5 mi southwest of Charlotte, 2.1 mi north of County Highway E63. Drainage area 1.77 mi^2.	1990-	07-03-99	10.62	(+)	05-29-96	13.02	(+)
			WAPSIPINICON RIVER BASIN					
Little Wapsipinicon River tributary near Riceville, IA (05420600)	Lat 43°21'31", long 92°29'08", near SW1/4 corner, sec. 27, T.99 N., R.14 W., Howard County, Hydrologic Unit 07080102, at culvert on county highway, 3.5 mi east of Riceville. Drainage area 1.10 mi^2.	1953-	07-21-99	6.96	(+)	07-21-99	6.96	(+)
Little Wapsipinicon River near Oran, IA (05420850)	Lat 42°42'53", long 92°02'29", near NW corner, sec.9, T.91 N., R.10 W., Fayette County, Hydrologic Unit 07080102, at bridge on State Highway 3, 2 mi northeast of Oran. Drainage area 94.1 mi^2.	1966-	05-17-99	94.15	(+)	05-17-99	94.15	(+)
Buck Creek near Oran, IA (05420875)	Lat 42°42'53", long 92°07'33", in NE1/4, sec.10, T.91 N., R.11 W., Bremer County, Hydrologic Unit 07080102, at bridge on State Highway 3, 2.5 mi northwest of Oran. Drainage area 37.9 mi^2.	1966-	05-17-99	91.02	(+)	05-17-99	91.02	(+)

Station name and number	Location and drainage area	Period of record	Water year 1999 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
	WAPSIPINICON RIVER BASIN--continued							
Pine Creek tributary near Winthrop, IA (05421100)	Lat 42°29′17″, long 91°47′10″, in SW1/4, sec.27, T.89 N., R.8 W., Buchanan County, Hydrologic Unit 07080102, at culvert on county road, 2.5 mi northwest of Winthrop. Drainage area 0.33 mi^2.	1953-	07-21-99	5.56	97.2	07-17-68	8.97	334
Wapsipinicon River tributary at Winthrop, IA (05421300) (formerly published as: "Pine Creek trib. no. 2 at Winthrop")	Lat 42°28′06″, long 91°44′33″, at N1/4 corner sec.2, T.88 N., R.8 W., Buchanan County, Hydrologic Unit 07080102, at culvert on State Highway 939, near west city limits of Winthrop. Drainage area 0.70 mi^2.	1953-	07-21-99	5.66	33.2	07-17-68	7.26	570
Silver Creek at Welton, IA (05421890)	Lat 41°54′54″, long 90°36′00″, in NW1/4, sec.15, T.82 N., R.3 E., Clinton County, Hydrologic Unit 07080103, at bridge on U.S. Highway 61, at north edge of Welton. Drainage area 9.03 mi^2.	1966-	10-18-98	86.85	525	05-17-74	89.77	[d]4,820
	IOWA RIVER BASIN							
Westmain drainage ditch 1 & 2 at Britt, IA (05448400) Low-flow site April 1958 to Sept. 1976	Lat 43°06′09″, long 93°47′04″, in SW1/4, sec.27, T.96 N., R.25 W., Hancock County, Hydrologic Unit 07080207, at bridge on U.S. Highway 18, near east city limits of Britt. Drainage area 21.2 mi^2.	1966-	05-05-99	80.60	(+)	04-28-75	83.59	372
East Branch Iowa River above Hayfield, IA (05448600)	Lat 43°09′21″, long 93°41′21″, at S1/4 corner sec.4, T.96 N., R.24 W., Hancock County, Hydrologic Unit 07080207, at bridge on county highway, 1.5 mi southeast of Hayfield. Drainage area 2.23 mi^2.	1953-	1999	(a)	<14.5	04-06-65	7.31	250
Honey Creek tributary near Radcliffe, IA (0545129280)	Lat 42°19′44″, long 93°25′28″, in SW1/4, sec.21, T.87 N., R.22 W., Hardin County, Hydrologic Unit 07080207, at culvert on county road highway S27, 1.1 mi northeast of Radcliffe. Drainage area 3.29 mi^2.	1991-	06-10-99	97.12	(+)	05-10-95	100.14	(+)
Stein Creek near Clutier, IA (05451955)	Lat 42°04′46″, long 92°18′00″, in NE1/4, sec.24, T.84 N., R.13 W., Tama County, Hydrologic Unit 07080208, at bridge on county highway E36, 5 mi east of Clutier. Drainage area 23.4 mi^2.	1971-	06-09-99	71.89	451	06-15-82	77.92	11,400
Price Creek at Amana, IA (05453200)	Lat 41°48′18″, long 91°52′23″, in SE1/4, sec.22, T.81 N., R.9 W., Iowa County, Hydrologic Unit 07080208, at bridge on State Highway 151, near north edge of Amana. Drainage area 29.1 mi^2.	1966-	06-09-99	85.11	1,830	06-17-90	88.80	(+)
North Fork tributary to Mill Creek near Solon, IA (05453430)	Lat 41°50′24″, long 91°30′04″ in NW1/4, sec.12, T.81 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at culvert on State Highway 1, 2 mi north of Solon. Drainage area 0.78 mi^2.	1990-1993, 1994-	06-10-99	13.42	(+)	07-16-92	(+)	(+)
Clear Creek tributary near Williamsburg, IA (05454180)	Lat 41°41′16″, long 91°57′02″, in SE1/4, sec.36, T.80 N., R.10 W., Iowa County, Hydrologic Unit 07080209, at culvert on county road, 4 mi northeast of Williamsburg, 1 mi south of county highway F35. Drainage area 0.37 mi^2.	1990-	04-09-99	45.54	30.2	06-17-90	48.76	291
North English River near Montezuma, IA (05455140)	Lat 41°38′51″, long 92°34′16″, in SW1/4, sec.14, T.79 N., R.15 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on county highway, 5.0 mi northwest of Montezuma. Drainage area 31.0 mi^2.	1972-	1999	(a)	<39.0	07-20-78	28.18	4,640

Station name and number	Location and drainage area	Period of record	Water year 1999 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
IOWA RIVER BASIN--continued								
North English River at Guernsey, IA (05455210)	Lat 41°38'42", long 92°21'28", at NW corner sec.22, T.79 N., R.13 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on State Highway 21, 1 mi southwest of Guernsey. Drainage area 81.5 mi^2.	1960, 1966-	1999	(+)	(+)	06-15-82	87.43	7,460
Deep River at Deep River, IA (05455230)	Lat 41°35'29", long 92°21'18", in SW1/4, sec.3, T.78 N., R.13 W., Poweshiek County, Hydrologic Unit 07080209, at bridge on State Highway 21, 1 mi northeast of Deep River. Drainage area is 30.5 mi^2.	1960, 1966-	06-12-99	76.41	(+)	^{c}05-14-70	83.85	6,200
Bulgers Run near Riverside, IA (05455550)	Lat 41°29'02", long 91°37'36", in SE1/4, sec.11, T.77 N., R.7 W., Washington County, Hydrologic Unit 07080209, at bridge on State Highway 22, 2.5 mi west of Riverside. Drainage area 6.31 mi^2.	1965-	10-17-98	87.09	860	09-21-65	89.04	3,080
Deer Creek near Carpenter, IA (05457440)	Lat 43°24'54", long 92°59'05", in NW1/4 sec.9, T.99 N., R.18 W., Mitchell County, Hydrologic Unit 07080201, at bridge on State Highway 105, 1.5 mi east of Carpenter. Drainage area 91.6 mi^2.	1966-	07-21-99	82.21	2,830	07-18-93	84.65	3,460
Gizzard Creek tributary near Bassett, IA (0545776680)	Lat 43°04'01",long 92°34'31", in SE1/4, sec.2, T.95 N., R.15 W., Floyd County, Hydrologic Unit 07080201, at culvert on U.S. Highway 18, 3.3 mi west of Bassett. Drainage area 3.42 mi^2.	1990-	07-21-99	103	(+)	07-21-99	103	(+)
Spring Creek near Mason City, IA (05459490)	Lat 43°12'48", long 93°12'38", in SE1/4, sec.16, T.97 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, at bridge on U.S. Highway 65, 4 mi north of Mason City. Drainage area 29.3 mi^2.	1966-	07-21-99	91.05	(+)	07-21-99	91.05	(+)
Willow Creek near Mason City, IA (05460100)	Lat 43°08'55", long 93°16'07", near center sec.12, T.96 N., R.21 W., Cerro Gordo County, Hydrologic Unit 07080203, at bridge on U.S. Highway 18, 3.5 mi west of Mason City. Drainage area 78.6 mi^2.	1966-	07-21-99	91.92	1,150	07-21-99	21.92	1,150
Miller Creek near Eagle Center, IA (05464025)	Lat 42°19'22", long 92°20'50", in NW1/4, sec.27, T.87 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, at culvert on State Highway 21, 1.3 mi southeast of Eagle Center. Drainage area is 9.14 mi^2.	1991-	05-17-99	40.47	(+)	06-11-98	47.60	(+)
Prairie Creek tributary near Van Horne, IA (05464535)	Lat 41°59'33", long 92°05'06", in NW1/4, sec.24, T.83 N., R.11 W., Benton County, Hydrologic Unit 07080205, at culvert on County Highway V66, 1.1 mi south of Van Horne. Drainage area is 0.94 mi^2.	1991-	10-18-99	12.01	30.3	05-26-97	18.14	d571
Thunder Creek at Blairstown, IA (05464562)	Lat 41°54'12", long 92°05'03", in NE1/4, sec.23, T.82 N., R.11 W., Benton County, Hydrologic unit 07080205, at culvert on county highway V66, near city limits of Blairstown. Drainage area 0.96 mi^2.	1991-	1999	(+)	(+)	08-16-93	16.12	d540
North Fork Long Creek at Ainsworth, IA (05465150)	Lat 41°16'51", long 91°32'16", Long Creek at in SW1/4, sec.22, T.75 N., R.6 W., Washington County, Hydrologic Unit 07080209, at bridge on U.S. Highway 218, 1 mi southeast of Ainsworth. Drainage area 30.2 mi^2.	1951, 1965-	10-05-98	91.10	(+)	05-10-96	93.40	(+)

