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Water Resources Data
Michigan
Water Year 2001

Water-Data Report MI-01-1

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

Prepared in cooperation with the State of Michigan and with other agencies

CALENDAR FOR WATER YEAR 2001

2000

OCTOBER

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2001

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

Water Resources Data Michigan Water Year 2001

By S.P. Blumer, T.E. Behrendt, J.M. Ellis, R.J. Minnerick, R.L. LeuVoy, and C.R. Whited

Water-Data Report MI-01-1

Prepared in cooperation with the
State of Michigan and with other agencies

U.S. DEPARTMENT OF THE INTERIOR

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2002

PREFACE

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

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

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for the 2001 water year for Michigan consists of records of stage, discharge, and water quality of streams; stage and contents of lakes and reservoirs; and water levels and water quality of ground-water wells. This report contains discharge records for 157 streamflow-gaging stations; stage only records for 2 stream-gaging stations and 25 lake-gaging stations; stage and contents for 1 reservoir; water-quality records for 38 streamflow-gaging stations; and water-level records for 47 ground-water wells. Also included are 30 crest-stage partial-record stations. Additional water data were collected at various sites not involved in the systematic data-collection program. Miscellaneous data were collected at 85 discharge measuring sites and 32 ground water special-study sites. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State, local, and Federal agencies in Michigan.

14. SUBJECT TERMS

*Michigan, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses.

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

Letters after station name designate type of data collected: (d) discharge, (b) biological, (c) chemical, (e) elevation, gage heights, or contents, (m) microbiological, (o) dissolved oxygen, (p) pH, (s) sediment, (t) water temperature, (sc) specific conductance.

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

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

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

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

DISCONTINUED SURFACE-WATER-DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Michigan have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Those stations with an asterisk (*) after the station number have had previous or subsequent operation as a crest-stage partial-record station. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[Letters after station name designate type of data collected: (d) discharge, (e) elevation (stage only). Letter (a) before drainage area means approximately.]

Station name	Station number	Drainage area (mi^2)	Period of record
STREAMS TRIBUTARY TO LAKE SUPERIOR			
Montreal River at Ironwood, MI (d)	04028000	63.0	1918-22, 1924-26, 1949-54
Montreal River near Saxon, WI (d)	04030000	262	1938-70
Black River at Ramsay, MI (d)	04030500	a82	1924-25
Presque Isle River at Marenisco, MI (d)	04031500	171	1945-82
Presque Isle River near Tula, MI (d)	04032000*	261	1945-73
Iron River near White Pine, MI (d)	04032500	98.1	1952-57
East Branch Ontonagon River near Mass, MI (d)	04035000	272	1942-79
Cisco Branch Ontonagon River near Watersmeet, MI (d)	04038000	62.2	1942-44
South Branch Ontonagon River at Ewen, MI (d)	04039500*	348	1942-71
Perch River near Sidnaw, MI (d)	04041000*	63.1	1913-15
Sturgeon River near Baraga, MI (d)	04042000	379	1927-31, 1943-47
Otter River near Elo, MI (d)	04042500*	162	1942-72
Sturgeon River near Arnheim, MI (d)	04043000	705	1942-74
Dead River near Negaunee, MI (d)	04043500	138	1902-03
Dead River at Forestville, MI (d)	04044000	158	1899-1902
Carp River near Negaunee, MI (d)	04044400	51.4	1961-87
Carp River near Marquette, MI (d)	04044500	a86	1902-04
Silver Lead Creek near Gwinn, MI (d)	040445315	a2.1	1997-99
Big Creek near Harvey, MI (d)	04044563	17.0	1979-81
Cedar Creek near Harvey, MI (d)	04044573	9.04	1979-81
Cherry Creek near Harvey, MI (d)	04044583	4.53	1965-70, 1979-81
Silver Creek at Harvey, MI (d)	04044595	8.58	1979-81
Tahquamenon River at Newberry, MI (d)	04045000	a200	1934-36
STREAMS TRIBUTARY TO LAKE MICHIGAN			
South Manistique Lake Outlet at Curtis, MI (d)	04046500	a44	1942-44
North Manistique Lake Outlet at Helmer, MI (d)	04047000	a15	1942-44
Manistique Lake near Curtis, MI (e)	04047200	118	1942-91
Manistique River near Germfask, MI (d)	04047500	a120	1942-50
Fox River at Seney, MI (d)	04048000	107	1942-44
East Branch Fox River near Germfask, MI (d)	04048500	104	1942-44
Holland Creek near Seney, MI (d)	04049000	a13	1938-42
Manistique River at Germfask, MI (d)	04049500*	341	1938-70
Goose Pen Outlet at Germfask, MI (d)	04050000	--	1939-41
Grays Creek near Germfask, MI (d)	04050500	a36	1938-40
Pine Creek near Germfask, MI (d)	04051000	a11	1938-40
Sand Creek near Germfask, MI (d)	04051500	a6	1938-40
Driggs River near Seney, MI (d)	04052000	a70	1938-42
Walsh Creek near Seney, MI (d)	04052500	a12	1938-42
Driggs River near Germfask, MI (d)	04053000	114	1938-41
Marsh Creek near Shingleton, MI (d)	04053500	a20	1938-42
Marsh Creek near Germfask, MI (d)	04054000	--	1938-41
Duck Creek near Blaney, MI (d)	04054500	a92	1938-54
Manistique River near Blaney, MI (d)	04055000*	704	1938-70
Creighton River near Shingleton, MI (d)	04055500	a35	1938-42

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

Station name	Station number	Drainage area (mi^2)	Period of record
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued			
West Branch Manistique River near Manistique, MI (d)	04056000	322	1938-56
Indian Lake near Manistique, MI (e)	04057000	302	1938-95
Indian River near Manistique, MI (d)	04057000*	302	1938-71, 1992-93
Manistique River above Manistique, MI (d)	04057004	a1,445	1994-96
Sturgeon River near St. Jacques, MI (d)	04057500	167	1950-52
Middle Branch Escanaba River near Greenwood, MI (d)	04057820*	73.3	1973-82
Black River near Republic, MI (d)	04057900*	34.4	1961-68
Middle Branch Escanaba River near Ishpeming, MI (d)	04058000	128	1954-75
Green Creek near Princeton, MI (d)	04058130	13.8	1977-82
Warner Creek near Palmer, MI (d)	04058300*	14.2	1961-68, 1972-78
Goose Lake Outlet near Sands Station, MI (d)	04058400*	37.5	1966-82
East Branch Escanaba River at Gwinn, MI (d)	04058500	124	1955-80
Tenmile Creek at Perronville, MI (d)	04059400*	38.4	1971-77
Iron River near Iron River, MI (d)	04060000	a65	1901-04
Iron River at Caspian, MI (d)	04060500	92.1	1948-80
Paint River at Crystal Falls, MI (d)	04061500*	597	1944-96
Peshekee River near Michigamme, MI (d)	04062100	66.5	1961-68, 1993-95
Lake Michigamme near Champion, MI (e)	04062228	193	1942-91
Michigamme River near Michigamme, MI (d)	04062230	194	1969-82
Michigamme River near Champion, MI (d)	04062270	231	1964-69
Michigamme River at Republic, MI (d)	04062300*	240	1961-75
Michigamme River near Witch Lake, MI (d)	04062400*	316	1964-80
Menominee River near Iron Mountain, MI (d)	04065000	2,430	1898-99, 1903-14
West Branch Sturgeon River near Randville, MI (d)	04065300	56.1	1958-81
East Branch Sturgeon River below Skunk Creek near Felch, MI (d)	04065393	61.8	1974-84
East Branch Sturgeon River at Hardwood, MI (d)	04065397	90.8	1978-83
Sturgeon River near Foster City, MI (d)	04065500	237	1955-80
Pine Creek near Iron Mountain, MI (d)	04065600	16.8	1972-81
Menominee River below Koss, MI (d)	04067000	3,720	1907-09, 1913-81
Galien River near New Troy, MI (d)	04095500	a47	1945-47
East Branch Galien River near New Troy, MI (d)	04096000	19.2	1945-47
Beebe Creek near Hillsdale, MI (d)	04096272*	42.4	1974-78
Sand Creek at Litchfield, MI (d)	04096312*	20.6	1974-77
Soap Creek near Litchfield, MI (d)	04096325	10.9	1975-77
St. Joseph River at Clarendon, MI (d)	04096340*	144	1974-77
Sauk (East Branch Coldwater) River at Coldwater, MI (d)	04096500	--	1938-62
Coldwater River near Hodunk, MI (d)	04096600	293	1963-89
Nottawa Creek near Athens, MI (d)	04096900	162	1967-97
St. Joseph River at Mendon, MI (d)	04097000	918	1903-05
Little Portage Creek near Fulton, MI (d)	04097060*	27.0	1965-67
Portage River near Vicksburg, MI (d)	04097170*	68.2	1946-51, 1965-80
Gourdneck Canal near Schoolcraft, MI (d)	04097195	--	1966-73, 1983-92
Gourdneck Creek near Schoolcraft, MI (d)	04097200	7.29	1964-73
Fawn River near White Pigeon, MI (d)	04098500*	192	1903-04, 1958-75
St. Joseph River at Berrien Springs, MI (d)	04102000*	4,081	1901-07, 1909-32, 1951-56

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

Station name	Station number	Drainage area (mi^2)	Period of record
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued			
Paw Paw River near Paw Paw, MI (d)	04102320	195	1980-82
Paw Paw River near Hartford, MI (d)	04102420	311	1980-82
St. Joseph River at St. Joseph, MI (d)	04102533	4,670	1994-96
South Branch Kalamazoo River near Albion, MI (d)	04102850	146	1972-76
Reed's Springs near Albion, MI (d)	04103000	--	1905-06
Kalamazoo River at Marshall, MI (d)	04103500	449	1949-82
Battle Creek at Charlotte, MI (d)	04104000	a67	1948-54
Battle Creek at Bellevue, MI (d)	04104500	178	1948-53
Gull Creek near Galesburg, MI (d)	04105800*	38.1	1965-73
Portage Creek near Portage, MI (d)	04106190	18.6	1965-67
Portage Creek at Kalamazoo, MI (d)	04106500	46.8	1948-58, 1975-86
Gun River at dam near Shelbyville, MI (d)	04107000	a30	1946-47
Gun River near Martin, MI (d)	04107500	a35	1946-47
Kalamazoo River near Allegan, MI (d)	04108000	a1,470	1903-08
Kalamazoo River near Fennville, MI (d)	04108500	a 1,600	1929-36, 1938-93
Kalamazoo River at New Richmond, MI (d)	04108660	a1,980	1994-96
Portage River below Little Portage Lake near Munith, MI (d)	04109500	a55	1944-56
Orchard Creek at Munith, MI (d)	04110000	a49	1944-56
Portage River near Munith, MI (d)	04110500	118	1944-46
Sycamore Creek near Holt, MI (d)	04112850	80.6	1975-80, 1989-90, 1995-98
Mud Lake Drain at Lansing, MI (d)	04112904	4.28	1975-76
Carrier Creek near Lansing, MI (d)	04113097	12.1	1975-80
Sebewa Creek near Sunfield, MI (d)	04113500	24.1	1954-56
Looking Glass River near Eagle, MI (d)	04114500	281	1944-96
Fish Creek near Carson City, MI (d)	04115500	145	1936-38
Flat River at Smyrna, MI (d)	04116500*	528	1951-86
Thornapple River near Caledonia, MI (d)	04118000*	773	1931-38, 1952-82, 1984-94
Grand River at Eastmanville, MI (d)	04119300	a5,230	1976-77
Crockery Creek at Slocums Grove, MI (d)	04120000	--	1903
Grand River at Grand Haven, MI (d)	04120250	5,518	1994-96
Higgins Lake Outlet (head of Muskegon River) near Roscommon, MI (d)	04120500	49.2	1942-50
Muskegon River near Merritt, MI (d)	04121000*	355	1947-74
Little Muskegon River near Morley, MI (d)	04121900	121	1967-96
Muskegon River at Newaygo, MI (d)	04122000	a2,350	1908-20, 1931-93
Muskegon River at Muskegon, MI (d)	04122150	2,680	1994-96
Big Sable River near Freesoil, MI (d)	04123000*	115	1942-74
Manistee River near Grayling, MI (d)	04123500*	123	1943-74
Pine River near Le Roy, MI (d)	04125000*	128	1952-63
Manistee River near Manistee, MI (d)	04126000	1,677	1952-93
Little Manistee River near Freesoil, MI (d)	04126200*	178	1957-75
Little Manistee River near Stronach, MI (d)	04126500	a196	1931
Boardman River near Mayfield, MI (d)	04127000	182	1952-89
Boardman River at Traverse City, MI (d)	04127500	--	1903-04
Intermediate River at Bellaire, MI (d)	04127565	146	1991
Elk Lake near Elk Rapids, MI (e)	445256085240001	a410	1952-95
STREAMS TRIBUTARY TO LAKE HURON			
Burt Lake at Indian River, MI (e)	04128500	598	1942-88
Indian River at Indian River, MI (d)	04128500	598	1942-82
Pigeon River at Afton, MI (d)	04129500	139	1942-81
Cheboygan River near Cheboygan, MI (d)	04130000	889	1943-82
Mullett Lake near Cheboygan, MI (e)	04130000	889	1943-91

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

Station name	Station number	Drainage area (mi^2)	Period of record
STREAMS TRIBUTARY TO LAKE HURON--Continued			
Black River near Tower, MI (d)	04130500	311	1943-00
Rainy River near Onaway, MI (d)	04131000	75.7	1942-52
Rainy River near Ocqueoc, MI (d)	04131500*	87.9	1953-79
Black River near Cheboygan, MI (d)	04132000*	558	1943-74
Cheboygan Pond at Cheboygan, MI (e)	04132052	a1,500	1943-91
Thunder Bay River near Hillman, MI (d)	04132500*	232	1945-73
Upper South Branch Thunder Bay River near Lachine, MI (d)	04133000	171	1945-54
Thunder Bay River near Bolton, MI (d)	04133500	588	1945-80
North Branch Thunder Bay River near Bolton, MI (d)	04134000	184	1945-80
Lower South Branch Thunder Bay River near Hubbard Lake, MI (d)	04134500	146	1945-54
Thunder Bay River near Alpena, MI (d)	04135000	1,238	1901-09, 1980-93
Au Sable River at Grayling, MI (d)	04135500*	110	1943-93
East Branch Au Sable River at Grayling, MI (d)	04135600	76.0	1958-84
Au Sable River at Bamfield, MI (d)	04137000	a1,420	1902-14
East Branch Au Gres River at McIvor, MI (d)	04138000*	a84	1951-74
Au Gres River near National City, MI (d)	04138500	154	1951-81
Houghton Creek near Lupton, MI (d)	04139000*	29.7	1950-73
Rifle River at "The Ranch" near Lupton, MI (d)	04139500	56.8	1950-71
Prior Creek near Selkirk, MI (d)	04140000*	21.4	1950-73
Rifle River at Selkirk, MI (d)	04140500*	117	1950-82
South Branch Shepards Creek near Selkirk, MI (d)	04141000*	1.15	1952-78
West Branch Rifle River near Selkirk, MI (d)	04141500*	a52	1952-63
Rifle River at Omer, MI (d)	04143000	364	1902-04
North Branch Kawkawlin River near Kawkawlin, MI (d)	04143500	101	1951-82
Shiawassee River at Byron, MI (d)	04144000	365	1948-83
Shiawassee River near Fergus, MI (d)	04145000	637	1940-84, 1989-94
Bad River near Brant, MI (d)	04145500*	a89	1949-59
Flint River at Columbiaville, MI (d)	04146500	470	1932-33, 1948-52
Holloway Reservoir near Otisville, MI (e)	04147000	526	1954-91
Butternut Creek near Genesee, MI (d)	04147990	34.7	1970-84
Flint River at Genesee, MI (d)	04148000	a593	1931-52
Gilkey Creek near Flint, MI (d)	04148160	6.43	1970-84
Swartz Creek near Holly, MI (d)	04148200*	12.1	1956-75
Swartz Creek at Flint, MI (d)	04148300*	115	1970-84
Thread Creek near Flint, MI (d)	04148440*	54.4	1970-84
Brent Run near Montrose, MI (d)	04148720	20.8	1970-84
Flint River near Fosters, MI (d)	04149000	1,188	1940-84, 1988-92
Flint River near Alicia, MI (e)	04149500	--	1949-84
South Branch Cass River near Cass City, MI (d)	04150000	238	1949-80
Cass River at Wahjamega, MI (d)	04150800	645	1969-94
Cass River at Vassar, MI (d)	04151000*	710	1910-28, 1949-70
Tobacco River at Beaverton, MI (d)	04152500	487	1948-82
Kinney Creek near Clare, MI (d)	04153000	a9	1935-36
Salt River near North Bradley, MI (d)	04153500	138	1934-71
Chippewa River near Midland, MI (d)	04154500*	597	1948-73
Tittabawassee River at Freeland, MI (d)	04156500	a2,530	1903-10, 1912-36
State Drain near Sebewaing, MI (d)	04157500	67.3	1940-54
Columbia Drain near Sebewaing, MI (d)	04158000	33.9	1940-54, 1988-90
Pigeon River near Owendale, MI (d)	04158500	53.2	1953-82
Pigeon River near Pigeon, MI (d)	04159000	93.3	1947-52
Pigeon River near Caseville, MI (d)	04159010	125	1987-93

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

Station name	Station number	Drainage area (mi^2)	Period of record
STREAMS TRIBUTARY TO ST. CLAIR RIVER			
Silver Creek near Jeddo, MI (d)	04159488	20.6	1978-82
Mill Creek near Abbottsford, MI (d)	04160000*	185	1947-64
Black River near Port Huron, MI (d)	04160050	684	1931, 1933-44
STREAMS TRIBUTARY TO LAKE ST. CLAIR			
Clinton River at Auburn Heights, MI (d)	04161000*	123	1935-40, 1957-82
Galloway Creek near Auburn Heights, MI (d)	04161100	17.9	1960-91
Paint Creek near Lake Orion, MI (d)	04161500*	38.5	1955-75, 1989-91
Red Run near Warren, MI (d)	04162010	--	1980-88
Bear Creek at Warren, MI (d)	04162500	17.3	1954-57
Big Beaver Creek near Warren, MI (d)	04162900	--	1959-88
Big Beaver Creek at Warren, MI (d)	04163000	25.2	1954-58
Plum Brook near Utica, MI (d)	04163500	22.9	1954-66
Red Run near Cady, MI (e)	04163900	--	1980-82
North Branch Clinton River at Almont, MI (d)	04164010*	9.56	1963-68
North Branch Clinton River near Romeo, MI (d)	04164050*	49.7	1965-69
North Branch Clinton River near Meade, MI (d)	04164150*	89.6	1968-72
Coon Creek near Armada, MI (d)	04164200*	10.0	1966-70
Tupper Brook at Ray Center, MI (d)	04164250*	8.62	1960-64
Highbank Creek near Armada, MI (d)	04164350*	14.9	1965-70
East Branch Coon Creek near New Haven, MI (d)	04164360*	36.1	1968-72
Deer Creek near Meade, MI (d)	04164400*	12.7	1960-65
McBride Drain near Macomb, MI (d)	04164450*	5.79	1960-64
Middle Branch Clinton River near Macomb, MI (d)	04164600*	22.2	1965-69
Middle Branch Clinton River at Macomb, MI (d)	04164800*	41.0	1963-68, 1970-82
Middle Branch Clinton River near Mount Clemens, MI (d)	04165000	a51	1947-49
Gloede Ditch near Waldenburg, MI (d)	04165200*	16.0	1959-64
Clinton River By-Pass below weir at Mount Clemens, MI (e)	04165556	--	1980-83
Clinton River By-Pass at mouth at Mount Clemens, MI (e)	04165557	--	1980-83
STREAMS TRIBUTARY TO DETROIT RIVER			
Lower River Rouge at Dearborn, MI (d)	04168500	91.9	1931-33
STREAMS TRIBUTARY TO LAKE ERIE			
Hayes Creek at Commerce, MI (d)	04169000	a8	1946-51
Huron River at Commerce, MI (d)	04169500*	57.3	1946-75
Davis Creek near Whitmore Lake, MI (d)	04171000	65.8	1953-54
South Ore Creek near Brighton, MI (d)	04171500	a31	1951-68
Portage River near Pinckney, MI (d)	04172500*	79.1	1945-71
Huron River near Dexter, MI (d)	04173000*	522	1904, 1946-72, 1976-77
Huron River at Dexter, MI (e)	04174000	--	1904-16
Huron River at Ypsilanti, MI (d)	04174800	807	1974-84, 1990-94
Willow Run near Rawsonville (d)	04174950	--	1986-97
Huron River at Flat Rock, MI (d)	04175100	851	1904-11
Huron River at Flat Rock, MI (e)	04175100	851	1912-22
Stony Creek at Oakville, MI (d)	04175340	68.0	1970-81
River Raisin near Tecumseh, MI (d)	04175700	267	1956-80
South Branch River Raisin at Adrian, MI (d)	04175957	164	1992-95
Saline River near Saline, MI (d)	04176400*	94.6	1966-77

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following continuous-record surface-water-quality stations in Michigan have been discontinued. Daily records of temperature, specific conductance, or sediment were collected and published for the record shown for each station. Information regarding these stations may be obtained from the District office at the address given on the back side of the title page of this report.

[Type of record: Temp. (temperature), S.C. (specific conductance), Sed. (sediment). Letter (a) before drainage area means approximately.]

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
STREAMS TRIBUTARY TO LAKE SUPERIOR				
Washington Creek at Windigo, MI	04001000	13.2	Temp.	1965-91
Black River near Bessemer, MI	04031000	200	Temp.	1955-71
Ontonagon River near Rockland, MI	04040000	1,340	Temp., S.C.	1975-81
Sturgeon River near Chassell, MI	04043004	723	Temp., S.C.	1978-81
Trap Rock River near Lake Linden, MI	04043050	28.0	Temp.	1972-83
Salmon Trout River near Big Bay, MI	04043250	37.8	Temp.	1971-73
Tahquamenon River near Paradise, MI	04045500	790	Temp., S.C.	1975-81
STREAMS TRIBUTARY TO ST. MARYS RIVER				
St. Marys River above Sault Ste. Marie, MI	04045580	a80,900	Temp., S.C.	1974-81
STREAMS TRIBUTARY TO LAKE MICHIGAN				
Black River near Garnet, MI	04046000	a28	Temp.	1952-75 1977-78
Manistique River above Manistique, MI	04057004	a1,445	Temp., S.C.	1976-81
Manistique River at Manistique, MI	04057005	a1,450	Temp., S.C.	1975
Middle Branch Escanaba River at Humboldt, MI	04057800	46.0	Temp.	1973-78
Greenwood Afterbay near Greenwood, MI	04057812	67.4	Temp.	1973-86
Greenwood Diverson near Greenwood, MI	04057813	--	Temp.	1973-82
Greenwood Release near Greenwood, MI	04057814	67.4	Temp.	1973-82
Middle Branch Escanaba River near Greenwood, MI	04057820	73.3	Temp.	1973-78
Black River near Republic, MI	04057900	34.4	Sed. Temp.	1962-63, 1965, 1962-68
Middle Branch Escanaba River near Ishpeming, MI	04058000	128	Temp.	1962-75, 1977-82
Green Creek near Palmer, MI	04058120	8.42	Temp., Sed. Temp.	1965, 1979-80
Green Creek near Princeton, MI	04058130	13.8	Temp.	1977-81
Schweitzer Creek near Palmer, MI	04058200	23.6	Temp.	1962-71
Goose Lake Outlet near Sands Station, MI	04058400	37.5	Temp.	1977-81
East Branch Escanaba River at Gwinn, MI	04058500	124	Temp. Sed.	1955-64 1962-63
Ford River near Hyde, MI	04059500	450	Temp. S.C.	1956-81 1975-81
Paint River near Alpha, MI	04062000	631	Temp.	1953-54, 1956-57
Peshekee River near Champion, MI	04062200	133	Temp.	1962, 1964-78
Michigamme River near Witch Lake, MI	04062400	316	Temp., Sed.	1965-69
East Branch Sturgeon River at Hardwood, MI	04065397	90.8	Temp.	1978-83
Sturgeon River near Foster City, MI	04065500	237	Temp.	1957-80
Pine Creek near Iron Mountain, MI	04065600	16.8	Temp.	1972-81
Beebe Creek near Hillsdale, MI	04096272	42.4	Sed. Temp., Sed.	1975, 1976-77
Sand Creek at Litchfield, MI	04096312	20.6	Temp., Sed. Sed.	1975-76, 1977
Soap Creek near Litchfield, MI	04096325	10.9	Temp., Sed. Sed.	1975-76, 1977

DISCONTINUED SURFACE-WATER-QUALITY STATIONS--Continued

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
St. Joseph River at Clarendon, MI	04096340	144	Temp., Sed.	1975-76,
			Sed.	1977
St. Joseph River at Niles, MI	04101500	3,666	Temp., S.C.	1979-84
Paw Paw River near Paw Paw, MI	04102320	195	Temp., Sed.	1981-82
Paw Paw River near Hartford, MI	04102420	311	Sed.	1981-82
Black River near Bangor, MI	04102700	83.6	Temp., Sed.	1981-82
Kalamazoo River at Comstock, MI	04106000	a1,010	Temp.	1969-75
Portage Creek near Kalamazoo, MI	04106300	22.4	Temp., S.C.	1968-71
West Fork Portage Creek at Kalamazoo, MI	04106400	18.7	Temp., S.C.	1971,
			Temp.	1972-73
Portage Creek at Kalamazoo, MI	04106500	46.8	S.C.	1968,
			Temp., S.C.	1972-75,
			Temp.	1976-86
Kalamazoo River near Cooper Center, MI	04106770	1,248	Temp.	1968,
				1970,
			Temp., S.C.	1969,
				1971-75
Kalamazoo River at Saugatuck, MI	04108690	a2,020	S.C.	1974,
			Temp, S.C.	1975-81
Grand River near Eaton Rapids, MI	04111000	661	Temp.	1964-74,
				1976-77
Grand River at Lansing, MI	04113000	a1,230	Temp.	1964,
				1967-68,
				1970-73
Grand River at Portland, MI	04114000	1,385	Temp.	1964-68
Grand River at Eastmanville, MI	04119300	a5,230	Temp., S.C.	1979-83
Muskegon River at Evart, MI	04121500	a1,450	Temp.	1957-83
Little Muskegon River near Morley, MI	04121900	138	Temp.	1967-83
Muskegon River near Bridgeton, MI	04122030	a2,420	Temp., S.C.	1975-81
Pere Marquette River near Scottville, MI	04122500	681	Temp.	1968-83
Manistee River near Grayling, MI	04123500	123	Temp.	1957-77
East Branch Pine River near Tustin, MI	04124500	60	Temp.	1952-63
Pine River near LeRoy, MI	04125000	128	Temp.	1953-63
Pine River near Luther, MI	04125200		Sed.	1967-70
Silver Creek near Luther, MI	04125210		Sed.	1969-70
Poplar Creek near Hoxeyville, MI	04125350		Sed.	1969-70
Pine River near Dublin, MI	04125450		Sed.	1968-70
Pine River near Hoxeyville, MI	04125500	251	Temp.	1952-63
Pine River near Wellston, MI	04125510		Sed.	1967-70
Little Manistee River near Freesoil, MI	04126200	178	Temp.	1957-77
Manistee River at Manistee	04126520	1,928	Temp., S.C.	1975-81
Boardman River at Brown Bridge Road nr Mayfield	04126970	141	Temp., S.C.	1998
Boardman River near Mayfield, MI	04127000	182	Temp.	1962-77
Boardman River at Traverse City	04127499	283	Temp., S.C.	1998
Jordan River near East Jordan, MI	04127800	67.9	Temp.	1967-83
STREAMS TRIBUTARY TO LAKE HURON				
Sturgeon River near Wolverine, MI	04128000	198	Temp.	1959-83
Pigeon River near Vanderbilt, MI	04129000	62.6	Temp.	1951-66
Cheboygan River at Cheboygan, MI	04132052	a1,500	Temp., S.C.	1975-81
Thunder Bay River near Alpena, MI	04135000	1,238	Temp., S.C.	1980-85
Thunder Bay River at Alpena, MI	04135020	a1,240	Temp., S.C.	1979

DISCONTINUED SURFACE-WATER-QUALITY STATIONS--Continued

Station name	Station number	Drainage area (mi^2)	Type of record	Period of record
STREAMS TRIBUTARY TO LAKE HURON--Continued				
Au Sable River at Grayling, MI	04135500	110	Temp.	1953-80
South Branch Au Sable River near Luzerne, MI	04135700	401	Temp.	1967-83
East Branch Au Gres River at McIvor, MI	04138000	a84	Temp.	1952-66
Au Gres River near National City, MI	04138500	154	Temp.	1952-59
Houghton Creek near Lupton, MI	04139000	29.7	Temp.	1950-68
Rifle River near Lupton, MI	04139500	56.8	Temp.	1950-71
Prior Creek near Selkirk, MI	04140000	21.4	Temp.	1951-68
Rifle River at Selkirk, MI	04140500	117	Temp.	1951-76
West Branch Rifle River near Selkirk, MI	04141500	a52	Temp.	1952-61
Rifle River near Sterling, MI	04142000	a320	Sed.	1966,
				1970-72,
			Temp., S.C.	1975-81
Shiawassee River at Byron, MI	04144000	365	Temp.	1962-81
Shiawassee River at Owosso, MI	04144500	538	Sed.	1966-72
Cass River at Frankenmuth, MI	04151500	841	Sed.	1966-72
Pigeon River near Caseville	04159010	125	Temp., S.C.	1978-81
STREAMS TRIBUTARY TO ST. CLAIR RIVER				
St. Clair River at Port Huron, MI	04159130	a222,400	Temp., S.C.	1978-81
Black River near Jeddo, MI	04159492	464	Temp.	1997
Black River at Fargo, MI	04159500	480	Sed.	1966,
			Temp.	1979-82
STREAMS TRIBUTARY TO LAKE ST. CLAIR				
Clinton River near Drayton Plains, MI	04160900	79.2	Temp.	1962-74
Clinton River at Sterling Heights, MI	04161820	309	Temp.	1996-98
Clinton River near Fraser, MI	04164000	444	Sed.	1966
Clinton River at Mount Clemens, MI	04165500	734	Temp., S.C.	1975-81
STREAMS TRIBUTARY TO DETROIT RIVER				
Detroit River at Detroit, MI	04165700	a228,800	Temp., S.C.	1974-81
STREAMS TRIBUTARY TO LAKE ERIE				
River Raisin near Manchester, MI	04175600	132	Temp.	1997
River Raisin near Monroe, MI	04176500	1,042	Temp., Sed.	1966-72
			Temp., S.C.	1978-81

WATER RESOURCES DATA - MICHIGAN, 2001

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of Michigan each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Michigan."

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 157 streamflow-gaging stations, 30 crest-stage partial-record stations and 85 miscellaneous sites; (2) stage only records for 2 stream-gaging stations and 25 lake-gaging stations; (3) stage and content records for 1 reservoir; (4) water-quality records for 38 streamflow-gaging stations, and 32 ground water special-study sites; (5) water-level records for 47 ground-water wells. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State, local, and Federal agencies in Michigan.

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

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Michigan were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Part 4." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report MI-01-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone (517) 887-8903.

COOPERATION

The U.S. Geological Survey and agencies of the State of Michigan have had cooperative agreements for the collection of water-resource records since 1930. Organizations that assisted in collecting the data in this report through cooperative agreement with the Survey are:

Michigan Department of Environmental Quality, Russell Harding, Director, through Land and Water Management Division, Richard A. Powers, Chief.

Michigan Department of Natural Resources, K. L. Cool, Director.

Michigan Department of Transportation, Gregory J. Rosine, Director.

Assistance with funds or services was given by the U.S. Army Corps of Engineers in collecting records for 6 gaging stations published in this report. Assistance was also furnished by the National Weather Service, National Oceanic Atmospheric Administration, and U.S. Department of Commerce.

The following organizations aided in collecting records:

Macomb County Board of Supervisors; Oakland County Drain Commission; Washtenaw County Drain Commission; Delta Township (Eaton County); Huron County; Kalamazoo County; Otsego County; Washtenaw County; Wayne County; Huron-Clinton Metropolitan Authority; Ann Arbor, Battle Creek, Cadillac, Coldwater, Flint, Imlay City, Kalamazoo, Norway, Portage, and Sturgis; American Aggregates Co.; Consumers Energy; Cleveland Cliffs Iron Co.; Dow Chemical Co.; French Paper Co.; Lansing Board of Water and Light; Mead Corporation; Indiana Michigan Power Co.; Pharmacia & Upjohn; STS Hydropower, Ltd; Swift-Eckrich, Inc.; Upper Peninsula Power Co.; White's Bridge Hydro Co.; Wisconsin-Electric Power Co.; and Wolverine Power Supply Cooperative, Inc.

Organizations that supplied data are acknowledged in the station descriptions.

WATER RESOURCES DATA - MICHIGAN, 2001

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

In the western Upper Peninsula, streamflow of the Sturgeon River near Sidnaw (fig. 1) was considerably below the 25th percentile from September through December, increasing to about the 25th percentile from January through March. Snow melt and runoff occurred in April and streamflow considerably exceeded the 75th percentile, before declining to about the 25th percentile in May and June. Above normal precipitation in July resulted in streamflow that again considerably exceeded the 75th percentile before declining below the 50th percentile in August and the 25th percentile in September. The 2001 annual mean discharge of 175 ft^3/s (cubic feet per second) is about 80 percent of 1961-1990 annual mean discharge of 218 ft^3/s and is also below the annual mean discharge for period of record (1913-2001) of 210 ft^3/s.

Dry conditions also prevailed in the eastern Upper Peninsula throughout much of 2001. Streamflow of the Tahquamenon River near Paradise began the year considerably below the mean for period of record (1953-2001) in October and continued the pattern through March. Warm temperatures accompanied by snowmelt and runoff occurred in the Tahquamenon River Basin in April and streamflow was above the mean, declining below the mean for the period from May through August. Above-normal precipitation in September resulted in above-average streamflow. Annual mean discharge for 2001 was 730 ft^3/s, which is about 80 percent of the period of record annual mean discharge of 907 ft^3/s.

In the northern Lower Peninsula, near-drought conditions continued from fall through early winter and streamflow of the Muskegon River at Evart (fig. 1) was below the 25th percentile from October through January. Streamflow was somewhat above the 50th percentile in February and slightly below the 50th percentile in March and April. Streamflow in May and June exceeded the 75th percentile in response to heavy precipitation, before falling to near the 25th percentile in July, and below the 25th percentile in August and September. Annual mean discharge for 2001 was 982 ft^3/s, which is about 92 percent of the 1961-1990 annual median discharge of 1,069 ft^3/s. New minimum instantaneous streamflows were established at several streams in the northern Lower Peninsula in 2001. One lake in the northern Lower Peninsula had a record low water level in 2001.

In the southern Lower Peninsula, streamflow of the Red Cedar River at East Lansing (fig. 1) considerably exceeded the 75th percentile in October and was somewhat above the 75th percentile in November, before declining to about the 50th percentile in December. In January, flow was between the 50th and the 75th percentile. Above-normal precipitation, coupled with warm weather, in early-February resulted in streamflow that considerably exceeds the 75th percentile, declining below the 50th percentile in March and about the 25th percentile in April. In May and June, streamflow again exceeded the 75th percentile, primarily the result of a storm in mid-May that dumped as much as 8 inches of precipitation in some areas in the southern Lower Peninsula. July and August streamflow was about the 50th percentile, increasing to near the 75th percentile in September. The 2001 annual mean discharge of 271 ft^3/s was about 30 percent greater than the 1961-1990 annual median discharge of 208 ft^3/s. Many streams in the southern Lower Peninsula established new maximum monthly mean discharges in February as a result of warm temperatures and above-normal precipitation.

Climatic conditions across the northern and southern parts of the Great Lakes-St. Lawrence River system were somewhat erratic in the 2001 water year, both spatially and temporally. A normal amount of precipitation fell in the Lake Superior, Lake Michigan, and Lake Huron Basins during the year, but was primarily the result of several intense precipitation events rather than prolonged wet periods. In the Lake Superior Basin in April, record-high monthly precipitation fell, exceeding the previous record by over an inch. Conversely, precipitation in the Lake Superior Basin was below normal during most other months of the year. The eastern part of the Lake Superior Basin remained quite dry throughout the year continuing a trend begun in June 1998. In the lower part of the Lake Huron and Lake Michigan Basins, several significant storm events occurred during the year, resulting in seven months of above-average precipitation. In contrast, the northern half of the Lake Michigan and Lake Huron Basins received below-normal precipitation throughout the year. In the Lake Erie and Ontario Basins, precipitation was 86 and 96 percent of normal, respectively.

Although precipitation in the entire Great Lakes Basin was 96 percent of normal, monthly water levels in the Lakes except Superior, continued to decline during the 2001 water year. At the end of September, Great Lakes water levels varied from long-term (1918-2000) September mean levels as follows; Lake Superior was about .65 ft lower; Lakes Michigan and Huron were about 1.8 ft lower; Lake St. Clair was about 1.2 ft lower; Lake Erie was about 1.1 ft lower; and Lake Ontario was about .40 ft lower. The water level in Lakes Michigan and Huron was about 4.5 ft lower than record high levels recorded in 1986, although the level remains about .80 ft higher than the minimum monthly level for September, which occurred during the drought period in 1964. No new record high- or low-water levels on any of the Great Lakes were recorded during the year.

Water Quality

Surface-water-quality data were collected at a number of sites in 2001. Daily records of water temperature were collected at two stations in the Upper Peninsula. Daily records of one or more water-quality parameters including specific conductance, pH, water temperature, and dissolved oxygen were collected at 17 stations in the northern Lower Peninsula and 14 stations in the southeastern Lower Peninsula, and one station in the southwestern Lower Peninsula.

Ground Water

Pleistocene glacial deposits cover most of the State. Outwash sand and gravel in these deposits form the most productive aquifers, although lacustrine sand aquifers are also productive. Till deposits formed of poorly-sorted, relatively impermeable mixtures of clay, silt, sand, and gravel tend to be poor aquifers; clay deposits generally yield little or no water. In most areas, glacial deposits are less than 200 ft thick, although deposits greater than 800 ft thick are found in some areas of the northern Lower Peninsula.

Sandstone, limestone, and dolomite are the principal bedrock aquifers. Where bedrock aquifers are hydraulically connected to overlying freshwater-bearing units, they yield freshwater. However, when bedrock aquifers are isolated from overlying freshwater-bearing units by impermeable deposits (confining units) such as till, clay, or shale, they typically yield brackish, saline, or briny water. Annual recharge to aquifers in Michigan, which ranges from 3 to 18 inches, is derived from precipitation, averaging 31 inches annually.

Ground-water levels were measured at 47 wells statewide during the 2001 water year (fig. 8). Distribution of wells equipped with the continuous recorders primarily defines localized ground-water conditions. In addition to wells equipped with continuous records, periodic measurements were made at other wells located throughout the state. Several of these wells are far from major municipal, industrial, or agricultural ground-water users and, as a result, reflect regional ground-water conditions.

Ground-water levels in the southern Lower Peninsula typically follow seasonal precipitation patterns with lowest levels occurring during the mid- to late-summer months followed by recovery in late-winter and spring. Ground-water levels in wells in the northern Lower Peninsula and Upper Peninsula more typically have lowest levels occurring in the late-winter as a result of little or no recharge occurring during the winter months followed by recovery in the summer months. New period of record low-water levels were measured in 10 wells statewide during the 2001 water year. Although several of the wells have a fairly-short period of record, many have at least a decade of previous record available for comparison. Above normal precipitation occurred in much of the southern part of the Lower Peninsula in April through July, and again in September, and water levels in many of the wells reflect above-normal recharge during months that are typically periods when levels decline. Notably, water levels in several wells in the southern Lower Peninsula continued to decline throughout much of the year, but that phenomena could be the result of modified pumping strategies by large municipal users, or localized deficiencies in precipitation. One well in Kalamazoo County had period of record high level, which may be related to pumping changes in nearby municipal or industrial water supply wells.

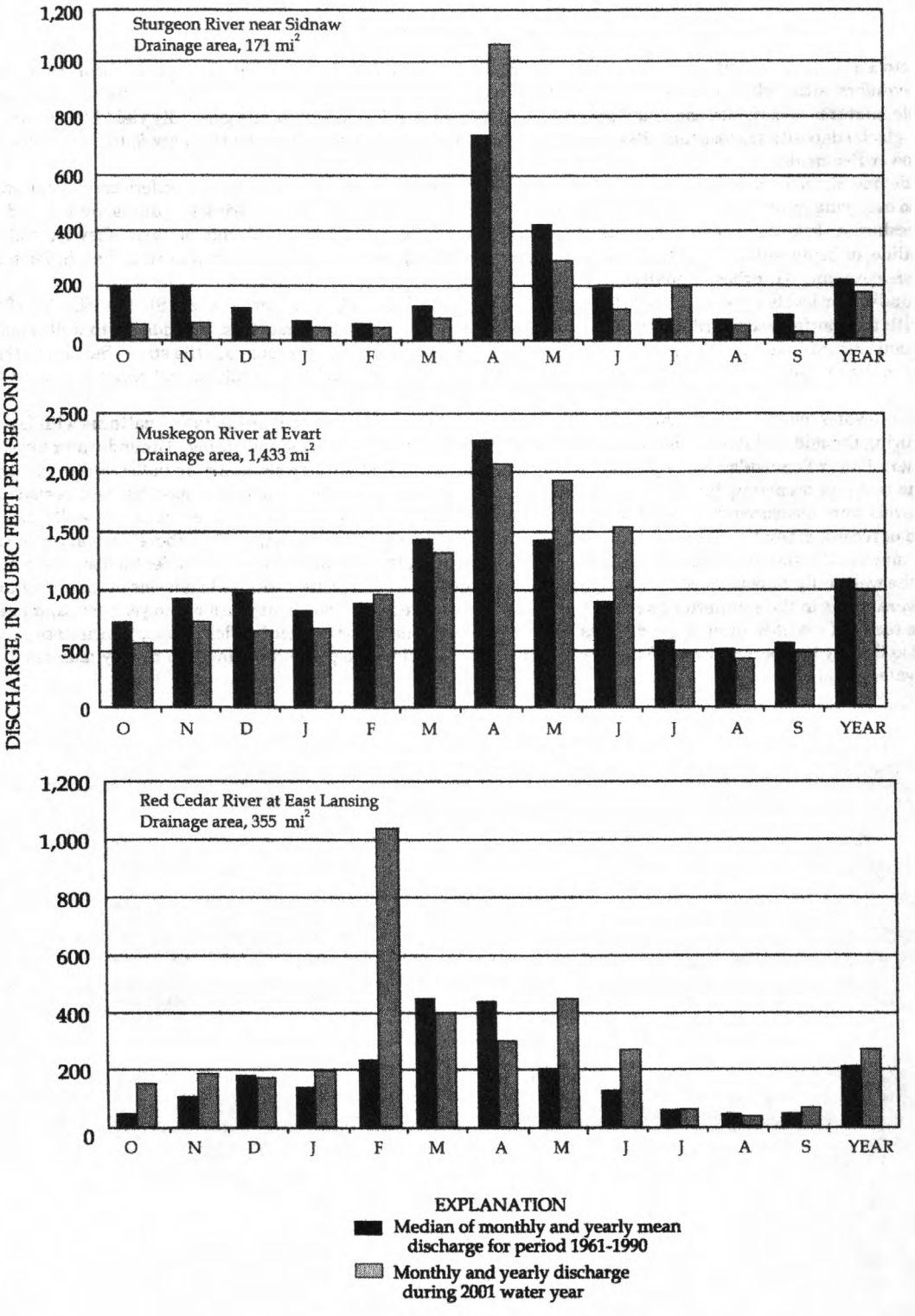


Figure 1. Discharge during 2001 water year compared with median discharge for period 1961-90 for three representative stations.

