Water Resources Data for Iowa

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT IA-78-1

WATER YEAR 1978

Prepared in cooperation with the Iowa Geological Survey and with other State and Federal agencies

CALENDAR FOR WATER YEAR 1978

1977

OCTOBER

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1978

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AUGUST

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SEPTEMBER

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Water Resources Data for Iowa

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WATER YEAR 1978

Prepared in cooperation with the Iowa Geological Survey and with other State and Federal agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

CECIL D. ANDRUS, Secretary

GEOLOGICAL SURVEY

H. William Menard, Director

For information on the water program in Iowa write to
District Chief, Water Resources Division
U.S. Geological Survey
P.O. Box 1230
Iowa City, Iowa 52244

1979

Preface

This report was prepared by personnel of the Iowa district of the Water Resources Division of the U.S. Geological Survey under the supervision of S. W. Wiitala, District Chief, and Alfred Clebsch, Jr., Regional Hydrologist, Central Region. It was done in cooperation with the State of Iowa and with other agencies.

This report is one of a series issued by Iowa. General direction for the series is by J. S. Cragwall, Jr., Chief Hydrologist, U.S. Geological Survey, and G. W. Whetstone, Assistant Chief Hydrologist for Scientific Publications and Data Management.

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16. Abstracts

Water resources data for the 1978 water year for Iowa consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels in wells. This report contains discharge records for 118 gaging stations; stage and contents for 5 lakes and reservoirs; water quality for 22 gaging stations; and water levels for 32 observation wells. Also included are 124 crest-stage partial-record stations. Additional water data were collected at various sites, not part of the systematic data-collection program, and are published as miscellaneous measurements and analyses. The data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Iowa.

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ILLUSTRATIONS

[Letter after station name designates type of data: (d) discharge, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment]

WATER RESOURCES DATA FOR IOWA, 1978

INTRODUCTION

Water resources data for the 1978 water year for Iowa consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water-levels of ground-water wells. This report contains records for water discharge at 118 gaging stations; stage or contents at 5 lakes and reservoirs; water quality at 22 gaging stations, and water levels at 32 observation wells. Also included are data for 124 crest-stage partial-record stations. Additional water data were collected at various sites, not involved in the systematic data-collection program and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Iowa.

Records of discharge and of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA. 22202.

For water years 1961 through 1974, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1974 were similarly released either in separate reports of in conjunction with streamflow records.

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published in official Survey reports on a State-boundary basis. These official Survey reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report IA-78-1." For archiving and general distribution, the reports for water years 1971-74 are also identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche, by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA. 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the district chief of 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 agreement with the Survey in 1976 are:

Iowa Geological Survey, Stanley C. Grant, director and state geologist

University of Iowa, Institute of Hydraulic Research, Robert G. Hering, dean of College of Engineering and John F. Kennedy, director

Iowa Department of Transportation, Highway Division, Donald E. McLean, Director, and Vernon J. Marks, research engineer

Iowa Natural Resources Council, James R. Webb, director

Iowa State University, Richard E. Hasbrook, contracts and grants officer, and Agricultural Experiment Station, Thamon Hazen, assistant director; Department of Agricultural Engineering, C. W. Bockhop, head; and Energy and Minerals Resources Research Institute, James E. Gulliford, Ass't Division Chief.

City of Cedar Rapids, Donald Canney, mayor

City of Des Moines, Leo L. Johnson, public works director

City of Fort Dodge, Vincent H. Gardner, general manager, department of municipal utilities

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting flow records for 64 gaging stations, and by the Environmental Protection Agency in collecting records for seven water-quality stations published in this report. Assistance was also furnished by NOAA - National Weather Service, U.S. Department of Commerce.

The following organizations aided in collecting records:

Union Electric Co.; Des Moines Water Works; Hospers Rural Water System No. 1; Ottumwa Water Works; Waterloo Sewage Treatment Plant; University of Iowa; and cities of Ames, Charles City, Clear Lake, Iowa City, Marshalltown, Sioux City, and Waterloo.

Organizations that supplied data are acknowledged in station descriptions.

ACKNOWLEDGMENT

Iowa district personnel who contributed significantly to the collection and preparation of the data in this report were: I. L. Burmeister, chief, data section, assisted by O. J. Ramsvick, F. E. Lindstrom, W. J. Matthes, and S. A. Dvorak.

HYDROLOGIC CONDITIONS

Annual runoff for the 1978 water year was well above normal throughout the State. Normal runoff varies from 2 inches in the Northwest to 8 inches in the Southeast. This year, runoff varied generally from 4 to 12 inches.

The water year began with excessive streamflow in the Southwest, deficient in the North Central, and normal elsewhere. Frequent general rains and occasional heavy thunderstorms during the Fall period kept streamflow above normal to excessive throughout the State. Severe cold temperatures during the winter period formed heavy ice cover over the streams. Spring runoff produced some flooding caused mostly from ice jams. Thunderstorms were frequent across the State during the remainder of the year. Near record flood peaks occurred in the extreme northeastern part of the State and in the Iowa River basin near Marengo. The water year ended with streamflow in the excessive range throughout most of the State.

DEFINITION OF TERMS

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

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

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

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

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

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

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as the organisms which produce colonies within 24 hours when incubated at 35°C ± 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 warmblooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C ± 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

Fecal streptococcal bacteria are bacteria found also in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C ± 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

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

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

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter (g/m^3)), and periphyton and benthic organisms in grams per square meter (g/m^2).

Dry mass refers to the mass of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

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

Cfs-day is the volume of water represented by flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-ft, about 646,000 gallons or 2,445 cubic meters.

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water, and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

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

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

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

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

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

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

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

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

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

Dissolved refers to the amount of a substance present in true chemical solution. In practice, however, the term includes all forms of the substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (colloidal) suspended particles. Analyses are performed on filtered samples.

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

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

Where n is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

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

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

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

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

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

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is idenified by an 8-digit number.

Methylene blue active substance (MBAS) is a measure of apparent detergents. This determination depends on the formation of a blue colcr when methylene blue dye reacts with synthetic detergent compounds.

Micrograms per gram (ug/g) is a unit expressing the concen-tration of a chemical element as mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

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

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

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

Organism is any living entity, such as an insect, phytolplankter, or zooplankter.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m^2), acres, or hectares. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (ml) or liters (l). Numbers of planktonic organisms can be expressed in these terms.

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

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

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

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

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

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

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

Periphyton is the assemblage of microorganisms attached to and growing upon solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton is a useful indicator of water quality.

Pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Insecticides and herbicides, which control insects and plants respectively, are the two categories reported.

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).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/ml) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/ml) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column, and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

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

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly green plants). The rate of primary production is estimated by measureing the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg C/m^2.time) for periphyton and macrophytes and mg C/(m^3.time)] for periphyton and macrophytes and mg C/m^3.time)] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [mg O_2/m^2.time) for periphyton and macrophytes and mg C/(mg O_2/(m^3.time)] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

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

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

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that passes a section in a given time. It is computed by multiplying discharge times mg/l times 0.0027.

Suspended-sediment load is quantity of suspended sedi-ment passing a section in a specified period.

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

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

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with 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 derived from the atmosphere, vegeta-tion, soil, or rocks 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 micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream and it may vary in the same source with changes in the composition of the water.

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

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

Substrate is the physical surface upon which an organism lived.

Natural substrates refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lived.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

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

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

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

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchial scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata is the following:

Kingdom	Animal
Phylum	Arthropoda
Class	Insecta
Order	Ephemeroptera
Family	Ephemeridae
Genus	Hexagenia
Species	Hexagenia limbata

Thermograph is a thermometer that continuously and automatically records, on a chart, the water temperature of a stream. "Temperature recorder" is the term used to indicate the presence of a thermograph or a digital mechanism that automatically records water temperatures on paper tape.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of indi-vidual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the water year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

Tons per day is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour day.

Total (as used in tables of chemical analyses) refers to the amount of a substance that is present both in solution and in suspension. Analyses are performed on representative samples of water-suspended sediment mixtures.

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

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.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

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

DOWNSTREAM ORDER AND STATION NUMBER

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 main-stream station are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all main-stream stations are listed before the first main-stream station. Stations on tributaries to tributaries are listed in a similar manner. In the lists of gaging stations and water-quality stations in the front of this report the rank of tributaries is indicated by indention, each indention representing one rank.

As an added means of identification and each hydrologic station and partial-record station has been assigned a station number. These are in the same downstream order used in this report. 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 8-digit number for each station, such as 05387500, which appears just to the left of the station name, includes the 2-digit part number "05" plus the 6-digit downstream order number "387500."

Downstream order station numbers are not assigned to miscellaneous sites where only random water-quality samples or discharge measurements are taken.

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. The former number serves not only to identify the well but also to locate it as a point on a map. 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 represent degrees, minutes, and seconds of latitude; "N" refers to north latitude and is used to break the string of numbers; the next seven digits are degrees, minutes, and seconds of west longitude; and the number after the decimal point is a sequential number assigned in the order in which the wells are located in a 1-second quadrangle.

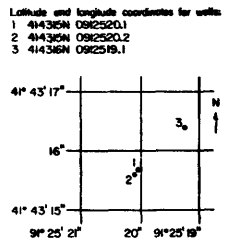

Figure 1. Latitude-longitude well number.

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 situated. 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 the 160-acre tract, the second the 40-acre tract, and the third the 10-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 SE1/4 NW1/4 SE1/4 SW1/4 sec.3, T.96 N., R.20 W.

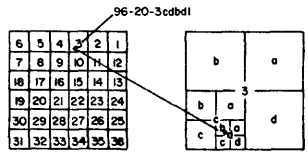

Figure 2. Local well numbering system for well 96-20-3cdbd1.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark 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 bench-mark station may be used to separate effects of natural from manmade changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

National stream-quality accounting network (NASQAN) is a data collection network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on river-basin accounting units (identified by 8-digit hydrologic-unit numbers) designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of streamflow and water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in stream quality.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

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

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nations'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 STAGE AND WATER-DISCHARGE

Collection and computation of data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard text-books, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6.

For stream-gaging stations, rating tables giving the dis-charge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharge are computed from the daily figures. 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 computed by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is basically the shifting-control method.

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

At some northern stream-gaging stations the stage-discharge relation is affected by ice in the winter, and it becomes impos-sible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge for other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly change in contents is computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations in the same or nearby basins. Likewise, daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30.

The description of the gaging stations gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision , the fact is brought out by notations 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 revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

The type of gage currently in use; the datum of the present gage referred to National Geodetic Vertical Datum; and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." National Geodetic Vertical Datum is explained in "DEFINITION OF TERMS" on page 4.

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks, including the maximum for the year, above the selected base with the time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the 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 may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharges are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage or contents. For some reservoirs a table showing daily contents is given. A skeleton table of capacity at given stages is published for most reservoirs.

Data collected at partial-record stations follow the information for continuous record sites. Data for partial-record discharge stations are presented as a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

Accuracy of data

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

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good" within 10 percent; and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other data available

Information of a more detailed nature than that published for most of the gaging stations, such as observations of water temperatures, discharge measurements, gage-height records, and rating tables, is on file in the district office. Also, most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

Records of discharge collected by agencies other than the Geological Survey

Records of discharge not published by the Geological Survey were collected during water year 1978 at several sites in Iowa by the Corps of Engineers, U.S. Army. The National Water Data Exchange, Water Resources Division, U.S. Geological Survey, National Center, Reston, Va. 22092, maintains an index of such sites. Information on records available at specific sites can be obtained upon request.

EXPLANATION OF WATER QUALITY RECORDS

Collection and examination of data

Surface water samples for analyses usually are collected at or near gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, pH, dissolved oxygen, water temperature, sediment discharge, etc.); extremes for the period of daily record; extremes for the current year; and general remarks.

Water analysis

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey Techniques of Water-Resources Investigations listed on a following page.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-gaulity conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH valu? and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the district office.

Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. Although these temperatures are measured on different days of the month, an analysis of these data for each month for a long period of record will indicate significant thermal characteristics of the stream. Data have been analyzed for the period of record through 1974 for gaging stations with 10 or more years of record. A summary on monthly maximum, minimum and mean temperatures were published in the 1974 water data report. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small daily temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharge.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published.

Sediment

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

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided day method. For periods when no samples are collected, daily loads 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 are collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic national network of observation wells are published herein. These water-level meas-urements are intended to provide a sampling and historical record of water-level changes in the nation's most important aquifers.

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude, and (2) a local number that is provided for local needs. See figures 1 and 2.

Measurements are made in many types of wells under varying conditions of access and of different temperatures, hence neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will insure that measurements at each well are consistent.

Water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error of determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

Thirty-four manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing 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) is on surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises. The reports listed below are for sale by the U.S. Geological Survey, Branch of Distribution, 1200 South Eads Street, Arlington, VA 22202 (authorized agent of the Superintendent of Documents, Government Printing Office. Prices are effective October 1978 but are subject to change.

NOTE: When ordering any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations".

1-D1. *Water temperature-influential factors, field measurement, and data presentation,* by H. H. Stevens Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages. $1.60.

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents,* by W.W.Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages. $0.85

2-D1. *Application of surface geophysics to ground-water investigations,* by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages. $1.90.

2-E1. *Application of borehole geophysics to water-resources investigations,* by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages. $1.75.

3-A1. *General field and office procedures for indirect discharge measurements,* by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages. $1.00.

3-A2. *Measurement of peak discharge by the slope-area method,* by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages. $0.35.

3-A3. *Measurement of peak discharge at culverts by indirect methods,* by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages. $0.40.

3-A4. *Measurement of peak discharge at width contractions by indirect methods,* by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages. $1.00.

3-A5. *Measurement of peak discharge at dams by indirect methods,* by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages. $0.35.

3-A6. *General procedure for gaging streams,* by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6, 1968, 13 pages. $1.00.

3-A7. *Stage measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages. $1.40.

3-A8. *Discharge measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages. $1.25.

3-A11. *Measurement of discharge by moving-boat method,* by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages. $1.20.

3-A12. *Fluorometric procedures for dye tracing,* by J. F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 pages. $0.35. Not currently available.

3-B1. *Aquifer-test design, observation, and data analysis,* by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages. $0.70.

3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction,* by G. D. Bennett: USGS--TWRI Book 3, Chapter B2 1976. 172 pages. $2.50.

3-C1. *Fluvial sediment concepts,* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages. $2.50.

3-C2. *Field methods for measurement of fluvial sediment,* by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2, 1970. 59 pages. $2.50.

3-C3. *Computation of fluvial-sediment discharge,* by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages. $2.10.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS -- Continued

4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4 Chapter A1. 1968. 39 pages. $1.60.
4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages. $1.20
4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972, 18 pages. $0.65.
4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages. $0.75.
4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages. $0.65.
4-D1. *Computation of rate and volume of stream depletion by wells*, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages. $1.10.
5-A1. *Methods for collection and analysis of water samples for dissolved minerals and gases*, by Eugene Brown, M. W. Skougstad, and M. J. Fishman: USGS--TWRI Book 5, Chapter A1. 1970. 160 pages. $2.40.
5-A2. *Determination of minor elments in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages. $0.80.
5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages. $0.90.
5-A4.* *Methods for collection and analysis of aquatic biological and microbiological samples*, edited by P.E. Greeson, T.A. Ehlke, G.A. Irwin, B.W. Lium, and K.V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages. $20.00.
5-A5.* *Methods for determination of radioactive substances in water and fluvial sediments*, by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages. $16.00.
5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages. $2.10.
7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages. $2.30.
8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages. $0.70.
8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages. $1.10.

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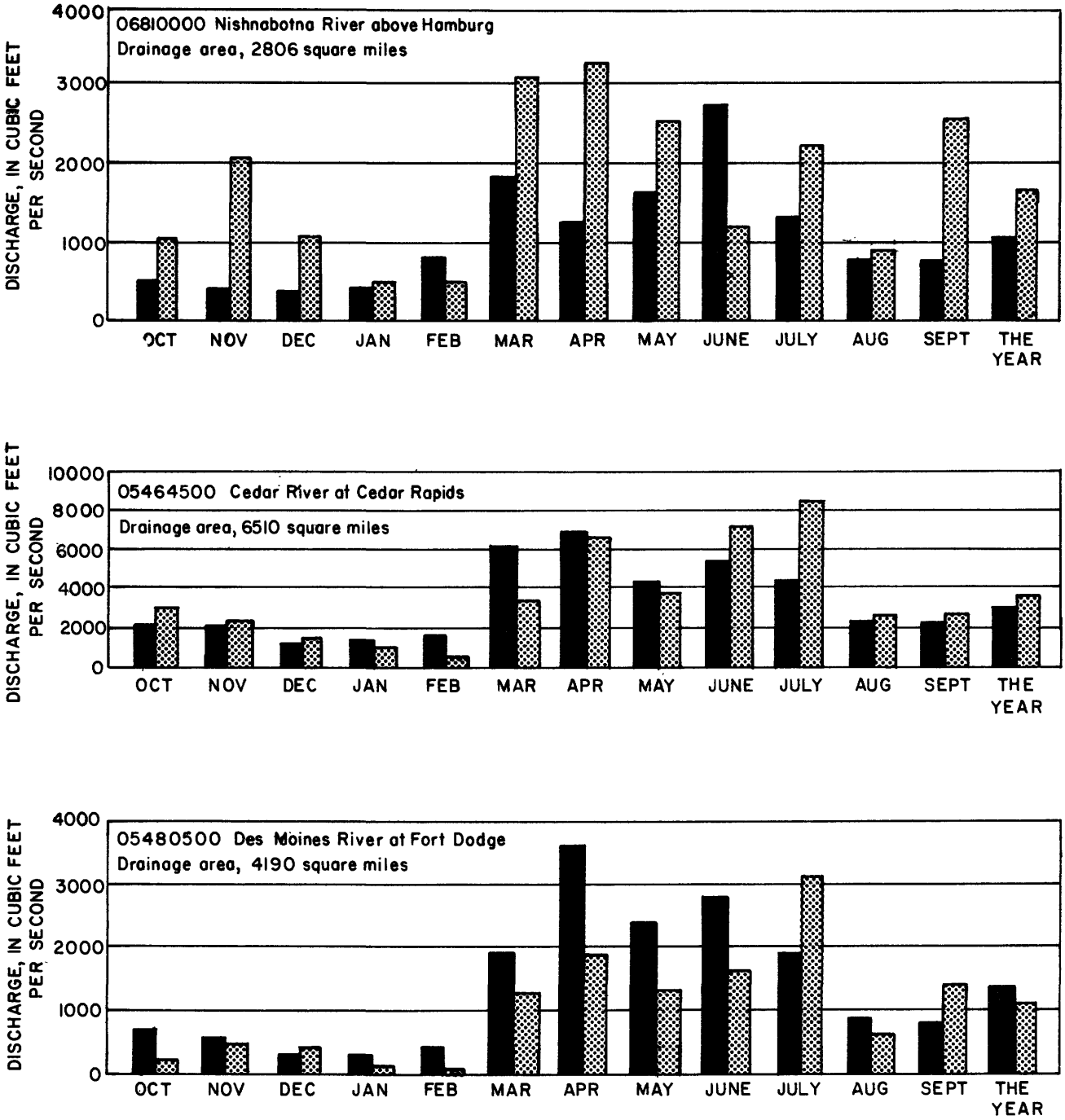

FIGURE 3.--RUNOFF DURING 1978 WATER YEAR COMPARED WITH MEAN RUNOFF FOR PERIOD 1941-70 FOR THREE REPRESENTATIVE GAGING STATIONS

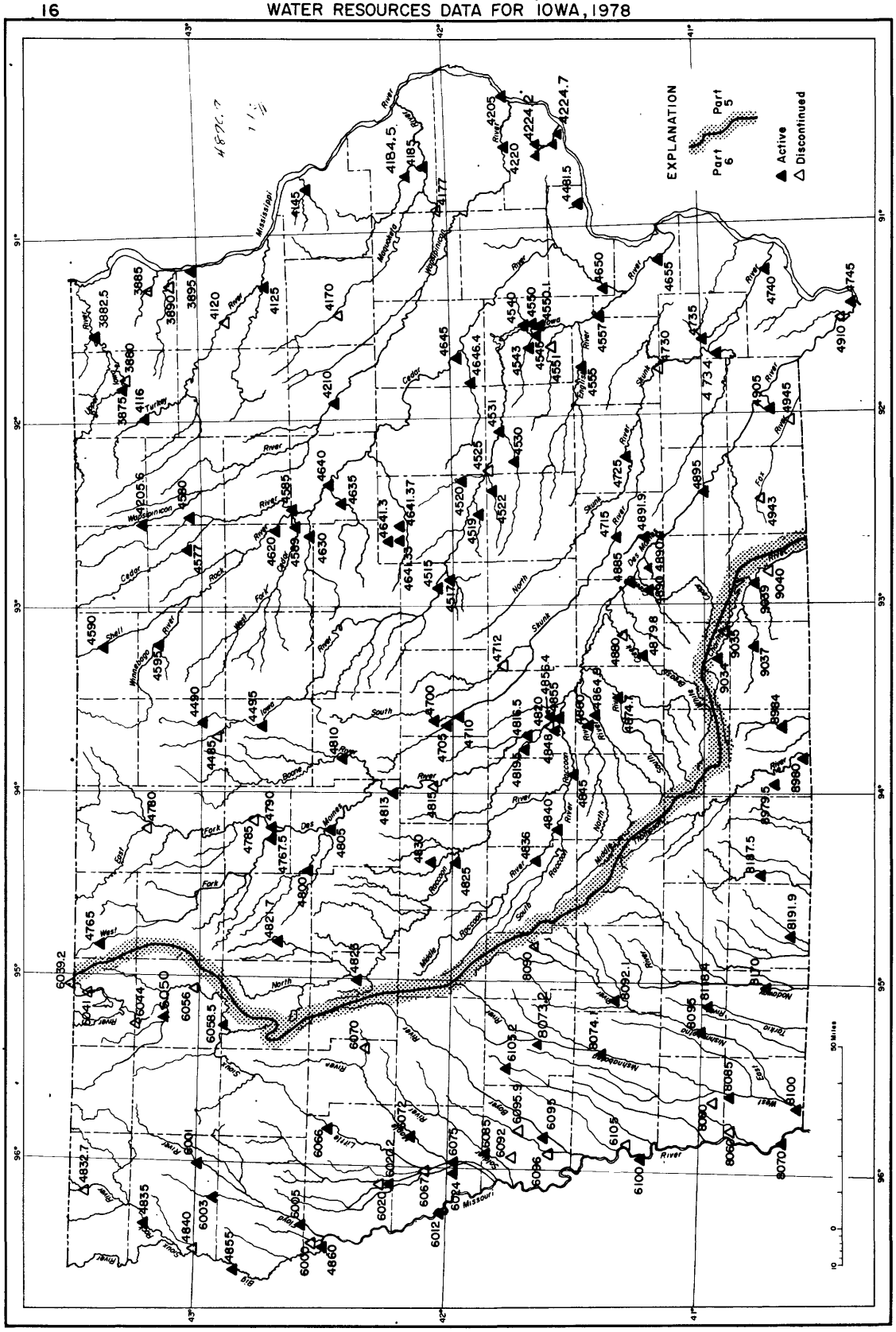

Figure 4.--Map of Iowa showing location of continuous-record gaging stations.

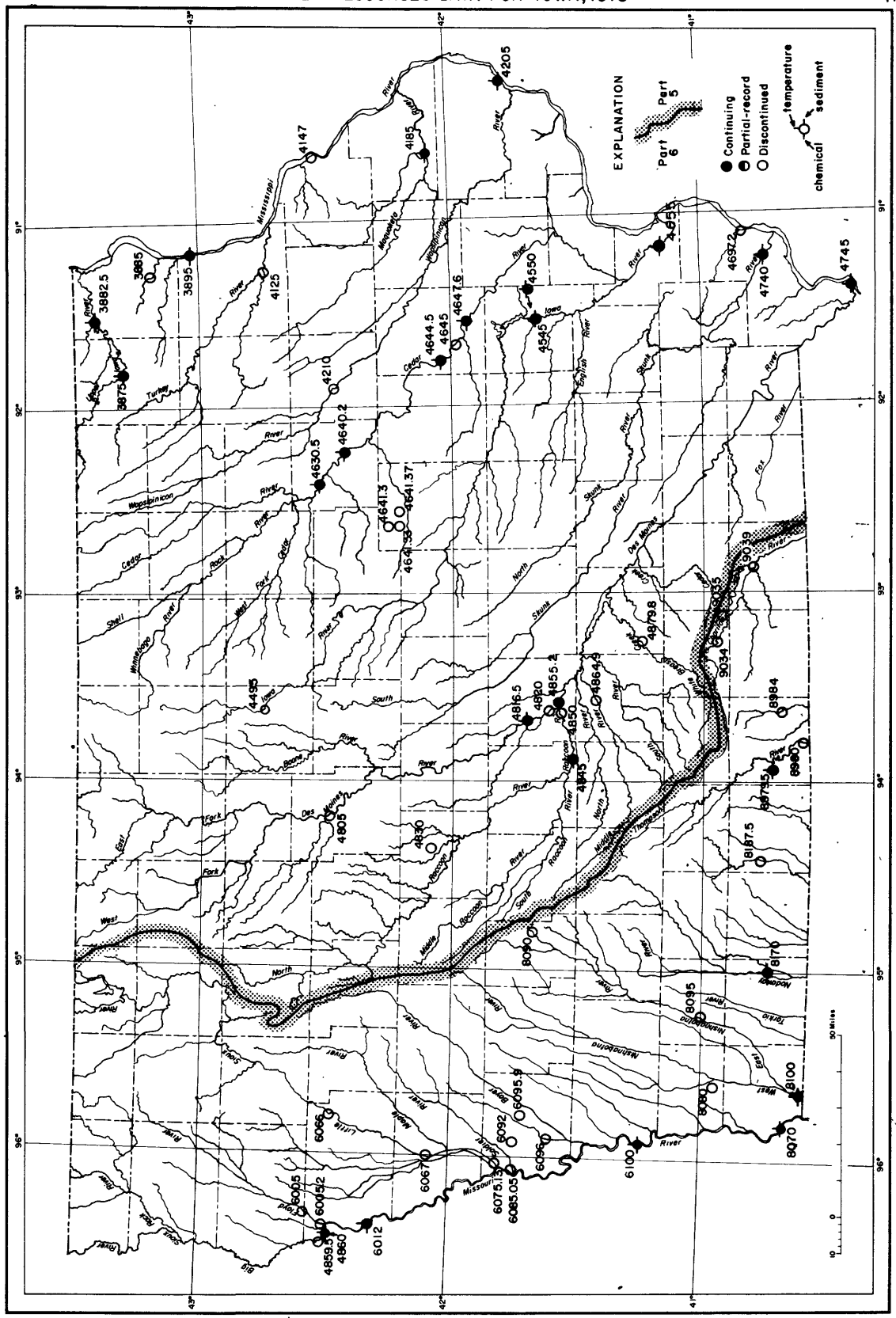

Figure 5.--Map of Iowa showing location of water-quality stations.

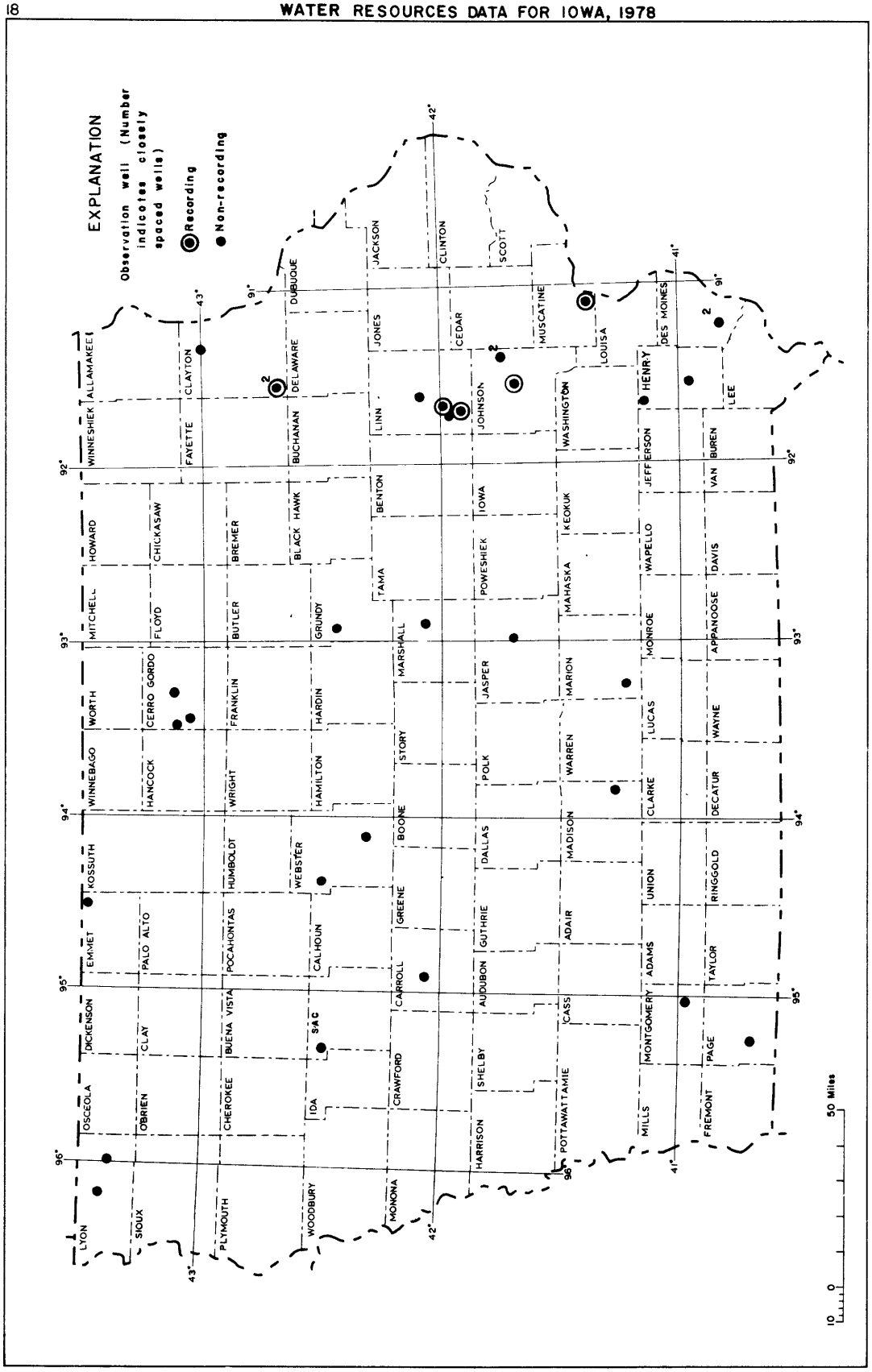

Figure 6.--Location of observation wells in Iowa.

DISCONTINUED GAGING STATIONS

The following stream-gaging stations have been discontinued in Iowa. Continuous daily streamflow records were collected and published for the period of record shown for each station.

Discontinued gaging stations

Station name	Station number	Drainage area (sq mi)	Period of record
Upper Iowa River near Decorah, Iowa.	05388000	568	1913-14; 1919-27; 1933-51.
Paint Creek at Waterville, Iowa.	05388500	42.8	1952-73.
Yellow River at Ion, Iowa.	05389000	221	1934-51.
Mississippi River at Clayton, Iowa.	05411500	79,200	1930-36.
Turkey River at Elkader, Iowa.	05412000	891	1932-42.
Maquoketa River near Manchester, Iowa.	05417000	305	1933-73.
Maquoketa River near Delhi, Iowa.	05417500	347	1933-40.
Bear Creek near Monmouth, Iowa.	05417700	61.3	1957-76.
Maquoketa River above North Fork Maquoketa River near Maquoketa, Iowa.	05418000	938	1913-14.
Wapsipinicon River at Stone City, Iowa.	05421500	1,324	1903-14.
West Branch (West Fork) Iowa River near Klemme, Iowa.	05448500	112	1948-58.
Iowa River near Iowa Falls, Iowa.	05450000	665	1911-14.
Upper Pine Lake at Eldora, Iowa.	05450500	14.9	1936-70.
Lower Pine Lake at Eldora, Iowa.	05451000	15.9	1936-70.
Iowa River near Belle Plaine, Iowa.	05452500	2,455	1939-59.
Lake Macbride near Solon, Iowa.	05453500	27.0	1936-71.
Old Mans Creek near Iowa City, Iowa.	05455100	201	1950-64.
Cedar River at Mitchell, Iowa.	05457500	826	1933-42.
Shell Rock River at Marble Rock (Greene), Iowa.	05460500	1,318	1933-53.
Shell Rock River at Greene, Iowa.	05461000	1,357	1933-42.
Shell Rock River near Clarksville, Iowa.	05461500	1,626	1915-27; 1932-34.
Indian Creek near Mingo, Iowa.	05471200	276	1958-75.
Lake Keomah near Oskaloosa, Iowa.	05472000	3.06	1936-71.
Skunk River at Coppock, Iowa.	05473000	2,916	1913-44.
East Fork Des Moines River near Burt, Iowa.	05478000	462	1971-74.
East Fork Des Moines River near Bardy, Iowa.	05478500	1,268	1940-54.
Des Moines River near Fort Dodge, Iowa.	05479500	3,753	1911-13.
Des Moines River near Boone, Iowa.	05481500	5,511	1920-68.
Des Moines River at Des Moines, Iowa.	05482000	6,245	1905-06; 1915-61.
Storm Lake at Storm Lake, Iowa.	05482140	28.3	1970-75.
Springbrook Lake near Guthrie Center, Iowa.	05483500	5.18	1936-71.
Raccoon River at Des Moines, Iowa.	05485000	3,590	1902-03.
Lake Ahquabi near Indianola, Iowa.	05487000	4.93	1936-71.
White Breast Creek near Knoxville, Iowa.	05488000	380	1945-62.
Lake Wapello near Drakesville, Iowa.	05490000	7.75	1936-71.
Sugar Creek near Keokuk, Iowa.	05491000	105	1922-31; 1958-73.
Fox River at Bloomfield, Iowa.	05494300	87.7	1957-73.
Fox River at Cantril, Iowa.	05494500	161	1940-51.
Rock River at Rock Rapids, Iowa.	06483270	788	1959-74.
Dry Creek at Hawarden, Iowa.	06484000	48.4	1948-69.
Perry Creek at 38th Street, Sioux City, Iowa.	06600000	65.1	1945-69.
West Fork ditch at Holly Springs, Iowa.	06602000	399	1939-69.
Loon Creek near Orleans, Iowa.	06603920	31	1971-74.
Spirit Lake outlet at Orleans, Iowa.	06604100	75.6	1971-74.
Milford Creek at Milford, Iowa.	06604400	146	1971-74.
Little Sioux River at Spencer, Iowa.	06605100	990	1936-42.
Little Sioux River at Gillett Grove, Iowa.	06605600	1,334	1958-73.
Little Sioux River near Kennebeck, Iowa.	06606700	2,738	1939-69.
Odebolt Creek near Arthur, Iowa.	06607000	39.3	1957-75.
Maple River at Turin, Iowa.	06607300	725	1939-41.
Little Sioux River near Blencoe (Turin), Iowa.	06607510	4,470	1939-42.
Steer Creek near Magnolai, Iowa.	06609200	9.26	1963-69.
Thompson Creek near Woodbine, Iowa.	06609590	6.97	1963-69.
Willow Creek near Logan, Iowa.	06609600	129	1972-75.
Indian Creek at Council Bluffs, Iowa.	06610500	7.99	1954-76.
Waubonsie Creek near Bartlett, Iowa.	06806000	30.4	1946-69.
West Nishnabotna River at (near) White Cloud, Iowa.	06807500	967	1918-24.
Mule Creek near Malvern, Iowa.	06808000	10.6	1954-69.
Spring Valley Creek near Tabor, Iowa.	06808200	7.6	1955-64.
Davids Creek near Hamlin, Iowa.	06809000	26.0	1952-73.
Tarkio River (East Tarkio Creek) at Blanchard, Iowa.	06812000	200	1934-40.
West Nodaway River at Villisca, Iowa	06816500	342	1918-25.
Honey Creek near Russell, Iowa.	06903500	13.2	1952-62.
Chariton River near Centerville, Iowa.	06904000	708	1938-59.

DISCONTINUED WATER-QUALITY STATIONS

The following water-quality stations have been discontinued in Iowa. Continuous daily records of water temperature or sediment and monthly or periodic samples of chemical quality were collected and published for the period of record shown for each station. An asterisk (*) in the type of record column indicates that periodic data is available for that parameter subsequent to the period of daily record.

Discontinued water-quality stations

Station name	Station number	Drainage area (sq mi)	Type of Record	Period of record
Paint Creek at Waterville, Iowa.	05388500	42.8	Temp	1952-56
			Sed.	1952-57
Turkey River at Garber, Iowa.	05412500	1,545	Temp.	1957-62
			Sed.	1957-62
Mississippi River at Dubuque, Iowa.	05414700	81,600	Chem.	1969-73
Wapsipinicon River at Independence, Iowa.	05421000	1,048	Chem. *	1968-70
			Temp. *	1967-70
			Sed. *	1967-70
Iowa River near Rowan, Iowa.	05449500	429	Temp. *	1957-62
			Sed. *	1957-62
Fourmile Creek near Lincoln, Iowa.	05464130	13.78	Chem.	1969-74
			Temp.	1969-74
			Sed.	1969-74
Half Mile Creek near Gladbrook, Iowa.	05464133	1.33	Chem.	1969-74
			Temp.	1969-74
			Sed.	1969-74
Fourmile Creek near Traer, Iowa.	05464137	19.51	Chem.	1969-74
			Temp.	1969-74
			Sed.	1969-74
Cedar River at Cedar Rapids, Iowa.	05464500	6,640	Chem. *	1906-07; 1944-54
			Temp. *	1944-54
			Sed.	1943-54
Mississippi River at Burlington, Iowa.	05469720	114,000	Chem.	1969-73
Des Moines River at Fort Dodge, Iowa.	05480500	4,190	Chem.	1972-73
Des Moines River at Des Moines, Iowa.	05482000	6,245	Chem.	1954-55
			Temp.	1954-61
			Sed.	1954-61
E. Fork Hardin Creek near Churdan, Iowa.	05483000	24.0	Temp. *	1952-57
			Sed. *	1952-57
Raccoon River at Des Moines, Iowa.	05485000	3,590	Chem.	1945-47
			Temp.	1945-47
Des Moines River below Raccoon River at Des Moines, Iowa.	05485500	9,770	Chem. *	1944-45
			Temp. *	1944-47
			Sed.	1944-47
Middle River near Indianola, Iowa.	05486490	503	Temp. *	1962-67
			Sed.	1962-67
White Breast Creek near Dallas, Iowa.	05487980	342	Chem.	1968-73
			Temp.	1967-73
			Sed.	1967-73
Big Sioux River at Sioux City, Iowa.	06485950	9,410	Chem.	1969-73
Floyd River at James, Iowa.	06600500	882	Temp.	1968-73
			Sed.	1968-73
FLoyd River at Sioux City, Iowa.	06600520	921	Chem.	1969-73
Little Sioux River at Correctionville, Iowa.	06606600	2,500	Chem. *	1954-55
			Temp. *	1951-62
			Sed.	1950-62
Little Sioux River near Kennebec, Iowa.	06606700	2,738	Temp.	1950-55
			Sed.	1950-57
Little Sioux River at River Sioux, Iowa.	06607513	3,600	Chem.	1969-73
Soldier River near Mondamin, Iowa.	06608505	440	Chem.	1970-73
Steer Creek near Magnolia, Iowa.	06609200	9.26	Temp.	1963-69
			Sed.	1963-69
Thompson Creek near Woodbine, Iowa.	06609590	6.97	Temp.	1963-69
			Sed.	1963-69
Willow Creek near Logan, Iowa.	06609600	129	Chem.	1972-75
			Temp.	1972-75
			Sed.	1971-75
Mule Creek near Malvern, Iowa.	06808000	10.6	Temp.	1958-69
			Sed.	1954-69
Davids Creek near Hamlin, Iowa.	06809000	26.0	Temp. *	1952-53; 1965-68
			Sed. *	1952-68
East Nishnabotna River at Red Oak, Iowa.	06809500	894	Temp.	1962-73
			Sed.	1962-73
Platte River near Diagonal, Iowa.	06818750	217	Chem.	1969-73
Thompson River at Davis City, Iowa.	06898000	701	Chem.	1967-73
			Temp.	1968-73
			Sed.	1968-73
Weldon River near Leon, Iowa.	06898400	104	Chem.	1968-73
Chariton River near Chariton, Iowa.	06903400	182	Temp.	1969-73
			Sed.	1969-73
Honey Creek near Russell, Iowa.	06903500	13.2	Sed.	1952-62
Chariton River near Rathbun, Iowa.	06903900	551	Temp. *	1962-69
			Sed. *	1962-69

Type of record: Chem. (chemical quality); Temp. (water temperature); Sed. (sediment).

05387500 UPPER IOWA RIVER AT DECORAH, IA

LOCATION.--Lat 43°18'19", long 91°47'48", in NE1/4 SW1/4 sec.16, T.98 N., R.8 W., Winneshiek County, Hydrologic Unit 07060002, on right bank 1,200 ft (366 m) upstream from bridge on U.S. Highway 52 (city route) in Decorah, 1,500 ft (457 m) downstream from Dry Run cutoff, and 3.0 mi (4.8 km) upstream from Trout Run.

DRAINAGE AREA.--511 mi² (1,323 km²).

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 850.00 ft (259.080 m) NGVD.

REMARKS.--Records good except those for winter period, which are fair.

AVERAGE DISCHARGE.--27 years, 297 ft³/s (8.411 m³/s), 7.89 in/yr (200 mm/yr), 215,200 acre-ft/yr (265 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,200 ft³/s (572 m³/s) Mar. 27, 1961, gage height, 13.08 ft (3.987 m); minimum daily, 22 ft³/s (0.62 m³/s) Feb. 2-7, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood known, probably since at least 1913, occurred May 29, 1941, at site of former gaging station near Decorah, 4 mi (6.4 km) downstream, discharge, 28,500 ft³/s (807 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

		Discharge		Gage height				Discharge		Gage height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
June 17	1300	*7,060	200	*9.83	2.996	July 6	1300	5,890	167	9.20	2.804

Minimum daily discharge, 44 ft³/s (1.25 m³/s) Dec. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	92	78	101	58	60	565	320	272	494	330	122
2	94	94	78	99	56	58	517	300	268	500	320	119
3	94	100	76	97	55	57	450	282	254	400	390	116
4	95	100	75	95	54	56	535	272	226	340	595	110
5	97	94	74	90	55	55	412	259	206	315	390	107
6	92	94	57	90	56	54	505	250	196	3220	340	107
7	93	92	45	90	56	55	718	238	188	2610	305	107
8	105	92	58	90	57	56	664	246	196	1620	282	105
9	110	97	50	80	58	56	535	246	174	982	254	105
10	109	94	44	73	58	57	517	238	164	746	238	102
11	122	92	49	66	58	60	500	338	158	625	226	100
12	125	89	53	69	58	62	494	277	151	541	218	116
13	129	87	58	72	58	65	417	360	144	488	214	360
14	131	87	66	73	57	67	365	315	141	428	206	350
15	125	84	70	72	57	70	330	286	138	395	199	214
16	116	84	75	71	57	73	295	268	206	610	185	185
17	113	84	86	70	56	76	286	254	5360	765	178	171
18	110	84	120	69	56	79	472	242	5360	478	174	158
19	106	82	134	68	56	82	1050	234	1210	360	161	151
20	102	84	130	68	56	92	1110	238	788	370	154	170
21	99	79	144	68	56	122	1150	222	619	771	144	165
22	97	78	140	68	57	461	658	196	523	1470	141	149
23	95	77	136	68	57	1240	589	192	461	1850	135	136
24	96	77	130	68	57	1310	535	203	422	1330	129	132
25	96	76	124	73	58	990	517	196	444	862	126	127
26	92	75	118	71	59	746	505	185	488	670	144	125
27	89	74	113	68	60	697	450	188	370	559	148	122
28	89	73	108	66	61	795	406	234	320	500	151	120
29	89	72	106	64	---	838	375	268	295	444	151	159
30	87	74	104	62	---	658	345	315	412	395	132	289
31	90	---	102	60	---	583	---	277	---	360	126	---
TOTAL	3181	2561	2801	2339	1597	9730	16267	7939	20154	25498	6886	4599
MEAN	103	85.4	90.4	75.5	57.0	314	542	256	672	823	222	153
MAX	131	100	144	101	61	1310	1150	360	5360	3220	595	360
MIN	87	72	44	60	54	54	286	185	138	315	126	100
CFSM	.20	.17	.18	.15	.11	.61	1.06	.50	1.32	1.61	.43	.30
IN.	.23	.19	.20	.17	.12	.71	1.18	.58	1.47	1.86	.50	.33
AC-FT	6310	5080	5560	4640	3170	19300	32270	15750	39980	50580	13660	9120

CAL YR 1977	TOTAL	44740	MEAN 123	MAX 1510	MIN 38	CFSM .24	IN 3.26	AC-FT	88740		
WTR YR 1978	TOTAL	103552	MEAN 284	MAX 5360	MIN 44	CFSM .56	IN 7.54	AC-FT	205400		

05387500 UPPER IOWA RIVER AT DECORAH, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1962 to September 1964, October 1966 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1962 to December 1967.

INSTRUMENTATION.--Temperature recorder since Apr. 12, 1967.

REMARKS.--No record Oct. 1-3.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 33.5°C July 5-6, 1977. minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,700 mg/L May 26, 1965; minimum daily mean, 1 mg/L Oct. 21, 1965.
SEDIMENT LOADS: Maximum daily, 62,300 tons (56,500 tonnes) June 10, 1967; minimum daily, 0.1 ton (0.09 tonne) Oct. 21, 1965.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 28.0 Sept. 8; minimum, 0.0°C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	14.5	13.0	11.0	10.0	.0	.0	.0	.0	.0	.0	.5	.0
2	15.0	11.0	11.0	10.6	.0	.0	.0	.0	.0	.0	.5	.0
3	15.0	10.0	12.0	10.5	.0	.0	.0	.0	.0	.0	.5	.0
4	13.5	10.0	11.0	9.0	.0	.0	.0	.0	.0	.0	.5	.0
5	14.5	11.5	10.0	7.0	.0	.0	.0	.0	.0	.0	.5	.0
6	13.5	9.5	10.0	10.0	.0	.0	.0	.0	.0	.0	.5	.0
7	11.0	9.0	11.0	10.0	.0	.0	.0	.0	.0	.0	.5	.0
8	9.0	8.5	11.5	11.0	.0	.0	.0	.0	.0	.0	.5	.0
9	8.0	8.0	11.5	8.0	.0	.0	.0	.0	.0	.0	1.0	.0
10	9.5	9.5	8.0	2.0	.0	.0	.0	.0	.0	.0	.5	.0
11	8.0	8.0	3.5	1.5	.0	.0	.0	.0	.0	.0	.5	.0
12	6.5	6.5	3.0	.5	.0	.0	.0	.0	.0	.0	.5	.0
13	7.0	7.0	3.0	1.0	.0	.0	.0	.0	.0	.0	.5	.0
14	8.6	8.5	3.0	1.0	.0	.0	.0	.0	.0	.0	.5	.0
15	12.0	9.5	4.5	3.0	.0	.0	.0	.0	.0	.0	1.0	.0
16	11.0	8.0	5.0	4.0	.0	.0	.0	.0	.0	.0	1.0	.0
17	11.0	8.5	3.5	2.0	.0	.0	.0	.0	.0	.0	1.0	.0
18	10.0	9.0	3.5	1.5	.0	.0	.0	.0	.0	.0	1.0	.0
19	11.5	7.0	3.0	3.0	.0	.0	.0	.0	.0	.0	1.0	.0
20	11.5	8.5	6.0	3.0	.0	.0	.0	.0	.0	.0	1.0	.0
21	13.5	9.5	3.0	.5	.0	.0	.0	.0	.0	.0	1.5	.0
22	12.0	10.5	1.0	.5	.0	.0	.0	.0	.0	.0	.5	.0
23	11.5	10.0	1.0	.5	.0	.0	.0	.0	.0	.0	1.5	.0
24	11.0	10.0	1.0	.5	.0	.0	.0	.0	.0	.0	1.5	.5
25	11.5	11.0	.5	.5	.0	.0	.0	.0	.0	.0	2.0	1.0
26	14.0	11.5	.5	.5	.0	.0	.0	.0	.0	.0	4.0	2.0
27	13.5	11.0	.5	.5	.0	.0	.0	.0	.0	.0	5.5	3.0
28	13.0	10.0	.0	.0	.0	.0	.0	.0	.5	.0	5.5	4.0
29	12.0	10.5	.0	.0	.0	.0	.0	.0	---	---	6.0	4.0
30	12.0	10.0	.0	.0	.0	.0	.0	.0	---	---	8.5	4.5
31	12.0	11.0	---	---	.0	.0	.0	.0	---	---	10.5	7.0
MONTH	15.0	6.5	12.0	.0	.0	.0	.0	.0	.5	.0	10.5	.0

053875000 UPPER IOWA RIVER AT DECORAH, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	10.5	8.5	14.5	10.0	22.0	19.5	24.5	21.5	21.0	18.0	23.5	19.0
2	9.0	5.0	15.0	10.0	20.0	16.5	23.5	22.0	23.0	19.5	24.5	20.0
3	8.0	5.0	15.5	11.0	21.5	16.5	22.0	21.0	21.5	19.0	25.5	20.5
4	10.0	8.0	13.5	12.0	21.5	17.0	21.0	19.5	20.0	17.0	25.5	20.0
5	9.0	7.0	13.0	10.5	23.0	17.0	25.5	19.5	20.5	16.5	24.0	20.0
6	9.5	6.5	14.0	10.0	23.0	18.5	24.5	20.0	22.0	18.5	25.5	20.0
7	10.0	7.0	13.0	10.5	22.0	19.5	21.5	20.0	22.0	19.0	26.5	21.0
8	9.5	8.0	12.0	10.5	21.0	15.5	22.0	20.5	22.0	20.0	28.0	22.0
9	8.5	6.5	11.5	10.5	23.5	16.5	21.0	20.0	23.5	19.5	26.5	22.0
10	8.5	8.0	16.0	9.5	24.5	19.0	20.0	18.0	23.0	19.0	26.0	22.0
11	9.0	6.5	18.5	13.5	23.5	20.0	20.5	18.0	23.0	19.0	26.0	22.0
12	10.5	7.0	18.0	14.0	24.5	19.0	20.0	19.0	24.5	20.0	24.5	19.0
13	9.5	6.0	14.5	11.5	24.5	18.5	21.0	18.0	25.5	21.0	19.0	18.0
14	10.0	6.5	13.5	11.0	22.0	19.5	23.5	19.0	27.0	22.0	20.0	18.0
15	11.0	6.5	15.5	11.5	24.5	18.5	25.5	21.0	25.5	24.0	20.0	16.5
16	12.0	9.0	18.0	13.5	22.0	19.0	25.5	20.5	25.0	20.5	18.5	16.5
17	10.5	7.0	19.0	14.5	20.0	19.5	23.0	20.5	26.0	21.0	19.0	17.0
18	7.0	5.5	20.5	15.0	20.0	19.0	24.5	21.5	24.5	23.0	19.0	18.0
19	6.5	5.0	21.0	16.5	20.5	18.0	25.5	22.0	24.0	20.0	18.5	17.0
20	5.0	4.5	20.0	16.0	20.0	18.5	25.0	22.0	23.5	18.5	17.0	16.0
21	8.5	5.0	19.5	14.0	20.0	16.5	22.0	20.0	21.0	19.0	16.5	15.0
22	9.0	6.0	20.0	15.0	20.0	18.0	20.5	19.0	24.0	18.0	16.0	14.0
23	9.0	8.0	18.5	16.5	19.5	18.5	20.0	18.0	26.5	21.5	15.5	13.5
24	8.5	8.0	19.0	16.0	21.0	18.0	20.5	18.5	26.0	23.5	16.5	14.0
25	11.5	7.0	23.5	18.0	21.0	20.0	21.0	19.0	24.5	23.5	18.5	14.0
26	12.0	9.0	25.5	20.5	24.0	19.5	21.5	19.5	23.5	21.0	18.0	14.0
27	14.5	10.5	25.0	21.0	24.5	21.5	21.0	19.0	22.0	21.0	18.0	14.5
28	15.0	11.5	23.5	20.5	23.5	21.0	20.0	18.5	21.5	19.5	18.0	13.0
29	14.0	13.0	22.0	20.0	24.5	20.5	20.0	19.0	23.0	18.0	16.5	13.5
30	15.5	11.0	21.5	19.0	24.5	22.0	19.5	18.0	23.5	18.5	15.0	13.5
31	---	---	21.5	19.0	---	---	21.0	17.0	23.5	19.0	---	---
MONTH	15.5	4.5	25.5	9.5	24.5	15.5	25.5	17.0	27.0	16.5	28.0	13.0
YEAR	28.0	.0										

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA

LOCATION.--Lat 43°25'16", long 91°30'31", in SW1/4 NW1/4 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 (198 m) upstream from Mineral Creek, 0.5 mi (0.8 km) upstream from Bear Creek, 3.5 mi (5.6 km) south of Dorchester, and 18.1 mi (29.1 km) upstream from mouth.

DRAINAGE AREA.--770 mi² (1,994 km²).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 660.00 ft (201.168 m) NGVD. Prior to Jan. 6, 1938, nonrecording gage on old bridge at site 0.2 mi (0.3 km) upstream at datum 5.91 ft (1.801 m) higher. Jan. 6, 1938, to Apr. 26, 1948, nonrecording gage at datum 60.00 ft (18.288 m) 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.--Water-discharge record good except those for winter period, which are poor. Corps of Engineers gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,000 ft³/s (396 m³/s) Mar. 12, 1976, gage height, 17.67 ft (5.386 m); minimum daily, 79 ft³/s (2.24 m³/s) Dec. 31, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1941, reached a stage of 21.8 ft (6.64 m), from flood profile, discharge, 30,400 ft³/s (861 m³/s) on basis of slope-area determination of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

		Discharge		Gage height				Discharge		Gage height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
June 17	0700	*8,680	245.82	*15.54	4.74	July 6	2100	5,170	146.41	13.42	4.09

Minimum daily discharge, 82 ft³/s (2.32 m³/s) Mar. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	173	152	131	188	128	86	931	503	423	1790	640	253
2	173	153	121	160	130	87	819	472	425	623	595	249
3	168	162	110	162	130	90	721	448	413	701	590	241
4	164	159	110	178	130	82	817	425	375	510	785	232
5	167	159	111	175	128	84	691	409	348	475	752	225
6	161	160	101	170	125	90	734	396	327	2770	610	222
7	162	165	98	170	125	94	904	380	312	2900	550	219
8	183	171	110	156	124	100	1130	380	310	2460	509	215
9	200	165	108	133	122	112	883	384	312	1550	475	210
10	202	160	104	116	120	126	833	376	297	1210	440	207
11	196	156	110	128	120	129	759	364	264	992	425	203
12	205	149	114	148	120	128	758	993	253	857	426	212
13	204	147	122	140	118	128	678	678	240	766	399	487
14	206	147	120	148	114	135	588	618	232	680	391	723
15	211	148	117	144	113	148	532	511	229	614	369	480
16	198	147	110	148	105	160	491	486	481	569	374	351
17	190	145	117	132	101	160	461	449	6380	1640	337	315
18	183	143	120	142	100	155	564	406	4480	1460	328	295
19	175	141	129	137	98	149	1020	398	2040	1030	323	280
20	170	144	180	147	100	165	1600	391	1400	749	303	327
21	166	141	160	132	100	188	1250	373	1080	1130	296	335
22	161	125	168	128	98	266	993	358	883	2130	289	296
23	156	117	168	123	103	1330	913	351	771	2410	284	266
24	155	120	158	135	103	1620	828	343	689	2080	272	257
25	164	119	150	146	97	1520	772	323	654	1610	261	250
26	160	122	151	146	94	1200	731	318	950	1290	263	242
27	152	131	178	138	91	1050	705	307	1010	1090	299	237
28	148	138	190	148	94	1210	639	322	665	944	303	229
29	147	141	182	128	---	1230	586	600	578	853	357	255
30	146	132	177	128	---	1140	544	481	719	761	292	356
31	149	---	190	127	---	984	---	480	---	697	264	---
TOTAL	5395	4359	4215	4501	3131	14146	23875	13723	27540	39341	12801	8669
MEAN	174	145	136	145	112	456	796	443	918	1269	413	289
MAX	211	171	190	188	130	1620	1600	993	6380	2900	785	723
MIN	146	117	98	116	91	82	461	307	229	475	261	203
CFSM	.23	.19	.18	.19	.15	.59	1.03	.58	1.19	1.65	.54	.38
IN.	.26	.21	.20	.22	.15	.68	1.15	.66	1.33	1.90	.62	.42
AC-FT	10700	8650	8360	8930	6210	28060	47360	27220	54630	78030	25390	17190

CAL YR 1977	TOTAL	67611	MEAN 185	MAX 2380	MIN 82	CFSM .24	IN 3.27	AC-FT	134100		
WTR YR 1978	TOTAL	161696	MEAN 443	MAX 6380	MIN 82	CFSM .58	IN 7.81	AC-FT	320700		

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IOWA--Continued.

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1975 to current year.
WATER TEMPERATURES: October 1977 to current year.
SEDIMENT RECORDS: 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, 635 micromhos Aug. 5, 1975; minimum daily, 205 micromhos July 21, 1977.
WATER TEMPERATURES: Maximum daily, 24.0°C July 19, Sept. 9-11, 1978; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 10,000 mg/L July 17, 1978; minimum daily mean, 5 mg/L Nov. 17, 1976, Jan. 17, 1977, Mar. 6, 1978.
SEDIMENT LOADS: Maximum daily, 173,000 tons (157,000 tonnes) June 17, 1978; minimum daily, 1.2 tons (1.1 tonnes) Mar. 6, 1978.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 590 micromhos Apr. 19: minimum daily, 220 micromhos June 17.
WATER TEMPERATURES: Maximum daily, 24.0°C July 19, Sept. 9-11; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 10,000 mg/L July 17; minimum daily mean, 5 mg/L Mar. 6.
SEDIMENT LOADS: Maximum daily, 173,000 tons (157,000 tonnes) June 17; minimum daily, 1.2 tons (1.1 tonnes) Mar. 6.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380	400	280	390	370	440	360	380	490	400	450	430
2	360	390	250	370	370	430	430	445	490	400	450	500
3	380	340	300	370	370	410	430	370	450	380	440	440
4	380	300	250	360	380	420	360	350	460	380	440	500
5	380	240	240	370	390	440	360	360	450	380	440	500
6	380	240	260	360	370	450	380	350	430	370	440	500
7	390	240	250	380	370	420	500	360	440	340	420	450
8	390	240	360	380	415	430	500	360	400	390	420	460
9	380	250	350	360	450	460	500	360	410	420	360	440
10	390	300	350	350	460	430	490	360	420	420	380	455
11	400	280	350	380	450	460	500	360	390	420	380	470
12	410	280	350	400	450	470	440	490	400	400	370	480
13	410	260	350	380	450	470	440	500	380	410	390	420
14	410	260	360	380	460	400	390	500	390	380	400	370
15	410	240	340	380	450	465	400	500	420	440	380	370
16	420	240	340	380	440	400	380	470	420	400	400	420
17	400	300	350	360	440	340	390	470	220	320	380	490
18	400	240	340	400	460	340	460	360	250	390	360	500
19	410	240	380	400	470	320	590	380	330	450	390	420
20	400	240	360	400	430	320	410	380	490	440	390	520
21	400	260	350	370	430	420	410	380	480	350	390	520
22	400	240	360	360	460	430	460	380	480	350	350	530
23	400	270	360	370	460	400	440	380	480	380	420	550
24	410	240	350	370	430	400	420	370	460	400	480	550
25	380	240	390	380	400	340	400	380	440	400	440	550
26	400	300	380	380	420	340	400	370	460	420	390	550
27	410	280	390	380	400	370	400	370	470	480	380	560
28	400	260	390	380	450	400	400	360	470	440	400	560
29	420	250	400	370	---	380	410	300	360	420	420	570
30	420	300	380	380	---	380	370	370	380	460	420	560
31	430	---	390	380	---	360	---	370	---	420	430	---

053882500 UPPER IOWA RIVER NEAR DORCHESTER, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.0	11.0	.0	.0	.0	.0	4.0	12.0	20.0	21.0	20.0	23.0
2	13.0	11.0	1.0	.0	.0	.0	5.0	12.5	20.0	21.0	20.0	23.0
3	13.0	11.5	.0	.0	.0	.0	5.0	11.0	20.0	21.0	20.0	23.0
4	13.0	10.0	.0	.0	.0	.0	5.0	14.0	20.0	21.0	21.0	22.0
5	13.0	9.0	.0	.0	.0	.0	5.0	14.0	20.0	21.0	20.0	23.0
6	10.0	9.0	.0	.0	.0	.0	5.0	15.0	20.0	23.5	20.0	23.0
7	11.0	9.0	.0	.0	.0	.0	6.0	15.0	20.0	21.0	20.0	23.0
8	10.0	9.0	.0	.0	.0	3.0	6.0	15.0	18.0	21.0	20.0	23.0
9	10.0	6.0	.0	.0	.0	.0	6.0	15.0	18.0	21.0	21.0	24.0
10	10.0	5.0	.0	.0	.0	.0	7.0	15.0	19.0	21.0	21.0	24.0
11	10.0	4.0	.0	.0	.0	.0	7.0	15.0	19.0	22.0	21.0	24.0
12	10.0	4.0	.0	.0	.0	.0	9.0	14.0	20.0	22.0	21.0	23.0
13	10.0	4.0	.0	.0	.0	.0	9.0	15.0	20.0	22.0	21.0	20.0
14	10.0	5.0	.0	.0	.0	.0	9.0	12.0	20.0	22.0	21.0	19.0
15	10.0	5.0	.0	.0	.0	.5	9.0	12.0	20.0	22.0	21.0	19.0
16	10.0	5.0	.0	.0	.0	.0	9.0	15.0	20.0	22.0	22.0	19.0
17	9.0	4.0	.0	.0	.0	.0	9.0	16.0	21.0	21.0	22.0	18.0
18	9.0	4.0	.0	.0	.0	.0	9.0	18.0	20.0	22.0	22.0	18.0
19	9.0	6.0	.0	.0	.0	.0	8.0	19.0	20.5	24.0	19.0	18.0
20	9.0	5.0	.0	.0	.0	.0	8.0	19.0	21.0	22.0	19.0	18.0
21	10.0	2.0	.0	.0	.0	1.0	6.0	20.0	21.0	21.0	20.0	18.0
22	10.0	2.0	.0	.0	.0	1.0	9.0	18.0	20.0	23.0	20.0	17.0
23	10.0	1.0	.0	.0	.0	1.0	9.0	18.0	20.0	22.0	20.5	16.0
24	10.0	.0	.0	.0	.0	1.0	9.0	19.0	21.0	22.0	21.0	15.0
25	11.0	.0	.0	.0	.0	2.0	9.0	19.0	21.0	20.0	21.0	14.0
26	11.0	.0	.0	.0	.0	2.0	9.0	21.0	21.0	21.0	21.0	14.0
27	10.0	1.0	.0	.0	.0	3.0	10.0	20.0	21.0	21.0	22.0	13.0
28	10.0	1.0	.0	.0	.0	4.0	10.0	20.0	21.0	20.0	22.0	13.0
29	10.0	1.0	.0	.0	---	4.0	11.0	19.0	21.0	20.0	21.0	15.0
30	10.0	1.0	.0	.0	---	4.0	12.0	19.0	21.0	21.0	22.0	15.0
31	11.0	---	.0	.0	---	4.0	---	20.0	---	21.0	22.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONGEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	25	12	26	11	114	40	61	31	16	5.5	25	5.8
2	16	7.5	17	7.0	87	28	31	13	24	8.4	16	3.8
3	16	7.3	40	17	72	21	26	11	20	7.0	17	4.1
4	32	14	62	27	80	24	27	13	12	4.2	24	5.3
5	34	15	50	21	95	28	33	16	52	18	12	2.7
6	13	5.7	32	14	95	26	34	16	28	9.5	5	1.2
7	12	5.2	14	6.2	64	17	21	9.6	28	9.5	18	4.6
8	20	9.9	28	13	27	8.0	44	19	22	7.4	12	3.2
9	34	18	20	8.9	27	7.9	35	13	24	7.9	10	3.0
10	24	13	30	13	18	5.1	28	8.8	23	7.5	12	4.1
11	23	12	38	16	28	8.3	46	16	28	9.1	5	2.1
12	19	11	15	6.0	14	4.3	35	14	25	8.1	12	4.1
13	17	9.4	6	2.4	12	4.0	38	14	24	7.6	19	6.6
14	10	5.6	25	9.9	17	5.5	58	23	24	7.4	15	5.5
15	10	5.7	73	29	26	8.2	39	15	26	7.9	15	6.0
16	6	3.2	52	21	67	20	38	15	25	7.1	10	4.3
17	15	7.7	35	14	37	12	32	11	16	4.4	20	8.6
18	18	8.9	33	13	44	14	72	28	27	7.3	24	10
19	19	9.0	58	22	26	9.1	51	19	29	7.7	36	14
20	10	4.6	67	26	22	11	60	24	40	11	29	13
21	13	5.8	73	28	25	11	28	10	28	7.6	13	6.6
22	16	7.0	92	31	35	16	64	22	25	6.6	55	40
23	20	8.4	82	26	29	13	58	19	25	7.0	1600	5490
24	25	10	73	24	43	18	63	23	26	7.2	1570	6710
25	35	15	38	12	33	13	31	12	30	7.9	930	3820
26	14	6.0	60	20	60	24	17	6.7	8	2.0	845	2740
27	25	10	75	27	27	13	16	6.0	14	3.4	639	1810
28	28	11	68	25	39	20	20	8.0	10	2.5	490	1600
29	12	4.8	40	15	62	30	19	6.6	---	---	310	1030
30	23	9.1	77	27	39	19	15	5.2	---	---	276	850
31	28	11	---	---	24	12	17	5.8	---	---	219	582
TOTAL	---	282.8	---	532.4	---	490.4	---	453.7	---	206.7	---	25790.6

053882500 UPPER IOWA RIVER NEAR DORCHESTER, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	110	277	61	83	590	674	1200	5800	106	183	54	37
2	125	276	36	46	1160	1330	400	673	113	182	91	61
3	94	183	37	45	880	981	820	1550	127	202	50	33
4	332	732	28	32	290	294	855	1180	179	379	111	70
5	170	317	20	22	215	202	1600	2050	78	158	94	57
6	331	656	28	30	245	216	6800	59000	88	145	78	47
7	310	757	15	15	210	177	9180	72200	86	128	30	18
8	240	732	15	15	204	171	8700	60500	95	131	65	38
9	293	699	34	35	231	195	1080	4520	94	121	46	26
10	199	448	25	25	250	200	1470	4800	67	80	37	21
11	176	361	38	37	111	79	3150	8440	42	48	80	44
12	199	407	1420	4920	134	92	1850	4280	67	77	29	17
13	140	256	1680	3080	147	95	970	2010	125	135	419	551
14	92	146	310	517	162	101	655	1200	57	60	763	1490
15	92	132	320	442	251	165	410	680	44	44	701	908
16	98	130	290	381	1010	1310	162	249	38	38	461	437
17	94	117	163	198	9840	173000	10000	53600	46	41	127	108
18	274	417	40	44	7880	103000	6120	38600	51	45	212	169
19	310	854	76	82	1450	7990	3650	12300	27	24	260	197
20	395	1710	125	132	905	3420	840	1700	55	45	119	105
21	402	1960	110	111	845	2460	2350	7170	52	42	107	97
22	121	324	80	77	345	823	3080	17700	59	54	117	94
23	129	318	97	92	165	343	2270	14800	44	34	39	28
24	105	235	90	83	140	260	1870	10500	17	12	44	31
25	105	219	88	77	180	318	490	2130	49	35	48	32
26	105	207	84	72	585	1500	1200	4180	57	40	52	34
27	100	190	93	77	245	668	370	1090	53	51	46	29
28	118	204	68	59	310	557	243	619	70	57	46	28
29	92	146	967	1690	310	484	219	504	64	62	19	13
30	88	129	940	1220	840	1630	279	573	62	49	61	59
31	---	---	460	596	---	---	232	437	65	46	---	---
TOTAL	---	12939	---	14335	---	302725	---	395035	---	2748	---	4879

TOTAL LOAD FOR YEAR: 760417.6 TONS.

053882500 UPPER IOWA RIVER NEAR DORCHESTER, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPERATURE (DEG C) (00010)	NUMBER OF SAMPLING POINTS (00063)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
MAR								
24...	1335	--	--	1750	859	4060	31	39
MAY								
02...	1445	14.0	10	473	--	--	--	--
26...	1200	--	9	1350	--	--	--	--
JUN								
17...	0700	21.0	--	8680	13000	305000	43	55
19...	1600	--	9	1820	--	--	--	--
JUL								
06...	1200	--	9	5710	--	--	--	--
06...	1450	23.5	--	3650	6680	65800	33	43
17...	0700	21.0	--	2630	19800	141000	32	40
19...	1000	24.0	6	1010	1470	4010	27	34
AUG								
28...	1905	--	9	296	--	--	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)
MAR									
24...	--	61	92	94	97	100	--	--	--
MAY									
02...	--	--	--	--	--	--	--	0	1
26...	--	--	--	--	--	--	--	0	1
JUN									
17...	59	74	--	--	--	--	99	--	--
19...	--	--	--	--	--	--	--	0	1
JUL									
06...	--	--	--	--	--	--	--	2	2
06...	54	68	97	98	99	100	--	--	--
17...	48	67	99	100	--	--	--	--	--
19...	34	36	100	--	--	--	--	1	2
AUG									
28...	--	--	--	--	--	--	--	1	1

DATE	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
MAR								
24...	--	--	--	--	--	--	--	--
MAY								
02...	7	53	74	81	85	89	92	100
26...	9	65	82	86	88	90	95	100
JUN								
17...	--	--	--	--	--	--	--	--
19...	4	24	59	76	82	87	90	100
JUL								
06...	17	58	73	78	82	86	88	100
06...	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--
19...	10	63	70	75	77	81	91	100
AUG								
28...	12	38	50	59	66	72	83	100

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 (4.2 km) upstream from Wisconsin River, 4.3 mi (6.9 km) downstream from Yellow River, and at mile 633.4 (1,019.1 km) upstream from Ohio River.

DRAINAGE AREA.--67,500 mi² (174,800 km²), 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 (184.355 m) NGVD. 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 (22.7 km) upstream in tailwater of dam 9, at datum 5.30 ft (1.615 m) lower.

REMARKS.--Records good except those for winter period, which are fair. Stage-discharge relation affected by backwater from Wisconsin River and Lock and Dam No. 10. Minor flow regulation caused by navigation dams.

COOPERATION.--Auxiliary gage-height and discharge data at Lock and Dam No. 9 furnished by Corps of Engineers.

AVERAGE DISCHARGE.--42 years, 33,500 ft³/s (948.7 m³/s), 6.74 in/yr (171 mm/yr), 24,270,000 acre-ft/yr (29,900 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 276,000 ft³/s (7,820 m³/s) Apr. 24, 1965; maximum gage height, 25.38 ft (7.736 m) Apr. 24, 1965; minimum daily discharge, 6,200 ft³/s (176 m³/s) Dec. 9, 1936; minimum gage height, -0.86 ft (-0.262 m) Aug. 18, 1936.

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 104,000 ft³/s (2,950 m³/s) July 9, 10; maximum gage height, 14.79 ft (4.507 m) July 10; minimum daily discharge, 14,000 ft³/s (396 m³/s) Mar. 1, 2, 3; minimum gage height, 6.56 ft (1.999 m) Aug. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44100	28200	19800	32000	21000	14000	52600	65500	41100	51400	52500	50200
2	45100	28100	21100	31200	21000	14000	54100	63500	44400	62200	47800	51100
3	45700	28300	23000	30000	20600	14000	56500	61300	47500	74800	46800	52100
4	45600	28600	23500	28400	19800	14200	58700	57900	50000	83400	44500	52800
5	45400	28400	24000	27200	18800	14800	60200	55300	51300	89800	42600	52200
6	42000	28500	24800	25000	18000	15000	64300	53300	53300	92400	39000	50200
7	36500	29700	25600	25000	17000	15600	70200	49100	52600	96100	36400	46300
8	34300	30000	26000	24400	16000	16800	73100	46200	50700	101000	35800	40300
9	33700	30400	24200	23600	16200	17600	75200	45500	47800	104000	35400	37000
10	32800	30100	22200	23000	16400	18600	77800	43900	45600	104000	34700	35500
11	33900	30800	20800	21000	16800	19600	81700	42400	43100	99800	31800	34800
12	35400	30500	19600	19800	17400	20000	87000	41600	42100	94300	28000	32100
13	36800	30300	20000	19400	17800	19400	92500	42800	41000	91600	23800	33100
14	38800	30900	22000	19000	18000	19600	96100	43700	38600	89100	23100	40300
15	41500	32000	24000	19200	18000	19000	99600	43100	34500	85900	24000	46500
16	44600	33200	26000	19400	17800	19000	101000	41700	32600	83000	27000	52500
17	46500	34600	27200	20400	17400	18600	102000	40200	43800	80700	27800	57500
18	48100	35400	29000	21400	17200	18400	102000	38300	57200	78900	26400	62400
19	49000	34500	29500	21800	17000	18000	100000	36300	59900	77600	28600	67100
20	48100	33400	31200	21800	16800	18000	98000	35900	58800	76500	29300	69900
21	46200	34300	34000	21600	16600	18000	95500	36600	55500	75600	27200	66600
22	44300	34600	35000	21200	16000	20000	91100	37200	51800	73600	26000	60400
23	41000	34400	36400	21000	15800	23000	88000	36700	48800	71500	25200	53000
24	38100	34700	37200	21000	15400	26800	85100	34900	47500	70400	25200	47800
25	36900	34100	38000	21000	15000	29000	82300	30300	47100	70800	26700	44200
26	35400	31500	37800	21000	14800	32000	79400	26800	47000	70700	27900	41600
27	33900	26100	38000	21000	14400	36000	76000	28300	46800	69400	30200	41000
28	33000	21900	38000	21000	14200	39000	71400	32400	46100	68400	37300	39000
29	30900	22000	36000	21200	---	42000	69200	34900	46600	67900	40600	37000
30	28600	20900	34200	21400	---	45000	67400	36900	45700	65000	43900	34400
31	28300	---	33000	21200	---	48900	---	38600	---	59400	47900	---
TOTAL	1227500	909400	881200	705600	481200	703900	2408000	1321100	1417800	2479200	1043400	1428900
MEAN	39600	30310	28430	22760	17190	22710	80270	42620	47260	79970	33660	47630
MAX	49000	35400	38000	32000	21000	48900	102000	65500	59900	104000	52500	69900
MIN	28300	20900	19600	19000	14200	14000	52600	26800	32600	51400	23100	32100
CFSM	.59	.45	.42	.34	.26	.34	1.19	.63	.70	1.19	.50	.71
IN.	.68	.50	.49	.39	.27	.39	1.33	.73	.78	1.37	.58	.79
AC-FT	2435000	1804000	1748000	1400000	954500	1396000	4776000	2620000	2812000	4917000	2070000	2834000

CAL YR 1977	TOTAL	8372850	MEAN	22940	MAX	49000	MIN	8000	CFSM .34	IN 4.61	AC-FT	16610000
WTR YR 1978	TOTAL	16007200	MEAN	41120	MAX	104000	MIN	14000	CFSM .61	IN 8.27	AC-FT	29770000

05389500 MISSISSIPPI RIVER AT MCGREGOR, IOWA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at bridge on U.S. Highway 18 1.2 mi (1.9 km) 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 sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATION: Maximum daily mean, 568 mg/L May 13, 1978; minimum daily mean, 1 mg/L Dec. 23-25, 1976, Dec. 20, 28, 1978.
SEDIMENT LOADS: Maximum daily, 65,600 tons (59,500 tonnes) May 13, 1978; minimum daily, 31 tons (28 tonnes) Dec. 26, 1976.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 568 mg/L May 13; minimum daily mean, 1 mg/L Dec. 20, 28.
SEDIMENT LOADS: Maximum daily, 65,600 tons (59,500 tonnes) May 13; minimum daily, 84 tons (76 tonnes) Mar. 7.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---		---	---	---	390	370	---	---	---	---	---
2	---		---	370	---	---	---	340	---	---	---	---
3	---		---	---	---	---	380	340	---	340	---	---
4	---		---	---	380	---	---	---	---	---	---	---
5	---		---	---	---	---	---	---	390	320	300	300
6	240		---	---	---	---	---	350	---	---	---	---
7	---		360	---	---	400	---	---	---	310	320	---
8	---		---	370	370	---	330	360	---	---	340	---
9	---		---	---	---	---	---	---	---	---	---	320
10	---		---	---	---	---	310	---	370	---	---	---
11	---		---	---	---	---	---	---	---	---	320	310
12	---		380	---	---	---	---	---	---	280	---	---
13	---		---	370	---	390	---	360	395	---	---	---
14	---		---	---	370	---	290	---	400	310	---	300
15	---		---	---	---	---	---	---	---	---	---	---
16	---		---	---	---	---	---	390	400	---	---	---
17	---		360	---	---	---	---	---	---	340	340	---
18	---		---	---	---	380	---	---	---	---	---	---
19	---		---	360	---	---	300	---	340	---	360	230
20	---		360	---	380	---	---	400	---	---	---	---
21	---		---	---	---	---	---	---	---	---	---	---
22	---		---	---	---	---	310	---	---	320	---	---
23	---		---	---	---	---	---	---	360	---	370	240
24	---		360	---	---	---	295	395	---	320	---	---
25	---		---	380	---	---	---	---	---	---	---	260
26	---		---	---	380	---	---	---	340	---	---	---
27	270		---	---	---	---	---	400	---	---	---	---
28	---		380	---	---	---	---	---	---	310	---	---
29	---		---	---	---	---	320	---	---	---	---	270
30	---		---	---	---	---	---	---	380	---	---	---
31	---		---	370	---	---	---	400	---	300	---	---

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---		---	---	---	.0	7.5	---	---	---	---	---
2	---		---	.0	---	---	---	13.5	---	---	---	---
3	---		---	---	---	---	7.5	15.0	21.0	24.0	---	---
4	---		---	---	.0	---	---	---	---	---	---	---
5	---		---	---	---	---	---	---	21.5	25.0	22.0	25.0
6	14.0		---	---	---	---	---	12.5	---	---	---	---
7	---		.0	---	---	.0	---	---	---	24.5	23.5	---
8	---		---	.0	.0	---	8.0	13.0	---	---	---	---
9	---		---	---	---	---	---	---	---	---	---	26.0
10	---		---	---	---	---	8.5	---	21.5	---	---	---
11	---		---	---	---	---	---	---	---	---	25.0	27.0
12	---		.0	---	---	---	---	---	---	23.0	---	---
13	---		---	.0	---	.0	---	16.5	23.0	---	---	---
14	---		---	---	.0	---	8.5	---	21.5	22.5	---	22.0
15	---		---	---	---	---	---	---	---	---	---	---
16	---		---	---	---	---	---	14.5	---	---	---	---
17	---		.0	---	---	---	---	---	---	25.5	25.0	---
18	---		---	---	---	---	---	---	---	---	---	---
19	---		---	.0	---	---	8.0	---	20.0	---	25.0	21.0
20	---		.0	---	.0	---	---	19.5	---	---	---	---
21	---		---	---	---	---	---	---	---	---	---	---
22	---		---	---	---	---	7.5	---	---	24.5	---	---
23	---		---	---	---	---	---	---	22.5	---	25.5	17.5
24	---		.0	---	---	---	9.5	20.0	---	23.5	---	---
25	---		---	.0	---	---	---	---	---	---	---	18.5
25	---		---	---	.0	---	---	---	23.0	---	---	---
27	---		---	---	---	---	---	23.0	---	---	---	---
28	---		.0	---	---	---	---	---	---	24.0	---	---
29	---		---	---	---	---	14.0	---	---	---	---	17.5
30	---		---	---	---	---	---	---	26.0	---	---	---
31	---		---	.0	---	---	---	23.5	---	23.0	---	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	51	7260	24	1830	50	2670	4	346	26	1470	46	1740
2	51	7590	22	1670	43	2450	4	337	54	3060	54	2040
3	58	7310	32	2450	34	2110	7	567	36	2000	51	1930
4	53	6670	47	3630	25	1590	9	690	16	855	40	1530
5	43	5270	62	4750	16	1040	11	808	16	812	22	879
6	31	3520	70	5390	8	605	12	810	17	826	8	324
7	27	2660	97	7780	4	311	9	607	21	964	2	84
8	24	2220	113	9150	4	313	5	329	24	1040	5	227
9	23	2090	123	10100	5	367	5	319	23	1010	14	665
10	21	1860	118	9590	5	337	5	310	22	974	30	1510
11	26	2380	103	8570	4	263	5	283	24	1090	48	2540
12	41	3920	84	6920	4	238	5	267	57	2680	67	3620
13	62	6160	67	5480	5	297	5	262	122	5860	40	2100
14	82	8590	53	4420	19	1230	4	206	194	9430	104	5500
15	101	11300	38	3280	27	1810	6	311	199	9670	101	5180
16	116	14000	31	2780	15	1130	8	419	151	7260	86	4410
17	128	16100	30	2800	3	235	10	551	100	4700	66	3310
18	129	16800	28	2680	3	243	12	693	54	2510	44	2190
19	124	16400	27	2520	2	162	14	824	20	918	39	1900
20	116	15100	25	2250	1	86	12	706	7	318	43	2090
21	104	13000	24	2220	4	367	10	583	6	269	49	2380
22	89	10600	23	2150	4	378	10	572	6	259	71	3830
23	74	8190	19	1760	3	295	9	510	6	256	180	11200
24	63	6480	17	1590	2	201	8	454	6	249	232	16800
25	53	5280	14	1290	2	205	7	397	6	243	237	18600
26	46	4400	13	1110	2	204	7	397	7	280	225	19400
27	42	3840	32	2170	2	205	7	397	12	467	189	18400
28	38	3390	62	3670	1	103	6	340	28	1070	141	14800
29	34	2840	64	3800	3	292	5	286	---	---	91	10300
30	31	2390	57	3220	4	369	6	289	---	---	59	7170
31	27	2060	---	---	4	356	6	343	---	---	56	7390
TOTAL	---	219670	---	121020	---	20452	---	14212	---	60540	---	174039

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	70	9940	37	6540	44	4880	65	9020	38	5390	54	7320
2	74	10800	39	6690	52	6230	115	19300	38	4900	52	7170
3	45	6860	32	5300	57	7310	152	30700	38	4800	48	5750
4	24	3300	30	4690	51	6880	145	32700	38	4570	44	6270
5	21	3410	30	4480	43	5960	105	25500	37	4260	40	5640
6	26	4510	30	4320	40	5760	98	24400	37	3900	41	5560
7	34	6440	32	4240	28	3980	103	26700	39	3830	39	4880
8	43	8490	44	5490	27	3700	95	25900	39	3770	37	4030
9	45	9140	54	6630	34	4390	85	23900	32	3060	35	3500
10	42	8820	64	7590	32	3940	74	20800	31	2900	37	3550
11	40	8820	72	8240	35	4070	63	17000	30	2580	37	3480
12	38	8930	100	11200	37	4210	54	13700	29	2190	37	3210
13	36	8990	568	65600	40	4430	52	12900	28	1800	37	3310
14	34	8820	433	51100	37	3860	49	11800	27	1680	46	5010
15	30	8070	168	19600	36	3350	48	11100	27	1750	63	7910
16	26	7090	50	5630	35	3080	47	10500	27	1970	69	9780
17	23	6330	36	3910	68	8040	47	10200	27	2030	72	11200
18	19	5230	33	3410	185	28600	57	12100	28	2000	68	11500
19	27	7290	29	2840	286	46300	75	15700	30	2320	62	11200
20	49	13000	27	2620	271	43000	98	20200	32	2530	58	10900
21	50	12900	25	2470	152	22800	125	25500	31	2280	58	10400
22	28	6890	27	2710	90	12600	132	26200	29	2040	58	9460
23	22	5230	41	4060	72	9490	80	15400	27	1840	57	8160
24	22	5050	33	3110	68	8720	49	9310	26	1770	58	7490
25	25	5560	20	1640	73	9280	46	8790	25	1800	58	6920
26	28	6000	24	1740	82	10400	44	8400	25	1880	58	6510
27	30	6160	27	2060	75	9480	42	7870	33	2690	58	6420
28	32	6170	30	2620	68	8460	39	7200	41	4130	58	6110
29	33	6170	33	3110	61	7510	39	7150	48	5260	57	5690
30	34	6190	35	3490	54	6660	38	6670	51	6050	50	4640
31	---	---	38	3960	---	---	38	6090	52	6730	---	---
TOTAL	---	221100	---	261090	---	307370	---	502700	---	98700	---	203970

TOTAL LOAD FOR YEAR: ?204863 TONS.

DATE	TIME	NUMBER OF SAMPLING POINTS (D0063)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	BED MAT. FALL DIAM. % FINER THAN .062 MM (80158)	BED MAT. FALL DIAM. % FINER THAN .125 MM (80159)	BED MAT. FALL DIAM. % FINER THAN .250 MM (80160)	BED MAT. FALL DIAM. % FINER THAN .500 MM (80161)	BED MAT. FALL DIAM. % FINER THAN 1.00 MM (80162)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)
OCT 27...	0930	6	34400	6	--	--	--	--	--	15
MAY 03...	1445	6	64500	--	--	--	--	--	--	6
JUN 13...	1300	6	40400	5	10	14	60	95	97	--
JUL 05...	1615	6	88500	8	24	26	50	95	99	--
AUG 08...	1600	6	37600	3	7	10	39	89	95	--

DATE	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
OCT 27...	22	54	95	97	98	100	--	--	--
MAY 03...	7	36	83	86	88	89	90	91	100
JUN 13...	--	--	--	--	97	100	--	--	--
JUL 05...	--	--	--	--	100	--	--	--	--
AUG 08...	--	--	--	--	97	100	--	--	--

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE TIME	OCT 11,77 1100		NOV 8,77 1145		MAY 9,78 1200		JUN 13,78 1145		JUL 11,78 0000		SEP 12,78 1130	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROCCOCCALES												
...CHROCCOCCACEAE												
....AGMENELLUM	--	-	--	-	--	-	--	-	--	-	350	7
....ANACYSTIS	370000#	98	430#	25	--	-	--	-	--	-	500	10
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	--	-	170	3
....APHANIZOMENON	*	0	--	-	1200	13	--	-	--	-	--	-
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	410#	24	420	5	--	-	--	-	--	-
..CHROCCOCCALES												
...CHROCCOCCACEAE												
....GOMPHOSPHAERIA	--	-	--	-	--	-	--	-	--	-	220	4
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	*	0	--	-	140	2	--	-	66	4	*	0

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05411600 TURKEY RIVER AT SPILLVILLE, IOWA

LOCATION.--Lat 43°12'28", long 91°66'56", in SW1/4 NE1/4 sec.19, T.97 N., R.9 W., Winneshiek County, on right bank 60 ft (18 m) downstream from bridge on county highway W14 at north edge of Spillville, 150 ft (46 m) downstream from old mill dam, 0.6 mi (1.0 km) upstream from Wonder Creek and at mile 98.5 (158.5 km).

DRAINAGE AREA.--177 mi² (458 km²).

PERIOD OF RECORD.--June 1956 to September 1973, October 1977 to current year. Monthly discharge only for some periods, published in WSP 1728.

GAGE.--Water-stage recorder. Datum of gage is 1,034.77 ft (315.40 m) NGVD.

REMARKS.--Records good.

AVERAGE DISCHARGE.--18 years, 109 ft³/s (3.09 m³/s), 8.36 in/yr (212 mm/yr), 78,970 acre-ft/yr (97.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,600 ft³/s (244 m³/s) July 12, 1972, gage height, 16.73 ft (5.099 m); minimum daily, 4.4 ft³/s (0.12 m³/s) Feb. 1-3, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.-- Flood in June 1947 reached a stage of 18.4 ft (5.61 m), from floodmark, discharge, about 10,000 ft³/s (283 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*):

		Discharge		Gage Height				Discharge		Gage Height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
May 11	2330	*5,140	146	*13.77	4.197	July 6	1330	2,340	66.3	10.20	3.109
June 18	0300	1,250	35.4	8.20	2.499						

Minimum daily discharge, 19 ft³/s (0.54 m³/s) Mar. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	64	36	32	28	23	140	137	141	297	120	41
2	68	76	34	31	29	22	130	129	120	197	112	39
3	68	74	31	30	30	23	140	120	109	147	104	37
4	61	77	31	29	30	19	229	112	96	131	98	36
5	56	69	32	29	30	20	184	106	90	146	91	34
6	54	68	26	29	30	23	235	100	83	1150	86	33
7	57	76	24	30	29	22	390	95	78	656	80	33
8	83	70	24	28	29	22	270	98	80	303	76	32
9	111	66	23	27	29	22	240	100	74	246	73	31
10	113	62	22	25	28	25	270	94	68	180	71	30
11	100	57	23	24	28	28	215	900	63	160	70	29
12	93	55	27	26	28	27	185	964	61	145	67	47
13	87	52	32	27	27	28	165	684	55	135	64	111
14	80	51	38	28	27	30	149	321	51	125	61	162
15	74	52	43	28	26	32	138	231	50	116	61	116
16	71	51	50	28	25	37	127	210	332	112	62	80
17	67	49	90	27	24	42	120	186	463	177	59	68
18	64	48	136	28	24	48	392	172	973	116	57	58
19	62	47	150	29	23	53	802	158	314	104	60	54
20	60	46	106	29	23	58	383	154	245	108	58	82
21	57	47	74	29	24	65	270	136	195	271	54	78
22	54	46	58	29	23	265	211	123	147	668	63	76
23	55	46	47	31	24	938	206	113	134	787	52	70
24	56	47	39	31	24	522	197	105	120	418	50	68
26	56	47	38	31	24	283	239	90	150	278	47	64
26	56	50	37	29	24	246	223	86	235	237	50	61
27	65	50	36	27	23	251	179	84	180	200	80	58
28	55	43	39	28	24	285	166	115	150	167	61	55
29	53	41	38	27	---	230	166	198	140	154	52	63
30	52	38	36	27	---	196	146	245	160	141	47	54
31	57	---	34	27	---	170	---	189	---	130	43	---
TOTAL	2093	1665	1453	880	737	4055	6897	6554	5157	8201	2119	1799
MEAN	67.5	55.5	46.9	28.4	26.3	131	230	211	172	265	68.4	60.0
MAX	113	77	150	32	30	938	802	964	973	1150	120	162
MIN	52	38	22	24	23	19	120	84	50	104	43	29
CFSM	.38	.31	.27	.16	.15	.74	1.30	1.19	.97	1.50	.39	.34
IN.	.44	.35	.31	.18	.15	.85	1.45	1.38	1.08	1.72	.45	.38
AC-FT	4150	3300	2880	1750	1460	8040	13680	13000	10230	16270	4200	3570

WTR YR 1978 TOTAL 41610 MEAN 114 MAX 1150 MIN 19 CFSM .64 IN 8.75 AC-FT 82530

05412500 TURKEY RIVER AT GARBER, IA

LOCATION.--Lat 42°44'24", long 91°15'42", in SE1/4 NW1/4 sec.36, T.92 N., R.4 W., Clayton County, Hydrologic Unit 07050004, on left bank 10 ft (3 m) downstream from bridge on county highway C43, 800 ft (244 m) upstream from Wayman Creek, 1,000 ft (305 m) southeast of Garber, 2,000 ft (610 m) downstream from Elk Creek, 1 mi (1.6 km) downstream from Volga River, and 19.8 mi (31.9 km) upstream from mouth.

DRAINAGE AREA.--1,545 mi² (4,002 km²).

PERIOD OF RECORD.--August 1913 to November 1915, 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.

GAGE.--Water-stage recorder. Datum of gage is 634.46 ft (193.383 m) NGVD. Prior to Feb. 7, 1935, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Eight discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--58 years (1913-16, 1919-27, 1929-30, 1932-78), 899 ft³/s (25.46 m³/s), 7.90 in/yr (201 mm/yr), 651,300 acre-ft/yr (803 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,300 ft³/s (915 m³/s) Feb. 23, 1922, gage height, 28.06 ft (8.553 m), from floodmark; minimum daily, 49 ft³/s (1.39 m³/s) Jan. 28, 29, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, that of Feb. 23, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 8,000 ft³/s (227 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 6	2000	8,220	233	15.43	4.703	May 13	1030	*8,250	234	*15.46	4.712

Minimum daily discharge, 240 ft³/s (6.80 m³/s) Dec. 7, Mar. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	691	685	390	540	310	260	2270	1550	1690	1760	946	374
2	801	678	370	520	310	270	1960	1440	1420	2740	886	358
3	807	701	330	500	320	280	1750	1360	1240	2190	808	342
4	761	764	330	500	320	240	6220	1290	1140	1530	736	330
5	720	775	350	500	320	250	4640	1240	1050	1340	688	322
6	664	765	265	490	310	275	6650	1170	972	1300	646	310
7	644	911	240	480	310	260	6160	1110	917	3380	610	310
8	978	858	270	440	315	250	4030	1130	895	3360	590	294
9	1150	834	275	350	320	245	3130	1130	861	2020	585	290
10	1230	805	270	360	300	280	3690	1070	794	1680	570	278
11	1170	752	280	370	305	290	3500	1030	748	1460	545	270
12	1070	703	330	370	305	270	2850	2800	700	1290	520	266
13	975	672	400	380	305	280	2400	6690	634	1220	500	525
14	903	653	480	390	300	290	2050	4450	605	1250	480	585
15	843	648	560	380	300	310	1820	3190	590	1340	470	585
16	766	638	640	380	280	340	1670	2510	1100	1300	495	628
17	734	618	964	370	275	390	1560	2180	3450	1830	475	742
18	706	596	1820	375	275	395	2890	1950	4360	1280	440	616
19	671	573	1990	380	270	400	5290	1760	3320	2160	470	520
20	645	562	1560	375	290	514	4910	1640	2260	1400	450	886
21	622	562	1020	370	275	992	3570	1540	1800	2050	410	1170
22	598	541	820	360	270	2440	2800	1440	1560	2480	406	964
23	583	542	680	370	295	6080	2510	1380	1400	2440	398	760
24	593	539	570	370	300	6060	2310	1310	1290	2790	386	628
25	610	540	560	360	300	3960	2170	1250	1310	2180	366	555
26	622	580	555	340	275	2600	2050	1170	2610	1760	362	505
27	620	560	550	340	280	2530	2020	1120	1740	1540	590	460
28	609	480	600	340	290	3310	1910	1520	1480	1340	676	425
29	598	450	600	330	---	2920	1800	1760	1260	1230	520	402
30	582	410	580	320	---	2460	1670	1910	1320	1090	450	390
31	603	---	560	315	---	2370	---	1660	---	1010	402	---
TOTAL	23569	19395	19209	12265	8325	41811	92250	56750	44516	55740	16876	15090
MEAN	760	647	620	396	297	1349	3075	1831	1484	1798	544	503
MAX	1230	911	1990	540	320	6080	6650	6690	4360	3380	946	1170
MIN	582	410	240	315	270	240	1560	1030	590	1010	362	266
CFSM	.49	.42	.40	.26	.19	.87	1.99	1.19	.96	1.16	.35	.33
IN.	.57	.47	.46	.30	.20	1.01	2.22	1.37	1.07	1.34	.41	.36
AC-FT	46750	38470	38100	24330	16510	82930	183000	112600	88300	110600	33470	29930

CAL YR 1977 TOTAL 171713 MEAN 470 MAX 4000 MIN 72 CFSM .30 IN 4.13 AC-FT 340600
WTR YR 1978 TOTAL 405795 MEAN 1112 MAX 6690 MIN 240 CFSM .72 IN 9.77 AC-FT 804900

05414500 LITTLE MAQUOKETA RIVER NEAR DURANGO, IA

LOCATION.--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 (3 m) upstream from bridge on county highway, 300 ft (91 m) upstream from Cloie Branch, 1.7 mi (2.7 km) east of Durango, 5.6 mi (9.0 km) northwest of court house at Dubuque, and 6.4 mi (10.3 km) upstream from mouth.

DRAINAGE AREA.--130 mi² (337 km²).

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

REVISED RECORDS.--WSP 1608: 1935-38, 1939 (M), 1940, 1943 (M), 1946, 1948. WDR IA-76-01: 1975.

GAGE.--Water-stage recorder. Datum of gage is 612.03 ft (186.547 m) NGVD. Prior to Jan. 5, 1939, nonrecording gage at same site and datum.

REMARKS.--Records excellent except those for winter period, which are good. Several observations of water temperature were made during the year.

COOPERATION.--Four discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--44 years, 85.5 ft³/s (2.421 m³/s), 8.93 in/yr (227 mm/yr), 61,940 acre-ft/yr (76.4 hm³/yr); median of yearly mean discharges, 73 ft³/s (2.07 m³/s), 7.6 in/yr (193 mm/yr), 52,900 acre-ft/yr (65.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,000 ft³/s (1,130 m³/s) Aug. 2, 1972, gage height, 23.13 ft (7.050 m) in gage well, 23.8 ft (7.25 m), from floodmarks, on basis of slope-area measurement of peak flow; minimum daily, 5 ft³/s (142 dm³/s) July 12, 13, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 15, 1925, reached a stage of about 22.1 ft (6.74 m), discharge, about 29,000 ft³/s (821 m³/s), computed by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,470 ft³/s (240 m³/s) May 13, gage height, 16.15 ft (4.923 m) at 0915 hours, no other peak above base of 3,000 ft³/s (85.0 m³/s); minimum daily, 15.0 ft³/s (0.425 m³/s) Mar. 3-6, Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	28	21	28	22	16	171	67	65	66	29	16
2	32	35	22	28	22	16	121	64	59	112	27	16
3	31	37	22	27	22	15	108	62	56	52	26	16
4	29	33	20	27	22	15	104	60	52	43	25	16
5	28	32	20	27	21	15	100	59	49	37	24	16
6	27	32	20	27	21	15	665	57	47	34	24	16
7	33	64	19	27	22	16	282	56	46	33	23	16
8	84	80	19	24	22	17	214	73	45	32	23	17
9	47	56	19	23	21	17	185	60	41	38	22	18
10	41	50	20	21	21	20	479	53	39	36	23	18
11	41	44	20	20	21	21	264	50	37	29	24	18
12	37	39	20	19	21	22	197	399	36	30	24	19
13	34	37	21	19	20	23	149	3070	34	43	24	105
14	33	36	23	19	20	24	124	540	33	32	23	33
15	32	38	36	22	20	29	108	358	35	30	22	20
16	30	35	84	23	20	36	95	272	518	29	25	16
17	29	33	216	23	19	41	96	221	487	31	23	224
18	29	32	161	23	19	42	535	184	152	29	22	69
19	28	32	129	22	18	86	297	157	68	30	26	32
20	28	40	110	22	18	242	217	156	55	391	22	72
21	28	41	80	22	18	573	190	127	51	144	20	66
22	27	32	56	22	18	568	161	113	44	59	21	29
23	28	32	45	21	17	370	153	113	42	46	20	22
24	36	33	39	21	17	223	135	106	40	39	19	20
25	35	30	35	22	17	141	118	96	57	37	19	18
26	32	25	34	23	17	121	102	86	74	87	19	17
27	30	23	30	23	17	169	93	81	43	49	25	17
28	30	22	29	23	17	238	85	132	36	33	26	17
29	29	21	28	22	---	185	80	122	35	31	20	17
30	27	20	28	22	---	159	73	80	37	30	18	19
31	27	---	28	22	---	195	---	69	---	29	17	---
TOTAL	1034	1092	1454	714	550	3670	5690	7143	2413	1741	705	1014
MEAN	33.4	36.4	46.9	23.0	19.6	118	190	230	80.4	56.2	22.7	33.8
MAX	84	80	216	28	22	573	665	3070	518	391	29	224
MIN	27	20	19	19	17	15	73	60	33	29	17	15
CFSM	.26	.28	.36	.18	.15	.91	1.46	1.77	.62	.43	.18	.26
IN.	.30	.31	.42	.20	.16	1.05	1.63	2.04	.69	.50	.20	.29
AC-FT	2050	2170	2880	1420	1090	7280	11290	14170	4790	3450	1400	2010

CAL YR 1977 TOTAL 13653.6 MEAN 37.4 MAX 1320 MIN 6.8 CFSM .29 IN 3.91 AC-FT 27080
WTR YR 1978 TOTAL 27220.0 MEAN 74.5 MAX 3070 MIN 15 CFSM .57 IN 7.79 AC-FT 53990

05418450 NORTH FORK MAQUOKETA RIVER AT FULTON, IA

LOCATION.--Lat 42°08'48", long 90°40'33" in N1/4 sec.25, T.85 N., R.2E, Jackson County, Hydrologic Unit 07060006, on right downstream bank at bridge on state Highway 61, 7.8 mi (12.6 km) upstream from mouth, and 5.5 mi (8.8 km) north of junction of Highway 64 and 61 and 0.5 mi (0.8 km) south of Fulton.

DRAINAGE AREA.--516 mi² (1,329 km²).

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

GAGE.--Water-state recorder. Datum of gage is 666.19 ft (203.055 m) NGVD. Non-recording gage July 7 to September 22, 1977.

REMARKS.--Records are fair. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,600 ft³/s (130 m³/s) July 17, 1977, gage height, 10.22 ft (3.115 m); minimum daily, 70 ft³/s (1.982 m³/s) July 11, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1974 reached a stage of 16.0 ft. (4.88 m), from floodmark, discharge 10,000 ft³/s (283.2 m³/s).

EXTREMES FOR CURRENT PERIOD.--July to September 1977: Maximum discharge observed during period, 4,320 ft³/s (122.3 m³/s) July 17, gage height, 9.98 ft (3.042 m) at 1530 hours, no other peak above base of 2,500 ft³/s (70.8 m³/s); minimum daily, 70 ft³/s (1.982 m³/s) July 11.

Water year 1978.--Peak discharges above base of 2,500 ft³/s (70.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 22	0245	3,650	103	9.35	2.850	May 13	1530	8,200	232	13.95	4.252

Minimum daily discharge, 82 ft³/s (2.32 m³/s) Mar. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1										110	90	171
2										89	89	149
3										87	89	154
4										85	98	151
5										83	249	151
6										83	209	145
7										81	138	140
8										80	544	112
9										76	346	108
10										76	189	104
11										70	154	104
12										73	123	106
13										75	114	112
14										75	110	110
15										73	127	108
16										209	382	118
17										2340	274	221
18										1540	167	965
19										708	156	247
20										301	280	173
21										207	249	154
22										158	274	151
23										140	214	138
24										136	165	292
25										134	158	231
26										121	160	198
27										108	165	173
28										112	184	158
29										110	234	151
30										106	176	149
31										102	158	---
TOTAL										7748	6065	5444
MEAN										250	196	181
MAX										2340	544	965
MIN										70	89	104
CFSM										.48	.38	.35
IN.										.56	.44	.39
AC-FT										15370	12030	10800

05418450 NORTH FORK MAQUOKETA RIVER AT FULTON, IA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	161	169	142	166	150	106	445	269	318	192	167	134
2	155	200	147	158	146	94	394	256	315	202	165	132
3	143	196	146	158	140	82	337	248	312	216	158	132
4	138	177	141	154	138	86	315	247	308	204	151	131
5	136	165	145	156	142	100	302	247	304	200	147	129
6	133	166	109	156	140	104	436	242	298	196	147	129
7	146	190	122	156	148	108	797	237	296	206	145	129
8	248	223	132	142	150	106	615	250	292	200	145	129
9	224	206	132	122	138	116	516	253	289	240	149	127
10	201	191	130	134	132	128	504	238	286	210	143	127
11	200	177	128	130	130	134	745	228	282	190	140	126
12	185	167	130	128	130	128	599	259	276	170	143	127
13	172	161	144	130	132	122	480	4740	272	215	143	235
14	167	160	150	136	132	116	407	2480	270	195	140	251
15	163	161	154	140	120	140	366	1140	320	192	138	185
16	155	162	160	142	108	150	337	866	400	192	145	159
17	152	162	210	140	102	178	320	724	380	190	147	162
18	153	156	358	142	108	254	442	627	380	190	148	608
19	150	150	400	142	114	464	577	559	360	230	179	318
20	147	149	350	142	118	758	570	511	310	210	161	282
21	145	151	250	146	112	1350	480	484	270	350	143	271
22	145	147	222	148	106	2600	427	440	240	330	143	249
23	152	145	220	148	110	1630	404	420	224	283	145	202
24	200	151	210	150	110	966	389	409	213	224	145	178
25	209	143	148	150	102	616	362	390	228	198	144	166
26	178	305	220	150	93	454	333	373	283	193	138	157
27	170	247	378	142	102	402	314	418	220	195	154	153
28	165	167	430	144	104	528	302	440	206	187	161	149
29	159	140	360	146	---	526	293	400	193	180	156	146
30	156	144	240	148	---	435	280	340	189	171	145	148
31	157	---	168	144	---	418	---	322	---	167	138	---
TOTAL	5165	5228	6376	4490	3457	13399	13088	19057	8534	6518	4613	5571
MEAN	167	174	206	145	123	432	436	615	284	210	149	186
MAX	248	305	430	166	150	2600	797	4740	400	350	179	608
MIN	133	140	109	122	93	82	280	228	189	167	138	126
CFSM	.32	.34	.40	.28	.24	.84	.85	1.19	.55	.41	.29	.36
IN.	.37	.38	.46	.32	.25	.97	.94	1.37	.62	.47	.33	.40
AC-FT	10240	10370	12650	8910	6860	26580	25960	37800	16930	12930	9150	11050

WTR YR 1978 TOTAL 95496 MEAN 262 MAX 4740 MIN 82 CFSM .51 IN 6.88 AC-FT 189400

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA

LOCATION.--Lat 42°05'05", long 90°38'04", in SW1/4 NE1/4 sec.17, T.84 N., R.3 E., Jackson County, Hydrologic Unit 07060006, on right bank 500 ft (152 m) upstream from bridge on State Highway 62, 1,200 ft (366 m) upstream from Prairie Creek, 2.0 mi (3.2 km) northeast of Maquoketa, 2.2 mi (3.5 km) downstream from North Fork, and 26.7 mi (43.0 km) upstream from mouth.

DRAINAGE AREA.--1,553 mi² (4,022 km²).

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 (190.793 m) NGVD, Prior to July 14, 1924, nonrecording gage, and July 15, 1924 to Sept. 30, 1972, recording gage at same site at datum 10.00 ft (3.048 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Diurnal fluctuation caused by powerplant 4 mi (6.4 km) above station. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

COOPERATION.--Eight discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--65 years, 1,007 ft³/s (28.52 m³/s), 8.81 in/yr (224 mm/yr), 729,600 acre-ft/yr (900 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 48,000 ft³/s (1,360 m³/s) June 27, 1944, gage height, 24.70 ft (7.529 m) at datum then in use; minimum daily, 105 ft³/s (2.97 m³/s) Feb. 11-20, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, probably in 1903, reached a stage of 23.5 ft (7.16 m), discharge, 43,000 ft³/s (1,220 m³/s), at datum in use prior to Oct. 1, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,920 ft³/s (253 m³/s) May 13, gage height, 21.96 ft (6.93 m) at 1845 hours no other peak above base of 7,500 ft³/s (212 m³/s); minimum daily, 244 ft³/s (6.91 m³/s) Feb. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	641	685	445	880	340	500	1690	1140	1490	658	544	420
2	583	807	425	850	330	465	1620	1080	1320	706	544	391
3	606	772	515	800	320	460	1380	1010	1030	745	520	381
4	626	649	620	620	305	430	1300	996	1050	808	493	370
5	638	641	462	600	310	430	1260	959	998	706	485	380
6	579	506	1020	650	290	440	1790	928	983	742	482	369
7	606	734	1090	600	290	450	3410	921	943	879	449	362
8	870	734	980	555	275	460	3700	947	910	588	456	353
9	812	738	880	550	270	440	2790	944	847	665	470	364
10	848	751	850	510	260	490	2510	906	801	682	462	347
11	992	738	720	450	260	600	3560	872	803	604	449	355
12	915	681	565	390	260	680	3380	883	758	561	438	357
13	821	653	600	345	270	700	2570	5370	726	634	384	673
14	768	626	625	370	255	790	1930	5100	639	624	363	623
15	738	638	640	350	260	880	1840	3570	777	576	377	551
16	681	645	705	320	265	720	1600	2650	853	528	454	520
17	638	630	860	330	260	720	1550	2120	920	533	380	547
18	634	587	1280	340	250	819	1770	1830	995	546	413	2610
19	641	556	1600	340	254	1520	2300	1590	1520	565	444	859
20	861	556	1500	340	244	2280	3180	1400	1650	626	474	853
21	929	518	1140	330	248	2930	2540	1340	1280	901	434	838
22	781	568	920	340	260	4870	2240	1220	963	1390	387	784
23	673	522	870	330	294	4360	2110	1170	913	1130	373	743
24	701	560	880	350	310	3750	1800	1120	859	970	389	673
25	947	534	940	360	345	2700	1740	1120	898	817	400	638
26	503	329	1000	360	360	1960	1470	1130	940	776	385	576
27	730	340	1530	360	430	1700	1480	1110	838	750	412	538
28	803	440	1380	350	520	1760	1390	1120	731	638	419	616
29	721	430	1310	360	---	2010	1280	1190	572	619	470	403
30	781	480	1120	360	---	1770	1200	1580	637	596	464	375
31	697	---	1030	355	---	1640	---	1590	---	576	446	---
TOTAL	22764	18148	28502	14045	8345	43724	62370	48905	28644	22139	13660	17869
MEAN	734	605	919	453	298	1410	2079	1578	955	714	441	595
MAX	992	807	1600	880	520	4870	3700	5370	1650	1390	544	2610
MIN	503	329	425	320	244	430	1200	872	572	528	363	347
CFSM	.47	.39	.59	.29	.19	.91	1.34	1.02	.62	.46	.28	.38
IN.	.55	.43	.68	.34	.20	1.05	1.49	1.17	.69	.53	.33	.43
AC-FT	45150	36000	56530	27860	16550	86730	123700	97000	56820	43910	27090	35440

CAL YR 1977	TOTAL	199392	MEAN 546	MAX 3140	MIN 145	CFSM .35	IN 4.78	AC-FT	395500
WTR YR 1978	TOTAL	329115	MEAN 902	MAX 5370	MIN 244	CFSM .58	IN 7.88	AC-FT	652800

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA--Continued

WATER QUALITY RECORDS

LOCATION.--Samples collected at bridge on Highway 62 500 ft (152 m) downstream from gage.

PERIOD OF RECORD.--April to September 1978.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April to September 1978.
WATER TEMPERATURE: April to September 1978.
SUSPENDED-SEDIMENT DISCHARGE: April to September 1978.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. During winter periods samples are collected in open water channel or through ice cover.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 600 micromhos June 7, 1978; minimum daily, 250 micromhos Sept. 18, 1978.
WATER TEMPERATURES: Maximum daily, 26.0°C Aug. 18, 1978; minimum daily, 8.0°C Apr. 3, 1978.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 7,170 mg/L May 14, 1978; minimum daily mean, 74 mg/L May 6, 1978.
SEDIMENT LOADS: Maximum daily 123,000 tons (112,000 tonnes) May 13, 1978; minimum daily, 72 tons (65 tonnes) Sept. 12, 1978.

EXTREMES FOR CURRENT PERIOD.--April to September 1978:
SPECIFIC CONDUCTANCE: Maximum daily, 600 micromhos June 7; minimum daily, 250 micromhos Sept. 18.
WATER TEMPERATURES: Maximum daily, 26.0°C Aug. 18; minimum daily, 8.0°C Apr. 3.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 7,170 mg/L May 14; minimum daily mean, 74 mg/L May 6.
SEDIMENT LOADS: Maximum daily, 123,000 tons (112,000 tonnes) May 13; minimum daily, 72 tons (65 tonnes) Sept. 12.

WATER QUALITY DATA, APRIL TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG.C), APRIL TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							480	450	500	460	---	500
2							---	---	500	---	470	---
3							480	450	500	500	450	460
4							490	420	490	---	---	450
5							500	430	500	500	---	480
6							490	410	---	490	---	480
7							440	---	600	---	440	460
8							430	430	510	480	400	500
9							440	450	480	---	460	---
10							460	420	---	470	---	---
11							450	420	480	470	480	470
12							460	500	460	440	450	500
13							460	300	480	440	480	340
14							470	280	470	---	480	420
15							500	380	480	420	480	---
16							---	490	500	---	460	460
17							500	500	450	---	450	---
18							500	---	490	---	480	250
19							490	520	470	---	---	350
20							470	520	470	---	---	420
21							490	---	480	480	480	400
22							490	500	450	---	---	---
23							---	480	---	440	---	---
24							480	460	---	490	---	---
25							510	450	---	490	500	440
26							520	470	460	480	---	440
27							490	460	480	480	---	490
28							500	---	490	---	470	500
29							480	500	440	---	480	500
30							---	430	470	440	440	500
31							---	480	---	450	440	---

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA--Continued

WATER QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, APRIL TO SEPTEMBER 1978

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							11.0	11.0	23.0	24.5	---	20.0
2							---	---	21.0	---	21.0	---
3							8.0	11.5	22.0	21.5	19.5	20.0
4							11.5	13.0	19.0	---	---	19.0
5							---	---	20.0	24.0	---	21.0
6							10.0	10.0	---	23.5	---	20.0
7							12.0	---	21.0	---	20.0	22.0
8							11.0	11.0	19.0	22.5	21.0	21.0
9							11.0	12.0	19.0	---	22.0	---
10							11.5	12.0	---	21.5	---	---
11							10.0	15.0	---	20.0	22.0	21.0
12							11.5	11.0	---	21.0	22.5	21.0
13							10.0	14.5	---	20.5	23.5	18.0
14							---	12.0	---	---	23.5	20.0
15							10.5	11.0	21.5	---	23.0	---
16							---	13.0	22.0	---	22.0	---
17							9.5	14.0	23.0	---	20.0	---
18							11.0	---	22.0	---	26.0	19.5
19							11.5	18.5	22.0	---	---	20.5
20							9.0	19.0	20.0	---	---	19.5
21							9.0	---	19.5	25.0	20.0	17.0
22							---	15.5	19.0	---	---	---
23							---	15.0	---	21.5	---	---
24							12.0	16.0	---	24.0	---	---
25							11.0	22.5	---	23.0	24.0	14.0
26							13.0	22.0	22.0	24.5	---	---
27							12.5	24.0	24.5	22.0	---	---
28							13.5	---	23.0	---	24.0	---
29							15.5	23.0	21.0	---	20.0	13.0
30							---	23.0	---	19.5	19.0	14.5
31							---	23.0	---	18.0	19.0	---

SUSPENDED_SEDIMENT, APRIL TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	310	1410	119	366	560	2250	230	409	112	165	128	145
2	292	1280	107	312	255	909	310	591	107	157	147	155
3	182	678	105	286	220	612	356	716	98	138	168	173
4	142	498	135	363	190	539	288	628	96	128	150	150
5	180	612	77	199	175	472	208	396	96	125	105	108
5	450	2170	74	185	177	470	223	447	98	128	118	118
7	1560	14400	84	209	185	471	265	629	98	119	162	158
8	1720	17200	135	345	196	482	411	653	103	127	86	82
9	735	5540	102	260	218	499	339	609	138	175	82	81
10	620	4200	75	183	225	487	222	409	136	170	82	77
11	1030	9870	82	193	212	460	198	323	102	124	79	76
12	1100	10000	550	1310	240	491	143	217	112	132	75	72
13	492	3410	6360	123000	183	359	141	241	142	147	1890	3830
14	290	1510	7170	103000	210	362	150	253	120	118	410	690
15	180	894	2100	21300	275	577	160	249	222	225	300	446
16	182	786	750	5370	795	1830	170	242	151	185	190	267
17	250	1050	215	1230	1100	2730	182	262	128	131	180	266
18	450	2150	287	1420	635	1710	191	282	205	229	3040	28200
19	490	3040	280	1200	1200	4920	197	301	219	263	1180	2740
20	1580	13600	242	915	620	2760	204	345	182	233	622	1430
21	2670	18300	245	886	372	1290	346	842	160	187	608	1380
22	335	2030	212	698	252	655	687	2580	158	165	453	959
23	220	1250	154	486	210	518	502	1530	169	170	351	704
24	170	826	146	442	207	480	321	841	186	195	268	487
25	145	681	133	402	208	504	204	450	205	221	215	370
25	103	409	138	421	220	558	190	398	216	225	200	311
27	134	535	132	396	246	557	178	360	218	243	183	266
28	122	458	267	807	267	527	159	274	185	209	980	1630
29	114	394	1770	5690	256	395	142	237	163	207	1240	1350
30	128	415	4390	18700	209	359	125	201	166	208	570	577
31	---	---	880	3780	---	---	114	177	127	153	---	---
TOTAL	---	119596	---	294354	---	29233	---	16092	---	5404	---	47298

TOTAL LOAD FOR YEAR: 524257 TONS.

005418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA--Continued

WATER QUALITY RECORDS

DATE	TIME	TEMPERATURE (DEG C) (00010)	NUMBER OF SAMPLING POINTS (00063)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
MAY									
13...	1800	14.5	--	8710	10900	256000	35	40	48
14...	0730	12.0	--	5160	8690	121000	25	50	57
JUN									
20...	1230	24.0	6	1560	480	2020	60	70	74
JUL									
25...	1100	23.5	8	871	206	484	41	48	--
AUG									
28...	1425	--	6	504	--	--	--	--	--
SEP									
18...	1630	--	9	3520	2950	28000	70	74	79

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)
MAY									
13...	64	96	97	99	100	--	--	--	--
14...	67	97	98	100	--	--	--	--	--
JUN									
20...	87	94	96	98	99	100	--	--	0
JUL									
25...	61	91	92	98	100	--	--	--	0
AUG									
28...	--	--	--	--	--	--	--	0	1
SEP									
18...	87	99	100	--	--	--	--	1	1

DATE	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
MAY								
13...	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--
JUN								
20...	5	44	74	84	88	90	94	100
JUL								
25...	14	69	91	95	97	98	100	--
AUG								
28...	23	50	68	79	86	94	97	100
SEP								
18...	18	61	84	91	94	96	100	--

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

LOCATION.--Lat 41°46'53", long 90°15'04", in NW1/4 sec.34, T.81 N., R.6 E., Clinton County, Hydrologic Unit 07080101, on right bank at foot of Seventh Avenue in Camanche, 5.0 mi (8.0 km) upstream from Wapsipinicon River, 6.4 mi (10.3 km) downstream from Clinton, 10.6 mi (17.1 km) downstream from dam 13, and at mile 511.8 (823.5 km) upstream from Ohio River. Prior to June 6, 1969, at site 400 ft (122 m) downstream.

DRAINAGE AREA.--85,600 mi² (221,700 km²), approximately, at Fulton-Lyons Bridge where discharge measurements are made.

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").

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

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft (171.505 m) NGVD. Oct. 1, 1955, to June 5, 1969, water-stage recorder at site 400 ft (121 m) downstream at same datum. Auxiliary water-stage recorder at dam 13 since Oct. 1, 1958. See WSP 1728 for history of changes prior to Oct. 1, 1955.

REMARKS.--Records good except those for winter period, which are poor. Minor flow regulation caused by navigation dams.

COOPERATION.--Four discharge measurements and discharge data at Lock and Dam No. 13 furnished by Corps of Engineers.

AVERAGE DISCHARGE.--105 years, 47,080 ft³/s (1,333 m³/s), 7.47 in/yr (190 mm/yr), 34,110,000 acre-ft/yr (42,060 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 307,000 ft³/s (8,690 m³/s) Apr. 28, 1965; maximum gage height, 24.65 ft (7.513 m) Apr. 28, 1965; minimum daily discharge, 6,500 ft³/s (184 m³/s) Dec. 25-27, 1933.

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 128,000 ft³/s (3,625 m³/s) Apr. 21; maximum gage height, 15.70 ft (4.785 m) Apr. 21; minimum daily discharge, 15,200 ft³/s (430 m³/s) Mar. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47800	38300	23800	45000	24400	17000	73900	80900	50700	49100	79700	56800
2	52700	37500	26200	43500	23600	17000	66300	76700	53100	56000	76000	58100
3	54000	36600	25400	43000	24000	16800	63000	74600	54500	60900	67300	61000
4	53900	35200	24200	40500	24000	16600	65500	72000	56700	64200	57400	62200
5	53700	34700	24000	38600	24000	15800	66200	68200	60000	75200	53700	62500
6	53900	34500	25800	36000	23200	15400	72400	63900	63900	85000	52000	62200
7	51100	34700	26600	34200	22000	15200	79500	62700	65000	95000	50300	61300
8	45900	38400	25600	33400	21600	15600	82800	61000	65100	105000	45800	59100
9	44900	40000	26000	32800	21400	16200	85200	60500	63500	108000	38900	54500
10	44400	43300	25800	30000	21000	17400	89300	58400	61100	112000	37700	46700
11	43700	46500	23000	28500	20400	20600	93000	53800	58900	115000	38100	43400
12	44400	47200	22200	31400	20200	21000	93000	52200	56300	118000	37000	39800
13	44200	44300	22000	31600	20400	20800	95200	65300	54000	121000	34600	43100
14	44500	43500	24000	28200	20000	20800	95800	84200	51700	121000	32100	44200
15	46100	44500	24800	24600	20200	21200	99700	82000	49200	119000	29800	46600
16	49100	47300	25200	23000	20600	22400	103000	72000	47200	113000	28700	51300
17	52100	47200	27000	23500	20800	23400	109000	64500	52800	102000	31100	56600
18	52700	46800	30000	24000	21000	24000	116000	62100	67700	96800	31500	70300
19	64500	45800	32800	24200	21000	25000	125000	59500	78700	92900	31300	76900
20	56000	42100	36000	28400	21000	26000	127000	56500	80900	87700	32400	75500
21	57900	42500	36000	26000	21000	25400	128000	54600	77500	87900	32600	76400
22	57600	42900	37000	26000	21000	30000	123000	51400	74300	89700	33200	78700
23	54500	43200	40500	26000	21600	40000	114000	50700	71100	89200	33200	79800
24	50900	43900	44000	25600	21600	41500	110000	50800	67900	87000	34600	78700
25	49400	45700	46000	25200	20600	45500	106000	50500	64200	84300	35200	72800
26	47800	39000	42100	25400	19800	49500	99400	48500	63600	83600	34700	64700
27	45100	28500	44000	25200	19000	53400	96900	42300	61300	82600	34800	59100
28	40800	23600	44500	25200	18000	55300	91500	40200	54500	82200	36800	57500
29	37000	17600	45500	25000	---	61800	85400	39400	51900	82400	43200	53200
30	35900	21000	45500	25000	---	68900	83600	42200	48700	82000	51400	50400
31	36300	---	45000	25000	---	76200	---	47600	---	81200	55800	---
TOTAL	1502800	1176300	989500	921000	597400	935700	2838600	1849200	1826000	2828900	1310900	1803400
MEAN	48480	39210	31920	29710	21340	30180	94620	59650	60870	91250	42290	60110
MAX	57900	47300	45500	45000	24400	76200	128000	84200	80900	121000	79700	79800
MIN	35900	17600	22000	23000	18000	15200	63000	39400	47200	49100	28700	39800
CFSM	.57	.46	.37	.36	.25	.35	1.11	.70	.71	1.07	.49	.70
IN.	.65	.51	.43	.40	.26	.41	1.23	.80	.79	1.23	.57	.78
AC-FT	2981000	2333000	1963000	1827000	1185000	1856000	5630000	3668000	3622000	5611000	2600000	3577000

CAL YR 1977	TOTAL	10343460	MEAN	28340	MAX	57900	MIN	9660	CFSM .33	IN 4.50	AC-FT	20520000
WTR YR 1978	TOTAL	18579700	MEAN	50900	MAX	128000	MIN	15200	CFSM .60	IN 8.07	AC-FT	36850000

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

WATER-QUALITY RECORDS

LOCATION.--Samples collected at bridge on State Highway 136 in Clinton, 6.4 mi (10.3 km) upstream from discharge station.