Station name and number	Location and drainage area	Period of record	Water year 1999 maximum: Date	Gage height (ft)	Discharge (ft^3/s)	Period of record maximum: Date	Gage height (ft)	Discharge (ft^3/s)
	IOWA RIVER BASIN--continued							
Haight Creek at Kingston, IA (05469350)	Lat 40°58'14", long 91°02'30", in NW1/4, sec.12, T.71 N., R.2 W., Des Moines County, Hydrologic Unit 07080104, at culvert on State Highway 99, 0.5 mi south of Kingston. Drainage area 2.67 mi^2.	1990-	10-18-98	12.23	(+)	06-16-90	15.18	(+)
	SKUNK RIVER BASIN							
Mud Lake drainage ditch 71, at Jewell, IA (05469860)	Lat 42°18'52", long 93°38'23", in SW1/4, sec.27, T.87 N., R.24 W., Hamilton County, Hydrologic Unit 07080105, at bridge on U.S. Highway 69, in Jewell. Drainage area 65.4 mi^2.	1966-	06-10-99	87.51	1,060	07-09-93	91.32	3,700
Long Dick Creek near Ellsworth, IA (05469970)	Lat 42°18'37", long 93°32'06", in NW1/4, sec.33, T.87 N., R.23 W., Hamilton County, Hydrologic Unit 07080105, at culvert on State Highway 175, 2.2 mi east of Ellsworth. Drainage area 6.08 mi^2.	1991-	06-10-99	93.19	(+)	08-17-93	94.73	(+)
Keigley Branch near Story City, IA (05469990)	Lat 42°09'01", long 93°37'13", in NW1/4, sec.26, T.85 N., R.24 W., Story County, Hydrologic Unit 07080105, at bridge on U.S. Highway 69, 3 mi south of Story City. Drainage area 31.0 mi^2.	1966-	1999	(a)	<228	06-17-96	92.26	d3,440
Snipe Creek tributary at Melbourne, IA (0547209280)	Lat 41°56'08", long 93°05'08", in SE1/4, sec.5, T.82 N., R.19 W., Marshall County, Hydrologic Unit 07080106, at culvert on county highway E63, 0.5 mi east of Melbourne. Drainage area 1.61 mi^2.	1990-	05-12-99	13.55	(+)	06-17-90	17.39	d492
Middle Creek near Lacey, IA (05472390)	Lat 41°25'17", long 92°23'04", at N1/4 corner sec.1, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080106, at bridge on U.S. Highway 63, 1.5 mi northwest of Lacey. Drainage area 23.0 mi^2.	1966-	10-17-98	87.19	1,300	04-24-76	90.06	9,650
Skunk River tributary near Richland, IA (05472555)	Lat 41°15'50", long 91°57'52", in NE1/4, sec.35, T.75 N., R.10 W., Keokuk County, Hydrologic Unit 07080107, at culvert on county highway W15, 4.9 mi north of Richland, 5.1 mi south of State Highway 92. Drainage area 0.19 mi^2.	1990-	1999	14.57	(+)	06-15-98	15.62	(+)
	DES MOINES RIVER BASIN							
Drainage Ditch 97 tributary near Britt, IA (0548065350)	Lat 43°06'42", long 93°54'22", in SW1/4, sec.22, T.96 N., R.26 W., Hancock County, Hydrologic Unit 07100005, at culvert on county road, 5.4 mi northwest of Britt. Drainage area 0.94 mi^2. (Revised)	1991-	05-18-99	93.07	(+)	07-09-93	94.53	(+)
White Fox Creek at Clarion, IA (05480930)	Lat 42°43'55", long 93°42'26", in NW1/4, sec.5, T.91 N., R.24 W., Wright County, Hydrologic Unit 07100005, at bridge on State Highway 3, 1.5 mi east of Clarion. Drainage area 13.3 mi^2.	1966-	05-18-99	90.12	346	06-29-95	92.91	e1,700
Brewers Creek tributary near Webster City, IA (05480993)	Lat 42°26'57", long 93°51'59", in NW1/4, sec.10, T.88 N., R.26, W., Hamilton County, Hydrologic Unit 07100005, at culvert on U.S. Highway 20, 2.5 mi southwest of Webster City. Drainage area 1.58 mi^2.	1990-	06-09-99	97.69	(+)	06-04-91	99.25	(+)

Station name and number	Location and drainage area	Period of record	Water year 1999 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
DES MOINES RIVER BASIN--continued								
Bluff Creek at Pilot Mound, IA (05481510)	Lat 42°09'59", long 94°01'11", in NW1/4, sec.20 T.85 N., R.27 W., Boone County, Hydrologic Unit 07100004, at bridge on county road E18 at northwest edge of Pilot Mound. Drainage area 23.5 mi^2. (Revised)	1966-	06-12-99	85.71	596	07-09-93	89.25	1,450
Peas Creek Tributary at Boone, IA (05481528)	Lat 42°02'06", long 93°51'13", in SW1/4, sec.35, T.84 N., R.26 W., Boone County, Hydrologic Unit 07100004, at culvert on Corporal Rodger Snedden Drive, at intersection with U.S. Highway 30, at the south edge of Boone city limits. Drainage area 0.30 mi^2.	1990-	06-10-99	91.16	(+)	06-17-96	94.59	(+)
Peas Creek at Boone, IA (05481530)	Lat 42°02'04", long 93°51'25", in SE1/4, sec.34, T.84 N., R.26 W., Boone County, Hydrologic Unit 07100004, at culvert on U.S. Highway 30, at the southeast side of Boone city limits. Drainage area 1.69 mi^2.	1990-	06-10-99	(a)	(+)	06-15-98	103.05	(+)
Hardin Creek near Farlin, IA (05482900)	Lat 42°05'34, long 94°25'39", in NE1/4 NW1/4 NW1/4, sec. 14, T.84 N., R.31 W., Greene County, Hydrologic Unit 07100006, at bridge on county highway, 1.5 mi northeast of Farlin. Drainage area 101 mi^2.	1951-	05-24-99	10.09	821	07-09-93	13.97	3,010
Brushy Creek near Templeton, IA (05483318)	Lat 41°56'45", long 94°52'45", in SW1/4 NW 1/4 NW 1/4, sec.1, T.82 N., R.35 W., Carroll County, Hydrologic Unit 07100007, at bridge on U.S. Highway 71, 4 mi northeast of Templeton. Drainage area 45.0 mi^2.	1966-	07-09-99	76.08	(+)	07-09-93	93.48	19,000
Middle Raccoon River tributary at Carroll, IA (05483349)	Lat 42°02'30", long 94°52'43", in NW1/4 NW1/4 SW1/4, sec. 36, T. 84 N,.R.35 W., Carroll County Hydrologic Unit 07100007, at bridge on U.S. Highway 71, 1.1 mi south of Carroll. Drainage area 6.58 mi^2.	1966-	07-03-99	23.55	1,040	06-17-96	25.88	4,600
Cedar Creek tributary No. 2 near Winterset, IA (05485940)	Lat 41°19'49", long 94°03'05", in SW1/4, sec.35, T.76 N., R.28 W., Madison County, Hydrologic Unit 07100008, at culvert on State Highway 92, 0.5 mi west of U.S. Highway 169, 1 mi west of Winterset. Drainage area 1.02 mi^2.	1990-	05-16-99	93.66	(+)	05-24-96	98.58	(e)
Bush Branch Creek near Stanzel, IA (05486230)	Lat 41°18'57", long 94°16'42", in SW1/4, sec.2, T.75 N., R.30 W., Adair County, Hydrologic Unit 07100008, at culvert on State Highway 92, 1 mi west of Stanzel. Drainage area is 3.02 mi^2.	1990-	05-21-99	88.43	(+)	09-15-92	97.06	(+)
Little White Breast Creek tributary near Chariton, IA (05487825)	Lat 41°03'36", long 93°18'12", in SW1/4, sec. 5, T.72 N., R.21 W., Lucas County, Hydrologic Unit 07100008, at culvert on State Highway 14, 2.0 mi north of Chariton. Drainage area 0.05 mi^2.	1990-	10-18-99	17.66	26.1	08-19-93	18.93	d56.2
South Avery Creek near Blakesburg, IA (05489350)	Lat 41°00'59", long 92°37'32", in SE1/4, sec.19, T.72 N., R.15 W., Wapello County, Hydrologic Unit 07100009, at bridge on U.S. Highway 34, 3.5 mi north of Blakesburg. Drainage area 33.1 mi^2.	1965-	04-28-99	84.90	5,560	07-03-82	90.20	(+)

Station name and number	Location and drainage area	Period of record	Water year 1999 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			DES MOINES RIVER BASIN--continued					
Bear Creek at Ottumwa, IA (05489490)	Lat 41°00'52", long 92°27'44", in NW1/4, sec.27, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, at bridge on U.S. Highway 34, near west edge of Ottumwa. Drainage area 22.9 mi^2.	1965-	10-05-98	89.84	2,840	09-21-65	92.80	4,000

The following water temperature and specific conductance measurements were made at the indicated sites during water year 1999.

05388250 Upper Iowa River near Dorchester, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
OCT 01...	1100	338	13.2	550	APR 21...	1100	1290	9.4	578
NOV 02...	1115	639	8.9	588	JUN 03...	0950	939	16.1	583
DEC 15...	0825	376	2.0	603	JUL 14...	1000	452	22.4	506
MAR 16...	1035	455	5.8	570	AUG 25...	1031	1770	18.2	462

05389400 Bloody Run Creek near Marquette, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
NOV 03...	1645	23	8.2	664	APR 20...	1537	25	9.3	619
DEC 15...	1300	20	6.2	671	JUN 03...	1330	40	15.3	627
FEB 03...	1410	20	5.8	647	JUL 14...	1315	27	19.0	630
MAR 16...	1540	20	10.7	633	AUG 26...	0735	30	14.9	656

05389500 Mississippi River at McGregor, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
NOV 03...	1345	47500	--	--	JUN 02...	1320	111000	20.7	421
MAR 17...	1120	37700	7.9	418	JUL 13...	1240	51600	25.5	474
APR 20...	1440	98400	10.0	431	AUG 24...	1335	52900	--	--

05411400 Sny Magill Creek near Clayton, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
NOV 02...	1505	19	9.3	641	APR 21...	1450	25	11.4	611
DEC 17...	1010	17	2.7	624	JUN 03...	1625	34	15.7	590
FEB 03...	1255	16	4.5	637	JUL 13...	1810	26	18.9	614
MAR 15...	1630	17	7.0	618	AUG 24...	1632	29	17.0	644

05412100 Roberts Creek above Saint Olaf, IA (RC-2)

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
NOV 04...	0800	16	4.8	715	MAY 17...	1715	805	14.6	398
DEC 15...	1028	9.9	.5	709	JUN 02...	1440	72	18.7	655
FEB 04...	1105	11	.1	658	JUL 13...	1650	5.7	26.6	622
MAR 16...	1450	22	3.8	582	AUG 24...	1440	127	18.9	456
APR 06...	0930	31	9.4	668	SEP 29...	1130	3.7	20.0	680
20...	1635	34	10.1	659					

05412500 Turkey River at Garber, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
NOV 04...	0945	1420	6.2	628	MAY 17...	1910	47500	--	--
DEC 17...	1301	779	2.4	630	19...	1604	7700	15.4	525
FEB 05...	0950	688	.0	593	JUN 01...	1705	2220	18.4	603
MAR 15...	1412	803	7.0	603	JUL 12...	1600	938	24.6	510
APR 19...	1630	1880	10.5	596	AUG 23...	1610	1530	19.4	550

05418400 North Fork Maquoketa River near Fulton, 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				
30...	1320	441	13.1	677
DEC				
11...	1110	269	1.3	682
FEB				
05...	1305	679	.4	486
25...	1026	347	1.3	581
MAR				
18...	1250	503	8.0	617
APR				
22...	1230	845	11.0	600
23...	1350	4250	8.8	287
MAY				
18...	1055	10600	16.9	243
18...	1535	5210	18.9	538
JUN				
01...	1052	587	19.1	654
JUL				
15...	0920	347	21.8	665
AUG				
26...	1245	384	22.5	609
SEP				
23...	1116	260	13.2	644

05418500 Maquoketa River near Maquoketa, 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				
19...	1345	4930	13.0	452
19...	1452	4930	13.0	452
NOV				
17...	1440	1100	7.5	632
JAN				
22...	0850	196	.4	506
FEB				
25...	1157	1160	1.3	615
MAR				
23...	1445	1020	9.1	608
APR				
06...	1215	1510	11.4	580
12...	1520	3010	9.5	527
MAY				
10...	1518	1590	17.3	606
18...	1340	14000	17.0	238
JUN				
16...	1410	2650	19.2	546
JUL				
08...	1550	1220	25.8	597
AUG				
17...	1015	901	20.9	608
SEP				
08...	1600	795	23.0	596