The principal aquifers in Michigan are glacial outwash deposits and sandstone, limestone, and dolomite bedrock. The following table lists the aquifers and some of their characteristics.

Aquifer name and description	Well characteristics		Remarks
	Depth, in feet	Yield, in gallons per minute	
	Common range	Common range	
Glacial aquifers:			
Outwash: Mostly sand and gravel.	25-200	1-1,000	Water generally hard; iron concentrations common; deep wells may produce salty water in places.
Lacustrine sand: Mostly sand, some gravel.	25-100	80-500	Used for domestic supply in Saginaw Bay and Detroit areas; is salty in places at depth
Till: Intermixed clay, silt, sand, gravel and boulders; abundant sand and gravel lenses in some areas.	25-200	5-200	Primary source of domestic supply in western Upper Peninsula.
Bedrock aquifers:			
Saginaw Formation: Sandstone, siltstone, some shale, limestone, and coal	25-300	100-300	One of Michigan's most important bedrock aquifers; water generally hard; salty in places at depth.
Marshall Formation: Sandstone and siltstone.	25-200	100-500	Another of Michigan's important bedrock aquifers; salty in places and at depth.
Silurian-Devonian rocks: Limestone and dolomite; some shale and sandstone.	25-150	10-300	Important aquifer in parts of eastern Upper Peninsula; water commonly hard.
Cambrian-Ordovician rocks: Sandstone, limestone, and dolomite.	25-150	10-100	Important aquifer in eastern Upper Peninsula; water commonly very hard; salty in places and at depth.
Precambrian sandstone: Sandstone interbedded with siltstone.	25-400	5-50	Important aquifer in western Upper Peninsula; salty in places.

Natural chemical characteristics of ground water in Michigan are determined primarily by the geologic environment through which the water flows. Natural ground water generally is suitable for human consumption and most other uses. Water from glacial deposits, at places, contains elevated concentrations of iron [2.5 to 5.0 mg/L (milligrams per liter)]; water from carbonate rocks is likely to be very hard (400 to 900 mg/L as calcium carbonate); and water from the Saginaw Formation in the Saginaw Bay-Thumb area commonly is highly mineralized (2,000 to 80,000 mg/L of dissolved solids). Throughout the State, salty water underlies and is in contact with freshwater at depths ranging from about 100 ft to about 900 ft. Average dissolved-solids concentration of water from bedrock (535 mg/L) is about twice as great as the average concentration from glacial deposits (241 mg/L) (Cummings, 1980).

REFERENCES CITED

Cummings, T.R., 1980, Chemical and physical characteristics of natural ground waters in Michigan--A preliminary report: U.S. Geological Survey Open-File Report 80-953, 34 p.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

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

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

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

http://nadp.sws.uiuc.edu/

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

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

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

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

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 2001 water year that began October 1, 2000, and ended September 30, 2001. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface water, and ground-water level data. The locations of the stations and wells where the data were collected are shown in figures 4-8. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

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

Downstream Order System

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

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 04037500, which appears just to the left of the station name, includes the two-digit Part number "04" plus the six-digit downstream-order number "037500." The Part number designates the major river basin; for example, Part "04" is the St. Lawrence River basin.

Latitude-Longitude System

The identification numbers for wells are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. This site-identification number, once assigned, is a pure number and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description. (See figure 2.)

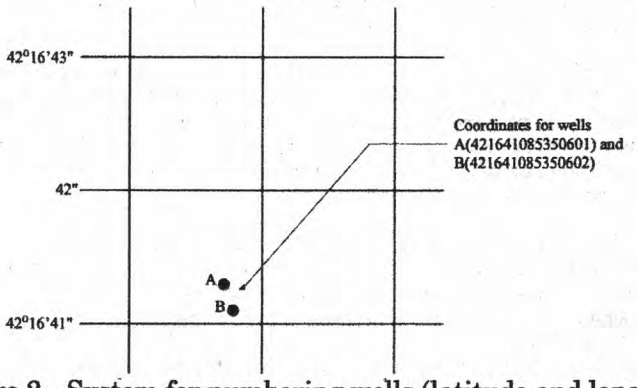


Figure 2.--System for numbering wells (latitude and longitude).

Local Well Numbering System

The local well number indicates the location of wells within the rectangular subdivision of land with reference to the Michigan meridian and base line. The first two segments of the well number designate township and range, the third segment of the number designates the section and the letters A through D designate successively smaller subdivisions of the section as shown in figure 3. Thus, a well designated as 32N 6E 16CCCB would be located to the nearest 2.5 acres and would be within the shaded area in section 16. In the event that two or more wells are located in the same 2.5 acre tract, a sequential number designation follows the letter designations--for example, 16CCCB1, 16CCCB2, 16CCCB3, etc.

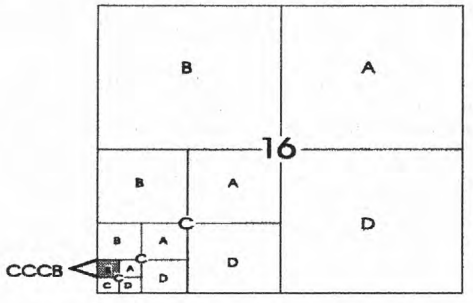


Figure 3.--Local well numbering system in Michigan.

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for anytime, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-month contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record water-discharge stations for which data are given in this report are shown in figures 4 and 5.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

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

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

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

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

At some gaging stations, acoustic velocity meter (AVM) systems are used to compute discharge. The AVM system measures the stream's velocity at one or more paths in the cross section. Coefficients are developed to relate this path velocity to the mean velocity in the cross section. Because the AVM sensors are fixed in position, the adjustment coefficients generally vary with stage. Cross-sectional area curves are developed to relate stage, recorded as noted above, to cross section area. Discharge is computed by multiplying path velocity by the appropriate stage related coefficient and area.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For some gaging stations, there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or for various reasons fails to operate properly. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

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

Station manuscripts

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

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

REVISED RECORDS.--Because of new information, published records occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to sea level (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge are flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge".) The REMARKS paragraph is used to present information relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

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

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

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data for a discontinued station were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

Headings for AVERAGE DISCHARGE, EXTREMES FOR PERIOD OF RECORD, AND EXTREMES FOR CURRENT YEAR are presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate.

Data table of daily mean values

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

Statistics of monthly mean data

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

Summary statistics

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage partial-record stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated".

Accuracy of the Records

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

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

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

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

Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the Michigan District Office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the Michigan District Office.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

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

A careful distinction needs to be made between "continuing records", as used in this report, and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 6.

Arrangement of Records

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

On-site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for on site measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. A1, A3, and A4; Book 9, Chap. A1-A9. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS", which appears at the end of the introductory text. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey district office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. Many samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis.

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

Water Temperature

Water temperatures are measured at all the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures and/or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the Michigan District Office.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section.

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

Laboratory Measurements

Sediment samples were analyzed in the Geological Survey laboratory in Louisville, Kentucky and Heidelburg College water quality laboratory in Tiffin, Ohio. All other samples were analyzed in the Geological Survey laboratories in Arvada, Colorado. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratories are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. In March 1989 the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989.

Data Presentation

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

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

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

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

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

INSTRUMENTATION.--Information is given only if a water-quality monitor or temperature recorder is or was in operation at a station.

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

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

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

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made in the U.S. Geological Survey's distributed data system, NWIS, and subsequently to its web-based National data system, NWISWeb [http://water.usgs.gov/nwis/nwis]. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from NWIS or NWISWeb to ensure the most recent updates. Updates to NWISWeb are currently made on an annual basis.

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

Remark Codes

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

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
M	Presence of material verified but not quantified.
N	Presumptive evidence of presence of material.
U	Material specifically analyzed for but not detected.
A	Value is an average.
V	Analyte was detected in both the environmental sample and the associated blanks.
S	Most probable value.

Dissolved Trace-Element Concentrations

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

Change in National Trends Network Procedures

NOTE: Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP Program Office, Illinois State Water Survey, 2204 Griffith Drive, Champaign, IL 61820-7495 (217-333-7873).

Records of Ground-Water Levels

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation's most important aquifers. Locations of the observation wells in this network in Michigan are shown in figure 8.

Data Collection and Computation

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

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

Water-level records are obtained from direct measurements with a steel tape, electric tape, or from electronic data loggers. The water-level measurements in this report are given in feet with reference to land-surface datum (LSD). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum, in feet above 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 to a tenth of a foot or a larger unit.

Data Presentation

Each well record consists of three parts, the station description, the data table of water levels observed during the current water year, and a graph of the water levels for the current water year or other selected period. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings of the well description.

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

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

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

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

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

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

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

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

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

ACCESS TO USGS WATER DATA

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

http://water.usgs.gov

Some water-quality and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on magnetic tape or 3-1/2 inch floppy disk. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division District offices (see address on the back of the title page).

DEFINITION OF TERMS

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. Terms such as algae, water level, precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acid neutralizing capacity (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point. This term designates titration of an "unfiltered" sample (formerly reported as alkalinity).

Acre-foot (AC-FT, acre-ft) is a unit of volume, commonly used to measure quantities of water used or stored, equivalent to the volume of water required to cover 1 acre to a depth of 1 foot and equivalent to 43,560 cubic feet, 325,851 gallons, or 1,233 cubic meters. (See also "Annual runoff")

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes ATP an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

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

Annual runoff is the total quantity of water that is discharged ("runs off") from a drainage basin in a year. Data reports may present annual runoff data as volumes in acre-feet, as discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches.

Annual 7-day minimum is the lowest mean value for any 7-consecutive-day period in a year. Annual 7-day minimum values are reported herein for the calendar year and the water year (October 1 to September 30). Most low-flow frequency analyses use a climatic year (April 1-March 31), which tends to prevent the low-flow period from being artificially split between adjacent years. The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

Aroclor is the registered trademark for a group of polychlorinated biphenyls that were manufactured by the Monsanto Company prior to 1976. Aroclors are assigned specific 4-digit reference numbers dependent upon molecular type and degree of substitution of the biphenyl ring hydrogen atoms by chlorine atoms. The first two digits of a numbered aroclor represent the molecular type and the last two digits represent the weight percent of the hydrogen substituted chlorine.

Artificial substrate is a device that 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 multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection. (See also "Substrate")

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 Ash mass of zooplankton and phytoplankton is expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2). (See also "Biomass")

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

Base discharge (for peak discharge) is a discharge value, determined for selected stations, above which peak discharge data are published. The base discharge at each station is selected so that an average of about three peaks per year will be published.

Base flow is sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharge.

Bedload is material in transport that is supported primarily by the streambed. In this report, bedload is considered to consist of particles in transit from the bed to an elevation equal to the top of the bedload sampler nozzle (ranging from 0.25 to 0.5 ft) that are retained in the bedload sampler. A sample collected with a pressure-differential bedload sampler may also contain a component of the suspended load.

Bedload discharge (tons per day) is rate of sediment moving as bedload, reported as dry weight, that passes through a cross section in a given time. NOTE: Bedload discharge values in this report may include a component of the suspended-sediment discharge. A correction may be necessary when computing the total sediment discharge by summing the bedload discharge and the suspended-sediment discharge. (See also "Bedload" and "Sediment")

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed. (See also "Bedload" and "Sediment")

Benthic organisms are the group of organisms inhabiting the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are useful as indicators of water quality.

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 mass per unit area or volume of habitat.

Biomass pigment ratio is an indicator of the total proportion of periphyton which are autotrophic (plants). This is also called the Autotrophic Index.

Blue-green algae (*Cyanophyta*) 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. Concentrations are expressed as a number of cells per milliliter (cells/mL) of sample. (See also "Phytoplankton")

Bottom material (See "Bed material")

Cells/volume refers to the number of cells of any organism that 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 volume, and are generally reported as cells or units per milliliter (mL) or liter (L).

Cells volume (biovolume) determination is one of several common methods used to estimate biomass of algae in aquatic systems. Cell members of algae are frequently used in aquatic surveys as an indicator of algal production. However, cell numbers alone cannot represent true biomass because of considerable cell-size variation among the algal species. Cell volume (mm^3) is determined by obtaining critical cell measurements on cell dimensions (for example, length, width, height, or radius) for 20 to 50 cells of each important species to obtain an average biovolume per cell. Cells are categorized according to the correspondence of their cellular shape to the nearest geometric solid or combinations of simple solids (for example, spheres, cones, or cylinders). Representative formulae used to compute biovolume are as follows:

$$\text{sphere } 4/3\ pr^3 \quad \text{cone } 1/3\ pr^3h \quad \text{cylinder } pr^3h.$$

pi is the ratio of the circumference to the diameter of a circle; pi = 3.14159...

From cell volume, total algal biomass expressed as biovolume (mm^3/mL) is thus determined by multiplying the number of cells of a given species by its average cell volume and then summing these volumes over all species.

Cfs-day (See "Cubic foot per second-day")

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 BOD or with carbonaceous organic pollution from sewage or industrial wastes. [See also "Biochemical oxygen demand (BOD)"]

Clostridium perfringens *(C. perfringens)* is a spore-forming bacterium that is common in the feces of human and other warm-blooded animals. Clostridial spores are being used experimentally as an indicator of past fecal contamination and presence of microorganisms that are resistant to disinfection and environmental stresses. (See also "Bacteria")

Coliphages are viruses that infect and replicate in coliform bacteria. They are indicative of sewage contamination of waters and of the survival and transport of viruses in the environment.

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

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

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

Continuous-record station is a site where data are collected with sufficient frequency to define daily mean values and variations within a day.

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

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

Cubic foot per second (CFS, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second or approximately 449 gallons per minute, or 0.02832 cubic meters per second. The term "second-feet" sometimes is used synonymously with "cubic feet per second" but is now obsolete.

Cubic foot per second-day (CFS-DAY, Cfs-day, [$(ft^3/s)/d$]) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.98347 acre-feet, 646,317 gallons, or 2,446.6 cubic meters. The daily-mean discharges reported in the daily-value data tables are numerically equal to the daily volumes in cfs-days, and the totals also represent volumes in cfs-days.

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

Daily mean suspended-sediment concentration is the time-weighted concentration of suspended sediment passing a stream cross section during a 24-hour day. (See also "Mean concentration of suspended sediment," "Sediment," and "Suspended-sediment concentration")

Daily-record station is a site where data are collected with sufficient frequency to develop a record of one or more data values per day. The frequency of data collection can range from continuous recording to periodic sample or data collection on a daily or near-daily basis.

Data Collection Platform (DCP) is an electronic instrument that collects, processes, and stores data from various sensors, and transmits the data by satellite data relay, line-of-sight radio, and/or landline telemetry.

Data logger is a microprocessor-based data acquisition system designed specifically to acquire, process, and store data. Data are usually downloaded from onsite data loggers for entry into office data systems.

Datum is a surface or point relative to which measurements of height and/or horizontal position are reported. A vertical datum is a horizontal surface used as the zero point for measurements of gage height, stage, or elevation; a horizontal datum is a reference for positions given in terms of latitude-longitude, State Plane coordinates, or UTM coordinates. (See also "Gage datum," "Land-surface datum," "National Geodetic Vertical Datum of 1929," and "North American Vertical Datum of 1988")

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. (See also "Phytoplankton")

Diel is of or pertaining to a 24-hour period of time; a regular daily cycle.

Discharge, or flow, is the rate that matter passes through a cross section of a stream channel or other water body per unit of time. The term commonly refers to the volume of water (including, unless otherwise stated, any sediments or other constituents suspended or dissolved in the water) that passes a cross section in a stream channel, canal, pipeline, etc., within a given period of time (cubic feet per second). Discharge also can apply to the rate at which constituents such as suspended sediment, bedload, and dissolved or suspended chemical constituents, pass through a cross section, in which cases the quantity is expressed as the mass of constituent that passes the cross section in a given period of time (tons per day).

Dissolved refers to that material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal and State agencies that collect water-quality data. Determinations of "dissolved" constituent concentrations are made on sample water that has been filtered.

Dissolved oxygen (DO) is the molecular oxygen (oxygen gas) dissolved in water. The concentration in water is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved-solids concentration. Photosynthesis and respiration by plants commonly cause diurnal variations in dissolved-oxygen concentration in water from some streams.

Dissolved-solids concentration in water is the quantity of dissolved material in a sample of water. It is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. In the mathematical calculation, the bicarbonate value, in milligrams per liter, is multiplied by 0.4926 to convert it to carbonate. Alternatively, alkalinity concentration (as mg/L $CaCO_3$) can be converted to carbonate concentration by multiplying by 0.60.

Diversity index (H) (Shannon Index) is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

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

where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. 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 specific location is that area upstream from the location, measured in a horizontal plane, that has a common outlet at the site for its surface runoff from precipitation that normally drains by gravity into a stream. Drainage areas given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the Earth's surface that contains a drainage system with a common outlet for its surface runoff. (See "Drainage area")

Dry mass refers to the mass of residue present after drying in an oven at 105 Ç 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. (See also "Ash mass," "Biomass," and "Wet mass")

Dry weight refers to the weight of animal tissue after it has been dried in an oven at 65 °C until a constant weight is achieved. Dry weight represents total organic and inorganic matter in the tissue. (See also "Wet weight")

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

EPT Index is the total number of distinct taxa within the insect orders Ephemeroptera, Plecoptera, and Trichoptera. This index summarizes the taxa richness within the aquatic insects that are generally considered pollution sensitive, the index usually decreases with pollution.

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

Estimated (E) value of a concentration is reported when an analyte is detected and all criteria for a positive result are met. If the concentration is less than the method detection limit (MDL), an 'E' code will be reported with the value. If the analyte is qualitatively identified as present, but the quantitative determination is substantially more uncertain, the National Water Quality Laboratory will identify the result with an 'E' code even though the measured value is greater than the MDL. A value reported with an 'E' code should be used with caution. When no analyte is detected in a sample, the default reporting value is the MDL preceded by a less than sign (<).

Euglenoids (*Euglenophyta*) are a group of algae that are usually free-swimming and rarely creeping. They have the ability to grow either photosynthetically in the light or heterotrophically in the dark. (See also "Phytoplankton")

Extractable organic halides (EOX) are organic compounds that contain halogen atoms such as chlorine. These organic compounds are semi-volatile and extractable by ethyl acetate from air-dried streambed sediments. The ethyl acetate extract is combusted, and the concentration is determined by microcoulometric determination of the halides formed. The concentration is reported as micrograms of chlorine per gram of the dry weight of the streambed sediments.

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

Fecal streptococcal bacteria are present in the intestine of warm-blooded animals and are ubiquitous in the environment. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms that produce red or pink colonies within 48 hours at 35 C plus or minus 1.0 C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fire algae (*Pyrrhophyta*) are free-swimming unicells characterized by a red pigment spot. (See also "Phytoplankton")

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

Gage datum is a horizontal surface used as a zero point for measurement of stage or gage height. This surface usually is located slightly below the lowest point of the stream bottom such that the gage height is usually slightly larger than the maximum depth of water. Because the gage datum itself is not an actual physical object, the datum usually is defined by specifying the elevations of permanent reference marks such as bridge abutments and survey monuments, and the gage is set to agree with the reference marks. Gage datum is a local datum that is maintained independently of any National geodetic datum. However, if the elevation of the gage datum relative to the National datum (North American Vertical Datum of 1988 or National Geodetic Vertical Datum of 1929) has been determined, then the gage readings can be converted to elevations above the National datum by adding the elevation of the gage datum to the gage reading.

Gage height (G.H.) is the water-surface elevation, in feet above the gage datum. If the water surface is below the gage datum, the gage height is negative. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used in reference to a reading on a gage.

Gage values are values that are recorded, transmitted and/or computed from a gaging station. Gage values typically are collected at 5-, 15-, or 30-minute intervals.

Gaging station is a site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is computed.

Gas chromatography/flame ionization detector (GC/FID) is a laboratory analytical method used as a screening technique for semivolatile organic compounds that are extractable from water in methylene chloride.

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

Habitat quality index is the qualitative description (level 1) of instream habitat and riparian conditions surrounding the reach sampled. Scores range from 0 to 100 percent with higher scores indicative of desirable habitat conditions for aquatic life. Index only applicable to wadable streams.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations (primarily calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

High tide is the maximum height reached by each rising tide. The high-high and low-high tides are the higher and lower of the two high tides, respectively, of each tidal day. *See NOAA web site: http://www.co-ops.nos.noaa.gov/tideglos.html*

Hilsenhoff's Biotic Index (HBI) is an indicator of organic pollution which uses tolerance values to weight taxa abundances; usually increases with pollution. It is calculated as follows:

$$HBI_{sum} \quad \frac{(n)(a)}{N}$$

where n is the number of individuals of each taxon, a is the tolerance value of each taxon, and N is the total number of organisms in the sample.

Horizontal datum (See "Datum")

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

Hydrologic index stations referred to in this report are four continuous-record gaging stations that have been selected as representative of streamflow patterns for their respective regions. Station locations are shown on index maps.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the USGS. Each hydrologic unit is identified by an 8-digit number.

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

Instantaneous discharge is the discharge at a particular instant of time. (See also "Discharge")

Laboratory Reporting Level (LRL) is generally equal to twice the yearly determined long-term method detection level (LT-MDL). The LRL controls false negative error. The probability of falsely reporting a non-detection for a sample that contained an analyte at a concentration equal to or greater than the LRL is predicted to be less than or equal to 1 percent. The value of the LRL will be reported with a "less than" (<) remark code for samples in which the analyte was not detected. The National Water Quality Laboratory collects quality-control data from selected analytical methods on a continuing basis to determine LT-MDLs and to establish LRLs. These values are reevaluated annually based on the most current quality-control data and may, therefore, change. [Note: In several previous NWQL documents (Connor and others, 1998; NWQL Technical Memorandum 98.07, 1998), the LRL was called the non-detection value or NDV—a term that is no longer used.)

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

Light-attenuation coefficient, also known as the extinction coefficient, is a measure of water clarity. Light is attenuated according to the Lambert-Beer equation

$$I = {}_{o}e^{-\lambda L} ,$$

where I_o is the source light intensity, I is the light intensity at length L (in meters) from the source, l is the light-attenuation coefficient, and e is the base of the natural logarithm. The light attenuation coefficient is defined as

$$\lambda = -\frac{1}{L}\log_e\frac{I}{I_o} .$$

Lipid is any one of a family of compounds that are insoluble in water and that make up one of the principal components of living cells. Lipids include fats, oils, waxes, and steroids. Many environmental contaminants such as organochlorine pesticides are lipophilic.

Long-Term Method Detection Level (LT–MDL) is a detection level derived by determining the standard deviation of a minimum of 24 method detection limit (MDL) spike sample measurements over an extended period of time. LT–MDL data are collected on a continuous basis to assess year-to-year variations in the LT–MDL. The LT–MDL controls false positive error. The chance of falsely reporting a concentration at or greater than the LT–MDL for a sample that did not contain the analyte is predicted to be less than or equal to 1 percent.

Low tide is the minimum height reached by each falling tide. The high-low and low-low tides are the higher and lower of the two low tides, respectively, of each tidal day. *See NOAA web site: http://www.co-ops.nos.noaa.gov/tideglos.html*

Macrophytes are the macroscopic plants in the aquatic environment. The most common macrophytes are the rooted vascular plants that are usually arranged in zones in aquatic ecosystems and restricted in the area by the extent of illumination through the water and sediment deposition along the shoreline.

Mean concentration of suspended sediment (Daily mean suspended-sediment concentration) is the time-weighted concentration of suspended sediment passing a stream cross section during a given time period. (See also "Daily mean suspended-sediment concentration" and "Suspended-sediment concentration")

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

Mean high or low tide is the average of all high or low tides, respectively, over a specific period.

Mean sea level is a local tidal datum. It is the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; for example, monthly mean sea level and yearly mean sea level. In order that they may be recovered when needed, such datums are referenced to fixed points known as benchmarks. (See also "Datum")

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

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

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the analyte concentration is greater than zero. It is determined from the analysis of a sample in a given matrix containing the analyte. At the MDL concentration, the risk of a false positive is predicted to be less than or equal to 1 percent.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

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

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

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

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

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

Minimum Reporting Level (MRL) is the smallest measured concentration of a constituent that may be reliably reported by using a given analytical method (Timme, 1995).

Miscellaneous site, miscellaneous station, or miscellaneous sampling site is a site where streamflow, sediment, and/or water-quality data or water-quality or sediment samples are collected once, or more often on a random or discontinuous basis to provide better areal coverage for defining hydrologic and water-quality conditions over a broad area in a river basin.

Most probable number (MPN) is an index of the number of coliform bacteria that, more probably than any other number, would give the results shown by the laboratory examination; it is not an actual enumeration. MPN is determined from the distribution of gas-positive cultures among multiple inoculated tubes.

Multiple-plate samplers are artificial substrates of known surface area used for obtaining benthic invertebrate samples. They consist of a series of spaced, hardboard plates on an eyebolt.

Nanograms per liter (NG/L, ng/L) is a unit expressing the concentration of chemical constituents in solution as mass (nanograms) of solute per unit volume (liter) of water. One million nanograms per liter is equivalent to 1 milligram per liter.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a fixed reference adopted as a standard geodetic datum for elevations determined by leveling. It was formerly called "Sea Level Datum of 1929" or "mean sea level." Although the datum was derived from the mean sea level at 26 tide stations, it does not necessarily represent local mean sea level at any particular place. *See NOAA web site: http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88* (See "North American Vertical Datum of 1988")

Natural substrate refers to any naturally occurring immersed or submersed solid surface, such as a rock or tree, upon which an organism lives. (See also "Substrate")

Nekton are the consumers in the aquatic environment and consist of large free-swimming organisms that are capable of sustained, directed mobility.

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

North American Vertical Datum of 1988 (NAVD 1988) is a fixed reference adopted as the official civilian vertical datum for elevations determined by Federal surveying and mapping activities in the U.S. This datum was established in 1991 by minimum-constraint adjustment of the Canadian, Mexican, and U.S. first-order terrestrial leveling networks.

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

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

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. Organic mass is expressed in the same units as for ash mass and dry mass. (See also "Ash mass," "Biomass," and "Dry mass")

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

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

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

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

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

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

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

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

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

Peak flow (peak stage) is an instantaneous local maximum value in the continuous time series of streamflows or stages, preceded by a period of increasing values and followed by a period of decreasing values. Several peak values ordinarily occur in a year. The maximum peak value in a year is called the annual peak; peaks lower than the annual peak are called secondary peaks. Occasionally, the annual peak may not be the maximum value for the year; in such cases, the maximum value occurs at midnight at the beginning or end of the year, on the recession from or rise toward a higher peak in the adjoining year. If values are recorded at a discrete series of times, the peak recorded value may be taken as an approximation to the true peak, which may occur between the recording instants. If the values are recorded with finite precision, a sequence of equal recorded values may occur at the peak; in this case, the first value is taken as the peak.

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

Percent shading is determined by using a clinometer to estimate left and right bank shading. The values are added together and divided by 180 to determine percent shading relative to a horizontal surface.

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

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

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

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

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. (See also "Plankton")

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactive nuclide represented by a curie (Ci). A curie is the quantity of radioactive nuclide that yields 3.7×10^{10} radioactive disintegrations per second (dps). A picocurie yields 0.037 dps, or 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. Concentrations are expressed as a number of cells per milliliter (cells/mL of sample).

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

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

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

Primary productivity (carbon method) is expressed as milligrams of carbon per area per unit time [mg C/(m^2/time)] for periphyton and macrophytes or per volume [mg C/(m^3/time)] for phytoplankton. Carbon method defines 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. (See also "Primary productivity")

Primary productivity (oxygen method) is expressed as milligrams of oxygen per area per unit time [mg O/(m^2/time)] for periphyton and macrophytes or per volume [mg O/(m^3/time)] for phytoplankton. Oxygen method defines 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. (See also "Primary productivity")

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

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

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

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

Return period (See "Recurrence interval")

River mileage is the curvilinear distance, in miles, measured upstream from the mouth along the meandering path of a stream channel in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council, and typically used to denote location along a river.

Runoff is the quantity of water that is discharged ("runs off") from a drainage basin in a given time period. Runoff data may be presented as volumes in acre-feet, as mean discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches. (See also "Annual runoff")

Sea level, as used in this report, refers to one of the two commonly used national vertical datums, (NGVD 1929 or NAVD 1988). See separate entries for definitions of these datums. See conversion of units page (inside back cover) for identification of the datum used in this report.

Sediment is solid material that originates mostly from disintegrated rocks; when transported by, suspended in, or deposited from water, it is referred to as "fluvial sediment." Sediment 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 and land-use factors. Some major factors are topography, soil characteristics, land cover, and depth and intensity of precipitation.

Seven-day 10-year low flow (7Q10) is the discharge below which the annual 7-day minimum flow falls in 1 year out of 10 on the long-run average. The recurrence interval of the 7Q10 is 10 years; the chance that the annual 7-day minimum flow will be less than the 7Q10 is 10 percent in any given year. (See also "Recurrence interval" and "Annual 7-day minimum")

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Sodium hazard in water is an index that can be used to evaluate the suitability of water for irrigating crops.

Specific electrical conductance (conductivity) is a measure of the capacity of water (or other media) to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 C Specific electrical conductance is a function of the types and quantity of dissolved substances in water and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stable isotope ratio (per MIL/MIL) is a unit expressing the ratio of the abundance of two radioactive isotopes. Isotope ratios are used in hydrologic studies to determine the age or source of specific waters, to evaluate mixing of different waters, as an aid in determining reaction rates, and other chemical or hydrologic processes.

Stage (See "Gage height")

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

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

Substrate is the physical surface upon which an organism lives.

Substrate Embeddedness Class is a visual estimate of riffle streambed substrate larger than gravel that is surrounded or covered by fine sediment (<2mm, sand or finer). Below are the class categories expressed as percent covered by fine sediment:

0	< no gravel or larger substrate		
1	> 75%		
2	51-75%	4	5-25%
3	26-50%	5	< 5%

Surface area of a lake is that area (acres) encompassed by the boundary of the lake as shown on USGS topographic maps, or other available maps or photographs. Because surface area changes with lake stage, surface areas listed in this report represent those determined for the stage at the time the maps or photographs were obtained.

Surficial bed material is the upper surface (0.1 to 0.2 ft) of the bed material such as that material which is sampled using U.S. Series Bed-Material Samplers.

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

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative suspended water-sediment sample that is retained on a 0.45-micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. Determinations of "suspended, recoverable" constituents are made either by directly analyzing the suspended material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent. (See also "Suspended")

Suspended sediment is the sediment maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid. (See also "Sediment")

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L). The analytical technique uses the mass of all of the sediment and the net weight of the water-sediment mixture in a sample to compute the suspended-sediment concentration. (See also "Sediment" and "Suspended sediment")

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

Suspended-sediment load is a general term that refers to a given characteristic of the material in suspension that passes a point during a specified period of time. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with either suspended-sediment discharge or concentration. (See also "Sediment")

Suspended, total is the total amount of a given constituent in the part of a water-sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. Knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total." Determinations of "suspended, total" constituents are made either by directly analyzing portions of the suspended material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent. (See also "Suspended")

Suspended solids, total residue at 105 °C concentration is the concentration of inorganic and organic material retained on a filter, expressed as milligrams of dry material per liter of water (mg/L). An aliquot of the sample is used for this analysis.

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

Taxa richness is the total number of distinct species or groups and usually decreases with pollution. (See also "Percent Shading")

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical 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*

Temperature preferences:

Cold – preferred water temperature for the species is less than 20 °C or spawning temperature preference less than 16 °C and native distribution is considered to be predominantly north of 45° N. latitude.

Warm – preferred water temperatures for the species is greater than 20 °C or spawning temperature preference greater than 16 °C and native distribution is considered to be predominantly south of 45° N. latitude.

Cool – intermediate between cold and warm water temperature preferences.

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder' is used in the table descriptions and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water resulting from the mixing of flow proportionally to the duration of the concentration.

Tons per acre-foot (T/acre-ft) is the dry mass (tons) of a constituent per unit volume (acre-foot) of water. It is computed by

$$\lambda = -\frac{1}{L}\log_e\frac{I}{I_o}$$

multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY, tons/d) is a common chemical or sediment discharge unit. It is the quantity of a substance in solution, in suspension, or as bedload that passes a stream section during a 24-hour period. It is equivalent to 2,000 pounds per day, or 0.9072 metric tons per day.

Total is the amount of a given constituent in a representative whole-water (unfiltered) sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined at least 95 percent of the constituent in the sample.)

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

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

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

Total length (fish) is the straight-line distance from the anterior point of a fish specimen's snout, with the mouth closed, to the posterior end of the caudal (tail) fin, with the lobes of the caudal fin squeezed together.

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

Total organism count is the number of organisms collected and enumerated in any particular sample. (See also "Organism count/volume.")

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

Total sediment discharge is the mass of suspended-sediment plus bed-load transport, measured as dry weight, that passes a cross section in a given time. It is a rate and is reported as tons per day. (See also "Sediment," "Suspended sediment," "Suspended-Sediment Concentration," "Bedload," and "Bedload discharge")

Total sediment load or total load is the sediment in transport as bedload and suspended-sediment load. The term may be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It differs from total sediment discharge in that load refers to the material whereas discharge refers to the quantity of material, expressed in units of mass per unit time. (See also "Sediment," "Suspended-Sediment Load," and "Total load")

Trophic group:

Filter feeder – diet composed of suspended plant and/or animal material.

Herbivore – diet composed predominantly of plant material.

Invertivore – diet composed predominantly of invertebrates.

Omnivore – diet composed of at least 25-percent plant and 25-percent animal material.

Piscivore – diet composed predominantly of fish.

Turbidity is the reduction in the transparency of a solution due to the presence of suspended and some dissolved substances. The measurement technique records the collective optical properties of the solution that cause light to be scattered and attenuated rather than transmitted in straight lines; the higher the intensity of scattered or attenuated light, the higher the value of the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU). Depending on the method used, the turbidity units as NTU can be defined as the intensity of light of a specified wavelength scattered or attenuated by suspended particles or absorbed at a method specified angle, usually 90 degrees, from the path of the incident light. Currently approved methods for the measurement of turbidity in the USGS include those that conform to EPA Method 180.1, ASTM D1889-00, and ISO 7027. Measurements of turbidity by these different methods and different instruments are unlikely to yield equivalent values. Consequently, the method of measurement and type of instrument used to derive turbidity records should be included in the "REMARKS" column of the Annual Data Report.

Ultraviolet (UV) absorbance (absorption) at 254 or 280 nanometers is a measure of the aggregate concentration of the mixture of UV absorbing organic materials dissolved in the analyzed water, such as lignin, tannin, humic substances, and various aromatic compounds. UV absorbance (absorption) at 254 or 280 nanometers is measured in UV absorption units per centimeter of pathlength of UV light through a sample.

Vertical datum (See "Datum")

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

Water table is the level in the saturated zone at which the pressure is equal to the atmospheric pressure.

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

Water year in USGS reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 2001, is called the "2001 water year."

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

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

Wet mass is the mass of living matter plus contained water. (See also "Biomass" and "Dry mass")

Wet weight refers to the weight of animal tissue or other substance including its contained water. (See also "Dry weight")

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

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. (See also "Plankton")

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

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

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

Book 1. Collection of Water Data by Direct Measurement

Section D. Water Quality

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

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

Book 2. Collection of Environmental Data

Section D. Surface Geophysical Methods

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

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

Section E. Subsurface Geophysical Methods

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

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

Section F. Drilling and Sampling Methods

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

Book 3. Applications of Hydraulics

Section A. Surface-Water Techniques

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Section B. Ground-Water Techniques

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

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

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

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

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

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

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

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

3-B8. *System and boundary conceptualization in ground-water flow simulation,* by T.E. Reilly: USGS–TWRI book 3, chap. B8. 2001. 29 p.

Section C. Sedimentation and Erosion Techniques

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

3-C2. *Field methods for measurement of fluvial sediment,* by T.K. Edwards and G.D. Glysson: USGS–TWRI book 3, chap. C2. 1999. 89 p.

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

Book 4. Hydrologic Analysis and Interpretation

Section A. Statistical Analysis

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

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

Section B. Surface Water

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

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

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

Section D. Interrelated Phases of the Hydrologic Cycle

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

Book 5. Laboratory Analysis

Section A. Water Analysis

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

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

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

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

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

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

Section C. Sediment Analysis

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

Book 6. Modeling Techniques

Section A. Ground Water

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

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

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

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

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

6-A6. A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction, by Eric D. Swain and Eliezer J. Wexler: USGS–TWRI book 6, chap. A5,1996. 125 p.

Book 7. Automated Data Processing and Computations

Section C. Computer Programs

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

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

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

Book 8. Instrumentation

Section A. Instruments for Measurement of Water Level

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

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

Section B. Instruments for Measurement of Discharge

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

Book 9. Handbooks for Water-Resources Investigations

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

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

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

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

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

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

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

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

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

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

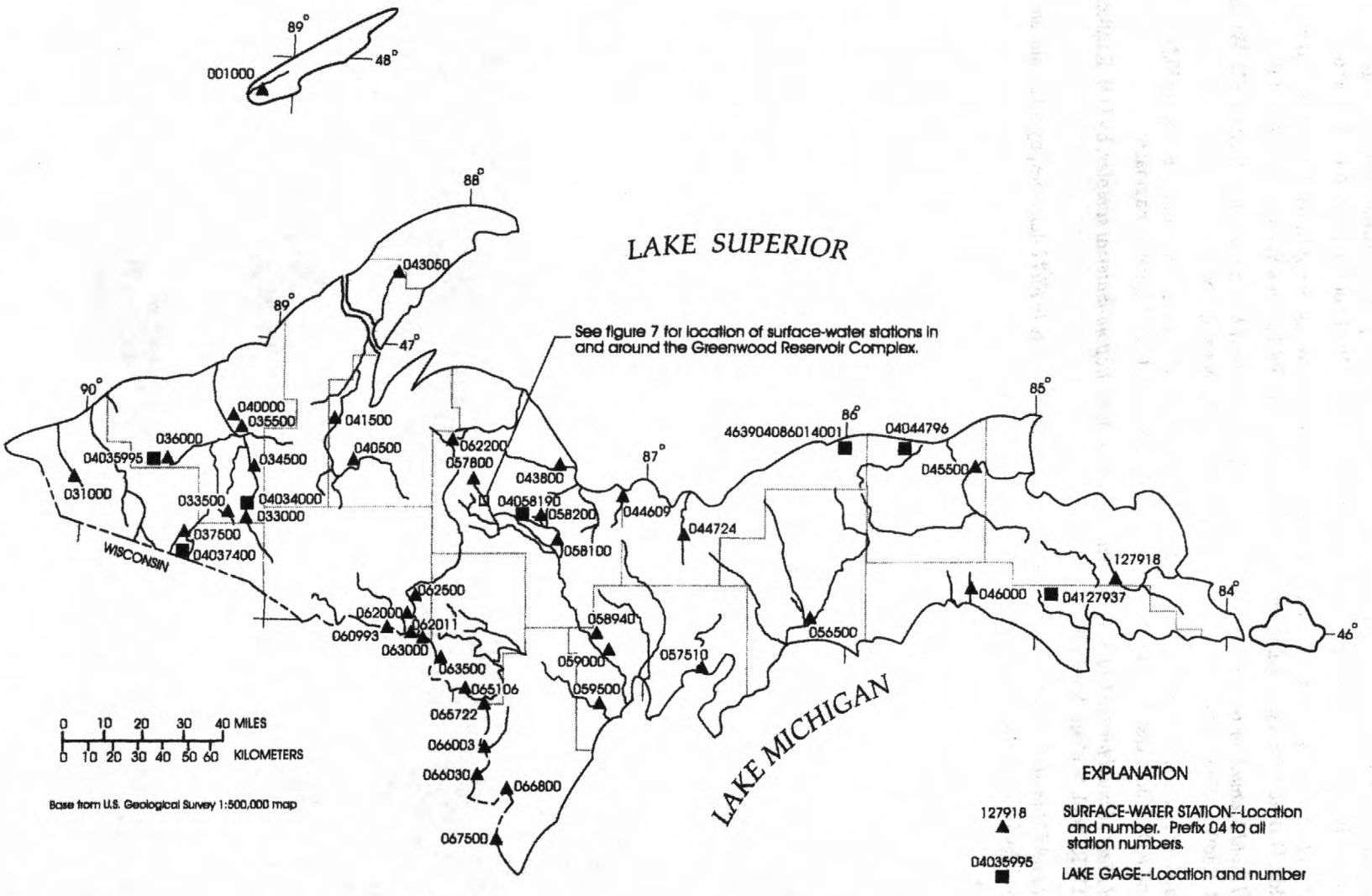


Figure 4. Identification number and location of active surface-water gaging stations in the Upper Peninsula of Michigan.