PERIOD OF RECORD.--Water years 1974 to current year.
SPECIFIC CONDUCTANCE: October 1974 to September 1976.
WATER TEMPERATURE: October 1974 to current year.

REMARKS.--Temperature data for 1978 water year were collected at Dam 13 (Sta. 05420400).

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum, 30.5° C July 15, 1977; minumum, 0.0° C on many days during winter periods each year.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 27.0° C July 1; minimum, 0.0° C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	17.5	16.5	17.0	13.0	11.5	12.5	.5	.5	.5	.5	.5	.5
2	17.0	16.0	16.5	13.0	12.0	12.5	.5	.5	.5	.5	.5	.5
3	16.5	15.0	15.5	14.0	13.0	13.5	.5	.5	.5	.5	.5	.5
4	15.5	14.5	15.0	14.0	13.0	13.5	.5	.5	.5	.5	.5	.5
5	15.0	14.0	14.5	12.0	11.0	11.5	.5	.5	.5	.5	.5	.5
6	14.0	13.0	13.5	12.0	11.0	11.5	.5	.5	.5	.5	.5	.5
7	13.5	12.5	13.0	11.5	11.5	11.5	.5	.5	.5	.5	.5	.5
8	13.0	12.0	12.5	12.0	10.5	10.5	.5	.5	.5	.5	.5	.5
9	12.5	11.0	12.0	12.5	11.0	11.0	.5	.0	.5	.5	.0	.0
10	11.5	10.5	11.0	11.0	8.0	9.0	.5	.5	.5	.0	.0	.0
11	10.5	10.0	10.5	7.5	6.5	7.0	.5	.5	.5	.5	.0	.5
12	10.5	9.5	10.0	6.0	4.5	5.0	.5	.5	.5	.5	.5	.5
13	11.0	9.5	10.0	5.5	4.5	5.0	.5	.5	.5	.5	.5	.5
14	11.0	10.0	10.5	6.0	4.5	5.0	.5	.5	.5	.5	.5	.5
15	11.5	10.5	11.0	7.0	6.0	6.5	.5	.5	.5	.5	.5	.5
16	11.0	9.5	10.0	7.0	6.5	6.5	.5	.5	.5	.5	.5	.5
17	11.0	9.5	10.0	6.5	5.0	5.5	.5	.5	.5	.5	.5	.5
18	11.0	10.0	10.5	5.0	4.0	4.5	.5	.5	.5	.5	.5	.5
19	11.5	10.0	10.5	5.0	4.5	5.0	.5	.5	.5	.5	.5	.5
20	11.5	10.0	10.5	6.5	4.5	5.5	.5	.5	.5	.5	.5	.5
21	12.0	10.5	10.5	6.0	3.5	4.0	.5	.5	.5	.5	.5	.5
22	11.5	10.5	11.5	3.0	2.5	2.5	.5	.5	.5	.5	.5	.5
23	10.5	10.5	10.5	3.0	2.5	2.5	.5	.5	.5	.5	.5	.5
24	11.0	10.5	10.5	3.0	2.5	2.5	.5	.5	.5	.5	.5	.5
25	11.5	11.0	11.0	2.5	.5	1.0	.5	.5	.5	.5	.5	.5
26	11.5	11.0	11.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
27	12.0	10.5	10.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
28	12.0	11.5	12.0	.5	.5	.5	.5	.5	.5	.5	.0	.5
29	12.5	11.5	12.0	.5	.5	.5	.5	.5	.5	.5	.0	.5
30	11.5	11.0	11.5	.5	.5	.5	.5	.5	.5	.5	.0	.5
31	11.5	10.5	11.0	---	---	---	.5	.5	.5	.5	.0	.5
MONTH	17.5	9.5	12.0	14.0	.5	6.5	.5	.0	.5	.5	.0	.5

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

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.5	.0	.5	.5	.0	.0	5.5	1.0	3.5	14.0	12.0	13.0
2	.5	.5	.5	.5	.0	.0	5.0	4.5	5.0	15.5	12.5	13.0
3	.5	.5	.5	.5	.0	.0	7.5	5.0	6.0	15.5	13.0	14.0
4	.5	.0	.5	.5	.0	.0	8.5	7.5	8.0	14.5	11.5	12.5
5	.5	.5	.5	.5	.0	.0	8.0	7.5	8.0	11.5	11.0	11.0
6	.5	.0	.0	.5	.0	.0	9.5	8.0	8.5	12.5	11.0	12.0
7	.5	.0	.5	.5	.0	.0	10.5	8.0	9.0	12.5	11.5	12.0
8	.5	.0	.5	.5	.0	.0	9.5	9.0	9.5	14.0	11.5	12.0
9	.5	.0	.5	.0	.0	.0	11.0	8.0	9.0	14.0	12.5	13.0
10	.5	.0	.5	.0	.0	.0	11.0	10.5	10.5	14.5	11.5	13.0
11	.5	.0	.0	.0	.0	.0	10.0	9.0	9.5	15.0	14.0	14.5
12	.0	.0	.0	.5	.0	.0	10.5	9.0	9.5	16.5	15.0	15.5
13	.5	.0	.5	.5	.0	.5	11.0	9.5	10.0	14.5	12.5	13.5
14	.5	.5	.5	.5	.5	.5	10.0	9.0	9.5	12.5	12.0	12.0
15	.5	.5	.5	.5	.5	.5	11.0	9.0	10.0	13.0	12.5	12.5
16	.5	.5	.5	.5	.5	.5	11.0	9.5	9.5	14.5	13.0	13.0
17	.5	.5	.5	.5	.5	.5	10.0	9.0	9.5	16.0	13.0	14.5
18	.5	.5	.5	.5	.5	.5	10.5	9.0	10.5	17.0	14.5	16.0
19	.5	.5	.5	.5	.5	.5	11.0	9.5	10.0	18.0	15.5	17.0
20	.5	.5	.5	.5	.5	.5	10.5	9.5	9.5	19.5	17.5	18.5
21	.5	.0	.5	.5	.0	.0	10.5	8.0	9.0	19.0	17.0	18.5
22	.5	.0	.0	.5	.0	.5	11.5	10.0	10.5	19.5	18.0	18.5
23	.5	.5	.5	.5	.5	.5	11.0	10.0	10.5	18.0	18.0	18.0
24	.5	.5	.5	.5	.5	.5	11.0	10.0	10.5	19.5	18.0	18.0
25	.5	.0	.0	.5	.0	.5	12.0	10.0	11.0	21.0	19.0	19.5
26	.5	.5	.5	.5	.0	.0	13.0	10.5	10.5	22.0	20.0	21.0
27	.5	.5	.5	.5	.0	.5	14.0	11.5	13.0	23.0	21.5	22.0
28	.5	.5	.5	.5	.5	.5	14.5	12.5	13.5	23.5	22.5	23.0
29	---	---	---	.5	.5	.5	14.5	13.5	14.0	24.0	22.5	23.0
30	---	---	---	.5	.5	.5	14.0	12.0	13.0	24.0	23.0	23.5
31	---	---	---	1.0	.5	.5	---	---	---	24.5	22.5	23.5
MONTH	.5	.0	.5	1.0	.0	.5	14.5	1.0	9.5	24.5	11.0	16.0

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	24.0	23.5	23.5	27.0	20.5	25.5	23.5	21.5	22.5	24.0	22.5	23.0
2	23.0	22.0	22.5	26.5	25.5	26.0	24.0	21.5	23.0	23.5	21.5	22.5
3	23.0	21.5	22.0	26.0	24.5	25.0	23.5	21.5	22.5	24.5	22.5	23.0
4	23.0	21.5	22.0	25.5	24.0	24.5	23.5	21.0	22.0	24.0	22.5	23.0
5	22.0	21.0	21.5	25.5	24.0	24.5	23.5	21.5	22.5	24.0	22.5	23.0
6	22.0	21.0	21.5	25.5	24.0	24.5	24.0	21.5	23.0	24.0	22.5	23.5
7	22.0	21.0	21.5	26.0	24.0	24.5	24.5	22.5	23.5	24.0	22.0	23.0
8	22.0	21.0	21.5	26.0	23.5	25.0	24.5	23.0	24.0	24.5	22.0	23.0
9	22.0	21.0	21.5	25.5	24.0	24.5	25.0	23.0	24.5	24.5	22.5	23.5
10	22.0	21.0	21.5	25.0	23.0	24.0	25.5	23.0	24.5	25.0	23.5	24.0
11	22.0	21.0	21.5	24.5	23.5	24.0	25.5	23.5	24.5	25.0	24.5	24.5
12	22.0	21.0	21.5	24.0	22.0	22.5	25.5	24.0	24.5	25.0	24.0	24.5
13	22.0	21.0	21.5	24.0	22.0	23.0	25.5	24.0	25.0	24.0	23.0	23.5
14	21.5	21.0	21.5	25.0	22.5	23.0	25.5	24.5	25.0	23.5	22.5	23.5
15	21.5	21.0	21.5	25.0	23.0	24.0	25.5	24.5	25.0	22.5	21.5	22.0
16	21.5	21.0	21.5	25.5	23.5	24.0	24.0	23.5	24.0	22.0	21.0	21.5
17	22.5	21.5	22.0	25.0	23.5	24.0	24.5	24.0	24.5	22.0	21.0	21.5
18	23.0	21.5	22.0	25.0	24.0	24.5	25.5	24.0	24.5	20.5	19.5	20.0
19	23.0	21.0	22.0	26.0	24.0	25.0	25.5	24.5	24.5	21.5	20.0	20.5
20	22.5	21.5	22.0	25.5	24.0	24.5	24.5	23.5	24.0	21.0	19.5	20.0
21	22.5	20.5	21.5	26.5	25.0	25.5	23.0	22.5	23.0	19.5	18.0	18.5
22	22.5	21.0	22.0	26.0	25.0	25.5	23.5	22.0	23.0	18.5	17.0	17.5
23	22.5	21.0	21.5	25.0	23.0	24.0	24.0	22.5	23.0	18.5	16.5	17.0
24	24.5	21.5	21.5	24.0	23.5	23.5	24.0	23.5	24.0	18.5	16.5	17.5
25	23.0	22.5	22.5	24.0	23.5	23.5	24.0	24.0	24.0	18.0	16.0	17.0
26	24.5	22.5	23.0	24.0	23.0	23.5	24.0	23.5	24.0	17.5	16.0	17.0
27	25.0	22.5	24.0	24.0	22.5	23.5	24.0	23.0	23.5	18.5	16.5	17.5
28	25.5	22.5	24.5	24.0	22.5	23.0	24.0	23.0	23.5	18.5	17.0	17.5
29	26.0	24.0	25.0	23.5	22.0	23.0	24.0	22.0	23.0	17.5	16.5	17.0
30	26.0	24.5	25.0	23.5	22.0	22.5	24.0	22.5	23.5	17.5	16.5	17.0
31	---	---	---	23.0	22.0	22.5	24.5	22.5	23.5	---	---	---
MONTH	26.0	20.5	22.0	27.0	20.5	24.0	25.5	21.0	23.5	25.0	16.0	21.0
YEAR	27.0	.0	11.5									

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

WATER QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
12...	1030	43	300	7.9	10.0	20	--	--	--	--	--
NOV											
23...	1330	43	311	8.2	2.5	15	--	9.9	88	490	350
FEB											
01...	1500	23600	380	7.4	.0	5	--	13.5	95	720	27
MAR											
07...	1430	15200	350	7.8	.0	4	--	--	--	480	1960
APR											
21...	1815	136000	300	7.3	10.0	40	--	8.7	83	--	--
JUN											
07...	0900	64700	380	7.5	23.0	--	26	--	--	--	--
JUL											
07...	1230	109000	320	7.9	25.0	--	70	5.0	61	--	--
AUG											
10...	0930	35700	310	8.1	26.0	--	15	7.2	89	--	--
SEP											
28...	1100	58000	260	8.0	18.0	--	29	7.8	80	500	320

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
12...	130	24	31	13	7.9	2.4	130	0	110	20	11
NOV											
23...	150	33	36	14	8.1	2.0	140	0	110	28	11
FEB											
01...	180	40	44	17	9.1	2.4	170	0	140	31	13
MAR											
07...	180	37	46	17	9.6	2.1	180	0	150	27	14
APR											
21...	130	33	33	12	5.9	3.1	120	0	98	24	9.6
JUN											
07...	180	46	44	16	8.6	2.8	--	--	130	44	11
JUL											
07...	140	27	35	12	7.9	3.0	--	--	110	26	9.2
AUG											
10...	140	28	34	13	5.7	2.3	--	--	110	21	9.1
SEP											
28...	110	16	27	10	6.1	2.7	--	--	93	17	9.1

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)
OCT										
12...	.1	8.7	168	158	.23	19.7	.80	--	--	.36
NOV										
23...	.1	9.6	186	178	.25	21.6	.11	--	--	.12
FEB										
01...	.2	14	233	215	.32	14800	1.4	.82	2.2	.11
MAR										
07...	.0	13	221	217	.30	9070	1.2	.82	2.0	.12
APR										
21...	.1	9.8	171	157	.23	62800	2.0	1.2	3.2	.20
JUN										
07...	.2	1.6	217	207	.30	37900	--	--	--	.15
JUL										
07...	.1	9.5	178	169	.24	52400	1.0	1.3	2.3	.22
AUG										
10...	.1	9.9	191	161	.26	18400	.58	.92	1.5	.14
SEP										
28...	.1	9.6	161	138	.22	25200	.58	1.0	1.6	.24

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

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	PHYTO-PLANK-TON, TOTAL (CELLS PER ML) (60050)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M (00573)	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M (00572)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2) (70957)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2) (70958)	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										
12...	--	--	18000	--	--	--	--	--	--	--
NOV										
23...	--	--	--	--	--	--	--	65	7.5	42
FEB										
01...	13	--	--	--	--	--	--	33	2100	86
MAR										
07...	8.9	--	--	--	--	--	--	--	--	--
APR										
21...	--	9.0	1300	--	--	--	--	--	--	--
JUN										
07...	--	17	--	--	--	--	--	84	14700	97
JUL										
07...	--	--	3000	6.85	5.98	11.8	1.81	--	--	--
AUG										
10...	11	--	54000	--	--	--	--	--	--	--
SEP										
28...	13	13	--	--	--	--	--	100	15700	89

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
APR											
21...	2	1	0	1	10	10	1	0	13	2	2600
JUN											
07...	2	1	1	1	10	5	2	0	14	5	1300
SEP											
28...	1	1	1	0	0	0	0	0	11	3	2300

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
APR											
21...	110	6	3	240	0	.9	.1	0	0	20	10
JUN											
07...	0	14	5	170	5	.4	.0	0	0	40	10
SEP											
28...	100	8	0	210	0	.1	.1	0	0	30	10

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

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO AUGUST 1978

DATE	OCT 12,77	APR 21,78	JUN 7,78	JUL 7,78	AUG 10,78
TIME	1030	1815	0000	1230	0930
TOTAL CELLS/ML	18000	1300	14000	3000	54000
DIVERSITY: DIVISION	1.6	1.5	1.4	1.4	0.9
.CLASS	1.6	1.5	1.4	1.4	0.9
..ORDER	2.0	2.0	2.0	1.7	1.1
...FAMILY	2.5	2.2	2.3	2.2	1.3
....GENUS	3.1	2.3	2.7	2.8	2.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...COELASTRACEAE										
....COELASTRUM	--	-	--	-	560	4	350	12	650	1
...MICRACTINIACEAE										
....GOLENKINIA	--	-	--	-	*	0	--	-	--	-
....MICRACTINIUM	--	-	--	-	140	1	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	*	0	--	-	240	2	44	1	330	1
....CHLORELLA	*	0	--	-	--	-	--	-	--	-
....DICTYOSPHAERIUM	*	0	--	-	140	1	88	3	--	-
....KIRCHNERIELLA	930	5	--	-	--	-	--	-	990	2
....OOCYSTIS	*	0	16	1	--	-	--	-	--	-
....QUADRIGULA	*	0	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	49	4	--	-	--	-	330	1
...SCENEDESMACEAE										
....CRUCIGENIA	4500#	26	--	-	--	-	--	-	--	-
....SCENEDESMUS	520	3	130	10	1200	9	460#	15	1200	2
....TETRASTRUM	440	2	--	-	--	-	--	-	1300	2
..TETRASPORALES										
...PALMELLACEAE										
....SPHAEROCYSTIS	230	1	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	240#	19	--	-	--	-	--	-
..CHLOROCOCCALES										
...OOCYSTACEAE										
....GLOEOACTINIUM	--	-	--	-	--	-	--	-	2000	4
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....COSCINODISCUS	--	-	16	1	--	-	--	-	--	-
....CYCLOTELLA	550	3	550#	42	170	1	310	10	1500	3
....MELOSIRA	3200#	18	--	-	2000	15	1200#	39	*	0
....SKELETONEMA	*	0	--	-	--	-	--	-	830	2
....STEPHANODISCUS	120	1	--	-	1400	10	66	2	--	-
....THALASSIOSIRA	*	0	--	-	--	-	--	-	--	-
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	--	-	22	1	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	*	0	22	1	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	--	-	*	0	--	-	--	-
...NAVICULACEAE										
....NAVICULA	120	1	--	-	100	1	44	1	--	-
...NITZSCHIACEAE										
....NITZSCHIA	*	0	49	4	100	1	66	2	--	-
.CHRYSOPHYCEAE										
..CHRYSOMONADALES										
...CHROMULINACEAE										
....CHRYSOCOCCUS	*	0	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)										
.CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....RHODOMONAS	*	0	--	-	--	-	--	-	--	-
...CRYPTOMONODACEAE										
....CRYPTOMONAS	*	0	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

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

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO AUGUST 1978

DATE / TIME	OCT 12,77 1030		APR 21,78 1815		JUN 7,78 0000		JUL 7,78 1230		AUG 10,78 0930	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROCCOCCALES										
...CHROCCOCCACEAE										
....AGMENELLUM	--	-	--	-	--	-	--	-	5300	10
....ANACYSTIS	1600	9	--	-	5400#	39	310	10	36000#	66
....COCCOCHLORIS	--	-	--	-	--	-	--	-	990	2
..HORMOGONALES										
...NOSTOCACEAE										
....APHANIZOMENON	3900#	22	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE										
....OSCILLATORIA	--	-	--	-	2300#	17	--	-	2600	5
....SCHIZOTHRIX	930	5	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	--	-	--	-	22	1	--	-
....TRACHELOMONAS	--	-	240#	19	--	-	22	1	330	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05420560 WAPSIPINICON RIVER NEAR ELMA, IA

LOCATION.--Lat 43°14'34", long 92°31'48", in NW1/4 NW1/4 sec.8, T.97 N., R.14 W., Howard County, Hydrologic Unit 07080102, on right bank 10 ft (3 m) downstream from bridge on county highway B17, 0.2 mi (0.3 km) downstream from small left-bank tributary, 4.8 mi (7.7 km) west of Elma, and at mile 217.9 (350.6 km).

DRAINAGE AREA.--95.2 mi² (247 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,130.05 ft (344.439 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 56.9 ft³/s (1.611 m³/s), 8.12 in/yr (206 mm/yr), 41,220 acre-ft/yr (50.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft³/s (286 m³/s) June 4, 1974, gage height, 14.94 ft (4.554 m), from high-water mark in well; minimum daily, 1.9 ft³/s (0.054 m³/s) Feb. 4-8, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft³/s (17.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
April 19	1100	823	23.3	11.00	3.353
June 18	1315	*948	26.8	*11.41	3.478
July 7	1530	704	19.9	10.44	3.182

Minimum daily discharge, 6.3 ft³/s (0.18 m³/s) Feb. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	32	21	16	8.5	8.1	121	51	34	142	24	9.0
2	35	30	21	15	8.5	8.3	90	44	33	70	21	8.7
3	29	27	21	14	8.6	8.6	67	40	27	39	18	8.6
4	24	25	20	13	8.6	8.8	68	37	23	29	15	8.5
5	21	23	20	12	8.5	8.6	70	34	21	24	14	8.6
6	19	21	18	13	8.8	8.6	205	31	19	211	13	9.2
7	20	20	16	13	8.8	8.5	249	29	18	629	13	9.8
8	39	20	18	12	8.8	8.8	122	35	16	293	12	11
9	51	21	18	10	8.9	8.9	91	38	15	127	12	13
10	45	22	15	8.9	9.0	9.2	129	34	14	96	11	13
11	48	19	17	9.1	9.1	9.8	130	30	13	72	11	13
12	58	17	21	9.9	9.2	12	94	28	12	55	11	15
13	46	17	22	9.9	9.4	13	73	52	12	48	11	40
14	36	17	22	9.5	9.4	15	59	79	11	39	10	44
15	30	17	22	9.5	9.4	15	51	52	12	32	11	27
16	26	16	25	9.5	9.0	15	45	42	50	27	13	18
17	24	15	33	9.8	8.4	16	45	36	212	24	12	14
18	22	15	63	10	8.0	17	448	32	855	23	10	13
19	21	14	86	11	7.4	21	843	29	195	23	10	13
20	20	13	64	11	7.0	32	324	54	102	23	9.1	14
21	19	11	48	10	6.4	90	215	54	77	40	9.2	16
22	18	17	41	10	6.4	230	162	36	58	252	9.5	15
23	18	14	35	10	6.3	320	132	30	46	392	9.0	13
24	21	19	30	10	6.8	260	125	27	39	218	9.2	12
25	24	18	25	9.8	7.0	150	128	25	45	115	9.2	11
26	26	16	22	9.2	7.1	130	107	23	49	84	9.3	11
27	23	18	20	9.8	7.4	156	89	21	35	64	12	10
28	21	19	19	11	8.0	180	76	21	27	48	13	11
29	20	19	18	11	---	169	67	22	24	38	12	13
30	18	20	17	9.2	---	120	60	24	29	32	11	15
31	27	---	16	8.6	---	122	---	35	---	27	9.6	---
TOTAL	884	572	854	334.7	228.7	2179.2	4485	1125	2123	3336	374.1	437.4
MEAN	28.5	19.1	27.5	10.8	8.17	70.3	150	36.3	70.8	108	12.1	14.6
MAX	58	32	86	16	9.4	320	843	79	855	629	24	44
MIN	18	11	15	8.6	6.3	8.1	45	21	11	23	9.0	8.5
CFSM	.30	.20	.29	.11	.09	.74	1.58	.38	.74	1.13	.13	.15
IN.	.35	.22	.33	.13	.09	.85	1.75	.44	.83	1.30	.15	.17
AC-FT	1750	1130	1690	664	454	4320	8900	2230	4210	6620	742	868

CAL YR 1977	TOTAL	5954.9	MEAN 16.3	MAX 86	MIN 3.0	CFSM .17	IN 2.33	AC-FT	11810	
WTR YR 1978	TOTAL	16933.1	MEAN 46.4	MAX 855	MIN 6.3	CFSM .49	IN 6.62	AC-FT	33590	

05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA

LOCATION.--Lat 42°27'49", long 91°53'42", in SE1/4 sec.4, T.88 N., R.9 W., Buchanan County, Hydrologic Unit 07080102, on right bank at Sixth Street in Independence, 1,800 ft (549 m) downstream from dam at abandoned hydroelectric plant, 4.9 mi (7.9 km) downstream from Otter Creek, 9.7 mi (15.6 km) upstream from Pine Creek, and at mile 142.5 (229.3 km).

DRAINAGE AREA.--1,048 mi² (2,714 km²).

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 882.86 ft (259.093 m) NGVD. Prior to May 24, 1941, nonrecording gage in tailrace of powerplant 1,800 ft (549 m) upstream at datum 80.00 ft (24.38 m) lower.

REMARKS.--Records excellent. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--45 years, 564 ft³/s (15.97 m³/s), 7.31 in/yr (186 mm/yr), 408,600 acre-ft/yr (504 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,800 ft³/s (759 m³/s) July 18, 1968, gage height, 21.11 ft (6.434 m); minimum daily, 7.0 ft³/s (0.20 m³/s) several days in 1934 and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, that of July 18, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,630 ft³/s (159 m³/s) Apr. 7, gage height, 9.54 ft (2.908 m) at 0745 hours, no other peak above base of 4,000 ft³/s (113 m³/s); minimum daily, 72 ft³/s (2.04 m³/s) Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	960	718	309	440	146	116	1660	1010	599	1170	507	139
2	1030	737	309	400	141	116	1440	888	623	1300	452	125
3	1080	758	302	360	136	117	1310	800	516	1390	391	113
4	1060	814	294	320	136	118	1730	732	444	1350	343	103
5	950	822	294	318	131	118	3450	684	389	1290	307	96
6	819	784	234	313	129	114	3860	631	351	1170	278	90
7	770	741	240	306	126	119	5260	576	331	1040	251	87
8	1000	700	239	310	123	120	4320	550	346	1280	230	83
9	1170	682	213	269	121	119	3370	578	328	1610	210	79
10	1260	645	220	253	121	116	4070	552	283	1840	189	76
11	1280	591	199	240	121	118	4750	537	269	1870	181	72
12	1180	548	191	228	121	120	3330	565	243	1860	173	75
13	1060	514	205	216	126	122	2490	808	215	1570	161	147
14	970	497	222	206	126	136	1910	994	138	1160	113	291
15	880	489	247	198	126	138	1560	961	135	857	74	374
16	788	472	290	194	126	142	1310	944	245	696	124	366
17	734	464	503	190	126	153	1160	914	672	585	130	480
18	681	430	1190	186	126	168	1810	820	1990	546	136	559
19	627	391	1570	182	126	204	3410	734	1760	699	121	478
20	583	422	1550	179	126	343	3770	667	1520	1310	106	750
21	549	383	1370	179	126	836	3590	610	1450	1490	104	1620
22	514	360	1180	179	126	1680	3230	560	1280	1580	108	1620
23	514	383	1150	173	121	2690	3280	523	1190	1550	106	1360
24	627	368	1050	173	119	3550	3070	501	1060	1570	103	1030
25	810	267	861	168	121	2950	2570	480	847	1510	97	809
26	900	234	694	162	117	2120	2000	440	718	1390	120	679
27	890	280	626	162	116	2610	1610	402	629	1250	403	598
28	809	287	588	162	116	3100	1400	405	688	1090	411	521
29	755	302	570	162	---	2880	1260	477	1090	887	283	476
30	687	309	515	162	---	2340	1130	588	1390	713	212	441
31	692	---	473	156	---	1910	---	525	---	595	168	---
TOTAL	26629	15392	17898	7146	3522	29483	79110	20456	21739	38219	6592	13737
MEAN	859	513	577	231	126	951	2637	660	725	1233	213	458
MAX	1280	822	1570	440	146	3550	5260	1010	1990	1870	507	1620
MIN	514	234	191	156	116	114	1130	402	135	546	74	72
CFSM	.82	.49	.55	.22	.12	.91	2.52	.63	.69	1.18	.20	.44
IN.	.95	.55	.64	.25	.13	1.05	2.81	.73	.77	1.36	.23	.49
AC-FT	52820	30530	35500	14170	6990	58480	156900	40570	43120	75810	13080	27250

CAL YR 1977	TOTAL	104622.0	MEAN 287	MAX 1570	MIN 7.0	CFSM .27	IN 3.71	AC-FT 207500				
WTR YR 1978	TOTAL	279923.0	MEAN 767	MAX 5260	MIN 72	CFSM .73	IN 9.94	AC-FT 555200				

05422000 WAPSIPINICON RIVER NEAR DE WITT, IA

LOCATION.--Lat 41°46'01", long 90°32'05", in SW1/4 NE1/4 sec.6, T.80 N., R.4 E., Clinton County, Hydrologic Unit 07080103, on left bank 5 ft (2 m) upstream from bridge on U.S. Highway 61, 0.9 mi (1.4 km) downstream from Silver Creek, 4.0 mi (6.4 km) south of water tower in De Witt, 6.2 mi (10.0 km) upstream from Brophy Creek, and 18.2 mi (29.3 km) upstream from mouth.

DRAINAGE AREA.--2,330 mi². (6,034 km²).

PERIOD OF RECORD.--June 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 (182.517 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Seven discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--44 years, 1,818 ft³/s (51.49 m³/s), 8.41 in/yr (214 mm/yr), 1,045,000 acre-ft/yr (1,288 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,900 ft³/s (847 m³/s) May 17, 1974, gage height, 13.07 ft (3.984 m); minimum daily, 46 ft³/s (1.30 m³/s) Jan. 22, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,000 ft³/s (170 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 11	1600	*8,320	236	*11.55	3.520	May 14	2145	6,400	181	10.52	3.206

Minimum daily discharge, 313 ft³/s (8.86 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2940	1930	992	3000	480	355	4450	2760	1940	1340	1520	536
2	2920	2710	1060	2500	470	360	4160	2460	1810	2160	1350	504
3	2150	2920	1010	2250	465	360	3600	2250	1680	2310	1200	465
4	2030	2510	945	2000	460	360	3140	2100	1600	2070	1090	434
5	1970	2310	905	1800	450	360	2770	1990	1590	1960	987	407
6	1870	2200	620	1560	445	355	2810	1880	1500	1950	912	385
7	1860	2350	530	1360	440	350	3500	1840	1410	2920	844	368
8	3000	3130	660	1200	430	350	4400	2000	1340	2370	784	359
9	3040	2660	870	1050	425	355	5220	2050	1240	1970	735	349
10	2550	2300	890	880	420	365	6960	1910	1170	1840	694	335
11	2640	2050	980	750	410	425	8120	1780	1100	1750	658	321
12	2620	1860	990	680	410	500	7920	1910	1050	1880	630	313
13	2480	1740	980	590	410	620	7560	3570	1000	2120	600	323
14	2380	1640	1010	605	405	860	7390	6080	946	2250	577	360
15	2260	1560	1050	610	405	1300	7100	5500	910	2360	556	365
16	2070	1480	1150	600	400	1800	6790	4410	893	2190	539	346
17	1920	1410	1400	620	395	2150	5390	3680	888	1860	533	380
18	1780	1340	1850	600	390	2300	4080	3260	871	1580	510	728
19	1640	1280	1820	600	390	2900	4050	2910	854	1390	477	1250
20	1530	1240	2080	620	385	3300	4230	2670	982	1290	484	819
21	1430	1210	2270	610	380	2600	4540	2440	1970	1290	479	852
22	1350	1140	2660	560	375	2600	4880	2250	2280	1920	457	923
23	1340	1110	2990	520	375	2690	5260	2120	2150	2500	447	885
24	1670	1090	3090	520	370	3350	5580	2010	2030	2440	431	1170
25	2270	1070	4870	530	365	4400	5700	1900	1900	2370	421	1540
26	2380	940	5040	540	360	4380	5940	1780	1940	2300	422	1570
27	2180	648	4980	540	355	4740	5130	1680	2390	2240	458	1400
28	2100	634	4820	550	355	5020	4740	1740	1820	2110	448	1190
29	2020	716	4380	560	---	4960	3960	1720	1510	1980	434	1030
30	1930	805	3910	530	---	4270	3230	1800	1350	1830	438	927
31	1830	---	3500	480	---	4360	---	1970	---	1680	512	---
TOTAL	66150	49983	64302	29815	11420	63095	152600	78420	44114	62220	20627	20834
MEAN	2134	1666	2074	962	408	2035	5087	2530	1470	2007	665	694
MAX	3040	3130	5040	3000	480	5020	8120	6080	2390	2920	1520	1570
MIN	1340	634	530	480	355	350	2770	1680	854	1290	421	313
CFSM	.92	.72	.89	.41	.18	.87	2.18	1.09	.63	.86	.29	.30
IN.	1.06	.80	1.03	.48	.18	1.01	2.44	1.25	.70	.99	.33	.33
AC-FT	131200	99140	127500	59140	22650	125100	302700	155500	87500	123400	40910	41320

CAL YR 1977 TOTAL 308191 MEAN 844 MAX 5320 MIN 46 CFSM .36 IN 4.92 AC-FT 611300
WTR YR 1978 TOTAL 663580 MEAN 1818 MAX 8120 MIN 313 CFSM .78 IN 10.59 AC-FT 1316000

05448150 PINE CREEK NEAR MUSCATINE, IA

LOCATION.--Lat 41°28'03", long 90°52'04", in SE1/4 SE1/4 sec.17, T.77 N., R.1 E., Muscatine County, Hydrologic Unit 07080101, on right bank in Old Pine Creek Mill at Wildcat Den State Park, 9.8 miles (15.8 km) NE of Muscatine, and 1.5 miles (2.4 km) upstream from mouth.

DRAINAGE AREA.--38.9 sq mi)100.8 km²).

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

GAGE.--Water-stage recorder. Prior to June 30, 1977, mill dam control.

REMARKS.--Records fair except those for winter period, which are poor. Mill dam partially washed out June 30, 1977 and replaced July 28, 1978. Gage heights referred to tailwater elevations since July 28, 1978.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,550 ft³/s (129 m³/s) July 20, 1976, gage height, 16.22 ft (4.944 m), from rating curve extended above 218 ft³/s (6.17 m³/s on basis of indirect measurement of peak flow over dam of 3,670 ft³/s (104 m³/s), gage height, 15.80 ft (4.82 m) Mar. 4, 1976; no flow Jan. 11-16, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,010 ft³/s (85.2 m³/s) July 10, gage height, 9.69 ft (2.954 m) at 1345 hours, no other peak above base of 700 ft³/s (19.82 m³/s); minimum daily, 1.6 ft³/s (0.045 m³/s) Jan. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	100	22	7.0	17	5.8	34	25	48	30	9.5	1.9
2	32	76	20	7.3	13	5.7	29	22	46	32	8.0	1.8
3	26	62	19	7.6	10	5.6	30	20	45	27	7.4	2.1
4	24	54	18	7.7	8.4	5.6	29	13	45	27	6.4	2.9
5	24	52	18	7.6	7.0	5.5	26	17	44	25	6.4	2.5
6	23	50	17	7.5	5.5	5.4	38	17	43	29	8.0	2.5
7	75	152	18	7.2	5.5	5.4	32	31	43	55	8.5	2.5
8	76	80	19	2.3	5.8	5.5	36	36	43	36	8.7	2.5
9	48	65	21	1.6	6.1	6.2	34	30	42	130	9.9	2.3
10	52	57	22	4.0	6.4	9.0	71	26	39	108	8.9	2.3
11	57	57	24	7.0	6.7	24	51	22	38	30	9.8	2.9
12	54	55	27	9.6	6.6	44	43	52	38	17	11	3.2
13	48	51	30	12	6.2	58	38	116	38	13	11	3.2
14	47	53	34	10	5.8	69	36	76	38	12	15	3.6
15	46	49	42	6.5	5.4	84	35	73	38	10	13	3.8
16	42	46	53	5.2	5.0	100	34	64	37	8.8	9.9	3.8
17	42	45	74	5.2	4.8	120	35	61	36	7.8	10	4.9
18	41	41	53	5.5	6.0	200	58	58	34	30	7.4	22
19	39	39	45	5.7	7.4	130	48	56	32	100	3.1	9.1
20	39	44	27	6.2	8.3	92	43	55	30	80	3.7	11
21	33	40	21	6.3	7.8	74	40	53	29	250	4.3	8.1
22	26	38	22	7.5	10	50	38	52	28	220	3.9	6.9
23	40	39	16	7.9	12	38	38	52	27	100	2.8	6.0
24	62	37	15	9.0	8.6	30	36	51	27	50	2.3	6.3
25	70	33	7.4	10	5.8	25	35	50	26	30	3.0	6.3
26	56	31	5.5	8.8	7.2	30	32	49	41	17	4.6	6.2
27	47	28	5.0	8.8	8.2	40	30	47	32	14	16	5.8
28	40	27	9.0	11	6.0	67	30	59	27	9.3	8.8	5.4
29	36	25	8.2	15	---	50	28	53	35	9.0	5.5	5.4
30	33	24	7.5	18	---	40	26	50	32	9.0	3.1	5.4
31	31	---	7.2	18	---	37	---	49	---	8.9	2.0	---
TOTAL	1371	1550	726.9	253.0	212.5	1461.7	1113	1435	1101	1524.8	231.9	152.6
MEAN	44.2	51.7	23.4	8.16	7.59	47.2	37.1	46.3	35.7	49.2	7.48	5.09
MAX	76	152	74	18	17	200	71	116	48	250	16	22
MIN	23	24	5.0	1.6	4.8	5.4	26	13	26	7.8	2.0	1.8
CFSM	1.12	1.31	.59	.21	.19	1.20	.94	1.18	.93	1.25	.19	.13
IN.	1.29	1.46	.69	.24	.20	1.38	1.05	1.35	1.04	1.44	.22	.14
AC-FT	2720	3070	1440	502	421	2900	2210	2850	2180	3020	460	303

CAL YR 1977 TOTAL 10000.45 MEAN 27.4 MAX 737 MIN .00 CFSM .70 IN 9.44 AC-FT 19840
WTR YR 1978 TOTAL 11133.40 MEAN 30.5 MAX 250 MIN 1.6 CFSM .77 IN 10.51 AC-FT 22080

05449000 EAST BRANCH IOWA RIVER NEAR KLEMME, IA

LOCATION.--Lat 43°00'31", long 93°37'42", in NE1/4 NW1/4 sec.36, T.95 N., R.24 W., Hancock County, Hydrologic Unit 07080207, on left bank 15 ft (5 m) downstream from bridge on county highway B55, 1.2 mi (1.9 km) west of Chicago, Rock Island and Pacific Railroad crossing in Klemme, 1.5 mi (2.4 km) upstream from Drainage ditch 9, 18.2 mi (29.3 km) upstream from confluence with West Branch Iowa River.

DRAINAGE AREA.--133 mi² (344 km²).

PERIOD OF RECORD.--April 1948 to September 1976, June 1977 to current year. Prior to October 1958, published as East Fork Iowa River near Klemme.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,179.33 ft (359.46 m) NGVD. Apr. 1, 1948, to Sept. 30, 1955, nonrecording gage at site 0.5 mi (1.0 km) upstream at datum 0.80 ft (0.24 m) higher. Oct. 1, 1955, to Sept. 30, 1969, at present site at datum 0.31 ft (0.09 m) lower.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--29 years, 55.9 ft³/s (1.583 m³/s), 5.71 in/yr (145 mm/yr), 40,500 acre-ft/yr (49.9 hm³/yr); median of yearly mean discharges, 43 ft³/s (1.22 m³/s), 4.4 in/yr (112 mm/yr), 31,200 acre-ft/yr (38.5 hm³/yr).

EXTREMEMES FOR PERIOD OF RECORD.--Maximum discharge, 5,960 ft³/s (169 m³/s) June 19, 1954, gage height, 11.2 ft (3.41 m), from floodmark, site and datum then in use; maximum gage height, 10.67 ft (3.252 m) Sept. 6, 1965, backwater from ice; minimum daily discharge, 0.2 ft³/s (0.006 m³/s) Feb. 22-26, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1944 reached a stage of about 10 ft (3 m), from information by local residents, former site and datum.

EXTREMES FOR CURRENT PERIOD.--June to September 1977: Maximum discharge during period, 58 ft³/s (1.64 m³/s) June 30, gage height, 3.38 ft (1.030 m); minimum, 2.2 ft³/s (0.062 m³/s) Sept. 11.

Water year 1978: Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 16	1015	753	21.3	*8.21	2.502	Sept. 14	0900	*882	25.0	8.11	2.472

Minimum daily discharge, 1.4 ft³/s (0.040 m³/s) Jan. 30 to Feb. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1									---	21	10	14
2									---	53	10	14
3									---	30	9.5	16
4									---	20	8.9	15
5									---	14	9.6	14
6									---	13	9.0	15
7									---	15	9.9	13
8									---	14	13	13
9									---	14	12	12
10									---	13	16	12
11									---	13	15	11
12									---	12	12	12
13									---	13	11	12
14									---	13	9.6	11
15									---	14	13	11
16									---	15	86	11
17									---	15	102	11
18									---	13	59	15
19									---	12	35	13
20									---	11	24	14
21									---	12	21	16
22									---	12	19	14
23									---	13	17	14
24									---	16	15	24
25									---	16	14	23
26									---	12	17	21
27									---	11	16	18
28									---	11	16	15
29									12	11	14	14
30									14	10	14	17
31									---	10	14	---
TOTAL									---	472	651.5	435
MEAN									---	15.2	21.0	14.5
MAX									---	53	102	24
MIN									---	10	8.9	11
CFSM									---	.04	.05	.03
IN.									---	.04	.06	.04
AC-FT									---	936	1290	863

05449000 EAST BRANCH IOWA RIVER NEAR KLEMME, IA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	10	9.6	4.3	1.4	2.1	85	22	21	10	26	11
2	6.1	9.1	8.7	4.2	1.4	2.3	52	21	19	7.4	25	11
3	5.6	9.6	8.8	4.2	1.5	2.6	34	19	17	5.7	21	8.5
4	5.0	10	8.5	4.0	1.5	2.6	34	20	13	3.9	19	7.8
5	5.3	9.6	8.4	3.9	1.5	2.7	28	17	13	4.2	20	7.5
6	4.2	9.6	8.2	3.9	1.6	2.7	42	17	10	223	18	7.4
7	6.2	9.3	8.4	3.8	1.7	2.8	35	16	10	352	16	7.0
8	14	8.9	8.0	3.6	1.8	2.9	27	23	11	272	17	6.3
9	9.2	10	7.9	3.5	1.9	3.0	24	19	11	166	16	6.1
10	9.9	10	7.9	3.5	2.0	3.1	21	16	9.0	114	14	5.8
11	13	11	7.9	3.6	2.0	3.5	19	17	15	86	11	6.0
12	11	9.5	8.0	3.5	2.0	4.3	18	19	10	91	11	86
13	10	9.4	8.1	3.5	2.0	6.0	16	27	9.8	70	11	643
14	10	7.0	7.3	3.2	2.0	7.5	16	25	9.3	55	10	860
15	8.2	6.7	6.2	3.1	2.0	10	15	24	334	45	11	652
16	7.2	6.4	5.4	2.9	1.9	14	13	23	730	38	12	446
17	7.5	6.3	6.0	2.8	1.9	22	15	22	580	33	13	313
18	6.9	6.4	4.9	2.8	1.9	27	39	18	410	28	12	220
19	6.3	5.9	7.0	2.7	1.9	35	76	18	278	24	9.1	150
20	5.7	6.0	10	2.6	1.9	60	62	19	214	50	8.3	132
21	6.5	4.5	7.2	2.4	2.0	84	54	14	168	87	10	181
22	6.1	6.0	5.4	2.4	2.1	84	59	13	117	124	11	154
23	6.7	6.1	5.5	2.3	2.2	98	56	12	81	171	11	119
24	8.9	8.7	5.9	2.2	2.2	92	46	14	58	133	8.8	96
25	8.4	9.6	5.8	2.1	2.1	89	38	20	49	100	8.2	78
26	7.9	7.4	5.5	2.1	1.9	66	36	17	50	77	15	67
27	8.4	8.4	4.7	2.0	1.9	56	37	16	30	59	18	63
28	7.8	9.5	4.5	1.7	2.0	78	34	20	23	48	13	56
29	7.8	9.4	4.4	1.5	---	80	29	31	18	41	11	55
30	7.6	9.4	4.2	1.4	---	69	27	30	13	34	9.2	48
31	11	---	4.4	1.4	---	87	---	26	---	29	14	---
TOTAL	246.5	249.7	212.7	91.1	52.2	1099.1	1087	615	3331.1	2581.2	429.6	4503.4
MEAN	7.95	8.32	6.86	2.94	1.86	35.5	36.2	19.8	111	83.3	13.9	150
MAX	14	11	10	4.3	2.2	98	85	31	730	352	26	860
MIN	4.2	4.5	4.2	1.4	1.4	2.1	13	12	9.0	3.9	8.2	5.8
CFSM	.06	.06	.05	.02	.01	.27	.27	.15	.84	.63	.11	1.13
IN.	.07	.07	.06	.03	.01	.31	.30	.17	.93	.72	.12	1.26
AC-FT	489	495	422	181	104	2180	2160	1220	6610	5120	852	8930

WTR YR 1978 TOTAL 14498.6 MEAN 39.7 MAX 860 MIN 1.4 CFSM .30 IN 4.06 AC-FT 28760

05449500 IOWA RIVER NEAR ROWAN, IA

LOCATION.--Lat 42°45'36", long 93°37'23", in NW1/4 NE1/4 sec.25, T.92 N., R.24 W., Wright County, Hydrologic Unit 07080207, on left bank 10 ft (3 m) downstream from bridge on county highway C38, 0.9 mi (1.4 km) downstream from Drainage ditch 123, 3.8 mi (6.1 km) northwest of Rowan, 10.7 mi (17.2 km) downstream from confluence of East and West Branches, and at mile 316.4 (509.1 km).

DRAINAGE AREA.--429 mi² (1,111 km²).

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

REVISED RECORDS.--WSP 1308: 1942-43 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,143.35 ft (348.49 m) NGVD. Prior to Oct. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period and periods of no gage height record, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--37 years, 187 ft³/s (5.296 m³/s), 5.92 in/yr (150 mm/yr), 135,500 acre-ft/yr (167 hm³/yr); median of yearly mean discharges, 180 ft³/s (5.10 m³/s), 5.7 in/yr (145 mm/yr), 130,000 acre-ft/yr (160 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,460 ft³/s (240 m³/s) June 21, 1954, gage height, 14.88 ft (4.535 m); minimum daily, 2.9 ft³/s (0.082 m³/s) Jan. 21-23,1959.

EXTREMES FOR CURRENT PERIOD.--June to September 1977: Maximum discharge during period, 119 ft³/s (3.37 m³/s) Aug. 17, gage height, 4.17 ft (1.271 m); minimum, 8.9 ft³/s (0.25 m³/s) Aug. 4.

Water year 1978: Maximum discharge, 1,930 ft³/s (54.7 m³/s) June 18, gage height, 10.10 ft (3.078 m), no other peak above base of 1,200 ft³/s (34.0 m³/s); minimum discharge, 7.2 ft³/s (0.20 m³/s) Feb. 22,23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1									---	19	2.6	3.7
2									---	9.4	3.4	2.8
3									---	5.7	2.4	2.5
4									---	4.2	3.4	2.8
5									---	3.9	4.1	3.0
6									---	4.6	2.4	2.8
7									---	5.8	2.6	4.6
8									---	5.2	9.5	3.2
9									---	4.2	6.6	2.9
10									---	3.7	5.0	3.0
11									---	5.5	3.3	2.2
12									---	4.9	2.9	2.9
13									---	4.0	3.2	3.8
14									---	4.1	2.9	2.4
15									---	5.9	5.2	3.9
16									---	4.2	23	2.7
17									---	4.1	13	2.9
18									---	4.2	6.7	6.5
19									---	5.1	6.0	6.1
20									---	3.4	5.1	4.3
21									---	9.9	4.5	3.7
22									---	9.6	3.7	3.4
23									---	5.3	4.2	4.5
24									3.1	4.2	4.7	8.2
25									2.6	3.7	3.9	5.4
26									2.3	3.9	3.8	4.4
27									2.6	3.0	4.1	3.8
28									5.8	5.5	4.0	3.4
29									4.0	4.9	3.6	5.9
30									30	3.8	4.7	7.7
31									---	2.9	4.8	---
TOTAL									---	167.8	159.3	119.4
MEAN									---	5.41	5.14	3.98
MAX									---	19	23	8.2
MIN									---	2.9	2.4	2.2
CFSM									---	.04	.04	.03
IN.									---	.05	.04	.03
AC-FT									---	333	316	237

05449500 IOWA RIVER NEAR ROWAN, IA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	30	37	19	9.4	7.8	187	97	73	151	81	36
2	21	33	35	19	9.4	7.9	185	88	65	133	74	36
3	20	33	35	18	9.2	8.0	136	84	57	114	68	33
4	18	31	34	17	9.2	8.1	120	80	54	94	62	31
5	16	30	37	16	9.0	8.2	115	77	49	93	58	27
6	15	31	36	16	8.8	8.3	110	73	44	483	55	27
7	18	31	35	15	8.8	8.5	123	72	41	950	52	27
8	23	31	35	15	8.8	8.7	121	74	38	1010	50	26
9	26	32	36	14	8.6	9.1	103	82	36	807	48	24
10	34	27	37	14	8.6	10	99	81	34	549	45	24
11	35	29	38	13	8.4	14	98	71	31	353	43	22
12	34	27	38	13	8.4	18	89	69	30	261	40	21
13	36	22	39	12	8.2	24	85	75	33	225	38	187
14	32	23	38	12	8.1	36	78	84	30	194	38	606
15	29	25	38	11	7.8	50	69	86	135	164	42	843
16	27	24	37	11	7.8	80	70	82	570	151	49	958
17	24	24	37	11	7.6	160	76	78	976	128	44	816
18	22	23	35	11	7.6	250	137	74	1710	103	40	589
19	23	23	33	11	7.4	350	213	69	1740	96	38	385
20	22	22	28	11	7.4	465	223	64	1400	87	36	281
21	21	32	30	11	7.4	520	204	64	1090	117	36	274
22	20	29	32	10	7.2	500	186	58	747	202	40	316
23	22	31	30	10	7.2	390	175	54	510	278	40	279
24	31	29	27	10	7.3	270	170	53	376	305	37	226
25	31	33	24	9.8	7.4	230	151	52	312	257	36	191
26	30	32	24	9.4	7.5	212	133	52	302	206	37	161
27	29	35	23	8.2	7.5	191	123	54	249	166	50	142
28	29	35	23	8.0	7.7	185	116	53	204	135	53	130
29	28	35	22	8.6	---	183	112	54	178	114	45	118
30	27	36	22	9.0	---	166	104	66	169	101	39	113
31	30	---	21	9.2	---	161	---	79	---	89	36	---
TOTAL	796	878	996	382.2	227.7	4539.6	3911	2199	11283	8116	1450	6949
MEAN	25.7	29.3	32.1	12.3	8.13	146	130	70.9	376	262	46.8	232
MAX	36	36	39	19	9.4	520	223	97	1740	1010	81	958
MIN	15	22	21	8.0	7.2	7.8	69	52	30	87	36	21
CFSM	.06	.07	.08	.03	.02	.34	.30	.17	.88	.61	.11	.54
IN.	.07	.08	.09	.03	.02	.39	.34	.19	.98	.70	.13	.60
AC-FT	1580	1740	1980	758	452	9000	7760	4360	22380	16100	2880	13780

WTR YR 1978 TOTAL 41727.5 MEAN 114 MAX 1740 MIN 7.2 CFSM .27 IN 3.62 AC-FT 82770

05451500 IOWA RIVER AT MARSHALLTOWN, IA

LOCATION.--Lat 42°03'57", long 92°54'27", in SE1/4 SE1/4 sec.23, T.84N., R.18 W., Marshall County, Hydrologic Unit 07080208, on right bank 10 ft (3 m) downstream from State Highway 14 bridge, 1,500 ft (457 m) upstream from Burnett Creek, 2.2 mi (3.5 km) upstream from Linn Creek, and at mile 222.8 (358.5 km).

DRAINAGE AREA.--1,564 mi² (4,050 km²), including that of Burnett Creek.

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 (260.025 m) NGVD. See WSP 1728 for history of changes prior to Sept. 21, 1934.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--60 years (1902-3, 1914-27, 1932-78), 765 ft³/s (21.66 m³/s), 6.64 in/yr (169 mm/yr), 554,200 acre-ft/yr (683 hm³/yr); median of yearly mean discharges, 690 ft³/s (19.5 m³/s), 6.0 in/yr (152 mm/yr), 500,000 acre-ft/yr (616 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft³/s (1,190 m³/s) June 4, 1918, gage height, 17.74 ft (5.407 m), from floodmark, from rating curve extended above 19,000 ft³/s (538 m³/s) on basis of velocity-area study; maximum gage height, 19.38 ft (5.907 m) June 23, 1974; minimum daily discharge, 4.7 ft³/s (0.13 m³/s) Jan. 25, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s (142 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 18	1700	5,840	165	15.30	4.66	Sept. 21	0830	*6,320	179	*16.05	4.89

Minimum daily discharge, 94 ft³/s (2.66 m³/s) Feb. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1410	926	300	250	105	113	897	955	614	819	385	375
2	760	836	290	245	110	120	919	893	601	705	357	331
3	622	775	275	240	105	120	831	889	578	626	351	290
4	545	715	260	240	110	120	676	826	560	574	320	260
5	502	651	190	225	110	130	731	772	533	546	269	234
6	449	629	150	220	105	130	1050	709	515	536	255	221
7	474	609	130	215	100	130	994	761	512	581	241	210
8	1110	588	122	210	100	135	867	861	493	604	228	199
9	1050	575	140	210	98	140	962	918	458	969	219	199
10	862	542	160	205	95	155	1440	864	434	1060	208	193
11	751	487	160	200	96	170	1380	830	415	1130	197	171
12	662	458	150	200	100	190	1190	817	399	1140	192	164
13	604	441	160	200	104	200	825	1110	372	976	185	1240
14	570	442	205	200	100	380	774	1330	355	711	175	3780
15	531	442	240	195	94	520	708	1170	410	603	165	2920
16	489	424	265	190	95	690	639	1080	566	546	164	2080
17	468	403	440	180	96	900	763	998	809	496	184	2090
18	447	385	700	155	97	1070	5010	927	1150	657	166	1840
19	413	380	700	150	98	1800	4650	865	1700	924	171	1820
20	384	397	520	150	100	2400	3550	890	2980	665	167	4270
21	379	360	410	140	100	2700	2800	948	3820	573	173	5830
22	397	322	375	140	105	2450	2350	895	3530	813	253	3730
23	767	361	450	140	110	1930	2050	827	3040	681	244	2560
24	1390	340	430	135	110	1640	1820	783	2490	725	207	2070
25	1290	195	350	130	110	1430	1580	734	2040	777	190	1670
26	1050	196	320	125	113	1190	1350	699	1650	742	181	1450
27	884	390	300	120	116	925	1330	665	1210	678	3040	1310
28	768	400	295	120	120	893	1300	664	982	580	1420	1180
29	691	340	290	115	---	855	1210	654	1320	515	742	1090
30	644	315	275	110	---	832	1070	575	1010	459	543	1040
31	879	---	260	110	---	813	---	570	---	421	441	---
TOTAL	22242	14324	9312	5465	2902	25271	45716	26479	35546	21832	12033	44817
MEAN	717	477	300	176	104	815	1524	854	1185	704	388	1494
MAX	1410	926	700	250	120	2700	5010	1330	3820	1140	3040	5830
MIN	379	195	122	110	94	113	639	570	355	421	164	164
CFSM	.46	.31	.19	.11	.07	.52	.97	.55	.76	.45	.25	.96
IN.	.53	.34	.22	.13	.07	.60	1.09	.63	.85	.52	.29	1.07
AC-FT	44120	28410	18470	10840	5760	50130	90680	52520	70510	43300	23870	88890

CAL YR 1977 TOTAL 105463.5 MEAN 289 MAX 4640 MIN 4.7 CFSM .19 IN 2.51 AC-FT 209200
WTR YR 1978 TOTAL 265939.0 MEAN 729 MAX 5830 MIN 94 CFSM .47 IN 6.33 AC-FT 527500

05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA

LOCATION.--Lat 42°00'25", long 92°51'15", in SE1/4 SW1/4 sec.8, T.83 N., R.17 W., Marshall County, Hydrologic Unit 07080208, on left bank 20 ft (6 m) downstream from bridge on U.S. Highway 30, 3.5 mi (5.6 km) upstream from mouth, and 4.1 mi (6.6 km) southeast of court house in Marshalltown.

DRAINAGE AREA.--118 mi² (306 km²).

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 (258.909 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Six discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--29 years, 67.1 ft³/s (1.900 m³/s), 7.72 in/yr (196 mm/yr), 48,610 acre-ft/yr (59.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s (340 m³/s) Aug. 16, 1977, gage height, 17.69 ft (5.392 m), no flow for a few days in 1956 and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 16.8 ft (5.12 m), discharge, 5,700 ft³/s (161 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 21	---	*2,000	56.6	a *13.30	4.054
Apr. 18	0915	1,680	47.6	12.02	3.664

Minimum daily discharge, 16 ft³/s (.453 m³/s), Sept. 11,12.
a Ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	241	208	64	38	39	26	104	115	81	100	57	21
2	116	181	53	45	41	28	89	108	75	89	53	21
3	93	160	48	52	39	29	83	103	72	75	49	20
4	86	142	55	56	37	28	77	100	71	69	47	20
5	76	133	52	58	36	28	83	95	66	65	45	19
6	69	129	54	53	37	29	187	90	65	67	44	18
7	109	122	48	40	38	28	127	132	65	66	42	18
8	228	116	56	33	39	26	134	146	61	57	40	17
9	130	113	53	38	37	25	161	118	58	487	39	17
10	113	103	51	38	37	25	249	103	56	136	36	17
11	108	94	50	40	36	25	190	98	54	93	36	16
12	95	92	70	41	34	29	159	99	51	85	36	16
13	83	92	78	42	36	31	135	356	48	78	34	43
14	76	91	80	43	36	33	121	240	50	64	31	104
15	70	90	80	42	35	37	112	195	68	61	30	38
16	65	82	84	41	33	62	103	176	61	55	29	31
17	66	78	170	41	33	86	162	161	54	52	28	286
18	63	73	134	37	33	110	992	148	51	295	28	169
19	55	72	110	37	32	570	425	138	47	584	26	92
20	52	75	110	36	35	1060	309	134	127	199	25	382
21	50	66	104	35	32	1500	265	124	78	178	25	358
22	78	64	92	35	32	614	233	118	65	153	30	176
23	245	66	75	35	34	358	225	117	61	128	24	126
24	325	65	61	36	33	222	198	113	60	108	22	109
25	252	66	51	36	32	166	182	106	56	96	22	95
26	198	73	54	31	30	149	169	99	274	86	28	86
27	171	71	50	33	29	158	157	95	103	76	61	81
28	150	60	52	34	29	153	146	96	132	71	34	74
29	134	61	54	36	---	131	138	95	523	68	26	71
30	123	62	50	37	---	119	127	87	142	65	23	70
31	304	---	44	38	---	117	---	82	---	61	22	---
TOTAL	4024	2900	2187	1237	974	6002	5842	3987	2775	3867	1072	2611
MEAN	130	96.7	70.5	39.9	34.8	194	195	129	92.5	125	34.6	87.0
MAX	325	208	170	58	41	1500	992	356	523	584	61	382
MIN	50	60	44	31	29	25	77	82	47	52	22	16
CFSM	1.10	.82	.60	.34	.30	1.64	1.65	1.09	.78	1.06	.29	.74
IN.	1.27	.91	.69	.39	.31	1.89	1.84	1.26	.87	1.22	.34	.82
AC-FT	7980	5750	4340	2450	1930	11900	11590	7910	5500	7670	2130	5180

CAL YR 1977	TOTAL	24603.90	MEAN	67.4	MAX	6570	MIN	.00	CFSM .57	IN 7.76	AC-FT	48800
WTR YR 1978	TOTAL	37478.00	MEAN	103	MAX	1500	MIN	16	CFSM .87	IN 11.81	AC-FT	74340

05451900 RICHLAND CREEK NEAR HAVEN, IA

LOCATION.--Lat 41°53'58", long 92°28'27", in SE1/4 NE1/4 sec.21, T.82 N., R.14 W., Tama County, Hydrologic Unit 07080208, on right bank 5 ft (1 m) upstream from bridge on county highway, 0.6 mi (1.0 km) northeast of Haven, and 2.8 mi (4.5 km) upstream from mouth.

DRAINAGE AREA.--56.1 mi² (145 km²).

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 (240.393 m) NGVD. Prior to Oct. 1, 1971, at datum 10 ft (3.05 m) higher.

REMARKS.--Records good except those for winter period, which are fair. Several observations of water temperature were made during the year.

COOPERATION.--Five discharge measurement furnished by Corps of Engineers.

AVERAGE DISCHARGE.--29 years, 33.5 ft³/s (0.949 m³/s), 8.11 in/yr (206 mm/yr), 24,270 acre-ft/yr (29.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,000 ft³/s (198 m³/s) May 28, 1974, gage height, 24.00 ft (7.315 m); no flow Jan. 22 to Feb. 2, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1918 reached a stage of 24.3 ft (7.41 m), discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*):

		Discharge		Gage Height				Discharge		Gage Height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
Mar. 21	2300	1,440	40.8	17.98	5.480	July 9	0145	*1,950	55.2	*19.10	5.822
Apr. 18	0645	1,590	45.0	18.28	5.572	July 19	1000	1,590	45.0	18.34	5.590

Minimum daily discharge, 4.2 ft³/s (0.12 m³/s) Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	80	24	15	14	7.6	40	52	37	39	31	8.2
2	48	71	17	15	14	8.4	35	49	35	36	29	8.0
3	38	65	14	21	13	8.6	33	48	34	32	27	7.6
4	34	57	13	24	13	8.6	31	46	33	30	25	7.4
5	30	54	10	20	13	8.3	40	43	30	30	24	6.3
6	26	52	17	19	12	8.2	84	41	29	30	23	5.8
7	60	49	19	18	12	8.2	53	61	29	28	23	5.7
8	107	46	21	15	11	7.8	65	58	28	25	22	5.1
9	54	48	18	12	11	7.2	105	48	26	952	20	4.7
10	48	41	16	16	11	6.5	183	44	25	82	19	4.5
11	44	38	20	17	10	7.6	103	43	24	56	20	4.2
12	38	36	25	19	9.6	10	77	42	22	60	19	4.4
13	35	36	25	17	11	12	63	212	22	50	18	15
14	34	36	25	15	12	13	57	113	23	42	17	30
15	30	35	25	16	10	15	52	90	38	40	16	17
16	28	32	27	14	9.2	26	48	81	30	36	16	14
17	28	30	60	14	9.2	35	102	74	26	35	16	170
18	26	29	33	14	9.4	41	744	69	25	107	15	126
19	22	26	22	14	10	143	217	66	23	863	17	55
20	23	25	18	14	10	422	146	62	40	192	15	418
21	22	21	26	13	9.3	758	122	58	29	184	15	158
22	39	22	35	13	10	438	104	57	26	97	16	94
23	112	21	25	14	10	162	114	55	25	75	14	73
24	208	19	21	15	9.4	85	100	53	25	64	12	62
25	124	18	16	13	8.4	57	87	51	24	58	11	54
26	90	24	19	11	8.7	63	77	45	276	52	14	50
27	72	27	18	13	8.4	73	70	45	48	45	25	45
28	63	24	18	14	8.0	68	66	46	115	40	14	39
29	57	24	18	15	---	54	62	43	173	37	11	40
30	52	24	17	16	---	49	57	40	52	35	11	41
31	105	---	16	15	---	49	---	38	---	34	9.5	---
TOTAL	1854	1110	678	481	296.6	2660.0	3137	1873	1372	3486	564.5	1572.9
MEAN	59.8	37.0	21.9	15.5	10.6	85.8	105	60.4	45.7	112	18.2	52.4
MAX	208	80	60	24	14	758	744	212	276	952	31	418
MIN	22	18	10	11	8.0	6.5	31	38	22	25	9.5	4.2
CFSM	1.07	.66	.39	.28	.19	1.53	1.87	1.08	.82	2.00	.32	.93
IN.	1.23	.74	.45	.32	.20	1.76	2.08	1.24	.91	2.31	.37	1.04
AC-FT	3680	2200	1340	954	588	5280	6220	3720	2720	6910	1120	3120

CAL YR 1977 TOTAL 10962.04 MEAN 30.0 MAX 2880 MIN .00 CFSM .54 IN 7.27 AC-FT 21740
WTR YR 1978 TOTAL 19085.00 MEAN 52.3 MAX 952 MIN 4.2 CFSM .93 IN 12.66 AC-FT 37860

05452000 SALT CREEK NEAR ELBERON, IA

LOCATION.--Lat 41°57'51", long 92°18'47", in NW1/4 NW1/4 sec.35, T.83 N., R.13 W., Tama County, Hydrologic Unit 07080208, near center of span on downstream side of bridge on U.S. Highway 30, 2.0 mi (3.2 km) upstream from Hog Run, 3.0 mi (4.8 km) south of Elberon, and 9.0 mi (14.5 km) upstream from mouth.

DRAINAGE AREA.--201 mi² (521 km²).

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 (238.226 m) NGVD (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 winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Six discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--33 years, 123 ft³/s (3.483 m³/s), 8.31 in/yr (211 mm/yr), 89,110 acre-ft/yr (110 hm³/yr); median of yearly mean discharges, 110 ft³/s (3.12 m³/s), 7.4 in/yr (188 mm/yr), 79,700 acre-ft/yr (98.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 35,000 ft³/s (991 m³/s) June 13, 1947, gage height, 17.6 ft (5.36 m) from rating curve extended above 17,000 ft³/s (481 m³/s); maximum gage height, 17.78 ft (5.419 m) July 18, 1969; minimum daily discharge, 0.85 ft³/s (.024 m³/s) Jan. 31, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1944, reached a stage of 19.9 ft (6.07 m), from floodmark at downstream side of bridge, discharge, about 30,000 ft³/s (850 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	0030	2,200	62.3	13.86	4.225	Apr. 18	2045	2,890	81.8	*14.80	4.511
Mar. 20	0800	*3,060	86.7	14.67	4.471	June 29	0915	1,860	52.7	13.47	4.106

Minimum daily discharge, 22 ft³/s (0.623 m³/s) Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	656	262	72	72	42	31	152	171	129	172	50	40
2	230	250	60	65	43	31	123	159	120	151	48	37
3	163	238	52	72	44	31	116	156	116	128	43	40
4	141	210	45	82	44	28	108	148	113	116	40	42
5	132	194	36	89	43	30	132	140	106	111	38	44
6	126	186	31	85	42	30	616	135	102	107	37	47
7	142	177	33	81	41	29	338	215	101	106	35	50
8	364	169	42	67	42	28	261	205	94	97	34	52
9	227	161	37	57	42	31	251	185	87	155	32	55
10	170	153	31	55	42	32	571	160	83	122	30	58
11	150	145	39	56	42	33	384	156	79	101	30	60
12	124	137	43	61	43	40	281	152	74	90	30	62
13	109	129	47	66	43	57	212	800	65	95	28	75
14	102	121	72	66	44	68	181	660	68	85	26	276
15	93	114	88	61	40	99	163	390	657	76	25	232
16	83	106	100	59	36	183	148	320	293	70	25	213
17	74	101	390	55	35	304	203	280	202	64	57	207
18	66	88	510	52	36	266	2550	260	166	64	28	211
19	60	86	212	55	37	924	1470	240	144	278	30	215
20	57	90	160	55	39	2880	583	230	572	181	23	472
21	54	74	220	50	38	2640	452	210	271	147	23	446
22	79	73	228	49	37	1670	369	202	202	121	41	215
23	675	77	190	50	40	565	364	202	180	104	28	153
24	1440	67	134	51	40	316	316	192	164	94	23	124
25	593	60	104	46	38	210	277	181	153	83	22	102
26	386	94	114	36	34	198	251	166	234	73	26	90
27	302	82	105	32	34	245	231	155	145	63	602	82
28	249	72	96	33	33	243	213	162	145	57	158	71
29	215	66	95	35	---	195	204	154	993	56	79	69
30	194	69	87	36	---	173	189	141	243	55	57	70
31	279	---	83	39	---	178	---	131	---	53	46	---
TOTAL	7735	3851	3556	1768	1114	11788	11709	7058	6101	3275	1794	3910
MEAN	250	128	115	57.0	39.8	380	390	228	203	106	57.9	130
MAX	1440	262	510	89	44	2880	2550	800	993	278	602	472
MIN	54	60	31	32	33	28	108	131	65	53	22	37
CFSM	1.24	.64	.57	.28	.20	1.89	1.94	1.13	1.01	.53	.29	.65
IN.	1.43	.71	.66	.33	.21	2.18	2.17	1.31	1.13	.61	.33	.72
AC-FT	15340	7640	7050	3510	2210	23380	23220	14000	12100	6500	3560	7760

CAL YR 1977	TOTAL	28311.34	MEAN	77.6	MAX	2220	MIN	.85	CFSM .39	IN 5.24	AC-FT	56160
WTR YR 1978	TOTAL	63659.00	MEAN	174	MAX	2880	MIN	22	CFSM .87	IN 11.78	AC-FT	126300

05452200 WALNUT CREEK NEAR HARTWICK, IA

LOCATION.--Lat 41°50'06", long 92°23'10", in SE1/4 SW1/4 sec.8, T.81 N., R.13 W., Poweshiek County, Hydrologic Unit 07080208, on left bank 5 ft (2 m) upstream from bridge on county highway V21, 1.2 mi (1.9 km) downstream from North Walnut Creek, 4.0 mi (6.4 km) northwest of Hartwick, and 6.5 mi (10.5 km) upstream from mouth.

DRAINAGE AREA.--70.9 mi² (184 km²).

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 (239.753 m) NGVD.

REMARKS.--Records fair except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Eight discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--29 years, 41.7 ft³/s (1.181 m³/s), 7.99 in/yr (203 mm/yr), 30,210 acre-ft/yr (37.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,800 ft³/s (193 m³/s) Aug. 16, 1977, gage height, 16.30 ft (4.968 m), from rating curve extended above 2,600 ft³/s (73.6 m³/s) on basis of contracted-opening and flow-over-embankment measurement of peak flow; no flow at times for most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 17.7 ft (5.39 m), from information by local residents, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 21	2215	1,130	32.0	11.62	3.542
June 26	0730	2,340	66.3	14.03	4.276
July 9	0400	3,460	98.0	14.80	4.511
July 19	0600	*6,060	172	*15.82	4.822
July 20	1515	1,120	31.7	11.36	3.463
Sept. 17	0245	1,240	35.1	11.60	3.536
Sept. 20	0030	1,410	39.9	12.07	3.679

Minimum daily discharge, 9.1 ft³/s (0.258 m³/s) Mar. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91	79	19	20	12	11	44	59	39	47	39	18
2	25	73	14	21	11	11	41	55	35	40	37	17
3	18	63	13	23	11	12	39	54	32	47	33	17
4	16	56	14	23	11	11	38	51	31	46	31	15
5	15	53	15	22	11	12	36	49	30	46	29	15
6	12	49	16	22	11	12	75	46	29	48	27	14
7	45	46	20	21	11	9.4	59	74	27	46	26	13
8	78	45	23	18	11	9.2	72	73	28	38	25	13
9	41	41	22	16	12	9.6	86	61	26	1360	23	11
10	37	38	23	16	12	9.1	167	54	26	92	22	11
11	31	36	24	17	12	11	362	53	24	58	21	12
12	27	34	26	18	11	13	106	52	23	46	20	12
13	27	33	28	19	13	15	75	279	22	40	19	63
14	31	33	31	17	15	17	70	158	23	36	18	53
15	27	31	32	16	13	19	68	121	74	35	18	26
16	23	29	50	15	12	35	59	104	36	32	18	25
17	25	27	88	14	12	45	281	92	32	29	18	379
18	25	23	39	14	13	50	564	83	36	44	17	243
19	20	23	27	13	14	250	294	76	28	1580	24	160
20	19	24	21	13	15	420	191	71	76	439	17	807
21	22	20	17	12	16	600	154	65	36	268	16	231
22	36	21	36	12	13	792	139	62	33	177	14	141
23	128	21	19	13	15	220	131	61	29	126	13	100
24	219	18	16	12	14	95	120	58	28	99	12	92
25	125	19	19	12	13	81	102	55	28	82	13	80
26	97	27	21	12	11	56	87	51	623	69	15	58
27	83	25	18	11	12	79	79	50	87	57	83	56
28	65	23	19	11	11	82	76	54	179	50	26	54
29	55	22	19	11	---	66	73	48	184	47	21	48
30	49	21	18	11	---	59	66	44	59	44	19	42
31	119	---	17	11	---	51	---	41	---	42	18	---
TOTAL	1631	1053	764	486	348	3162.3	3754	2254	1963	5213	732	2826
MEAN	52.6	35.1	24.6	15.7	12.4	102	125	72.7	65.4	168	23.6	94.2
MAX	219	79	88	23	16	792	564	279	623	1580	83	807
MIN	12	18	13	11	11	9.1	36	41	22	29	12	11
CFSM	.74	.50	.35	.22	.18	1.44	1.76	1.03	.92	2.37	.33	1.33
IN.	.86	.55	.40	.25	.18	1.66	1.97	1.18	1.03	2.74	.38	1.48
AC-FT	3240	2090	1520	964	690	6270	7450	4470	3890	10340	1450	5610

CAL YR 1977 TOTAL 8993.22 MEAN 24.6 MAX 1940 MIN .00 CFSM .35 IN 4.72 AC-FT 17840
WTR YR 1978 TOTAL 24186.30 MEAN 66.3 MAX 1580 MIN 9.1 CFSM .94 IN 12.69 AC-FT 47970

05453000 BIG BEAR CREEK AT LADORA, IA

LOCATION.--Lat 41°44'58", long 92°10'55", in SW1/4 SW1/4 sec.7, T.80 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 10 ft (3 m) downstream from bridge on county highway V52, 0.4 mi (0.6 km) south of Ladora, 1.2 mi (1.9 km) downstream from Coats Creek, 2.8 mi (4.5 km) upstream from Little Bear Creek, and 8.1 mi (13.0 km) upstream from mouth.

DRAINAGE AREA.--189 mi² (490 km²).

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 754.94 ft (230.106 m) NGVD. Prior to June 26, 1946, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Nine discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--33 years, 117 ft³/s (3.313 m³/s), 5.41 in/yr (214 mm/yr), 84,770 acre-ft/yr (105 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,500 ft³/s (297 m³/s) Mar. 30, 1960, gage height, 14.60 ft (4.450 m); maximum gage height, 15.32 ft (4.670 m) Sept. 18, 1977; no flow for several days in 1956 and 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft³/s (56.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	2245	2,620	74.2	10.77	3.283
Apr. 18	0600	2,920	82.7	11.28	3.438
July 19	2145	5,400	153	13.51	4.118
July 21	0915	*6,440	182	*14.72	4.487
Sept. 17	0600	2,060	58.3	9.63	2.935
Sept. 20	1700	3,290	93.2	11.08	3.408

Minimum daily discharge, 22 ft³/s (0.623 m³/s) Sept.12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	231	80	53	36	26	162	187	115	147	137	37
2	116	198	73	52	35	25	137	175	108	131	128	35
3	97	184	65	60	34	25	132	173	103	116	117	33
4	91	166	57	59	33	25	127	172	98	104	107	32
5	88	158	54	58	32	25	123	165	93	100	101	30
6	81	155	48	57	31	25	220	163	87	98	97	29
7	104	148	62	56	30	25	187	223	81	99	91	28
8	267	142	68	48	30	25	186	224	75	90	86	26
9	165	149	63	43	30	25	270	201	76	972	81	25
10	138	132	54	44	29	26	587	182	75	215	77	23
11	133	117	58	46	29	30	395	182	73	134	73	23
12	115	114	67	50	29	38	300	189	74	122	66	22
13	105	114	79	51	29	50	242	831	61	115	63	81
14	99	117	88	52	28	66	216	527	66	98	61	90
15	92	116	96	50	28	98	200	380	100	92	58	55
16	85	108	97	48	28	160	189	321	99	86	55	43
17	83	104	220	47	27	230	204	296	82	82	51	980
18	80	97	225	45	27	210	1710	284	77	82	56	624
19	74	95	130	45	26	660	748	254	72	4080	49	389
20	70	98	97	45	26	960	506	244	83	2850	48	2780
21	67	86	88	44	26	1250	408	226	81	3990	43	895
22	179	84	120	42	26	1130	346	209	68	810	43	496
23	365	90	120	41	26	572	331	205	67	576	41	368
24	712	82	93	42	27	306	315	190	67	393	39	315
25	413	82	76	42	27	211	279	170	65	316	40	275
26	289	82	75	38	27	200	257	161	704	266	51	252
27	237	97	73	34	26	301	243	152	223	226	115	229
28	204	88	68	34	26	260	226	151	202	197	73	208
29	182	75	68	33	---	210	213	144	930	179	49	199
30	168	79	63	34	---	185	201	133	202	166	42	200
31	211	---	60	35	---	180	---	122	---	150	39	---
TOTAL	5259	3589	2685	1428	808	7559	9660	7236	4307	17082	2177	8825
MEAN	170	120	86.6	46.1	28.9	244	322	233	144	551	70.2	294
MAX	712	231	225	60	36	1250	1710	831	930	4080	137	2780
MIN	67	75	48	33	26	25	123	122	61	82	39	22
CFSM	.90	.64	.46	.24	.15	1.29	1.70	1.23	.76	2.92	.37	1.56
IN.	1.04	.71	.53	.28	.16	1.49	1.90	1.42	.85	3.36	.43	1.74
AC-FT	10430	7120	5330	2830	1600	14990	19160	14350	8540	33880	4320	17500

CAL YR 1977	TOTAL	30171.87	MEAN	82.7	MAX	6630	MIN	.00	CFSM	.44	IN	5.94	AC-FT	59850
WTR YR 1978	TOTAL	70615.00	MEAN	193	MAX	4080	MIN	22	CFSM	1.02	IN	13.90	AC-FT	140100

05453100 IOWA RIVER AT MARENGO, IA

LOCATION.--Lat 41°48'41", long 92°03'42", in SW1/4 NE1/4 sec.24, T.81 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on right bank 10 ft (3 m) downstream from abandoned highway bridge, 0.7 mi (1.1 km) downstream from Big Bear Creek, 0.8 mi (1.3 km) north of Marengo, 4.9 mi (7.9 km) upstream from Hilton Creek, and at mile 139.4 (224.3 km).

DRAINAGE AREA.--2,794 mi² (7,236 km²).

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 (219.614 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeters at station.

COOPERATION.--Seventeen discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--22 years, 1,673 ft³/s (47.38 m³/s), 8.13 in/yr (207 mm/yr), 1,212,000 acre-ft/yr (1,490 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,800 ft³/s (872 m³/s) Mar. 31, 1960, gage height, 19.21 ft (5.855 m); maximum gage height, 19.79 ft (6.032 m) July 12, 1969; minimum daily discharge, 24 ft³/s (0.68 m³/s), Jan. 29 to Feb. 1, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,000 ft³/s (170 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	---	12,000	340	ice jam	
Apr. 20	1800	8,550	242	15.23	4.642
June 29	0730	6,350	180	14.41	4.392
July 21	1345	*13,500	382	*17.99	5.483
Sept. 21	0030	7,420	210	15.72	4.791

Minimum daily discharge, 318 ft³/s (9.01 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1770	2250	1180	960	430	390	2150	2360	1420	2760	1320	911
2	2220	2430	1100	930	430	390	1990	2190	1370	2180	1220	791
3	2210	2310	1040	900	420	390	1870	2070	1350	1840	1120	694
4	1700	2140	940	850	420	390	1780	1970	1310	1650	1020	614
5	1500	1980	870	820	420	390	1720	1900	1280	1500	931	550
6	1350	1870	720	800	420	390	2200	1830	1230	1300	864	506
7	1310	1780	720	780	410	390	2490	1930	1200	1240	800	476
8	1810	1720	780	760	410	390	2410	2030	1180	1190	740	438
9	1990	1670	830	740	410	420	2510	2060	1140	3720	681	399
10	2120	1620	820	730	410	460	3900	2010	1110	3530	624	362
11	1950	1530	800	700	410	500	3800	1940	1070	2400	615	334
12	1750	1440	780	680	410	570	3410	1880	1030	1980	604	318
13	1600	1380	780	660	400	650	2890	3920	993	1930	589	680
14	1480	1350	780	640	400	740	2500	4310	971	1810	574	761
15	1380	1330	820	640	400	860	2250	3650	1240	1610	562	2030
16	1290	1300	890	630	400	1100	2050	3150	1420	1400	533	2850
17	1220	1260	1400	620	400	1550	1990	2780	1210	1270	553	3770
18	1170	1220	1900	600	400	2200	6440	2540	1210	1180	582	3300
19	1120	1180	1900	580	400	4300	7620	2350	1280	6660	637	3110
20	1080	1160	1750	560	400	9700	8240	2210	1690	9340	537	6180
21	1040	1140	1500	550	400	11000	7800	2080	2470	12600	466	6430
22	1110	1100	1300	530	400	10500	7470	2020	3240	6290	461	5310
23	1550	1090	1330	520	400	9600	7340	2000	3490	3400	473	4900
24	3630	1060	1300	510	400	8310	5940	1930	3430	2670	507	4780
25	3970	1020	1200	500	400	6430	4430	1840	3140	2260	526	4460
26	3560	1050	1100	490	400	3820	3710	1760	4420	2080	515	3380
27	3000	1100	1040	480	400	3380	3250	1670	3840	1940	830	2750
28	2550	1100	1040	470	400	3080	2940	1630	2940	1790	1310	2390
29	2250	1150	1040	460	---	2710	2720	1620	5410	1660	2170	2190
30	2030	1200	1000	450	---	2430	2540	1550	3580	1540	1450	2080
31	1960	---	980	440	---	2280	---	1480	---	1410	1090	---
TOTAL	58670	43930	33630	19980	11400	89710	112350	68660	60664	88130	24904	67744
MEAN	1893	1464	1085	645	407	2894	3745	2215	2022	2843	803	2258
MAX	3970	2430	1900	960	430	11000	8240	4310	5410	12600	2170	6430
MIN	1040	1020	720	440	400	390	1720	1480	971	1180	461	318
CFSM	.68	.52	.39	.23	.15	1.04	1.34	.79	.72	1.02	.29	.81
IN.	.78	.58	.45	.27	.15	1.19	1.50	.91	.81	1.17	.33	.90
AC-FT	116400	87140	66710	39630	22610	177900	222800	136200	120300	174800	49400	134400

CAL YR 1977 TOTAL 290844 MEAN 797 MAX 11400 MIN 24 CFSM .29 IN 3.87 AC-FT 576900
WTR YR 1978 TOTAL 679772 MEAN 1862 MAX 12600 MIN 318 CFSM .67 IN 9.05 AC-FT 1348000

05453510 CORALVILLE LAKE NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'29", long 91°31'40", in SW1/4 NE1/4 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 (3.7 km) upstream from Rapid Creek, 4.3 mi (6.9 km) northeast of Coralville Post Office and at mile 83.3 (134.0 km).

DRAINAGE AREA.--3,115 mi² (8,067 km²).

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

GAGE.--Water-stage recorder. Datum of gage is at NGVD (levels by 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 (2.539 m) wide and 20 ft (6 m) high, into forechamber of 23-ft (7 m) diameter concrete conduit through dam. Inlet invert elevation at 646.0 ft (197 m). No dead storage. Maximum design discharge through gates is 20,000 ft³/s (566 m³/s). Ungated spillway is concrete overflow section 500 ft (152 m) in length at elevation 712 ft (217 m) NGVD, contents, 469,000 acre-ft (578 hm³). Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 670 ft (204 m) Feb. 15 to June 15, 680 ft (207 m) June 15 to Sept. 25, 683 ft (208 m) Sept. 25 to Dec. 15, and 680 ft (207 m) December 15 to Feb. 1 with a minimum release of 150 ft³/s (4.25 m³/s) and maximum release of 10,000 ft³/s (283 m³/s) Dec. 15 to May 1 and 6,000 ft³/s (170 m³/s) May 1 to Dec. 15.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 472,000 acre-ft (582 hm³) July 21, 1969, elevation, 711.85 ft (216.972 m); minimum daily contents, 456 acre-ft (0.562 hm³) Jan. 15, 1975; minimum elevation, 658.77 ft (200.793 m) Mar. 10, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 119,000 acre-ft (147 hm³) July 24; maximum elevation, 690.84 ft (210.568 m) July 25; minimum daily contents, 20,700 acre-ft (25.5 hm³) May 12; minimum elevation, 670.25 ft (204.292 m) Mar. 16.

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

665	5,000	683	55,000	700	232,000
670	10,600	685	69,000	705	327,000
675	21,000	690	108,000	710	427,000
680	40,300	695	162,000	712	469,000

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84500	68600	67300	49700	49800	24000	33300	33600	47600	69300	82200	46700
2	82500	68500	66800	49300	49800	23500	32400	29400	48100	67700	75500	45700
3	81300	68500	65100	49200	49700	23000	31700	27400	48400	64300	69100	45400
4	79400	68100	63800	49500	49500	22700	31300	26600	48300	59800	63800	45400
5	76600	67300	64000	49600	49200	22500	30800	25700	48100	57100	59000	45500
6	73700	66100	53800	49900	47800	22300	30200	24600	47800	54900	55000	45700
7	72300	54300	63700	50100	45500	22200	29700	23800	47500	52400	52000	45800
8	71700	63700	63700	50200	43200	22000	29300	23600	47200	50600	49900	45800
9	71300	64100	63500	50100	40900	21800	29800	22800	47300	55000	45700	45700
10	71300	64300	63600	49900	38500	21700	31900	22000	47500	59600	45600	45600
11	71100	64000	63900	49800	36200	21900	34500	21300	47700	59100	45500	45500
12	70200	63900	63900	49700	33800	22200	34200	20700	47900	55600	46000	46000
13	69000	63900	63800	49600	33600	22400	32100	25700	48100	52200	46700	46700
14	67600	63900	63800	49500	31600	22200	30100	36700	48500	49900	48000	48000
15	66000	63800	63400	49600	30400	22100	27700	45000	48900	47800	50300	50300
16	64900	63600	61400	49700	30000	21500	26000	46300	48300	45300	55500	55500
17	64500	63200	60300	49700	29600	21600	25700	44800	47900	43700	58700	58700
18	64200	63000	59500	49700	29200	22700	26900	42500	47300	44400	65200	65200
19	63900	63100	58800	49600	28800	24500	31600	39400	47200	51700	67500	67500
20	63600	63500	57200	49500	28400	26000	35500	35600	47300	55300	69800	69800
21	63800	63700	54700	49400	28000	26900	38600	32100	47700	64100	74700	74700
22	64100	64000	52000	49100	27600	28700	41700	32000	47600	84600	79000	79000
23	65900	64100	50600	49300	27100	34300	45100	36500	47600	107000	81800	81800
24	70800	64200	50300	49400	26600	47500	47900	40800	48300	119000	84000	84000
25	75200	64300	49900	49600	26100	49800	50100	43300	48300	118000	48200	85300
26	76900	64400	49400	49900	25600	48400	49300	45000	50900	113000	48200	86600
27	76900	64800	49300	49900	25100	44800	46400	47200	51500	109000	48500	84800
28	76800	65500	49700	50100	24500	40000	42900	47700	51200	104000	48900	81000
29	73300	66100	49700	50000	---	38300	39100	47200	57700	99100	49000	76600
30	70600	66600	49700	49900	---	36900	37000	46900	66800	94300	49200	71300
31	69100	---	49700	49800	---	34900	---	47200	---	88300	48200	---
MAX	84500	68600	67300	50200	49800	49800	50100	47700	66800	119000	84000	86600
MIN	63600	63000	49300	49100	24500	21500	25700	20700	47200	43700	45500	45400

WTR YR 1978 MAX 119000 MIN 20700

05454000 RAPID CREEK NEAR IOWA CITY, IA

LOCATION.--Lat 41°41'19", long 91°29'15", in NE1/4 NE1/4 sec.36, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 80 ft (24 m) upstream from bridge on State Highway 1, 3.5 mi (5.6 km) northeast of Iowa City, and 4.7 mi (7.6 km) upstream from mouth.

DRAINAGE AREA.--25.3 mi² (65.5 km²).

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 IOWA 1967: Drainage area.

GAGE.--Water-stage recorder and concrete control with sharp-created weir. Datum of gage is 673.72 ft (205.350 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--41 years, 16.3 ft³/s (0.433 m³/s), 8.21 in/yr (209 mm/yr), 11,080 acre-ft/yr (13.7 hm³/yr). median of yearly discharges, 14 ft³/s (0.396 m³/s), 7.5 in/yr (190 mm/yr), 10,000 acre-ft/yr (12.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,100 ft³/s (173 m³/s) May 23, 1965, gage height, 14.10 ft (4.298 m), from contracted-opening measurement of peak flow; maximum gage height, 14.93 ft (4.551 m) July 17, 1972; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft³/s (17.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
July 21	2145	*679	19.2	*8.70	2.652	Sept. 18	0240	636	18.0	8.48	2.585

Minimum daily discharge, 0.28 ft³/s (0.008 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	19	8.6	4.7	11	2.8	23	15	18	16	7.7	1.1
2	31	37	7.3	4.8	10	2.9	18	14	16	16	7.2	1.0
3	25	31	6.6	5.2	6.8	3.1	17	14	14	9.7	6.4	.93
4	22	27	6.1	5.1	5.0	2.7	15	13	13	8.6	5.7	.84
5	20	25	6.8	5.0	4.3	2.6	14	14	12	7.6	5.5	.76
6	17	23	6.1	4.8	3.6	2.8	20	12	11	6.6	5.1	.67
7	51	22	6.7	5.1	3.6	2.6	16	22	10	16	4.7	.62
8	71	21	5.3	4.3	3.9	2.7	18	29	9.5	7.8	4.5	.53
9	42	19	6.1	3.9	4.0	3.4	37	23	8.9	42	4.2	.46
10	35	17	4.8	3.8	4.1	4.4	122	19	8.1	12	3.8	.44
11	34	16	8.1	5.4	4.4	8.8	68	18	7.8	8.6	3.8	.36
12	28	14	12	7.3	4.1	28	46	25	6.9	8.2	3.8	.28
13	25	14	13	8.4	4.2	37	35	145	6.4	7.7	3.3	.80
14	23	14	15	8.0	3.8	43	29	69	6.6	6.3	2.9	1.1
15	20	13	13	4.5	3.4	62	26	50	14	5.8	2.9	.62
16	18	12	17	3.5	3.1	79	23	42	9.2	5.2	3.2	13
17	18	11	53	3.4	3.0	70	23	35	8.1	5.0	2.9	34
18	16	10	43	3.7	2.8	110	92	30	7.1	5.4	3.3	125
19	14	10	29	3.6	2.9	156	70	27	6.4	53	2.8	13
20	13	11	21	4.2	3.1	71	48	25	10	25	1.9	23
21	13	8.6	18	4.0	2.8	58	40	22	6.9	130	1.7	15
22	13	8.3	19	4.5	2.9	46	33	21	6.4	94	1.8	9.4
23	28	9.4	15	5.2	3.1	33	34	20	6.2	34	1.6	7.3
24	39	8.6	11	5.9	3.1	23	31	18	6.0	24	1.6	6.1
25	33	8.0	10	9.0	3.1	17	27	16	5.8	19	1.6	5.0
26	28	7.6	8.0	3.9	2.8	19	24	15	18	16	2.0	4.3
27	25	7.4	5.3	3.8	2.9	28	22	13	8.1	13	7.3	3.8
28	22	7.3	7.3	6.6	3.1	58	20	30	10	11	3.3	3.3
29	20	7.1	6.8	9.4	---	45	19	59	46	10	2.3	3.2
30	19	7.8	5.4	12	---	33	17	25	17	9.3	1.7	3.3
31	21	---	5.2	11	---	29	---	20	---	8.5	1.5	---
TOTAL	849	445.1	397.5	174.0	114.8	1083.8	1027	900	333.4	641.3	112.0	279.21
MEAN	27.4	14.8	12.8	5.61	4.10	35.0	34.2	29.0	11.1	20.7	3.61	9.31
MAX	71	37	53	12	11	156	122	145	46	130	7.7	125
MIN	13	7.1	4.8	3.4	2.8	2.6	14	12	5.8	5.0	1.5	.28
CFSM	1.08	.59	.51	.22	.16	1.38	1.35	1.15	.44	.82	.14	.37
IN.	1.25	.65	.68	.26	.17	1.59	1.51	1.32	.49	.94	.16	.41
AC-FT	1680	883	788	345	228	2150	2040	1790	661	1270	222	554

CAL YR 1977 TOTAL 5537.09 MEAN 15.2 MAX 1260 MIN .00 CFSM .60 IN 8.14 AC-FT 10980
WTR YR 1978 TOTAL 6357.11 MEAN 17.4 MAX 156 MIN .28 CFSM .69 IN 9.35 AC-FT 12610

05454300 CLEAR CREEK NEAR CORALVILLE, IA

LOCATION.--Lat 41°40'36", long 91°35'55", in NE1/4 SE1/4 sec.1, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank about 50 ft (15 m) upstream from bridge on county highway, 1.1 mi (1.8 km) west of post office in Coralville, 1.5 mi (2.4 km) downstream from Deer Creek and 2.7 mi (4.3 km) upstream from mouth.

DRAINAGE AREA.--98.1 mi² (254.1 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 647.48 ft (197.352 m) NGVD (levels by Corps of Engineers). Prior to Jan. 7, 1957, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage-height telemeter at station.

COOPERATION.--Seven discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--26 years, 63.6 ft³/s (1.801 m³/s), 8.80 in/yr (224 mm/yr), 46,080 acre-ft/yr (56.8 hm³/yr); median of yearly mean discharges, 48 ft³/s (1.36 m³/s), 6.6 in/yr (168 mm/yr), 34,800 acre-ft/yr (42.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,630 ft³/s (188 m³/s) May 17, 1974, gage height, 13.93 ft (4.246 m); no flow Jan. 18 to Feb. 4, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
June 29	2130	*3,360	95.2	*12.94	3.944	July 19	1015	1,230	34.8	9.77	2.978
July 9	0730	1,400	39.6	10.28	3.133	July 22	1000	1,990	56.4	11.65	3.551

Minimum daily discharge, 7.8 ft³/s (0.22 m³/s) Feb. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	164	91	38	30	21	9.3	86	70	47	208	56	24
2	92	243	38	25	22	12	72	62	43	170	52	23
3	74	174	38	24	23	15	67	59	42	136	48	22
4	62	133	38	29	25	11	61	57	40	112	44	21
5	53	111	38	27	26	13	58	59	37	97	41	20
6	46	99	37	26	24	14	105	55	35	84	39	19
7	79	91	37	25	22	15	86	107	34	112	37	18
8	283	87	37	23	21	13	87	143	32	48	34	17
9	133	84	37	19	22	13	113	104	30	965	32	17
10	96	80	37	16	21	19	693	85	28	436	29	17
11	82	78	38	17	21	35	309	77	26	158	28	16
12	72	76	39	20	19	63	203	82	25	121	27	16
13	66	75	40	24	17	94	152	596	23	104	26	16
14	64	74	46	23	16	127	123	455	27	80	24	22
15	61	70	55	23	15	190	109	239	119	67	23	20
16	58	65	89	23	13	290	96	194	76	57	23	35
17	55	61	99	21	12	350	90	171	49	49	22	325
18	52	57	174	21	11	294	403	146	40	46	31	267
19	49	55	122	21	10	486	316	128	35	921	26	139
20	46	50	110	22	9.8	471	219	116	80	640	23	371
21	43	44	96	22	8.3	347	182	103	47	678	20	316
22	41	45	86	21	8.0	260	160	94	38	1590	19	156
23	87	43	78	21	7.8	170	149	96	36	354	18	122
24	320	41	68	24	8.2	116	148	89	34	224	17	97
25	198	40	62	25	8.4	88	133	81	32	171	17	79
26	139	40	56	26	8.5	94	111	74	84	134	22	66
27	116	40	49	24	8.6	122	100	66	49	106	132	59
28	106	40	44	21	9.8	205	90	65	202	86	61	52
29	102	39	40	21	---	141	83	65	1840	74	34	47
30	97	38	36	22	---	108	77	56	876	66	30	40
31	92	---	34	22	---	101	---	50	---	61	27	---
TOTAL	3018	2264	1836	708	437.4	4286.3	4681	3844	4106	8155	1062	2459
MEAN	97.4	75.5	59.2	22.8	15.6	138	156	124	137	263	34.3	82.0
MAX	320	243	174	30	25	486	693	596	1840	1590	132	371
MIN	41	38	34	16	7.8	9.3	58	50	23	46	17	16
CFSM	.99	.77	.60	.23	.16	1.41	1.59	1.26	1.40	2.68	.35	.84
IN.	1.14	.86	.70	.27	.17	1.63	1.78	1.46	1.56	3.09	.40	.93
AC-FT	5990	4490	3640	1400	868	8500	9280	7620	8140	16180	2110	4880

CAL YR 1977	TOTAL	18609.99	MEAN	51.0	MAX	1970	MIN	.00	CFSM	.52	IN	7.06	AC-FT	36910
WTR YR 1978	TOTAL	36856.70	MEAN	101	MAX	1840	MIN	7.8	CFSM	1.03	IN	13.98	AC-FT	73110

05454500 IOWA RIVER AT IOWA CITY, IA

LOCATION.--Lat 41°39'24", long 91°32'27", in SE1/4 SE1/4 sec.9, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 25 ft (8 m) downstream from Hydraulics Laboratory of University of Iowa in Iowa City, 175 ft (53 m) downstream from University Dam, 0.8 mi (1.3 km) upstream from Ralston Creek, 3.6 mi (5.8 km) downstream from Clear Creek, and at mile 74.2 (119.4 km).

DRAINAGE AREA.--3,271 mi² (8,472 km²).

WATER-DISCHARGE RECORDS

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 (8.839 m) above Iowa City datum, and 617.27 ft (188.144 m) NGVD. Oct. 1, 1934 to Sept. 30, 1972, at datum 10.00 ft (3.05 m) higher. See WSP 1708 for history of changes prior to Oct. 1, 1934.

REMARKS.--Records excellent. Slight fluctuation at low stages caused by powerplant above station. Flow regulated by Coralville Lake (station 05453510) 9.1 mi (14.6 km) upstream, since Sept. 17, 1958. Corps of Engineers gage height telemeter at station.

AVERAGE DISCHARGE.--75 years, 1,635 ft³/s (46.30 m³/s), 6.79 in/yr (172 mm/yr), 1,185,000 acre-ft/yr (1,461 hm³/yr); median of yearly mean discharges, 1,450 ft³/s (41.1 m³/s), 6.0 in/yr (152 mm/yr), 1,051,000 acre-ft/yr (1,300 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,500 ft³/s (1,204 m³/s) June 8, 1918, gage height, 19.6 ft (5.974 m) from graph based on gage readings, site and datum then in use; minimum daily, 29 ft³/s (0.82 m³/s) Oct. 21, 22, 1916, regulated.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 17, 1881, reached a stage of 21.1 ft (6.43 m), from floodmarks at site and datum in use 1913-21, from information by local resident, discharge, 51,000 ft³/s (1,440 m³/s). Maximum stage known since at least 1850, about 3 ft (1 m) higher than that of July 17, 1881, occurred in June 1851, discharge, 70,000 ft³/s (1,980 m³/s), estimated.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,510 ft³/s (269 m³/s) Mar. 26, gage height, 20.34 ft (6.200 m); minimum daily, 246 ft³/s (6.97 m³/s) Sept. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3400	3020	653	1170	551	560	3410	4070	1320	2800	4250	1680
2	3170	3220	1120	1200	547	557	2900	4070	1310	3920	4190	1300
3	3110	3110	1550	1040	548	550	2580	3230	1310	3800	4000	998
4	3090	3040	1410	897	550	502	2300	2810	1400	3730	3540	655
6	3060	3000	1050	898	547	454	2290	2780	1490	3620	3250	605
6	3020	2980	655	896	910	465	2490	2740	1360	3040	2950	552
7	2940	2960	585	899	1480	453	2760	2820	1250	3020	2430	506
8	2980	2600	585	875	1440	451	3040	2850	1330	2450	1920	498
9	2710	1840	599	867	1420	461	3180	2890	1140	3030	1650	498
10	2660	1810	540	858	1390	451	4140	2800	1010	2700	1360	493
11	2650	1780	464	849	1350	447	4070	2660	1010	3380	941	449
12	2600	1640	594	840	1320	469	4690	2680	996	3980	785	364
13	2580	1500	755	804	1230	603	4640	3310	957	3620	780	248
14	2540	1600	764	763	1140	776	4050	1980	932	3130	774	248
15	2380	1600	1040	714	945	1060	3780	2150	1260	2890	620	236
16	2020	1500	1740	708	632	1360	3350	3680	1490	2880	485	407
17	1630	1490	2280	702	626	1500	2850	4540	1660	2890	489	1660
18	1440	1390	2490	696	617	1500	3220	4440	1630	1180	498	2260
19	1360	1170	2670	690	612	2260	4020	4350	1460	2760	481	1990
20	1230	1050	2960	683	613	2920	4850	4250	1660	4500	477	3630
21	1170	1040	3220	683	609	3610	5860	3910	1990	5280	344	3980
22	1000	1030	3040	677	600	3940	6120	2940	2540	4970	274	4010
23	1120	1040	2320	604	595	4980	6260	742	3340	1860	481	4540
24	1380	1040	1870	547	593	7120	6340	725	3340	1780	561	4570
26	2070	1030	1600	545	587	8740	6400	1120	3480	3180	640	4580
26	3620	928	1660	545	586	9490	6390	1540	3880	4760	719	4600
27	3820	716	1390	545	572	9160	5850	820	4500	4500	897	4590
28	3800	520	1060	544	563	7340	5460	964	4470	4460	941	4570
29	3770	458	1100	544	---	5070	5210	2180	4620	4410	1490	4530
30	3740	605	1180	549	---	4040	4140	1950	2830	4370	1890	4500
31	3540	---	1180	551	---	3680	---	1590	---	4160	1880	---
TOTAL	79600	50407	44124	23383	23173	84949	126640	83581	60965	107050	45987	63747
MEAN	2568	1680	1423	754	828	2740	4221	2696	2032	3453	1483	2125
MAX	3820	3220	3220	1200	1480	9490	6400	4540	4620	5280	4250	4600
MIN	1000	458	464	544	547	447	2290	725	932	1180	274	236
AC-FT	157900	99980	87520	46380	45960	168500	251200	165800	120900	212300	91220	126400

CAL YR 1977	TOTAL	348065	MEAN	954	MAX	4710	MIN 49	AC-FT	690400
WTR YR 1978	TOTAL	793606	MEAN	2174	MAX	9490	MIN 236	AC-FT	1574000

05454500 IOWA RIVER AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at Benton Street bridge at Iowa City, 0.5 mi (0.8 km) downstream from gaging station.

PERIOD OF RECORD.--Ssptember 1906 to September 1907, water years 1944 to current year.

PERIOD OF DAILY RECORD.--
CHEMICAL ANALYSIS: September 1906 to September 1907, October 1943 to September 1954.
SPECIFIC CONDUCTANCE: October 1968 to current year.
WATER TEMPERATURES: January 1944 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1943 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at times 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, 750 micromhos Feb. 25, 1972, Mar. 2, 7, 1977; minimum daily, 150 micromhos May 17, 1974
WATER TEMPERATURES: Maximum daily, 32.0°C July 19, 1957, Aug. 24, 25, 1959, June 27, 1971; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 7,800 mg/L June 13, 1953; minimum daily mean, 2 mg/L Dec. 16, 18, 20, 21, 27, 1963, Jan. 19, 20, 21, 22, 1977.
SEDIMENT LOADS: Maximum daily, 177,000 tons (161,000 tonnes) May 23, 1944; minimum daily, 0.82 ton (0.74 tonne) Jan. 21, 22, 1977.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 650 micromhos Feb. 24; minimum daily, 270 micromhos July 31.
WATER TEMPERATURES: Maximum daily, 29.0°C June 26, July 5; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,230 mg/L June 29; minimum daily mean, 4.0 mg/L Feb. 24.
SEDIMENT LOADS: Maximum daily, 27,800 tons (25,200 tonnes) June 29; minimum daily, 6.4 tons (5.8 tonnes) Feb. 24.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	490	460	---	580	---	---	580	490	---	310	---
2	---	480	500	---	---	460	---	570	500	---	380	---
3	390	490	---	520	490	---	---	540	---	480	380	---
4	420	500	---	600	---	---	---	570	---	450	500	---
5	450	---	490	610	---	---	---	560	500	420	---	430
6	420	---	---	490	500	470	---	---	490	420	---	460
7	490	520	---	---	---	---	---	---	500	420	480	460
8	---	530	420	---	480	550	---	490	520	---	480	460
9	---	510	---	520	---	---	---	530	---	---	---	---
10	---	450	---	---	500	550	440	520	---	460	490	---
11	450	460	---	---	---	---	---	510	---	510	500	450
12	530	---	580	510	---	---	500	510	530	580	---	---
13	540	---	480	500	---	560	460	---	540	580	---	450
14	---	490	520	---	480	---	470	---	540	---	490	450
15	---	500	540	---	---	---	---	490	480	---	490	440
16	---	470	520	510	---	320	---	460	510	---	420	---
17	490	500	---	---	480	350	560	420	---	420	440	---
18	500	---	---	540	---	---	530	420	---	440	440	440
19	500	---	580	---	---	---	560	450	520	280	---	430
20	450	---	520	490	---	520	530	---	500	400	---	---
21	520	---	600	---	---	---	390	---	490	500	480	440
22	---	---	580	---	490	---	---	530	480	---	500	440
23	---	600	---	520	---	---	---	510	460	---	500	---
24	---	---	---	---	650	---	480	530	---	480	480	---
25	520	410	---	530	---	---	480	540	---	---	---	440
26	520	---	---	---	---	---	500	510	500	---	---	420
27	470	---	---	---	480	580	540	---	490	300	---	440
28	500	---	540	---	---	---	550	---	500	280	---	450
29	---	540	540	---	---	---	---	500	---	---	470	560
30	---	525	540	500	---	---	---	500	420	---	420	---
31	---	---	---	---	---	---	---	540	---	270	---	---

05454500 IOWA RIVER AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	12.0	1.0	---	.0	---	---	12.0	23.0	---	26.0	---
2	---	12.5	1.5	---	---	.0	---	13.0	23.0	---	25.0	---
3	17.0	12.5	---	.0	---	---	---	13.0	---	25.0	25.0	---
4	17.5	11.0	---	.5	---	---	---	12.0	---	27.0	26.0	---
5	16.0	---	.0	1.0	---	---	---	12.0	26.0	29.0	---	27.0
6	15.5	---	---	1.0	.0	.5	---	---	27.0	28.5	---	27.5
7	14.0	12.0	---	---	---	---	---	---	26.0	27.0	27.0	28.0
8	---	12.0	.0	---	.0	1.5	---	12.0	23.5	---	23.5	28.0
9	---	11.5	---	.0	---	---	---	12.0	---	---	---	---
10	---	7.0	---	---	1.0	2.5	12.0	12.0	---	26.0	26.5	---
11	11.0	8.0	---	---	---	---	---	15.0	---	27.0	27.0	28.0
12	11.0	---	1.0	.5	---	---	12.5	18.0	25.0	25.0	---	---
13	---	---	2.0	.5	---	1.0	11.0	---	24.0	24.5	---	28.0
14	---	8.5	---	---	.0	---	10.0	---	23.0	---	27.0	27.0
15	---	8.5	3.0	---	---	---	---	15.0	20.0	---	28.0	27.0
16	---	7.5	3.5	.0	---	1.5	---	14.0	23.0	---	28.0	---
17	15.0	7.0	---	---	.0	2.0	10.0	18.0	---	27.0	27.0	---
18	12.0	---	---	.0	---	---	10.5	19.0	---	25.0	26.0	25.0
19	11.0	---	1.0	---	---	---	9.0	19.0	26.0	26.0	---	24.0
20	11.0	---	---	.0	---	3.0	8.5	---	25.0	26.0	---	---
21	11.5	---	1.0	---	---	---	8.0	---	24.0	25.0	22.0	21.0
22	---	---	1.0	---	.0	---	---	19.0	24.0	---	---	21.0
23	---	---	---	1.0	---	---	---	19.0	25.0	---	---	---
24	---	---	---	---	1.0	---	11.0	20.0	---	25.5	26.0	---
25	11.0	2.0	---	.0	---	---	12.0	22.0	---	---	---	21.0
26	9.5	---	---	---	---	---	12.0	23.0	29.0	---	---	20.0
27	13.0	---	---	---	.5	2.0	12.0	---	28.0	26.0	---	20.5
28	12.5	---	1.0	---	---	---	14.0	---	28.0	26.0	---	19.5
29	---	.0	1.0	---	---	---	---	22.0	26.0	---	27.0	20.0
30	---	.0	.5	.0	---	---	---	22.0	27.0	---	27.0	---
31	---	---	---	---	---	---	---	23.0	---	25.0	---	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	76	698	46	375	31	55	17	54	13	19	17	26
2	74	633	74	643	34	103	17	55	12	18	20	30
3	73	613	50	420	44	184	15	42	14	21	22	33
4	68	567	33	271	31	118	9	22	13	19	24	33
5	67	554	36	292	20	57	13	32	12	18	25	31
6	73	595	39	314	19	34	37	90	24	59	27	34
7	72	572	39	312	18	28	42	102	44	176	20	24
8	79	636	41	277	17	27	31	73	23	89	15	18
9	59	432	50	248	17	27	34	80	23	88	18	22
10	50	359	66	323	17	25	31	72	28	105	20	24
11	42	301	44	211	16	20	24	55	27	98	19	23
12	33	232	42	186	17	27	20	45	27	96	20	25
13	33	230	47	190	22	45	14	30	27	90	24	39
14	33	226	46	186	15	31	14	29	25	77	32	67
15	33	212	34	138	20	56	18	35	21	54	40	113
16	30	164	45	182	43	202	27	52	18	31	47	173
17	26	114	37	149	58	357	41	78	10	17	43	174
18	25	97	29	109	54	363	36	68	9	15	50	202
19	22	81	27	85	39	281	29	54	9	15	98	598
20	32	106	25	71	35	280	20	37	7	12	220	1730
21	29	92	24	67	33	287	18	33	7	12	316	3080
22	31	84	22	61	63	517	20	37	11	18	319	3390
23	42	127	19	53	80	501	34	55	9	14	288	3870
24	72	268	19	53	57	288	44	65	4	6.4	233	4480
25	60	335	19	53	49	212	34	50	6	9.5	169	3990
26	97	948	18	45	35	157	38	56	9	14	130	3330
27	93	959	18	35	29	109	37	54	11	17	105	2600
28	64	657	17	24	24	69	33	48	14	21	181	3590
29	59	601	17	21	18	53	30	44	---	---	216	2960
30	53	535	15	25	17	54	30	44	---	---	153	1670
31	47	449	---	---	17	54	25	37	---	---	98	974
TOTAL	---	12477	---	5419	---	4621	---	1628	---	1228.9	---	37353

05454500 IOWA RIVER AT IOWA CITY, IA-- Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	83	764	74	813	43	153	230	1740	98	1120	90	408
2	82	642	78	857	41	145	130	1380	87	984	89	312
3	78	543	72	628	41	145	128	1310	86	929	88	237
4	75	466	78	592	48	181	154	1550	51	487	86	152
5	72	445	111	833	52	209	151	1480	34	298	83	136
6	85	571	102	755	50	184	133	1090	37	295	69	103
7	107	797	89	678	52	175	217	1770	52	341	46	68
8	160	1310	77	593	49	176	185	1220	46	238	43	58
9	315	2700	83	648	51	157	336	2840	42	187	44	59
10	1240	13900	107	809	52	142	353	2570	41	151	45	60
11	385	4230	116	833	52	142	363	3310	41	104	44	53
12	217	2750	116	839	52	140	241	2590	43	91	42	41
13	110	1380	86	769	53	137	185	1810	44	93	38	25
14	104	1140	116	620	57	143	166	1400	46	96	41	27
15	100	1020	154	894	117	398	158	1230	45	75	45	29
16	93	841	175	1740	126	507	144	1120	64	84	69	76
17	89	685	103	1260	118	529	123	960	68	90	217	973
18	540	4690	107	1280	112	493	74	236	79	106	202	1230
19	212	2300	94	1100	93	367	1340	11700	77	100	136	731
20	168	2200	86	987	135	605	650	7900	60	77	148	1450
21	196	3100	102	1080	128	688	680	9690	39	36	125	1340
22	152	2510	121	960	155	1060	740	9930	43	32	116	1260
23	106	1790	64	128	134	1210	270	1360	52	68	121	1480
24	68	1160	53	104	110	992	123	591	52	79	127	1570
25	69	1190	57	172	115	1080	151	1300	54	93	135	1670
26	58	1000	65	270	154	1610	195	2510	56	109	114	1420
27	52	821	83	184	153	1860	137	1660	57	138	109	1350
28	48	708	86	224	240	2900	114	1370	59	150	107	1320
29	47	661	75	441	2230	33300	102	1210	61	245	89	1090
30	58	648	74	390	703	6250	97	1140	82	418	65	790
31	---	---	57	245	---	---	95	1070	89	452	---	---
TOTAL	---	56962	---	21726	---	56078	---	81037	---	7766	---	19513

TOTAL LOAD FOR YEAR: 305808.9 TONS.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)
APR 10...	0930	12.0	4220	1500	17100	52	61	65	72
JUN 29...	1530	26.0	4130	2010	22400	75	87	90	91
JUL 31...	1300	--	4310	116	1350	72	72	--	87

DATE	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	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)
APR 10...	--	98	--	--	--	--	--	--	--
JUN 29...	--	100	--	--	--	--	--	--	--
JUL 31...	98	--	9	46	83	90	92	95	100

05455000 RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'50", long 91°30'48", in SE1/4 NW1/4 sec.11, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 10 ft (3 m) upstream from bridge on Rochester Avenue, 1.0 mi (1.6 km) northeast of post office in Iowa City and 2.2 mi (3.5 km) upstream from mouth.

DRAINAGE AREA.--3.01 mi² (7.80 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1924 to current year.

REVISED RECORDS.--WSP 1508: 1933, 1935-37, 1940-41 (M); 1942, 1943 (M), 1948-51, 1952 (P), 1953, 1954 (M), 1955. WDR IOWA 1967: 1965-66.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 663.27 ft (202.165 m) NGVD (University of Iowa bench mark).

REMARKS.--Records good except those for winter period, which are poor.