05420460 Beaver Slough at 3rd St at Clinton, 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				
19...	0940	9970	13.1	436
NOV				
17...	1025	12500	5.8	471
MAR				
23...	1140	14000	7.6	420
APR				
12...	1115	23700	9.6	406
MAY				
10...	1000	16700	16.2	479
AUG				
17...	1430	12200	23.7	376
SEP				
08...	1015	10500	24.0	365

05420500 Mississippi River at Clinton, 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				
20...	1130	49800	12.6	420
20...	1140	--	--	--
NOV				
18...	0915	53400	4.9	445
18...	0925	--	--	--
FEB				
18...	1115	52300	.7	444
MAR				
18...	1200	--	--	--
23...	1455	56900	10.2	434
24...	1215	55800	6.6	407
24...	1225	--	--	--
APR				
12...	1345	103000	9.8	411
19...	1115	118000	10.8	379
19...	1125	--	--	--
28...	1100	116000	11.6	407
28...	1110	--	--	--
MAY				
11...	0900	70300	16.1	470
11...	0910	--	--	--
21...	1045	136000	17.9	390
21...	1055	--	--	--
JUN				
16...	1125	78500	24.0	457
17...	0835	78400	21.1	457
17...	0845	--	--	--
JUL				
08...	1320	60900	29.0	477
09...	0840	63300	26.2	474
09...	0843	63300	--	--
09...	0850	--	--	--
20...	1300	68000	26.7	427
20...	1310	--	--	--
AUG				
17...	1315	49200	24.5	382
18...	0830	50500	23.4	377
18...	0840	--	--	--
30...	1200	--	--	--
30...	1300	--	--	--
SEP				
08...	1130	43300	24.4	369
09...	0850	40500	22.0	371
09...	0900	--	--	--

05421000 Wapsipinicon River at Independence, 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...	--	167	16.3	459
30...	0910	1460	13.3	495
DEC				
17...	1045	420	2.2	481
MAR				
15...	0945	451	5.1	473
APR				
19...	0750	1520	9.5	460
MAY				
20...	1215	10700	17.6	293
JUN				
04...	1350	2100	--	--
JUL				
12...	0935	588	23.4	467
AUG				
23...	0900	606	20.8	382

05422000 Wapsipinicon River near De Witt, 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				
27...	1310	3410	13.5	436
DEC				
01...	1415	1690	9.5	545
MAR				
02...	1425	1740	4.3	518
APR				
12...	1515	3980	9.8	475
MAY				
25...	1235	18000	16.6	290
JUN				
28...	1450	1960	26.1	411
AUG				
16...	1445	1530	23.1	423
SEP				
30...	1105	636	14.7	449

05422470 Crow Creek at Bettendorf, 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...	0805	23	14.1	629
DEC				
02...	0800	11	8.1	765
FEB				
01...	1040	26	3.4	764
MAR				
03...	0740	13	1.3	783
APR				
13...	0805	21	7.6	741
MAY				
26...	1340	16	17.4	690
JUN				
29...	0740	9.7	17.9	723
AUG				
17...	0745	1.5	21.2	720
SEP				
28...	1325	110	13.3	241

05422560 Duck Creek at 110th Ave at Davenport, 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				
27...	0855	20	14.1	694
DEC				
01...	0900	11	7.4	679
FEB				
01...	1400	22	5.0	629
MAR				
02...	0925	11	4.6	651
APR				
12...	0945	13	6.8	646
MAY				
26...	1010	13	12.3	665
JUN				
28...	0935	13	17.4	655
AUG				
16...	0830	1.9	18.6	667
SEP				
28...	0920	41	13.0	279

05422600 Duck Creek at DC Golf Course at Davenport, 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				
27...	1110	53	15.1	747
DEC				
01...	1055	33	8.5	703
FEB				
01...	1210	78	3.9	792
MAR				
02...	1120	43	4.9	768
APR				
12...	1145	49	8.2	765
MAY				
26...	1155	36	15.8	720
JUN				
28...	1130	32	22.0	702
AUG				
16...	1035	4.4	20.8	682
SEP				
28...	1130	526	14.2	202

05449500 Iowa River near Rowan, 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				
22...	1505	152	9.9	758
DEC				
03...	0900	133	7.4	753
FEB				
04...	1155	60	2.0	709
MAR				
18...	1340	609	3.7	560
MAY				
06...	1420	476	11.9	654
13...	1210	1700	--	--
JUN				
17...	1320	926	14.8	635
JUL				
27...	0900	678	29.1	479
SEP				
07...	1200	60	19.1	604

05451210 South Fork Iowa River NE of New Providence, 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				
27...	1404	89	16.3	687
JAN				
14...	1045	21	.1	692
14...	1046	21	--	--
FEB				
10...	1040	328	.1	572
10...	1041	328	--	--
MAR				
03...	1015	87	.1	701
03...	1016	87	--	--
03...	1025	--	--	--
APR				
08...	1000	261	10.0	722
08...	1001	261	--	--
08...	1005	--	--	--
08...	1006	261	--	--
MAY				
05...	1020	270	14.4	690
05...	1021	270	--	--
JUN				
03...	1223	318	17.1	692
03...	1224	318	--	--
JUL				
07...	1053	196	22.4	714
07...	1054	196	--	--
AUG				
04...	1013	22	24.1	533
04...	1014	22	--	--
SEP				
02...	1014	6.3	22.2	545
02...	1015	6.3	--	--

05451500 Iowa River at Marshalltown, 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					MAY				
28...	0825	739	14.1	692	11...	1005	1730	16.7	667
DEC					17...	1255	5910	14.6	568
16...	0825	460	1.5	688	JUN				
FEB					22...	0945	2340	20.4	660
10...	1130	1480	1.9	590	AUG				
MAR					04...	0950	877	23.9	631
17...	0750	858	7.4	672	SEP				
					15...	1055	177	14.9	563

05451700 Timber Creek near Marshalltown, 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...	1115	50	14.2	612	11...	1110	631	17.0	432
DEC					22...	1250	137	19.9	566
15...	1515	37	3.0	613	AUG				
FEB					04...	0835	31	20.5	594
09...	0815	109	1.2	472	SEP				
MAR					15...	0910	12	10.8	611
17...	1040	93	7.9	518					
MAY									
11...	0830	105	16.5	568					

05451900 Richland Creek near Haven, 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					MAY				
26...	1205	36	14.0	530	27...	1300	85	15.5	515
NOV					JUL				
30...	1155	30	10.8	529	06...	1430	39	24.3	511
JAN					AUG				
22...	1225	22	.0	482	18...	1440	18	20.7	461
MAR					SEP				
01...	1340	27	6.0	509	27...	1135	6.9	13.1	500
APR									
14...	1555	45	13.2	494					

05452000 Salt Creek near Elberon, 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					MAY				
26...	1410	156	13.7	609	27...	1130	259	15.0	568
NOV					JUN				
30...	1355	118	12.1	593	09...	1230	1460	19.0	174
JAN					JUL				
22...	1325	81	.0	556	06...	1115	148	24.2	560
MAR					AUG				
01...	1515	93	5.1	576	19...	1010	45	20.4	559
APR					SEP				
14...	1420	164	10.8	570	27...	1300	25	14.2	528

05452200 Walnut Creek near Hartwick, 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					APR				
26...	1025	47	12.6	526	14...	1710	54	14.3	218
NOV					MAY				
30...	1020	40	10.8	516	27...	1440	97	18.4	504
JAN					JUL				
22...	1110	27	.0	342	06...	1550	41	29.1	507
FEB					AUG				
17...	1135	48	1.6	485	18...	1320	26	21.8	346
MAR					SEP				
01...	1035	37	2.6	492	27...	1120	6.4	13.4	445

05453000 Big Bear Creek at Ladora, 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					MAY				
26...	0845	104	11.8	549	27...	1620	225	19.0	506
NOV					JUN				
30...	0835	96	12.3	537	09...	1045	2950	18.9	202
JAN					JUL				
22...	1000	60	.0	519	07...	1130	112	22.5	518
MAR					AUG				
01...	0900	169	1.8	480	18...	1040	32	20.9	515
APR					SEP				
15...	0900	148	10.4	506	27...	0850	13	14.1	568
23...	1515	869	8.6	422					

05453100 Iowa River at Marengo, 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					MAY				
29...	1015	1920	14.5	636	21...	1220	8160	18.9	492
DEC					JUL				
03...	1015	1390	9.7	645	07...	1330	3920	25.0	501
MAR					AUG				
04...	1150	1580	2.9	643	19...	1340	937	23.7	586
APR					SEP				
08...	1000	1400	13.4	578	29...	0955	377	13.2	581
14...	1145	5260	10.3	629					

05453520 Iowa River below Coralville Dam nr Coralville,

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					MAR				
05...	1418	1630	18.5	496	01...	1110	--	1.8	601
NOV					04...	1107	1790	2.9	575
17...	1507	2560	5.1	600	24...	1500	2100	9.0	575
DEC					MAY				
21...	1140	--	2.4	598	03...	1545	5730	17.8	582
					JUN				
					15...	1410	5990	24.1	537

05454000 Rapid Creek near Iowa 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)	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					MAY				
19...	1400	84	13.5	542	19...	1220	38	14.1	569
NOV					JUN				
30...	1425	17	12.0	588	22...	1325	23	21.1	571
JAN					AUG				
11...	1430	6.6	.0	550	09...	1420	2.4	21.0	549
FEB					SEP				
25...	1425	15	.1	435	20...	1400	.06	16.9	573
APR									
05...	1450	27	9.6	27					

05454220 Clear Creek near Oxford, 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					MAY				
18...	1300	1100	13.7	357	19...	1440	121	15.0	523
19...	1200	249	12.6	531	JUN				
NOV					22...	1025	40	20.5	567
30...	1150	42	12.5	558	AUG				
FEB					09...	1150	3.7	21.4	603
25...	1145	30	1.6	534	SEP				
APR					20...	1240	.82	16.7	795
05...	1305	68	9.1	536					

05454300 Clear Creek near Coralville, 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					FEB				
18...	1015	1340	15.0	272	25...	0955	56	.6	565
19...	0950	471	12.7	522	MAR				
NOV					10...	0920	59	.2	578
30...	1000	72	12.5	569	APR				
DEC					06...	1300	128	10.7	541
21...	1154	39	.0	545	MAY				
28...	1124	45	.1	609	20...	1205	157	16.2	529
JAN					JUN				
07...	1046	35	.0	582	22...	0900	64	20.3	557
11...	1045	34	.0	242	AUG				
19...	1335	36	.0	576	09...	1000	10	19.3	647
21...	1355	43	.0	627	SEP				
25...	0905	107	.0	230	20...	1130	3.3	14.9	729

05454500 Iowa River at Iowa 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)	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					MAY				
21...	1335	6170	14.5	466	20...	1020	5780	18.8	487
DEC					JUN				
01...	1110	1640	7.0	638	23...	1145	6390	22.8	457
JAN					AUG				
12...	1145	790	.0	680	10...	1120	1250	26.8	591
FEB					SEP				
26...	1055	2100	1.7	595	07...	1508	334	24.7	555
APR					23...	1220	308	19.7	534
06...	1525	1680	14.4	592					