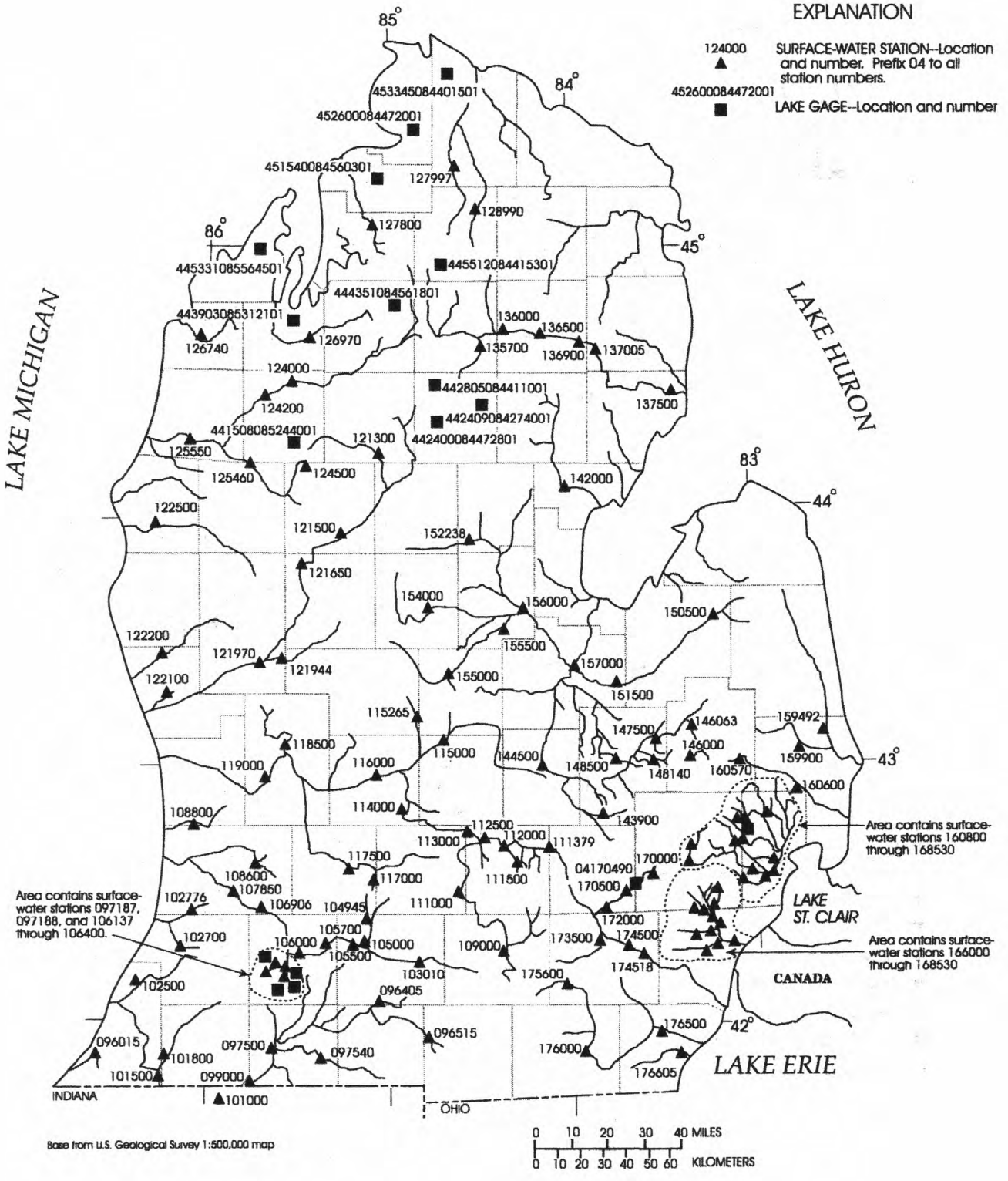


Figure 5. Identification number and location of active surface-water gaging stations in the Lower Peninsula of Michigan.

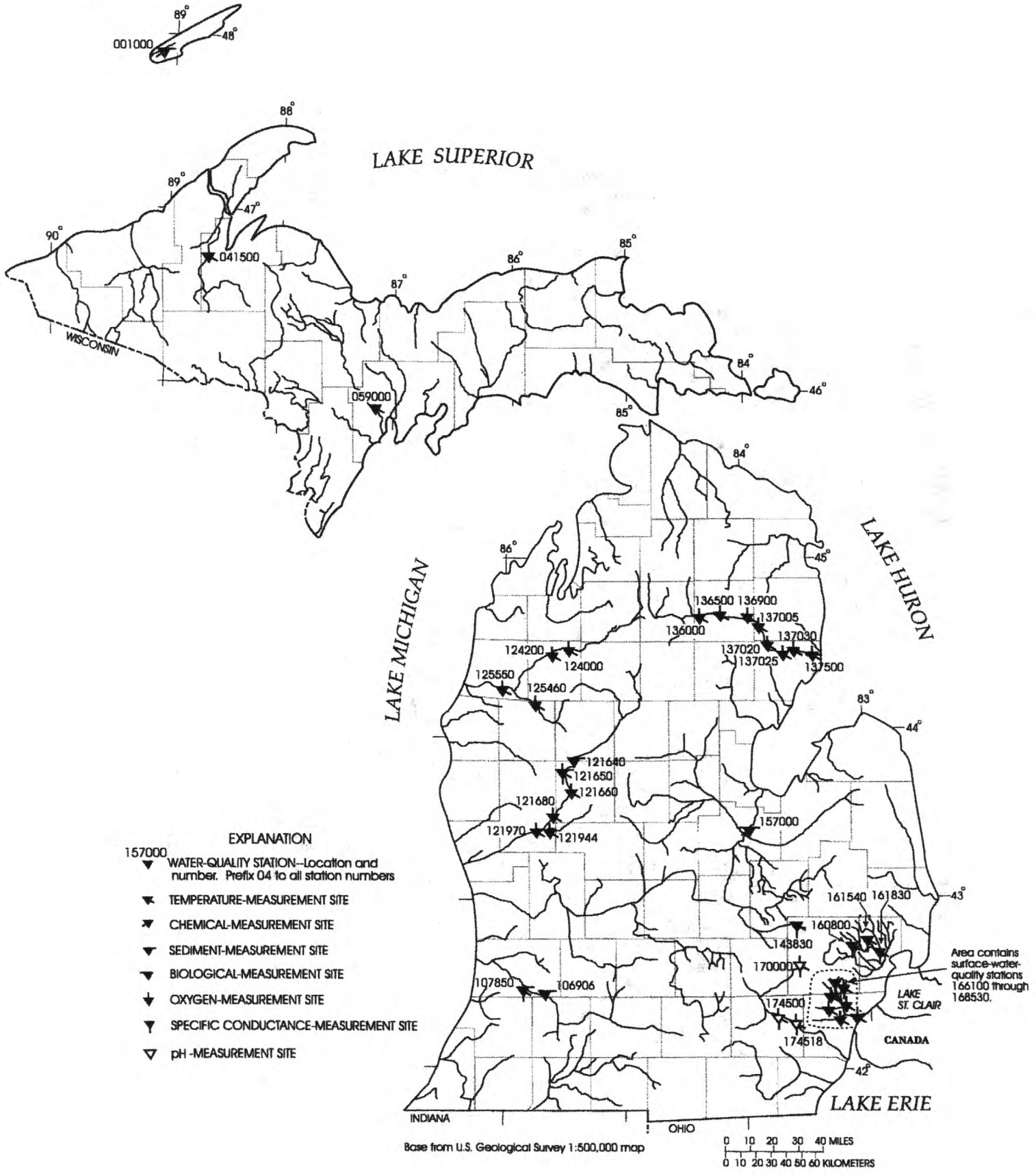


Figure 6. Identification number and location of active surface-water-quality stations in Michigan.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MI
(Hydrologic bench-mark station)

LOCATION.--Lat 47°55'23", long 89°08'42", in NW1/4 sec.28, T.64 N., R.38 W., Keweenaw County, Isle Royale National Park, Hydrologic Unit 04020300, on left bank 0.8 mi northeast of Windigo, and 35 mi southwest of Rock Harbor.

DRAINAGE AREA.--13.2 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder, crest-stage gage, and concrete control. Elevation of gage is 605 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges below 10 ft^3/s, which are poor. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	1.5	2.3	e1.2	e1.6	e1.5	17	113	21	5.0	15	2.6
2	.82	6.9	1.6	e1.2	e1.5	1.5	22	105	32	4.1	12	3.1
3	.78	5.4	e1.6	e1.2	e1.5	1.6	24	79	30	3.9	7.7	2.5
4	.76	4.3	e1.6	e1.2	e1.5	1.5	32	59	27	4.3	5.4	2.2
5	.77	4.0	1.5	e1.2	e1.5	1.5	50	45	22	3.5	3.9	2.0
6	.77	3.6	1.5	e1.2	e1.5	1.5	87	37	18	3.4	3.2	1.9
7	.78	11	e1.4	e1.2	e1.5	1.5	156	41	15	5.8	2.5	2.5
8	.76	13	1.3	e1.2	e1.5	1.6	229	41	13	3.9	2.6	5.2
9	.76	12	1.1	e1.2	e1.5	1.5	199	34	12	3.2	5.5	7.1
10	.77	10	e1.1	e1.2	e1.5	1.5	195	29	10	2.9	3.3	5.4
11	.78	8.7	1.1	1.3	e1.5	1.6	227	26	9.6	2.5	2.5	4.1
12	.76	7.7	1.1	1.3	e1.5	1.5	e270	22	8.6	2.2	2.1	3.6
13	.78	8.4	1.1	1.4	e1.5	1.6	e240	19	15	1.9	1.9	3.1
14	4.1	8.2	1.1	1.6	e1.5	1.6	e210	18	57	1.7	1.7	2.5
15	4.5	7.2	1.1	e1.6	e1.5	1.7	e190	17	40	7.0	3.0	2.2
16	2.3	6.3	1.2	e1.6	e1.5	1.7	e170	37	30	23	26	2.1
17	2.1	5.5	1.2	e1.6	e1.5	1.7	e150	30	21	18	69	2.0
18	2.1	4.6	1.2	e1.6	e1.5	1.7	e130	24	16	14	47	2.0
19	2.0	4.2	1.2	e1.6	1.5	1.8	e140	20	98	11	30	2.0
20	1.8	4.0	1.2	e1.6	1.5	1.8	e160	17	72	8.2	19	1.9
21	1.6	3.8	1.2	e1.6	1.5	1.7	e200	25	51	6.2	13	1.8
22	1.5	3.0	1.2	e1.6	1.4	7.2	e250	65	39	4.7	9.2	1.7
23	1.4	2.5	1.2	e1.6	1.4	e8.2	355	52	29	3.7	7.0	1.7
24	1.4	3.2	1.2	e1.6	e1.5	e7.9	261	38	22	2.9	5.0	1.5
25	1.4	3.4	e1.2	e1.6	e1.6	e7.4	199	39	18	2.4	4.2	1.4
26	1.5	3.3	e1.2	e1.6	e1.6	e6.4	209	66	14	2.0	3.8	1.4
27	1.8	3.1	e1.2	e1.6	e1.5	e6.4	183	57	12	1.7	3.4	1.4
28	1.6	2.9	e1.2	e1.6	e1.5	e6.4	130	43	9.2	1.6	3.0	1.3
29	1.5	2.8	e1.2	e1.6	—	e6.8	123	33	7.8	1.6	2.7	1.3
30	1.4	2.7	e1.2	e1.6	—	10	132	26	6.7	1.6	3.5	1.3
31	1.4	—	e1.2	e1.6	—	18	—	22	—	2.8	3.1	—
TOTAL	45.52	167.2	39.7	44.8	42.1	118.3	4940	1279	775.9	160.7	321.2	74.8
MEAN	1.47	5.57	1.28	1.45	1.50	3.82	165	41.3	25.9	5.18	10.4	2.49
MAX	4.5	13	2.3	1.6	1.6	18	355	113	98	23	69	7.1
MIN	.76	1.5	1.1	1.2	1.4	1.5	17	17	6.7	1.6	1.7	1.3
CFSM	.11	.42	.10	.11	.11	.29	12.5	3.13	1.96	.39	.78	.19
IN.	.13	.47	.11	.13	.12	.33	13.92	3.60	2.19	.45	.91	.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	11.3	14.5	7.28	4.12	3.84	12.7	69.5	39.1	13.5	7.27	4.47	7.01
MAX	33.8	47.2	18.3	18.1	13.0	58.7	165	108	34.2	23.6	14.0	55.1
(WY)	1986	1992	1966	1966	1966	1966	2001	1996	1968	1999	1966	1977
MIN	.76	.88	.63	.60	.61	1.10	20.3	4.87	2.47	.87	.65	.57
(WY)	1977	1977	1977	1977	1977	1965	1987	1998	1998	1998	1998	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	3410.71		8009.22			
ANNUAL MEAN	9.32		21.9		16.2	
HIGHEST ANNUAL MEAN					33.1	1966
LOWEST ANNUAL MEAN					8.12	1998
HIGHEST DAILY MEAN	84	Mar 10	355	Apr 23	439	May 18 1996
LOWEST DAILY MEAN	.76	Oct 4	.76	Oct 4	.44	Aug 25 1977
ANNUAL SEVEN-DAY MINIMUM	.77	Oct 4	.77	Oct 4	.47	Aug 19 1977
MAXIMUM PEAK FLOW			427	Apr 23	(a)657	May 18 1996
MAXIMUM PEAK STAGE			6.78	Apr 23	8.17	May 18 1996
INSTANTANEOUS LOW FLOW			.70	(b)	.43	Sep 2 1995
ANNUAL RUNOFF (CFSM)	.71		1.66		1.23	
ANNUAL RUNOFF (INCHES)	9.61		22.57		16.66	
10 PERCENT EXCEEDS	25		54		38	
50 PERCENT EXCEEDS	3.1		2.7		5.8	
90 PERCENT EXCEEDS	.96		1.2		1.4	

(a) From rating curve extended above 280 ft^3/s.
(b) Oct. 3, 8.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.-Water years 1965-96, 2001.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1964 to September 1991.

INSTRUMENTATION.--Water-temperature recorder from Oct. 20, 1964 to Sept. 30, 1991.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (water years 1966-72, 1974-91): Maximum, 24.5°C, July 8, 1987; minimum, 0.0°C on many days during winter periods.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TURBID-ITY LAB HACH 2100AN (NTU) (99872)	UV ABSORB-ANCE 254 NM, WTR FLT (UNITS /CM) (50624)	UV ABSORB-ANCE 280 NM, WTR FLT (UNITS /CM) (61726)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)
AUG 02...	1230	12	7.9	.803	.605	8.2	89	7.4	121	17.5

DATE	HARD-NESS NONCARB DISSOLV LAB AS CACO3 (MG/L) (00905)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	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)
AUG 02...	7	68	18.7	5.20	.36	2.5	7	1.4	<.2	14.1

DATE	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN DIS-SOLVED (MG/L AS N) (00602)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
AUG 02...	2.2	.17	3.95	122	82	<.040	.60	.60	.67	.068

DATE	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN,PAR TICULTE WAT FLT SUSP (MG/L AS N) (49570)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)
AUG 02...	E.005	.031	.66	<.060	<.020	<.060	.4	<.1	18	.4

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	1,2,5,6 -DIBENZ -ANTHRA -CENE TOTAL (UG/L) (34556)	1,2-DI-PHENYL-HYDRA-ZINE WATER TOT.REC (UG/L) (82626)	1,4-NAPTHO QUINON WATER FLTRD REC (UG/L) (61611)
AUG 02...	.5	32	340	E.3	<.3	34.7	1.5	<3	<2	<.0509

DATE	1-NAPH THOL, WATER, FLTRD, GF 0.7U REC (UG/L) (49295)	2(4TERT BUTYL-PHENOXY CYCLO-HEXANOL FLT REC (UG/L) (61637)	2,4,6-TRI-CHLORO-PHENOL TOTAL (UG/L) (34621)	2,4-DI-METHYL-PHENOL TOTAL (UG/L) (34606)	2,4-DI-CHLORO-PHENOL TOTAL (UG/L) (34601)	2,4,-DI-NITRO-PHENOL TOTAL (UG/L) (34616)	2,4-DI-NITRO-TOLUENE TOTAL (UG/L) (34611)	2,5-DI-CHLORO-ANILINE WATER FLTRD REC (UG/L) (61614)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	2,6-DI-NITRO-TOLUENE TOTAL (UG/L) (34626)
AUG 02...	<.088	<.0108	<3	<3	<3	<20	<3	<.0261	<.002	<2

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	2-[2-ETHYL-6-METHYPANOL WAT FLT REC (UG/L) (61615)	2AMINON ISOPROP PYLBEN ZAMIDE WAT FLT REC (UG/L) (61617)	2CHLORO -2,6-DIETHYL ACET-ANILIDE FLT REC (UG/L) (61618)	2-CHLORO-NAPH-THALENE TOTAL (UG/L) (34581)	2-CHLORO-PHENOL TOTAL (UG/L) (34586)	2-NITRO-PHENOL TOTAL (UG/L) (34591)	3,3'-DI-CHLORO-BENZI-DINE TOTAL (UG/L) (34631)	4,6-DINITRO -ORTHO CRESOL TOTAL (UG/L) (34657)	4-BROMO-PHENYL -PHENYL ETHER TOTAL (UG/L) (34636)	4CHLORO 2-METH-YL-PHENOL WAT FLT REC (UG/L) (61633)
AUG 02...	<.1260	<.0049	<.0050	<2	<2	<3	<3	<3	<2	<.0056

DATE	4CHLORO BENZYL METHYL SULFONE WAT FLT REC (UG/L) (61634)	4-CHLORO-PHENYL PHENYL ETHER TOTAL (UG/L) (34641)	4-NITRO-PHENOL TOTAL (UG/L) (34646)	ACE-NAPHTH-ENE TOTAL (UG/L) (34205)	ACE-NAPHTH-YLENE TOTAL (UG/L) (34200)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	ANILINE 2-ETHYL 6METHYL WATER FLTRD REC (UG/L) (61620)	ANILINE 3,4-DI-CHLORO WATER FLTRD REC (UG/L) (61625)
AUG 02...	<.0304	<2	<3	<2	<2	<.004	<.002	<.005	<.0045	<.0045

DATE	ANILINE 3,5-DI-CHLORO WATER FLTRD REC (UG/L) (61627)	ANILINE 3-TRI-FLUORO-METHYL WAT FLT REC (UG/L) (61630)	ANTHRA-CENE TOTAL (UG/L) (34220)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	AZIN-PHOS-METHYL-OXON WAT FLT REC (UG/L) (61635)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BENZENE NITRO-WATER UNFLTRD RECOVER (UG/L) (34447)	BENZI-DINE TOTAL (UG/L) (39120)	BENZO-A-PYRENE TOTAL (UG/L) (34247)	BENZO B FLUOR-AN-THENE TOTAL (UG/L) (34230)
AUG 02...	<.0047	<.0108	<2	<.007	<.0160	<.010	<2	<40	<3	<3

DATE	BENZO K FLUOR-AN-THENE TOTAL (UG/L) (34242)	BENZO-[A]-ANTHRA-CENE WAT UNF (UG/L) (34526)	BENZO-[GHI]-PERY-LENE TOTAL (UG/L) (34521)	BENZO-PHENONE 4,4-DI-CHLORO WAT FLT REC (UG/L) (61631)	BENZYL ALCOHOL 3-PHEN-OXY WAT FLT REC (UG/L) (61629)	BI-FENTH-RIN WATER FLTRD REC (UG/L) (61580)	BIS(2-CHLORO-ETHOXY) METHANE TOTAL (UG/L) (34278)	BIS(2-CHLORO-ETHYL) ETHER UNFLTRD RECOVER (UG/L) (34273)	BIS(2-CHLORO-ISO-PROPYL) ETHER TOTAL (UG/L) (34283)	BIS(2-ETHYL HEXYL) PHTHAL-ATE TOTAL (UG/L) (39100)
AUG 02...	<3	<2	<3	<.0034	<.0466	<.0053	<3	<2	<2	<20

DATE	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CHLOR-PYRIFOS OXYGEN ANALOG WAT FLT REC (UG/L) (61636)	CHRY-SENE TOTAL (UG/L) (34320)	CIS-CARBOX-YATE WATER FLTRD REC (UG/L) (79842)	CIS-PROPI-CONAZ-OLE WAT FLT REC (UG/L) (79846)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	SI-CLOATE, WATER, DISS, REC (UG/L) (04031)
AUG 02...	<.002	<.041	<.020	<.005	<.0562	<3	<.0393	<.0080	<.018	<.0047

DATE	CYCLOPE NTADIEN HEXA-CHLORO-UNFLTRD RECOVER (UG/L) (34386)	CY-FLUTH-RIN WATER FLTRD REC (UG/L) (61585)	CYPER-METHRIN WATER FLTRD REC (UG/L) (61586)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DICROT-OPHOS WATER FLTRD REC (UG/L) (38454)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DIETHYL PHTHAL-ATE TOTAL (UG/L) (34336)	DIMETH-OATE WATER FLTRD 0.7 U GF, REC (UG/L) (82662)
AUG 02...	<2	<.0080	<.0086	<.003	<.006	<.005	<.0843	<.005	<2	<.01

DATE	DI-METHYL PHTHAL-ATE TOTAL (UG/L) (34341)	DI-N-BUTYL PHTHAL-ATE TOTAL (UG/L) (39110)	DI-N-OCTYL PHTHAL-ATE TOTAL (UG/L) (34596)	DISULF-OTON SULFONE WATER FLTRD REC (UG/L) (61640)	DISULF-OTON SULF-OXIDE WAT FLT REC (UG/L) (61641)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	E-DI-METHO-MORPH WATER FLTRD REC (UG/L) (79844)	ENDO-SULFAN ALPHA DISSOLV (UG/L) (34362)	ENDO-SULFAN BETA DISSOLV (UG/L) (34357)	ENDO-SULFAN ETHER WATER FLTRD REC (UG/L) (61642)
AUG 02...	<2	<3	<5	<.0159	<.0024	<.021	<.0203	<.0047	<.01	<.0041

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	ENDOSULFAN SULFATE WATER FLTRD REC (UG/L) (61590)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHALFLURALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHION DISSOLV (UG/L) (82346)	ETHION MONOXON WATER FLTRD REC (UG/L) (61644)	ETHOPROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FENAMIPHOS SULFONE WATER FLTRD REC (UG/L) (61645)	FENAMIPHOS SULFOXIDE WAT FLT REC (UG/L) (61646)	FENAMIPHOS WATER FLTRD REC (UG/L) (61591)	FENTHION SULFOXIDE WAT FLT REC (UG/L) (61647)
AUG 02...	<.0058	<.002	<.009	<.0040	<.0336	<.005	<.0077	<.0310	<.0290	<.0079

DATE	FENTHION WATER FLTRD (UG/L) (38801)	FLUMETRALIN WATER FLTRD REC (UG/L) (61592)	FLUORANTHENE TOTAL (UG/L) (34376)	FLUORENE TOTAL (UG/L) (34381)	FONOFOS OXYGEN ANALOG WATER FLTRD REC (UG/L) (61649)	FONOFOS WATER DISS REC (UG/L) (04095)	HEXACHLOROBENZENE TOTAL (UG/L) (39700)	HEXAZINONE, WATER, DISS, REC (UG/L) (04025)	HYDROXYMETHYLPENDIMETHLION FLT REC (UG/L) (61665)	INDENO (1,2,3-CD) PYRENE TOTAL (UG/L) (34403)
AUG 02...	<.015	<.0040	<2	<2	<.0021	<.003	<2	<.01	<.1430	<3

DATE	IPRODIONE WATER FLTRD REC (UG/L) (61593)	ISOFENPHOS WATER FLTRD REC (UG/L) (61594)	ISOPHORONE TOTAL (UG/L) (34408)	LAMDACYHALOTHRIN WATER FLTRD REC (UG/L) (61595)	LINDANE DISSOLVED (UG/L) (39341)	LINURON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALAOXON WATER FLTRD REC (UG/L) (61652)	MALATHION, DISSOLVED (UG/L) (39532)	METALAXYL WATER FLTRD REC (UG/L) (61596)	METHIDATHION WATER FLTRD REC (UG/L) (61598)
AUG 02...	<1.42	<.0034	M	<.0089	<.004	<.035	<.0080	<.027	<.0051	<.0058

DATE	METHYL AZINPHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARATHION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METOLACHLOR WATER DISSOLV (UG/L) (39415)	METRIBUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOLINATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	MYCLOBUTANIL WATER FLTRD REC (UG/L) (61599)	NAPROPAMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	N-BUTYL BENZYL PHTHALATE TOTAL (UG/L) (34292)	N-NITROSODIMETHYLAMINE TOTAL (UG/L) (34438)	N-NITROSODI-N-PROPYLAMINE TOTAL (UG/L) (34428)
AUG 02...	<.050	<.006	<.013	<.006	<.002	<.0080	<.007	<4	<3	<2

DATE	N-NITROSODIPHENYLAMINE TOTAL (UG/L) (34433)	O-ETHYL O-METHY S-PROPY HIOATE WAT FLT RE (UG/L) (61660)	OXYFLUORFEN WATER FLTRD CREC (UG/L) (61600)	P,P' DDE DISSOLV (UG/L) (34653)	PARACHLOROMETA CRESOL TOTAL (UG/L) (34452)	PARAOXON ETHYL WATER FLTRD REC (UG/L) (61663)	PARAOXON METHYL WATER FLTRD REC (UG/L) (61664)	PARATHION, DISSOLVED (UG/L) (39542)	PEBULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	PENDIMETHALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
AUG 02...	<3	<.0083	<.0073	<.003	<3	<.0080	<.0299	<.007	<.002	<.010

DATE	PENTACHLOROPHENOL TOTAL (UG/L) (39032)	PERMETHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PHENANTHRENE TOTAL (UG/L) (34461)	PHENOL UNFILT. WATER (UG/L) (34694)	PHORATE OXON WATER FLTRD REC (UG/L) (61666)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PHOSMET OXON WATER FLTRD REC (UG/L) (61668)	PHOSMET WATER FLTRD REC (UG/L) (61601)	PHOSTEBUPIRIM WATER FLTRD REC (UG/L) (61602)	PROFENOFOS WATER FLTRD REC (UG/L) (61603)
AUG 02...	<4	<.006	<2	<3	<.0973	<.011	<.0553	<.0079	<.0055	<.0059

DATE	PROMETON, WATER, DISS, REC (UG/L) (04037)	PROMETRYN, WATER, DISS, REC (UG/L) (04036)	PRONAMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROPACHLOR, WATER, DISS, REC (UG/L) (04024)	PROPANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	PROPARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PROPETAMPHOS WATER FLTRD REC (UG/L) (61604)	PYRENE TOTAL (UG/L) (34469)	SIMAZINE, WATER, DISS, REC (UG/L) (04035)	SULFOTEPP WATER FLTRD REC (UG/L) (61605)
AUG 02...	<.015	<.01	<.004	<.010	<.011	<.023	<.0038	<2	<.011	<.0025

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	SUL-PROFOS WATER FLTRD REC (UG/L) (38716)	TEBUPIR IMPHOS OXYGEN ANALOG WAT FLT REC (UG/L) (61669)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TEFLU-THRIN METAB-OLITE R119364 FLT REC (UG/L) (61671)	TEFLU-THRIN METAB-OLITE R152912 FLT REC (UG/L) (61672)	TEFLU-THRIN WATER FLTRD REC (UG/L) (61606)	TEME-PHOS WATER FLTRD REC (UG/L) (61607)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	TER-BUFOS O-ANA-LOGUE WAT FLT REC (UG/L) (61674)
AUG 02...	<.0155	<.0063	<.016	<.0156	<.0103	<.0077	<.2670	<.034	<.017	<.0676

DATE	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRANS-CARBOX-YATE WATER FLTRD REC (UG/L) (79843)	TRANS-PROPI-CONA-ZOLE WAT FLT REC (UG/L) (79847)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRIBU-PHOS WATER FLTRD REC (UG/L) (61610)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	Z-DI-METHO-MORPH WATER FLTRD REC (UG/L) (79845)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L) (34506)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L) (34511)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L) (34496)
AUG 02...	<.005	<.0335	<.0133	<.002	<.0044	<.009	<.0457	<.03	<.06	<.04

DATE	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L) (34501)	1,1-DI CHLORO-PRO-PENE, WAT, WH TOTAL (UG/L) (77168)	123-TRI CHLORO-PROPANE WATER WHOLE TOTAL (UG/L) (77443)	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L) (77651)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L) (32103)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L) (34541)	TRANS-1,2-DI-CHLORO-ETHENE TOTAL (UG/L) (34546)	2,2-DI CHLORO-PRO-PANE WAT, WH TOTAL (UG/L) (77170)	2BUTENE TRANS-1 4-DI-CHLORO UNFLTRD RECOVER (UG/L) (73547)	2-HEXA-NONE WATER WHOLE TOTAL (UG/L) (77103)
AUG 02...	<.04	<.03	<.2	<.04	<.1	<.03	<.03	<.05	<.7	<.7

DATE	ACETONE WATER WHOLE TOTAL (UG/L) (81552)	ACRYLO-NITRILE TOTAL (UG/L) (34215)	1,2,3-TRI-CHLORO BENZENE WAT, WH REC (UG/L) (77613)	BENZENE 123-TRI METHYL-WATER UNFLTRD RECOVER (UG/L) (77221)	BENZENE 1,2,4-TRI-CHLORO-WAT UNF REC (UG/L) (34551)	BENZENE 124-TRI METHYL UNFILT RECOVER (UG/L) (77222)	BENZENE 135-TRI METHYL WATER UNFLTRD REC (UG/L) (77226)	BENZENE 1,3-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34571)	ISO-PROPYL-BENZENE WATER WHOLE REC (UG/L) (77223)
AUG 02...	<7	<1	<.3	<.1	<2.0	<.06	<.04	<2.00	E.02	<.03

DATE	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L) (77342)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L) (77224)	BENZENE O-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34536)	BENZENE SEC BUTYL-WATER UNFLTRD REC (UG/L) (77350)	BENZENE TERT-BUTYL-WATER UNFLTRD REC (UG/L) (77353)	BENZENE TOTAL (UG/L) (34030)	BROMO-BENZENE WATER, WHOLE, TOTAL (UG/L) (81555)	BROMO-ETHENE WATER UNFLTRD RECOVER (UG/L) (50002)	BROMO-FORM TOTAL (UG/L) (32104)	CARBON DI-SULFIDE WATER WHOLE TOTAL (UG/L) (77041)
AUG 02...	<.2	<.04	<2.00	<.03	<.06	<.04	<.04	<.1	<.06	<.07

DATE	CARBON TETRA-CHLO-RIDE TOTAL (UG/L) (32102)	CHLORO-BENZENE TOTAL (UG/L) (34301)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L) (32105)	CHLORO-ETHANE TOTAL (UG/L) (34311)	CHLORO-FORM TOTAL (UG/L) (32106)	CIS-1,2 -DI-CHLORO-ETHENE WATER TOTAL (UG/L) (77093)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34704)	DIBROMO CHLORO-PROPANE WATER WHOLE TOT.REC (UG/L) (82625)	DI-BROMO-METHANE WATER WHOLE RECOVER (UG/L) (30217)	BROMO-DI-CHLORO-METHANE TOTAL (UG/L) (32101)
AUG 02...	<.06	<.03	<.2	<.1	<.02	<.04	<.09	<.5	<.05	<.05

DATE	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L) (34668)	DI-ISO-PROPYL-ETHER, WATER, UNFLTRD RECOVER (UG/L) (81577)	ETHANE, 1112-TETRA-CHLORO-WAT UNF REC (UG/L) (77562)	ETHANE, 1,1,2,2 TETRA-CHLORO-WAT UNF REC (UG/L) (34516)	ETHANE HEXA-CHLORO-WATER UNFLTRD RECOVER (UG/L) (34396)	ETHER ETHYL WATER UNFLTRD RECOVER (UG/L) (81576)	ETHER TERT-BUTYL ETHYL UNFLTRD RECOVER (UG/L) (50004)	ETHER TERT-PENTYL METHYL UNFLTRD RECOVER (UG/L) (50005)	ETHYL-BENZENE TOTAL (UG/L) (34371)	FREON-113 WATER UNFLTRD REC (UG/L) (77652)
AUG 02...	<.3	<.1	<.03	<.09	<2.0	<.2	<.05	<.1	<.03	<.06

STREAMS TRIBUTARY TO LAKE SUPERIOR

04001000 WASHINGTON CREEK AT WINDIGO, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	FURAN, TETRA-HYDRO-WATER UNFLTRD RECOVER (UG/L) (81607)	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	ISO-DURENE WATER UNFLTRD RECOVER (UG/L) (50000)	METHAC-RYLATE ETHYL-WATER UNFLTRD RECOVER (UG/L) (73570)	METHAC-RYLATE METHYL WATER UNFLTRD RECOVER (UG/L) (81597)	METH-ACRYLO-NITRILE WATER UNFLTRD RECOVER (UG/L) (81593)	METHANE BROMO CHLORO-WAT UNFLTRD REC (UG/L) (77297)	METHYL ACRY-LATE WATER UNFLTRD RECOVER (UG/L) (49991)	METHYL IODIDE WATER UNFLTRD RECOVER (UG/L) (77424)	METHYL TERT-BUTYL ETHER WAT UNF REC (UG/L) (78032)
AUG 02...	<2	<3.0	<.2	<.2	<.3	<.6	<.04	<1	<.1	<.2

DATE	METHYL-BROMIDE TOTAL (UG/L) (34413)	METHYL-CHLO-RIDE TOTAL (UG/L) (34418)	METHYL ENE CHLO-RIDE TOTAL (UG/L) (34423)	METHYL-ETHYL-KETONE WATER WHOLE TOTAL (UG/L) (81595)	METHYL ISO-BUTYL KETONE WAT.WH. TOTAL (UG/L) (78133)	META/ PARA-XYLENE WATER UNFLTRD REC (UG/L) (85795)	NAPHTH-ALENE TOTAL (UG/L) (34696)	O-CHLORO-TOLUENE WATER WHOLE TOTAL (UG/L) (77275)	O-XYLENE WATER WHOLE TOTAL (UG/L) (77135)	P-ISO-PROPYL-TOLUENE WATER WHOLE REC (UG/L) (77356)
AUG 02...	<.3	<.2	<.2	<2	<.4	<.06	<5.0	<.03	<.04	<.07

DATE	1234-TETRA METHYL BENZENE UNFLTRD REC (UG/L) (49999)	1,3-DI-CHLORO-PROPANE WAT. WH TOTAL (UG/L) (77173)	PROPENE 3-CHLORO-WATER UNFLTRD RECOVER (UG/L) (78109)	STYRENE TOTAL (UG/L) (77128)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE O-ETHYL WATER UNFLTRD RECOVER (UG/L) (77220)	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L) (77277)	TOLUENE TOTAL (UG/L) (34010)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34699)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L) (39180)
AUG 02...	<.2	<.1	<.1	<.04	<.1	<.06	<.06	<.05	<.09	<.04

DATE	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L) (34488)	VINYL CHLO-RIDE TOTAL (UG/L) (39175)	DICHLOR VOS, WATER FLTRD REC (UG/L) (38775)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
AUG 02...	<.09	<.1	<.01	98	25	.81

STREAMS TRIBUTARY TO LAKE SUPERIOR

04031000 BLACK RIVER NEAR BESSEMER, MI

LOCATION.--Lat 46°30'41", long 90°04'28", in NE1/4 SE1/4 sec.32, T.48 N., R.46 W., Gogebic County, Hydrologic Unit 04020101, on right bank 450 ft downstream from bridge on county highway, 500 ft downstream from Powder Mill Creek, and 2.5 mi northwest of Bessemer.

DRAINAGE AREA.--200 mi^2.

PERIOD OF RECORD.--October 1954 to September 1982, October 2000 to September 2001.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,154.3 ft above sea level (levels by registered surveyor).

REMARKS.--Records good except for estimated daily discharges, which are fair. Prior to 1967, flow included some ground water pumped from mines at Bessemer. Several measurements of water temperature were made during the year. Gage height telemeter at staton.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e37	e74	118	e50	e80	e72	e200	362	176	40	330	22
2	e35	91	112	e50	e80	e74	e250	321	182	37	514	20
3	e33	93	e110	e50	e80	e76	e326	278	184	42	425	21
4	e32	78	e105	e50	e80	e78	367	243	156	44	297	19
5	e33	75	e98	e52	e80	e80	513	208	130	43	212	17
6	e37	77	e92	e54	e80	e80	741	188	113	36	153	17
7	e40	98	e88	e55	e80	e82	1890	171	97	37	111	24
8	e45	112	e85	e56	e80	e82	3220	152	82	33	87	50
9	e49	102	e80	e56	e80	e83	2960	133	71	30	68	75
10	e51	100	e76	e56	e80	e84	2710	258	86	28	50	65
11	e52	101	e72	e58	e78	e86	3730	302	94	25	42	61
12	e56	100	e68	e60	e76	e88	5570	248	116	23	41	56
13	e62	119	e64	e62	e74	e88	4760	211	110	22	39	49
14	e74	164	e62	e64	e74	e90	4420	184	139	21	36	44
15	e90	163	e58	e66	e74	e94	4500	162	162	23	33	41
16	e110	151	e54	e68	e72	e98	4070	169	138	22	41	37
17	e115	147	e52	e70	e71	e100	2440	173	131	21	52	35
18	e110	208	e52	e70	e70	e105	1590	149	128	22	59	34
19	e98	233	e50	e70	e70	e110	1200	130	137	23	52	31
20	e94	489	e50	e70	e70	e115	1170	116	118	26	42	30
21	e86	542	e50	e70	e70	e120	1420	112	113	32	36	28
22	e78	501	e50	e72	e70	e130	1800	162	108	26	33	27
23	e74	407	e50	e72	e70	e150	3530	165	93	23	31	35
24	e78	347	e50	e74	e70	e190	3000	166	80	22	26	44
25	e82	321	e50	e74	e70	e190	1790	184	69	20	24	46
26	e84	245	e50	e74	e70	e185	1190	392	60	21	23	43
27	e84	197	e50	e75	e72	e175	856	553	65	19	28	43
28	e84	158	e50	e76	e72	e165	646	435	68	38	21	38
29	e80	135	e50	e77	---	e155	507	318	49	37	19	35
30	e74	130	e50	e78	---	e155	410	238	44	44	22	33
31	e72	---	e50	e80	---	e160	---	187	---	46	24	---
TOTAL	2129	5758	2096	2009	2093	3540	61776	7070	3299	926	2966	1120
MEAN	68.7	192	67.6	64.8	74.8	114	2059	228	110	29.9	95.7	37.3
MAX	115	542	118	80	80	190	5570	553	184	46	514	75
MIN	32	74	50	50	70	72	200	112	44	19	19	17
CFSM	.34	.96	.34	.32	.37	.57	10.3	1.14	.55	.15	.48	.19
IN.	.40	1.07	.39	.37	.39	.66	11.49	1.32	.61	.17	.55	.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 2001, BY WATER YEAR (WY)

MEAN	188	222	103	62.6	55.0	202	1138	380	180	96.1	102	128
MAX	543	496	221	124	115	816	2059	802	475	362	590	553
(WY)	1978	1976	1961	1969	1981	1973	2001	1965	1974	1982	1972	1977
MIN	15.2	15.9	13.3	12.0	14.9	52.7	498	65.9	32.9	21.2	12.2	8.19
(WY)	1977	1977	1977	1977	1977	1964	1968	1977	1977	1963	1976	1976

SUMMARY STATISTICS	FOR 2001 WATER YEAR		WATER YEARS 1955 - 2001	
ANNUAL TOTAL	94782			
ANNUAL MEAN	260		238	
HIGHEST ANNUAL MEAN			310	1968
LOWEST ANNUAL MEAN			166	1977
HIGHEST DAILY MEAN	5570	Apr 12	12700	Apr 24 1960
LOWEST DAILY MEAN	17	Sep 5	6.8	(a)
ANNUAL SEVEN-DAY MINIMUM	20	Aug 31	7.2	Sep 28 1976
MAXIMUM PEAK FLOW	5650	Apr 12	(b)14800	Apr 24 1960
MAXIMUM PEAK STAGE	9.93	Apr 12	(c)14.27	Apr 24 1960
ANNUAL RUNOFF (CFSM)	1.30		1.19	
ANNUAL RUNOFF (INCHES)	17.63		16.14	
10 PERCENT EXCEEDS	364		560	
50 PERCENT EXCEEDS	78		86	
90 PERCENT EXCEEDS	31		29	

(a) Sept. 25, Oct. 1-3, 1976.
(b) From rating curve extended above 5,300 ft^3/s on basis of slope-area measurement of peak flow.
(c) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04033000 MIDDLE BRANCH ONTONAGON RIVER NEAR PAULDING, MI

LOCATION.--Lat 46°21'25", long 89°04'38", in SE1/4 NE1/4 sec.29, T.46 N., R.38 W., Ontonagon County, Hydrologic Unit 04020102, Ottawa National Forest, on right bank 25 ft downstream from bridge on Forest Service Road 5250, 2.4 mi upstream from Bond Falls Reservoir, and 5.7 mi southeast of Paulding.

DRAINAGE AREA.--164 mi^2.