AVERAGE DISCHARGE.--54 years, 1.69 ft³/s (0.048 m³/s), 7.62 in/yr (194 mm/yr), 1,220 acre-ft/yr (1.50 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,940 ft³/s (54.9 m³/s) Sept. 21, 1965, gage height, 6.90 ft (2.103 m); maximum gage height, 9.06 ft (2.761 m) July 18, 1956; no flow at times during most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft³/s (5.66 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
June 28	2005	*379	10.7	*5.31	1.618	Sept. 18	0245	208	5.89	4.17	1.271
Sept. 17	0245	253	7.16	4.47	1.362						

Minimum daily discharge, 0.05 ft³/s (0.001 m³/s) Jan. 10-12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.1	.83	.60	.21	.20	.28	3.3	1.4	1.6	8.5	1.3	.24
2	1.3	4.2	.56	.20	.20	.30	2.8	1.3	1.3	6.3	.87	.21
3	.87	1.7	.55	.19	.19	.32	2.5	1.2	.57	2.9	.72	.19
4	.79	1.2	.52	.18	.19	.29	2.0	1.2	.53	2.2	.58	.17
5	.71	1.0	.50	.18	.19	.29	1.8	1.9	.53	1.7	.55	.16
6	.62	.92	.42	.19	.20	.31	5.1	1.4	.44	1.4	.50	.15
7	8.1	.87	.41	.20	.20	.32	2.9	5.0	.43	13	.47	.16
8	4.2	.83	.40	.15	.22	.29	3.5	6.5	.39	2.4	.42	.15
9	1.7	.92	.38	.10	.24	.31	16	3.1	.35	32	.38	.13
10	1.7	.79	.37	.05	.25	.72	25	2.4	.31	4.9	.35	.11
11	1.5	.68	.40	.05	.28	2.5	9.6	2.2	.29	3.2	.36	.11
12	.92	.65	.48	.05	.26	4.0	6.1	5.1	.26	3.1	.34	.09
13	.79	.65	.70	.06	.28	6.0	4.1	30	.23	2.3	.34	.33
14	.75	.68	1.5	.06	.26	8.0	3.3	9.0	1.6	1.8	.28	.31
15	.68	.68	2.3	.07	.23	9.6	2.8	6.3	7.0	1.6	.30	.13
16	.65	.62	4.3	.08	.22	12	2.4	4.8	1.1	1.3	.35	9.7
17	.62	.62	6.9	.08	.22	16	3.8	3.8	.59	1.3	.37	27
18	.62	.59	2.5	.09	.21	19	17	3.0	.41	1.2	.50	32
19	.59	.59	1.5	.10	.22	21	11	2.6	.33	32	.25	2.0
20	.56	.62	1.2	.12	.24	13	6.6	2.3	2.1	12	.20	8.0
21	.56	.53	1.1	.13	.23	11	5.3	2.0	.47	14	.23	3.1
22	.68	.53	1.0	.16	.24	8.6	4.2	1.8	.39	14	.24	1.7
23	4.5	.59	.90	.20	.27	5.3	5.1	1.9	.36	5.7	.18	1.4
24	3.2	.53	.75	.23	.27	3.1	4.3	1.7	.32	3.9	1.2	1.1
25	1.7	.53	.56	.36	.28	2.4	3.4	1.5	.30	3.2	.34	.98
26	1.2	.38	.40	.16	.26	4.1	2.8	1.2	3.9	2.9	.65	.85
27	.92	.53	.34	.17	.28	8.2	2.4	1.0	1.0	2.4	6.7	.81
28	.83	.53	.30	.18	.30	11	2.1	2.9	41	1.7	.66	.71
29	.75	.50	.27	.19	---	6.6	2.0	2.9	31	1.6	.41	.86
30	.71	.83	.25	.19	---	5.0	1.7	1.9	4.8	1.4	.31	1.4
31	1.2	---	.23	.20	---	4.4	---	1.6	---	1.2	.27	---
TOTAL	53.02	24.82	32.59	4.58	6.63	184.23	164.9	115.9	103.90	187.1	20.62	94.25
MEAN	1.71	.83	1.05	.15	.24	5.94	5.50	3.74	3.46	6.04	.67	3.14
MAX	9.1	4.2	6.9	.36	.30	21	25	30	41	32	6.7	32
MIN	.56	.38	.23	.05	.19	.28	1.7	1.0	.23	1.2	.18	.09
CFSM	.57	.28	.35	.05	.08	1.97	1.83	1.24	1.15	2.01	.22	1.04
IN.	.66	.31	.40	.06	.08	2.28	2.04	1.43	1.28	2.31	.25	1.16
AC-FT	105	49	65	9.1	13	365	327	230	206	371	41	187

CAL YR 1977 TOTAL 352.92 MEAN .97 MAX 54 MIN .00 CFSM .32 IN 4.36 AC-FT 700
WTR YR 1978 TOTAL 992.54 MEAN 2.72 MAX 41 MIN .05 CFSM .90 IN 12.26 AC-FT 1970

05455000 RALSTON CREEK AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1952 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1968 to current year.
WATER TEMPERATURES: October 1960 to current year.
SUSPENDED-SEDIMENT DISCHARGE: April 1952 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, 8,000 micromhos Dec. 24, 1973; minimum daily, 120 micromhos May 19, 20, 1977.
WATER TEMPERATURES: Maximum daily, 31.0°C July 21, 1968; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATION: Maximum daily mean, 9,300 mg/L Aug. 20, 1975; minimum daily mean, 0 mg/L on many days in 1953-59, 1963-68, 1971, 1975, 1976, 1977.
SEDIMENT LOADS: Maximum daily, 4,300 tons (3,900 tonnes) May 23, 1966; minimum daily, 0 ton (0 tonne) on many days most years.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 2300 micromhos Dec. 11, 12, Mar. 2; minimum daily, 150 micromhos June 30.
WATER TEMPERATURES: Maximum daily, 27.0°C June 26; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 6,190 mg/L June 26; minimum daily mean, 6 mg/L on Jan. 5.
SEDIMENT LOADS: Maximum daily, 784 tons (711 tonnes) July 19; minimum dsily, 0 ton (0 tonne) Jan. 5, 11, 13, 14, 16-19.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	460	490	820	500	560	2250	500	560	460	170	440	480
2	460	380	690	500	725	2300	500	440	460	470	440	470
3	430	460	660	590	500	610	480	440	460	460	430	470
4	400	470	560	580	520	560	490	450	440	460	420	470
6	440	480	650	600	530	530	490	450	440	450	450	470
6	420	500	700	700	530	1100	540	460	480	470	430	470
7	430	500	600	750	480	540	570	500	450	420	430	460
8	430	500	600	650	500	1150	570	520	440	480	430	460
9	460	470	530	600	1200	1150	550	480	450	530	460	460
10	420	470	530	560	1100	850	490	450	450	440	460	460
11	460	420	2300	540	590	850	580	450	450	460	440	460
12	410	440	2300	520	520	540	540	470	450	480	440	460
13	420	420	1000	650	580	530	540	350	450	460	470	520
14	420	430	1000	1200	480	400	520	470	440	450	470	560
15	460	430	750	590	480	380	520	460	550	460	500	540
16	450	440	1000	520	480	410	500	450	565	420	540	515
17	420	400	800	520	480	490	500	450	480	460	540	490
18	410	460	810	520	430	300	560	450	460	440	535	490
19	420	440	1300	510	510	280	580	450	480	470	485	520
20	450	480	1400	540	510	470	560	450	600	495	460	560
21	460	430	500	500	500	580	540	440	520	520	460	515
22	600	460	500	500	510	600	530	440	460	520	450	480
23	340	1250	600	500	2100	580	530	440	500	540	460	470
24	470	520	550	650	530	580	550	440	460	460	475	470
25	520	1700	470	520	500	490	520	440	460	400	490	480
26	500	1180	510	510	540	700	540	450	490	450	510	460
27	495	650	510	500	650	725	540	450	500	430	510	460
28	490	700	500	480	580	570	540	480	210	440	510	460
29	485	700	490	480	---	580	540	510	150	440	500	450
30	480	700	500	480	---	520	560	470	480	430	490	440
31	485	---	450	480	---	520	---	460	---	440	480	---

05455000 RALSTON CREEK AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	8.0	.0	.0	.0	.0	8.0	8.0	21.0	24.0	22.0	22.0
2	15.0	9.0	.0	.0	.0	.0	4.0	14.0	20.0	23.0	22.0	24.0
3	10.0	9.0	.0	.0	.0	.0	5.0	14.0	18.0	20.0	20.0	20.0
4	10.0	6.0	.0	.0	.0	.0	12.0	12.0	20.0	20.0	15.0	22.0
5	10.0	7.0	.0	.0	.0	.0	11.0	11.0	22.0	25.0	18.0	23.0
6	10.0	9.0	.0	.0	.0	.0	12.0	11.0	20.0	23.0	20.0	23.0
7	4.0	10.0	.0	.0	.0	.0	11.0	9.0	20.0	21.0	21.0	24.0
8	7.0	.0	.0	.0	.0	.0	9.0	12.0	20.0	18.0	23.0	24.0
9	6.0	7.0	.0	.0	.0	.0	12.0	12.0	21.0	19.0	23.0	24.0
10	10.0	6.0	.0	.0	.0	.0	9.0	12.0	18.0	20.0	22.0	20.0
11	5.0	1.0	.0	.0	.0	1.0	6.0	13.0	25.0	19.0	22.0	25.0
12	5.0	1.0	.0	.0	.0	1.0	8.0	17.0	24.0	18.0	22.0	22.0
13	7.0	.0	.0	.0	.0	1.0	8.0	10.0	23.0	22.0	23.0	20.0
14	7.0	3.0	.0	.0	.0	.0	9.0	14.0	19.0	20.0	25.0	21.0
15	7.0	5.0	.0	.0	.0	1.0	5.0	14.0	21.0	20.0	24.0	17.0
16	4.0	5.0	.0	.0	.0	1.0	10.0	14.0	21.0	19.0	23.0	20.0
17	9.0	3.0	.0	.0	.0	.0	10.0	18.0	21.0	20.5	23.0	21.0
18	7.0	3.0	.0	.0	.0	1.0	10.0	20.0	21.0	22.0	25.0	21.0
19	4.0	2.0	.0	.0	.0	3.0	7.0	18.0	22.0	20.5	22.0	23.0
20	7.0	4.0	.0	.0	.0	4.0	5.0	16.0	20.0	22.0	20.0	18.0
21	7.0	.0	.0	.0	.0	8.0	8.0	18.0	19.0	23.0	18.0	16.5
22	6.0	.0	.0	.0	.0	10.0	10.0	15.0	20.0	20.0	20.0	16.0
23	6.0	.0	.0	.0	.0	13.0	9.0	15.0	24.0	21.0	21.0	14.0
24	10.0	.0	.0	.0	.0	5.0	9.0	18.0	20.0	21.0	22.0	13.0
25	9.0	.0	.0	.0	.0	1.0	8.0	16.0	23.0	24.0	21.0	17.0
26	9.0	.0	.0	.0	.0	2.0	7.0	24.0	27.0	22.0	23.0	15.0
27	11.0	2.0	.0	.0	.0	2.0	7.0	20.0	25.0	21.0	20.0	15.0
28	9.0	.0	.0	.0	.0	4.0	14.0	21.0	20.5	21.0	23.0	13.0
29	6.0	.0	.0	.0	---	4.0	11.0	22.0	20.0	20.0	22.0	12.0
30	5.0	.0	.0	.0	---	9.0	8.0	22.0	25.0	20.0	20.0	11.0
31	10.0	---	.0	.0	---	18.0	---	23.0	---	20.0	22.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	310	7.6	133	.30	156	.25	123	.07	27	.01	62	.05
2	160	.56	300	3.4	170	.26	129	.07	21	.01	80	.06
3	180	.42	310	1.4	164	.24	54	.03	28	.01	49	.04
4	640	1.4	135	.44	163	.23	23	.01	15	.01	31	.02
5	260	.50	121	.33	133	.18	6	.00	27	.01	48	.04
6	168	.28	117	.29	134	.15	37	.02	18	.01	83	.07
7	1490	55	101	.24	163	.18	89	.05	18	.01	68	.06
8	340	3.9	123	.28	143	.15	105	.04	10	.01	128	.10
9	160	.73	146	.36	130	.13	150	.04	13	.01	162	.14
10	580	2.7	109	.23	121	.12	73	.01	15	.01	173	.34
11	410	1.7	143	.26	112	.12	37	.00	17	.01	147	.99
12	630	1.6	162	.28	102	.13	51	.01	22	.02	61	.66
13	240	.51	166	.29	20	.04	30	.00	62	.05	63	1.0
14	146	.30	160	.29	11	.04	30	.00	91	.06	88	1.9
15	130	.24	155	.28	46	.29	30	.01	41	.03	96	2.5
16	150	.26	183	.31	60	.70	16	.00	29	.02	218	7.1
17	156	.26	169	.28	25	.47	19	.00	32	.02	208	9.0
18	143	.24	158	.25	17	.11	18	.00	50	.03	2360	121
19	144	.23	153	.24	52	.21	13	.00	58	.03	1510	86
20	115	.17	142	.24	40	.13	18	.01	57	.04	590	21
21	78	.12	98	.14	141	.42	20	.01	51	.03	170	5.0
22	32	.06	112	.16	149	.40	32	.01	38	.02	71	1.6
23	440	5.3	124	.20	78	.19	14	.01	54	.04	39	.56
24	198	1.7	142	.20	126	.26	25	.02	56	.04	20	.17
25	112	.51	134	.19	186	.28	38	.04	57	.04	67	.43
26	124	.40	57	.06	167	.18	32	.01	57	.04	105	1.2
27	119	.30	23	.03	163	.15	32	.01	45	.03	86	1.9
28	124	.28	22	.03	137	.11	48	.02	38	.03	61	1.8
29	115	.23	25	.03	128	.09	43	.02	---	---	39	.69
30	114	.22	78	.11	119	.08	43	.02	---	---	45	.61
31	181	.59	---	---	110	.07	53	.03	---	---	70	.83
TOTAL	---	88.31	---	11.14	---	6.36	---	0.57	---	0.68	---	266.86

054550000 RALSTON CREEK AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	70	.62	34	.13	94	.41	677	45	69	.24	60	.04
2	79	.60	40	.14	46	.16	400	6.8	27	.06	64	.04
3	70	.47	20	.06	30	.05	117	.92	40	.08	74	.04
4	77	.42	33	.11	35	.05	105	.62	50	.08	57	.03
5	42	.20	45	.23	39	.06	73	.34	26	.04	53	.02
6	60	.83	52	.20	35	.04	95	.36	17	.02	44	.02
7	36	.28	450	8.5	42	.05	708	30	28	.04	54	.02
8	57	.54	482	9.5	28	.03	90	.58	35	.04	87	.04
9	1140	49	113	.95	27	.03	342	53	28	.03	84	.03
10	1220	82	57	.37	32	.03	83	1.1	25	.02	89	.03
11	162	4.2	76	.45	10	.01	91	.79	34	.03	75	.02
12	83	1.4	303	5.2	8	.01	123	1.0	29	.03	79	.02
13	48	.53	2160	282	12	.01	85	.53	18	.02	138	.12
14	57	.51	112	3.9	178	6.0	80	.39	23	.02	103	.09
15	48	.36	68	2.1	946	26	67	.29	42	.03	91	.03
16	28	.18	78	1.0	122	.36	71	.25	31	.03	216	33
17	205	2.1	74	.76	103	.16	50	.18	22	.02	366	77
18	465	21	59	.48	75	.08	41	.13	36	.05	784	110
19	104	3.1	73	.51	53	.05	3260	784	53	.04	220	1.2
20	67	1.2	63	.39	357	2.0	3470	219	46	.02	298	7.1
21	48	.69	62	.33	258	.33	1380	72	74	.05	75	.63
22	42	.48	71	.35	109	.11	226	8.5	92	.06	53	.24
23	50	.69	71	.36	92	.09	93	1.4	87	.04	44	.17
24	40	.46	53	.24	72	.06	108	1.1	216	.70	38	33
25	46	.42	55	.22	72	.06	77	.67	124	.11	53	.14
26	35	.26	61	.20	215	2.3	59	.46	137	.24	74	.17
27	30	.19	64	.17	150	.41	55	.36	257	4.6	32	.07
28	60	.34	165	3.9	2130	436	46	.21	132	.24	45	.09
29	36	.19	172	2.1	5190	702	64	.28	91	.10	38	.09
30	33	.15	58	.30	450	5.8	38	.14	82	.07	34	.13
31	---	---	43	.19	---	---	82	.27	86	.06	---	---
TOTAL	---	173.41	---	325.34	---	1181.75	---	1230.67	---	7.21	---	263.62

TOTAL LOAD FOR YEAR: 3555.92 TONS.

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)
JUN 28...	2100	20.0	50	8570	1160	46	65	72	85	99	99	100
JUL 20...	1730	22.0	26	16800	1180	33	37	41	57	100	--	--

05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'05", long 91°30'27", in SW1/4 NE1/4 sec.14, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 60 ft (18 m) downstream from bridge on Muscatine Avenue in Iowa City, and 1.2 mi (1.9 km) upstream from mouth.

DRAINAGE AREA.--2.94 mi² (7.61 km²).

PERIOD OF RECORD.--October 1963 to current year.

REVISED RECORDS.--WDR IOWA 1966: Drainage area.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 678.03 ft (206.664 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations fo water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 2.55 ft³/s (0.072 m³/s), 11.78 in/yr (299 mm/yr), 1,850 acre-ft/yr (2.28 hm³/yr); median of yearly mean discharges, 2.2 ft³/s (0.06 m³/s), 10.2 in/yr (259 mm/yr), 1,590 acre-ft/yr (1.96 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,070 ft³/s (30.3 m³/s) July 17, 1972, gage height, 9.47 ft (2.886 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 14, 1962, reached a stage of 10.5 ft (3.20 m), from flood profile, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft³/s (5.66 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 9	2015	299	8.47	5.89	1.795	July 19	0315	373	10.6	6.31	1.923
June 28	1950	*680	19.3	*7.89	2.405	Sept. 16	2315	510	14.4	7.38	2.249
July 7	0100	211	5.98	4.75	1.448	Sept. 18	0110	356	10.1	6.35	1.935
July 9	0245	540	15.3	7.28	2.219						

Minimum daily discharge, 0.05 ft³/s (0.001 m³/s) Jan. 11-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	2.4	.68	.25	.13	.23	4.5	1.4	1.6	14	1.2	.33
2	2.5	7.4	.61	.22	.13	.24	3.7	1.5	1.1	8.9	.99	.30
3	1.6	3.6	.54	.20	.13	.25	2.5	1.3	1.0	4.9	.86	.29
4	1.4	2.5	.51	.18	.14	.26	2.0	1.3	.90	3.5	.81	.30
5	1.3	2.1	.51	.18	.14	.27	3.2	3.5	.81	3.2	.75	.32
6	.97	2.0	.48	.20	.15	.28	4.8	1.9	.81	2.6	3.0	.29
7	13	2.0	.45	.21	.16	.30	2.1	9.7	.68	30	2.5	.26
8	7.0	1.5	.43	.17	.18	.70	5.1	8.7	.62	5.1	1.4	.23
9	3.7	1.7	.42	.11	.19	.84	21	4.1	.55	50	.50	.21
10	4.3	1.2	.40	.06	.20	1.3	23	3.2	.51	8.4	.47	.19
11	2.8	1.1	.38	.05	.21	2.0	12	7.7	.46	5.4	.47	.16
12	2.1	1.1	.45	.05	.22	3.3	9.0	13	.92	4.5	.45	.13
13	1.2	1.1	.52	.05	.22	5.0	7.0	37	1.1	4.5	.43	1.8
14	.82	1.1	.59	.06	.21	6.6	5.7	10	8.1	3.2	.45	2.0
15	.76	1.1	1.3	.06	.20	9.0	5.4	7.4	9.5	2.6	.84	.15
16	.72	.98	2.7	.07	.20	12	4.8	6.0	1.7	2.1	.53	30
17	.67	.94	6.9	.08	.19	11	8.3	5.1	2.1	2.1	1.5	30
18	.65	.79	3.4	.09	.19	14	22	4.2	1.0	2.2	1.7	47
19	.62	1.0	2.1	.09	.19	10	12	3.5	.85	47	.34	4.9
20	.60	.81	1.6	.10	.19	7.8	8.4	3.8	5.3	16	.26	11
21	.82	.59	1.4	.11	.20	6.3	7.0	4.5	.98	23	.75	5.1
22	2.1	.78	1.3	.13	.20	5.1	6.1	4.2	.99	15	.25	3.1
23	8.8	.79	1.2	.16	.21	3.6	7.7	4.1	.74	7.3	.57	2.4
24	6.0	.65	1.1	.29	.21	2.4	5.1	3.2	.63	5.2	3.8	1.6
25	3.6	.65	.95	.35	.22	2.4	4.5	2.4	.59	4.2	.53	1.2
26	2.5	.64	.80	.20	.22	5.1	3.5	1.8	4.5	4.6	4.1	1.1
27	2.0	.64	.60	.15	.22	7.3	2.8	1.5	2.6	2.6	16	1.1
28	1.7	.58	.43	.14	.23	8.5	2.4	8.0	68	2.1	.86	.98
29	1.5	.61	.35	.14	---	5.8	2.1	3.8	32	1.8	.49	.94
30	1.3	.64	.31	.13	---	4.5	1.6	2.5	7.4	1.5	.39	.91
31	3.2	---	.28	.13	---	4.1	---	2.1	---	1.3	.34	---
TOTAL	88.13	42.99	33.69	4.41	5.28	140.47	210.4	172.4	158.04	288.8	47.53	148.29
MEAN	2.84	1.43	1.09	.14	.19	4.53	7.01	5.56	5.27	9.32	1.53	4.94
MAX	13	7.4	6.9	.35	.23	14	23	37	68	50	16	47
MIN	.60	.58	.28	.05	.13	.23	1.6	1.3	.46	1.3	.25	.13
CFSM	.97	.49	.37	.05	.07	1.54	2.38	1.89	1.79	3.17	.52	1.68
IN.	1.11	.54	.43	.06	.07	1.78	2.66	2.18	2.00	3.65	.60	1.88
AC-FT	175	85	67	8.7	10	279	417	342	313	573	94	294

CAL YR 1977 TOTAL 541.69 MEAN 1.48 MAX 48 MIN .00 CFSM .50 IN 6.85 AC-FT 1070
WTR YR 1978 TOTAL 1340.43 MEAN 3.67 MAX 68 MIN .05 CFSM 1.25 IN 16.95 AC-FT 2660

05455500 ENGLISH RIVER AT KALONA, IA

LOCATION.--Lat 41°27'59", long 91°42'56", in SE1/4 SE1/4 sec.13, T.77 N., R.8 W., Washington County, Hydrologic Unit 07080209, on right bank 30 ft (9 m) upstream from bridge on State Highway 1, 0.8 mi (1.3 km) south of Kalona, 1.1 mi (1.8 km) upstream from Camp Creek, 4.5 mi (7.2 km) downstream from Smith Creek, and 14.5 mi (23.3 km) upstream from mouth.

DRAINAGE AREA.--573 mi² (1,484 km²).

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 (193.076 m) NGVD (levels by Corps of Engineers). Prior to Dec. 27, 1939, nonrecording gage 30 ft (9 m) downstream at same datum.

REMARKS.--Records good except those for winter period and Oct. 1 - 24, Mar. 17 to Apr. 18, which are fair. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--39 years, 366 ft³/s (10.36 m³/s), 8.67 in/yr (220 mm/yr), 265,200 acre-ft/yr (327 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s (566 m³/s) Sept. 21, 1965, gage height, 21.45 ft (6.538 m); minimum daily, 0.66 ft³/s (0.019 m³/s) Feb. 5-7, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 19.9 ft (6.07 m) from floodmark, from information by local residents, discharge, 18,500 ft³/s (524 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 22	2330	4,950	140	13.90	4.237
Apr. 10	1830	4,690	133	13.68	4.170
Apr. 19	2130	4,360	123	13.23	4.032
May 14	0100	5,760	163	14.86	4.529
July 23	0545	*6,340	180	*15.70	4.785

Minimum daily discharge, 27 ft³/s (0.76 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	197	992	166	175	72	78	643	417	248	895	285	56
2	227	1850	158	160	74	78	508	369	230	2400	255	50
3	191	1130	148	144	74	79	418	343	213	1390	227	46
4	191	795	128	140	72	79	385	330	201	613	199	43
5	163	638	112	138	73	78	349	324	190	387	177	39
6	163	566	98	132	72	79	462	323	177	306	164	37
7	286	518	96	130	73	78	629	558	169	2530	149	35
8	967	479	101	130	73	76	526	1140	159	1090	136	33
9	762	455	105	124	74	86	819	878	150	1610	124	32
10	482	436	96	105	74	98	4190	622	166	792	113	30
11	428	370	80	98	75	110	3570	516	164	375	108	29
12	400	321	82	100	77	126	1670	1770	156	293	106	27
13	400	305	91	110	77	150	984	4420	145	276	100	31
14	290	303	112	115	79	200	738	5520	136	244	92	58
15	261	303	150	115	79	300	626	2740	155	205	85	96
16	239	289	200	110	78	500	548	1260	267	182	78	68
17	219	264	390	104	78	940	500	965	254	162	84	1450
18	211	241	690	98	78	1200	2380	808	234	149	92	2410
19	195	223	380	95	77	2100	4070	694	201	1420	78	1050
20	177	221	220	94	77	2800	3060	618	284	2660	70	1490
21	169	230	116	94	76	4080	1420	551	243	3240	60	3340
22	181	205	120	90	75	4800	1060	492	201	5750	55	1790
23	237	195	174	88	75	3930	935	474	167	6140	55	765
24	2640	202	200	87	75	1860	896	459	163	2910	56	533
25	2390	185	195	89	76	837	789	426	163	1060	55	419
26	1310	230	360	89	76	672	671	386	162	759	64	340
27	868	228	340	85	76	717	592	346	248	592	165	296
28	683	214	310	77	78	1760	532	323	260	472	207	257
29	566	195	270	74	---	2000	492	332	928	401	133	228
30	492	170	230	73	---	897	465	315	1540	356	82	215
31	521	---	200	72	---	765	---	275	---	318	64	---
TOTAL	16506	12753	6118	3335	2113	31553	34927	28994	7974	39977	3718	15293
MEAN	532	425	197	108	75.5	1018	1164	935	266	1290	120	510
MAX	2640	1850	690	175	79	4800	4190	5520	1540	6140	285	3340
MIN	163	170	80	72	72	76	349	275	136	149	55	27
CFSM	.93	.74	.34	.19	.13	1.78	2.03	1.63	.46	2.25	.21	.89
IN.	1.07	.83	.40	.22	.14	2.05	2.27	1.88	.52	2.60	.24	.99
AC-FT	32740	25300	12140	6610	4190	62590	69280	57510	15820	79290	7370	30330

CAL YR 1977	TOTAL	75691.38	MEAN 207	MAX 3350	MIN .66	CFSM .36	IN 4.91	AC-FT 150100
WTR YR 1978	TOTAL	203261.00	MEAN 557	MAX 6140	MIN 27	CFSM .97	IN 13.20	AC-FT 403200

05455700 IOWA RIVER NEAR LONE TREE, IA

LOCATION.--Lat 41°25'15", long 91°28'25", in NW1/4 NE1/4 sec.6, T.76 N., R.5 W., Louisa County, Hydrologic Unit 07080209, on left bank 10 ft (3 m) downstream from bridge on county highway W66, 5 mi (8.0 km) southwest of Lone Tree, 6.2 mi (10.0 km) downstream from English River, and at mile 47.2 (75.9 km).

DRAINAGE AREA.--4,293 mi² (11,118 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 588.16 ft (179.271 m) NGVD. Prior to Dec. 28, 1956, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Flow regulated by Coralville Lake (station 05453510) 36.1 mi (58.1 km) upstream since Sept. 17, 1958. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Seven discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--22 years, 2,721 ft³/s (77.06 m³/s), 8.61 in/yr (219 mm/yr), 1,971,000 acre-ft/yr (2,430 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,700 ft³/s (110 m³/s) May 19, 1974, gage height, 18.97 ft (5.782 m); maximum gage height, 20.27 ft (6.178 m) Sept. 22, 1965; minimum daily discharge, 69 ft³/s (1.95 m³/s) Aug. 4, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 25, 1944, reached a stage of 19.94 ft (6.078 m), discharge not determined, from information by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,800 ft³/s (334 m³/s) July 23, gage height, 13.86 ft (4.225 m); maximum gage height, 14.07 ft (4.289 m), backwater from ice; minimum daily discharge, 591 ft³/s (16.7 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4070	4560	1140	2000	730	820	5100	4850	2280	4530	4600	1960
2	3940	6430	1290	1700	730	820	4390	5240	2130	7470	4510	1630
3	3680	5820	1840	1780	740	820	3790	4600	2080	6260	4450	1440
4	3570	4850	1970	1700	740	780	3430	3780	2050	5160	3990	1240
5	3520	4440	1760	1700	740	790	3210	3670	2160	4540	3480	1190
6	3450	4250	1250	1660	740	790	3300	3610	2150	3890	3330	1160
7	3530	4150	1000	1600	1400	790	3860	3810	1960	6600	2840	1070
8	4650	4000	890	1400	1580	780	4000	4660	1920	5500	2390	808
9	4630	3140	850	1140	1600	780	4390	4680	1950	7400	2070	792
10	3840	2900	820	1240	1580	780	9080	4300	1690	7260	1860	689
11	3600	2770	720	1240	1540	790	10300	3870	1630	4530	1440	647
12	3490	2640	850	1240	1480	800	8400	5090	1610	4680	1160	591
13	3360	2360	1000	1090	1350	840	6940	7500	1570	4630	1070	609
14	3260	2320	1300	1030	1200	1100	5860	9820	1490	4000	966	659
15	3180	2320	2030	1000	1000	1500	5200	8520	1850	3490	880	660
15	2860	2300	2660	960	860	2100	4910	5900	2120	3350	799	666
17	2460	2240	3300	930	830	2900	4190	6310	2390	3240	749	2600
18	2100	2180	4870	920	830	3500	6110	6140	2400	2300	807	8900
19	2020	1980	4200	890	830	4300	9530	5860	2340	4020	849	4290
20	1830	1780	3890	880	830	5000	9370	5620	2170	7060	857	4500
21	1760	1730	3770	860	820	5700	8510	5380	2660	8100	862	6200
22	1650	1690	3840	850	820	9950	7940	4790	2660	11100	838	6820
23	1910	1650	3280	840	830	9870	7790	2970	3590	10800	757	5970
24	4710	1660	2870	780	830	10000	7850	2100	3780	8320	762	5490
25	5470	1640	2320	760	820	9320	7790	1990	3810	4660	810	5260
26	5620	1520	1910	740	830	9840	7630	2720	4180	5040	874	5150
27	5420	1440	1660	750	840	10200	7460	2070	4690	5290	1690	5090
28	5100	1290	1680	750	830	10900	6750	2180	5130	5050	1610	5040
29	4890	1160	1900	740	---	9740	6410	3330	9060	4890	1460	4990
30	4740	1010	2200	740	---	6490	5820	3020	7110	4790	1900	4940
31	4720	---	2200	730	---	5480	---	2720	---	4690	1990	---
TOTAL	113030	82220	65260	34640	27950	128270	189310	141100	86610	172640	56650	91051
MEAN	3646	2741	2105	1117	998	4138	6310	4552	2887	5569	1827	3035
MAX	5620	6430	4870	2000	1600	10900	10300	9820	9060	11100	4600	8900
MIN	1650	1010	720	730	730	780	3210	1990	1490	2300	749	591
AC-FT	224200	153100	129400	68710	55440	254400	375500	279900	171800	342400	112400	180600

CAL YR 1977 TOTAL 515343 MEAN 1412 MAX 7550 MIN 69 AC-FT 1022000
WTR YR 1978 TOTAL 1188731 MEAN 3257 MAX 11100 MIN 591 AC-FT 2358000

05457700 CEDAR RIVER AT CHARLES CITY, IA

LOCATION.--Lat 43°03'45", long 92°40'23", in SE1/4 NE1/4, sec.12, T.95 N., R.16 W., Floyd County, Hydrologic Unit 07080201, on right bank 800 ft (244 m) downstresm from bridge on U.S. Highway 18 (Brantingham Street) in Charles City, 10.6 mi (17.1 km) upstream from Gizzard Creek, and at mile 252.9 (406.9 km) upstream from mouth of Iowa River.

DRAINAGE AREA.--1,054 mi² (2,730 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 973.02 ft (295.576 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Occasional minor regulation by dam 0.2 mi (0.3 km) above 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 (0.3 km) upstream. Several observations of water temperature were made during the year. National Weather Service gage height telemeters at station.

AVERAGE DISCHARGE.--14 years, 641 ft³/s (18.15 m³/s), 8.26 in/yr (210 mm/yr), 464,400 acre-ft/yr (573 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,000 ft³/s (595 m³/s) Apr. 7, 1965, gage height, 19.14 ft (5.834 m); maximum gage height, 21.64 ft (6.596 m) Mar. 2, 1965, backwater from ice; minimum daily discharge, 60 ft³/s (1.70 m³/s) Nov. 23, 1977, Jan. 7, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 27, 1961, reached a stage of 21.6 ft (6.58 m), from floodmarks, discharge, 29,200 ft³/s (827 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft³/s (71 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 16	0745	2,650	75.0	5.61	1.710	July 19	1030	*10,800	306	*13.15	4.008
June 18	0030	4,440	126	7.60	2.316	July 24	1015	7,370	209	10.39	3.167
July 8	1130	9,880	280	12.45	3.795	Aug. 3	2145	3,240	91.8	6.27	1.911

Minimum daily discharge, 60 ft³/s (1.70 m³/s) Jan. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	210	204	169	124	176	106	894	421	1240	544	1120	240
2	210	208	164	116	174	108	853	393	889	726	1020	237
3	210	205	162	100	174	110	709	375	703	787	2000	233
4	205	200	156	77	174	106	571	363	563	801	2110	222
5	205	198	138	66	170	106	510	351	468	802	1320	215
6	200	194	132	62	170	104	551	342	403	2300	1170	208
7	205	190	130	60	168	104	568	335	366	6610	960	205
8	225	188	128	91	166	98	673	349	331	9130	802	201
9	230	198	124	116	164	104	683	343	304	4100	693	196
10	225	197	120	122	160	106	591	343	280	1970	628	195
11	235	194	116	110	156	104	525	334	263	1490	571	189
12	235	185	112	97	154	92	493	325	249	1370	518	220
13	230	181	110	92	146	91	460	353	231	1300	472	571
14	230	178	110	90	144	90	418	359	222	1130	431	1170
15	225	183	114	91	142	94	375	379	1130	1040	407	1270
16	225	181	130	146	140	112	342	360	2440	962	381	943
17	225	241	148	153	138	118	336	330	2990	932	381	694
18	210	196	170	126	138	140	637	308	3670	3610	343	538
19	210	166	178	110	138	170	598	291	1890	9440	321	460
20	210	140	203	118	140	198	674	314	1440	3000	299	431
21	206	134	203	120	138	352	798	290	1210	1410	285	410
22	199	110	198	120	140	948	737	261	1010	1860	276	401
23	204	160	160	116	138	1260	678	247	833	4470	268	394
24	210	130	214	118	132	1550	619	241	705	6930	268	382
25	203	100	162	120	124	1540	592	235	664	3910	260	359
26	200	136	172	136	116	1270	599	229	766	2030	254	334
27	204	150	180	148	116	1140	612	360	790	1620	274	319
28	198	160	140	168	110	986	563	685	649	1400	272	302
29	195	167	110	170	---	1090	500	604	556	1430	265	303
30	189	168	95	174	---	1180	458	1940	491	1370	255	293
31	208	---	92	172	---	1000	---	2000	---	1240	247	---
TOTAL	6576	5242	4540	3629	4146	14577	17617	14060	27746	79714	18871	12135
MEAN	212	175	146	117	148	470	587	454	925	2571	609	405
MAX	235	241	214	174	176	1550	894	2000	3670	9440	2110	1270
MIN	189	100	92	60	110	90	336	229	222	544	247	189
CFSM	.20	.17	.14	.11	.14	.45	.56	.43	.88	2.44	.58	.38
IN.	.23	.19	.16	.13	.15	.51	.62	.50	.98	2.81	.67	.43
AC-FT	13040	10400	9010	7200	8220	28910	34940	27890	55030	158100	37430	24070

CAL YR 1977	TOTAL	64716	MEAN 177	MAX 558	MIN 92	CFSM .17	IN 2.28	AC-FT	128400	
WTR YR 1978	TOTAL	208853	MEAN 572	MAX 9440	MIN 60	CFSM .54	IN 7.37	AC-FT	414300	

05458000 LITTLE CEDAR RIVER NEAR IONIA, IA

LOCATION.--Lat 43°02'05", long 92°30'05", in SW1/4 NE1/4 sec.21, T.95 N., R.14 W., Chickasaw County, Hydrologic Unit 07080201, on left bank 12 ft (4 m) downstream from bridge on county highway B57, 2.4 mi (3.9 km) west of Ionia, 6.4 mi (10.3 km) upstream from mouth, and 7.6 mi (12.2 km) downstream from Beaver Creek.

DRAINAGE AREA.--306 mi² (793 km²).

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 (296.677 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--24 years, 150 ft³/s (4.248 m³/s), 6.66 in/yr (169 mm/yr), 108,700 acre-ft/yr (134 hm³/yr); median of yearly mean discharges, 130 ft³/s (3.68 m³/s), 5.8 in/yr (147 mm/yr), 94,200 acre-ft/yr (116 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s (306 m³/s) Mar. 27, 1961, gage height, 15.58 ft (4.749 m); minimum daily, 3.0 ft³/s (0.085 m³/s) Feb. 4-9, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1954, reached a stage of 11.37 ft (3.466 m), discharge, 4,600 ft³/s (130 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 23	1345	*1,720	48.7	a*8.57	2.612	July 19	1200	1,250	35.4	6.79	2.070
July 7	1745	1,500	42.5	7.21	2.198	July 23	1800	1,410	39.9	7.07	2.155

Minimum daily discharge, 18 ft³/s (0.51 m³/a) Dec. 11,12.

a Ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	93	37	48	24	24	225	145	253	187	149	37
2	82	82	38	48	23	24	198	132	197	218	128	37
3	84	77	38	46	23	24	168	119	173	171	110	36
4	80	71	38	44	23	24	154	113	144	131	98	34
5	71	68	36	43	23	24	142	105	121	114	90	33
6	64	66	31	43	23	24	232	99	108	982	84	30
7	71	65	27	42	23	24	302	93	99	1320	80	30
8	126	64	24	42	23	24	248	101	90	1140	77	30
9	106	65	22	40	23	24	208	100	82	608	69	28
10	115	64	19	37	23	25	230	93	75	403	66	27
11	123	60	18	34	23	24	229	90	68	316	63	26
12	127	57	18	32	23	25	196	87	64	256	61	31
13	141	57	21	31	23	27	168	122	59	224	57	91
14	130	57	23	31	23	27	145	111	55	203	55	120
15	115	57	26	32	23	27	128	106	162	179	54	135
16	101	56	31	31	24	28	115	100	107	151	55	114
17	90	54	60	31	24	28	116	96	244	136	56	88
18	83	52	101	31	24	28	649	88	769	195	52	73
19	76	50	80	31	24	29	748	80	568	975	49	66
20	72	45	62	31	24	30	580	84	371	417	45	66
21	68	34	63	31	24	150	441	147	245	381	46	62
22	64	31	72	31	24	400	356	102	203	681	45	59
23	64	33	75	31	24	880	305	87	181	1310	43	55
24	67	26	71	30	24	600	281	80	151	1240	43	52
25	69	21	68	30	24	450	273	73	187	614	41	49
26	70	30	63	29	24	350	256	68	210	398	45	46
27	69	35	60	29	24	334	229	62	165	306	45	44
28	66	35	57	28	24	325	201	68	137	267	45	42
29	64	35	55	28	---	304	178	86	118	223	43	42
30	62	36	53	27	---	270	163	311	112	193	41	43
31	98	---	51	25	---	242	---	439	---	171	38	---
TOTAL	2706	1576	1438	1067	658	4819	7864	3587	5518	14110	1973	1626
MEAN	87.3	52.5	46.4	34.4	23.5	155	262	116	184	455	63.6	54.2
MAX	141	93	101	48	24	880	748	439	769	1320	149	135
MIN	62	21	18	25	23	24	115	62	55	114	38	26
CFSM	.29	.17	.15	.11	.08	.51	.86	.38	.60	1.49	.21	.18
IN.	.33	.19	.17	.13	.08	.59	.96	.44	.67	1.72	.24	.20
AC-FT	5370	3130	2850	2120	1310	9560	15600	7110	10940	27990	3910	3230

CAL YR 1977 TOTAL 15955.7 MEAN 43.7 MAX 230 MIN 3.4 CFSM .14 IN 1.94 AC-FT 31650
WTR YR 1978 TOTAL 46942.0 MEAN 129 MAX 1320 MIN 18 CFSM .42 IN 5.71 AC-FT 93110

05458500 CEDAR RIVER AT JANESVILLE, IA

LOCATION.--Lat 42°38'54", long 92°27'54", in NE1/4 SW1/4 sec.35, T.91 N., R.14 W., Bremer County, Hydrologic Unit 07080201, on left bank 300 ft (91 m) downstream from bridge on county highway at Janesville, 3.6 mi (5.8 km) upstream from West Fork Cedar River, and at mile 207.7 (334.2 km) upstream from mouth of Iowa River.

DRAINAGE AREA.--1,661 mi² (4,301 km²).

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, 1905-6.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1905 (M), 1915-16 (M), 1917, 1918-19 (M), 1920-27, 1933-37 (M), 1940-42 (M).

GAGE.--Water-stage recorder. Datum of gage is 868.26 ft (264.646 m) NGVD. Prior to July 26, 1919, nonrecording gage at site 1,000 ft (305 m) downstream at datum 4.0 ft (1.2 m) 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 (91 m) upstream at same datum.

REMARKS.--Records good except those for winter period, which are poor. Diurnal fluctuation during low water caused by powerplant at Waverly, 10 mi (16.1 km) upstream. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--58 years (1904-6, 1914-27, 1932-42, 1945-78), 774 ft³/s (21.92 m³/s), 6.33 in/yr (161 mm/yr), 560,800 acre-ft/yr (691 hm³/yr); median of yearly mean discharges, 700 ft³/s (19.8 m³/s), 5.7 in/yr (145 mm/yr) 507,000 acre-ft/yr (625 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,000 ft³/s (1,050 m³/s) Mar. 28, 1961, gage height, 16.33 ft (4.977 m); minimum daily, 28 ft³/s (0.79 m³/s) Oct. 21, 1922.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1945, reached a stage of 16.2 ft (4.94 m), from floodmark at site 300 ft (91 m) upstream, discharge, 34,300 ft³/s (971 m³/s). Flood of Mar. 16, 1929, reached a stage of about 16 ft (5 m), from information by City of Waterloo, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
June 19	1245	5,570	158	5.94	1.811	July 21	0030	8,750	248	8.37	2.551
July 10	0015	*9,740	276	*8.90	2.713	July 25	2400	7,550	214	7.59	2.313

Minimum daily discharge, 140 ft³/s (3.96 m³/s) Dec. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	637	524	325	184	270	220	1700	1060	2530	995	1420	245
2	669	557	270	190	270	230	1510	927	2010	1020	1240	378
3	634	529	210	210	265	210	1420	855	1490	1210	1150	446
4	538	506	200	200	265	180	2390	800	1260	1130	1540	433
5	523	424	210	190	260	215	1720	719	1060	1160	2650	406
6	499	465	140	180	255	235	1840	708	894	1950	1840	401
7	495	519	180	190	250	210	1690	680	790	3750	1260	377
8	659	465	200	155	250	210	1570	716	717	5430	1070	352
9	745	448	160	190	245	205	1470	699	644	8490	945	364
10	717	428	180	190	245	220	1980	683	550	8290	886	357
11	638	477	170	225	245	200	1620	643	481	4310	804	367
12	610	383	155	215	240	220	1420	641	530	2720	719	362
13	667	403	158	230	235	212	1200	699	484	2300	702	443
14	637	470	160	230	230	212	1020	801	457	1690	638	649
15	579	404	150	240	230	190	956	778	666	1540	625	1090
16	623	388	144	255	230	165	862	717	1540	1380	617	1420
17	654	423	150	245	225	220	837	735	3010	1270	605	1320
18	546	356	250	255	220	265	1880	742	4770	1570	600	1090
19	585	400	280	250	215	190	3010	512	5340	2650	589	898
20	491	394	215	240	215	160	2540	587	4450	6730	566	1050
21	465	413	190	220	220	670	2050	605	3260	7170	590	972
22	402	358	290	240	215	1500	1840	669	2230	3670	588	751
23	459	419	290	250	235	2040	1760	612	1810	3040	514	666
24	554	287	230	265	250	2550	1680	572	1520	4350	396	631
25	734	292	240	250	225	2750	1500	537	1340	6800	495	603
26	567	580	305	215	220	2750	1390	516	1480	6630	507	571
27	469	640	330	250	240	2430	1320	403	1400	3950	556	540
28	491	585	220	250	235	2120	1270	428	1300	2740	552	513
29	412	400	205	245	---	1850	1150	726	1300	2330	530	487
30	446	345	180	250	---	1780	1110	873	1140	1910	407	473
31	522	---	160	270	---	1860	---	1510	---	1630	267	---
TOTAL	17667	13282	6547	6969	6700	26469	47705	22153	50453	103805	25867	18655
MEAN	570	443	211	225	239	854	1590	715	1682	3349	834	622
MAX	745	640	330	270	270	2750	3010	1510	5340	8490	2650	1420
MIN	402	287	140	155	215	160	837	403	457	995	267	245
CFSM	.34	.27	.13	.14	.14	.51	.96	.43	1.01	2.02	.50	.37
IN.	.40	.30	.15	.16	.15	.59	1.07	.50	1.13	2.32	.58	.42
AC-FT	35040	26340	12990	13820	13290	52500	94620	43940	100100	205900	51310	37000

CAL YR 1977	TOTAL	113811	MEAN 312	MAX 1780	MIN 106	CFSM .19	IN 2.55	AC-FT	225700	
WTR YR 1978	TOTAL	346272	MEAN 949	MAX 8490	MIN 140	CFSM .57	IN 7.76	AC-FT	686800	

05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA

LOCATION.--Lat 42°37'50", long 92°32'24", in SW1/4 SE1/4 sec.6, T.90 N., R.14 W., Black Hawk County, Hydrologic Unit 07080204, on left bank 100 ft (30 m) downstream from bridge on county highway C55 at Finchford, 3.2 mi (5.1 km) upstream from Shell Rock River, and 5.0 mi (8.0 km) upstream from mouth.

DRAINAGE AREA.--846 mi² (2,191 km²).

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 (264.426 m) NGVD. Prior to June 10, 1955, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. An authorized diversion is made into Big Marsh, 16 mi (26.7 km) upstream from gage, of 2,100 acre-ft each year between September 1 and November 15. Net effect on daily flows at gage is unknown. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--33 years, 443 ft³/s (12.55 m³/s), 7.11 in/yr (181 mm/yr), 321,000 acre-ft/yr (396 hm³/yr); median of yearly mean discharges, 350 ft³/s (9.9 m³/s), 5.6 in/yr (142 mm/yr), 254,000 acre-ft/yr (313 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft³/s (903 m³/s) June 27, 1951, gage height, 17.28 ft (5.267 m), from floodmarks; minimum daily, 5.9 ft³/s (0.17 m³/s) Feb. 26, 27, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of about 14 ft (4 m), from information by local resident, discharge, about 12,800 ft³/s (362 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft³/s (70.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 21	0630	2,500	70.8	10.16	3.097
June 20	1700	*7,860	223	*13.57	4.136
July 8	2300	7,650	217	13.50	4.115

Minimum daily discharge, 84 ft³/s (2.379 m³/s) Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	398	496	180	120	92	95	545	668	326	1060	457	165
2	457	454	160	110	93	98	516	623	323	1140	441	140
3	480	442	153	110	93	98	489	588	313	1190	396	126
4	411	415	134	104	92	100	559	565	297	1010	360	120
5	345	386	130	104	94	104	797	545	281	580	331	116
6	292	364	97	104	96	104	994	524	268	702	310	112
7	268	346	105	110	96	104	949	512	255	1500	289	108
8	378	335	115	105	97	104	966	527	241	5210	275	105
9	481	334	110	100	96	104	871	549	235	5990	261	101
10	557	326	104	98	94	114	1060	551	222	4020	261	99
11	515	305	95	95	93	125	1030	529	210	2770	247	95
12	468	282	94	94	92	136	896	509	216	1830	233	95
13	432	262	94	93	91	140	756	589	212	1430	226	131
14	405	251	98	92	90	130	658	681	230	1230	219	513
15	370	247	104	92	89	130	589	658	695	1110	212	1250
16	332	239	110	91	88	148	544	611	1100	1030	208	1720
17	301	226	140	90	86	214	528	570	1570	1030	199	1630
18	275	215	185	92	86	295	1300	532	2530	1060	178	1170
19	256	204	210	92	86	440	2010	502	3510	762	178	924
20	239	204	170	94	86	800	2240	485	7150	650	175	952
21	225	197	150	94	85	1500	2450	470	6990	702	172	991
22	214	179	140	94	84	2050	2020	454	6040	870	172	942
23	216	170	155	95	86	2430	1580	434	5360	1400	145	904
24	290	200	160	96	87	2030	1370	419	4450	1430	128	778
25	414	174	150	98	90	1340	1220	405	2930	1460	133	670
26	421	184	135	100	93	970	1080	387	2200	1180	133	582
27	419	180	135	100	95	845	965	370	1790	842	162	514
28	389	165	135	98	94	766	867	351	1500	716	197	440
29	363	172	130	94	---	683	784	339	1260	608	212	405
30	338	190	124	92	---	617	721	327	1110	520	193	388
31	379	---	120	90	---	576	---	320	---	492	175	---
TOTAL	11328	8144	4122	3041	2544	17390	31454	15594	53814	45524	7278	18286
MEAN	365	271	133	98.1	90.9	561	1048	503	1794	1469	235	543
MAX	557	496	210	120	97	2430	2450	681	7150	5990	457	1720
MIN	214	165	94	90	84	95	489	320	210	492	128	95
CFSM	.43	.32	.16	.12	.11	.66	1.24	.60	2.12	1.74	.28	.64
IN.	.50	.36	.18	.13	.11	.76	1.38	.69	2.37	2.00	.32	.72
AC-FT	22470	16150	8180	6030	5050	34490	62390	30930	106700	90300	14440	32300

CAL YR 1977	TOTAL	47831	MEAN 131	MAX 557	MIN 12	CFSM .16	IN 2.10	AC-FT	94870		
WTR YR 1978	TOTAL	216519	MEAN 593	MAX 7150	MIN 84	CFSM .70	IN 9.52	AC-FT	429500		

05459000 SHELL ROCK RIVER NEAR NORTHWOOD, IA

LOCATION.--Lat 43°24'51", long 93°13'14", in NW1/4 NW1/4 sec.9, T.99 N., R.20 W., Worth County, Hydrologic Unit 07080202, on right bank 50 ft (15 m) downstream from bridge on county highway A27, 1.3 mi (2.1 km) downstream from Drainage ditch 2, 2.0 mi (3.2 km) south of Northwood, 3.7 mi (6.0 km) upstream from Elk Creek, and 84.5 mi (136.0 km) upstream from mouth.

DRAINAGE AREA.--300 mi² (777 km²).

PERIOD OF RECORD.--October 1945 to current year. Prior to April 1948 monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1948 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,176.48 ft (358.591 m) NGVD. Prior to May 17, 1956, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--33 years, 140 ft³/s (3.965 m³/s), 6.34 in/yr (161 mm/yr), 101,400 acre-ft/yr (125 hm³/yr); median of yearly mean discharges, 130 ft³/s (3.68 m³/s), 5.9 in/yr (150 mm/yr), 94,200 acre-ft/yr (116 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,400 ft³/s (96.3 m³/s) Apr. 8, 1965, gage height, 12.07 ft (3.679 m), backwater from ice; no flow Jan. 14-19, 26-30, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 15	1045	1,140	32.3	7.95	2.423
June 17	1015	*1,290	36.5	*8.25	2.515
June 26	1545	809	22.9	7.16	2.182
July 6	1245	1,270	36.0	8.21	2.502
July 27	0345	703	19.9	6.51	1.984

Minimum daily discharge, 11 ft³/s (0.31 m³/s) Feb. 23,24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	32	37	32	24	20	261	111	197	380	383	42
2	40	37	37	31	24	23	254	103	188	381	331	38
3	40	37	35	31	25	23	242	96	174	347	291	35
4	36	34	32	31	24	23	244	88	156	298	254	35
5	32	33	30	31	24	23	247	85	147	265	217	33
6	31	30	31	31	24	23	236	75	134	1040	191	30
7	38	29	31	30	25	23	232	71	119	781	171	29
8	45	30	31	29	24	23	223	71	117	664	151	28
9	54	31	31	28	24	23	198	82	113	574	138	26
10	65	30	30	27	24	23	189	90	103	502	126	25
11	69	31	29	27	24	23	186	74	86	438	111	26
12	76	32	28	27	23	25	172	72	77	370	100	76
13	71	31	29	27	23	30	168	110	80	368	92	236
14	56	30	32	27	23	35	150	135	93	345	82	179
15	51	27	36	26	23	38	122	113	935	328	88	142
16	51	26	44	25	23	44	108	92	859	301	90	109
17	46	26	49	24	20	51	110	80	1210	263	85	88
18	42	26	49	23	18	60	119	75	1160	220	70	81
19	45	26	44	24	16	74	142	74	1090	193	71	71
20	39	26	41	25	14	97	166	67	1050	189	64	75
21	33	37	38	25	13	130	171	69	992	227	56	83
22	30	29	35	25	12	176	162	61	908	438	51	76
23	31	34	34	25	11	224	165	55	830	635	48	66
24	34	30	34	25	11	276	158	52	764	673	45	59
25	34	29	33	25	13	290	164	50	765	674	45	56
26	35	31	33	25	14	264	157	47	741	674	46	52
27	34	32	33	24	16	220	149	55	635	697	49	47
28	34	34	32	23	18	250	141	72	558	651	49	48
29	33	36	32	23	---	340	133	151	491	579	51	44
30	33	37	32	23	---	288	122	167	427	511	49	43
31	34	---	32	24	---	275	---	178	---	444	45	---
TOTAL	1330	933	1074	823	557	3437	5281	2721	15199	14440	3640	1978
MEAN	42.9	31.1	34.6	26.6	19.9	111	176	87.8	507	466	117	65.9
MAX	76	37	49	32	25	340	261	178	1210	1040	383	236
MIN	30	26	28	23	11	20	108	47	77	189	45	25
CFSM	.14	.10	.12	.09	.07	.37	.59	.29	1.69	1.55	.39	.22
IN.	.16	.12	.13	.10	.07	.43	.65	.34	1.88	1.79	.45	.25
AC-FT	2640	1850	2130	1630	1100	6820	10470	5400	30150	28540	7220	3920

CAL YR 1977	TOTAL	10417.61	MEAN	28.5	MAX	116	MIN	.00	CFSM .10	IN 1.29	AC-FT	20660
WTR YR 1978	TOTAL	51413.00	MEAN	141	MAX	1210	MIN	11	CFSM .47	IN 5.38	AC-FT	102000

05459500 WINNEBAGO RIVER AT MASON CITY, IA

LOCATION.--Lat 43°09'54", long 93°11'33", in NE1/4 NW1/4 sec.3, T.96 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, on right bank 650 ft (198 m) upstream from Thirteenth Street Bridge in Mason City, 0.1 mi (0.2 km) downstream from Calmus Creek, and 1.0 mi (1.6 km) upstream from Willow Creek.

DRAINAGE AREA.--526 mi² (1,362 km²).

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 (326.011 m) NGVD. Prior to Oct. 15, 1934, nonrecording gage at datum 6.47 ft (1.97 m) 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 winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--46 years, 233 ft³/s (6.598 m³/s), 6.02 in/yr (153 mm/yr), 168,800 acre-ft/yr (208 hmΔ/yr); median of yearly mean discharges, 190 ft³/s (5.38 m³/s), 4.9 in/yr (124 mm/yr), 138,000 acre-ft/yr (170 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s (306 m³/s) Mar. 30, 1933, gage height, 15.7 ft (4.79 m), present datum; minimum daily, 2.6 ft³/s (0.071 m³/s) Dec. 29-31, 1933, Aug. 5, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft³/s (56.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 15	1715	*2,430	68.8	*7.36	2.243
June 17	1230	2,160	60.9	7.01	2.137

Minimum daily discharge, 9.8 ft³/s (0.28 m³/s) Feb. 11-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	63	26	16	20	11	243	121	258	394	223	40
2	43	67	26	16	15	11	208	110	249	355	200	39
3	38	64	24	17	13	11	195	106	206	313	178	40
4	29	57	22	18	12	11	194	98	165	277	162	33
5	25	57	18	17	12	11	181	93	135	260	146	26
6	21	61	16	15	12	11	209	86	114	1190	136	23
7	31	49	15	14	13	11	205	84	99	1250	126	24
8	58	50	15	13	13	11	181	109	82	914	122	23
9	73	50	17	15	11	11	170	111	69	715	114	19
10	73	55	16	19	9.9	11	166	102	57	581	108	18
11	83	40	15	18	9.8	11	158	100	45	489	103	16
12	89	44	15	17	9.8	12	144	100	38	445	99	42
13	74	39	15	14	9.8	12	112	115	29	419	91	210
14	65	41	16	14	10	13	106	119	35	373	87	295
15	68	46	18	14	10	14	98	110	1660	329	99	209
16	57	44	22	15	11	15	95	116	1860	286	106	136
17	61	48	30	19	12	16	98	111	1940	262	94	109
18	49	41	52	16	13	17	225	89	1680	233	86	98
19	42	40	82	14	13	39	292	89	1440	193	81	92
20	39	39	57	14	11	240	253	82	1470	170	73	99
21	39	27	38	15	11	558	253	75	1320	236	73	113
22	40	29	39	17	11	620	245	64	1070	543	75	112
23	40	33	35	15	11	500	237	59	917	803	69	95
24	53	28	30	13	11	440	217	56	794	695	59	80
25	65	26	21	12	11	430	201	50	866	592	54	71
26	63	24	18	13	11	400	176	45	1060	521	58	66
27	57	23	17	19	11	373	164	76	789	438	73	63
28	54	22	18	28	11	308	157	593	635	351	68	56
29	53	22	17	35	---	253	145	302	536	298	60	53
30	51	23	17	29	---	245	134	273	457	263	53	45
31	63	---	16	26	---	249	---	263	---	241	44	---
TOTAL	1626	1241	783	537	328.3	4875	5462	3907	20075	14429	3120	2345
MEAN	52.5	41.4	25.3	17.3	11.7	157	182	126	669	465	101	78.2
MAX	89	67	82	35	20	620	292	593	1940	1250	223	295
MIN	21	22	15	12	9.8	11	95	45	29	170	44	16
CFSM	.10	.08	.05	.03	.02	.30	.35	.24	1.27	.88	.19	.15
IN.	.11	.09	.06	.04	.02	.34	.39	.28	1.42	1.02	.22	.17
AC-FT	3230	2460	1550	1070	651	9670	10830	7750	39820	28620	6190	4650

CAL YR 1977 TOTAL 15032.6 MEAN 41.2 MAX 282 MIN 4.5 CFSM .08 IN 1.06 AC-FT 29820
WTR YR 1978 TOTAL 58728.3 MEAN 161 MAX 1940 MIN 9.8 CFSM .31 IN 4.15 AC-FT 116500

05460000 CLEAR LAKE AT CLEAR LAKE, IA

LOCATION.—Lat 43°08'01", long 93°22'57", in SE1/4 NE1/4 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 mi² (58.5 km²).

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 (372.539 m) NGVD, and 4.60 ft (1.40 m) 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 (15 m) long at elevation 1,226.84 ft (373.941 m) NGVD. 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 (1,460 hm²).

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.94 ft (1.811 m) July 3, 1951; minimum observed, 1.16 ft (0.354 m) Dec. 20, 22-24, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 2.85 ft (0.869 m) July 5; minimum, 1.97 ft (0.600 m) Nov. 19.

GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.10	2.14	2.09	2.13	---		---	2.34	2.36	2.52	2.50	2.31
2	2.11	2.13	2.09	2.13	---		---	2.35	2.31	2.49	2.48	2.30
3	2.10	2.14	2.07	2.12	---		---	2.33	2.28	2.46	2.46	2.26
4	2.10	2.11	2.07	2.12	---		2.27	2.28	2.28	2.45	2.43	2.26
5	2.09	2.10	2.07	2.12	---		2.25	2.28	2.25	2.51	2.44	2.25
6	2.06	2.11	2.07	2.12	---		2.34	2.28	2.24	2.68	2.40	2.25
7	2.06	2.12	2.05	2.12	---		2.28	2.24	2.21	2.68	2.40	2.24
8	2.18	2.10	2.07	2.12	---		2.24	2.38	2.18	2.64	2.36	2.20
9	2.14	2.16	2.06	2.12	---		2.31	2.35	2.17	2.64	2.33	2.20
10	2.16	2.17	2.06	2.12	---		2.34	2.32	2.19	2.61	2.32	2.19
11	2.20	2.11	2.06	2.12	---		2.37	2.32	2.13	2.60	2.30	2.18
12	2.15	2.07	2.06	2.10	---		2.43	2.30	2.10	2.58	2.30	2.25
13	2.15	2.07	2.06	2.11	---		2.33	2.33	2.08	2.59	2.28	2.60
14	2.14	2.07	2.06	2.12	---		2.27	2.30	2.08	2.58	2.26	2.65
15	2.13	2.10	2.05	2.12	---		2.25	2.27	2.41	2.56	2.34	2.64
16	2.12	2.09	2.05	2.12	---		2.25	2.28	2.44	2.57	2.37	2.63
17	2.13	2.13	2.08	2.12	---		2.18	2.28	2.47	2.57	2.32	2.62
18	2.08	2.08	2.09	---	---		2.31	2.27	2.50	2.57	2.30	2.64
19	2.07	2.01	2.09	---	---		2.39	2.27	2.50	2.53	2.30	2.66
20	2.06	2.20	2.11	---	---		2.40	2.27	2.56	2.53	2.26	2.70
21	2.05	2.08	2.11	---	---		2.38	2.24	2.55	2.57	2.26	2.72
22	2.03	2.03	2.10	---	2.13		2.37	2.21	2.54	2.61	2.26	2.71
23	2.03	2.06	2.10	---	---		2.45	2.20	2.52	2.63	2.31	2.71
24	2.08	2.07	2.10	---	---		2.40	2.19	2.52	2.64	2.25	2.69
25	2.10	2.09	2.10	---	---		2.38	2.20	2.56	2.61	2.25	2.68
26	2.10	2.08	2.09	---	---		2.38	2.20	2.55	2.60	2.29	2.68
27	2.09	2.08	2.09	---	---		2.38	2.23	2.55	2.58	2.35	2.65
28	2.08	2.08	2.08	---	---		2.37	2.31	2.52	2.56	2.35	2.64
29	2.08	2.08	2.08	---	---		2.37	2.33	2.51	2.54	2.32	2.64
30	2.05	2.08	2.08	---	---		2.35	2.34	2.51	2.52	2.30	2.63
31	2.13	---	2.09	---	---		---	2.31	---	2.52	2.30	---
MEAN	2.10	2.10	2.08	---	---		---	2.28	2.37	2.57	2.34	2.49
MAX	2.20	2.20	2.11	---	---		---	2.38	2.56	2.68	2.50	2.72
MIN	2.03	2.01	2.05	---	---		---	2.19	2.08	2.45	2.25	2.18

05462000 SHELL ROCK RIVER AT SHELL ROCK, IA

LOCATION.--Lat 42°39'10", long 92°35'46", in NE1/4 NW1/4 sec.11, T.91 N., R.15 W., Butler County, Hydrologic Unit 07080202, on right bank 400 ft (122 m) upstream from bridge on county highway C45 in Shell Rock, 2.2 mi (3.5 km) downstream from Curry Creek, and 10.4 mi (16.7 km) upstream from mouth.

DRAINAGE AREA.--1,746 mi² (4,522 km²).

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 (269.852 m) above mean sea level.

REMARKS.--Records good except those for winter period, which are poor. Diurnal fluctuation at low stages caused by powerplant at Greene. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--25 years, 836 ft³/s (23.68 m³/s), 6.50 in/yr (165 mm/yr), 605,700 acre-ft/yr (747 hm³/yr); median of yearly mean discharges, 700 ft³/s (19.8 m³/s), 5.4 in/yr (137 mm/yr), 507,000 acre-ft/yr (625 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,500 ft³/s (949 m³/s) Mar. 28, 1961, gage height, 16.26 ft (4.956 m); minimum daily, 38 ft³/s (1.08 m³/s) Feb. 9, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1856 reached a stage of 17.7 ft (5.39 m) at bridge 400 ft (122 m) downstream; from information furnished by Corps of Engineers, discharge, about 45,000 ft³/s (1,270 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge m³/s	Gage Height (ft)	Gage Height (m)
June 18	1630	*9,320	264	*12.31	3.752	July 7	1630	9,060	257	12.24	3.731

Minimum daily discharge, 156 ft³/s (4.418 m³/s) Feb.7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	326	403	240	212	169	168	889	736	800	1520	1230	422
2	301	380	240	224	166	169	839	696	769	1370	1140	407
3	280	374	240	224	165	163	822	664	764	1260	1040	399
4	285	361	232	224	164	163	1070	640	712	1180	963	387
5	278	354	218	220	166	160	876	617	645	1090	906	376
6	268	343	184	222	164	169	1020	591	581	4100	853	366
7	272	342	210	210	156	170	991	572	548	8500	806	359
8	416	333	210	170	159	167	955	588	503	6230	773	350
9	372	329	202	192	167	169	905	607	465	3880	747	340
10	389	348	191	184	170	180	1010	587	428	3000	715	333
11	393	321	186	182	168	182	902	572	408	2400	690	320
12	411	308	186	181	170	185	856	573	388	2020	666	320
13	422	290	201	190	175	197	795	655	363	1760	642	527
14	407	300	211	190	176	202	738	609	365	1570	618	1170
15	386	305	218	190	177	211	704	608	1010	1420	583	1200
16	354	308	239	190	172	216	667	606	3900	1290	564	933
17	342	305	321	186	168	223	658	577	5140	1190	569	766
18	339	300	434	184	172	235	1410	547	8730	1140	561	666
19	328	285	412	184	171	277	1770	512	6600	1010	523	605
20	314	289	352	187	175	448	1480	495	5160	952	493	613
21	298	296	269	187	169	1200	1270	490	5590	1180	493	619
22	291	284	320	187	161	2000	1200	472	4150	1380	495	620
23	301	242	350	187	166	2000	1120	455	3180	2150	475	599
24	365	274	310	189	172	1800	1070	437	2730	2520	456	547
25	383	190	250	190	172	1180	1010	418	2460	2260	438	502
26	370	202	260	187	169	1120	953	402	3130	2080	476	459
27	368	220	255	184	169	1090	899	366	2940	1950	549	436
28	351	233	265	182	175	1120	845	359	2300	1750	530	408
29	337	234	262	176	---	1120	807	670	1970	1600	481	398
30	327	235	250	169	---	1020	771	810	1730	1450	447	392
31	404	---	238	168	---	934	---	886	---	1330	438	---
TOTAL	10678	8958	7955	5952	4723	18638	29302	17817	68459	66532	20360	15839
MEAN	344	299	257	192	169	601	977	575	2282	2146	657	528
MAX	422	403	434	224	177	2000	1770	886	8730	8500	1230	1200
MIN	268	190	184	168	156	160	658	359	363	952	438	320
CFSM	.20	.17	.15	.11	.10	.34	.56	.33	1.31	1.23	.38	.30
IN.	.23	.19	.17	.13	.10	.40	.62	.38	1.46	1.42	.43	.34
AC-FT	21180	17770	15780	11810	9370	36970	58120	35340	135800	132000	40380	31420

CAL YR 1977 TOTAL 77726 MEAN 213 MAX 776 MIN 38 CFSM .12 IN 1.65 AC-FT 154200
WTR YR 1978 TOTAL 275214 MEAN 754 MAX 8730 MIN 156 CFSM .43 IN 5.85 AC-FT 545900

05463000 BEAVER CREEK AT NEW HARTFORD, IA

LOCATION.--Lat 42°30'50", long 92°37'55", in SE1/4 SE1/4 sec.28, T.90 N., R.15 W., Butler County, Hydrologic Unit 07080205, on downstream side of center bridge pier of bridge on county highway T55, 0.2 mi (0.3 km) north of New Hartford, and 8 mi (12.9 km) upstream from mouth.

DRAINAGE AREA.--347 mi² (899 km²).

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 (268.968 m) NGVD. Prior to July 14, 1959, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--33 years, 183 ft³/s (5.183 m³/s), 7.16 in/yr (182 mm/yr), 132,600 acre-ft/yr (163 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft³/s (510 m³/s) June 13, 1947, gage height, 13.5 ft (4.11 m), from graph based on gage readings, from rating curve extended above 14,000 ft³/s (396 m³/s); minimum daily, 2.3 ft³/s (0.065 m³/s) Jan. 20-24, 1956, Jan. 24, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft³/s (39.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 21	1600	1,770	50.1	8.48	2.585	June 18	1445	2,380	67.4	9.04	2.755
Apr. 19	0800	1,880	53.2	8.59	2.618	June 21	1530	*2,520	71.4	*9.15	2.789

Minimum daily discharge, 17 ft³/s (0.48 m³/s) Dec. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	220	52	57	41	36	193	228	153	214	120	46
2	172	218	49	55	41	35	176	213	146	195	112	44
3	157	195	44	53	42	34	167	205	142	178	103	43
4	131	174	40	53	43	34	161	200	136	163	96	41
5	113	158	37	53	44	36	157	192	131	154	90	39
6	98	150	33	55	44	36	230	182	127	186	86	38
7	96	145	30	55	44	35	258	183	128	209	82	38
8	134	138	27	55	44	34	234	206	123	170	79	37
9	208	135	24	54	44	36	234	217	115	160	76	36
10	198	131	21	54	43	39	335	204	109	158	70	36
11	171	119	19	54	43	48	386	194	103	143	71	35
12	148	110	17	53	42	56	324	190	102	133	69	34
13	130	107	19	53	42	40	268	282	96	127	66	72
14	118	105	20	53	41	39	235	446	128	120	63	131
15	107	100	22	53	40	46	217	350	827	113	61	149
16	98	95	24	52	39	100	205	298	514	107	59	112
17	92	88	26	52	38	174	209	269	896	102	57	90
18	86	80	56	52	37	250	920	246	2180	537	58	83
19	80	74	94	52	36	410	1740	231	1590	1070	59	80
20	75	72	95	52	35	915	1070	324	1220	404	53	209
21	70	62	110	52	35	1600	725	406	2360	321	52	461
22	67	55	110	51	35	1230	582	284	1400	431	55	336
23	74	64	110	51	35	725	516	249	616	371	53	237
24	133	62	100	51	37	445	466	231	474	295	47	194
25	222	124	86	52	37	318	398	214	389	240	58	168
26	229	114	78	50	37	271	350	194	336	209	55	151
27	196	78	69	45	36	255	316	181	283	185	69	137
28	172	58	62	42	36	247	287	174	246	165	80	124
29	154	54	60	41	---	223	267	169	360	151	65	116
30	140	51	58	41	---	207	247	161	247	140	55	109
31	158	---	56	41	---	203	---	158	---	129	50	---
TOTAL	4176	3336	1648	1587	1111	8157	11873	7281	15677	7280	2169	3426
MEAN	135	111	53.2	51.2	39.7	263	396	235	523	235	70.0	114
MAX	229	220	110	57	44	1600	1740	446	2360	1070	120	461
MIN	67	51	17	41	35	34	157	158	96	102	47	34
CFSM	.39	.32	.15	.15	.11	.76	1.14	.68	1.51	.68	.20	.33
IN.	.45	.36	.18	.17	.12	.87	1.27	.78	1.68	.78	.23	.37
AC-FT	8280	6620	3270	3150	2200	16180	23550	14440	31100	14440	4300	6800

CAL YR 1977	TOTAL	16266.3	MEAN	44.6	MAX	229	MIN	2.3	CFSM	.13	IN	1.74	AC-FT	32260
WTR YR 1978	TOTAL	67721.0	MEAN	186	MAX	2360	MIN	.17	CFSM	.54	IN	7.26	AC-FT	134300

IOWA RIVER BASIN

05463050 CEDAR RIVER AT CEDAR FALLS, IA

WATER-QUALITY RECORDS

LOCATION.--Lat 42°32'20", long 92°26'58", in NW1/4 NE1/4 sec.12, T.89 N., R.14 W., Black Hawk County, Hydrologic Unit 07080205, at bridge on U.S. Highway 20 at Cedar Falls, 1.1 mi (1.8 km) upstream from Dry Run, and at mile 196.0 (315.4 km) above mouth of Iowa River.

DRAINAGE AREA.--4,734 mi² (12,261 km²).

PERIOD OF RECORD.--Water years 1975 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 8.1 mi (13.0 km) downstream at Waterloo. No significant inflow between gaging station and sampling site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
04...	1120	1600	63	23	12	3.3	250	0	210	42	24
NOV											
02...	0930	1910	66	23	12	2.7	260	0	210	48	27
DEC											
19...	1200	2320	69	20	10	2.6	200	0	160	43	24
FEB											
08...	0830	652	78	24	16	2.4	280	0	230	45	24
APR											
27...	1330	4300	84	25	10	2.8	240	3	200	53	30
JUL											
19...	1600	5680	64	19	6.5	3.2	220	0	180	38	18
SEP											
05...	1500	1150	69	20	13	2.5	200	0	160	45	18

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
04...	4.6	.09	1.0	1.1	5.7	25	.19	350	.48	1510
NOV										
02...	4.7	.00	.82	.82	5.5	24	.17	353	.48	1820
DEC										
19...	6.3	.28	.82	1.1	7.4	33	.18	321	.44	2010
FEB										
08...	3.4	.57	.29	.86	4.3	19	.27	359	.49	632
APR										
27...	8.2	.05	1.8	1.8	10	44	.14	327	.44	3800
JUL										
19...	5.4	.01	1.4	1.4	6.8	30	.32	316	.43	4850
SEP										
05...	1.5	.05	1.3	1.3	2.8	12	.15	265	.36	823

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
04...	399	556	8.3	13.5	15	--	--	39	2.0	--
NOV										
02...	386	580	8.4	11.0	14	--	--	24	1.7	290
DEC										
19...	372	510	8.3	.5	8.4	--	--	7	1.6	--
FEB										
08...	366	430	8.1	.0	1.2	--	--	53	3.6	320
APR										
27...	439	600	8.5	15.5	8.6	8.4	86	28	1.2	110
JUL										
19...	459	460	8.5	26.5	65	--	--	56	1.1	290
SEP										
05...	321	460	8.3	25.0	6.8	7.9	96	10	1.6	1350

05463500 BLACK HAWK CREEK AT HUDSON, IA

LOCATION.--Lat 42°24'28", long 92°27'47", in SW1/4 NE1/4 sec.27, T.88 N., R.14 W., Black Hawk County, Hydrologic Unit 07080205, on left bank 35 ft (11 m) downstream from bridge on State Highway 58, 0.2 mi (0.3 km) northwest of Chicago Great Western Railway tracks at the west edge of Hudson, 4.5 mi (7.2 km) upstream from Prescotts Creek, and 9.5 mi (15.4 km) upstream from mouth.

DRAINAGE AREA.--303 mi² (785 km²).

PERIOD OF RECORD.--April 1952 to current year.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 865.03 ft (263.661 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--25 years, 156 ft³/s (4.418 m³/s), 6.99 in/yr (178 mm/yr), 113,000 acre-ft/yr (139 hm³/yr); median of yearly mean discharges, 130 ft³/s (3.68 m³/s), 5.8 in/yr (147 mm/yr), 94,200 acre-ft/yr (116 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,300 ft³/s (547 m³/s) July 9, 1969, gage height, 18.23 ft (5.557 m); minimum daily, 0.12 ft³/s (0.003 m³/s) Jan. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 22	1100	*2,720	77.0	*14.66	4.468
Apr. 19	0900	1,730	49.0	13.02	3.968
Sept. 21	2145	1,500	42.5	12.25	3.734

Minimum daily discharge, 12 ft³/s (0.34 m³/s) Dec. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	131	35	46	28	27	208	240	198	205	81	62
2	51	149	33	43	28	28	181	221	250	180	75	52
3	56	155	29	41	28	28	173	213	195	155	71	46
4	56	151	25	41	28	29	165	206	173	139	64	41
5	52	141	25	41	27	30	158	194	157	129	58	38
6	49	132	20	41	27	31	313	180	146	123	54	36
7	46	124	18	42	26	31	351	187	142	125	52	34
8	94	116	18	41	26	32	283	213	175	113	51	32
9	141	110	17	42	26	33	273	220	137	110	49	32
10	116	105	14	41	25	34	666	197	122	103	47	29
11	93	98	13	41	25	35	498	187	115	95	46	28
12	77	91	12	42	25	36	382	184	107	90	45	32
13	67	85	12	42	25	38	298	382	95	91	43	124
14	60	79	13	42	25	40	246	562	100	80	43	373
15	54	75	13	42	24	42	218	432	747	77	41	308
16	49	71	14	42	24	50	199	359	649	70	41	188
17	46	68	33	42	24	63	203	312	609	66	40	422
18	45	63	94	41	23	96	1040	278	1040	75	40	425
19	42	60	130	40	23	200	1630	254	425	444	38	335
20	39	61	120	39	23	580	977	278	870	396	38	886
21	38	52	88	38	22	1400	667	258	998	231	37	1410
22	38	49	74	37	22	2200	566	228	485	345	41	1100
23	50	52	68	37	23	970	517	216	371	316	38	608
24	240	49	64	36	24	493	476	204	311	227	32	501
25	408	66	63	35	24	350	417	190	270	175	30	414
26	327	49	63	35	25	285	373	176	239	150	61	357
27	228	40	62	32	26	270	340	167	203	128	649	317
28	180	37	56	31	27	273	312	362	219	109	264	278
29	149	34	52	29	---	241	289	206	381	99	128	257
30	129	34	49	29	---	216	265	185	268	93	85	240
31	122	---	46	28	---	215	---	167	---	85	69	---
TOTAL	3186	2527	1374	1199	703	8396	12684	7658	10197	4824	2451	9005
MEAN	103	84.2	44.3	38.7	25.1	271	423	247	340	156	79.1	300
MAX	408	155	130	46	28	2200	1630	562	1040	444	649	1410
MIN	38	34	12	28	22	27	158	167	95	66	30	28
CFSM	.34	.28	.15	.13	.08	.89	1.40	.82	1.12	.52	.26	.99
IN.	.39	.31	.17	.15	.09	1.03	1.56	.94	1.25	.59	.30	1.11
AC-FT	6320	5010	2730	2380	1390	16650	25160	15190	20230	9570	4860	17860

CAL YR 1977	TOTAL	13524.93	MEAN	37.1	MAX	408	MIN	.12	CFSM .12	IN 1.66	AC-FT	26830
WTR YR 1978	TOTAL	64204.00	MEAN	176	MAX	2200	MIN	12	CFSM .58	IN 7.88	AC-FT	127300

05464000 CEDAR RIVER AT WATERLOO, IA

LOCATION.--Lat 42°29'44", long 92°20'03", in NW1/4 NW1/4 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 (0.5 km) upstream from Eleventh Avenue Bridge in Waterloo, 1.1 mi (1.8 km) downstream from Black Hawk Creek, and at mile 187.9 (302.3 km) above mouth of Iowa River.

DRAINAGE AREA.--5,146 mi² (13,328 km²).

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 (251.198 m) NGVD.

REMARKS.--Records good except those for winter period, which are fair. Slight diurnal fluctuation during low flow caused by powerplant above station. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--38 years, 2,719 ft³/s (77.00 m³/s), 7.18 in/yr (182 mm/yr), 1,970,000 acre-ft/yr (2,430 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,700 ft³/s (2,170 m³/s) Mar. 29, 1961, gage height, 21.86 ft (6.663 m); minimum daily, 152 ft³/s (4.30 m³/s) Jan. 28, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 16, 1929, reached a stage of about 20 ft (6.1 m), determined by Corps of Engineers, from information by City of Waterloo, discharge, 65,000 ft³/s (1,840 m³/s). Flood of Apr. 2, 1933, reached a stage of about 19.5 ft (5.9 m), from information by City of Waterloo, discharge, 61,000 ft³/s (1,730 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 13,000 ft³/s (368 m³/s) and maximum (*):

		Discharge		Gage Height				Discharge		Gage Height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
June 20	0330	17,700	501	10.73	3.271	July 10	1300	*18,000	510	*10.82	3.298

Minimum daily discharge, 625 ft³/s (17.7 m³/s) Mar. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1450	1780	1140	1150	715	700	3840	3250	3950	4840	3890	1190
2	1680	1890	1120	1100	692	717	3530	2870	3690	4350	3540	1140
3	1640	1850	1080	1050	678	697	3300	2800	3140	4130	3200	1210
4	1550	1740	1030	1010	667	625	3760	2660	2810	3940	2900	1190
5	1440	1650	894	1000	667	634	4400	2530	2530	3720	4040	1150
6	1330	1580	795	987	640	700	4300	2410	2310	4120	3800	1120
7	1380	1560	739	998	650	709	4720	2360	2130	9090	2970	1090
8	1540	1550	740	970	652	697	4260	2400	2030	13200	2420	1050
9	1840	1550	730	960	655	702	4400	2440	1850	16300	2340	1040
10	1910	1490	717	940	671	733	5200	2420	1710	17800	2200	990
11	1840	1440	745	920	679	783	5040	2330	1560	14600	2070	984
12	1770	1390	752	899	674	761	4330	2300	1480	9850	1950	1090
13	1710	1310	797	831	684	801	3490	2970	1440	7540	1830	1770
14	1600	1290	829	822	726	818	3230	3330	1460	6080	1750	2550
15	1540	1330	869	803	706	819	2920	3130	3980	5170	1690	3810
16	1600	1270	930	811	698	838	2690	2650	6130	4660	1640	4390
17	1490	1510	1130	789	687	901	2780	2570	9730	4240	1590	4770
18	1450	1260	1630	784	686	1040	5090	2620	13300	4510	1580	4150
19	1380	1190	2290	780	687	1380	8780	2290	16300	5650	1570	3430
20	1330	1260	2100	779	697	2470	9630	2340	17300	7910	1490	4690
21	1280	1180	1180	764	682	5130	9000	2440	17300	10500	1490	4890
22	1250	1160	1160	745	678	9010	7100	2280	16300	8620	1550	4690
23	1350	1150	1300	755	687	9330	6320	2190	13300	6990	1400	3740
24	1500	1130	1500	762	709	7840	5690	2070	10900	8090	1270	3180
25	1850	889	2000	773	704	6820	5080	1990	9300	9960	1350	2680
26	2110	860	1850	737	714	5830	4690	1900	8170	11300	1550	2500
27	1790	806	1650	750	705	5430	4360	1770	7880	9220	2370	2320
28	1730	949	1480	760	721	4930	4030	1800	6820	6700	1980	2110
29	1620	1040	1300	760	---	4490	3730	1870	6260	5680	1720	1990
30	1510	1120	1240	752	---	4190	3480	2450	5530	4900	1540	1890
31	1570	---	1170	734	---	4090	---	2730	---	4330	1280	---
TOTAL	49030	40174	36887	26675	19211	84615	142170	76160	200590	237990	65960	72794
MEAN	1582	1339	1190	860	686	2730	4739	2457	6686	7677	2128	2426
MAX	2110	1890	2290	1150	726	9330	9630	3330	17300	17800	4040	4890
MIN	1250	806	717	734	640	625	2690	1770	1440	3720	1270	984
CFSM	.31	.26	.23	.17	.13	.53	.92	.48	1.30	1.49	.41	.47
IN.	.35	.29	.27	.19	.14	.61	1.03	.55	1.45	1.72	.48	.53
AC-FT	97250	79690	73170	52910	38110	167800	282000	151100	397900	472100	130800	144400

CAL YR 1977	TOTAL	312923	MEAN	857	MAX	2650	MIN 275	CFSM .17	IN 2.26	AC-FT	620700
WTR YR 1978	TOTAL	1052256	MEAN	2883	MAX	17800	MIN 625	CFSM .56	IN 7.61	AC-FT	2087000

05464020 CEDAR RIVER NEAR GILBERTVILLE, IA

WATER-QUALITY RECORDS

LOCATION.--Lat 42°24'54", long 92°13'00", in SW1/4 SW1/4 sec.23, T.88 N., R.12 W., Black Hawk County, Hydrologic Unit 07080205, at bridge on county highway D38 at Gilbertville, 1.4 mi (2.2 km) upstream from Indian Creek, and at mile 176.5 (284.0 km) above mouth of Iowa River.

DRAINAGE AREA.--5,234 mi² (13,556 km²).

PERIOD OF RECORD.--Water years 1971, 1975 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 11.4 mi (18.3 km) upstream at Waterloo. No significant inflow between gaging station and sampling site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
04...	1400	1600	64	22	14	3.3	240	0	200	45	28
NOV											
02...	1100	1910	70	24	14	2.5	270	0	220	52	28
DEC											
19...	1545	2320	74	21	13	2.9	220	0	180	44	27
FEB											
08...	1200	652	76	23	19	2.5	260	1	220	46	28
APR											
27...	1500	4300	81	24	11	2.9	240	7	210	52	30
JUL											
19...	1800	5680	68	19	8.2	3.0	160	0	130	37	20
SEP											
06...	0900	1150	47	20	16	2.7	200	0	160	46	24

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
04...	4.6	.04	1.4	1.4	6.0	27	.29	345	.47	1490
NOV										
02...	4.6	.06	.93	.99	5.6	25	.26	362	.49	1870
DEC										
19...	5.8	.21	1.3	1.5	7.3	32	.30	334	.45	2090
FEB										
08...	3.4	.90	.30	1.2	4.6	20	.45	355	.48	625
APR										
27...	8.4	.01	1.6	1.6	10	44	.19	321	.44	3730
JUL										
19...	5.9	.00	2.0	2.0	7.9	35	.20	318	.43	4880
SEP										
06...	1.4	.10	1.5	1.6	3.0	13	.26	264	.36	820

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
04...	403	560	8.0	15.5	15	--	--	38	3.8	340
NOV										
02...	402	580	8.5	12.5	14	--	--	20	1.4	1700
DEC										
19...	393	580	8.1	.5	11	--	--	19	2.8	270
FEB										
08...	358	560	8.4	.0	1.4	--	--	20	1.7	--
APR										
27...	437	625	8.4	16.0	9.1	8.4	88	30	1.6	310
JUL										
19...	494	480	8.4	28.0	39	--	--	48	1.0	1200
SEP										
06...	329	500	8.0	19.0	9.5	7.6	84	18	3.2	42000

05464130 FOURMILE CREEK NEAR LINCOLN, IA

LOCATION.--Lat 42°13'32", long 92°36'39", in SW1/4 SW1/4 sec.28, T.86 N., R.15 W., Tama County, Hydrologic Unit 07080205, on left bank 10 ft (3 m) downstream from bridge on county highway, 1.0 mi (1.6 km) upstream from Half Mile Creek and 4.7 mi (7.6 km) southeast of Lincoln.

DRAINAGE AREA.--13.78 mi² (35.7 km²).

PERIOD OF RECORD.--October 1962 to September 1967, October 1969 to September 1974, June 1976 to current year.

GAGE.--Water-stage recorder and concrete control with V-notch sharp-crested weir. Datum of gage is 931.26 ft (283.848 m) NGVD.

REMARKS.--Records good except those for winter period which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, (1963-67, 1970-74, 76-78), 5.39 ft³/s (0.238 m³/s), 8.27 in/yr (210 mm/yr), 6,080 acre-feet/yr (7.50 hm³/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft³/s (41.1 m³/s) June 22, 1974, gage height, 13.98 ft (4.261 m); no flow Dec. 4 to Feb. 23, July 4, 5, 13, 14, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 350 ft³/s (9.91 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 19	1915	ice jam		*12.62	3.847	Apr. 18	0330	*424	12.0	12.38	3.773

Minimum daily discharge, 0.30 ft³/s (0.008 m³/s) Dec. 6.

REVISIONS.-- Revised daily and peak discharges for water years 1963-74 are given below. These figures supersede those published in WSP 1914, 2114 and in the reports for 1963-74.

Discharge, in cubic feet per second, 1970 water year:

Apr. 7	5.4	Apr. 12	4.7	Apr. 17	4.3	Apr. 22	6.1				
8	5.2	13	5.1	18	4.3	23	6.4				
9	5.1	14	4.7	19	5.4	24	5.4				
10	4.9	15	4.7	20	7.5	25	5.1				
11	4.7	16	4.6	21	6.4						

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
April 1970	156.9	5.23	7.5	4.3	.38	.42	311
Wtr. yr.	2,117.99	5.80	261	.41	.42	5.72	4,200

Discharge, in cubic feet per second, 1971 water year:

May 24	61	June 5	7.2	June 17	5.9	June 29	3.2
25	20	6	7.0	18	8.5	30	5.4
26	14	7	13	19	6.8	July 1	4.1
27	11	8	7.7	20	7.7	2	3.8
28	10	9	6.8	21	7.5	3	3.6
29	9.0	10	5.7	22	6.8	4	17
30	8.8	11	5.4	23	5.9	5	14
31	11	12	6.4	24	4.1	6	9.3
June 1	31	13	31	25	3.9	7	82
2	10	14	10	26	3.9	8	123
3	8.2	15	9.1	27	3.6		
4	7.5	16	8.2	28	3.3		

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
May 1971	307.0	9.90	61	3.1	.72	.83	609
June 1971	250.7	8.36	31	3.2	.61	.68	497
July 1971	379.8	12.3	123	2.4	.89	1.03	753
Wtr. yr.	4,313.17	11.8	411	.20	.86	11.64	8,560

Discharge, in cubic feet per second, 1973 water year:

Dec. 16	10	Dec. 18	14	Jan. 26	19	Feb. 1	170
17	12	Jan. 17	150	27	20	July 4	243

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
December 1972	631.4	20.4	350	5.0	1.48	1.70	1,250
January 1973	534.4	17.2	150	5.6	1.25	1.44	1,060
February 1973	546.0	19.5	170	5.0	1.42	1.47	1,080
July 1973	601.0	19.4	243	6.1	1.41	1.62	1,190
Wtr. yr.	7,931.8	21.7	350	1.3	1.58	21.41	15,730

Discharge in cubic feet per second, 1974 water year:

Mar. 2	63	Mar. 5	20	Mar. 8	16	Mar. 11	16
3	37	6	17	9	16	June 9	283
4	28	7	16	10	16	22	277

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
March 1974	484.1	15.6	63	6.9	1.13	1.31	960
June 1974	1,350	45.0	283	14	3.27	3.64	2,680
Wtr. yr.	4,991.3	13.7	283	1.6	.99	13.47	9,900

05464130 FOURMILE CREEK NEAR LINCOLN--Continued

Peak discharges, above base of 350 ft³/s (9.91 m³/s) and annual maximum (*):

Water year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1963	July 18	---	*342	9.69	*11.61	3.539
1964	Sept. 8	---	*110	3.12	*8.79	2.679
1965	Mar. 1	1115	402	11.4	12.01	3.661
	Apr. 5	1945	*421	11.9	*12.14	3.700
1966	Feb. 8	0915	400	11.3	ice jam	
1967	Jan. 24	---	*240	6.80	a*12.34	3.761
1970	Mar. 2	1730	*508	14.4	*12.59	3.837
1971	Mar. 13	1900	*510	14.4	*12.60	3.840
1972	Mar. 6	---	370	10.5	ice jam	
1973	Dec. 30	---	550	15.6	ice jam	
	Feb. 1	---	380	10.8	ice jam	
1974	June 9	0445	767	21.7	13.59	4.142
	June 22	0600	*893	25.3	*13.98	4.261
	July 9	---	400	11.3	--	
	July 26	1730	*514	14.6	*12.62	3.847
	May 23	0315	362	10.2	11.75	3.581
	July 8	0900	362	10.2	11.72	3.572
	June 13	2215	*379	10.7	*11.86	3.603
	Apr. 16	0900	410	11.6	12.07	3.679
	July 4	0700	*590	16.7	*12.96	3.950
	July 4	0500	366	10.4	11.77	3.587
	July 10	1945	390	11.0	11.93	3.636

a Ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	8.7	1.8	2.4	1.3	1.1	7.0	9.4	19	6.1	1.9	1.3
2	2.3	6.2	1.6	2.3	1.3	1.1	6.3	8.9	8.4	5.6	1.7	1.1
3	1.6	5.2	1.5	2.2	1.3	1.1	5.9	8.6	7.7	5.0	1.5	.96
4	1.3	4.4	1.2	2.2	1.2	1.1	5.6	8.1	7.3	4.7	1.3	.85
5	1.1	4.1	.60	2.2	1.2	1.1	9.5	7.7	7.2	4.4	1.2	.77
6	.83	4.0	.30	2.5	1.2	1.1	20	7.4	6.9	4.5	1.1	.75
7	2.6	3.7	1.2	3.0	1.2	1.1	12	8.5	6.7	4.4	1.0	.72
8	15	3.5	1.1	2.9	1.2	1.1	9.9	9.3	6.5	3.9	.97	.69
9	6.2	3.4	1.3	2.7	1.2	1.2	30	8.6	6.2	4.0	.90	.59
10	3.4	3.1	1.4	2.5	1.2	1.3	35	8.1	6.1	3.5	.83	.56
11	2.8	2.7	1.4	2.3	1.2	1.4	16	8.1	5.8	3.4	.80	.56
12	2.3	2.5	.90	2.1	1.2	1.5	12	8.0	5.3	3.4	.75	.55
13	2.0	2.5	.84	2.0	1.2	1.6	9.8	38	5.0	3.2	.67	2.9
14	1.8	2.6	1.6	1.9	1.2	1.6	8.9	23	5.3	2.9	.59	19
15	1.6	2.6	2.0	1.8	1.2	2.0	8.2	16	18	2.8	.58	6.1
16	1.4	2.5	2.7	1.7	1.2	10	7.8	14	7.4	2.6	.62	3.9
17	1.3	2.3	61	1.7	1.2	57	29	13	6.9	2.7	.55	4.3
18	1.2	2.1	28	1.6	1.2	41	155	11	6.2	2.9	.46	7.2
19	1.1	2.1	11	1.6	1.2	84	51	11	5.9	6.4	.45	9.1
20	.96	2.2	8.8	1.6	1.2	88	31	10	39	4.5	.38	75
21	.89	2.1	7.8	1.5	1.2	72	22	9.5	13	4.1	.60	36
22	1.1	1.9	7.0	1.5	1.2	58	17	9.2	11	3.9	.73	18
23	10	2.0	6.3	1.5	1.2	23	14	9.0	9.6	3.5	.51	14
24	40	1.9	5.8	1.5	1.2	13	9.7	8.5	8.9	3.1	.41	12
25	21	1.7	5.3	1.5	1.1	9.5	11	8.1	8.4	2.9	.41	9.7
26	9.2	1.6	4.8	1.5	1.1	9.0	14	7.7	7.8	2.8	2.4	8.3
27	6.4	1.6	4.2	1.1	1.1	9.7	13	34	6.9	2.5	20	7.8
28	4.9	1.7	3.8	1.2	1.1	9.5	12	11	13	2.3	5.0	6.9
29	4.0	1.8	3.4	1.2	---	8.2	11	8.2	7.4	2.2	2.7	6.8
30	3.7	1.8	3.1	1.3	---	8.0	10	7.2	6.4	2.1	1.9	6.2
31	10	---	2.7	1.3	---	8.2	---	9.2	---	2.0	1.5	---
TOTAL	164.78	88.5	184.44	58.3	33.5	527.5	603.6	358.3	279.2	112.3	54.41	262.60
MEAN	5.32	2.95	5.95	1.88	1.20	17.0	20.1	11.6	9.31	3.62	1.76	8.75
MAX	40	8.7	61	3.0	1.3	88	155	38	39	6.4	20	75
MIN	.83	1.6	.30	1.1	1.1	1.1	5.6	7.2	5.0	2.0	.38	.55
CFSM	.39	.21	.43	.14	.09	1.23	1.46	.84	.68	.26	.13	.64
IN.	.44	.24	.50	.16	.09	1.42	1.63	.97	.75	.30	.15	.71
AC-FT	327	176	366	116	66	1050	1200	711	554	223	108	521

CAL YR 1977 TOTAL 613.02 MEAN 1.68 MAX 61 MIN .00 CFSM .12 IN 1.65 AC-FT 1220
WTR YR 1978 TOTAL 2727.43 MEAN 7.47 MAX 155 MIN .30 CFSM .54 IN 7.35 AC-FT 5410

05464133 HALF MILE CREEK NEAR GLADBROOK, IA

LOCATION.--Lat 42°12'40", long 92°36'39", in SW1/4, SW1/4 sec.33, T.86 N., R.15 W., Tama County, Hydrologic Unit 07080205, on right bank 10 ft (3 m) downstream from bridge on county highway, 0.8 mi (1.3 km) upstream from mouth, and 5.3 mi (8.5 km) northeast of Gladbrook.

DRAINAGE AREA.--1.33 mi² (3.44 km²).

PERIOD OF RECORD.--October 1962 to September 1967, October 1969 to September 1974, June 1976 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 948.16 ft (288.999 m) NGVD.

REMARKS.--Records fair except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years (1963-67, 2020-74, 76-78) 0.78 ft³/s (0.022 m³/s), 7.96 in/yr (202 mm/yr), 565 acre-feet/yr (0.697 hm³/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 307 ft³/s (8.69 m³/s) July 9, 1965, gage height, 9.24 ft (2.816 m); no flow several days in 1964-67, 1971-72, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 90 ft³/s (2.55 m³/s) and maximum (*):

		Discharge		Gage Height				Discharge		Gage Height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
Mar. 19	1715	ice jam	---	*9.98	3.042	Aug. 26	2135	*180	5.10	7.85	2.393
Apr. 18	0005	97	2.75	6.57	2.003	Sept. 19	2000	122	3.46	6.90	2.103
May 27	1705	114	3.23	6.78	2.067						

Minimum daily discharge, 0.01 ft³/s (0.003 m³/s) Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.88	.95	.22	.14	.11	.11	.82	1.1	3.2	.72	.16	.11
2	.49	.83	.21	.15	.11	.11	.76	1.1	1.9	.65	.14	.10
3	.38	.78	.20	.18	.11	.12	.74	1.1	1.5	.59	.12	.09
4	.31	.70	.20	.25	.11	.12	.65	1.0	1.3	.56	.11	.08
5	.26	.68	.12	.22	.10	.12	3.9	.95	1.1	.51	.10	.07
6	.22	.62	.11	.21	.10	.13	3.9	1.0	1.0	.52	.09	.07
7	2.5	.58	.13	.20	.10	.13	2.0	1.1	.99	.51	.08	.06
8	1.4	.53	.14	.20	.10	.14	1.6	1.3	.88	.44	.07	.06
9	.78	.50	.15	.20	.10	.14	5.3	1.2	.83	.47	.07	.05
10	.64	.42	.19	.19	.10	.15	2.6	1.1	.79	.39	.06	.05
11	.55	.36	.22	.19	.10	.16	1.9	1.0	.75	.37	.06	.05
12	.46	.35	.24	.19	.10	.18	1.4	1.1	.68	.38	.05	.05
13	.42	.34	.25	.18	.10	.21	1.1	8.5	.66	.36	.04	.20
14	.38	.34	.31	.18	.10	.35	.90	2.7	.69	.34	.04	1.4
15	.32	.32	.35	.18	.10	.51	.82	2.2	1.6	.32	.04	.40
16	.30	.30	.45	.18	.10	1.0	.75	2.1	.99	.28	.04	.30
17	.30	.28	1.8	.18	.09	1.3	7.4	1.8	.92	.28	.04	.40
18	.23	.26	.60	.17	.09	4.0	13	1.6	.79	.54	.03	.52
19	.23	.27	.50	.17	.09	6.8	1.9	1.6	.74	1.3	.03	7.7
20	.24	.26	.45	.16	.09	8.2	2.4	1.5	4.2	.44	.03	12
21	.24	.23	.40	.16	.09	5.0	2.5	1.3	1.4	.42	.05	4.2
22	.33	.25	.42	.16	.09	2.8	2.2	1.3	1.2	.40	.04	2.6
23	4.7	.24	.37	.15	.09	2.0	2.2	1.2	1.0	.33	.03	1.8
24	4.6	.22	.35	.15	.09	1.5	1.8	1.2	.89	.31	.01	1.4
25	2.4	.23	.33	.14	.10	1.0	1.7	1.1	.84	.29	.02	1.2
26	1.5	.24	.34	.14	.10	1.6	1.6	1.1	.75	.27	15	1.0
27	1.1	.23	.37	.13	.10	2.1	1.5	5.3	.67	.22	.40	.88
28	.89	.20	.32	.13	.11	1.7	1.4	2.3	3.2	.20	.24	.82
29	.79	.22	.25	.13	---	1.2	1.3	1.7	1.2	.19	.16	.80
30	.71	.23	.20	.12	---	1.3	1.2	1.4	.80	.18	.13	.74
31	1.2	---	.16	.12	---	1.1	---	2.3	---	.17	.12	---
TOTAL	29.75	11.96	10.35	5.25	2.77	45.28	71.24	55.25	37.46	12.95	17.60	39.20
MEAN	.96	.40	.33	.17	.099	1.46	2.37	1.78	1.25	.42	.57	1.31
MAX	4.7	.95	1.8	.25	.11	8.2	13	8.5	4.2	1.3	15	12
MIN	.22	.20	.11	.12	.09	.11	.65	.95	.66	.17	.01	.05
CFSM	.72	.30	.25	.13	.07	1.10	1.78	1.34	.94	.32	.43	.99
IN.	.83	.33	.29	.15	.08	1.27	1.99	1.54	1.05	.36	.49	1.10
AC-FT	59	24	21	10	5.5	90	141	110	74	26	35	78

CAL YR 1977 TOTAL 96.54 MEAN .26 MAX 18 MIN .00 CFSM .20 IN 2.70 AC-FT 191
WTR YR 1978 TOTAL 339.06 MEAN .93 MAX 15 MIN .01 CFSM .70 IN 9.48 AC-FT 673

05464137 FOURMILE CREEK NEAR TRAER, IA

LOCATION.--Lat 42°12'07", long 92°33'44", NW1/4 SE1/4 sec.2, T.85 N., R.15 W., Tama County, Hydrologic Unit 07080205, on left bank 10 ft (3 m) downstream from bridge on county highway T69, 2.0 mi (3.2 km) upstream from mouth, and 5.0 mi (8.0 km) northwest of Traer.

DRAINAGE AREA.--19.51 mi² (50.53 km²).

PERIOD OF RECORD.--July 1962 to September 1974, October 1975 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 905.87 ft (276.109 m) above mean sea level.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years (water years 1963-74, 76-78), 11.1 ft³/s (0.314 m³/s), 7.73 in/yr (196 mm/yr), 8,040 acre-ft/yr (9.913 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,040 ft³/s (29.5 m³/s) June 22, 1974, gage height, 12.91 ft (3.935 m); maximum gage height, 13.41 ft (4.087 m) Feb. 19, 1971, backwater from ice; no flow for many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft³/s (11.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 19	2130	ice jam		*10.50	3.200	Apr. 18	0230	*249	7.05	9.44	2.877

Minimum daily discharge, 0.61 ft³/s (0.02 m³/s) Aug. 20.

REVISIONS.-- Revised daily and peak discharges for water years 1963-74 are given below. These figures supersede those published in WSP 1914, Z114 and in the reports for 1963-74.

Discharge, in cubic feet per second, 1970 water year.

Feb. 2	2.1	Feb. 12	2.2	Feb. 24	80	Sept. 23	2.9
3	2.0	13	2.1	25	30	24	26
4	2.0	14	1.9	26	15	25	18
5	2.1	15	1.8	27	10	26	32
6	2.2	16	2.0	28	80	27	15
7	2.4	18	3.5	Mar. 2	400	28	11
9	2.9	19	6.0	May 14	110	29	9.2
10	2.7	22	80	23	86	30	7.5
11	2.4	23	128	24	51		

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
February 1970	441.4	15.8	128	1.8	0.81	0.84	876
March 1970	906.7	29.2	400	6.5	1.50	1.73	1,800
May 1970	548.2	17.7	110	4.4	.91	1.05	1,090
September 1970	173.14	5.77	32	.75	.30	.33	343
Wtr. yr.	2,973.89	8.15	400	.44	.42	5.67	5,900

Discharge, in cubic feet per second, 1971 water year:

Oct. 1	5.8	Oct. 17	17	July 1	5.6	July 17	7.1
2	6.2	18	16	2	5.0	18	6.6
3	5.5	19	14	3	6.0	19	5.8
4	5.2	20	14	4	26	20	5.5
5	5.2	21	13	5	14	21	5.2
6	4.8	22	14	6	10	22	4.7
7	4.7	23	14	7	8.9	23	4.7
8	7.1	24	15	8	146	24	4.4
9	166	25	14	9	21	25	4.1
10	55	26	13	10	78	26	3.9
11	37	27	13	11	33	27	3.7
12	32	28	13	12	17	28	3.8
13	27	29	12	13	13	29	3.4
14	23	30	12	14	10	30	3.3
15	20	31	11	15	9.2	31	3.0
16	18			16	7.9		

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
October 1970	628.5	20.3	166	4.7	1.04	1.20	1,250
July 1971	479.8	15.5	146	3.0	.79	.91	952
Wtr. yr.	5,925.49	16.2	384	.24	.83	11.30	11,750

Discharge, in cubic feet per second, 1972 water year:

June 14 329

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
June 1972	1,032.9	34.4	329	4.6	1.76	1.97	2,050
Wtr. yr.	4,093.48	11.2	329	.22	.57	7.80	8,120

05464137 FOURMILE CREEK NEAR TRAER, IA--Continued

Discharge, in cubic feet per second, 1973 water year:

May 1	50	May 24	21	June 16	24	July 9	17
2	46	25	20	17	22	10	15
3	38	26	21	18	44	11	14
4	33	27	73	19	30	12	13
5	31	28	89	20	24	13	12
6	31	29	62	21	21	14	11
7	94	30	48	22	18	15	10
8	83	31	40	23	16	16	9.6
9	62	June 1	36	24	16	17	9.4
10	51	2	34	25	15	18	8.6
11	43	3	36	26	15	19	8.9
12	38	4	48	27	16	20	9.4
13	35	5	56	28	14	21	9.9
14	33	6	38	29	13	22	11
15	31	7	32	30	13	23	10
16	29	8	29	July 1	12	24	9.4
17	27	9	27	2	14	25	8.9
18	26	10	25	3	21	26	8.6
19	25	11	24	4	237	27	8.4
20	23	12	29	5	38	28	7.5
21	23	13	25	6	31	29	22
22	23	14	24	7	27	30	31
23	22	15	24	8	20	31	13

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
May 1973	1,271	41.0	94	20	2.10	2.42	2,520
June 1973	788	26.3	56	13	1.35	1.50	1,560
July 1973	677.6	21.9	237	7.5	1.12	1.29	1,340
Wtr. yr.	9,469.9	25.9	340	2.4	1.33	18.05	18,780

Discharge, in cubic feet per second, 1974 water year:

May 13	24	June 2	22	June 22	316	July 12	24
14	31	3	21	23	51	13	21
15	24	4	19	24	40	14	18
16	57	5	18	25	35	15	16
17	38	6	18	26	33	16	15
18	84	7	18	27	31	17	14
19	51	8	18	28	30	18	13
20	42	9	252	29	27	19	13
21	39	10	76	30	25	20	12
22	35	11	50	July 1	24	21	12
23	31	12	43	2	22	22	13
24	29	13	38	3	22	23	12
25	28	14	36	4	64	24	10
26	27	15	34	5	31	25	10
27	26	16	32	6	29	26	10
28	34	17	31	7	26	27	9.4
29	29	18	29	8	24	28	9.4
30	27	19	29	9	22	29	8.2
31	24	20	27	10	43	30	7.7
June 1	22	21	26	11	38	31	7.3

Month	Total	Mean	Max	Min	Cfsm	In.	Ac-ft
May 1974	828.8	26.7	84	9.8	1.37	1.58	1,640
June 1974	1,447	48.2	316	18	2.47	2.76	2,870
July 1974	600.0	19.4	64	7.3	.99	1.14	1,190
Wtr. yr.	5,963.8	16.3	316	1.0	.84	11.37	11,830

Peak discharges, above base of 400 ft³/s (11.3 m³/s) and annual maximum (*):

Water year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1963	July 18	--	*338	9.57	*11.24	3.426						
1964	Apr. 2	--	*157	4.45	9.48	2.890						
1965	Mar. 1	1600	*493	14.0	*11.91	3.630	Apr. 5	1500	466	13.2	11.82	3.603
	July 9	1200	408	11.6	11.59	3.533						
1966	July 26	2300	*520	14.7	*12.00	3.658						
1967	Jan. 24	--	*340	9.63	a*12.50	3.810						
1968	Mar. 8	--	*233	6.60	*10.40	3.170						
1969	Mar. 17	2330	*685	19.4	*12.39	3.776	July 8	1445	568	16.1	12.12	3.694
	July 18	0945	650	18.4	12.32	3.755						
1970	Mar. 2	1515	*514	14.6	*11.98	3.652						
1971	Mar. 13	2330	*584	16.5	*12.16	3.706						
1972	June 14	0600	*520	14.7	*12.00	3.658						
1973	Feb. 1	1500	*596	16.9	*12.19	3.716						
1974	June 9	0715	700	19.8	12.42	3.786	June 22	0800	*1,040	29.4	*12.91	3.935

a Ice jam

05464137 FOURMILE CREEK NEAR TRAER, IA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	12	2.6	3.7	2.3	1.7	12	15	24	8.1	2.3	1.8
2	4.9	9.7	2.5	3.5	2.2	1.6	10	14	11	7.5	2.1	1.6
3	3.7	8.8	2.2	3.4	2.2	1.7	9.3	13	10	6.9	1.9	1.5
4	3.1	8.0	1.5	3.3	2.1	1.7	8.7	12	9.0	6.6	1.8	1.3
5	2.6	7.5	.85	3.3	2.1	1.7	18	12	7.8	6.0	1.7	1.2
6	2.2	7.2	1.2	4.2	2.0	1.7	39	11	7.2	6.1	1.6	1.1
7	5.4	6.7	1.9	6.0	2.0	1.8	18	14	6.8	6.0	1.5	1.1
8	12	6.3	1.7	5.8	2.0	1.8	11	15	5.7	5.3	1.4	.97
9	8.2	6.3	2.1	5.4	1.9	1.9	21	14	5.1	5.5	1.3	1.1
10	6.0	5.5	2.4	5.2	1.9	2.0	49	13	4.1	4.9	1.2	.89
11	5.2	5.0	2.3	4.9	1.9	2.2	28	12	3.9	4.6	1.2	.86
12	4.4	4.6	1.8	4.7	1.8	2.5	21	12	3.3	4.7	1.1	.96
13	3.9	4.7	2.2	4.6	1.8	2.7	15	44	2.2	4.5	1.0	4.2
14	3.6	4.7	3.3	4.5	1.8	3.0	13	32	1.9	4.0	.91	27
15	3.2	4.7	4.3	4.4	1.8	3.5	12	26	18	3.8	.88	8.9
16	2.8	4.4	6.5	4.4	1.8	17	10	23	8.0	3.5	.84	5.8
17	2.7	4.0	64	4.4	1.7	74	34	20	4.2	3.5	.79	5.4
18	2.5	3.7	39	4.3	1.7	55	186	18	2.8	4.1	.76	8.8
19	2.3	3.7	26	4.1	1.7	120	65	17	1.8	10	.69	12
20	2.1	3.7	16	3.9	1.7	130	51	16	40	6.2	.61	53
21	2.1	3.6	12	3.7	1.7	80	43	15	19	5.5	.87	38
22	2.4	3.5	11	3.5	1.7	54	37	14	15	5.3	1.2	25
23	11	3.4	10	3.3	1.7	35	37	14	13	4.6	.84	20
24	28	3.1	9.2	3.1	1.7	17	29	13	12	4.1	.65	16
25	21	2.8	8.5	3.0	1.7	13	24	12	11	3.9	.66	14
26	14	2.6	7.6	2.9	1.7	13	21	12	9.8	3.7	3.6	12
27	10	2.6	6.9	2.8	1.7	16	18	26	8.7	3.2	24	11
28	8.6	2.6	6.0	2.6	1.7	17	18	23	13	2.8	7.7	9.5
29	7.5	2.7	5.3	2.5	---	15	17	16	11	2.8	4.0	9.3
30	7.2	2.7	4.6	2.4	---	14	16	14	8.5	2.6	2.7	9.0
31	10	---	4.0	2.3	---	15	---	13	---	2.5	2.1	---
TOTAL	208.5	150.8	269.45	120.1	52.0	716.5	891.0	525	297.8	152.8	73.90	303.28
MEAN	6.73	5.03	8.69	3.87	1.86	23.1	29.7	16.9	9.93	4.93	2.38	10.1
MAX	28	12	64	6.0	2.3	130	186	44	40	10	24	53
MIN	2.1	2.6	.85	2.3	1.7	1.6	8.7	11	1.8	2.5	.61	.86
CFSM	.35	.26	.45	.20	.10	1.18	1.52	.87	.51	.25	.12	.52
IN.	.40	.29	.51	.23	.10	1.37	1.70	1.00	.57	.29	.14	.58
AC-FT	414	299	534	238	103	1420	1770	1040	591	303	147	602

CAL YR 1977 TOTAL 850.12 MEAN 2.33 MAX 64 MIN .00 CFSM .12 IN 1.62 AC-FT 1690
WTR YR 1978 TOTAL 3761.13 MEAN 10.3 MAX 186 MIN .61 CFSM .53 IN 7.17 AC-FT 7460

05464450 CEDAR RIVER NEAR PALO, IA

WATER-QUALITY RECORDS

LOCATION.--Lat 42°03'09", long 91°46'16", in NE1/4 NE1/4 sec.33, T.84 N., R.8 W., Linn County, Hydrologic Unit 07080205, at bridge on county highway E36, 1.2 mi (1.9 km) upstream from Otter Creek, 1.5 mi (2.4 km) southeast of Palo, 2.4 mi (3.9 km) downstream from Bear Creek, and at mile 124.2 (199.8 km) above mouth of Iowa River.

DRAINAGE AREA.--6,380 mi² (16,524 km²).

PERIOD OF RECORD.--Water years 1975 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 11.5 mi (18.5 km) downstream at Cedar Rapids. No significant inflow between gaging station and sampling site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
03...	1400	3020	70	21	12	3.0	230	0	190	47	26
NOV											
01...	1300	3190	71	22	12	2.2	250	0	210	61	25
DEC											
12...	1145	1100	69	24	17	2.4	290	0	240	57	33
FEB											
07...	1200	950	81	23	16	2.2	260	0	210	55	24
APR											
25...	1330	8380	76	22	9.4	2.6	220	0	180	46	26
SEP											
06...	1130	1480	31	19	14	2.6	88	0	72	45	20

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
03...	5.8	.14	1.3	1.4	7.2	32	.25	342	.47	2790
NOV										
01...	6.8	.00	1.2	1.2	8.0	35	.19	390	.53	3360
DEC										
12...	4.9	.48	.62	1.1	6.0	27	.23	378	.51	1120
FEB										
07...	4.2	.57	.21	.78	5.0	22	.33	366	.50	939
APR										
26...	12	.06	1.5	1.5	14	60	.24	362	.49	8190
SEP										
06...	.36	.04	2.2	2.2	2.6	11	.22	200	.27	799

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
03...	419	550	8.4	15.0	21	--	--	36	1.5	270
NOV										
01...	411	600	8.1	12.0	12	--	--	16	3.2	310
DEC										
12...	415	651	8.3	.0	3.0	--	--	24	2.3	280
FEB										
07...	370	580	8.2	.0	1.6	--	--	27	2.6	130
APR										
25...	462	560	8.1	14.0	30	9.8	97	18	2.8	K350
SEP										
06...	285	360	8.9	23.5	79	7.8	94	41	.2	460

05464500 CEDAR RIVER AT CEDAR RAPIDS, IA

LOCATION.--Lat 41°58'14", long 91°40'01", in SE1/4 NW1/4 sec.28, T.83 N., R.7 W., Linn County, Hydrologic Unit 07080205, on right bank 400 ft (122 m) upstream from bridge on Eighth Avenue in Cedar Rapids, 2.7 mi (4.3 km) upstream from Prairie Creek, and at mile 112.7 (181.3 km) upstream from mouth of Iowa River.

DRAINAGE AREA.--6,510 mi² (16,861 km²).

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 1568: 1915-18 (M), 1920 (M), 1922 (M), 1929, 1933, 1943.

GAGE.--Water-stage recorder. Datum of gage is 700.47 ft (213.503 m) NGVD. Prior to Aug. 20, 1920, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--76 years, 3,238 ft³/s (91.70 m³/s), 6.75 in/yr (171 mm/yr), 2,346,000 acre-ft/yr (2,893 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 73,000 ft³/s (2,070 m³/s) Mar. 31, 1961, gage height, 19.66 ft (5.992 m); maximum gage height, 20.0 ft (6.10 m) Mar. 18, 1929; minimum discharge, 53 ft³/s (1.50 m³/s) Jan. 6, 1950, caused by construction operations upstream; minimum daily, 212 ft³/s (6.00 m³/s) Dec. 10, 1949.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1851 reached a stage of about 20 ft (6 m), discharge, 65,000 ft³/s (1,840 m³/s), estimated.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 12,000 ft³/s (340 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 23	0245	*19,700	557.90	*8.34	2.64
Apr. 21	2245	12,700	359.66	6.68	2.04
June 23	2100	18,000	509.76	7.88	2.40
July 13	0300	17,200	487.10	7.70	2.35
July 21	1100	13,700	387.98	6.86	2.09

Minimum daily discharge, 710 ft³/s (20.1 m³/s) Nov. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3330	3190	1260	1520	960	900	5010	4870	3290	8510	5090	1980
2	3350	3300	1330	1680	990	890	4760	4590	3900	6790	4650	1720
3	3050	3480	1380	1540	980	870	4440	4340	4480	5970	4260	1590
4	2950	3460	1400	1190	980	860	4210	4020	4090	5270	3880	1510
5	2800	3300	1120	1070	990	870	4160	3950	3710	4960	3560	1520
6	2600	3110	1130	1050	1070	870	6370	3760	3430	4660	3610	1480
7	2580	2970	810	920	950	900	7940	3650	3190	4600	4230	1440
8	3330	2850	890	1100	930	920	7100	3690	2960	6280	3640	1400
9	3730	2800	960	1320	890	910	6210	3660	2800	9550	3030	1350
10	3550	2730	1000	1200	830	900	6920	3600	2630	11700	2810	1290
11	3460	2610	1050	1090	820	940	8400	3530	2460	14100	2740	1270
12	3380	2440	1100	1130	790	980	7860	3500	2300	16300	2620	1230
13	3130	2340	1130	1070	780	990	6420	5100	2150	16800	2480	1630
14	2930	2250	1210	1140	770	1000	5320	6000	2100	12800	2340	1910
15	2830	2200	1200	1380	770	1040	4560	5740	2320	8510	2240	2380
16	2700	2170	1340	1400	840	1060	4220	5310	3260	6490	2160	3190
17	2550	2130	1780	1330	850	1080	3950	4760	5350	5620	2070	4090
18	2450	2050	2600	1250	860	1140	5500	4240	7280	5170	2020	4750
19	2350	2140	2900	1150	890	1400	8900	4060	9640	5590	2060	4690
20	2230	2030	2830	1120	920	1700	10800	3880	12000	7460	1950	4750
21	2090	1920	2340	1180	950	6000	12200	3590	14100	12200	1880	5210
22	2180	1900	2340	1180	920	8150	12400	3530	16200	10900	1860	6010
23	2350	1860	1730	1090	920	12200	10800	3600	17500	11300	1870	5860
24	3520	1820	1980	900	910	11600	9470	3400	17800	9680	1850	5190
25	4450	1730	2750	930	910	11000	8420	3270	16300	8340	1710	4320
26	4400	970	2820	1030	900	9030	7470	3100	13800	9210	1650	3810
27	4120	710	2260	1010	900	7610	6660	2950	11100	9720	2070	3330
28	3800	740	2000	960	910	6920	6080	2930	9570	8800	2670	3130
29	3350	830	1800	1020	---	6280	5640	2940	9200	9720	3040	2940
30	3100	1010	2000	1030	---	6700	5230	3020	9210	6960	2620	2770
31	3060	---	1680	990	---	5220	---	3040	---	5890	2250	---
TOTAL	95700	67040	52120	35970	25170	109930	207420	121520	218120	269840	84910	87740
MEAN	3087	2235	1681	1160	899	3546	6914	3920	7271	8705	2739	2925
MAX	4450	3480	2900	1680	1070	12200	12400	6000	17800	16800	5090	6010
MIN	2090	710	810	900	770	860	3950	2930	2100	4600	1650	1230
CFSM	.47	.34	.26	.18	.14	.55	1.06	.60	1.12	1.34	.42	.45
IN.	.56	.38	.30	.21	.14	.63	1.19	.69	1.25	1.54	.49	.60
AC-FT	189800	133000	103400	71350	49920	218000	411400	241000	432600	535200	168400	174000

CAL YR 1977	TOTAL	508381	MEAN	1393	MAX	12900	MIN	283	CFSM	.21	IN	2.91	AC-FT	1008000
WTR YR 1978	TOTAL	1375480	MEAN	3768	MAX	17800	MIN	710	CFSM	.68	IN	7.86	AC-FT	2728000

05464640 PRAIRIE CREEK AT FAIRFAX, IA

LOCATION.--Lat 41°55'22", long 91°47'02", in SE1/4 SW1/4 sec.9, T.82 N., R.8 W., Linn County, Hydrologic Unit 07080205, on right bank 12 ft (4 m) upstream from bridge on State Highway 149 at west side of Fairfax, and 10.7 mi (17.2 km) upstream from mouth.

DRAINAGE AREA.--178 mi² (461 km²).

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 737.00 ft (224.638 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, 132 ft³/s (3.738 m³/s), 10.07 in/yr (256 mm/yr), 95,630 acre-ft/yr (118 hm³/yr); median of yearly mean discharges, 110 ft³/s (3.12 m³/s), 8.4 in/yr (213 mm/yr), 79,700 ac-ft/yr (98.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,160 ft³/s (174 m³/s) May 16, 1974, gage height, 13.66 ft (4.164 m); no flow July 10-15, 30, Aug. 1, 3, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--An outstanding flood occurred in June 1944, stage and discharge unknown.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 20	2315	1,420	40.2	7.33	2.234
May 13	1730	1,620	45.9	7.75	2.362
June 26	1945	1,270	36.0	6.99	2.131
June 29	2100	3,280	92.9	10.46	3.188
July 20	0345	2,920	82.7	9.94	3.030
July 21	1830	*5,080	144	*12.58	3.834
Sept. 21	0130	1,260	35.7	6.98	2.128

Minimum daily discharge, 17 ft³/s (0.48 m³/s) Sept. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	548	248	70	52	38	26	124	121	88	360	89	30
2	314	260	69	47	38	27	110	107	82	275	80	27
3	192	258	69	44	38	27	105	102	78	214	72	25
4	147	226	68	43	39	27	96	99	73	178	64	24
6	122	201	68	42	39	28	100	92	69	152	61	22
6	100	198	67	41	39	29	110	80	66	132	57	21
7	106	187	67	40	38	30	140	103	63	124	54	20
8	402	176	66	40	39	33	180	141	61	107	52	19
9	298	171	66	40	39	37	300	137	58	603	48	18
10	210	158	66	40	39	50	1150	108	57	262	44	18
11	178	136	68	40	38	80	700	102	56	159	43	17
12	149	126	70	40	37	130	400	101	56	128	42	17
13	128	124	73	39	36	199	300	1130	56	119	38	132
14	116	126	82	39	36	221	240	800	56	94	36	93
15	104	126	110	39	34	263	200	502	208	85	35	75
16	91	120	150	39	33	330	180	396	160	74	34	51
17	85	110	200	38	32	430	160	334	115	67	31	43
18	80	100	300	38	30	370	720	290	83	70	35	75
19	73	96	220	38	29	681	540	255	58	1400	40	88
20	68	102	200	38	28	1160	450	237	310	1910	34	823
21	64	92	180	38	27	1200	350	208	344	3800	31	877
22	70	88	160	38	26	942	300	188	222	1730	36	414
23	151	84	140	37	26	485	270	174	180	519	36	275
24	774	80	130	37	26	270	240	158	154	354	32	209
25	605	76	120	37	26	169	230	145	136	273	30	163
26	407	75	106	37	26	146	215	133	788	220	36	137
27	330	74	90	38	26	179	192	122	438	174	85	119
28	258	73	80	38	26	227	172	112	318	140	96	100
29	228	72	72	38	---	182	156	106	2180	122	55	92
30	201	71	64	38	---	147	139	98	1060	109	39	89
31	212	---	66	38	---	143	---	94	---	97	34	---
TOTAL	6811	4034	3346	1231	927	8268	8569	6775	7673	14041	1499	4113
MEAN	220	134	108	39.7	33.1	267	286	219	256	453	48.4	137
MAX	774	260	300	52	39	1200	1150	1130	2180	3800	96	877
MIN	64	71	66	37	26	26	96	80	56	67	30	17
CFSM	1.24	.75	.61	.22	.19	1.50	1.61	1.23	1.44	2.55	.27	.77
IN.	1.42	.84	.70	.26	.19	1.73	1.79	1.42	1.60	2.93	.31	.86
AC-FT	13510	8000	6640	2440	1840	16400	17000	13440	15220	27850	2970	8160

CAL YR 1977	TOTAL	27545.08	MEAN	75.5	MAX	1860	MIN	.00	CFSM	.42	IN	5.76	AC-FT	54640
WTR YR 1978	TOTAL	67287.00	MEAN	184	MAX	3800	MIN	17	CFSM	1.03	IN	14.06	AC-FT	133500

05464760 CEDAR RIVER NEAR BERTRAM, IA

WATER-QUALITY RECORDS

LOCATION.--Lat 41°56'02", long 91°32'54", in SE1/4 NW1/4 sec.9, T.82 N., R.6 W., Linn County, Hydrologic Unit 07080206, at bridge on U.S. Highway 30, 0.2 mi (0.3 km) downstream from Big Creek, 1.7 mi (2.7 km) southwest of Bertram, and at mile 103.1 (165.9 km) above mouth of Iowa River.

DRAINAGE AREA.--6,955 mi² (18,013 km²).

PERIOD OF RECORD.--Water years 1975 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 9.6 mi (15.4 km) upstream at Cedar Rapids. No significant inflow between gaging station and sampling site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
03...	1030	3020	66	21	15	3.7	220	0	180	49	30
NOV											
01...	1020	3190	71	22	15	2.6	260	0	210	57	30
DEC											
12...	0930	1100	70	24	24	2.8	280	0	230	62	45
FEB											
07...	0930	950	78	23	27	2.7	250	0	210	55	42
APR											
25...	1500	8380	80	22	11	2.6	220	0	180	47	29
SEP											
06...	1300	1480	31	18	20	3.0	69	0	57	50	30

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
03...	6.8	.12	1.4	1.5	8.3	37	.34	346	.47	2820
NOV										
01...	6.7	.36	1.2	1.6	8.3	37	.31	384	.52	3310
DEC										
12...	4.8	1.8	.70	2.5	7.3	32	.39	423	.58	1260
FEB										
07...	3.8	1.8	.80	2.6	6.4	28	.58	390	.53	1000
APR										
25...	11	.23	1.4	1.6	13	56	.32	361	.49	8170
SEP										
06...	1.0	.24	2.8	3.0	4.0	18	.43	227	.31	907

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
03...	397	550	7.9	15.5	23	--	--	34	4.4	--
NOV										
01...	429	600	7.1	12.5	19	--	--	23	33	--
DEC										
12...	437	700	8.2	.5	3.7	--	--	44	2.8	--
FEB										
07...	395	625	8.3	.0	3.5	--	--	18	2.0	--
APR										
25...	433	560	8.1	14.0	27	9.6	95	29	2.8	29000
SEP										
06...	297	400	8.9	25.5	5.5	7.6	95	32	.1	15300

05465000 CEDAR RIVER NEAR CONESVILLE, IA

LOCATION.--Lat 41°24'36", long 91°17'06", in SW1/4 SW1/4 sec.2, T.76 N., R.4 W., Muscatine County, Hydrologic Unit 07080206, on right bank 10 ft (3 m) downstream from bridge on county highway G28, 3.4 mi (5.5 km) northeast of Conesville, 5.2 mi (8.4 km) downstream from Wapsinonoc Creek, 10.7 mi (17.2 km) upstream from mouth, and at mile 39.8 (64.0 km) upstream from mouth of Iowa River.

DRAINAGE AREA.--7,785 mi² (20,163 km²).

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 (177.378 m) NGVD. 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. 15, 1963, water-stage recorder, at site 150 ft (46 m) downstream on left bank at same datum.