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
05455100 Old Mans Creek near Iowa City, IA				
OCT				
08...	1455	348	14.3	475
19...	1050	1890	12.5	336
NOV				
19...	1400	194	7.4	505
JAN				
07...	1030	61	.0	527
FEB				
18...	0935	150	2.4	485
APR				
01...	1435	117	14.6	488
MAY				
11...	0830	175	16.5	488
AUG				
02...	0935	22	22.2	512
SEP				
03...	1410	76	23.4	515
15...	1515	5.5	18.0	594
05455500 English River at Kalona, IA				
OCT				
08...	1310	893	13.6	380
NOV				
19...	1215	418	6.4	451
JAN				
06...	1650	132	.0	467
FEB				
10...	1400	564	4.8	384
APR				
01...	1255	285	14.7	442
MAY				
14...	1245	2390	12.8	366
JUN				
23...	1700	670	22.4	361
AUG				
02...	1145	60	23.7	448
SEP				
16...	1420	20	16.5	496
05455700 Iowa River near Lone Tree, IA				
OCT				
28...	1505	4340	14.0	503
DEC				
02...	1420	2410	8.7	608
FEB				
02...	1435	2750	3.6	544
MAR				
03...	1505	3000	--	--
APR				
15...	1310	6410	11.0	524
MAY				
28...	1040	7030	20.1	506
JUN				
29...	1525	7180	23.7	468
AUG				
17...	1535	1400	27.7	604
SEP				
23...	1140	383	17.4	584
05458000 Little Cedar River near Ionia, IA				
OCT				
21...	1235	141	10.1	535
21...	1400	141	10.1	535
DEC				
02...	0835	121	5.9	540
FEB				
03...	1050	64	.0	506
MAR				
17...	0930	305	4.4	340
MAY				
05...	0845	293	15.3	478
JUN				
16...	0915	360	13.9	507
JUL				
19...	1325	2370	21.5	165
20...	1300	2160	22.6	274
21...	1130	11200	21.7	136
21...	1220	11000	21.7	136
21...	1310	10900	21.7	136
22...	1445	9830	23.9	171
28...	0905	757	21.9	461
SEP				
08...	1535	106	21.4	426
05458500 Cedar River at Janesville, IA				
OCT				
20...	1045	1810	10.2	568
20...	1150	1810	10.2	568
DEC				
01...	1200	937	6.8	601
FEB				
02...	1150	454	.7	579
MAR				
16...	1050	833	5.6	572
MAY				
04...	1200	2250	16.1	546
17...	1710	20900	--	--
JUN				
15...	1325	3320	17.4	524
JUL				
22...	0905	37800	26.0	131
23...	1015	35100	24.1	191
27...	1355	6530	26.5	438
SEP				
09...	1515	860	19.0	464
05458900 West Fork Cedar River at Finchford, IA				
OCT				
19...	1630	2070	12.4	533
NOV				
30...	1430	645	9.3	626
FEB				
02...	1450	270	1.1	482
MAR				
15...	1415	419	6.4	604
MAY				
03...	1445	1340	18.6	572
17...	1833	15100	15.9	239
JUN				
14...	1520	3930	20.5	485
JUL				
23...	0900	2770	26.9	411
26...	1615	1560	27.9	484
SEP				
09...	1144	251	17.7	505

05459500 Winnebago River at Mason 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				
22...	0850	415	7.2	785
DEC				
02...	1400	259	7.9	756
FEB				
04...	0835	108	.0	433
MAR				
18...	0840	664	2.1	557
MAY				
06...	0930	844	12.1	664
13...	0830	3250	10.1	441
JUN				
17...	0835	1290	15.1	585
JUL				
21...	1450	5860	23.4	276
22...	1425	3280	24.6	402
29...	0945	1270	25.9	561
SEP				
08...	0855	237	19.0	543

05462000 Shell Rock River at Shell Rock, 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				
20...	1525	1500	10.7	658
DEC				
01...	1500	1000	7.8	657
FEB				
03...	0830	448	1.4	606
MAR				
16...	0820	939	4.1	660
MAY				
04...	1511	2490	16.3	572
17...	1015	17900	--	--
JUN				
15...	1630	4870	17.9	521
JUL				
22...	0800	25000	23.3	195
22...	1900	28000	24.7	207
27...	1715	5520	26.4	477
SEP				
09...	0855	868	16.9	503

05463000 Beaver Creek at New Hartford, 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				
19...	1305	1660	11.8	422
NOV				
30...	1120	177	6.8	812
FEB				
01...	1420	100	.0	632
MAR				
15...	1130	166	4.8	579
MAY				
03...	1125	412	15.5	585
17...	1310	8020	16.4	248
17...	1502	9210	--	--
JUN				
14...	1145	1280	16.8	444
JUL				
26...	1340	516	27.4	528
SEP				
10...	1240	91	17.5	590

05464000 Cedar River at Waterloo, 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				
20...	0820	6780	10.5	542
20...	0825	6780	10.5	542
26...	1150	3830	13.4	643
DEC				
01...	0810	3220	7.0	637
FEB				
02...	0830	1910	.0	669
MAR				
16...	1325	2970	7.6	599
MAY				
04...	0830	7480	16.2	576
18...	0750	57000	15.3	257
JUN				
15...	0830	17100	18.3	480
JUL				
23...	1500	68800	25.0	197
24...	0915	59100	24.9	236
27...	0950	16000	25.6	459
SEP				
10...	0915	2740	16.3	498

05464500 Cedar River at Cedar Rapids, 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				
05...	0810	3540	14.4	443
NOV				
17...	1130	6890	5.0	619
DEC				
21...	1034	1540	.0	616
MAR				
01...	1020	4050	3.1	616
22...	1240	4960	7.3	540
MAY				
03...	1215	11400	16.8	576
20...	1700	52500	17.5	321
JUN				
15...	1100	27400	20.5	447
SEP				
07...	1116	4180	23.3	431

05465000 Cedar River near Conesville, 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...	1225	7340	14.3	638
DEC				
02...	1155	5300	9.6	661
FEB				
02...	1230	4250	2.0	522
MAR				
03...	1210	5420	4.3	443
APR				
13...	1340	15200	10.3	545
MAY				
24...	1550	42000	18.6	437
JUN				
29...	1225	11700	24.0	558
JUL				
28...	1120	56500	27.7	305
AUG				
17...	1240	5880	24.5	579
SEP				
29...	1415	2810	18.0	500

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)

05465500 Iowa River at Wapello, 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				
05...	1115	6670	14.8	500
06...	0922	--	15.2	392
06...	0923	19400	--	--
NOV				
09...	0933	11300	5.8	594
09...	0934	11300	--	--
09...	0938	--	--	--
09...	0939	11300	--	--
23...	1310	10400	6.1	610
DEC				
01...	0900	--	8.9	609
01...	0901	8800	--	--
JAN				
13...	0920	--	.1	674
13...	0921	8370	--	--
FEB				
08...	1130	9240	3.6	552
09...	0927	--	3.6	547
09...	0928	9130	--	--
MAR				
02...	0905	--	4.4	593
02...	0906	9180	--	--
29...	1315	8120	11.4	577
APR				
07...	0925	--	12.4	502
07...	0926	8530	--	--
MAY				
04...	0905	--	17.0	569
04...	0906	25600	--	--
11...	1310	16000	17.8	568
JUN				
07...	0924	--	21.6	527
07...	0925	23900	--	--
21...	1345	25200	22.7	529
JUL				
06...	0932	--	25.9	400
06...	0933	24000	--	--
06...	0937	--	--	--
06...	0938	24000	--	--
21...	1300	13800	29.1	560
28...	1225	53600	28.0	269
AUG				
03...	0930	--	26.0	515
03...	0931	23600	--	--
31...	0945	12300	25.0	507
SEP				
01...	0917	--	22.3	502
01...	0918	6220	--	--
16...	1115	3880	17.7	471

05470000 South Skunk River near Ames, 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				
27...	1040	72	15.1	725
FEB				
08...	1050	178	.0	652
APR				
06...	1250	520	8.9	716
MAY				
10...	1045	300	14.2	741
JUN				
11...	1050	3440	19.0	353
21...	1240	356	21.1	726
AUG				
03...	1210	36	24.1	658
SEP				
13...	1110	5.5	17.2	715

05470500 Squaw Creek at Ames, 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				
27...	0750	71	15.9	528
DEC				
16...	1310	28	3.6	523
FEB				
08...	1305	141	.2	639
MAR				
16...	1240	133	7.4	718
APR				
22...	1215	2240	9.3	401
MAY				
10...	1240	223	15.8	722
JUN				
11...	1000	2800	26.3	375
21...	1440	231	20.9	710
AUG				
03...	1355	35	24.6	673
SEP				
13...	1230	7.7	15.2	750

05471000 South Skunk River below Squaw Creek near Ames, 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				
27...	1410	130	17.9	475
DEC				
16...	1125	74	3.4	723
16...	1505	52	2.9	758
FEB				
08...	1430	319	.5	636
MAR				
16...	1500	307	9.0	722
MAY				
10...	1455	537	17.4	724
JUN				
22...	0635	606	20.3	718
AUG				
03...	1625	71	28.0	674
SEP				
13...	1555	14	15.8	761

05471040 Squaw Creek near Colfax, 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...	1130	7.3	16.0	577
DEC				
10...	1200	7.2	2.8	606
JAN				
21...	1235	4.0	.5	552
MAR				
03...	0945	8.0	.0	609
APR				
13...	1250	11	11.0	554
16...	1330	34	4.5	530
MAY				
25...	1020	30	11.5	539
JUN				
29...	0935	16	14.5	549
AUG				
17...	1400	7.5	23.5	554

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)
05471050 South Skunk River at Colfax, IA									
OCT 28...	1540	207	15.9	716	MAY 11...	1520	856	18.0	702
DEC 14...	1215	161	3.0	721	JUN 23...	1300	1100	21.6	684
FEB 09...	1150	459	4.1	658	AUG 04...	1525	176	26.4	683
MAR 17...	1505	483	11.9	724	SEP 15...	1000	84	13.0	613
05471200 Indian Creek near Mingo, IA									
OCT 28...	1345	101	15.9	736	MAY 11...	1325	249	17.9	545
DEC 15...	1300	55	2.8	736	JUN 22...	1525	262	22.6	690
FEB 09...	1030	189	.8	626	AUG 04...	1350	35	29.1	643
MAR 17...	1255	158	11.2	674	SEP 15...	1225	8.2	20.0	606
05471500 South Skunk River near Oskaloosa, IA									
NOV 12...	0745	1140	5.4	602	APR 26...	1250	4420	11.8	610
DEC 11...	1200	404	2.9	643	JUN 07...	1313	2920	23.2	564
FEB 01...	1220	339	.0	615	JUL 19...	1115	972	27.6	553
MAR 18...	1145	1130	8.4	618	SEP 01...	1500	267	24.7	490
05472500 North Skunk River near Sigourney, IA									
NOV 09...	1000	650	5.6	438	APR 22...	1330	974	12.7	432
DEC 11...	0910	320	1.6	482	26...	1000	1460	12.0	441
FEB 01...	0905	312	.1	445	JUN 07...	0944	1040	21.3	422
MAR 15...	0845	403	3.0	475	JUL 19...	0750	220	27.3	534
					AUG 30...	0835	43	22.8	528
05473400 Cedar Creek near Oakland Mills, IA									
OCT 08...	0940	5380	14.2	232	MAY 12...	1515	301	18.7	497
NOV 16...	1405	360	7.7	505	JUN 23...	1220	177	23.5	532
JAN 05...	1040	75	.0	--	AUG 04...	1150	9.7	26.0	600
FEB 10...	0930	319	4.9	492	SEP 03...	1005	180	22.5	358
MAR 30...	1500	166	14.1	537	13...	1015	4.9	17.0	813
05473450 Big Creek near Mt. Pleasant, IA									
OCT 07...	1515	57	14.8	551	MAY 12...	1715	32	18.0	548
NOV 19...	0915	40	7.2	584	JUN 21...	1745	18	24.0	546
JAN 05...	1330	8.4	.0	--	AUG 04...	1355	.47	26.6	596
FEB 08...	1405	61	6.5	542	SEP 13...	0900	.29	15.6	761
APR 01...	1055	19	14.1	560					