PERIOD OF RECORD.--June 1942 to September 1995, October 2000 to September 2001.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,485.66 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 28, 1942, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	84	e108	e78	e78	e72	109	280	144	122	182	81
2	75	87	e105	e78	e78	e72	112	277	150	112	337	81
3	77	89	e100	e78	e78	e72	114	263	144	109	275	78
4	75	85	e98	e78	e78	e74	120	238	139	115	190	74
5	75	82	e95	e78	e78	e74	133	217	132	112	145	72
6	76	81	e92	e78	e78	e76	161	199	124	103	129	71
7	80	86	e88	e78	e78	e76	230	196	119	101	118	98
8	85	93	e86	e78	e78	e76	365	219	115	98	112	118
9	85	89	e84	e78	e78	e76	374	191	111	94	106	118
10	86	90	e80	e78	e78	e78	375	220	116	89	98	111
11	82	90	e80	e80	e76	e78	462	265	137	85	91	103
12	81	90	e78	e80	e76	e80	639	234	167	80	88	98
13	99	101	e78	e80	e76	e84	764	202	155	78	92	93
14	129	118	e78	e80	e76	e86	773	181	143	75	96	88
15	121	118	e78	e80	e74	e90	724	177	134	81	93	86
16	117	116	e78	e80	e72	e95	668	169	130	101	97	84
17	110	115	e78	e78	e70	e98	594	156	177	95	112	84
18	101	128	e78	e78	e70	e100	512	143	154	86	112	82
19	101	128	e78	e78	e70	e100	439	135	186	84	118	81
20	93	123	e78	e78	e70	e103	394	127	176	112	120	82
21	91	109	e78	e78	e70	e110	404	126	154	119	107	83
22	87	162	e78	e78	e70	e120	511	190	142	113	98	81
23	93	172	e78	e78	e70	e160	591	193	131	102	93	93
24	101	176	e78	e78	e70	e180	699	178	122	98	87	113
25	98	163	e78	e78	e70	e160	663	176	115	98	86	110
26	98	145	e78	e78	e70	e150	562	208	110	94	86	98
27	97	128	e78	e78	e70	e130	470	281	117	90	82	91
28	90	125	e78	e78	e70	e120	395	246	169	97	81	86
29	87	119	e78	e78	---	112	336	201	161	120	79	84
30	85	112	e78	e78	---	103	295	169	133	121	78	81
31	84	---	e78	e78	---	103	---	150	---	122	79	---
TOTAL	2833	3404	2576	2430	2070	3108	12988	6207	4207	3106	3667	2703
MEAN	91.4	113	83.1	78.4	73.9	100	433	200	140	100	118	90.1
MAX	129	176	108	80	78	180	773	281	186	122	337	118
MIN	74	81	78	78	70	72	109	126	110	75	78	71
CFSM	.56	.69	.51	.48	.45	.61	2.64	1.22	.86	.61	.72	.55
IN.	.64	.77	.58	.55	.47	.70	2.95	1.41	.95	.70	.83	.61

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	158	161	127	109	105	142	355	268	197	147	124	140
MAX	377	293	186	168	176	352	578	591	438	414	267	308
(WY)	1955	1989	1952	1969	1984	1973	1967	1965	1944	1953	1978	1951
MIN	76.5	92.2	81.9	78.4	73.9	82.7	152	114	89.4	80.7	69.8	76.4
(WY)	1949	1949	1964	2001	2001	1965	1987	1977	1948	1990	1990	1948

SUMMARY STATISTICS	FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	49299			
ANNUAL MEAN	135		169	
HIGHEST ANNUAL MEAN			226	1943
LOWEST ANNUAL MEAN			107	1948
HIGHEST DAILY MEAN	773	Apr 14	2000	Apr 30 1951
LOWEST DAILY MEAN	70	Feb 17	57	Aug 8 1990
ANNUAL SEVEN-DAY MINIMUM	70	Feb 17	61	Aug 7 1990
MAXIMUM PEAK FLOW	783	Apr 13	2050	Apr 30 1951
MAXIMUM PEAK STAGE	7.07	Apr 13	(a)10.0	Apr 30 1951
INSTANTANEOUS LOW FLOW	(b)54	Mar 25	(c)27	Nov 22 1946
ANNUAL RUNOFF (CFSM)	.82		1.03	
ANNUAL RUNOFF (INCHES)	11.18		14.04	
10 PERCENT EXCEEDS	218		292	
50 PERCENT EXCEEDS	97		130	
90 PERCENT EXCEEDS	77		89	

(a) From floodmark.
(b) Result of ice jam upstream.
(c) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04033500 BOND FALLS CANAL NEAR PAULDING, MI

LOCATION.--Lat 46°23'57", long 89°08'47", in SW1/4 NE1/4 sec.11, T.46 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, on right bank 40 ft upstream from intake to pipeline No. 2, 0.8 mi downstream from Bond Falls Reservoir on Middle Branch Ontonagon River, and 1.6 mi east of Paulding.

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,441.59 ft above sea level. Prior to Oct. 1, 1968, nonrecording gage at same site and at datum 3.00 ft higher.

REMARKS.--Records good except for daily discharges below 5.0 ft^3/s, which are poor. Canal diverts water from Bond Falls Reservoir (station 04034000) to South Branch Ontonagon River; water is used for power production at Victoria Dam near Rockland. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	155	104	8.5	9.4	68	64	122	13	53	150	4.5	25
2	155	104	8.5	9.4	68	65	78	13	117	196	4.4	25
3	154	104	8.5	9.4	68	65	9.3	13	117	257	4.2	25
4	153	104	8.5	35	68	e64	8.9	28	117	256	4.2	25
5	153	104	8.5	67	68	64	9.1	59	117	256	4.2	25
6	152	104	8.5	67	68	64	8.9	59	117	167	4.3	25
7	152	104	8.5	67	68	64	9.6	60	117	15	4.4	26
8	151	90	8.5	67	68	67	9.2	86	117	14	16	25
9	151	67	8.5	67	68	92	8.9	125	117	14	33	25
10	151	55	8.5	67	68	129	8.9	126	117	12	28	25
11	150	55	8.5	67	68	129	9.3	109	117	5.7	26	25
12	150	55	8.5	67	68	129	9.7	84	117	4.6	26	25
13	150	38	8.5	67	68	128	9.2	84	117	4.4	26	25
14	150	8.8	8.5	68	68	126	9.4	116	118	4.2	26	25
15	150	8.5	8.4	68	e68	126	9.8	203	156	4.1	25	25
16	150	8.6	8.7	67	e68	126	10	262	205	4.0	25	25
17	149	8.5	8.6	67	e68	126	10	259	205	3.9	25	25
18	128	8.5	8.5	67	e68	126	11	195	221	3.8	25	26
19	106	8.5	8.5	68	e68	126	11	87	247	3.8	25	26
20	106	8.5	8.7	68	e68	126	11	87	247	3.8	25	26
21	106	8.5	8.9	68	e68	125	11	108	248	4.0	25	26
22	105	8.5	8.8	68	e68	125	11	149	247	4.0	25	26
23	106	8.5	8.8	68	e68	125	12	150	246	4.1	25	26
24	105	8.5	8.9	68	e68	125	11	150	246	1.5	26	26
25	105	8.5	8.8	68	68	125	11	99	245	2.0	27	26
26	105	8.5	8.9	68	65	126	11	31	244	3.6	26	26
27	105	8.5	8.9	68	e65	125	31	15	246	3.5	26	26
28	105	8.5	8.9	67	65	125	55	14	243	4.0	26	117
29	105	8.5	9.1	68	—	124	48	14	211	3.7	26	220
30	104	8.5	9.4	68	—	124	32	14	150	4.8	25	220
31	104	—	9.4	68	—	123	—	14	—	4.6	25	—
TOTAL	4071	1232.9	269.2	1886.2	1895	3378	606.2	2826	5182	1419.1	643.2	1243
MEAN	131	41.1	8.68	60.8	67.7	109	20.2	91.2	173	45.8	20.7	41.4
MAX	155	104	9.4	68	68	129	122	262	248	257	33	220
MIN	104	8.5	8.4	9.4	65	64	8.9	13	53	1.5	4.2	25

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	110	97.8	139	181	197	133	30.2	112	165	168	161	138
MAX	296	253	292	303	305	287	194	310	312	300	320	275
(WY)	1998	1972	1972	1986	1969	1984	1973	1986	1966	1997	1947	1944
MIN	.000	6.24	8.68	55.2	35.8	2.21	.33	.92	3.37	14.5	2.98	1.37
(WY)	1965	1944	2001	1990	1999	1959	1962	1962	1943	1949	1966	1959

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	26824.28		24651.8			
ANNUAL MEAN	73.3		67.5		136	
HIGHEST ANNUAL MEAN					206	1983
LOWEST ANNUAL MEAN					55.9	1977
HIGHEST DAILY MEAN	261	Sep 23	262	May 16	368	May 5 1960
LOWEST DAILY MEAN	.00	Mar 18	1.5	Jul 24	(a)	
ANNUAL SEVEN-DAY MINIMUM	.07	Mar 16	3.2	Jul 23	(b)	
10 PERCENT EXCEEDS	156		150		295	
50 PERCENT EXCEEDS	66		64		131	
90 PERCENT EXCEEDS	2.0		8.5		5.2	

(a) No flow for several days in 1963-70, 1973-75, 1982, 1987, 1991, 1994, 2000.
(b) No flow in 1963-65, 1967, 1975, 1987, 1991.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04034000 BOND FALLS RESERVOIR NEAR PAULDING, MI

LOCATION.--Lat 46°24'29", long 89°07'42", in SW1/4 sec.1, T.46 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, at Bond Falls Dam on Middle Branch Ontonagon River, 2.5 mi east of Paulding.

DRAINAGE AREA.--190 mi^2.

PERIOD OF RECORD.--June 1942 to current year. Prior to October 1950, monthend contents only published in WSP 1307.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Nonrecording gage read once daily. Datum of gage is 1,335.59 ft above sea level.

REMARKS.--Reservoir is formed by earthfill and concrete dam with one taintor gate; dam completed in 1937. Capacity of reservoir, 41,300 acre-ft between gage heights of 120 ft (maximum drawdown) and 141 ft (full pond). Dead storage unknown. Water diverted to South Branch Ontonagon River through Bond Falls Canal (station 04033500); water used for power production at Victoria Dam near Rockland.

COOPERATION.--Gage-height record provided by Upper Peninsula Power Co. and converted to acre-feet by U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD (SINCE 1947).--Maximum contents observed, 42,980 acre-ft, July 3, 1953, gage height, 141.7 ft, of which 1,680 acre-ft was uncontrolled storage; no usable storage at times; minimum gage height observed, 116.0 ft, Mar. 21, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 39,140 acre-ft, Apr. 24, gage height, 140.1 ft; minimum observed, 15,700 acre-ft, Nov. 7, 8, gage height, 129.0 ft.

MONTHEND GAGE HEIGHT AND CONTENTS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Change in contents (equivalent in ft^3/s)
Sept. 30	131.6	20,700		
Oct. 31	129.4	16,460	-4,240	-69
Nov. 30	130.5	18,550	+2,090	+35.1
Dec. 31	132.2	21,900	+3,350	+54.5
CAL YR 2000			+12,260	204.4
Jan. 31	132.5	22,500	+600	+9.8
Feb. 29	132.5	22,500	0	0
Mar. 31	131.6	20,700	-1,800	-29.3
Apr. 30	139.6	37,980	+17,280	+290
May 31	139.5	37,750	-230	-3.7
June 30	137.6	33,380	-4,370	-73.4
July 31	137.7	33,610	+230	+3.7
Aug. 31	138.8	36,140	+2,530	+41.1
Sept. 30	138.9	36,370	+230	+3.9
WTR YR 2001			+15,670	+263

STREAMS TRIBUTARY TO LAKE SUPERIOR

04034500 MIDDLE BRANCH ONTONAGON RIVER NEAR TROUT CREEK, MI

LOCATION.--Lat 46°28'40", long 89°05'25", in SW1/4 sec.8, T.47 N., R.38 W., Ontonagon County, Hydrologic Unit 04020102, on right bank 0.1 mi upstream from State Highway 28, 3.8 mi west of village of Trout Creek, and 7.5 mi downstream from Bond Falls Reservoir.

DRAINAGE AREA.--203 mi^2.

PERIOD OF RECORD.--June 1942 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,132.03 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 4, 1942, nonrecording gage at same site and datum.

REMARKS.--Records good. Flow regulated by Bond Falls Reservoir (station 04034000) 7.5 mi upstream. Diversion to South Branch Ontonagon River 8.5 mi upstream by Bond Falls Canal (station 04033500). Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	44	44	44	42	45	45	247	50	51	70	54
2	44	44	39	39	42	45	45	248	56	51	58	54
3	44	44	41	41	41	44	45	248	56	51	53	54
4	44	43	e41	e41	e41	44	47	246	54	50	52	52
5	44	43	41	e41	e41	43	52	245	54	50	52	44
6	44	44	42	e41	e41	e43	54	247	53	49	51	44
7	45	44	e42	e41	e41	43	77	250	53	49	51	51
8	44	43	43	e41	e41	44	80	182	53	49	51	48
9	44	43	44	e41	e41	44	63	49	52	49	51	46
10	44	44	e45	e41	42	43	60	54	56	49	51	98
11	44	44	e46	e42	e42	44	75	50	55	49	51	174
12	44	44	45	e43	e42	44	93	48	56	49	51	150
13	48	46	e46	e44	e42	44	68	47	56	49	51	88
14	46	47	e46	e44	e42	44	59	47	54	49	51	44
15	46	44	e46	e44	e43	44	57	48	54	51	52	45
16	46	44	46	e44	43	44	55	47	53	50	53	44
17	45	44	46	e44	43	44	51	46	53	50	54	45
18	44	44	46	e44	e43	43	48	46	54	50	52	45
19	44	44	46	e44	e43	44	47	46	55	55	52	46
20	44	44	45	e44	44	45	49	46	52	53	52	46
21	44	43	44	e44	44	46	55	48	52	55	52	45
22	44	43	45	e44	44	44	61	51	52	51	52	45
23	47	43	e45	e44	44	44	149	49	51	52	52	47
24	46	44	44	e44	44	43	557	47	51	51	52	46
25	45	44	45	e44	44	42	760	50	51	51	52	46
26	45	44	44	e44	44	43	770	51	51	51	52	45
27	45	44	44	e44	45	43	613	50	61	51	53	45
28	44	44	44	e44	e45	42	337	385	57	56	52	45
29	44	44	44	e47	—	43	246	400	51	53	54	44
30	44	44	44	46	—	43	245	336	54	56	54	44
31	44	—	44	45	—	44	—	182	—	53	54	—
TOTAL	1384	1318	1367	1338	1194	1355	4963	4136	1610	1583	1638	1724
MEAN	44.6	43.9	44.1	43.2	42.6	43.7	165	133	53.7	51.1	52.8	57.5
MAX	48	47	46	47	45	46	770	400	61	56	70	174
MIN	44	43	39	39	41	42	45	46	50	49	51	44

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	54.3	55.4	48.1	46.7	46.3	50.4	87.5	121	94.7	69.2	57.5	53.2
MAX	221	239	102	84.7	76.8	118	297	745	461	253	105	216
(WY)	1943	1943	1943	1943	1943	1943	1943	1996	1943	1953	1952	1942
MIN	41.2	33.1	32.0	31.7	31.0	32.4	36.5	38.8	50.1	49.3	42.6	43.2
(WY)	2000	1949	1949	1949	1949	1949	1949	1949	1998	1998	1944	1967

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	17077		23610			
ANNUAL MEAN	46.7		64.7		65.0	
HIGHEST ANNUAL MEAN					187	1943
LOWEST ANNUAL MEAN					42.4	1949
HIGHEST DAILY MEAN	66	Mar 27	770	Apr 26	1550	May 2 1951
LOWEST DAILY MEAN	39	Dec 2	39	Dec 2	30	Dec 1 1948
ANNUAL SEVEN-DAY MINIMUM	41	Dec 2	41	Jan 2	31	Mar 6 1949
MAXIMUM PEAK FLOW			781	Apr 24	1750	Nov 7 1951
MAXIMUM PEAK STAGE			3.64	Apr 24	5.05	Nov 7 1951
INSTANTANEOUS LOW FLOW			(a)22	Feb 7	14	(b)
10 PERCENT EXCEEDS	52		57		65	
50 PERCENT EXCEEDS	45		46		50	
90 PERCENT EXCEEDS	42		43		44	

(a) Result of ice jam upstream.
(b) Sometime during period Jan. 23 to Feb. 13, 1947, result of ice jam upstream.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04035500 MIDDLE BRANCH ONTONAGON RIVER NEAR ROCKLAND, MI

LOCATION.--Lat 46°41'57", long 89°09'36", in SE1/4 sec.27, T.50 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, on left bank 10 ft upstream from bridge on U.S. Highway 45, 700 ft downstream from East Branch, and 2.8 mi southeast of Rockland.

DRAINAGE AREA.--671 mi^2.

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 661.1 ft above sea level. Prior to Apr. 1, 1959, nonrecording gage at site 400 ft upstream at same datum. Apr. 1, 1959, to Oct. 21, 1968, nonrecording gage at present site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Regulation by Bond Falls Reservoir (station 04034000) 30.0 mi upstream. Diversion to South Branch Ontonagon River by Bond Falls Canal (station 04033500) 31.0 mi upstream. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	173	190	222	e190	e205	e170	712	679	293	304	398	187
2	176	190	219	e190	e205	e175	928	648	287	245	597	185
3	174	192	170	e190	e205	e180	945	610	316	214	369	180
4	171	191	e175	e190	e205	e180	1100	561	309	209	278	177
5	169	188	e180	e190	e205	e180	1660	521	279	198	237	170
6	174	189	e185	e190	e205	e180	2380	489	255	187	214	166
7	179	191	e190	e190	e205	e190	5250	498	237	187	199	199
8	185	194	e190	e190	e205	e200	8230	602	228	186	194	266
9	182	195	e190	e190	e205	e205	3630	381	219	181	199	247
10	178	197	e190	e190	e200	e205	2480	505	255	179	186	226
11	176	200	e190	e190	e200	e205	3600	610	366	175	179	323
12	175	199	e190	e195	e200	e210	5320	421	353	169	178	331
13	183	223	e190	e200	e195	e220	3560	343	313	167	184	274
14	219	333	e190	e200	e190	e225	2630	303	291	166	182	210
15	221	318	e190	e200	e190	e235	2380	288	264	178	182	189
16	225	282	e190	e200	e185	e240	2220	296	249	190	197	187
17	222	262	e190	e200	e180	e250	1310	286	258	186	228	185
18	208	234	e190	e200	e180	e260	1010	260	263	179	212	186
19	197	224	e190	e200	e180	e275	916	239	351	191	201	186
20	192	205	e190	e200	e180	e290	998	227	341	213	194	188
21	187	266	e190	e200	e180	e320	1510	230	265	291	194	186
22	185	805	e190	e200	e180	483	2490	515	240	258	189	189
23	204	793	e190	e200	e175	659	3940	551	223	326	188	223
24	220	834	e190	e200	e170	634	2800	401	207	247	187	231
25	216	759	e190	e200	e170	489	2170	387	201	208	188	217
26	211	627	e190	e200	e170	437	1740	819	196	191	185	204
27	207	418	e190	e200	e170	449	1450	823	192	180	184	197
28	205	315	e190	e200	e170	433	961	736	884	202	180	198
29	196	275	e190	e205	---	395	739	758	527	270	177	196
30	193	250	e190	e205	---	407	701	664	357	274	188	194
31	193	---	e190	e205	---	476	---	463	---	360	197	---
TOTAL	5996	9739	5901	6100	5310	9457	69760	15114	9019	6711	6865	6297
MEAN	193	325	190	197	190	305	2325	488	301	216	221	210
MAX	225	834	222	205	205	659	8230	823	884	360	597	331
MIN	169	188	170	190	170	170	701	227	192	166	177	166

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	425	453	319	264	275	581	1541	760	529	359	325	345
MAX	1026	1145	618	378	634	1652	2919	1974	1396	1181	1091	1224
(WY)	1986	1989	1983	1946	1984	1973	1971	1996	1944	1949	1953	1942
MIN	191	214	190	193	187	183	385	222	189	182	173	175
(WY)	1949	1949	2001	1995	1949	1965	1987	2000	1992	1988	1976	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	121686		156269			
ANNUAL MEAN	332		428		512	
HIGHEST ANNUAL MEAN					756	1943
LOWEST ANNUAL MEAN					331	1987
HIGHEST DAILY MEAN	3570	Feb 27	8230	Apr 8	16300	Aug 22 1942
LOWEST DAILY MEAN	169	Oct 5	166	Jul 14	145	Dec 3 1963
ANNUAL SEVEN-DAY MINIMUM	173	Sep 30	171	Feb 23	163	Sep 24 1948
MAXIMUM PEAK FLOW			9870	Apr 8	(a)27000	Aug 22 1942
MAXIMUM PEAK STAGE			12.05	Apr 8	(b)21.2	Aug 22 1942
INSTANTANEOUS LOW FLOW			(c)110	(d)	(c)110	(d)
10 PERCENT EXCEEDS	607		737		1000	
50 PERCENT EXCEEDS	210		205		288	
90 PERCENT EXCEEDS	181		180		208	

(a) From rating curve extended above 7,500 ft^3/s on basis of slope-area measurement of peak flow.
(b) From floodmark.
(c) Result of freezeup.
(d) Dec. 2, 3, 2000.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04035995 LAKE GOGEBIC NEAR BERGLAND, MI

LOCATION.--Lat 46°35'19", long 89°32'52", in SW1/4 NW1/4 sec.3, T.48 N., R.42 W., Ontonagon County, Hydrologic Unit 04020102, at upstream side of dam on lake outlet, 1.0 mi southeast of Bergland, and 4.3 mi east of Merriweather.

DRAINAGE AREA.--162 mi^2.

PERIOD OF RECORD.--July 1958 to September 1959 (no winter record), February 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,292.70 ft above sea level. July 1958 to September 1959, nonrecording gage at mouth of Merriweather Creek at different datum. February 1969 to September 1988, at datum 1.00 ft higher.

REMARKS.--Lake Gogebic is used as a storage reservoir (capacity 35,200 acre-ft) by Upper Peninsula Power Co. for power production at Victoria Dam near Rockland. Lake level is controlled at the outlet by a concrete and steel dam with removable flash boards. Major inlets to Lake Gogebic are Slate River, Trout Brook, and Merriweather Creek. Streamflow records are currently collected at the outlet, West Branch Ontonagon River (station 04036000). Surface area of lake is 14,780 acres. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.44 ft, present datum, May 9, 1996; minimum daily, 0.68 ft, present datum, Apr. 5, 6, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum daily gage height, 3.90 ft, Apr. 24, 25; minimum daily, 1.17 ft, Mar. 23.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.28	2.40	2.41	1.92	1.69	1.43	1.19	3.51	3.33	3.05	3.04	2.82
2	2.25	2.51	2.40	1.91	1.67	1.42	1.20	3.43	3.26	3.05	3.11	2.85
3	2.27	2.49	2.39	1.89	1.67	1.39	1.21	3.32	3.25	3.03	3.14	2.78
4	2.24	2.38	2.39	1.88	1.66	1.37	1.23	3.31	3.22	3.00	3.16	2.74
5	2.22	2.38	2.38	1.86	1.66	1.36	1.26	3.38	3.19	2.95	3.20	2.77
6	2.24	2.39	2.37	1.84	1.66	1.34	1.33	3.39	3.17	2.96	3.16	2.78
7	2.21	2.39	2.33	1.84	1.64	1.34	1.49	3.40	3.15	2.92	3.14	2.81
8	2.26	2.44	2.31	1.84	1.65	1.33	1.79	3.41	3.14	2.91	3.13	2.85
9	2.26	2.35	2.29	1.83	1.67	1.31	1.99	3.38	3.12	2.91	3.09	2.87
10	2.25	2.36	2.28	1.82	1.68	1.29	2.16	3.40	3.14	2.87	3.02	2.87
11	2.24	2.33	2.26	1.79	1.66	1.28	2.38	3.40	3.16	2.86	3.01	2.86
12	2.25	2.32	2.24	1.78	1.66	1.27	2.75	3.43	3.16	2.84	2.97	2.83
13	2.26	2.35	2.21	1.76	1.66	1.30	3.05	3.43	3.17	2.84	2.95	2.81
14	2.27	2.43	2.18	1.75	1.63	1.27	3.28	3.44	3.20	2.83	2.97	2.82
15	2.28	2.47	2.16	1.78	1.63	1.25	3.46	3.44	3.20	2.84	2.97	2.81
16	2.31	2.43	2.15	1.77	1.63	1.24	3.61	3.42	3.18	2.83	2.92	2.81
17	2.33	2.46	2.15	1.77	1.61	1.21	3.65	3.41	3.15	2.83	2.95	2.79
18	2.32	2.46	2.13	1.76	1.61	1.21	3.65	3.39	3.16	2.82	2.93	2.78
19	2.35	2.45	2.12	1.74	1.61	1.20	3.61	3.36	3.22	2.86	2.93	2.76
20	2.34	2.41	2.10	1.73	1.61	1.19	3.58	3.37	3.16	2.91	2.93	2.76
21	2.31	2.48	2.09	1.72	1.61	1.18	3.57	3.37	3.15	2.91	2.94	2.76
22	2.32	2.46	2.08	1.72	1.61	1.19	3.60	3.43	3.13	2.90	2.92	2.76
23	2.35	2.48	2.06	1.71	1.56	1.17	3.76	3.36	3.15	2.92	2.89	2.71
24	2.37	2.47	2.04	1.69	1.49	—	3.90	3.33	3.15	2.87	2.89	2.74
25	2.39	2.46	2.03	1.69	1.50	—	3.90	3.36	3.16	2.81	2.88	2.74
26	2.42	2.45	2.01	1.68	1.50	—	3.87	3.46	3.15	2.78	2.88	2.72
27	2.35	2.46	1.99	1.69	1.48	—	3.78	3.49	3.13	2.79	2.87	2.72
28	2.39	2.46	1.97	1.67	1.47	1.21	3.72	3.47	3.17	2.82	2.84	2.73
29	2.40	2.44	1.96	1.66	—	1.19	3.68	3.44	3.19	2.82	2.86	2.74
30	2.41	2.42	1.95	1.68	—	1.19	3.61	3.40	3.14	2.83	2.87	2.74
31	2.38	—	1.93	1.69	—	1.18	—	3.37	—	2.87	2.80	—
MEAN	2.31	2.43	2.17	1.77	1.61	—	2.84	3.40	3.17	2.88	2.98	2.78
MAX	2.42	2.51	2.41	1.92	1.69	—	3.90	3.51	3.33	3.05	3.20	2.87
MIN	2.21	2.32	1.93	1.66	1.47	—	1.19	3.31	3.12	2.78	2.80	2.71

CAL YR 2000 MEAN 2.54 MAX 3.52 MIN 1.63

STREAMS TRIBUTARY TO LAKE SUPERIOR

04036000 WEST BRANCH ONTONAGON RIVER NEAR BERGLAND, MI

LOCATION.--Lat 46°35'15", long 89°32'30", in SW1/4 NE1/4 sec.3, T.48 N., R.42 W., Ontonagon County, Hydrologic Unit 04020102, on right bank 0.4 mi downstream from dam at outlet of Lake Gogebic, and 1.5 mi east of Bergland.

DRAINAGE AREA.--162 mi^2.

PERIOD OF RECORD.--July 1942 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,290.81 ft above sea level. Prior to Nov. 5, 1942, nonrecording gage 0.4 mi upstream at different datum.

REMARKS.--Records good except for daily discharges below 5.0 ft^3/s, which are fair. Flow regulated by Lake Gogebic (station 04035995). Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	4.7	132	146	113	176	136	832	359	147	16	6.8
2	7.9	4.7	130	144	112	173	137	801	294	149	15	6.4
3	7.6	4.3	129	143	110	168	139	764	292	89	15	6.2
4	6.8	4.1	128	138	109	165	140	424	281	53	15	6.1
5	5.4	4.0	127	136	109	162	145	122	272	52	63	6.2
6	5.4	4.1	126	134	109	160	155	118	222	52	99	6.3
7	5.1	3.9	156	133	106	157	184	117	192	51	96	6.3
8	4.8	41	173	133	106	156	247	114	155	36	96	6.4
9	4.8	49	170	132	109	154	293	108	130	24	93	6.2
10	4.8	57	167	130	113	152	340	106	131	23	85	6.0
11	4.6	54	162	125	109	149	406	102	134	23	84	5.9
12	4.7	52	159	124	109	149	539	103	132	22	81	5.5
13	5.0	54	158	122	108	152	658	138	133	22	43	5.0
14	5.0	62	e180	121	107	149	742	161	134	22	19	4.5
15	4.8	67	193	124	106	145	807	159	135	21	19	4.2
16	4.9	61	191	123	106	143	865	157	132	21	19	4.1
17	4.5	65	191	123	106	141	879	157	129	21	19	4.0
18	4.3	65	187	121	106	139	877	152	129	21	18	3.6
19	4.2	63	185	119	103	138	864	149	105	21	18	3.3
20	4.2	60	181	118	102	136	851	149	82	22	16	3.5
21	4.2	67	177	116	100	135	851	149	81	22	15	3.4
22	4.3	64	174	115	e150	134	856	156	81	22	14	3.4
23	4.5	66	170	115	e180	134	915	148	71	22	13	3.7
24	4.4	65	167	112	184	135	968	143	63	21	11	3.3
25	4.4	64	163	112	189	136	974	148	62	21	10	3.3
26	4.8	64	160	110	189	137	963	217	62	19	9.6	3.3
27	4.8	64	156	111	186	138	931	400	60	17	8.8	3.3
28	4.7	64	153	109	181	137	907	451	57	18	8.5	3.4
29	4.5	105	151	107	—	136	890	464	57	17	8.2	3.4
30	4.4	135	150	111	—	135	865	449	128	17	7.5	3.7
31	4.6	—	148	113	—	135	—	431	—	15	7.0	—
TOTAL	156.3	1537.8	4994	3820	3517	4556	18524	8089	4295	1103	1041.6	140.7
MEAN	5.04	51.3	161	123	126	147	617	261	143	35.6	33.6	4.69
MAX	7.9	135	193	146	189	176	974	832	359	149	99	6.8
MIN	4.2	3.9	126	107	100	134	136	102	57	15	7.0	3.3

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	126	153	168	167	156	148	332	291	210	138	78.8	77.3
MAX	698	489	346	360	257	327	742	995	550	578	550	408
(WY)	1986	1989	1968	1966	1969	1973	1943	1996	1954	1952	1972	1980
MIN	.65	2.99	18.5	23.3	35.8	55.8	10.7	3.09	21.5	7.09	1.25	.88
(WY)	1990	1999	1949	1949	1949	1949	1949	1987	1986	1988	1963	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	39574.7		51774.4			
ANNUAL MEAN	108		142		170	
HIGHEST ANNUAL MEAN					288	1952
LOWEST ANNUAL MEAN					70.1	1948
HIGHEST DAILY MEAN	745	Jul 6	974	Apr 25	1380	Apr 26 1960
LOWEST DAILY MEAN	3.9	Nov 7	3.3	Sep 19	.38	Nov 16 1989
ANNUAL SEVEN-DAY MINIMUM	4.3	Nov 1	3.4	Sep 21	.39	Nov 12 1989
MAXIMUM PEAK FLOW			989	Apr 26	1400	Apr 26 1960
MAXIMUM PEAK STAGE			5.04	Apr 26	5.98	Apr 26 1960
ANNUAL RUNOFF (CFSM)	.67		.88		1.05	
ANNUAL RUNOFF (INCHES)	9.09		11.89		14.22	
10 PERCENT EXCEEDS	213		257		360	
50 PERCENT EXCEEDS	62		109		126	
90 PERCENT EXCEEDS	7.4		4.7		8.2	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04037400 CISCO LAKE NEAR WATERSMEET, MI

LOCATION.--Lat 46°15'10", long 89°27'07", in NE1/4 sec.32, T.45 N., R.41 W., Gogebic County, Hydrologic Unit 04020102, on right bank at outlet, 100 ft upstream from dam, 13 mi west of Watersmeet.

DRAINAGE AREA.--50.6 mi^2.

PERIOD OF RECORD.--July 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,679.53 ft above sea level (levels by Michigan Department of Natural Resources). July 15, 1942, to Oct. 28, 1969, nonrecording gage, and Oct. 28, 1969, to Oct. 23, 1989, water-stage recorder at site 90 ft downstream at same datum.

REMARKS.--Cisco Lake (capacity 15,600 acre-ft) is the downstream lake in a chain of lakes used as storage reservoirs by Upper Peninsula Power Company for power production at Victoria Dam near Rockland. Lake level is controlled at the outlet by a concrete dam with two bays and removable flash boards. The major inlet to Cisco Lake is the combined outlet from Lindsley Lake and Thousand Island Lake. Streamflow records are currently collected at the outlet, Cisco Branch Ontonagon River (station 04037500). The lake level is maintained at an elevation of approximately 1,683.5 ft, above sea level, during winter months and 1,684.0 ft, above sea level, during summer months. Surface area of lake is 506 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.69 ft, July 19, 1942; minimum, 1.72 ft, Mar. 20-22, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 4.16 ft, Aug. 1; minimum, 3.88 ft, July 10, 12, 14, Aug. 27.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.95	3.99	3.97	4.01	4.01	3.98	3.94	4.02	4.00	3.93	4.08	3.94
2	3.93	4.02	3.97	4.02	3.98	3.98	3.93	4.02	4.00	3.92	4.03	3.95
3	3.94	3.97	3.98	4.00	3.98	3.98	3.95	3.99	4.02	3.94	3.98	3.92
4	3.92	3.98	3.98	4.00	3.97	3.98	3.96	3.97	4.05	3.93	3.99	3.93
5	3.93	4.00	3.99	3.98	3.96	3.98	3.99	4.00	4.06	3.93	4.00	3.94
6	3.93	4.02	3.99	3.98	3.97	3.98	4.02	4.03	4.03	3.95	3.97	3.95
7	3.98	4.02	3.99	3.97	3.98	3.99	4.06	4.04	3.99	3.93	3.97	4.01
8	3.99	3.98	4.00	3.97	4.00	4.00	4.07	4.03	3.95	3.93	3.98	4.03
9	3.99	3.94	4.01	3.97	4.03	4.01	4.04	4.01	3.95	3.94	3.94	4.00
10	4.00	3.94	4.01	3.98	4.04	4.01	4.02	4.04	4.00	3.92	3.92	3.98
11	4.01	3.96	4.01	3.98	4.04	4.01	4.01	4.00	4.03	3.91	3.93	3.98
12	4.01	3.98	4.01	3.98	4.04	4.02	4.05	3.97	4.04	3.91	3.92	3.96
13	4.05	4.01	3.99	3.98	4.01	4.03	4.07	3.94	4.04	3.90	3.92	3.96
14	4.03	4.04	3.99	3.98	3.98	4.01	4.06	3.93	4.02	3.89	3.92	3.96
15	4.02	4.04	3.98	4.01	3.96	3.99	4.06	3.93	3.99	3.92	3.92	3.95
16	4.00	3.99	3.99	4.02	3.96	3.96	4.05	3.93	3.96	3.92	3.90	3.95
17	3.98	3.99	4.00	4.01	3.98	3.94	4.01	3.93	3.98	3.92	3.92	3.95
18	3.97	3.98	3.99	4.00	4.00	3.93	3.99	3.94	4.01	3.91	3.94	3.95
19	4.00	3.98	3.99	3.99	4.00	3.91	3.99	3.95	4.01	3.96	3.93	3.95
20	3.98	3.97	3.99	3.98	4.01	3.92	4.01	3.97	4.02	4.03	3.94	3.94
21	4.00	3.98	4.00	3.97	4.02	3.94	4.03	3.99	4.03	4.02	3.95	3.95
22	4.01	3.99	3.99	3.96	4.02	3.96	4.06	4.03	4.01	4.01	3.93	3.95
23	4.02	3.99	3.99	3.97	4.01	3.98	4.11	4.04	4.02	4.00	3.92	3.99
24	4.02	4.00	3.98	3.97	4.01	4.00	4.10	3.99	4.04	3.96	3.93	3.99
25	4.03	4.00	3.98	3.99	4.01	4.01	4.09	3.97	4.04	3.95	3.92	3.98
26	4.01	4.00	3.98	4.00	4.01	4.03	4.05	4.01	4.01	3.94	3.91	3.97
27	3.97	4.01	3.98	4.02	4.00	4.03	4.01	4.01	4.03	3.94	3.91	3.98
28	3.98	4.00	3.98	4.03	4.00	4.01	4.03	3.98	4.09	3.98	3.91	3.98
29	3.99	3.99	3.99	4.04	---	3.98	4.04	3.97	4.06	3.98	3.92	3.99
30	3.99	3.98	4.00	4.06	---	3.96	4.03	3.97	4.00	4.01	3.92	3.99
31	3.97	---	4.01	4.04	---	3.95	---	3.99	---	4.02	3.92	---
MEAN	3.99	3.99	3.99	4.00	4.00	3.98	4.03	3.99	4.02	3.95	3.94	3.97
MAX	4.05	4.04	4.01	4.06	4.04	4.03	4.11	4.04	4.09	4.03	4.08	4.03
MIN	3.92	3.94	3.97	3.96	3.96	3.91	3.93	3.93	3.95	3.89	3.90	3.92

CAL YR 2000 MEAN 3.85 MAX 4.24 MIN 3.44
WTR YR 2001 MEAN 3.99 MAX 4.11 MIN 3.89

STREAMS TRIBUTARY TO LAKE SUPERIOR

04037500 CISCO BRANCH ONTONAGON RIVER AT CISCO LAKE OUTLET, MI

LOCATION.--Lat 46°15'12", long 89°27'05", in NE1/4 sec.32, T.45 N., R.41 W., Gogebic County, Hydrologic Unit 04020102, on left bank 80 ft downstream from Cisco Lake Dam, 2.5 mi upstream from Langford Creek, 5.0 mi upstream from U.S. Highway 2, and 13 mi west of Watersmeet.

DRAINAGE AREA.--50.7 mi^2.

PERIOD OF RECORD.--October 1944 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,672.69 ft above sea level. Prior to Oct. 1, 1968, nonrecording gage at same site and at datum 4.00 ft higher.

REMARKS.--Records good except for daily discharges below 3.0 ft^3/s, which are poor. Flow regulated by Cisco Lake (station 04037400). Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	1.3	25	13	93	35	63	95	.71	90	112	.45
2	.85	1.4	15	32	68	23	35	108	.76	40	170	.45
3	.80	1.2	15	47	46	23	11	91	.81	1.9	104	.45
4	.80	1.1	15	47	45	23	11	36	17	1.7	27	.50
5	.80	1.2	15	46	26	23	12	3.0	57	1.6	27	.45
6	.80	27	15	46	6.9	16	45	2.9	94	1.5	16	.47
7	.80	58	15	45	1.9	12	141	29	91	1.3	2.3	.53
8	.80	55	15	33	1.9	12	172	62	44	1.2	2.0	39
9	.72	16	15	19	14	19	170	68	1.3	1.2	1.4	68
10	.70	1.2	15	14	25	25	167	89	1.4	1.1	.95	46
11	.70	1.2	22	14	25	25	168	119	17	1.0	.71	24
12	6.4	1.2	37	14	49	36	173	116	39	1.0	.61	14
13	44	1.4	47	14	80	58	175	112	67	.97	.53	1.3
14	76	23	47	14	76	68	173	59	82	.91	.52	1.1
15	75	87	41	21	41	66	172	14	53	.90	.52	.86
16	74	91	35	38	12	64	171	1.5	24	.80	.52	.77
17	49	47	35	48	2.6	63	167	1.0	25	.80	.56	.67
18	13	47	35	47	2.6	61	123	.70	50	.71	.52	.52
19	.88	46	35	46	2.6	32	71	.66	43	.84	.52	.52
20	.72	35	35	46	7.1	1.1	59	.70	27	13	.51	.49
21	.70	11	35	45	23	.92	71	.92	39	27	.45	.42
22	.72	11	35	28	40	.90	103	29	39	26	.45	.42
23	8.2	11	35	6.5	47	.83	156	70	27	25	.45	.45
24	19	11	34	1.6	47	.80	178	90	27	14	.45	.44
25	51	11	35	1.6	48	.80	176	58	49	.80	.45	.41
26	70	11	22	1.6	47	15	172	55	47	.74	.45	.42
27	36	17	13	1.6	47	52	111	92	14	.70	.45	.42
28	13	34	13	1.4	46	67	72	72	34	.80	.45	.40
29	13	47	13	13	---	66	72	20	80	.80	.45	.40
30	13	42	13	47	---	65	85	1.7	96	.82	.45	.41
31	6.2	---	13	81	---	64	---	1.0	---	12	.45	---
TOTAL	578.39	749.2	790	872.3	970.6	1018.35	3475	1498.08	1186.98	271.09	473.12	204.72
MEAN	18.7	25.0	25.5	28.1	34.7	32.8	116	48.3	39.6	8.74	15.3	6.82
MAX	76	91	47	81	93	68	178	119	96	90	170	68
MIN	.70	1.1	13	1.4	1.9	.80	11	.66	.71	.70	.45	.40

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2001, BY WATER YEAR (WY)

MEAN	67.3	66.3	47.3	39.0	34.9	43.9	61.2	46.5	44.8	32.6	25.3	36.6
MAX	151	116	84.1	62.6	81.0	92.1	117	160	123	113	99.7	104
(WY)	1986	1968	1961	1983	1945	1973	1997	1996	1953	1953	1978	1977
MIN	13.1	14.5	23.5	23.1	20.6	24.1	2.02	.17	.11	.25	.15	.23
(WY)	1958	1945	1990	1959	1950	1956	1948	1977	1977	1977	1970	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1945 - 2001	
ANNUAL TOTAL	11073.33		12087.83			
ANNUAL MEAN	30.3		33.1		45.5	
HIGHEST ANNUAL MEAN					65.9	1973
LOWEST ANNUAL MEAN					25.2	1949
HIGHEST DAILY MEAN	188	Jul 3	178	Apr 24	288	May 1 1951
LOWEST DAILY MEAN	.35	May 25	.40	Sep 28	.08	Jul 21 1988
ANNUAL SEVEN-DAY MINIMUM	.39	May 21	.41	Sep 24	.09	Jul 28 1988
MAXIMUM PEAK FLOW			182	(a)	288	May 1 1951
MAXIMUM PEAK STAGE			5.60	(a)	(b)6.10	May 1 1951
ANNUAL RUNOFF (CFSM)	.60		.65		.90	
ANNUAL RUNOFF (INCHES)	8.12		8.87		12.19	
10 PERCENT EXCEEDS	77		88		102	
50 PERCENT EXCEEDS	18		17		37	
90 PERCENT EXCEEDS	.80		.53		.90	

(a) Apr. 24, Aug. 1.
(b) Present datum.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04040000 ONTONAGON RIVER NEAR ROCKLAND, MI

LOCATION.--Lat 46°43'15", long 89°12'25", in NE1/4 sec.20, T.50 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, on left bank 150 ft downstream from bridge on Victoria Road, 1.8 mi southwest of Rockland, and 2.4 mi downstream from confluence of Middle and West Branches.

DRAINAGE AREA.--1,340 mi^2.

PERIOD OF RECORD.--June 1942 to current year.