REMARKS.--Records fair except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.-- Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--39 years, 4,348 ft³/s (123.1 m³/s), 7.58 in/yr (192 mm/yr), 3,150,000 acre-ft/yr (3,880 hm³/yr); median of yearly mean discharges, 3,990 ft³/s (113 m³/s), 7.0 in/yr (178 mm/yr), 2,891,000 acre-ft/yr (3,560 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 70,800 ft³/e (2,010 m³/s) Apr. 2, 1961, gage height, 16.62 ft (5.066 m); maximum gage height, 16.85 ft (5.136 m) Apr. 12, 1965; minimum daily discharge, 250 ft³/s (7.08 m³/s) Nov. 28, 1955, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of 15.8 ft (4.82 m), from information by local residents to Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 12,000 ft³/s (340 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 24	1500	14,000	396	11.40	3.475	June 26	0700	*19,000	538	*12.64	3.853
Apr. 11	1500	12,900	365	11.04	3.365	July 15	0245	17,000	481	12.21	3.722
Apr. 23	0730	14,900	422	11.67	3.557	July 23	0800	15,700	445	11.88	3.621

Minimum daily discharge, 1,280 ft³/s (36.2 m³/s) Mar. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4780	4570	1930	2650	1350	1340	7300	6950	4480	10700	7260	2710
2	5340	5000	2080	2600	1350	1330	6930	6490	4620	11500	6470	2440
3	6150	6530	2100	2550	1350	1340	6490	6110	4790	8510	5620	2240
4	4620	5470	2080	2600	1340	1350	6150	5770	5090	7410	5020	1980
5	4490	5220	2000	2700	1320	1300	5700	5330	5070	6580	4610	1950
6	4060	4930	1900	2850	1350	1280	5750	5330	4830	6170	4240	1920
7	3820	4950	1600	3000	1320	1300	7370	5220	4690	5770	4030	1890
8	5220	4790	1490	2750	1320	1320	9760	5340	4410	5950	4000	1850
9	5790	4660	1470	2450	1320	1340	9580	5420	3970	7320	3530	1820
10	5700	4320	1500	1850	1320	1350	11200	5240	3820	10800	3580	1730
11	5400	3940	1570	1920	1350	1360	12700	5040	3610	11900	3740	1690
12	5090	3880	1610	1980	1350	1380	12100	5240	3340	13400	3510	1660
13	4810	3710	1700	1980	1340	1460	11100	6640	3300	15200	3390	1610
14	4530	3530	1770	1950	1350	1580	9340	10100	3020	16600	3130	1770
15	4240	3470	1850	1920	1350	1820	7950	10500	3010	15900	2970	2110
16	4000	3370	2000	1820	1350	2100	6830	9090	3010	10900	2840	3570
17	3870	3280	2500	1820	1350	2300	6270	8220	3430	8080	2890	2980
18	3780	3220	3200	1780	1340	2700	6910	7210	4660	6910	2750	5470
19	3640	3060	3700	1750	1340	3500	9040	6190	6830	7540	2650	5740
20	3460	3080	3850	1730	1340	5480	12100	5700	8900	7430	2630	5550
21	3390	3100	3750	1700	1340	7000	13400	5430	11200	9650	2500	5810
22	3510	2950	3500	1690	1350	8970	14200	5160	13100	14000	2420	6510
23	3720	2770	3100	1650	1350	10600	14800	5180	14800	15400	2390	6660
24	3840	2510	2600	1650	1340	13600	13900	4910	16300	13300	2310	6600
25	5250	2280	2400	1580	1340	13600	12300	4930	18000	11700	2370	6070
26	6490	2240	2100	1580	1320	13400	10800	4810	18900	9760	2410	5160
27	6230	1950	1950	1500	1320	11500	9630	4830	18100	9760	2390	4510
28	5510	1490	2300	1380	1340	10400	8680	3430	14100	10500	2390	4060
29	5400	1620	2600	1360	---	9910	8040	4270	12400	11400	2660	3840
30	4880	1730	2650	1350	---	8800	7480	4290	11600	10700	2480	3610
31	4690	---	2700	1350	---	7970	---	4350	---	8270	2480	---
TOTAL	144700	107620	71550	61440	37500	152680	283800	182720	237380	319010	105660	105510
MEAN	4668	3587	2308	1982	1339	4925	9460	5894	7913	10290	3408	3517
MAX	6490	6530	3850	3000	1350	13600	14800	10500	18900	16600	7260	6660
MIN	3390	1490	1470	1350	1320	1280	5700	3430	3010	5770	2310	1610
CFSM	.60	.46	.30	.26	.17	.63	1.22	.76	1.02	1.32	.44	.45
IN.	.69	.51	.34	.29	.18	.73	1.36	.87	1.13	1.52	.50	.50
AC-FT	287000	213500	141900	121900	74380	302800	562900	362400	470800	632800	209600	209300

CAL YR 1977	TOTAL	764736	MEAN	2095	MAX	16800	MIN	320	CFSM .27	IN 3.66	AC-FT	1517000
WTR YR 1978	TOTAL	1809570	MEAN	4958	MAX	18900	MIN	1280	CFSM .64	IN 8.65	AC-FT	3589000

05465500 IOWA RIVER AT WAPELLO, IA

LOCATION.--Lat 41°10'48", long 91°10'57", in NW1/4 SE1/4 sec.27, T.74 N., R.3 W., Louisa County, Hydrologic Unit 07080209, on right bank 30 ft (9 m) downstream from bridge on State Highway 99 at east edge of Wapello, 13.0 mi (20.9 km) downstream from Cedar River, and at mile 16.0 (25.7 km).

DRAINAGE AREA.--12,499 mi² (32,372 km²).

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: 1956.

GAGE.--Water-stage recorder. Datum of gage is 538.17 ft (164.034 m) NGVD; Oct. 1, 1914 to Apr. 15, 1934, non recording gage and Apr. 16, 1934 to Sept. 30, 1972, water-stage recorder at datum 10 ft (3.05 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Flow regulated by Coralville Lake (station 05453510) 67.3 mi (108.3 km) upstream, since Sept. 17, 1958. Several observations of water temperature were made during the year.

COOPERATION.--Eight discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--64 years, 6,636 ft³/s (187.9 m³/s), 7.21 in/yr (183 mm/yr), 4,808,000 acre-ft/yr (5,928 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,000 ft³/s (2,660 m³/s) June 18, 1947, gage height, 16.14 ft (4.919 m), datum then in use; maximum gage height, 28.63 ft (8.726 m) Apr. 22, 1973; minimum daily discharge, 300 ft³/s (8.50 m³/s) Nov. 28, 1955, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30,300 ft³/s (858 m³/s) Mar. 22, gage height, 20.14 ft (6.139 m); minimum daily, 2,240 ft³/s (63.4 m³/s) Mar. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8490	9710	6600	4250	2480	2480	13200	13100	7330	18400	12800	5300
2	9800	11500	5300	4150	2480	2460	12000	12400	6850	18500	11800	4870
3	9320	13000	4000	3900	2460	2440	11000	12000	6920	17800	11000	4250
4	8770	11200	3740	4000	2440	2420	10200	10900	7400	14500	10300	3880
5	8240	10300	3450	4250	2400	2340	9650	10200	7850	12800	9450	3340
6	7930	9800	4260	4300	2440	2240	9370	9900	7610	11700	8710	3100
7	7810	9470	3140	4400	2440	2300	10100	10000	7160	14500	8050	3020
8	9230	9460	2800	4300	2700	2400	12800	10800	6740	15800	7580	2900
9	11000	9080	2700	4400	2800	2350	13400	11400	6510	13600	7460	2850
10	10300	7730	2500	4100	2700	2380	17100	10800	6140	18800	6680	2780
11	9650	7590	2500	3550	2800	2740	23900	10200	5710	17400	5950	2730
12	9210	7210	3200	3550	2750	3400	22700	10600	5470	17000	5290	2670
13	8790	6840	4200	3350	2750	4100	19300	13700	5240	18400	4950	2570
14	8420	6470	5400	3350	2750	5200	16600	19800	5000	19500	4740	2470
15	8050	6350	7000	3350	2700	7430	14100	20900	5270	20100	4550	2760
16	7620	6240	8740	3300	2700	9060	12400	17100	5840	17900	4300	2990
17	7100	6080	9790	3150	2600	10900	11300	15100	6120	13500	4080	3450
18	6600	5920	12000	3100	2500	12200	12600	14500	7550	11500	3960	11500
19	6210	6740	10400	3100	2400	15000	17500	13500	9030	11000	3920	14500
20	5960	5490	9000	3000	2450	21500	20700	12600	10600	13900	3740	10500
21	5670	5400	7400	2950	2450	24200	22300	12100	12700	15700	3670	12500
22	5510	5240	6200	2900	2400	25000	22100	11400	14400	22700	3480	14600
23	5450	5050	5150	2900	2400	19900	22600	10200	15900	26700	3250	13400
24	7310	5000	4450	2800	2400	21700	22600	8210	18000	24400	3320	12700
25	10500	4930	3350	2700	2400	23300	21200	7770	19400	19800	3470	12200
26	11700	4640	3550	2700	2480	22900	19400	7610	20800	15600	3710	11400
27	12000	4570	3350	2600	2480	22700	17900	7940	22200	15600	4360	10500
28	11200	4270	3100	2350	2480	21900	16500	7020	22300	15400	4820	9960
29	10600	8330	3600	2500	---	22600	15300	7990	23600	15700	4530	9460
30	10000	7000	4050	2550	---	17600	14400	8290	22200	16000	4990	9140
31	9580	---	4200	2500	---	14600	---	7780	---	14500	5570	---
TOTAL	268020	219610	159120	104300	71230	351740	484220	355810	327840	518700	184480	208290
MEAN	8646	7320	5133	3365	2544	11350	16140	11480	10930	16730	5951	6943
MAX	12000	13000	12000	4400	2800	25000	23900	20900	23600	26700	12800	14600
MIN	5450	4270	2500	2350	2400	2240	9370	7020	5000	11000	3250	2470
AC-FT	531600	435600	315600	206900	141300	697700	960500	705700	650300	1029000	365900	413100

CAL YR 1977 TOTAL 1376512 MEAN 3772 MAX 20600 MIN 460 AC-FT 2731000
WTR YR 1978 TOTAL 3253360 MEAN 8913 MAX 26700 MIN 2240 AC-FT 6453000

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--November 1977 to September 1978.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January to September 1978.
WATER TEMPERATURE: January to September 1978.
SUSPENDED-SEDIMENT: April to September 1978.

REMARKS.--During periods of ice effect samples are collected in open water channel or through ice cover.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 810 micromhos Jan 23, 1978; minimum daily, 250 micromhos Sept. 18, 1978.
WATER TEMPERATURES: Maximum daily, 29.0°C Aug. 14, Sept. 10, 1978; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,920 mg/L June 28, 1978; minimum daily mean, 52 mg/L Sept. 2, 1978.
SEDIMENT LOADS: Maximum daily, 183,000 tons (166,000 tonnes) June 29,1978; minimum daily, 654 tons (593 tonnes) Sept. 3, 1978.

EXTREMES FOR CURRENT PERIOD.--November 1977 to September 1978.
SPECIFIC CONDUCTANCE: Maximum daily, 810 micromhos Jan. 23; minimum daily, 250 micromhos Sept. 18.
WATER TEMPERATURES: Maximum daily, 29.0°C Aug. 14, Sept. 10; minimum daily, 0.0°C many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,920 mg/L June 28; minimum daily mean, 52 mg/L Sept. 2.
SEDIMENT LOADS: Maximum daily 183,000 tons (166,000 tonnes) June 29; minimum daily, 654 tons (593 tonnes) Sept. 3.

WATER QUALITY DATA, NOVEMBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 2.5 DEG.C), JANUARY TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				630	700	660	440	560	410	---	420	440
2				650	730	660	440	560	460	460	440	440
3				650	740	650	500	500	500	460	410	430
4				670	710	690	500	550	530	490	440	440
5				670	720	680	510	540	540	510	490	420
6				650	700	680	520	540	540	470	490	360
7				640	690	660	530	520	520	450	460	---
8				640	700	650	530	540	530	390	---	---
9				660	740	660	500	510	490	350	---	340
10				680	720	680	450	500	540	340	460	410
11				690	700	660	400	520	530	---	450	---
12				700	700	650	460	480	490	---	360	420
13				680	700	690	480	410	480	---	350	420
14				690	680	660	480	380	470	---	370	420
15				700	640	580	460	---	480	440	380	420
16				710	700	540	520	---	480	500	380	---
17				710	690	540	550	---	510	510	380	---
18				720	670	500	490	470	540	520	380	250
19				730	660	360	440	430	520	530	380	280
20				730	670	320	540	400	---	460	380	320
21				720	690	340	520	440	---	420	400	---
22				690	700	340	540	460	390	360	440	380
23				810	700	350	480	490	420	320	430	380
24				640	660	350	500	510	450	350	390	390
25				630	620	330	520	480	470	---	---	460
26				630	690	320	510	470	480	---	---	---
27				650	670	320	510	450	440	340	340	---
28				720	660	320	550	480	410	350	400	480
29				730	---	380	550	480	300	410	460	480
30				750	---	410	530	490	410	380	450	490
31				710	---	440	---	480	---	420	---	---

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				.0	.0	.0	2.0	14.0	23.0	---	25.0	27.0
2				.0	.0	.0	10.0	14.0	23.0	26.0	25.0	27.0
3				.0	.0	.0	13.0	14.0	22.0	26.0	24.0	27.0
4				.0	.0	.0	13.0	11.0	22.0	26.0	24.0	27.0
5				.0	.0	.0	12.0	10.0	24.0	27.0	24.0	27.0
6				.0	.0	.0	12.0	10.0	24.0	26.0	25.0	26.5
7				.0	.0	.0	14.0	10.0	24.0	26.0	25.5	---
8				.0	.0	.0	12.0	13.0	23.0	26.0	---	---
9				.0	.0	.0	14.0	12.0	23.0	25.0	---	28.0
10				.0	.0	.0	12.0	15.0	24.0	24.0	26.0	29.0
11				.0	.0	.0	12.0	16.0	24.0	---	26.0	---
12				.0	.0	.0	11.0	17.0	24.0	---	27.0	28.0
13				.0	.0	.0	12.0	14.0	24.0	---	28.0	27.0
14				.0	.0	.0	11.0	12.0	23.0	---	29.0	26.0
15				.0	.0	1.0	12.0	---	23.0	26.0	28.0	25.0
16				.0	.0	1.0	12.0	---	23.0	27.0	23.5	---
17				.0	.0	2.0	10.0	---	24.0	27.0	26.0	---
18				.0	.0	2.0	10.0	18.0	24.0	27.0	26.0	23.0
19				.0	.0	3.0	9.0	18.0	25.0	27.0	26.0	25.0
20				.0	.0	3.0	8.0	18.0	---	26.0	26.0	21.0
21				.0	.0	4.0	10.0	18.0	---	25.5	26.0	---
22				.0	.0	5.0	9.0	18.0	23.0	25.0	26.0	20.0
23				.0	.0	5.0	11.0	18.0	23.0	24.0	27.0	20.0
24				.0	.0	5.0	11.0	19.0	24.0	25.0	27.0	20.0
25				.0	.0	4.0	11.0	23.0	25.0	---	---	20.0
26				.0	.0	4.0	12.0	25.0	26.0	---	---	---
27				.0	.0	4.0	14.0	24.0	26.0	26.0	25.0	---
28				.0	.0	4.0	14.0	25.0	25.0	26.0	25.0	18.0
29				.0	---	6.0	14.0	24.0	25.0	24.0	25.0	18.0
30				.0	---	9.0	14.0	24.0	26.0	24.0	26.0	17.0
31				.0	---	12.0	---	24.0	---	25.0	26.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	256	9120	166	5870	174	3440	2000	99400	207	7150	59	844
2	273	8850	161	5390	182	3370	685	34200	196	6240	52	684
3	220	6530	172	5570	168	3140	510	24500	200	5940	57	654
4	200	5510	155	4560	144	2880	1020	39900	165	4590	66	691
5	192	5000	137	3770	160	3390	665	23000	150	3830	114	1030
6	176	4450	179	4780	155	3180	310	9790	160	3760	116	971
7	196	5340	151	4080	144	2780	1600	62600	163	3540	118	962
8	291	10100	212	6180	181	3290	1650	70400	169	3460	137	1070
9	345	12500	369	11400	121	2130	1200	44100	181	3650	152	1170
10	1690	78000	260	7580	134	2220	1740	88300	187	3370	137	1030
11	1890	122000	200	5510	143	2200	680	31900	163	2620	128	943
12	970	59500	785	22500	148	2190	269	12300	159	2270	130	937
13	580	30200	1460	54000	142	2010	265	13200	174	2330	138	958
14	413	18500	1380	73800	139	1880	261	13700	170	2180	220	1470
15	310	11800	1140	64300	285	4060	256	13900	177	2170	142	1060
16	255	8540	800	36900	364	5740	252	12200	200	2320	77	622
17	225	6860	505	20600	335	5540	253	9220	207	2280	300	1860
18	1190	43700	305	11900	400	8150	218	6770	149	1590	1480	52100
19	1730	81700	205	7470	412	10000	770	22900	131	1390	1440	58300
20	970	54200	194	6600	402	11500	1500	56300	147	1480	920	26100
21	660	39700	179	5850	665	22800	965	40900	144	1430	730	24600
22	675	40300	174	5360	705	27400	1430	87600	134	1260	415	16400
23	905	55200	166	4570	637	27300	1090	78600	124	1090	345	12500
24	365	22300	157	3480	378	18400	520	34300	323	2900	340	11700
25	250	14300	150	3150	333	17400	420	22500	455	4260	304	10000
26	232	12200	146	3000	302	17000	355	15000	458	4590	265	8160
27	203	9810	149	3190	1760	105000	325	13700	458	5390	230	6520
28	188	8380	208	3940	2920	176000	305	12700	436	5670	200	5380
29	183	7560	216	4660	2870	183000	284	12000	372	4550	196	5010
30	179	6960	189	4230	2830	170000	257	11100	282	3800	184	4540
31	---	---	195	4100	---	---	231	9040	109	1640	---	---
TOTAL	---	799110	---	408290	---	847390	---	1026020	---	102740	---	258266

TOTAL LOAD FOR YEAR: 3441816 TONS.

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

05466500 IOWA RIVER AT WAPELLO, IA--Continued

WATER QUALITY RECORDS

DATE	TIME	TEMPERATURE (DEG C) (00010)	NUMBER OF SAMPLING POINTS (00063)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
FEB									
10...	1500	.0	--	2720	63	389	--	--	--
MAR									
28...	1500	10.0	--	20400	423	23300	34	38	--
APR									
10...	1800	12.0	--	20000	2550	138000	38	48	51
25...	1300	--	6	20400	633	34900	40	42	43
MAY									
17...	1630	--	9	14900	--	--	--	--	--
JUN									
21...	1430	24.0	10	13000	700	24600	50	59	68
JUL									
25...	1615	26.0	7	19900	370	19900	51	56	61
SEP									
07...	1120	--	7	3010	--	--	--	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)
FEB									
10...	--	--	--	--	--	--	89	--	--
MAR									
28...	47	70	73	78	95	100	--	--	--
APR									
10...	67	98	98	99	100	--	--	--	--
25...	55	88	89	92	98	100	--	--	2
MAY									
17...	--	--	--	--	--	--	--	--	0
JUN									
21...	78	97	98	99	100	--	--	1	1
JUL									
25...	71	96	98	100	--	--	--	--	--
SEP									
07...	--	--	--	--	--	--	--	1	2

DATE	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
FEB								
10...	--	--	--	--	--	--	--	--
MAR								
28...	--	--	--	--	--	--	--	--
APR								
10...	--	--	--	--	--	--	--	--
25...	43	91	98	99	99	99	100	--
MAY								
17...	4	45	75	91	97	99	100	--
JUN								
21...	6	49	79	89	95	97	--	--
JUL								
25...	10	42	72	82	91	96	98	100
SEP								
07...	7	35	74	90	98	100	100	--

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV											
10...	1130	8060	600	8.2	8.0	35	--	11.4	97	110	132
DEC											
21...	1200	7400	494	8.2	.0	30	--	13.9	97	72	--
FEB											
10...	1500	2720	580	7.4	.0	7	--	13.0	91	148	300
APR											
04...	1530	10500	560	8.0	13.0	70	--	10.0	99	360	180
MAY											
11...	1030	10200	500	7.5	13.5	40	--	8.7	86	--	--
JUN											
21...	1300	13000	410	7.7	24.0	--	230	6.7	81	--	--
JUL											
25...	1530	19900	360	7.6	24.5	--	120	8.3	82	--	--
SEP											
07...	1430	2950	400	9.4	26.0	--	23	15.0	188	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
NOV											
10...	270	69	70	24	11	2.8	250	0	210	48	31
DEC											
21...	280	110	73	24	11	2.6	210	0	170	49	22
FEB											
10...	340	97	88	28	18	2.4	290	0	238	58	29
APR											
04...	250	86	67	20	17	4.2	200	0	160	40	24
MAY											
11...	260	110	66	24	10	2.3	190	0	160	50	25
JUN											
21...	180	52	48	15	12	2.8	--	0	130	34	23
JUL											
25...	170	43	46	14	6.7	3.7	--	--	130	25	12
SEP											
07...	180	40	39	20	18	2.9	--	--	140	46	24

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)
NOV										
10...	.2	13	343	323	.47	7460	7.9	--	--	.28
DEC										
21...	.3	11	330	297	.45	6590	7.0	--	--	.20
FEB										
10...	.3	16	401	383	.55	2950	5.0	.90	5.9	.23
APR										
04...	.2	11	311	283	.42	8820	6.4	1.9	8.3	.45
MAY										
11...	.3	3.9	302	275	.41	8320	2.5	2.1	4.6	.29
JUN										
21...	.3	8.9	235	222	.32	8240	7.7	1.8	9.5	.74
JUL										
25...	.2	12	227	198	.31	12200	4.6	1.6	6.2	.39
SEP										
07...	.2	--	203	--	.28	1620	.12	2.5	2.6	.26

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	PHYTO-PLANK-TON, TOTAL (CELLS PER ML) (60050)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M (00573)	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M (00672)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2) (70957)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2) (70958)	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...	--	--	1300	--	--	--	--	--	--	--
DEC 21...	--	6.3	--	--	--	--	--	--	--	--
FEB 10...	--	--	--	--	--	--	--	53	389	89
APR 04...	--	9.0	2000	--	--	--	--	--	--	--
MAY 11...	--	--	62000	2.36	1.57	.070	.000	--	--	--
JUN 21...	--	4.7	7100	--	--	--	--	--	--	--
JUL 25...	--	--	--	--	--	--	--	--	--	--
SEP 07...	16	7.7	--	--	--	--	--	--	--	--

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
DEC 21...	2	2	2	1	0	0	1	0	14	3	2900
APR 04...	3	3	1	1	0	0	2	0	32	11	3600
JUN 21...	5	4	1	1	20	5	5	0	39	4	17000
SEP 07...	5	3	16	0	10	0	0	0	24	4	1800

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
DEC 21...	90	29	1	200	200	.1	.0	1	1	30	10
APR 04...	450	10	2	280	0	.0	.0	1	0	40	10
JUN 21...	0	56	5	850	15	.5	.0	1	1	100	0
SEP 07...	10	12	0	320	0	.1	.0	0	1	20	10

05455500 IOWA RIVER AT WAPELLO, IA--Continued

WATER QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JUNE 1978

DATE	NOV 10,77	APR 4,78	MAY 11,78	JUN 21,78
TIME	1130	1530	1030	1300
TOTAL CELLS/ML	1300	2000	62000	7100
DIVERSITY: DIVISION	1.0	1.6	1.1	0.6
.CLASS	1.0	1.6	1.1	0.6
..ORDER	1.4	2.1	1.1	0.6
...FAMILY	1.9	3.0	1.9	1.1
....GENUS	2.0	3.2	2.5	1.2

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHARACIACEAE								
....SCHROEDERIA	--	-	--	-	--	-	*	0
...MICRACTINIACEAE								
....GOLENKINIA	--	-	--	-	1300	2	--	-
....MICRACTINIUM	--	-	27	1	16000#	27	46	1
...OOCYSTACEAE								
....ANKISTRODESMUS	160	13	27	1	1000	2	46	1
....CHODATELLA	--	-	27	1	--	-	--	-
....DICTYOSPHAERIUM	--	-	54	3	--	-	300	4
....FRANCEIA	--	-	81	4	--	-	--	-
...SCENEDESMACEAE								
....ACTINASTRUM	--	-	--	-	4200	7	93	1
....SCENEDESMUS	520#	42	510#	25	16000#	27	5800#	82
....TETRASTRUM	--	-	--	-	4700	8	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	-	14	1	--	-	--	-
..ZYGNEMATALES								
...DESMIDIACEAE								
....CLOSTERIUM	--	-	14	1	--	-	--	-
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	300#	24	110	5	15000#	24	69	1
....MELOSIRA	40	3	41	2	--	-	--	-
..PENNALES								
...ACHNANTHACEAE								
....COCCONEIS	--	-	--	-	--	-	*	0
...FRAGILARIACEAE								
....SYNEDRA	--	-	150	7	--	-	--	-
...NAVICULACEAE								
....CALONEIS	--	-	14	1	--	-	--	-
....NAVICULA	--	-	27	1	--	-	140	2
....PINNULARIA	--	-	--	-	--	-	*	0
...NITZSCHIACEAE								
....NITZSCHIA	230#	18	14	1	--	-	69	1
...SURIRELLACEAE								
....SURIRELLA	--	-	27	1	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROCCOCCALES								
...CHROCCOCCACEAE								
....ANACYSTIS	--	-	140	7	--	-	--	-
..HORMOGONALES								
...NOSTOCACEAE								
....APHANIZOMENON	--	-	530#	26	--	-	--	-
...OSCILLATORIACEAE								
....LYNGBYA	--	-	--	-	2100	3	--	-
....OSCILLATORIA	--	-	200	10	--	-	460	7
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....EUGLENA	--	-	--	-	520	1	--	-
....TRACHELOMONAS	--	-	27	1	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05470000 SOUTH SKUNK RIVER NEAR AMES, IA

LOCATION.--Lat 42°04'05", long 93°37'02", in NW1/4 SW1/4 sec.23, T.84 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 2.5 mi (4.0 km) north of Ames, 3.5 mi (5.6 km) downstream from Keigley Branch, 5.2 mi (8.4 km) upstream from Squaw Creek, and at mile 228.1 (367.0 km) upstream from mouth of Skunk River.

DRAINAGE AREA.--315 mi² (816 km²).

PERIOD OF RECORD.--July 1920 to September 1927, October 1932 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 Iowa. 1967: 1965, 1974: 1973 (P).

GAGE.--Water-stage recorder. Concrete control since July 21, 1934. Datum of gage is 893.61 ft (272.372 m) NGVD (Iowa Highway Commission benchmark). Prior to Aug. 25, 1921, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for winter period, which are poor. Several diversions for irrigation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--53 years, 149 ft³/s (4.220 m³/s), 6.42 in/yr (163 mm/yr), 108,000 acre-ft/yr (133 hm³/yr); median of yearly mean discharges, 120 ft³/s (3.40 m³/s) 5.2 in/yr (132 mm/yr), 86,900 acre-ft/yr (107 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,630 ft³/s (244 m³/s) June 10, 1954, gage height, 13.66 ft (4.164 m); maximum gage height, 13.90 ft (4.237 m) May 20, 1944; no flow at times in 1934, 1937, 1953-57, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 18	0845	2,100	59.5	5.83	1.777	Sept. 21	0530	1,650	46.7	5.34	1.628
Sept.14	1415	*2,240	63.4	*5.93	1.808						

Minimum daily discharge, 8.4 ft³/s (0.24 m³/s) Mar. 1-3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	477	440	84	60	23	8.4	110	184	185	300	47	80
2	363	358	74	47	22	8.4	93	165	173	223	42	65
3	289	303	66	49	22	8.4	85	155	154	172	35	54
4	247	256	55	52	22	11	81	149	143	143	30	45
5	216	231	46	53	21	13	84	137	130	124	26	39
6	183	220	40	53	21	12	117	122	121	143	24	35
7	209	204	48	54	21	10	110	150	117	168	21	31
8	535	196	50	51	21	8.8	135	218	115	155	19	27
9	505	190	42	44	21	9.8	196	260	100	170	17	24
10	384	172	38	37	20	9.4	590	227	92	127	16	21
11	323	146	39	33	17	10	456	205	87	110	15	18
12	284	134	47	39	16	47	322	195	81	99	14	16
13	250	133	59	37	16	92	237	351	74	90	13	978
14	232	136	72	36	15	76	191	449	74	78	13	2050
15	206	136	84	35	15	70	168	368	159	71	14	1570
16	183	128	100	32	17	84	151	314	584	62	14	907
17	177	119	180	35	20	112	537	276	393	55	13	650
18	161	108	250	32	23	126	1970	245	323	69	13	519
19	144	103	320	30	24	300	1620	222	269	71	12	429
20	133	99	140	29	19	390	1100	229	357	57	11	1130
21	130	93	130	28	14	470	822	241	468	127	42	1510
22	136	87	145	30	13	505	665	216	340	219	123	1010
23	180	93	158	27	12	380	555	207	368	358	124	708
24	327	80	140	27	12	246	472	193	306	235	67	560
25	394	50	94	25	11	174	392	178	254	169	47	454
26	340	57	90	25	10	140	341	164	217	134	56	394
27	291	63	96	25	9.0	135	300	155	174	107	359	348
28	254	69	106	25	8.9	138	268	152	149	83	441	304
29	229	73	92	25	---	121	238	147	707	72	227	285
30	212	82	80	25	---	114	213	139	466	61	144	261
31	287	---	73	24	---	112	---	127	---	53	104	---
TOTAL	8281	4559	3038	1124	485.9	3941.2	12619	6540	7180	4105	2143	14522
MEAN	267	152	98.0	36.3	17.4	127	421	211	239	132	69.1	484
MAX	535	440	320	60	24	505	1970	449	707	358	441	2050
MIN	130	50	38	24	8.9	8.4	81	122	74	53	11	16
CFSM	.85	.48	.31	.12	.06	.40	1.34	.67	.76	.42	.22	1.54
IN.	.98	.54	.36	.13	.06	.47	1.49	.77	.85	.48	.25	1.71
AC-FT	16430	9040	6030	2230	964	7820	25030	12970	14240	8140	4250	28800

CAL YR 1977 TOTAL 47938.72 MEAN 131 MAX 4230 MIN .00 CFSM .42 IN 5.66 AC-FT 95090
WTR YR 1978 TOTAL 68538.10 MEAN 188 MAX 2050 MIN 8.4 CFSM .60 IN 8.09 AC-FT 135900

05470500 SQUAW CREEK AT AMES, IA

LOCATION.--Lat 42°01'21", long 93°37'45", in NE1/4 NW1/4 sec.10, T.83 N., R.24 W., Story County, Hydrological Unit 07080105, on left bank 65 ft (20 m) downstream from Lincoln Way Bridge in Ames, 0.1 mi (0.2 km) downstream from College Creek, and 1.8 mi (2.9 km) upstream from mouth.

DRAINAGE AREA.--204 mi² (528 km²).

PERIOD OF RECORD.--May 1919 to April 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), WRD Iowa. 1966: 1965, WDR Iowa. 1971: 1970 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 881.00 ft (268.529 m) NGVD (levels by Iowa State University). Prior to Mar. 11, 1925, nonrecording gage at site 0.6 mi (1.0 km) upstream at different datum. Mar. 11, 1925, to Apr. 30, 1927, nonrecording gage at site 65 ft (20 m) upstream at datum about 4 ft (1 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--21 years, 118 ft³/s (3.342 m³/s), 7.86 in/yr (200 mm/yr), 84,490 acre-ft/yr (105 hm³/yr); median of yearly mean discharges, 95 ft³/s (2.69 m³/s), 6.3 in/yr (160 mm/yr), 68,800 acre-ft/yr (84.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s (320 m³/s) June 27, 1975, gage height, 14.00 ft (4.267 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 4, 1918, reached a stage of 14.5 ft (4.42 m), from flood marks, site and datum used 1919-25, discharge, 6,900 ft³/s (195 m³/s). Flood of Mar. 1, 1965, reached a stage of 10.7 ft (3.26 m), from graph based on gage readings, at present site and datum, discharge, 4,200 ft³/s (119 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft³/s, revised (45.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 18	0230	2,060	58.3	7.11	2.167	Sept. 14	2000	*2,230	63.2	*7.51	2.289
June 24	0315	1,840	52.1	6.33	1.929	Sept. 20	1800	1,720	48.7	5.97	1.820

Minimim daily discharge, 3.1 ft³/s (0.088 m³/s) Aug. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	784	305	63	23	5.6	6.8	77	160	200	155	41	58
2	214	232	63	23	5.8	7.0	66	145	152	129	38	54
3	160	184	52	25	6.2	6.8	62	138	122	106	30	43
4	135	153	45	24	6.4	7.0	58	135	101	93	25	34
5	123	142	38	22	8.4	7.6	81	117	93	84	23	28
6	96	132	33	21	13	7.0	90	98	90	99	21	26
7	135	123	43	20	10	7.2	77	129	84	102	19	22
8	257	114	45	18	8.2	7.8	108	169	69	97	17	19
9	198	119	40	22	7.0	8.4	157	176	65	768	15	17
10	163	105	33	31	6.4	11	730	155	64	259	13	15
11	142	92	27	29	6.4	20	436	142	58	160	13	12
12	129	87	28	19	6.6	116	262	166	52	123	11	10
13	117	86	29	15	7.0	120	182	333	40	89	8.9	1310
14	111	89	35	13	7.0	120	149	345	47	69	7.2	2040
15	98	89	46	12	7.0	122	129	276	87	58	9.2	1530
16	91	83	73	14	7.4	184	117	239	129	46	6.8	748
17	89	77	136	13	8.6	240	690	212	107	43	5.8	507
18	84	69	140	10	9.2	372	1740	193	87	88	9.9	400
19	77	67	94	9.6	9.2	740	1280	178	74	74	4.1	346
20	66	61	60	9.4	7.6	520	824	172	386	56	3.1	1440
21	73	53	52	9.2	6.4	360	626	159	295	163	130	1460
22	101	58	62	9.0	6.6	270	496	153	201	411	125	829
23	149	61	70	8.6	6.8	247	424	152	1080	404	37	562
24	272	44	58	8.6	7.2	179	352	146	1250	223	21	436
25	252	33	46	9.0	6.6	138	296	140	580	159	27	352
26	214	46	40	11	6.8	114	262	132	333	121	106	279
27	178	60	40	11	6.8	108	233	124	238	98	706	246
28	146	54	37	8.6	7.2	103	210	120	219	76	533	203
29	130	52	35	7.9	---	92	190	115	385	66	265	192
30	123	57	32	6.4	---	86	174	109	210	56	150	168
31	244	---	27	6.0	---	84	---	109	---	49	96	---
TOTAL	5151	2927	1622	468.3	207.4	4411.6	10578	5137	6898	4524	2517.0	13386
MEAN	166	97.6	52.3	15.1	7.41	142	353	166	230	146	81.2	446
MAX	784	305	140	31	13	740	1740	345	1250	768	706	2040
MIN	66	33	27	6.0	5.6	6.8	58	98	40	43	3.1	10
CFSM	.81	.48	.26	.07	.04	.70	1.73	.81	1.13	.72	.40	2.19
IN.	.94	.53	.30	.09	.04	.80	1.93	.94	1.26	.82	.46	2.44
AC-FT	10220	5810	3220	929	411	8750	20980	10190	13680	8970	4990	26550

CAL YR 1977	TOTAL	20355.85	MEAN	55.8	MAX	2240	MIN	.00	CFSM .27	IN 3.71	AC-FT	40380
WTR YR 1978	TOTAL	57827.30	MEAN	158	MAX	2040	MIN	3.1	CFSM .78	IN 10.54	AC-FT	114700

05471000 SOUTH SKUNK RIVER BELOW SQUAW CREEK NEAR AMES, IA

LOCATION.--Lat 42°00'31", long 93°35'37", in NE1/4 NW1/4 sec.13, T.83 N., R.24 W., Story County, Hydrological Unit 07080105, on right bank 15 ft (5 m) downstream from bridge on county highway, 0.2 mi (0.3 km) downstream from Squaw Creek, 0.2 mi (0.3 km) upstream from bridge on U.S. Highway 30, 2 mi (3.2 km) southeast of Ames, and at mile 222.6 (358.2 km) upstream from mouth of Skunk River.

DRAINAGE AREA.--556 mi² (1,440 km²).

PERIOD OF RECORD.--October 1952 to current year. Prior to October 1966, published as Skunk River below Squaw Creek near Ames.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 857.10 ft (251.244 m) NGVD. Prior to Oct. 1, 1973, at datum 10.00 ft higher.

REMARKS.--Records good except those for winter period, 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. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--26 years, 291 ft³/s (8.241 m³/s), 7.11 in/yr (181 mm/yr), 210,800 acre-ft/yr (260 hm³/yr); median of yearly mean discharges, 240 ft³/s (6.80 m³/s), 5.9 in/yr (150 mm/yr), 174,000 acre-ft/yr (215 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,700 ft³/s (416 m³/s) June 27, 1975, gage height, 25.57 ft (7.794 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1944, reached a stage of 13 ft (4 m), from floodmarks, discharge, 10,000 ft³/s (283 m³/s), datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft³/s (70.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 18	0500	4,430	125	*20.08	6.120	Sept. 20	2245	3,590	102	18.39	5.605
Sept.14	2100	*4,700	133	19.97	6.087						

Minimum daily discharge, 23 ft³/s (0.65 m³/s) Mar. 3-7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1400	766	118	93	36	24	276	333	315	468	113	250
2	762	603	120	92	36	24	252	305	275	380	110	176
3	543	504	110	86	35	23	239	295	233	310	94	118
4	445	430	100	81	35	23	230	288	214	268	80	80
5	374	390	94	79	35	23	279	274	193	259	70	62
6	319	371	92	75	35	23	318	253	180	296	60	56
7	399	343	88	71	35	23	296	316	174	334	51	61
8	334	304	92	67	34	25	365	388	162	315	45	52
9	758	328	104	64	34	27	462	442	149	1300	46	45
10	588	307	95	62	33	31	1490	402	140	612	46	41
11	492	285	85	60	31	40	1060	374	132	388	46	37
12	432	254	84	58	31	140	718	372	123	263	46	35
13	381	245	89	58	34	292	520	647	113	208	46	1910
14	356	250	115	59	32	302	416	735	121	176	44	4380
15	316	248	140	57	31	333	354	588	183	159	43	3530
16	280	234	180	56	31	507	308	495	527	149	44	1840
17	263	218	318	54	31	626	1010	436	393	142	47	1270
18	268	204	390	53	31	599	3950	386	314	204	57	999
19	270	197	430	51	31	1510	3060	357	274	212	70	889
20	240	192	210	48	31	1420	1970	349	626	162	81	2930
21	220	178	180	46	32	1220	1410	343	666	291	255	3140
22	275	173	210	45	33	1030	1090	317	456	531	309	1890
23	403	168	230	44	33	763	885	307	1330	641	227	1300
24	657	148	200	43	32	538	736	289	1490	417	179	989
25	667	120	140	42	30	416	619	272	739	310	212	796
26	563	126	158	40	28	350	545	252	558	252	396	695
27	476	140	170	39	26	330	484	241	407	207	1390	605
28	416	126	150	38	24	329	435	235	370	169	1320	524
29	374	110	130	37	---	305	399	227	1010	150	807	485
30	356	106	110	36	---	287	368	216	669	135	580	442
31	541	---	93	36	---	287	---	207	---	123	400	---
TOTAL	14168	8068	4825	1770	900	11870	24544	10941	12536	9831	7314	29627
MEAN	457	269	156	57.1	32.1	383	818	353	418	317	236	988
MAX	1400	766	430	93	36	1510	3950	735	1490	1300	1390	4380
MIN	220	106	84	36	24	23	230	207	113	123	43	35
CFSM	.82	.48	.28	.10	.06	.69	1.47	.64	.75	.57	.42	1.78
IN.	.95	.54	.32	.12	.06	.79	1.64	.73	.84	.66	.49	1.98
AC-FT	28100	16000	9570	3510	1790	23540	48680	21700	24870	19500	14510	58770

CAL YR 1977 TOTAL 69806.56 MEAN 191 MAX 5320 MIN .00 CFSM .34 IN 4.67 AC-FT 138500
WTR YR 1978 TOTAL 136394.00 MEAN 374 MAX 4380 MIN 23 CFSM .67 IN 9.13 AC-FT 270500

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA

LOCATION.--Lat 41°21'19", long 92°39'31", in NW1/4 SW1/4 sec.25, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080105, on right bank 400 ft (122 m) upstream from bridge on U.S. Highway 63, 0.3 mi (0.5 km) downstream from Painter Creek, 4.0 mi (6.4 km) north of Oskaloosa, 53.7 mi (86.4 km) upstream from confluence with North Skunk River, and at mile 147.3 (237.0 km) upstream from mouth of Skunk River.

DRAINAGE AREA.--1,635 mi² (4,234 km²).

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.

GAGE.--Water-stage recorder. Datum of gage is 685.50 ft (208.940 m) NGVD. Prior to Nov. 21, 1947, nonrecording gage at site 400 ft (122 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--33 years, 879 ft³/s (24.89 m³/s), 7.30 in/yr (185 mm/yr), 636,800 acre-ft/yr (785 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s (566 m³/s) June 15, 1947, gage height, 21.26 ft (6.480 m), from floodmarks; maximum gage height, 22.52 ft (6.864 m) Feb. 3, 1973, backwater from ice; minimum daily discharge, 1.8 ft³/s (0.051 m³/s) Oct. 11-13, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 25.8 ft (7.86 m), from floodmarks, discharge, 37,000 ft³/s (1,050 m³/s), from rating curve extended above 18,000 ft³/s (510 m³/s) on basis of velocity-area study.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s (142 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 22	0045	*8,760	248	*19.40	5.913	July 20	1600	6,860	194	17.42	5.310
Apr. 20	0830	7,710	218	18.19	5.544	Sept. 22	0115	6,500	184	17.09	5.209

Minimum daily discharge, 160 ft³/s (4.53 m³/s) Feb. 13-26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	683	2700	540	680	220	170	1170	1440	890	2850	842	503
2	1650	2330	480	620	210	170	1080	1320	873	2830	806	509
3	1690	2100	410	560	200	170	1000	1230	904	1650	747	456
4	1230	1790	370	550	200	170	948	1170	862	1300	687	408
5	1020	1540	350	540	190	170	911	1120	806	1120	642	369
6	893	1370	260	500	190	170	1060	1060	768	1140	610	330
7	820	1260	210	480	180	170	1270	1330	715	1140	583	302
8	862	1170	310	470	180	170	1200	1430	733	1100	561	278
9	1020	1090	350	450	180	190	1380	1420	673	1050	533	254
10	1240	995	310	400	170	220	2180	1430	631	1940	512	235
11	1300	910	300	390	170	240	2600	1390	610	1740	502	222
12	1170	825	320	380	170	290	2600	1720	596	1260	491	209
13	1020	759	340	370	160	330	1990	3030	589	1080	481	351
14	932	717	450	360	160	410	1630	2720	600	946	467	768
15	874	680	650	350	160	620	1400	2470	603	848	456	3440
16	815	642	1010	340	160	940	1260	2210	631	775	442	3630
17	766	603	1420	330	160	1300	1290	1950	701	712	428	2250
18	729	688	1820	320	160	1600	5880	1720	929	729	414	2350
19	698	764	2080	310	160	3000	7190	1540	789	4220	400	1960
20	666	748	1860	300	160	5000	7600	1450	820	6210	390	3870
21	633	739	1240	290	160	6000	6230	1380	1120	5660	376	6230
22	1270	701	999	280	160	8440	4540	1290	1590	3530	362	6260
23	1830	682	1000	270	160	6080	3700	1250	2370	2750	351	4740
24	3400	680	1120	260	160	3650	3110	1220	4470	2450	341	3360
25	4290	661	1090	260	160	2420	2670	1180	3320	2080	330	2630
26	3080	680	840	250	160	1860	2320	1110	2640	1710	323	2170
27	2450	680	700	240	170	1680	2100	1060	3080	1450	337	1900
28	2040	680	750	230	170	1550	1910	1030	2820	1260	1160	1600
29	1680	620	750	220	---	1420	1740	1000	4370	1110	1450	1420
30	1440	560	810	220	---	1300	1600	974	2380	1010	1060	1350
31	1880	---	770	220	---	1230	---	929	---	929	810	---
TOTAL	44071	30364	23909	11440	4840	51130	75559	45573	42883	58579	17894	54454
MEAN	1422	1012	771	369	173	1649	2519	1470	1429	1890	577	1815
MAX	4290	2700	2080	680	220	8440	7600	3030	4470	6210	1450	6260
MIN	633	560	210	220	160	170	911	929	589	712	323	209
CFSM	.87	.62	.47	.23	.11	1.01	1.54	.90	.87	1.16	.35	1.11
IN.	1.00	.69	.54	.26	.11	1.16	1.72	1.04	.98	1.33	.41	1.24
AC-FT	87410	60230	47420	22690	9600	101400	149900	90390	85060	116200	35490	108000

CAL YR 1977	TOTAL	179495.2	MEAN	492	MAX	5490	MIN	4.4	CFSM .30	IN 4.08	AC-FT	356000
WTR YR 1978	TOTAL	460696.0	MEAN	1262	MAX	8440	MIN	160	CFSM .77	IN 10.48	AC-FT	913800

05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA

LOCATION.--Lat 41°18'03", long 92°12'16", in NE1/4 SE1/4 sec.14, T.75 N., R.12 W., Keokuk County, Hydrologic Unit 07080106, on right bank 20 ft (6 m) downstream from bridge on State Highway 149, 1.2 mi (1.9 km) downstream from Cedar Creek, 2.2 mi (3.5 km) south of Sigourney, 4.0 mi (6.4 km) upstream from Bridge Creek, and 16.2 mi (26.1 km) upstream from confluence with South Skunk River.

DRAINAGE AREA.--730 mi² (1,890 km²).

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 (198.586 m) NGVD. Prior to June 10, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for Oct. 9 to Oct. 13 when float sunk and winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--33 years, 428 ft³/s (12.12 m³/s), 7.96 in/yr (202 mm/yr), 310,000 acre-ft/yr (382 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,500 ft³/s (779 m³/s) Mar. 31, 1960, gage height, 25.33 ft (7.721 m); minimum daily, 0.1 ft³/s (0.003 dm³/s) Oct. 7 to Nov. 15, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 22.8 ft (6.95 m), from floodmark, discharge, 14,500 ft³/s (411 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,800 ft³/s (108 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 24	0715	6,100	173	19.30	5.883	July 24	0515	*6,830	193	*19.75	6.020
Apr. 21	0315	4,230	120	17.11	5.215						

Minimum daily discharge, 43 ft³/s (1.22 m³/s) Sept. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	204	992	189	214	79	90	676	568	339	1250	362	83
2	150	1300	182	198	79	90	591	516	316	2600	327	73
3	152	894	179	182	78	93	512	477	299	1290	301	66
4	134	740	160	167	79	92	466	456	279	575	277	63
5	84	620	146	162	80	91	435	445	262	425	244	60
6	73	551	110	165	79	91	541	430	246	360	218	57
7	62	513	107	172	79	92	628	667	231	2150	199	52
8	60	485	118	176	80	91	628	1030	220	567	183	49
9	66	462	129	165	80	90	701	871	210	356	169	49
10	137	504	134	137	80	91	1900	712	201	280	157	47
11	262	429	125	118	80	94	2360	612	185	500	146	45
12	323	366	121	105	80	97	1540	760	175	303	139	44
13	259	331	119	109	84	102	993	2860	161	250	132	43
14	222	319	155	115	87	110	768	2870	147	225	122	64
15	219	317	218	120	86	170	665	2660	162	198	108	277
16	188	315	364	120	85	335	599	1510	200	171	96	225
17	171	301	763	115	84	600	566	1040	238	154	91	184
18	153	276	1200	108	86	860	1940	874	326	137	93	732
19	145	259	1110	102	87	1700	2720	768	216	562	95	1130
20	136	248	779	99	88	2550	3610	694	229	1890	89	1210
21	124	255	540	99	88	2950	4010	647	194	2230	81	2150
22	126	240	450	99	87	3650	2130	599	262	3320	76	2190
23	795	217	449	96	88	5290	1260	565	243	4840	67	2050
24	1930	213	442	93	88	6000	1120	547	205	6540	73	935
25	2140	203	429	94	89	4040	1000	521	212	3320	75	669
26	1720	218	398	95	88	1310	848	482	201	1030	71	527
27	1020	197	340	94	88	1100	753	440	601	744	166	434
28	783	186	305	88	89	1510	699	417	820	593	214	370
29	656	204	264	81	---	1120	649	449	795	501	310	318
30	795	216	240	80	---	864	612	403	1970	444	160	284
31	668	---	225	80	---	747	---	369	---	399	104	---
TOTAL	13956	12371	10490	3847	2345	36110	35920	26259	10145	38104	4945	14480
MEAN	450	412	338	124	83.8	1165	1197	847	338	1229	160	483
MAX	2140	1300	1200	214	89	6000	4010	2870	1970	6540	362	2190
MIN	60	186	107	80	78	90	435	369	147	137	67	43
CFSM	.62	.56	.46	.17	.12	1.60	1.64	1.16	.46	1.68	.22	.66
IN.	.71	.63	.53	.20	.12	1.84	1.83	1.34	.52	1.94	.25	.74
AC-FT	27680	24540	20810	7630	4650	71620	71250	52080	20120	75580	9810	28720

CAL YR 1977 TOTAL 62885.8 MEAN 172 MAX 2140 MIN 2.0 CFSM .24 IN 3.20 AC-FT 124700
WTR YR 1978 TOTAL 208972.0 MEAN 573 MAX 6540 MIN 43 CFSM .79 IN 10.65 AC-FT 414500

05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA

LOCATION.--Lat. 40°55'20", long 91°40'10", in SE1/4 NW1/4 sec. 28, T.71 N., R.7 W., Henry County, Hydrologic Unit 07080107 on left bank 30 ft. (9.1 m) upstream from bridge on county highway H46, 3.0 mi. (4.8 km) west of Oakland Mills, 2.9 mi. (4.7 km) upstream from Wolf Creek, and 4.3 mi. (6.9 km) upstream from mouth.

DRAINAGE AREA.--530 mi.² (1,373 km²), revised.

PERIOD OF RECORD.--July 1977 to current year. October 1957 to July 1977 (operated as low-flow station only).

GAGE.--Water-stage recorder. Datum of gage is 565.07 (172.233 m) NGVD.

REMARKS.--Records good except for Oct. 1 to Oct. 21, when gage was installed, April 21 to June 28 when silt was over orfice, and winter period, which are fair. Occasional high water measurements were made by Corps of Engineers in 1965, 1966, 1970 and 1974 and by U.S. Geological Survey in 1966 and 1967. Several observations of water temperature were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 22, 1973 reached a stage of 24.09 ft (7.343 m), discharge not determined. Flood of June 1905 reached a stage approximately 2 feet higher from information by local resident.

EXTREMES FOR CURRENT PERIOD.--Peak discharges above base of 3,000 ft³/s (85.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Aug. 9, 1977	1200	3,430	97.1	13.18	4.017	Apr. 19, 1978	1430	3,740	106	13.75	4.191
Nov. 2, 1977	2300	5,670	160	16.78	5.114	May 8, 1978	0045	3,400	96.3	13.12	3.999
Mar. 21, 1977	1600	4,650	132	15.29	4.660	May 14, 1978	1100	*6,900	195	*18.15	5.532
Mar. 28, 1978	2330	3,970	112	14.15	4.313	July 8, 1978	0830	5,570	158	16.65	5.075
Apr. 11, 1978	1345	5,070	144	15.95	4.862	Sept.19, 1978	0700	5,080	144	15.97	4.868

Minimum daily discharge, 1.0 ft³/s (0.028 m³/s) July 9, 1977.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1										3.3	172	91
2										3.3	95	249
3										4.3	30	991
4										5.1	18	1240
5										5.1	13	1130
6										4.3	57	810
7										3.3	379	426
8										2.3	1650	255
9										1.0	3120	126
10										2.6	1710	88
11										4.3	934	70
12										5.1	160	321
13										6.4	77	1310
14										5.1	60	2490
15										4.3	67	2130
16										4.0	134	1690
17										26	130	1310
18										74	118	1470
19										52	112	931
20										33	95	360
21										32	136	152
22										33	1100	79
23										33	622	84
24										33	426	166
25										32	819	187
26										31	616	122
27										31	358	63
28										30	703	30
29										30	200	43
30										29	154	111
31										54	95	---
TOTAL	---	---	---	---	---	---	---	---	---	616.8	14360	18525
MEAN	---	---	---	---	---	---	---	---	---	19.9	463	618
MAX	---	---	---	---	---	---	---	---	---	74	3120	2490
MIN	---	---	---	---	---	---	---	---	---	1.0	13	30
CFSM	---	---	---	---	---	---	---	---	---	.04	.89	1.18
IN.	---	---	---	---	---	---	---	---	---	.04	1.02	1.32
AC-FT	---	---	---	---	---	---	---	---	---	1220	28480	36740

05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	2540	64	78	32	39	484	190	220	592	41	46
2	96	5440	66	70	33	39	386	164	206	1280	36	36
3	92	4650	68	63	33	40	302	147	195	981	34	30
4	88	1080	69	57	33	40	290	141	180	368	32	24
5	85	571	66	60	34	40	284	204	172	261	31	21
6	84	411	67	63	33	40	487	276	164	270	27	19
7	145	331	62	66	33	40	470	2170	158	4250	25	17
8	1700	282	61	76	33	40	344	2940	151	5070	23	16
9	1020	280	62	78	33	40	401	1460	154	3700	22	14
10	660	280	64	59	32	40	3520	563	148	1640	21	13
11	1300	222	64	43	32	43	4930	366	135	298	20	13
12	490	178	65	41	32	45	4780	1240	129	188	19	11
13	330	161	74	42	32	62	1430	5680	123	154	19	10
14	230	153	160	44	33	160	502	5690	119	133	19	40
15	171	153	350	46	34	520	366	6080	327	105	19	34
16	142	153	740	47	34	1180	312	3060	388	89	17	57
17	117	147	1760	44	35	2040	270	684	216	78	132	70
18	108	144	1530	42	36	1980	2010	479	247	66	107	3750
19	100	138	545	40	37	2600	3600	372	211	63	312	4840
20	96	135	357	39	37	4470	1860	304	147	81	164	1340
21	92	135	320	39	37	4540	799	262	136	427	65	949
22	89	138	360	39	37	4240	568	227	132	860	42	493
23	94	132	340	39	37	2230	492	261	130	1850	29	267
24	1150	122	310	39	37	972	514	344	213	390	22	196
25	2060	120	230	39	38	619	397	227	346	167	467	162
26	1240	121	170	38	39	680	286	187	323	142	484	138
27	524	102	148	38	39	1010	240	162	350	119	1190	120
28	342	84	130	37	39	2740	216	379	340	65	608	104
29	261	75	104	34	---	2800	200	1660	1450	54	192	93
30	216	66	88	32	---	968	202	342	2090	46	95	85
31	209	---	84	31	---	597	---	245	---	41	62	---
TOTAL	13433	18544	8578	1503	974	34894	30942	37506	9300	23828	4376	13008
MEAN	433	618	277	48.5	34.8	1126	1031	1210	310	769	141	434
MAX	2060	5440	1760	78	39	4540	4930	5690	2090	5070	1190	4840
MIN	84	66	61	31	32	39	200	141	119	41	17	10
CFSM	.83	1.18	.53	.09	.07	2.16	1.98	2.32	.59	1.47	.27	.83
IN.	.96	1.32	.61	.11	.07	2.49	2.21	2.67	.66	1.70	.31	.93
AC-FT	26640	36780	17010	2980	1930	69210	61370	74390	18450	47260	8680	25800

WTR YR 1978 TOTAL 196886 MEAN 539 MAX 6690 MIN 10 CFSM 1.03 IN 14.03 AC-FT 390500

05473500 BIG CREEK NEAR MOUNT PLEASANT, IA

LOCATION.--Lat 41°00'52", long 91°34'49", in NW1/4 NW1/4 sec.29, T.72 N., R.6 W., Henry County, Hydrologic Unit 07080107, on left bank 12 ft (4 m) downstream from bridge on county highway, 100 ft (30 m) downstream from Lynn Creek, 0.7 mi (1.1 km) downstream from Brandywine Creek, and 3.7 mi (6.0 km) northwest of Court House at Mount Pleasant.

DRAINAGE AREA.--106 mi² (275 km²).

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

REVISED RECORDS.--WSP 1628: 1958 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 630.53 ft (192.186 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--23 years, 65.6 ft³/s (1.858 m³/s), 8.40 in/yr (213 mm/yr), 47,530 acre-ft/yr (58.6 hm³/yr); median of yearly mean discharges, 52 ft³/s (1.47 m³/s), 6.7 in/yr (170 mm/yr), 37,700 acre-ft/yr (46.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,500 ft³/s (297 m³/s) Apr. 22, 1973, gage height, 25.58 ft (7.797 m), on basis of contracted-opening measurement at gage at gage height 18.51 ft (5.642 m) and contracted-opening measurements of the 1973 peak flow at sites 2 mi (3 km) upstream [63 mi² (163 km²)] and 6 mi (10 km) downstream [115 mi² (298 km²)]; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 3, 1948, reached a stage of about 27 ft (8.2 m), from floodmarks established by local residents, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 900 ft³/s (25.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Nov. 2	0430	1,550	43.9	6.99	2.740	May 13	1030	*2,110	59.8	*10.39	3.167
Apr. 10	0630	1,160	32.8	7.69	2.344	July 7	0730	1,420	40.2	8.60	2.621

Minimum daily discharge, 0.28 ft³/s (0.008 m³/s) Aug. 16, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	806	32	18	14	6.0	75	43	85	31	4.3	11
2	65	1190	28	14	12	6.4	67	38	66	321	3.8	9.5
3	47	495	26	16	10	6.4	72	37	55	72	3.0	7.7
4	41	292	23	19	9.0	5.8	64	39	49	42	2.2	6.1
5	38	213	24	23	8.2	7.0	57	58	43	32	1.4	5.5
6	31	166	15	24	8.0	7.0	85	65	39	39	1.0	4.9
7	125	144	14	26	9.2	6.4	72	549	38	1050	1.1	4.5
8	449	125	16	25	8.7	6.0	137	526	34	434	1.3	4.5
9	239	137	19	19	8.9	8.3	158	275	30	122	1.2	5.1
10	166	103	15	15	8.0	15	928	171	27	66	.99	4.9
11	243	73	16	15	8.0	40	503	128	25	46	.75	4.7
12	179	67	19	19	7.2	104	255	210	22	38	.68	4.7
13	120	60	35	23	6.8	196	150	1570	18	35	.71	4.5
14	95	60	58	20	6.6	300	97	700	17	27	.98	7.2
15	74	59	78	18	5.8	450	77	300	165	24	.69	5.3
16	63	56	218	18	5.4	480	65	214	200	20	.28	6.8
17	59	52	390	20	5.5	600	61	158	97	18	.67	10
18	54	45	206	24	6.6	700	396	119	151	16	.67	308
19	46	42	114	20	7.2	590	419	96	62	20	2.2	124
20	41	47	79	17	6.9	440	298	82	53	19	1.6	96
21	39	48	64	16	5.3	261	205	66	43	16	1.0	90
22	37	40	56	17	5.8	117	148	61	37	27	.54	47
23	57	43	44	15	6.8	83	120	59	33	16	.28	33
24	142	40	32	15	6.8	56	93	53	31	11	.29	27
25	279	37	25	14	6.8	39	75	48	28	9.8	200	22
26	189	35	28	13	5.2	43	64	44	40	9.2	242	16
27	127	35	24	13	5.5	106	57	41	40	8.7	499	15
28	88	30	23	17	6.0	296	51	132	28	7.1	145	13
29	72	25	24	22	---	198	52	558	26	7.0	47	11
30	63	27	23	23	---	113	50	199	26	5.7	28	12
31	70	---	20	17	---	95	---	119	---	5.0	18	---
TOTAL	3421	4592	1788	575	210.2	5381.3	4951	6758	1608	2594.5	1210.63	920.9
MEAN	110	153	57.7	18.5	7.51	174	165	218	53.6	83.7	39.1	30.7
MAX	449	1190	390	26	14	700	928	1570	200	1050	499	308
MIN	31	25	14	13	5.2	5.8	50	37	17	5.0	.28	4.5
CFSM	1.04	1.44	.54	.18	.07	1.64	1.56	2.06	.51	.79	.37	.29
IN.	1.20	1.61	.63	.20	.07	1.89	1.74	2.37	.56	.91	.42	.32
AC-FT	6790	9110	3550	1140	417	10670	9820	13400	3190	5150	2400	1830

CAL YR 1977 TOTAL 16099.91 MEAN 44.1 MAX 1190 MIN .00 CFSM .42 IN 5.65 AC-FT 31930
WTR YR 1978 TOTAL 34010.53 MEAN 93.2 MAX 1570 MIN .28 CFSM .88 IN 11.94 AC-FT 67460

05474000 SKUNK RIVER AT AUGUSTA, IA

LOCATION.--Lat 40°45'13", long 91°16'40", in NE1/4 NE1/4 sec.26, T.69 N., R.4 W., Des Moines County, Hydrologic Unit 07080107, on left bank 300 ft (91 m) upstream from bridge on State Highway 394 at Augusta, 2.0 mi (3.2 km) upstream from Long Creek, and at mile 12.5 (20.1 km).

DRAINAGE AREA.--4,303 mi² (11,144 km²).

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 Iowa 1971: 1966 (M).

GAGE.--Water-stage recorder. Datum of gage is 521.24 ft (158.874 m) NGVD. Prior to Nov. 15, 1913, nonrecording gage at site 400 ft (122 m) upstream at datum about 0.7 ft (0.2 m) higher. May 27, 1915, to Jan. 14, 1935, nonrecording gage at site 400 ft (122 m) upstream at present datum.

REMARKS.--Records good except those for Aug. 1-15 which are fair and the winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

COOPERATION.--Four discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--64 years (1914-78), 2,345 ft³/s (66.41 m³/s), 7.40 in/yr (188 mm/yr), 1,699,000 acre-ft/yr (2,090 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft³/s (1,892 m³/s) Apr. 23, 1973, gage height, 27.05 ft (8.245 m); minimum daily, 7 ft³/s (0.20 m³/s) Aug. 27 to Sept. 1, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1903, reached a stage of about 21 ft (6 m), discharge, about 45,000 ft³/s (1,270 m³/s). Stage and discharge for flood of April 1973 are believed to be the greatest since 1851.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 15,000 ft³/s (425 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Nov. 2	1845	16,800	476	14.43	4.398
Mar. 21	1200	*34,500	977	*20.70	6.309
Mar. 28	2400	17,400	493	13.73	4.185
Apr. 11	1500	17,300	490	13.70	4.176
May 14	2000	21,600	612	16.63	5.069
July 7	2100	15,100	428	13.45	4.100
Sept. 19	0645	15,300	433	13.58	4.139

Minimum daily discharge, 414 ft³/s (11.7 m³/s) Sept. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1670	7560	1260	1660	500	540	5090	3780	2620	6130	1980	1670
2	2130	16400	1310	1450	500	550	4310	3530	2400	7770	1790	1340
3	2190	15600	1350	1220	500	570	3730	3230	2190	8150	1640	1100
4	1800	10600	1160	1120	500	570	3290	3000	2080	6970	1500	923
5	2340	6830	1040	1080	490	560	3170	3030	1960	4530	1390	796
6	2210	5220	660	1080	490	560	3270	3230	1900	3010	1280	719
7	2020	4380	550	1080	480	570	3300	6380	1810	11400	1180	658
8	4300	3910	650	1120	480	580	3490	8040	1700	14200	1090	609
9	6240	3720	760	1060	490	580	3710	8260	1620	12100	1010	539
10	4290	3550	900	940	490	600	10700	6120	1550	8260	948	492
11	3760	3230	980	830	500	640	17100	4660	1500	3880	895	462
12	3700	2980	1060	760	490	710	16400	5390	1400	2940	848	438
13	3180	2720	1440	720	520	820	12900	14400	1360	3360	799	414
14	2670	2510	1830	670	540	1320	7210	21400	1200	2750	759	511
15	2360	2400	2040	650	520	2840	5370	20100	1800	2340	716	458
16	2100	2340	2760	660	620	5000	4330	17300	2190	2040	677	452
17	1940	2280	5930	640	520	7500	3180	11300	1860	1800	1180	1700
18	1800	2200	5750	630	530	8200	6510	6950	1960	1540	928	10300
19	1680	2110	5030	610	630	9900	10800	5400	2240	1420	970	13900
20	1570	2020	3880	600	530	15800	11400	4660	2190	1360	1120	8370
21	1480	2090	3200	600	540	27700	11300	4110	1950	3130	798	5490
22	1390	2010	4780	580	540	17900	10300	3780	1780	7040	603	5940
23	1370	1880	4600	570	550	15400	10100	3590	1650	9140	516	5920
24	2540	1780	4340	570	550	12000	10500	3610	1940	9620	481	5900
25	7870	1720	3240	560	550	11200	10900	3410	2480	8860	993	5700
26	8810	1380	2140	580	540	12300	10500	3110	3590	8700	2180	5190
27	7570	1200	1680	570	550	14200	7150	2900	4340	8940	3860	5130
28	6450	1700	1880	560	550	16900	5570	3150	3880	5710	3710	4410
29	5260	1260	2200	560	---	15500	4600	6940	4540	3280	1960	3200
30	4300	1050	1960	550	---	10400	4130	4120	5920	2620	1320	2690
31	3690	---	1780	530	---	6510	---	3000	---	2240	1660	---
TOTAL	104680	117630	72140	24810	14490	218420	224310	201880	69600	175230	40781	95421
MEAN	3377	3921	2327	800	518	7046	7477	6512	2320	5653	1316	3181
MAX	8810	16600	5930	1660	550	27700	17100	21400	5920	14200	3860	13900
MIN	1370	1050	550	530	480	540	3170	2900	1200	1360	481	414
CFSM	.79	.91	.54	.19	.12	1.64	1.74	1.51	.54	1.31	.31	.74
IN.	.90	1.02	.62	.21	.13	1.89	1.94	1.75	.60	1.51	.35	.82
AC-FT	207600	233300	143100	49210	28740	433200	444900	400400	138100	347600	80890	189300

CAL YR 1977	TOTAL	526118	MEAN	1441	MAX	15600	MIN	22	CFSM	.34	IN	4.55	AC-FT	1044000
WTR YR 1978	TOTAL	1359392	MEAN	3724	MAX	27700	MIN	414	CFSM	.87	IN	11.75	AC-FT	2696000

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER QUALITY RECORDS

LOCATION.--Samples collected at bridge on State Highway 394 300 ft (91 m) downstream from gage.

PERIOD OF RECORD.--October 1975 to September 1976.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to current year.
WATER TEMPERATURE: October 1975 to current year.
SUSPENDED-SEDIMENT: October 1975 to current year.

REMARKS.--Records of specific conductance were obtained from suspended-sediment samples at time of analysis from Oct. 1 to Nov. 9 and on site from Nov. 10 to Sept. 30. During periods of ice effect, sediment samples are collected in open water channel.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 810 micromhos Jan. 13, 1977, Jan. 5, 1979; minimum daily, 190 micromhos Aug. 10, 1977.
WATER TEMPERATURES: Maximum daily, 33.0°C July 14, 15, 19, 20, 1977; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 7,010 mg/L July 21, 1976; minimum daily mean, 1 mg/L Mar. 8, 9, 12, 1978.
SEDIMENT LOADS: Maximum daily, 499,000 tons (453,000 tonnes) Mar. 21, 1978; minimum daily, 1.5 tons (1.4 tonnes) Feb. 8, 1977.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 810 micromhos Jan. 5; minimum daily, 200 micromhos July 9.
WATER TEMPERATURES: Maximum daily, 29.0°C Aug. 5; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 6,840 mg/L July 7; minimum daily mean, 1 mg/L Mar. 8, 9, 12.
SEDIMENT LOADS: Maximum daily, 499,000 tons (453,000 tonnes) Mar.21; minimum daily, 1.6 tons (1.5 tonnes), Mar. 8, 9.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	610	340	670	750	710	725	480	640	560	360	580	460
2	610	345	670	750	700	690	500	640	600	340	600	400
3	570	305	700	750	660	700	560	640	580	350	560	470
4	560	330	700	770	700	660	560	580	600	300	625	510
5	640	390	700	810	700	700	520	600	600	380	600	550
6	470	470	700	770	690	750	580	600	600	440	600	580
7	390	460	725	750	700	710	560	440	600	245	610	560
8	410	460	710	740	700	750	580	420	580	240	530	560
9	290	540	700	740	710	750	600	440	600	200	490	500
10	520	600	700	700	710	750	340	520	625	300	480	450
11	540	600	725	710	725	750	320	560	640	460	410	420
12	550	640	725	710	700	700	345	600	625	520	390	430
13	590	670	725	700	700	700	430	280	580	580	370	450
14	640	700	670	750	710	700	540	270	580	480	380	440
15	650	650	670	700	690	500	580	280	480	520	410	520
16	510	650	600	700	700	420	600	360	540	600	420	500
17	700	700	400	710	740	360	600	490	540	600	330	500
18	480	670	400	710	700	330	480	540	480	610	490	230
19	530	670	440	710	750	345	380	550	540	600	370	230
20	450	650	440	740	660	290	380	600	440	610	420	290
21	490	650	500	740	700	260	380	600	500	530	400	390
22	600	650	540	740	690	245	390	600	545	260	450	430
23	510	650	600	720	700	250	425	610	560	220	480	340
24	500	650	590	700	750	250	500	620	610	230	460	400
25	360	610	610	690	650	250	560	600	600	290	470	500
26	360	640	650	710	700	275	590	570	600	320	300	600
27	440	640	710	700	700	310	600	560	400	380	250	620
28	510	690	675	775	700	400	600	540	410	480	260	650
29	580	700	---	670	---	370	560	380	540	530	350	650
30	600	700	---	700	---	300	650	460	325	560	400	650
31	580	---	---	740	---	460	---	540	---	580	440	---

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	12.0	1.0	.0	.0	.0	12.0	14.0	23.0	26.0	25.0	25.0
2	16.0	12.0	1.0	.0	.0	.0	11.0	14.0	23.0	25.0	25.0	26.0
3	16.0	12.0	.0	.0	.0	.0	13.0	14.0	22.0	25.0	23.0	26.0
4	16.0	12.0	.0	2.0	.0	.0	13.0	14.0	23.0	25.0	24.0	26.0
5	15.0	12.0	.0	2.0	.0	.0	11.0	10.0	23.0	27.0	23.0	26.0
6	15.0	12.0	.0	.0	.0	.0	12.0	10.0	24.0	27.0	24.0	26.0
7	16.0	12.0	.0	.0	.0	.0	13.0	9.0	24.0	24.0	25.0	27.0
8	12.0	12.0	.0	.0	.0	.0	13.0	10.0	20.0	24.0	27.0	29.0
9	11.0	11.0	.0	.0	.0	.0	15.0	11.0	22.0	24.0	27.0	28.0
10	11.0	8.0	.0	.0	.0	.0	12.0	14.0	23.0	25.0	24.0	28.0
11	11.0	7.0	.0	.0	.0	.0	11.0	14.0	25.0	25.0	26.0	28.0
12	10.0	7.0	.0	.0	.0	.0	11.0	16.0	25.0	23.0	27.0	28.0
13	10.0	5.0	.0	.0	.0	1.0	11.0	13.0	25.0	24.0	28.0	28.0
14	12.0	7.0	1.0	.0	.0	1.0	10.0	12.0	25.0	25.0	29.0	26.0
15	12.0	7.0	2.0	.0	.0	1.0	11.0	13.0	21.0	26.0	28.0	25.0
16	11.0	6.0	3.0	.0	.0	1.0	11.0	13.0	24.0	26.0	28.0	26.0
17	11.0	6.0	2.0	.0	.0	1.5	11.0	14.0	25.0	28.0	23.0	24.0
18	11.0	5.0	2.0	.0	.0	2.0	10.0	17.0	25.0	28.0	28.0	21.0
19	12.0	5.0	1.0	.0	.0	1.5	8.0	18.0	25.0	28.0	26.0	22.0
20	13.0	8.0	.0	.0	.0	2.0	7.0	18.0	25.0	28.0	26.0	22.0
21	12.0	5.0	.0	.0	.0	1.5	8.0	18.0	25.0	28.0	26.0	20.0
22	12.0	5.0	.0	.0	.0	1.5	8.0	18.0	24.0	25.0	27.0	19.0
23	11.0	5.0	.0	.0	.0	2.5	10.0	18.0	25.0	23.0	28.0	19.0
24	12.0	5.0	.0	.0	.0	2.0	10.0	18.0	27.0	24.0	27.0	19.0
25	11.0	5.0	.0	.0	.0	2.0	11.0	19.0	28.0	25.0	26.0	18.0
26	11.0	.0	.0	.0	.0	.5	12.0	24.0	26.0	24.0	25.0	18.0
27	12.0	.0	.0	.0	.0	2.0	14.0	25.0	26.0	24.0	25.0	18.0
28	12.0	.0	.0	.0	.0	4.0	14.0	25.0	26.0	25.0	24.0	18.0
29	12.0	.0	.0	.0	---	5.0	13.0	22.0	26.0	25.0	24.0	18.0
30	12.0	.0	.0	.0	---	9.0	14.0	24.0	26.0	24.0	25.0	17.0
31	12.0	---	.0	.0	---	11.0	---	24.0	---	25.0	25.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	123	555	2410	55300	52	177	72	323	208	281	7	10
2	290	1670	1730	73400	73	258	38	149	138	186	8	12
3	333	1970	1980	83400	68	248	76	250	81	109	5	7.7
4	222	1080	1090	31200	58	182	92	278	110	148	4	6.1
5	301	1900	770	14200	58	163	85	248	129	171	3	4.5
6	330	1970	480	6770	59	105	97	283	131	173	3	4.5
7	321	1750	280	3310	46	68	98	286	120	156	2	3.1
8	930	11700	246	2600	22	39	96	290	78	101	1	1.6
9	1220	20600	292	2930	13	27	104	298	74	98	1	1.6
10	615	6860	303	2900	18	44	67	170	110	146	2	3.2
11	417	4230	296	2580	15	40	67	150	102	138	2	3.5
12	343	3430	255	2050	13	37	92	189	95	126	1	1.9
13	326	2800	180	1320	19	74	83	161	77	108	2	4.4
14	278	2000	133	901	28	138	85	154	83	121	14	50
15	167	1060	89	577	36	198	45	79	85	119	85	652
16	120	680	72	455	72	537	43	77	81	114	146	1970
17	109	571	68	419	387	6200	73	126	52	73	157	3180
18	92	447	64	380	1050	16300	58	99	33	47	126	2790
19	99	449	66	376	735	9980	38	63	44	63	490	13100
20	95	403	65	355	435	4560	38	62	77	110	1510	64400
21	94	376	59	333	260	2250	32	52	41	60	6670	499000
22	112	420	77	418	294	3790	27	42	27	39	3210	155000
23	92	340	69	350	69	857	32	49	39	58	2110	87700
24	296	2760	37	178	26	305	31	48	33	49	1110	36000
25	1400	30800	44	204	30	262	32	48	20	30	3130	94700
26	1630	38800	45	168	14	81	28	44	11	16	1270	42200
27	1340	27400	30	97	4	18	27	42	8	12	1720	65900
28	1000	17400	30	138	12	61	26	39	7	10	1830	83500
29	698	9910	26	88	88	523	20	30	---	---	1090	45600
30	530	6150	34	96	98	519	40	59	---	---	1050	29500
31	363	3620	---	---	57	274	90	129	---	---	780	13700
TOTAL	---	204101	---	287493	---	48315	---	4317	---	2862	---	1239006.1

054740000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	600	8250	298	3040	316	2240	4890	80900	200	1070	265	1190
2	478	5560	269	2560	190	1230	3840	80600	166	802	208	753
3	538	5420	225	1960	163	964	3960	87100	128	567	162	481
4	417	3700	199	1610	132	741	3700	69600	101	409	120	299
5	318	2720	221	1810	112	593	2480	30300	84	315	76	163
6	319	2820	215	1880	104	534	1450	11800	92	318	60	116
7	318	2830	1270	24600	96	469	6840	237000	123	392	54	96
8	332	3130	1530	33200	87	399	5830	225000	119	350	63	104
9	430	4310	1090	24300	86	376	3200	105000	91	248	55	80
10	2890	99300	700	11600	77	322	1650	38700	79	202	37	49
11	3210	148000	500	6290	78	316	630	6600	56	135	43	54
12	2130	94300	1200	19600	95	359	470	3730	48	110	39	46
13	1300	45300	2970	119000	104	382	597	5420	48	104	38	42
14	1240	24100	2320	134000	103	334	625	4640	53	109	146	201
15	980	14200	1300	70600	820	4460	540	3410	70	135	99	122
16	590	6900	950	44400	605	3580	383	2110	65	119	72	88
17	400	3430	700	21400	325	1630	258	1250	1680	6800	825	5200
18	1850	37800	580	10900	1820	9980	200	832	1040	2610	5170	157000
19	2440	71200	453	6600	1230	7440	166	636	314	822	4870	193000
20	1920	59100	418	5260	682	4030	114	419	299	904	1300	29400
21	1530	46700	380	4220	558	2940	1680	17700	225	485	1160	17200
22	1050	29200	291	2970	340	1630	3410	64800	132	215	1360	21800
23	790	21500	242	2350	275	1230	3520	86900	74	103	1570	25100
24	710	20100	243	2370	302	1580	1880	48800	60	78	1240	19800
25	570	16800	270	2490	390	2610	820	19600	540	1450	800	12300
26	510	14500	245	2060	900	8720	688	16200	1300	7650	635	8900
27	450	8690	370	2900	4030	47500	624	15100	1940	20200	575	7960
28	422	6350	1320	11200	2400	57300	577	8900	1520	15200	515	6130
29	364	4520	2860	54500	1690	20700	463	4100	410	2170	468	4040
30	315	3510	1510	16800	3470	55500	322	2280	236	841	371	2690
31	---	---	730	5910	---	---	255	1540	242	1080	---	---
TOTAL	---	814240	---	652380	---	240089	---	1280967	---	65993	---	514404

TOTAL LOAD FOR YEAR: 5354167.1 TONS.

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
OCT 26...	1800	11.0	--	9080	1560	38200	46	56	59
JAN 31...	1730	.0	--	536	107	155	--	--	--
APR 11...	1830	11.0	--	16200	2860	125000	43	45	51
MAY 29...	1830	22.0	--	6210	2680	44900	52	56	61
JUN 18...	1730	25.0	--	2130	2630	15100	58	64	80
27...	1830	26.0	--	4200	3140	35600	26	73	83
JUL 02...	2030	25.0	--	9390	4080	103000	53	60	66

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)
OCT 26...	70	92	94	100	--	--	--	--	--
JAN 31...	--	--	--	--	--	--	45	--	--
APR 11...	60	90	93	98	100	--	--	--	--
MAY 29...	79	99	99	100	--	--	--	--	--
JUN 18...	96	--	--	--	--	--	99	--	--
27...	91	--	--	--	--	--	98	--	--
JUL 02...	81	97	99	100	--	--	--	--	--

054740000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
OCT 26...	--	--	--	--	--	--	--	--
JAN 31...	--	--	--	--	--	--	--	--
APR 11...	--	--	--	--	--	--	--	--
MAY 29...	--	--	--	--	--	--	--	--
JUN 18...	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--
JUL 02...	--	--	--	--	--	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
NOV 09...	1100	1810	620	8.3	12.0	65	--	11.4	108	--	--
DEC 20...	1400	3880	420	8.2	.0	--	110	12.8	90	76	--
JAN 31...	1730	536	707	7.4	.0	2	--	--	--	150	23
MAR 22...	1800	17600	190	7.5	3.0	440	--	11.8	98	460	270
JUN 14...	1500	1180	540	8.1	24.0	--	6.3	7.2	83	180	780
JUL 12...	1200	2880	480	7.6	25.0	--	130	6.8	83	590	870
SEP 13...	1040	414	480	8.6	27.0	--	9.4	6.4	81	260	210

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
NOV 09...	300	89	78	26	11	3.2	260	0	210	55	27
DEC 20...	170	45	41	16	10	4.4	150	0	120	43	14
JAN 31...	340	98	90	29	19	2.7	300	0	250	74	24
MAR 22...	95	26	25	8.0	5.9	7.1	85	0	70	23	16
JUN 14...	290	63	76	25	12	2.4	--	0	230	51	18
JUL 12...	240	63	66	19	13	3.7	--	0	180	41	18
SEP 13...	220	51	52	22	13	3.9	--	--	170	52	19

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)
NOV 09...	.3	17	376	346	.51	1840	9.4	--	--	.36
DEC 20...	.3	11	259	214	.35	2710	6.2	--	--	.52
JAN 31...	.3	18	419	405	.57	606	4.9	.82	5.7	.12
MAR 22...	.2	7.4	147	135	.20	6990	2.5	5.5	8.0	1.2
JUN 14...	.3	13	380	336	.52	1210	6.5	.97	7.5	.19
JUL 12...	.3	15	304	284	.41	2360	6.2	3.4	9.6	.30
SEP 13...	.4	7.3	284	272	.39	317	.04	1.6	1.6	.20

054740000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	PHYTO-PLANK-TON, TOTAL (CELLS PER ML) (60050)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M (00573)	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M (00572)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2) (70957)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2) (70958)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY) (80156)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 09...	--	--	85	--	--	--	--	--	--	--
DEC 20...	--	--	--	--	--	--	--	--	--	--
JAN 31...	--	--	--	--	--	--	--	107	155	45
MAR 22...	--	--	--	--	--	--	--	--	--	98
JUN 14...	--	6.8	1900	--	--	--	--	--	--	--
JUL 12...	19	--	880	--	--	--	--	--	--	--
SEP 13...	--	11	170000	--	--	--	--	--	--	--

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
DEC 20...	3	1	0	2	0	0	0	0	10	4	860
JUN 14...	3	2	1	1	0	0	0	0	11	3	1000
SEP 13...	4	1	1	0	10	0	0	0	6	2	920

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
DEC 20...	520	9	1	40	30	.2	.2	1	0	20	20
JUN 14...	30	2	1	150	0	.1	.0	1	1	30	10
SEP 13...	20	6	0	340	20	1.9	1.7	1	3	0	10

054740000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	NOV 9,77	JUN 14,78	JUL 12,78	SEP 13,78
TIME	1100	1500	1200	1040
TOTAL CELLS/ML	85	1900	880	170000
DIVERSITY: DIVISION	0.0	0.6	1.6	1.1
.CLASS	0.0	0.6	1.6	1.1
..ORDER	0.0	0.9	2.3	1.5
...FAMILY	0.0	1.8	3.0	1.5
....GENUS	0.0	1.8	3.4	2.1

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...COELASTRACEAE								
....COELASTRUM	--	-	380#	20	--	-	--	-
...OOCYSTACEAE								
....ANKISTRODESMUS	--	-	59	3	44	5	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	970	1
....OOCYSTIS	--	-	--	-	22	2	--	-
....SELENASTRUM	--	-	--	-	--	-	970	1
....TREUBARIA	--	-	--	-	--	-	*	0
...SCENEDESMACEAE								
....SCENEDESMUS	--	-	1200#	60	180#	20	970	1
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	-	--	-	44	5	--	-
..ZYGNEMATALES								
...DESMIDIACEAE								
....CLOSTERIUM	--	-	73	4	22	2	--	-
....COSMARIUM	--	-	59	3	--	-	*	0
..CHLOROCOCCALES								
...OOCYSTACEAE								
....GLOEOACTINIUM	--	-	--	-	--	-	5300	3
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	--	-	88	5	110	13	42000#	25
..PENNALES								
...GOMPHONEMATACEAE								
....GOMPHONEMA	--	-	--	-	66	7	--	-
...NAVICULACEAE								
....GYROSIGMA	--	-	--	-	22	2	--	-
....NAVICULA	--	-	--	-	130	15	--	-
...NITZSCHIACEAE								
....NITZSCHIA	85#	100	--	-	66	7	*	0
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROCCOCCALES								
...CHROCCOCCACEAE								
....ANACYSTIS	--	-	120	6	--	-	16000	9
..HORMOGONALES								
...NOSTOCACEAE								
....ANABAENA	--	-	--	-	--	-	72000#	43
....APHANIZOMENON	--	-	--	-	--	-	30000#	18
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....EUGLENA	--	-	--	-	22	2	--	-
....LEPOCINCLIS	--	-	--	-	22	2	--	-
....TRACHELOMONAS	--	-	--	-	110	13	--	-
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..GYMNODINIALES								
...GYMNODINIACEAE								
....GYMNODINIUM	--	-	--	-	22	2	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05474500 MISSISSIPPI RIVER AT KEOKUK, IA
(National stream-quality accounting network station)

LOCATION.--Lat 40°23'37", long 91°22'27", in SE1/4 SW1/4 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 (0.3 km) upstream from bridge on U.S. Highway 136, 2.7 mi (4.3 km) upstream from Des Moines River, and at mile 364.2 (586.0 km) upstream from Ohio River.

DRAINAGE AREA.--119,000 mi² (308,000 km²), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1878 to current year.

GAGE.--Water-stage recorder. Datum of gage is 477.41 ft (145.515 m) NGVD (levels by Corps of Engineers); Jan. 1, 1878, to May 1913, nonrecording gage at Galland (formerly Nashville), 8 mi (12.9 km) upstream; zero of gage was set to low-water mark of 1864, or 496.52 ft (151.339 m) NGVD.

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 furnished by Union Electric Co.

AVERAGE DISCHARGE.--100 years, 62,330 ft³/s (1,765 m³/s), 7.11 in/yr (181 mm/yr), 45,160,000 acre-ft/yr (55,680 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 344,000 ft³/s (9,740 m³/s) Apr. 24, 1973; maximum gage height, 23.35 ft (7.117 m) Apr. 24, 1973; minimum daily discharge, 5,000 ft³/s (142 m³/s) Dec. 27, 1933.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 6, 1851, reached a stage of 21.0 ft (6.40 m), present site and datum, estimated as 13.5 ft (4.11 m) at Galland, discharge, 360,000 ft³/s (10,200 m³/s).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 178,000 ft³/s (5,041 m³/s) Apr. 24; minimum daily, 28,000 ft³/s (793 m³/s) Mar. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68600	77200	32400	63800	37600	30800	116000	123000	70400	111000	115000	67000
2	75400	102000	37200	63700	38500	31900	117000	115000	74100	113000	109000	68500
3	78600	108000	44400	62700	38400	30400	108000	109000	73300	108000	106000	71200
4	77800	95700	46000	61900	36500	29200	92700	106000	79400	111000	98300	67300
5	78900	82200	36700	62500	35100	28400	94000	132000	77700	113000	85000	68600
6	75000	77900	35300	60800	36200	29700	101000	98500	77600	121000	76700	70100
7	74600	69700	29100	60500	36100	29000	101000	110000	82600	141000	73700	71100
8	78900	66100	32300	59400	33800	28000	112000	104000	86800	158000	70000	70600
9	78600	68300	32000	55600	36100	28700	121000	98800	83900	158000	65900	68500
10	73000	68800	31500	51800	37200	29100	139000	92700	79300	160000	58400	63500
11	72200	68800	36600	48800	35300	30200	151000	87300	76100	158000	54900	54900
12	73400	68600	37900	48700	33400	32400	158000	89200	74400	155000	53700	52700
13	71900	71000	39900	47800	33700	32800	160000	102000	74600	156000	41000	49200
14	70200	67300	42700	46500	34400	35800	153000	124000	68300	156000	47300	45100
15	68500	62000	42200	45100	33800	37500	147000	146000	67100	157000	46400	54700
16	68200	62800	45700	43100	33600	46100	144000	155000	59000	156000	41300	58700
17	64500	63000	52500	42800	33000	55300	141000	149000	62900	152000	36600	64200
18	72000	66800	61600	40500	33600	58600	148000	129000	73200	142000	42400	81700
19	71800	64700	65500	40300	33000	59900	160000	113000	84300	131000	46300	108000
20	72500	60700	67800	40200	32800	61800	167000	106000	98800	124000	45400	112000
21	71900	61200	57000	39700	31800	74500	175000	102000	107000	121000	41400	105000
22	74100	58000	49800	38600	34200	89100	176000	92400	107000	122000	39300	106000
23	71600	56700	51700	37400	33500	107000	177000	89800	106000	130000	42900	109000
24	75300	56700	59000	39900	33600	110000	178000	82800	104000	137000	44200	109000
25	84700	59200	58000	40000	33300	112000	172000	81100	101000	137000	43100	113000
26	90800	57700	55000	40800	32200	104000	165000	79700	101000	133000	45500	106000
27	89600	53700	48100	41300	32100	101000	155000	78700	105000	126000	50100	97200
28	83800	39400	51300	39800	32600	115000	145000	73800	115000	122000	55300	83500
29	72200	30900	57600	37300	---	120000	138000	70300	122000	119000	54600	82000
30	63700	31200	59300	37700	---	114000	131000	69700	119000	119000	51900	78200
31	56700	---	64300	37800	---	111000	---	66800	---	116000	55700	---
TOTAL	2299000	1976300	1460400	1476800	965400	1903200	4242700	3176600	2610800	4163000	1837300	2356500
MEAN	74160	65880	47110	47640	34480	61390	141400	102500	87030	134300	59270	78550
MAX	90800	108000	67800	63800	38500	120000	178000	155000	122000	160000	115000	113000
MIN	56700	30900	29100	37300	31800	28000	92700	66800	59000	108000	36600	45100
CFSM	.62	.55	.40	.40	.29	.52	1.19	.86	.73	1.13	.50	.66
IN.	.72	.62	.46	.46	.30	.59	1.33	.99	.82	1.30	.57	.74
AC-FT	4560000	3920000	2897000	2929000	1915000	3775000	8415000	6301000	5179000	8257000	3644000	4674000

CAL YR 1977 TOTAL 15284700 MEAN 41880 MAX 108000 MIN 14100 CFSM .35 IN 4.78 AC-FT 30320000
WTR YR 1978 TOTAL 28468000 MEAN 77990 MAX 178000 MIN 28000 CFSM .66 IN 8.90 AC-FT 56470000

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Samples collected at bridge on U.S. Highway 136, 0.2 mi (0.3 km) downstream from discharge station.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1977 to current year.
WATER TEMPERATURES: December 1977 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 547 micromhos Feb. 19, 1978; minimum daily, 327 micromhos Sept. 10, 1978.
WATER TEMPERATURES: Maximum daily, 26.5° C Aug. 26 and Sept. 9,10, 1978; minimum daily, 0.0° C on many days during winter periods.

EXTREMES FOR CURRENT PERIOD.--December 1977 to September 1978:
SPECIFIC CONDUCTANCE: Maximum daily, 547 micromhos Feb. 19; minumum daily, 327 micromhos Sept. 10.
WATER TEMPERATURES: Maximum daily, 26.5° C Aug. 26 and Sept. 9,10; minumum daily, 0.0° C on many days during winter period.

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT.	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---	.0	.0	.0	8.0	13.0	22.0	26.0	25.0	25.0
2			---	.0	.0	.0	8.0	13.0	22.0	26.0	24.0	26.0
3			---	.0	.0	.0	8.0	14.0	22.0	26.0	24.0	26.0
4			---	.0	.0	.0	9.0	12.0	22.0	26.0	23.0	26.0
5			---	.0	.0	.0	8.0	12.0	22.0	26.0	23.0	26.0
6			---	.0	.0	.0	10.0	12.0	23.0	26.0	23.0	26.0
7			---	.0	.0	.0	10.0	11.0	23.0	26.0	24.0	26.0
8			---	.0	.0	.0	11.0	11.0	23.0	26.0	24.0	26.0
9			---	.0	.0	.0	12.0	11.0	23.0	26.0	23.0	26.0
10			---	.0	.0	.0	12.0	12.0	23.0	25.0	24.0	26.0
11			.0	.0	.0	.5	10.0	14.0	22.0	24.0	24.0	26.5
12			.0	.0	.0	1.0	11.0	15.0	22.0	23.0	24.0	26.5
13			.0	.0	.0	1.0	11.0	15.0	22.0	23.0	26.0	26.0
14			1.0	.0	.0	1.0	11.0	15.0	22.0	25.0	26.0	26.0
15			1.0	.0	.0	.5	11.0	15.0	22.0	25.0	26.0	26.0
16			1.0	.0	.0	.5	11.0	15.0	21.0	25.0	26.0	26.0
17			1.5	.0	.0	.0	11.0	15.0	22.0	26.0	26.0	26.0
18			1.0	.0	.0	.0	10.0	15.0	22.0	26.0	26.0	26.0
19			1.0	.0	.0	.0	10.0	15.0	23.0	26.0	26.0	26.0
20			.0	.0	.0	.5	9.0	15.0	23.0	26.0	25.0	26.0
21			.0	.0	.0	.5	9.0	15.0	23.0	26.0	25.0	26.0
22			.0	.0	.0	1.0	10.0	16.0	23.0	26.0	25.0	26.0
23			.0	.0	.0	1.0	10.0	16.0	23.0	26.0	26.0	24.0
24			.0	.0	.0	.0	10.0	17.0	23.0	26.0	26.0	23.0
25			.0	.0	.0	1.0	10.0	18.0	23.0	26.0	26.0	23.0
26			.0	.0	.0	1.0	11.0	19.0	23.0	26.0	26.5	24.0
27			.0	.0	.0	1.5	11.0	20.0	24.0	26.0	26.0	24.0
28			.0	.0	.0	1.5	12.0	20.0	24.0	25.0	26.0	22.0
29			.0	.0	---	3.0	---	20.0	24.0	26.0	25.0	20.0
30			.0	.0	---	4.0	13.0	21.0	26.0	25.0	25.0	20.0
31			.0	.0	---	7.0	---	22.0	---	25.0	25.0	---
TOTAL			6.5	0.0	0.0	26.5	297.0	474.0	682.0	791.0	773.5	752.0
MEAN			.5	.0	.0	1.0	10.0	15.5	22.5	25.5	25.0	25.0
MAX			1.5	.0	.0	7.0	13.0	22.0	26.0	26.0	26.5	26.5
MIN			.0	.0	.0	.0	8.0	11.0	21.0	23.0	23.0	20.0

WTR YR 1978 TOTAL 3802.5 MEAN 13.0 MAX 26.5 MIN .0

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued
(National stream-quality accounting network stations)

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---	504	498	520	418	419	468	407	375	356
2			---	504	505	516	420	418	465	385	384	382
3			---	502	509	501	418	419	465	383	379	387
4			---	505	495	524	456	426	460	385	382	391
5			---	502	499	503	444	412	465	390	374	393
6			---	503	493	505	459	420	470	403	376	384
7			---	503	529	498	441	419	490	396	375	382
8			---	504	524	496	467	401	485	364	381	383
9			---	505	531	510	453	405	490	346	386	383
10			---	507	502	514	457	392	485	327	385	375
11			521	507	519	512	462	401	445	332	384	359
12			511	506	538	506	439	414	441	346	386	344
13			509	505	521	508	415	405	440	363	373	341
14			522	505	517	501	420	379	438	394	375	332
15			499	504	514	524	424	370	440	348	377	336
16			497	503	516	505	459	347	410	346	378	338
17			494	506	519	520	451	351	408	344	375	342
18			478	506	502	512	434	349	411	360	378	338
19			495	513	547	472	423	352	406	361	376	338
20			481	531	536	458	403	351	409	365	370	340
21			492	519	528	454	407	355	410	372	373	335
22			497	532	519	398	398	400	408	376	368	342
23			503	530	514	346	391	405	403	378	375	340
24			506	533	522	366	389	420	389	394	372	350
25			494	535	542	387	386	425	395	390	374	350
26			502	521	531	372	408	440	393	333	370	352
27			503	527	543	385	417	445	401	344	372	354
28			503	522	518	374	414	447	402	353	371	360
29			505	518	---	395	426	448	401	363	359	363
30			502	509	---	409	425	460	400	371	363	360
31			503	500	---	400	---	467	---	369	360	---
TOTAL			10517	15871	14531	14391	12824	12562	12993	11388	11626	10730
MEAN			501	512	519	464	427	405	433	367	375	358
MAX			522	535	547	524	467	467	490	407	386	393
MIN			478	500	493	346	386	347	389	327	359	332

WTR YR 1978 TOTAL 127433 MEAN 433 MAX 547 MIN 327

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
11...	1100	70200	400	8.2	11.0	50	--	--	--	--	--
NOV											
08...	1145	65000	440	7.9	13.0	30	--	10.2	93	560	270
DEC											
13...	1200	48500	464	8.4	.0	10	--	12.0	120	200	180
JAN											
10...	1100	52700	500	8.3	.0	6	--	--	--	--	--
APR											
18...	1300	141200	370	7.4	10.0	75	--	10.8	98	290	410
MAY											
09...	1200	99000	380	7.8	13.0	--	70	10.0	97	165	112
JUN											
13...	1145	73900	400	8.3	24.5	--	60	8.0	96	156	96
JUL											
11...	1100	157800	340	7.4	25.0	--	160	6.2	64	480	990
SEP											
12...	1130	55900	330	7.8	27.5	--	16	6.4	82	270	190

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS, NONCARBONATE (MG/L CACO3) (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE (MG/L AS HCO3) (00440)	CARBONATE (MG/L AS CO3) (00445)	ALKALINITY (MG/L AS CACO3) (00410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)
OCT											
11...	160	33	41	15	8.9	3.4	160	0	130	32	15
NOV											
08...	200	44	50	19	9.5	3.2	190	0	156	35	18
DEC											
13...	220	48	52	22	12	2.2	210	0	170	42	24
JAN											
10...	230	71	58	20	12	2.4	190	0	160	44	22
APR											
18...	180	48	47	15	8.0	3.1	160	0	130	37	16
MAY											
09...	180	65	44	17	7.9	3.0	140	0	110	42	18
JUN											
13...	200	50	47	20	11	3.1	--	0	150	49	20
JUL											
11...	170	41	47	13	8.1	3.3	--	0	130	28	13
SEP											
12...	150	32	36	15	8.7	3.9	--	0	120	26	13

DATE	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)
OCT										
11...	.2	8.8	214	203	.29	40600	2.6	--	--	.64
NOV										
08...	.3	18	261	247	.35	45800	4.3	--	--	.23
DEC										
13...	.2	11	293	269	.40	38400	2.4	--	--	.15
JAN										
10...	.1	13	291	265	.40	41400	3.6	--	--	.12
APR										
18...	.1	8.8	226	214	.31	86200	4.4	1.4	5.8	.32
MAY										
09...	.2	4.6	216	206	.29	57700	2.6	2.9	5.5	.30
JUN										
13...	.2	5.9	259	247	.35	51700	1.8	1.3	3.1	.31
JUL										
11...	.2	9.7	214	200	.29	91200	2.3	2.0	4.3	.35
SEP										
12...	.2	9.0	207	184	.28	31200	.66	.95	1.6	.22

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	PHYTOPLANKTON, TOTAL (CELLS PER ML) (60050)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M (00573)	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M (00572)	CHLOR-A PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2) (70957)	CHLOR-B PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2) (70958)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
11...	--	--	370000	.000	.000	.008	.001	--	--	--
NOV										
08...	--	--	1700	--	--	--	--	--	--	--
DEC										
13...	--	10	--	--	--	--	--	16	2100	100
JAN										
10...	8.6	--	--	--	--	--	--	32	4560	91
APR										
18...	11	--	--	--	--	--	--	80	30500	93
MAY										
09...	--	--	8600	--	--	--	--	--	--	--
JUN										
13...	--	9.5	1700	--	--	--	--	--	--	--
JUL										
11...	16	--	--	--	--	--	--	--	--	--
SEP										
12...	--	2.6	5100	--	--	--	--	--	--	--

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
DEC											
13...	2	1	2	1	0	0	0	0	12	3	720
JUN											
13...	3	2	2	1	10	5	4	0	18	9	4000
SEP											
12...	4	1	2	0	10	10	0	0	8	5	1600

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
DEC											
13...	80	21	4	60	30	.2	.3	0	1	40	10
JUN											
13...	630	9	2	270	50	.1	.0	1	1	40	20
SEP											
12...	50	9	2	200	10	1.8	1.2	0	1	10	10

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	OCT 11,77	NOV 8,77	MAY 9,78	JUN 13,78	JUL 11,78	SEP 12,78
TIME	1100	1145	1200	1145	0000	1130
TOTAL CELLS/ML	370000	1700	8600	1700	1700	5100
DIVERSITY: DIVISION	0.2	1.5	1.6	1.0	1.1	1.2
.CLASS	0.2	1.5	1.6	1.0	1.1	1.2
..ORDER	0.2	2.4	1.9	1.4	2.0	1.7
...FAMILY	0.2	2.4	2.7	1.9	2.6	2.3
....GENUS	0.2	2.4	3.2	2.4	3.0	3.7

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...HYDRODICTYACEAE												
....PEDIASTRUM	--	-	--	-	--	-	190	11	200	12	--	-
...MICRACTINIACEAE												
....GOLENKINIA	--	-	--	-	--	-	--	-	--	-	44	1
....MICRACTINIUM	--	-	--	-	1600#	18	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	*	0	33	2	310	4	23	1	--	-	*	0
....CHLORELLA	*	0	--	-	--	-	--	-	--	-	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-	130	3
....CLOSTERIOPSIS	--	-	--	-	--	-	--	-	--	-	*	0
....DICTYOSPHAERIUM	*	0	--	-	--	-	--	-	--	-	280	6
....KIRCHNERIELLA	*	0	--	-	*	0	--	-	--	-	350	7
....OOCYSTIS	*	0	--	-	--	-	--	-	--	-	150	3
....QUADRIGULA	*	0	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	66	1
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-	*	0
...SCENEDESMACEAE												
....ACTINASTRUM	*	0	--	-	280	3	--	-	--	-	--	-
....CRUCIGENIA	*	0	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	*	0	280#	16	1300#	15	760#	45	270#	16	940#	18
....TETRASTRUM	*	0	--	-	--	-	--	-	--	-	680	13
..TETRASPORALES												
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	88	5	--	-
...PALMELLACEAE												
....SPHAEROCYSTIS	--	-	--	-	--	-	--	-	--	-	350	7
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	33	2	70	1	46	3	22	1	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....CLOSTERIUM	--	-	--	-	*	0	--	-	--	-	--	-
..CHLOROCOCCALES												
...OOCYSTACEAE												
....GLOEOACTINIUM	--	-	--	-	--	-	--	-	--	-	390	8
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	*	0	--	-	1800#	21	69	4	220	13	370	7
....MELOSIRA	3200	1	410#	24	980	11	210	12	510#	30	--	-
....SKELETONEMA	*	0	--	-	--	-	--	-	--	-	--	-
....STEPHANODISCUS	*	0	--	-	--	-	320#	19	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....COCCONEIS	--	-	--	-	*	0	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	22	1	--	-
...FRAGILARIACEAE												
....ASTERIONELLA	--	-	--	-	310	4	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	--	-	66	4	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	--	-	--	-	22	1	--	-
...NAVICULACEAE												
....NAVICULA	--	-	--	-	--	-	46	3	44	3	--	-
....PINNULARIA	--	-	--	-	--	-	--	-	22	1	--	-
...NITZSCHIACEAE												
....NITZSCHIA	*	0	120	7	70	1	46	3	150	9	--	-
...SURIRELLACEAE												
....SURIRELLA	--	-	--	-	*	0	--	-	--	-	--	-
.CHRYSOPHYCEAE												
..CHRYSOMONADALES												
...CHROMULINACEAE												
....CHRYSOCOCCUS	--	-	11	1	--	-	--	-	--	-	--	-
...OCHROMONADACEAE												
....DINOBRYON	--	-	--	-	*	0	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%.
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

05476500 DES MOINES RIVER AT ESTHERVILLE, IA

LOCATION.--Lat 43°23'51", long 94°50'38", in SW1/4 SE1/4 sec.10, T.99 N., R.34 W., Emmet County, Hydrologic Unit 07100002, on right bank in city park, 1,200 ft (366 m) downstream from bridge on State Highway 9 at Estherville, 0.1 mi (0.2 km) upstream from School Creek, 2.3 mi (3.7 km) upstream from Brown Creek, and at mile 404.2 (650.4 km).

DRAINAGE AREA.--1,372 mi² (3,553 km²).

PERIOD OF RECORD.--October 1951 to current year. Prior to November 1951, monthly discharge only, published in WSP 1728.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,247.55 ft (380.253 m) NGVD.

REMARKS.--Records good except those for winter period, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--27 years, 280 ft³/s (7.930 m³/s), 2.77 in/yr (70 mm/yr), 202,900 acre-ft/yr (250 hm³/yr); median of yearly mean discharges, 210 ft³/s (5.95 m³/s), 2.1 in/yr (53 mm/yr), 152,000 acre-ft/yr (187 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,000 ft³/s (453 m³/s) Apr. 12, 1969, gage height, 17.68 ft (5.389 m), from floodmark; no flow Jan. 16-18, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	-----	1,890	53.5	Ice jam	---	Mar. 25	0315	*2,140	60.6	*7.58	2.310

Minimum daily discharge, 38 ft³/s (1.08 m³/s) Mar. 9,10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	156	174	284	197	58	42	945	899	366	234	343	120
2	128	179	290	190	51	44	893	863	384	217	328	114
3	89	182	292	179	49	44	849	819	407	204	308	109
4	71	169	290	172	49	45	827	784	389	190	287	100
5	59	155	282	192	55	52	840	750	359	197	267	93
6	52	150	262	178	59	53	963	708	335	246	250	89
7	65	147	250	164	61	49	1090	679	314	344	237	86
8	89	148	230	160	60	43	1270	680	294	307	224	82
9	109	512	216	180	61	38	1170	682	270	295	210	78
10	125	780	212	188	57	38	1100	676	244	280	197	75
11	151	582	208	174	52	86	1110	648	231	272	186	74
12	148	489	204	138	50	140	1110	630	220	284	177	76
13	151	445	197	114	50	350	1070	627	202	305	168	76
14	152	452	194	104	50	470	1020	597	179	309	162	88
15	144	454	194	100	54	520	962	576	167	305	199	102
16	136	440	206	96	60	520	926	553	174	291	189	84
17	129	424	226	94	65	450	894	531	377	274	187	69
18	120	402	250	93	70	460	998	504	252	261	193	84
19	110	386	284	89	69	750	1060	475	237	247	193	86
20	106	377	300	89	64	1290	992	444	374	236	185	82
21	102	337	288	89	59	1440	953	414	306	302	182	77
22	95	266	266	88	53	1610	935	384	260	605	192	71
23	93	253	244	77	49	1750	958	361	234	768	179	65
24	95	230	233	68	47	1930	992	346	238	625	169	53
25	95	186	242	65	44	1990	1020	327	236	546	161	43
26	94	142	246	66	44	1410	998	308	226	493	167	40
27	95	194	248	72	45	1200	957	295	204	462	156	42
28	96	224	244	79	42	1210	932	382	305	423	148	46
29	94	252	237	82	---	1200	936	525	338	393	143	45
30	98	272	222	72	---	1120	929	480	260	375	138	43
31	146	---	208	63	---	1010	---	381	---	361	130	---
TOTAL	3393	9403	7549	3712	1527	21354	29699	17328	8382	10651	6255	2292
MEAN	109	313	244	120	54.5	689	990	559	279	344	202	76.4
MAX	156	780	300	197	70	1990	1270	899	407	768	343	120
MIN	52	142	194	63	42	38	827	295	167	190	130	40
CFSM	.08	.23	.18	.09	.04	.50	.72	.41	.20	.25	.15	.06
IN.	.09	.25	.20	.10	.04	.58	.81	.47	.23	.29	.17	.06
AC-FT	6730	18650	14970	7360	3030	42360	58910	34370	16630	21130	12410	4550

CAL YR 1977	TOTAL	32027.02	MEAN	87.7	MAX	780	MIN	.00	CFSM .06	IN .87	AC-FT	63530
WTR YR 1978	TOTAL	121545.00	MEAN	333	MAX	1990	MIN	38	CFSM .24	IN 3.30	AC-FT	241100

05476750 DES MOINES RIVER AT HUMBOLDT, IA

LOCATION.--Lat 42°43'12", long 94°13'06", in SE1/4 SW1/4 sec.1, T.91 N., R.29 W., Humboldt County, Hydrologic Unit 07100002, on left bank 5 ft (2 m) downstream from First Avenue bridge in city of Humboldt, about 700 ft (213 m) below dam, 3.2 mi (5.1 km) upstream from Indian Creek, 3.9 mi (6.3 km) upstream from East Fork Des Moines River, and at mile 334.3 (537.9 km).

DRAINAGE AREA.--2,256 mi² (5,843 km²).

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 (321.119 m) NGVD. Prior to Oct. 3, 1966, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for winter period, which are poor. Daily nonrecording gage readings available in district office for period Mar. 7, 1940, to Sept. 30, 1964. Discharge not published for this period because of extreme regulation at dam 700 ft (213 m) upstream from gage. Power generation and streamflow regulation discontinued August 1964. Low flow discharges occasionally affected by minor regulation. Several observations of water temperature were made during the year.

COOPERATION.--Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--14 years, 698 ft³/s (19.77 m³/s), 4.20 in/yr (107 mm/yr), 505,700 acre-ft/yr (624 hm³/yr); median of yearly mean discharges, 590 ft³/s (16.7 m³/s) 3.6 in/yr (91 mm/yr), 427,000 acre-ft/yr (526 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft³/s (610 m³/s) Apr. 14, 1969, gage height, 15.40 ft (4.694 m); minimum daily, 13 ft³/s (0.37 m³/s) Nov. 12, 1976, Jan. 12 to Feb. 2, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23, 1947, reached a stage of 12.2 ft (3.72 m), discharge, 11,000 ft³/s (312 m³/s) at present site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,590 ft³/s (102 m³/s) July 8, gage height, 7.53 ft (2.295 m) at 0745 hours, no other peak above base of 2,800 ft³/s (79.3 m³/s); minimum daily, 62 ft³/s (1.76 m³/s) Oct. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	171	388	254	96	80	1410	1430	1000	834	612	300
2	62	201	394	244	94	80	1290	1380	888	680	579	283
3	86	258	396	224	92	80	1230	1320	790	566	532	264
4	126	271	380	216	92	81	1150	1270	736	498	489	248
5	139	278	360	208	90	81	1090	1200	678	532	457	239
6	129	278	350	198	88	80	1100	1130	626	2000	422	217
7	117	270	318	198	91	81	1180	1080	557	3110	403	193
8	117	256	290	216	91	81	1310	1050	514	3490	370	188
9	120	277	286	232	90	81	1440	1030	485	3070	359	193
10	133	267	264	226	88	90	1550	1010	441	2500	337	186
11	161	698	244	202	85	100	1470	986	398	1960	324	180
12	158	1020	242	176	89	114	1430	966	364	1610	313	204
13	162	909	240	158	89	158	1420	964	336	1370	296	1240
14	190	803	238	146	88	179	1380	933	323	1190	288	1960
15	191	744	238	144	88	278	1290	900	310	1050	304	2050
16	187	721	248	148	88	390	1260	858	250	926	310	1760
17	212	712	270	146	90	500	1200	816	903	827	319	1380
18	263	675	280	132	90	610	1260	780	1130	735	303	1150
19	178	658	310	126	89	780	1480	753	870	665	295	1010
20	191	610	335	124	89	860	1790	703	714	618	299	881
21	182	500	370	122	88	1000	1850	655	686	586	332	832
22	168	440	400	118	88	1170	1440	613	817	660	349	776
23	165	420	365	116	89	1660	1620	588	740	1110	326	671
24	171	350	340	114	87	2220	1540	503	674	1650	313	622
25	165	220	316	112	86	2380	1580	519	692	1670	314	545
26	163	177	300	112	82	2150	1570	506	688	1410	353	496
27	157	154	310	110	83	2200	1560	483	571	1150	402	449
28	105	210	282	110	82	1940	1520	485	1030	965	435	402
29	106	310	258	106	---	1650	1470	592	1060	839	395	379
30	146	380	260	103	---	1580	1440	723	882	744	342	362
31	167	---	258	98	---	1520	---	1010	---	665	311	---
TOTAL	4681	13238	9539	4939	2482	24254	42320	27236	20153	39680	11483	19660
MEAN	151	441	308	159	88.6	782	1411	879	672	1280	370	655
MAX	263	1020	400	254	96	2380	1850	1430	1130	3490	612	2050
MIN	62	154	238	98	82	80	1090	483	250	498	288	180
CFSM	.07	.20	.14	.07	.04	.35	.63	.39	.30	.57	.16	.29
IN.	.08	.22	.16	.08	.04	.40	.70	.45	.33	.66	.19	.32
AC-FT	9280	26260	18920	9800	4920	48110	83940	54020	39970	78710	22780	39000

CAL YR 1977 TOTAL 52484 MEAN 144 MAX 1020 MIN 13 CFSM .06 IN .87 AC-FT 104100
WTR YR 1978 TOTAL 219665 MEAN 602 MAX 3490 MIN 62 CFSM .27 IN 3.62 AC-FT 435700

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 (15 m) upstream from old mill dam, in city park at east edge of Dakota City, 500 ft (152 m) upstream from bridge on county highway P56, 0.6 mi (1.0 km) downstream from bridge on State Highway 3, 3.4 mi (5.5 km) upstream from confluence with Des Moines River, and at mile 333.8 (537.1 km) upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,308 mi² (3,387 km²).

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 (316.599 m) NGVD. Prior to Oct. 1, 1954, nonrecording gage at site 8 mi (12.9 km) upstream at different datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather service gage height telemeter at station.

COOPERATION.--Seven discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 469 ft³/s (13.28 m³/s), 4.87 in/yr (124 mm/yr), 339,800 acre-ft/yr (419 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,800 ft³/s (532 m³/s) June 21, 1954, gage height, 16.95 ft (5.166 m), from floodmark, site and datum then in use; minimum daily, 4.8 ft³/s (0.14 m³/s) Jan. 11-14, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 24.02 ft (7.321 m), discharge, 17,400 ft³/s (493 m³/s) at present site. Flood of September 1938 reached a stage of 17.4 ft (5.30 m), discharge, about 22,000 ft³/s (623 m³/s) site and datum in use during the period 1940-54.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 28	1545	*2,620	74.2	*12.49	3.807	Sept. 15	0115	1,530	43.3	10.72	3.267
July 8	1615	2,600	73.6	12.47	3.801						

Minimum daily discharge, 12 ft³/s (0.34 m³/s) Oct.6, Feb. 2-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	35	52	29	13	17	243	271	732	802	487	110
2	14	34	50	29	12	18	222	259	767	768	392	100
3	13	36	48	28	12	20	217	235	761	737	337	92
4	14	33	46	28	12	20	219	250	632	741	286	83
5	14	30	45	27	14	20	210	230	453	800	255	78
6	12	48	44	27	17	18	210	208	348	1330	228	72
7	17	78	43	27	18	18	207	217	287	2280	208	66
8	23	73	43	28	18	19	202	219	250	2580	188	61
9	21	68	45	30	17	19	197	212	212	2460	174	56
10	32	63	43	32	17	20	207	203	182	2160	159	52
11	35	58	40	32	16	29	227	200	159	1910	148	49
12	27	54	39	31	16	58	223	199	137	1750	139	53
13	23	51	36	29	17	94	206	222	119	1540	128	391
14	22	52	32	27	17	124	195	222	111	1160	121	1430
15	22	96	30	26	18	120	189	228	104	779	117	1490
16	20	117	29	25	19	160	178	235	103	542	119	1150
17	25	111	34	24	20	186	170	255	492	448	114	770
18	26	99	35	23	21	220	175	263	1430	400	109	585
19	26	89	36	22	21	300	178	257	1190	362	102	484
20	26	79	33	21	20	350	185	237	973	333	101	420
21	25	65	31	20	21	520	204	213	904	323	110	394
22	24	56	30	19	22	790	317	191	881	318	125	391
23	27	45	30	17	19	560	403	176	870	455	117	351
24	31	37	29	16	18	481	407	164	858	655	104	307
25	33	32	28	15	18	507	370	157	888	811	113	272
26	32	57	28	14	18	521	336	150	905	888	118	241
27	30	60	28	14	18	476	313	151	727	918	156	219
28	28	56	28	14	17	421	298	142	1090	923	172	194
29	26	52	28	14	---	342	291	210	1220	902	157	179
30	26	51	28	14	---	301	282	508	899	834	144	169
31	37	---	28	13	---	269	---	653	---	666	125	---
TOTAL	746	1815	1119	715	486	7018	7281	7337	18684	31575	5353	10309
MEAN	24.1	60.5	36.1	23.1	17.4	226	243	237	623	1019	173	344
MAX	37	117	52	32	22	790	407	653	1430	2580	487	1490
MIN	12	30	28	13	12	17	170	142	103	318	101	49
CFSM	.02	.05	.03	.02	.01	.17	.19	.18	.48	.78	.13	.26
IN.	.02	.05	.03	.02	.01	.20	.21	.21	.53	.90	.15	.29
AC-FT	1480	3600	2220	1420	964	13920	14440	14550	37060	62630	10620	20450

CAL YR 1977 TOTAL 13314.4 MEAN 36.5 MAX 274 MIN 4.8 CFSM .03 IN .38 AC-FT 26410
WTR YR 1978 TOTAL 92438.0 MEAN 253 MAX 2580 MIN 12 CFSM .19 IN 2.63 AC-FT 183400

05480000 LIZARD CREEK NEAR CLARE, IA

LOCATION.--Lat 42°32'35", long 94°20'45", in NE1/4 NE1/4 sec.11, T.89 N., R.30 W., Webster County, Hydrologic Unit 07100004, on right bank 20 ft (6 m) downstream from bridge on county highway, 2.3 mi (3.7 km) downstream from Drainage ditch 3, 3.0 mi (4.8 km) south of Clare, and 8.2 mi (13.2 km) upstream from South Lizard Creek.

DRAINAGE AREA.--257 mi² (666 km²).

PERIOD OF RECORD.--March 1940 to current year. Prior to April 1940, monthly discharge only, published in WSP 1308. Prior to October 1954, published as North Lizard Creek near Clare.

REVISED RECORDS.--.--WSP 1508: 1940, 1942, 1944-46 (M), 1947-48.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,079.30 ft (328.971 m) NGVD. Prior to May 6, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 93.6 ft³/s (2.651 m³/s), 4.95 in/yr (126 mm/yr) 67,810 acre-ft/yr (83.6 hm³/yr); median of yearly mean discharges, 82 ft³/s (2.32 m³/s); 4.3 in/yr (109 mm/yr), 59,400 acre-ft/yr (73.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,000 ft³/s (283 m³/s) June 23, 1947, gage height, 16.0 ft (4.88 m), from floodmark, from rating curve extended above 5,300 ft³/s (150 m³/s); no flow on a few days in 1943, 1956 and 1968 and many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 800 ft³/s (22.7 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 18	1215	815	23.1	6.02	1.835	Sept. 15	0445	1,650	46.7	7.29	2.222
July 7	2200	*1,950	55.2	*8.12	2.475						

Minimum daily discharge, 1.2 ft³/s (0.034 m³/s) Feb.18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	23	24	11	2.6	2.0	38	56	97	71	46	42
2	12	26	22	12	2.3	1.9	34	52	87	61	48	36
3	13	24	21	13	2.0	1.7	30	49	81	53	43	31
4	14	24	20	11	1.9	1.6	30	48	72	51	35	27
5	12	24	19	9.8	1.8	1.4	28	46	64	62	32	24
6	11	24	24	9.4	1.6	1.3	28	43	60	482	30	21
7	16	24	24	8.3	1.6	1.3	28	46	56	1700	27	19
8	24	24	23	9.0	1.6	1.4	26	59	53	1710	25	18
9	22	30	19	17	1.6	3.5	28	70	46	1090	24	15
10	29	30	16	13	1.5	5.4	30	71	41	690	23	13
11	27	35	13	11	1.6	11	28	67	38	470	23	12
12	25	56	13	11	1.5	19	27	65	37	339	19	14
13	23	82	13	8.8	1.5	23	26	75	33	257	17	397
14	21	68	12	7.4	1.4	26	25	79	31	195	15	1460
15	19	64	13	6.3	1.3	32	23	78	32	155	18	1490
16	19	58	14	5.8	1.3	44	22	72	34	123	24	870
17	17	55	21	5.5	1.3	49	23	67	89	99	19	572
18	18	50	23	5.2	1.2	60	39	59	739	86	16	438
19	15	45	19	4.9	1.2	94	81	57	457	72	15	356
20	13	43	15	4.6	1.3	118	114	53	265	77	13	314
21	14	31	18	4.2	1.5	140	112	49	182	85	28	337
22	12	30	19	4.0	1.8	132	101	44	131	99	67	308
23	14	38	14	3.9	2.1	122	96	44	127	192	51	259
24	16	33	13	3.9	2.6	114	90	44	228	234	41	223
25	16	28	15	3.9	3.1	106	84	41	184	178	43	188
26	16	36	17	3.7	3.1	95	73	38	225	140	51	168
27	15	30	16	3.5	2.9	87	69	40	154	108	93	154
28	14	26	13	3.6	2.5	80	67	51	111	84	88	136
29	14	22	12	3.4	---	66	67	121	88	71	75	128
30	14	24	12	3.2	---	48	62	110	81	60	63	118
31	22	---	11	3.0	---	41	---	112	---	53	52	---
TOTAL	529	1107	528	224.3	51.7	1528.5	1529	1906	3923	9147	1164	8188
MEAN	17.1	36.9	17.0	7.24	1.85	49.3	51.0	61.5	131	295	37.5	273
MAX	29	82	24	17	3.1	140	114	121	739	1710	93	1490
MIN	11	22	11	3.0	1.2	1.3	22	38	31	51	13	12
CFSM	.07	.14	.07	.03	.007	.19	.20	.24	.51	1.15	.15	1.06
IN.	.08	.16	.08	.03	.01	.22	.22	.28	.57	1.32	.17	1.19
AC-FT	1050	2200	1050	445	103	3030	3030	3780	7780	18140	2310	16240

CAL YR 1977 TOTAL 4616.58 MEAN 12.6 MAX 494 MIN .00 CFSM .05 IN .67 AC-FT 9160
WTR YR 1978 TOTAL 29825.50 MEAN 81.7 MAX 1710 MIN 1.2 CFSM .32 IN 4.32 AC-FT 59160

05480500 DES MOINES RIVER AT FORT DODGE, IA

LOCATION.--Lat 42°30'22", long 94°12'04", in NW1/4 SW1/4 sec.19, T.89 N., R.28 W., Webster County, Hydrologic Unit 07100004, on right bank 400 ft (122 m) upstream from Soldier Creek, 1,800 ft (549 m) downstream from Illinois Central Railroad bridge in Fort Dodge, 2,000 ft (610 m) downstream from Lizard Creek, and at mile 314.6 (506.2 km).