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)
05474000 Skunk River at Augusta, IA									
OCT					MAY				
06...	1030	15200	15.1	270	12...	1120	3990	18.2	557
NOV					JUN				
24...	1115	2110	6.4	593	22...	0950	4330	22.3	577
JAN					AUG				
04...	1230	690	.0	--	03...	0925	751	25.8	499
FEB					SEP				
09...	0945	3190	3.6	482	15...	1030	349	18.5	533
MAR									
30...	1150	1920	12.2	563					
05474500 Mississippi River at Keokuk, IA									
MAR					JUL				
19...	1345	85300	6.9	649	22...	0700	85900	29.1	482
MAY					SEP				
28...	1220	232000	19.6	446	07...	1330	62500	26.5	407
05476750 Des Moines River at Humboldt, IA									
OCT					MAY				
28...	1220	761	14.5	775	25...	0920	2960	15.6	784
DEC					JUL				
08...	1235	1170	3.0	937	06...	0950	2430	24.9	740
JAN					AUG				
20...	1125	286	.5	1010	18...	1420	303	24.7	641
MAR					SEP				
04...	1015	955	.0	809	30...	0825	107	13.0	724
APR									
12...	0920	3890	7.2	763					
05479000 East Fork Des Moines River at Dakota City, IA									
OCT					MAY				
28...	1440	393	14.6	753	25...	1105	2780	16.4	685
DEC					JUN				
08...	1035	409	3.2	802	11...	1330	5880	24.5	396
JAN					JUL				
20...	1015	115	.0	1000	06...	1120	2160	25.3	643
MAR					AUG				
04...	0830	611	.0	706	19...	0755	153	21.5	653
APR					SEP				
12...	1135	3760	7.9	690	30...	1005	36	12.6	725
05480500 Des Moines River at Fort Dodge, IA									
OCT					APR				
28...	0840	1050	12.9	505	14...	1010	8460	9.6	713
DEC					MAY				
09...	1215	1750	.6	818	25...	1450	6870	16.3	697
JAN					JUL				
20...	1310	465	.0	871	08...	1210	4660	24.6	701
MAR					AUG				
04...	1435	2130	.5	757	19...	1055	510	21.9	590
05481000 Boone River near Webster City, IA									
OCT					FEB				
29...	0905	241	15.9	671	05...	1100	153	.0	825
DEC					08...	0840	242	.5	707
09...	1015	133	.5	731	10...	0900	878	1.3	578
21...	1100	85	.0	785	18...	1355	501	.6	685
24...	0855	66	.0	1070	MAR				
29...	1120	79	4.0	994	03...	1600	418	2.4	578
31...	1025	73	.0	824	APR				
JAN					14...	1240	2160	9.6	711
05...	1030	54	.0	632	MAY				
08...	1300	46	.0	905	13...	0915	4120	10.4	604
11...	1410	44	.0	905	27...	1140	1740	15.9	699
15...	1040	40	.0	858	JUL				
19...	1025	46	.0	830	06...	1430	1530	--	--
22...	1030	54	.0	910	AUG				
FEB					18...	0855	79	21.4	705
01...	1040	101	.0	877	SEP				
					30...	1245	13	18.0	771

05481300 Des Moines River near Stratford, 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 10...	1300	1830	3.8	820
JAN 08...	1355	611	.0	959
FEB 18...	0945	2900	.0	651
APR 02...	0840	2270	11.4	742
MAY 20...	1240	14400	16.2	661
JUN 28...	1000	10500	21.6	562
AUG 09...	1020	1260	23.6	610
SEP 13...	1000	321	15.3	520

05481650 Des Moines River near Saylorville, 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 10...	0855	2170	8.6	656
JAN 08...	0935	694	.7	964
FEB 17...	0830	5230	2.3	747
APR 01...	0815	2280	9.5	730
MAY 19...	1510	11700	17.0	--
JUN 28...	1505	12100	22.9	614
AUG 10...	0900	1820	26.1	639
SEP 14...	0810	336	17.5	593
22...	1230	286	19.5	556

05481950 Beaver Creek near Grimes, 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...	0840	66	15.7	720
29...	0845	66	15.7	720
DEC 15...	0925	54	.8	822
FEB 09...	1345	165	3.0	630
MAR 18...	0755	276	6.1	708
MAY 12...	0945	861	13.9	543
JUN 23...	0840	489	20.9	678
AUG 05...	0845	43	22.2	650
SEP 13...	1525	29	18.3	638

05482000 Des Moines River at 2nd Avenue, Des Moines, 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 30...	0800	1600	13.5	620
DEC 11...	1210	1810	5.7	847
JAN 22...	0930	655	.0	994
MAR 04...	1520	2960	3.0	750
APR 12...	1330	15100	10.0	638
MAY 24...	1345	13000	17.5	618
JUN 28...	1410	13000	22.5	587
AUG 18...	1550	2700	23.5	523

05482300 North Raccoon River near Sac 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 10...	1010	190	4.5	760
JAN 06...	1030	60	.0	875
FEB 17...	1320	345	.5	695
APR 06...	1320	2350	7.5	764
MAY 18...	1400	1720	13.0	690
JUN 11...	1115	3620	19.5	450
29...	1415	1040	17.5	695
AUG 03...	1045	107	24.0	675
SEP 16...	1105	21	14.5	814

05482500 North Raccoon River near Jefferson, 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...	1410	272	15.9	715
DEC 08...	1150	323	2.3	787
JAN 20...	0735	158	.0	814
MAR 03...	1110	1380	2.4	720
APR 15...	1300	3410	7.9	708
MAY 27...	0755	2530	16.6	720
JUL 08...	0715	1550	26.0	715
AUG 17...	1000	207	23.4	593
SEP 28...	1140	65	16.1	595

05483450 Middle Raccoon River near Bayard, 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...	1050	133	14.6	683
28...	1245	133	14.6	683
DEC				
08...	0915	70	.0	669
JAN				
19...	1520	61	.0	678
MAR				
03...	0900	212	.0	686
APR				
15...	1125	767	7.3	601
MAY				
26...	1650	489	18.8	657
JUL				
07...	1520	483	26.0	648
20...	1040	3000	23.2	207
AUG				
17...	1210	193	23.1	677
SEP				
28...	1325	62	16.4	651

05483600 Middle Raccoon River at Panora, 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...	1050	95	14.0	553
DEC				
07...	1145	90	8.2	515
JAN				
15...	1335	98	--	--
APR				
15...	0855	812	9.0	563
MAY				
26...	1430	539	19.6	551
JUL				
07...	1225	547	25.9	418
AUG				
17...	1445	185	26.4	523
SEP				
28...	1615	105	18.7	528

05484000 South Raccoon River at Redfield, 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...	0905	260	11.0	534
DEC				
07...	1430	245	3.8	556
JAN				
19...	1330	184	.0	580
MAR				
02...	1005	588	6.0	516
APR				
14...	1600	1520	11.1	526
MAY				
26...	1245	1650	19.1	--
JUL				
07...	0950	1860	23.0	434
AUG				
17...	1625	419	27.6	459
SEP				
29...	0825	208	12.9	501

05484500 Raccoon River at Van Meter, 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				
09...	1215	980	4.5	623
JAN				
06...	1600	387	.0	274
FEB				
16...	1230	1870	2.9	629
MAR				
31...	0800	1380	11.7	660
MAY				
20...	0745	9650	16.6	577
JUN				
30...	1000	8370	19.5	545
AUG				
09...	1045	1290	24.9	449
SEP				
08...	1330	478	28.1	422

05484650 Raccoon River at 63rd Street at Des Moines, 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				
27...	1000	693	15.5	641
DEC				
14...	1445	678	2.8	678
JAN				
19...	1440	456	.0	712
MAR				
03...	1500	2070	3.5	669
APR				
09...	1230	15900	11.2	490
MAY				
25...	0715	8090	15.6	561
JUN				
30...	0900	8890	19.6	470
AUG				
18...	0850	1070	24.3	374
SEP				
29...	1105	427	14.1	487

05484800 Walnut Creek at Des Moines, 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)
DEC				
14...	1200	16	2.6	758
JAN				
19...	1230	15	.0	1110
MAR				
02...	1630	66	4.5	710
APR				
08...	1505	--	12.7	492
09...	1320	291	10.0	597
MAY				
25...	1125	220	16.4	570
JUN				
28...	1215	63	22.0	529
AUG				
17...	1450	15	30.7	533
SEP				
27...	1430	93	15.6	218

05484900 Raccoon River at Fleur Drive, Des Moines, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
OCT 28...	1515	654	15.5	631
DEC 15...	1220	631	2.5	679
JAN 19...	1750	466	.0	454
MAR 03...	1130	2160	2.0	685
APR 07...	1515	8030	17.1	492
MAY 24...	1540	9760	19.2	578
JUN 30...	0910	9430	19.2	536
AUG 18...	1140	2110	24.6	340
SEP 29...	0830	391	13.0	393

05485500 Des Moines River blw Raccoon Riv at Des Moines, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
NOV 09...	1515	3200	6.8	662
FEB 17...	1610	6930	2.8	749
MAR 31...	1320	3850	9.3	731
APR 12...	1245	27200	10.0	661
MAY 18...	1605	26300	16.6	701
JUN 29...	1430	24000	22.7	595
AUG 09...	1540	3710	27.5	602
SEP 14...	1810	732	19.5	603

05485640 Fourmile Creek at Des Moines, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
OCT 29...	1525	25	18.5	776
DEC 14...	1435	19	4.3	761
JAN 21...	1440	15	.0	993
MAR 02...	1455	68	6.0	793
APR 12...	1500	124	12.0	766
MAY 24...	1615	285	16.0	704
JUN 28...	1550	69	21.0	749
AUG 18...	1335	405	22.0	315
SEP 22...	1030	7.8	13.0	860

05486000 North River near Norwalk, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
OCT 27...	1345	58	14.5	479
DEC 16...	1015	76	1.5	477
MAR 02...	1340	301	4.5	443
APR 13...	0750	370	10.6	457
MAY 19...	1155	1260	16.3	371
JUN 29...	0810	595	20.1	367
AUG 17...	1110	30	25.2	522
SEP 28...	1340	8.8	16.8	449

05486490 Middle River near Indianola, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
OCT 27...	1500	62	17.0	511
DEC 16...	1240	69	3.0	503
JAN 20...	1100	46	.0	582
MAR 04...	0755	272	2.5	555
APR 12...	1520	542	11.7	426
MAY 18...	1315	2500	16.6	309
JUN 29...	1000	1390	20.6	227
AUG 17...	0750	64	27.0	440
SEP 28...	1120	35	14.4	444