REVISED RECORDS.--WSP 1387: 1943, 1946-47. WSP 1911: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 638.72 ft above sea level. Prior to Nov. 23, 1943, nonrecording gage, and Nov. 23, 1943, to Oct. 17, 1967, water-stage recorder at site 50 ft upstream at same datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by Victoria powerplant on West Branch 5 mi upstream; Bond Falls Reservoir (station 04034000) 34 mi upstream; Lake Gogebic (station 04035995) and Cisco Lake (station 04037400), in headwaters. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	463	450	502	e510	e550	e460	e1700	2170	1180	845	619	287
2	526	435	458	e510	e550	e470	e1800	2080	1010	724	1210	279
3	421	397	400	e510	e550	e450	1890	2050	1180	832	1430	256
4	386	417	459	e510	e550	e480	2210	1840	1100	780	855	252
5	322	393	e500	e510	e560	e480	3210	1170	1080	481	703	243
6	405	379	e510	e490	e560	e480	4280	1120	1010	671	593	424
7	411	403	e520	e510	e560	e500	8590	1110	660	665	338	297
8	435	411	e520	e510	e560	e520	15600	1150	860	465	461	395
9	421	462	e490	e510	e560	e540	11300	975	743	307	503	381
10	402	432	e510	e510	e520	e520	9120	1330	719	295	370	362
11	426	495	e510	e510	e540	e550	9910	1660	928	291	362	444
12	356	494	e510	e520	e540	e560	13100	1350	923	287	361	571
13	401	439	e510	e510	e530	e580	11700	1200	790	284	366	524
14	370	684	e510	e540	e520	e600	9890	1110	881	283	366	357
15	495	646	e510	e540	e520	e620	8690	1090	809	293	362	336
16	569	528	e490	e540	e510	e640	7780	1140	843	303	374	294
17	514	523	e510	e540	e470	e630	5000	1020	853	299	399	223
18	623	568	e510	e540	e490	e690	4150	1000	798	295	386	223
19	518	516	e510	e540	e490	e720	3650	950	962	300	377	222
20	403	439	e510	e510	e490	e760	3700	754	1050	323	367	268
21	457	394	e510	e540	e490	e830	4500	786	937	391	365	317
22	422	362	e510	e540	e490	e1130	6400	1080	725	364	361	316
23	455	456	e490	e540	e480	e1520	9370	1310	727	462	322	339
24	405	446	e510	e540	e440	e1550	8190	1170	743	551	285	341
25	424	480	e510	e540	e460	e1420	6330	1110	745	379	285	331
26	390	545	e510	e540	e460	e1250	4980	2030	652	262	287	318
27	364	483	e510	e510	e460	e1220	3870	2940	673	252	285	314
28	437	514	e510	e540	e460	e1190	2960	2530	1340	264	281	295
29	497	545	e510	e550	---	e1140	2530	2030	1210	333	278	276
30	439	543	e490	e550	---	e1250	2360	1830	811	448	286	276
31	355	---	e510	e550	---	e1400	---	1320	---	723	298	---
TOTAL	13512	14279	15519	16310	14360	25150	188760	44405	26942	13452	14135	9761
MEAN	436	476	501	526	513	811	6292	1432	898	434	456	325
MAX	623	684	520	550	560	1550	15600	2940	1340	845	1430	571
MIN	322	362	400	490	440	450	1700	754	652	252	278	222

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	1109	1226	926	829	862	1543	4037	2023	1437	1001	796	856
MAX	3767	3232	1683	1473	1525	4355	6912	5257	3309	2879	2563	2679
(WY)	1986	1989	1983	1969	1984	1973	1971	1996	1951	1952	1942	1942
MIN	333	400	410	396	505	667	922	404	431	314	359	312
(WY)	1949	1949	1949	1949	1949	1956	1987	1977	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	303392		396585			
ANNUAL MEAN	829		1087		1379	
HIGHEST ANNUAL MEAN					1967	1996
LOWEST ANNUAL MEAN					774	1948
HIGHEST DAILY MEAN	7000	Feb 27	15600	Apr 8	31200	Aug 22 1942
LOWEST DAILY MEAN	322	Oct 5	222	Sep 19	170	(a)
ANNUAL SEVEN-DAY MINIMUM	392	Sep 3	266	Sep 16	246	Jul 25 1963
MAXIMUM PEAK FLOW			17300	Apr 8	(b)42000	Aug 22 1942
MAXIMUM PEAK STAGE			16.65	Apr 8	(c)28.6	Aug 22 1942
ANNUAL RUNOFF (CFSM)	.62		.81		1.03	
ANNUAL RUNOFF (INCHES)	8.42		11.01		13.98	
10 PERCENT EXCEEDS	1740		1830		2730	
50 PERCENT EXCEEDS	514		510		872	
90 PERCENT EXCEEDS	400		311		508	

(a) Aug. 13, 14, 1991.
(b) From rating curve extended above 14,000 ft^3/s on basis of slope-area measurement of peak flow.
(c) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04040500 STURGEON RIVER NEAR SIDNAW, MI

LOCATION.--Lat 46°35'03", long 88°34'33", in NE1/4 SE1/4 sec.5, T.48 N., R.34 W., Baraga County, Hydrologic Unit 04020104, on right bank 30 ft downstream from highway bridge, 3.0 mi downstream from Rock River, 3.5 mi northwest of Covington, 6.5 mi upstream from Perch River, 8.5 mi northeast of Sidnaw, and at mile 71.

DRAINAGE AREA.--171 mi^2.

PERIOD OF RECORD.--October 1912 to September 1915, April 1943 to current year.

REVISED RECORDS.--WSP 1507: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,214.40 ft above sea level. October 1912 to September 1915, nonrecording gage at site 200 ft upstream at different datum. Apr. 2, 1943, to Oct. 1, 1946, nonrecording gage at present site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	56	72	e46	e52	e43	146	501	167	38	156	18
2	26	54	e70	e46	e52	e44	153	446	180	33	168	17
3	25	51	e58	e46	e52	e45	151	395	216	31	146	19
4	24	47	e56	e46	e52	e46	188	342	211	28	123	16
5	22	45	e56	e46	e52	e46	253	294	183	25	105	13
6	23	43	e56	e46	e52	e46	377	251	153	22	92	12
7	26	43	e56	e46	e51	e48	704	236	128	22	81	32
8	30	43	e54	e46	e50	e50	1150	306	111	21	70	40
9	34	45	e54	e46	e50	e52	933	277	98	19	63	51
10	37	46	e53	e46	e49	e52	845	271	103	18	54	55
11	38	46	e52	e46	e49	e52	1090	274	151	16	47	59
12	38	49	e50	e48	e48	e52	1580	251	148	15	41	52
13	44	54	e49	e49	e48	e52	1760	219	133	14	36	55
14	57	90	e49	e50	e47	e57	1870	198	124	13	32	41
15	77	104	e48	e51	e46	e58	1910	184	107	15	30	35
16	93	104	e47	e52	e46	e59	1890	218	103	20	30	30
17	91	99	e46	e52	e45	e61	1560	230	143	29	36	27
18	83	92	e46	e52	e45	e63	1220	197	147	126	37	25
19	75	80	e46	e52	e44	e70	1030	165	146	402	34	23
20	68	82	e46	e52	e44	e100	983	142	121	1240	31	22
21	61	79	e46	e52	e43	116	1160	127	98	979	28	22
22	55	79	e46	e52	e43	158	1610	346	84	738	25	22
23	56	78	e46	e52	e43	165	1790	449	74	577	23	25
24	62	81	e46	e52	e43	167	1880	414	65	391	21	34
25	65	81	e46	e52	e43	149	1650	361	57	273	20	34
26	70	79	e46	e52	e43	142	1220	374	51	206	20	33
27	67	80	e46	e52	e43	131	940	373	49	165	19	31
28	72	79	e46	e52	e43	136	775	321	54	151	18	28
29	70	78	e46	e53	---	120	662	266	50	167	16	26
30	62	76	e46	e54	---	120	574	218	45	166	18	25
31	58	---	e46	e54	---	127	---	187	---	154	19	---
TOTAL	1635	2063	1570	1541	1318	2627	32054	8833	3500	6114	1639	922
MEAN	52.7	68.8	50.6	49.7	47.1	84.7	1068	285	117	197	52.9	30.7
MAX	93	104	72	54	52	167	1910	501	216	1240	168	59
MIN	22	43	46	46	43	43	146	127	45	13	16	12
CFSM	.31	.40	.30	.29	.28	.50	6.25	1.67	.68	1.15	.31	.18
IN.	.36	.45	.34	.34	.29	.57	6.97	1.92	.76	1.33	.36	.20

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2001, BY WATER YEAR (WY)

MEAN	175	190	114	69.6	63.6	164	754	456	208	128	80.7	120
MAX	547	599	242	162	191	744	1321	1147	579	503	319	586
(WY)	1986	1989	1983	1969	1984	1973	1960	1965	1944	1968	1978	1968
MIN	11.5	17.3	16.0	15.5	15.4	39.8	266	33.8	24.4	8.00	7.86	4.63
(WY)	1977	1977	1977	1977	1977	1956	1946	1998	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1913 - 2001	
ANNUAL TOTAL	54515		63816			
ANNUAL MEAN	149		175		209	
HIGHEST ANNUAL MEAN					311	1968
LOWEST ANNUAL MEAN					99.9	1998
HIGHEST DAILY MEAN	1050	Mar 27	1910	Apr 15	4450	Apr 21 1985
LOWEST DAILY MEAN	20	Aug 25	12	Sep 6	2.7	Sep 13 1976
ANNUAL SEVEN-DAY MINIMUM	25	Oct 1	16	Jul 9	3.2	Aug 28 1976
MAXIMUM PEAK FLOW			1960	Apr 16	4630	Apr 24 1960
MAXIMUM PEAK STAGE			8.25	Apr 16	11.63	Apr 24 1960
INSTANTANEOUS LOW FLOW			12	(a)	2.7	Sep 13 1976
ANNUAL RUNOFF (CFSM)	.87		1.02		1.22	
ANNUAL RUNOFF (INCHES)	11.86		13.88		16.61	
10 PERCENT EXCEEDS	380		375		514	
50 PERCENT EXCEEDS	70		53		98	
90 PERCENT EXCEEDS	38		25		32	

(a) July 14, 15, Sept. 5, 6.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04041500 STURGEON RIVER NEAR ALSTON, MI

LOCATION.--Lat 46°43'35", long 88°39'43", in SE1/4 sec.15, T.50 N., R.35 W., Baraga County, Hydrologic Unit 04020104, on right bank in powerhouse of Upper Peninsula Power Co. at Prickett Dam, 4.0 mi upstream from Clear Creek, 5.0 mi southeast of Alston, and at mile 45.

DRAINAGE AREA.--346 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1932 to June 1941, October 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 709.64 ft above sea level. Prior to Jan. 5, 1948, nonrecording gage, and Jan. 5, 1948 to Sept. 30, 1963, water-stage recorder at same site at datum 39.34 ft lower.

REMARKS.--Records good. Flow regulated by powerplant at station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	172	201	168	140	176	279	926	290	249	310	91
2	135	172	201	168	141	182	321	922	318	206	308	92
3	136	170	200	168	253	189	345	815	496	172	307	89
4	138	171	199	167	216	189	345	578	493	140	205	88
5	136	170	199	167	139	189	447	435	377	54	186	88
6	131	158	176	e167	140	188	897	434	248	54	186	89
7	127	147	157	167	163	180	1350	436	218	101	186	90
8	129	147	151	167	183	175	2910	497	232	148	186	109
9	129	147	145	167	189	175	1950	583	241	148	187	168
10	129	147	145	167	195	175	1470	571	242	147	175	168
11	129	148	145	167	195	175	1760	543	444	147	59	168
12	130	148	145	167	184	168	2550	541	328	147	60	167
13	130	155	150	167	168	162	2930	441	256	123	74	167
14	131	189	155	167	169	167	2800	342	263	96	193	160
15	130	221	153	163	168	172	2710	336	298	97	187	154
16	133	258	153	162	173	172	2730	338	271	128	59	153
17	203	234	153	164	178	173	2450	442	222	132	74	152
18	249	219	154	167	177	172	2050	498	233	59	180	152
19	249	249	153	168	175	187	1630	474	253	203	179	152
20	198	250	156	167	164	195	1500	302	292	1260	149	138
21	158	221	159	167	170	214	1690	249	288	1560	56	125
22	158	181	160	167	171	221	2430	324	231	1130	57	107
23	158	167	159	168	160	293	2660	669	220	627	58	84
24	159	166	159	175	150	352	2840	712	220	635	106	84
25	159	167	159	180	149	351	2450	603	201	518	181	105
26	158	167	164	173	150	273	2030	701	185	263	179	152
27	158	175	168	181	151	222	1390	678	125	188	179	152
28	158	182	168	181	166	281	1480	399	124	224	121	151
29	158	192	168	172	---	315	1040	473	306	335	92	151
30	164	201	169	164	---	293	833	502	250	335	92	150
31	172	---	169	154	---	278	---	334	---	322	92	---
TOTAL	4767	5491	5093	5214	4777	6654	52267	16098	8165	9948	4663	3896
MEAN	154	183	164	168	171	215	1742	519	272	321	150	130
MAX	249	258	201	181	253	352	2930	926	496	1560	310	168
MIN	127	147	145	154	139	162	279	249	124	54	56	84
CFSM	.44	.53	.47	.49	.49	.62	5.04	1.50	.79	.93	.43	.38
IN.	.51	.59	.55	.56	.51	.72	5.62	1.73	.88	1.07	.50	.42

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 2001, BY WATER YEAR (WY)

MEAN	338	378	265	210	202	373	1158	791	432	303	226	266
MAX	973	1001	433	380	412	1255	2093	1799	973	894	595	1056
(WY)	1986	1989	1988	1969	1984	1973	1960	1996	1944	1968	1978	1968
MIN	99.4	120	101	111	133	164	420	146	138	94.2	100	70.9
(WY)	1949	1949	1977	1977	1964	1940	1987	1998	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1932 - 2001	
ANNUAL TOTAL	114141		127033			
ANNUAL MEAN	312		348		414	
HIGHEST ANNUAL MEAN					582	1960
LOWEST ANNUAL MEAN					247	1948
HIGHEST DAILY MEAN	1900	Mar 28	2930	Apr 13	6820	Apr 25 1960
LOWEST DAILY MEAN	113	Jun 8	54	Jul 5	(a)1.0	(b)
ANNUAL SEVEN-DAY MINIMUM	113	Aug 24	90	Sep 1	1.1	Aug 14 1960
MAXIMUM PEAK FLOW			3140	Apr 8	7360	Apr 24 1960
MAXIMUM PEAK STAGE			8.37	Apr 8	(c)13.75	Apr 24 1960
ANNUAL RUNOFF (CFSM)	.90		1.01		1.20	
ANNUAL RUNOFF (INCHES)	12.27		13.66		16.24	
10 PERCENT EXCEEDS	684		630		841	
50 PERCENT EXCEEDS	184		173		262	
90 PERCENT EXCEEDS	134		128		138	

(a) Approximately; result of draining pond for dam repair.
(b) Aug. 14-19, 1960.
(c) Present datum.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04041500 STURGEON RIVER NEAR ALSTON, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 1998 to current year.

INSTRUMENTATION.--Water temperature recorder with telemetry since Apr. 7, 1998.

REMARKS.--Records represent water temperature at sensor within 0.5°C, from Apr. 1 to Sept. 30.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 29.5°C, Aug. 7, 2001.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 29.5°C, Aug. 7.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	2.5	.5	1.5	15.0	12.0	13.0
2	---	---	---	---	---	---	2.5	.5	1.5	15.5	13.0	14.0
3	---	---	---	---	---	---	2.5	.5	2.0	15.0	13.0	14.0
4	---	---	---	---	---	---	3.0	.5	2.0	15.0	13.0	14.0
5	---	---	---	---	---	---	3.0	1.0	2.0	16.0	13.0	14.5
6	---	---	---	---	---	---	3.0	1.0	2.0	16.0	14.0	15.0
7	---	---	---	---	---	---	3.5	1.0	2.0	15.5	14.0	15.0
8	---	---	---	---	---	---	3.0	1.0	2.0	15.5	13.5	14.5
9	---	---	---	---	---	---	3.0	.5	2.0	16.5	13.5	14.5
10	---	---	---	---	---	---	2.5	.0	1.5	16.5	13.5	15.0
11	---	---	---	---	---	---	2.0	.0	1.0	15.0	13.0	14.0
12	---	---	---	---	---	---	2.5	.0	1.5	15.5	12.5	14.0
13	---	---	---	---	---	---	3.0	1.0	2.0	15.5	12.5	13.5
14	---	---	---	---	---	---	3.5	1.5	2.5	15.5	13.0	14.0
15	---	---	---	---	---	---	3.5	1.5	2.5	16.0	13.5	14.5
16	---	---	---	---	---	---	4.5	2.0	3.0	17.0	14.5	15.5
17	---	---	---	---	---	---	4.5	2.5	3.5	17.5	14.5	16.0
18	---	---	---	---	---	---	4.5	2.5	3.5	18.0	15.5	16.5
19	---	---	---	---	---	---	5.0	2.5	3.5	20.0	16.0	17.0
20	---	---	---	---	---	---	5.5	3.0	4.0	20.5	15.5	18.0
21	---	---	---	---	---	---	6.5	3.5	5.0	20.0	18.0	19.0
22	---	---	---	---	---	---	7.0	4.5	6.0	19.0	17.0	18.0
23	---	---	---	---	---	---	7.0	5.0	6.0	18.5	16.0	17.0
24	---	---	---	---	---	---	8.0	5.5	6.5	17.0	14.0	15.5
25	---	---	---	---	---	---	9.5	5.5	7.5	16.5	13.5	15.0
26	---	---	---	---	---	---	10.0	7.5	8.5	16.0	14.0	15.0
27	---	---	---	---	---	---	10.0	7.5	9.0	15.5	13.5	14.5
28	---	---	---	---	---	---	12.5	8.0	10.5	16.0	13.0	14.5
29	---	---	---	---	---	---	13.5	11.0	12.0	15.0	13.0	14.0
30	---	---	---	---	---	---	13.5	11.5	12.5	16.0	14.0	15.0
31	---	---	---	---	---	---	---	---	---	17.5	14.0	15.5
MONTH	---	---	---	---	---	---	13.5	.0	4.3	20.5	12.0	15.1

STREAMS TRIBUTARY TO LAKE SUPERIOR

04041500 STURGEON RIVER NEAR ALSTON, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	14.5	16.0	25.5	22.0	23.5	23.0	20.5	22.0	21.0	19.0	20.0
2	16.0	13.5	15.0	23.5	21.0	22.5	23.5	21.0	22.0	21.5	19.0	20.5
3	15.0	13.0	14.0	23.5	20.5	21.5	24.5	21.0	22.5	21.0	19.5	20.5
4	15.0	13.0	14.0	22.5	18.5	21.5	25.0	21.5	23.5	21.0	19.0	20.0
5	15.0	12.5	14.0	20.0	17.5	19.0	29.0	22.5	26.0	21.5	19.0	20.0
6	15.5	13.0	14.0	20.5	17.5	19.0	28.0	25.0	26.5	22.0	19.5	21.0
7	16.0	13.5	15.0	22.5	18.0	20.5	29.5	25.0	27.0	22.5	20.5	21.5
8	18.0	14.5	16.0	23.5	20.5	22.0	28.0	25.0	26.5	22.5	20.5	21.5
9	18.5	15.5	17.0	23.5	21.0	22.5	27.5	25.0	26.5	22.0	20.0	21.0
10	17.0	15.0	16.0	23.5	19.5	21.5	26.0	20.0	24.5	21.0	19.5	20.5
11	20.0	15.0	17.5	22.5	20.5	21.5	23.0	20.0	21.5	21.0	19.0	20.0
12	19.5	16.5	18.5	23.0	20.0	21.5	22.0	19.5	21.0	20.5	19.0	19.5
13	18.5	16.0	17.0	22.0	19.5	21.0	23.0	19.5	20.5	20.0	17.5	19.0
14	21.5	16.5	19.0	23.0	19.5	21.0	24.0	21.5	22.5	19.0	17.5	18.0
15	21.5	19.5	20.5	22.5	19.5	21.0	23.5	21.5	22.0	19.5	17.0	18.5
16	21.5	19.0	20.0	24.0	20.0	22.0	22.0	18.5	20.0	19.0	17.0	18.0
17	22.0	18.5	20.0	23.0	18.5	21.0	23.0	18.5	20.0	19.0	17.5	18.0
18	20.0	18.0	19.0	22.0	18.0	20.0	22.5	19.0	21.0	18.5	17.0	17.5
19	20.5	18.5	19.5	25.5	18.5	22.5	21.0	19.5	20.5	18.0	16.0	17.0
20	21.5	18.5	20.0	25.5	22.5	24.0	22.5	18.5	20.5	18.0	16.0	17.0
21	19.5	16.5	18.0	25.5	22.5	24.0	22.0	18.5	20.0	18.0	16.0	17.0
22	19.0	17.5	18.0	26.0	22.0	23.5	21.5	19.5	20.5	17.5	16.0	16.5
23	22.5	17.5	19.5	27.5	23.5	25.0	21.0	17.5	19.5	17.0	14.5	16.0
24	23.0	19.0	21.0	26.5	23.0	25.0	22.0	18.0	20.0	16.0	14.0	15.0
25	24.5	20.5	22.5	24.0	21.0	22.5	22.5	20.5	21.5	16.0	13.5	14.5
26	25.0	22.0	23.5	23.0	21.0	22.0	23.0	21.0	22.0	15.5	14.0	15.0
27	24.0	19.0	22.0	23.5	21.0	22.5	23.0	21.0	22.0	15.5	14.0	15.0
28	25.5	18.5	21.0	23.0	21.0	22.0	22.5	20.0	21.0	15.5	13.5	14.5
29	26.5	22.5	25.0	22.0	20.5	21.5	23.0	19.5	21.0	16.0	13.5	14.5
30	27.0	24.0	25.5	22.0	20.0	21.0	22.5	20.5	21.5	16.5	14.5	15.5
31	—	—	—	22.5	20.0	21.0	22.0	19.5	20.5	—	—	—
MONTH	27.0	12.5	18.6	27.5	17.5	21.9	29.5	17.5	22.1	22.5	13.5	18.1

STREAMS TRIBUTARY TO LAKE SUPERIOR

04043050 TRAP ROCK RIVER NEAR LAKE LINDEN, MI

LOCATION.--Lat 47°13'43", long 88°23'07", in SE1/4 SE1/4 sec.20, T.56 N., R.32 W., Houghton County, Hydrologic Unit 04020103, on right bank 20 ft upstream from bridge on county highway, 2.0 mi northeast of Lake Linden, and 3.0 mi upstream from mouth.

DRAINAGE AREA.--28.0 mi^2.

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 621.7 ft above sea level.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	9.0	12	12	13	e12	38	171	31	14	19	9.4
2	7.7	9.1	11	12	12	e12	37	123	39	14	22	9.3
3	7.8	9.1	e11	12	e12	e12	44	92	38	14	17	9.0
4	7.4	9.1	11	12	e12	12	56	73	33	14	15	9.0
5	7.6	9.0	11	12	e12	12	72	60	27	14	14	8.8
6	9.5	9.0	11	12	13	e12	93	50	23	14	13	9.2
7	11	10	e11	12	12	12	144	51	21	15	12	9.3
8	12	11	e11	12	12	e12	260	66	20	16	13	11
9	12	11	e11	12	12	12	256	51	19	14	14	15
10	11	11	11	12	12	12	183	54	19	14	13	16
11	10	12	11	12	e12	12	239	52	23	13	12	20
12	9.8	12	12	12	e12	12	518	42	22	13	11	17
13	9.4	17	12	12	e12	e12	486	39	30	12	11	16
14	9.8	18	12	12	e12	e12	421	35	46	12	11	13
15	12	17	12	12	e12	e12	428	33	30	13	13	12
16	11	15	12	12	e12	e12	425	41	25	36	15	12
17	11	14	12	12	e12	13	218	42	21	70	15	11
18	11	13	12	12	e12	13	194	34	20	94	14	11
19	10	12	12	12	e12	13	252	29	20	78	13	11
20	9.9	12	12	12	e12	14	357	32	19	59	12	11
21	9.8	12	12	12	e12	19	747	40	18	33	11	10
22	9.4	12	12	12	e12	27	623	213	19	24	11	10
23	9.5	12	12	12	e12	31	498	115	18	20	11	10
24	9.7	12	e12	12	e12	29	416	68	16	18	10	9.8
25	9.7	12	e12	11	e12	25	334	56	15	16	10	9.7
26	9.4	12	e12	12	e12	22	363	69	15	15	10	9.7
27	9.4	12	e12	12	e12	21	330	57	14	14	10	9.7
28	9.5	13	e12	12	e12	20	206	45	14	14	9.7	9.6
29	9.2	13	e12	12	---	20	194	37	14	14	9.4	9.8
30	9.0	13	e12	13	---	24	218	31	15	14	9.4	9.5
31	9.0	---	e12	13	---	30	---	27	---	14	9.5	---
TOTAL	301.3	362.3	362	373	338	513	8650	1928	684	739	390.0	337.8
MEAN	9.72	12.1	11.7	12.0	12.1	16.5	288	62.2	22.8	23.8	12.6	11.3
MAX	12	18	12	13	13	31	747	213	46	94	22	20
MIN	7.4	9.0	11	11	12	12	37	27	14	12	9.4	8.8
CFSM	.35	.43	.42	.43	.43	.59	10.3	2.22	.81	.85	.45	.40
IN.	.40	.48	.48	.50	.45	.68	11.49	2.56	.91	.98	.52	.45

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2001, BY WATER YEAR (WY)

MEAN	30.8	38.7	25.6	20.2	20.3	44.0	177	77.8	36.8	21.7	17.1	21.5
MAX	94.6	134	43.9	33.2	42.8	112	288	223	117	63.5	70.2	92.5
(WY)	1986	1989	1988	1969	1984	1973	2001	1972	1968	1968	1988	1968
MIN	8.71	9.66	9.28	9.03	9.00	16.1	63.5	16.5	11.7	11.4	9.34	7.84
(WY)	1977	1977	1977	1977	1977	1972	1998	1998	1977	1967	2000	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1967 - 2001	
ANNUAL TOTAL	10865.4		14978.4			
ANNUAL MEAN	29.7		41.0		44.2	
HIGHEST ANNUAL MEAN					62.6	1979
LOWEST ANNUAL MEAN					26.8	1998
HIGHEST DAILY MEAN	270	Mar 27	747	Apr 21	1120	May 10 1979
LOWEST DAILY MEAN	7.3	Aug 30	7.4	Oct 4	6.5	Sep 11 1998
ANNUAL SEVEN-DAY MINIMUM	7.8	Sep 29	8.4	Oct 1	6.8	Sep 7 1998
MAXIMUM PEAK FLOW			987	Apr 21	1590	May 10 1979
MAXIMUM PEAK STAGE			10.39	Apr 21	10.72	May 10 1979
INSTANTANEOUS LOW FLOW			5.4	Mar 18	(a)1.7	Jan 18 1990
ANNUAL RUNOFF (CFSM)	1.06		1.47		1.58	
ANNUAL RUNOFF (INCHES)	14.44		19.90		21.47	
10 PERCENT EXCEEDS	70		68		89	
50 PERCENT EXCEEDS	15		12		21	
90 PERCENT EXCEEDS	8.6		9.7		12	

(a) Result of ice jam upstream.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04043800 McCLURE STORAGE BASIN RELEASE NEAR MARQUETTE, MI

LOCATION.--Lat 46°34'19", long 87°28'35", in SW1/4 NE1/4 sec.7, T.48 N., R.25 W., Marquette County, Hydrologic Unit 04020105, on left bank in power house of Upper Peninsula Power Co., 600 ft upstream from Reany Creek, 2.5 mi downstream from McClure Dam, and 4.3 mi northwest of Marquette.

PERIOD OF RECORD.--April 1990 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 785 ft above sea level, from topographic map.

REMARKS.--Records good except for daily discharges below 10 ft^3/s, which are poor. Flow completely regulated by powerplant at station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	31	64	53	59	139	164	335	315	345	242	112
2	61	.15	64	53	59	138	170	335	317	322	285	111
3	61	.02	64	54	61	137	173	334	320	201	238	111
4	60	.02	58	54	60	138	174	337	317	137	216	111
5	57	.02	53	54	59	161	233	339	314	138	215	112
6	54	.05	57	54	59	176	264	338	290	61	199	112
7	54	.22	59	54	59	176	274	337	269	.33	180	112
8	55	.26	59	54	62	176	283	338	218	.28	181	112
9	55	.26	59	54	65	174	332	338	52	.23	180	113
10	54	23	59	54	66	175	346	325	98	.22	159	112
11	54	96	59	54	66	173	348	342	160	.11	138	111
12	54	96	59	54	63	150	e362	343	170	43	137	111
13	54	94	58	54	62	143	e362	341	214	100	130	111
14	54	121	58	54	60	140	355	342	220	87	127	112
15	54	140	58	58	59	129	352	342	313	88	121	112
16	135	139	53	63	59	130	350	343	348	88	118	112
17	168	139	49	59	59	131	342	346	348	102	115	104
18	159	139	55	50	60	131	339	345	348	123	113	98
19	277	140	60	48	61	131	341	345	348	167	114	98
20	349	140	60	49	62	128	346	345	347	340	112	101
21	351	139	58	49	62	120	353	348	348	338	110	101
22	352	138	58	49	61	123	351	349	348	339	109	101
23	350	136	58	48	60	123	e353	349	349	346	109	101
24	351	135	58	48	60	123	e353	350	346	345	109	105
25	172	133	58	48	60	122	339	350	345	343	109	106
26	64	133	57	48	86	126	336	350	344	300	109	105
27	71	132	57	48	122	138	338	351	342	214	110	103
28	74	128	53	49	138	153	338	349	347	184	110	101
29	74	91	53	49	---	159	336	349	343	184	110	100
30	92	66	53	50	---	162	336	350	342	183	110	99
31	72	---	53	56	---	164	---	329	---	181	111	---
TOTAL	3953	2530.00	1781	1623	1869	4489	9343	10614	8780	5300.17	4526	3210
MEAN	128	84.3	57.5	52.4	66.8	145	311	342	293	171	146	107
MAX	352	140	64	63	138	176	362	351	349	346	285	113
MIN	54	.02	49	48	59	120	164	325	52	.11	109	98

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 2001, BY WATER YEAR (WY)

MEAN	123	141	162	150	171	233	280	257	198	140	104	107
MAX	213	295	304	254	337	334	348	355	347	242	267	194
(WY)	1991	1991	1992	1997	1997	1998	1998	1996	1996	1996	2000	1997
MIN	78.6	2.53	57.5	52.4	66.8	145	195	99.6	73.7	14.9	6.29	57.3
(WY)	1999	2000	2001	2001	2001	2001	1995	2000	1991	1997	1997	1993

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1990 - 2001	
ANNUAL TOTAL	54895.00		58018.17			
ANNUAL MEAN	150		159		173	
HIGHEST ANNUAL MEAN					234	1996
LOWEST ANNUAL MEAN					140	1998
HIGHEST DAILY MEAN	353	Mar 24	362	Apr 12	(e)370	May 20 1996
LOWEST DAILY MEAN	.02	Nov 3	.02	Nov 3	.00	(a)
ANNUAL SEVEN-DAY MINIMUM	.11	Nov 2	.11	Nov 2	.00	Nov 2 1999
10 PERCENT EXCEEDS	348		346		341	
50 PERCENT EXCEEDS	128		115		168	
90 PERCENT EXCEEDS	58		53		61	

(a) On several days in water years 1992, 1994, 1998, 1999, 2000.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE SUPERIOR

04044609 SAND RIVER WILDLIFE FLOODING AT SAND RIVER, MI

LOCATION.--Lat 46°29'14", long 87°07'30", in SW1/4 NE1/4 sec.12, T.47 N., R.23 W., Marquette County, Hydrologic Unit 04020201, on right bank at dam at Sand River, 1.2 mi upstream from mouth.

DRAINAGE AREA.--28.6 mi^2. Area of Sand River Wildlife Flooding is 0.6 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 600.0 ft above sea level (Michigan Department of Natural Resources bench mark).

REMARKS.--Pond level regulated by concrete dam with two 20-foot stop-log bays and a 20-foot radial gate. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 11.84 ft, Nov. 6, 1988; minimum, 4.46 ft, Aug. 5, 1998.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 9.70 ft, June 19; minimum, 5.12 ft, May 7.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.75	9.00	9.52	7.06	6.23	6.20	5.38	5.37	8.07	9.16	7.96	7.29
2	7.73	9.00	9.51	6.92	6.29	6.04	5.40	5.33	8.24	9.12	7.92	7.29
3	7.72	8.98	9.49	6.78	6.32	5.79	5.54	5.29	8.49	9.07	7.89	7.25
4	7.71	8.96	9.46	6.64	6.33	5.68	5.66	5.24	8.77	9.02	7.85	7.22
5	7.71	8.96	9.34	6.53	6.29	5.60	5.89	5.19	8.94	8.96	7.82	7.21
6	7.71	8.96	9.23	6.44	6.24	5.45	6.31	5.16	9.02	8.92	7.77	7.20
7	7.74	8.95	9.14	6.39	6.18	5.35	6.83	5.20	9.05	8.86	7.73	7.20
8	7.83	8.95	9.09	6.34	6.12	5.27	7.93	5.82	9.05	8.81	7.77	7.19
9	7.88	8.93	9.03	6.31	6.11	5.25	7.91	6.08	9.05	8.75	7.79	7.19
10	7.93	8.94	8.97	6.27	6.08	5.24	7.24	6.26	9.06	8.69	7.75	7.26
11	7.96	8.99	8.89	6.23	6.05	5.23	7.00	6.68	9.11	8.63	7.72	7.27
12	8.00	9.01	8.81	6.21	6.02	5.21	7.42	7.10	9.23	8.58	7.69	7.27
13	8.09	9.06	8.74	6.23	6.00	5.22	7.79	7.29	9.33	8.53	7.66	7.26
14	8.27	9.19	8.68	6.26	5.99	5.21	7.26	7.38	9.38	8.48	7.63	7.26
15	8.43	9.36	8.61	6.34	5.97	5.24	6.86	7.45	9.41	8.46	7.60	7.25
16	8.55	9.47	8.57	6.43	5.95	5.25	6.64	7.51	9.54	8.47	7.59	7.24
17	8.63	9.57	8.53	6.51	5.92	5.23	6.37	7.57	9.62	8.45	7.59	7.23
18	8.69	9.60	8.48	6.57	5.88	5.24	6.06	7.63	9.65	8.46	7.57	7.21
19	8.75	9.61	8.43	6.62	5.86	5.28	5.89	7.63	9.65	8.45	7.54	7.20
20	8.77	9.62	8.38	6.63	5.84	5.36	5.87	7.62	9.64	8.44	7.51	7.30
21	8.78	9.62	8.33	6.62	5.81	5.37	5.98	7.61	9.64	8.40	7.48	7.38
22	8.81	9.61	8.28	6.58	5.77	5.26	6.09	7.76	9.60	8.36	7.44	7.46
23	8.85	9.59	8.21	6.55	5.76	5.37	6.16	7.91	9.57	8.32	7.40	7.54
24	8.88	9.57	8.12	6.51	5.72	5.35	6.25	7.97	9.52	8.26	7.38	7.68
25	8.92	9.55	8.00	6.47	5.76	5.34	6.01	8.03	9.47	8.20	7.38	7.79
26	8.95	9.53	7.86	6.44	5.95	5.32	5.78	8.14	9.42	8.15	7.41	7.85
27	8.95	9.52	7.74	6.41	6.17	5.28	5.62	8.22	9.37	8.10	7.40	7.90
28	8.97	9.52	7.61	6.38	6.25	5.24	5.50	8.25	9.33	8.07	7.37	7.92
29	8.98	9.51	7.48	6.29	---	5.25	5.45	8.17	9.30	8.04	7.35	7.91
30	8.99	9.52	7.35	6.06	---	5.28	5.41	8.06	9.23	8.01	7.32	7.91
31	8.99	---	7.21	6.11	---	5.32	---	7.99	---	7.98	7.29	---
MEAN	8.38	9.29	8.55	6.46	6.03	5.38	6.32	7.00	9.23	8.52	7.60	7.40
MAX	8.99	9.62	9.52	7.06	6.33	6.20	7.93	8.25	9.65	9.16	7.96	7.92
MIN	7.71	8.93	7.21	6.06	5.72	5.21	5.38	5.16	8.07	7.98	7.29	7.19

WTR YR 2001 MEAN 7.52 MAX 9.65 MIN 5.16

STREAMS TRIBUTARY TO LAKE SUPERIOR

04044724 AU TRAIN RIVER AT FOREST LAKE, MI

LOCATION.--Lat 46°20'27", long 86°51'00", in SE1/4 NE1/4 sec.31, T.46N., R.20W., Alger County, Hydrologic Unit 04020201, on left bank 800 ft downstream from Upper Peninsula Power Co. powerhouse, 0.6 mi downstream from Au Train Dam, and 0.6 mi northwest of Forest Lake.

DRAINAGE AREA.--81 mi^2, approximately.

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

GAGE.--Water-stage recorder. Elevation of gage is 650 ft above sea level, from topographic map.

REMARKS.--Records good. Flow regulated by powerplant 800 ft upstream and by Au Train Basin, capacity 12,342 acre-ft, 0.6 mi upstream. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	70	55	105	72	95	128	233	134	46	137	52
2	51	70	54	105	94	99	81	212	133	43	138	52
3	40	69	55	105	100	99	93	191	133	36	98	51
4	37	69	55	104	100	99	129	177	129	35	55	51
5	33	69	55	104	97	98	129	170	122	32	56	96
6	33	69	56	104	97	97	131	163	115	30	45	123
7	33	70	58	104	100	97	131	154	108	30	40	114
8	32	69	59	104	100	97	132	154	90	30	44	114
9	33	59	59	104	100	97	131	151	75	30	53	115
10	33	49	59	104	100	97	131	143	75	31	54	118
11	34	49	59	104	100	97	132	138	74	32	54	127
12	35	49	59	104	105	97	134	133	75	33	54	83
13	41	49	59	103	109	96	142	133	74	33	55	66
14	46	48	59	103	109	96	182	130	74	32	54	64
15	46	48	59	104	109	96	371	122	71	33	54	62
16	59	48	59	104	109	96	509	115	70	45	54	62
17	72	48	59	104	109	96	561	109	69	64	55	62
18	72	48	59	99	109	96	538	92	73	76	55	57
19	71	48	63	96	109	96	467	78	74	77	54	53
20	71	48	69	96	109	96	413	78	73	95	54	54
21	71	53	88	96	101	99	410	77	70	142	54	54
22	71	57	105	86	96	105	416	115	64	141	53	54
23	68	53	106	78	91	110	453	139	60	141	53	55
24	29	53	106	69	88	112	446	136	60	140	53	61
25	2.7	53	106	57	89	112	431	137	60	131	54	66
26	2.5	54	106	54	88	122	390	139	53	122	53	63
27	34	54	106	54	88	129	349	140	46	122	53	61
28	69	54	106	54	90	129	317	141	46	122	53	63
29	69	54	106	54	—	129	286	139	46	122	54	64
30	69	55	106	55	—	128	259	136	45	118	53	64
31	71	—	106	55	—	128	—	135	—	127	52	—
TOTAL	1490.2	1686	2316	2772	2768	3240	8422	4310	2391	2291	1848	2181
MEAN	48.1	56.2	74.7	89.4	98.9	105	281	139	79.7	73.9	59.6	72.7
MAX	72	70	106	105	109	129	561	233	134	142	138	127
MIN	2.5	48	54	54	72	95	81	77	45	30	40	51
CFSM	.59	.69	.92	1.10	1.22	1.29	3.47	1.72	.98	.91	.74	.90
IN.	.68	.77	1.06	1.27	1.27	1.49	3.87	1.98	1.10	1.05	.85	1.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 2001, BY WATER YEAR (WY)

MEAN	63.8	76.7	64.4	72.6	91.7	114	156	152	74.6	58.7	66.0	75.3
MAX	116	136	82.7	99.5	127	133	281	428	124	90.3	86.8	109
(WY)	1997	1994	1996	1997	1996	1999	2001	1996	1996	1999	1997	1998
MIN	35.0	25.4	27.4	48.6	57.8	84.4	82.6	46.5	51.3	30.7	45.5	53.0
(WY)	1995	1995	1999	1999	1995	1995	1994	2000	1994	1998	1994	1995

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1994 - 2001	
ANNUAL TOTAL	27224.2		35715.2			
ANNUAL MEAN	74.4		97.8		88.7	
HIGHEST ANNUAL MEAN					127	1996
LOWEST ANNUAL MEAN					65.8	1995
HIGHEST DAILY MEAN	154	Jun 22	561	Apr 17	670	May 11 1996
LOWEST DAILY MEAN	2.5	Oct 26	2.5	Oct 26	2.5	Oct 26 2000
ANNUAL SEVEN-DAY MINIMUM	32	Jun 6	31	Jul 5	22	Jul 14 1998
MAXIMUM PEAK FLOW			595	Apr 17	686	May 11 1996
MAXIMUM PEAK STAGE			5.75	Apr 17	6.08	May 11 1996
ANNUAL RUNOFF (CFSM)	.92		1.21		1.10	
ANNUAL RUNOFF (INCHES)	12.50		16.40		14.88	
10 PERCENT EXCEEDS	131		139		139	
50 PERCENT EXCEEDS	67		78		71	
90 PERCENT EXCEEDS	41		46		37	

STREAMS TRIBUTARY TO LAKE SUPERIOR

463910086014201 GRAND SABLE LAKE NEAR GRAND MARAIS, MI

LOCATION.--Lat 46°39'10", long 86°01'42", in SW1/4 SW1/4 sec.11, T.49 N., R.14 W., Alger County, Hydrologic Unit 04020201, at National Park Service Public Access Site, 2.5 mi southwest of Grand Marais.

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

PERIOD OF RECORD.--October 1944 to September 1950, June 1979 to September 1982, October 1992 to current year.

GAGE.--Nonrecording gage. Datum of gage is 743.44 ft above sea level. Oct. 18, 1944 to Sept. 23, 1950, nonrecording gage at different site and datum.