DRAINAGE AREA.--4,190 mi² (10,852 km²).

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 (295.467 m) NGVD. See WSP 1728 for history of changes prior to Dec. 8, 1949.

REMARKS.--Records good except those for winter period, which are poor. Occasional minor regulation caused by dam 0.8 mi (1.3 km) upstream from gage. Several observations of water temperature were made during the year. Corps of Engineers rain gage and gage height telemeters at station.

COOPERATION.--Six discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--46 years (1913-27, 1946-78), 1,332 ft³/s (37.72 m³/s) 4.32 in/yr (110 mm/yr), 965,000 acre-ft/yr (1,190 hm³/yr); median of yearly mean discharges, 1,150 ft³/s (32.6 m³/s), 3.7 in/yr (94 mm/yr), 833,000 acre-ft/yr (1,030 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,600 ft³/s (1,010 m³/s) Apr. 8, 1965, gage height, 17.79 ft (5.422 m); maximum gage height, 19.62 ft (5.980 m), from floodmark, June 23, 1947, present site and datum; minimum daily discharge, 14 ft³/s (0.40 m³/s) Nov. 3, 1955.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,000 ft³/s (170 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 28	2045	6,520	185	6.87	2.094	Sept.15	1030	6,210	176	6.60	2.012
July 8	1045	*9,160	259	*7.97	2.429						

Minimum daily discharge, 98 ft³/s (2.78 m³/s) Feb. 28, Mar.1, 2, 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	160	348	420	300	126	98	1940	1740	2230	1990	1460	492
2	168	348	440	310	124	98	1760	1700	2080	1660	1310	460
3	159	377	440	300	124	99	1660	1620	1970	1420	1110	426
4	190	403	415	290	124	98	1580	1590	1790	1350	953	396
5	217	395	395	244	124	98	1460	1540	1530	1350	865	372
6	212	395	375	220	122	100	1460	1440	1290	3430	782	354
7	249	422	360	220	120	104	1500	1440	1130	7580	728	327
8	275	420	360	235	118	114	1650	1500	990	8970	682	309
9	268	435	360	240	118	134	1750	1490	895	8050	645	291
10	284	427	355	235	114	158	1890	1450	805	6520	594	276
11	320	526	330	220	112	300	1830	1430	744	5240	563	268
12	321	982	310	215	100	500	1760	1410	690	4420	536	298
13	304	980	275	195	100	530	1700	1540	633	3760	499	1220
14	311	863	270	180	108	590	1680	1490	612	3220	472	5000
15	308	813	275	170	106	780	1610	1440	601	2570	481	6010
16	297	911	285	170	106	980	1530	1390	582	2040	476	4830
17	300	789	300	170	104	1140	1490	1350	1100	1720	487	3490
18	331	742	320	170	104	1280	1610	1320	3530	1560	466	2730
19	316	711	340	170	104	1470	1800	1280	3090	1360	445	2270
20	291	660	365	168	104	2240	2300	1190	2340	1370	428	2070
21	282	560	400	164	104	2500	2450	1100	1870	1430	510	2040
22	264	470	430	162	102	2230	2330	1030	1830	1570	557	1940
23	275	460	450	158	102	2640	2280	996	1930	2180	561	1670
24	307	400	385	150	100	3430	2170	951	1910	3120	513	1440
25	291	309	360	138	100	3240	2090	860	1760	3340	495	1230
26	283	290	335	138	100	2920	2030	855	1900	3090	535	1080
27	276	260	345	132	100	2940	1980	864	1600	2740	695	964
28	263	290	350	130	98	2760	1910	865	2270	2470	774	848
29	190	345	340	130	---	2320	1850	1180	3690	2270	716	784
30	229	385	330	130	---	2160	1790	1610	2350	2050	622	746
31	355	---	300	128	---	2080	---	2030	---	1780	547	---
TOTAL	8296	15716	11015	5982	3068	40131	54840	41691	49742	95620	20507	44631
MEAN	268	524	355	193	110	1295	1828	1345	1658	3085	662	1488
MAX	355	982	450	310	126	3430	2450	2030	3690	8970	1460	6010
MIN	159	260	270	128	98	98	1460	855	582	1350	428	268
CFSM	.06	.13	.09	.05	.03	.31	.44	.32	.40	.74	.16	.36
IN.	.07	.14	.10	.05	.03	.36	.49	.37	.44	.85	.18	.40
AC-FT	16460	31170	21850	11870	6090	79600	108800	82690	98660	189700	40680	88530

CAL YR 1977 TOTAL 82817 MEAN 227 MAX 1980 MIN 23 CFSM .05 IN .74 AC-FT 164300
WTR YR 1978 TOTAL 391239 MEAN 1072 MAX 8970 MIN 98 CFSM .26 IN 3.47 AC-FT 776000

05481000 BOONE RIVER NEAR WEBSTER CITY, IA

LOCATION.--Lat 42°26'01", long 93°48'12", in NW1/4 SE1/4 sec.18, T.88 N., R.25 W., Hamilton County, Hydrologic Unit 07100005, on right bank 100 ft (30 m) upstream from bridge on State Highway 17, 2.5 mi (4.0 km) south of Webster City, and 3.2 mi (5.1 km) downstream from Brewers Creek.

DRAINAGE AREA.--844 mi² (2,185 km²).

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 and concrete control. Datum of gage is 989.57 ft (301.621 m) NGVD. Prior to June 26, 1940, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers rain gage and gage height telemeters at station.

COOPERATION.--Eight discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 366 ft³/s (10.37 m³/s), 5.89 in/yr (150 mm/yr), 265,200 acre-ft/yr (327 hm³/yr); median of yearly mean discharges, 270 ft³/s (7.65 m³/s), 4.3 in/yr (109 mm/yr), 196,000 acre-ft/yr (242 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,300 ft³/s (575 m³/s) June 22, 1954, gage height, 18.55 ft (5.654 m); no flow Feb. 7, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1896, 19.1 ft (5.82 m) about June 10, 1918, from floodmarks, from information by local resident, discharge, 21,500 ft³/s (609 m³/s). Flood of June 18, 1932, reached a stage of 16.0 ft (4.88 m), discharge, 15,000 ft³/s (425 m³/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,490 ft³/s (98.8 m³/s) June 18, gage height, 7.43 ft (2.265 m) at 1815 hours, no other peak above base of 2,200 ft³/s (62.3 m³/s); minimum daily, 15 ft³/s (0.42 m³/s) Feb. 19 to Mar. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	155	220	70	44	22	15	252	195	292	540	143	104
2	118	198	64	41	21	15	244	180	262	396	131	89
3	96	162	60	40	20	15	227	171	220	300	109	81
4	84	138	57	37	20	15	196	163	192	239	94	66
5	72	126	56	34	19	15	192	155	170	194	85	57
6	62	123	61	32	19	16	197	143	154	288	74	50
7	103	116	65	30	19	15	189	163	144	600	67	44
8	202	111	69	28	19	15	184	205	128	974	62	42
9	182	111	73	27	19	25	192	220	116	986	58	39
10	168	96	80	27	19	42	238	215	107	789	52	37
11	168	81	85	27	18	70	210	209	98	528	48	35
12	160	78	90	28	17	150	187	205	92	420	45	36
13	149	76	95	28	17	186	159	266	82	324	40	271
14	133	76	102	27	16	238	143	297	81	257	38	464
15	114	78	110	27	16	294	133	293	465	213	43	465
16	100	74	128	26	16	350	125	275	849	175	43	460
17	98	70	200	26	16	425	205	253	1300	149	48	368
18	91	63	250	26	16	510	670	232	3110	208	39	307
19	83	60	234	26	15	700	781	224	2920	175	33	279
20	83	52	180	25	15	652	601	226	2370	170	29	281
21	78	44	160	25	15	611	526	200	1640	475	307	312
22	72	55	146	24	15	699	452	185	1130	881	358	334
23	76	63	130	23	15	594	404	179	830	895	177	345
24	87	71	112	23	15	462	353	167	640	662	113	351
25	96	74	98	22	15	397	313	154	510	534	97	346
26	96	77	87	22	15	337	284	141	432	434	102	282
27	89	79	78	22	15	307	261	136	427	341	320	231
28	83	80	70	23	15	308	242	138	900	272	310	206
29	79	78	59	23	---	292	230	135	1110	227	215	200
30	79	74	54	23	---	273	213	229	789	191	156	185
31	198	---	50	23	---	254	---	277	---	165	124	---
TOTAL	3454	2804	3173	859	479	8296	8603	6231	21560	13002	3560	6367
MEAN	111	93.5	102	27.7	17.1	268	287	201	719	419	115	212
MAX	202	220	250	44	22	700	781	297	3110	986	358	465
MIN	62	44	50	22	15	15	125	135	81	149	29	35
CFSM	.13	.11	.12	.03	.02	.32	.34	.24	.85	.50	.14	.25
IN.	.15	.12	.14	.04	.02	.37	.38	.27	.95	.57	.16	.28
AC-FT	6850	5560	6290	1700	950	16460	17060	12360	42760	25790	7060	12630

CAL YR 1977 TOTAL 22328.31 MEAN 61.2 MAX 1030 MIN .00 CFSM .07 IN .98 AC-FT 44290
WTR YR 1978 TOTAL 78388.00 MEAN 215 MAX 3110 MIN 15 CFSM .26 IN 3.46 AC-FT 155500

05481300 DES MOINES RIVER NEAR STRATFORD, IA

LOCATION.--Lat 42°15'04", long 93°69'52", in NW1/4 NE1/4 sec.21, T.86 N., R.27 W., Webster County, Hydrologic Unit 07100004, on right bank 6 ft (2 m) downstream from bridge on State Highway 175, 0.1 mi (0.2 km) downstream from Skillet Creek, 4.0 mi (6.4 km) southwest of Stratford, 7.3 mi (11.7 km) downstream from Boone River and at mile 276.7 (445.2 km).

DRAINAGE AREA.--5,452 mi² (14,120 km²).

PERIOD OF RECORD.--April 1920 to current year in reports of Geological Survey. Published as "near Boone" 1920-67. Monthly discharge only for some periods, published in WSP 1308. December 1904 to April 1920 (fragmentary gage heights during high-water periods only) in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1925-27, 1934. WSP 1708: 1955.

GAGE.--Water-stage recorder. Datum of gage is 894.00 ft (272.491 m) NGVD. Prior to May 1, 1920, nonrecording gage 16.6 mi (26.7 km) downstream at datum 23.49 ft (7.16 m) lower. Oct. 9, 1924, to Jan. 10, 1933, nonrecording gage 17.6 mi (28.3 km) downstream at datum 28.53 ft (8.70 m) lower. Jan. 11, 1933, to Sept. 30, 1934, nonrecording gage 17.9 mi (28.8 km) downstream at datum 22.25 ft (6.78 m) lower. Oct. 1, 1934 to Feb. 6, 1935, nonrecording gage and Feb. 7, 1935 to Sept. 30, 1967, water-stage recorder 17.9 mi (28.8 km) downstream at datum 21.84 ft (6.66 m) lower.

REMARKS.--Records good except those for winter period, which are poor. Occasional minor regulation caused by dam at Fort Dodge. Several observations of water temperature were made during the year. Corps of Engineers rain gage and gage height telemeters at station.

COOPERATION.--Ten discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--58 years, 1,731 ft³/s (49.02 m³/s), 4.31 in/yr (109 mm/yr), 1,264,000 acre-ft/yr (1,550 hm³/yr); median of yearly mean discharges, 1,520 ft³/s (43.0 m³/s), 3.8 in/yr (97 mm/yr), 1,101,000 acre-ft/yr (1,360 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,400 ft³/s (1,630 m³/s) June 22, 1954, gage height, 25.35 ft (7.727 m), from graph based on hourly gage readings, site and datum then in use; no flow for a short time on Jan. 9, 25, 1938, caused by manipulation of gates in control dam, site then in use; minimum unregulated daily discharge, 13 ft³/s (0.37 m³/s) Jan. 23, 24, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1903, reached a stage of 25.4 ft (7.74 m), from high-water mark, site and datum then in use, discharge, 43,600 ft³/s (1,230 m³/s). Flood of June 22, 1954, reached a stage of 29.7 ft (9.05 m), from floodmark, present site and datum, discharge, 54,200 ft³/s (1,530 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 7,000 ft³/s (198 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 19	0515	7,250	205	11.55	3.520	July 9	1130	*10,700	303	*13.86	4.225

Minimum daily discharge, 170 ft³/s (4.81 m³/s) Mar. 5,6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	487	1140	1080	540	230	180	2440	2300	2490	3590	1870	831
2	525	990	1160	600	230	180	2250	2210	2520	2990	1650	738
3	442	886	1120	496	225	180	2090	2140	2370	2520	1450	668
4	394	821	1080	480	220	175	1990	2070	2210	2260	1280	596
5	364	796	1010	460	210	170	1880	2030	1990	2170	1150	542
6	355	767	1010	430	210	170	1860	1920	1770	2470	1040	495
7	408	748	890	410	196	200	1830	1930	1590	6220	947	465
8	756	755	970	370	210	230	1880	2150	1440	9570	878	430
9	812	780	990	315	200	260	2120	2190	1310	10600	814	390
10	714	760	880	290	205	295	2670	2160	1210	9200	765	370
11	706	695	880	310	200	350	2510	2080	1100	7110	710	355
12	700	789	830	306	190	455	2340	2020	1020	5890	671	344
13	684	1210	810	300	200	760	2190	2230	921	4980	625	1000
14	632	1240	800	296	195	1060	2090	2360	862	4190	579	3690
15	584	1170	760	290	195	1140	2010	2280	1010	3540	564	6430
16	547	1130	790	276	195	1380	1930	2150	1590	2880	587	6560
17	519	1200	1000	266	190	1740	2080	2030	1690	2390	536	5120
18	500	1080	1190	276	186	2400	4320	1920	4590	2210	552	3930
19	491	1020	1150	270	180	3330	4710	1830	6980	2040	500	3230
20	495	1010	950	265	186	4100	3970	1950	6110	1860	475	3070
21	429	968	790	255	186	4100	3940	1740	4930	2040	594	3430
22	415	852	810	260	185	3760	3640	1590	3850	2860	1410	3180
23	407	810	930	246	186	3660	3440	1510	3820	3400	1010	2810
24	486	810	870	246	186	3630	3230	1440	3630	3620	832	2440
25	568	670	710	246	185	4160	3020	1340	3190	4050	716	2120
26	550	840	600	240	180	3630	2860	1260	3050	3950	723	1880
27	527	830	620	226	180	3460	2740	1230	2970	3450	1110	1690
28	494	850	620	225	180	3420	2640	1240	2650	2980	1540	1520
29	454	810	630	220	---	3020	2530	1240	5170	2680	1380	1390
30	400	900	610	215	---	2670	2420	1570	4570	2410	1150	1300
31	814	---	580	220	---	2650	---	2070	---	2160	969	---
TOTAL	16669	27327	27120	9726	5616	56695	79620	58180	82503	122280	29077	61014
MEAN	638	911	875	314	197	1829	2654	1877	2750	3945	938	2034
MAX	814	1240	1190	640	230	4160	4710	2366	6980	10600	1870	6560
MIN	364	670	580	216	180	170	1830	1230	862	1860	475	344
CFSM	.10	.17	.16	.06	.04	.34	.49	.34	.50	.72	.17	.37
IN.	.11	.19	.19	.07	.04	.39	.54	.40	.56	.83	.20	.42
AC-FT	33060	54200	53790	19290	10940	112500	157900	116400	163600	242500	57670	121000

CAL YR 1977 TOTAL 167282 MEAN 431 MAX 3600 MIN 13 CFSM .08 IN 1.07 AC-FT 312000
WTR YR 1978 TOTAL 575725 MEAN 1577 MAX 10600 MIN 170 CFSM .29 IN 3.93 AC-FT 1142000

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 (5.1 km) northwest of Saylorville, 4.2 mi (6.8 k) upstream from Beaver Creek, and at mile 213.4 (343.4 km).

DRAINAGE AREA.--5,823 mi² (15,082 km²).

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

GAGE.--Water-stage recorder. Datum of gage is at NGVD (levels by 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 (6.71 m) diameter concrete conduit through dam. Ungated chute spillway 430 ft (131 m) in length at right end of dam at elevation 884 ft (269 m), contents 570,000 acre-ft (703 hm³). Conservation pool at elevation 833 ft (254 m), contents, 74,000 acre-ft (91 hm³), surface area, 5,400 acres (2,185 hm²). Flood pool elevation at 890 ft (271 m), contents, 676,000 acre-ft (834 hm³), surface area, 16,700 acres (6,758 hm). Reservoir is used for flood control, low-flow augmentation, conservation and recreation.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 96,100 acre-ft (118 hm³) July 14, 1978; maximum elevation, 837.15 ft (255.163 m) July 11, 1978; minimum daily contents, 71,500 acre-ft (88.2 hm³) Nov. 11, 1977; minimum elevation, 832.92 ft (253.74 m) Nov. 27, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 96,100 acre-ft (118 hm³) July 14; maximum elevation, 837.15 ft (255.163 m) July 11; minimum daily contents, 71,500 acre-ft (88.2 hm³) Nov. 11; minimum elevation, 832.92 ft (253.874 m) Nov. 27,1977.

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

805	360	833	74,000	884	570,000
810	2,300	840	116,000	890	676,000
815	7,700	850	190,000	900	938,000
820	19,000	860	278,000	910	1,320,000
830	58,600	880	511,000	915	1,530,000

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75900	73000	73800	73200	72600	72100	73400	73700	75300	76900	74400	75300
2	76100	72000	74000	73000	72600	72100	73400	73400	75700	75400	74400	75200
3	76000	71700	74000	72800	72600	72200	73300	73500	76200	73800	74100	75100
4	75700	71700	73900	72700	72700	72200	72500	73900	76100	74100	74100	74800
5	75200	72000	73900	72900	72700	72200	72700	73900	75700	74400	74200	74400
6	74700	72500	73400	73000	72700	72200	73400	73800	75200	75200	74300	74600
7	75400	73300	73400	73200	72700	72200	73600	74000	74800	76200	74500	74600
8	75300	73200	73500	73200	72700	72300	74000	73500	74900	81400	74500	74500
9	75300	72700	73200	73200	72700	72300	75000	73000	75400	89900	74500	74700
10	75400	71700	73300	73000	72600	72300	76100	73200	76000	95700	74500	74800
11	75400	71500	73400	72700	72600	72400	76000	73600	76100	96100	74300	74900
12	75200	71700	73700	72600	72600	72600	75400	74500	75700	93700	74200	75200
13	75100	72100	73700	72700	72800	73000	74700	75100	75600	90700	74000	78600
14	75000	72600	73600	72800	72800	73500	74300	75300	75600	89600	74000	82200
15	74900	73200	73600	72900	72600	73700	73700	75200	75800	83800	74100	83300
16	74400	73700	73800	72900	72500	73800	73400	74700	75400	81300	74300	83300
17	73600	73700	74000	72800	72400	73700	76400	74300	75000	78100	74700	83000
18	72800	73300	73800	72700	72200	73800	83000	74300	75400	76600	74600	83300
19	72500	73300	74200	72700	72100	75300	90000	74500	79700	74800	74200	84400
20	72600	73300	74300	72800	71900	74900	88000	74200	81700	74500	74100	89100
21	72900	73300	74200	72800	71900	72800	84900	73800	80900	75300	74200	88300
22	75600	73200	74000	72800	71900	72900	82800	73800	79900	76600	74400	86100
23	75700	73100	73800	73000	72000	73900	80200	73900	79200	77200	75200	84900
24	75900	73000	74000	73000	72000	74600	76800	74000	77300	76700	75400	84700
25	75600	72200	74200	73000	72000	74800	74600	73900	75800	75800	75400	84600
26	74500	71700	74000	73000	72000	74600	74300	73900	75200	74800	76600	84500
27	73000	71900	73300	72900	72100	44300	74100	74300	75200	74500	78200	84400
28	72500	72400	73000	72800	72100	74100	74000	74500	75400	74600	77300	85000
29	72800	73200	73000	72700	---	73600	74300	74800	76100	74900	76900	85400
30	73300	73600	73000	72600	---	73200	74000	75100	78700	74700	76800	85500
31	74100	---	73500	72600	---	73400	---	75100	---	74500	76000	---
MAX	76100	73700	74300	73200	72800	75300	90000	75300	81700	96100	78200	89100
MIN	72500	71500	73000	72600	71900	44300	72500	73000	74800	73800	74000	74400

WTR YR 1978 MAX 96100 MIN 44300

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°40'50", long 93°40'07", near center of sec.5, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, near center of span on downstream side of bridge on county highway F42, 2.0 mi (3.2 km) west of Saylorville, 2.1 mi (3.4 km) downstream from Rock Creek, 2.4 mi (3.9 km) upstream from Beaver Creek, and at mile 211.6 (340.5 km).

DRAINAGE AREA.--5,841 mi² (15,128 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 787.42 ft (240.006 m) NGVD (levels by Corps of Engineers). Prior to Aug. 6, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are fair. Several observations of water temperature were made during the year. Flow regulated by Saylorville Lake (Station 05481630) 2.1 mi (3.4 km) upstream since Apr. 12, 1977. Corps of Engineers gage height telemeter at station.

COOPERATION.--Twenty-eight discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--17 years, 2,360 ft³/s (66.84 m³/s), 5.49 in/yr (139 mm/yr), 1,710,000 acre-ft/yr (2,110 hm³/yr); median of yearly mean discharges, 1,950 ft³/s (55.2 m³/s) 4.5 in/yr (114 mm/yr), 1,410,000 acre-ft/yr (1,740 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft³/s (1,340 m³/s) Apr. 10, 1965, gage height, 24.02 ft (7.321 m); minimum daily, 13 ft³/s (0.37 m³/s) Jan. 25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, 24.5 ft (7.47 m), present gage datum, June 24, 1954, from floodmarks, discharge, 50,000 ft³/s (1,700 m³/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,850 ft³/s (222 m³/s) Mar. 20, gage height, 12.96 ft (3.950 m); minimum daily, 144 ft³/s (4.08 m³/s) Nov. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	514	2220	564	625	221	169	2630	2760	2180	4970	2340	1230
2	810	2160	660	627	205	170	2540	2630	2330	4950	1960	902
3	990	1650	735	629	198	169	2450	2390	2340	3720	1830	752
4	984	1210	840	532	199	167	2430	2050	2630	2180	1360	754
5	834	894	834	461	207	164	2110	2180	2510	2150	1210	718
6	700	822	780	461	204	165	1880	2250	2290	2220	1130	644
7	600	630	600	459	196	165	1870	2280	1850	2880	1090	486
8	762	1070	528	453	197	165	1960	2570	1380	4030	1030	426
9	972	1200	675	511	197	165	2200	2680	1110	5220	1020	392
10	966	1490	510	475	198	166	2650	2290	976	7280	967	389
11	948	1080	411	474	198	166	3150	2180	1060	7770	912	367
12	942	715	411	384	198	166	3320	2160	1210	7760	868	295
13	948	640	510	318	200	167	3110	2370	1060	7240	839	270
14	942	810	610	318	238	269	2750	2470	1070	6320	749	773
15	936	936	610	315	268	589	2510	2620	1170	5920	646	3910
16	936	930	630	337	267	815	2160	2740	1490	5130	586	6740
17	936	1100	750	358	261	1100	2260	2680	1660	4310	395	6280
18	930	1210	1000	358	261	1290	2850	2360	1640	3860	589	4820
19	665	1080	1120	303	261	1700	3950	2360	2570	4060	650	3670
20	487	882	1110	263	262	3300	6940	2350	5570	2980	521	3880
21	496	870	1100	263	216	5740	6890	2330	6370	2140	520	5260
22	519	876	1030	261	173	5020	6000	2000	5360	2570	675	5570
23	685	882	846	263	167	4470	5900	1710	4960	3520	985	4290
24	1210	876	841	263	169	4430	5820	1710	5310	4050	1120	3520
25	1310	864	835	263	169	4400	5010	1630	5050	4540	1120	2880
26	1630	655	839	579	168	4400	3640	1460	4410	4920	1120	2530
27	1800	403	841	392	170	4190	3200	1330	3550	4180	1160	2060
28	1210	299	765	271	170	3760	3180	1330	3140	3310	1650	1740
29	568	144	685	263	---	3750	2840	1330	3130	2780	1830	1580
30	564	303	633	253	---	3460	2880	1470	3990	2760	1470	1580
31	1130	---	634	251	---	2840	---	1900	---	2610	1450	---
TOTAL	27924	28901	22927	11983	5838	57686	101080	66570	83266	132330	33782	68608
MEAN	901	963	740	387	209	1861	3369	2147	2776	4269	1090	2287
MAX	1800	2220	1120	629	268	5740	6940	2760	6370	7770	2340	6740
MIN	487	144	411	251	167	164	1870	1330	976	2140	395	270
AC-FT	55390	57330	45480	23770	11580	114400	200500	132000	165200	262500	67010	136100

CAL YR 1977 TOTAL 135009 MEAN 370 MAX 2220 MIN 13 AC-FT 267800
WTR YR 1978 TOTAL 640895 MEAN 1756 MAX 7770 MIN 144 AC-FT 1271000

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD: Water years 1962 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1967 to September 1971, October 1971 to current year (partial record station).
WATER TEMPERATURES: October 1961 to September 1971, October 1971 to current year (partial record station).
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. Sediment records for the period October to December 1977 were estimated from sediment rating curve.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (1967-71, 1977-78): Maximum daily, 1,400 micromhos Feb. 18, 1977; minimum daily, 90 micromhos Feb. 19, 1971.
WATER TEMPERATURES (1967-71, 1977-78): Maximum daily, 36.0°C June 29, 1971; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 6,400 mg/L May 14, 1970; minimum daily mean, 1 mg/L Jan. 8, 1965.
SEDIMENT LOADS: Maximum daily, 148,000 tons (134,000 tonnes) June 12, 1966; minimum daily, 1 ton (0.91 tonne) Jan. 8, 1965, Feb. 8-12, 23, 1967.

EXTREMES FOR CURRENT YEAR:
SEDIMENT CONCENTRATIONS: Maximum daily mean, 322 mg/L April 19; minimum daily mean, 6 mg/L Feb. 19, 20.
SEDIMENT LOADS: Maximum daily, 3,680 tons (3,340 tonnes) June 20; minimum daily, 2.0 tons (1.8 tonnes) Nov. 29.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---	---	990	1000	590	680	700	600	---	670
2			---	---	1050	960	---	660	---	600	---	670
3			---	---	---	---	610	---	---	---	---	---
4			---	---	950	950	580	680	---	---	---	---
5			---	---	1080	1000	600	690	700	590	---	---
6			---	---	1060	1000	620	680	700	580	---	---
7			---	870	---	---	550	---	700	580	---	650
8			---	900	1000	1010	---	---	700	---	---	650
9			---	840	1000	1000	---	680	---	580	---	650
10			---	---	1100	1000	550	---	---	---	---	---
11			---	900	---	---	580	680	---	560	---	---
12			---	890	---	---	580	---	---	560	---	---
13			---	900	---	---	---	---	---	560	---	---
14			---	---	---	---	570	---	650	540	640	650
15			---	---	---	---	---	---	650	---	600	650
16			---	950	1080	1000	---	700	650	---	650	---
17			---	940	920	850	---	685	650	---	---	640
18			---	950	1000	---	---	640	---	---	570	---
19			---	900	---	850	---	610	---	570	600	---
20			---	950	---	---	595	---	---	570	580	560
21			---	950	---	---	640	---	650	510	580	---
22			---	900	950	---	---	---	650	520	---	575
23			---	950	900	---	---	---	640	500	---	---
24			---	900	---	---	600	650	645	550	---	580
25			---	900	---	---	600	---	640	---	640	---
26			---	950	---	---	---	---	---	---	640	---
27			---	960	950	580	620	---	---	---	640	---
28			750	950	950	580	---	650	---	560	---	570
29			---	960	---	---	---	---	---	540	590	---
30			---	1000	---	600	---	650	---	520	680	580
31			---	---	---	---	---	700	---	---	670	---

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---	---	2.0	3.0	4.5	12.0	21.5	26.0	---	26.5
2			---	---	2.0	3.0	---	12.0	---	26.0	---	25.5
3			---	---	---	---	5.0	---	---	---	---	---
4			---	---	2.0	3.0	5.5	12.0	---	---	---	---
5			---	2.0	1.5	2.5	6.0	12.0	22.0	28.0	---	---
6			---	---	1.5	2.5	6.5	---	22.5	25.0	---	---
7			---	2.5	---	---	8.0	---	22.0	26.0	---	26.0
8			---	2.0	2.5	4.0	---	---	24.0	---	---	26.0
9			---	---	2.5	6.0	---	13.0	---	27.0	---	27.0
10			---	---	2.5	5.5	10.0	---	---	---	---	---
11			---	3.5	---	---	10.0	14.0	---	25.0	---	---
12			---	3.5	---	---	10.0	---	---	24.0	---	---
13			---	2.0	---	---	---	---	---	24.0	---	---
14			.5	---	---	---	12.0	---	23.0	---	26.0	26.0
15			---	---	---	---	---	---	23.5	---	26.0	26.0
16			---	1.0	2.5	3.0	---	---	24.0	---	25.5	---
17			---	2.5	2.5	3.0	---	16.0	24.5	---	---	23.0
18			---	2.0	2.5	---	---	17.0	---	---	26.5	---
19			---	1.0	---	3.5	---	17.5	---	27.0	25.0	---
20			---	2.5	---	---	---	---	---	26.0	24.5	20.0
21			---	1.5	---	---	9.0	---	24.0	26.5	24.0	---
22			---	2.0	3.0	---	---	---	23.5	24.5	---	21.0
23			---	2.5	3.0	---	---	---	23.5	24.0	---	---
24			---	3.0	---	---	9.5	20.0	23.5	26.0	---	20.0
25			---	2.5	---	---	9.5	---	24.0	---	24.5	---
26			---	5.0	---	---	---	---	---	---	24.0	---
27			---	5.0	3.0	4.5	10.0	---	---	---	24.0	---
28			.0	1.5	3.0	3.5	---	21.0	---	26.5	---	20.0
29			---	1.0	---	---	---	---	---	25.0	26.0	---
30			---	2.0	---	6.0	---	22.0	---	24.5	26.5	18.0
31			---	---	---	---	---	22.0	---	---	26.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1		32		445		44	14	24	35	21	31	14
2		102		430		63	14	24	38	21	38	17
3		150		312		83	14	24	37	20	50	23
4		148		213		111	74	106	42	23	44	20
5		108		124		109	86	107	41	23	45	20
6		75		107		96	68	85	23	13	30	13
7		51		58		51	48	59	19	10	24	11
8		91		170		36	32	39	23	12	26	12
9		147		210		69	49	68	51	27	24	11
10		143		275		32	40	51	26	14	25	11
11		140		177		16	33	42	19	10	25	11
12		139		82		16	43	45	19	10	25	11
13		140		61		32	40	34	19	10	23	10
14		139		102		53	30	26	30	19	54	39
15		136		136		53	23	20	31	22	55	87
16		136		135		58	53	48	20	14	58	123
17		136		180		87	47	45	32	23	106	315
18		135		211		153	28	27	15	11	83	239
19		67		175		188	25	20	6	4.2	86	395
20		28		122		182	42	30	6	4.2	66	588
21		30		118		180	35	25	35	20	64	992
22		33		119		160	38	27	80	37	93	1260
23		72		122		113	88	62	73	33	61	736
24		211		119		112	40	28	66	30	52	622
25		240		118		109	34	24	58	26	48	570
26		312		67		110	64	100	52	24	44	523
27		350		15		112	40	42	45	21	190	2150
28		211		5.0		91	39	29	34	16	90	914
29		44		2.0		72	43	31	---	---	87	881
30		44		7.0		58	34	23	---	---	138	1290
31		193				59	30	20	---	---	100	767
TOTAL		3983		4417.0		2708	---	1335	---	518.4	---	12730

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	54	383	53	395	19	112	73	980	90	569	23	76
2	66	453	38	270	20	126	56	748	73	384	23	56
3	62	410	58	374	20	126	180	1810	127	628	22	45
4	71	466	49	271	18	123	138	812	96	353	22	45
5	97	553	46	271	17	115	62	360	65	212	19	37
6	40	203	38	231	15	93	76	456	54	165	16	24
7	37	187	37	228	13	65	100	778	50	147	13	17
8	54	286	57	396	13	48	102	1110	50	139	13	15
9	75	445	47	340	14	42	98	1380	50	138	13	14
10	119	851	50	309	12	32	92	1810	48	125	14	15
11	68	578	48	283	11	31	85	1780	47	116	15	15
12	29	260	40	233	55	180	90	1890	44	103	15	12
13	40	336	37	237	34	97	79	1540	39	88	13	9.5
14	53	394	34	227	23	66	68	1160	33	67	94	196
15	40	271	30	212	32	101	61	975	48	84	47	496
16	54	315	27	200	43	173	52	720	101	160	36	655
17	207	1260	47	340	52	233	53	617	88	94	68	1150
18	290	2230	57	363	56	248	48	500	74	118	71	924
19	322	3430	41	261	184	1280	43	471	84	147	65	644
20	125	2340	37	235	245	3680	84	676	78	110	70	733
21	98	1820	35	220	126	2170	102	589	82	115	92	1310
22	69	1120	33	178	96	1390	115	798	77	140	56	842
23	55	876	30	139	75	1000	120	1140	72	191	43	498
24	50	786	29	134	57	817	91	995	70	212	38	361
25	90	1220	27	119	55	750	68	834	69	209	36	280
26	83	816	24	95	92	1100	58	770	67	202	37	253
27	70	605	21	75	119	1140	85	959	63	197	39	217
28	74	635	18	65	135	1140	85	760	58	258	41	190
29	53	406	18	65	134	1130	98	736	29	143	41	175
30	46	358	17	67	112	1210	112	835	24	95	41	175
31	---	---	17	87	---	---	105	740	25	98	---	---
TOTAL	---	24293	---	6920	---	18818	---	29729	---	5808	---	9482.5

TOTAL LOAD FOR YEAR: 120741.9 TONS.

DATE	TIME	TEMPER-ATURE (DEG C) (00010)	NUMBER OF SAM-PLING POINTS (00063)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)
AUG 16...	1015	25.5	4	579	7	31	71
SEP 22...	1130	21.0	8	5850	0	2	10

DATE	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)
AUG 16...	91	95	97	99	100	--
SEP 22...	50	73	83	92	98	100

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
26...	1000	1020	52	25	22	4.8	230	0	190	72	32
DEC											
14...	1215	610	100	40	25	4.9	280	0	230	120	44
JAN											
25...	0900	263	130	49	32	5.3	380	0	310	200	54
MAY											
02...	1430	2630	96	31	13	4.0	250	0	210	97	30
JUN											
20...	1400	6360	89	40	18	4.0	240	0	200	110	40
AUG											
16...	1015	579	90	32	15	3.4	290	0	240	86	32

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
26...	2.1	.07	.93	1.0	3.1	14	.14	350	.48	964
DEC										
14...	6.7	.32	1.1	1.4	8.1	36	.10	535	.73	881
JAN										
25...	8.0	.43	1.2	1.6	9.6	43	.24	754	1.03	535
MAY										
02...	8.7	.01	1.7	1.7	10	46	.11	492	.67	3490
JUN										
20...	.00	.12	1.6	1.7	1.7	7.5	.12	505	.69	8670
AUG										
16...	9.6	.07	1.3	1.4	11	49	.12	502	.68	785

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
26...	386	580	8.5	12.0	7.5	--	--	27	1.2	240
DEC										
14...	567	848	7.7	.5	4.5	12.9	93	44	8.9	240
JAN										
25...	790	1000	7.6	.0	6.1	15.0	110	30	15	96
MAY										
02...	536	700	8.3	14.0	5.2	--	--	42	2.0	180
JUN										
20...	568	700	8.2	23.5	9.2	8.3	99	31	2.4	K540
AUG										
16...	553	700	8.3	25.5	14	7.7	95	15	2.3	1280

05481950 BEAVER CREEK NEAR GRIMES, IA

LOCATION.--Lat 41°41'18", long 93°44'08", in SW1/4 SW1/4 sec.35, T.80 N., R.25 W., Polk County, Hydrologic Unit 07100004, on right bank 6 ft (2 m) upstream from bridge on Northwest 70th Avenue, 0.5 mi (0.8 km) downstream from Little Beaver Creek, 2.5 mi (4.0 km) east of Grimes and 6 mi (9.7 km) upstream from mouth.

DRAINAGE AREA.--358 mi² (927 km²).

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

REVISED RECORDS.--WDR IA-77-1: 1974 (P).

GAGE.--Water-stage recorder and concrete and steel sheeting broad-crested control. Datum of gage is 805.98 ft (245.968 m) NGVD. Prior to Aug. 31, 1966, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Six discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--18 years, 195 ft³/s (5.522 m³/s), 7.40 in/yr (188 mm/yr), 141,300 acre-ft/yr (174 hm³/yr); median of yearly mean discharges, 180 ft³/s (5.10 m³/s) 6.8 in/yr (173 mm/yr), 130,000 acre-ft/yr (160 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,340 ft³/s (208 m³/s) May 19, 1974, gage height, 14.69 ft (4.478 m); no flow for several days in 1970 and 1971; many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 21	1815	*2,980	84.4	*11.38	3.469
Apr. 19	1530	2,910	82.4	11.27	3.435
Sept. 21	1730	1,880	53.5	9.47	2.886

Minimum daily discharge, 0.73 ft³/s (0.021 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116	786	116	77	19	21	151	381	148	164	64	28
2	481	632	90	75	19	21	127	379	143	132	60	21
3	381	400	112	72	20	20	114	404	139	105	63	16
4	261	302	117	72	20	20	108	307	132	83	47	11
5	204	248	96	74	21	19	104	231	123	75	41	8.1
6	150	227	129	77	21	18	189	213	120	138	36	6.0
7	142	215	144	72	21	18	186	260	118	190	33	4.9
8	302	200	152	60	20	19	162	353	109	239	31	3.4
9	396	218	158	50	19	20	273	395	96	216	27	2.2
10	322	205	100	42	19	21	538	453	88	372	25	1.6
11	253	178	84	37	20	24	949	317	82	356	24	1.2
12	208	163	77	34	20	30	623	333	78	233	24	.73
13	176	158	84	31	20	44	368	417	69	177	22	39
14	153	160	94	33	20	66	286	320	66	131	20	606
15	127	163	105	35	20	150	252	323	99	99	18	1060
16	112	156	116	37	19	400	239	290	139	79	13	969
17	104	150	194	35	19	922	378	255	134	63	11	487
18	95	136	288	32	18	1040	1850	213	111	61	8.6	418
19	84	130	308	29	18	1270	2620	190	91	354	6.7	358
20	74	144	164	26	18	1720	2730	199	97	254	4.9	1070
21	69	135	132	25	18	2660	1890	177	160	221	4.6	1800
22	83	122	181	26	19	1850	1210	162	165	286	4.4	1770
23	275	139	190	27	19	800	901	157	162	688	4.4	1250
24	830	151	140	28	19	538	708	212	206	503	5.2	777
25	706	106	110	29	20	380	600	198	190	324	5.9	581
26	457	82	90	27	20	290	497	181	421	241	327	466
27	330	184	76	23	20	252	426	170	436	180	193	398
28	257	189	71	21	20	240	363	167	249	134	185	344
29	208	133	70	20	---	221	323	165	229	103	115	299
30	178	117	72	20	---	193	343	161	211	87	59	287
31	458	---	75	19	---	185	---	146	---	75	42	---
TOTAL	7992	6329	3935	1264	546	13472	19508	8129	4611	6363	1524.7	13083.13
MEAN	258	211	127	40.8	19.5	435	650	262	154	205	49.2	436
MAX	830	786	308	77	21	2660	2730	453	436	688	327	1800
MIN	69	82	70	19	18	18	104	146	66	61	4.4	.73
CFSM	.72	.59	.36	.11	.05	1.22	1.82	.73	.43	.57	.14	1.22
IN.	.83	.66	.41	.13	.06	1.40	2.03	.84	.48	.66	.16	1.36
AC-FT	15850	12550	7810	2510	1080	26720	38690	16120	9150	12620	3020	25950

CAL YR 1977	TOTAL	28338.30	MEAN	77.6	MAX	830	MIN	.00	CFSM .22	IN 2.94	AC-FT	56210
WTR YR 1978	TOTAL	86756.83	MEAN	238	MAX	2730	MIN	.73	CFSM .67	IN 9.01	AC-FT	172100

05482170 BIG CEDAR CREEK NEAR VARINA, IA

LOCATION.--Lat 42°41'16", long 94°47'52", in NE1/4 NE1/4 sec.24, T.91 N., R.34 W., Pocahontas County, Hydrologic Unit 07100006, on left bank 5 ft (2 m) downstream from bridge on county highway N33, 2.0 mi (3.2 km) downstream from Drainage ditch 21, 3.5 mi (5.6 km) upstream from Drainage ditch 74, and 5.5 mi (8.8 km) northeast of Varina.

DRAINAGE AREA.--80.0 mi² (207 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,225.12 ft (373.417 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--19 years, 32.8 ft³/s (0.929 m³/s), 5.57 in/yr (141 mm/yr), 23,760 acre-ft/yr (29.3 hm³/yr); median of yearly mean discharges, 27 ft³/s (0.765 m³/s), 4.6 in/yr (117 mm/yr), 19,600 acre-ft/yr (24.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,080 ft³/s (58.9 m³/s) Aug. 31, 1962, gage height, 13.68 ft (4.170 m); maximum gage height, 15.05 ft (4.587 m) Apr. 6, 1965, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft³/s (11.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
July 6	0815	*818	23.2	*10.39	3.167	Sept. 14	0430	788	22.3	10.02	3.054

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	44	11	.86	.00	.00	12	17	18	13	13	14
2	3.9	29	9.6	.86	.00	.00	8.6	15	20	19	13	12
3	3.4	22	7.8	.86	.00	.00	7.8	15	21	13	10	9.8
4	2.5	16	6.7	.86	.00	.00	6.6	14	22	9.8	8.9	8.3
5	1.9	13	6.0	.83	.00	.00	5.9	12	24	16	8.1	7.3
6	1.6	12	5.8	.80	.00	.00	7.3	9.5	23	623	7.2	6.4
7	2.3	11	6.0	.75	.00	.00	8.4	11	22	595	6.0	5.8
8	11	9.7	6.2	.64	.00	.00	8.1	25	18	468	5.2	5.1
9	19	32	4.6	.50	.00	.00	8.3	29	16	362	4.3	4.6
10	12	75	4.3	.41	.00	.02	9.0	26	15	270	3.7	4.2
11	11	72	5.3	.33	.00	.04	8.8	24	12	195	3.3	4.0
12	9.8	56	5.5	.25	.00	.10	8.4	21	9.2	143	2.8	54
13	7.5	46	5.6	.20	.00	.20	7.0	20	7.5	99	2.5	622
14	6.1	39	5.4	.16	.00	.50	6.1	17	5.5	68	2.1	691
15	4.5	36	5.1	.13	.00	1.2	5.5	17	6.4	51	5.7	517
16	3.3	30	4.7	.10	.00	2.6	5.3	16	5.6	37	4.9	395
17	2.6	26	6.0	.08	.00	6.0	6.6	15	69	29	2.8	312
18	1.9	22	5.0	.06	.00	15	50	13	72	25	3.2	266
19	1.5	19	3.6	.05	.00	32	90	12	39	20	6.9	205
20	1.5	20	2.6	.04	.00	36	70	11	33	17	2.8	164
21	1.4	23	2.4	.03	.00	38	54	9.0	30	17	68	156
22	.91	18	2.2	.02	.00	40	45	8.5	25	102	103	128
23	.76	13	1.9	.02	.00	37	42	8.6	25	173	55	106
24	.85	15	1.5	.02	.00	34	36	7.8	29	106	31	89
25	1.0	17	1.2	.01	.00	32	30	6.7	31	69	39	75
26	1.1	13	1.0	.00	.00	29	28	5.3	56	48	44	69
27	1.1	14	.97	.00	.00	27	27	4.4	37	34	43	60
28	.77	11	.91	.00	.00	25	25	4.9	26	26	39	54
29	.56	11	.89	.00	---	24	24	9.6	19	21	33	52
30	.54	11	.87	.00	---	20	21	21	15	18	24	46
31	17	---	.86	.00	---	16	---	18	---	15	18	---
TOTAL	136.29	775.7	130.50	8.87	.00	415.66	671.7	442.3	751.2	3701.8	613.4	4142.5
MEAN	4.40	25.9	4.21	.29	.000	13.4	22.4	14.3	25.0	119	19.8	138
MAX	19	75	11	.86	.00	40	90	29	72	623	103	691
MIN	.54	9.7	.86	.00	.00	.00	5.3	4.4	5.5	9.8	2.1	4.0
CFSM	.06	.32	.05	.004	.000	.17	.28	.18	.31	1.49	.25	1.73
IN.	.06	.36	.06	.00	.00	.19	.31	.21	.35	1.72	.29	1.93
AC-FT	270	1540	259	18	.00	824	1330	877	1490	7340	1220	8220

CAL YR 1977	TOTAL	1832.36	MEAN	5.02	MAX	75	MIN	.00	CFSM	.06	IN	.85	AC-FT	3630
WTR YR 1978	TOTAL	11789.92	MEAN	32.3	MAX	691	MIN	.00	CFSM	.40	IN	5.48	AC-FT	23390

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA

LOCATION.--Lat 42°20'28", long 94°59'05", in NE1/4 NW1/4 sec.24, T.87 N., R.35 W., Sac County, Hydrologic Unit 07100006, on right bank 15 ft (5 m) downstream from bridge on county highway, 0.2 mi (0.3 km) upstream from Indian Creek, 0.9 mi (1.4 km) downstream from Drainage ditch 73, and 5.6 mi (9.0 km) south of Sac City.

DRAINAGE AREA.--713 mi² (1,846 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,144.60 ft (348.874 m) NGVD (levels by Iowa Natural Resources Council).

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 278 ft³/s (7.872 m³/s), 5.29 in/yr (134 mm/yr), 201,400 acre-ft/yr (248 hm³/yr); median of yearly mean discharges, 250 ft³/s (7.08 m³/s), 4.8 in/yr (122 mm/yr), 181,000 acre-ft/yr (223 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.-- Maximum discharge, 10,800 ft³/s (306 m³/s) Sept. 1, 1962, gage height, 18.12 ft (5.523 m); no flow Jan. 30, to Feb. 4, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 15.61 ft (4.758 m), from floodmark, discharge, 7,000 ft³/s (198 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft³/s (56.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 18	0615	2,890	81.8	11.53	3.514	Sept. 14	1600	*5,880	166	*15.23	4.642
July 7	0530	4,180	118	13.47	4.106						

Minimum daily discharge, 11 ft³/s (0.31 m³/s) Jan.30, Mar.2-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	78	160	37	12	12	176	208	328	695	137	133
2	48	155	150	34	13	11	153	184	273	638	144	114
3	55	160	142	31	14	11	136	168	243	534	123	101
4	52	131	126	29	14	11	129	163	212	811	100	85
5	46	109	106	31	14	11	122	156	188	385	86	71
6	41	92	73	31	14	11	127	143	167	1880	76	64
7	60	86	59	30	14	11	179	148	152	4030	69	59
8	86	81	78	28	14	11	194	174	137	3740	62	52
9	137	398	75	25	13	16	176	245	123	3060	57	46
10	175	1030	65	22	13	21	175	262	105	2070	52	43
11	152	1070	58	20	13	38	179	244	96	1420	49	39
12	123	783	62	19	14	106	173	232	89	1080	46	108
13	100	594	65	20	14	240	152	214	75	851	44	3390
14	85	477	69	20	15	330	127	186	98	661	42	5640
15	76	418	69	19	15	395	117	165	216	522	54	5040
16	68	371	77	18	16	480	110	157	309	420	66	4120
17	57	318	91	18	16	580	133	150	1010	341	71	3370
18	49	270	95	18	16	800	376	140	2720	286	53	2440
19	48	235	94	18	15	1010	840	132	1640	237	48	1950
20	49	215	76	18	14	1220	738	123	1220	197	62	1460
21	38	160	58	18	14	1600	582	115	1030	183	67	1340
22	36	168	68	17	14	1520	480	104	787	392	707	1220
23	39	200	66	18	13	846	425	110	625	831	896	1050
24	38	168	65	18	13	539	403	110	545	755	558	918
25	38	160	53	18	13	393	363	102	543	556	366	798
26	37	160	42	17	13	322	321	92	982	427	307	714
27	36	198	37	14	12	292	299	84	816	330	348	642
28	40	180	36	13	12	275	276	92	539	258	306	544
29	35	160	35	12	---	246	255	124	431	215	248	510
30	35	150	35	11	---	212	235	550	544	183	202	474
31	58	---	37	12	---	191	---	441	---	157	160	---
TOTAL	1983	8775	2312	654	387	11761	8151	5518	16243	28145	5606	36535
MEAN	64.0	293	74.6	21.1	13.8	379	272	178	541	908	181	1218
MAX	175	1070	160	37	16	1600	840	550	2720	4030	896	5640
MIN	35	78	35	11	12	11	110	84	75	157	42	39
CFSM	.09	.41	.11	.03	.02	.53	.38	.25	.76	1.27	.25	1.71
IN.	.10	.46	.12	.03	.02	.61	.43	.29	.85	1.47	.29	1.91
AC-FT	3930	17410	4590	1300	768	23330	16170	10940	32220	55830	11120	72470

CAL YR 1977	TOTAL	21577.36	MEAN	59.1	MAX	1070	MIN	.00	CFSM .08	IN 1.13	AC-FT	42800
WTR YR 1978	TOTAL	126070.00	MEAN	345	MAX	5640	MIN	11	CFSM .48	IN 6.58	AC-FT	250100

05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA

LOCATION.--Lat 41°59'17", long 94°22'36", in SW1/4 NW1/4 sec.20, T.83 N., R.30 W., Greene County, Hydrologic Unit 07100005, on right bank 5 ft (2 m) downstream from bridge on State Highway 4, 0.1 mi (0.2 km) downstream from Drainage ditch 33, and 40, 1.9 mi (3.1 km) south of Jefferson, and 4.2 mi (6.8 km) upstream from Hardin Creek.

DRAINAGE AREA.--1,619 mi² (4,193 km²).

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 (294.769 m) NGVD. Prior to Apr. 22, 1946, nonrecording gage at site 4 mi (6.4 km) 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 winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

COOPERATION.--Four discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 654 ft³/s (18.52 m³/s), 5.49 in/yr (139 mm/yr), 473,800 acre-ft/yr (584 hm³/yr); median of yearly mean discharges, 580 ft³/a (16.4 m³/s), 4.9 in/yr (124 mm/yr), 420,000 acre-ft/yr (518 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,100 ft³/s (824 m³/s) June 23, 1947, gage height, 22.3 ft (6.80 m); minimum daily, 0.6 ft³/s (0.017 m³/s) Oct. 5, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
July 10	0600	5,160	146	12.21	3.722	Sept. 21	1145	4,010	114	10.98	3.347
Sept. 17	2045	*8,200	232	*14.57	4.471						

Minimum daily discharge, 28 ft³/s (0.79 m³/s) Mar. 5-7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	236	170	274	102	48	31	415	466	948	940	464	382
2	319	176	248	100	45	29	387	429	782	970	450	326
3	198	173	234	100	44	29	362	394	664	1000	422	282
4	163	188	218	100	43	29	326	368	582	932	375	247
5	147	226	200	100	39	28	304	346	524	1660	336	216
6	136	230	174	99	37	28	291	329	480	1350	303	195
7	145	219	162	98	35	28	281	350	448	2080	272	175
8	166	203	158	98	33	29	281	385	416	4020	249	158
9	189	207	140	97	33	41	391	447	386	4750	226	145
10	179	201	132	95	35	56	452	528	357	4960	206	134
11	184	220	130	90	35	98	444	613	324	3520	192	124
12	223	716	126	91	36	130	400	600	298	2380	182	115
13	237	1030	120	95	37	200	374	576	276	1830	167	2130
14	223	810	116	98	38	260	349	530	276	1430	158	4560
15	205	684	114	98	40	395	322	485	312	1160	150	5920
16	184	591	118	94	41	820	294	446	376	938	147	7180
17	167	532	128	94	42	1110	339	417	428	776	154	8090
18	154	500	130	93	41	1350	416	400	702	676	151	7640
19	145	434	138	91	39	2200	520	381	2620	718	148	5540
20	135	401	144	91	37	2680	701	371	2570	573	140	3820
21	131	359	144	84	37	2420	1160	362	2310	1070	139	3900
22	129	300	144	83	36	2430	1040	338	1820	1380	139	3500
23	128	280	128	77	34	2190	889	325	1420	2000	153	2970
24	131	280	118	74	34	1450	790	316	1120	1940	665	2430
25	129	310	116	71	33	1040	724	311	986	1700	675	2030
26	125	288	114	65	33	785	669	304	865	1350	546	1730
27	119	296	110	60	32	671	606	300	1000	1150	867	1530
28	115	290	106	56	31	601	560	310	1170	873	717	1360
29	111	278	102	56	---	549	534	453	930	709	638	1220
30	115	286	100	50	---	495	502	592	925	599	549	1130
31	170	---	100	49	---	455	---	688	---	520	455	---
TOTAL	5138	10878	4486	2549	1048	22657	15123	13160	26315	49954	10435	69179
MEAN	166	363	145	85.5	37.4	731	504	425	877	1611	337	2306
MAX	319	1030	274	102	48	2680	1160	688	2620	4960	867	8090
MIN	111	170	100	49	31	28	281	300	276	520	139	115
CFSM	.10	.22	.09	.05	.02	.45	.31	.26	.54	1.00	.21	1.42
IN.	.12	.25	.10	.06	.02	.52	.35	.30	.60	1.15	.24	1.59
AC-FT	10190	21580	8900	5250	2080	44940	30000	26100	52200	99080	20700	137200

CAL YR 1977 TOTAL 36955.9 MEAN 101 MAX 1030 MIN 2.4 CFSM .06 IN .85 AC-FT 73300
WTR YR 1978 TOTAL 231022.0 MEAN 633 MAX 8090 MIN 28 CFSM .39 IN 5.31 AC-FT 458200

05483000 EAST FORK HARDIN CREEK NEAR CHURDAN, IA

LOCATION.--Lat 42°06'27", long 94°22'12", in SE1/4 SW1/4 sec.5, T.84 N., R.30 W., Greene County, Hydrologic Unit 07100006, on left bank 35 ft (11 m) upstream from bridge on county highway E26, 1.6 mi (2.6 km) upstream from small left-bank tributary, 4.4 mi (7.1 km) upstream from mouth, and 6.5 mi (10.5 km) southeast of Churdan.

DRAINAGE AREA.--24.0 mi² (62.2 km²).

PERIOD OF RECORD.--July 1952 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1954-55, 1957 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,050.90 ft (320.314 m) NGVD.

REMARKS.--Records good except those for winter period or those below 2.0 ft³/s (0.057 m³/s), which are poor. Small diversion for irrigation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years, 9.36 ft³/s (0.265 m³/s), 5.30 in/yr (135 mm/yr), 6,780 acre-ft/yr (8.36 hmΔ/yr); median of yearly mean discharges, 7.4 ft³/s (0.210 m³/s), 4.2 in/yr (107 mm/yr), 5,400 acre-ft/yr (6.66 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 413 ft³/s (11.7 m³/s) May 5, 1960, gage height, 8.92 ft (2.719 m), from rating curve extended above 270 ft³/s (7.65 m³/s); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 150 ft³/s (4.25 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
July 9	0815	180	5.10	5.64	1.719	Sept. 20	1715	191	5.41	5.88	1.792
Sept. 13	0445	*225	7.22	*7.59	2.313						

Minimum daily discharge, 0.10 ft³/s (.003 m³/s) Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	30	3.0	.18	.49	.24	1.4	7.5	14	2.2	6.3	.97
2	63	22	2.0	5.8	.47	.23	1.2	7.0	12	1.8	5.7	.75
3	33	17	1.7	12	.46	.23	1.1	6.8	11	1.3	4.4	.61
4	22	14	1.5	7.0	.45	.23	.84	6.5	9.4	7.4	3.7	.50
5	16	14	2.3	1.9	.43	.23	1.1	5.0	8.4	3.9	3.4	.45
6	12	13	1.7	1.1	.47	.24	1.6	4.3	8.1	6.7	2.9	.41
7	20	11	1.6	.60	.48	.24	1.3	9.5	7.4	31	2.5	.33
8	41	11	1.5	.34	.52	.25	2.7	33	6.1	15	2.2	.18
9	26	13	.62	.25	.46	.26	13	25	6.0	133	1.8	.15
10	20	13	2.5	.22	.44	1.8	34	20	6.5	62	1.5	.12
11	17	11	10	.25	.43	7.5	22	18	6.4	31	1.4	.10
12	15	10	12	1.1	.42	16	16	15	4.7	21	1.3	2.1
13	13	10	7.4	2.2	.40	20	11	13	4.6	15	1.1	201
14	11	9.8	5.0	1.5	.38	18	9.8	12	6.4	12	.96	161
15	8.8	9.3	4.2	.71	.37	17	8.4	11	7.5	9.6	.94	119
16	8.1	7.9	4.1	.53	.35	12	7.7	10	8.3	7.8	.83	88
17	7.8	7.0	3.7	.47	.34	11	12	9.3	7.0	6.5	.71	63
18	6.3	6.0	2.0	.45	.33	17	51	8.6	5.5	6.9	.63	54
19	5.3	6.1	1.4	.43	.33	16	61	8.6	5.8	6.2	.57	37
20	4.8	6.8	2.6	.43	.33	16	40	10	6.2	5.1	.52	80
21	4.4	4.5	3.4	.44	.33	15	31	10	5.3	8.9	.58	85
22	3.7	4.5	3.6	.44	.32	14	26	11	6.2	42	.33	52
23	3.6	4.2	2.2	.43	.32	11	22	11	5.6	38	.26	40
24	5.4	4.0	1.5	.43	.29	10	18	11	4.5	25	.23	32
25	8.3	4.0	2.9	.44	.26	6.8	15	12	4.7	19	.29	22
26	8.5	4.0	3.9	.45	.25	5.0	14	12	3.8	18	7.9	19
27	7.5	3.2	5.9	.52	.25	4.1	13	11	2.7	17	31	19
28	6.1	2.7	8.2	.57	.24	3.8	12	21	2.4	13	11	18
29	5.7	2.5	6.0	.60	---	2.9	11	45	2.3	10	4.9	18
30	6.1	2.8	1.7	.58	---	2.4	8.9	24	2.0	8.8	2.5	17
31	43	---	.45	.55	---	2.4	---	18	---	7.6	1.4	---
TOTAL	592.4	278.3	110.57	42.91	10.61	231.85	468.04	426.1	190.8	592.7	103.75	1131.67
MEAN	19.1	9.28	3.57	1.38	.38	7.48	15.6	13.7	6.36	19.1	3.35	37.7
MAX	140	30	12	12	.52	20	61	45	14	133	31	201
MIN	3.6	2.5	.45	.18	.24	.23	.84	4.3	2.0	1.3	.23	.10
CFSM	.80	.39	.15	.06	.02	.31	.65	.57	.27	.80	.14	1.57
IN.	.92	.43	.17	.07	.02	.36	.73	.66	.30	.92	.16	1.75
AC-FT	1180	552	219	85	21	460	928	845	378	1180	206	2240

CAL YR 1977 TOTAL 1241.87 MEAN 3.40 MAX 140 MIN .00 CFSM .14 IN 1.92 AC-FT 2460
WTR YR 1978 TOTAL 4179.70 MEAN 11.5 MAX 201 MIN .10 CFSM .48 IN 6.48 AC-FT 8290

05483600 MIDDLE RACCOON RIVER AT PANORA, IA

LOCATION.--Lat 41°41'14", long 94°22'15", in NE1/4 NW1/4 sec.5, T.79 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft (5 m) downstream from bridge on county highway, 0.2 mi (0.3 km) southwest of Panora, 1.5 mi (2.4 km) upstream from Andy's Branch, and 1.7 mi (2.7 km) downstream from Lake Panorama.

DRAINAGE AREA.--440 mi² (1,139 km²).

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

REVISED RECORDS.--WDR IOWA 1974: 1973 (P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 991.20 ft (302.118 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. City of Panora diverts approximately 100 acre-ft/yr (0.123 hm³/yr) above station. Flow regulated by dam on Lake Panorama since August 1970. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 209 ft³/s (5.919 m³/s), 6.45 in/yr (164 mm/yr), 151,400 acre-ft/yr (187 hm³/yr); median of yearly mean discharges, 170 ft³/s (4.81 m³/s), 5.2 in/yr (132 mm/yr), 123,000 acre-ft/yr (152 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,000 ft³/s (396 m³/s) May 19, 1974, gage height, 14.80 ft (4.511 m), from rating curve extended above 5,200 ft³/s (147 m³/s) by step-backwater analysis; no flow June 9, 10, 1977, result of gate operation at Lake Panorama; minimum daily discharge excluding regulation at Lake Panorama, 3.0 ft³/s (0.085 m³/s) Jul. 9, 14, 22-23, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, reached a stage of 14.3 ft (4.36 m), from floodmark, discharge, about 14,000 ft³/s (396 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft³/s (70.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 20	1830	4,180	118	8.97	2.734	Sept. 13	2330	*4,470	127	*9.18	2.798

Minimum daily discharge, 14 ft³/s (0.40 m³/s) Apr. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	425	52	38	29	32	115	427	287	236	32	43
2	55	341	52	38	29	32	93	36	138	134	37	44
3	57	240	52	37	29	33	89	61	18	18	41	44
4	57	324	51	37	29	34	53	95	26	26	46	43
5	53	243	48	37	29	34	16	98	66	619	48	41
6	47	171	44	37	29	34	16	99	92	108	47	40
7	69	303	43	36	29	34	14	243	102	50	47	38
8	92	305	44	35	28	34	20	240	153	46	46	37
9	95	312	46	33	25	35	22	174	111	231	44	35
10	98	179	56	32	25	36	27	180	83	693	42	34
11	60	230	53	31	26	37	42	179	80	196	41	32
12	30	194	43	30	27	38	26	180	78	152	41	31
13	37	127	41	29	28	40	47	200	73	47	39	2300
14	43	122	43	28	28	42	67	159	105	42	39	3980
15	47	131	46	28	29	57	78	142	89	16	40	1150
16	43	101	50	28	30	111	80	137	90	23	49	466
17	45	90	65	27	31	187	816	133	89	98	35	663
18	42	74	67	27	32	354	1010	129	79	119	36	622
19	40	66	70	27	32	772	742	126	68	165	34	384
20	39	63	61	26	32	2820	482	126	80	86	32	916
21	40	56	59	26	31	3250	374	114	75	249	31	1060
22	52	54	58	26	31	2370	319	92	69	317	31	870
23	128	54	55	26	31	570	205	89	195	539	30	365
24	142	53	50	26	31	145	177	93	417	342	30	286
25	124	50	49	26	31	197	86	97	259	137	31	299
26	109	46	46	30	31	178	22	95	290	211	40	280
27	97	46	42	32	31	114	22	93	385	208	590	257
28	83	45	39	33	31	110	19	109	316	125	788	177
29	76	43	38	32	---	68	22	161	688	29	145	160
30	79	46	38	31	---	45	37	461	305	29	35	174
31	250	---	38	29	---	107	---	394	---	30	41	---
TOTAL	2278	4534	1539	958	824	11950	5138	4962	4906	5321	2608	14871
MEAN	73.5	151	49.6	30.9	29.4	385	171	160	164	172	84.1	496
MAX	250	425	70	38	32	3250	1010	461	688	693	788	3980
MIN	30	43	38	26	25	32	14	36	18	16	30	31
CFSM	.17	.34	.11	.07	.07	.88	.39	.36	.37	.39	.19	1.13
IN.	.19	.38	.13	.08	.07	1.01	.43	.42	.41	.45	.22	1.26
AC-FT	4520	8990	3050	1900	1630	23700	10190	9840	9730	10550	5170	29500

CAL YR 1977	TOTAL	19001.60	MEAN	52.1	MAX	1140	MIN	.00	CFSM .12	IN 1.61	AC-FT 37690
WTR YR 1978	TOTAL	59889.00	MEAN	164	MAX	3980	MIN	14	CFSM .37	IN 5.06	AC-FT 118800

05484000 SOUTH RACCOON RIVER AT REDFIELD, IA

LOCATION.--Lat 41°34'48", long 94°10'58", in SW1/4 SW1/4 sec.3, T.78 N., R.29 W., Dallas County, Hydrologic Unit 07100007, on left bank 15 ft (5 m) downstream from bridge on county highway at Redfield, 0.8 mi (1.3 km) downstream from bridge on U.S. Highway 6, 1.0 mi (1.6 km) downstream from Middle Raccoon River, and 15.6 mi (25.1 km) upstream from mouth.

DRAINAGE AREA.--988 mi² (2,558 km²).

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940.

GAGE.--Water-stage recorder. Datum of gage is 896.43 ft (273.232 m) NGVD. Prior to June 12, 1946, nonrecording gage, and June 12, 1946, to Sept. 30, 1956, water-stage recorder at site 20 ft (6 m) upstream at same datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Five discharge measurement furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 443 ft³/s (12.55 m³/s), 6.09 in/yr (155 mm/yr), 321,000 acre-ft/yr (396 hm³/yr); median of yearly mean discharges, 390 ft³/s (11.0 m³/s), 5.4 in/yr (137 mm/yr), 283,000 acre-ft/yr (349 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft³/s (991 m³/s) July 2, 1958, gage height, 29.04 ft (8.851 m), from floodmark; minimum daily, 17 ft³/s (0.48 m³/s) Aug. 4, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s (142 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 21	----	8,640	245	ice jam	--
Mar. 22	0330	8,990	255	14.02	4.273
Apr. 17	2215	*12,700	360	*17.13	5.221
Sept. 13	1945	8,770	248	13.79	4.203
Sept. 14	0800	9,760	276	14.63	4.459

Minimum daily discharge, 60 ft³/s (1.70 m³/s) Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	1440	230	128	92	94	392	644	571	655	91	123
2	202	1120	220	126	90	96	330	442	443	542	60	117
3	186	850	218	122	90	98	303	347	202	237	64	116
4	176	748	240	120	90	100	287	389	165	172	73	111
5	166	705	244	116	90	99	231	390	163	679	81	105
6	148	583	252	112	89	100	458	386	226	415	88	100
7	344	609	290	108	89	100	311	768	270	385	96	99
8	828	656	284	104	84	100	303	910	265	243	99	90
9	487	779	278	102	79	102	637	690	282	302	103	84
10	393	600	268	100	79	104	894	583	204	842	96	81
11	337	481	260	98	81	109	632	523	178	611	91	81
12	229	570	240	97	84	114	427	534	174	257	90	76
13	201	451	200	97	86	118	360	633	167	280	87	4070
14	198	410	200	94	87	124	370	519	197	149	81	7080
15	197	443	204	92	89	170	457	443	240	104	86	3120
16	183	396	218	90	92	320	395	430	230	78	91	1100
17	171	393	280	90	95	500	4980	409	210	101	111	1130
18	167	352	294	89	99	1000	6400	384	191	248	99	1480
19	152	322	292	89	98	2600	3830	373	172	589	96	881
20	153	296	266	88	98	5000	2150	367	186	526	87	2470
21	143	272	260	88	98	6400	1540	330	208	436	84	2410
22	177	250	252	86	92	6240	1260	324	190	1100	89	1790
23	957	260	240	85	92	2690	1010	378	527	1340	73	1080
24	1390	256	220	84	91	907	780	352	1070	1100	81	670
25	824	248	212	82	91	732	625	319	688	450	94	648
26	585	235	200	86	91	614	501	289	708	422	117	589
27	483	234	183	90	91	546	440	285	892	394	665	537
28	413	236	160	92	91	504	410	344	775	377	1470	451
29	371	237	142	92	---	467	405	556	1290	149	581	359
30	370	240	132	92	---	328	394	729	1070	125	155	385
31	2430	---	128	91	---	347	---	738	---	114	130	---
TOTAL	13250	14672	7107	3030	2518	30823	31513	14808	12154	13422	5309	31433
MEAN	427	489	229	97.7	89.9	994	1050	478	405	433	171	1048
MAX	2430	1440	294	128	99	6400	6400	910	1290	1340	1470	7080
MIN	143	234	128	82	79	94	231	285	163	78	60	76
CFSM	.43	.50	.23	.10	.09	1.01	1.06	.48	.41	.44	.17	1.06
IN.	.50	.55	.27	.11	.09	1.16	1.19	.56	.46	.51	.20	1.18
AC-FT	26280	29100	14100	6010	4990	61140	62510	29370	24110	26620	10530	62350

CAL YR 1977	TOTAL	85719	MEAN 235	MAX 6080	MIN 17	CFSM .24	IN 3.23	AC-FT	170000		
WTR YR 1978	TOTAL	180039	MEAN 493	MAX 7080	MIN 60	CFSM .50	IN 6.78	AC-FT	357100		

05484500 RACCOON RIVER AT VAN METER, IA

LOCATION.--Lat 41°32'02", long 93°56'59", in SW1/4 SW1/4 sec.22, T.78 N., R.27 W., Dallas County, Hydrologic Unit 07100007, on right bank 10 ft (3.0 m) downstream from bridge on county highway R15, 0.3 mi (0.5 km) northeast of Van Meter, 0.7 mi (1.1 km) upstream from small left bank tributary, 1.2 mi (1.9 km) downstream from confluence of North and South Raccoon River, and 30 mi (48.3 km) upstream from mouth.

DRAINAGE AREA.--3,441 mi² (8,912 km²).

PERIOD OF RECORD.--April 1915 to current year. Prior to October 1934, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1927 (M). WSP 1438: Drainage area. WSP 1508: 1915 (M), 1916-17, 1918-23 (M), 1925 (M), 1926, 1933 (M), 1939 (M), 1947 (M), 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 841.16 ft (256.386 m) NGVD. See WSP 1308 for history of changes prior to Aug. 8, 1934.

REMARKS.--Records good except those for winter period, which are poor. Corps of Engineers rain gage and gage height telemeters at station.

COOPERATION.--Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--63 years, 1,296 ft³/s (36.70 m³/s), 5.11 in/yr (130 mm/yr), 939,000 acre-ft/yr (1,160 hm³/yr); median of yearly mean discharges, 1,120 ft³/s (31.7 m³/s), 4.4 in/yr (112 mm/yr), 811,000 acre-ft/yr (1,000 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,200 ft³/s (1,170 m³/s) June 13, 1947, gage height, 21.37 ft (6.514 m), from floodmark; maximum gage height, 21.77 ft (6.635 m) July 3, 1958; minimum daily discharge, 10 ft³/s (0.28 m³/s) Jan. 22-31, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 8,500 ft³/s (241 m³/s) and maximum (*):

		Discharge		Gage height				Discharge		Gage height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
Mar. 22	1130	*20,800	589	a*17.62	5.371	Sept. 14	1345	12,800	362	13.14	4.005
Aug. 18	Unknown	15,300	433	14.48	4.414	Sept. 20	1415	11,800	334	12.63	3.850

Minimum daily discharge, 148 ft³/s (4.19 m³/s) Jan. 31, Feb. 3,9.

a Ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	405	2660	650	300	150	170	1410	1540	1870	2230	974	775
2	554	2240	630	310	155	172	1230	1790	1870	2300	873	655
3	1100	1840	600	305	148	174	1080	1280	1570	1760	817	564
4	942	1490	540	300	160	178	973	1290	1270	1570	748	493
5	740	1450	540	290	158	178	890	1210	1130	1530	671	429
6	614	1250	550	290	158	180	1270	1140	1100	2530	598	384
7	628	1100	560	290	156	182	1010	1720	1090	2500	546	344
8	1560	1310	550	265	152	188	912	2020	1020	2820	489	312
9	1120	1440	540	235	148	190	1400	1910	1080	4620	439	279
10	1100	1330	520	225	152	190	2120	1910	965	5710	415	277
11	989	1090	510	218	158	192	2300	1830	778	6380	384	250
12	809	1120	490	218	168	200	1920	1810	726	4380	360	235
13	716	1040	470	218	172	218	1450	1940	670	3170	344	2660
14	711	1380	440	218	170	288	1260	1770	647	2410	318	10800
15	701	1490	430	220	168	447	1260	1550	753	1950	308	9490
16	660	1360	455	218	168	800	1130	1450	831	1590	293	7450
17	622	1250	630	205	168	1360	4190	1340	832	1320	336	7970
18	586	1120	640	195	166	3000	10900	1240	817	1270	311	8990
19	541	1010	610	195	164	5800	8390	1160	823	1760	277	9130
20	508	973	500	195	166	9000	5930	1540	2440	2000	255	10900
21	496	890	455	195	164	12000	4640	1220	3050	1560	252	9490
22	504	778	530	190	168	11000	4280	1170	2790	2560	247	7840
23	1180	748	560	188	172	7600	3710	1340	3570	3860	247	6650
24	3140	733	540	188	172	4740	3110	1210	3290	4210	283	5150
25	2170	663	460	188	170	3430	2760	1100	2610	3280	401	4410
26	1590	719	450	175	170	2750	2270	1030	2620	2840	854	3840
27	1160	720	425	158	170	2320	2020	989	2770	2360	1230	3320
28	1040	710	380	160	170	2040	1820	973	2490	2160	2520	2920
29	932	700	360	155	---	1870	1760	1100	3750	1670	2090	2620
30	878	670	340	152	---	1600	1610	1600	3070	1340	1190	2500
31	3240	---	320	148	---	1460	---	2050	---	1120	920	---
TOTAL	31936	35274	15675	6807	4561	73917	79005	45222	52292	80760	19990	121127
MEAN	1030	1176	506	220	163	2384	2634	1459	1743	2605	645	4038
MAX	3240	2660	650	310	172	12000	10900	2050	3750	6380	2520	10900
MIN	405	663	320	148	148	170	890	973	647	1120	247	235
CFSM	.30	.34	.15	.06	.05	.69	.77	.42	.51	.76	.19	1.17
IN.	.35	.38	.17	.07	.05	.80	.85	.49	.57	.87	.22	1.31
AC-FT	63350	69970	31090	13500	9050	146600	156700	89700	103700	160200	39650	240300

CAL YR 1977 TOTAL 171328 MEAN 469 MAX 7440 MIN 43 CFSM .14 IN 1.85 AC-FT 339800
WTR YR 1978 TOTAL 566566 MEAN 1552 MAX 12000 MIN 148 CFSM .45 IN 6.13 AC-FT 1124000

05484500 RACCOON RIVER AT VAN METER, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-73, 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
26...	1200	1400	71	27	12	4.7	300	0	250	46	22
DEC											
15...	0920	430	90	30	16	2.8	300	0	250	61	25
JAN											
25...	1045	188	94	29	16	2.9	330	0	270	62	22
MAR											
09...	1030	190	80	25	18	3.1	300	0	250	64	24
MAY											
04...	1445	1270	93	32	12	2.8	310	0	250	60	27
JUN											
21...	0745	3200	91	29	7.1	5.8	190	0	160	36	23
AUG											
16...	1200	299	40	28	18	2.8	180	0	150	69	29

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
26...	7.7	.06	2.1	2.2	9.9	44	.30	385	.52	1460
DEC										
15...	6.9	.25	.95	1.2	8.1	36	.12	416	.57	483
JAN										
25...	4.8	.31	.35	.66	5.5	24	.11	430	.58	218
MAR										
09...	3.3	.19	.46	.65	4.0	17	.11	418	.57	214
MAY										
04...	10	.01	2.4	2.4	12	55	.12	439	.60	1510
JUN										
21...	11	.00	2.2	2.2	13	58	.85	314	.43	2710
AUG										
16...	.25	.61	1.3	1.9	2.2	9.5	.13	290	.39	234

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
26...	550	622	8.4	13.0	50	--	--	43	1.9	K1100
DEC										
15...	448	700	7.9	.5	7.6	13.4	96	29	6.0	300
JAN										
25...	454	800	7.2	.0	2.1	14.3	100	16	33	160
MAR										
09...	402	640	7.2	.0	2.3	--	--	22	30	290
MAY										
04...	514	700	8.1	14.0	17	--	--	31	3.9	290
JUN										
21...	1360	470	7.5	23.0	350	8.1	95	120	9.6	700
AUG										
16...	336	490	8.4	26.0	5.5	7.6	95	15	1.1	K1800

05484800 WALNUT CREEK AT DES MOINES, IA

LOCATION.--Lat 41°35'14", long 93°42'11", in SW1/4 SE1/4 sec.2, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, 25 ft (8 m) downstream from bridge on 63rd Street in Des Moines, and 2.2 mi (3.5 km) upstream from Raccoon River.

DRAINAGE AREA.--78.4 mi² (203 km²), revised.

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

REVISED RECORDS.--WDR Iowa 1973: 1972; WDR Iowa 1975: 1973-74.

GAGE.--Water-stage recorder. Datum of gage is 801.04 ft (244.157 m) NGVD (levels by Iowa Natural Resources Council).

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--7 years, 69.1 ft³/s (1.957 m³/s), 11.60 in/yr (295 mm/yr), 50,060 acre-ft/yr (61.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,000 ft³/s (255 m³/s) July 1, 1973, gage height, 17.72 ft (5.401 m); no flow for many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft³/s (17.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 20	2345	620	17.6	8.80	2.682
Apr. 17	1600	933	26.4	9.99	3.045
Apr. 17	2330	*1,180	33.4	*10.75	3.277
Aug. 27	0030	965	27.3	10.32	3.146
Sept. 20	1030	616	17.4	8.62	2.627

Minimum daily discharge, 0.25 ft³/s (0.007 m³/s) Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	185	22	17	14	12	43	79	40	152	12	11
2	32	142	19	16	15	11	37	71	36	97	13	9.6
3	32	119	17	15	16	11	34	69	34	71	11	9.1
4	29	90	16	14	16	11	31	67	32	56	9.1	8.2
5	24	85	16	13	15	10	51	61	30	47	8.7	7.3
6	22	77	17	12	14	10	63	67	29	83	8.2	7.3
7	85	73	16	13	13	10	52	159	30	94	7.8	7.3
8	99	67	14	14	13	15	50	126	29	49	6.9	6.4
9	78	90	13	13	13	20	61	101	26	39	6.0	6.0
10	63	59	15	12	13	24	83	86	25	32	6.4	5.5
11	47	50	19	12	13	26	78	81	25	29	5.5	5.2
12	40	45	28	13	13	23	64	110	24	35	6.4	4.8
13	34	45	45	14	13	22	49	180	21	29	6.2	117
14	33	45	36	14	13	26	51	118	34	25	4.1	72
15	29	45	34	16	12	29	47	99	54	25	14	17
16	24	44	41	13	11	47	43	88	30	23	4.8	11
17	25	42	45	13	11	76	381	77	25	21	4.1	63
18	25	37	32	13	11	142	608	70	22	75	3.1	108
19	24	36	26	14	12	282	425	82	20	45	2.7	62
20	22	51	21	14	13	412	311	105	44	72	2.0	436
21	22	32	44	14	11	381	248	76	21	153	3.1	260
22	41	29	66	14	10	266	212	72	19	102	1.5	140
23	104	27	50	14	13	179	185	76	49	69	1.0	95
24	217	27	38	15	17	129	157	65	27	47	.25	75
25	156	20	24	15	22	94	137	59	23	36	13	60
26	114	18	27	13	16	75	125	53	150	28	49	52
27	92	19	22	12	14	69	114	54	91	22	203	44
28	77	37	21	11	13	66	108	52	72	18	33	37
29	66	29	20	11	---	59	100	50	315	16	23	45
30	72	26	20	12	---	52	89	44	242	15	16	36
31	273	---	19	14	---	50	---	41	---	13	13	---
TOTAL	2035	1691	843	420	380	2639	4037	2538	1619	1618	496.85	1817.7
MEAN	65.6	56.4	27.2	13.5	13.6	85.1	135	81.9	54.0	52.2	16.0	60.6
MAX	273	185	66	17	22	412	608	180	315	153	203	436
MIN	22	18	13	11	10	10	31	41	19	13	.25	4.8
CFSM	.81	.70	.34	.17	.17	1.05	1.67	1.01	.57	.65	.20	.75
IN.	.94	.78	.39	.19	.17	1.21	1.86	1.17	.74	.74	.23	.84
AC-FT	4040	3350	1570	833	754	5230	8010	5030	3210	3210	986	3610

CAL YR 1977	TOTAL	10028.22	MEAN 27.5	MAX 734	MIN .00	CFSM .34	IN 4.61	AC-FT	19890
WTR YR 1978	TOTAL	20134.55	MEAN 55.2	MAX 608	MIN .25	CFSM .68	IN 9.26	AC-FT	39940

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA

LOCATION.--Lat 41°34'30", long 93°35'48", in NE1/4 SE1/4 sec.10, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100008, on right bank 10 ft (3 m) downstream from bridge on Southeast 14th Street at Des Moines, 0.8 mi (1.3 km) downstream from Raccoon River and Scott Street Dam, and at mile 200.7 (322.9 km).

DRAINAGE AREA.--9,879 mi² (25,586 km²).

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 (232.42 m) NGVD. Prior to Oct. 1, 1951, and Oct. 1, 1953, to Sept. 30, 1959, water-stage recorder above Scott Street Dam, 0.8 mi (1.3 km) upstream at datum 11.16 ft (3.40 m) higher. Oct. 1, 1951, to Sept. 30, 1953, and Oct. 1, 1969 to Sept. 30, 1961, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi (5.6 km) above station. Average daily pumpage was about 55 ft³/s (1.56 m³/s). At times, water is pumped from Raccoon River into recharge basins, or into Waterworks Reservoir, capacity, 4,800 acre-ft (5.92 hm³). Effluent from sewage treatment plant enters the river 2.3 mi (3.7 km) below station. Net effect of diversions not known. Several observations of water temperature were made during the year. Flow regulated by Saylorville Lake (station 05481630) 13.0 mi (20.9 km) upstream, since Apr. 12, 1977. Corps of Engineers gage height telemeter at station.

COOPERATION.--Fourteen discharge measurements furnished by Corps of Engineers. Average monthly pumpage from galleries furnished by Des Moines Water Works.

AVERAGE DISCHARGE.--38 years, 3,976 ft³/s (113 m³/s), 5.47 in/yr (139 mm/yr), 2,881,000 acre-ft/yr (3,552 hm³/yr); median of yearly mean discharges, 3,450 ft³/s (97.7 m³/s) 4.7 in/yr (119 mm/yr), 2,600,000 acre-ft/yr (3,206 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 77,000 ft³/s (2,180 m³/s) June 26, 1947, gage height, 20.8 ft (6.34 m) in gage well, 21.6 ft (6.58 m) from outside floodmark, site and datum then in use; minimum daily, 26 ft³/s (0.74 m³/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 (6.37 m), from flood profile) at Scott Street site and datum, by office of Des Moines City Engineer.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 22,200 cfs (629 m³/s) Mar. 21, gage height, 20.40 ft (6.218 m); minimum daily, 200 ft³/s (5.66 m³/s) Mar. 12-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	940	6670	1390	850	435	300	4510	5160	4200	8060	3920	2510
2	1370	5720	1530	890	415	300	4380	5130	4270	7640	3480	2050
3	1620	4620	1570	920	410	295	4090	4600	4270	6640	3230	1690
4	2080	3740	1670	920	390	285	3980	4080	4050	4250	2700	1600
5	2010	3040	1560	970	380	275	3810	4120	4080	4070	2440	1520
6	1530	2860	1290	1040	370	270	3610	4190	3830	4690	2250	1220
7	1640	2560	1590	1110	365	260	3710	4800	3450	5370	2140	1030
8	2000	2800	1580	1090	345	270	3550	5210	3010	6580	1990	944
9	2840	3070	1300	1160	335	220	3960	5450	2620	8530	1930	817
10	2460	3410	1310	1240	330	280	5070	4930	2410	12200	1890	772
11	2300	2930	1070	1290	325	220	6300	4760	2340	14300	1760	722
12	2080	2300	896	1220	320	200	6240	4790	2270	13700	1690	615
13	1880	2220	1020	1140	320	200	5440	5470	2210	11600	1600	1020
14	1800	2360	1210	1070	330	350	4820	5220	2150	9800	1490	8300
15	1750	2920	1230	1000	335	760	4480	5010	2380	8620	1340	14200
16	1690	2850	1280	950	335	1520	4130	5010	2650	7630	1280	15100
17	1620	2790	1600	920	330	2410	5230	4840	2930	6300	934	15000
18	1540	2850	2200	820	335	3230	18500	4400	2880	5820	977	14900
19	1330	2680	2300	740	335	6190	16400	4330	3180	6090	1310	13600
20	955	2380	2000	700	340	14600	16000	4540	6550	6240	991	16300
21	928	2290	1690	640	330	20400	14700	4240	9560	4670	993	18300
22	1080	2170	1530	590	290	20700	12200	3930	8490	4680	1040	16000
23	1530	2100	1380	550	315	15500	11300	3600	8450	7360	1470	13400
24	4520	2110	1400	495	310	10700	10400	3610	8920	8460	1720	10600
25	4790	1990	1600	500	315	8710	9310	3430	8920	8450	1760	8730
26	3820	1350	1900	540	320	7730	7390	3140	8530	8330	2170	7540
27	3750	875	1500	560	330	7070	6370	2910	7820	7330	3410	6460
28	3110	1100	1200	530	325	6230	6120	2880	6070	5980	3340	5670
29	2030	916	800	490	---	5980	5580	2880	7190	5150	4600	5050
30	1900	1060	790	480	---	5620	5400	3140	7710	4670	3310	4700
31	3850	---	840	450	---	4840	---	3930	---	4330	2830	---
TOTAL	66743	80731	44226	25865	9615	145915	216980	133730	147390	227540	65985	210360
MEAN	2153	2691	1427	834	343	4707	7233	4314	4913	7340	2129	7012
MAX	4790	6670	2300	1290	435	20700	18500	5470	9560	14300	4600	18300
MIN	928	875	790	450	290	200	3650	2880	2150	4070	934	615
AC-FT	132400	160100	87720	51300	19070	289400	430400	265300	292300	451300	130900	417200

CAL YR 1977 TOTAL 346291 MEAN 949 MAX 11000 MIN 26 AC-FT 686900
WTR YR 1978 TOTAL 1375080 MEAN 3767 MAX 20700 MIN 200 AC-FT 2727000

05485520 DES MOINES RIVER BELOW DES MOINES, IA

WATER-QUALITY RECORDS

LOCATION.--Lat 41°33'03", long 93°31'29", in NE1/4 NE1/4 sec.20, T.78 N., R.23 W., Polk County, Hydrologic Unit 07100008, at bridge on State Highway 5 near east edge of Des Moines, 0.2 mi (0.3 km) downstream from unnamed stream, 1.4 mi (2.3 km) upstream from Fourmile Creek, and at mile 195.9 (315.2 km).

DRAINAGE AREA.--9,901 mi² (25,644 km²).

PERIOD OF RECORD.--Water years 1971, 1975 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 4.8 mi (7.7 km) upstream at SE 14th Street, Des Moines. No significant inflow between gaging station and sampling site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
26...	1530	3960	65	24	12	5.5	250	0	210	48	21
DEC											
14...	1500	1230	100	36	29	4.8	300	0	250	100	45
JAN											
25...	1200	920	120	40	39	5.1	360	0	300	150	59
MAR											
09...	1330	220	110	38	44	3.2	340	0	280	130	66
MAY											
03...	0800	4740	97	30	14	4.0	280	0	230	78	30
JUN											
21...	1230	9700	100	40	15	5.7	230	0	190	91	10
AUG											
16...	1330	1230	71	31	18	3.9	230	0	190	86	33

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
26...	6.2	.09	1.9	2.0	8.2	36	.54	345	.47	3690
DEC										
14...	8.6	.07	1.0	1.1	9.7	43	.38	530	.72	1760
JAN										
25...	6.6	1.3	.90	2.2	8.8	39	.68	653	.89	1620
MAR										
09...	4.8	2.1	1.2	3.3	8.1	36	.88	645	.88	383
MAY										
03...	8.9	.22	2.2	2.4	11	50	.23	485	.66	6210
JUN										
21...	8.4	.01	2.0	2.0	10	46	.66	423	.58	11100
AUG										
16...	5.2	.84	1.7	2.5	7.7	34	.43	415	.56	1380

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
26...	693	557	8.3	14.5	120	--	--	61	2.0	15
DEC										
14...	573	858	7.6	.5	7.1	10.0	72	53	12	13000
JAN										
25...	691	1000	7.3	.0	6.6	--	--	33	29	K790
MAR										
09...	627	900	7.0	.5	9.0	--	--	38	54	K1100
MAY										
03...	581	700	8.0	14.5	34	--	--	38	4.5	2000
JUN										
21...	1320	650	7.8	23.0	280	7.1	84	100	5.8	9600
AUG										
16...	490	680	8.1	25.0	14	7.2	90	25	2.9	13000

05485640 FOURMILE CREEK AT DES MOINES, IA

LOCATION.--Lat 41°36'50", long 93°32'43", in NE1/4 NE1/4 sec.32, T.79 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank 20 ft (6 m) downstream from bridge on Easton Blvd., 4.4 mi (7.1 km) downstream from Muchikinock Creek and 5.0 mi (8.0 km) upstream from Des Moines River.

DRAINAGE AREA.--92.7 mi² (240 km²).

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 (242.581 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--7 years, 75.9 ft³/s (2.149 m³/s), 11.1 in/yr (282 mm/yr), 54,900 acre-ft/yr (67.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,340 ft³/s (151 m³/s) June 9, 1974, gage height, 14.84 ft (4.523 m); no flow for many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	0530	740	21.0	8.00	2.438
Mar. 19	2315	a*1,900	53.8	*11.43	3.484
Apr. 18	1415	767	21.7	7.72	2.353
July 19	0115	830	23.5	8.13	2.478
Sept. 20	1245	1,040	29.5	8.79	2.679

Minimum daily discharge, 3.6 ft³/s (0.10 m³/s) Aug. 24.

a Ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	208	37	15	9.5	9.0	57	86	55	130	25	24
2	33	175	25	13	10	8.1	50	82	52	80	22	20
3	31	139	21	12	10	7.4	47	78	51	62	20	17
4	34	111	21	11	10	7.0	44	74	48	49	18	14
5	27	96	24	10	9.7	6.8	54	68	46	41	16	13
6	19	91	31	11	8.8	6.6	95	63	45	72	14	11
7	55	78	37	11	8.4	7.0	76	136	68	82	13	11
8	114	72	64	11	8.3	7.9	77	174	56	43	12	11
9	77	71	56	10	8.4	9.5	150	146	43	34	11	9.4
10	64	66	40	8.8	8.4	14	198	118	40	27	12	10
11	53	58	38	9.2	8.5	23	147	107	38	25	11	9.4
12	46	56	37	11	8.6	27	109	112	33	30	10	9.3
13	41	54	37	11	8.8	31	79	389	27	25	8.9	63
14	41	54	35	10	8.9	41	67	286	34	35	7.7	149
15	38	54	33	9.4	8.5	55	62	198	118	33	6.5	68
16	36	54	35	8.8	7.6	77	57	162	142	31	6.4	44
17	31	53	40	8.2	7.1	103	53	136	86	29	5.9	47
18	31	49	30	8.8	7.4	250	300	118	63	154	5.6	125
19	29	62	22	8.8	8.1	770	662	108	54	395	4.9	100
20	25	60	20	8.5	8.4	1190	433	129	87	198	4.0	672
21	25	57	42	7.8	7.3	618	330	95	101	133	4.5	840
22	183	55	57	8.7	6.7	438	260	90	76	128	7.1	315
23	358	58	44	9.3	8.9	277	217	89	130	113	4.3	214
24	592	54	32	9.5	13	192	175	77	100	83	3.6	162
25	378	54	21	8.8	17	133	148	73	20	64	6.6	124
26	222	53	23	8.2	13	98	128	68	130	53	28	95
27	150	45	18	7.9	12	93	115	73	80	42	168	78
28	118	47	18	7.9	10	93	105	73	63	35	84	67
29	100	44	17	8.2	---	78	103	64	270	32	45	69
30	150	43	16	8.7	---	68	95	59	210	29	35	67
31	300	---	16	9.2	---	66	---	55	---	27	27	---
TOTAL	3436	2171	986	300.7	261.3	4804.3	4493	3586	2366	2314	647.0	3158.1
MEAN	111	72.4	31.8	9.70	9.33	155	150	116	78.9	74.6	20.9	105
MAX	592	208	64	15	17	1190	662	389	270	395	168	672
MIN	19	43	16	7.8	6.7	6.6	44	55	20	25	3.6	9.3
CFSM	1.20	.78	.34	.11	.10	1.67	1.62	1.25	.85	.81	.23	1.13
IN.	1.38	.87	.40	.12	.10	1.93	1.80	1.44	.95	.93	.26	1.27
AC-FT	6820	4310	1960	596	518	9530	8910	7110	4690	4590	1280	6260

CAL YR 1977 TOTAL 12195.47 MEAN 33.4 MAX 959 MIN .00 CFSM .36 IN 4.89 AC-FT 24190
WTR YR 1978 TOTAL 28523.40 MEAN 78.1 MAX 1190 MIN 3.6 CFSM .84 IN 11.45 AC-FT 56580

05486000 NORTH RIVER NEAR NORWALK, IA

LOCATION.--Lat 41°27'25", long 93°39'10", in NW1/4 SW1/4 sec.20, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on left bank 10 ft (3 m) downstream from bridge on county highway R57, 1.7 mi (2.7 km) southeast of Norwalk, 5.2 mi (8.4 km) upstream from Middle Creek, and 6.2 mi (10.0 km) downstream from Badger Creek.

DRAINAGE AREA.--349 mi² (904 km²).

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 (240.320 m) NGVD (levels by 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 (3.4 km) upstream at different datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

COOPERATION.--Two discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 180 ft³/s (5.098 m³/s), 7.00 in/yr (178 mm/yr), 130,400 acre-ft/yr (161 hm³/s/yr); median of yearly mean discharges, 160 ft³/s (4.53 m³/s), 6.2 in/yr (157 mm/yr), 116,000 acre-ft/yr (143 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,000 ft³/s (906 m³/s) June 13, 1947, gage height, 25.3 ft (7.71 m), from floodmark, from rating curve extended above 9,100 ft³/s (258 m³/s) on basis of velocity-area studies; no flow at times during period 1954-58.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,700 ft³/s (48.1 ft³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Nov. 1	2215	1,880	53.2	19.69	6.002	Apr. 19	0800	*6,760	191	*22.44	6.840
Mar. 21	1930	4,060	115	21.53	6.562	Sept. 21	2030	2,000	56.6	19.57	5.965

Minimum daily discharge, 5.9 ft³/s (0.17 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	1780	92	67	21	32	68	239	203	290	37	12
2	50	1050	94	65	21	32	50	204	219	866	35	11
3	40	494	88	61	21	32	38	181	177	404	32	9.7
4	28	394	83	58	23	32	32	171	172	148	29	9.0
5	23	319	80	58	28	30	37	165	173	100	29	8.4
6	19	286	76	59	28	29	99	159	152	87	29	8.1
7	35	269	75	61	29	28	110	688	103	236	27	7.4
8	172	255	70	58	27	28	70	1190	97	653	21	6.9
9	317	316	72	49	26	30	129	716	89	143	19	6.3
10	218	423	67	37	26	32	756	452	80	120	19	6.0
11	135	277	62	28	26	34	697	351	74	97	20	6.3
12	107	219	67	26	28	37	291	410	69	82	21	5.9
13	81	203	83	27	29	43	165	986	63	87	21	14
14	68	199	118	29	30	66	115	781	58	86	20	362
15	61	198	147	32	30	105	147	445	61	66	17	287
16	55	191	181	34	31	390	155	362	77	58	16	71
17	52	197	305	33	31	600	3680	330	81	53	16	38
18	45	199	620	29	30	840	6250	296	64	51	14	203
19	42	170	349	26	29	1480	7300	272	54	58	13	436
20	39	164	160	26	29	2000	4430	270	50	246	12	791
21	36	164	130	28	28	3800	2480	356	52	620	12	1890
22	42	147	180	30	29	4370	746	266	59	387	11	1000
23	113	127	187	32	29	3380	565	268	415	202	11	247
24	1060	127	130	33	29	1030	465	348	839	158	10	147
25	1300	122	110	33	31	225	397	376	291	102	10	105
26	562	87	88	31	31	140	352	274	159	75	10	81
27	382	99	76	28	31	121	310	224	143	59	34	68
28	303	102	65	26	32	122	282	235	160	49	77	57
29	252	86	62	21	---	119	267	244	916	44	44	51
30	228	84	66	21	---	92	262	229	485	40	20	53
31	968	---	68	20	---	78	---	215	---	38	15	---
TOTAL	6898	8748	4051	1166	783	19377	30745	11703	5635	5705	701	5998.0
MEAN	223	292	131	37.6	28.0	625	1025	378	188	184	22.6	200
MAX	1300	1780	620	67	32	4370	7300	1190	916	866	77	1890
MIN	19	84	62	20	21	28	32	159	50	38	10	5.9
CFSM	.64	.84	.38	.11	.08	1.79	2.94	1.08	.54	.53	.07	.57
IN.	.74	.93	.43	.12	.08	2.07	3.28	1.25	.60	.61	.07	.64
AC-FT	13680	17350	8040	2310	1550	38430	60980	23210	11180	11320	1390	11900

CAL YR 1977	TOTAL	45468.35	MEAN 125	MAX 3600	MIN .05	CFSM .36	IN 4.85	AC-FT 90190
WTR YR 1978	TOTAL	101510.00	MEAN 278	MAX 7300	MIN 5.9	CFSM .80	IN 10.82	AC-FT 201300

05486490 MIDDLE RIVER NEAR INDIANOLA, IA

LOCATION.--Lat 41°25'27", long 93°35'09", in SW1/4 SE1/4 sec.35, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on right bank 10 ft (3 m) downstream from bridge on county highway, 0.4 mi (0.6 km) upstream from Cavitt Creek, 1.5 mi (2.4 km) upstream from bridge on U.S. Highway 69, and 4.6 mi (7.4 km) northwest of Indianola.

DRAINAGE AREA.--503 mi² (1,302 km²).

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 (236.571 m) NGVD (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, Sept. 1, 1952, to Sept. 30, 1962, water-stage recorder at site 1.6 mi (2.6 km) downstream at datum 2.81 ft (0.856 m) lower.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 255 ft³/s (7.222 m³/s) 6.88 in/yr (175 mm/yr), 184,700 acre-ft/yr (228 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft³/s (963 m³/s) June 13, 1947, gage heights: 26.40 ft (8.047 m), from floodmark, former site and datum; 28.27 ft (8.617 m), from floodmark, present site and datum; minimum daily, 0.11 ft³/s (0.003 m³/s) July 2, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s (127 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	0900	4,920	139	16.76	5.108
Oct. 31	1730	4,730	134	16.49	5.026
Mar. 19	1130	6,780	192	19.16	5.840
Mar. 21	0245	4,640	131	16.36	4.987
Mar. 22	0615	4,930	140	16.78	5.115
Apr. 18	1015	*9,190	260	*21.46	6.541
Sept. 20	1345	4,520	128	16.19	4.935

Minimum daily discharge, 14 ft³/s (0.40 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116	1840	170	75	39	42	301	313	225	743	54	24
2	113	923	135	76	39	43	262	284	314	498	53	23
3	109	693	101	74	38	43	236	261	206	161	51	23
4	99	507	87	73	38	43	218	246	180	118	48	20
5	88	426	230	72	38	44	250	238	167	92	46	18
6	75	363	148	73	38	44	406	228	157	89	44	18
7	115	338	169	72	37	44	333	1790	146	301	42	17
8	491	323	128	68	38	44	299	1470	131	252	39	16
9	415	513	108	60	37	45	298	834	124	214	36	15
10	280	410	100	53	37	54	1080	546	117	133	40	15
11	212	287	97	49	37	65	840	678	109	100	41	15
12	181	239	99	48	37	80	527	827	101	108	39	14
13	154	222	116	48	39	100	385	1950	94	109	33	42
14	137	216	140	47	40	130	346	891	87	90	32	301
15	123	216	167	47	41	265	444	521	94	82	31	89
16	111	207	323	47	40	600	401	414	99	71	30	105
17	101	224	628	46	40	950	2110	363	100	64	27	78
18	93	202	476	46	41	1950	8930	328	98	78	26	422
19	87	186	182	46	40	4600	5970	300	86	108	25	308
20	80	183	105	45	41	3760	2250	312	84	245	24	2980
21	73	179	134	44	40	4070	1220	407	81	788	23	1220
22	111	160	177	43	40	3860	885	282	77	347	22	496
23	609	148	159	43	41	2550	729	310	813	182	21	310
24	3840	146	132	44	41	1140	609	505	240	149	21	232
25	1390	142	104	44	42	588	518	391	165	137	20	192
26	736	168	95	43	41	440	452	291	144	98	38	172
27	505	195	90	43	41	430	406	246	123	80	72	158
28	396	141	83	42	42	465	370	320	280	70	64	146
29	336	147	79	41	---	422	355	329	1350	65	37	139
30	299	156	78	40	---	364	342	270	328	61	28	146
31	2940	---	77	40	---	330	---	235	---	57	26	---
TOTAL	14415	10100	4917	1632	1103	27605	31772	16380	6320	5690	1133	7754
MEAN	465	337	159	52.6	39.4	890	1059	528	211	184	36.5	258
MAX	3840	1840	628	76	42	4600	8930	1950	1350	788	72	2980
MIN	73	141	77	40	37	42	218	228	77	57	20	14
CFSM	.92	.67	.32	.11	.08	1.77	2.11	1.05	.42	.37	.07	.51
IN.	1.07	.75	.36	.12	.08	2.04	2.35	1.21	.47	.42	.08	.57
AC-FT	28590	20030	9750	3240	2190	54750	63020	32490	12540	11290	2250	15380

CAL YR 1977 TOTAL 64467.91 MEAN 177 MAX 7990 MIN .11 CFSM .35 IN 4.77 AC-FT 127900
WTR YR 1978 TOTAL 128821.00 MEAN 353 MAX 8930 MIN 14 CFSM .70 IN 9.53 AC-FT 255500

05487470 SOUTH RIVER NEAR ACKWORTH, IA

LOCATION.--Lat 41°20'14", long 93°29'10", in SE1/4 SE1/4 sec.34, T.76 N., R.23 W., Warren County, Hydrologic Unit 07100008, on right bank 15 ft (5 m) downstream from bridge on county highway, 0.5 mi (0.8 km) downstream from Otter Creek, and 2.2 mi (3.5 km) southwest of Ackworth.

DRAINAGE AREA.--460 mi² (1,191 km²).

PERIOD OF RECORD.--February 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 (234.687 m) NGVD (levels by Corps of Engineers). 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 (6.4 km) downstream at datum 8.06 ft (2.457 m) lower.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Four discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 242 ft³/s (6.853 m³/s), 7.14 in/yr (181 mm/yr), 175,300 acre-ft/yr (216 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft³/s (963 m³/s) June 5, 1947, gage height, 24.60 ft (7.498 m), site and datum then in use; maximum gage height, 29.07 ft (8.861 m) June 10, 1974; no flow Sept. 19 to Oct. 13, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 24.5 ft (7.47 m), from information by local residents, discharge, about 30,000 ft³/s (850 m³/s), at site 4.0 mi (6.4 km) downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s (142 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 23	2115	8,900	252	21.55	6.568	June 23	0815	7,110	201	19.51	5.947
Oct. 31	1115	5,440	154	17.42	5.310	July 1	1945	5,100	144	17.00	5.182
Apr. 18	0315	*11,600	329	*24.17	7.367	Sept. 20	1445	10,000	286	22.81	6.962

Minimum daily discharge, 6.9 ft³/s (0.20 m³/s) Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	1810	85	42	21	18	240	141	185	1180	31	17
2	38	838	83	42	22	19	186	116	220	925	34	17
3	35	565	75	40	22	19	172	104	141	208	31	17
4	29	382	70	39	22	19	154	99	120	119	30	15
5	27	290	160	37	22	20	195	95	112	74	27	13
6	23	258	121	37	22	19	472	95	81	100	24	13
7	93	242	93	38	22	20	384	3140	56	1190	22	13
8	615	230	76	36	22	20	285	1830	48	417	20	16
9	269	631	74	33	21	20	317	660	41	187	19	15
10	130	449	67	32	21	21	1940	356	37	123	28	11
11	107	203	69	25	19	23	1150	442	32	100	33	14
12	94	154	78	22	20	36	539	941	28	127	24	16
13	79	146	100	23	20	60	362	2580	23	168	19	133
14	72	148	140	24	19	105	325	892	21	117	15	539
15	56	149	180	24	18	245	719	394	38	77	15	155
16	48	136	280	25	18	500	449	308	50	45	14	85
17	49	158	381	22	18	880	3070	251	47	30	12	75
18	44	131	198	21	17	1500	8790	214	27	45	12	1200
19	41	113	104	20	17	2300	3010	185	19	430	13	582
20	41	119	73	21	17	2500	1070	231	23	575	9.3	5930
21	41	100	110	21	17	2120	630	242	19	699	9.4	3200
22	192	85	114	21	17	3500	446	158	19	707	8.9	644
23	3130	92	95	20	18	2170	406	504	2120	267	7.3	278
24	7420	87	86	27	18	875	322	621	317	159	6.9	197
25	2190	116	66	28	18	400	260	299	134	121	7.7	153
26	771	120	52	29	18	363	215	197	112	88	84	128
27	510	98	44	29	18	531	190	262	84	68	140	111
28	382	77	40	30	18	540	170	225	401	51	104	97
29	306	70	39	17	---	391	170	197	1380	44	49	94
30	258	70	38	27	---	309	182	181	365	38	30	115
31	3650	---	40	20	---	291	---	143	---	31	22	---
TOTAL	20776	8067	3231	872	542	19834	26820	16103	6300	8510	901.5	13893
MEAN	670	269	104	28.1	19.4	640	894	519	210	275	29.1	463
MAX	7420	1810	381	42	22	3500	8790	3140	2120	1190	140	5930
MIN	23	70	38	17	17	18	154	95	19	30	6.9	11
CFSM	1.46	.59	.23	.06	.04	1.39	1.94	1.13	.46	.60	.06	1.01
IN.	1.68	.65	.26	.07	.04	1.60	2.17	1.30	.51	.69	.07	1.12
AC-FT	41210	16000	6410	1730	1080	39340	53200	31940	12500	16880	1790	27560

CAL YR 1977 TOTAL 61804.63 MEAN 169 MAX 11900 MIN .15 CFSM .37 IN 5.00 AC-FT 122600
WTR YR 1978 TOTAL 125849.50 MEAN 345 MAX 8790 MIN 6.9 CFSM .75 IN 10.18 AC-FT 249600

05487980 WHITE BREAST CREEK NEAR DALLAS, IA

LOCATION.--Lat 41°14'41", long 93°16'08", in NW1/4 NW1/4 sec.3, T.74 N., R.21 W., Marion County, Hydrologic Unit 07100008, on left bank 15 ft (5 m) downstream from bridge on county highway, 0.5 mi (0.8 km) downstream from Kirk Branch, and 1.7 mi (2.7 km) northwest of Dallas.

DRAINAGE AREA.--342 mi² (886 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 759.12 ft (231.380 m) NGVD, (Corps of Engineers bench mark).

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Four discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--16 years, 187 ft³/s (5.296 m³/s), 7.43 in/yr (189 mm/yr), 135,500 acre-ft/yr (167 hm³/yr); median of yearly mean discharges, 160 ft³/s (4.53 m³/s), 6.4 in/yr (162 mm/yr), 116,000 acre-ft/yr (143 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,430 ft³/s (267 m³/s) Oct. 11, 1973, gage height, 26.04 ft (7.937 m); minimum daily, 0.07 ft³/s (0.002 m³/s) Sept. 29, 1968.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1962, reached a stage of 28.87 ft (8.800 m), from floodmark, discharge, about 12,000 ft³/s (340 m³/s). Flood of June 6, 1947, may have been slightly higher.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft³/s (85.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	0700	*6,260	177	*21.27	6.483
Oct. 31	0945	3,750	106	17.08	5.206
Mar. 20	2145	3,420	96.8	16.45	5.014
Mar. 21	2100	3,340	94.6	16.28	4.962
Apr. 18	0430	5,610	159	20.19	6.154
Apr. 19	1715	3,770	107	17.11	5.215
May 13	0930	4,070	115	17.62	5.371
June 23	1145	4,960	140	19.10	5.822
Sept. 20	1445	5,620	159	20.20	6.157

Minimum daily discharge, 6.6 ft³/s (0.19 m³/s) Sept. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	2140	48	19	10	19	196	218	124	520	20	16
2	62	1990	46	20	10	21	160	154	166	493	19	6.9
3	45	600	45	22	10	22	136	83	159	118	35	6.6
4	35	320	41	29	11	22	123	79	111	75	37	6.8
5	30	230	41	36	11	23	109	82	92	58	28	7.1
6	28	194	34	39	11	23	261	95	81	218	22	8.6
7	116	174	44	42	11	23	228	1990	73	1220	18	9.3
8	621	160	39	41	11	24	156	2110	68	495	15	10
9	333	225	40	40	11	24	205	1270	64	207	14	12
10	153	400	35	27	11	25	1440	339	60	115	14	13
11	156	177	33	21	11	25	1640	238	57	81	15	15
12	112	129	38	20	11	25	465	277	53	82	15	17
13	89	111	56	21	12	25	246	2740	50	105	15	63
14	73	108	100	22	12	25	182	1070	47	74	14	272
15	62	107	127	23	13	135	438	364	49	70	14	72
16	55	100	127	23	13	435	317	243	57	56	14	73
17	52	103	128	21	13	570	1110	205	43	45	13	77
18	49	95	128	18	14	1100	3950	192	34	48	15	1110
19	45	84	125	17	14	1850	3360	175	25	260	14	1060
20	41	86	100	16	15	2540	1700	169	21	1030	16	3510
21	39	86	140	17	14	2680	467	159	18	339	15	2780
22	229	64	110	16	14	2380	306	165	14	248	15	2530
23	2730	66	84	17	14	1860	285	193	2000	387	15	1360
24	5110	60	63	18	14	791	248	213	328	178	14	212
25	3470	64	38	19	15	338	220	200	151	116	14	144
26	2470	67	22	19	16	284	219	165	95	83	15	114
27	418	40	15	16	17	444	218	377	210	62	41	97
28	262	33	12	13	18	468	218	354	503	47	176	73
29	207	34	13	11	---	348	218	165	1440	36	109	68
30	179	39	15	11	---	255	218	143	323	29	41	68
31	2490	---	18	11	---	220	---	127	---	24	25	---
TOTAL	19838	8086	1905	685	357	17024	19039	14364	6516	6919	848	13811.3
MEAN	640	270	61.5	22.1	12.8	549	635	463	217	223	27.4	460
MAX	5110	2140	140	42	18	2680	3950	2740	2000	1220	176	3510
MIN	28	33	12	11	10	19	109	79	14	24	13	6.6
CFSM	1.87	.79	.18	.07	.04	1.61	1.86	1.35	.64	.65	.08	1.35
IN.	2.16	.88	.21	.07	.04	1.85	2.07	1.56	.71	.75	.09	1.50
AC-FT	39350	16040	3780	1360	708	38770	37760	28490	12920	13720	1680	27390

CAL YR 1977 TOTAL 49182.48 MEAN 135 MAX 5110 MIN .20 CFSM .40 IN 5.35 AC-FT 97550
WTR YR 1978 TOTAL 109392.30 MEAN 300 MAX 5110 MIN 6.6 CFSM .88 IN 11.90 AC-FT 217000

05488100 LAKE RED ROCK NEAR PELLA, IA

LOCATION.--Lat 41°22'11", long 92°58'48", in NE1/4 NW1/4 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 (2.3 km) upstream from Lake Creek, 4.5 mi (7.2 km) southwest of Pella and at mile 142.3 (229.0 km).

DRAINAGE AREA.--12,323 mi² (31,917 km²).

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

GAGE.--Water-stage recorder. Datum of gage is at NGVD (levels by 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 (210 m) NGVD. Maximum design discharge through the conduits is 37,500 ft³/s (1,060 m³/s) but normal flood control operation limits maximum outflow to 30,000 ft³/s (850 m³/s). Spillway section consists of 5 Tainter gates, 41 ft (12 m) wide and 46 ft (14 m) high, on concrete ogee crest at elevation 736 ft (224 m). The storage capacity of the reservoir at full flood-control pool level, 780 ft (238 m), is 1,830,000 acre-ft (2,260 hm³) and that of conservation pool level, 725 feet (221 m), is 90,000 acre-feet (111 hm³). Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 725 ft (221 m) with minimum release of 300 ft³/s (8.50 m³/s) and maximum releaae of 30,000 ft³/s (850 m³/s) during the non-growing season, providing discharges at Ottumwa and Keosauqua do not exceed 30,000 ft³/s (850 m³/s) and 35,000 ft³/s (991 m³/s) respectively.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,680,000 acre-ft (2,070 hm³) May 12-14, 1973; maximum elevation, 777.95 ft (237.119 m) May 14, 1973; minimum daily contents, 58,000 acre-ft (71.5 hm³) Feb. 16, 1977; minimum elevation, 719.68 ft (219.358 m) Feb. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 356,000 acre-ft (439 hm³) Apr. 22; maximum elevation, 742.53 ft (226.323 m) Apr. 23; minimum daily contents, 107,000 acre-ft (132 hm³) Mar. 14; minimum elevation, 725.55 ft (221.148 m) Mar. 15.

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

722	66,200	740	292,000	760	825,000
725	90,000	745	392,000	765	1,020,000
730	142,000	750	517,000	770	1,250,000
735	208,400	755	653,000		

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	139000	194000	139000	134000	135000	131000	213000	274000	146000	173000	138000	140000
2	137000	206000	139000	134000	135000	128000	209000	261000	146000	180000	137000	139000
3	137000	213000	139000	134000	135000	126000	207000	247000	145000	177000	138000	138000
4	138000	211000	139000	134000	135000	123000	204000	233000	143000	169000	138000	137000
5	137000	208000	138000	134000	134000	120000	201000	222000	143000	163000	138000	138000
6	137000	203000	137000	134000	134000	117000	199000	213000	143000	157000	137000	138000
7	139000	197000	138000	133000	134000	114000	194000	221000	142000	159000	137000	138000
8	144000	191000	139000	133000	134000	112000	187000	230000	142000	160000	137000	138000
9	145000	188000	139000	133000	134000	110000	182000	224000	143000	158000	138000	138000
10	148000	182000	139000	133000	134000	109000	185000	209000	142000	154000	138000	137000
11	148000	174000	139000	134000	134000	108000	191000	196000	142000	152000	139000	137000
12	147000	167000	139000	134000	134000	108000	192000	194000	141000	151000	139000	137000
13	145000	161000	138000	134000	134000	108000	187000	218000	141000	147000	140000	141000
14	142000	156000	138000	134000	134000	107000	182000	236000	143000	142000	140000	147000
15	139000	152000	139000	134000	134000	108000	177000	238000	144000	135000	140000	155000
16	136000	148000	139000	134000	134000	110000	172000	225000	143000	133000	139000	155000
17	135000	145000	140000	134000	134000	111000	172000	210000	143000	134000	139000	155000
18	133000	142000	140000	134000	134000	111000	235000	197000	144000	137000	139000	168000
19	133000	140000	138000	134000	134000	132000	309000	185000	143000	142000	138000	188000
20	134000	137000	137000	134000	134000	184000	341000	174000	143000	145000	138000	217000
21	136000	135000	135000	134000	134000	240000	355000	162000	146000	142000	138000	264000
22	136000	135000	135000	134000	134000	290000	356000	152000	149000	144000	139000	287000
23	151000	136000	137000	133000	134000	316000	351000	150000	162000	147000	140000	294000
24	182000	136000	138000	133000	134000	308000	344000	147000	154000	147000	140000	288000
25	203000	135000	136000	133000	134000	288000	339000	145000	159000	144000	140000	278000
26	200000	135000	134000	133000	134000	265000	327000	143000	154000	138000	141000	267000
27	190000	136000	133000	133000	134000	249000	314000	142000	145000	138000	143000	253000
28	184000	137000	134000	134000	134000	240000	303000	143000	150000	140000	144000	237000
29	181000	138000	135000	134000	---	233000	294000	143000	169000	140000	142000	220000
30	175000	139000	135000	135000	---	226000	283000	143000	171000	139000	142000	203000
31	181000	---	135000	135000	---	220000	---	144000	---	138000	141000	---
MAX	203000	213000	140000	135000	135000	316000	356000	274000	171000	180000	144000	294000
MIN	133000	135000	133000	133000	134000	107000	172000	142000	141000	133000	137000	137000

WTR YR 1978 MAX 356000 MIN 107000

05488500 DES MOINES RIVER NEAR TRACY, IA

LOCATION.--Lat 41°16'53", long 92°51'34", in NW1/4 SE1/4 sec.19, T.75 N., R.17 W., Mahaska County, Hydrologic Unit 07100009, on right bank 250 ft (76 m) upstream from abandoned Bellefountaine Bridge, 0.5 mi (0.8 km) downstream from bridge on State Highway 92, 0.8 mi (1.3 km) east of Tracy, 3.1 mi (5.0 km) upstream from Cedar Creek, 6.4 mi (10.3 km) downstream from English Creek, and at mile 130.4 (209.8 km).

DRAINAGE AREA.--12,479 mi² (32,321 km²).

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 (204.493 m) NGVD. 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 (76 m) downstream at same datum.

REMARKS.--Records good except those for winter period, which are fair. Flow regulated by Lake Red Rock (station 05488100) 11.9 mi (19.1 km) upstream, since March 12, 1969. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Five discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--58 years, 4,595 ft³/s (130.1 m³/s), 5.00 in/yr (127 mm/yr), 3,329,000 acre-ft/yr (4,105 hm³/yr); median of yearly mean discharges, 3,960 ft³/s (112 m³/s), 4.3 in/yr (109 mm/yr), 2,869,000 acre-ft/yr (3,540 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 155,000 ft³/s (4,390 m³/s), June 14, 1947, gage height, 26.5 ft (8.08 m); minimum daily, 40 ft³/s (1.13 m³/s) Jan. 29 to Feb. 1, 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 (7 m), discharge, about 130,000 ft³/s (3,680 m³/s). Minimum daily discharge since at least 1910, that of Jan. 29 to Feb. 1, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,300 ft³/s (716 m³/s) Mar. 25, gage height, 14.22 ft (4.334 m); minimum daily, 590 ft³/s (16.7 m³/s) Jan. 26, Feb. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2590	12400	2020	1980	750	1170	9380	11900	4490	11800	5030	2980
2	2680	10300	2120	1960	750	1780	8480	11800	4920	12800	4520	2950
3	2430	6020	2120	1480	740	1600	7130	11600	5790	11400	3860	2830
4	1970	7750	2100	1240	740	1610	7090	11500	5930	11200	3120	2140
5	1960	7700	2250	1420	730	1600	6880	10500	5140	9900	3020	1400
6	1960	7660	2320	1640	740	1590	6380	9370	4600	7950	2900	1390
7	2030	7620	1740	1640	740	1550	7170	9920	4600	8060	2690	1380
8	2090	7570	1060	1640	740	1590	8140	11100	4260	7120	2180	1340
9	2600	7550	2220	1860	740	1430	8100	13800	3170	9520	2080	1180
10	3290	8100	3600	1710	750	1080	8790	16200	3150	11400	1730	1160
11	3300	8290	2280	1700	750	1050	10300	14400	3080	13500	1710	1040
12	3300	7160	2300	1700	750	1020	10100	12900	2940	14500	1700	746
13	3550	6740	2160	1780	780	1030	9960	10900	2590	14500	1690	680
14	3940	6170	1860	1600	880	1100	9580	7250	1620	13700	1690	1030
15	3930	6120	1900	1360	810	1290	8780	7130	2100	12300	1680	5200
16	3590	6080	2220	1200	770	2170	8760	13100	3490	10100	1670	13900
17	3060	6050	2980	1100	770	4550	8370	14000	3730	7320	1590	15000
18	2870	5820	3450	1100	760	6970	9780	12700	2930	6010	1430	12600
19	2330	4970	3850	1040	800	7480	11400	12000	3110	6060	1420	7360
20	1670	4970	3680	980	800	7950	16100	11100	4630	8750	1340	12900
21	1130	4580	2680	920	780	14200	17900	10900	6050	12300	1180	11100
22	1560	3510	2020	910	740	15200	18300	10400	7220	10400	1020	13700
23	2630	2640	1920	920	810	22400	18400	8200	9410	6720	1010	15900
24	5420	2760	1920	870	860	24200	17700	7160	13300	7890	1240	15900
25	10900	2950	2420	720	630	25000	16400	7010	12100	10100	1790	15100
26	13300	2780	2560	590	700	23200	15600	6200	12000	10500	2060	14000
27	12800	1920	2000	740	590	19400	15400	5280	12100	9160	2110	13800
28	9060	1320	1480	600	630	14800	14000	4560	10600	6440	2950	13700
29	6810	1270	1240	620	---	12500	12100	4360	8060	6450	4630	13600
30	6350	1400	1550	630	---	11100	12000	4330	9870	5930	4520	13400
31	7990	---	1900	680	---	10300	---	4350	---	5240	3740	---
TOTAL	134190	170170	69920	38330	21030	241910	338470	304920	176980	299020	73300	229406
MEAN	4329	5672	2255	1236	751	7804	11280	9836	5899	9646	2365	7647
MAX	13300	12400	3850	1980	880	25000	18400	15200	13300	14500	5030	15900
MIN	1130	1270	1060	590	590	1020	6380	4330	1620	5240	1010	680
AC-FT	266200	337500	138700	76030	41710	479800	671400	604800	351000	593100	145400	455000

CAL YR 1977 TOTAL 671316 MEAN 1839 MAX 14000 MIN 165 AC-FT 1332000
WTR YR 1978 TOTAL 2097646 MEAN 5747 MAX 25000 MIN 590 AC-FT 4161000

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 (3 m) downstream from bridge on State Highway 156, 0.8 mi (1.3 km) downstream from North Cedar Creek, 1.6 mi (2.6 km) northwest of Bussey, 3.0 mi (4.8 km) upstream from Honey Creek, and 8.9 mi (14.3 km) upstream from mouth.

DRAINAGE AREA.--374 mi² (969 km²).