05487470 South River near Ackworth, IA

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)
OCT 28...	0845	21	13.5	447
DEC 15...	1550	41	3.7	480
JAN 20...	1510	28	.0	587
MAR 04...	1040	152	2.5	431
APR 13...	1125	199	11.7	431
MAY 18...	1315	1860	16.7	257
JUN 29...	1225	69	21.4	432
AUG 16...	1220	38	30.8	372
SEP 28...	0825	35	13.1	393

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)

05487500 Des Moines River near Runnells, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT				
07...	1100	2150	14.3	541
NOV				
09...	1145	4010	5.9	664
FEB				
17...	1240	7920	2.2	741
APR				
01...	1410	4580	11.8	699
MAY				
19...	0810	31300	17.2	622
JUN				
29...	1300	27700	22.8	519
AUG				
10...	1610	4310	27.8	540
SEP				
14...	1110	1070	18.9	603

05487540 Walnut Creek near Prairie City, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT				
29...	0910	3.0	15.0	561
DEC				
10...	1330	3.0	5.5	567
JAN				
21...	1335	1.6	2.5	541
MAR				
03...	1500	3.1	7.0	525
APR				
12...	1600	5.1	16.5	527
MAY				
25...	1325	11	16.5	535
JUN				
29...	0845	6.6	14.0	547
AUG				
16...	1400	4.6	22.0	534

05487550 Walnut Creek near Vandalia, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT				
29...	1300	6.8	17.5	519
DEC				
10...	1450	7.3	3.0	532
JAN				
21...	0905	4.0	.0	496
MAR				
03...	1130	11	1.0	504
APR				
13...	1040	13	9.5	477
16...	1200	61	4.0	425
MAY				
25...	0800	29	11.5	488
JUN				
29...	1140	15	17.5	513
AUG				
18...	0900	18	20.0	462

05487980 White Breast Creek near Dallas, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
NOV				
10...	1307	2060	6.8	263
DEC				
15...	1306	42	2.5	564
FEB				
03...	1200	174	.3	461
MAR				
16...	1604	1600	6.3	324
APR				
16...	1150	5660	5.6	221
27...	1510	2450	12.7	265
JUN				
09...	0725	88	23.3	440
JUL				
20...	0930	90	26.3	403
AUG				
31...	1250	7.5	25.7	525

05488110 Des Moines River near Pella, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
OCT				
06...	1111	--	--	--
06...	1635	--	--	--
07...	1300	629	16.3	566
NOV				
13...	0715	6930	7.0	582
DEC				
08...	1344	--	--	--
16...	0848	2840	6.0	696
FEB				
02...	0900	2310	1.5	820
09...	1350	--	--	--
MAR				
17...	1510	11000	3.9	674
APR				
06...	1545	--	--	--
28...	0930	30600	11.5	574
JUN				
08...	0820	22400	21.4	555
08...	1520	--	--	--
JUL				
20...	1800	17900	26.1	545
AUG				
03...	1515	--	--	--
SEP				
01...	0820	1650	22.7	548

05488200 English Creek near Knoxville, IA

DATE	TIME	DISCHARGE (00061)	TEMPERATURE (00010)	SPECIFIC CONDUCTANCE (00095)
NOV				
12...	1518	57	5.7	389
DEC				
15...	1503	16	2.7	569
FEB				
02...	1310	84	.1	444
MAR				
17...	0845	699	7.7	297
APR				
27...	1030	127	11.9	383
JUN				
08...	0957	28	23.3	435
JUL				
20...	1030	91	24.3	461
SEP				
01...	1050	.62	21.4	734

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
05488500 Des Moines River near Tracy, IA				
NOV 13...	1005	7130	7.1	581
DEC 16...	0936	3110	5.6	675
FEB 02...	0945	2190	1.5	807
MAR 18...	0745	11500	3.4	661
APR 27...	0630	33500	11.3	599
JUN 08...	1140	21600	22.0	553
JUL 20...	1220	18700	26.7	521
SEP 01...	1205	1850	23.7	552
05489000 Cedar Creek near Bussey, IA				
NOV 12...	1100	421	5.6	401
DEC 15...	0912	100	1.3	600
FEB 01...	1605	213	.0	494
MAR 17...	1420	2800	7.4	235
APR 26...	1515	340	13.1	487
JUN 07...	1551	257	25.2	376
JUL 19...	1450	27	30.4	639
AUG 31...	1610	6.3	24.0	730
05489500 Des Moines River at Ottumwa, IA				
OCT 07...	1030	4460	15.5	277
NOV 25...	0940	5240	6.4	603
FEB 17...	1050	6330	2.3	720
MAR 31...	1235	5780	11.8	660
APR 28...	1110	37600	11.5	543
MAY 13...	1100	20900	15.0	516
JUN 23...	1010	23600	21.7	559
AUG 04...	0945	17500	28.5	526
SEP 13...	1540	931	21.2	600
05490500 Des Moines River at Keosauqua, IA				
OCT 06...	1440	19100	15.5	259
NOV 24...	1535	4620	7.3	618
FEB 17...	1410	6390	4.5	725
MAR 31...	1720	6020	13.8	660
APR 28...	1430	39300	11.9	560
MAY 13...	1610	23700	15.4	592
JUN 22...	1405	22500	23.0	551
AUG 03...	1320	18400	27.8	507
SEP 14...	1430	1270	19.7	520
05494300 Fox River at Bloomfield, IA				
OCT 05...	1250	4270	15.4	124
07...	1210	82	14.1	296
NOV 16...	1105	30	7.7	461
JAN 04...	1715	8.6	.0	--
FEB 09...	1405	29	7.9	479
24...	1405	24	4.1	502
MAR 31...	1410	15	19.3	503
MAY 13...	1245	153	14.1	304
17...	1750	2700	18.4	154
JUN 22...	1600	33	25.2	351
AUG 03...	1505	1.0	29.0	518
SEP 13...	1710	.20	18.4	542

The following surface water-quality data were measured at various locations during water year 1999.

05420680 Wapsipinicon River near Tripoli, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
JUL												
22...	1100	13600	110	6.5	22.9	6.9	83	45	39	82	65	13

DATE	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUL												
22...	2.8	1.3	2.8	48	0	3.6	2.7	.13	6.7	.040	1.69	.059

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)
JUL												
22...	.47	.86	.53	.194	.180	.159	26	10	1.1	6.1	<.003	.107

DATE	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)
JUL												
22...	.061	.981	<.001	<.002	<.002	<.003	E.073	<.004	<.040	<.002	<.002	<.001

DATE	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)
JUL											
22...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.648	.009	<.004

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
JUL											
22...	<.003	<.004	<.006	<.004	.015	<.002	<.018	<.007	<.004	<.013	<.003

DATE	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	P,P' DDE DISSOLV (UG/L) (34653)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
JUL											
22...	.016	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	84

05461390 Flood Creek near Powersville, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

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)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
JUL												
22...	1500	3240	194	6.9	25.7	6.9	88	86	68	128	104	26

DATE	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUL												
22...	5.1	1.6	2.7	83	0	4.0	.16	.15	10	.103	2.98	<.020

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)
JUL												
22...	.79	1.3	.206	.078	.339	E7.0	3.9	1.6	5.2	<.003	.084	.086

DATE	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)
JUL											
22...	.955	<.001	<.002	<.002	<.003	E.023	<.004	<.020	<.002	<.002	<.001

DATE	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)
JUL											
22...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.779	.010	<.004

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
JUL											
22...	<.003	<.004	<.006	<.004	.022	<.002	<.018	<.007	<.004	<.013	<.003

DATE	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	P,P' DDE DISSOLV (UG/L) (34653)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
JUL											
22...	<.005	<.010	<.007	<.013	<.002	<.001	.011	<.002	<.005	<.006	110

05464935 Cedar River near Nichols, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	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)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
JUL 28...	1000	293	7.6	27.2	25.5	5.3	68	140	99	189	166	41

DATE	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
JUL 28...	9.5	4.1	3.2	121	0	10	6.1	.19	13	.077	3.96	<.020

DATE	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C) (00689)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)
JUL 28...	.50	.89	.192	.163	.253	E8.5	E2.6	1.6	5.0	<.003	.0[illegible]5	.024

DATE	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)
JUL 28...	1.03	<.001	<.002	.006	<.003	<.003	<.004	.039	<.002	<.002	<.001

DATE	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)
JUL 28...	<.017	<.002	<.004	<.003	<.003	<.004	<.002	<.005	.373	.016	<.004

DATE	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PARA-THION, DIS-SOLVED (UG/L) (39542)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PROP-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
JUL 28...	<.003	<.004	<.006	<.004	<.004	<.002	E.016	<.007	<.004	<.013	<.003

DATE	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	P,P' DDE DISSOLV (UG/L) (34653)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
JUL 28...	.015	<.010	<.007	<.013	<.002	<.001	<.002	<.002	<.005	<.006	121

05494200 Fox River near West Grove, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
01...	1315	6.1	--	736	16	421	13.4	112	8.2	7.5	0	157
APR												
20...	1410	12.7	16.5	735	20	419	10.4	102	7.6	7.9	0	152
MAY												
18...	0830	14.6	17.4	742	109	274	8.9	90	7.3	7.4	0	111
JUN												
10...	1615	21.2	--	739	1170	145	6.5	73	7.0	7.2	0	47
22...	1145	23.7	27.5	741	5.5	465	11.0	130	8.3	8.0	8	186
JUL												
13...	1300	25.3	30.2	741	.20	600	8.1	98	7.8	7.8	0	245
SEP												
21...	1015	10.4	11.4	748	.04	940	3.9	33	7.6	7.9	0	510

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)
MAR												
01...	129	.120	<.020	1.0	.710	.100	.060	6.9	56	13	14	3.5
APR												
20...	124	.230	<.020	.60	1.00	.040	.060	6.2	58	13	12	3.5
MAY												
18...	91	.200	<.020	2.2	.890	.600	.090	15	42	11	6.3	5.5
JUN												
10...	38	.240	<.010	7.9	.860	2.80	.030	41	59	23	3.1	19
22...	166	.120	.090	.90	.200	.100	.060	5.6	65	15	16	5.1
JUL												
13...	201	2.80	.400	4.2	.800	.500	.280	10	70	18	20	16
SEP												
21...	418	10.0	.130	16	.500	1.10	.320	14	84	26	45	63

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)
MAR											
01...	13	69	.2	11	<10	1800	260	<.100	780	K20	<.100
APR											
20...	10	64	.2	13	<10	2200	130	--	K200	K400	--
MAY											
18...	6.0	34	.2	21	<10	1900	400	<.100	12670	6900	<.100
JUN											
10...	5.0	8.9	.2	10	110	110000	3100	<.100	E180000	K94000	<.100
22...	13	55	.2	9.6	<10	870	70	<.100	4100	2100	<.100
JUL											
13...	18	74	.2	7.8	<10	580	460	<.100	650	880	<.100
SEP											
21...	39	56	.2	20	<10	2300	6900	<.100	K1300	--	<.100

DATE	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)
MAR											
01...	<.10	<.100	<.10	280	<.100	<.100	<.100	34	1.4	<.10	<.100
APR											
20...	--	--	--	260	--	--	--	41	2.2	--	--
MAY											
18...	<.10	1.30	.33	200	<.100	<.100	<.100	627	185	.12	<.100
JUN											
10...	.26	26.0	5.9	220	.170	.770	<.200	5020	15900	<.10	.490
22...	<.10	3.80	.54	280	.100	.310	<.100	20	.29	<.10	.370
JUL											
13...	<.10	1.10	<.10	380	<.100	.180	<.100	23	.01	<.10	.210
SEP											
21...	<.10	.340	<.10	600	<.100	<.100	<.100	26	.00	<.10	<.100