REMARKS.--Staff gage read by observer. Intermittent record only for some periods. Inlets are Rhody Creek, DeMull Creek, and Towes Creek. The outlet is Sable Creek. Partial-record site at outlet 1979-82. Surface area of lake is 628 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 3.30 ft, Apr. 28, 1994, May 2, 1995, July 30, 1996; minimum observed, 0.55 ft, Sept. 5, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 3.00 ft, Apr. 24; minimum observed, 1.52 ft, Oct. 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	2.60	---	---	2.58	---
2	---	---	---	---	---	---	---	---	2.06	2.12	---	---
3	1.52	1.96	---	---	---	---	---	2.46	---	---	2.58	2.60
4	1.53	---	---	---	---	---	---	---	1.98	2.12	---	---
5	1.54	1.96	---	---	---	---	---	2.40	---	---	---	---
6	---	---	---	---	---	---	---	---	1.94	2.12	---	---
7	1.54	1.98	---	---	---	---	---	---	---	---	---	---
8	---	2.02	---	---	2.28	---	---	---	1.88	2.12	2.62	2.60
9	---	---	---	---	---	---	---	---	---	---	---	---
10	1.74	1.98	---	---	---	---	---	2.12	---	2.12	---	2.78
11	---	---	---	---	---	---	---	---	---	2.12	2.56	---
12	---	---	---	---	---	---	---	2.60	1.94	2.14	---	2.78
13	1.78	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	2.00	2.14	2.50	2.70
15	---	---	---	---	---	---	---	---	---	---	---	---
16	1.88	---	---	---	---	---	---	2.44	---	---	---	2.68
17	---	2.12	---	---	---	---	---	---	2.02	2.32	2.70	---
18	1.88	---	---	---	---	---	---	2.56	---	---	---	2.66
19	---	---	---	---	---	---	---	---	---	---	2.70	---
20	1.92	---	---	---	---	---	---	2.50	2.04	---	---	2.94
21	---	---	---	---	---	---	---	---	---	---	2.66	---
22	---	---	---	---	---	---	---	---	2.08	2.64	---	2.94
23	1.94	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	3.00	2.24	---	---	---	---
25	---	---	---	---	---	---	---	---	---	2.62	---	2.96
26	---	---	---	---	---	---	---	2.24	---	---	2.70	---
27	---	---	---	---	---	---	---	---	2.12	2.58	---	---
28	1.96	2.20	2.31	---	---	2.21	---	2.18	---	---	2.70	2.80
29	1.96	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	2.14	---	2.70	---
31	1.96	---	---	---	---	---	---	2.06	---	---	---	---

STREAMS TRIBUTARY TO LAKE SUPERIOR

04044796 MUSKALLONGE LAKE NEAR DEER PARK, MI

LOCATION.--Lat 46°40'34", long 85°37'35", in SE1/4 NW1/4 sec.1, T.49 N., R.11 W., Luce County, Hydrologic Unit 04020201, at Muskallonge Lake State Park, 0.5 mi west of Deer Park.

DRAINAGE AREA.--11 mi^2, approximately.

PERIOD OF RECORD.--October 1958 to September 1964, May 1971 to September 1982, October 1992 to August 2001 (discontinued).

GAGE.--Nonrecording gage. Datum of gage is 612.98 ft above sea level.

REMARKS.--Staff gage read by observer. The inlet to Muskallonge Lake is Trout Creek. There is no continuous outlet, however during periods of high lake level, water flows through an intermittent stream channel to Cranberry Lake. Surface area of lake is 786 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 22.32 ft, May 23, 1979, Feb. 16, 1994; minimum observed, 18.65 ft, Aug. 4, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 20.66 ft, Apr. 25; minimum observed, 19.95 ft, Oct. 4.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	20.08	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	20.08	---	---	---	---	---	---	---	---	---	---
4	19.95	---	---	---	---	---	---	20.60	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	20.08	---	---	---	---	---	20.60	---	---	---	---
8	---	20.09	---	---	20.44	---	---	---	---	---	---	---
9	20.08	20.10	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	20.06	---	---	---	---	---	---	20.58	---	20.08	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	20.06	20.14	---	---	---	---	---	---	---	---	---	---
14	---	20.16	---	---	---	---	---	20.54	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	20.06	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	20.58	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	20.08	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	20.08	---	---	---	---	---	---	20.48	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	20.08	---	---	---	---	---	20.66	20.46	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	20.45	20.62	---	---	---	---	---
28	---	20.23	20.39	---	---	---	---	20.46	---	---	20.02	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	20.08	---	---	---	---	---	20.62	20.46	---	---	---	---
31	---	---	---	---	---	---	---	20.45	---	---	---	---

STREAMS TRIBUTARY TO LAKE SUPERIOR

04045500 TAHQUAMENON RIVER NEAR PARADISE, MI

LOCATION.--Lat 46°34'30", long 85°16'10", in NE1/4 sec.11, T.48 N., R.8 W., Luce County, Hydrologic Unit 04020202, on left bank 0.7 mi upstream from Tahquamenon Falls (upper), 11.5 mi west of Paradise, and 19 mi northeast of Newberry.

DRAINAGE AREA.--790 mi^2.

PERIOD OF RECORD.--August 1953 to current year. Prior to October 1989, published as "near Tahquamenon Paradise".

GAGE.--Water-stage recorder. Datum of gage is 698.03 ft above sea level.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	225	281	416	293	347	457	776	2650	720	319	283	446
2	215	278	395	296	351	474	831	2420	683	304	268	432
3	217	277	377	296	358	488	899	2210	698	274	263	386
4	213	274	365	297	360	500	997	2020	737	253	261	358
5	211	277	352	297	360	507	1150	1880	739	241	255	346
6	211	275	320	298	361	514	1360	1740	706	241	239	325
7	211	277	310	301	361	520	1640	1600	648	233	231	308
8	219	281	315	302	360	524	2030	1520	583	228	235	294
9	224	289	321	304	361	525	2440	1410	530	225	237	285
10	229	325	320	302	360	528	2830	1300	502	210	231	357
11	232	369	314	301	361	525	3210	1230	513	201	233	445
12	235	382	309	302	362	524	3910	1180	529	194	224	509
13	245	390	305	304	364	524	4600	1140	544	188	214	545
14	285	418	300	305	364	510	5030	1070	530	185	217	557
15	327	448	293	310	369	497	5230	995	495	183	217	536
16	357	462	291	310	370	491	5290	1010	499	191	218	501
17	370	488	295	316	368	488	5180	1130	497	211	335	460
18	370	491	299	321	365	484	5100	1190	503	236	501	426
19	371	472	302	323	363	485	4970	1230	508	248	595	397
20	361	446	306	326	360	494	4810	1220	526	257	613	524
21	345	413	307	321	361	512	4680	1160	544	252	583	790
22	341	401	306	323	355	544	4560	1150	617	266	510	943
23	331	394	307	321	349	591	4460	1090	665	330	438	1040
24	324	395	308	321	344	638	4270	1020	644	350	401	1180
25	326	387	306	325	361	664	4090	1010	611	346	370	1300
26	321	381	302	324	389	675	3870	1030	561	326	402	1440
27	304	388	301	323	415	683	3580	1030	501	311	464	1510
28	306	395	299	325	437	693	3350	1000	460	290	495	1530
29	301	406	295	326	—	698	3110	948	420	285	508	1510
30	294	417	292	335	—	712	2900	888	367	287	481	1450
31	287	—	293	341	—	739	—	814	—	287	453	—
TOTAL	8808	11177	9821	9689	10236	17208	101153	41285	17080	7952	10975	21130
MEAN	284	373	317	313	366	555	3372	1332	569	257	354	704
MAX	371	491	416	341	437	739	5290	2650	739	350	613	1530
MIN	211	274	291	293	344	457	776	814	367	183	214	285
CFSM	.36	.47	.40	.40	.46	.70	4.27	1.69	.72	.32	.45	.89
IN.	.41	.53	.46	.46	.48	.81	4.76	1.94	.80	.37	.52	.99

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2001, BY WATER YEAR (WY)

MEAN	839	1001	762	490	481	758	2703	1623	672	490	421	602
MAX	1768	2284	1756	983	894	2517	4575	4511	1736	1081	1126	1623
(WY)	1979	1989	1967	1983	1999	2000	1976	1960	1974	1956	1973	1970
MIN	256	373	317	303	279	335	1259	323	244	209	167	220
(WY)	1964	2001	2001	1963	1963	1956	2000	1998	1988	1963	2000	2000

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1953 - 2001	
ANNUAL TOTAL	213271		266514			
ANNUAL MEAN	583		730		903	
HIGHEST ANNUAL MEAN					1294	1971
LOWEST ANNUAL MEAN					600	1998
HIGHEST DAILY MEAN	3550	Mar 11	5290	Apr 16	6820	May 10 1960
LOWEST DAILY MEAN	143	Aug 26	183	Jul 15	143	Aug 26 2000
ANNUAL SEVEN-DAY MINIMUM	147	Aug 23	193	Jul 10	147	Aug 23 2000
MAXIMUM PEAK FLOW			5290	Apr 15	6990	May 10 1960
MAXIMUM PEAK STAGE			9.17	Apr 15	10.26	May 10 1960
INSTANTANEOUS LOW FLOW			176	Jul 14	136	Aug 29 2000
ANNUAL RUNOFF (CFSM)	.74		.92		1.14	
ANNUAL RUNOFF (INCHES)	10.04		12.55		15.54	
10 PERCENT EXCEEDS	1840		1440		1870	
50 PERCENT EXCEEDS	346		371		570	
90 PERCENT EXCEEDS	190		241		294	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04046000 BLACK RIVER NEAR GARNET, MI

LOCATION.--Lat 46°07'05", long 85°21'55", in SE1/4 sec.13, T.43 N., R.9 W., Mackinac County, Hydrologic Unit 04060107, on right bank 20 ft upstream from footbridge, 15 ft downstream from Peters Creek, 3.5 mi upstream from mouth, and 3.7 mi southwest of Garnet.

DRAINAGE AREA.--28 mi^2, approximately.

PERIOD OF RECORD.--September 1951 to September 1978, October 1978 to September 1994 (operated as a crest-stage partial-record station), October 1994 to current year.

REVISED RECORDS.--WSP 1707: 1959.

GAGE.--Water-stage recorder. Datum of gage is 629.7 ft above sea level. Oct. 1, 1978 to Sept. 30, 1994, nonrecording gage at same site and datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	6.4	8.4	5.6	6.8	13	16	34	19	11	8.3	14
2	5.4	6.4	7.8	5.4	6.7	13	19	34	22	11	8.2	13
3	5.4	6.4	7.7	5.4	e6.7	12	22	59	26	10	7.7	12
4	5.3	6.4	7.8	5.5	6.8	12	27	50	23	8.5	7.1	11
5	5.4	6.1	7.2	5.7	6.5	11	34	42	21	8.4	6.8	11
6	5.4	6.1	8.3	5.7	6.4	11	57	37	19	7.9	6.8	10
7	5.4	6.6	7.2	5.5	6.4	11	76	35	18	9.3	6.7	10
8	5.6	6.9	6.7	e5.5	6.4	11	117	41	16	8.5	7.1	9.9
9	5.5	8.4	6.4	e5.5	e6.4	10	126	35	16	8.1	9.1	12
10	5.5	9.6	6.4	5.4	e6.6	13	133	39	16	8.0	9.3	26
11	5.4	9.5	6.2	5.4	e6.8	10	152	64	17	7.7	7.4	21
12	5.4	9.5	6.0	5.4	e6.8	e10	281	51	17	7.7	7.1	18
13	7.1	11	6.7	5.5	e7.0	9.5	263	43	16	7.4	9.8	17
14	9.8	15	5.7	5.5	7.1	9.5	196	38	15	7.4	7.7	14
15	9.1	14	5.7	5.6	e7.0	9.4	155	35	15	7.8	7.1	13
16	9.1	14	6.1	5.6	6.8	9.1	132	61	16	10	12	12
17	8.9	13	6.4	5.6	6.7	9.1	109	54	18	11	38	12
18	8.6	12	6.2	5.7	7.4	9.4	92	44	16	9.9	30	11
19	8.4	11	6.0	5.5	6.8	9.6	81	37	25	9.3	24	13
20	8.3	11	6.8	e5.5	6.7	10	74	32	21	8.9	19	35
21	8.1	10	5.9	e5.6	6.8	11	72	29	19	8.5	16	36
22	7.9	9.8	5.8	e5.6	6.5	12	70	30	17	17	14	31
23	7.9	9.5	6.3	5.7	5.6	14	65	27	16	17	13	40
24	7.5	9.1	5.9	5.7	5.5	14	60	24	15	15	12	57
25	7.3	8.7	6.3	5.7	9.1	15	53	27	14	13	12	43
26	7.1	8.6	5.7	5.7	12	15	48	27	13	11	30	41
27	7.1	8.6	5.8	5.6	13	13	44	25	13	10	25	36
28	6.8	8.7	e5.8	5.5	e13	12	40	23	13	9.7	20	32
29	6.4	9.0	5.7	5.4	—	13	37	21	12	9.6	17	28
30	6.4	9.0	5.7	6.8	—	13	35	19	12	8.9	16	25
31	6.4	—	5.7	7.3	—	15	—	18	—	8.4	15	—
TOTAL	213.3	280.3	200.3	175.1	206.3	359.6	2686	1135	516	305.9	429.2	663.9
MEAN	6.88	9.34	6.46	5.65	7.37	11.6	89.5	36.6	17.2	9.87	13.8	22.1
MAX	9.8	15	8.4	7.3	13	15	281	64	26	17	38	57
MIN	5.3	6.1	5.7	5.4	5.5	9.1	16	18	12	7.4	6.7	9.9
CFSM	.25	.33	.23	.20	.26	.41	3.20	1.31	.61	.35	.49	.79
IN.	.28	.37	.27	.23	.27	.48	3.57	1.51	.69	.41	.57	.88

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	23.3	29.3	23.2	14.9	13.3	22.2	86.4	45.5	23.8	17.2	14.0	18.8
MAX	68.0	69.9	60.0	26.0	24.7	61.7	168	141	75.3	38.6	38.7	65.5
(WY)	1960	1978	1971	1967	1966	1953	1971	1960	1974	1952	1973	1970
MIN	6.06	7.12	6.46	5.65	7.09	7.43	28.4	11.2	10.1	7.64	5.38	5.94
(WY)	1964	1977	2001	2001	1995	1956	2000	1998	2000	1998	2000	2000

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	5328.7		7170.9			
ANNUAL MEAN	14.6		19.6		27.6	
HIGHEST ANNUAL MEAN					49.9	1971
LOWEST ANNUAL MEAN					14.2	1998
HIGHEST DAILY MEAN	130	Mar 9	281	Apr 12	752	May 7 1960
LOWEST DAILY MEAN	4.8	Aug 25	5.3	Oct 4	4.8	Aug 25 2000
ANNUAL SEVEN-DAY MINIMUM	5.0	Aug 23	5.4	Oct 1	5.0	Aug 23 2000
MAXIMUM PEAK FLOW			301	Apr 13	(a)860	May 7 1960
MAXIMUM PEAK STAGE			5.81	Apr 13	8.55	May 7 1960
INSTANTANEOUS LOW FLOW			4.8	Jan 17	4.8	(b)
ANNUAL RUNOFF (CFSM)	.52		.70		.99	
ANNUAL RUNOFF (INCHES)	7.08		9.53		13.41	
10 PERCENT EXCEEDS	37		40		56	
50 PERCENT EXCEEDS	8.4		10		16	
90 PERCENT EXCEEDS	5.4		5.7		8.3	

(a) From rating curve extended above 400 ft^3/s.
(b) Part of each day Aug. 20, 23-25, Aug. 27 to Sept. 1, 2000, Jan. 17, 2001.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04056500 MANISTIQUE RIVER NEAR MANISTIQUE, MI

LOCATION.--Lat 46°01'50", long 86°09'40", in SE1/4 sec.15, T.42 N., R.15 W., Schoolcraft County, Hydrologic Unit 04060106, on left bank 1.0 mi downstream from West Branch, 6.0 mi northeast of Manistique, and at mile 19.5.

DRAINAGE AREA.--1,100 mi^2, approximately.

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS.--WSP 1387: 1940-42(M), 1943, 1945. WSP 1627, 1727: 1938, 1939.

GAGE.--Water-stage recorder. Datum of gage is 608.46 ft above sea level. Prior to July 15, 1939, non-recording gage at site 1,600 ft upstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Since July 1948, slight regulation by dam on outlet of Manistique Lake. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	447	678	899	e670	e760	e820	e1350	2770	1340	871	677	672
2	442	671	868	e670	e760	e820	1410	2610	1350	821	660	647
3	436	678	762	e660	e760	e820	1550	2500	1410	796	630	624
4	431	679	717	e660	e760	e830	1720	2390	1460	785	608	601
5	426	673	e700	e660	e760	e840	2010	2250	1430	770	589	576
6	424	665	e700	e660	e770	e840	2510	2090	1360	746	574	560
7	439	667	e700	e660	e770	e850	3170	1930	1280	733	573	549
8	460	685	e700	e660	e770	e850	3860	1810	1200	728	562	556
9	505	704	e700	e660	e770	e860	4600	1730	1070	716	591	559
10	568	722	e700	e660	e770	e860	5720	1680	1010	703	610	619
11	574	736	e700	e670	e770	e860	6840	1720	1040	680	630	706
12	559	739	e700	e670	e770	e860	7840	1800	1130	660	614	764
13	563	744	e700	e680	e770	e860	9230	1830	1230	644	600	806
14	608	779	e680	e680	e770	e880	10200	1780	1240	631	568	770
15	706	838	e680	e680	e770	e900	9910	1700	1190	620	555	716
16	789	897	e680	e680	e770	e920	9000	1670	1160	638	572	674
17	828	935	e680	e690	e770	e940	8100	1810	1170	657	693	645
18	819	934	e680	e700	e770	e960	7290	2000	1210	682	834	625
19	789	888	e680	e700	e770	e980	6530	2090	1260	705	887	635
20	753	888	e680	e700	e780	e1000	5730	2130	1260	693	879	741
21	719	860	e680	e700	e780	e1000	4980	2100	1210	685	826	977
22	680	797	e680	e700	e780	e1050	4460	2020	1140	718	755	1110
23	656	890	e680	e710	e780	e1050	4190	1900	1080	775	695	1160
24	645	996	e680	e720	e780	e1100	4080	1780	1040	897	658	1240
25	644	1060	e680	e720	e800	e1100	4030	1680	1000	929	639	1280
26	656	1020	e680	e720	e800	e1100	3930	1630	952	921	688	1270
27	656	949	e680	e720	e800	e1150	3770	1650	903	906	760	1240
28	640	927	e680	e730	e800	e1200	3560	1650	866	856	791	1190
29	625	919	e670	e730	—	e1200	3290	1610	854	795	775	1120
30	620	906	e670	e730	—	e1250	3000	1520	883	727	732	1050
31	675	—	e670	e740	—	e1300	—	1410	—	695	704	—
TOTAL	18772	24524	21756	21390	21680	30050	147860	59240	34728	23183	20929	24682
MEAN	606	817	702	690	774	969	4929	1911	1158	748	675	823
MAX	828	1060	899	740	800	1300	10200	2770	1460	929	887	1280
MIN	424	665	670	660	760	820	1350	1410	854	620	555	549
CFSM	.55	.74	.64	.63	.70	.88	4.48	1.74	1.05	.68	.61	.75
IN.	.63	.83	.74	.72	.73	1.02	5.00	2.00	1.17	.78	.71	.83

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2001, BY WATER YEAR (WY)

MEAN	1123	1492	1240	938	864	1331	3986	2304	1286	881	688	799
MAX	2720	3777	2569	1777	1516	3358	6401	6963	4531	1783	1733	2657
(WY)	1979	1989	1966	1966	1966	1946	1976	1960	1943	1993	1996	1978
MIN	386	606	480	469	480	547	1926	789	602	402	384	350
(WY)	1949	1977	1977	1977	1963	1963	2000	2000	1988	1955	1963	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1938 - 2001	
ANNUAL TOTAL	351377		448794			
ANNUAL MEAN	960		1230		1410	
HIGHEST ANNUAL MEAN					2229	1960
LOWEST ANNUAL MEAN					806	1948
HIGHEST DAILY MEAN	4120	Mar 11	10200	Apr 14	16500	May 11 1960
LOWEST DAILY MEAN	355	Aug 31	424	Oct 6	290	Oct 4 1948
ANNUAL SEVEN-DAY MINIMUM	367	Aug 26	435	Oct 1	294	Sep 30 1948
MAXIMUM PEAK FLOW			10300	Apr 14	16900	May 11 1960
MAXIMUM PEAK STAGE			11.67	Apr 14	12.85	May 11 1960
INSTANTANEOUS LOW FLOW			422	Oct 6	288	Oct 4 1948
ANNUAL RUNOFF (CFSM)	.87		1.12		1.28	
ANNUAL RUNOFF (INCHES)	11.88		15.18		17.41	
10 PERCENT EXCEEDS	2280		2000		2710	
50 PERCENT EXCEEDS	680		770		995	
90 PERCENT EXCEEDS	441		625		558	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057510 STURGEON RIVER NEAR NAHMA JUNCTION, MI

LOCATION.--Lat 45°56'35", long 86°42'20", in SW1/4 SE1/4 sec.17, T.41 N., R.19 W., Delta County, Hydrologic Unit 04030112, Hiawatha National Forest, on left bank 30 ft upstream from bridge on Forest Service Road 2231, 500 ft downstream from Mormon Creek, 0.1 mi east of Federal Forest Highway 13, and 3.2 mi north of Nahma Junction.

DRAINAGE AREA.--183 mi^2.

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 610.99 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Satellite telemetry at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	89	116	e70	e92	e135	e190	247	141	91	67	55
2	66	88	110	e70	e92	e135	195	236	165	85	65	52
3	74	86	e105	e70	e92	e135	229	236	179	80	61	50
4	71	83	e100	e70	e92	e135	281	224	171	79	57	47
5	67	81	e95	e70	e92	e135	356	203	155	77	54	45
6	65	79	e92	e70	e92	e135	463	186	142	71	52	43
7	72	85	e88	e70	e92	e135	620	175	131	69	50	43
8	103	98	e85	e70	e92	e135	806	172	121	67	50	47
9	107	98	e82	e70	e92	e135	904	166	116	64	51	51
10	105	105	e80	e72	e92	e135	884	167	120	65	49	72
11	98	103	e78	e74	e92	e135	938	195	173	61	46	89
12	93	103	e75	e78	e92	e135	1270	182	239	57	45	90
13	94	122	e72	e82	e92	e135	1500	169	259	54	51	82
14	120	175	e70	e84	e92	e140	1360	172	217	53	48	73
15	131	182	e70	e86	e92	e140	1170	164	189	52	44	67
16	133	169	e70	e86	e92	e140	1050	173	218	56	45	62
17	132	159	e70	e86	e92	e145	954	186	227	60	68	59
18	126	144	e70	e86	e92	e145	814	168	194	59	79	57
19	119	131	e70	e86	e92	e150	694	150	184	58	70	56
20	112	122	e70	e86	e92	e155	605	137	167	61	64	75
21	105	108	e70	e86	e92	e155	549	131	157	64	58	106
22	100	138	e70	e86	e94	e160	546	183	145	73	55	120
23	102	181	e70	e86	e96	e160	523	193	131	134	53	129
24	112	191	e70	e86	e105	e165	537	173	118	147	51	162
25	111	162	e70	e86	e110	e170	482	165	110	117	52	187
26	109	125	e70	e86	e130	e170	417	176	102	100	83	197
27	106	121	e70	e86	e135	e175	369	207	95	91	91	180
28	103	121	e70	e86	e135	e175	328	207	95	85	78	155
29	97	121	e70	e88	---	e180	293	186	95	80	69	139
30	94	119	e70	e90	---	e185	263	163	93	74	63	123
31	90	---	e70	e92	---	e185	---	147	---	70	59	---
TOTAL	3083	3689	2438	2494	2737	4650	19590	5639	4649	2354	1828	2713
MEAN	99.5	123	78.6	80.5	97.8	150	653	182	155	75.9	59.0	90.4
MAX	133	191	116	92	135	185	1500	247	259	147	91	197
MIN	65	79	70	70	92	135	190	131	93	52	44	43
CFSM	.54	.67	.43	.44	.53	.82	3.57	.99	.85	.41	.32	.49
IN.	.63	.75	.50	.51	.56	.95	3.98	1.15	.95	.48	.37	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2001, BY WATER YEAR (WY)

MEAN	172	216	161	106	98.1	180	542	282	175	116	105	124
MAX	337	532	369	198	181	396	847	590	411	254	330	354
(WY)	1983	1978	1971	1997	1984	2000	1979	1996	1979	1968	1978	1978
MIN	55.5	64.4	49.8	50.0	54.2	72.6	219	88.4	50.3	45.7	48.1	40.7
(WY)	1977	1977	1977	1977	1977	1994	2000	1998	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1967 - 2001	
ANNUAL TOTAL	47354		55864			
ANNUAL MEAN	129		153		190	
HIGHEST ANNUAL MEAN					289	1978
LOWEST ANNUAL MEAN					121	1987
HIGHEST DAILY MEAN	672	Mar 9	1500	Apr 13	2030	Apr 21 1985
LOWEST DAILY MEAN	39	Aug 31	43	Sep 6	32	Aug 5 1998
ANNUAL SEVEN-DAY MINIMUM	42	Aug 25	47	Sep 3	34	Jul 31 1998
MAXIMUM PEAK FLOW			1530	Apr 13	2120	Apr 21 1985
MAXIMUM PEAK STAGE			9.82	Apr 13	11.50	Apr 21 1985
INSTANTANEOUS LOW FLOW			43	(a)	32	(b)
ANNUAL RUNOFF (CFSM)	.71		.84		1.04	
ANNUAL RUNOFF (INCHES)	9.63		11.36		14.08	
10 PERCENT EXCEEDS	249		217		385	
50 PERCENT EXCEEDS	92		98		125	
90 PERCENT EXCEEDS	61		59		65	

(a) Aug. 15, 16, Sept. 6, 7.
(b) July 8, 1988, Aug. 5-7, 1998.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057800 MIDDLE BRANCH ESCANABA RIVER AT HUMBOLDT, MI

LOCATION.--Lat 46°29'57", long 87°53'11", in SW1/4 sec.1, T.47 N., R.29 W., Marquette County, Hydrologic Unit 04030110, on left bank 15 ft upstream from county road FX, 1.5 mi downstream from Halfway Creek, and 0.3 mi north of Humboldt.

DRAINAGE AREA.--46.0 mi^2.

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

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. V-notch sharp-crested weir since Oct. 3, 1960. Datum of gage is 1,521.20 ft above sea level (Cleveland-Cliffs Iron Co. bench mark). Prior to Sept. 1, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. From July 1960 to June 1972, some diversion 100 ft upstream by industry for iron ore processing; figures of runoff adjusted. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e14	13	16	e13	e14	e12	25	117	54	39	39	11
2	e9.9	13	16	e13	e14	e12	27	107	70	34	41	12
3	e8.0	12	15	e13	e14	e12	31	102	75	32	35	11
4	e6.5	11	15	e13	e14	e12	38	88	72	30	30	11
5	6.9	10	15	e13	e14	e12	49	76	62	28	30	11
6	7.7	9.7	15	e13	e14	e12	72	66	54	25	33	11
7	8.5	11	14	e13	e14	e12	111	65	46	24	29	21
8	9.7	11	14	e13	e13	e12	192	75	42	22	26	20
9	11	11	13	e13	e13	e12	232	64	39	20	23	17
10	14	11	13	e13	e13	e12	249	71	41	19	17	17
11	15	12	13	e13	e13	e12	262	84	56	18	16	17
12	16	12	13	14	e13	e12	304	72	109	16	15	15
13	28	14	13	14	e13	e12	409	62	127	14	14	14
14	43	24	12	14	e13	e12	436	57	122	14	13	12
15	39	21	13	14	e12	e12	404	68	100	16	12	14
16	40	19	e13	14	e12	e13	388	114	104	21	15	13
17	32	18	e13	e14	e12	e14	345	130	91	23	17	12
18	27	17	e13	e14	e12	e15	271	98	78	85	15	13
19	21	15	e13	e14	e12	e16	228	74	84	101	13	13
20	18	16	e13	14	e12	17	219	60	66	130	12	13
21	17	17	e13	14	e12	20	233	56	57	170	12	13
22	15	17	e13	14	e12	24	278	80	52	95	12	12
23	19	17	e13	14	e12	27	313	88	46	80	12	18
24	22	17	e13	13	e12	28	370	79	41	62	12	25
25	20	16	e13	14	e12	27	340	85	37	48	12	24
26	17	16	e13	14	e12	25	253	89	35	40	14	20
27	17	16	e13	14	e12	23	205	86	38	33	14	17
28	16	16	e13	14	e12	23	170	75	76	37	12	16
29	14	16	e13	14	---	22	150	64	58	47	12	15
30	13	17	e13	e14	---	22	139	55	47	41	12	12
31	12	---	e13	e14	---	23	---	50	---	40	12	---
TOTAL	557.2	445.7	418	422	357	519	6743	2457	1979	1404	581	450
MEAN	18.0	14.9	13.5	13.6	12.8	16.7	225	79.3	66.0	45.3	18.7	15.0
MAX	43	24	16	14	14	28	436	130	127	170	41	25
MIN	6.5	9.7	12	13	12	12	25	50	35	14	12	11
CFSM	.39	.32	.29	.30	.28	.36	4.89	1.72	1.43	.98	.41	.33
IN.	.45	.36	.34	.34	.29	.42	5.45	1.99	1.60	1.14	.47	.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2001, BY WATER YEAR (WY)

MEAN	52.2	55.8	36.5	23.3	20.7	41.0	197	123	59.5	32.6	25.5	35.1
MAX	191	198	77.5	41.5	55.9	149	423	326	153	89.9	76.5	184
(WY)	1986	1989	1992	1966	1984	1973	1985	1972	1989	1968	1978	1978
MIN	5.87	5.97	5.57	5.30	6.00	11.5	74.9	21.1	13.3	7.57	5.80	4.91
(WY)	1977	1977	1977	1977	1977	1964	1987	1998	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1959 - 2001	
ANNUAL TOTAL	13545.0		16332.9			
ANNUAL MEAN	37.0		44.7		58.3	
HIGHEST ANNUAL MEAN					95.3	1960
LOWEST ANNUAL MEAN					30.7	1998
HIGHEST DAILY MEAN	273	Mar 28	436	Apr 14	1830	Apr 20 1985
LOWEST DAILY MEAN	5.4	Aug 25	6.5	Oct 4	4.2	Sep 12 1976
ANNUAL SEVEN-DAY MINIMUM	5.9	Aug 19	8.2	Oct 2	4.5	Sep 7 1976
MAXIMUM PEAK FLOW			445	Apr 14	1930	Apr 20 1985
MAXIMUM PEAK STAGE			5.33	Apr 14	9.21	Apr 20 1985
INSTANTANEOUS LOW FLOW			(a)6.5	Oct 4	3.5	Aug 22 1998
ANNUAL RUNOFF (CFSM)	.80		.97		1.27	
ANNUAL RUNOFF (INCHES)	10.95		13.21		17.23	
10 PERCENT EXCEEDS	96		100		128	
50 PERCENT EXCEEDS	17		16		30	
90 PERCENT EXCEEDS	11		12		12	

(a) Discharge measurement.
(e) Estimated.

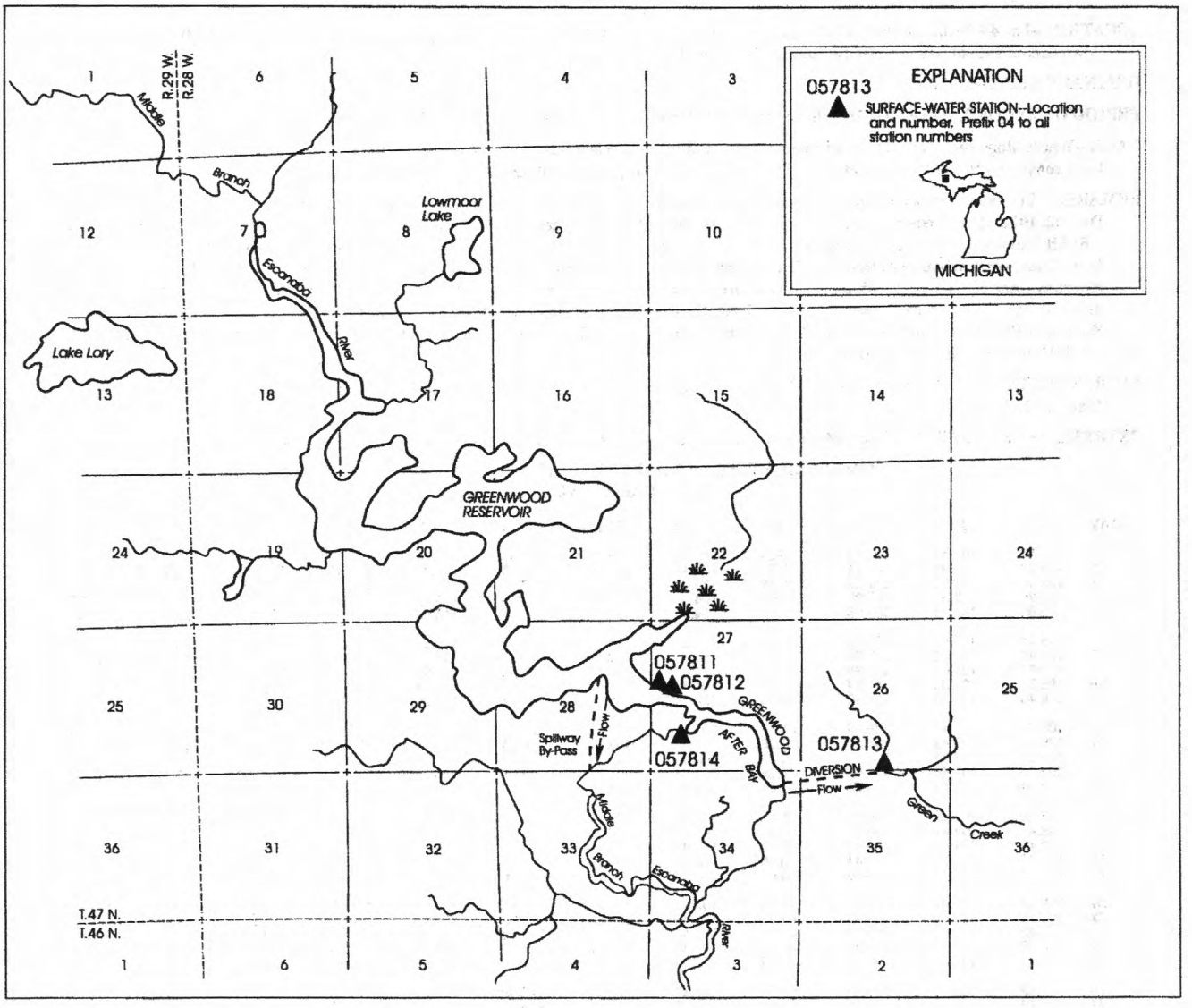


Figure 7. Identification number and location of active surface-water gaging stations in and around the Greenwood Reservoir Complex.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057811 GREENWOOD RESERVOIR NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'32", long 87°48'02", in NW1/4 SW1/4 sec.27, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, at downstream side of dam on Middle Branch Escanaba River, 3.7 mi southwest of Greenwood.

DRAINAGE AREA.--67.4 mi^2.

PERIOD OF RECORD.--December 1972 to current year. Prior to October 1997 month end elevations and contents only.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level (levels by Cleveland-Cliffs Iron Co.); EXTREMES reported below have been converted to sea level elevations. Prior to Feb. 20, 1973, nonrecording gage at same site and datum.

REMARKS.--The reservoir is formed by an earth/rockfill main dam and several earthfill dikes surrounding the storage area. Storage began Dec. 22, 1972. The fixed-crest concrete spillway was completed in September 1973. Capacity of reservoir, 23,300 acre-ft at spillway elevation 1,515 ft. Above elevation 1,515 ft, water flows over concrete spillway into Middle Branch Escanaba River approximately 2,000 ft downstream from Greenwood Release (station 04057814). The main dam is equipped with an outlet structure with 4 valves to control flow to Greenwood Afterbay (station 04057812) which has a capacity of 420 acre-ft at elevation 1,480 ft. Two outlet systems from the afterbay provide for diversion and release flow. Diverted flow to Green Creek gaged at Greenwood Diversion (station 04057813); released flow to Middle Branch Escanaba River gaged at Greenwood Release (station 04057814). Reservoir impounds water for diversion to Schweitzer Reservoir (station 04058190), for use in iron ore processing.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,517.3 ft, Apr. 21, 22, 23, 1985; minimum since first filling, 1,491.1 ft, Mar. 12, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,515.50 ft, Apr. 27; minimum, 1,502.01 ft, Mar. 31.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109.18	107.98	107.17	105.83	104.46	103.12	102.03	115.40	115.21	115.14	115.10	113.87
2	109.09	107.92	107.14	105.77	104.41	103.06	102.03	115.39	115.23	115.10	115.10	113.80
3	109.00	107.87	107.10	105.72	104.36	103.00	102.05	115.36	115.24	115.09	115.08	113.74
4	108.90	107.80	107.07	105.66	104.31	102.94	102.09	115.33	115.25	115.07	115.07	113.67
5	108.80	107.74	107.05	105.62	104.26	102.88	102.17	115.28	115.24	115.05	115.03	113.61
6	108.72	107.69	107.02	105.59	104.21	102.82	102.37	115.24	115.22	115.02	115.02	113.54
7	108.68	107.65	107.00	105.56	104.15	102.75	102.68	115.23	115.20	115.02	115.00	113.55
8	108.62	107.61	106.98	105.52	104.11	102.69	103.23	115.24	115.17	115.01	114.97	113.53
9	108.54	107.56	106.94	105.47	104.10	102.64	103.87	115.23	115.14	114.99	114.95	113.50
10	108.46	107.52	106.90	105.43	104.05	102.59	104.51	115.26	115.14	114.97	114.89	113.46
11	108.37	107.46	106.86	105.39	104.01	102.53	105.22	115.26	115.16	114.93	114.85	113.41
12	108.29	107.42	106.81	105.35	103.97	102.49	106.09	115.24	115.26	114.90	114.81	113.37
13	108.27	107.41	106.75	105.30	103.93	102.47	107.10	115.21	115.34	114.86	114.76	113.31
14	108.29	107.44	106.66	105.26	103.88	102.41	108.21	115.19	115.39	114.83	114.71	113.26
15	108.34	107.43	106.56	105.24	103.83	102.36	109.26	115.24	115.40	114.82	114.65	113.20
16	108.39	107.42	106.53	105.20	103.78	102.31	110.22	115.30	115.40	114.84	114.63	113.15
17	108.41	107.41	106.49	105.15	103.73	102.26	111.04	115.34	115.38	114.84	114.62	113.09
18	108.40	107.38	106.44	105.11	103.67	102.20	111.67	115.34	115.36	114.91	114.57	113.03
19	108.37	107.36	106.41	105.06	103.62	102.15	112.15	115.31	115.36	115.06	114.52	112.99
20	108.34	107.37	106.36	105.01	103.57	102.11	112.56	115.26	115.32	115.17	114.46	112.96
21	108.29	107.37	106.32	104.95	103.51	102.07	112.95	115.25	115.29	115.26	114.41	112.90
22	108.25	107.36	106.29	104.90	103.45	102.05	113.38	115.28	115.25	115.30	114.38	112.85
23	108.23	107.33	106.24	104.85	103.40	102.06	113.92	115.30	115.22	115.29	114.34	112.85
24	108.22	107.32	106.23	104.80	103.35	102.07	114.53	115.30	115.18	115.23	114.28	112.82
25	108.21	107.30	106.18	104.75	103.33	102.07	115.11	115.31	115.16	115.18	114.25	112.78
26	108.19	107.28	106.13	104.70	103.27	102.07	115.39	115.32	115.14	115.12	114.22	112.72
27	108.19	107.27	106.09	104.66	103.22	102.06	115.47	115.32	115.15	115.08	114.17	112.65
28	108.15	107.25	106.05	104.61	103.16	102.05	115.47	115.30	115.20	115.09	114.11	112.58
29	108.12	107.22	106.00	104.56	—	102.04	115.46	115.27	115.21	115.10	114.05	112.52
30	108.08	107.20	105.95	104.54	—	102.03	115.43	115.23	115.19	115.10	114.00	112.46
31	108.04	—	105.89	104.50	—	102.02	—	115.20	—	115.09	113.94	—
MEAN	108.43	107.48	106.57	105.16	103.83	102.40	108.92	115.28	115.25	115.05	114.61	113.17
MAX	109.18	107.98	107.17	105.83	104.46	103.12	115.47	115.40	115.40	115.30	115.10	113.87
MIN	108.04	107.20	105.89	104.50	103.16	102.02	102.03	115.19	115.14	114.82	113.94	112.46

CAL YR 2000 MEAN 111.42 MAX 115.48 MIN 105.89
WTR YR 2001 MEAN 109.71 MAX 115.47 MIN 102.02

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057812 GREENWOOD AFTERBAY NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'32", long 87°48'02", in NW1/4 SW1/4 sec.27, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, at control house on Middle Branch Escanaba River, 3.7 mi southwest of Greenwood.

DRAINAGE AREA.--67.4 mi^2.

PERIOD OF RECORD.--March 1999 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level (levels by Cleveland-Cliffs Iron Co.).

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 81.04 ft, July 29, 2000; minimum daily, 79.22 ft, Sept. 21, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 80.90 ft, Sept. 30; minimum daily, 79.22 ft, Sept. 21.

REMARKS.--Flow completely regulated by four valve outlet structure from Greenwood Reservoir (station 04057811) immediately upstream. Capacity of afterbay, 420 acre-ft at elevation 1,480 ft. Two outlet systems provide for diversion for use in iron ore processing and for release flow. Diverted flow to Green Creek gaged at Greenwood Diversion (station 04057813); released flow to Middle Branch Escanaba River gaged at Greenwood Release (station 04057814).