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 (207.919 m) NGVD (levels by Corps of Engineers). Prior to Feb. 21, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

AVERAGE DISCHARGE.--31 years, 200 ft³/s (5.664 m³/s), 7.26 in/yr (184 mm/yr), 144,900 acre-ft/yr (179 hm³/yr); median of yearly mean discharges, 180 ft³/s (5.10 m³/s), 6.5 in/yr (165 mm/yr), 130,000 acre-ft/yr (160 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,300 ft³/s (830 m³/s) May 9, 1950, gage height, 27.50 ft (8.382 m); maximum gage height, 28.06 ft (8.553 m) July 2, 1958; no flow Sept. 6-20, 1955, Oct. 11, 12, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1946 reached a stage of 28.45 ft (8.672 m) on upstream side and 28.05 ft (8.550 m) on downstream side of bridge, levels to floodmarks by Corps of Engineers, discharge, 31,500 ft³/s (892 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 25	0200	6,900	195	21.40	6.523	May 14	0245	*7,290	206	*21.74	6.626
Nov. 1	0500	5,130	146	19.40	5.913	June 24	0315	4,650	132	18.72	5.706
Mar. 19	0830	4,790	136	18.91	5.763	June 29	1330	4,560	129	18.59	5.666
Mar. 22	0515	4,300	122	18.17	5.538	July 7	1745	6,220	176	20.69	6.306
Apr. 11	1045	5,400	153	19.75	6.020	July 23	0430	4,060	115	17.72	5.401
Apr. 18	2015	7,120	202	21.60	6.584	Sept. 21	0530	5,760	163	20.11	6.130

Minimum daily discharge, 0.11 ft³/s (0.31 m³/s) Sept. 5-7,9-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	366	2920	42	37	20	27	265	125	72	465	133	17
2	140	1150	47	42	19	27	204	107	101	1340	99	13
3	90	711	45	42	19	29	175	103	70	232	107	12
4	72	398	44	44	19	31	165	99	57	127	56	12
5	68	288	45	48	18	29	176	115	52	96	44	11
6	64	246	39	54	17	30	596	124	48	196	39	11
7	182	225	44	67	18	31	324	2400	47	5040	35	11
8	1440	209	37	84	18	31	197	1940	44	2870	32	12
9	332	290	39	91	18	32	173	616	39	455	31	11
10	175	322	35	68	18	36	2970	288	37	289	29	11
11	301	130	33	50	18	39	4390	206	35	240	33	11
12	209	146	38	44	19	45	578	1240	32	229	35	12
13	133	138	53	42	23	53	305	4500	30	247	28	15
14	111	137	140	43	26	74	222	4920	30	242	24	26
15	102	138	242	45	24	200	321	557	47	232	21	20
16	90	136	351	43	22	510	243	347	114	220	20	16
17	82	131	516	42	21	1000	416	259	57	209	36	59
18	80	118	330	40	23	1190	5710	207	34	199	45	641
19	69	105	188	36	24	4240	4040	167	41	519	51	244
20	61	105	117	35	25	4070	1010	154	31	1900	44	3000
21	63	112	100	35	24	3810	548	139	27	797	42	4040
22	256	96	130	34	23	3650	368	120	25	2350	36	352
23	1870	90	107	33	25	2200	360	125	1560	2010	39	165
24	6110	93	99	32	26	866	310	136	3540	294	43	108
25	3660	75	102	31	27	376	240	116	371	218	59	87
26	612	55	72	30	26	389	191	95	211	229	57	76
27	365	44	45	27	26	861	163	85	1830	228	92	71
28	266	36	29	24	27	1120	146	98	1620	227	92	56
29	216	32	28	23	---	580	146	90	3970	208	39	49
30	187	35	30	22	---	376	149	76	921	198	25	52
31	2330	---	32	21	---	316	---	69	---	193	24	---
TOTAL	20102	8712	3199	1309	613	26368	25101	19623	15093	22299	1490	9221
MEAN	648	290	103	42.2	21.9	851	837	633	503	719	48.1	307
MAX	6110	2920	516	91	27	4240	5710	4920	3970	5040	133	4040
MIN	61	32	28	21	17	27	146	69	25	95	20	11
CFSM	1.73	.78	.28	.11	.06	2.28	2.24	1.69	1.35	1.92	.13	.82
IN.	2.00	.87	.32	.13	.06	2.62	2.50	1.95	1.50	2.22	.15	.92
AC-FT	39870	17280	6350	2600	1220	52300	49790	38920	29940	44230	2960	18290

CAL YR 1977 TOTAL 69339.95 MEAN 190 MAX 6270 MIN .15 CFSM .51 IN 6.90 AC-FT 137500
WTR YR 1978 TOTAL 153130.00 MEAN 420 MAX 5110 MIN 11 CFSM 1.12 IN 15.23 AC-FT 303700

05489190 MUCHAKINOCK CREEK NEAR EDDYVILLE, IA

LOCATION.--Lat. 41°12'04", long 92°38'24", in SW1/4 NW1/4 sec.19, T.74 N., R.15 W., Mahaska County, Hydrologic Unit 07100009, on left bank 20 ft (6.1 m) downstream from bridge on state highway 137, 3.0 mi (4.8 km) north of Eddyville and 4.0 mi (6.4 km) upstream from mouth.

DRAINAGE AREA.--70.2 mi² (181.8 km²).

PERIOD OF RECORD.--July 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 664.4 ft (202.61 m) NGVD.

REMARKS.--Records fair except those for winter period, which are poor. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,000 ft³/s (227 m³/s) Apr. 24, 1976, gage height, 18.10 ft (5.517 m); minimum daily, 0.13 ft³/s (0.004 m³/s) Jan. 8, 9, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Apr. 18	0100	1,080	30.6	13.27	4.045	July 7	0015	1,000	28.32	13.00	3.962
June 30	0330	1,100	31.2	13.33	4.063	July 22	0100	*1,240	35.12	*13.76	4.194
July 1	2015	1,090	30.9	13.29	4.051						

Minimum daily discharge, 2.0 ft³/s (0.057 m³/s) Jan. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	93	6.6	3.7	4.6	3.8	56	46	29	309	14	3.3
2	7.8	82	5.3	3.9	6.0	4.2	44	41	26	751	13	3.1
3	5.8	61	4.3	4.1	6.7	3.7	38	40	23	341	12	3.0
4	5.1	44	8.1	5.0	5.9	3.2	35	38	20	94	9.9	2.8
5	4.9	35	9.2	5.2	5.5	3.3	30	39	18	64	8.1	3.1
6	4.9	32	8.3	5.9	3.4	3.4	46	45	17	95	8.1	3.4
7	54	29	6.8	6.6	2.7	3.4	48	350	17	406	8.5	3.3
8	86	26	6.8	6.4	2.5	3.6	40	280	18	113	8.4	3.3
9	36	42	6.8	4.9	2.6	4.1	56	100	15	72	7.5	3.2
10	20	29	6.8	4.7	2.6	4.6	287	80	13	53	7.3	3.2
11	22	21	6.8	5.7	2.8	4.5	128	70	13	41	7.3	3.0
12	15	18	5.1	6.9	2.8	5.4	88	200	12	38	6.6	3.2
13	11	17	3.6	8.0	3.5	11	61	610	11	38	6.2	3.2
14	8.4	17	5.2	8.7	3.9	22	52	680	11	30	6.0	5.8
15	6.6	17	6.6	7.0	5.3	69	49	185	33	27	5.6	4.6
16	6.5	16	15	6.1	4.8	100	43	120	24	23	5.0	3.6
17	6.4	17	30	5.3	4.3	134	160	88	18	19	5.6	12
18	5.9	14	19	4.8	4.2	170	792	73	17	18	6.0	57
19	6.1	12	7.6	6.2	4.2	320	475	62	15	82	6.0	18
20	6.4	15	6.7	5.6	4.5	465	197	58	16	135	4.8	320
21	5.8	13	8.2	5.0	4.1	540	148	50	18	566	4.6	136
22	28	11	7.6	4.4	3.6	397	118	46	12	670	4.5	37
23	145	11	4.3	4.7	4.2	229	103	50	154	148	4.2	19
24	238	11	4.6	5.4	4.3	112	89	46	180	58	3.8	11
25	101	12	7.0	6.2	5.4	63	78	41	51	42	4.3	6.5
26	54	13	3.9	4.3	5.3	62	68	38	36	33	5.6	4.8
27	40	8.0	3.0	2.9	4.3	92	62	35	70	27	25	4.0
28	33	7.7	2.8	2.3	4.5	191	57	38	271	22	12	3.8
29	26	7.3	3.3	2.0	---	109	56	35	855	18	6.0	3.3
30	23	6.7	3.4	2.2	---	75	53	32	538	17	4.3	4.0
31	128	---	3.2	2.9	---	64	---	28	---	16	3.9	---
TOTAL	1168.6	737.7	225.9	156.0	118.5	3262.2	3557	3644	2551	4366	234.1	691.5
MEAN	37.7	24.6	7.29	5.03	4.23	105	119	118	85.0	141	7.55	23.1
MAX	238	93	30	8.7	6.7	540	792	680	855	751	25	320
MIN	4.9	6.7	2.8	2.0	2.5	3.2	30	28	11	16	3.8	2.8
CFSM	.54	.35	.10	.07	.06	1.50	1.70	1.68	1.21	2.01	.11	.33
IN.	.62	.39	.12	.08	.06	1.73	1.88	1.93	1.35	2.31	.12	.37
AC-FT	2320	1460	448	309	235	6470	7060	7230	5060	8660	464	1370

CAL YR 1977 TOTAL 3683.43 MEAN 10.1 MAX 238 MIN .13 CFSM .14 IN 1.95 AC-FT 7310
WTR YR 1978 TOTAL 20712.50 MEAN 56.7 MAX 855 MIN 2.0 CFSM .81 IN 10.98 AC-FT 41080

05489500 DES MOINES RIVER AT OTTUMWA, IA

LOCATION.--Lat 41°00'39", long 92°24'40", in SE1/4 NE1/4 sec.25, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, on right bank 15 ft (4 m) downstream from Wabash Railroad Bridge at Ottumwa, 0.4 mi (0.6 km) downstream from Ottumwa powerplant, 6.5 mi (10.5 km) upstream from Village Creek, 9.5 mi (15.3 km) downstream from South Avery Creek, and at mile 94.1 (151.4 km).

DRAINAGE AREA.--13,374 mi² (34,638 km²).

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 (189.586 m) NGVD. Prior to Sept. 30, 1930, nonrecording gages at Market Street Bridge 1,700 ft (518 m) upstream at datum 0.83 ft (0.25 m) higher. Oct. 1, 1930, to Mar. 31, 1935, nonrecording gage at Eldon 15 mi (24.1 km) downstream at different datum. Apr. 1, 1935, to Oct. 25, 1963, water-stage recorder at site 1,100 ft (335 m) downstream at Vine Street Bridge at datum 0.77 ft (0.23 m) higher.

REMARKS.--Records good except those for winter period, which are fair. Prior to Dec. 12, 1958, and since Nov. 30, 1960, diurnal fluctuation at low flow caused by powerplant above station. Flow regulated by Lake Red Rock (station 05488100) 48.2 mi (77.6 km) upstream, since March 12, 1969. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

COOPERATION.--Three discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--61 years, 5,024 ft³/s (142 m³/s), 5.10 in/yr (130 mm/yr), 3,640,000 acre-ft/yr (4,490 hm³/yr); median of yearly mean discharges, 4,170 ft³/s (118 m³/s), 4.2 in/yr (107 mm/yr), 3,020,000 acre-ft/yr (3,720 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 135,000 ft³/s (3,820 m³/s) June 7, 1947, gage height, 20.2 ft (6.16 m), site and datum then in use; minimum daily, 30 ft³/s (0.85 m³/s) Jan. 27-29, 31, Feb. 2, 3, 5-7, 1940.

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 (5.91 m), former site and datum at Vine Street Bridge or about 22 ft (6.71 m) at Market Street Bridge, from information by Corps of Engineers and U.S. Weather Bureau, discharge about 140,000 ft³/s (3,960 m³/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,600 ft³/s (753 m³/s) May 13, gage height, 9.62 ft (2.932 m); minimum daily, 501 ft³/s (14.2 m³/s) Sept. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3780	15700	1800	1550	760	820	10700	12300	4860	14000	4910	3230
2	3430	15100	2300	1700	820	1220	10300	12200	4930	16700	4590	2850
3	2990	8830	2320	1520	790	1750	8430	12100	5910	13200	4050	2710
4	2490	8550	2200	1100	790	1520	7990	12000	6550	12200	3300	2470
5	2050	8680	2200	860	760	1590	8220	11900	6060	12200	2900	1570
6	2080	8550	2050	950	700	1600	8120	10300	5230	12200	2700	1120
7	2910	8420	2300	1160	810	1550	7850	12900	4990	12600	2710	1120
8	4550	8430	2320	2400	830	1500	9030	14800	4970	12300	2260	1130
9	3790	8610	3350	3250	780	1500	9920	14200	4160	12300	1880	1030
10	3760	8500	2500	2600	840	1310	17700	15600	3640	11100	1780	964
11	3940	9540	3400	1800	850	1090	15600	15800	3610	12500	1530	902
12	4040	7990	2100	1550	840	1140	13400	17600	3450	14000	1550	735
13	3840	7750	2250	1560	920	1140	11300	23300	3390	14100	1430	507
14	4250	6930	3050	1620	910	1260	11000	15500	2510	14000	1540	501
15	4410	6840	3100	1450	1000	1800	10100	9830	2130	12600	1460	1330
16	4300	6780	3400	1240	980	3450	9830	11200	3120	11400	1480	9970
17	3610	6730	4800	1030	860	6400	9850	14800	4440	8590	1530	13400
18	3340	6800	5320	960	950	10000	18700	13400	3750	6600	1360	16100
19	2890	6050	5170	990	820	14200	17900	13000	3380	7380	1210	8100
20	2430	5500	4900	940	960	12000	16500	11900	4030	7590	1230	12800
21	1420	5510	4300	920	950	16000	18700	11600	5840	14300	1020	16300
22	1280	4640	3600	860	870	19000	18500	11400	6990	12000	946	12800
23	3820	3350	2800	890	860	22400	18700	10200	9480	8000	776	14700
24	11200	2820	2830	860	950	24200	18500	8050	15100	9000	781	15000
25	15800	3260	2800	840	960	24500	17800	7820	14300	9770	1250	14800
26	13900	2590	3100	780	920	24300	15200	7320	12700	10300	1860	13400
27	14900	2400	3000	690	900	22500	15800	6360	13100	10300	2260	13100
28	11600	2140	2300	820	800	19300	15400	5440	14600	7110	2260	12900
29	8420	1170	1640	570	---	15200	12900	4920	13200	6220	3780	12900
30	7190	1400	1370	600	---	12700	12500	4810	12800	6180	4420	12700
31	9980	---	1250	640	---	12200	---	4790	---	5190	4020	---
TOTAL	168490	199560	89820	38700	24180	279140	396440	357340	203220	335930	68773	221139
MEAN	5435	6652	2897	1248	864	9005	13210	11530	6774	10840	2218	7371
MAX	15800	15700	5320	3250	1000	24500	18700	23300	15100	16700	4910	16300
MIN	1280	1170	1250	570	700	820	7850	4790	2130	5190	776	501
AC-FT	334200	395800	178200	76760	47960	553700	786300	708800	403100	666300	136400	438600

CAL YR 1977 TOTAL 834077 MEAN 2285 MAX 15800 MIN 133 AC-FT 1654000
WTR YR 1978 TOTAL 2382732 MEAN 6528 MAX 24500 MIN 501 AC-FT 4726000

05490500 DES MOINES RIVER AT KEOSAUQUA, IA

LOCATION.--Lat 40°43'40", long 91°57'34", in SE1/4 SW1/4 sec.36, T.69 N., R.10 W., Van Buren County, Hydrologic Unit 07100009, on right bank 10 ft (3 m) upstream from bridge on State Highway 1 at Keosauqua, 4.0 mi (6.4 km) downstream from Chequest Creek, and at mile 51.3 (82.5 km).

DRAINAGE AREA.--14,038 mi² (36,358 km²).

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 (166.835 m) NGVD. Prior to Dec. 24, 1933, nonrecording gage, and Dec. 25, 1933, to Sept. 30, 1972, water-stage recorder, same site at datum 10.00 ft (3.05 m) higher.

REMARKS.--Records good except those for winter period, which are fair. Prior to Dec. 21, 1958, and since Nov. 30, 1960, some diurnal fluctuation at medium and low stages caused by powerplant at Ottumwa. Flow regulated by Lake Red Rock (station 05488100) 91.0 mi (146 km) upstream, since March 12, 1969. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

COOPERATION.--Two discharge measurements furnished by Corps of Engineers.

AVERAGE DISCHARGE.--69 years (1903-5, 1911-78), 5,469 ft³/s (154.9 m³/s) 5.29 in/yr (134 mm/yr), 3,962,000 acre-ft/yr (4,880 hm³/yr); median of yearly mean discharges, 4,880 ft³/s (138 m³/s), 4.7 in/yr (119 mm/yr), 3,540,000 acre-ft/yr (4,400 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 146,000 ft³/s (4,130 m³/s) June 1, 1903, gage height, 27.85 ft (8.489 m), from floodmark, datum then in use; minimum daily, 40 ft³/s (1.13 m³/s) Jan. 30, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1851, reached a stage of 24 ft (7 m), discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40,600 ft³/s (1,150 m³/s) May 13, gage height, 21.94 ft (6.687 m); minimum daily, 661 ft³/s (18.7 m³/s) Sept. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3330	15600	1580	2380	730	850	11200	11900	4610	11500	5580	3900
2	3780	22600	1900	1820	670	890	9890	11600	4690	14900	5400	3040
3	3310	13900	2400	1880	800	890	9030	11500	4820	15300	4950	2910
4	2960	7990	2300	1960	820	1450	7820	11400	5600	12000	4450	2700
5	2440	8590	2220	1800	830	1400	7870	11700	5880	11300	3660	2490
6	2130	8220	2000	1740	780	1400	9100	10900	5410	10500	3170	1650
7	2730	7990	2250	1760	750	1410	7810	16600	4730	25800	3000	1290
8	6970	7830	2400	1820	810	1410	7690	19300	4700	18900	2950	1300
9	5130	7800	2900	1480	800	1400	8620	15100	4560	10800	2580	1310
10	3830	8130	3400	1220	770	1420	26200	14900	3650	9990	2230	1250
11	4240	8160	2750	1300	800	1340	23900	15500	3380	11400	2060	1070
12	4210	8380	3600	1320	780	1340	15700	21700	3370	13300	1800	1050
13	3970	7140	2300	1300	840	1500	11800	32700	3080	14100	1800	1040
14	3860	6870	2600	1300	880	1800	10900	27100	3000	14100	1750	811
15	4250	6260	3200	1480	840	2550	10400	13900	2880	13300	1780	661
16	4250	6200	3500	1440	870	3750	9550	9080	2400	11900	1720	5430
17	4070	6200	3800	1220	870	5400	9410	13600	3060	10100	1990	15200
18	3410	6140	4500	1100	830	7800	20100	14300	4310	7530	1950	30100
19	3300	6020	4900	1050	860	15000	21300	12900	3460	9150	4510	18100
20	2800	5300	4300	1070	850	11200	17800	12200	3150	15500	1640	9210
21	2410	5190	3600	1040	880	8000	17900	11200	3940	14600	1360	18200
22	1640	4990	2800	1020	910	20500	18700	11100	5550	21600	1160	14500
23	1700	4190	2500	960	900	22000	18700	10700	7230	17000	1090	13600
24	7490	3140	2350	1000	870	25400	18700	8860	12500	9970	969	15300
25	14400	2870	1880	980	850	25100	17800	7510	15300	8490	1110	15200
26	14800	2900	1480	960	910	25300	16200	7300	12700	10300	1660	14400
27	13900	2600	2800	950	900	24300	15400	6610	12900	10600	3230	13400
28	12900	2440	4200	900	900	25700	15100	5980	15000	9720	2990	13100
29	9490	1780	4100	1050	---	18500	13900	5310	17700	6860	2480	13100
30	7160	1470	3500	930	---	14100	12100	4790	13100	6550	4190	13000
31	7470	---	2680	860	---	12200	---	4660	---	6310	4420	---
TOTAL	168330	206890	90690	41090	23300	285300	420590	391900	195660	383370	83629	248312
MEAN	5430	6896	2925	1325	832	9203	14020	12640	6555	12370	2698	8277
MAX	14800	22600	4900	2380	910	25700	26200	32700	17700	25800	5580	30100
MIN	1640	1470	1480	860	670	850	7690	4660	2400	6310	969	661
AC-FT	333900	410400	179900	81500	46220	565900	834200	777300	390100	760400	165900	492500

CAL YR 1977 TOTAL 907802 MEAN 2487 MAX 22600 MIN 172 AC-FT 1801000
WTR YR 1978 TOTAL 2540061 MEAN 6959 MAX 32700 MIN 661 AC-FT 5038000

BIG SIOUX RIVER BASIN

06483500 ROCK RIVER NEAR ROCK VALLEY, IA

LOCATION.--Lat 43°12'52", long 96°17'39", in SW1/4 SW1/4 sec.16, T.97 N., R.46 W., Sioux County, Hydrologic Unit 10170204, on right bank 3 ft (0.9 m) upstream from bridge on county highway K30, 0.3 mi (0.5 km) north of Rock Valley and at mile 19.1 (30.7 km). Prior to May 5, 1976, at site 3.2 mi (5.1 km) downstream.

DRAINAGE AREA.--1,592 mi² (4,123 km²).

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

REVISED RECORDS.--WSP 1439: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,222.54 ft (372.630 m) NGVD. Prior to Aug. 13, 1952, nonrecording gage (June 4, 1949, to Aug. 12, 1952, supplementary water-stage recorder operating above 6.2 ft (1.89 m) gage height) and Aug. 13, 1952, to May 4, 1976, water-stage recorder, at site 3.2 mi (5.1 km) downstream at datum 10.73 ft (3.271 m) lower.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--30 years, 296 ft³/s (8.383 m³/s), 2.51 in/yr (64 mm/yr), 214,500 acre-ft/yr (264 hm³/yr); median of yearly mean discharges, 240 ft³/s (6.80 m³/s), 2.0 in/yr (51 mm/yr), 174,000 acre-ft/yr (215 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,400 ft³/s (1,140 m³/s) Apr. 7, 1969, gage height, 17.32 ft (5.279 m); no flow for many days during winter period in 1959 and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of 17.0 ft (5.18 m), former site and datum, discharge not determined, from information by State Highway Commission.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft³/s (85.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 2	2400	3,300	93.5	10.60	3.231	Mar. 21	1200	*7,990	226	a*15.32	4.670

a - backwater from ice

Minimum daily discharge, 50 ft³/s (1.42 m³/s) Feb. 16 to Mar. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	464	338	460	110	56	50	649	790	936	218	428	127
2	2330	448	440	105	56	50	675	729	871	214	450	118
3	2300	451	420	105	54	50	867	678	764	206	576	111
4	1120	393	410	100	52	50	1170	636	646	189	464	107
5	805	355	400	98	52	50	986	601	543	195	365	101
6	629	324	280	98	52	50	1180	560	464	226	315	94
7	578	305	250	96	52	50	2370	534	406	399	276	89
8	599	301	220	96	52	50	1820	560	365	813	244	84
9	1010	395	180	94	52	50	1330	630	329	1530	222	81
10	1240	282	180	94	52	50	1150	681	293	1190	195	78
11	780	387	180	92	52	52	1190	640	269	787	177	80
12	791	720	180	92	52	52	1120	604	250	620	168	89
13	690	994	180	90	52	100	936	534	230	504	155	92
14	608	970	180	90	52	2000	806	490	220	413	146	116
15	535	962	180	88	51	2400	713	450	216	351	162	134
16	477	1050	200	88	50	1900	649	423	206	291	180	132
17	434	1240	600	88	50	2100	627	396	200	267	180	127
18	395	1170	1500	88	50	2100	928	384	191	234	171	118
19	366	998	2540	88	50	4500	1940	370	184	210	166	115
20	340	847	1160	86	50	6610	2280	346	846	195	150	108
21	313	600	600	86	50	7160	1600	322	684	255	139	99
22	284	550	400	84	50	4880	1250	315	601	1180	132	92
23	269	550	300	80	50	3330	1110	303	476	1910	127	91
24	259	550	250	76	50	2100	1150	291	462	2370	124	85
25	252	500	200	72	50	1400	1390	281	432	1600	119	84
26	252	500	180	70	50	1080	1340	276	375	1190	196	81
27	254	500	160	66	50	925	1150	272	327	925	182	80
28	246	500	140	64	50	871	994	324	281	774	228	81
29	236	500	130	60	---	803	910	627	248	656	180	80
30	233	500	120	58	---	732	846	1240	228	560	160	75
31	305	---	110	56	---	684	---	1140	---	490	141	---
TOTAL	19394	18180	12730	2658	1439	46279	35126	16427	12543	20962	6918	2949
MEAN	626	606	411	85.7	51.4	1493	1171	530	418	676	223	98.3
MAX	2330	1240	2540	110	56	7160	2370	1240	936	2370	576	134
MIN	233	282	110	56	50	50	627	272	184	189	119	75
CFSM	.39	.38	.26	.05	.03	.94	.74	.33	.26	.43	.14	.06
IN.	.45	.42	.30	.06	.03	1.08	.82	.38	.29	.49	.16	.07
AC-FT	38470	36060	25250	5270	2850	91790	69670	32580	24880	41580	13720	5850

CAL YR 1977 TOTAL 77698.36 MEAN 213 MAX 2620 MIN .00 CFSM .13 IN 1.82 AC-FT 154100
WTR YR 1978 TOTAL 195605.00 MEAN 536 MAX 7160 MIN 50 CFSM .34 IN 4.57 AC-FT 388000

06485500 BIG SIOUX RIVER AT AKRON, IA
(National stream-quality accounting network station)

LOCATION.--Lat 42°49'42", long 96°33'45", in NW1/4 SW1/4 sec.31, T.93 N., R.48 W., Plymouth County, Iowa, Hydrologic Unit 10170203, on left bank at west edge of Akron, 0.6 mi (1.0 km) downstream from bridge on State Highway 48, and 2.3 mi (3.7 km) upstream from Union Creek.

DRAINAGE AREA.--9,030 mi² (23,390 km²), approximately, of which about 1,970 mi² (5,100 km²) is probably noncontributing.

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

REVISED RECORDS.--WSP 1309: 1929 (M), 1931-33 (M), 1936 (M), 1938 (M), 1940 (M). WSP 1389: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,118.90 ft (341.041 m) NGVD. Prior to Dec. 3, 1934, nonrecording gage at bridge 300 ft (91 m) upstream at same datum.

REMARKS.--Records good except those for the winter period, which are poor. Water-quality data available in reports of Water Resources Data for South Dakota. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--50 years, 833 ft³/s (23.59 m³/s), 603,500 acre-ft/yr (744 hm³/yr); median of yearly mean discharges, 720 ft³/s (20.4 m³/s), 522,000 acre-ft/yr (640 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,800 ft³/s (2,290 m³/s) Apr. 9, 1969, gage height, 22.99 ft (7.007 m); minimum daily, 4 ft³/s (0.11 m³/s) Jan. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,500 ft³/s (99.1 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 22	1900	*18,200	515	*19.88	6.059
Apr. 9	0530	6,890	195	15.88	4.840
Apr. 21	0915	5,280	150	14.11	4.301

Minimum daily discharge, 113 ft³/s (3.20 m³/s) Mar. 5,6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	224	408	1130	520	176	127	4950	2740	2290	799	1070	383
2	372	437	1080	500	174	122	4880	2570	2120	698	1410	351
3	1770	524	1010	470	172	117	5180	2400	2100	617	1100	330
4	2920	597	950	450	170	115	5610	2230	1990	568	1210	309
5	2080	572	880	430	170	113	6160	2080	1850	562	1220	296
6	1370	518	820	410	169	113	6340	1950	1770	2090	993	302
7	1090	476	760	390	168	115	6070	1880	1670	1140	839	318
8	962	452	700	370	167	118	6400	1800	1530	1170	744	313
9	902	539	640	350	166	120	6770	1810	1370	1500	685	294
10	1220	551	600	335	164	123	6010	1900	1230	1910	622	288
11	1820	576	580	320	162	127	5170	1990	1140	1870	573	277
12	1670	533	600	310	160	130	4590	1980	1050	1430	527	284
13	1300	646	650	290	158	190	4110	1980	978	1150	488	310
14	1120	1000	690	280	156	350	3600	1970	913	1010	461	333
15	1010	1180	710	270	154	900	3180	1930	891	885	506	369
16	911	1240	720	260	152	2500	2820	1850	870	778	506	401
17	825	1400	740	250	150	4000	2620	1750	832	699	512	396
18	751	1620	750	240	150	5900	2600	1630	776	632	509	362
19	683	1680	730	230	148	7500	3300	1520	731	576	461	352
20	631	1560	720	220	147	11600	4640	1420	695	533	443	338
21	586	1350	700	210	146	14200	5180	1320	1050	912	425	348
22	537	1150	680	205	145	17600	4280	1230	1260	2560	398	335
23	500	1000	670	200	143	17500	3590	1160	1230	3040	380	322
24	476	900	660	195	141	14300	3320	1120	1110	2900	368	309
25	449	940	650	190	140	11600	3290	1080	1230	2980	347	295
26	430	980	630	187	138	9530	3560	1050	1490	2540	414	281
27	419	1030	615	183	134	8410	3480	1020	1340	2030	519	275
28	403	1100	600	182	130	7360	3180	1010	1120	1740	514	264
29	392	1150	580	180	---	6570	3000	1120	1040	1560	544	266
30	378	1200	560	178	---	6050	2860	1580	929	1340	476	264
31	384	---	540	177	---	5530	---	2370	---	1150	420	---
TOTAL	28585	27309	22345	8982	4350	153030	130740	53440	38595	43369	19684	9565
MEAN	922	910	721	290	155	4936	4358	1724	1287	1399	635	319
MAX	2920	1680	1130	520	176	17600	6770	2740	2290	3040	1410	401
MIN	224	408	540	177	130	113	2600	1010	695	533	347	264
AC-FT	56700	54170	44320	17820	8630	303500	259300	106000	76550	86020	39040	18970

CAL YR 1977	TOTAL	158707.8	MEAN	435	MAX	4940	MIN	4.0	AC-FT	314800
WTR YR 1978	TOTAL	539994.0	MEAN	1479	MAX	17600	MIN	113	AC-FT	1071000

06486000 MISSOURI RIVER AT SIOUX CITY, IA
(National stream-quality accounting network station)

LOCATION.--Lat 42°29'10", long 96°24'47", in NW1/4 SE1/4 sec.16, T.29 N., R.9 E., sixth principal meridan, Dakota County, Nebraska, Hydrologic Unit 10230001, on right bank on upstream side of bridge on U.S. Highway 77 at South Sioux City, Nebraska, 2.0 mi (3.2 km) downstream from Big Sioux River, and at mile 732.3 (1,178.3 km).

DRAINAGE AREA.--314,600 mi² (814,800 km²), approximately.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,056.98 ft (322.168 m) NGVD. Sept. 2, 1878, to Dec. 31, 1905, nonrecording gages at various locations within 1.7 mi (2.7 km) of present site and at various datums. Jan. 1, 1906, to Feb. 14, 1935, nonrecording gage, and Feb. 15, 1935 to Sept. 30, 1969, water-stage recorder at present site at datum 19.98 ft (6.090 m) higher, and Oct. 1, 1969 to Sept. 30, 1970 at datum 20.00 ft (6.096 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Flow regulated by upstream main-stem reservoirs. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--81 years, 32,000 ft³/s (906.2 m³/s), 23,180,000 acre-ft/yr (28,600 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 441,000 ft³/s (12,500 m³/s) Apr. 14, 1952, gage height, 24.28 ft (7.401 m), datum then in use; minimum, 2,500 ft³/s (70.8 m³/s) Dec. 29, 1941; minimum gage height observed, 10.68 ft (3.255 m), Dec. 6, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 62,500 ft³/s (1,770 m³/s) July 23, gage height, 25.42 ft (7.748 m); minimum daily, 10,000 ft³/s (283 m³/s) Dec. 6; minimum gage height observed, 10.68 ft (3.255 m), Dec. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33300	31400	14200	15400	16000	17300	36100	32000	41600	45500	55900	52600
2	31800	31200	13600	14400	16000	17000	34700	32100	41000	45000	57400	52900
3	31600	31400	13300	16200	16000	17200	34100	31600	41100	44600	53800	52900
4	32800	30700	13000	16600	16000	17300	33900	31300	41400	44600	51700	53600
5	32200	30800	12800	16700	16000	17700	34400	31300	42000	45000	52000	53800
6	32800	30800	10400	16700	16500	17700	35700	31300	42100	46200	52500	53900
7	34000	30800	11000	16600	16500	17500	35600	31800	41700	43200	53800	54200
8	33500	30600	14900	15900	16500	17600	34100	31300	42600	43800	54400	54200
9	30400	34400	14900	14300	16500	18000	34500	31100	44400	48600	55000	54200
10	30800	30700	13700	15000	16500	18200	35500	31500	43800	48900	55300	53800
11	30200	29600	16200	15500	17000	18100	34000	31900	43000	48400	54800	53300
12	31600	31000	18500	16000	17000	18000	30600	32100	42200	48100	54800	54100
13	31800	31800	19000	16500	17000	18300	31200	32200	41700	47500	53800	54800
14	32600	32400	18500	16700	17000	18600	32600	31600	41800	47800	54500	55400
15	32700	32800	17700	16700	17000	19100	31800	32000	41600	47500	56300	55100
16	32100	33200	18200	16000	17000	19900	30700	32000	42600	46900	55800	54700
17	31900	34100	18400	15000	17000	18900	32200	32100	44100	46700	55700	53900
18	31800	34200	18200	15500	17000	21400	33600	32000	42600	47300	55700	53700
19	32000	34200	17800	16000	17000	30900	34400	32100	41900	48600	55300	52900
20	32200	34900	17300	16500	17500	38700	34300	31200	41900	49500	55500	53600
21	32600	34900	16300	16500	17500	34600	35000	31000	41400	52800	54600	54200
22	32200	33700	16400	16500	17500	30800	34200	31700	41700	59000	54400	55300
23	32000	33400	18900	16500	17500	33200	32400	32100	43200	61200	54500	55300
24	32400	32200	17200	16500	17500	42800	31600	32900	43800	56300	55700	55700
25	31000	29400	16900	16500	17300	45000	32100	35400	44000	57000	56000	55800
26	31600	25800	14900	16500	17300	43900	32600	35800	44000	58100	55800	56500
27	31800	23600	16400	16000	17500	42300	33200	35200	43700	56900	55900	55500
28	31500	20700	16500	15000	17300	38400	32400	36900	43700	55600	55300	54400
29	31600	19500	17000	15500	---	38600	32400	39200	44000	56000	54600	53900
30	32200	16400	16900	16000	---	37800	32600	40000	45400	55400	54400	53600
31	32800	---	16800	16000	---	37300	---	40400	---	55400	53600	---
TOTAL	993800	910600	496800	495700	472400	822100	1002500	1025100	1280000	1557400	1698800	1627800
MEAN	32060	30350	15990	15990	16870	26520	33420	33070	42670	50240	54800	54260
MAX	34000	34900	19000	16700	17500	45000	36100	40400	45400	61200	57400	56500
MIN	30200	16400	10400	14300	16000	17000	30600	31000	41000	43200	51700	52600
AC-FT	1971000	1806000	983400	983200	937000	1631000	1988000	2033000	2539000	3089000	3370000	3229000

CAL YR 1977 TOTAL 10187800 MEAN 27910 MAX 37800 MIN 9000 AC-FT 20210000
WTR YR 1978 TOTAL 12382000 MEAN 33920 MAX 61200 MIN 10400 AC-FT 24560000

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year. Daily sediment loads October 1954 to September 1971 in reports of Corps of Engineers.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1972 to September 1976, November 1977 to September 1978 (partial-record station).
WATER TEMPERATURES: October 1971 to September 1976, November 1977 to September 1978 (partial-record station).
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976, November 1977 to September 1978 (partial-record station).

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,620 mg/L Nov. 20, 1972; minimum daily mean, 42 mg/L Dec. 29, 1975.
SEDIMENT LOADS: Maximum daily, 222,000 tons (201,000 tonnes) Nov. 20, 1972; minimum daily, 2,970 tons (2,700 tonnes) Dec. 29, 1975.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	780	---	800	---		---	---	660	710	740
2	---	---	780	---	800	---		---	---	650	700	740
3	---	---	800	780	---	---		---	---	650	710	740
4	740	---	780	800	---	---		---	---	640	740	745
5	---	---	680	800	---	---		---	---	650	750	750
6	---	---	830	800	---	---		---	---	650	740	750
7	---	---	850	800	---	---		---	---	660	740	750
8	---	---	850	---	---	630		---	---	660	740	750
9	---	---	850	---	---	---		---	---	670	740	740
10	---	---	800	---	---	---		---	---	660	740	740
11	---	---	810	---	---	---		---	650	660	730	745
12	---	---	800	---	---	---		---	---	650	740	730
13	---	---	770	---	---	---		---	---	650	725	730
14	---	---	800	---	---	---		670	---	660	725	730
15	---	---	790	---	---	760		680	---	665	725	740
16	---	---	780	---	---	---		690	---	670	725	740
17	---	---	790	---	---	---		700	---	670	720	745
18	---	---	800	---	---	---		700	---	675	720	740
19	---	---	800	---	---	---		---	---	675	720	730
20	---	---	740	800	---	520		---	---	695	700	740
21	---	---	840	800	---	490		---	---	700	700	740
22	---	---	800	810	---	410		---	---	690	710	740
23	---	---	820	800	---	490		---	---	690	700	740
24	---	---	820	800	---	530		---	---	680	720	740
25	---	---	820	830	---	550		---	670	690	730	740
26	---	---	820	850	---	530		---	---	680	730	750
27	---	---	820	830	---	470		---	---	680	730	740
28	---	800	800	810	---	440		---	---	690	735	745
29	---	780	---	810	---	410		---	---	690	740	750
30	---	770	---	810	---	---		---	---	700	735	740
31	---	---	---	800	---	---		---	---	710	740	---
TOTAL	740	2350	22420	13730	1600	6230		3440	1320	20820	22510	22240
MEAN	740	783	801	808	800	519		688	660	672	726	741
MAX	740	800	850	850	800	760		700	670	710	750	750
MIN	740	770	680	780	800	410		670	650	640	700	730

WTR YR 1978 TOTAL 117400 MEAN 725 MAX 850 MIN 410

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

05486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		---	3.5	---	.5	---		---	---	25.0	25.0	23.0
2		---	3.0	---	.5	---		---	---	25.0	25.0	24.0
3		---	2.0	1.0	---	---		---	---	25.0	24.0	24.0
4		---	1.0	1.0	---	---		---	---	25.0	23.0	24.0
5		---	1.0	1.0	---	---		---	---	24.0	23.0	25.0
6		---	1.0	1.0	---	---		---	---	25.0	24.0	25.0
7		---	1.5	1.0	---	---		---	---	24.0	24.0	26.0
8		---	1.0	---	---	.5		---	---	24.0	25.0	26.0
9		---	1.0	---	---	---		---	---	23.0	25.0	25.0
10		---	1.0	---	---	---		---	---	23.0	26.0	25.0
11		---	2.0	---	---	---		---	21.0	23.0	26.0	25.0
12		---	2.0	---	---	---		---	---	24.0	26.0	24.0
13		---	3.0	---	---	---		---	---	24.0	27.0	24.0
14		---	4.0	---	---	---		16.0	---	24.0	26.0	23.0
15		---	3.0	---	---	---		16.0	---	25.0	24.0	23.0
16		---	3.0	---	---	---		17.0	---	26.0	25.0	23.0
17		---	3.0	---	---	---		16.0	---	27.0	24.0	22.0
18		---	3.0	---	---	---		17.0	---	27.0	23.0	21.0
19		---	1.0	---	---	---		---	---	27.0	23.0	21.0
20		---	.5	.5	---	1.0		---	---	26.0	23.0	20.0
21		---	.5	.5	---	1.0		---	---	25.0	23.0	20.0
22		---	.5	1.0	---	2.0		---	---	25.0	23.0	19.0
23		---	.5	1.0	---	1.5		---	---	24.0	23.0	19.0
24		---	.5	1.0	---	1.0		---	---	24.0	24.0	19.0
25		---	.5	.5	---	1.0		---	25.0	25.0	24.0	19.0
26		---	.5	.5	---	3.0		---	---	26.0	24.0	19.0
27		---	.5	.5	---	5.0		---	---	25.0	25.0	19.0
28		5.0	1.5	.5	---	6.0		---	---	25.0	25.0	19.0
29		4.0	---	.6	---	6.0		---	---	25.0	25.0	19.0
30		4.0	---	.5	---	---		---	---	25.0	24.0	19.0
31		---	---	.5	---	---		---	---	25.0	23.0	---
TOTAL		13.0	45.5	12.5	1.0	28.0		82.0	46.0	771.0	754.0	664.0
MEAN		4.5	1.5	.5	.5	2.5		16.5	23.0	25.0	24.5	22.0
MAX		6.0	4.0	1.0	.5	6.0		17.0	25.0	27.0	27.0	26.0
MIN		4.0	.5	.5	.5	.5		16.0	21.0	23.0	23.0	19.0

WTR YR 1978 TOTAL 2417.0 MEAN 15.0 MAX 27.0 MIN .5

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00051)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L) (00340)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
03...	1620	31500	710	7.7	17.0	20	--	8.6	91	12	60	100
NOV												
08...	1430	30700	690	8.1	12.5	15	--	--	--	--	--	--
DEC												
05...	1300	13000	884	8.0	.0	30	--	14.8	100	36	23	120
JAN												
16...	1230	16500	765	8.2	.0	15	--	16.0	110	39	K162	30
FEB												
08...	1150	16000	745	8.3	.0	6	--	13.4	92	25	16	19
APR												
03...	1510	34000	360	7.7	5.0	90	--	--	--	--	K50	720
MAY												
01...	1530	30800	660	8.4	11.0	23	--	11.5	100	23	15	22
24...	1545	32000	650	8.5	19.0	--	9.0	9.8	110	35	K12	20
JUN												
13...	1400	42600	660	8.3	20.0	25	26	8.9	97	19	16	52
JUL												
18...	1230	48200	700	8.3	25.5	--	28	7.7	93	16	20	98
AUG												
10...	1300	65000	710	8.4	25.5	--	20	7.2	87	--	20	60
SEP												
05...	1420	51400	750	8.4	24.0	--	19	8.3	98	--	20	42

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS, NONCARBONATE (MG/L CACO3) (00902)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA) (00916)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG) (00927)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE (MG/L AS HCO3) (00440)
OCT											
03...	230	73	61	57	23	21	66	66	5.1	5.4	190
NOV											
08...	240	79	--	61	--	22	--	50	--	5.3	200
DEC											
05...	280	96	68	71	27	26	65	56	5.4	5.5	230
JAN											
16...	250	90	66	64	23	23	69	68	5.6	6.5	200
FEB											
08...	250	82	63	64	23	23	66	66	5.4	5.2	210
APR											
03...	150	44	--	42	--	11	--	16	--	9.6	130
MAY											
01...	250	78	77	62	220	22	50	50	6.4	6.5	200
24...	240	74	66	61	220	22	62	64	6.2	6.3	190
JUN											
13...	230	84	58	58	22	21	58	61	5.9	6.4	180
JUL											
18...	220	75	62	57	21	20	110	60	5.6	5.9	--
AUG											
10...	270	110	--	67	--	24	--	67	--	5.8	--
SEP											
05...	240	79	87	61	21	21	67	72	5.0	5.4	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CARBONATE (MG/L AS CO3) (00445)	ALKALINITY (MG/L AS CACO3) (00410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)
OCT											
03...	0	150	190	10	.6	9.7	461	453	.63	39300	517
NOV											
08...	0	160	200	11	.6	10	460	459	.63	38100	--
DEC											
05...	0	190	220	15	.2	11	524	527	.71	18400	590
JAN											
16...	0	160	220	14	.7	12	505	506	.69	22500	517
FEB											
08...	0	170	200	12	.5	12	489	486	.67	21100	503
APR											
03...	0	110	76	5.8	.2	13	238	238	.32	21800	--
MAY											
01...	2	170	170	10	.5	11	445	433	.61	37000	527
24...	6	166	200	12	.5	6.8	428	472	.58	37000	451
JUN											
13...	0	150	190	12	.5	8.3	436	446	.59	50100	542
JUL											
18...	0	150	200	10	.5	6.1	455	450	.62	59300	536
AUG											
10...	--	160	210	15	.6	7.0	487	493	.66	72300	--
SEP											
06...	--	160	220	14	.6	8.9	498	499	.68	59100	--

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHYTOPLANKTON, TOTAL (CELLS PER ML) (60050)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
OCT											
03...	.03	.03	.04	.07	.10	.07	3100	281	24000	16	--
NOV											
08...	.16	.03	--	--	--	.08	2000	294	24400	19	8.6
DEC											
05...	.72	.10	--	--	--	.17	--	129	4530	75	--
JAN											
16...	.19	.06	--	--	--	.05	--	109	4860	24	3.4
FEB											
08...	.19	.06	.13	.19	.38	.04	--	133	5750	25	3.0
APR											
03...	.63	.29	1.1	1.4	2.0	.32	3700	481	44200	41	--
MAY											
01...	.17	.01	.80	.81	.98	.18	--	261	21700	34	8.0
24...	.02	.00	--	--	--	.06	--	319	27600	27	13
JUN											
13...	.19	.03	.55	.58	.77	.07	12000	--	--	--	--
JUL											
18...	.06	.00	.52	.52	.58	.08	17000	--	--	--	4.7
AUG											
10...	.05	--	--	.33	.38	.10	28000	--	--	--	4.8
SEP											
05...	.05	.02	.53	.55	.60	.10	10000	465	64500	20	--

DATE	TIME	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC SUSPENDED TOTAL (UG/L AS AS) (01001)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM SUSPENDED RECOVERABLE (UG/L AS CD) (01026)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, SUSPENDED RECOV. (UG/L AS CR) (01031)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COBALT, SUSPENDED RECOVERABLE (UG/L AS CO) (01036)
DEC												
05...	1300	4	2	2	0	0	0	10	10	0	2	1
APR												
03...	1510	4	3	1	1	1	0	0	0	0	1	1
JUN												
13...	1400	4	2	2	0	--	3	5	5	0	0	0
SEP												
05...	1420	5	2	3	24	21	3	10	10	0	0	0

DATE	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, SUSPENDED RECOVERABLE (UG/L AS CU) (01041)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE) (01044)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB) (01050)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)
DEC											
05...	1	12	9	3	2700	--	30	6	5	1	140
APR											
03...	0	13	10	3	4200	--	50	11	10	1	320
JUN											
13...	0	16	11	5	3400	--	10	17	4	13	180
SEP											
05...	0	23	5	18	3400	3400	20	66	66	0	170

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
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WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	MANGANESE, SUSPENDED RECOV. (UG/L AS MN) (01054)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY SUSPENDED RECOVERABLE (UG/L AS HG) (71895)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, SUSPENDED TOTAL (UG/L AS SE) (01146)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN) (01091)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC 05...	100	40	.1	.1	.0	2	0	2	60	50	10
APR 03...	320	0	.0	.0	.1	3	1	2	50	40	10
JUN 13...	180	0	.0	.0	.0	0	0	1	30	20	10
SEP 05...	160	10	.0	.0	.0	1	0	2	50	40	10

DATE	ALDRIN, TOTAL (UG/L) (39330)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39333)	ATRAZINE, TOTAL (UG/L) (39630)	CHLORDANE, TOTAL (UG/L) (39350)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39351)	DDD, TOTAL (UG/L) (39360)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG) (39363)	DDE, TOTAL (UG/L) (39365)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39368)	DDT, TOTAL (UG/L) (39370)	DIAZINON, TOTAL (UG/L) (39570)
NOV 08...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 24...	ND	--	ND	ND	--	ND	--	ND	--	ND	ND
MAY 02...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 10...	ND	--	ND	ND	--	ND	--	ND	--	ND	ND

DATE	DIAZINON, TOTAL IN BOTTOM MATERIAL (UG/KG) (39571)	DIELDRIN TOTAL (UG/L) (39380)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39383)	ENDRIN, TOTAL (UG/L) (39390)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39393)	ETHION, TOTAL (UG/L) (39398)	ETHION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39399)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG) (39413)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG) (39423)
NOV 08...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 24...	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 02...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 10...	--	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	LINDANE TOTAL (UG/L) (39340)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG) (39343)	MALATHION, TOTAL (UG/L) (39530)	MALATHION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39531)	METHOXYCHLOR, TOTAL (UG/L) (39480)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG) (39481)	METHYL PARATHION, TOTAL (UG/L) (39600)	METHYL PARATHION, TOT. IN BOTTOM MATL. (UG/KG) (39601)	METHYL TRITHION, TOTAL (UG/L) (39790)	METHYL TRITHION, TOT. IN BOTTOM MATL. (UG/KG) (39791)	PARATHION, TOTAL (UG/L) (39540)
NOV 08...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 24...	ND	--	ND	--	ND	--	ND	--	ND	--	ND
MAY 02...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 10...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	PARATHION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39541)	TOXAPHENE, TOTAL (UG/L) (39400)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39403)	TOTAL TRITHION (UG/L) (39786)	TRITHION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39787)	2,4-D, TOTAL (UG/L) (39730)	2,4-D, TOTAL IN BOTTOM MATERIAL (UG/KG) (39731)	2,4,5-T TOTAL (UG/L) (39740)	2,4,5-T TOTAL IN BOTTOM MATERIAL (UG/KG) (39741)	SILVEX, TOTAL (UG/L) (39760)	SILVEX, TOTAL IN BOTTOM MATERIAL (UG/KG) (39761)
NOV 08...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 24...	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 02...	ND	ND	ND	ND	ND	--	--	--	--	--	--
AUG 10...	--	ND	--	ND	--	--	--	--	--	--	--

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	OCT 3,77	NOV 8,77	APR 3,78	JUN 13,78
TIME	1620	1430	1510	1400
TOTAL CELLS/ML	3100	2000	3700	12000
DIVERSITY: DIVISION	1.7	1.0	1.3	1.4
.CLASS	1.7	1.0	1.3	1.4
..ORDER	2.5	1.3	1.8	1.8
...FAMILY	2.8	2.1	2.1	2.6
....GENUS	3.2	2.8	2.4	3.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHARACIACEAE								
....SCHROEDERIA	31	1	--	-	--	-	--	-
...COELASTRACEAE								
....COELASTRUM	--	-	440#	22	--	-	720	6
...MICRACTINIACEAE								
....GOLENKINIA	16	1	--	-	--	-	--	-
....MICRACTINIUM	--	-	--	-	--	-	--	-
...OOCYSTACEAE								
....ANKISTRODESMUS	78	3	110	5	270	7	--	-
....CHODATELLA	--	-	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	65	3	--	-	1100	9
....FRANCEIA	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-
....OOCYSTIS	47	2	--	-	--	-	1100	9
....QUADRIGULA	--	-	--	-	--	-	--	-
....TREUBARIA	--	-	--	-	--	-	--	-
...SCENEDESMACEAE								
....ACTINASTRUM	--	-	--	-	--	-	--	-
....CRUCIGENIA	--	-	170	9	540	15	1300	11
....SCENEDESMUS	530#	17	220	11	810#	22	1400	12
....TETRASTRUM	62	2	--	-	--	-	--	-
..TETRASPORALES								
...PALMELLACEAE								
....SPHAEROCYSTIS	190	6	--	-	--	-	1300	11
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CARTERIA	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	140	5	--	-	270	7	--	-
...PHACOTACEAE								
....PHACOTUS	--	-	--	-	--	-	--	-
...VOLVOCACEAE								
....PANDORINA	--	-	--	-	--	-	--	-
..ZYGNEMATALES								
...DESMIDIACEAE								
....CLOSTERIUM	16	1	--	-	--	-	--	-
..CHLOROCOCCALES								
...OOCYSTACEAE								
....GLOEOACTINIUM	--	-	--	-	--	-	--	-
CHRYSOPHYTA								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	700#	23	150	8	1400#	37	60	1
....MELOSIRA	310	10	87	4	--	-	--	-
....SKELETONEMA	--	-	--	-	--	-	--	-
....STEPHANODISCUS	--	-	650#	32	--	-	--	-
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	-	--	-	--	-	--	-
....COCCONEIS	62	2	--	-	--	-	--	-
...FRAGILARIACEAE								
....ASTERIONELLA	--	-	--	-	--	-	2700#	23
....FRAGILARIA	--	-	--	-	--	-	--	-
...NAVICULACEAE								
....GYROSIGMA	--	-	--	-	--	-	--	-
....NAVICULA	--	-	22	1	140	4	--	-
...NITZSCHIACEAE								
....NITZSCHIA	--	-	110	5	--	-	120	1
...SURIRELLACEAE								
....SURIRELLA	--	-	--	-	--	-	--	-
.CHRYSOPHYCEAE								
..CHRYSOMONADALES								
...OCHROMONADACEAE								
....OCHROMONAS	--	-	--	-	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)								
.CRYPTOPHYCEAE								
..CRYPTOMONIDALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	31	1	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)
PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	OCT 3,77		NOV 8,77		APR 3,78		JUN 13,78	
TIME	1620		1430		1510		1400	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROCCOCCALES								
...CHROCCOCCACEAE								
....ANACYSTIS	470#	15	--	-	--	-	2100#	18
..HORMOGONALES								
...NOSTOCACEAE								
....APHANIZOMENON	390	13	--	-	--	-	--	-
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	--	-	--	-
..CHROCCOCCALES								
...CHROCCOCCACEAE								
....GOMPHOSPHAERIA	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....TRACHELOMONAS	16	1	--	-	270	7	--	-

DATE	JUL 18,78	AUG 10,78	SEP 5,78
TIME	1230	1300	1420
TOTAL CELLS/ML	17000	28000	10000
DIVERSITY: DIVISION	1.2	1.5	1.6
.CLASS	1.2	1.5	1.6
..ORDER	1.6	1.7	2.5
...FAMILY	2.2	2.2	3.2
....GENUS	3.2	3.2	3.8

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)						
.CHLOROPHYCEAE						
..CHLOROCOCCALES						
...CHARACIACEAE						
....SCHROEDERIA	150	1	*	0	--	-
...COELASTRACEAE						
....COELASTRUM	--	-	570	2	--	-
...MICRACTINIACEAE						
....GOLENKINIA	--	-	--	-	200	2
....MICRACTINIUM	--	-	160	1	400	4
...OOCYSTACEAE						
....ANKISTRODESMUS	510	3	400	1	280	3
....CHODATELLA	*	0	*	0	*	0
....DICTYOSPHAERIUM	--	-	320	1	160	2
....FRANCEIA	--	-	*	0	--	-
....KIRCHNERIELLA	--	-	730	3	--	-
....OOCYSTIS	150	1	320	1	79	1
....QUADRIGULA	--	-	1300	5	--	-
....TREUBARIA	*	0	--	-	--	-
...SCENEDESMACEAE						
....ACTINASTRUM	1500	9	650	2	320	3
....CRUCIGENIA	290	2	--	-	160	2
....SCENEDESMUS	5700#	35	2400	9	1500#	15
....TETRASTRUM	590	4	--	-	470	5
..TETRASPORALES						
...PALMELLACEAE						
....SPHAEROCYSTIS	290	2	--	-	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CARTERIA	--	-	*	0	*	0
....CHLAMYDOMONAS	370	2	160	1	160	2
...PHACOTACEAE						
....PHACOTUS	150	1	1100	4	280	3
...VOLVOCACEAE						
....PANDORINA	--	-	--	-	320	3
..ZYGNEMATALES						
...DESMIDIACEAE						
....CLOSTERIUM	--	-	--	-	*	0
..CHLOROCOCCALES						
...OOCYSTACEAE						
....GLOEOACTINIUM	1500	9	--	-	--	-

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
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ORGANISM	JUL 18,78 1230 CELLS /ML	PER-CENT	AUG 10,78 1300 CELLS /ML	PER-CENT	SEP 5,78 1420 CELLS /ML	PER-CENT
CHRYSOPHYTA						
.BACILLARIOPHYCEAE						
..CENTRALES						
...COSCINODISCACEAE						
....CYCLOTELLA	2700#	16	3400	12	1300	13
....MELOSIRA	220	1	1900	7	79	1
....SKELETONEMA	660	4	--	-	160	2
....STEPHANODISCUS	--	-	--	-	--	-
..PENNALES						
...ACHNANTHACEAE						
....ACHNANTHES	--	-	--	-	*	0
....COCCONEIS	--	-	--	-	--	-
...FRAGILARIACEAE						
....ASTERIONELLA	--	-	--	-	--	-
....FRAGILARIA	--	-	--	-	1600#	15
...NAVICULACEAE						
....GYROSIGMA	--	-	*	0	--	-
....NAVICULA	--	-	--	-	--	-
...NITZSCHIACEAE						
....NITZSCHIA	150	1	*	0	320	3
...SURIRELLACEAE						
....SURIRELLA	--	-	*	0	--	-
.CHRYSOPHYCEAE						
..CHRYSOMONADALES						
...OCHROMONADACEAE						
....OCHROMONAS	--	-	--	-	*	0
CRYPTOPHYTA (CRYPTOMONADS)						
.CRYPTOPHYCEAE						
..CRYPTOMONIDALES						
...CRYPTOCHRYSIDACEAE						
....CHROOMONAS	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
.CYANOPHYCEAE						
..CHROCCOCCALES						
...CHROCCOCCACEAE						
....ANACYSTIS	1200	7	5300#	19	1300	13
..HORMOGONALES						
...NOSTOCACEAE						
....APHANIZOMENON	--	-	--	-	--	-
...OSCILLATORIACEAE						
....OSCILLATORIA	--	-	--	-	710	7
..CHROCCOCCALES						
...CHROCCOCCACEAE						
....GOMPHOSPHAERIA	--	-	8500#	31	--	-
EUGLENOPHYTA (EUGLENOIDS)						
.EUGLENOPHYCEAE						
..EUGLENALES						
...EUGLENACEAE						
....TRACHELOMONAS	290	2	--	-	120	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

06600100 FLOYD RIVER AT ALTON, IA

LOCATION.--Lat 42°58'55", long 96°00'03", in NE1/4 NE1/4 sec.11, T.94 N., R.44 W., Sioux County, Hydrologic Unit 10230002, on left bank at downstream side of Chicago and Northwestern Railway Company bridge at east edge of Alton, 34.3 mi (55.2 km) upstream from West Branch Floyd River at mile 58.1 (93.5 km).

DRAINAGE AREA.--265 mi² (686 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,269.55 ft (386.959 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--23 years, 45.1 ft³/s (1.277 m³/s), 2.31 in/yr (59 mm/yr), 32,670 acre-ft/yr (40.3 hm³/yr); median of yearly mean discharges, 37 ft³/s (1.05 m³/s), 1.9 in/yr (48 mm/yr), 26,800 acre-ft/yr (33.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,200 ft³/s (346 m³/s) Mar. 28, 1962, gage height, 18.35 ft (5.593 m); no flow at times in 1956, 1958-59, 1965, 1968, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1953 reached a discharge of about 45,500 ft³/s (1,290 m³/s), from information by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,450 ft³/s (41.1 m³/s) Mar. 19, gage height, 13.37 ft (4.075 m) at 2330 hours, no other peak above base of 800 ft³/s (22.7 m³/s); minimum daily, 1.2 ft³/s (0.034 m³/s) Mar. 5-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	40	20	7.0	3.5	1.3	52	89	70	38	75	17
2	12	58	20	6.5	3.5	1.3	53	83	72	34	63	16
3	9.9	51	20	6.0	3.0	1.3	54	78	68	30	56	15
4	9.2	40	19	5.5	3.0	1.3	53	77	60	27	52	13
5	8.7	35	19	5.0	3.0	1.2	53	75	54	26	47	10
6	7.7	32	19	5.0	2.5	1.2	98	71	49	168	41	9.5
7	11	28	19	5.0	2.5	1.2	140	70	45	177	37	9.6
8	16	28	18	5.0	2.5	1.2	108	76	42	144	33	9.4
9	18	39	18	5.0	2.0	1.5	96	83	39	125	28	8.8
10	20	30	18	5.0	2.0	2.0	93	82	37	107	25	8.6
11	22	50	18	5.0	2.0	5.0	92	76	35	85	23	8.1
12	22	90	17	4.5	1.5	20	86	73	33	66	20	7.8
13	21	137	17	4.5	1.5	200	81	70	31	58	20	15
14	20	121	17	4.5	1.5	600	78	67	54	51	19	35
15	19	126	18	4.5	1.4	350	75	63	40	46	31	20
16	18	130	22	4.5	1.4	400	71	60	36	41	32	15
17	15	122	200	4.5	1.4	450	65	57	35	37	22	14
18	14	104	252	4.5	1.4	650	114	55	34	34	21	13
19	14	90	92	4.0	1.4	1150	262	53	33	34	20	13
20	12	85	40	4.0	1.4	980	219	51	33	31	19	11
21	12	50	20	4.0	1.4	383	165	49	32	40	21	10
22	12	40	16	4.0	1.4	222	139	47	50	219	19	10
23	12	30	14	4.0	1.4	145	132	45	55	602	18	8.3
24	12	26	12	4.0	1.4	113	135	44	45	475	17	7.3
25	12	24	11	4.0	1.4	102	129	44	43	287	17	8.5
26	11	23	10	4.0	1.3	93	118	43	43	206	51	7.9
27	10	22	9.5	4.0	1.3	90	110	42	42	166	34	6.5
28	10	21	9.0	4.0	1.3	75	103	42	42	133	30	6.1
29	12	20	8.5	3.5	---	65	100	42	41	113	25	6.0
30	14	20	8.0	3.5	---	54	97	49	40	100	20	5.7
31	26	---	7.5	3.5	---	53	---	77	---	85	19	---
TOTAL	440.3	1712	1008.5	142.0	53.3	6213.5	3171	1933	1333	3785	955	345.1
MEAN	14.2	57.1	32.5	4.58	1.90	200	106	62.4	44.4	122	30.8	11.5
MAX	26	137	252	7.0	3.5	1150	262	89	72	602	75	35
MIN	7.7	20	7.5	3.5	1.3	1.2	52	42	31	26	17	5.7
CFSM	.05	.22	.12	.02	.007	.76	.40	.24	.17	.46	.12	.04
IN.	.06	.24	.14	.02	.01	.87	.45	.27	.19	.53	.13	.05
AC-FT	873	3400	2000	282	106	12320	6290	3830	2640	7510	1890	685

CAL YR 1977	TOTAL	5394.15	MEAN 14.8	MAX 252	MIN .00	CFSM .06	IN .76	AC-FT 10700				
WTR YR 1978	TOTAL	21091.70	MEAN 57.8	MAX 1150	MIN 1.2	CFSM .22	IN 2.96	AC-FT 41840				

06600300 WEST BRANCH FLOYD RIVER NEAR STRUBLE, IA

LOCATION.--Lat 42°55'15", long 96°10'30", in NE1/4 NE1/4 sec.32, T.94 N., R.45 W., Sioux County, Hydrologic Unit 10230002, on right bank at downstream side of bridge on county highway B62, 0.2 mi (0.3 km) west of U.S. Highway 75, 0.8 mi (1.3 km) downstream from Orange City slough, 2.2 mi (3.5 km) northeast of Struble, 14 mi (23 km) upstream from Floyd River, and at mile 39.3 (63.2 km).

DRAINAGE AREA.--181 mi² (469 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,239.40 ft (377.769 m) NGVD (State Highway Commission benchmark).

REMARKS.--Records fair except those for winter period and period of no gage-height record Oct. 1 to Nov. 11, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--23 years, 28.9 ft³/s (0.818 m³/s), 2.17 in/yr (55 mm/yr), 20,940 acre-ft/yr (25.8 hm³/yr); median of yearly mean discharges, 24 ft³/s (0.68 m³/s), 1.8 in/yr (46 mm/yr), 17,400 acre-ft/yr (21.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,060 ft³/s (228 m³/s) Mar. 28, 1962, gage height, 15.63 ft (4.764 m); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft³/s (11.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 19	1900	2,550	72.2	13.64	4.157	July 21	1130	815	23.1	9.02	2.749
July 6	0200	*3,220	91.2	*14.42	4.395	July 22	1130	2,370	67.1	13.37	4.075

No flow Jan. 13 to Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	4.0	.50	.40	.00	.10	31	23	70	8.5	29	9.7
2	.30	3.5	.40	.40	.00	.10	31	21	50	8.5	29	9.7
3	.20	3.0	.40	.40	.00	.10	31	18	37	8.5	29	7.8
4	.20	2.5	.40	.40	.00	.10	31	17	29	7.1	28	7.8
5	.20	2.0	.40	.40	.00	.10	34	18	26	181	24	7.4
6	.20	1.8	.40	.40	.00	.10	44	16	22	1170	23	6.1
7	1.0	1.6	.40	.40	.00	.10	40	16	19	103	20	5.8
8	2.0	1.6	.40	.40	.00	.10	31	19	18	61	17	5.8
9	1.5	5.0	.40	.30	.00	.10	29	22	17	47	17	6.1
10	1.0	20	.40	.20	.00	1.0	28	20	16	38	15	5.8
11	.90	5.0	.40	.10	.00	10	26	17	16	29	14	5.8
12	.80	4.5	.40	.10	.00	50	20	15	15	28	14	5.8
13	.80	4.0	.40	.00	.00	150	17	16	15	21	14	13
14	.80	3.5	.40	.00	.00	500	14	14	22	18	14	17
15	.80	3.0	.40	.00	.00	600	13	12	24	15	22	14
16	.70	2.5	.60	.00	.00	700	13	12	16	16	19	12
17	.70	2.2	1.0	.00	.00	800	17	10	15	14	16	11
18	.70	2.0	.90	.00	.00	900	47	10	15	14	16	9.3
19	.70	1.8	.70	.00	.00	1500	70	10	14	13	13	7.4
20	.70	1.5	.60	.00	.00	724	51	10	13	23	16	7.4
21	.60	1.2	.50	.00	.00	206	43	10	13	238	13	7.4
22	.60	.90	.50	.00	.00	102	38	10	19	1170	13	5.8
23	.60	.70	.50	.00	.10	54	36	10	19	340	11	7.4
24	.60	.60	.50	.00	.10	45	37	10	16	148	10	7.4
25	.60	.50	.50	.00	.10	39	36	10	18	94	8.5	5.8
26	.60	.50	.40	.00	.10	36	33	10	16	73	40	5.8
27	.60	.50	.40	.00	.10	32	30	10	11	69	30	4.4
28	.60	.50	.40	.00	.10	31	29	10	11	66	25	4.4
29	.60	.50	.40	.00	---	33	26	47	8.9	44	17	3.1
30	1.0	.50	.40	.00	---	31	25	105	10	34	12	4.4
31	5.0	---	.40	.00	---	31	---	72	---	32	12	---
TOTAL	25.80	81.40	14.80	3.90	.60	6575.90	951	620	610.9	4121.6	580.5	230.6
MEAN	.83	2.71	.48	.13	.021	212	31.7	20.0	20.4	133	18.7	7.69
MAX	5.0	20	1.0	.40	.10	1500	70	105	70	1170	40	17
MIN	.20	.50	.40	.00	.00	.10	13	10	8.9	7.1	8.5	3.1
CFSM	.005	.02	.003	.001	.000	1.17	.18	.11	.11	.74	.10	.04
IN.	.01	.02	.00	.00	.00	1.35	.20	.13	.13	.85	.12	.05
AC-FT	51	161	29	7.7	1.2	13040	1890	1230	1210	8180	1160	457

CAL YR 1977	TOTAL	955.69	MEAN	2.62	MAX	150	MIN	.00	CFSM	.01	IN	.20	AC-FT	1900
WTR YR 1978	TOTAL	13817.00	MEAN	37.9	MAX	1500	MIN	.00	CFSM	.21	IN	2.84	AC-FT	27410

06600500 FLOYD RIVER AT JAMES, IA

LOCATION.--Lat 42°34'36", long 96°18'43", in SE1/4 SE1/4 sec.30, T.90 N., R.46 W., Plymouth County, Hydrologic Unit 10230002, on right bank at downstream side of bridge on county highway C70, 0.2 mi (0.3 km) east of James, 14.3 mi (23.0 km) downstream from West Branch Floyd River, and at mile 9.5 (15.3 km).

DRAINAGE AREA.--882 mi² (2,284 km²).

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,092.59 ft (333.021 m) NGVD. Prior to Sept. 11, 1938, June 9 to Nov. 5, 1953, and Oct. 1, 1955, to May 22, 1957, nonrecording gage and May 23, 1957, to Sept. 30, 1970, water-stage recorder at same site at datum 10.0 ft (3.048 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--43 years (water years 1936-78), 174 ft³/s (4.928 m³/s), 2.68 in/yr (68 mm/yr), 126,100 acre-ft/yr (155 hm³/yr); median of yearly mean discharges, 150 ft³/s (4.25 m³/s), 2.3 in/yr (58 mm/yr), 109,000 acre-ft/yr (134 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 71,500 ft³/s (2,020 m³/s) June 8, 1953, gage height, 25.3 ft (7.71 m), from floodmarks, datum then in use, from rating curve extended above 16,000 ft³/s (453 m³/s) on basis of contracted-opening and flow-over-embankment measurement of peak flow; minimum daily, 0.90 ft³/s (0.025 m³/s) Jan. 10-22, 1977.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft³/s (70.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 20	0615	*7,630	216	*21.94	6.687	July 23	0830	4,270	121	18.63	5.678
July 6	1500	3,800	108	18.08	5.511						

Minimum daily discharge, 3.0 ft³/s (0.085 m³/s) Mar. 9,10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	54	42	17	11	5.0	133	194	213	73	278	85
2	17	52	41	16	11	5.0	130	179	180	66	503	80
3	16	58	40	15	11	4.5	127	166	146	61	275	77
4	17	67	39	14	11	4.5	120	157	130	52	228	72
5	17	64	38	13	11	4.0	119	150	118	87	194	72
6	17	56	37	12	11	4.0	166	146	108	2810	180	70
7	29	54	36	11	11	3.5	202	144	102	1860	166	64
8	43	52	35	10	11	3.5	248	149	97	557	147	65
9	32	65	34	9.5	11	3.0	213	152	93	338	134	58
10	30	40	33	9.0	11	3.0	195	156	87	312	122	53
11	37	35	32	8.5	11	3.5	180	139	83	244	115	53
12	38	55	32	8.0	11	5.0	176	134	75	186	110	53
13	42	113	32	7.5	11	15	162	130	70	156	105	69
14	36	176	32	7.5	11	50	147	123	75	142	104	198
15	36	162	33	7.5	11	100	140	113	104	127	127	112
16	34	161	35	7.5	11	300	134	106	134	117	134	93
17	31	160	250	7.5	10	800	134	102	153	102	117	79
18	30	162	1170	7.5	9.5	2000	187	99	120	99	107	65
19	28	153	627	7.5	9.0	4570	348	96	99	106	97	68
20	26	153	150	8.0	8.5	6910	484	91	86	117	86	67
21	21	85	40	8.0	8.0	4170	418	88	73	448	160	65
22	21	70	32	9.0	7.5	1650	349	86	74	2520	164	60
23	22	60	28	10	7.0	770	314	85	224	4060	101	57
24	24	55	26	10	6.5	484	297	83	182	3380	92	57
25	24	50	24	11	6.0	355	285	82	115	1220	85	54
26	24	46	23	11	6.0	287	268	81	101	1030	86	46
27	25	44	22	11	5.5	241	248	79	112	623	317	53
28	22	43	21	11	5.5	207	232	76	98	492	166	52
29	22	42	20	11	---	182	217	75	88	406	122	51
30	24	42	19	11	---	159	207	136	80	346	102	51
31	103	---	18	11	---	146	---	204	---	307	91	---
TOTAL	906	2429	3041	317.5	265.0	23444.5	6580	3801	3420	23444	4815	2099
MEAN	29.2	81.0	98.1	10.2	9.46	756	219	123	114	724	155	70.0
MAX	103	176	1170	17	11	6910	484	204	224	4060	503	198
MIN	16	35	18	7.5	5.5	3.0	119	75	70	52	85	46
CFSM	.03	.09	.11	.01	.01	.86	.25	.14	.13	.82	.18	.08
IN.	.04	.10	.13	.01	.01	.99	.28	.16	.14	.95	.20	.09
AC-FT	1800	4820	6030	630	526	46500	13050	7540	6780	44520	9550	4160

CAL YR 1977	TOTAL	20067.10	MEAN	55.0	MAX	1170	MIN	.90	CFSM .06	IN .85	AC-FT	39800
WTR YR 1978	TOTAL	73562.00	MEAN	202	MAX	6910	MIN	3.0	CFSM .23	IN 3.10	AC-FT	145900

06601200 MISSOURI RIVER AT DECATUR, NB

WATER-QUALITY RECORDS

LOCATION.--Lat 42°00'26", long 96°14'29", NE1/4 SW1/4 sec. 36, T.24 N., R.10 E., Burt County, Hydrologic Unit 10230001, at bridge on State Highway 175 and 51 at Decatur, Nebraska, 6.0 mi (9.7 km) west of Onawa, Iowa and at mile 691.0 (1,111.8 km).

DRAINAGE AREA.--316,160 mi² (818,850 km²).

PERIOD OF RECORD.--Water years 1974 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 41.3 mi (66.4 km) upstream at Sioux City. No significant inflow between gaging station and sampling site. Records of daily gage heights available in subdistrict office, USGS, Council Bluffs, Iowa.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	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)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
03...	1030	29200	26	11	33	2.6	190	0	160	200	15
NOV											
08...	1030	30700	55	23	60	4.7	200	0	160	200	13
DEC											
05...	1115	13000	68	25	63	5.3	230	0	190	210	17
JAN											
16...	1445	16500	66	24	68	5.4	200	0	160	220	11
FEB											
08...	1415	16000	64	23	67	5.4	200	0	160	200	12
APR											
03...	1200	32400	48	130	16	10	130	0	110	71	6.4
MAY											
01...	1205	30000	87	25	52	6.5	210	0	170	170	12
24...	1245	32000	64	23	60	6.3	190	4	160	200	11
JUN											
13...	1030	42000	65	21	59	6.0	180	0	150	170	12
JUL											
19...	1300	48200	55	21	62	5.5	180	0	150	200	10
AUG											
10...	1105	55000	62	23	55	5.1	190	0	160	210	15
SEP											
05...	1100	52000	61	21	67	5.0	180	0	150	220	13

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, TOTAL (MG/L AS NO3) (71887)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
OCT										
03...	.05	.00	.24	.24	.29	1.3	.05	463	.63	36500
NOV										
08...	.18	.04	.38	.42	.60	2.7	.10	460	.63	38100
DEC										
05...	.61	.18	.21	.39	1.0	4.4	.00	514	.70	18000
JAN										
16...	.22	.12	.48	.60	.82	3.6	.07	507	.69	22600
FEB										
08...	.19	.09	.11	.20	.39	1.7	.05	495	.67	21400
APR										
03...	.71	.68	1.0	1.6	2.3	10	.18	230	.31	20100
MAY										
01...	.38	.04	.92	.96	1.3	5.9	.03	456	.62	36900
24...	.01	.01	.67	.68	.69	3.1	.08	459	.62	39700
JUN										
13...	.21	.05	.84	.89	1.1	4.9	.10	434	.59	49200
JUL										
19...	.07	.01	.61	.62	.69	3.1	.09	456	.62	59300
AUG										
10...	.05	.00	.37	.37	.42	1.9	.10	489	.67	72600
SEP										
05...	.06	.03	.73	.76	.82	3.6	.11	463	.63	65000

MISSOURI RIVER MAIN STEM

06601200 MISSOURI RIVER AT DECATUR, NB--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	SPECIFIC CONDUCTANCE (MICROMHOS) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TURBIDITY (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L) (00340)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)
OCT										
03...	536	710	7.6	16.0	21	8.6	88	32	7.6	5500
NOV										
08...	531	720	8.3	12.5	16	--	--	25	1.6	--
DEC										
05...	571	790	8.3	.0	27	14.0	96	50	1.8	6800
JAN										
16...	524	730	8.2	.0	6.6	17.2	120	13	2.0	6750
FEB										
08...	510	560	8.2	.0	2.5	13.0	89	22	2.0	6200
APR										
03...	268	360	7.7	6.5	120	--	--	100	4.2	1900
MAY										
01...	584	680	8.3	11.5	29	10.8	--	23	1.7	2300
24...	484	720	8.5	18.0	23	8.7	92	53	1.0	11000
JUN										
13...	572	686	8.2	20.0	31	7.8	100	16	1.8	--
JUL										
19...	563	700	8.3	26.5	26	--	--	--	1.4	--
AUG										
10...	575	740	8.4	25.5	25	7.5	90	27	1.2	5700
SEP										
05...	606	720	8.5	24.5	15	7.3	87	26	.9	--

06602020 WEST FORK DITCH AT HORNICK, IA

LOCATION.--Lat 42°13'37", long 96°04'40", in SW1/4 sec.27, T.86 N., R.45 W., Woodbury County, Hydrologic Unit 10230004, on left bank at upstream side of State Highway 141 bridge, 1.0 mi (1.6 km) east of Hornick, 9.2 mi (14.8 km) upstream from Wolf Creek, and 13.5 mi (21.7 km) north of Onawa.

DRAINAGE AREA.--403 mi² (1,044 km²).

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

REVISED RECORDS.--WSP 1240: 1943, 1945 (M). WSP 1310: 1941 (M) 1944-46 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,045.82 ft (318.766 m) NGVD. Prior to June 16, 1959, nonrecording gage at site 3.0 mi (4.8 km) upstream and June 16, 1959 to Sept. 30, 1969, recording gage at site 2.2 mi (3.5 km) upstream at datum 7.0 ft (2.134 m) higher.

REMARKS.--Records good except those for winter period, which are poor. West Fork ditch is a dredged channel which diverts flow of West Fork Little Sioux River at Holly Springs 5.5 mi (8.8 km) south, thence southeast 6.5 mi (10.5 km) to a point 1.2 mi (1.9 km) west of Kennebec, where Wolf Creek enters from left. From this point, ditch roughly parallels Little Sioux River and becomes known as Monona-Harrison ditch. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years (1940-69, 1975-78), 92.6 ft³/s (2.622 m³/s), 3.12 in/yr (79 mm/yr), 67,090 acre-ft/yr, (82.7 hm³/yr); median of yearly mean discharges, 83 ft³/s (2.35 m³/s), 2.8 in/yr (71 mm/yr), 60,100 acre-ft/yr (74.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft³/s (351 m³/s) Mar. 28, 1962, gage height, 22.46 ft (6.846 m), site and datum then in use; maximum gage height, 25.2 ft (7.681 m) site and datum then in use, Mar. 30, 1950, from floodmark; minimum daily discharge, 0.2 ft³/s (0.006 m³/s) July 30, Aug. 17, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,920 ft³/s (111 m³/s) Mar. 20, gage height, 18.01 ft (5.489 m) at 0745 hours, no other peak above base of 1,800 ft³/s (51.0 m³/s); minimum daily, 14 ft³/s (0.40 m³/s) Oct. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,800 ft³/s (51.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
June 23	1945	*2,200	62.3	*15.20	4.633	Aug. 9	0900	1,830	51.8	14.09	4.295

Minimum daily discharge, 2.0 ft³/s (0.057 m³/s) Jan. 18-31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	98	48	35	18	15	42	84	69	40	68	44
2	17	45	48	30	18	15	40	76	65	37	227	40
3	16	36	47	28	18	15	40	71	61	35	83	36
4	15	32	45	27	18	15	54	68	57	34	64	34
5	15	29	43	26	18	15	54	68	52	33	58	33
6	14	28	41	25	17	15	161	65	49	874	53	33
7	26	27	39	25	17	15	142	68	46	570	50	32
8	32	27	38	24	17	15	97	79	45	294	47	31
9	22	280	37	24	17	17	84	82	45	185	44	30
10	20	150	37	23	17	19	79	76	44	115	42	29
11	22	67	38	23	16	20	83	67	39	92	38	29
12	20	72	41	23	16	20	77	64	35	80	37	29
13	19	72	45	22	16	25	66	62	34	70	36	44
14	18	70	50	22	16	28	64	60	34	57	35	86
15	17	81	55	22	16	35	63	56	43	56	200	88
16	17	80	60	21	15	800	61	52	47	55	180	66
17	17	71	150	21	15	1000	64	50	764	51	70	54
18	17	66	200	21	15	2000	112	50	151	46	60	50
19	16	63	100	21	15	3000	228	48	70	44	50	48
20	17	62	80	21	15	3720	190	44	216	43	45	49
21	16	54	70	20	15	2860	151	43	56	43	40	50
22	16	54	68	20	15	1170	135	43	53	100	37	52
23	16	50	66	20	15	296	132	43	50	657	120	48
24	17	48	64	20	15	124	129	43	91	421	60	44
25	18	45	62	20	15	74	120	44	77	191	49	31
26	19	40	60	19	15	61	107	43	71	149	46	30
27	17	40	56	19	15	54	98	40	57	173	78	30
28	17	42	52	19	15	49	98	42	52	108	104	29
29	17	43	48	19	---	68	93	58	50	91	72	27
30	26	45	45	19	---	50	91	80	45	80	58	27
31	190	---	40	19	---	45	---	61	---	71	49	---
TOTAL	746	1917	1873	698	450	15655	2955	1830	2568	4895	2200	1253
MEAN	24.1	63.9	60.4	22.5	16.1	505	98.5	59.0	85.6	158	71.0	41.8
MAX	190	280	200	35	18	3720	228	84	764	874	227	88
MIN	14	27	37	19	15	15	40	40	34	33	35	27
CFSM	.06	.16	.15	.06	.04	1.25	.24	.15	.21	.39	.18	.10
IN.	.07	.18	.17	.06	.04	1.45	.27	.17	.24	.45	.20	.12
AC-FT	1480	3800	3720	1380	893	31050	5860	3630	5090	9710	4360	2490

CAL YR 1977	TOTAL	14198.4	MEAN	38.9	MAX	882	MIN	2.0	CFSM .10	IN 1.31	AC-FT	28160
WTR YR 1978	TOTAL	37040.0	MEAN	101	MAX	3720	MIN	14	CFSM .25	IN 3.42	AC-FT	73470

06602400 MONONA-HARRISON DITCH NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°59'30", in NW1/4 NE1/4 sec.32, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230004, on left pier at downstream side of bridge on county highway E54, 1.0 mi (1.6 km) west of gaging station on Little Sioux River near Turin, 4 mi (6.4 km) southwest of Turin, 5.2 mi (8.4 km) northeast of Blencoe, and 12.5 mi (20.1 km) upstream from mouth.

DRAINAGE AREA.--900 mi² (2,331 km²).

PERIOD OF RECORD.--April 1939 to current year. Records for April 1939 to January 1958 not equivalent owing to diversion from Little Sioux River through equalizer ditch 1.5 mi (2.4 km) upstream. Prior to May 1942, published as "near Blencoe".

GAGE.--Water-stage recorder. Datum of gage is 1,015.00 ft (309.372 m) NGVD (Corps of Engineers bench mark). Prior to May 7, 1942, non-recording gage at site 4.8 mi (7.7 km) downstream at datum 5.40 ft (1.646 m) lower. May 7, 1942, to Oct. 13, 1953, nonrecording gage and Oct. 14, 1953 to Sept. 30, 1975, recording gage at same site at datum 5.00 ft (1.524 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Monona-Harrison ditch is a dug channel and is a continuation of West Fork ditch, paralleling the Little Sioux River, and discharging into the Missouri River 1.5 mi (2.4 km) upstream from the mouth of the Little Sioux River. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 208 ft³/s (5.891 m³/s), 3.30 in/yr (84 mm/yr), 150,700 acre-ft/yr (186 hm³/yr): median of yearly mean discharges, 200 ft³/s (5.66 m³/s), 3.2 in/yr (81 mm/yr), 145,000 acre-ft/yr (180 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,900 ft³/s (564 m³/s) Feb. 19, 1971, gage height, 23.03 ft (7.020 m); minimum daily, 8.5 ft³/s (0.24 m³/s) Jan. 3-11, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,570 ft³/s (271 m³/s) May 19, gage height, 21.90 ft (6.675 m), from graph based on gage readings; no other peak above base of 2,500 ft³/s (70.8 m³/s); minimum daily, 40 ft³/s (1.13 m³/s) Jan. 26 to Feb. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft³/s (70.8 m³/s) and maximum (*):

		Discharge		Gage height				Discharge		Gage height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
June 24	0500	2,750	77.9	14.61	4.453	Aug. 9	1900	*5,510	156	*18.37	5.599

Minimum daily discharge, 40 ft³/s (1.13 m³/s) Jan. 26 to Feb. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	416	115	52	40	45	113	166	254	87	106	82
2	61	176	112	48	40	45	105	150	200	90	581	77
3	55	116	114	46	40	45	109	143	160	84	513	68
4	51	93	107	44	40	45	104	141	143	89	161	63
5	49	84	100	43	40	45	97	145	131	87	133	61
6	46	75	95	42	40	46	561	137	122	916	118	57
7	58	68	90	42	40	47	378	293	118	955	106	56
8	186	68	86	42	40	48	256	171	111	432	99	53
9	113	725	84	42	40	50	230	177	97	282	92	53
10	77	652	82	42	40	54	332	169	97	204	86	53
11	70	386	85	41	40	60	245	152	89	157	81	53
12	75	296	90	41	40	80	188	137	76	142	77	72
13	66	249	95	41	40	150	158	133	70	129	75	142
14	60	274	94	41	40	500	146	133	74	121	73	308
15	58	342	92	41	40	1000	152	122	90	113	429	179
16	55	305	92	41	40	1800	133	120	107	118	441	111
17	56	236	1340	41	40	2300	145	114	306	115	152	81
18	52	190	972	41	40	2500	275	113	1890	118	105	76
19	52	168	305	41	40	8020	527	111	1040	118	108	73
20	54	155	209	41	40	7050	455	104	739	122	87	65
21	52	100	180	41	41	6400	338	97	350	135	76	64
22	50	110	160	41	42	3460	296	98	213	125	73	59
23	51	139	150	41	43	1770	272	104	177	542	172	55
24	54	100	130	41	45	625	263	113	166	673	122	52
25	56	95	110	41	45	146	250	109	196	317	92	52
26	56	90	90	40	45	261	225	107	175	207	80	49
27	52	95	80	40	45	217	209	137	143	227	90	50
28	48	100	70	40	45	181	198	141	113	172	160	50
29	49	105	64	40	---	158	188	314	105	138	123	49
30	60	110	60	40	---	139	183	600	97	122	102	50
31	657	---	56	40	---	129	---	450	---	112	89	---
TOTAL	2549	6118	5509	1298	1151	37416	7131	5201	7649	7249	4802	2313
MEAN	82.2	204	178	41.9	41.1	1207	238	168	255	234	155	77.1
MAX	657	725	1340	52	45	8020	561	600	1890	955	581	308
MIN	46	68	56	40	40	45	97	97	70	84	73	49
CFSM	.09	.23	.20	.05	.05	1.34	.26	.19	.28	.26	.17	.09
IN.	.11	.25	.23	.05	.05	1.55	.29	.21	.32	.30	.20	.10
AC-FT	5060	12140	10930	2570	2280	74210	14140	10320	15170	14380	9520	4590

CAL YR 1977	TOTAL	40598	MEAN 111	MAX 2170	MIN 18	CFSM .12	IN 1.68	AC-FT	80530		
WTR YR 1978	TOTAL	88386	MEAN 242	MAX 8020	MIN 40	CFSM .27	IN 3.65	AC-FT	175300		

06605000 OCHEYEDAN RIVER NEAR SPENCER, IOWA

LOCATION.--Lat 43° 07'44", long 95° 12' 37", in SW1/4SW1/4 sec.16, T.96N., R.37W., Clay County, Hydrologic Unit 10230003, on left bank 3 ft (1 m) downstream from bridge on county highway M38, 3.4 mi (5.5 km) west by southwest of Spencer, and at mile 4.1 (6.6 km).

DRAINAGE AREA.--426 mi² (1,103 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1311.66 ft NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,200 ft³/s (90.6 m³/s) July 23, 1978, gage height, 9.25 ft (2.819 m); maximum gage height, 9.39 ft (2.862 m) Mar. 15, 1978, backwater from ice; minimum daily discharge, 6.8 ft³/s (0.19 m³/s) Mar. 8, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 2.95 ft³/s (0.084 m³/s) was measured Oct. 17, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,700 ft³/s (48.1 m³/s) and maximum (*):

		Discharge		Gage height				Discharge		Gage height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
Mar. 15	----	Ice jam		*9.39	2.862	July 7	0630	2,300	65.1	8.93	2.722
Mar. 20	Unknown	1,780	50.4	8.35	2.545	July 23	1430	*3,200	90.6	9.25	2.819

Minimum daily discharge, 6.8 ft³/s (0.19 m³/s) Mar. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	168	38	28	8.4	8.0	126	276	175	355	273	57
2	52	157	36	27	8.4	7.8	122	251	160	307	283	56
3	43	124	33	28	8.5	7.6	127	236	143	227	263	53
4	33	107	29	28	8.5	7.6	122	227	129	177	217	51
5	29	94	32	27	8.4	7.6	115	213	118	450	193	49
6	24	89	28	25	8.3	7.4	342	199	109	1020	174	47
7	26	85	37	24	8.3	7.0	410	192	104	1980	157	47
8	42	84	38	22	8.4	6.8	283	221	96	1240	145	44
9	56	372	35	20	8.6	8.0	252	233	89	817	132	42
10	63	680	33	19	8.9	13	252	207	81	618	120	40
11	61	547	34	19	9.0	18	238	205	78	504	111	38
12	57	411	34	19	8.7	46	218	186	71	425	105	38
13	52	332	35	18	8.3	138	191	178	66	361	97	40
14	48	304	36	18	8.0	256	175	162	64	304	90	50
15	42	264	37	17	7.8	340	167	154	64	269	115	57
16	38	236	39	16	7.4	345	163	150	62	239	137	51
17	38	214	42	16	7.2	460	168	143	61	214	121	47
18	35	190	41	15	7.2	500	346	136	57	202	110	45
19	32	166	40	15	7.2	880	628	132	53	176	102	44
20	30	144	38	14	7.2	1080	520	126	141	162	94	43
21	30	126	35	13	7.1	455	416	119	272	263	88	41
22	28	80	33	13	7.4	332	360	115	195	860	85	39
23	26	55	31	13	7.7	245	352	114	204	2130	80	38
24	26	46	28	12	8.0	184	358	111	169	1850	76	37
25	27	39	27	11	8.0	159	350	108	179	1100	72	36
26	26	35	28	9.8	8.0	150	332	106	211	773	71	35
27	26	33	29	9.1	8.0	147	307	110	155	626	73	34
28	25	35	29	8.5	8.0	147	288	105	124	513	71	34
29	23	37	29	8.2	---	137	276	108	110	431	66	33
30	28	38	29	8.1	---	129	279	162	195	361	67	33
31	89	---	29	8.2	---	129	---	207	---	313	60	---
TOTAL	1175	5292	1042	528.9	224.9	6357.8	8283	5192	3735	19267	3848	1299
MEAN	37.9	176	33.6	17.1	8.03	205	276	167	125	622	124	43.3
MAX	89	680	42	28	9.0	1080	628	276	272	2130	283	57
MIN	20	33	27	8.1	7.1	6.8	115	105	53	162	60	33
CFSM	.09	.41	.08	.04	.02	.48	.65	.39	.29	1.46	.29	.10
IN.	.10	.46	.09	.05	.02	.56	.72	.45	.33	1.68	.34	.11
AC-FT	2330	10500	2070	1050	446	12610	16430	10300	7410	38220	7630	2580

WTR YR 1978 TOTAL 56244.6 MEAN 154 MAX 2130 MIN 6.8 CFSM .36 IN 4.91 AC-FT 111600

06605850 LITTLE SIOUX RIVER AT LINN GROVE, IA

LOCATION.--Lat 42°53'24", long 95°14'30", in SW1/4 SW1/4 sec.5, T.93 N., R.37 W., Buena Vista County, Hydrologic Unit 10230003, on right bank at downstream side of bridge on State Highway 264, in Linn Grove, Iowa, and at mile 123.7 (199.0 km).

DRAINAGE AREA.--1,548 mi² (4,009 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,223.60 ft (372.95 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

AVERAGE DISCHARGE.--6 years, 425 ft³/s (12.04 m³/s), 3.73 in/yr (95 mm/yr), 307,900 acre-ft/yr (380 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,620 ft³/s (244 m³/s) Apr. 29, 1975; gage height, 17.85 ft (5.441 m); minimum daily, 0.70 ft³/s (0.020 m³/s) Feb. 4, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 22	2045	2,580	73.1	12.45	3.795	July 11	1445	3,860	109	14.74	4.493
Apr. 21	1530	1,540	43.6	9.75	2.972	July 27	1515	*3,900	110	*14.80	4.511

Minimum daily discharge, 24 ft³/s (0.68 m³/s) Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	159	480	130	44	38	575	832	812	346	1430	226
2	30	250	450	118	43	38	534	807	709	517	1230	215
3	52	330	420	110	43	40	504	759	637	562	1110	197
4	79	325	400	105	43	39	494	714	556	464	1020	180
5	85	299	390	100	41	42	468	677	491	423	899	166
6	90	274	440	97	42	41	524	633	438	1080	796	158
7	110	258	390	92	42	39	713	599	396	1750	713	151
8	115	268	430	88	43	39	930	597	365	2230	640	140
9	137	619	380	88	43	42	854	627	335	2670	578	132
10	165	1020	330	89	40	47	800	638	309	3290	523	122
11	192	1130	280	88	39	76	794	613	286	3850	476	113
12	208	1240	250	86	38	150	783	579	263	3680	436	128
13	209	1390	230	77	38	340	733	561	241	3140	402	287
14	208	1310	220	70	37	530	663	521	234	2470	370	784
15	204	1170	210	69	36	630	601	483	230	1970	371	576
16	202	1100	208	69	36	710	551	455	220	1510	422	397
17	194	1010	220	70	37	840	527	433	217	1230	444	320
18	182	950	222	72	38	990	625	411	204	1030	426	272
19	176	870	240	69	39	1110	1010	390	188	951	391	238
20	165	790	290	69	39	1220	1360	369	338	831	358	217
21	154	680	280	66	37	1420	1510	347	536	758	430	211
22	147	580	230	64	38	2100	1440	325	645	919	436	199
23	140	520	200	62	39	2120	1260	314	660	1490	350	182
24	135	440	208	60	37	1640	1160	307	558	1950	308	168
25	128	370	230	58	35	1520	1110	299	535	2320	294	157
26	125	350	195	52	37	1220	1060	288	462	3040	299	146
27	120	360	170	48	38	990	1020	282	501	3800	273	139
28	115	450	145	48	36	857	971	289	453	3520	270	128
29	110	500	128	46	---	767	916	306	376	2850	264	122
30	110	500	118	46	---	687	871	834	377	2200	248	120
31	132	---	122	44	---	625	---	912	---	1730	232	---
TOTAL	4243	19512	8506	2350	1098	20947	25361	16201	12572	58571	16439	6591
MEAN	137	650	274	75.8	39.2	676	845	523	419	1889	530	220
MAX	209	1390	480	130	44	2120	1510	912	812	3850	1430	784
MIN	24	159	118	44	35	38	468	282	188	346	232	113
CFSM	.09	.42	.18	.05	.03	.44	.55	.34	.27	1.22	.34	.14
IN.	.10	.47	.20	.06	.03	.50	.61	.39	.30	1.41	.40	.16
AC-FT	8420	38700	16870	4660	2180	41550	50300	32130	24940	116200	32610	13070

CAL YR 1977 TOTAL 51247.92 MEAN 140 MAX 1390 MIN .70 CFSM .09 IN 1.23 AC-FT 101700
WTR YR 1978 TOTAL 192391.00 MEAN 527 MAX 3850 MIN 24 CFSM .34 IN 4.62 AC-FT 381600

06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IA

LOCATION.--Lat 42°28'20", long 95°47'49", in NE1/4 NW1/4 sec.1, T.88 N., R.43 W., Woodbury County, Hydrologic Unit 10230003, on right bank 10 ft (3 m) upstream from bridge on State Highway 31, 0.3 mi (0.5 km) upstream from Bacon Creek, 0.5 mi (0.8 km) west of Correctionville, 0.8 mi (1.3 km) downstream from Pierson Creek, and at mile 56.0 (90.1 km).

DRAINAGE AREA.--2,500 mi² (6,475 km²).

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,096.49 ft (334.210 m) NGVD. May 28, 1918, to July 1, 1925 and Oct. 29, 1928 to July 15, 1929, nonrecording gage 0.2 mi (0.3 km) downstream at datum 1.25 ft (0.381 m) lower. July 16, 1929, to July 2, 1932, and June 15, 1936, to Nov. 7, 1938, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--51 years (1918-24, 1928-31, 1936-78), 689 ft³/s (19.51 m³/s), 3.74 in/yr (95 mm/yr), 499,200 acre-ft/yr (616 hm³/yr); median of yearly mean discharge, 550 ft³/s (15.6 m³/s), 3.0 in/yr (76 mm/yr), 398,000 acre-ft/yr (491 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,800 ft³/s (844 m³/s) Apr. 7, 1965, gage height, 25.86 ft (7.882 m); minimum daily, 2.6 ft³/s (0.074 m³/s) July 17, 25, 1936, caused by construction dam above gage.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23 or 24, 1891, reached a stage of 29.34 ft (8.943 m), present datum, from levels to floodmark by Soil Conservation Service (discharge not determined).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	1015	7,600	215	18.59	5.666	July 23	2330	4,480	127	14.71	4.484
June 17	1000	*8,450	239	*18.81	5.733	July 30	0600	4,000	113	14.04	4.279
July 7	2115	5,440	154	15.99	4.874						

Minimum daily discharge, 73 ft³/s (2.07 m³/s) Feb.13-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	375	650	160	76	80	1010	1420	1290	950	2420	473
2	100	401	620	140	76	80	936	1350	1280	900	2050	446
3	90	420	580	130	76	80	877	1290	1170	972	1720	425
4	85	414	540	120	76	80	838	1250	1050	1010	1510	400
5	86	439	500	110	74	82	813	1200	953	1020	1370	375
6	98	447	480	105	74	82	922	1140	853	1640	1250	353
7	176	431	460	100	74	84	960	1130	774	4690	1130	333
8	237	419	440	95	74	86	1060	1120	717	4380	1040	320
9	218	934	430	92	74	90	1130	1100	674	3360	964	307
10	223	924	430	90	74	95	1240	1090	632	3320	905	299
11	239	1320	430	88	74	100	1160	1080	593	3410	864	291
12	251	1350	440	88	74	120	1120	1060	559	3610	821	277
13	261	1380	440	85	73	170	1090	1020	530	3840	770	338
14	270	1410	440	85	73	230	1060	977	525	3890	730	629
15	273	1450	450	82	73	300	1030	941	959	3500	819	721
16	272	1410	460	82	73	500	974	905	1060	2820	775	738
17	273	1350	500	82	73	700	987	876	3090	2250	739	584
18	273	1290	500	82	73	1000	1270	851	1460	1900	713	504
19	269	1250	480	82	74	2500	1530	828	1050	1720	700	455
20	264	1210	450	82	74	4000	1940	799	1290	1560	675	419
21	267	1130	420	82	74	7070	2120	768	1220	1500	652	398
22	261	1020	390	82	76	4890	2220	747	1160	1710	905	376
23	257	1020	370	80	76	3020	2230	745	1230	3470	845	362
24	259	949	350	80	78	2820	2070	724	1250	4040	725	347
25	255	700	330	80	78	2270	1900	716	1360	3230	639	331
26	255	500	300	80	80	1990	1780	723	2350	3160	625	312
27	252	480	270	80	80	1770	1700	740	1470	3230	643	298
28	246	470	240	78	80	1520	1630	759	1200	3510	606	288
29	245	550	220	78	---	1330	1560	1070	1100	3830	565	281
30	318	650	200	78	---	1190	1500	936	1000	3890	533	273
31	439	---	180	78	---	1090	---	906	---	3220	503	---
TOTAL	7121	26093	12990	2856	2104	39419	40657	30261	33849	85532	29206	11953
MEAN	230	870	419	92.1	75.1	1272	1355	976	1128	2759	942	398
MAX	439	1450	650	160	80	7070	2230	1420	3090	4690	2420	738
MIN	85	375	180	78	73	80	813	716	525	900	503	273
CFSM	.09	.35	.17	.04	.03	.51	.54	.39	.45	1.10	.38	.16
IN.	.11	.39	.19	.04	.03	.59	.60	.45	.50	1.27	.43	.18
AC-FT	14120	51760	25770	5660	4170	78190	80640	60020	67140	169700	57930	23710

CAL YR 1977 TOTAL 104341.5 MEAN 286 MAX 1800 MIN 9.5 CFSM .11 IN 1.55 AC-FT 207000
WTR YR 1978 TOTAL 322041.0 MEAN 882 MAX 7070 MIN 73 CFSM .35 IN 4.79 AC-FT 638800

06607200 MAPLE RIVER AT MAPLETON, IA

LOCATION.--Lat 42°09'28", long 95°48'27", in SE1/4 SE1/4 sec.23, T.85 N., R.43 W., Monona County, Hydrologic Unit 10230005, on right bank on downstream side of bridge on State Highway 175, 0.5 mi (0.8 km) southwest of Mapleton, 0.8 mi (1.3 km) downstream from Wilsey Creek, 2.0 mi (3.2 km) upstream from McClarey Creek, and 16.0 mi (25.7 km) upstream from mouth.

DRAINAGE AREA.--669 mi² (1,732 km²).

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,085.86 ft (330.970 m) NGVD. See WSP 1730 for history of changes prior to Sept. 20, 1956.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--37 years, 227 ft³/s (6.429 m³/s), 4.61 in/yr (117 mm/yr), 164,500 acre-ft/yr (203 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,800 ft³/s (589 m³/s) Sept. 12, 1978, gage height, 16.74 ft (5.102 m); maximum gage height, 22.1 ft (6.74 m) June 12, 1950; no flow Sept. 21, 22, 1945 caused by temporary dam above gage.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 20	0015	6,570	186	9.23	2.813	July 7	0030	4,090	116	7.27	2.216
June 18	0315	5,210	148	8.24	2.512	Sept. 12	2100	*20,800	589	*16.74	5.102
June 20	0015	4,090	116	7.27	2.216						

Minimum daily discharge, 35 ft³/s (0.99 m³/s) Jan. 11 to Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	131	200	58	35	39	199	260	304	286	147	108
2	66	138	180	54	35	39	190	240	236	292	279	104
3	64	136	160	51	35	40	188	225	204	265	222	104
4	61	124	130	47	35	40	183	217	191	230	158	103
5	61	113	110	43	35	41	181	207	186	251	139	98
6	59	107	98	41	35	41	220	213	175	1260	121	90
7	99	106	96	39	35	42	260	254	173	2490	116	84
8	131	110	94	39	35	42	300	294	168	1250	116	81
9	111	683	94	36	35	44	266	269	161	727	114	76
10	102	696	94	36	35	47	260	243	158	504	111	75
11	98	488	96	35	35	50	249	227	157	402	106	75
12	89	324	100	35	35	54	215	227	155	353	103	2470
13	81	273	105	35	35	70	201	213	149	307	101	8160
14	79	253	115	35	35	200	190	208	145	267	101	3450
15	76	249	130	35	35	400	183	203	214	239	393	1200
16	75	227	150	35	35	900	168	196	206	220	208	753
17	71	216	200	35	35	1000	213	175	1850	206	158	517
18	71	189	140	35	35	2000	476	164	2820	195	134	450
19	69	174	120	35	35	4790	770	160	1030	188	149	387
20	65	170	110	35	35	5330	665	152	2050	183	121	338
21	64	158	100	35	35	4390	513	149	854	188	102	333
22	62	143	88	35	35	2390	432	143	684	243	105	299
23	63	140	86	35	36	978	406	186	489	289	210	266
24	67	130	84	35	37	504	381	201	475	257	197	243
25	66	120	80	35	37	347	357	166	1290	216	146	221
26	63	100	76	35	38	294	333	154	886	190	168	212
27	60	100	74	35	38	269	314	166	711	170	214	206
28	59	110	72	35	38	257	294	551	432	162	170	192
29	59	140	70	35	---	232	284	514	358	158	138	191
30	116	170	66	35	---	215	278	661	316	155	116	192
31	179	---	62	35	---	208	---	354	---	149	104	---
TOTAL	2454	6218	3380	1179	994	25293	9169	7592	17227	12292	4767	21078
MEAN	79.2	207	109	38.0	35.5	816	306	245	574	397	154	703
MAX	179	696	200	58	38	5330	770	661	2820	2490	393	8160
MIN	59	100	62	35	35	39	168	143	145	149	101	75
CFSM	.12	.31	.16	.06	.05	1.22	.46	.37	.86	.59	.23	1.05
IN.	.14	.35	.19	.07	.06	1.41	.51	.42	.96	.68	.27	1.17
AC-FT	4870	12330	6700	2340	1970	50170	18190	15060	34170	24380	9460	41810

CAL YR 1977 TOTAL 35778.2 MEAN 98.0 MAX 2550 MIN 3.7 CFSM .15 IN 1.99 AC-FT 70970
WTR YR 1978 TOTAL 111643.0 MEAN 306 MAX 8160 MIN 35 CFSM .46 IN 6.21 AC-FT 221400

06607500 LITTLE SIOUX RIVER NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°58'21", in NW1/4 NE1/4 sec.33, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230003, on left bank on downstream side of bridge on county highway E54, 1.0 mi (1.6 km) east of gaging station on Monona-Harrison ditch near Turin, 2.5 mi (4.0 km) downstream from Maple River, 3.8 mi (6.1 km) south of Turin, 6.2 mi (10.0 km) northeast of Blencoe, and at mile 13.5 (21.7 km).

DRAINAGE AREA.--3,526 mi² (9,132 km²). Prior to Jan. 15, 1958, 4,426 mi² (11,463 km²), combined area above this station and Monona-Harrison ditch station 1.0 mi (1.6 km) west.

PERIOD OF RECORD.--January 1958 to current year. April 1939 to May 1942 at site 4.7 mi (7.6 km) downstream published as "near Blencoe", June 1942 to January 1958 at site 1,200 ft (370 m) east on old river channel; records not equivalent owing to diversion into Monona-Harrison ditch through equalizer ditch 1.5 mi (2.4 km) upstream.

GAGE.--Water-stage recorder. Datum of gage is 1,019.850 ft (310.850 m) NGVD (Corps of Engineers bench mark). Prior to July 15, 1958, nonrecording gages near present site at different datums. July 15 to Sept. 3, 1958, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--20 years, 1,051 ft³/s (29.76 m³/s), 4.04 in/yr (103 mm/yr), 761,400 acre-ft/yr (939 hm³/yr); median of yearly mean discharges, 930 ft³/s (26.3 m³/s), 3.6 in/yr (91 mm/yr), 674,000 acre-ft/yr (830 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 30,000 ft³/s (850 m³/s) Feb. 19, 1971, gage height, 27.44 ft (8.364 m), backwater from ice; minimum daily, 17 ft³/s (0.48 m³/s) Jan. 18-20, Jan. 28 to Feb. 1, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s (127 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 19	----	a*25,000	708	*26.47	8.068	July 8	0230	7,280	206	17.53	5.343
June 18	0500	7,770	220	17.97	5.477	July 24	1545	4,540	128	14.62	4.456
June 20	1100	3,860	109	13.77	4.197	Sept. 14	0015	8,950	253	18.89	5.758

a - backwater from ice.

Minimum daily discharge, 150 ft³/s (4.25 m³/s) Feb. 19 to Mar. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	222	657	1100	460	180	150	1270	1690	1200	1050	3110	670
2	207	553	1050	440	180	150	1160	1610	1400	972	2740	621
3	188	577	1000	420	170	150	1140	1540	1340	942	2390	587
4	190	569	950	400	170	150	1070	1510	1250	928	1930	553
5	185	557	900	380	170	150	1020	1500	1160	1010	1690	531
6	171	569	850	360	170	150	1090	1420	1100	1570	1530	506
7	216	577	800	340	170	150	1230	1430	1020	5900	1390	485
8	417	577	760	320	170	150	1370	1440	965	6730	1260	466
9	425	1590	720	300	170	150	1330	1420	911	4520	1170	428
10	368	2100	680	280	170	150	1530	1390	895	3730	1090	425
11	352	1950	660	260	160	160	1520	1290	783	3630	1040	416
12	351	2150	640	240	160	170	1430	1260	729	3740	975	652
13	366	2080	620	230	160	180	1380	1220	704	3970	925	6750
14	372	2090	600	220	160	250	1340	1200	695	4140	880	5300
15	371	2130	580	210	160	500	1280	1140	714	4010	1270	2280
16	374	2130	580	200	160	800	1240	1100	1290	3440	1180	1900
17	366	2040	600	190	160	1500	1310	1040	2710	2770	961	1570
18	360	1930	650	190	160	3000	1620	1010	6030	2270	889	1270
19	350	1860	600	190	150	6000	1940	964	1820	1950	871	1120
20	345	1760	580	190	150	10500	2260	915	3100	1770	862	1020
21	330	1680	560	190	150	11000	2510	884	1930	1590	804	970
22	311	1530	560	190	150	9450	2570	854	1480	1660	858	912
23	311	1380	580	190	150	5780	2590	851	1390	2140	1180	848
24	299	1280	600	190	150	3770	2570	909	1420	4230	1220	782
25	300	1150	580	190	150	3150	2380	845	1920	3800	943	735
26	292	1050	560	180	150	2510	2180	813	2970	3260	853	701
27	282	1000	540	180	150	2200	2030	903	2420	3280	990	666
28	268	1000	540	180	150	1940	1920	1140	1580	3420	916	640
29	277	1050	520	180	---	1670	1820	1690	1280	3780	835	609
30	284	1100	500	180	---	1480	1770	1520	1160	4060	750	583
31	925	---	480	180	---	1320	---	1030	---	3860	697	---
TOTAL	10075	40666	20940	7850	4500	68830	49870	37528	47366	94122	38199	34996
MEAN	325	1356	675	253	161	2220	1662	1211	1579	3036	1232	1167
MAX	925	2150	1100	460	180	11000	2590	1690	6030	6730	3110	6750
MIN	171	553	480	180	150	150	1020	813	695	928	697	416
CFSM	.09	.39	.19	.07	.05	.63	.47	.34	.45	.86	.35	.33
IN.	.11	.43	.22	.08	.05	.73	.53	.40	.50	.99	.40	.37
AC-FT	19980	80660	41530	15570	8930	136500	98920	74440	93950	186700	75770	69410

CAL YR 1977 TOTAL 153730 MEAN 421 MAX 3150 MIN 17 CFSM .12 IN 1.62 AC-FT 304900
WTR YR 1978 TOTAL 454942 MEAN 1246 MAX 11000 MIN 150 CFSM .35 IN 4.80 AC-FT 902400

05608500 SOLDIER RIVER AT PISGAH, IA

LOCATION.--Lat 41°49'52", long 95°55'50", in NW1/4 NE1/4 sec.14, T.81 N., R.44 W., Harrison County, Hydrologic Unit 10230001, on left bank on downstream side of bridge on county highway F20, at west edge of Pisgah, 0.4 mi (0.6 km) downstream from Cobb Creek, 0.5 mi (0.8 km) upstream from Mogger Ditch, and 13.1 mi (21.1 km) upstream from mouth.

DRAINAGE AREA.--407 mi² (1,054 km²).

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,036.53 ft (315.934 m) NGVD. Prior to Oct. 11, 1954, nonrecording gage at same site and datum with supplementary water-stage recorder operating above 8.2 ft (2.50 m) gage height Mar. 2, 1946, to Sept. 24, 1953.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--38 years, 123 ft³/s (3.483 m³/s), 4.10 in/yr (104 mm/yr), 89,110 acre-ft/yr (110 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft³/s (637 m³/s) June 12, 1950, gage height, 28.17 ft (8.586 m); minimum daily, 2 ft³/s (0.057 m³/s) Jan. 2-10, 1945.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s (142 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 20	2245	5,420	153	14.90	4.541	Sept. 14	0300	6,900	195	16.67	5.081
Sept. 13	0530	*17,900	507	*25.60	7.802						

Minimum daily discharge, 27 ft³/s (0.765 m³/s) Oct. 5,6, Sept. 9,10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,600 ft³/s (385 m³/s) Aug. 31, gage height, 23.85 ft (7.269 m) at 0700 hours, no other peak above base of 5,000 ft³/s (142 m³/s); minimum daily, 6.0 ft³/s (0.17 m³/s) Jan. 26 to Feb. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	85	48	36	29	33	112	99	65	35	41	40
2	34	59	48	36	29	33	105	91	60	35	63	38
3	29	50	46	36	29	33	100	88	55	35	75	36
4	29	44	44	36	29	33	96	88	51	33	52	34
5	27	44	43	36	29	33	99	88	49	32	46	34
6	27	44	42	36	29	33	127	85	54	59	43	32
7	40	44	41	35	29	33	115	112	50	649	41	31
8	86	48	40	35	29	33	118	122	48	158	39	29
9	49	1000	39	35	29	33	131	102	48	70	38	27
10	38	184	38	35	29	33	147	84	45	58	37	27
11	35	115	37	34	29	33	115	80	42	46	38	28
12	33	113	38	34	29	35	99	81	39	42	38	95
13	32	108	40	34	29	40	88	82	37	49	37	9210
14	33	108	45	33	29	60	85	76	37	43	36	2720
15	33	105	50	33	29	90	85	70	39	46	263	344
16	30	96	60	33	28	200	84	68	40	50	212	212
17	30	89	80	32	28	550	113	63	38	41	64	169
18	31	83	75	32	28	1200	322	63	60	42	54	173
19	29	75	70	31	28	2500	234	59	53	42	97	138
20	30	67	60	31	28	2420	158	58	83	45	54	124
21	34	58	50	30	28	1680	141	58	99	46	44	140
22	33	77	45	30	29	861	138	57	55	78	39	108
23	37	69	42	30	30	482	143	59	50	107	38	96
24	42	54	40	30	31	218	138	59	46	60	35	91
25	42	50	39	30	32	175	129	59	47	48	34	85
26	42	48	38	30	32	167	120	57	48	44	35	84
27	40	46	37	30	32	149	115	54	43	42	546	81
28	39	44	37	30	32	145	110	58	37	40	201	78
29	40	46	37	30	---	138	107	73	38	40	69	76
30	42	48	36	30	---	124	100	72	37	40	51	69
31	155	---	36	30	---	112	---	64	---	40	45	---
TOTAL	1257	3101	1421	1013	821	11709	3774	2329	1493	2195	2505	14449
MEAN	40.5	103	45.8	32.7	29.3	378	126	75.1	49.8	70.8	80.8	482
MAX	155	1000	80	36	32	2500	322	122	99	649	546	9210
MIN	27	44	36	30	28	33	84	54	37	32	34	27
CFSM	.10	.25	.11	.08	.07	.93	.31	.19	.12	.17	.20	1.18
IN.	.11	.28	.13	.09	.08	1.07	.34	.21	.14	.20	.23	1.32
AC-FT	2490	6150	2820	2010	1630	23220	7490	4620	2960	4350	4970	28660

CAL YR 1977	TOTAL	29880.6	MEAN	81.9	MAX	6340	MIN	6.0	CFSM .20	IN 2.73	AC-FT 59270
WTR YR 1978	TOTAL	46067.0	MEAN	126	MAX	9210	MIN	27	CFSM .31	IN 4.21	AC-FT 91370

06609500 BOYER RIVER AT LOGAN, IA

LOCATION.--Lat 41°38'33", long 95°46'57", in SE1/4 NW1/4 sec.19, T.79 N., R.42 W., Harrison County, Hydrologic Unit 10230007, on left bank 9 ft (3 m) downstream from Illinois Central Railroad bridge at Logan, 0.4 mi (0.6 km) downstream from Elk Grove Creek, 10.5 mi (16.9 km) upstream from Willow Creek, and 15.8 mi (25.4 km) upstream from mouth.

DRAINAGE AREA.--871 mi² (2,256 km²).

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,009.38 ft (307.659 m) NGVD (Chicago and Northwestern Railway Company bench mark). See WSP 1918 for history of changes prior to Oct. 18, 1960.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--46 years (water years 1919-24, 1939-78), 304 ft³/s (8.609 m³/s), 4.74 in/yr (120 mm/yr), 220,200 acre-ft/yr (272 hm³/yr); median of yearly mean discharge, 271 ft³/s (7.67 mb/s), 4.2 in/yr (107 mm/yr), 196,000 acre-ft/yr (242 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,000 ft³/s (708 m³/s) Feb. 19, 1971, gage height, 22.65 ft (6.904 m), from floodmark; maximum gage height, 25.22 ft (7.687 m) Mar. 1, 1965, backwater from ice; minimum daily discharge, 1.5 ft³/s (0.042 m³/s) July 16, 1938.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,000 ft³/s (170 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	0015	12,100	343	16.81	5.124	Sept. 13	1015	*21,900	620	*21.73	6.623

Minimum daily discharge, 28 ft³/s (0.79 m³/s) Feb. 14-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	118	100	35	30	29	239	218	201	156	110	126
2	76	86	100	34	30	29	207	198	216	145	114	109
3	48	71	90	33	30	29	198	190	147	131	186	95
4	42	56	85	33	30	29	180	189	131	140	134	89
5	40	50	80	33	30	29	173	186	118	611	104	84
6	32	49	75	33	29	29	193	179	125	319	94	75
7	62	46	70	33	29	29	191	234	114	1440	88	66
8	184	50	65	33	29	29	557	310	104	1670	79	63
9	161	2460	60	33	29	29	325	286	100	691	76	64
10	96	1640	56	33	29	30	324	235	92	482	78	62
11	76	920	54	33	29	31	269	210	85	303	74	58
12	66	549	52	33	29	32	208	189	74	241	72	62
13	58	426	50	33	29	35	179	188	74	216	67	10800
14	54	360	50	32	28	50	165	175	76	182	64	9550
15	44	321	55	32	28	100	160	155	69	151	172	4700
16	41	290	65	32	28	300	156	144	114	138	201	2360
17	43	273	90	32	28	600	248	139	118	125	151	1380
18	37	248	80	32	28	1000	706	141	556	134	110	1190
19	37	221	65	32	28	6510	774	133	1280	254	290	982
20	37	211	50	32	28	6450	614	127	420	151	149	856
21	35	190	45	31	28	5570	490	120	566	129	96	1030
22	34	170	40	31	28	3180	423	111	301	625	85	807
23	41	160	40	31	28	1630	389	118	234	1010	81	690
24	49	150	40	31	29	761	368	121	213	414	86	606
25	46	140	39	31	29	528	326	123	208	293	92	544
26	41	130	38	31	29	430	301	112	208	224	90	500
27	39	120	37	31	29	380	282	110	380	186	566	466
28	36	110	37	31	29	361	268	121	218	162	632	435
29	33	105	37	30	---	321	251	201	174	142	255	406
30	35	100	37	30	---	276	245	219	153	129	183	390
31	118	---	36	30	---	254	---	228	---	118	149	---
TOTAL	1800	9820	1818	994	807	29090	9411	5410	6869	11112	4728	38645
MEAN	58.1	327	58.6	32.1	28.8	938	314	175	229	358	153	1288
MAX	184	2460	100	35	30	6510	774	310	1280	1670	632	10800
MIN	32	46	36	30	28	29	156	110	69	118	54	58
CFSM	.07	.38	.07	.04	.03	1.08	.36	.20	.26	.41	.18	1.48
IN.	.08	.42	.08	.04	.03	1.24	.40	.23	.29	.47	.20	1.65
AC-FT	3570	19480	3610	1970	1600	57700	18670	10730	13620	22040	9380	76650

CAL YR 1977	TOTAL	37545.5	MEAN 103	MAX 2460	MIN 2.5	CFSM .12	IN 1.60	AC-FT 74470			
WTR YR 1978	TOTAL	120504.0	MEAN 330	MAX 10800	MIN 28	CFSM .38	IN 5.15	AC-FT 239000			

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

LOCATION.--Lat 41°15'32", long 95°55'20", in SE1/4 NW1/4 sec.23, T.15 N., R.13 E., Douglas County, Hydrologic Unit 10230006, on right bank on left side of concrete floodwall, at foot of Douglas Street, 275 ft (84 m) downstream from Interstate 480 Highway bridge in Omaha, and at mile 615.9 (991.0 km).

DRAINAGE AREA.--322,800 mi² (836,100 km²), approximately.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 761: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 958.24 ft (292.072 m) NGVD. See WSP 1730 for history of changes prior to Sept. 30, 1936.