05494250 Fox River near Paris, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND- ARD UNITS) (00403)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
01...	1605	8.4	--	735	24	429	12.4	110	7.4	8.0	0	148
APR												
20...	1700	14.3	17.8	734	29	426	9.8	100	7.7	7.8	0	165
MAY												
18...	1035	15.2	18.1	744	153	276	8.9	91	7.4	7.4	0	104
JUN												
10...	1820	18.1	--	739	1410	175	7.6	80	7.2	7.3	0	49
22...	1440	25.0	29.8	741	19	294	8.1	98	7.9	7.8	0	108
JUL												
13...	1615	30.4	30.0	741	.93	462	14.1	188	8.5	8.4	11	143
SEP												
21...	1105	11.1	14.3	748	.14	549	9.9	90	7.5	8.0	0	245

DATE	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)
MAR												
01...	121	.110	.020	.80	.650	.110	.070	7.3	54	13	14	3.5
APR												
20...	135	.190	<.020	.70	1.20	.100	.070	6.6	58	13	12	3.6
MAY												
18...	86	.300	<.020	2.1	1.20	.600	.060	17	42	11	6.4	5.7
JUN												
10...	40	.140	<.010	6.1	.740	2.00	.110	28	46	18	3.4	14
22...	89	.060	.060	2.8	1.80	.600	.110	20	44	12	9.3	7.8
JUL												
13...	136	<.100	<.010	.50	<.050	<.100	.040	5.9	52	15	17	6.4
SEP												
21...	201	<.020	<.010	.20	<.050	<.100	.040	4.8	63	18	23	5.8

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	BUTYL- ATE WATER WHLREC (UG/L) (30236)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)
MAR											
01...	14	70	.2	13	<10	1800	160	<.100	510	K11	<.100
APR											
20...	12	62	.2	14	<10	2700	110	--	K240	K170	--
MAY											
18...	7.0	28	.2	21	20	19000	420	<.100	11750	5700	<.100
JUN											
10...	5.0	9.2	.2	4.8	90	98000	2600	<.100	E160000	E57000	<.100
22...	9.0	33	.2	14	20	17000	300	<.100	43000	20000	<.100
JUL											
13...	14	69	.2	5.2	<10	380	140	<.100	190	24	<.100
SEP											
21...	13	67	.2	16	<10	570	210	<.100	820	240	<.100

DATE	METOLA- CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA- ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO- CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA- ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN- AZINE TOTAL (UG/L) (81757)
MAR											
01...	<.10	<.100	<.10	270	<.100	<.100	<.100	32	2.0	<.10	<.100
APR											
20...	--	--	--	270	--	--	--	60	4.7	--	--
MAY											
18...	<.10	5.50	1.1	210	<.100	.240	<.100	671	277	<.10	<.100
JUN											
10...	.42	25.0	2.4	220	.170	.690	<.200	4070	15500	<.10	.360
22...	.15	26.0	.44	240	.450	1.30	<.100	489	26	<.10	.190
JUL											
13...	<.10	1.10	<.10	290	<.100	.180	<.100	10	.03	<.10	.130
SEP											
21...	<.10	.360	<.10	330	<.100	<.100	<.100	5	.00	<.10	<.100

05494350 Fox River at County Road J40 near Bloomfield, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
02...	0800	5.8	--	736	33	447	12.4	103	8.2	8.0	0	164
APR												
21...	0815	10.8	11.6	734	50	423	9.8	92	7.3	7.8	0	151
MAY												
19...	0800	16.0	15.0	748	127	314	8.5	88	7.1	7.5	0	122
JUN												
10...	1745	24.1	32.3	741	599	387	6.6	81	7.4	7.3	0	62
23...	0820	21.4	23.2	736	18	365	7.1	81	7.5	7.9	0	166
JUL												
15...	0840	21.5	24.5	742	3.0	534	7.1	83	7.3	8.1	0	229
SEP												
21...	1230	19.9	18.1	751	1.1	576	11.5	126	7.8	8.1	0	204

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)
MAR												
02...	135	.100	.020	.90	.700	.170	.090	6.0	59	14	17	4.3
APR												
21...	128	.070	<.020	.50	1.20	.110	.120	5.6	58	13	14	4.3
MAY												
19...	100	.100	.070	1.6	1.10	.400	.080	9.7	45	11	8.9	5.5
JUN												
10...	51	.280	<.020	12	1.79	4.80	.090	31	59	28	3.9	19
23...	136	.060	.040	1.3	1.40	.300	.100	10	50	11	12	6.2
JUL												
15...	188	<.100	<.010	.40	<.050	.100	.070	5.4	67	15	21	5.4
SEP												
21...	167	<.020	<.010	.30	<.050	.200	.090	5.0	61	15	32	4.7

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)
MAR											
02...	16	69	.2	12	<10	2500	90	<.100	4400	160	<.100
APR											
21...	11	61	.2	14	<10	2900	90	--	1100	530	--
MAY											
19...	9.0	32	.2	16	<10	12000	290	<.100	5300	3200	<.100
JUN											
10...	10	16	.1	5.3	120	160000	3600	<.100	E250000	K120000	<.100
23...	12	39	.2	9.8	10	6300	170	<.100	7600	2400	<.100
JUL											
15...	17	66	.3	10	<10	410	360	<.100	2500	260	<.100
SEP											
21...	30	64	.3	12	<10	260	320	<.100	K1500	K160	<.100

DATE	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)
MAR											
02...	<.10	<.100	<.10	290	<.100	<.100	<.100	55	4.9	<.10	<.100
APR											
21...	--	--	--	260	--	--	--	72	9.7	--	--
MAY											
19...	<.10	4.00	.68	230	<.100	.170	<.100	381	131	<.10	.190
JUN											
10...	<.20	20.0	1.5	200	.400	1.50	<.200	8050	13000	<.10	1.70
23...	<.10	8.70	.29	260	.360	1.10	<.100	166	8.3	<.10	.490
JUL											
15...	<.10	1.30	<.10	340	<.100	.270	<.100	9	.07	<.10	.560
SEP											
21...	<.10	.360	<.10	340	<.100	<.100	<.100	5	.01	<.10	<.100

05494450 Fox River at County Road V56 near Milton, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
02...	1040	6.1	7.5	740	45	449	12.1	100	7.5	7.9	0	163
APR												
21...	1020	10.8	14.3	736	70	416	10.1	94	7.6	7.8	0	151
MAY												
19...	1010	16.4	20.6	750	181	300	8.6	90	7.2	7.6	0	88
JUN												
10...	2000	22.9	29.2	750	259	272	6.6	78	7.3	7.7	0	84
24...	0810	20.9	23.4	741	44	422	7.9	89	7.9	8.2	0	167
JUL												
14...	1500	30.6	39.0	741	6.0	542	9.8	130	8.3	8.4	11	191
SEP												
21...	1410	17.2	18.8	750	1.6	557	10.5	109	7.9	8.3	0	191

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA) (00916)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929)	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)
MAR												
02...	134	.020	<.020	.60	.860	.170	.090	6.2	56	14	17	3.9
APR												
21...	124	<.020	<.020	.50	1.30	.140	.100	6.2	56	13	13	4.4
MAY												
19...	72	.100	.070	1.8	1.20	.600	.070	17	43	11	8.2	6.5
JUN												
10...	69	.150	.040	8.6	.610	2.80	.110	36	50	18	6.2	13
24...	137	<.010	.030	1.2	.920	.400	.100	7.2	58	13	15	6.4
JUL												
14...	175	<.100	<.010	.30	<.050	.100	.050	5.0	69	15	20	5.0
SEP												
21...	156	<.020	<.010	.10	<.050	<.100	.030	3.7	64	15	25	3.3

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUORIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	BUTYLATE WATER WHLREC (UG/L) (30236)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)
MAR											
02...	16	70	<.2	16	<10	2600	90	<.100	2000	130	<.100
APR											
21...	11	61	.2	14	<10	3500	100	--	3000	670	--
MAY											
19...	8.0	31	.2	18	10	20000	440	<.100	6900	4100	<.100
JUN											
10...	12	24	.2	16	60	68000	1900	<.100	K110000	63000	<.100
24...	12	51	.2	10	<10	7300	250	<.100	3500	2300	<.100
JUL											
14...	16	76	.2	9.6	<10	220	120	<.100	240	56	<.100
SEP											
21...	19	80	.2	16	<10	200	390	<.100	790	160	<.100

DATE	METOLACHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRAZINE WATER UNFLTRD REC (UG/L) (39630)	ACETOCHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRAZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALACHLOR TOTAL RECOVER (UG/L) (77825)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	METRIBUZIN IN WHOLE WATER (UG/L) (81408)	CYANAZINE TOTAL (UG/L) (81757)
MAR											
02...	<.10	.100	<.10	290	<.100	<.100	<.100	60	7.3	<.10	<.100
APR											
21...	--	--	--	260	--	--	--	97	18	--	--
MAY											
19...	<.10	5.50	1.1	200	<.100	.240	<.100	588	288	<.10	.400
JUN											
10...	2.50	44.0	13	280	1.50	3.30	<.200	3560	2490	<.10	12.0
24...	<.10	5.10	.32	270	.240	.790	<.100	255	30	<.10	.350
JUL											
14...	<.10	1.10	<.10	340	<.100	.190	<.100	3	.06	<.10	.250
SEP											
21...	<.10	.270	<.10	340	<.100	<.100	<.100	4	.02	<.10	<.100

05494570 Valley Branch near Mount Sterling, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
02...	1525	5.0	--	743	1.2	400	12.9	104	6.3	7.9	0	133
APR												
21...	1340	14.7	23.2	735	2.5	365	9.8	100	7.4	7.7	0	134
MAY												
18...	1610	18.4	22.9	749	4.4	305	8.5	92	7.4	7.5	0	104
JUN												
11...	0925	21.1	25.5	747	.16	483	7.4	85	7.5	7.9	0	189
23...	1320	20.4	26.1	740	.80	361	8.0	89	7.4	7.9	0	131

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA) (00916)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929)	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)
MAR												
02...	109	.010	<.020	.30	.420	.040	.040	4.4	53	13	15	2.5
APR												
21...	110	<.020	<.020	.30	.400	.020	.050	4.7	52	12	13	2.9
MAY												
18...	85	.100	.040	.90	.490	.100	.030	9.2	39	9.3	8.7	3.2
JUN												
11...	155	<.100	<.010	.20	1.01	<.100	.010	47	59	13	13	3.0
23...	107	<.010	.020	.40	.090	<.100	.050	4.8	51	11	12	4.5

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUORIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	BUTYLATE WATER WHLREC (UG/L) (30236)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)
MAR											
02...	8.0	73	.2	13	<10	860	230	<.100	960	85	<.100
APR											
21...	3.0	80	.2	16	<10	1500	140	--	340	94	--
MAY											
18...	4.0	47	.2	19	<10	4200	110	<.100	5800	1300	<.100
JUN											
11...	6.0	77	.2	15	<10	160	640	<.100	2400	440	<.100
23...	6.0	63	.2	12	<10	790	230	<.100	4000	3200	<.100