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80.19	79.52	79.90	80.25	80.07	79.92	79.98	80.40	80.04	80.22	80.06	—
2	80.32	79.76	79.96	80.30	80.15	79.90	79.98	80.22	80.08	80.22	79.96	—
3	80.53	79.99	80.00	80.33	80.22	79.96	79.97	80.02	80.10	80.23	79.83	—
4	80.42	80.20	80.04	80.36	80.29	80.00	80.00	79.89	80.10	80.22	79.75	—
5	80.29	80.33	79.99	80.33	80.34	80.04	80.07	80.14	79.94	80.19	79.79	—
6	80.11	80.26	79.91	80.10	80.37	80.07	79.96	80.41	79.79	80.17	79.82	—
7	80.05	80.18	79.87	79.89	80.36	80.08	79.82	80.58	79.72	80.18	79.83	—
8	79.99	80.11	79.91	79.79	80.33	80.09	79.81	80.29	79.81	80.17	79.92	—
9	79.91	80.10	80.04	79.98	80.27	80.07	79.84	79.94	80.01	80.15	80.02	—
10	79.85	80.13	80.18	80.13	80.18	80.04	80.06	79.72	80.21	80.13	80.02	—
11	79.88	80.22	80.21	80.12	80.10	80.02	79.97	79.61	80.42	80.12	79.85	—
12	79.92	80.31	79.97	80.09	80.05	80.02	79.93	79.92	80.59	80.13	79.71	—
13	80.06	80.36	79.70	80.05	80.00	80.03	79.91	80.29	80.53	80.14	79.62	—
14	80.48	80.14	79.74	80.02	79.96	80.01	79.93	80.51	80.45	80.18	79.65	79.46
15	80.29	79.96	80.38	80.01	79.93	79.97	79.95	80.33	80.38	80.23	79.67	79.45
16	79.93	80.08	80.29	79.98	79.99	79.93	80.10	80.14	80.32	80.28	79.75	79.39
17	79.65	80.21	80.04	80.00	80.04	79.90	80.25	79.94	80.27	80.23	79.84	79.31
18	79.39	80.26	79.87	80.01	80.07	79.88	80.16	79.85	80.23	80.21	80.05	79.26
19	79.54	80.29	79.90	80.07	80.11	79.87	80.02	79.91	80.21	80.19	80.26	79.29
20	79.75	80.32	79.95	80.13	80.12	79.96	80.00	79.98	80.15	80.17	80.39	79.26
21	79.90	80.21	80.08	80.18	80.14	80.10	80.08	80.08	80.09	80.14	80.34	79.22
22	80.05	80.10	80.10	80.20	80.14	80.17	80.17	80.20	80.04	80.11	80.17	79.34
23	80.15	79.98	80.11	80.19	80.16	80.14	80.29	80.08	79.98	80.13	—	79.44
24	80.02	79.88	80.15	80.16	80.17	80.11	80.11	79.92	79.93	80.09	—	79.45
25	79.87	79.80	80.15	80.13	80.20	80.08	79.87	79.88	79.89	80.14	—	79.58
26	79.79	79.73	80.14	80.11	80.20	80.06	79.86	79.91	79.87	80.24	—	79.79
27	79.83	79.67	80.11	80.10	80.18	80.04	80.04	79.96	79.99	80.30	—	80.01
28	79.86	79.64	80.01	80.08	80.03	80.02	80.24	79.99	80.26	80.32	—	80.30
29	79.89	79.74	79.95	80.06	—	80.01	80.45	80.00	80.28	80.34	—	80.57
30	79.85	79.84	80.06	80.08	—	79.99	80.56	80.00	80.26	80.31	—	80.74
31	79.75	—	80.16	80.07	—	79.98	—	80.00	—	80.19	—	—
MEAN	79.98	80.04	80.03	80.11	80.15	80.01	80.05	80.07	80.13	80.20	—	—
MAX	80.53	80.36	80.38	80.36	80.37	80.17	80.56	80.58	80.59	80.34	—	—
MIN	79.39	79.52	79.70	79.79	79.93	79.87	79.81	79.61	79.72	80.09	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057813 GREENWOOD DIVERSION NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'04", long 87°46'10", in NW1/4 NE1/4 sec.35, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, on left bank at downstream end of pipeline, 200 ft upstream from Green Creek, 0.7 mi downstream from Greenwood Afterbay, and 3.6 mi south of Greenwood.

PERIOD OF RECORD.--January 1973 to current year.

GAGE.--Water-stage recorder and concrete flume. Datum of gage is 1,454.57 ft above sea level (Cleveland-Cliffs Iron Co. bench mark). Prior to Aug. 22, 1973, nonrecording gage at same site and datum.

REMARKS.--Records excellent except for estimated daily discharges, which are good and daily discharges below 1.0 ft^3/s, which are poor. Flow completely regulated; diversion began January 7, 1973. A pipeline, 0.7 mi long, diverts water from Greenwood Afterbay (station 04057812), which regulates released flow from Greenwood Reservoir (station 04057811), into Green Creek, tributary to Schweitzer Reservoir (station 04058190). Water is used for iron ore processing, some returned to Middle Branch Escanaba River 27 mi downstream via another Green Creek, some returned 31 mi downstream via Goose Lake Outlet and East Branch Escanaba River. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	21	6.7	e16	12	15	6.5	.02	2.9	3.0	4.7	20
2	19	14	6.7	e16	12	15	6.5	.03	2.9	3.0	4.8	20
3	25	13	6.7	e16	13	15	6.5	.47	2.9	3.0	4.8	20
4	28	14	6.9	e16	13	15	5.1	1.1	2.9	3.0	4.8	20
5	28	14	6.8	e16	13	16	2.6	1.1	2.8	3.0	4.8	20
6	28	14	6.7	16	13	16	2.1	1.1	2.8	3.0	6.2	20
7	28	14	6.7	16	13	16	2.0	2.1	2.8	3.0	9.4	20
8	27	13	6.7	e13	13	14	1.0	2.9	2.8	3.0	10	20
9	27	13	6.7	e9.7	13	12	.03	2.9	2.8	4.1	10	20
10	27	13	6.8	11	13	12	.03	2.8	2.9	4.9	15	20
11	27	14	13	12	13	12	.02	2.8	3.0	5.9	18	20
12	27	14	21	12	13	12	.02	2.8	3.0	6.7	17	20
13	22	12	29	12	13	12	.02	2.9	3.0	6.7	17	19
14	9.0	10	24	12	13	12	.02	2.9	3.0	6.7	17	19
15	5.4	7.9	20	12	13	12	.02	2.9	3.0	6.7	17	19
16	5.2	7.0	20	12	13	12	.02	2.9	3.0	7.8	17	19
17	8.1	7.0	20	12	13	12	.02	2.9	3.0	8.9	14	19
18	8.8	7.0	17	12	13	12	.02	2.9	2.9	9.1	13	19
19	6.7	7.0	15	12	13	11	.02	2.9	2.9	e9.4	13	19
20	6.8	7.0	13	12	13	9.3	.02	2.9	2.9	e7.7	14	19
21	6.9	7.0	11	12	12	8.5	.02	2.9	2.9	5.4	15	19
22	7.0	6.9	11	12	12	7.5	.02	2.9	2.9	5.4	16	19
23	7.0	6.9	11	12	12	6.6	.03	2.9	2.9	e5.4	17	19
24	7.0	6.8	11	12	12	6.6	.03	2.8	2.9	e5.0	16	17
25	6.9	6.7	11	12	12	6.6	.02	2.8	2.9	e4.7	16	16
26	6.9	6.7	11	12	12	6.6	.02	2.8	2.9	4.7	16	15
27	6.9	6.6	e14	12	13	6.5	.02	2.8	2.9	4.7	16	15
28	6.9	6.6	e16	12	16	6.5	.02	2.9	3.0	4.7	16	15
29	6.9	6.7	e16	12	—	6.5	.02	2.9	3.0	4.7	16	15
30	10	6.7	e16	12	—	6.5	.02	2.9	3.0	4.7	18	16
31	18	—	e16	12	—	6.5	—	2.9	—	4.7	20	—
TOTAL	476.4	303.5	403.4	397.7	359	337.2	32.78	74.82	87.5	162.7	413.5	558
MEAN	15.4	10.1	13.0	12.8	12.8	10.9	1.09	2.41	2.92	5.25	13.3	18.6
MAX	28	21	29	16	16	16	6.5	2.9	3.0	9.4	20	20
MIN	5.2	6.6	6.7	9.7	12	6.5	.02	.02	2.8	3.0	4.7	15

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 2001, BY WATER YEAR (WY)

MEAN	14.5	12.6	14.7	17.9	17.1	13.0	6.41	9.49	12.2	17.1	17.3	16.7
MAX	26.5	26.4	25.5	26.0	26.0	25.8	17.2	24.2	26.0	26.1	28.5	28.1
(WY)	1995	1995	1995	1994	1995	1982	1980	1998	1977	1988	1994	1994
MIN	.046	.37	.19	.19	.28	.31	.11	.22	.28	1.63	1.20	.39
(WY)	1978	1974	1974	1974	1974	1974	1977	1973	1974	1982	1977	1977

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1973 - 2001	
ANNUAL TOTAL	5371.3		3606.50			
ANNUAL MEAN	14.7		9.88		14.2	
HIGHEST ANNUAL MEAN					22.4	1995
LOWEST ANNUAL MEAN					4.06	1974
HIGHEST DAILY MEAN	29	Dec 13	29	Dec 13	30	(a)
LOWEST DAILY MEAN	1.3	Mar 23	.02	Apr 11	.00	(b)
ANNUAL SEVEN-DAY MINIMUM	2.1	Mar 13	.02	Apr 11	.00	Apr 7 1998
10 PERCENT EXCEEDS	23		19		26	
50 PERCENT EXCEEDS	17		9.4		14	
90 PERCENT EXCEEDS	2.5		2.8		1.2	

(a) June 25-28, 1977, Nov. 9, 1979.
(b) Apr. 8-13, 1998; result of shutdown of flume for maintenance.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04057814 GREENWOOD RELEASE NEAR GREENWOOD, MI

LOCATION.--Lat 46°26'22", long 87°47'52", in NW1/4 SW1/4 sec.27, T.47 N., R.28 W., Marquette County, Hydrologic Unit 04030110, on left bank at outlet of Greenwood Afterbay releasing to Middle Branch Escanaba River, 2.6 mi upstream from Bell Creek, and 3.8 mi southwest of Greenwood.

DRAINAGE AREA.--67.4 mi^2.

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

GAGE.--Water-stage recorder and concrete flume. Datum of gage is 1,473.77 ft above sea level (Cleveland-Cliffs Iron Co. bench mark). Prior to Nov. 7, 1973, nonrecording gage at same site and different datum.

REMARKS.--Records good. Since December 1972, flow from Greenwood Reservoir (station 04057811) below spillway elevation 1,515 ft is completely regulated by Greenwood Afterbay release structure (station 04057812) into the Middle Branch Escanaba River. Since January 1973, water diverted immediately upstream from station via Greenwood Diversion (station 04057813) to Green Creek for iron ore processing and some returned to Middle Branch Escanaba River 27 mi downstream via another Green Creek. Since October 1979, some of the diversion returned 31 mi downstream via Goose Lake Outlet and East Branch Escanaba River. Overflow from reservoir spillway bypasses and returns to the Middle Branch Escanaba River 0.5 mi downstream from station. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	24	24	25	24	24	25	25	25	25	24	25
2	25	25	25	24	24	24	24	25	25	25	24	25
3	25	24	25	24	25	24	25	24	25	25	24	25
4	24	25	24	24	25	24	25	24	25	25	23	25
5	24	25	24	24	25	25	25	25	24	25	24	25
6	24	24	24	24	25	25	24	25	24	24	24	25
7	24	24	24	24	25	25	24	25	24	24	24	24
8	24	24	24	24	25	25	24	25	24	24	25	24
9	24	24	24	24	25	25	25	24	25	24	25	23
10	24	24	25	24	25	24	25	24	25	24	24	23
11	24	24	24	24	24	24	24	24	26	24	24	24
12	24	25	24	24	24	24	24	25	26	24	25	24
13	24	24	24	24	24	24	23	26	26	24	24	24
14	24	24	24	24	24	24	23	27	26	24	25	24
15	23	24	25	24	24	25	24	25	26	24	25	24
16	24	24	25	24	24	24	24	24	25	24	25	24
17	24	25	24	24	24	24	23	24	25	24	25	24
18	24	25	24	24	25	24	23	24	25	24	25	24
19	25	25	24	24	25	24	24	24	25	24	25	24
20	24	24	24	25	25	25	24	24	25	24	25	24
21	25	24	24	25	25	25	25	25	25	24	25	24
22	25	24	24	25	25	25	25	25	25	24	24	24
23	25	24	25	25	25	25	25	25	25	24	23	25
24	24	24	25	25	25	25	24	24	25	24	24	25
25	24	24	25	25	25	25	24	24	24	24	25	25
26	24	24	25	24	25	25	23	24	24	25	24	25
27	24	24	25	24	25	25	24	24	24	25	24	25
28	25	24	25	24	24	25	25	24	25	25	25	25
29	25	24	24	24	---	25	25	25	25	25	25	25
30	24	24	24	24	---	25	26	25	25	25	25	26
31	24	---	24	24	---	25	---	25	---	24	25	---
TOTAL	752	727	755	751	690	762	728	763	748	754	758	733
MEAN	24.3	24.2	24.4	24.2	24.6	24.6	24.3	24.6	24.9	24.3	24.5	24.4
MAX	25	25	25	25	25	25	26	27	26	25	25	26
MIN	23	24	24	24	24	24	23	24	24	24	23	23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 2001, BY WATER YEAR (WY)

MEAN	29.5	28.8	25.7	25.4	26.3	28.4	27.5	26.7	26.9	26.2	25.6	25.6
MAX	141	122	35.6	32.6	35.9	56.3	44.9	40.3	42.2	42.2	30.6	30.2
(WY)	1973	1973	1974	1974	1986	1989	1989	1976	1975	1974	1997	1984
MIN	21.7	14.1	13.0	18.9	22.0	22.0	12.1	17.3	21.7	20.3	21.8	22.0
(WY)	1996	1999	1999	1973	1973	1973	1998	1999	1995	1973	1995	1995

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1973 - 2001	
ANNUAL TOTAL	9110		8921			
ANNUAL MEAN	24.9		24.4		26.9	
HIGHEST ANNUAL MEAN					44.8	1973
LOWEST ANNUAL MEAN					21.0	1999
HIGHEST DAILY MEAN	28	Apr 24	27	May 14	(a)290	Oct 1 1972
LOWEST DAILY MEAN	23	Oct 15	23	Oct 15	.00	(b)
ANNUAL SEVEN-DAY MINIMUM	24	Oct 9	23	Apr 12	.00	Apr 15 1998
10 PERCENT EXCEEDS	26		25		29	
50 PERCENT EXCEEDS	25		24		25	
90 PERCENT EXCEEDS	24		24		24	

(a) Prior to regulation; since regulation began, 63 ft^3/s, July 10, 11, 1974.
(b) Apr. 15-29, 1998; result of shutdown of flume for maintenance.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058100 MIDDLE BRANCH ESCANABA RIVER NEAR PRINCETON, MI

LOCATION.--Lat 46°19'02", long 87°30'07", in NW1/4 sec.12, T.45 N., R.26 W., Marquette County, Hydrologic Unit 04030110, on right bank 400 ft downstream from powerplant, 0.3 mi upstream from Green Creek, and 2.2 mi northwest of Princeton.

DRAINAGE AREA.--210 mi^2.

PERIOD OF RECORD.--July 1961 to September 1982, October 1989 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,102.68 ft above sea level.

REMARKS.--Records good. Flow regulated by powerplant 400 ft upstream from station. Since December 1972, additional regulation 27 mi upstream by Greenwood Release (station 04057814). Since January 1973, some flow diverted to Green Creek via Greenwood Diversion (station 04057813) 27 mi upstream by industry for iron ore processing and some returned 0.3 mi downstream via another Green Creek. Since October 1979, some of the diversion returned 5.0 mi downstream via Goose Lake Outlet and East Branch Escanaba River. From 1973 to 1991 annual mean discharge and runoff figures adjusted for diversion and change in contents in Greenwood Reservoir (station 04057811). Several measurements of water temperature were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 22, 1985, reached a stage of 11.84 ft, from floodmark, discharge, 4,200 ft^3/s, from rating curve extended above 2,400 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84	107	106	97	99	90	106	435	223	371	174	87
2	84	107	107	97	99	90	117	411	218	262	182	87
3	78	107	105	97	99	92	150	387	221	173	152	86
4	74	107	96	93	99	92	166	361	224	161	133	77
5	74	105	87	87	95	92	191	309	231	160	134	71
6	74	105	95	88	91	93	282	255	246	135	133	71
7	78	105	95	89	90	92	348	281	239	111	121	71
8	112	105	87	89	90	92	356	274	186	111	108	73
9	126	105	87	89	90	92	523	251	157	111	108	73
10	114	114	87	89	90	92	586	221	159	111	107	136
11	96	120	89	93	90	92	616	262	159	94	96	126
12	96	119	92	99	90	92	671	296	196	82	99	89
13	139	119	92	100	90	91	744	277	317	94	94	89
14	224	143	92	101	91	91	776	267	350	101	90	90
15	231	164	92	101	91	92	725	284	365	101	90	90
16	247	147	92	99	91	92	676	336	393	130	90	90
17	195	139	92	94	90	92	616	326	392	145	90	84
18	186	143	92	88	90	92	546	316	369	122	90	80
19	139	143	92	88	90	92	479	302	381	133	90	81
20	122	129	92	88	90	104	430	293	363	287	90	114
21	122	112	92	89	90	116	400	225	329	357	90	119
22	123	108	92	89	90	123	391	238	242	369	90	81
23	125	108	94	89	90	130	393	307	220	443	79	83
24	130	108	97	89	90	130	436	310	231	376	73	157
25	131	118	97	90	90	129	472	295	230	316	74	159
26	132	128	97	90	90	123	470	300	176	213	76	125
27	129	122	97	90	90	120	504	331	145	185	88	108
28	128	110	97	90	90	113	516	346	335	206	101	107
29	128	105	97	83	—	105	480	363	370	205	94	105
30	121	105	97	101	—	105	452	316	330	177	89	105
31	110	—	97	100	—	105	—	245	—	159	88	—
TOTAL	3952	3557	2923	2866	2565	3146	13618	9420	7997	6001	3213	2914
MEAN	127	119	94.3	92.5	91.6	101	454	304	267	194	104	97.1
MAX	247	164	107	101	99	130	776	435	393	443	182	159
MIN	74	105	87	83	90	90	106	221	145	82	73	71

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	168	174	134	105	100	148	501	428	239	154	122	147
MAX	376	349	235	196	162	348	917	1056	518	318	216	566
(WY)	1973	1973	1992	1969	1969	1973	1976	1972	1968	1968	1978	1978
MIN	54.4	70.0	79.4	61.0	56.1	71.0	179	97.4	101	63.5	53.0	60.4
(WY)	1964	1977	1977	1964	1963	1964	1990	1998	1977	1965	1963	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	54208		62172			
ANNUAL MEAN	148		170		202	
HIGHEST ANNUAL MEAN					296	1979
LOWEST ANNUAL MEAN					122	1998
HIGHEST DAILY MEAN	506	Mar 31	776	Apr 14	2550	May 6 1972
LOWEST DAILY MEAN	50	Aug 25	71	Sep 5	4.1	Feb 4 1967
ANNUAL SEVEN-DAY MINIMUM	73	Aug 20	75	Sep 3	28	Aug 29 1961
MAXIMUM PEAK FLOW			792	Apr 14	(a)2580	May 6 1972
MAXIMUM PEAK STAGE			4.23	Apr 14	8.37	Apr 27 1979
INSTANTANEOUS LOW FLOW			16	(b)	2.2	Oct 5 1964
10 PERCENT EXCEEDS	280		363		401	
50 PERCENT EXCEEDS	114		107		126	
90 PERCENT EXCEEDS	87		88		80	

(a) Gage height 7.85 ft.
(b) Jan. 29, Aug. 11.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058190 SCHWEITZER RESERVOIR NEAR PALMER, MI

LOCATION.--Lat 46°25'00", long 87°38'48", in SE1/4 NW1/4 sec.2, T.46 N., R.27 W., Marquette County, Hydrologic Unit 04030110, on left bank 120 ft upstream from dam on Schweitzer Creek, 3.0 mi southwest of Palmer.

DRAINAGE AREA.--23.1 mi^2.

PERIOD OF RECORD.--January 1963 to current year. Prior to October 1997 monthend elevations and contents only.

GAGE.--Water-stage recorder. Datum of gage is 1,300.00 ft above sea level (Cleveland-Cliffs Iron Co. reference mark); EXTREMES reported below have been converted to sea level elevations. Prior to Oct. 25, 1967, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by an earthfill dam with fixed crest concrete spillway completed in 1963. Capacity of reservoir, 5,300 acre-ft at spillway elevation, 1,338.00 ft. The dam includes a discharge pipe equipped with valve to control release flow to Schweitzer Creek (station 04058200). An average of 29 ft^3/s (figure furnished by Cleveland Cliffs Iron Co.) was diverted from reservoir for iron ore processing, some returned to Middle Branch Escanaba River via Green Creek and some returned to the East Branch Escanaba River via Goose Lake Outlet. Since January 1973, controlled diversion from Greenwood Reservoir (station 04057811) via Greenwood Diversion (station 04057813) into Schweitzer Reservoir. Controlled inflow averaged 9.9 ft^3/s for the year. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation recorded, 1,339.5 ft, May 31, 1970, Apr. 20, 1985; minimum recorded since first filling, 1,329.7 ft, Apr. 10, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,338.66 ft, June 28; minimum, 1,335.83 ft, Apr. 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36.61	36.91	37.27	37.22	37.27	37.02	35.89	38.13	38.14	38.19	38.02	36.77
2	36.62	36.95	37.27	37.23	37.27	37.02	35.85	38.12	38.14	38.08	38.00	36.78
3	36.52	36.94	37.25	37.27	37.28	37.02	35.84	38.11	38.22	38.00	37.94	36.78
4	36.46	36.93	37.20	37.30	37.28	37.05	35.89	38.09	38.26	37.93	37.86	36.76
5	36.49	36.89	37.15	37.34	37.26	37.08	35.99	38.05	38.26	37.83	37.77	36.76
6	36.54	36.86	37.09	37.37	37.25	37.13	36.22	38.01	38.25	37.72	37.70	36.75
7	36.65	36.84	37.03	37.42	37.24	37.14	36.63	37.99	38.24	37.63	37.64	36.82
8	36.75	36.81	37.01	37.44	37.22	37.14	37.45	38.00	38.22	37.53	37.60	36.89
9	36.82	36.78	36.95	37.41	37.24	37.02	38.27	37.98	38.21	37.42	37.55	36.93
10	36.88	36.79	36.86	37.38	37.23	36.88	38.37	38.01	38.22	37.38	37.39	36.96
11	36.95	36.83	36.76	37.36	37.24	36.76	38.42	38.08	38.25	37.36	37.35	36.95
12	37.04	36.89	36.78	37.36	37.25	36.68	38.51	38.08	38.37	37.36	37.30	36.93
13	37.30	36.99	36.86	37.38	37.24	36.61	38.58	38.08	38.44	37.35	37.28	36.91
14	37.60	37.14	36.99	37.40	37.22	36.49	38.49	38.07	38.42	37.26	37.28	36.90
15	37.66	37.19	37.08	37.43	37.18	36.36	38.41	38.23	38.37	37.20	37.30	36.91
16	37.59	37.20	37.16	37.40	37.15	36.25	38.37	38.34	38.40	37.17	37.33	36.89
17	37.48	37.19	37.24	37.37	37.12	36.22	38.31	38.30	38.39	37.19	37.39	36.89
18	37.42	37.18	37.28	37.37	37.10	36.20	38.26	38.23	38.36	37.25	37.34	36.88
19	37.43	37.18	37.32	37.38	37.08	36.20	38.24	38.14	38.39	37.40	37.26	36.88
20	37.41	37.23	37.35	37.37	37.06	36.21	38.23	38.10	38.31	37.95	37.18	36.96
21	37.36	37.26	37.35	37.38	37.07	36.24	38.23	38.09	38.24	38.24	37.12	37.03
22	37.30	37.27	37.31	37.34	37.07	36.24	38.26	38.24	38.20	38.23	37.05	37.05
23	37.25	37.27	37.24	37.33	37.07	36.18	38.33	38.33	38.18	38.39	36.98	37.10
24	37.22	37.27	37.21	37.33	37.06	36.19	38.46	38.30	38.14	38.33	36.92	37.19
25	37.18	37.28	37.16	37.33	37.08	36.21	38.40	38.28	38.09	38.23	36.88	37.22
26	37.15	37.28	37.11	37.33	37.07	36.22	38.30	38.30	37.99	38.15	36.89	37.20
27	37.12	37.28	37.09	37.31	37.05	36.18	38.22	38.29	38.05	38.09	36.84	37.17
28	37.06	37.29	37.11	37.28	37.01	36.13	38.16	38.25	38.57	38.08	36.80	37.13
29	37.00	37.28	37.13	37.25	—	36.08	38.12	38.20	38.55	38.08	36.78	37.07
30	36.93	37.28	37.16	37.27	—	36.02	38.13	38.15	38.36	38.05	36.77	37.02
31	36.89	—	37.19	37.30	—	35.96	—	38.12	—	38.03	36.77	—
MEAN	37.05	37.08	37.13	37.34	37.17	36.52	37.76	38.15	38.27	37.78	37.30	36.95
MAX	37.66	37.29	37.35	37.44	37.28	37.14	38.58	38.34	38.57	38.39	38.02	37.22
MIN	36.46	36.78	36.76	37.22	37.01	35.96	35.84	37.98	37.99	37.17	36.77	36.75

WTR YR 2001 MEAN 37.38 MAX 38.58 MIN 35.84

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058200 SCHWEITZER CREEK NEAR PALMER, MI

LOCATION.--Lat 46°24'40", long 87°37'27", in SW1/4 sec.1, T.46 N., R.27 W., Marquette County, Hydrologic Unit 04030110, on right bank 10 ft upstream from bridge on County Road PFS, 1.0 mi downstream from Schweitzer Reservoir, and 2.5 mi southwest of Palmer.

DRAINAGE AREA.--23.6 mi^2.

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

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1963. Datum of gage is 1,268.28 ft above sea level (Cleveland-Cliffs Iron Co. bench mark). Prior to Aug. 21, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Since August 1962, flow completely regulated by Schweitzer Reservoir (station 04058190) 1.0 mi upstream. Prior to June 1994, some diversion from headwaters of basin for municipal supply and the effluent discharged to the Carp River basin. An average of 29 ft^3/s (figure furnished by Cleveland Cliffs Iron Co.) was diverted from Schweitzer Reservoir by industry for iron ore processing, some returned to the Middle Branch Escanaba River via Green Creek and some returned via Goose Lake Outlet and East Branch Escanaba River. Diversion into Schweitzer Reservoir from Greenwood Reservoir (station 04057811) via Greenwood Diversion (station 04057813). Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.5	4.2	3.7	3.8	e3.9	4.4	21	15	19	4.6	4.3
2	4.1	4.4	4.2	e3.7	e3.8	3.8	4.6	19	14	7.7	4.5	4.3
3	4.0	4.3	4.2	e3.7	e3.8	3.9	4.8	18	21	5.0	4.5	4.3
4	4.1	4.3	4.2	e3.7	e3.8	3.9	5.1	14	26	4.9	4.4	4.3
5	4.2	4.2	4.2	3.7	e3.8	3.9	5.4	10	27	5.0	4.4	4.3
6	4.2	4.3	e4.2	3.7	e3.8	3.9	6.4	7.0	25	5.0	4.4	5.6
7	4.6	4.4	e4.2	3.7	e3.8	3.9	7.9	5.6	23	4.7	5.0	4.5
8	4.5	4.3	4.1	3.7	e3.8	3.9	7.4	5.8	21	4.7	4.2	4.5
9	4.5	4.3	e4.1	3.7	e3.8	3.9	61	5.2	20	4.7	4.3	4.4
10	4.4	4.2	e4.1	3.7	e3.8	3.8	84	7.7	21	5.3	4.2	4.4
11	5.1	4.2	e4.1	3.7	e3.8	3.8	87	13	24	5.6	4.3	4.5
12	4.5	4.3	e4.1	3.8	e3.8	3.9	119	14	36	4.6	4.3	4.4
13	6.2	4.9	e4.1	3.9	e3.8	3.9	136	13	45	4.5	4.5	4.4
14	4.8	4.9	e4.1	3.8	e3.8	3.9	101	13	44	4.5	4.5	4.4
15	4.6	4.8	e4.1	3.9	e3.8	3.9	77	40	37	4.8	4.5	4.4
16	4.5	4.4	4.0	3.9	e3.8	3.9	63	62	37	4.8	4.7	4.3
17	4.4	4.3	4.0	3.9	e3.8	3.9	50	47	34	4.6	4.6	5.2
18	4.4	4.4	4.1	3.9	e3.8	3.9	41	35	31	4.9	4.4	4.1
19	4.8	4.3	4.0	3.8	e3.8	3.9	37	22	45	6.3	4.4	4.7
20	4.3	4.5	e4.0	e3.8	e3.8	4.1	36	15	36	10	4.3	4.8
21	4.3	4.3	e4.0	e3.8	e3.8	4.4	35	13	25	45	4.3	4.5
22	4.3	4.2	e4.0	e3.8	e3.8	4.5	39	30	19	38	4.4	4.4
23	4.6	4.2	4.1	e3.8	e3.8	4.3	52	41	15	50	5.1	5.2
24	4.4	4.2	e4.0	e3.8	e3.8	4.1	76	36	12	42	5.1	4.5
25	4.4	4.2	e4.0	e3.8	e4.0	4.1	64	32	8.0	22	4.2	4.5
26	4.4	4.2	e4.0	3.8	e4.1	4.0	46	33	5.1	12	5.3	4.2
27	4.4	4.2	e3.9	3.9	e4.2	4.0	33	32	15	5.9	4.3	5.7
28	4.4	4.2	e3.9	3.9	e4.0	4.1	24	27	60	5.3	4.3	4.3
29	4.4	4.2	e3.8	3.8	—	4.1	20	21	59	5.2	4.2	4.2
30	4.4	4.2	e3.8	4.1	—	4.2	22	15	37	4.7	4.3	4.2
31	4.4	—	3.7	4.0	—	4.4	—	13	—	4.6	4.2	—
TOTAL	138.6	130.3	125.5	117.9	107.5	124.1	1349.0	680.3	837.1	355.3	138.7	135.8
MEAN	4.47	4.34	4.05	3.80	3.84	4.00	45.0	21.9	27.9	11.5	4.47	4.53
MAX	6.2	4.9	4.2	4.1	4.2	4.5	136	62	60	50	5.3	5.7
MIN	4.0	4.2	3.7	3.7	3.8	3.8	4.4	5.2	5.1	4.5	4.2	4.1

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	10.3	11.2	7.46	5.57	5.06	7.31	45.9	27.1	15.1	8.15	6.81	8.67
MAX	41.8	41.3	24.0	13.5	9.98	35.3	115	98.1	55.8	24.2	28.9	56.5
(WY)	1986	1989	1966	1966	1961	1966	1985	1972	1968	1979	1973	1978
MIN	2.85	3.02	2.90	2.15	1.92	2.40	1.45	1.69	4.07	3.80	3.46	3.62
(WY)	2000	1999	1999	1963	1963	1963	1963	1963	1998	1999	1963	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	1828.0		4240.1			
ANNUAL MEAN	4.99		11.6		13.2	
HIGHEST ANNUAL MEAN					26.4	1966
LOWEST ANNUAL MEAN					4.64	1987
HIGHEST DAILY MEAN	21	Apr 6	136	Apr 13	699	Apr 20 1985
LOWEST DAILY MEAN	3.2	Jun 7	3.7	Dec 31	1.0	(a)
ANNUAL SEVEN-DAY MINIMUM	3.4	Mar 18	3.7	Dec 31	1.0	Apr 9 1963
MAXIMUM PEAK FLOW			150	Apr 13	860	May 31 1970
MAXIMUM PEAK STAGE			4.34	Apr 13	6.50	May 31 1970
INSTANTANEOUS LOW FLOW					.40	Sep 6 1962
10 PERCENT EXCEEDS	5.5		35		28	
50 PERCENT EXCEEDS	4.5		4.4		5.4	
90 PERCENT EXCEEDS	3.8		3.8		3.9	

(a) Apr. 9-18, May 5, 6, 1963.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04058940 ESCANABA RIVER NEAR ST. NICHOLAS, MI

LOCATION.--Lat 45°58'45", long 87°16'13", in SW1/4 NE1/4 sec.2, T.41 N., R.24 W., Delta County, Hydrologic Unit 04030110, on right bank 600 ft downstream from Boney Falls Dam, 2.1 mi west of St. Nicholas, and 23 mi upstream from mouth.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--December 1987 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 854.03 ft above sea level.

REMARKS.--Diurnal fluctuation caused by hydroelectric plant 600 ft upstream. Some regulation by Schweitzer Reservoir (station 04058190) approximately 40 mi upstream and Greenwood Reservoir (station 04057811) approximately 50 mi upstream. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 7.09 ft, Apr. 29, 1996, result of unusual regulation; minimum daily, 1.81 ft, July 26, 27, 1998.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.54 ft, Apr. 11; minimum daily, 1.87 ft, Sept. 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.07	2.34	2.27	2.17	2.18	2.14	2.49	3.11	2.54	2.74	2.25	1.99
2	2.07	2.33	2.16	—	2.17	2.14	2.52	3.05	2.60	2.64	2.21	1.97
3	2.05	2.31	2.11	—	2.16	2.13	2.68	3.01	2.66	2.39	2.23	1.92
4	2.03	2.30	2.18	2.04	2.17	2.13	2.86	2.94	2.61	2.35	2.19	1.92
5	2.03	2.27	2.15	2.15	2.17	2.14	3.12	2.85	2.62	2.32	2.05	1.93
6	2.01	2.27	2.02	2.11	2.15	2.13	3.35	2.68	2.59	2.29	2.08	1.87
7	2.06	2.28	1.98	2.09	2.14	2.13	3.88	2.66	2.55	2.20	2.08	1.88
8	2.14	2.30	2.16	2.09	2.14	2.14	4.53	2.71	2.44	2.18	2.10	1.99
9	2.28	2.30	2.06	2.11	2.12	2.13	4.84	2.63	2.39	2.22	2.02	2.12
10	2.35	2.31	2.15	2.10	2.11	2.13	4.70	2.65	2.39	2.07	1.93	2.04
11	2.32	2.33	2.10	2.12	2.12	2.13	4.69	2.66	2.42	2.07	1.98	2.27
12	2.29	2.30	2.15	2.12	2.13	2.12	4.77	2.75	2.80	2.14	2.08	2.10
13	2.34	2.35	2.11	2.14	2.12	2.12	4.87	2.70	2.92	2.01	1.94	1.97
14	2.69	2.60	2.15	2.13	2.12	2.12	4.80	2.64	2.98	1.96	1.98	2.05
15	2.86	2.76	2.13	2.12	2.12	2.14	4.64	2.79	2.90	2.16	2.04	2.09
16	2.83	2.70	2.15	2.14	2.12	2.17	4.48	3.08	3.08	1.95	1.94	2.07
17	2.73	2.60	2.15	2.14	2.12	2.17	4.27	3.18	3.09	2.23	2.00	2.01
18	2.67	2.53	2.14	2.12	2.10	2.16	4.01	3.05	3.00	2.18	2.01	1.98
19	2.56	2.45	2.13	2.12	2.10	2.19	3.78	2.89	2.96	2.23	2.03	2.03
20	2.45	2.43	2.13	2.09	2.09	2.22	3.62	2.76	2.96	2.40	2.02	2.08
21	2.40	2.31	2.15	2.10	2.10	2.31	3.56	2.73	2.86	2.69	2.00	2.27
22	2.36	2.31	2.15	2.10	2.08	2.36	3.59	2.85	2.72	2.69	2.03	2.22
23	2.42	2.28	2.14	2.11	2.08	2.43	3.65	3.05	2.53	2.72	1.89	2.21
24	2.53	2.38	2.11	2.10	2.07	2.50	3.84	3.03	2.49	2.75	1.99	2.42
25	2.54	2.31	2.07	2.10	2.09	2.39	3.90	2.98	2.46	2.58	1.90	2.61
26	2.49	2.41	2.19	2.10	2.12	2.45	3.77	2.99	2.37	2.43	2.03	2.44
27	2.49	2.38	2.19	2.09	2.12	2.41	3.59	2.93	2.27	2.24	2.10	2.31
28	2.46	2.37	2.18	2.10	2.13	2.38	3.45	2.96	2.53	2.27	2.01	2.25
29	2.42	2.34	2.17	2.09	—	2.40	3.33	2.86	3.18	2.29	2.03	2.22
30	2.41	2.32	2.17	2.10	—	2.37	3.20	2.80	3.01	2.30	2.00	2.19
31	2.36	—	2.17	2.15	—	2.41	—	2.57	—	2.23	2.00	—
MEAN	2.38	2.38	2.14	—	2.12	2.24	3.83	2.86	2.70	2.32	2.04	2.11
MAX	2.86	2.76	2.27	—	2.18	2.50	4.87	3.18	3.18	2.75	2.25	2.61
MIN	2.01	2.27	1.98	—	2.07	2.12	2.49	2.57	2.27	1.95	1.89	1.87

STREAMS TRIBUTARY TO LAKE MICHIGAN

04059000 ESCANABA RIVER AT CORNELL, MI

LOCATION.--Lat 45°54'31", long 87°12'49", in NW1/4 sec.32, T.41 N., R.23 W., Delta County, Hydrologic Unit 04030110, on right bank 50 ft downstream from bridge on County Road 519, 0.4 mi downstream from Bobs Creek, 0.7 mi northeast of Cornell, and 16 mi upstream from mouth.
DRAINAGE AREA.--870 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1903 to December 1912, January 1913 to November 1915 (gage heights only), October 1950 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as "near Escanaba" 1903-15.
REVISED RECORDS.--WSP 1387: 1904. WDR MI-85-1: 1970 (M).
GAGE.--Water-stage recorder. Datum of gage is 749.26 ft above sea level (levels by Michigan Department of Natural Resources). August 1903 to November 1915, nonrecording gage at site 10 mi downstream at different datum.
REMARKS.--Records good except for estimated daily discharges, which are fair. Since 1950, diurnal fluctuation and slight regulation by Boney Falls powerplant 7 mi upstream. Since August 1962, some regulation by Schweitzer Reservoir (station 04058190) approximately 50 mi upstream. Since December 1972, some regulation by Greenwood Reservoir (station 04057811) approximately 60 mi upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	276	411	e400	e330	e330	e310	e900	1230	652	779	384	223
2	274	413	e350	e320	e330	e310	1210	1160	710	697	343	223
3	269	396	e300	e300	e320	e310	1290	1140	754	515	366	175
4	251	382	e340	e270	e330	e310	1780	1030	728	476	348	203
5	248	368	e320	e320	e330	e310	1820	931	696	456	275	183
6	241	367	e260	e310	e320	e310	1930	782	661	420	281	163
7	269	392	e240	e290	e310	e310	2700	757	628	385	272	177
8	314	388	e320	e290	e310	e300	3820	789	548	352	293	204
9	393	399	e280	e300	e300	e310	4430	718	494	415	236	284
10	448	406	e320	e290	e300	e310	4180	734	514	288	204	257
11	442	424	e290	e300	e300	e310	4140	760	543	295	201	354
12	414	416	e320	e300	e310	e300	4530	823	924	320	268	287
13	430	498	e300	e310	e300	e300	4860	764	1040	258	213	203
14	697	713	e320	e310	e300	e300	4530	719	1060	240	202	236
15	843	843	e310	e300	e300	e310	4000	969	997	359	270	242
16	823	784	e320	e310	e300	e330	3650	1320	1260	237	198	266
17	760	690	e320	e310	e300	e330	3120	1410	1250	367	235	220
18	689	633	e310	e300	e290	e320	2670	1210	1130	364	246	197
19	610	567	e310	e300	e290	e340	2280	1010	1030	368	254	236
20	532	567	e310	e290	e290	e360	2020	866	1040	475	246	248
21	483	517	e320	e290	e290	e410	1880	878	972	693	236	344
22	461	678	e320	e290	e280	e440	1930	1140	823	716	263	354
23	491	664	e310	e300	e280	e490	2000	1300	665	731	180	370
24	579	722	e300	e290	e280	e540	2220	1240	604	764	238	458
25	593	555	e280	e290	e290	e460	2260	1190	572	623	180	590
26	561	521	e340	e290	e300	e500	2070	1170	508	514	259	484
27	533	490	e340	e290	e300	e480	1800	1100	434	390	291	385
28	501	481	e330	e290	e310	e460	1620	1110	560	383	228	339
29	479	460	e330	e290	—	e470	1460	979	1190	397	250	324
30	458	450	e330	e290	—	e450	1310	893	1010	412	229	310
31	436	—	e330	e320	—	e700	—	704	—	367	223	—
TOTAL	14798	15595	9770	9280	8490	11690	78410	30826	23997	14056	7912	8539
MEAN	477	520	315	299	303	377	2614	994	800	453	255	285
MAX	843	843	400	330	330	700	4860	1410	1260	779	384	590
MIN	241	367	240	270	280	300	900	704	434	237	180	163
CFSM	.55	.60	.36	.34	.35	.43	3.00	1.14	.92	.52	.29	.33
IN.	.63	.67	.42	.40	.36	.50	3.35	1.32	1.03	.60	.34	.37

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 2001, BY WATER YEAR (WY)

MEAN	698	769	531	365	345	598	2536	1655	927	596	487	603
MAX	1690	2230	945	720	959	1879	4329	4388	2172	1859	2014	1874
(WY)	1986	1989	1907	1969	1984	2000	1951	1907	1968	1951	1911	1978
MIN	196	218	230	190	185	227	830	312	255	193	191	194
(WY)	1964	1977	1977	1964	1959	1964	1990	1998	1988	1998	1998	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1903 - 2001	
ANNUAL TOTAL	224151		233363			
ANNUAL MEAN	612		639		(a)815	
HIGHEST ANNUAL MEAN					1385	1960
LOWEST ANNUAL MEAN					506	1963
HIGHEST DAILY MEAN	2980	Mar 9	4860	Apr 13	10400	Apr 22 1985
LOWEST DAILY MEAN	176	Aug 26	163	Sep 6	(b)90	Jul 5 1910
ANNUAL SEVEN-DAY MINIMUM	210	Aug 21	190	Sep 2	131	Jul 23 1998
MAXIMUM PEAK FLOW			5040	Apr 13	(c)10700	Apr 26 1979
MAXIMUM PEAK STAGE			3.71	Apr 13	(d)6.40	Apr 9 1971
INSTANTANEOUS LOW FLOW			129	Aug 23	(b)90	Jul 5 1910
ANNUAL RUNOFF (CFSM)	.70		.73		.94	
ANNUAL RUNOFF (INCHES)	9.58		9.98		12.74	
10 PERCENT EXCEEDS	1240		1210		1830	
50 PERCENT EXCEEDS	412		367		504	
90 PERCENT EXCEEDS	270		249		254	

(a) Does not include water years 1904-12.
(b) Observed; site and datum then in use, but may have been less during extended periods of no gage-height record during winter periods of 1903-12, or periods of ice effect in 1959.
(c) Gage height 5.00 ft.
(d) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04059000 ESCANABA RIVER AT CORNELL, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967, 1969-73, 1975-94, 1998 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1975 to September 1981.
WATER TEMPERATURE: February 1975 to September 1981, April 1998 to current year.