REMARKS.--Records good. Flow regulated by upstream main-stem reservoirs. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--50 years, 29,490 ft³/s (835.2 m³/s), 21,370,000 acre-ft/yr (26,300 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 396,000 ft³/s (11,200 m³/s) Apr. 13, 1952, gage height, 30.20 ft (9.205 m); minimum, about 2,200 ft³/s (62 m³/s) Jan. 6, 1937; minimum gage height observed, -2.77 ft (-0.844 m) Jan. 10, 1957, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 88,400 ft³/s (2.500 m³/s) Mar. 19, gage height, 14.19 ft (4.325 m); maximum gage height, 14.38 ft (4.383 m) Mar. 20; minimum daily discharge, 6,140 ft³/s (174 m³/s) Jan. 31; minimum gage height, 0.17 ft (0.052 m) Jan. 28, from graph based on outside gage height readings.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35000	36000	20400	18800	16200	18300	38000	35300	42400	46100	59200	55700
2	34700	33400	18000	18200	16200	18000	37300	34500	42700	46600	57500	55600
3	33600	32000	15700	16000	15600	17400	36600	33800	43000	46200	58000	55300
4	32500	32500	13800	15400	14800	17100	36700	33100	42900	45400	56500	55200
5	32800	32000	12600	17100	14600	14200	36000	33000	43100	45700	54100	55200
6	32600	32100	11400	17800	17100	14400	36800	33200	42700	47200	52700	55500
7	34500	32900	9100	17600	16900	16400	38000	34400	43000	50600	52900	55600
8	36200	34600	6140	18000	16400	18400	40000	34600	42600	48700	54000	55400
9	36600	39400	6630	17400	15800	18400	37800	34800	42800	50900	53900	55300
10	34200	43900	10000	16100	17600	17800	37700	33900	44300	49300	55600	54700
11	33300	37800	10400	14900	19500	18000	38900	33300	44300	50400	55600	54500
12	32700	34200	9400	15200	20900	18800	38700	33500	43800	51000	56500	54800
13	33300	33700	9400	16900	21200	19800	34800	33700	43100	52300	56200	74500
14	32800	35000	18900	17400	20400	21100	34400	34100	42100	51600	56400	81200
15	32500	34800	19600	17000	19300	24300	36800	33600	41400	51700	58700	67500
16	32100	35300	19000	17000	19200	28100	35500	33000	41700	52100	60200	62400
17	32200	35600	19200	16500	19400	32200	34100	32900	42400	51400	59800	59700
18	32300	35900	18600	16000	18800	34700	38100	33500	47600	51200	58500	59400
19	31800	35300	23400	16000	18300	54800	38800	33700	47600	52300	57700	58400
20	32200	35100	21200	16500	18400	76900	38200	33500	46900	52600	57900	58800
21	33000	35000	19400	17000	18300	76900	37400	33100	47200	52700	56800	56200
22	33500	34100	17800	17000	18700	65800	37000	32300	47000	58000	56200	56300
23	34700	33100	16300	17000	18000	50100	35800	32500	45200	58800	56200	56600
24	34400	31800	17800	17000	19000	48300	34600	32600	45500	62300	56200	56600
25	34800	30400	20400	17000	19300	51100	33700	33100	45500	64100	55800	57100
26	33600	28100	18900	16000	19600	52700	34200	34300	46200	63300	55500	56900
27	33500	25600	17000	12000	18700	49800	34500	36800	47300	64200	56400	56900
28	33400	23800	15400	6710	17900	41500	34700	37000	46700	63500	56800	56100
29	33600	22400	16800	9050	---	39800	35000	39000	45900	62000	56900	55600
30	33900	21600	17800	12400	---	39300	35200	41400	45300	61100	55700	54800
31	34400	---	18500	13600	---	38800	---	43600	---	60200	55800	---
TOTAL	1040700	987400	488970	490560	506100	1053200	1095300	1071100	1332200	1663500	1750200	1747800
MEAN	33570	32910	15770	15820	18080	33970	36510	34550	44410	53660	56460	58260
MAX	36600	43900	23400	18800	21200	76900	40000	43600	47600	64200	60200	81200
MIN	31800	21600	6140	6710	14600	14200	33700	32300	41400	45400	52700	54500
AC-FT	2064000	1959000	969900	973000	1004000	2089000	2173000	2125000	2642000	3300000	3472000	3467000

CAL YR 1977 TOTAL 10580370 MEAN 28990 MAX 43900 MIN 6140 AC-FT 20990000
WTR YR 1978 TOTAL 13227030 MEAN 36240 MAX 81200 MIN 6140 AC-FT 26240000

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

WATER-QUALITY RECORDS

LOCATION.--Sediment samples collected from Interstate 80 highway bridge 2.0 mi (3.2 km) downstream from gaging station.

PERIOD OF RECORD.--July 1969 to September 1976 (discontinued). Daily sediment loads April 1939 to September 1971 are in reports of Corps of Engineers.

PERIOD OF DAILY RECORD.--
CHEMICAL ANALYSES: July 1969 to June 1972, January 1978 to September 1978.
SPECIFIC CONDUCTANCE: October 1972 to September 1976, January 1978 to September 1978.
WATER TEMPERATURES: October 1971 to September 1976, January 1978 to September 1978.
SEDIMENT RECORDS: October 1971 to September 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,180 mg/L May 19, 1974; minimum daily mean, 165 mg/L Sept. 13, 1976.
SEDIMENT LOADS: Maximum daily, 1,060,000 tons (962,000 tonnes) May 19, 1974; minimum daily, 3,990 tons (3,620 tonnes) Jan. 14, 1975.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 860 micromhos Jan. 11,28; minimum daily, 335 micromhos Mar. 22.
WATER TEMPERATURE: Maximum daily, 28.0° C July 17; minimum daily, 0.0° C on many days during winter period.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				---	620	700	410	700	670	640	700	750
2				---	520	700	390	700	670	650	690	750
3				750	520	720	390	700	680	650	690	750
4				790	690	720	380	690	660	650	710	750
5				800	700	740	400	700	660	650	700	750
6				800	700	720	420	700	660	580	680	750
7				800	540	710	460	690	670	570	720	620
8				850	660	710	460	700	670	600	720	620
9				850	800	700	550	700	670	650	730	620
10				820	800	710	550	700	660	660	730	560
11				860	800	710	570	700	640	680	720	570
12				850	800	700	580	700	680	670	720	625
13				840	790	700	580	700	670	660	720	590
14				840	790	675	620	700	680	660	710	500
15				810	780	660	630	700	610	670	720	560
16				820	800	610	650	710	660	720	700	600
17				830	800	580	630	710	650	670	700	500
18				820	800	550	610	700	---	680	710	600
19				820	800	430	620	710	600	700	730	600
20				810	800	370	580	710	620	680	720	600
21				800	800	395	680	710	630	710	690	610
22				800	790	335	690	710	650	700	730	620
23				840	730	390	640	710	650	680	730	580
24				800	720	410	690	700	640	660	730	600
25				800	700	480	680	700	660	680	740	600
26				840	690	480	700	700	640	700	740	610
27				850	700	480	700	700	640	720	720	610
28				860	690	440	710	700	640	660	720	600
29				800	---	440	710	700	650	720	740	540
30				660	---	420	700	680	640	720	750	560
31				620	---	410	---	670	---	700	750	---
TOTAL				23430	20330	17795	17380	21700	18920	20740	22260	18595
MEAN				808	726	574	579	700	652	669	718	620
MAX				860	800	740	710	710	680	720	750	750
MIN				620	520	335	380	670	600	570	680	500

WTR YR 1978 TOTAL 181150 MEAN 671 MAX 860 MIN 335

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

06610000 MISSOURI RIVER AT OMAHA, NB--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				---	.0	1.0	11.0	12.0	19.0	---	26.0	25.0
2				---	1.0	1.0	11.0	13.0	19.0	---	26.0	24.0
3				.0	.0	1.0	11.0	14.0	19.0	---	26.0	25.0
4				2.0	.0	1.0	10.0	13.0	23.0	---	24.0	25.0
5				3.0	1.0	.0	9.5	16.0	22.0	---	24.0	25.0
6				1.0	.0	.0	11.0	12.0	23.0	25.0	24.0	25.0
7				1.0	.0	1.0	11.0	13.0	23.0	25.0	25.0	25.0
8				.0	1.0	1.0	12.0	13.0	21.0	25.0	25.0	26.0
9				.0	1.0	3.0	12.0	14.0	21.0	25.0	26.0	26.0
10				1.0	1.0	3.0	12.0	15.0	22.0	25.0	26.0	26.0
11				2.0	3.0	2.0	12.0	16.0	22.0	25.0	25.0	26.0
12				1.0	1.0	2.0	13.0	16.0	22.0	26.0	26.0	26.0
13				1.0	1.0	2.0	13.0	16.0	24.0	26.0	27.0	25.0
14				2.0	1.0	3.0	12.0	17.0	23.0	26.0	26.0	24.0
15				.0	1.0	4.0	10.0	16.0	24.0	27.0	27.0	23.0
16				.0	1.0	3.0	10.0	16.0	24.0	26.0	26.0	24.0
17				2.0	1.0	2.0	9.0	19.0	24.0	28.0	27.0	23.0
18				3.0	1.0	3.0	9.0	19.0	---	25.0	24.0	24.0
19				.0	1.0	2.0	8.0	19.0	25.0	26.0	23.0	20.0
20				1.0	.5	2.0	8.0	19.0	23.0	26.0	24.0	20.0
21				1.0	1.0	4.0	9.0	20.0	23.0	24.0	25.0	22.0
22				1.0	2.0	6.0	7.5	19.0	22.0	25.0	27.0	21.0
23				.0	2.0	6.0	9.0	18.0	24.0	25.0	26.0	20.0
24				2.0	2.5	5.0	9.0	20.0	24.0	25.0	25.0	20.0
25				1.0	2.0	5.0	11.0	22.0	25.0	25.0	25.0	21.0
26				1.0	2.0	5.0	11.0	24.0	24.0	26.0	27.0	20.0
27				.0	2.0	7.0	11.0	22.0	25.0	27.0	25.0	19.0
28				1.0	2.0	8.0	14.0	23.0	---	26.0	25.0	20.0
29				.0	---	9.0	12.0	22.0	---	27.0	25.0	19.0
30				.0	---	11.0	13.0	22.0	---	25.0	26.0	20.0
31				.0	---	12.0	---	22.0	---	26.0	25.0	---
TOTAL				27.0	32.0	115.0	321.0	542.0	590.0	667.0	788.0	689.0
MEAN				1.0	1.0	3.5	10.5	17.5	22.5	25.5	25.5	23.0
MAX				3.0	3.0	12.0	14.0	24.0	25.0	28.0	27.0	26.0
MIN				.0	.0	.0	7.5	12.0	19.0	24.0	23.0	19.0

WTR YR 1978 TOTAL 3771.0 MEAN 14.5 MAX 28.0 MIN .0

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
JAN 13...	1200	16800	803	7.6	.0	8	--	14.8	100	7500	K11000
FEB 09...	1245	17600	757	8.0	.0	3	--	13.9	95	650	2000
MAR 30...	1430	39200	410	8.0	7.5	120	--	--	--	10000	24000
APR 25...	1400	33500	710	8.1	6.0	70	--	10.5	84	1700	5100
MAY 22...	1230	32300	660	8.5	19.5	30	--	8.8	95	1700	710
JUN 12...	1300	41900	650	8.4	20.0	--	38	8.2	89	2300	220
JUL 17...	1255	52700	675	8.4	26.0	--	46	--	--	--	--
AUG 08...	1030	53100	700	8.4	25.0	--	27	7.6	90	870	K250
SEP 07...	1330	55800	725	8.3	24.5	--	22	8.1	96	4500	250

06610000 MISSOURI RIVER AT OMAHA, NB--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS, NONCARBONATE (MG/L CACO3) (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE (MG/L AS HCO3) (00440)	CARBONATE (MG/L AS CO3) (00445)	ALKALINITY (MG/L AS CACO3) (00410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)
JAN 13...	--	--	--	--	--	--	--	--	--	--	--
FEB 09...	270	94	67	24	66	5.2	210	0	170	200	13
MAR 30...	170	44	44	14	20	8.2	150	0	120	78	7.8
APR 25...	270	100	70	24	44	7.0	210	0	170	160	15
MAY 22...	250	86	64	23	57	6.4	200	3	170	190	2.3
JUN 12...	240	91	62	21	55	6.8	--	--	150	190	13
JUL 17...	230	92	60	20	61	5.9	150	--	140	180	12
AUG 08...	240	94	63	21	65	5.9	--	--	150	200	15
SEP 07...	230	92	60	20	69	5.4	--	0	140	310	14

DATE	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)
JAN 13...	--	--	--	--	--	--	--	--	--	--
FEB 09...	.5	12	496	491	.67	23600	.28	.22	.50	.05
MAR 30...	.2	11	252	257	.34	26700	1.0	2.1	3.1	.18
APR 25...	.4	11	445	435	.61	40300	1.9	1.1	3.0	.31
MAY 22...	.5	5.5	477	450	.65	41600	.03	.89	.92	.17
JUN 12...	.5	9.1	447	448	.61	50600	.48	.57	1.1	.03
JUL 17...	.5	7.1	446	505	.61	63500	.56	.88	1.4	.15
AUG 08...	.5	6.7	479	467	.65	68700	.25	.60	.85	.12
SEP 07...	.5	8.7	497	572	.68	74900	.07	.57	.64	.07

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	PHYTOPLANKTON, TOTAL (CELLS PER ML) (60050)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M (00573)	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M (00572)	CHLOR-A PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2) (70957)	CHLOR-B PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2) (70958)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
JAN 13...	--	--	--	--	--	--	--	--	--	--
FEB 09...	3.4	--	--	--	--	--	--	95	4510	24
MAR 30...	--	11	--	--	--	--	--	663	70200	65
APR 25...	12	--	--	--	--	--	--	644	58300	40
MAY 22...	14	--	--	--	--	--	--	449	39200	30
JUN 12...	--	4.3	27000	--	--	--	--	571	64600	30
JUL 17...	6.0	--	26000	--	--	--	--	946	135000	25
AUG 08...	5.1	--	25000	--	--	--	--	570	81700	23
SEP 07...	--	4.7	15000	--	--	--	--	584	88000	17

MISSOURI RIVER MAIN STEM

06610000 MISSOURI RIVER AT OMAHA, NB--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR JANUARY 1978 TO SEPTEMBER 1978

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
MAR											
30...	5	2	1	1	10	0	4	5	20	32	7400
JUN											
12...	4	2	2	0	5	5	2	4	20	5	3900
SEP											
07...	7	3	3	0	10	0	0	0	13	7	3300

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
MAR											
30...	40	13	7	530	10	.0	.0	2	1	40	10
JUN											
12...	10	11	0	270	0	.1	.0	0	2	40	20
SEP											
07...	30	6	0	190	0	.0	.0	2	2	30	10

06610000 MISSOURI RIVER AT OMAHA, NB--Continued

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE	MAR 30,78	JUN 12,78	JUL 17,78	AUG 8,78	SEP 7,78
TIME	1430	1300	1255	1030	1330
TOTAL CELLS/ML	840	27000	26000	25000	15000
DIVERSITY: DIVISION	1.5	1.4	1.1	1.4	1.3
.CLASS	1.5	1.4	1.1	1.4	1.3
..ORDER	1.9	1.6	1.3	1.8	1.6
...FAMILY	2.6	2.2	2.6	2.5	2.3
....GENUS	2.7	2.3	3.7	3.4	3.1

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	480	2	--	-
...COELASTRACEAE										
....COELASTRUM	--	-	250	1	--	-	760	3	360	2
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	600	2	3200	12	--	-	--	-
...MICRACTINIACEAE										
....GOLENKINIA	--	-	--	-	200	1	--	-	180	1
....MICRACTINIUM	--	-	--	-	390	2	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	170#	20	500	2	1300	5	480	2	91	1
....DICTYOSPHAERIUM	--	-	--	-	3600	14	7200#	29	1600	11
....FRANCEIA	--	-	--	-	200	1	--	-	91	1
....KIRCHNERIELLA	--	-	--	-	*	0	--	-	--	-
....OOCYSTIS	*	0	--	-	1800	7	1100	5	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	180	1
....TETRAEDRON	--	-	--	-	--	-	--	-	91	1
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	790	3	760	3	1500	10
....CRUCIGENIA	--	-	250	1	--	-	380	2	--	-
....SCENEDESMUS	--	-	11000#	41	5200#	20	860	3	2200	14
....TETRASTRUM	--	-	--	-	1200	5	380	2	730	5
..TETRASPORALES										
...PALMELLACEAE										
....SPHAEROCYSTIS	--	-	250	1	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	14	2	--	-	990	4	570	2	550	4
...PHACOTACEAE										
....PHACOTUS	--	-	--	-	200	1	570	2	91	1
..ZYGNEMATALES										
...DESMIDIACEAE										
....COSMARIUM	--	-	500	2	--	-	--	-	--	-
..CHLOROCOCCALES										
...OOCYSTACEAE										
....GLOEOACTINIUM	--	-	--	-	1200	5	--	-	--	-
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	86	10	*	0	2100	8	4100#	16	5700#	38
....MELOSIRA	14	2	--	-	1300	5	2000	8	450	3
....SKELETONEMA	--	-	--	-	--	-	1400	6	91	1
....STEPHANODISCUS	--	-	--	-	300	1	--	-	--	-
..PENNALES										
...CYMBELLACEAE										
....AMPHORA	14	2	--	-	--	-	--	-	--	-
...DIATOMACEAE										
....DIATOMA	43	5	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....ASTERIONELLA	14	2	1400	5	--	-	--	-	--	-
....SYNEDRA	14	2	200	1	--	-	--	-	--	-
...GOMPHONEMATACEAE										
....GOMPHONEMA	14	2	--	-	--	-	--	-	--	-
...NAVICULACEAE										
....NAVICULA	14	2	900	3	--	-	--	-	91	1
....PINNULARIA	14	2	--	-	--	-	--	-	--	-
...NITZSCHIACEAE										
....NITZSCHIA	29	3	800	3	*	0	480	2	180	1
...SURIRELLACEAE										
....CYMATOPLEURA	--	-	450	2	--	-	--	-	--	-
....SURIRELLA	43	5	--	-	--	-	--	-	--	-
.CHRYSOPHYCEAE										
..CHRYSOMONADALES										
...OCHROMONADACEAE										
....OCHROMONAS	--	-	--	-	--	-	--	-	91	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

06610000 MISSOURI RIVER AT OMAHA, NB--Continued

WATER-QUALITY RECORDS

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO SEPTEMBER 1978

DATE TIME	MAR 30,78 1430		JUN 12,78 1300		JUL 17,78 1255		AUG 8,78 1030		SEP 7,78 1330	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CRYPTOPHYTA (CRYPTOMONADS)										
.CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
...CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	--	-	200	1	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROCCOCCALES										
...CHROCCOCCACEAE										
....AGMENELLUM	--	-	9800#	36	--	-	--	-	--	-
....ANACYSTIS	--	-	--	-	1600	6	2700	11	1000	7
..HORMOGONALES										
...OSCILLATORIACEAE										
....OSCILLATORIA	360#	42	--	-	--	-	570	2	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	--	-	*	0	--	-	--	-
....PHACUS	--	-	--	-	*	0	--	-	--	-
....TRACHELOMONAS	--	-	--	-	*	0	*	0	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

06610520 MOSQUITO CREEK NEAR EARLING, IA

LOCATION.--Lat 41°45'10", long 95°27'50", in N1/2 SE1/4 sec.11, T.80 N., R.40 W., Shelby County, Hydrologic Unit 10230006, on right bank at stream-stabilization structure 1,300 ft (396 m) downstream from bridge on State Highway 191, 0.5 mi (0.8 km) downstream from small left-bank tributary and 2.3 mi (3.7 km) southwest of Earling.

DRAINAGE AREA.--32.0 mi² (82.9 km²).

PERIOD OF RECORD.--August 1965 to current year.

GAGE.--Duplex water-stage recorder. Datum of gage is 1,222.56 ft (372.636 m) NGVD. Gage heights obtained of headwater (base gage) and tailwater (supplementary gage) elevations at stream-stabilization structure.

REMARKS.--Records fair except those for winter period, which are poor. The stabilization structure is a dam approximately 16 ft (5 m) high constructed of sheet piling and derrick stone. The crest of the cut-off piling is rectangular in shape at low stages and trapezoidal at high stages. Daily discharges computed from headwater gage readings. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years, 15.5 ft³/s (0.439 m³/s), 6.58 in/yr (167 mm/yr), 11,230 acre-ft/yr (13.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s (340 m³/s) Sept. 11, 1972, gage height, 31.18 ft (9.504 m), from floodmarks; no flow for several days in 1970-72, 77.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 9	0200	775	21.9	20.61	6.282	May 28	1830	1,590	45.0	22.00	6.706
Mar. 20	1730	1,880	53.2	22.40	6.828	Sept. 12	1900	*9,910	281	*29.79	9.080

Minimum daily discharge, 0.64 ft³/s (0.018 m³/s) Oct. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	4.5	8.3	2.5	1.8	1.7	6.6	6.6	2.5	2.2	2.0	1.3
2	2.2	4.2	8.0	2.5	1.8	1.7	6.6	6.3	2.8	2.2	8.3	1.2
3	.92	4.0	7.7	2.5	1.8	1.7	6.3	6.3	3.2	2.8	2.8	1.2
4	.78	3.8	6.3	2.5	1.8	1.7	5.7	6.6	3.6	3.0	2.0	1.2
5	.71	3.8	5.4	2.5	1.8	1.7	6.6	6.6	4.0	3.3	2.0	1.2
6	.64	3.8	4.2	2.5	1.7	1.7	7.1	6.6	4.9	7.7	1.9	1.2
7	9.0	3.8	4.0	2.5	1.7	1.7	5.7	13	4.7	57	1.8	1.2
8	3.3	117	4.0	2.5	1.7	1.8	8.3	11	3.5	5.2	1.7	1.1
9	1.7	275	4.0	2.5	1.7	1.9	13	8.0	3.5	4.2	1.7	1.1
10	2.0	75	3.8	2.5	1.7	2.0	12	7.4	2.7	4.2	1.6	1.1
11	2.0	27	4.0	2.5	1.7	4.0	7.1	6.8	2.9	4.5	1.6	1.1
12	1.2	16	4.0	2.5	1.7	4.0	5.2	6.8	1.7	5.2	1.5	1900
13	1.2	15	4.5	2.5	1.7	8.0	4.9	6.6	2.5	4.9	1.5	398
14	1.5	14	5.0	2.4	1.7	20	6.6	5.7	2.7	4.9	3.0	19
15	1.1	13	5.0	2.4	1.7	50	6.3	6.0	2.9	6.8	13	13
16	1.1	12	8.0	2.3	1.7	90	5.2	6.0	2.0	7.1	3.8	12
17	1.2	12	9.0	2.3	1.7	45	14	6.3	3.1	5.4	2.5	16
18	1.1	11	5.7	2.2	1.7	250	32	6.0	2.0	5.4	2.0	16
19	1.2	10	5.2	2.2	1.7	600	18	5.7	2.4	5.4	1.8	13
20	1.1	9.7	4.0	2.1	1.7	655	14	5.7	2.5	6.0	1.6	30
21	1.1	8.0	3.8	2.1	1.7	392	12	5.7	2.0	11	4.4	15
22	1.5	10	3.8	2.0	1.7	138	11	5.7	3.3	75	3.0	13
23	4.2	11	3.8	2.0	1.7	25	11	6.3	2.9	5.2	2.5	12
24	2.7	9.7	3.5	2.0	1.7	13	10	5.4	2.9	2.4	2.2	11
25	2.0	8.3	3.2	1.9	1.7	11	9.0	5.2	2.7	1.7	3.5	10
26	1.8	7.7	2.9	1.9	1.7	9.0	8.3	4.9	1.7	1.7	5.5	9.7
27	2.2	5.4	2.8	1.9	1.7	7.4	8.3	5.4	1.2	1.7	11	9.0
28	2.2	4.0	2.7	1.8	1.7	8.0	8.0	135	1.2	1.7	4.5	8.7
29	2.2	6.8	2.6	1.8	---	7.1	7.4	48	1.2	1.5	3.0	9.3
30	8.2	9.0	2.5	1.8	---	7.4	7.7	11	2.2	1.6	2.0	8.7
31	8.7	---	2.5	1.8	---	7.4	---	4.9	---	1.6	1.5	---
TOTAL	73.25	714.5	144.2	69.4	48.1	2368.9	283.9	377.5	81.4	252.5	101.2	2536.3
MEAN	2.36	23.8	4.65	2.24	1.72	76.4	9.46	12.2	2.71	8.15	3.26	84.5
MAX	9.0	275	9.0	2.5	1.8	655	32	135	4.9	75	13	1900
MIN	.64	3.8	2.5	1.8	1.7	1.7	4.9	4.9	1.2	1.5	1.5	1.1
AC-FT	145	1420	286	138	95	4700	563	749	161	501	201	5030

CAL YR 1977	TOTAL	5425.38	MEAN 14.9	MAX 1900	MIN .00	AC-FT	10760	
WTR YR 1978	TOTAL	7051.15	MEAN 19.3	MAX 1900	MIN .64	AC-FT	13990	

06807000 MISSOURI RIVER AT NEBRASKA CITY, NB
(National stream-quality accounting network station)

LOCATION.--Lat 40°40'55", long 95°50'48", in NW1/4 NE1/4 sec.9, T.8 N., R.14 E., Otoe County, Hydrologic Unit 10240001, on right bank 0.7 mi (1.1 km) upstream from Waubonsie Highway Bridge at Nebraska City, and at mile 562.6 (905.2 km).

DRAINAGE AREA .--410,00 mi² (1,062,000 km²), approximately. The 3,959 mi² (10,254 km²) in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 761: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 905.36 ft (275.954 m) NGVD, supplementary adjustment of 1954. See WSP 1918 or 1919 for history of changes prior to Apr. 1, 1963.

REMARKS.--Records good. Flow regulated by upstream main-stem reservoirs. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--49 years, 35,330 ft³/s (1001 m³/s), 25,600,000 acre-ft/yr (31,600 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 414,000 ft³/s (11,700 m³/s) Apr. 19, 1952; maximum gage height, 27.66 ft (8.431 m) Apr. 18, 1952; minimum discharge, 1,600 ft³/s (45.3 m³/s) Dec. 31, 1946 (discharge measurement); minimum gage height observed, -0.28 ft (-0.085 m) Dec. 24, 1960, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 156,000 ft³/s (4,420 m³/s) Mar. 22, gage height, 22.43 ft (6.837 m); minimum daily, 12,900 ft³/s (365 m³/s) Jan. 29; minimum gage height, 2.06 ft (0.628 m) Jan. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38100	41600	26200	22300	16600	21700	48900	46300	52100	50900	62100	57200
2	37700	40700	25600	21500	17600	22400	47100	46200	52600	51700	60900	57200
3	37200	39000	25200	20500	17500	22100	45700	45000	52400	51500	61000	57600
4	36400	38900	24500	19200	17400	22200	46200	43500	50800	50600	61000	57100
5	36500	37900	23600	19200	16800	22000	46900	42800	49000	49800	59300	56800
6	36500	37200	22800	20900	16900	21600	47700	42500	48200	50600	57600	56900
7	38100	37000	21500	21300	17800	22200	51200	48700	48100	53500	56300	56800
8	39500	36900	19000	20600	18000	23400	55900	51500	47500	56800	55800	56800
9	41200	45000	16100	19600	18100	24100	63400	48400	47200	56200	56500	56800
10	40600	51900	14800	18600	18800	24100	67400	46000	48300	53200	59000	56800
11	39200	49000	16600	18100	19800	24400	59700	44600	49200	53700	58500	56800
12	38600	45000	16900	18000	21100	25000	56800	43100	49300	55400	58600	57000
13	38500	42000	18700	18400	22100	26600	51600	42300	49300	55600	58000	64500
14	38300	41500	21400	19300	21800	37100	48500	41500	48400	55700	57500	80500
15	38100	41400	22500	19800	21000	45800	50000	41400	47300	56800	58900	71900
16	37800	41400	22800	19600	20500	50200	50200	40600	46900	55700	60100	64800
17	37400	41800	23200	19000	20500	56400	53700	40100	47500	54200	61500	61500
18	37300	42800	24600	18800	20000	58000	65100	39300	49700	53300	61800	62700
19	36900	42600	26500	18600	20000	84800	60900	39600	52700	54200	61400	61400
20	37100	42400	25400	18500	20500	118000	58400	41900	53000	55800	60600	67500
21	37600	42800	24100	18700	20500	143000	56500	40000	52600	57200	59800	64200
22	38300	42600	22600	18800	20500	154000	55500	39500	52000	78800	59300	63000
23	39500	42000	21300	18500	20600	130000	55100	39200	52300	72800	58100	61100
24	39700	41300	21100	18600	21000	89000	53000	40000	53300	68500	58100	59700
25	39000	40200	22000	18500	21500	79500	51000	40200	52300	69200	57900	59000
26	38600	36900	21900	18000	22000	75800	49100	40400	53000	68100	58400	57800
27	37800	33200	21100	17000	22200	70000	47700	42700	54000	66800	59400	57600
28	37900	30000	20000	13400	21600	60600	46100	45400	52900	66400	59500	57800
29	38100	27700	20200	12900	---	55300	45800	45800	51500	65100	59500	57300
30	38500	26400	21000	14800	---	53000	45600	47600	51200	63300	58800	57100
31	39600	---	22000	15900	---	51000	---	50000	---	63000	58200	---
TOTAL	1185600	1199100	675200	577000	552900	1713300	1580700	1346100	1514600	1814400	1833400	1813200
MEAN	38250	39970	21780	18610	19750	55270	52690	43420	50490	58530	59140	60440
MAX	41200	51900	26500	22300	22200	154000	67400	51500	54000	78800	62100	80500
MIN	36400	26400	14800	12900	16600	21600	45600	39200	46900	49800	55800	56800
AC-FT	2352000	2378000	1339000	1144000	1097000	3398000	3135000	2670000	3004000	3599000	3637000	3596000

CAL YR 1977 TOTAL 12520000 MEAN 34300 MAX 58600 MIN 13000 AC-FT 24830000
WTR YR 1978 TOTAL 15805500 MEAN 43300 MAX 154000 MIN 12900 AC-FT 31350000

06807000 MISSOURI RIVER AT NEBRASKA CITY, NB--Continued.
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1951 to December 1977. Daily sediment loads August 1957 to September 1971 in reports of Corps of Engineers. NASQAN sampling was transferred to Omaha, NB, January 1, 1978.

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

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 994 micromhos Dec. 17, 1962; minimum daily, 273 micromhos June 17, 1964.
WATER TEMPERATURES: Maximum daily, 31°C July 26, 1977; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,220 mg/L May 19, 1974; minimum daily mean, 137 mg/L Jan. 14, 1975.
SEDIMENT LOADS: Maximum daily, 1,590,000 tons (1,440,000 tonnes) May 19, 1974; minimum daily, 4,050 tons (3,670 tonnes) Jan. 17, 1972.

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	720	710	770									
2	710	690	860									
3	690	680	850									
4	680	710	620									
5	680	720	800									
6	700	700	770									
7	600	690	700									
8	640	700	740									
9	640	610	840									
10	650	650	920									
11	650	600	980									
12	650	680	810									
13	660	700	830									
14	680	690	800									
15	690	700	760									
16	690	700	770									
17	670	700	740									
18	680	700	710									
19	690	710	660									
20	700	710	650									
21	690	750	600									
22	690	760	640									
23	690	760	680									
24	700	740	750									
25	670	710	690									
26	700	720	740									
27	700	610	690									
28	700	650	670									
29	710	820	700									
30	740	840	650									
31	700	---	---									
TOTAL	21160	21110	22390									
MEAN	683	704	745									
MAX	740	840	980									
MIN	600	600	600									

WTR YR 1978 TOTAL 64660 MEAN 711 MAX 980 MIN 600

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

06807000 MISSOURI RIVER AT NEBRASKA CITY, NB--Continued.
(National stream-quality accounting network station)

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.5	14.0	1.0									
2	18.0	13.5	1.5									
3	16.5	13.5	1.5									
4	15.5	13.0	1.5									
5	15.5	12.0	1.0									
6	15.5	13.0	.5									
7	14.0	13.0	.0									
8	13.0	13.0	.0									
9	13.0	10.0	.0									
10	12.0	8.0	.0									
11	10.5	6.5	.0									
12	10.5	5.5	.0									
13	11.0	4.5	.5									
14	11.0	5.5	1.0									
15	11.0	6.5	1.5									
16	11.5	6.5	2.0									
17	11.5	6.5	2.5									
18	11.0	6.0	2.0									
19	11.0	6.5	1.5									
20	11.5	6.5	.5									
21	12.0	5.0	.0									
22	12.0	4.0	.0									
23	12.0	3.5	.0									
24	12.0	2.0	.0									
25	12.0	1.0	.0									
26	13.0	.5	.0									
27	13.0	.0	.0									
28	14.0	.0	.0									
29	14.0	.0	.0									
30	14.5	.5	.0									
31	14.5	---	---									
TOTAL	406.0	200.0	18.5									
MEAN	13.0	6.5	.5									
MAX	19.5	14.0	2.5									
MIN	10.5	.0	.0									

WTR YR 1978 TOTAL 624.5 MEAN 7.0 MAX 19.5 MIN .0

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (JTU) (00070)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
11...	1445	39000	690	--	10.0	2	--	--	--	40000	100000
NOV											
15...	1200	41500	700	8.3	6.0	--	--	12.6	100	43000	K400000
DEC											
13...	1230	18000	860	8.0	1.5	20	--	13.2	94	35000	K80000

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE (MG/L AS HCO3) (00440)	CAR-BONATE (MG/L AS CO3) (00445)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
11...	230	73	57	21	60	5.7	190	--	160	190	15
NOV											
15...	--	--	--	--	--	--	--	--	--	--	--
DEC											
13...	290	75	71	27	73	6.2	260	0	210	170	28

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)
OCT										
11...	.5	13	427	456	.58	45000	.54	--	--	.42
NOV										
15...	--	--	--	--	--	--	--	--	--	--
DEC										
13...	.6	15	442	519	.60	21500	.99	--	--	.22

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)	PHYTOPLANKTON, TOTAL (CELLS PER ML) (60050)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M (00573)	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M (00572)	CHLOR-A PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2) (70957)	CHLOR-B PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2) (70958)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
11...	--	--	--	--	--	--	--	1100	116000	14
NOV										
15...	--	--	--	--	--	--	--	--	--	--
DEC										
13...	--	4.0	--	--	--	--	--	--	--	--

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)
DEC											
13...	2	2	0	1	0	0	1	0	17	7	1500

DATE	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC											
13...	10	15	1	80	20	.1	.0	3	2	70	20

06807320 WEST NISHNABOTNA RIVER AT HARLAN, IA

LOCATION.--Lat 41°38'41", long 95°18'50", in NW1/4 NE1/4 sec. 19, T.79 N., R.38 W., Shelby County, Hydrologic Unit 10240002, in southeast part of City of Harlan, in city owned brick pumphouse on right bank, 50 ft (15 m) landward of levee, 250 ft (76 m) downstream from State Highway 44, 1.4 mi (2.3 km) downstream from confluence with West Fork.

DRAINAGE AREA.--316 mi² (818 km²).

PERIOD OF RECORD.--Oct. 1, 1977 to current year. Occasional low-flow measurements, water years 1957-77.

GAGE.--Water-stage recorder. Datum of gage is 1,162.894 ft (354.450 m) NGVD.

REMARKS.-- Records fair except those for winter period, which are poor. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft³/s (411 m³/s) Sept. 13, 1978, gage height, 26.18 ft (7.980 m); minimum daily, 9.0 ft³/s (0.25 m³/s) Feb. 16-22.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

		Discharge		Gage Height				Discharge		Gage Height	
Date	Time	(ft³/s)	(m³/s)	(ft)	(m)	Date	Time	(ft³/s)	(m³/s)	(ft)	(m)
Nov. 9	0700	3,340	94.6	10.47	3.191	May 29	0300	2,130	60.3	12.00	3.658
Mar. 21	0045	7,790	221	18.88	5.755	Sept. 13	1345	*14,500	411	*26.18	7.980

Minimum daily discharge, 9.0 ft³/s (0.25 m³/s) Feb. 16-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	72	40	20	12	13	95	90	110	39	40	21
2	17	53	39	20	11	13	88	85	99	41	43	18
3	14	42	38	20	11	14	84	85	92	38	52	18
4	14	33	37	20	11	14	78	85	88	36	59	18
5	12	30	36	20	10	14	76	83	84	36	52	19
6	12	28	35	19	10	15	79	83	84	44	42	19
7	39	28	34	19	10	16	74	109	82	155	31	19
8	57	57	33	19	10	17	126	113	79	115	28	19
9	41	1750	32	19	10	18	124	100	75	57	28	18
10	32	210	31	19	10	19	135	91	70	38	28	18
11	32	120	30	19	10	21	112	89	66	35	28	18
12	27	97	29	19	10	24	99	89	63	35	27	26
13	23	83	29	19	10	28	89	90	59	33	27	10600
14	20	76	30	18	10	34	91	84	57	31	26	2040
15	21	71	31	18	10	40	88	80	57	31	51	367
16	20	65	34	17	9.0	60	84	79	55	29	46	239
17	18	64	40	17	9.0	100	124	79	55	26	38	187
18	15	59	34	16	9.0	300	247	78	53	29	25	209
19	15	56	26	16	9.0	1500	218	79	55	32	23	173
20	14	54	25	16	9.0	3690	175	78	59	39	20	359
21	14	52	24	15	9.0	4080	151	77	59	49	33	335
22	17	50	23	15	9.0	2320	138	79	59	123	24	209
23	15	48	23	15	10	702	134	84	61	137	19	175
24	31	46	23	14	11	223	124	86	64	70	18	154
25	25	44	23	14	11	161	116	86	57	58	18	138
26	24	42	22	14	12	136	109	79	62	51	42	129
27	21	40	22	13	12	129	105	72	48	45	50	115
28	21	38	21	13	13	126	101	256	44	41	51	104
29	20	39	21	13	---	110	97	826	43	40	29	99
30	28	40	20	12	---	100	96	169	40	41	22	101
31	86	---	20	12	---	100	---	117	---	40	22	---
TOTAL	766	3487	905	520	287.0	14137	3457	3680	1979	1614	1042	15964
MEAN	24.7	116	29.2	16.8	10.3	456	115	119	66.0	52.1	33.6	532
MAX	86	1750	40	20	13	4080	247	826	110	155	59	10600
MIN	12	28	20	12	9.0	13	74	72	40	26	18	18
CFSM	.08	.37	.09	.05	.03	1.44	.36	.38	.21	.17	.11	1.68
IN.	.09	.41	.11	.06	.03	1.66	.41	.43	.23	.19	.12	1.88
AC-FT	1520	6920	1800	1030	569	28040	6860	7300	3930	3200	2070	31660

WTR YR 1978 TOTAL 47838.0 MEAN 131 MAX 10600 MIN 9.0 CFSM .42 IN 5.63 AC-FT 94890

06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IA

LOCATION.--Lat 41°23'24", long 95°22'17", in NE1/4 sec.18, T.76 N., R.39 W., Pottawattamie County, Hydrologic Unit 10240002, on downstream end of right pier of bridge on county highway G30, 0.6 mi (1.0 km) west of Hancock school, and 3.0 mi (4.8 km) downstream from Jim Creek.

DRAINAGE AREA.--609 mi² (1,577 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,085.94 ft (330.995 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--19 years, 264 ft³/s (7.476 m³/s), 5.89 in/yr (150 mm/yr), 191,300 acre-ft/yr (236 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,400 ft³/s (748 m³/s) Sept. 13, 1972, gage height, 22.12 ft (6.742 m); minimum daily, 2.2 ft³/s (0.062 m³/s) Feb. 8, 9, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft³/s (113 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	0300	10,500	297	13.82	4.212
Apr. 8	1400	4,330	123	8.57	2.612
Sept. 13	1800	*16,800	476	*17.85	5.441

Minimum daily discharge, 34 ft³/s (0.96 m³/s) Oct. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,110 ft³/s (31.4 m³/s) Sept. 1, gage height, 4.70 ft (1.433 m), no peak above base of 4,000 ft³/s (113 m³/s); minimum daily, 9.2 ft³/s (0.26 m³/s) July 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	289	140	74	56	57	207	310	313	142	111	64
2	53	184	140	70	56	57	188	289	268	144	106	61
3	46	150	140	68	56	57	178	276	256	135	111	57
4	42	124	130	66	56	57	165	273	244	129	99	54
5	38	106	120	64	56	57	161	266	234	122	94	50
6	34	102	110	64	56	57	167	261	224	126	89	49
7	66	97	110	60	56	57	154	383	256	239	86	48
8	131	135	110	58	56	60	1450	410	220	286	82	46
9	122	2280	105	56	56	66	584	359	217	182	79	44
10	88	725	100	56	56	72	595	308	198	148	83	42
11	77	365	110	56	56	90	432	289	186	137	77	40
12	73	281	110	56	56	110	360	281	175	135	76	40
13	66	244	120	56	56	140	289	276	171	131	71	12000
14	59	222	130	56	56	180	273	256	167	124	68	9250
15	57	207	140	56	56	250	281	244	161	121	128	1110
16	49	192	160	56	56	500	256	242	160	117	119	592
17	46	188	180	56	57	700	440	235	156	109	91	560
18	43	171	150	56	57	1000	890	230	154	116	77	532
19	44	160	130	56	57	3600	872	226	152	238	71	497
20	39	158	110	56	57	5450	654	232	163	142	70	1300
21	38	137	100	56	57	6620	560	220	163	167	84	1030
22	43	126	100	56	57	4370	525	213	158	433	68	595
23	112	148	100	56	57	1830	504	203	161	438	67	472
24	109	139	100	56	57	581	462	203	171	244	67	410
25	86	130	90	56	57	374	422	201	167	182	79	356
26	71	120	84	56	57	329	398	196	180	160	67	324
27	68	120	84	56	57	292	380	190	188	140	139	297
28	61	125	86	56	57	286	359	443	154	128	131	271
29	59	130	80	56	---	281	344	1310	148	121	94	259
30	93	135	80	56	---	228	332	525	144	116	77	252
31	308	---	80	56	---	224	---	362	---	112	70	---
TOTAL	2267	7690	3529	1812	1580	28032	12882	9712	5709	5264	2731	30702
MEAN	73.1	256	114	58.5	56.4	904	429	313	190	170	88.1	1023
MAX	308	2280	180	74	57	6620	1450	1310	313	438	139	12000
MIN	34	97	80	56	56	57	154	190	144	109	67	40
CFSM	.12	.42	.19	.10	.09	1.48	.70	.51	.31	.28	.15	1.68
IN.	.14	.47	.22	.11	.10	1.71	.79	.59	.35	.32	.17	1.88
AC-FT	4500	15250	7000	3590	3130	55600	25550	19260	11320	10440	5420	60900

CAL YR 1977	TOTAL	29791.6	MEAN	81.6	MAX	2280	MIN	9.2	CFSM .13	IN 1.82	AC-FT 59090
WTR YR 1978	TOTAL	111910.0	MEAN	307	MAX	12000	MIN	34	CFSM .50	IN 6.84	AC-FT 222000

06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IA

LOCATION.--Lat 40°52'23", long 95°34'48", in NE1/4 NE1/4 sec.17, T.70 N., R.41 W., Fremont County, Hydrologic Unit 10240002, on right bank 30 ft (9 m) upstream from bridge on State Highway 184, 0.3 mi (0.5 km) downstream from Deer Creek, 0.5 mi (0.8 km) west of Randolph, and 16.2 mi (26.1 km) upstream from confluence with East Nishnabotna River.

DRAINAGE AREA.--1,326 mi² (3,434 km²).

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

REVISED RECORDS.--WSP 1440: Drainage area. WDR Iowa 1974: 1973 (M). WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 932.99 ft (284.375 m) NGVD, unadjusted. Prior to Aug. 26, 1955, nonrecording gage and June 30, 1949, to Aug. 25, 1955, supplementary water-stage recorder, operating above gage height 8.4 ft (2.56 m) at same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--30 years, 539 ft³/s (15.26 m³/s), 5.52 in/yr (140 mm/yr), 390,500 acre-ft/yr (481 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,500 ft³/s (1,010 m³/s) June 21, 1967, gage height, 22.60 ft (6.888 m); maximum gage height, 24.8 ft (7.56 m) Mar. 5, 1949, from graph based on gage readings (backwater from ice); minimum daily discharge, 10 ft³/s (0.283 m³/s) Dec. 17-21, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 24 ft (7.3 m), discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,500 ft³/s (184 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	----	9,000	255	ice jam	----	Sept. 14	1515	*12,700	360	*19.46	5.931
July 22	0830	12,100	343	19.18	5.846	Sept. 20	0915	6,850	194	15.96	4.865

Minimum daily discharge, 150 ft³/s (4.248 m³/s) Feb. 16-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,200 ft³/s (289 m³/s) Sept. 4, gage height, 18.14 ft (5.529 m) at 1930 hours, no other peak above base of 6,500 ft³/s (184 m³/s); minimum daily, 59 ft³/s (1.67 m³/s) Jan. 31 to Feb. 2, July 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	449	801	393	360	160	200	507	801	900	344	570	244
2	277	688	393	340	160	190	469	757	740	344	506	263
3	256	557	393	330	160	190	435	746	675	331	472	235
4	247	486	393	330	160	180	408	724	640	306	444	232
5	237	443	350	330	160	170	438	696	615	290	425	232
6	222	426	340	330	160	170	512	746	575	319	411	230
7	615	421	320	330	160	170	453	2060	585	779	402	224
8	978	538	300	300	160	170	470	1440	655	516	402	217
9	550	4280	290	280	160	170	2260	1160	560	535	375	212
10	472	2540	280	250	160	200	1510	1030	525	411	487	205
11	411	1340	280	230	160	250	1160	950	496	348	453	202
12	363	1030	290	220	160	350	861	922	492	645	375	202
13	343	906	320	210	160	450	716	872	468	362	370	4400
14	330	828	400	200	160	600	723	818	453	327	344	12000
15	313	774	450	200	160	800	749	779	439	323	388	4420
16	297	713	450	190	150	1000	828	752	429	319	525	1550
17	285	665	439	190	150	1500	1870	730	414	302	406	1230
18	276	630	416	190	150	2000	2090	719	396	286	348	1390
19	265	605	393	190	150	3500	2110	844	379	319	306	1290
20	258	585	300	190	150	6190	1670	1690	511	762	306	5380
21	261	530	290	180	150	6960	1380	784	482	1350	279	2650
22	363	468	300	180	160	5680	1260	708	487	8160	275	1630
23	361	380	330	180	170	3120	1210	872	520	2010	247	1190
24	490	360	370	180	180	1600	1110	806	453	1150	255	1040
25	448	340	370	180	190	957	1030	708	434	872	315	947
26	381	330	360	180	200	752	970	665	487	724	344	838
27	355	350	340	180	200	669	931	665	520	645	389	782
28	336	370	340	170	200	640	894	994	444	580	483	733
29	327	380	350	170	---	618	862	1170	388	545	350	697
30	324	397	370	170	---	566	867	1650	357	492	299	687
31	736	---	400	170	---	536	---	955	---	506	263	---
TOTAL	11826	23161	11010	7130	4600	41548	30753	29213	15519	25202	11814	45552
MEAN	381	772	355	230	164	1340	1025	942	517	813	381	1518
MAX	978	4280	450	360	200	6960	2260	2060	900	8160	570	12000
MIN	222	330	280	170	150	170	408	665	357	286	247	202
CFSM	.29	.58	.27	.17	.12	1.01	.77	.71	.39	.61	.29	1.15
IN.	.33	.65	.31	.20	.13	1.17	.86	.82	.44	.71	.33	1.28
AC-FT	23460	45940	21840	14140	9120	82410	61000	57940	30780	49990	23430	90350

CAL YR 1977	TOTAL	107639	MEAN 295	MAX	4280	MIN 59	CFSM .22	IN 3.02	AC-FT	213500		
WTR YR 1978	TOTAL	257328	MEAN 705	MAX	12000	MIN 150	CFSM .53	IN 7.22	AC-FT	510400		

06809210 EAST NISHNABOTNA RIVER NEAR ATLANTIC, IA

LOCATION.--Lat 41°20'47", long 95°04'31", in NW1/4 NW1/4 sec.35, T.76 N., R.37 W., Cass County, Hydrologic Unit 10240003, on left bank at downstream side of bridge on county highway, 1.9 mi (3.1 km) upstream from Turkey Creek, and 5.4 mi (8.7 km) southwest of junction of U.S. Highway 6 and State Highway 83 in Atlantic.

DRAINAGE AREA.--436 mi² (1,129 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,105.83 ft (337.057 m) NGVD. Prior to Oct. 1, 1970, at site 2.0 mi (3.2 km) upstream at datum 5.00 ft (1.524 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--18 years, 210 ft³/s (5.947 m³/s), 6.54 in/yr (166 mm/yr), 152,100 acre-ft/yr (188 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,700 ft³/s (756 m³/s) Sept. 12, 1972, gage height, 22.81 ft (6.952 m); minimum daily, 2.5 ft³/s (0.071 m³/s) July 10, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft³/s (85.0 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Mar. 20	2400	*6,440	182	*12.25	3.734	Sept. 13	1200	6,280	178	12.00	3.658

Minimum daily discharge, 33 ft³/s (0.93 m³/s) Dec. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,230 ft³/s (120 m³/s) Sept. 3, gage height, 10.29 ft (3.136m) at 2130 hours, no other peak above base of 3,000 ft³/s (85.0 m³/s); minimum daily 2.5 ft³/s (0.071 m³/s) July 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	556	54	43	45	45	182	346	197	85	112	55
2	127	347	52	44	45	45	184	328	188	87	110	53
3	85	269	50	44	45	45	138	316	188	85	110	50
4	74	200	48	45	45	45	132	313	173	80	103	44
5	69	170	46	45	45	45	138	303	162	76	98	46
6	58	156	44	45	45	47	173	289	151	96	94	46
7	122	151	44	45	45	47	145	693	173	185	89	44
8	442	156	43	45	45	48	760	885	156	127	87	43
9	272	450	43	45	45	48	865	532	145	94	83	40
10	173	228	42	45	45	52	1020	434	135	87	87	38
11	148	151	42	45	45	60	507	399	127	83	80	38
12	117	132	42	45	45	70	387	384	122	87	78	37
13	100	125	44	45	45	90	323	384	115	89	76	2640
14	85	122	48	45	45	120	320	337	115	80	72	3420
15	72	117	52	45	45	150	354	316	115	85	78	556
16	62	108	56	45	45	200	313	299	112	76	89	292
17	58	112	60	45	45	300	1090	289	108	80	72	232
18	50	96	58	45	45	500	1960	272	98	76	65	326
19	40	87	45	45	45	700	1490	286	94	347	63	357
20	37	87	33	45	45	2980	950	344	115	182	60	1920
21	33	58	40	45	45	3390	757	252	112	154	60	960
22	46	52	40	45	45	2240	600	241	96	1200	67	442
23	253	60	40	45	45	1040	500	264	98	600	60	313
24	395	54	40	45	45	395	520	238	120	313	56	265
25	248	50	40	45	45	252	470	225	108	228	72	228
26	168	48	40	45	45	206	440	203	112	182	71	209
27	132	48	40	45	45	228	430	325	108	154	120	188
28	108	50	40	45	45	258	405	282	89	135	120	164
29	87	52	40	45	---	228	385	255	85	125	74	158
30	91	54	42	45	---	200	370	245	91	122	63	152
31	1060	---	43	45	---	197	---	206	---	117	58	---
TOTAL	4908	4346	1391	1391	1260	14271	16308	10485	3808	5517	2527	13356
MEAN	158	145	44.9	44.9	45.0	460	544	338	127	178	81.5	445
MAX	1060	556	60	45	45	3390	1960	885	197	1200	120	3420
MIN	33	48	33	43	45	45	132	203	85	76	56	37
CFSM	.36	.33	.10	.10	.10	1.06	1.25	.78	.29	.41	.19	1.02
IN.	.42	.37	.12	.12	.11	1.22	1.39	.89	.32	.47	.22	1.14
AC-FT	9740	8620	2760	2760	2500	28310	32350	20800	7550	10940	5010	26490

CAL YR 1977	TOTAL	29895.5	MEAN	81.9	MAX 1890	MIN 2.5	CFSM .19	IN 2.55	AC-FT	59300	
WTR YR 1978	TOTAL	79568.0	MEAN	218	MAX 3420	MIN 33	CFSM .50	IN 6.79	AC-FT	157800	

06809500 EAST NISHNABOTNA RIVER AT RED OAK, IA

LOCATION.--Lat 41°00'41", long 95°14'07", in NW1/4 SE1/4 sec.29, T.72 N., R.38 W., Montgomery County, Hydrologic Unit 10240003, on left bank on downstream side of Coolbaugh Street bridge in Red Oak, and 0.2 mi (0.3 km) upstream from Red Oak Creek.

DRAINAGE AREA.--894 mi² (2,315 km²).

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,005.45 ft (306.461 m) NGVD. Prior to July 5, 1925, nonrecording gage at present site at datum 4.60 ft (1.402 m) higher. May 29, 1936, to Nov. 13, 1952, nonrecording gage with supplementary water-stage recorder in operation above 3.2 ft (0.975 m) gage height July 30, 1939, to Nov. 13, 1952, and Nov. 14, 1952, to June 13, 1966, water-stage recorder, all at site 0.5 mi (0.8 km) upstream at datum 5.00 ft (1.524 m) higher. June 14, 1966, to Sept. 30, 1969, at present site at datum 5.00 ft (1.524 m) higher.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--48 years (water years 1918-24, 1936-78), 372 ft³/s (10.54 m³/s), 5.65 in/yr (144 mm/yr), 269,500 acre-ft/yr (332 hm³/yr); median of yearly mean discharges, 360 ft³/s (10.2 m³/s), 5.5 in/yr (140 mm/yr), 261,000 acre-ft/yr (322 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,000 ft³/s (1,080 m³/s) Sept. 13, 1972, gage height, 27.43 ft (8.361 m); maximum gage height, 28.23 ft (8.605 m) June 13, 1947, present datum; minimum daily discharge, 6 ft³/s (0.17 m³/s) Aug. 18, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s (127 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	0545	*9,280	263	*16.34	4.980
Apr. 18	0245	6,270	178	13.82	4.212
Sept. 14	0900	8,440	239	15.70	4.785

Minimum daily discharge, 110 ft³/s (3.12 m³/s) Mar. 5-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	288	1830	380	180	120	115	428	798	556	214	310	139
2	261	983	337	160	120	115	392	698	523	207	303	134
3	250	773	332	170	120	115	360	646	496	203	280	131
4	221	653	324	180	120	115	343	622	472	195	262	127
5	207	577	300	180	120	110	341	600	439	187	246	122
6	196	541	170	190	120	110	489	585	422	193	235	121
7	393	526	210	200	120	110	471	1670	521	476	224	119
8	741	637	300	190	120	110	603	2490	476	526	219	118
9	673	3070	250	170	120	110	2360	1590	400	306	210	115
10	440	1260	210	150	120	120	2250	1160	374	248	228	114
11	368	778	190	140	120	160	1400	988	350	227	226	114
12	334	644	180	130	120	200	953	925	333	219	212	113
13	302	596	170	130	120	280	736	879	320	226	201	3090
14	284	575	200	130	120	350	651	812	305	215	193	5770
15	271	553	280	130	120	430	744	717	298	205	191	1450
16	256	532	370	130	120	500	698	672	295	199	198	601
17	246	513	441	130	120	700	1890	648	286	190	200	473
18	237	492	440	125	120	1000	4810	625	268	177	178	556
19	226	450	345	125	120	4600	4240	618	256	265	168	607
20	219	446	220	125	120	5570	2430	1360	275	472	161	2710
21	213	414	130	125	120	6060	1850	713	298	328	155	2630
22	244	366	160	125	120	5080	1560	594	283	2120	158	1080
23	288	380	200	125	120	2710	1410	828	280	2080	161	740
24	609	383	250	125	120	1040	1230	688	271	794	164	604
25	610	340	230	125	120	705	1090	600	277	555	167	521
26	459	200	220	125	120	547	986	552	287	463	176	464
27	391	210	210	125	120	502	918	1090	285	405	176	427
28	357	330	210	120	115	526	854	1770	253	366	281	392
29	334	364	205	120	---	525	810	981	229	342	203	367
30	481	369	205	120	---	461	790	763	216	325	161	362
31	1830	---	205	120	---	429	---	616	---	318	148	---
TOTAL	12229	19785	7874	4420	3355	33505	38087	28298	10344	13246	6395	24311
MEAN	394	660	254	143	120	1081	1270	913	345	427	206	810
MAX	1830	3070	441	200	120	6060	4810	2490	556	2120	310	5770
MIN	196	200	130	120	115	110	341	552	216	177	148	113
CFSM	.44	.74	.28	.16	.13	1.21	1.42	1.02	.39	.48	.23	.91
IN.	.51	.82	.33	.18	.14	1.39	1.58	1.18	.43	.55	.27	1.01
AC-FT	24260	39240	15620	8770	6650	66460	75550	56130	20520	26270	12680	48220

CAL YR 1977	TOTAL	87574	MEAN 240	MAX 3070	MIN 27	CFSM .27	IN 3.64	AC-FT	173700	
WTR YR 1978	TOTAL	201849	MEAN 553	MAX 6060	MIN 110	CFSM .62	IN 8.40	AC-FT	400400	

06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA

LOCATION.--Lat 40°37'57", long 95°37'32", in SW1/4 SE1/4 sec.11, T.67 N., R.42 W., Fremont County, Hydrologic Unit 10240004, on left bank 1.6 mi (2.6 km) downstream from confluence of East Nishnabotna and West Nishnabotna Rivers and 2 mi (3.2 km) northeast of Hamburg, and at mile 13.2 (21.2 km).

DRAINAGE AREA.--2,806 mi² (7,268 km²).

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

REVISED RECORDS.--WSP 1240: 1923, 1929-37, 1938-40 (M), 1943 (M). WSP 1440: Drainage area. WDR Iowa. 1974: 1973.

GAGE.--Water-stage recorder. Datum of gage is 894.17 ft (272.543 m) NGVD. See WSP 1730 for history of changes prior to Nov. 16, 1950.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--51 years, 1,023 ft³/s (28.97 m³/s), 4.95 in/yr (126 mm/yr), 741,200 acre-ft/yr (914 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,500 ft³/s (1,570 m³/s) June 24, 1947, gage height, 26.03 ft (7.934 m), present site and datum, from floodmark; maximum gage height, 27.42 ft (8.358 m) Sept. 15, 1972; minimum daily discharge, 4.5 ft³/s (0.13 m³/s) Aug. 30, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,000 ft³/s (255 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 21	1830	17,700	501	24.98	7.614	July 22	1100	19,300	547	24.72	7.535
Apr. 17	1845	15,000	425	22.98	7.004	Sept. 15	0030	*20,500	581	*25.17	7.672

Minimum daily discharge, 320 ft³/s (9.06 m³/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	986	3100	1100	650	460	470	1480	2210	1880	890	1410	501
2	818	2340	1100	600	450	470	1400	2090	1740	880	1380	485
3	742	1790	1100	600	450	470	1360	1950	1620	850	1320	465
4	718	1500	1050	620	440	470	1310	1880	1540	810	1230	431
5	678	1340	1000	640	440	460	1370	1840	1460	760	1160	414
6	638	1250	950	650	440	450	1600	1900	1410	785	1090	407
7	999	1200	900	650	430	450	1490	5580	1440	3650	1040	389
8	2260	1290	850	600	430	450	1400	5760	1570	1840	995	374
9	1630	6450	800	550	430	450	3810	4510	1420	1520	960	359
10	1360	5900	750	500	440	460	5290	3400	1300	1270	1100	350
11	1090	3680	720	450	450	500	4020	2960	1240	990	1320	332
12	954	2680	700	420	450	600	2770	2820	1180	2350	965	320
13	914	2190	750	450	450	700	2240	2610	1130	1500	870	1950
14	870	2040	850	480	450	1000	2280	2370	1120	1370	815	16600
15	830	1960	950	480	450	1800	2310	2190	1100	1830	830	13300
16	802	1860	1100	460	440	2200	3100	2060	1080	1040	1000	3440
17	778	1760	1200	450	430	2800	7520	1980	1060	905	915	2430
18	742	1680	1380	450	430	3200	8660	1910	1050	820	815	3580
19	714	1630	1280	450	440	8000	8290	1850	1030	810	710	2230
20	694	1620	1100	460	440	14400	6190	3360	1060	2640	650	6430
21	690	1530	900	460	450	15600	4810	2470	1140	2400	624	7860
22	1230	1450	700	470	450	13300	4180	1940	1100	16600	610	4110
23	1110	1430	750	480	470	8000	3870	1930	1660	9060	624	2680
24	1050	1430	850	480	480	5070	3390	2310	1130	4270	755	2160
25	1300	1400	800	480	500	3000	3070	1880	1060	2850	955	1840
26	1190	1000	700	470	500	2360	2850	1740	1100	2240	745	1650
27	1040	800	600	470	490	2030	2650	1640	1420	1680	770	1490
28	966	850	620	470	480	1890	2530	3100	1180	1680	870	1380
29	906	1000	640	480	---	1790	2410	2680	1030	1540	905	1300
30	890	1050	660	490	---	1640	2310	2790	935	1500	682	1260
31	1990	---	700	500	---	1550	---	2090	---	1460	574	---
TOTAL	31579	59200	27550	15860	12660	96030	99960	79800	38205	72990	28689	80517
MEAN	1019	1973	889	512	452	3098	3332	2574	1274	2355	925	2684
MAX	2260	6450	1380	650	500	15600	8660	5760	1880	16600	1410	16600
MIN	638	800	600	420	430	450	1310	1640	935	760	574	320
CFSM	.36	.70	.32	.18	.16	1.10	1.19	.92	.45	.84	.33	.96
IN.	.42	.78	.37	.21	.17	1.27	1.33	1.06	.51	.97	.38	1.07
AC-FT	62640	117400	54650	31460	25110	190500	198300	158300	75780	144800	56900	159700

CAL YR 1977	TOTAL	272563	MEAN	747	MAX	8490	MIN 94	CFSM .27	IN 3.61	AC-FT	540600	
WTR YR 1978	TOTAL	643040	MEAN	1762	MAX	16600	MIN 320	CFSM .63	IN 8.52	AC-FT	1275000	

06811840 TARKIO RIVER AT STANTON, IA

LOCATION.--Lat 40°58'52", long 95°06'32", in NW1/4 SW1/4 sec.4, T.71 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, on right bank 10 ft (3 m) downstream from bridge on county highway H42, 0.1 mi (0.2 km) downstream from Little Tarkio Creek, and 0.5 mi (0.8 km) west of Stanton.

DRAINAGE AREA.--49.3 mi² (127.7 km²).

PERIOD OF RECORD.--October 1957 to current year. Annual maximum, water years 1952-57.

REVISED RECORDS.--WSP 1919: 1960 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,104.67 ft (336.703 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--21 years, 27.1 ft³/s (0.767 m³/s), 7.46 in/yr (189 mm/yr), 19,630 acre-ft/yr (24.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft³/s (637 m³/s) June 9, 1967, gage height, 28.56 ft (8.705 m), from rating curve extended above 1,600 ft³/s (45.3 m³/s) on basis of slope-area measurement of peak flow; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 9	0100	2,790	79.0	14.62	4.456	July 22	0015	1,930	54.7	13.26	4.042
Apr. 17	1230	3,520	99.7	15.57	4.746						

Minimum daily discharge, 0.12 ft³/s (0.003 m³/s) Sept. 10-12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	106	42	16	5.4	9.0	23	49	83	10	18	.60
2	57	122	38	14	5.4	9.5	22	46	56	8.3	65	.50
3	50	88	38	13	5.4	9.5	22	44	54	6.1	18	.45
4	49	76	38	12	5.4	9.5	18	44	47	5.4	17	.40
5	44	72	32	11	5.4	9.0	26	41	46	4.8	15	.35
6	41	69	28	11	5.4	9.0	32	88	44	13	14	.30
7	311	67	30	11	5.2	9.5	22	477	51	79	12	.17
8	128	276	28	11	5.2	9.5	20	253	44	27	11	.16
9	88	734	24	10	5.2	10	140	152	38	21	11	.14
10	76	131	23	8.0	5.2	12	166	141	32	16	53	.12
11	68	114	23	7.0	5.2	15	79	136	30	15	15	.12
12	63	100	24	6.6	5.2	20	58	133	26	16	13	.12
13	61	94	26	6.4	5.2	45	47	112	25	13	11	4.9
14	57	85	30	6.2	5.2	110	92	94	26	11	9.0	1.7
15	55	79	35	6.0	5.2	120	81	73	25	11	11	.84
16	52	69	40	5.8	5.0	130	154	61	20	8.4	8.2	.78
17	56	63	50	5.8	5.0	135	986	49	18	6.5	6.7	67
18	54	60	33	5.6	5.0	300	356	39	17	5.5	5.4	99
19	52	58	32	5.6	5.0	451	237	46	16	16	5.4	14
20	52	56	24	5.5	5.0	404	146	185	17	150	5.4	194
21	51	46	23	5.5	5.2	261	118	71	21	295	4.8	38
22	115	46	25	5.5	5.6	128	109	71	20	586	3.3	23
23	65	51	26	5.5	6.0	52	102	186	26	107	1.9	18
24	67	48	23	5.5	6.4	32	83	121	20	65	36	17
25	60	43	19	5.5	6.8	25	73	98	17	47	8.1	15
26	56	36	20	5.5	7.2	23	67	83	20	35	4.7	14
27	51	34	19	5.5	7.4	29	61	225	15	29	6.1	13
28	48	35	19	5.5	8.0	30	58	126	13	25	3.4	12
29	47	38	19	5.5	---	28	56	83	11	22	2.5	14
30	254	42	18	5.4	---	28	56	90	10	21	.88	15
31	301	---	16	5.4	---	26	---	85	---	19	.70	---
TOTAL	2597	2938	865	237.8	156.8	2488.5	3510	3502	888	1694.0	393.48	564.65
MEAN	83.8	97.9	27.9	7.67	5.60	80.3	117	113	29.6	54.6	12.8	18.8
MAX	311	734	50	16	8.0	451	986	477	83	586	65	194
MIN	41	34	16	5.4	5.0	9.0	18	39	10	4.8	.70	.12
CFSM	1.70	1.99	.57	.16	.11	1.63	2.37	2.29	.60	1.11	.26	.38
IN.	1.96	2.22	.65	.18	.12	1.88	2.65	2.64	.67	1.28	.30	.43
AC-FT	5150	5830	1720	472	311	4940	6960	6950	1760	3360	786	1120

CAL YR 1977 TOTAL 14962.40 MEAN 41.0 MAX 1870 MIN .00 CFSM .83 IN 11.29 AC-FT 29680
WTR YR 1978 TOTAL 19838.23 MEAN 54.4 MAX 986 MIN .12 CFSM 1.10 IN 14.97 AC-FT 39350

06813500 MISSOURI RIVER AT RULO, NB

LOCATION.--Lat 40°03'14", long 95°25'12", in NW1/4 NW1/4 sec.17, T.1 N., R.18 E., Richardson County, Hydrologic Unit 10240005, on downstream end of middle pier of bridge on U.S. Highway 159 at Rulo, 3.2 mi (5.1 km) upstream from Nemaha River, and at mile 498.0 (801.3 km).

DRAINAGE AREA (REVISED).--414,900 mi² (1,074,600 km²), approximately. The 3,959 mi² (10,254 km²) in Great Divide basin are not included.

PERIOD OF RECORD.--October 1949 to current year in reports of Geological Survey. Gage-height record collected at site 80 ft (24 m) upstream January 1886 to December 1899 published in reports of Missouri River Commission September 1929 to September 1950 in files of Kansas City office of Corps of Engineers.

GAGE.--Water-stage recorder. Datum of gage is 837.23 ft (255.188 m) NGVD. Prior to Sept. 13, 1950, nonrecording gage at site 80 ft (24 m) upstream at same datum.

REMARKS.--Records good except those for winter period, which are poor. Flow regulated by upstream main-stem reservoirs. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--29 years, 39,270 ft³/s (1,112 m³/s), 28,450,000 acre-ft/yr (35,100 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 358,000 ft³/s (10,100 m³/s) Apr. 22, 1952, gage height, 25.60 ft (7.803 m); minimum daily, 4,420 ft³/s (125 m³/s) Jan. 13, 1957; minimum gage height, 0.65 ft (0.198 m) Jan. 7, 1971, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1881 reached a stage of 22.9 ft (6.98 m), from floodmark, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 161,000 ft³/s (4,560 m³/s) Mar. 23, gage height, 22.01 ft (6.709 m); minimum daily, 14,000 ft³/s (396 m³/s) Jan. 30; minimum gage height, 3.76 ft (1.146 m) Jan. 29,30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39400	42500	28100	23200	17000	22600	52000	49000	59400	51600	62400	57900
2	40000	43500	27000	22200	17000	23200	49800	47800	57100	51800	61900	57500
3	39800	40300	27100	21400	18000	22900	47600	47100	55000	52700	61100	57900
4	38900	39200	24700	20400	18000	22400	46700	46000	54000	51300	62100	57700
5	38700	38400	24200	19500	17500	22300	47400	45300	52400	50300	60800	56800
6	38300	37700	22900	20500	17500	21500	49200	44900	50900	50500	59700	57400
7	40000	37500	21200	22300	18000	21800	50400	90000	50200	56800	57700	57400
8	48300	38200	19500	21900	18500	22600	55100	80700	49800	61600	57100	57200
9	45700	74800	18700	20500	18500	24000	63500	62000	49800	61500	57400	57000
10	43200	72800	17200	19400	19300	24300	88700	53700	49000	55900	57900	57000
11	40300	56800	17700	18800	20100	24200	74000	50700	50200	54300	61100	56800
12	39000	49600	19900	18900	21300	25000	62000	49400	49800	57500	58200	57000
13	38500	46100	20900	19100	22400	27900	56700	50100	49200	60200	58600	58800
14	38800	44100	21700	19800	21800	45200	51000	46600	48700	56500	58300	85600
15	39400	43900	23300	20600	21000	55500	50900	44900	48200	60600	58200	89100
16	39300	44600	24300	20600	20600	60800	53200	44000	47800	56400	60700	73800
17	39000	44700	24800	20000	20600	64000	70500	42300	48000	54500	62600	66800
18	39300	45000	25100	19700	20500	67700	106000	41800	48800	53300	62100	83900
19	38900	45100	26300	19600	20300	110000	85600	41300	53600	58600	62700	72700
20	38600	45000	25400	19600	20300	122000	68800	45900	54400	61600	61500	74000
21	38600	44400	23200	19800	20600	134000	62900	45000	53500	65100	61300	79000
22	45000	44700	22100	20300	20700	148000	60400	41900	52700	80000	60000	73300
23	45100	43600	21600	20400	21000	160000	61000	41600	52700	100000	59100	66600
24	44800	41200	21600	20800	20800	149000	58600	41900	52900	90000	58500	63200
25	41900	40400	22400	19000	21800	111000	55300	41900	52700	78600	58900	61500
26	40600	37700	23300	19800	22900	86200	53000	41400	53100	74900	58900	60100
27	39200	34200	22000	18500	23200	77700	51700	42900	51700	71600	58700	58600
28	38900	31400	21000	17000	23100	69000	49700	47000	56100	69600	60000	58400
29	38800	29100	20700	15000	---	60500	49100	49400	51800	67100	60000	58200
30	38900	28300	20800	14000	---	56300	48000	49700	50900	64800	59000	58200
31	43500	---	22300	15000	---	54600	---	53200	---	63800	57900	---
TOTAL	1258700	1304800	701000	607500	562300	1936200	1778800	1519400	1564400	1943000	1854400	1929400
MEAN	40600	43490	22610	19600	20080	62460	59290	49010	52150	62680	59820	64310
MAX	48300	74800	28100	23200	23200	160000	106000	90000	61700	100000	62700	89100
MIN	38300	28300	17200	14000	17000	21500	46700	41300	47800	50300	57100	56800
AC-FT	2497000	2588000	1390000	1205000	1115000	3840000	3528000	3014000	3103000	3854000	3678000	3827000

CAL YR 1977 TOTAL 13105400 MEAN 35910 MAX 77700 MIN 14000 AC-FT 25990000
WTR YR 1978 TOTAL 16960000 MEAN 46470 MAX 160000 MIN 14000 AC-FT 33640000

06817000 NODAWAY RIVER AT CLARINDA, IA

LOCATION.--Lat 40°44'19", long 95°00'47", in SW1/4 NE1/4 sec.32, T.69 N., R.36 W., Page County, Hydrologic Unit 10240009, near left abutment on downstream side of bridge on State Highway 2 (city route), 0.5 mi (0.8 km) downstream from North Branch, 1.2 mi (1.9 km) east of city square of Clarinda, and 7.5 mi (12.1 km) upstream from East Nodaway River.

DRAINAGE AREA.--762 mi² (1,973 km²).

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Datum of gage is 960.36 ft (292.718 m) NGVD. Prior to July 5, 1925, and May 28, 1936, to Mar. 26, 1957, nonrecording gage at same site and datum.

REMARKS.--Records good prior to Aug. 28 and fair thereafter, except those for winter period, which are poor. Clarinda municipal water supply is taken from Nodaway River, 500 ft (152 m) above station. Average daily pumpage was 1.05 ft³/s (0.030 m³/s).

COOPERATION.--Average pumpage furnished by Clarinda water works.

AVERAGE DISCHARGE.--48 years (1918-24, 1936-78), 329 ft³/s (9.317 m³/s), 5.86 in/yr (149 mm/yr), 238,400 acre-ft/yr (294 hm³/yr); median of yearly mean discharges, 260 ft³/s (7.36 m³/s), 4.6 in/yr (117 mm/yr), 188,000 acre-ft/yr (232 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,100 ft³/s (881 m³/s) June 13, 1947, gage height, 25.3 ft (7.71 m), from floodmark, from rating curve extended above 15,000 ft³/s (425 m³/s) on basis of an overflow profile and extended channel rating; minimum daily, 1 ft³/s (0.028 m³/s) Sept. 5, 9, 12, 14, 1918, Dec. 9, 27-31, 1923.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1903 reached a stage of 25.4 ft (7.74 m), from floodmarks, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,000 ft³/s (142 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 31	1100	10,800	306	11.00	3.353	May 20	0615	5,470	155	7.55	2.301
Nov. 8	2400	6,560	186	8.33	2.539	May 23	1630	6,270	178	8.12	2.475
Mar. 19	0830	6,170	175	8.05	2.454	May 27	2045	7,540	214	8.96	2.731
Apr. 17	1800	*23,300	660	*17.03	5.191	July 20	1230	8,770	248	9.73	2.966
May 7	1200	6,530	185	8.31	2.533	July 21	2400	17,900	507	14.73	4.490

Minimum daily discharge, 47 ft³/s (1.33 m³/s) Sept. 11,12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	629	3110	380	140	110	110	380	399	1120	147	199	68
2	468	2240	375	130	110	110	320	319	622	140	387	66
3	378	1670	340	130	110	110	270	278	489	138	207	64
4	342	1160	314	130	110	110	244	266	423	125	170	59
5	328	928	250	130	110	110	322	254	375	110	157	55
6	305	859	180	130	110	110	385	336	343	147	140	54
7	818	816	180	130	110	110	391	4900	368	2130	129	54
8	982	1040	200	120	110	110	288	3980	322	1630	127	51
9	830	4380	200	120	110	110	1170	1570	284	416	118	51
10	643	1830	200	120	110	120	2600	1040	266	261	1280	50
11	533	1010	220	120	110	150	1310	863	253	202	324	47
12	453	799	240	120	110	200	649	2220	232	339	234	47
13	411	741	280	120	110	300	464	1180	221	199	193	73
14	396	709	320	120	110	600	464	950	213	175	168	123
15	376	679	380	120	110	1000	482	708	210	154	195	171
16	359	622	350	120	110	2000	2080	648	208	139	168	112
17	342	575	500	110	110	3000	12200	632	201	124	151	113
18	328	540	442	110	110	3560	14800	590	185	115	128	1220
19	310	496	318	110	110	5810	6960	555	170	574	116	502
20	297	500	130	110	110	5050	3250	3270	211	3260	107	1840
21	297	460	120	110	110	4870	2230	836	243	2530	98	1020
22	1080	407	120	110	110	3810	1650	501	260	7940	95	368
23	738	427	130	110	110	1980	1420	3460	286	2210	94	195
24	1500	424	140	110	110	788	1050	2560	255	779	112	159
25	1100	350	150	110	110	438	838	1080	243	485	125	145
26	695	200	150	110	110	411	698	725	262	360	95	138
27	568	280	150	110	110	452	598	1980	343	281	113	134
28	495	350	150	110	110	540	526	3150	224	243	99	124
29	456	370	150	110	---	496	481	1270	167	218	82	124
30	858	350	150	110	---	427	453	1600	150	210	78	129
31	7330	---	150	110	---	393	---	760	---	204	73	---
TOTAL	24645	28322	7359	3650	3080	37385	58973	42880	9149	25985	5762	7356
MEAN	795	944	237	118	110	1206	1966	1383	305	838	186	245
MAX	7330	4380	500	140	110	5810	14800	4900	1120	7940	1280	1840
MIN	297	200	120	110	110	110	244	254	150	110	73	47
CFSM	1.04	1.24	.31	.16	.14	1.58	2.58	1.82	.40	1.10	.24	.32
IN.	1.20	1.38	.36	.18	.15	1.83	2.88	2.09	.45	1.27	.28	.36
AC-FT	48880	56180	14600	7240	6110	74150	117000	85050	18150	51540	11430	14590

CAL YR 1977 TOTAL 164718 MEAN 451 MAX 18200 MIN 12 CFSM .59 IN 8.04 AC-FT 326700
WTR YR 1978 TOTAL 254546 MEAN 697 MAX 14800 MIN 47 CFSM .92 IN 12.43 AC-FT 504900

05817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1976 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to current year.
WATER TEMPERATURE: October 1975 to current year.
SEDIMENT RECORDS: October 1975 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. Suspended-sediment samples at normal flows and winter period are collected below dam 300 ft (91 m) upstream from gage. Samples at higher stages are collected from bridge at gage. No daily temperature record for several days, October to February.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 470 micromhos Jan. 16, 1976, Nov. 19, 1977, Sept. 1, 1978; minimum daily, 130 micromhos June 15, 1976.
WATER TEMPERATURES: Maximum daily, 30.5°C Aug. 23, 1978; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 23,800 mg/L Apr. 17, 1978; minimum daily mean, 5 mg/L Dec. 14, 1977, Feb. 24, 1978.
SEDIMENT LOADS: Maximum daily, 991,000 tons (899,000 tonnes) Sept. 2, 1977; minimum daily, 0.23 ton (0.21 tonne) Dec. 14, 1977.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 470 micromhos Nov. 19, Sept. 1; minimum daily, 180 micromhos Mar. 20.
WATER TEMPERATURES: Maximum daily, 30.5°C Aug. 23; minimum daily, 0.0°C several days.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 23,800 mg/L Apr. 17; minimum daily mean, 5 mg/L Feb. 24.
SEDIMENT LOADS: Maximum daily, 952,000 tons (864,000 tonnes) Apr. 17; minimum daily, 1.5 ton (1.4 tonne) Dec. 14.

WATER QUALITY DATA, OCTOBER 1977 TO SEPTEMBER 1978

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	275	410	400	400	---	270	340	300	420	400	470
2	400	350	420	410	360	---	265	340	350	430	450	460
3	410	360	410	440	---	---	360	380	400	---	400	---
4	420	380	---	410	410	---	360	380	420	430	440	450
5	420	---	420	410	380	---	---	350	400	390	450	450
6	420	400	450	410	380	420	340	290	410	420	450	440
7	---	320	420	410	400	420	350	280	410	240	450	440
8	270	---	440	---	390	410	370	260	---	240	450	440
9	320	---	450	400	---	420	370	310	410	320	450	430
10	380	350	400	420	---	420	310	340	420	360	---	400
11	400	390	440	410	370	420	310	350	420	400	380	430
12	410	---	440	430	400	420	340	280	420	370	430	420
13	410	---	410	410	---	420	340	320	420	390	450	370
14	420	410	400	420	420	370	350	340	420	400	450	370
15	420	410	---	410	400	300	300	370	420	410	430	---
16	420	420	360	420	410	280	290	300	420	420	440	410
17	420	420	350	400	400	260	250	380	420	420	450	300
18	420	400	360	---	360	250	185	390	430	430	460	310
19	---	470	---	---	450	---	---	400	430	270	350	300
20	---	410	400	---	380	180	290	---	420	290	450	290
21	430	430	450	370	360	200	320	290	415	290	460	290
22	---	410	420	240	400	200	300	360	410	280	460	340
23	---	---	440	420	420	220	340	230	400	---	450	400
24	275	---	440	400	420	240	340	220	420	370	450	420
25	350	430	440	400	420	290	360	340	420	230	420	440
26	380	---	440	410	420	260	360	360	420	410	440	450
27	420	---	440	370	430	330	350	380	390	430	---	455
28	420	440	450	420	450	330	370	200	420	445	440	450
29	420	440	410	420	---	320	330	310	420	450	450	450
30	410	410	440	360	---	290	380	250	430	400	---	440
31	---	---	410	360	---	340	---	360	---	450	450	---

06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	12.0	---	---		.0	14.0	11.0	19.0	26.0	26.0	---
2	---	---	---	---		---	12.0	13.0	19.0	27.0	25.0	---
3	---	---	---	---		---	14.0	13.0	20.0	---	23.0	---
4	---	---	---	---		---	13.0	12.0	---	27.0	20.0	---
5	---	---	---	---		---	11.0	12.0	19.0	27.0	20.0	24.0
6	---	---	---	---		4.0	---	12.0	25.0	25.0	22.0	---
7	---	---	---	---		1.0	16.0	13.0	---	22.0	---	---
8	---	---	---	---		4.0	17.0	13.0	---	---	25.0	---
9	---	---	---	---		1.0	17.0	12.0	21.0	---	26.0	---
10	---	---	---	---		2.0	12.0	14.0	21.0	22.0	21.0	---
11	---	---	---	---		2.0	13.0	17.0	22.0	22.0	25.0	---
12	---	---	---	---		3.0	14.0	15.0	21.0	---	---	---
13	---	---	---	---		2.0	12.0	14.0	21.0	---	---	---
14	---	---	---	---		2.0	12.0	15.0	21.0	25.0	30.0	---
15	---	---	---	---		2.0	---	15.0	24.0	24.0	---	---
16	---	---	---	---		3.0	---	17.0	24.0	27.0	30.0	---
17	---	---	---	---		2.0	8.0	17.0	---	28.0	28.0	---
18	---	---	---	---		4.0	6.0	18.5	---	26.0	28.0	---
19	---	---	---	---		5.0	7.0	20.0	22.0	26.0	---	---
20	---	---	---	---		3.0	6.0	---	21.0	26.0	---	---
21	---	---	2.5	---		2.0	7.0	19.0	21.5	25.0	23.0	---
22	---	1.5	---	---		9.0	10.0	19.0	23.0	24.0	25.0	---
23	---	---	---	---		6.0	10.0	18.0	22.0	24.0	30.5	---
24	10.5	---	---	.0		5.0	13.0	18.0	23.0	25.0	24.0	---
25	---	---	---	---		4.0	9.0	19.0	26.0	23.0	25.0	---
26	---	---	---	---		5.0	13.0	21.0	21.0	26.0	24.0	---
27	---	---	---	---		11.0	13.0	---	28.0	---	---	21.5
28	---	---	.0	---		12.0	13.0	---	---	24.0	---	---
29	---	---	---	---		10.5	14.0	---	25.0	---	---	---
30	---	---	---	---		11.0	14.0	19.0	26.0	---	---	---
31	---	---	---	---		15.0	---	19.0	---	---	---	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	252	428	2860	25500	142	146	38	14	13	3.9	24	7.1
2	160	202	1270	7680	147	149	28	9.8	28	8.3	34	10
3	125	128	880	3970	134	123	36	13	25	7.4	31	9.2
4	110	102	570	1790	125	106	29	10	11	3.3	27	8.0
5	107	95	420	1050	105	71	25	8.8	31	9.2	24	7.1
6	81	67	360	835	25	12	24	8.4	18	5.3	21	6.2
7	1920	7090	330	727	33	16	24	8.4	10	3.0	9	2.7
8	2600	6890	1100	7050	58	31	24	7.8	10	3.0	9	2.7
9	1030	2310	4290	56700	51	28	24	7.8	11	3.3	20	5.9
10	450	781	1190	6390	72	39	28	9.1	11	3.3	14	4.5
11	330	475	480	1310	78	46	26	8.4	11	3.3	21	8.5
12	282	345	342	738	83	54	22	7.1	23	6.8	36	19
13	225	250	292	584	81	61	22	7.1	18	5.3	81	66
14	184	197	260	498	73	63	27	8.7	9	2.7	338	548
15	180	183	248	455	102	105	24	7.8	12	3.6	416	1120
16	159	154	227	381	138	130	20	6.5	9	2.7	372	2010
17	139	128	215	334	613	828	20	5.9	8	2.4	475	3850
18	132	117	212	309	375	448	18	5.3	15	4.5	1250	12000
19	124	104	222	297	205	176	19	5.6	13	3.9	6150	96500
20	116	93	197	266	84	29	21	6.2	30	8.9	9300	127000
21	110	88	170	211	42	14	38	11	23	6.8	9350	123000
22	1520	4430	162	178	39	13	83	25	11	3.3	8100	83300
23	680	1350	156	180	18	6.3	24	7.1	6	1.8	4850	25900
24	1120	4540	142	163	40	15	25	7.4	5	1.5	2650	5640
25	720	2140	124	117	38	15	19	5.6	10	3.0	820	970
26	389	730	60	32	37	15	20	5.9	11	3.3	460	510
27	279	428	37	28	37	15	43	13	9	2.7	500	610
28	230	307	52	49	88	36	17	5.0	7	2.1	670	977
29	234	288	62	62	68	28	7	2.1	---	---	660	884
30	1120	5880	121	114	40	16	24	7.1	---	---	490	565
31	5750	94500	---	---	39	16	20	5.9	---	---	409	434
TOTAL	---	134820	---	117998	---	2850.3	---	260.8	---	118.6	---	485974.9

06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	402	412	499	538	4540	15000	64	25	14	7.5	56	10
2	328	283	418	360	1500	2620	64	24	375	608	46	8.2
3	267	195	360	270	563	743	63	23	280	156	43	7.4
4	398	262	330	227	437	499	53	18	110	50	45	7.2
5	3300	2870	320	219	412	417	20	5.9	61	26	46	6.8
6	1470	1530	155	141	334	309	1490	788	50	19	50	7.3
7	1300	1370	12400	174000	358	356	6670	40800	38	13	46	6.7
8	610	474	5480	63300	325	283	5240	27300	25	8.6	48	6.6
9	5340	26600	2210	9370	277	212	1380	1550	23	7.3	58	8.0
10	10500	39700	1100	3090	213	153	500	352	13100	84200	59	8.0
11	4150	15100	1150	2660	183	125	350	191	630	551	58	7.4
12	1350	4770	9120	59400	164	103	654	735	133	84	58	7.4
13	870	1090	2650	8440	127	76	345	185	85	44	88	17
14	1100	1360	1190	3050	105	60	219	103	41	19	166	55
15	600	781	768	1510	88	50	162	67	103	54	212	98
16	6500	36500	500	875	78	44	124	47	100	45	193	58
17	23800	952000	420	717	52	28	83	28	62	25	295	177
18	18600	810000	388	618	58	29	50	16	37	13	2210	7450
19	10400	195000	349	523	55	25	3250	7800	22	6.9	1830	2480
20	5600	49100	9580	95900	158	90	6040	69300	44	13	1650	8200
21	3250	19600	4790	12100	142	90	3800	26000	58	15	1540	4240
22	2170	9670	1600	2160	170	119	5060	13300	60	15	840	835
23	1750	6710	12300	142000	213	164	2700	16100	40	10	282	148
24	1750	4960	6050	52300	197	139	980	2060	83	25	167	72
25	1170	2580	1800	5250	188	123	271	355	101	34	125	49
26	905	1710	950	1860	345	244	282	274	90	23	140	52
27	770	1240	6680	81540	925	857	223	169	72	22	126	46
28	660	997	12400	138000	230	139	188	123	54	14	94	31
29	590	766	2820	10900	340	155	110	65	48	11	82	27
30	580	709	8520	42200	57	23	19	11	46	10	80	28
31	---	---	1300	2670	---	---	46	26	56	11	---	---
TOTAL	---	2188299	---	916178	---	23170	---	327540.9	---	86140.3	---	24164.0

TOTAL LOAD FOR YEAR: 4307504.8 TONS.

06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	TEMPERATURE (DEG C) (00010)	NUMBER OF SAMPLING POINTS (00063)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
OCT									
08...	0805	--	--	960	2880	7470	34	38	41
31...	0945	--	--	7330	7100	141000	29	32	--
NOV									
09...	1430	--	--	2800	3600	27200	36	40	--
JAN									
24...	1600	.0	3	114	--	--	--	--	--
MAR									
19...	0830	5.0	--	5810	5720	89700	10	23	25
22...	1310	9.0	--	3740	7990	80700	40	45	47
24...	0900	5.0	--	878	2940	6970	65	67	68
APR									
05...	0830	11.0	--	424	7760	8880	50	59	60
10...	1000	13.0	--	3010	8730	70900	49	50	52
18...	0635	5.5	--	19200	15700	814000	33	39	46
19...	0710	7.0	--	6920	11400	213000	30	34	38
JUL									
21...	0830	26.0	--	800	2700	5830	78	75	87
22...	0915	24.0	--	9490	2880	73800	41	43	57
AUG									
10...	0835	21.0	--	2230	29500	178000	35	37	42
23...	1650	30.5	3	92	--	--	--	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)
OCT									
08...	50	93	97	100	--	--	--	--	--
31...	38	82	85	90	95	100	--	--	--
NOV									
09...	52	94	97	100	--	--	--	--	--
JAN									
24...	--	--	--	--	--	--	--	--	0
MAR									
19...	41	88	92	98	99	100	--	--	--
22...	57	96	98	100	--	--	--	--	--
24...	77	100	--	--	--	--	--	--	--
APR									
05...	75	100	--	--	--	--	--	--	--
10...	67	99	99	100	--	--	--	--	--
18...	56	91	98	99	100	--	--	--	--
19...	48	92	96	99	100	--	--	--	--
JUL									
21...	92	--	--	--	--	--	100	--	--
22...	67	95	99	100	--	--	--	--	--
AUG									
10...	59	99	100	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	1	1

DATE	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
OCT								
08...	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--
NOV								
09...	--	--	--	--	--	--	--	--
JAN								
24...	12	57	87	97	99	100	--	--
MAR								
19...	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--
APR								
05...	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--
JUL								
21...	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--
AUG								
10...	--	--	--	--	--	--	--	--
23...	6	38	67	78	85	91	95	100

06818750 PLATTE RIVER NEAR DIAGONAL, IA

LOCATION.--Lat 40°46'02", long 94°24'46", in NE1/4 NW1/4 sec.22, T.69 N., R.31 W., Ringgold County, Hydrologic Unit 10240012, on left bank at downstream side of bridge on county highway, 2.2 mi (3.5 km) upstream from Turkey Creek, 4.6 mi (7.4 km) southwest of Diagonal, and 4.9 mi (7.9 km) downstream from Gard Creek.

DRAINAGE AREA.--217 mi² (562 km²).

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

REVISED RECORDS.--WSP 2119: 1969 (P).

GAGE.--Water-stage recorder. Datum of gage is 1,095.27 ft (333.838 m) NGVD.

REMARKS.--Records fair except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 131 ft³/s (3.710 m³/s), 8.20 in/yr (208 mm/yr), 94,910 acre-ft/yr (117 hm³/yr); median of yearly mean discharge, 110 ft³/s (3.12 m³/s), 6.9 in/yr (175 mm/yr), 79,700 acre-ft/yr (98.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,420 ft³/s (182 m³/s) Oct. 12, 1973, gage height, 23.24 ft (7.084 m); minimum daily, 0.21 ft³/s (0.006 m³/s) Jan. 14, 15, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1967 reached a stage of 23.16 ft (7.059 m), from floodmark by local resident, discharge, 6,360 ft³/s (180 m³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft³/s (85.0 m³/s), revised, and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 22	1130	3,160	89.5	16.27	4.959	May 7	--	4,500	127	---	
Oct. 24	0415	5,260	149	20.93	6.379	July 21	0230	4,730	134	19.85	6.050
Oct. 31	0600	5,040	143	20.47	6.239	July 22	1215	4,170	118	18.60	5.669
Apr. 18	0900	*5,820	165	*22.03	6.715						

Minimum daily discharge, 0.30 ft³/s (0.008 m³/s) Jan. 21 to Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	1140	35	5.0	.30	6.8	83	80	200	24	60	13
2	90	639	37	4.5	.30	7.0	69	50	100	22	59	13
3	70	399	38	4.3	.30	7.2	57	70	80	23	57	13
4	68	277	35	4.2	.30	7.4	50	103	64	22	35	12
5	70	223	30	4.2	.30	8.5	104	200	55	19	30	9.6
6	60	206	25	4.2	.30	11	169	1000	45	21	28	9.6
7	656	195	23	4.2	.30	15	89	3100	40	815	27	8.6
8	1320	190	23	4.0	.30	20	98	1380	35	182	27	9.2
9	350	365	24	2.0	.30	25	218	424	25	101	26	10
10	228	208	24	1.0	.30	30	1260	250	24	74	218	10
11	222	140	27	.80	.30	50	292	182	22	51	82	11
12	163	112	35	.60	.30	60	137	193	16	112	38	13
13	125	99	40	.45	.30	80	89	363	14	101	27	13
14	107	96	45	.40	.30	100	236	198	12	49	21	18
15	107	101	50	.35	.30	150	337	126	10	41	18	16
16	104	99	60	.35	.30	250	481	107	9.5	35	17	11
17	84	91	100	.35	.30	400	2580	99	8.0	28	15	26
18	80	79	80	.35	.30	700	4500	90	8.5	27	14	266
19	65	66	50	.35	.30	1500	1690	250	8.0	1050	13	110
20	62	74	38	.35	.30	1700	570	1500	18	2150	12	1120
21	74	73	25	.30	.30	1990	342	500	20	2320	11	661
22	2380	53	20	.30	.30	1350	260	200	17	3730	9.6	115
23	2220	51	15	.30	.35	689	229	800	18	678	8.9	55
24	4610	52	12	.30	.90	267	183	300	18	239	8.6	40
25	1420	50	10	.30	1.5	127	156	200	16	155	8.9	35
26	572	50	9.0	.30	2.5	118	130	168	23	119	8.9	30
27	378	51	7.0	.30	3.5	162	111	250	43	99	15	29
28	289	42	6.5	.30	5.5	175	80	1000	32	79	30	24
29	240	31	6.5	.30	---	135	90	200	19	66	20	21
30	404	32	6.5	.30	---	111	100	150	22	59	16	24
31	4310	---	6.2	.30	---	100	---	100	---	56	13	---
TOTAL	21080	5284	942.7	45.25	20.85	10351.9	14790	13633	1022.0	12547	973.9	2746.0
MEAN	680	176	30.4	1.46	.74	334	493	440	34.1	405	31.4	91.5
MAX	4610	1140	100	5.0	5.5	1990	4500	3100	200	3730	218	1120
MIN	60	31	6.2	.30	.30	6.8	50	50	8.0	19	8.6	8.6
CFSM	3.13	.81	.14	.007	.003	1.54	2.27	2.03	.16	1.87	.15	.42
IN.	3.61	.91	.16	.01	.00	1.77	2.54	2.34	.18	2.15	.17	.47
AC-FT	41810	10480	1870	90	41	20530	29340	27040	2030	24890	1930	5450

CAL YR 1977	TOTAL	53342.62	MEAN 146	MAX 4610	MIN .74	CFSM .67	IN 9.14	AC-FT 105800
WTR YR 1978	TOTAL	83436.60	MEAN 229	MAX 4610	MIN .30	CFSM 1.06	IN 14.30	AC-FT 165500

06819190 EAST FORK ONE HUNDRED AND TWO RIVER NEAR BEDFORD, IA

LOCATION.--Lat 40°38'01", long 94°44'41", in NE1/4 NE1/4 sec.9, T.67 N., R.34 W., Taylor County, Hydrologic Unit 10240013, on left bank at downstream side of bridge of county highway J55, 0.4 mi (0.6 km) upstream from Daugherty Creek, and 2.8 mi (4.5 km) southwest of junction of U.S. Highways 2 and 148 in Bedford.

DRAINAGE AREA.--92.1 mi² (238.5 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 1,057.51 ft (322.329 m) NGVD (levels by Corps of Engineers). Prior to Oct. 1, 1968, at datum 5.00 ft (1.524 m) higher.

REMARKS.--Records fair except those for winter period, which are poor. Slight regulation at low flow by low dam used for water supply in Bedford. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--19 years, 53.4 ft³/s (1.512 m³/s), 7.87 in/yr (200 mm/yr), 38,690 acre-ft/yr (47.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,980 ft³/s (283 m³/s) Oct. 11, 1973, gage height, 20.72 ft (6.315 m); maximum gage height, 20.95 ft (6.386 m) Jan. 12, 1960, present datum; no flow at times in 1966-68, 1972, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft³/s (56.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 22	0545	3,780	107	11.80	3.597	May 7	0115	5,230	148	14.13	4.307
Oct. 23	1830	5,840	165	15.11	4.606	May 20	0030	2,230	63.2	8.90	2.713
Oct. 31	0300	*7,420	210	*17.28	5.267	May 27	1630	2,090	59.2	8.37	2.551
Apr. 17	1600	3,970	112	12.12	3.694	Sept. 20	1315	3.020	85.5	10.31	3.142

Minimum daily discharge, 0.31 ft³/s (0.009 m³/s) Jan. 13 to Feb. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	334	17	1.2	.31	2.6	36	28	170	12	9.9	1.1
2	24	352	15	.90	.31	2.8	24	20	56	10	18	.65
3	18	145	14	.80	.31	3.0	22	17	32	7.3	10	.91
4	16	88	13	.70	.31	3.0	19	17	25	5.3	7.4	.91
5	19	67	11	.65	.31	3.5	157	18	19	4.2	5.0	.65
6	14	60	9.5	.60	.31	5.0	81	386	17	4.9	4.0	.65
7	554	58	9.0	.55	.31	6.0	39	2860	17	659	3.2	.77
8	394	62	9.5	.45	.31	7.0	28	584	12	78	2.6	.55
9	85	305	10	.40	.31	9.0	437	173	9.9	37	2.6	.47
10	54	68	10	.35	.31	12	800	98	9.9	29	337	.40
11	53	42	11	.33	.31	20	98	66	6.9	19	64	.47
12	34	37	15	.32	.31	30	36	137	6.4	27	20	.40
13	28	36	18	.31	.31	50	19	148	5.9	33	14	.47
14	24	35	19	.31	.31	100	208	56	4.0	19	9.3	3.0
15	23	36	20	.31	.31	300	97	38	3.2	17	9.4	6.1
16	21	32	24	.31	.31	500	455	32	2.9	12	7.9	4.6
17	19	30	42	.31	.31	600	1670	27	2.2	9.2	5.5	21
18	16	24	22	.31	.31	700	948	24	1.7	8.1	4.6	362
19	14	23	16	.31	.31	1040	569	188	1.4	354	3.3	39
20	12	27	13	.31	.31	951	198	794	5.0	108	2.7	1170
21	15	21	9.5	.31	.31	961	119	124	6.6	220	1.8	253
22	1850	18	8.0	.31	.35	614	100	80	11	1090	2.0	51
23	2540	21	7.0	.31	.45	246	111	343	28	123	1.6	24
24	1760	20	6.5	.31	.80	97	63	109	11	50	1.4	16
25	413	17	5.0	.31	1.0	47	50	58	7.0	32	1.4	12
26	166	15	4.0	.31	1.2	58	40	37	101	23	1.2	8.3
27	116	13	2.8	.31	1.5	69	33	530	295	17	20	6.9
28	87	12	2.4	.31	2.0	71	30	248	70	13	11	5.3
29	75	12	2.2	.31	---	57	36	78	25	11	4.3	5.4
30	858	15	2.0	.31	---	44	40	48	16	10	1.7	11
31	3330	---	1.8	.31	---	42	---	37	---	10	1.3	---
TOTAL	12660	2025	369.2	13.14	13.81	6650.9	6563	7503	978.0	3052.0	588.1	2007.00
MEAN	408	67.5	11.9	.42	.49	215	219	242	32.6	98.5	19.0	66.9
MAX	3330	352	42	1.2	2.0	1040	1670	2860	295	1090	337	1170
MIN	12	12	1.8	.31	.31	2.6	19	17	1.4	4.2	1.2	.40
CFSM	4.43	.73	.13	.005	.005	2.33	2.38	2.63	.35	1.07	.21	.73
IN.	5.11	.82	.15	.01	.01	2.69	2.65	3.03	.40	1.23	.24	.81
AC-FT	25110	4020	732	26	27	13190	13020	14880	1940	6050	1170	3980

CAL YR 1977	TOTAL	29906.63	MEAN	81.9	MAX	3330	MIN	.00	CFSM	.89	IN 12.08	AC-FT 59320
WTR YR 1978	TOTAL	42423.15	MEAN	116	MAX	3330	MIN	.31	CFSM	1.26	IN 17.13	AC-FT 84150

06897950 ELK CREEK NEAR DECATUR CITY, IA
(Hydrologic bench-mark station)

LOCATION .--Lat 40°43'18", long 93°56'12", near the southeast corner sec.34, T.69 N., R.27 W., Decatur County, Hydrologic Unit 10280102, at right downstream corner of bridge on county highway, 1,000 ft (305 m) downstream from West Elk Creek, 5.2 mi (8.4 km) upstream from mouth, and 5.7 mi (9.2 km) southwest of Decatur City.

DRAINAGE AREA.--52.5 mi² (136 km²).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 924.70 ft (281.849 m) NGVD. Oct. 1, 1967, to Sept. 30, 1974, at datum 10.00 ft (3.05 m) higher.

REMARKS.--Records fair except those for winter period, which are poor.

AVERAGE DISCHARGE.--11 years, 31.4 ft³/s (0.889 m³/s), 8.12 in/yr (206 mm/yr), 22,750 acre-ft/yr (28.0 hm³/yr); median of yearly discharges, 26 ft³/s (0.74 m³/s), 6.7 in/yr (170 mm/yr), 18,800 acre-ft/yr (23.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft³/s (323 m³/s) Apr. 24, 1976, gage height, 25.80 ft (7.864 m), from rating curve extended above 5,300 ft³/s (150 m³/s) on basis of step-backwater computation; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 14, 1967, reached a stage of 18.35 ft (5.593 m), datum in use prior to Oct. 1, 1974, discharge, 15,000 ft³/s (425 m³/s), estimated from rating curve extended above 5,300 ft³/s (150 m³/s) on basis of step-backward computation. Flood of Aug. 6, 1959, reached a stage between 20.5 and 22.5 ft (6.25 and 6.86 m), datum in use prior to Oct. 1, 1974, 300 ft (91 m) downstream , from information by assistant county engineer, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 23	1615	1,960	55.5	17.98	5.480	May 7	0200	6,460	183	22.45	6.843
Oct. 31	0215	2,340	66.3	18.62	5.675	May 11	1945	2,010	56.9	17.50	5.334
Mar. 21	1845	1,110	31.4	15.78	4.810	July 21	2400	4,200	119	20.37	6.209
Apr. 10	0115	1,500	42.5	16.65	5.075	Sept.18	0230	653	18.5	14.42	4.395
Apr. 17	1500	5,530	157	21.67	6.605	Sept.20	1000	*11,100	314	*25.73	7.843

Minimum daily discharge, 0.01 ft³/s (<0.001 m³/s) Sept. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.53	98	6.2	1.2	1.3	1.9	24	23	39	.90	20	.36
2	.27	72	8.2	1.3	1.3	2.1	19	20	16	.80	17	.27
3	.49	43	4.8	1.3	1.3	2.4	19	20	10	.70	3.0	.27
4	.27	29	5.6	1.4	1.3	2.4	17	22	8.3	.70	1.6	.25
5	.31	22	5.6	1.4	1.3	2.1	92	25	7.1	.66	1.1	.20
6	.09	19	4.7	1.4	1.3	2.1	59	224	5.7	8.3	.80	.16
7	96	18	4.8	1.5	1.3	2.1	35	2080	5.4	95	.70	.12
8	64	19	4.8	1.6	1.3	2.1	32	177	3.8	5.7	.80	.07
9	15	39	4.9	1.6	1.3	2.2	190	92	3.1	3.0	.66	.03
10	7.9	17	6.2	1.7	1.3	2.0	560	73	2.8	2.1	1.6	.03
11	7.9	13	4.0	1.7	1.3	2.5	92	224	2.1	1.3	1.9	.01
12	4.1	14	4.7	1.8	1.3	3.5	56	102	1.5	1.7	.90	.01
13	3.0	15	8.7	1.8	1.3	4.8	41	83	1.3	1.5	.66	.31
14	2.2	14	7.9	1.8	1.3	10	79	32	1.4	1.3	.57	3.1
15	1.9	14	8.5	1.7	1.3	30	63	24	1.2	1.3	.61	.70
16	1.6	13	8.6	1.7	1.3	90	169	22	1.2	1.2	.44	.53
17	1.5	12	10	1.6	1.3	110	1380	19	1.0	.80	.44	92
18	1.2	10	6.5	1.6	1.3	160	500	17	.80	.61	.61	262
19	.90	10	4.0	1.5	1.3	250	153	19	.70	26	2.1	31
20	.70	11	4.6	1.5	1.3	346	62	63	1.7	20	.61	3910
21	1.2	8.3	3.5	1.4	1.3	392	42	21	.90	213	.36	129
22	133	7.5	3.0	1.4	1.3	323	36	25	.90	406	.31	51
23	689	8.8	2.5	1.4	1.4	142	43	37	1.2	20	.23	33
24	406	8.3	2.6	1.5	1.4	70	33	23	1.3	9.2	.20	26
25	79	8.4	2.1	1.6	1.5	47	30	17	1.0	5.7	.20	19
26	40	6.0	1.7	1.3	1.5	53	28	14	31	3.8	1.0	15
27	26	4.6	1.5	1.2	1.5	71	25	14	25	2.2	45	13
28	19	4.1	1.3	1.1	1.7	59	25	20	6.1	1.5	3.0	11
29	16	4.5	1.2	1.1	---	42	27	15	2.1	1.3	.90	10
30	62	5.6	1.2	1.2	---	35	26	15	1.5	1.2	.57	12
31	782	---	1.2	1.3	---	33	---	18	---	1.3	.57	---
TOTAL	2463.06	568.1	145.2	45.6	37.6	2295.2	3957	3580	185.10	838.77	108.44	4620.42
MEAN	79.5	18.9	4.68	1.47	1.34	74.0	132	115	6.17	27.1	3.50	154
MAX	782	98	10	1.8	1.7	392	1380	2080	39	406	45	3910
MIN	.09	4.1	1.2	1.1	1.3	1.9	17	14	.70	.61	.20	.01
CFSM	1.51	.36	.09	.03	.03	1.41	2.51	2.19	.12	.52	.07	2.93
IN.	1.75	.40	.10	.03	.03	1.63	2.80	2.54	.13	.59	.08	3.27
AC-FT	4890	1130	288	90	75	4550	7850	7100	367	1660	215	9160

CAL YR 1977 TOTAL 4004.85 MEAN 11.0 MAX 782 MIN .00 CFSM .21 IN 2.84 AC-FT 7940
WTR YR 1978 TOTAL 18844.49 MEAN 51.6 MAX 3910 MIN .01 CFSM .98 IN 13.35 AC-FT 37380

06897950 ELK CREEK NEAR DECATUR CITY, IA--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

REMARKS.--Miscellaneous biological data collected September 1970 to September 1972 are available in the District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML) (31501)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)
NOV											
18...	1300	7.0	568	8.1	6.5	11.2	94	240	K680	230	290
DEC											
28...	1630	1.3	900	7.9	.0	11.0	77	--	230	K420	410
FEB											
09...	0830	1.3	657	7.6	.0	14.8	110	K13	K7	37	340
MAR											
16...	0900	90	300	7.9	.0	--	--	K14000	K2600	K4300	130
28...	1530	46	360	7.2	12.0	10.4	100	16000	11000	8400	180
MAY											
24...	0800	52	320	7.8	19.0	9.2	103	--	--	--	240
JUL											
18...	1625	.75	510	8.5	30.0	8.0	107	--	K140	--	250
AUG											
31...	0830	.38	500	7.9	19.0	7.8	87	--	3550	1190	230

DATE	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE (MG/L AS HCO3) (00440)	ALKA-LINITY (MG/L AS CACO3) (00410)	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)
NOV											
18...	59	86	18	12	3.4	280	230	72	8.3	.2	11
DEC											
28...	100	120	26	9.6	4.0	370	300	100	16	.2	9.6
FEB											
09...	57	100	21	12	3.4	340	280	63	10	.2	13
MAR											
16...	31	38	8.3	4.9	17	120	98	31	14	.1	8.3
28...	46	51	12	8.5	4.6	160	130	50	6.9	.6	10
MAY											
24...	47	70	15	9.8	3.9	--	190	44	6.5	.2	11
JUL											
18...	40	72	17	12	5.2	--	210	45	10	.2	6.0
AUG											
31...	22	70	14	7.9	7.0	--	210	34	8.3	.2	9.8

05689750 ELK CREEK NEAR DECATUR CITY, IA--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)	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											
18...	383	349	.52	7.24	.89	.05	8	.3	--	--	--
DEC											
28...	482	473	.66	1.64	.94	.02	7	.3	--	--	--
FEB											
09...	397	390	.54	1.39	.36	.02	7	.3	--	--	--
MAR											
16...	206	181	.28	50.1	2.4	.73	7	.2	--	--	--
28...	223	222	.30	28.2	1.5	.17	9	.3	352	44	82
MAY											
24...	272	275	.37	38.4	.53	.10	8	.3	99	14	93
JUL											
18...	291	294	.40	.59	.10	.02	9	.3	--	--	--
AUG											
31...	299	277	.41	.31	.37	.10	7	.2	--	--	--

DATE	CYANIDE TOTAL (MG/L AS CN) (00720)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)
NOV											
18...	.00	1	400	0	4	4	4	.1	1	0	30
MAR											
28...	.00	4	200	1	0	6	10	.0	1	0	20

06898000 THOMPSON RIVER AT DAVIS CITY, IA

LOCATION.--Lat 40°38'25", long 93°48'29", in SE1/4 SE1/4 sec.35, T.68 N., R.26 W., Decatur County, Hydrologic Unit 10280102, on right bank 15 ft (5 m) downstream from bridge on U.S. Highway 69 at Davis City, 2.6 mi (4.2 km) upstream from Dickersons Branch, and 6.2 mi (8.4 km) upstream from Iowa-Missouri State line.

DRAINAGE AREA.--701 mi² (1,816 km²).

PERIOD OF RECORD.--May 1918 to July 1925, July 1941 to current year. Monthly discharge only for some periods, published in WSP 1310. Prior to October 1918, published as "Grand River".

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

GAGE.--Water-stage recorder. Datum of gage is 874.04 ft (266.407 m) NGVD. May 14, 1918, to July 2, 1925, July 14, 1941, to Feb. 24, 1942, nonrecording gage, and Feb. 25, 1942, to Feb. 8, 1967, water-stage recorder at same site at datum 2.00 ft (0.61 m) higher.

REMARKS.-- Records good except those for winter period, which are poor. Several observations of water temperature were made during the year. National Weather Service gage height telemeter at station.

AVERAGE DISCHARGE.--43 years (1918-24, 1941-78), 370 ft³/s (10.48 m³/s), 7.17 in/yr (182 mm/yr), 268,100 acre-ft/yr (331 hm³/yr); median of yearly mean discharges, 310 ft³/s (8.78 m³/s) 6.0 in/yr (152 mm/yr) 225,000 acre-ft/yr (277 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,300 ft³/s (688 m³/s) June 10, 1974, gage height, 19.43 ft (5.922 m), from rating curve extended above 17,000 ft³/s (481 m³/s) on basis of velocity-area study; minimum daily, 0.1 ft³/s (0.003 m³/s) June 25, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 8, 1885, reached a stage of 22.8 ft (6.95 m), datum in use prior to Feb. 9, 1967, from floodmark, discharge, 30,000 ft³/s (850 m³/s), from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s (127 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	0500	6,500	184	9.07	2.765	May 7	0730	8,510	241	10.46	3.188
Mar. 22	2130	6,880	195	9.16	2.792	July 22	0400	4,880	138	7.59	2.313
Apr. 10	1645	5,020	142	7.61	2.320	Sept.20	1930	*10,200	289	*11.68	3.560
Apr. 19	1715	9,960	282	11.37	3.466						

Minimum daily discharge, 17 ft³/s (0.48 m³/s) Sept. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	151	5700	127	46	41	40	493	405	376	88	77	31
2	147	4260	126	57	40	40	417	357	676	72	106	26
3	138	1820	127	55	39	41	347	309	634	60	122	24
4	131	1010	128	50	39	41	307	281	310	47	111	24
5	126	697	120	50	39	43	540	282	241	43	97	23
6	124	574	107	49	37	44	625	405	227	44	83	23
7	111	501	96	52	37	45	484	6920	227	602	71	22
8	646	451	106	58	35	47	427	5890	224	571	63	22
9	1160	553	109	70	34	51	525	2800	220	363	57	21
10	510	663	105	57	34	56	4430	1190	210	222	52	19
11	280	446	97	54	33	60	2630	910	201	207	52	18
12	217	317	89	50	32	64	1080	1420	188	189	59	18
13	198	271	88	43	34	71	634	1350	170	173	58	17
14	166	259	88	43	36	100	525	1580	159	162	46	17
15	155	256	119	42	37	460	1190	942	148	151	47	22
16	151	250	152	45	39	1100	1440	562	141	141	47	28
17	146	237	220	48	40	1500	2990	451	136	131	44	129
18	141	224	650	47	41	1900	7910	395	136	121	41	2950
19	137	227	350	43	41	3500	9690	353	136	346	41	1370
20	133	209	140	40	42	4810	8220	501	133	725	40	7300
21	128	195	100	39	41	5740	3440	704	131	966	39	7830
22	766	197	152	39	41	6320	1250	583	129	4240	37	4350
23	3260	190	114	39	41	5810	976	519	129	1370	35	530
24	6010	174	135	38	41	2630	812	1390	129	372	32	276
25	5980	167	129	38	42	1160	656	1360	129	226	29	191
26	5650	165	123	43	41	773	544	607	129	197	27	162
27	5650	170	118	45	40	827	476	420	307	159	644	154
28	5650	132	60	45	40	952	422	367	159	124	331	137
29	5650	127	48	44	---	854	411	462	131	103	83	120
30	5650	128	43	43	---	673	417	507	109	89	61	110
31	5670	---	42	42	---	556	---	367	---	80	41	---
TOTAL	55032	20570	4208	1454	1077	40308	54308	34589	6375	12384	2673	25964
MEAN	1775	686	136	46.9	38.5	1300	1810	1116	213	399	86.2	865
MAX	6010	5700	650	70	42	6320	9690	6920	676	4240	644	7830
MIN	111	127	42	38	32	40	307	281	109	43	27	17
CFSM	2.53	.98	.19	.07	.06	1.85	2.58	1.59	.30	.57	.12	1.23
IN.	2.92	1.09	.22	.08	.06	2.14	2.88	1.84	.34	.66	.14	1.38
AC-FT	109200	40800	8350	2880	2140	79950	107700	68610	12640	24560	5300	51500

CAL YR 1977	TOTAL	111765.74	MEAN 306	MAX 6010	MIN .17	CFSM .44	IN 5.93	AC-FT 221700
WTR YR 1978	TOTAL	258942.00	MEAN 709	MAX 9690	MIN 17	CFSM 1.01	IN 13.74	AC-FT 513600

06898400 WELDON RIVER NEAR LEON, IA

LOCATION.--Lat 40°41'45", long 93°38'07", in NE1/4 NE1/4 sec.17, T.68 N., R.24 W., Decatur County, Hydrologic Unit 10280102, on left bank 10 ft (3 m) downstream from bridge on county highway A, 200 ft (61 m) upstream from unnamed creek, 1.3 mi (2.1 km) downstream from Brush Creek, and 6.5 mi (10.5 km) southeast of post office at Leon.

DRAINAGE AREA.--104 mi² (269 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 906.26 ft (276.228 m) NGVD.

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 73.3 ft³/s (2.076 m³/s), 9.57 in/yr (243 mm/yr), 53,110 acre-ft/yr (65.5 hm³/yr); median of yearly mean discharges, 51 ft³/s (1.44 m³/s), 6.7 in/yr (170 mm/yr), 36,900 acre-ft/yr (45.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 48,600 ft³/s (1,376 m³/s) Aug. 6, 1959, gage height, 25.27 ft (7.702 m), from rating curve extended above 5,600 ft³/s (159 m³/s) on basis of contracted-opening and flow-over-embankment measurement at gage height 25.27 ft (7.702 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Stage and discharge of the flood of Aug. 6, 1959, are the greatest since at least 1919.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s (127 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	1800	*7,130	202	*18.68	5.694	May 7	0500	5,690	161	16.88	5.145
Apr. 17	2400	4,990	141	15.89	4.843	Sept. 20	0200	4,950	140	15.79	4.813

No flow July 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	902	13	4.6	5.7	6.6	59	27	29	5.2	71	1.8
2	21	337	9.8	4.4	5.6	6.7	45	21	25	.94	26	1.4
3	6.0	158	8.2	4.0	5.4	6.4	39	18	14	.07	12	1.4
4	2.1	82	3.4	3.8	5.2	5.8	46	22	9.8	.01	6.2	1.4
5	1.9	44	4.9	3.6	4.7	6.0	508	30	6.9	.00	2.2	1.4
6	1.3	40	6.2	3.4	4.2	7.4	178	592	6.5	13	1.4	1.4
7	241	36	7.6	3.4	3.6	8.4	70	3050	4.8	401	1.4	1.4
8	357	31	8.8	3.6	3.0	9.5	137	518	3.5	51	1.8	1.4
9	67	595	10	4.3	3.0	12	595	92	3.3	21	1.8	1.4
10	38	84	11	5.3	2.9	13	2100	39	4.4	15	5.7	1.4
11	50	41	12	5.8	2.9	16	225	334	6.3	13	3.2	1.4
12	33	30	11	5.6	2.9	24	62	395	6.8	19	1.4	1.4
13	22	26	28	3.2	2.9	70	30	599	8.6	18	1.4	1.4
14	14	25	28	3.5	3.0	154	125	94	16	10	2.6	6.9
15	13	25	25	3.8	2.9	330	131	49	19	4.9	5.8	4.1
16	7.5	23	28	4.0	2.8	450	229	40	17	2.2	6.3	1.8
17	5.2	22	25	4.2	2.8	420	1480	32	14	1.1	9.0	158
18	4.3	20	15	4.5	2.8	500	1890	25	14	.63	13	2020
19	3.3	19	14	4.7	2.9	900	495	22	16	74	7.1	207
20	3.0	20	12	5.0	3.0	860	125	81	18	35	6.9	2540
21	2.0	13	10	5.4	3.0	980	67	33	18	261	17	650
22	672	14	8.2	5.4	3.0	900	51	25	21	1400	20	250
23	3370	14	7.0	5.4	2.9	448	88	48	24	79	23	85
24	4900	16	6.5	5.4	3.0	168	53	55	24	23	25	77
25	1480	14	8.0	5.4	3.1	92	38	33	25	13	166	75
26	1040	13	8.4	5.4	3.2	93	30	23	71	6.2	94	74
27	907	11	7.6	5.4	3.6	195	26	21	390	2.2	900	73
28	679	9.0	6.8	5.5	7.2	171	24	24	63	.62	188	75
29	622	8.4	6.3	5.6	---	106	40	22	146	.22	27	77
30	585	13	5.6	5.6	---	82	38	20	22	.09	10	80
31	1990	---	5.6	5.7	---	76	---	12	---	.11	4.2	---
TOTAL	17168.6	2785.4	350.9	144.9	101.1	7116.8	9024	6396	1045.9	2460.49	1660.4	6472.4
MEAN	554	92.8	11.6	4.67	3.61	230	301	206	34.9	79.4	53.6	216
MAX	4900	902	28	5.8	7.2	980	2100	3050	390	1400	900	2540
MIN	1.3	8.4	3.4	3.2	2.8	5.8	24	12	3.3	.00	1.4	1.4
CFSM	5.33	.89	.11	.05	.04	2.21	2.89	1.98	.34	.76	.52	2.08
IN.	6.14	1.00	.13	.05	.04	2.55	3.23	2.29	.37	.88	.59	2.32
AC-FT	34050	5520	716	287	201	14120	17900	12690	2070	4880	3290	12840

CAL YR 1977 TOTAL 25355.03 MEAN 69.5 MAX 4900 MIN .00 CFSM .67 IN 9.07 AC-FT 50290
WTR YR 1978 TOTAL 54736.89 MEAN 150 MAX 4900 MIN .00 CFSM 1.44 IN 19.58 AC-FT 108600

06903400 CHARITON RIVER NEAR CHARITON, IA

LOCATION.--Lat 40°57'12", long 93°15'37", in SW1/4 NE1/4 sec.15, T.71 N., R.21 W., Lucas County, Hydrologic Unit 10280201, on right bank 15 ft (5 m) downstream from bridge on county highway S43, 0.4 mi (0.6 km) downstream from Wolf Creek, and 5.0 mi (8.0 km) southeast of Chariton.

DRAINAGE AREA.--182 mi^2 (471 km^2).

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

GAGE.--Water-stage recorder. Datum of gage is 917.96 ft (279.794 m) NGVD (levels by U.S. Weather Bureau from a Corps of Engineers bench mark).