DATE	METOLACHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRAZINE WATER UNFLTRD REC (UG/L) (39630)	ACETOCHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRAZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALACHLOR TOTAL RECOVER (UG/L) (77825)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	METRIBUZIN IN WHOLE WATER (UG/L) (81408)	CYANAZINE TOTAL (UG/L) (81757)
MAR											
02...	<.10	<.100	<.10	260	.100	<.100	<.100	13	.04	<.10	<.100
APR											
21...	--	--	--	250	--	--	--	24	.16	--	--
MAY											
18...	<.10	2.90	<.10	230	<.100	.180	<.100	80	.95	<.10	2.30
JUN											
11...	<.20	.540	<.20	320	<.100	<.100	<.200	11	.00	<.10	.240
23...	<.10	.480	<.10	240	<.100	.130	<.100	19	.04	<.10	<.100

05494600 Fox River at Mount Sterling, IA

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
03...	0835	.8	--	748	51	442	15.0	107	7.6	8.0	0	163
APR												
21...	1240	12.6	21.1	737	100	401	10.3	100	7.6	7.4	0	144
MAY												
19...	1410	19.2	--	750	258	280	8.3	92	7.3	7.4	0	103
JUN												
11...	1200	21.5	--	745	1010	193	6.0	68	7.0	7.4	0	66
23...	1150	22.3	23.8	740	27	484	7.8	89	7.8	8.2	0	202
JUL												
14...	1040	21.2	27.0	747	7.2	542	7.1	80	7.7	8.1	0	228
SEP												
22...	0835	11.3	7.4	751	.80	512	7.8	71	7.2	7.8	0	192

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM. TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)
MAR												
03...	134	<.010	<.020	.50	.740	.120	.070	5.4	58	14	18	3.6
APR												
21...	118	<.020	<.020	.70	1.30	.120	.130	6.2	55	13	14	4.5
MAY												
19...	E85	.100	.060	2.4	1.10	.800	.070	14	40	11	7.3	6.5
JUN												
11...	54	<.100	<.010	8.4	3.75	3.20	.070	40	46	21	4.4	16
23...	166	<.010	.020	.40	<.050	.100	.080	4.4	67	14	16	5.7
JUL												
14...	187	<.100	<.010	.20	<.050	<.100	.040	4.1	70	16	18	5.2
SEP												
22...	157	.040	<.010	.60	<.050	<.100	.030	4.5	58	14	21	3.8

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)
MAR											
03...	15	73	.2	15	<10	1700	130	<.100	3400	110	<.100
APR											
21...	11	61	.2	14	<10	3600	110	--	2000	320	--
MAY											
19...	8.0	27	.2	19	20	24000	530	<.100	7200	3900	<.100
JUN											
11...	6.0	13	.2	13	100	110000	2800	<.100	K135000	72000	<.100
23...	13	62	.2	11	<10	930	120	<.100	4000	690	<.100
JUL											
14...	13	66	.2	9.2	<10	370	230	<.100	440	84	<.100
SEP											
22...	17	69	.2	11	<10	1100	780	<.100	1400	480	<.100

DATE	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)
MAR											
03...	<.10	<.100	<.10	280	<.100	<.100	<.100	35	4.8	<.10	<.100
APR											
21...	--	--	--	250	--	--	--	68	18	--	--
MAY											
19...	<.10	5.60	1.1	200	<.100	.270	<.100	652	454	<.10	.490
JUN											
11...	.42	24.0	2.8	210	.270	.980	<.200	4190	11400	<.10	1.40
23...	<.10	3.70	.12	300	<.100	.290	<.100	29	2.1	<.10	.290
JUL											
14...	<.10	.970	<.10	340	<.100	.210	<.100	10	.19	<.10	.150
SEP											
22...	<.10	.440	<.10	330	<.100	<.100	<.100	12	.03	<.10	<.100

05494690 Fox River above Chambersburg, MO

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
03...	1100	2.7	--	750	62	434	14.0	105	7.4	8.0	0	167
APR												
22...	0830	13.9	--	734	109	419	--	88	7.3	7.8	0	164
MAY												
19...	1700	19.4	--	750	428	252	8.1	90	7.3	7.4	0	94
JUN												
11...	1115	22.8	30.8	749	1020	290	6.3	75	7.2	7.6	0	88
24...	1210	23.2	31.0	755	46	472	8.3	96	7.9	8.2	0	193
JUL												
14...	0845	21.6	23.6	746	8.1	542	7.4	84	7.6	8.2	0	241
SEP												
22...	1030	12.8	13.8	751	.30	495	8.0	74	7.6	7.7	0	219

DATE	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOV-ERABLE (MG/L AS CA) (00916)	MAGNE-SIUM, TOTAL RECOV-ERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929)	POTAS-SIUM, TOTAL RECOV-ERABLE (MG/L AS K) (00937)
MAR												
03...	137	.030	<.020	.60	.750	.110	.050	6.2	56	14	16	3.6
APR												
22...	134	.020	<.020	.80	1.10	.180	.120	6.3	56	13	13	4.4
MAY												
19...	77	.200	.060	2.7	1.00	.900	.050	15	39	11	6.3	7.0
JUN												
11...	72	.100	.020	9.3	.220	3.80	.070	54	59	23	5.6	14
24...	158	<.010	.020	.80	<.050	.200	.050	5.9	65	14	16	5.6
JUL												
14...	198	<.100	<.010	.30	<.050	<.100	.080	4.9	70	16	17	4.7
SEP												
22...	180	<.020	<.010	.60	<.050	<.100	.030	6.1	59	15	18	4.7

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUO-RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	BUTYL-ATE WATER WHLREC (UG/L) (30236)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)
MAR											
03...	17	62	.2	11	<10	2300	240	<.100	2500	K22	<.100
APR											
22...	7.0	63	.2	13	<10	4300	200	--	2300	390	--
MAY											
19...	7.0	23	.2	22	30	29000	670	<.100	5500	4600	<.100
JUN											
11...	9.0	21	.2	21	90	110000	3400	<.100	E150000	58000	<.100
24...	13	64	.2	10	<10	2600	210	<.100	3400	620	<.100
JUL											
14...	14	62	.2	7.6	<10	780	430	<.100	620	80	<.100
SEP											
22...	13	55	.2	7.5	<10	1400	910	<.100	190	630	<.100

DATE	METOLA-CHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRA-ZINE WATER UNFLTRD REC (UG/L) (39630)	ACETO-CHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALA-CHLOR TOTAL RECOVER (UG/L) (77825)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	METRI-BUZIN IN WHOLE WATER (UG/L) (81408)	CYAN-AZINE TOTAL (UG/L) (81757)
MAR											
03...	<.10	<.100	<.10	280	<.100	<.100	<.100	55	9.3	<.10	<.100
APR											
22...	--	--	--	250	--	--	--	124	36	--	--
MAY											
19...	.16	5.90	1.3	180	<.100	.310	<.100	901	1040	<.10	.670
JUN											
11...	.31	19.0	3.0	240	.460	1.60	<.200	5950	16400	<.10	3.30
24...	.15	4.00	.12	290	<.100	.290	<.100	75	9.5	<.10	.240
JUL											
14...	<.10	.990	<.10	340	<.100	.170	<.100	28	.61	<.10	.150
SEP											
22...	<.10	.370	<.10	290	<.100	<.100	<.100	24	.02	<.10	<.100

05494800 Little Fox River at Iowa-Missouri State Line

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)
MAR												
02...	1305	5.8	--	740	7.7	438	12.5	103	7.0	7.9	0	160
APR												
21...	1505	15.9	15.0	733	15	418	9.3	98	7.7	7.7	0	143
MAY												
18...	1510	20.0	24.0	749	48	305	8.4	94	7.5	7.4	0	82
JUN												
11...	0950	21.2	--	745	55	222	7.4	83	7.0	7.2	0	58
23...	1635	22.7	28.0	740	9.8	421	7.9	92	7.7	8.1	0	157
JUL												
14...	1245	26.1	34.6	745	2.5	263	7.8	96	7.8	7.9	0	110
SEP												
22...	0740	7.5	4.5	750	.02	565	8.2	69	7.3	8.0	0	226

DATE	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA) (00916)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG) (00927)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929)	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)
MAR												
02...	131	.050	<.020	.50	.950	.120	.080	5.3	50	13	20	3.2
APR												
21...	117	.120	<.020	.60	2.50	.080	.090	5.6	52	13	17	3.4
MAY												
18...	68	.100	.090	2.0	3.70	.500	.090	11	38	10	9.3	5.7
JUN												
11...	48	<.100	.040	4.6	.740	2.00	.080	34	32	11	5.0	8.8
23...	129	.020	.040	.90	.400	.200	.080	4.8	55	13	16	5.8
JUL												
14...	90	<.100	.020	1.0	.210	.300	.130	7.6	33	8.2	7.4	4.6
SEP												
22...	185	<.020	<.010	.20	<.050	<.100	.030	5.4	64	17	30	4.6

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE (MG/L AS SO4) (00946)	FLUORIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L-SIO2) (00956)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	BUTYLATE WATER WHLREC (UG/L) (30236)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)	TRIFLURALIN TOTAL RECOVER (UG/L) (39030)
MAR											
02...	14	72	.2	11	<10	1300	90	<.100	3000	190	<.100
APR											
21...	12	65	.2	14	<10	2000	70	--	800	320	--
MAY											
18...	12	26	.2	20	10	12000	230	<.100	13330	3400	<.100
JUN											
11...	14	14	.2	13	30	35000	980	<.100	K90000	16000	<.100
23...	10	74	.2	12	<10	6300	130	<.100	15330	12000	<.100
JUL											
14...	13	19	.2	11	<10	4300	130	<.100	5000	840	<.100
SEP											
22...	13	83	.2	11	<10	650	1200	<.100	9500	390	<.100

DATE	METOLACHLOR WATER UNFLTRD REC (UG/L) (39356)	ATRAZINE WATER UNFLTRD REC (UG/L) (39630)	ACETOCHLOR, WATER, UNFLTRD REC (UG/L) (49259)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L) (75980)	DEETHYL ATRAZINE, WATER, WHOLE, TOTAL (UG/L) (75981)	ALACHLOR TOTAL RECOVER (UG/L) (77825)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	METRIBUZIN IN WHOLE WATER (UG/L) (81408)	CYANAZINE TOTAL (UG/L) (81757)
MAR											
02...	<.10	<.100	<.10	280	<.100	<.100	<.100	32	.67	<.10	<.100
APR											
21...	--	--	--	260	--	--	--	48	1.9	--	--
MAY											
18...	.35	11.0	1.6	250	.120	.460	<.100	404	52	<.10	12.0
JUN											
11...	2.00	40.0	3.1	290	1.30	3.20	<.200	3790	566	<.10	31.0
23...	.35	2.90	<.10	310	.160	.620	<.100	149	3.9	<.10	.740
JUL											
14...	1.20	.440	<.10	190	<.100	<.100	<.100	103	.68	<.10	<.100
SEP											
22...	<.10	.390	<.10	360	<.100	<.100	<.100	11	.00	<.10	<.100

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^{0}	kilometer
	Area	
acre	4.047×10^{3}	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi^2)	2.590×10^{0}	square kilometer
	Volume	
gallon (gal)	3.785×10^{0}	liter
	3.785×10^{0}	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^{3}	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft^3)	2.832×10^{1}	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^{3}	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second
	2.832×10^{1}	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^{1}	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
	Mass	
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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