REMARKS.--Records good except those for winter period, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years, 105 ft^3/s (2.974 m^3/s), 7.83 in/yr (199 mm/yr), 76,070 acre-ft/yr (93.8 hm^3/yr); median of yearly mean discharges, 83 ft^3/s (2.35 m^3/s), 6.2 in/yr (157 mm/yr), 60,100 acre-ft/yr (74.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,320 ft^3/s (179 m^3/s) Aug. 8, 1970, gage height, 20.15 ft (6.142 m); maximum gage height, 20.20 ft (6.157 m) Oct. 12, 1973; no flow Aug. 1, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1960 reached a stage of about 23 ft (7.0 m), discharge, about 15,000 ft^3/s (425 m^3/s) and flood of June 5, 1947 reached a stage of 21.65 ft (6.599 m), from floodmark, discharge, 11,000 ft^3/s (312 m^3/s). A discharge of 0.08 ft^3/s (0.002 m^3/s) was measured on Oct. 30, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft^3/s (34.0 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage Height (ft)	Gage Height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	0530	3,520	99.7	19.34	5.895	Apr. 18	1300	1,730	49.0	17.66	5.383
Oct. 31	2145	1,500	42.5	17.28	5.267	May 7	1700	1,830	51.8	17.51	5.337
Mar. 22	0915	1,300	36.8	17.48	5.328	May 13	1430	1,770	50.1	17.43	5.313
Apr. 10	1445	3,340	94.6	18.22	5.553	Sept.21	0100	*3,660	104	*19.79	6.032

No flow Sept. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	1120	14	7.7	5.8	8.5	124	39	50	138	5.7	4.7
2	8.9	1240	14	8.1	5.6	9.7	87	39	86	58	7.5	2.2
3	9.6	1090	13	7.4	5.6	10	65	32	38	30	5.5	.97
4	9.0	615	13	8.0	6.2	9.6	64	27	41	20	4.2	.40
5	9.0	170	14	8.6	5.8	9.6	101	32	35	14	5.0	.24
6	7.2	98	13	9.8	5.8	9.6	342	89	26	38	4.5	.05
7	60	74	11	12	6.0	9.6	235	626	19	840	3.5	.00
8	510	64	11	13	4.3	9.6	206	1240	14	395	2.2	.00
9	317	137	10	11	3.8	10	350	1290	12	273	1.6	.05
10	182	202	8.2	7.6	4.0	10	2700	918	11	60	1.5	.19
11	126	212	8.0	7.6	4.3	12	1560	186	9.4	27	2.5	.53
12	81	66	9.3	9.0	4.7	13	1270	433	8.5	20	2.1	.53
13	59	34	19	9.2	6.2	17	542	1560	7.5	20	1.6	1.2
14	37	29	53	8.5	6.3	24	169	1070	6.9	14	1.2	3.2
15	24	29	74	7.9	5.1	47	324	755	11	12	.82	4.4
16	16	27	137	7.5	5.3	225	270	189	26	13	.60	4.4
17	13	30	277	7.5	5.3	440	391	75	16	9.4	.67	5.0
18	8.6	30	285	7.1	5.8	540	1960	55	13	7.0	.88	144
19	7.4	27	208	7.7	6.2	950	1740	43	16	706	.60	339
20	6.8	28	82	7.2	6.6	1060	1490	46	14	721	.60	1620
21	6.1	28	58	7.0	5.4	1050	713	45	11	392	.53	3040
22	475	24	39	7.4	5.7	1200	170	36	8.4	467	.40	2150
23	1310	22	28	7.6	6.6	980	131	113	684	324	.29	1220
24	3440	20	23	9.0	6.8	780	126	75	133	331	.35	507
25	2600	15	15	8.1	7.8	520	114	47	29	71	.35	55
26	1380	13	11	6.5	7.4	180	70	55	67	25	.67	24
27	972	12	8.5	5.8	8.0	340	53	36	872	14	3.6	16
28	288	10	7.8	5.5	8.8	380	43	80	492	9.3	19	11
29	109	10	7.7	5.4	---	353	41	45	812	6.4	197	9.3
30	74	11	7.6	5.8	---	239	43	36	367	5.8	60	8.4
31	1010	---	7.3	5.5	---	168	---	31	---	5.1	12	---
TOTAL	13162.7	5487	1486.4	246.0	165.2	9614.2	15494	9343	3935.7	5066.0	346.96	9171.76
MEAN	425	183	47.9	7.94	5.90	310	516	301	131	163	11.2	306
MAX	3440	1240	285	13	8.8	1200	2700	1560	872	840	197	3040
MIN	6.1	10	7.3	5.4	3.8	8.5	41	27	6.9	5.1	.29	.00
CFSM	2.34	1.01	.26	.04	.03	1.70	2.84	1.65	.72	.90	.06	1.68
IN.	2.69	1.12	.30	.05	.03	1.97	3.17	1.91	.80	1.04	.07	1.87
AC-FT	26110	10880	2950	488	328	19070	30730	18530	7810	10050	688	18190

CAL YR 1977	TOTAL	31975.23	MEAN	87.6	MAX	3440	MIN	.00	CFSM	.48	IN	6.54	AC-FT	63420
WTR YR 1978	TOTAL	73518.92	MEAN	201	MAX	3440	MIN	.00	CFSM	1.10	IN	15.03	AC-FT	145800

06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IA

LOCATION.--Lat 40°48'02", long 93°11'32", in SW1/4 SW1/4 sec.5, T.69 N., R.20 W., Wayne County, Hydrologic Unit 10280201, on right bank 20 ft (6 m) downstream from bridge on county highway S50, 1.3 mi (2.1 km) downstream from Jordan Creek and 4.3 mi (6.9 km) northwest of Promise City.

DRAINAGE AREA.--168 mi² (435 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 913.70 ft (278.496 m) NGVD (Corps of Engineers bench mark.

REMARKS.--Records good except for period June 15 to Aug. 2 and those for winter period, which are poor. Several observations of water temperature made during the year.

AVERAGE DISCHARGE.--11 years, 104 ft³/s (2.945 m³/s), 8.41 in/yr (214 mm/yr) 75,350 acre-ft/yr (92.9 hm³/yr); median of yearly mean discharges, 82 ft³/s (2.322 m³/s), 6.6 in/yr (168 mm/yr) 59,400 acre-ft/yr (73.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,700 ft³/s (275 m³/s) Apr. 10, 1978, gage height, 21.92 ft (6.681 m); no flow July 6, 7, 21-24, 28-31, and Aug. 1, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 21, 1965, reached a stage of 25.5 ft (7.77 m), from floodmarks, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft³/s (56.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage Height (ft)	Gage Height (m)
Oct. 24	1300	5,300	150	19.72	6.011
Oct. 31	1300	3,660	104	17.08	5.206
Apr. 10	0715	*9,700	275	*21.92	6.681
Apr. 18	0745	4,510	128	18.74	5.712
May 7	1900	5,460	155	19.87	6.056
May 13	1200	4,250	120	18.32	5.584
Sept.20	1915	3,970	112	17.73	5.404

Minimum daily discharge, 1.1 ft³/s (0.031 m³/s) Feb. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	195	816	15	12	3.8	4.7	109	34	65	34	61	1.4
2	69	1020	12	13	3.6	5.1	76	25	89	28	28	1.3
3	32	269	14	12	3.6	5.6	111	21	34	16	19	3.6
4	17	132	11	14	3.4	4.2	426	22	15	12	8.2	4.6
5	14	85	9.0	16	3.1	3.4	864	44	12	7.8	4.3	2.5
6	12	70	13	18	1.1	5.8	792	62	8.6	24	3.2	1.8
7	435	66	9.8	26	3.1	4.9	147	4270	8.6	693	2.5	1.4
8	884	62	11	23	2.3	5.0	748	2040	8.2	118	2.2	1.3
9	119	198	10	12	2.7	5.2	1320	253	7.8	37	1.9	1.3
10	135	97	10	4.6	2.8	6.4	7020	109	6.8	23	2.4	1.3
11	289	44	12	5.7	2.7	7.6	1670	255	3.9	16	2.4	1.4
12	94	32	19	6.4	3.0	8.0	210	1630	2.4	13	2.1	1.4
13	48	30	52	7.0	4.1	10	107	3180	1.5	16	2.1	1.6
14	32	30	110	6.8	4.3	15	175	528	1.5	12	2.0	1.9
15	25	32	108	6.6	3.7	37	229	128	4.9	7.8	1.9	1.8
16	22	29	150	5.2	2.4	146	220	80	6.1	6.1	1.7	2.0
17	21	28	210	3.0	2.2	208	818	62	4.9	5.2	1.6	8.6
18	17	24	145	3.1	2.4	280	3920	50	4.6	6.1	1.9	477
19	14	22	71	4.3	2.9	800	1110	38	3.7	440	2.1	111
20	12	27	55	4.4	4.5	1010	321	52	3.5	102	1.8	2250
21	10	32	50	2.9	3.3	1160	137	60	2.9	93	2.3	976
22	827	21	36	3.7	2.6	900	88	37	3.3	68	2.0	91
23	2540	20	32	4.7	3.6	600	102	233	71	60	1.6	36
24	5440	20	29	4.5	3.8	202	85	109	8.2	13	1.5	22
25	1200	20	20	4.2	4.4	94	64	55	4.2	8.6	1.5	14
26	236	17	13	4.0	4.3	185	50	32	35	6.4	1.6	10
27	125	12	11	3.9	4.7	564	40	26	568	5.2	6.1	8.0
28	84	10	9.3	3.8	4.9	560	35	87	161	3.9	8.7	6.4
29	63	9.7	9.8	2.7	---	233	39	44	430	3.9	5.8	5.5
30	50	12	13	3.3	---	167	44	31	67	3.5	2.7	5.8
31	2370	---	12	3.1	---	140	---	23	---	9.0	1.9	---
TOTAL	15431	3286.7	1281.9	243.9	93.3	7376.9	21077	13620	1642.6	1891.5	188.0	4051.9
MEAN	498	110	41.4	7.87	3.33	238	703	439	54.8	61.0	6.06	135
MAX	5440	1020	210	26	4.9	1160	7020	4270	568	693	61	2250
MIN	10	9.7	9.0	2.7	1.1	3.4	35	21	1.5	3.5	1.5	1.3
CFSM	2.96	.66	.25	.05	.02	1.42	4.19	2.51	.33	.36	.04	.80
IN.	3.42	.73	.28	.05	.02	1.63	4.67	3.02	.36	.42	.04	.90
AC-FT	30610	6520	2540	484	185	14630	41810	27020	3260	3750	373	8040

CAL YR 1977	TOTAL	33761.57	MEAN	92.5	MAX	5440	MIN	.00	CFSM	.55	IN	7.48	AC-FT	66970
WTR YR 1978	TOTAL	70184.70	MEAN	192	MAX	7020	MIN	1.1	CFSM	1.14	IN	15.54	AC-FT	139200

06903880 RATHBUN LAKE NEAR RATHBUN, IA

LOCATION.--Lat 40°49'30", long 92°53'33", in NW1/4 NE1/4 sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, at control tower of Rathbun Dam, 1.8 mi (2.9 km) north of Rathbun and 3.9 mi (6.3 km) upstream from Walnut Creek and at mile 142.3 (229.0 km).

DRAINAGE AREA.--549 mi² (1,421 km²).

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

GAGE.--Water-stage recorder. Datum of gage is at NGVD.

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in November 1969. Release is controlled by two hydraulically controlled slide gages, 6 ft (2 m) wide and 12 ft (4 m) high, into forechamber of an 11-ft (3 m) diameter horseshoe conduit through the dam. No dead storage. Maximum design discharge through gates is 5,000 ft³/s (142 m³/s). Uncontrolled notch spillway is concrete overflow section 500 ft (152 m) in length, located about 3,000 ft (914 m) west of the right abutment of the dam and provides emergency discharge into the adjacent drainage area of Little Walnut Creek. Uncontrolled notch spillway is at elevation 926 ft (282 m), contents 552,000 acre-ft (681 hm³). Conservation pool level is at elevation 904.0 ft (275.54 m), contents 205,000 acre-ft (253 hm³). Reservoir is used for flood control, low-flow augumentation, conservation and recreation.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 402,000 acre-ft (496 hm³) May 8-10, 1973; maximum elevation, 918.15 ft (279.852 m) May 9, 1973; minimum daily contents, 100 acre-ft (0.123 hm³) Oct. 1-15, Nov. 17-21, 1969; minimum elevation, 855.40 ft (260.726 m) Oct. 6-10, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 369,000 acre-ft (445 hm³) May 16; maximum elevation, 916.13 ft (279.236 m) May 16; minimum daily contents, 176,000 acre-ft (217 hm³) Mar. 14-16; minimum elevation, 901.19 ft (274.683 m) Mar. 15-16.

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

860	400	880	33,800	900	164,300
862	850	885	55,730	905	216,600
865	2,390	890	84,530	910	278,500
870	7,950	895	120,000	915	351,000
860	18,100				

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	261000	321000	280000	213000	187000	182000	247000	321000	341000	323000	301000	225000
2	261000	328000	278000	211000	187000	182000	245000	319000	339000	324000	298000	223000
3	261000	333000	276000	209000	187000	182000	246000	316000	337000	322000	296000	220000
4	260000	334000	273000	206000	186000	182000	246000	314000	334000	319000	293000	218000
5	260000	334000	272000	204000	186000	182000	246000	313000	332000	317000	291000	215000
6	259000	333000	269000	202000	186000	182000	249000	310000	329000	314000	288000	213000
7	257000	333000	256000	200000	186000	182000	249000	313000	327000	319000	286000	210000
8	262000	331000	264000	198000	185000	181000	249000	328000	325000	323000	283000	208000
9	264000	330000	263000	195000	185000	180000	249000	337000	322000	325000	280000	206000
10	264000	330000	259000	194000	185000	179000	256000	338000	320000	325000	278000	203000
11	265000	326000	256000	193000	185000	178000	290000	338000	317000	323000	275000	201000
12	264000	324000	254000	190000	185000	178000	300000	344000	315000	321000	273000	198000
13	264000	321000	252000	189000	185000	177000	303000	357000	313000	320000	270000	195000
14	263000	319000	250000	188000	185000	176000	303000	366000	310000	317000	268000	194000
15	262000	317000	248000	189000	185000	176000	304000	368000	307000	315000	265000	191000
16	261000	315000	246000	189000	185000	176000	304000	369000	307000	313000	263000	189000
17	260000	313000	244000	188000	184000	178000	303000	368000	304000	310000	259000	187000
18	259000	310000	243000	188000	184000	180000	315000	365000	302000	307000	256000	189000
19	259000	308000	242000	188000	184000	183000	330000	363000	300000	313000	255000	189000
20	257000	305000	241000	188000	184000	189000	336000	362000	297000	317000	252000	191000
● 21	256000	304000	238000	188000	184000	199000	338000	360000	295000	320000	249000	197000
22	256000	301000	236000	187000	184000	212000	338000	357000	292000	322000	247000	203000
23	257000	299000	234000	187000	184000	224000	337000	355000	299000	322000	244000	207000
24	270000	297000	232000	187000	183000	232000	336000	354000	305000	320000	242000	209000
25	289000	295000	230000	187000	183000	236000	334000	352000	307000	318000	239000	209000
26	301000	292000	227000	187000	183000	239000	331000	350000	308000	315000	237000	207000
27	308000	290000	225000	186000	182000	240000	329000	348000	311000	313000	236000	205000
28	310000	287000	222000	186000	182000	243000	327000	347000	316000	310000	235000	203000
29	311000	285000	220000	186000	---	242000	325000	346000	321000	308000	233000	200000
30	310000	282000	217000	186000	---	243000	323000	345000	324000	305000	230000	199000
31	312000	---	215000	186000	---	247000	---	342000	---	303000	228000	---
MAX	312000	334000	280000	213000	187000	247000	338000	369000	341000	325000	301000	225000
MIN	256000	282000	215000	186000	182000	176000	245000	310000	292000	303000	228000	187000

WTR YR 1978 MAX 369000 MIN 176000

06903900 CHARITON RIVER NEAR RATHBUN, IA

LOCATION.--Lat 40°49'22", long 92°53'22", in SE1/4 NE1/4 sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, on left bank 600 ft (183 m) downstream from outlet of Rathbun Dam, 1.8 mi (2.9 km) north of Rathbun and 3.7 mi (6.0 km) upstream from Walnut Creek and at mile 142.1 (228.6 km).

DRAINAGE AREA.--549 mi² (1,421 km²).

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

REVISED RECORDS.--WSP 1560: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 847.92 ft (258.446 m) NGVD. Prior to Nov. 16, 1960, nonrecording gage and Nov. 17, 1960, to Sept. 30, 1969, recording gage, at site 3.1 mi (5.0 km) downstream at datum 4.65 ft (1.42 m) lower.

REMARKS.--Records fair. Flow regulated by Rathbun Reservoir (station 06903880) since Nov. 21, 1969. Records of discharge include diversion of 7 ft³/s (0.20 m³/s) Nov. 1 to Nov. 21; 12 ft³/s (0.34 m³/s) Nov. 22 to Feb. 28, May 1 to Aug. 16; 14 ft³/s (0.40 m³/s) Aug. 17; 15 ft³/s (0.42 m³/s) Aug. 18 to Sept. 18; 12 ft³/s (0.34 m³/s) Sept. 19 and 15 ft³/s (0.42 m³/s) Sept. 20 to Sept. 30 from reservoir through fish ponds on left bank downstream from dam. Diverted flow returns to stream 0.1 mi (0.2 km) downstream from gage. Several observations of water temperature were made during the year. Corps of Engineers gage height telemeter at station.

AVERAGE DISCHARGE.--22 years, 316 ft³/s (8.95 m³/s) 7.82 in/yr (199 mm/yr), 228,900 acre-ft/yr (282 hm³/yr); median of yearly mean discharges, 230 ft³/s (6.51 m³/s) 5.7 in/yr (145 mm/yr), 167,000 acre-ft/yr (206 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,800 ft³/s (617 m³/s) Mar. 31, 1960, gage height, 25.3 ft (7.71 m), from floodmark, site and datum then in use; no flow Oct. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,240 ft³/s (35.1 m³/s) May 17-21, May 23-26; maximum gage height, 14.47 ft (4.410 m) Apr. 10, backwater from Walnut Creek. No flow Oct. 26 (gates shut for repairs to stilling basin).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	97	1170	1150	89	99	504	1220	1220	1070	1220	1190
2	12	55	1170	1150	89	100	504	1220	1220	757	1220	1190
3	263	493	1170	1150	88	101	504	1220	1210	1190	1220	1200
4	564	1210	1170	1140	87	102	504	1220	1210	1190	1210	1200
5	381	1200	1170	1150	87	103	509	1220	1210	1220	1210	1190
6	310	607	1170	1160	87	103	509	1220	1210	1200	1220	1190
7	280	832	1170	1150	87	110	764	1220	1220	495	1220	1190
8	14	1150	1170	1140	86	319	1010	495	1190	37	1220	1190
9	332	1020	1170	916	88	481	969	348	1040	34	1210	1190
10	568	1190	1170	597	92	481	505	895	1030	448	1210	1200
11	574	1180	1170	600	92	484	50	1140	1210	1180	1210	1200
12	571	1170	1170	559	93	486	50	781	1210	1010	1210	1210
13	568	1170	1170	329	95	487	83	1080	1220	1040	1210	1200
14	567	1170	1180	94	97	284	563	319	1210	1180	1210	1080
15	570	1170	1180	94	96	117	563	573	1020	1180	1200	1200
16	571	1170	1180	92	98	118	564	956	1100	1190	1200	1200
17	571	1170	1180	91	100	118	211	1240	1190	1210	1200	506
18	574	1170	1180	89	100	123	41	1240	1090	1210	1210	65
19	575	1170	1180	89	102	155	11	1240	1210	1090	1200	62
20	578	1170	1170	89	101	177	11	1240	1210	49	1200	62
21	584	1170	1170	89	101	220	890	1240	1210	381	1200	522
22	598	1170	1170	88	102	230	1220	1230	1210	686	1200	1170
23	201	1170	1170	89	104	149	1220	1240	943	1020	1200	1180
24	43	1170	1160	92	105	122	1220	1240	88	1190	1200	1190
25	21	1170	1160	89	106	120	1220	1240	32	1190	1200	1180
26	.00	1170	1160	87	107	122	1220	1240	23	1210	1200	1190
27	306	1170	1160	89	108	72	1220	1060	23	1230	604	1190
28	568	1170	1160	90	110	135	1220	646	33	1220	840	1180
29	567	1170	1160	90	---	121	1210	651	35	1220	1200	1050
30	564	1170	1150	90	---	299	1210	986	606	1220	1190	821
31	473	---	1150	89	---	504	---	1230	---	1220	1190	---
TOTAL	12380.00	31264	36230	13811	2697	6642	20279	32090	27633	29767	36434	30388
MEAN	399	1042	1169	446	96.3	214	676	1035	921	960	1175	1013
MAX	598	1210	1180	1160	110	504	1220	1240	1220	1230	1220	1210
MIN	.00	55	1150	87	86	72	11	319	23	34	604	62
CFSM	.73	1.90	2.13	.81	.18	.39	1.23	1.89	1.68	1.75	2.14	1.85
IN.	.84	2.12	2.45	.94	.18	.45	1.37	2.17	1.87	2.02	2.47	2.06
AC-FT	24560	62010	71860	27390	5350	13170	40220	63650	54810	59040	72270	60270

CAL YR 1977 TOTAL 94580.00 MEAN 259 MAX 1210 MIN .00 CFSM .47 IN 6.41 AC-FT 187600
WTR YR 1978 TOTAL 279615.00 MEAN 766 MAX 1240 MIN .00 CFSM 1.40 IN 18.95 AC-FT 554600

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, but is not published herein. The years given in the period of record represent water years up to the current year for which the annual maximum has been determined.

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		UPPER IOWA RIVER BASIN					
05388310	WATERLOO CR NR DORCHESTER, IOWA.	LAT 4327XX, LONG 9130XX, IN NW 1/4 SEC. 25, T.100 N., R.6 W., ALLAMAKEE COUNTY, ON STATE HIGHWAY 76, 1.4 MILES SOUTH OF DORCHESTER.	43.6	1966-	07-01-78	704.80	9,380
		WEXFORD CREEK BASIN					
05388400	WEXFORD CR NR HARPERS FERRY, IOWA.	LAT 4316XX, LONG 9108XX, IN SE 1/4 SEC. 25, T.98 N., R.3 W., ALLAMAKEE COUNTY, AT BRIDGE, 5 MILES NORTH OF HARPERS FERRY.	11.9	1953-	07-01-78	9.78	8,100
		PAINT CREEK BASIN					
05388600	PAINT CR NR WATERVILLE, IOWA.	LAT 4311XX, LONG 9116XX, NEAR CENTER SEC.36, T.97 N., R.4 W., ALLAMAKEE COUNTY, AT BRIDGE, 3 MILES SOUTHEAST OF WATERVILLE.	56.0	1953-	07-01-78	10.82	2,400
05388700	LITTLE PAINT CR TR NR WATERVILLE, IOWA.	LAT 4314XX, LONG 9115XX, IN SE 1/4 SEC. 1, T.97 N., R.4 W., ALLAMAKEE COUNTY, AT CULVERT, 3.5 MILES NORTHEAST OF WATERVILLE.	1.09	1953-	07-01-78	2.77	185
		TURKEY RIVER BASIN					
05411530	NB TURKEY R NR CRESCO, IOWA.	LAT 4322XX, LONG 9213XX, IN NW 1/4 SEC. 25, T.99 N., R.12 ., HOWARD COUNTY, AT BRIDGE ON STATE HIGHWAY 9, ABOUT 5 MILES WEST OF CRESCO.	19.5	1966-	1978	A	(+)
05411650	CRANE CR TR NR SARATOGA, IOWA.	LAT 4322XX, LONG 9223XX, NEAR SOUTHEAST CORNER OF SEC.21, T.99 N., R.13 W., HOWARD COUNTY, AT BRIDGE ON STATE HWY 9, 1 MILE EAST OF SARATOGA.	4.06	1953-	1978	A	(+)
05411700*	CRANE CR NR LOURDES, IOWA.	LAT 4315XX, LONG 9219XX, IN NW 1/4 SEC. 6, T.97 N., R.12 W., HOWARD COUNTY, AT BRIDGE ON STATE HIGHWAY 272, 1 MILE SW OF LOURDES.	75.8	1951-	1978	A	(+)
		LITTLE MAQUOKETA RIVER BASIN					
05414350	LITTLE MAQUOKETA R NEAR GRAF, IOWA.	LAT 423009, LONG 905150, IN SE 1/4 SEC. 20, T.89 N., R.1 E., DUBUQUE COUNTY, AT BRIDGE, 300 FEET DOWNSTREAM FROM ILLINOIS CENTRAL RR BRIDGE, 0.5 MILE NE OF GRAF.	39.6	1951-	06-16-78	10.22	2,600
05414400	MF LITTLE MAQUOKETA R NEAR RICKARDSVILLE, IOWA.	LAT 423338, LONG 905135, IN SE 1/4 SEC. 32, T.90 N., R.1 E., DUBUQUE COUNTY, AT BRIDGE, 2 MILES SOUTHEAST OF RICKARDSVILLE.	30.2	1951-	06-16-78	A	(+)
05414450*	NF LITTLE MAQUOKETA NEAR RICKARDSVILLE, IOWA.	LAT 423509, LONG 905120, NEAR NW CORNER SEC. 28, T.90 N., R.1 E., DUBUQUE COUNTY, AT BRIDGE, 1 MILE NE OF RICKARDSVILLE.	21.6	1951-	06-16-78	8.66	1,600
05414600	LITTLE MAQUOKETA R TR AT DUBUQUE, IOWA.	LAT 423233, LONG 904138, NEAR NW CORNER SEC.11, T.89 N., R.2 E., DUBUQUE COUNTY, AT BRIDGE ON STATE HIGHWAY 386 NR NORTH CITY LIMITS OF DUBUQUE.	1.54	1951-	06-16-78	12.05	290
		MAQUOKETA RIVER BASIN					
05417530	PLUM CR AT EARLVILLE, IOWA.	LAT 422813, LONG 911453, IN NE 1/4 SEC. 1, T.88 N., R.4 W., DELAWARE COUNTY, AT BRIDGE ON U.S. HIGHWAY 20, 1.5 MILES SOUTHEAST OF EARLVILLE.	41.1	1966-	09-13-78	84.00	1,200
05417590	KITTY CR NR LANGWORTHY, IOWA.	LAT 4212XX, LONG 9112XX, IN NW 1/4 SEC. 4, T.85 N., R.3 W., JONES COUNTY, AT BRIDGE ON U.S. HIGHWAY 151, ABOUT 1 MILE NE OF LANGWORTHY.	14.4	1966-	04-18-78	85.34	420

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		WAPSIPINICON RIVER BASIN					
05420600	LITTLE WAPSIPINICON TR NR RICEVILLE, IOWA.	LAT 4321XX, LONG 9229XX, NEAR S 1/4 CORNER SEC.27, T.99 N., R.14 W., HOWARD COUNTY, AT CULVERT, 3.5 MILES EAST OF RICEVILLE.	0.90	1953-	07-07-78	3.30	30
05420620	LITTLE WAPSIPINICON R NR ACME, IOWA.	LAT 4320XX, LONG 9229XX, AT N 1/4 CORNER SEC. 10, T.98 N., R.14 W., HOWARD COUNTY, AT BRIDGE ON CO. ROAD D, 1 MILE NORTH OF ACME.	7.76	1953-	04-19-78	4.65	265
05420640*	LITTLE WAPSIPINICON R AT ELMA, IOWA.	LAT 4314XX, LONG 9227XX, IN NW 1/4 SEC. 12, T.97 N., R.14 W., HOWARD COUNTY, AT BRIDGE ON COUNTY ROAD A, NEAR WEST CITY LIMITS OF ELMA.	37.3	1953-	1978	A	(+)
05420650	LITTLE WAPSIPINICON R NR NEW HAMPTON, IOWA.	LAT 4304XX, LONG 9224XX, IN NW 1/4 SEC. 9, T.95 N., R.13 W., CHICKASAW COUNTY AT BRIDGE ON U.S. HIGHWAY 18, 4 MILES WEST OF NEW HAMPTON.	95.0	1966-	04-19-78	85.53	765
05420690	EF WAPSIPINICON R NR NEW HAMPTON, IOWA.	LAT 4305XX, LONG 9218XX, IN SE 1/4 SEC. 31, T.96 N., R.12 W., CHICKASAW CO. AT BRIDGE ON U.S. HIGHWAY 63, 2 MILES NORTH OF NEW HAMPTON.	30.3	1966-	1978	A	(+)
05420850	LITTLE WAPSIPINICON R NR ORAN, IOWA.	LAT 4243XX, LONG 9202XX, IN NE 1/4 SEC. 8, T.91 N., R.10 W., FAYETTE COUNTY, AT BRIDGE ON STATE HIGHWAY 3, 2 MILES NE OF ORAN.	94.1	1966-	04-06-78	87.61	1,130
05420855	BUCK CR NR ORAN, IOWA.	LAT 424253, LONG 920733, IN NE 1/4 SEC. 10, T.91 N., R.11 W., BREMER COUNTY, AT BRIDGE ON STATE HIGHWAY 3, 2.5 MILES NW OF ORAN.	37.9	1966-	06-06-78	87.70	440
05421100	PINE CR TR NR WINTHROP, IOWA.	LAT 4229XX, LONG 9147XX, IN SW 1/4 SEC. 27, T.89 N., R.8 W., BUCHANAN COUNTY, AT CULVERT, 1.4 MILES NORTH OF U.S. HIGHWAY 20 AND 2.5 MILES NW OF WINTHROP.	0.334	1953-	06-17-78	5.95	115
05421200	PINE CR NR WINTHROP, IOWA.	LAT 4228XX, LONG 9147XX, IN SW 1/4 SEC. 34, T.89 N., R.8 W., BUCHANAN COUNTY, AT RR BRIDGE, 500 FT UPSTREAM FROM U.S. HIGHWAY 20 AND 2.5 MILES NW OF WINTHROP.	28.3	1950-	06-17-78	12.49	1,000
05421300	PINE CR TR NO. 2 AT WINTHROP, IOWA.	LAT 4228XX, LONG 9144XX, AT N 1/4 CORNER SEC. 2, T.88 N., R.8 W., BUCHANAN COUNTY, AT CULVERT ON U.S. HIGHWAY 20 NEAR WEST CITY LIMITS OF WINTHROP.	0.704	1953-	06-17-78	6.40	115
05421550*	BUFFALO CR ABOVE WINTHROP, IOWA.	LAT 4230XX, LONG 9144XX, NEAR NE CORNER SEC. 25, T.89 N., R. 8 W., BUCHANAN COUNTY, AT BRIDGE, 1.5 MILES NE OF WINTHROP.	68.2	1957-	08-27-78	16.29	740
05421600	BUFFALO CR NR WINTHROP, IOWA.	LAT 4228XX, LONG 9143XX, IN NE 1/4 SEC. 1, T.88 N., R.8 W., BUCHANAN COUNTY, AT BRIDGE ON U.S. HIGHWAY 20, 1 MILE EAST OF WINTHROP.	71.4	1953-	06-17-78	87.16	860
05421890	SILVER CR AT WELTON, IOWA.	LAT 4155XX, LONG 9036XX, IN NW 1/4 SEC. 15, T.82 N., R.3 E., CLINTON COUNTY, AT BRIDGE ON U.S. HIGHWAY 61 AT NORTH EDGE OF WELTON.	9.03	1966-	04-10-78	85.29	(+)
		IOWA RIVER BASIN					
05448400*	WESTMAIN DRAINAGE DITCH 1 & 2 NR BRITT, IOWA.	LAT 4306XX, LONG 9347XX, IN SW 1/4 SEC. 27, T.96 N., R.25 W., HANCOCK COUNTY, AT BRIDGE ON U.S. HIGHWAY 18 NEAR EAST CITY LIMITS OF BRITT.	21.2	1966-	1978	A	(+)
05448600	EB IOWA R ABOVE HAYFIELD, IOWA.	LAT 4309XX, LONG 9341XX, NEAR S 1/4 CORNER SEC. 4, T.96 N., R.24 W., HANCOCK COUNTY, AT BRIDGE, 1.5 MILES SE OF HAYFIELD.	2.23	1953-	06-15-78	3.96	48
05448700	EB IOWA R NR HAYFIELD, IOWA.	LAT 4311XX, LONG 9339XX, IN NW 1/4 SEC. 35, T.97 N., R.24 W., HANCOCK COUNTY, AT BRIDGE, 2 MILES EAST OF HAYFIELD.	7.94	1952-	06-15-78	9.14	74
05448800	EB IOWA R NR GARNER, IOWA.	LAT 4306XX, LONG 9337XX, NEAR CENTER SEC. 25, T.96 N., R.24 W., HANCOCK COUNTY, AT BRIDGE ON U.S. HIGHWAY 18, 1.2 MILES WEST OF GARNER.	45.1	1952-	06-15-78	9.75	400

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		IOWA RIVER BASIN--CONTINUED					
05448900	EB IOWA R TR NR GARNER, IOWA.	LAT 4306XX, LONG 9340XX, NEAR CENTER SEC. 27, T.96 N., R.24 W., HANCOCK COUNTY, AT CULVERT ON U.S. HWY 18, 2.1 MILES WEST OF GARNER.	5.98	1952-	06-15-78	4.32	27
05451955	STEIN CR NR CLUTIER, IOWA.	LAT 420446, LONG 921800, IN NE 1/4 SEC. 24, T.84 N., R.13 W., TAMA COUNTY, AT BRIDGE ON STATE HIGHWAY 318, 5 MILES EAST OF CLUTIER.	23.4	1971-	06-29-78	74.10	1,750
05453200	PRICE CR AT AMANA, IOWA.	LAT 4148XX, LONG 9153XX, IN SE 1/4 SEC. 22, T.81 N., R.9 W., IOWA COUNTY, AT BRIDGE ON STATE HIGHWAY 149, NEAR NORTH EDGE OF AMANA.	29.1	1966-	06-29-78	86.42	4,100
05453600	RAPID CR BELOW MORSE, IOWA.	LAT 414345, LONG 912538, NEAR NE CORNER SEC. 21, T.80 N., R.5 W., JOHNSON COUNTY, AT BRIDGE, 1.5 MILES SE OF MORSE.	8.12	1951-	07-21-78	16.38	170
05453750	RAPID CR SW OF MORSE, IOWA.	LAT 414323, LONG 912616, IN W 1/2 SEC. 21, T.80 N., R.5 W., JOHNSON COUNTY, AT BRIDGE, 2 MILES SOUTHWEST OF MORSE.	15.2	1951-	1978	A	(+)
05453850	RAPID CR TR NO. 3 NR OASIS, IOWA.	LAT 414233, LONG 912714, NEAR CENTER OF SEC. 29, T.80 N., R.5 W., JOHNSON COUNTY, AT BRIDGE, 3.5 MILES WEST OF OASIS.	1.62	1951-	07-21-78	19.57	170
05453900	RAPID CR TR NR OASIS, IOWA.	LAT 414114, LONG 912637, NEAR SW CORNER SEC. 33, T.80 N., R.5 W., JOHNSON COUNTY, AT BRIDGE, 3 MILES SW OF OASIS.	.97	1951-	1978	A	(+)
05453950	RAPID CR TR NR IOWA CITY, IOWA.	LAT 414156, LONG 912839, IN NW 1/4 SEC. 31, T.80 N., R.5 W., JOHNSON COUNTY, AT BRIDGE, 4 MILES NE OF IOWA CITY.	3.43	1951-	07-21-78	22.21	290
05455100*	OLD MANS CR NR IOWA CITY, IOWA.	LAT 413623, LONG 913656, IN NW 1/4 SEC. 36, T.79 N., R.7 W., JOHNSON COUNTY, AT BRIDGE, 3 MILES SOUTHWEST OF IOWA CITY.	201	1950-64, 1965-	1978	A	(+)
05455140	N ENGLISH R NR MONTEZUMA, IOWA.	LAT 413845, LONG 923420, IN SW 1/4 SEC. 14, T.79 N., R.15 W., POWESHIEK CO., AT BRIDGE, 5.0 MILES NORTHWEST OF MONTEZUMA.	31.0	1972-	07-20-78	28.18	6,800
05455200*	N ENGLISH R NR GUERNSEY, IOWA.	LAT 4138XX, LONG 9224XX, NEAR SW CORNER SEC. 17, T.79 N., R.13 W., POWESHIEK COUNTY, AT BRIDGE, 2.2 MILES WEST OF GUERNSEY.	68.7	1953-	07-20-78	14.25	4,000
05455210	N ENGLISH R AT GUERNSEY, IOWA.	LAT 4138XX, LONG 9221XX, IN NW 1/4 SEC. 22, T.79 N., R.13 W., POWESHIEK CO., AT BRIDGE ON STATE HIGHWAY 21, 1 MILE SW OF GUERNSEY.	81.5	1960, 1966-	07-20-78	86.62	5,500
05455230	DEEP R AT DEEP RIVER, IOWA.	LAT 4135XX, LONG 9221XX, IN SW 1/4 SEC. 3, T.78 N., R.13 W., POWESHIEK CO., AT BRIDGE ON STATE HIGHWAY 21, 1 MILE NE OF DEEP RIVER.	30.5	1960, 1966-	04-18-78	80.19	910
05455300	S ENGLISH R NR BARNES CITY, IOWA.	LAT 4131XX, LONG 9228XX, NEAR NW CORNER SEC. 34, T.78 N., R.14 W., POWESHIEK COUNTY, AT BRIDGE, 1 MILE NORTH OF BARNES CITY.	11.5	1953-	07-20-78	12.37	850
05455350	S ENGLISH R TR NO.2 NR MONTEZUMA, IOWA.	LAT 4134XX, LONG 9227XX, NEAR SW CORNER SEC. 11, T.78 N., R.14 W., POWESHIEK COUNTY, AT BOX CULVERT, 4 MILES SE OF MONTEZUMA.	0.523	1953-	07-20-78	9.40	60

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		IOWA RIVER BASIN--CONTINUED					
05455550	BULGERS RUN NR RIVERSIDE, IOWA.	LAT 41Z9XX, LONG 9138XX, IN SE 1/4 SEC. 11, T.77 N., R.7 W., WASHINGTON CO., AT BRIDGE ON STATE HIGHWAY 22, 2.5 MILES WEST OF RIVERSIDE.	6.31	1965-	04-12-78	88.07	2,300
05457440	DEER CR NR CARPENTER, IOWA.	LAT 4325XX, LONG 9259XX, IN NE 1/4 SEC. 8, T.99 N., R.18 W., MITCHELL COUNTY, AT BRIDGE ON STATE HIGHWAY 105, 1.5 MILES EAST OF CARPENTER.	91.6	1966-	06-15-78	82.06	2,760
05458560	BEAVERDAM CR NR SHEFFIELD, IOWA.	LAT 4256XX, LONG 9312XX, IN NW 1/4 SEC. 27, T.94 N., R.20 W., CERRO GORDO CO. AT BRIDGE ON U.S. HIGHWAY 65, 3 MILES NORTH OF SHEFFIELD.	123	1966-	06-15-78	56.77	2,850
05459010	ELK CR AT KENSETT, IOWA.	LAT 4322XX, LONG 9313XX, IN NE 1/4 SEC. 28, T.99 N., R.20 W., WORTH COUNTY, AT BRIDGE ON U.S. HIGHWAY 65, 1 MILE NORTH OF KENSETT.	58.1	1966-	07-06-78	90.39	452
05459490	SPRING CR NR MASON CITY, IOWA.	LAT 431248, LONG 931238, IN SE 1/4 SEC. 16, T.97 N., R.20 W., CERRO GORDO CO. AT BRIDGE ON U.S. HIGHWAY 65, 4 MILES NORTH OF MASON CITY.	29.3	1966-	06-15-78	86.16	940
05460100	WILLOW CR NR MASON CITY, IOWA.	LAT 4309XX, LONG 9316XX, IN NE 1/4 SEC. 12, T.96 N., R.21 W., CERRO GORDO CO. AT BRIDGE ON U.S. HIGHWAY 18, 3.5 MILES WEST OF MASON CITY.	78.6	1966-	06-15-78	90.75	790
05462750	BEAVER CR TR NR APLINGTON, IOWA.	LAT 4235XX, LONG 9251XX, IN NW 1/4 SEC. 27, T.90 N., R.17 W., BUTLER COUNTY, AT BRIDGE ON U.S. HIGHWAY 20, 2 MILES EAST OF APLINGTON.	11.6	1966-	07-19-78	93.37	850
05463090	BLACK HAWK CR AT GRUNDY CENTER, IOWA.	LAT 4222XX, LONG 9246XX, IN NW 1/4 SEC. 7, T.87 N., R.16 W., GRUNDY COUNTY, AT BRIDGE ON STATE HIGHWAY 14, AT NORTH EDGE OF GRUNDY CENTER.	56.9	1966-	03-20-78	85.76	C
05464145	TWELVE MILE CR NR TRAER, IOWA.	LAT 421350, LONG 922756, IN SE 1/4 SEC. 27, T.86 N., R.14 W., TAMA COUNTY, AT BRIDGE ON U.S. HIGHWAY 63, 2.5 MILES NORTH OF TRAER.	43.8	1966-	08-21-66	86.19	760
					03-26-67	85.57	640
					06-08-69	86.04	740
					03-14-71	86.00	740
					02-29-72	86.40	C
					06-21-74	86.71	920
					03-19-75	86.03	740
					04-18-76	85.82	700
					06-28-78	86.16	760
05464310	PRATT CR NR GARRISON, IOWA.	LAT 421053, LONG 921110, IN SE 1/4 SEC. 12, T.85 N., R.12 W., BENTON COUNTY, AT BRIDGE ON U.S. HIGHWAY 218, 3.5 MILES NW OF GARRISON.	23.4	1966-	1966	89.37	1,200
					03-20-67	87.09	600
					08-05-68	88.14	860
					07-18-69	92.03	2,500
					03-03-70	91.46	2,200
					02-01-73	89.79	1,400B
					05-28-74	90.70	1,800
					03-19-75	90.08	1,600B
					09-18-77	91.23	2,100B
					03-18-78	88.10	850
05464318	E BLUE CR AT CENTER POINT, IOWA.	LAT 421244, LONG 914721, IN SW 1/4 SEC. 33, T.86 N., R.8 W., LINN COUNTY, AT BRIDGE ON STATE HIGHWAY 150, 1.5 MILES NORTH OF CENTER POINT.	17.6	1966-	1978	A	(+)
05464560	PRAIRIE CR AT BLAIRSTOWN, IOWA.	LAT 415442, LONG 920503, IN SW 1/4 SEC. 13, T.82 N., R.11 W., BENTON COUNTY, AT BRIDGE ON STATE HIGHWAY 82, AT NORTH EDGE OF BLAIRSTOWN.	87.0	1966-	07-20-78	83.92	3,500
05464880	OTTER CR AT WILTON, IOWA.	LAT 413617, LONG 910208, IN NE 1/4 SEC. 35, T.79 N., R.2 W., CEDAR COUNTY, AT BRIDGE ON STATE HIGHWAY 38, 1.5 MILES NW OF WILTON.	10.7	1966-	04-10-78	86.70	1,400
05465150	NF LONG CR AT AINSWORTH, IOWA.	LAT 4117XX, LONG 9132XX, IN SW 1/4 SEC. 22, T.75 N., R.6 W., WASHINGTON CO., AT BRIDGE ON U.S. HIGHWAY 218, 1 MILE SE OF AINSWORTH.	30.2	1951, 1965-	07-22-78	87.92	770

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		SKUNK RIVER BASIN					
05469860	MUD LAKE DRAINAGE DITCH 71 IN JEWELL, IOWA.	LAT 4219XX, LONG 9338XX, IN SW 1/4 SEC. 27, T.87 N., R.24 W., HAMILTON CO., AT BRIDGE ON U.S. HIGHWAY 69 IN JEWELL.	65.4	1966-	04-18-78	85.38	640
05469990	KEIGLEY BR NR STORY CITY, IOWA.	LAT 4209XX, LONG 9337XX, IN NW 1/4 SEC. 26, T.85 N., R.24 W., STORY COUNTY, AT BRIDGE ON U.S. HIGHWAY 69, 3 MILES SOUTH OF STORY CITY.	31.0	1966-	1978	A	(+)
05472090	N SKUNK R NR BAXTER, IOWA.	LAT 4149XX, LONG 93D4XX, IN NE 1/4 SEC. 21, T.81 N., R.19 W., JASPER COUNTY, AT BRIDGE ON STATE HIGHWAY 223, 4.5 MILES EAST OF BAXTER.	52.2	1966-	1978	A	(+)
05472290	SUGAR CR NR SEARSBORO, IOWA.	LAT 4134XX, LONG 9244XX, IN SE 1/4 SEC. 7, T.78 N., R.16 W., POWESHIEK CO., AT BRIDGE ON STATE HIGHWAY 225, 1.8 MILES WEST OF SEARSBORO.	52.7	1966-	09-13-78	91.60	1,700
05472390	MIDDLE CR NR LACEY, IOWA.	LAT 4125XX, LONG 9239XX, IN NE 1/4 SEC. 1, T.76 N., R.16 W., MAHASKA COUNTY, AT BRIDGE ON U.S. HIGHWAY 63, 1.5 MILES NW OF LACEY.	23.0	1966-	07-07-78	86.13	900
05472445	ROCK CR AT SIGOURNEY, IOWA.	LAT 412012, LONG 921320, IN NE 1/4 SEC. 3, T.75 N., R.12 W., KEOKUK COUNTY, AT BRIDGE ON STATE HIGHWAY 92, NEAR WEST EDGE OF SIGOURNEY.	26.3	1966-	07-07-78	90.24	2,200
05473300*	CEDAR CR NR BATAVIA, IOWA.	LAT 4101XX, LONG 9207XX, IN SW 1/4 SEC. 27, T.72 N., R.11 W., JEFFERSON CO., AT BRIDGE ON U.S. HIGHWAY 34, 2.5 MILES NE OF BATAVIA.	252	1966-	04-12-78	82.21	5,400
		DES MOINES RIVER BASIN					
05480930	WHITE FOX CR AT CLARION, IOWA.	LAT 4244XX, LONG 9342XX, IN NW 1/4 SEC. 5, T.91 N., R.24 W., WRIGHT COUNTY, AT BRIDGE ON STATE HIGHWAY 3, 1.5 MILES EAST OF CLARION.	13.3	1966-	1978	A	(+)
05481510	BLUFF CR AT PILOT MOUND, IOWA.	LAT 4210XX, LONG 9401XX, IN NW 1/4 SEC. 20, T.85 N., R.27 W., BOONE COUNTY, AT BRIDGE ON STATE HIGHWAY 329, AT NW EDGE OF PILOT MOUND.	23.5	1965-	1978	A	(+)
05481680	BEAVER CR AT BEAVER, IOWA.	LAT 4202XX, LONG 9409XX, IN NE 1/4 SEC. 6, T.83 N., R.28 W., BOONE COUNTY, AT BRIDGE ON U.S. HIGHWAY 30, AT SW EDGE OF BEAVER.	38.5	1966-	09-12-78	88.39	520
05481690	W BEAVER CR AT GRAND JUNCTION, IOWA.	LAT 4202XX, LONG 9413XX, IN NE 1/4 SEC. 3, T.83 N., R.29 W., GREENE COUNTY, AT BRIDGE ON U.S. HIGHWAY 30, NEAR EAST EDGE OF GRAND JUNCTION.	12.6	1965-	09-12-78	86.39	183
05482600	HARDIN CR AT FARNHAMVILLE, IOWA.	LAT 421601, LONG 942510, NEAR NE CORNER SEC. 14, T.86 N., R.31 W., CALHOUN CO., AT BRIDGE ON STATE HIGHWAY 175, NEAR WEST CITY LIMITS OF FARNHAMVILLE.	43.7	1952-	1978	A	(+)
05482800	HAPPY RUN AT CHURDAN, IOWA.	LAT 4210XX, LONG 9430XX, NEAR SW CORNER SEC. 17, T.85 N., R.31 W., GREENE CO. AT BRIDGE NEAR WEST CITY LIMITS OF CHURDAN.	7.58	1952-	1978	A	(+)
05482900	HARDIN CR NR FARLIN, IOWA.	LAT 4206XX, LONG 9426XX, NEAR N 1/4 CORNER SEC. 14, T.84 N., R.31 W., GREENE COUNTY, AT BRIDGE, 1.5 MILES NE OF FARLIN.	101	1951-	03-16-78	9.26	510
05483318	BRUSHY FORK CR NR TEMPLETON, IOWA.	LAT 4157XX, LONG 9453XX, IN NW 1/4 SEC. 1, T.82 N., R.35 W., CARROLL COUNTY, AT BRIDGE ON U.S. HIGHWAY 71, 4 MILES NE OF TEMPLETON.	45.0	1966-	09-12-78	87.56	1,850
05483349	M RACCOON R TR AT CARROLL, IOWA.	LAT 4203XX, LONG 9453XX, IN NW 1/4 SEC. 36, T.84 N., R.35 W., CARROLL COUNTY, AT BRIDGE ON U.S. HIGHWAY 71, 1.5 MILES SOUTH OF CARROLL.	6.58	1966-	1978	A	(+)

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		DES MOINES RIVER BASIN--CONTINUED					
05487350	S OTTER CR TR NR WOODBURN, IOWA.	LAT 4103XX, LONG 9336XX, NEAR SW CORNER SEC. 11, T.72 N., R.24 W., CLARKE CO. AT BRIDGE, 2 MILES NORTH OF WOODBURN.	0.71	1955-	10-23-77	11.75	(+)
05487600	S WHITE BREAST CR NR OSCEOLA, IOWA.	LAT 405736, LONG 934128, NEAR SW CORNER SEC. 12, T.71 N., R.25 W., CLARKE COUNTY, AT BRIDGE, 6 MILES SE OF OSCEOLA.	28.0	1953-	05-12-78	11.65	2,000
05487800*	WHITE BREAST CR AT LUCAS, IOWA.	LAT 4101XX, LONG 9328XX, IN NE 1/4 SEC. 23, T.72 N., R.23 W., LUCAS COUNTY, AT BRIDGE ON U.S. HIGHWAY 65, NEAR SOUTH CITY LIMITS OF LUCAS.	128	1953	05-12-78	16.66	9,800
05488620	COAL CR NR ALBIA, IOWA.	LAT 4101XX, LONG 9251XX, IN SW 1/4 SEC. 20, T.72 N., R.17 W., MONROE COUNTY, AT BRIDGE ON U.S. HIGHWAY 34, 2 MILES SW OF ALBIA.	13.5	1966	05-07-78	80.09	(+)
05489150	L MUCHAKINOCK CR AT OSKALOOSA, IOWA.	LAT 4116XX, LONG 9238XX, IN SE 1/4 SEC. 25, T.75 N., R.16 W., MAHASKA COUNTY, AT BRIDGE ON STATE HIGHWAY 137, AT SOUTH EDGE OF OSKALOOSA.	9.12	1966-	07-07-78	85.87	350
05489350	S AVERY CR NR BLAKESBURG, IOWA.	LAT 4101XX, LONG 9237XX, IN SE 1/4 SEC. 19, T.72 N., R.15 W., WAPELLO COUNTY, AT BRIDGE ON U.S. HIGHWAY 34, 3.5 MILES NORTH OF BLAKESBURG.	33.1	1965-	07-21-78	83.75	4,100
05489490	BEAR CR AT OTTUMWA, IOWA.	LAT 410043, LONG 922754, IN NW 1/4 SEC. 27, T.72 N., R.14 W., WAPELLO COUNTY, AT BRIDGE ON U.S. HIGHWAY 34, NEAR WEST EDGE OF OTTUMWA.	22.9	1965-	07-21-78	88.38	2,300
		FOX RIVER BASIN					
05494100	S FOX CR TR NR WEST GROVE, IOWA.	LAT 4044XX, LONG 9238XX, NEAR S 1/4 CORNER SEC. 31, T.69 N., R.15 W., DAVIS CO., AT CULVERT ON STATE HIGHWAY 2, 3.5 MILES WEST OF WEST GROVE.	0.55	1953-	07-19-78	6.26	(+)
05494110	S FOX CR NR WEST GROVE, IOWA.	LAT 4044XX, LONG 9236XX, IN SE 1/4 SEC. 32, T.69 N., R.15 W., DAVIS COUNTY, AT BRIDGE ON STATE HIGHWAY 2, 2.4 MILES WEST OF WEST GROVE.	12.2	1965-	04-10-78	85.63	(+)
		BIG SIOUX RIVER BASIN					
06483410	OTTER CR NORTH OF SIBLEY, IOWA.	LAT 4328XX, LONG 9544XX, AT NE CORNER SEC. 25, T.100 N., R.42 W., OSCEOLA CO., AT BRIDGE ON COUNTY ROAD H, 4 MILES NORTH OF SIBLEY.	11.9	1952-	07-22-78	6.56	230
06483420	SCHUTTE CR NR SIBLEY, IOWA.	LAT 4328XX, LONG 9547XX, NEAR NW CORNER SEC. 23, T.100 N., R.42 W., OSCEOLA COUNTY, AT CULVERT, 6 MILES NW OF SIBLEY.	1.43	1952-	05-31-78	8.05	(+)
06483430	OTTER CR AT SIBLEY, IOWA.	LAT 4324XX, LONG 9546XX, NEAR N 1/4 CORNER SEC. 14, T.99 N., R.42 W., OSCEOLA CO., AT BRIDGE, 1 MILE NW OF SIBLEY.	29.9	1952-	07-22-78	6.33	155
06483440	DAWSON CR NR SIBLEY, IOWA.	LAT 4323XX, LONG 9543XX, NEAR NW CORNER SEC. 20, T.99 N., R.41 W., OSCEOLA CO., AT CULVERT ON COUNTY ROAD D, 2 MILES SE OF SIBLEY.	4.35	1952-	07-22-78	5.37	550
06483450	WAGNER CR NR ASHTON, IOWA.	LAT 4321XX, LONG 9545XX, ON SOUTH LINE SEC. 35, T.99 N., R.42 W., OSCEOLA COUNTY, AT BRIDGE, 3 MILES NE OF ASHTON.	7.09	1952-	07-22-78	14.34	(+)
06483460*	OTTER CR NR ASHTON, IOWA.	LAT 4320XX, LONG 9546XX, IN SE 1/4 SEC. 2, T.98 N., R.42 W., OSCEOLA COUNTY, AT BRIDGE, 2 MILES NORTHEAST OF ASHTON.	88.0	1952	09-14-78	7.27	440
06483495	BURR OAK CR NR PERKINS, IOWA.	LAT 431443, LONG 961038, IN SE 1/4 SEC. 5, T.97 N., R.45 W., SIOUX CO., AT BRIDGE ON U.S. HIGHWAY 75, 4 MILES NORTH OF PERKINS.	30.9	1966-	07-22-78	82.92	46

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		PERRY CREEK BASIN					
06599800	PERRY CR NR MERRILL, IOWA.	LAT 424316, LONG 962033, IN NW 1/4 SEC. 12, T.91 N., R.47 W., PLYMOUTH CO., AT BRIDGE ON COUNTY ROAD M, 5 MILES WEST OF MERRILL.	8.17	1953-	03-19-78	8.87c	(+)
06599950	PERRY CR NR HINTON, IOWA.	LAT 423757, LONG 962213, IN NE 1/4 SEC. 15, T.90 N., R.47 W., PLYMOUTH CO., AT BRIDGE, 4 MILES WEST OF HINTON.	30.8	1953-	03-19-78	33.27c	(+)
		FLOYD RIVER BASIN					
06600030	L FLOYD R NR SANBORN, IOWA.	LAT 431110, LONG 954330, IN NE 1/4 SEC. 31, T.97 N., R.41 W., O BRIEN CO., AT BRIDGE ON U.S. HIGHWAY 18, 3.5 MILES WEST OF SANBORN.	8.44	1966-	1978	A	(+)
06600080	WILLOW CR AT HOSPERS, IOWA.	LAT 430438, LONG 955416, IN NE 1/4 SEC. 3, T.95 N., R.43 W., SIOUX CO., AT BRIDGE ON STATE HIGHWAY 60, AT NORTH EDGE OF HOSPERS.	37.9	1966-	07-22-78	86.51	(+)
		MONONA-HARRISON DITCH BASIN					
06601480	BIG WHISKEY SLOUGH NR REMSEN, IOWA.	LAT 4248XX, LONG 9553XX, IN NW 1/4 SEC. 11, T.92 N., R.43 W., PLYMOUTH CO., AT BRIDGE ON STATE HIGHWAY 3, 4.2 MILES EAST OF REMSEN.	12.9	1966-	07-22-78	92.78	(+)
06602190	ELLIOTT CR AT LAWTON, IOWA.	LAT 422830, LONG 961122, IN NW 1/4 SEC. 3, T.88 N., R.46 W., WOODBURY CO., AT BRIDGE ON U.S. HIGHWAY 20, AT WEST EDGE OF LAWTON.	34.8	1966-	03-22-78	79.72	1,330
06602240	BIG WHISKEY CR NR LAWTON, IOWA.	LAT 422830, LONG 961501, IN NW 1/4 SEC. 6, T.88 N., R.46 W., WOODBURY CO., AT BRIDGE ON U.S. HIGHWAY 20, 3.5 MILES WEST OF LAWTON.	51.3	1966-	1978	A	(+)
		LITTLE SIOUX RIVER BASIN					
06604510	OCHEYEDAN R NR OCHEYEDAN, IOWA.	LAT 4326XX, LONG 9537XX, IN NE 1/4 SEC. 6, T.99 N., R.40 W., OSCEOLA CO., AT BRIDGE ON STATE HIGHWAY 9, 4 MILES NW OF OCHEYEDAN.	73.5	1966-	1978	A	(+)
06605340	PRAIRIE CR NR SPENCER, IOWA.	LAT 430516, LONG 950940, IN SE 1/4 SEC. 36, T.96 N., R.37 W., CLAY COUNTY, AT BRIDGE ON U.S. HIGHWAY 71, 4 MILES SOUTH OF SPENCER.	22.3	1966-	1978	A	(+)
06605760	WILLOW CR NR CORNELL, IOWA.	LAT 4243XX, LONG 9510XX, IN SE 1/4 SEC. 12, T.94 N., R.37 W., CLAY COUNTY, AT BRIDGE ON U.S. HIGHWAY 71, 2 MILES NW OF CORNELL.	78.6	1966-	09-12-78	88.23	1,080
06605890	WATERMAN CR AT HARTLEY, IOWA.	LAT 431106, LONG 953043, IN NE 1/4 SEC. 36, T.97 N., R.40 W., O BRIEN CO., AT BRIDGE ON U.S. HIGHWAY 18, 1.8 MILES WEST OF HARTLEY.	28.7	1966-	07-22-78	86.89	940
06606790	MAPLE CR NR ALTA, IOWA.	LAT 4245XX, LONG 9522XX, IN NE 1/4 SEC. 31, T.92 N., R.38 W., BUENA VISTA CO. AT BRIDGE ON STATE HIGHWAY 3, 6 MILES NW OF ALTA.	15.5	1966-	09-12-78	86.12	145
06607197	WILSEY CR AT MAPLETON, IOWA.	LAT 4210XX, LONG 9545XX, IN SE 1/4 SEC. 14, T.85 N., R.43 W., MONONA CO., AT BRIDGE ON STATE HIGHWAY 141, 1.2 MILES NW OF MAPLETON.	18.4	1966-	09-12-78	80.71	(+)

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		SOLDIER RIVER BASIN					
06608450	JORDAN CR AT MOORHEAD, IOWA.	LAT 4155XX, LONG 9552XX, IN NW 1/4 SEC. 16, T.82 N., R.43 W., MONONA CO., AT BRIDGE ON STATE HIGHWAY 183, AT SW CORNER OF MOORHEAD.	30.1	1966-	09-13-78	84.88	(+)
		BOYER RIVER BASIN					
06609560	WILLOW CR NR SOLDIER, IOWA.	LAT 4155XX, LONG 9542XX, IN NW 1/4 SEC. 14, T.82 N., R.42 W., MONONA CO., AT BRIDGE ON STATE HIGHWAY 37, 6 MILES SE OF SOLDIER.	29.1	1966-	1978	---	(+)
		MOSQUITO CREEK BASIN					
06610510	MOSER CR NR EARLING, IOWA.	LAT 4147XX, LONG 9527XX, IN NE 1/4 SEC. 1, T.80 N., R.40 W., SHELBY CO., AT BRIDGE ON STATE HIGHWAY 37, 1.5 MILES WEST OF EARLING.	21.6	1966-	09-13-78	86.83	8,000
06610600*	MOSQUITO CR AT NEOLA, IOWA.	LAT 412709, LONG 953637, IN NE 1/4 SEC. 19, T.77 N., R.42 W., POTTAWATTAMIE CO., AT BRIDGE ON COUNTY ROAD S, 0.5 MILE SOUTH OF NEOLA.	131	1966-	09-13-78	31.28	(+)
		NISHNABOTNA RIVER BASIN					
06807418	GRAYBILL CR NR CARSON, IOWA.	LAT 4114XX, LONG 9523XX, IN NW 1/4 SEC. 7, T.74 N., R.39 W., POTTAWATTAMIE CO., AT BRIDGE ON STATE HIGHWAY 92, 2 MILES EAST OF CARSON.	45.9	1966-	1978	A	(+)
06807470	INDIAN CR NR EMERSON, IOWA.	LAT 4102XX, LONG 9523XX, IN NW 1/4 SEC. 19, T.72 N., R.39 W., MONTGOMERY CO., AT BRIDGE ON U.S. HIGHWAY 34, 1 MILE EAST OF EMERSON.	37.3	1966-	1978	A	(+)
06807720	M SILVER CR NR AVOCA, IOWA.	LAT 412833, LONG 952806, NEAR N 1/4 CORNER SEC. 17, T.77 N., R.40 W., POTTAWATTAMIE CO., AT BRIDGE ON STATE HIGHWAY 83, 7 MILES SOUTH OF AVOCA.	3.21	1955-	09-13-78	8.53	550
06807760	M SILVER CR NR OAKLAND, IOWA.	LAT 411928, LONG 953319, NEAR E 1/4 CORNER SEC. 4, T.75 N., R.41 W., POTTAWATTAMIE CO., AT BRIDGE, 8.5 MILES NW OF OAKLAND.	25.7	1953	09-13-78	11.60	1,400
06807780	M SILVER CR AT TREYNOR, IOWA.	LAT 411437, LONG 953653, NEAR NE CORNER SEC. 1, T.74 N., R.42 W., POTTAWATTAMIE CO., AT BRIDGE ON COUNTY ROAD F, 1 MILE NORTH OF TREYNOR.	42.7	1953-	09-13-78	7.01	1,300
06808880	BLUEGRASS CR AT AUDUBON, IOWA.	LAT 4143XX. LONG 9456XX, IN NW 1/4 SEC. 28, T.80 N., R.35 W., AUDUBON CO., AT BRIDGE ON U.S. HIGHWAY 71, NEAR SOUTH EDGE OF AUDUBON.	15.4	1966-	1978	A	(+)
		TARKIO RIVER BASIN					
06811760	TARKIO R NR ELLIOT, IOWA.	LAT 4106XX, LONG 9506XX, NEAR NE CORNER SEC. 28, T.73 N., R.37 W., MONTGOMERY COUNTY, AT BRIDGE, 4.5 MILES SE OF ELLIOT.	10.7	1952-	05-27-78	10.33	1,020
06811800	E TARKIO CR NR STANTON, IOWA.	LAT 4105XX, LONG 9506XX, IN W 1/2 SEC. 34, T.73 N., R.37 W., MONTGOMERY CO., AT BRIDGE, 7 MILES NORTH OF STANTON.	4.66	1952-	1978	A	(+)
06811820	TARKIO R TR NR STANTON, IOWA.	LAT 4103XX,LONG 9506XX, NEAR NE CORNER SEC. 16, T.72 N., R.37 W., MONTGOMERY COUNTY, AT BOX CULVERT, 4 MILES NORTH OF STANTON.	0.67	1952-	1978	A	(+)
06811875	SNAKE CR NR YORKTOWN, IOWA.	LAT 4045XX, LONG 9508XX, IN NW 1/4 SEC. 32, T.69 N., R.37 W., PAGE COUNTY, AT BRIDGE ON STATE HIGHWAY 2, 1.5 MILES NE OF YORKTOWN.	9.10	1966-	07-21-78	94.73	1,660

ANNUAL MAXIMUM DISCHARGE AT CREST-STAGE PARTIAL-RECORD STATIONS DURING WATER YEAR 1978--CONTINUED

STATION NO.	STATION NAME	LOCATION	DRAINAGE AREA (SQ MI)	PERIOD OF RECORD	ANNUAL MAXIMUM DATE	ANNUAL MAXIMUM GAGE HEIGHT (FEET)	ANNUAL MAXIMUM DISCHARGE (CFS)
		NODAWAY RIVER BASIN					
06816290	W NODAWAY R AT MASSENA, IOWA.	LAT 4115XX, LONG 9445XX, IN SE 1/4 SEC. 33, T.75 N., R.34 W., CASS COUNTY, AT BRIDGE ON STATE HIGHWAY 148, AT SE CORNER OF MASSENA.	23.4	1966-	04-17-78	78.48	(+)
		PLATTE RIVER BASIN					
06818598	PLATTE R NR STRINGTOWN, IOWA.	LAT 4059XX, LONG 9430XX, IN SE 1/4 SEC. 2, T.71 N., R.32 W., ADAMS COUNTY, AT BRIDGE ON U.S. HIGHWAY 34, 3.8 MILES EAST OF STRINGTOWN.	51.7	1966-	04-18-78	90.82	1,520
06819110	MB 102 R NR GRAVITY, IOWA.	LAT 4050XX, LONG 9444XX, IN SE 1/4 SEC. 27, T.70 N., R.34 W., TAYLOR COUNTY, AT BRIDGE ON STATE HIGHWAY 148, 4.8 MILES NORTH OF GRAVITY.	33.5	1966-	1978	A	(+)
		CHARITON RIVER BASIN					
06903980	CHARITON R NR UDELL, IOWA.	LAT 404653, LONG 925012, IN NE 1/4 SEC. 17, T.69 N., R.17 W., APPANOOSE CO., AT BRIDGE, 5.0 MILES WEST OF UDELL.	631	1972-	04-10-78	857.35	4,800
06903990	COOPER CR AT CENTERVILLE, IOWA.	LAT 404502, LONG 925136, IN NW 1/4 SEC. 30, T.69 N., R.17 W., APPANOOSE CO., AT BRIDGE ON STATE HIGHWAY 5, AT NORTH EDGE OF CENTERVILLE.	47.8	1966-	05-07-78	73.92	2,200
06904040	CHARITON R AT COAL CITY, IOWA.	LAT 403535, LONG 924240, IN NE 1/4 SEC. 20, T.67 N., R.16 W., APPANOOSE CO., AT BRIDGE IN COAL CITY.	816	1972-	07-22-78	821.78	4,800

* Also a low-flow partial-record station.
\+ Discharge not determined.
A Peak stage did not reach bottom of gage.
B Revised.
C Ice affected.

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1978

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Upper Iowa River basin				
Bear Creek	Upper Iowa River	NE1/4 sec.2, T.99 N., R.6 W., Allamakee County, at bridge on State Highway 76, 3.0 mi (4.8 km) south of Dorchester, Iowa.	118	1941-77	03-24-78	63.1
					05-02-78	56.0
					05-25-78	45.4
					08-24-78	51.5
Boyer River Basin						
*06609400 Boyer River	Missouri River	Lat 4200XX, long 9523XX, in NE1/4 sec.16, T.83 N., R.39 W., Crawford County, at bridge, 2 miles SW of Denison.	517	1957-77	10-07-77	78.0
					11-02-77	46.5
					12-12-77	36.4
					01-12-78	19.1
					02-07-78	15.6
					03-10-78	21.0
					04-12-78	125
					05-03-78	131
					07-05-78	278
					09-01-78	62.4

* Also a low-flow partial-record station.

During the period May to November 1978, the Geological Survey collected surface water samples in the Des Moines River basin on White Breast, English and Cedar Creeks for Project IA-77-035C. These data are published below. The project report, Baseline Water Quality of Iowa's Coal Region, by Larry J. Slack, open-file report 79-980 is now available for inspection at the Iowa City office.

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)
05487700 - WHITE BREAST CR NR WOODBURN, IOWA (LAT 40 58 36 LONG 093 35 14)												
MAY , 1978												
23...	1400	31	510	7.5	17.5	65	8.5	90	4.0	4200	230	33
JUN												
24...	1030	7.0	410	7.2	22.5	7.7	8.5	96	--	--	160	24
AUG												
25...	0950	.31	584	8.0	25.0	7.7	6.6	80	2.0	3500	230	12
05487810 - WHITE BREAST C NR LUCAS, IA (LAT 41 03 26 LONG 093 24 41)												
MAY , 1978												
23...	1600	50	460	7.8	18.0	9.3	9.2	100	2.0	1100	280	63
JUN												
23...	1930	39	380	7.4	22.0	210	7.9	93	--	--	110	13
AUG												
25...	1100	1.0	580	8.0	25.0	14	7.7	94	2.0	280	240	9
05487880 - WHITE BREAST C NR LACONA, IA (LAT 41 09 38 LONG 093 21 05)												
MAY , 1978												
23...	1730	95	559	7.6	19.0	20	8.4	93	3.0	2300	280	66
JUN												
23...	1600	1335	240	7.1	21.0	1600	6.6	76	--	--	110	39
AUG												
25...	1200	1.8	540	8.2	27.0	21	8.4	106	5.0	980	220	11
05487980 - WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41 LONG 093 16 08)												
MAY , 1978												
24...	0900	140	480	7.6	17.0	85	8.7	93	3.0	25000	240	63
JUN												
24...	1250	270	290	7.6	22.5	430	8.0	95	--	--	140	48
AUG												
24...	1545	5.0	480	8.2	30.0	16	9.2	123	5.0	170	210	17
05488000 - WHITE BREAST CREEK NR KNOXVILLE, IOWA (LAT 41 19 25 LONG 093 08 55)												
MAY , 1978												
24...	1030	158	450	7.4	17.0	150	8.8	94	3.0	37000	210	60
AUG												
24...	1430	6.3	633	8.0	28.0	11	10.5	136	4.0	360	250	49
NOV												
13...	1415	167	540	7.2	9.5	31	4.0	--	--	2300	280	78
05488180 - ENGLISH C NR COLUMBIA, IA (LAT 41 10 54 LONG 093 11 56)												
MAY , 1978												
24...	1545	6.2	420	7.6	23.0	6.4	9.0	107	1.0	360	250	65
AUG												
22...	1545	.04	520	7.9	26.0	4.2	--	--	3.0	300	250	36
NOV												
14...	1300	4.2	460	7.1	6.0	17	5.0	--	--	100000	240	66
05488200 - ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00 LONG 093 05 00)												
MAY , 1978												
24...	1430	21	532	7.3	18.5	19	9.4	100	2.0	520	260	87
AUG												
22...	1450	.07	700	7.8	26.0	11	--	--	4.0	1700	350	100
NOV												
14...	1130	17	560	7.2	6.0	29	5.0	--	--	1300	270	78

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (00095)	PH (UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS, NONCAR-BONATE (MG/L CACO3) (00902)
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)												
MAY , 1978												
24...	1230	32	700	7.4	17.0	6.1	9.4	100	3.0	30	350	190
AUG												
22...	1215	1.0	1307	8.0	25.0	7.0	--	--	7.0	870	580	440
NOV												
14...	0945	43	780	7.2	6.0	29	4.0	--	--	2500	400	230
05488550 - CEDAR CR AT MELROSE, IOWA (LAT 40 58 00 LONG 093 03 00)												
MAY , 1978												
24...	1800	7.9	420	7.6	22.5	9.6	9.0	105	2.0	5000	230	37
AUG												
23...	1430	.18	520	8.0	28.0	2.3	8.4	109	2.0	140	240	20
SEP												
20...	1500	935	110	6.9	17.5	21	7.0	74	--	160000	42	7
05488600 - CEDAR CR NR ALBIA, IOWA (LAT 41 01 00 LONG 092 53 00)												
MAY , 1978												
24...	1900	38	470	7.4	22.5	35	9.2	107	2.0	5500	230	56
AUG												
23...	1300	1.8	570	8.2	29.0	1.0	8.2	106	2.0	80	300	84
SEP												
21...	0900	116	200	7.5	16.0	280	8.0	82	--	110000	110	46
05488700 - CEDAR CR NR LOVILIA, IOWA (LAT 41 07 00 LONG 092 56 00)												
MAY , 1978												
24...	2030	83	470	7.6	22.5	8.1	8.4	98	<1.0	830	270	85
AUG												
23...	1550	6.6	561	8.2	27.0	4.6	8.6	112	6.0	620	280	76
SEP												
21...	1045	575	200	7.4	16.0	35	8.0	82	--	80000	99	47
05488895 - N CEDAR C NR ATTICA, IA (LAT 41 10 10 LONG 093 03 23)												
MAY , 1978												
25...	0930	7.9	570	7.3	21.0	5.1	9.0	102	1.0	1300	290	110
AUG												
23...	0930	.15	1000	7.8	22.0	4.0	8.6	98	2.0	990	440	230
SEP												
20...	1700	1275	140	7.5	17.5	9.0	7.2	77	--	720000	53	10
05488990 - N CEDAR C NR BUSSEY, IA (LAT 41 12 44 LONG 093 55 50)												
MAY , 1978												
25...	1030	36	700	7.6	20.0	6.2	8.8	98	1.0	170	330	150
AUG												
24...	0945	2.4	950	7.3	23.0	15	6.2	73	4.0	860	480	340
SEP												
21...	1200	2770	160	7.6	16.5	320	8.2	85	--	150000	77	33
05489000 - CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09 LONG 092 54 38)												
MAY , 1978												
25...	1130	115	650	7.3	22.0	6.6	8.4	98	1.0	460	250	82
AUG												
24...	1100	11	940	7.6	25.0	12	5.9	72	2.0	550	330	150
SEP												
21...	1315	4920	170	7.3	17.0	32	7.8	82	--	120000	89	48
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)												
MAY , 1978												
25...	1230	153	700	7.6	22.0	6.8	9.0	100	1.0	380	310	150
AUG												
24...	1200	14	680	7.8	26.0	17	7.6	95	5.0	180	320	150
SEP												
21...	1415	4760	180	7.2	18.0	.70	7.4	80	--	78000	92	48

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)
05487700 - WHITE BREAST CR NR WOODBURN, IOWA (LAT 40 58 36 LONG 093 35 14)												
MAY , 1978												
23...	30	4	1	300	200	2	2	10	0	10	3	4300
JUN												
24...	210	4	2	400	300	7	1	10	0	21	5	8800
AUG												
25...	0	3	2	200	200	1	<1	0	20	6	1	510
05487810 - WHITE BREAST C NR LUCAS, IA (LAT 41 03 26 LONG 093 24 41)												
MAY , 1978												
23...	20	3	1	200	200	2	3	5	0	5	3	1400
JUN												
23...	--	1	1	400	300	12	1	20	0	24	4	10000
AUG												
25...	0	3	2	200	200	1	<1	0	0	6	1	790
054B79B0 - WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41 LONG 093 16 08)												
MAY , 1978												
24...	80	4	1	400	100	2	2	--	0	15	5	5000
JUN												
24...	370	4	1	600	300	11	1	30	0	40	5	27000
AUG												
24...	0	2	2	200	200	18	<1	0	0	7	1	1200
05488180 - ENGLISH C NR COLUMBIA, IA (LAT 41 10 54 LONG 093 11 56)												
MAY , 1978												
24...	40	2	1	100	200	1	1	5	5	8	2	660
AUG												
22...	0	2	2	300	300	0	0	0	0	9	1	380
NOV												
14...	50	2	1	0	0	4	3	0	0	4	2	1300
05488200 - ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00 LONG 093 05 00)												
MAY , 1978												
24...	50	2	0	200	200	2	2	0	0	8	2	1600
AUG												
22...	0	2	2	300	300	9	0	0	0	7	1	960
NOV												
14...	20	3	1	100	0	12	2	10	0	9	1	3500
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)												
MAY , 1978												
24...	30	2	0	200	100	2	2	0	0	9	2	1000
AUG												
22...	20	2	1	100	200	1	<1	10	0	6	1	690
NOV												
14...	40	1	0	0	0	3	3	0	0	7	2	2100
05488600 - CEDAR CR NR ALBIA, IOWA (LAT 41 01 00 LONG 092 53 00)												
MAY , 1978												
24...	60	2	1	100	100	2	1	20	0	15	2	3400
AUG												
23...	20	2	1	300	300	0	0	D	0	6	1	350
SEP												
21...	850	4	2	200	200	2	3	10	0	21	16	23000
05488700 - CEDAR CR NR LOVILIA, IOWA (LAT 41 07 00 LONG 092 56 00)												
MAY , 1978												
24...	30	2	1	100	100	1	1	10	5	8	1	1200
AUG												
23...	0	2	1	200	200	1	0	0	0	6	1	1000
SEP												
21...	910	8	2	300	200	3	2	20	0	28	16	32000

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)
05488990 - N CEDAR C NR BUSSEY, IA (LAT 41 12 44 LONG 093 55 50)												
MAY , 1978												
25...	0	1	1	0	100	1	1	10	0	8	2	1300
AUG												
24...	0	2	1	100	200	1	<1	10	0	6	0	2000
SEP												
21...	1100	7	2	200	200	4	3	20	0	22	19	29000
05489000 - CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09 LONG 092 54 38)												
MAY , 1978												
25...	20	1	1	0	100	1	1	10	5	9	1	1300
AUG												
24...	20	2	1	200	200	0	<1	0	0	6	0	2500
SEP												
21...	1300	8	3	200	200	4	3	10	10	21	25	28000
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)												
MAY , 1978												
25...	30	1	1	300	200	1	2	20	0	11	3	1300
AUG												
24...	0	1	1	200	100	0	<1	10	0	6	0	2100
SEP												
21...	1000	5	2	300	200	3	3	30	0	33	18	37000

DATE	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS) (01003)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD) (01028)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01029)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU) (01043)	IRON, RECOV. FM BOTTOM MATERIAL (UG/G AS FE) (01170)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB) (01052)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/L AS HG) (71921)	MOLYBDENUM, RECOV. FM BOTTOM MATERIAL (UG/G) (01063)	SELENIUM, TOTAL IN BOTTOM MATERIAL (UG/G) (01148)	CARBON, INORGANIC, TOT IN BOT MAT (G/KG AS C) (00686)
05488000 - WHITE BREAST CREEK NR KNOXVILLE, IOWA (LAT 41 19 25 LONG 093 08 55)										
AUG , 1978										
24...	4	0	2	50	6500	180	.0	63	0	.4
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)										
AUG , 1978										
22...	10	0	5	70	--	150	.0	3	0	3.4
NOV										
14...	--	--	--	--	--	--	--	--	--	--
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)										
AUG , 1978										
24...	8	0	2	50	810000	130	.0	6	0	.1
SEP										
21...	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, MAY TO NOVEMBER 1978

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)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
05487700 - WHITE BREAST CR NR WOODBURN, IOWA (LAT 40 58 36 LONG 093 35 14)												
MAY , 1978												
23...	69	14	15	4.4	200	40	16	9.1	295	286	.40	24.7
JUN												
24...	49	10	18	5.5	140	35	18	7.9	239	228	.33	4.52
AUG												
25...	67	16	28	7.1	220	44	28	5.2	343	330	.47	.29
05487810 - WHITE BREAST C NR LUCAS, IA (LAT 41 03 26 LONG 093 24 41)												
MAY , 1978												
23...	84	18	14	4.0	220	69	8.8	9.8	343	341	.47	46.3
JUN												
23...	33	6.9	3.8	5.2	98	23	5.8	7.4	169	146	.23	17.8
AUG												
25...	69	16	17	5.7	230	37	17	8.5	318	309	.43	.93
05487880 - WHITE BREAST C NR LACONA, IA (LAT 41 09 38 LONG 093 21 05)												
MAY , 1978												
23...	82	18	14	4.1	210	70	9.1	10	334	335	.45	86.6
JUN												
23...	34	6.3	4.0	5.1	72	22	8.2	6.1	179	129	.24	646
AUG												
25...	65	15	14	5.0	210	34	9.8	9.1	301	280	.41	1.48
05487980 - WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41 LONG 093 16 08)												
MAY , 1978												
24...	71	16	13	4.3	180	78	9.5	10	322	311	.44	122
JUN												
24...	40	9.3	7.3	5.5	90	39	8.2	8.4	209	173	.28	152
AUG												
24...	61	15	14	5.1	200	48	8.1	11	294	281	.40	3.97
05488000 - WHITE BREAST CREEK NR KNOXVILLE, IOWA (LAT 41 19 25 LONG 093 08 55)												
MAY , 1978												
24...	60	14	13	4.4	150	57	8.4	8.5	273	254	.37	116
AUG												
24...	72	16	31	5.0	200	120	16	12	495	390	.67	8.42
NOV												
13...	82	19	15	5.8	210	92	11	8.0	468	356	.64	211
05488180 - ENGLISH C NR COLUMBIA, IA (LAT 41 10 54 LONG 093 11 56)												
MAY , 1978												
24...	70	17	11	3.8	180	77	5.9	9.2	309	303	.42	5.19
AUG												
22...	70	18	9.2	5.4	210	49	5.4	5.2	305	291	.41	.03
NOV												
14...	69	16	12	8.1	170	70	10	8.8	326	298	.44	3.73
05488200 - ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00 LONG 093 05 00)												
MAY , 1978												
24...	74	18	13	4.0	170	88	9.4	9.3	334	320	.45	19.1
AUG												
22...	100	24	24	6.4	250	130	12	7.1	482	453	.66	.09
NOV												
14...	77	20	14	8.4	200	97	17	7.9	374	360	.51	17.6
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)												
MAY , 1978												
24...	94	28	21	5.0	150	210	9.9	10	476	473	.65	41.4
AUG												
22...	160	43	58	7.7	140	560	20	8.8	1010	942	1.37	2.81
NOV												
14...	110	30	23	8.1	160	250	10	8.4	586	540	.80	68.5

WATER QUALITY DATA, MAY TO NOVEMBER 1978

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)	ALKA-LINITY (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)
05488550 - CEDAR CR AT MELROSE, IOWA (LAT 40 58 00 LONG 093 03 00)												
MAY , 1978												
24...	64	16	10	3.6	190	41	6.0	10	263	264	.36	5.61
AUG												
23...	67	18	12	7.7	220	61	6.1	8.1	317	313	.43	.15
SEP												
20...	12	2.8	7.6	4.5	34	10	3.0	8.2	90	69	.12	227
05488600 - CEDAR CR NR ALBIA, IOWA (LAT 41 01 00 LONG 092 53 00)												
MAY , 1978												
24...	65	16	10	3.7	170	71	5.1	9.1	292	284	.40	30.0
AUG												
23...	86	20	13	4.9	210	94	5.1	9.4	368	361	.50	1.79
SEP												
21...	32	6.7	3.9	5.7	62	28	4.1	9.8	141	132	.19	44.2
05488700 - CEDAR CR NR LOVILIA, IOWA (LAT 41 07 00 LONG 092 56 00)												
MAY , 1978												
24...	75	19	12	3.8	180	98	5.5	9.8	336	332	.46	75.3
AUG												
23...	81	19	15	4.5	210	120	6.4	10	349	380	.47	6.25
SEP												
21...	29	6.5	3.8	5.1	53	40	3.4	8.8	122	133	.17	189
05488895 - N CEDAR C NR ATTICA, IA (LAT 41 10 10 LONG 093 03 23)												
MAY , 1978												
25...	80	21	15	4.8	180	110	8.5	7.7	361	355	.49	7.73
AUG												
23...	130	27	72	6.5	210	360	7.4	8.4	--	735	1.00	.30
SEP												
20...	15	3.7	4.2	4.1	43	14	3.2	7.9	107	78	.15	368
05488990 - N CEDAR C NR BUSSEY, IA (LAT 41 12 44 LONG 093 55 50)												
MAY , 1978												
25...	91	24	13	4.3	170	150	5.1	10	410	403	.56	39.9
AUG												
24...	130	38	17	4.8	140	370	5.6	12	716	667	.97	4.79
SEP												
21...	23	4.8	2.3	4.9	44	17	2.4	8.2	99	94	.13	740
05489000 - CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09 LONG 092 54 38)												
MAY , 1978												
25...	83	9.5	13	3.8	160	110	5.6	10	389	335	.53	121
AUG												
24...	92	25	18	4.6	180	230	6.1	9.7	496	496	.67	14.7
SEP												
21...	27	5.2	2.9	5.0	41	20	3.0	7.9	100	101	.14	1330
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)												
MAY , 1978												
25...	88	22	13	3.8	160	150	5.9	12	416	395	.57	171
AUG												
24...	89	24	16	4.4	170	190	6.4	9.3	464	444	.63	18.4
SEP												
21...	27	5.9	2.6	5.0	44	27	2.7	7.7	105	109	.14	1350

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	PHENOLS (UG/L) (32730)
05487700 - WHITE BREAST CR NR WOODBURN, IOWA (LAT 40 58 36 LONG 093 35 14)												
MAY , 1978												
23...	70	8	3	320	140	10	3	1	1	11	.00	1
JUN												
24...	220	20	4	470	10	18	7	1	0	15	--	0
AUG												
25...	10	3	0	900	770	8	3	1	0	8.8	.91	2
05487810 - WHITE BREAST C NR LUCAS, IA (LAT 41 03 26 LONG 093 24 41)												
MAY , 1978												
23...	40	5	2	160	100	5	5	1	1	9.0	.00	0
JUN												
23...	1400	20	5	420	30	20	8	1	0	--	.00	1
AUG												
25...	20	5	0	940	770	8	2	0	0	9.4	.00	14
05487880 - WHITE BREAST C NR LACONA, IA (LAT 41 09 38 LONG 093 21 05)												
MAY , 1978												
23...	--	--	--	--	--	--	--	--	--	5.8	--	--
JUN												
23...	--	--	--	--	--	--	--	--	--	--	.01	1
AUG												
25...	--	--	--	--	--	--	--	--	--	10	--	--
05487980 - WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41 LONG 093 16 08)												
MAY , 1978												
24...	110	11	3	260	30	15	3	1	1	9.5	.00	0
JUN												
24...	480	31	4	1200	20	34	7	1	0	22	.00	1
AUG												
24...	<10	93	0	470	170	8	2	0	1	10	.00	2
05488000 - WHITE BREAST CREEK NR KNOXVILLE, IOWA (LAT 41 19 25 LONG 093 08 55)												
MAY , 1978												
24...	--	--	--	--	--	--	--	--	--	11	--	--
AUG												
24...	--	--	--	--	--	--	--	--	--	10	--	--
NOV												
13...	--	-	--	--	--	--	--	--	--	8.8	--	--
05488180 - ENGLISH C NR COLUMBIA, IA (LAT 41 10 54 LONG 093 11 56)												
MAY , 1978												
24...	70	6	2	160	120	6	1	0	1	4.6	.00	2
AUG												
22...	20	5	0	240	220	8	4	0	0	9.7	.00	2
NOV												
14...	110	24	23	220	180	7	5	1	1	11	.00	4
05488200 - ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00 LONG 093 05 00)												
MAY , 1978												
24...	120	9	3	320	260	8	4	1	1	4.8	.00	1
AUG												
22...	20	120	0	1300	1100	9	5	0	0	7.6	.00	2
NOV												
14...	70	71	6	660	460	11	5	2	1	12	.00	2
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)												
MAY , 1978												
24...	100	4	5	1200	1100	26	15	1	1	4.9	.00	1
AUG												
22...	<10	6	0	560	340	10	3	1	1	10	.00	2
NOV												
14...	20	33	31	1800	1600	33	36	1	1	8.9	.00	0

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV.-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	PHENOLS (UG/L) (32730)
05488550 - CEDAR CR AT MELROSE, IOWA (LAT 40 58 00 LONG 093 03 00)												
MAY , 1978												
24...	--	--	--	--	--	--	--	--	--	6.3	--	--
AUG												
23...	--	--	--	--	--	--	--	--	--	11	--	--
SEP												
20...	--	--	--	--	--	--	--	--	--	29	--	--
05488600 - CEDAR CR NR ALBIA, IOWA (LAT 41 01 00 LONG 092 53 00)												
MAY , 1978												
24...	150	9	4	150	70	10	2	0	1	5.4	.00	2
AUG												
23...	20	7	3	540	480	4	4	0	0	6.4	.00	2
SEP												
21...	2100	15	12	1200	1200	29	15	0	1	29	.00	1
05488700 - CEDAR CR NR LOVILIA, IOWA (LAT 41 07 00 LONG 092 56 00)												
MAY , 1978												
24...	110	4	4	200	140	6	2	0	1	5.4	.00	2
AUG												
23...	70	5	0	1000	830	9	0	0	1	14	.00	3
SEP												
21...	1600	21	10	1800	1600	37	20	1	0	28	.00	1
05488895 - N CEDAR C NR ATTICA, IA (LAT 41 10 10 LONG 093 03 23)												
MAY , 1978												
25...	--	--	--	--	--	--	--	--	--	4.6	--	--
AUG												
23...	--	--	--	--	--	--	--	--	--	8.0	--	--
SEP												
20...	--	--	--	--	--	--	--	--	--	31	--	--
05488990 - N CEDAR C NR BUSSEY, IA (LAT 41 12 44 LONG 093 55 50)												
MAY , 1978												
25...	40	4	3	1700	1700	10	17	0	1	4.1	.00	1
AUG												
24...	<10	2	2	5600	5200	48	31	0	0	7.1	.00	2
SEP												
21...	2000	19	16	1100	990	38	22	1	0	26	.00	2
05489000 - CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09 LONG 092 54 38)												
MAY , 1978												
25...	20	3	3	1000	1000	14	12	0	1	4.9	.00	1
AUG												
24...	10	3	0	2500	2100	17	10	0	0	11	.00	1
SEP												
21...	2400	18	23	1400	1300	40	25	1	0	31	.00	2
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)												
MAY , 1978												
25...	20	8	3	1000	1000	14	10	0	0	4.7	.00	1
AUG												
24...	<10	4	0	1600	1300	13	4	0	0	7.8	.00	2
SEP												
21...	1800	23	13	1600	1200	47	23	1	0	31	.00	2

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	NITROGEN, NITRATE TOTAL (MG/L AS N) (00620)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P) (00668)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)
05487700 - WHITE BREAST CR NR WOODBURN, IOWA (LAT 40 58 36 LONG 093 35 14)												
MAY , 1978												
23...	478	.48	.02	.50	.10	1.3	1.4	1.9	.21	.07	--	3000
JUN												
24...	476	1.6	.06	1.7	.05	2.1	2.2	3.9	.31	.08	--	6500
AUG												
25...	358	.01	.01	.02	.06	.72	.78	.80	.08	.02	--	0
05487810 - WHITE BREAST C NR LUCAS, IA (LAT 41 03 26 LONG 093 24 41)												
MAY , 1978												
23...	404	.14	.01	.15	.09	.75	.84	.99	.08	.02	--	700
JUN												
23...	566	3.0	.08	3.1	.06	1.3	1.4	4.5	.34	.13	--	6500
AUG												
25...	352	.04	.01	.05	.12	.62	.74	.79	.08	.01	--	0
05487880 - WHITE BREAST C NR LACONA, IA (LAT 41 09 38 LONG 093 21 05)												
MAY , 1978												
23...	366	.19	.02	.21	.12	.68	.80	1.0	.10	.04	--	--
JUN												
23...	3420	3.9	.09	4.0	.09	9.2	9.3	13	1.4	.14	--	--
AUG												
25...	343	.00	.01	.01	.01	.91	.92	.93	.12	.01	--	--
05487980 - WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41 LONG 093 16 08)												
MAY , 1978												
24...	523	1.4	.05	1.4	.09	1.0	1.1	2.5	.21	.07	--	3900
JUN												
24...	1350	4.4	.05	4.4	.05	3.9	3.9	8.3	.64	.10	--	17000
AUG												
24...	328	.01	.01	.02	.01	.70	.71	.73	.12	.01	--	0
05488000 - WHITE BREAST CREEK NR KNOXVILLE, IOWA (LAT 41 19 25 LONG 093 08 55)												
MAY , 1978												
24...	546	2.1	.05	2.1	.06	1.4	1.5	3.6	.07	.07	--	--
AUG												
24...	435	.00	.01	.01	.14	.74	.88	.89	.14	.04	620	--
NOV												
13...	591	.29	.01	.30	.07	.91	.98	1.3	.16	.02	--	--
05488180 - ENGLISH C NR COLUMBIA, IA (LAT 41 10 54 LONG 093 11 56)												
MAY , 1978												
24...	343	.40	.02	.42	.01	.49	.50	.92	.02	.02	--	350
AUG												
22...	316	.12	.01	.13	.14	.60	.74	.87	.06	.02	--	0
NOV												
14...	766	1.1	.05	1.1	.02	1.3	1.3	2.4	.15	.06	--	760
05488200 - ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00 LONG 093 05 00)												
MAY , 1978												
24...	370	2.3	.04	2.3	.05	.78	.83	3.1	.09	.04	--	990
AUG												
22...	527	.04	.01	.05	.10	.84	.94	.99	.07	.01	--	0
NOV												
14...	479	.59	.02	.61	.02	1.5	1.5	2.1	.22	.05	--	2000
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)												
MAY , 1978												
24...	479	2.2	.07	2.3	.28	.92	1.2	3.5	.05	.02	--	460
AUG												
22...	1070	.28	.02	.30	.24	.86	1.1	1.4	.08	.00	950	40
NOV												
14...	686	.35	.02	.38	.10	1.0	1.1	1.5	.11	.02	--	880

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	NITROGEN, NITRATE TOTAL (MG/L AS N) (00620)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, TOTAL (MG/L AS N) (00600)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO. TOTAL (MG/L AS P) (70507)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P) (00668)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)
05488550 - CEDAR CR AT MELROSE, IOWA (LAT 40 58 00 LONG 093 03 00)												
MAY , 1978												
24...	279	.29	.03	.32	.06	.58	.64	.96	.08	.05	--	--
AUG												
23...	345	.00	.01	.01	.01	.81	.82	.83	.04	.00	--	--
SEP												
20...	885	.73	.04	.77	.13	3.3	3.4	4.2	.74	.18	--	--
05488600 - CEDAR CR NR ALBIA, IOWA (LAT 41 01 00 LONG 092 53 00)												
MAY , 1978												
24...	393	.40	.02	.42	.01	.52	.53	.95	.04	.03	--	17000
AUG												
23...	371	.00	.01	.00	.04	.56	.60	.60	.04	.01	--	70
SEP												
21...	877	.89	.05	.94	.14	2.4	2.5	3.4	.58	.11	--	12000
05488700 - CEDAR CR NR LOVILIA, IOWA (LAT 41 07 00 LONG 092 56 00)												
MAY , 1978												
24...	392	.25	.01	.26	.01	.32	.33	.59	.03	.01	--	480
AUG												
23...	394	.01	.01	.02	.01	.53	.54	.56	.05	.00	--	0
SEP												
21...	1280	.80	.05	.85	.13	3.2	3.3	4.2	.66	.09	--	17000
05488895 - N CEDAR C NR ATTICA, IA (LAT 41 10 10 LONG 093 03 23)												
MAY , 1978												
25...	374	1.9	.06	2.0	.08	.81	.89	2.9	.04	.01	--	--
AUG												
23...	728	.11	.02	.13	.18	.59	.77	.90	.04	.01	--	--
SEP												
20...	1160	.68	.06	.74	.16	3.8	4.0	4.7	1.0	.23	--	--
05488990 - N CEDAR C NR BUSSEY, IA (LAT 41 12 44 LONG 093 55 50)												
MAY , 1978												
25...	474	.47	.03	.50	.04	.29	.33	.83	.01	.00	--	500
AUG												
24...	766	.13	.02	.15	.12	.41	.53	.68	.06	.01	--	0
SEP												
21...	910	.52	.05	.57	.13	2.4	2.5	3.1	.53	.12	--	14000
05489000 - CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09 LONG 092 54 38)												
MAY , 1978												
25...	438	1.0	.06	1.1	.03	.42	.45	1.6	.01	.00	--	540
AUG												
24...	536	.00	.01	.00	.01	.69	.70	.70	.07	.00	--	30
SEP												
21...	1140	.58	.05	.63	.14	3.1	3.2	3.8	.55	.12	--	12000
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)												
MAY , 1978												
25...	452	.60	.02	.62	.03	.38	.41	1.0	.01	.01	--	550
AUG												
24...	535	.00	.01	.01	.02	.55	.57	.58	.10	.00	700	0
SEP												
21...	1420	.60	.04	.64	.14	3.2	3.3	3.9	.68	.08	--	19000

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L) (80020)	SOLIDS, VOLA-TILE IN BOTTOM MA-TERIAL (MG/KG) (00496)	PHOS-PHORUS, TOTAL IN BOT. MAT. (MG/KG AS P) (00668)
05487700 - WHITE BREAST CR NR WOODBURN, IOWA (LAT 40 58 36 LONG 093 35 14)											
JUN , 1978											
24...	1030	3.8	12	9.7	8.9	8.7	8.8	.08	6.1	--	--
AUG											
25...	0950	<6.4	<.4	9.9	1.0	9.2	1.1	.03	4.0	--	--
05487810 - WHITE BREAST C NR LUCAS, IA (LAT 41 03 26 LONG 093 24 41)											
JUN , 1978											
23...	1930	3.0	30	8.8	19	8.1	19	.10	5.7	--	--
AUG											
25...	1100	5.6	.6	7.2	1.0	6.9	1.1	.08	4.8	--	--
05487980 - WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41 LONG 093 16 08)											
JUN , 1978											
24...	1250	<2.0	60	8.6	37	7.9	35	.09	.41	--	--
AUG											
24...	1545	4.5	1.3	6.7	1.6	6.4	1.7	.25	3.6	--	--
05488000 - WHITE BREAST CREEK NR KNOXVILLE, IOWA (LAT 41 19 25 LONG 093 08 55)											
AUG , 1978											
24...	1430	--	--	--	--	--	--	--	--	9380	620
05488180 - ENGLISH C NR COLUMBIA, IA (LAT 41 10 54 LONG 093 11 56)											
AUG , 1978											
22...	1545	5.5	<.4	9.1	.6	8.7	.7	.05	4.5	--	--
NOV											
14...	1300	<3.7	1.3	9.1	2.2	8.5	2.2	.05	3.0	--	--
05488200 - ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00 LONG 093 05 00)											
AUG , 1978											
22...	1450	9.3	.7	8.8	1.6	8.3	1.6	.05	5.8	--	--
NOV											
14...	1130	<4.1	5.6	9.8	4.2	9.2	4.2	.06	4.1	--	--
05488300 - ENGLISH R NR HARVEY, IOWA (LAT 41 20 00 LONG 092 57 00)											
AUG , 1978											
22...	1215	<12	.8	14	1.3	13	1.3	.79	4.3	67700	950
NOV											
14...	0945	<6.0	3.7	10	3.2	9.5	3.2	.05	2.9	--	--
05488600 - CEDAR CR NR ALBIA, IOWA (LAT 41 01 00 LONG 092 53 00)											
AUG , 1978											
23...	1300	<3.8	<.4	7.3	.5	6.9	.6	.07	3.9	--	--
SEP											
21...	0900	<1.2	49	6.6	25	6.1	22	.06	.60	--	--
05488700 - CEDAR CR NR LOVILIA, IOWA (LAT 41 07 00 LONG 092 56 00)											
AUG , 1978											
23...	1550	<4.0	1.1	6.4	1.5	6.0	1.5	.04	3.7	--	--
SEP											
21...	1045	<1.2	130	5.8	57	5.4	48	.07	.50	--	--

WATER QUALITY DATA, MAY TO NOVEMBER 1978

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L) (80020)	SOLIDS, VOLA-TILE IN BOTTOM MA-TERIAL (MG/KG) (00496)	PHOS-PHORUS, TOTAL IN BOT. MAT. (MG/KG AS P) (00668)
05488990 - N CEDAR C NR BUSSEY, IA (LAT 41 12 44 LONG 093 55 50)											
AUG , 1978											
24...	0945	<4.6	1.8	5.4	2.3	5.2	2.3	.06	3.2	--	--
SEP											
21...	1200	1.5	93	5.9	36	5.5	32	.07	.50	--	--
05489000 - CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09 LONG 092 54 38)											
AUG , 1978											
24...	1100	<8.0	1.4	6.7	1.6	6.1	1.6	.05	1.7	--	--
SEP											
21...	1315	<1.4	93	5.9	45	5.5	38	.08	1.9	--	--
05489030 - CEDAR C NR TRACY, IA (LAT 41 15 18 LONG 092 51 26)											
AUG , 1978											
24...	1200	<4.6	1.9	5.5	2.1	5.2	2.2	.04	2.9	24100	700
SEP											
21...	1415	<1.3	63	5.4	31	5.0	28	.05	.60	--	--

Carroll County

420335N0945215.1. Local number 84-35-25bddb1. City of Carroll, test hole 1. Drilled observation artesian well in Dakota Sandstone of Early Cretaceous age, diam 8 in, depth 120 ft, cased to 100. Lsd 1,244 ft above msl. MP top of casing, 4.0 ft above lsd (since July 1975). Highest water level 34.55 below lsd, Sept. 8, 1945; lowest 77.68 below lsd, June 14, 1968. Records available: 1939-49, 1952 to current year.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov. 21, 1977	67.00	Feb. 20, 1978	69.50	May 17, 1978	74.30	Aug. 14, 1978	74.50

Cerro Gordo County

430456N0932536.1. Local number 95-22-3abba1. Knut Olson. Drilled domestic and stock artesian well in limestone of Devonian age, diam 4 in, depth 134 ft, casing information not available. Lsd 1,258 ft above msl. MP top of casing, 1.40 ft above lsd. Highest water level 14.34 below lsd, July 3, 1945; lowest 24.50 below lsd, Aug. 4, 1977. Records available: 1941 to current year.

Nov. 7, 1977	23.50	Feb. 15, 1978	23.60	May 23, 1978	23.27	Aug. 3, 1978	22.22

430806N0931645.1. Local number 96-21-13bccb1. Mason City & Clear Lake RR. Drilled unused artesian well in dolomite in Cedar Valley Limestone of Devonian age, diam 5 in, depth 198 ft, casing information not available. Lsd 1,165 ft above msl. MP top of well curb, 2.00 ft above lsd. Highest water level 1.73 below lsd, June 28, 1951; lowest 17.26 below lsd, Nov. 18, 1955. Records available: 1940 to current year.

Feb. 15, 1978	9.00	May 23, 1978	7.63	Aug. 4, 1978	9.03		

430658N0932810.1. Local number 96-22-20cadc1. W. Baine and H. Elder. Drilled unused water-table well in glacial drift, diam 5 in, depth 126 ft, casing information not available. Lsd 1,249 ft above msl. MP hole in side of casing, 1.30 ft above lsd. Highest water level 29.65 below lsd, Mar. 25, 1942; lowest 51.37 below lsd, Aug. 4, 1977. Records available: 1940 to current year.

Nov. 7, 1977	44.93	May 23, 1978	44.64	Aug. 3, 1978	47.52		

Clayton County

424101N0913200.1. Local number 91-6-22acab1. Howard Bowman. Dug unused water-table well in glacial drift, diam 36 in, depth 18 ft, cribbed with brick. Lsd 1,221 ft above msl. MP top of board platform, 0.08 ft above lsd. Highest water level 3.54 below lsd, May 6, 1960; lowest 10.03 below lsd, Jan. 24, 1965 and Feb. 7, 1977. Records available: 1957 to current year.

Oct. 7, 1977	6.92	Jan. 7, 1978	7.62	Apr. 7, 1978	4.72	July 7, 1978	7.30
Oct. 21	7.35	Jan. 21	8.23	Apr. 21	5.20	July 21	7.63
Nov. 7	6.97	Feb. 7	8.58	May 7	6.78	Aug. 7	8.34
Nov. 22	7.30	Feb. 21	8.77	May 21	6.78	Aug. 21	8.63
Dec. 7	8.25	Mar. 7	9.02	June 7	6.86	Sept. 7	8.48
Dec. 21	5.94	Mar. 21	6.90	June 21	6.89	Sept.21	5.88

424057N0913200.1. Local number 91-6-22acac1. City of Strawberry Point, well 2. Drilled unused artesian well in dolomite of Silurian age, diam 16 to 10 in, depth 492 ft, cased 16-in 0-130, 12-in 130-161, lined 10-in 229-370. Lsd 1,219 ft above msl. MP top of recorder platform, 2.10 ft above lsd. Highest water level 114.38 below lsd, May 9, 1973; lowest 133.18 below lsd, Feb. 4, 1968. Records available: 1963 to current year.

Water level at noon, from recorder graph, water year October 1 to September 30
1977-78

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
5	131.06	130.12	129.61	128.47	129.24	129.24	125.77	123.53	124.84	125.66	126.47	127.35
10	130.20	129.61	130.10	128.78	128.95	129.26	123.93	124.18	125.04	125.87	126.52	127.30
15	130.35	129.39	129.17	128.40	129.08	129.43	123.99	124.34	125.54	126.15	e126.55	127.48
20	130.44	129.47	128.34	128.38	128.96	128.98	123.23	124.33	125.24	126.24	e126.80	127.73
25	130.18	129.77	128.40	128.17	129.06	127.67	123.26	124.69	125.10	125.90	127.15	127.93
Eom	129.86	129.54	128.47	128.94	129.25	126.19	123.07	124.53	125.57	126.31	127.19	127.51

e Estimated

425940N0911947.1. Local number 95-4-32dddd1. Milton and Willis Meier. Drilled stock artesian well in St. Peter Sandstone of Middle Ordovician age, diam 6 in, reported depth 380 ft, Casing information not available. Lsd 1,090 ft above msl. MP plug in pumpbase, 1.00 ft above lsd. Highest water level 82.56 below lsd, Oct. 8, 1974; lowest 126.56 below lsd, Jan. 13, 1969. Records available: 1957 to current year.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov. 7, 1977	97.20	Mar. 13, 1978	95.90	June 5, 1978	91.84	Aug. 1, 1978	90.16

Des Moines County

404844N0911427.1. Local number 69-3-6aabal. Iowa Ordnance Plant, well 3. Drilled unused artesian well in St. Peter Sandstone of Middle Ordovician age, diam 16 in, depth 1,209 ft, cased 0-855. Lsd 717 ft above msl. MP top of platform, 1.61 ft above lsd. Highest water level 162.70 below lsd, Mar. 27, 1950; lowest 201.75 below lsd, Aug. 15, 1978. Records available: 1950 to current year.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 26, 1977	200.27	Jan. 22, 1978	199.59	May 20, 1978	200.19	Aug. 15, 1978	201.75
Dec. 3	199.65	Mar. 19	199.64	June 20	200.99		
Dec. 24	198.95	Apr. 23	199.94	July 16	200.30		

Recorder discontinued October 1977.

404753N0911425.1. Local number 69-3-6ddcdl. Iowa Ordnance Plant, well 2. Drilled unused artesian well in limestone of Devonian and Mississippian age, diam 19 in, depth 675 ft, cased 0-75. Lsd 699 ft above msl. MP top of platform, 1.91 ft above lsd. Highest water level 74.46 below lsd, Apr. 18, 1975; lowest 83.19 below lsd, Apr. 26, 1950. Records available: 1950 to current year.

Oct. 26, 1977	78.92	Jan. 22, 1978	78.53	May 20, 1978	77.74	Aug. 15, 1978	77.70
Dec. 3	78.55	Mar. 19	77.94	June 20	77.64		
Dec. 24	78.31	Apr. 23	77.73	July 16	77.59		

Recorder discontinued October 1977.

Emmet County

432927N0943455.1. Local number 100-32-11ddddl. Okamanpedan Lake Reserve State Park. Drilled public-supply artesian well in Dakota Sandstone of Early Cretaceous age, diam 6 in, depth 277 ft, casing information not available. Lsd 1,233 ft above msl. MP plug in pumpbase, 0.61 ft above lsd. Highest water level 59.60 below lsd, Dec. 19, 1946; lowest 71.07 below lsd, Aug. 2, 1977. Records available: 1939 to current year.

Oct. 31, 1977	70.78	Jan. 31, 1978	70.98	May 2, 1978	70.65	Aug. 18, 1978	70.59

Grundy County

422605N0925600.1 Local number 88-18-15dbbl. Town of Wellsburg. Drilled public-emergency-supply artesian well in English River Siltstone, of Stainbrook (1950), of Early Mississippian age, diam 12 in, depth 280 ft, cased to 128. Lsd 1,060 ft above msl. MP edge of vent pipe, 1.25 ft above lsd. Highest water level 35.42 below lsd, Mar. 14, 1978. lowest 96.81 below lsd, Sept. 27, 1960. Records available: 1960 to current year.

Nov. 7, 1977	36.19	Mar. 14, 1978	35.42	June 6, 1978	35.58	Aug. 2, 1978	35.62

Henry County

405810N0913305.2. Local number 71-6-9aba2. City of Mount Pleasant, well 4. Drilled municipal artesian well in Jordan Sandstone of Late Cambrian age, diam 20 to 19 in, depth 1,860 ft, cased 20-in 0-623. Lsd 732 ft above msl. MP hole in pumpbase, 2.25 ft above lsd. Highest water level 132.00 below lsd, May 5, 1946; lowest non pumping 198.75 below lsd, June 7, 1978. Records available: 1946-50, 1953-57, 1959 to current year. Water levels affected by pumping.

Nov. 3, 1977	p202.75	Mar. 15, 1978	195.75	June 7, 1978	198.75	Aug. 3, 1978	208.75

p Well being pumped.

410848N0913948.1. Local number 73-7-9aabl. Town of Wayland. Dug unused water-table well in glacial drift, diam 4 ft, depth 52 ft, casing information not available. Lsd 745 ft above msl. MP top of cement cover, 0.21 ft above lsd. Highest water level 2.30 below lsd, Sept. 1, 1965; lowest 14.69 below lsd, Feb. 2, 1977. Records available: 1960 to current year.

Nov. 3, 1977	6.25	Mar. 15, 1978	9.39	June 7, 1978	9.32	Aug. 3, 1978	9.39

Jasper County

414205N0925920.1. Local number 80-18-31abbbl. P. W. Beukema. Dug stock water-table well in glacial drift, diam 36 in, depth 37 ft, cribbed with brick. Lsd 937 ft above msl. MP top of cement platform, 0.70 ft above lsd (since Apr. 1, 1970). Highest water level 2.67 below lsd, June 10, 1947; lowest 27.15 below lsd, Dec. 18, 1948. Records available: 1940 to current year.

Nov. 8, 1977	5.33	Mar. 14, 1978	12.46	June 6, 1978	5.29	Aug. 2, 1978	6.15

Johnson County

414107N0913229.1. Local number 79-6-4aaaa1. Forest View Trailer Court. Drilled unused artesian well in limestone of Silurian age, diam 6 in, depth 280 ft, cased to 96 ft. Lsd 735 ft above msl. MP top of casing, 1.00 ft above lsd. Highest water level 102.33 ft below lsd, Apr. 18, 1978; lowest 146.01 ft below lsd, July 17, 1971. Records available: 1971 to current year.

Water level at noon, from recorder graph, water year October 1 to September 30 1977-78

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
5	133.07	e128.00	e109.00	e106.20	e104.70	e104.00	104.65	106.28	e127.30	e130.67	131.45	131.23
10	131.62	e126.00	e108.20	e106.00	e104.50	103.63	e103.30	e112.00	e128.20	e131.34	131.79	131.12
15	129.40	e117.00	e107.50	e105.80	104.39	103.73	103.23	117.54	e129.10	133.90	132.41	130.75
20	128.20	e113.50	e107.00	e105.50	e104.20	103.15	102.78	120.40	129.76	e131.50	132.76	130.27
25	128.54	e111.50	e106.60	e105.10	e104.10	e103.70	e102.90	122.67	129.74	e131.20	132.10	130.07
Eom	128.66	e110.00	e106.40	e104.80	e104.10	104.72	102.95	e125.55	e130.30	131.17	131.35	129.54

e Estimated.

414315N0912520.1. Local number 80-5-22cbcb1. Chicago, Rock Island & Pacific RR. Co. Drilled unused water-table well in glacial drift, diam 1 1/4 in, depth 20 ft, screened 18-20 ft. Lsd 753 ft above msl. MP top of casing 4.20 ft above lsd. Highest water level 5.78 below lsd, Sept. 20, 1977; lowest dry, Dec. 2-31, 1955, Nov. 8 to Dec. 31, 1964. Records available: 1941-56, 1958 to current year.

Oct. 21, 1977	8.56	Jan. 23, 1978	12.53	Apr. 28, 1978	6.10	July 22, 1978	6.29
Nov. 21	10.46	Feb. 24	14.20	May 22	6.94	Aug. 22	12.20
Dec. 29	11.05	Mar. 21	10.25	June 21	10.39		

414315N0912520.2. Local number 80-5-22cbcb2. Chicago, Rock Island & Pacific RR. Co. Drilled unused artesian well in limestone of Devonian age, diam 5 in, depth 82 ft cased. Lsd 753 ft above msl. MP top of casing 2.50 ft above lsd (since July 1, 1975). Highest water level 8.15 below lsd, Apr. 21, 1952; lowest 21.05 below lsd, Sept. 26, 1957. Records available: 1941 to current year.

Oct. 21, 1977	17.24	Jan. 23, 1978	18.02	Apr. 28, 1978	16.05	July 22, 1978	15.40
Nov. 21	17.72	Feb. 24	18.23	May 22	16.05	Aug. 22	17.52
Dec. 29	17.48	Mar. 21	16.91	June 21	16.98		

Linn County

415422N0914226.1. Local number 82-7-18cdcd1. Lester Petrak. Dug unused water-table well in glacial drift, diam 4 ft, depth 14 ft, cribbed with brick. Lsd 835 ft above msl. MP base of recorder shelter, 0.08 ft above lsd. Highest water level 1.09 below lsd, Aug. 4, 1968; lowest e11.75 below lsd, Feb. 8, 1977. Records available: 1959 to current year.

Water level at noon, from recorder graph, water year October 1 to September 30 1977-78

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
5	.....	4.01	4.99	4.89	e5.42	.....	.....	4.85	5.31	5.33	5.51	6.48
10	.....	4.37	5.10	e4.91	e5.53	.....	.....	4.79	5.45	5.39	5.78	6.73
15	.....	4.56	4.68	e5.04	e5.64	.....	.....	4.06	5.50	5.53	6.02	6.52
20	.....	4.69	3.92	e5.16	e5.76	e4.60	.....	4.72	5.57	5.49	6.31	5.91
25	.....	4.82	e4.50	e5.13	5.93	.....	.....	4.94	5.55	4.96	6.53	5.21
Eom	4.27	4.88	4.76	e5.30	e6.00	.....	4.67	5.13	5.18	5.27	6.18	5.35

e Estimated.

415816N0913934.1. Local number 83-7-28adda1. The Kacena Co., Inc. (formerly Collins Radio). Drilled unused artesian well in limestone of Silurian age, diam 10 in, depth 420 ft, cased to 75. Lsd 735 ft above msl. MP top of well cover, 6.15 ft below lsd. Highest water level 51.10 below lsd, Feb. 25, 1963; lowest 93.80 below lsd, Aug. 1, 1975. Records available: 1962 to current year.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec. 29, 1977	79.08	Mar. 21, 1978	80.28	June 2, 1978	83.73	Aug. 22, 1978	89.39

Recorder temporarily discontinued because of construction.

Linn County--Continued

415725N0914104.1. Local number 83-7-32acdc1. Floyd Felter. 22nd Ave. SW. and 11th St. SW., Cedar Rapids. Drilled unused artesian well in limestone of Silurian age, diam 5 in, depth 282 ft, cased. Lsd 805 ft above msl. MP plug in well cover, at lsd. Highest water level 75.88 below lsd, Jan. 26, 1942; lowest 107.00 below lsd, Sept. 16, 1976. Records available: 1940 to current year.

Oct. 21, 1977	103.57	Jan. 23 1978	100.54	Mar. 21 1978	102.98	July 22, 1978	101.83
Nov. 21	101.41	Feb. 24	100.32	June 2	98.66	Aug. 22	102.40
Dec. 19	99.25						

420526N0913707.1. Local number 84-7-13bcbb1. U.S. Geol. Survey. Drilled observation water-table well in glacial drift, diam 1 1/4 in, depth 17 ft, screened 15-17. Lsd 882 ft above msl. MP top of casing, 0.75 ft above lsd. Highest water level 1.11 below lsd, Mar. 29, 1960; lowest 12.90 below lsd, Dec. 3, 1956. Records available: 1940 to current year.

Oct. 21, 1977	3.25	Jan. 23, 1978	3.79	Apr. 22, 1978	1.83	July 21, 1978	2.53
Nov. 21	2.59	Feb. 21	4.40	May 22	2.54	Aug. 22	5.43
Dec. 22	2.24	Mar. 21	2.30	June 21	3.04	Sept.22	3.48

Lyon County

432140N0955953.1. Local number 99-44-26dddd1. State of Iowa. Drilled unused water-table well in glacial drift, diam 20 in, depth 38 ft, lined with tile. Lsd 1,400 ft above msl. MP plug in well cover, 2.01 ft above lsd. Highest water level 0.09 below lsd, Mar. 2, 1973; lowest 9.74 below lsd, Oct. 24, 1940. Records available: 1940-43, 1947 to current year.

Oct. 4, 1977	1.37	Nov. 15, 1977	0.24	May 8, 1978	0.20		

432553N0961055.1. Local number 99-45-5abac1. City of Rock Rapids. Drilled unused artesian well in Dakota Sandstone of Early Cretaceous age, diam 10 in, depth 375 ft, cased to 296. Lsd 1,375 ft above msl. MP plug in cover over casing, 1.00 ft above lsd. Highest water level 100.08 below lsd, July 27, 1964; lowest 113.90 below lsd, Nov. 30, 1974. Records available: 1960 to current year.

Nov. 16, 1977	113.47	Feb. 16, 1978	113.46	May 8, 1978	113.19	Aug 4, 1978	113.40

Madison County

411727N0934830.1. Local number 75-26-23aaac1. Town of St. Charles, No. 1. Drilled unused artesian well in limestone of Mississippian age, diam 10 in, depth 1,058 ft, cased 0-657. Lsd 1,067 ft above msl. MP plug in well cover, 1.20 ft above lsd (since Jan. 1, 1971). Highest water level 261.62 below lsd, Nov. 20, 1962; lowest 268.49 below lsd, Aug. 2, 1978. Records available: 1962 to current year. Records prior to April 1970 are from recording gage; subsequent records are periodic tape measurements.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov. 8, 1977	267.90	Mar. 14, 1978	268.00	June 6, 1978	268.10	Aug. 2, 1978	268.49

Marion County

411323N0931426.1. Local number 74-21-11dbcc2. Town of Melcher. Drilled unused water-table well in glacial drift, diam 18 in, depth 25 ft, lined with tile. Lsd 948 ft above msl. MP top of well cover, 0.75 ft above lsd (since June 21, 1976). Highest water level 0.12 below lsd, Apr. 24, 1976; lowest 16.27 below lsd, Oct. 22, 1953. Records available: 1950 to current year.

Oct. 12, 1977	4.65	Jan. 11, 1978	4.48	Apr. 14, 1978	3.20	July 14, 1978	4.34
7	2.85	28	4.99	29	2.72	25	4.25
Nov. 18	3.80	Feb. 10	5.15	May 15	1.85	Aug. 19	5.53
25	3.82	23	5.40	23	3.11	29	5.55
Dec. 3	4.14	Mar. 10	4.98	June 10	4.25		
28	3.89	23	2.60	26	4.75	Sept.14	5.60

Marshall County

420355N0925347.1. Local number 84-18-24cdca1. City of Marshalltown. Drilled unused artesian well in glacial sand and gravel of Pleistocene age, diam 8 in, depth 200 ft, cased to 190, screened 190-200. Lsd 871 ft above msl. MP top of casing, at lsd. Highest water level 4.92 below lsd, July 13, 1951; lowest 52.17 below lsd, Aug. 2, 1978. Records available: 1949 to current year.

Nov. 7, 1977	37.93	Mar. 14, 1978	44.20	June 6, 1978	43.60	Aug. 2, 1978	52.17

Montgomery County

405835N0950129.1. Local number 71-36-6dad1. State of Iowa. Drilled observation water-table well in glacial drift, diam 1 1/4 in, depth 38 ft, screened 36-38. Lsd 1,081 ft above msl. MP top of casing, 3.02 ft above lsd. Highest water level 2.52 below lsd, May 31, 1951; lowest 30.99 below lsd, Apr. 26, 1950. Records available: 1950 to current year.

Oct. 15, 1977	12.58	Jan. 21, 1978	16.46	May 12, 1978	12.23	Aug. 13, 1978	12.34
Nov. 15	11.96	Mar. 12	17.83	June 15	12.35	Sept.13	13.12
Dec. 13	11.83	Apr. 13	13.22	July 16	9.70		

Muscatine County

412120N0910804.4. Local number 76-2-30cbaa1. U.S. Geol. Survey. Drilled observation water-table well in alluvial sand and gravel, diam 6 in, depth 27 ft, screened 24-27. Lsd 545 ft above msl. MP base of recorder shelter, 3.70 ft above lsd. Highest water level 8.51 below lsd, May 16, 1973; lowest 15.03 below lsd, June 30, 1977. Records available: 1966 to current year.

Water level at noon, from recorder graph, water year October 1 to September 30
1977-78

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
5	e12.78	12.69	12.75	e13.30	.....	.....	14.13	13.59	13.33	13.70	13.51	14.05
10	e12.73	12.58	12.89	.....	.....	14.23	14.10	13.55	13.43	13.66	13.62	14.13
15	e12.69	12.53	12.98	.....	.....	e14.18	14.06	13.54	13.57	e13.49	13.74	14.19
20	e12.64	12.54	e13.07	.....	.....	e14.26	13.85	13.48	13.57	e13.43	13.86	14.25
25	12.59	12.60	e13.15	.....	.....	e14.22	13.79	13.36	13.65	e13.38	13.95	14.25
Eom	12.63	12.70	e13.18	.....	.....	14.15	13.65	13.34	13.70	13.41	14.01	14.26

e Estimated

Page County

404257N0951512.1. Local number 68-38-7cca1. William Brayman. Drilled unused water-table well in glacial drift, diam 12 in, depth 44 ft, lined with tile. Lsd 1,087 ft above msl. MP top of 3/4-in pipe inserted through board cover, 1.50 ft above lsd. Highest water level 1.44 below lsd, June 23, 1947; lowest 20.96 below lsd, Nov. 24, 1958. Records available: 1934 to current year.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct. 18, 1977	11.94	Jan. 23, 1978	11.20	Apr. 21, 1978	4.90	July 17, 1978	12.36
Nov. 17	9.92	Feb. 11	12.68	May 18	9.70	Aug. 13	12.26
Dec. 14	10.92	Mar. 18	8.08	June 15	12.27	Sept.13	14.23

Sac County

423013N0951753.1. Local number 89-38-26abaa1. City of Schaller. Drilled public-emergency-supply artesian well in Dakota Sandstone of Early Cretaceous age, diam 10 to 8 in, depth 352 ft, cased to 352, perforated 304-352. Lsd 1,376 ft above msl. MP edge of pump breather pipe, 1.80 ft above lsd. Highest water level 210.04 below lsd, Mar. 25, 1948; lowest 240.10 below lsd, May 24, 1977. Records available: 1940 to current year.

Nov. 1, 1977	229.87	Feb. 21, 1978	232.10	May 17, 1978	230.50	Aug. 18, 1978	230.17

Webster County

421837N0940836.1. Local number 87-28-29cccd1. Ransom Helms. Drilled unused water-table well in glacial drift, diam 12 in, depth 42 ft, lined with tile. Lsd 1,165 ft above msl. MP top of platform, 4.10 ft above lsd. Highest water level 0.05 below lsd, Aug. 1, 1972; lowest 13.62 below lsd, Mar. 12, 1956. Records available: 1942 to current year.

Oct. 20, 1977	4.10	Jan. 20, 1978	4.00	Apr. 21, 1978	1.53	July 20, 1978	2.55
Nov. 18	2.70	Feb. 21	4.05	May 17	1.85	Aug. 8	4.38
Dec. 20	4.70	Mar. 21	3.68	June 20	2.32	Sept. 20	2.03

e Estimated.

423013N0942147.1. Local number 89-30-22ddaa1. Johnson Township Consolidated School, Barnum. Drilled unused artesian well in sandstone of Cretaceous age, diam 4 in, reported depth 208 ft, cased to bottom, perforated 203-208, measured depth 203 ft. Lsd 1,174 ft above msl. MP top of casing, 6.40 ft below lsd. Highest water level 30.86 below lsd, July 2, 1945; lowest 44.55 below lsd, May 24, 1977. Records available: 1942-45, 1947 to current year.

Oct. 31, 1977	43.95	Feb. 21, 1978	43.47	May 17 1978	43.78	Aug. 18, 1978	30.90

☆ U.S. GOVERNMENT PRINTING OFFICE: 1979-667-480/37 REG. #6

October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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