INSTRUMENTATION.--Water-quality monitor from Oct. 15, 1975 to Sept. 30, 1981. Water-temperature recorder with telemetry since Apr. 14, 1998.

REMARKS.--Records represent water temperature at sensor within 0.5°C, from Apr. 1 to Sept. 30.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1975, 1978-81): Maximum daily recorded (more than 20 percent missing record), 360 microsiemens, Sept. 10, 1975; minimum measured, 114 microsiemens, Apr. 15, 1981.
WATER TEMPERATURE (water years 1975, 1977-81, 1998 to current year): Maximum daily recorded (more than 20 percent missing record), 35.0°C, July 31, 1975; minimum, 0.0°C on many days during winter.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--A specific conductance of 72 microsiemens was measured Apr. 24, 1985.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 33.0°C, Aug. 7.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	.5	.0	.0	16.0	13.0	14.0
2	—	—	—	—	—	—	.5	.0	.0	14.5	13.0	14.0
3	—	—	—	—	—	—	.5	.0	.0	17.5	13.0	14.5
4	—	—	—	—	—	—	.5	.0	.0	17.0	12.5	14.0
5	—	—	—	—	—	—	.5	.0	.0	15.0	10.5	12.5
6	—	—	—	—	—	—	.5	.0	.0	13.5	11.0	12.0
7	—	—	—	—	—	—	.5	.0	.5	13.0	11.0	12.0
8	—	—	—	—	—	—	2.0	.5	1.0	16.5	9.5	12.5
9	—	—	—	—	—	—	2.5	.5	1.5	17.5	9.5	13.0
10	—	—	—	—	—	—	3.5	1.5	2.5	18.5	12.0	14.5
11	—	—	—	—	—	—	3.0	3.0	3.0	14.5	10.5	12.5
12	—	—	—	—	—	—	4.5	3.0	4.0	16.5	9.0	12.0
13	—	—	—	—	—	—	5.5	3.5	4.5	15.0	10.0	12.5
14	—	—	—	—	—	—	7.0	4.5	5.5	14.5	10.5	12.0
15	—	—	—	—	—	—	6.0	5.0	5.5	12.0	11.0	11.5
16	—	—	—	—	—	—	5.5	4.0	4.5	16.0	11.5	13.0
17	—	—	—	—	—	—	5.0	2.5	3.5	17.0	13.5	14.5
18	—	—	—	—	—	—	5.5	3.0	4.5	17.5	13.0	15.0
19	—	—	—	—	—	—	7.0	3.5	5.5	18.5	13.0	15.5
20	—	—	—	—	—	—	6.5	5.5	6.0	19.5	14.0	16.5
21	—	—	—	—	—	—	8.5	6.5	7.0	16.0	14.0	15.0
22	—	—	—	—	—	—	9.0	6.5	7.5	14.5	12.5	13.5
23	—	—	—	—	—	—	10.0	7.5	9.0	13.0	12.0	12.5
24	—	—	—	—	—	—	10.5	7.5	9.0	13.5	11.5	12.5
25	—	—	—	—	—	—	10.0	8.0	9.0	15.0	12.0	13.5
26	—	—	—	—	—	—	11.5	9.0	10.0	14.0	12.5	13.0
27	—	—	—	—	—	—	12.5	9.0	10.5	12.5	11.0	11.5
28	—	—	—	—	—	—	12.0	8.5	10.0	15.5	10.5	13.0
29	—	—	—	—	—	—	12.5	8.5	10.0	16.0	12.5	14.0
30	—	—	—	—	—	—	15.0	10.0	12.0	15.5	11.0	13.0
31	—	—	—	—	—	—	—	—	—	16.0	10.5	13.5
MONTH	—	—	—	—	—	—	15.0	.0	4.9	19.5	9.0	13.3

04059000 ESCANABA RIVER AT CORNELL, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

Y	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	13.0	11.0	12.0	23.0	18.0	20.5	24.0	20.5	22.0	23.0	11.5	17.0
2	11.0	9.5	10.5	23.5	16.0	19.0	29.0	20.5	24.0	24.5	15.5	19.5
3	11.0	9.0	10.0	23.0	16.5	19.5	29.0	19.0	24.0	26.0	17.5	20.5
4	13.5	9.0	11.0	25.0	16.5	20.0	30.5	19.5	24.0	25.0	14.5	19.0
5	16.0	9.5	12.0	24.0	15.0	19.0	29.0	20.5	24.5	24.5	13.0	18.5
6	19.0	11.0	14.0	23.5	14.0	18.5	32.0	23.0	27.0	26.0	15.5	20.5
7	20.0	12.0	15.5	25.0	17.5	21.0	33.0	22.5	27.5	24.0	19.0	21.0
8	22.0	12.5	16.5	28.5	16.5	22.0	29.5	22.5	26.0	24.5	19.0	21.0
9	21.5	13.5	17.5	26.0	18.0	22.0	30.0	22.0	25.5	20.5	17.0	18.5
0	16.5	14.0	15.5	26.0	17.5	21.5	25.5	18.0	21.5	22.0	15.0	18.0
1	19.0	15.0	16.5	27.0	16.5	21.0	27.0	15.5	21.0	21.5	13.0	17.0
2	19.5	15.0	17.0	27.5	16.0	21.0	26.5	17.5	21.5	22.0	16.0	18.0
3	20.0	16.5	18.0	28.0	15.5	21.5	26.0	15.5	20.5	19.0	13.0	15.5
4	23.0	18.0	20.0	28.0	16.5	22.0	27.0	14.5	20.5	19.5	10.0	14.5
5	20.5	17.5	19.5	22.0	18.5	19.5	23.5	17.5	19.5	22.0	12.5	16.5
6	20.5	17.0	18.5	25.0	17.5	21.0	21.0	17.5	18.5	21.5	12.0	16.5
7	19.5	16.0	18.0	25.5	18.5	21.5	25.5	17.5	21.0	17.0	14.5	16.0
8	17.5	16.5	17.0	25.0	18.5	21.0	24.0	17.5	20.5	18.5	14.5	16.5
9	20.5	16.5	18.0	25.0	18.5	21.5	24.5	16.5	20.0	16.0	14.5	15.0
0	20.5	16.0	17.5	28.0	19.5	23.0	26.0	16.0	20.5	16.0	14.0	14.5
1	17.0	15.0	16.0	29.0	21.5	24.5	26.0	16.5	21.0	17.0	14.0	15.0
2	19.5	14.0	16.5	29.5	22.5	25.0	23.0	18.0	20.5	19.5	12.0	15.5
3	21.0	13.5	17.0	27.0	22.5	24.5	26.0	17.5	21.0	15.5	10.5	13.0
4	23.0	15.0	18.5	28.5	22.0	24.5	22.5	17.0	19.5	13.0	9.5	11.0
5	24.5	16.5	20.0	25.0	19.5	22.0	19.5	17.5	18.5	13.0	9.0	10.5
6	27.0	18.0	22.0	26.5	18.0	21.5	28.5	17.5	21.5	13.0	9.5	10.5
7	25.5	20.0	22.0	25.0	15.5	20.0	25.5	18.0	21.0	12.0	9.5	10.5
8	28.0	19.5	23.0	21.5	17.5	19.0	26.0	15.5	20.5	15.5	8.5	11.5
9	27.5	22.0	24.0	24.0	18.0	21.0	25.5	15.5	20.5	17.5	7.5	12.0
0	27.5	22.5	24.5	23.5	17.5	20.5	25.5	18.0	21.5	18.0	8.5	13.0
1	—	—	—	27.5	18.5	22.5	20.5	15.0	18.0	—	—	—
TH	28.0	9.0	17.3	29.5	14.0	21.3	33.0	14.5	21.7	26.0	7.5	15.9

STREAMS TRIBUTARY TO LAKE MICHIGAN

04059500 FORD RIVER NEAR HYDE, MI

LOCATION.--Lat 45°45'20", long 87°12'05", in SW1/4 sec.19, T.39 N., R.23 W., Delta County, Hydrologic Unit 04030109, on right bank 40 ft downstream from bridge on County Road 533, 1.4 mi downstream from Tenmile Creek, and 1.5 mi north of Hyde.

DRAINAGE AREA.--450 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 681.77 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	118	196	e56	e80	e94	e450	481	283	274	54	32
2	101	113	184	e56	e82	e96	e540	438	281	311	55	29
3	92	109	175	e56	e82	e98	e650	430	280	297	53	28
4	88	108	e170	e56	e82	e100	762	413	272	196	52	25
5	85	105	e165	e56	e82	e100	865	377	251	144	51	24
6	81	100	e165	e56	e82	e100	1120	335	225	123	49	22
7	81	113	e155	e58	e82	e100	1510	305	199	110	44	23
8	93	121	e145	e58	e82	e100	2260	297	171	100	39	24
9	105	133	e135	e60	e82	e105	2150	278	155	91	37	25
10	110	183	e130	e60	e82	e105	2090	269	154	83	33	41
11	113	193	e120	e62	e82	e110	2170	288	186	73	30	62
12	110	169	e115	e64	e82	e110	2520	278	312	66	28	62
13	106	213	e105	e66	e82	e110	2450	264	426	60	27	55
14	108	371	e95	e68	e82	e115	2150	248	441	54	26	50
15	116	462	e90	e68	e82	e115	1900	287	460	53	25	45
16	126	483	e85	e70	e82	e115	1790	367	576	55	28	41
17	137	474	e76	e70	e82	e120	1600	393	586	54	31	40
18	135	426	e72	e70	e82	e125	1410	363	525	58	29	38
19	129	335	e68	e70	e82	e135	1240	311	516	67	30	41
20	121	284	e65	e70	e82	e145	1100	263	460	74	31	52
21	115	228	e62	e70	e82	e160	998	265	421	131	32	53
22	109	226	e58	e70	e82	e185	925	598	395	167	31	57
23	110	220	e56	e70	e84	e210	879	617	342	157	30	84
24	116	260	e56	e70	e86	e250	883	591	290	129	28	98
25	131	274	e56	e70	e88	e280	893	624	242	103	32	112
26	139	237	e56	e70	e89	e300	877	595	203	84	50	e122
27	145	214	e56	e70	e90	e315	864	594	171	72	40	e130
28	141	204	e56	e70	e92	e325	794	541	155	66	41	103
29	137	200	e56	e72	---	e345	672	460	145	61	43	87
30	e135	199	e56	e75	---	e355	556	380	213	55	42	76
31	e128	---	e56	e78	---	e360	---	317	---	53	38	---
TOTAL	3545	6875	3135	2035	2331	5283	39068	12267	9336	3421	1159	1681
MEAN	114	229	101	65.6	83.2	170	1302	396	311	110	37.4	56.0
MAX	145	483	196	78	92	360	2520	624	586	311	55	130
MIN	81	100	56	56	80	94	450	248	145	53	25	22
CFSM	.25	.51	.22	.15	.19	.38	2.89	.88	.69	.25	.08	.12
IN.	.29	.57	.26	.17	.19	.44	3.23	1.01	.77	.28	.10	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 2001, BY WATER YEAR (WY)

MEAN	295	374	200	113	104	274	1292	776	394	206	160	244
MAX	819	1246	589	346	493	1078	2353	2483	1006	793	713	1013
(WY)	1960	1986	1966	1966	1984	1973	1979	1960	1966	1968	1978	1978
MIN	39.9	42.5	27.7	26.5	29.6	48.5	345	99.7	52.4	34.7	37.4	26.2
(WY)	1977	1977	1977	1977	1977	1964	1990	1998	1988	1988	2001	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1955 - 2001	
ANNUAL TOTAL	96786		90136			
ANNUAL MEAN	264		247		369	
HIGHEST ANNUAL MEAN					640	1960
LOWEST ANNUAL MEAN					183	1963
HIGHEST DAILY MEAN	1900	Mar 9	2520	Apr 12	6850	May 8 1960
LOWEST DAILY MEAN	41	Aug 28	22	Sep 6	19	Aug 30 1976
ANNUAL SEVEN-DAY MINIMUM	43	Aug 25	24	Sep 3	22	Jul 31 1998
MAXIMUM PEAK FLOW			2580	Apr 12	7590	May 7 1960
MAXIMUM PEAK STAGE			5.43	Apr 12	8.27	May 7 1960
INSTANTANEOUS LOW FLOW			22	(a)	18	(b)
ANNUAL RUNOFF (CFSM)	.59		.55		.82	
ANNUAL RUNOFF (INCHES)	8.00		7.45		11.14	
10 PERCENT EXCEEDS	656		547		909	
50 PERCENT EXCEEDS	134		110		174	
90 PERCENT EXCEEDS	63		43		54	

(a) Sept. 6, 7.
(b) Aug. 30, 1976, July 7, 8, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04060993 BRULE RIVER NEAR FLORENCE, WI

LOCATION.--Lat 45°57'39", long 88°18'57", in NW1/4 SE1/4 sec.9, T.41 N., R.32 W., Michigan Meridian, Iron County, Hydrologic Unit 04030106, on left bank 30 ft upstream from bridge on U.S. Highway 2, 4.0 mi upstream from Paint River, 4.0 mi northwest of Florence, WI, and 8.0 mi upstream from confluence with Michigamme River.

DRAINAGE AREA.--366 mi^2, approximately.

PERIOD OF RECORD.--January 1914 to February 1916, June 1944 to current year.

REVISED RECORDS.--WSP 1387: 1914-16. WDR MI-92-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,240 ft above sea level, from topographic map. Prior to Aug. 29, 1944, nonrecording gage, and Aug. 29, 1944 to Apr. 4, 1994, water-stage recorder at site 3.0 mi downstream at different datum.

REMARKS.--Records excellent except for estimated daily discharges, which are fair. Discharge includes some mine pumpage prior to August 1977. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	203	215	218	e220	e220	e200	256	371	317	209	249	164
2	215	217	e210	e220	e200	e220	256	369	362	202	309	164
3	202	217	e200	e220	e200	e210	258	375	334	228	274	163
4	195	212	e190	e220	e190	e210	279	358	303	269	235	159
5	195	218	e230	e220	e190	e210	322	336	280	242	215	158
6	193	212	e170	e230	e198	e200	402	309	260	214	208	157
7	195	227	e190	e240	e210	e187	661	321	247	203	200	285
8	199	236	e200	e230	e180	e200	1130	400	237	199	196	441
9	198	227	e220	e220	e220	e210	1280	357	228	194	190	356
10	193	223	e210	e220	e210	e220	1130	363	266	188	182	297
11	193	218	e190	e230	e210	e220	1040	376	357	181	176	248
12	197	221	e180	e220	e210	e220	1220	349	378	177	174	230
13	206	252	e190	e240	e220	e210	1430	319	343	172	179	219
14	250	297	e190	e230	e230	e220	1460	306	307	185	178	202
15	259	277	e180	e220	e210	e240	1210	296	287	182	172	195
16	237	263	e180	e220	e210	e230	1020	292	288	188	187	190
17	228	256	e190	e230	e220	e220	858	283	282	184	203	188
18	218	240	e167	e230	e220	e240	710	270	292	181	199	188
19	e205	236	e190	e210	e220	e230	607	256	376	213	206	195
20	e210	246	e180	e200	e230	e230	567	254	344	584	189	206
21	e210	228	e200	e200	e210	e250	588	262	310	623	177	195
22	e210	194	e190	e200	e200	e280	655	356	311	465	171	196
23	e210	245	e190	e200	e220	e300	794	362	268	316	183	277
24	e240	295	e200	e197	e230	e260	809	348	244	275	181	301
25	e230	282	e220	e200	e220	e230	681	365	229	246	183	250
26	222	261	e210	e200	e210	e230	576	371	222	216	196	221
27	230	248	e210	e200	e220	e250	516	437	241	201	186	210
28	227	243	e200	e180	e220	e260	459	395	326	209	176	198
29	218	232	e210	e220	—	e260	408	340	251	245	168	194
30	217	226	e220	e220	—	e260	386	298	222	239	169	192
31	217	—	e230	e210	—	244	—	283	—	249	167	—
TOTAL	6622	7164	6155	6697	5928	7151	21968	10377	8712	7679	6078	6639
MEAN	214	239	199	216	212	231	732	335	290	248	196	221
MAX	259	297	230	240	230	300	1460	437	378	623	309	441
MIN	193	194	167	180	180	187	256	254	222	172	167	157
CFSM	.58	.65	.54	.59	.58	.63	2.00	.91	.79	.68	.54	.60
IN.	.67	.73	.63	.68	.60	.73	2.23	1.05	.89	.78	.62	.67

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2001, BY WATER YEAR (WY)

MEAN	323	333	274	250	243	320	646	493	390	338	287	308
MAX	612	600	424	369	406	833	1235	1104	712	983	604	582
(WY)	1986	1916	1986	1986	1984	1973	1967	1965	1981	1953	1972	1959
MIN	179	202	175	156	163	178	235	242	194	185	186	182
(WY)	1949	1990	1990	1995	1995	1965	1990	1998	1988	1989	1948	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1914 - 2001	
ANNUAL TOTAL	99347		101170			
ANNUAL MEAN	271		277		349	
HIGHEST ANNUAL MEAN					512	1973
LOWEST ANNUAL MEAN					221	1990
HIGHEST DAILY MEAN	782	Jun 25	1460	Apr 14	4420	Jul 2 1953
LOWEST DAILY MEAN	167	Dec 18	157	Sep 6	130	Dec 2 1963
ANNUAL SEVEN-DAY MINIMUM	173	Jan 26	162	Aug 31	140	Jan 2 1995
MAXIMUM PEAK FLOW			1530	Apr 14	4700	Jul 2 1953
MAXIMUM PEAK STAGE			5.76	Apr 14	(a)8.41	Jul 15 1999
INSTANTANEOUS LOW FLOW					(b)95	Dec 17 1999
ANNUAL RUNOFF (CFSM)	.74		.76		.95	
ANNUAL RUNOFF (INCHES)	10.10		10.28		12.96	
10 PERCENT EXCEEDS	409		373		550	
50 PERCENT EXCEEDS	232		220		287	
90 PERCENT EXCEEDS	193		186		205	

(a) Present site and datum; peak stage at previous site and datum, 8.60 ft, Dec. 20, 1983, backwater from ice.
(b) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062000 PAINT RIVER NEAR ALPHA, MI

LOCATION.--Lat 46°00'40", long 88°15'30", in NW1/4 NW1/4 sec.25, T.42 N., R.32 W., Iron County, Hydrologic Unit 04030106, on right bank 0.6 mi downstream from Lower Paint Dam, 5.5 mi upstream from Brule River, and 6.0 mi southeast of Alpha.

DRAINAGE AREA.--631 mi^2.

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

REVISED RECORDS.--WSP 1727: Drainage area, WDR MI-96-1: 1985 (M).

GAGE.--Water-stage recorder. Elevation of gage is 1,260 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow completely regulated by powerplant and Lower Paint Dam, 0.6 mi upstream. Records not adjusted for diversion to Michigamme River by Paint River Diversion Canal. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	92	90	e76	e76	e84	86	437	85	88	83	80
2	83	92	91	e76	e76	e84	85	433	84	87	83	81
3	84	91	88	e76	e76	e86	170	210	85	92	83	81
4	85	92	87	e76	e76	e88	179	82	85	89	83	81
5	85	92	e87	e76	e76	e92	82	82	85	87	83	81
6	84	92	e86	e76	e76	e95	83	81	85	87	83	81
7	83	92	e86	e76	e76	e95	90	82	85	87	83	82
8	85	92	e84	e76	e76	e95	503	83	85	86	81	83
9	85	92	e84	e76	e76	e96	1170	83	85	85	81	83
10	87	92	e84	e78	e76	e96	1090	83	86	85	81	83
11	87	92	e84	e78	e76	e96	1230	83	86	85	83	83
12	89	92	e82	e78	e76	e96	1840	82	87	83	81	82
13	90	92	e82	e78	e76	e96	3110	83	87	83	81	82
14	88	92	e82	e76	e76	e96	3160	83	87	83	81	83
15	89	90	e82	e76	e76	e96	2520	83	87	83	81	83
16	89	89	e80	e76	e76	e96	1860	83	87	82	81	83
17	89	89	e80	e76	e76	e96	1370	83	87	82	81	83
18	91	89	e80	e76	e76	e96	791	82	89	83	81	83
19	92	89	e80	e76	e76	e96	340	83	90	82	81	83
20	91	89	e80	e76	e76	e98	69	83	100	82	81	84
21	92	89	e78	e76	e76	98	66	84	169	82	81	83
22	92	89	e78	e76	e76	172	62	83	174	82	81	84
23	92	89	e76	e76	e76	116	76	83	90	81	81	85
24	91	89	e76	e76	e76	112	493	83	90	81	81	84
25	90	89	e76	e76	e78	e105	762	89	89	81	81	83
26	86	89	e76	e76	e80	101	990	85	89	81	81	84
27	102	87	e76	e76	e84	93	673	85	91	81	81	83
28	92	87	e76	e76	e84	95	84	85	90	83	92	83
29	92	87	e76	e76	—	84	83	84	89	83	80	83
30	92	87	e76	e76	—	83	282	84	89	83	79	83
31	92	—	e76	e76	—	84	—	84	—	83	79	—
TOTAL	2754	2704	2519	2364	2150	3016	23399	3413	2797	2602	2533	2480
MEAN	88.8	90.1	81.3	76.3	76.8	97.3	780	110	93.2	83.9	81.7	82.7
MAX	102	92	91	78	84	172	3160	437	174	92	92	85
MIN	83	87	76	76	76	83	62	81	84	81	79	80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	124	116	92.0	89.5	92.1	104	455	380	197	138	101	112
MAX	554	383	145	102	225	487	1389	1921	937	969	215	305
(WY)	1986	1989	1983	1965	1984	1973	1954	1996	1983	1953	1978	1980
MIN	81.5	82.0	81.3	71.4	76.8	84.0	81.4	83.5	85.4	82.0	81.7	66.8
(WY)	2000	1992	2001	1955	2001	1956	1990	1992	1975	1998	2001	1962

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	32216		52731			
ANNUAL MEAN	88.0		144		166	
HIGHEST ANNUAL MEAN					356	1996
LOWEST ANNUAL MEAN					87.9	2000
HIGHEST DAILY MEAN	113	Mar 3	3160	Apr 14	7380	Apr 26 1960
LOWEST DAILY MEAN	76	Dec 23	62	Apr 22	62	(a)
ANNUAL SEVEN-DAY MINIMUM	76	Dec 23	76	Dec 23	65	Jan 9 1955
MAXIMUM PEAK FLOW			3420	Apr 13	8050	Jul 2 1953
MAXIMUM PEAK STAGE			7.94	Apr 13	10.50	Jul 2 1953
10 PERCENT EXCEEDS	93		96		108	
50 PERCENT EXCEEDS	87		84		91	
90 PERCENT EXCEEDS	83		76		85	

(a) Mar. 22, 1963, Apr. 22, 2001.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062011 BRULE RIVER NEAR COMMONWEALTH, WI

LOCATION.--Lat 45°56'51", long 88°12'55", in NW1/4 sec. 14, T.40 N., R.18 E., Wisconsin Meridian, Florence County, Hydrologic Unit 04030106, on right bank 900 ft downstream from Brule Island Dam, 1.5 mi upstream from confluence with Michigamme River, and 2.8 mi north of Commonwealth, WI.

DRAINAGE AREA.--1,020 mi^2.

PERIOD OF RECORD.--October 1989 to current year.

REVISED RECORDS.--WDR MI-91-1: 1990(M).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,130 ft above sea level, from topographic map.

REMARKS.--Records good. Flow regulated by powerplant 900 ft upstream and by Lower Paint Dam 8.2 mi upstream. Records not adjusted for diversion to Michigamme River by Paint River Diversion Canal. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

COOPERATION.--Gage-height record was provided by Wisconsin Electric Power Co., under general supervision of the Geological Survey.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	302	321	320	308	330	267	414	963	449	309	349	289
2	305	299	228	300	299	308	428	804	476	298	431	255
3	307	301	258	297	300	304	405	674	447	368	419	258
4	333	303	235	296	297	305	396	507	429	384	337	257
5	314	306	315	294	296	307	445	426	386	382	344	257
6	311	347	203	308	330	302	602	420	374	312	310	282
7	288	347	247	325	332	284	862	437	374	340	313	392
8	275	344	275	314	255	293	1710	502	359	307	315	556
9	301	341	311	304	329	313	2440	488	334	306	288	496
10	306	333	305	300	304	325	2290	469	550	315	275	402
11	307	315	258	313	303	324	2160	529	533	277	304	359
12	301	317	249	299	303	305	2930	439	538	276	249	341
13	319	368	269	334	320	291	4390	449	483	285	272	282
14	364	448	278	315	323	307	4430	444	448	280	271	335
15	366	429	281	297	281	334	3600	398	390	314	285	309
16	336	423	298	308	280	316	2790	454	446	309	315	278
17	328	327	338	337	309	300	2150	387	392	297	338	365
18	322	336	295	336	307	325	1530	379	427	286	293	258
19	315	344	320	292	291	319	1040	373	478	290	301	321
20	313	308	288	295	318	320	626	371	493	772	337	315
21	313	301	311	292	288	349	692	404	470	740	267	318
22	312	253	282	307	265	408	851	486	512	587	275	270
23	314	263	274	307	299	443	1030	509	391	418	285	448
24	356	341	302	323	314	361	1260	458	364	387	287	450
25	362	414	327	310	306	306	1470	503	328	382	300	362
26	282	318	306	305	283	305	1570	489	341	286	351	318
27	301	312	301	304	310	346	1230	528	439	321	283	320
28	349	394	279	256	300	361	576	571	478	323	295	281
29	339	361	279	337	—	372	490	464	394	345	282	311
30	294	336	294	342	—	370	674	410	326	374	240	312
31	348	—	312	313	—	371	—	396	—	385	292	—
TOTAL	9883	10150	8838	9568	8472	10141	45481	15131	12849	11255	9503	9997
MEAN	319	338	285	309	303	327	1516	488	428	363	307	333
MAX	366	448	338	342	332	443	4430	963	550	772	431	556
MIN	275	253	203	256	255	267	396	371	326	276	240	255

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 2001, BY WATER YEAR (WY)

MEAN	409	394	340	329	336	429	985	821	474	456	359	360
MAX	712	571	416	424	410	634	2288	2757	730	887	465	467
(WY)	1991	1993	1992	1997	1997	1998	1996	1996	1996	1999	1996	1997
MIN	276	307	270	259	270	327	322	355	334	272	296	285
(WY)	1990	1990	1990	1991	1991	2001	1990	1998	1992	1990	1990	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1990 - 2001	
ANNUAL TOTAL	141850		161268			
ANNUAL MEAN	388		442		475	
HIGHEST ANNUAL MEAN					810	1996
LOWEST ANNUAL MEAN					325	1990
HIGHEST DAILY MEAN	923	Jul 9	4430	Apr 14	7750	Apr 26 1996
LOWEST DAILY MEAN	203	Dec 6	203	Dec 6	182	Feb 11 1994
ANNUAL SEVEN-DAY MINIMUM	252	Dec 2	252	Dec 2	202	Mar 26 1990
MAXIMUM PEAK FLOW			5490	Apr 13	8480	Apr 25 1996
MAXIMUM PEAK STAGE			11.70	Apr 13	13.91	Apr 25 1996
10 PERCENT EXCEEDS	532		528		641	
50 PERCENT EXCEEDS	348		320		367	
90 PERCENT EXCEEDS	301		280		280	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062200 PESHEKEE RIVER NEAR CHAMPION, MI

LOCATION.--Lat 46°33'25", long 88°00'09", in NW1/4 sec.13, T.48 N., R.30 W., Marquette County, Hydrologic Unit 04030107, on left bank 10 ft downstream from bridge on County Road 607, 0.6 mi downstream from West Branch, and 3.5 mi northwest of Champion.

DRAINAGE AREA.--133 mi^2.

PERIOD OF RECORD.--July 1961 to September 1978, October 1979 to September 1982 (operated as a crest-stage partial-record station), October 2000 to September 2001.

GAGE.--Water-stage recorder. Datum of gage is 1,557.49 ft above sea level. Prior to Aug. 15, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	42	e52	e40	e46	e39	e75	757	128	34	69	6.9
2	23	41	e52	e40	e46	e39	e80	663	142	29	75	6.7
3	21	37	e52	e40	e46	e39	e90	565	207	26	67	6.3
4	20	35	e50	e40	e46	e39	e110	462	273	25	56	6.0
5	20	33	e48	e40	e46	e39	e140	376	254	22	49	5.5
6	20	32	e48	e40	e45	e39	e200	305	195	20	43	4.8
7	22	31	e46	e40	e45	e39	e270	267	147	19	34	13
8	26	32	e45	e40	e44	e39	e370	293	119	17	31	17
9	29	31	e45	e42	e44	e39	e500	266	101	16	29	22
10	34	31	e44	e44	e44	e39	e700	259	97	14	29	21
11	44	33	e44	e44	e42	e39	e850	267	131	13	25	23
12	54	34	e42	e45	e42	e39	e1080	236	260	11	23	23
13	67	39	e42	e46	e42	e39	1440	201	293	10	20	22
14	79	58	e42	e46	e40	e39	1680	174	250	9.4	17	19
15	87	75	e42	e46	e40	e39	1770	169	201	10	16	17
16	94	80	e42	e47	e40	e40	1660	277	198	20	17	15
17	93	77	e40	e48	e39	e42	1400	285	193	50	19	13
18	86	75	e40	e48	e39	e46	1170	229	167	289	18	13
19	77	e70	e40	e48	e39	e48	1040	185	164	485	17	12
20	68	e65	e40	e46	e39	e50	1100	155	143	574	15	12
21	60	e60	e40	e46	e39	e60	1330	138	118	511	13	12
22	53	e58	e40	e46	e39	e70	1920	186	101	354	12	12
23	52	e56	e40	e46	e39	e80	2090	236	85	296	11	15
24	51	e56	e40	e46	e39	e90	2470	242	71	200	9.7	25
25	49	e56	e40	e46	e39	e88	2100	240	59	135	9.4	32
26	47	e56	e40	e46	e39	e85	1570	258	51	102	9.4	33
27	48	e56	e40	e46	e39	e80	1430	259	57	79	8.9	28
28	48	e55	e40	e46	e39	e75	1210	238	80	85	7.8	26
29	48	e54	e40	e46	---	e70	966	204	56	103	6.9	23
30	46	e54	e40	e46	---	e72	846	168	43	85	6.7	20
31	44	---	e40	e46	---	e72	---	137	---	73	6.6	---
TOTAL	1533	1512	1336	1376	1166	1653	31657	8697	4384	3716.4	770.4	504.2
MEAN	49.5	50.4	43.1	44.4	41.6	53.3	1055	281	146	120	24.9	16.8
MAX	94	80	52	48	46	90	2470	757	293	574	75	33
MIN	20	31	40	40	39	39	75	137	43	9.4	6.6	4.8
CFSM	.37	.38	.32	.33	.31	.40	7.93	2.11	1.10	.90	.19	.13
IN.	.43	.42	.37	.38	.33	.46	8.85	2.43	1.23	1.04	.22	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	148	175	119	69.1	55.3	125	799	543	194	86.6	57.7	116
MAX	316	327	226	150	112	512	1303	1253	463	339	238	539
(WY)	1969	1968	1976	1969	1969	1973	1976	1965	1967	1968	1978	1968
MIN	5.53	10.3	11.2	10.1	10.1	42.9	280	105	39.1	8.26	2.13	1.90
(WY)	1977	1977	1977	1977	1977	1970	1972	1977	1977	1976	1976	1976

SUMMARY STATISTICS	FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	58305.0			
ANNUAL MEAN	160		208	
HIGHEST ANNUAL MEAN			273	1968
LOWEST ANNUAL MEAN			136	1977
HIGHEST DAILY MEAN	2470	Apr 24	3470	Apr 18 1976
LOWEST DAILY MEAN	4.8	Sep 6	.71	Sep 11 1976
ANNUAL SEVEN-DAY MINIMUM	6.1	Aug 31	.83	Sep 7 1976
MAXIMUM PEAK FLOW	2550	Apr 24	3610	May 8 1965
MAXIMUM PEAK STAGE	6.84	Apr 24	8.01	May 8 1965
INSTANTANEOUS LOW FLOW	4.8	(a)	.70	(b)
ANNUAL RUNOFF (CFSM)	1.20		1.56	
ANNUAL RUNOFF (INCHES)	16.31		21.25	
10 PERCENT EXCEEDS	291		468	
50 PERCENT EXCEEDS	46		90	
90 PERCENT EXCEEDS	17		17	

(a) Sept. 5, 6.
(b) Sept. 7, 8, 9, 10, 11, 1976.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04062500 MICHIGAMME RIVER NEAR CRYSTAL FALLS, MI

LOCATION.--Lat 46°06'50", long 88°12'57", in NW1/4 sec.20, T.43 N., R.31 W., Iron County, Hydrologic Unit 04030107, on right bank 400 ft upstream from highway bridge, 5.0 mi downstream from Michigamme Reservoir, 6.0 mi east of Crystal Falls, and 15 mi upstream from confluence with Brule River.

DRAINAGE AREA.--656 mi^2.

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,300 ft above sea level, from topographic map.

REMARKS.--Records excellent. Flow regulated by powerplant and by Michigamme Reservoir, capacity, 119,950 acre-ft, 5 mi upstream. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246	230	232	603	814	1020	195	1410	676	640	556	404
2	485	231	231	601	813	836	195	1400	680	575	553	405
3	470	230	231	602	811	497	507	1420	675	575	552	401
4	469	229	353	602	808	475	708	1420	654	573	552	476
5	469	229	428	607	806	371	711	1420	633	569	552	391
6	467	229	427	602	805	316	413	1410	623	490	550	394
7	467	238	476	601	804	290	248	1330	648	384	547	401
8	466	239	485	737	804	293	299	1260	538	383	547	290
9	417	249	351	807	952	338	302	907	481	463	546	218
10	346	237	348	687	1060	381	293	764	549	515	544	218
11	338	226	348	597	1060	375	295	921	483	516	544	308
12	337	227	346	533	1050	349	318	883	607	510	544	189
13	289	235	346	412	1040	338	311	882	881	491	542	173
14	254	235	346	415	1040	312	299	852	905	485	541	172
15	251	235	350	523	1030	275	290	767	856	486	540	173
16	245	237	348	710	1030	191	289	817	892	481	543	171
17	229	235	346	829	1020	193	263	812	686	479	373	172
18	228	233	389	828	1010	195	371	762	689	490	232	381
19	226	233	434	708	1000	196	268	676	828	487	230	355
20	228	232	434	609	1010	187	274	674	1080	409	453	351
21	226	231	436	609	1050	177	287	649	983	167	537	349
22	226	231	423	766	1030	179	297	640	784	155	545	352
23	231	231	364	846	963	182	324	643	676	156	500	301
24	229	231	362	844	1040	181	331	876	668	457	416	236
25	229	231	360	842	1020	183	765	906	528	565	418	230
26	230	231	421	841	1030	184	1210	891	506	555	414	501
27	232	231	502	837	1040	185	1410	937	555	552	413	386
28	231	231	605	828	891	186	1170	927	606	556	412	165
29	230	231	605	808	—	188	1170	915	652	553	410	163
30	230	231	605	822	—	189	e1280	776	677	555	408	164
31	231	—	604	818	—	191	—	672	—	555	406	—
TOTAL	9452	6979	12536	21474	26831	9453	15093	29619	20699	14827	14920	8890
MEAN	305	233	404	693	958	305	503	955	690	478	481	296
MAX	485	249	605	846	1060	1020	1410	1420	1080	640	556	501
MIN	226	226	231	412	804	177	195	640	481	155	230	163

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 2001, BY WATER YEAR (WY)

MEAN	495	544	779	864	831	522	641	1081	806	669	589	511
MAX	1220	1432	1427	1274	1252	819	1662	2865	1650	1461	1035	1325
(WY)	1952	1989	1989	1983	1983	1971	1973	1960	1983	1953	1987	1968
MIN	151	88.3	238	390	350	160	142	130	257	261	292	157
(WY)	1970	1949	1949	1977	1948	1977	1987	1987	1987	1959	1977	1975

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1944 - 2001	
ANNUAL TOTAL	176420		190773			
ANNUAL MEAN	482		523		694	
HIGHEST ANNUAL MEAN					1049	1960
LOWEST ANNUAL MEAN					382	1977
HIGHEST DAILY MEAN	1090	Jan 22	1420	May 3	6940	Apr 27 1960
LOWEST DAILY MEAN	170	Mar 3	155	Jul 22	71	Nov 26 1950
ANNUAL SEVEN-DAY MINIMUM	182	Mar 2	182	Mar 21	83	Mar 21 1968
MAXIMUM PEAK FLOW			1540	Apr 27	7260	Apr 28 1960
MAXIMUM PEAK STAGE			5.48	Apr 27	10.73	Apr 28 1960
10 PERCENT EXCEEDS	907		931		1180	
50 PERCENT EXCEEDS	428		475		645	
90 PERCENT EXCEEDS	226		227		174	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04063000 MENOMINEE RIVER NEAR FLORENCE, WI

LOCATION.--Lat 45°57'05", long 88°11'21", in SE1/4 sec.12, T.41 N., R.18 E., Wisconsin Meridian, Florence County, Hydrologic Unit 04030108, on right bank 0.4 mi downstream from confluence of Brule and Michigamme Rivers, 3.5 mi northeast of Florence, WI, and at mile 117.

DRAINAGE AREA.--1,760 mi^2.

PERIOD OF RECORD.--January 1914 to current year. Published as "at Twin Falls near Iron Mountain, MI", January 1914 to June 1950, October 1996 to September 1998. Records published for both sites July 1950 to September 1957, October 1989 to September 1996, October 1998 to current year.

REVISED RECORDS.--WSP 1707: 1953(M). WDR MI-92-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,119.23 ft above sea level (levels by Owen Ayres Associates). Prior to July 5, 1950, headwater and tailwater gages and generation data entered hourly in daily log sheets by company employees at the Twin Falls Powerplant of Wisconsin Electric Power Co., 10.4 mi downstream. July 5, 1950 to Oct. 19, 2000, water-stage recorder at site 500 ft downstream at same datum.

REMARKS.--Records good. Prior to July 1950, discharge determined from powerplant records computed on basis of load-discharge rating of hydroelectric units and rating for tailwater gage during periods of spill; ratings developed by U.S. Geological Survey. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft, on Michigamme River, and by many smaller reservoirs upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	928	939	952	1260	1470	1590	769	2930	1760	1160	1430	964
2	866	872	1060	1270	e1500	1310	1700	2670	1470	e1250	1500	807
3	915	898	956	1300	1440	1000	1320	2860	1270	e1350	1350	886
4	796	895	887	1280	1440	966	1270	2590	1680	e800	1210	747
5	857	895	860	1250	1350	1600	1560	2450	1720	e1450	1310	943
6	1050	874	972	715	1410	1550	1650	2570	1770	1390	1560	902
7	808	773	1020	816	1450	1550	1320	2390	1360	831	1270	e800
8	832	811	896	1370	1460	1570	1700	1990	1590	718	1370	e900
9	861	816	760	1300	1570	1510	2270	1970	845	1250	1050	e1100
10	936	868	742	1320	1350	1120	3210	1650	823	1190	1070	e1150
11	698	743	914	1190	1460	1170	3940	2460	1740	1250	1130	e900
12	764	810	866	1320	1560	1060	3870	2640	1860	1210	844	e850
13	861	1150	923	708	1950	944	5210	1670	2350	1240	1040	961
14	719	1190	880	718	1480	926	4780	1830	1920	925	890	743
15	807	834	908	1090	1670	1230	4870	1910	1860	902	1060	868
16	951	1080	777	1320	1840	1620	4350	1890	1530	752	998	781
17	961	1230	924	1510	1330	1590	3790	1880	1260	1040	881	928
18	960	793	1050	1270	1260	e1500	3120	1910	1470	835	840	903
19	940	711	1050	1290	1690	1360	2530	1500	2040	902	881	1030
20	1020	841	1030	1510	1630	1560	2040	1050	2120	1520	1140	977
21	853	858	1160	1310	1670	1510	1720	1560	2140	1140	1010	1040
22	908	924	1140	1410	1700	1540	1880	1970	1710	1250	1070	671
23	892	946	747	1390	1680	1600	1950	1810	984	1210	1240	743
24	871	767	928	1430	1550	962	2850	1940	1050	1320	1010	1180
25	902	720	977	1440	1470	879	3800	2100	1550	1210	781	1150
26	844	786	1160	1430	1510	1620	3880	2140	1480	1320	914	1600
27	859	822	1190	991	1540	1420	3610	2110	1180	1180	998	1040
28	754	890	1050	1030	1440	1490	3040	2270	1370	740	998	828
29	939	846	1280	1350	---	1600	2910	2200	932	771	941	677
30	916	837	1270	1530	---	1440	2860	2020	1560	1520	889	791
31	828	---	1050	1430	---	747	---	1890	---	1350	976	---
TOTAL	27096	26419	30379	38548	42870	41534	83769	64820	46394	34976	33651	27860
MEAN	874	881	980	1243	1531	1340	2792	2091	1546	1128	1086	929
MAX	1050	1230	1280	1530	1950	1620	5210	2930	2350	1520	1560	1600
MIN	698	711	742	708	1260	747	769	1050	823	718	781	671

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2001, BY WATER YEAR (WY)

MEAN	1456	1579	1443	1395	1381	1594	3138	3019	2111	1592	1291	1386
MAX	3537	3465	2640	2253	2514	3544	8159	6319	5035	4253	2359	3149
(WY)	1986	1986	1984	1983	1984	1973	1916	1960	1916	1953	1972	1968
MIN	726	725	765	691	647	692	735	595	799	721	545	718
(WY)	1949	1964	1925	1924	1926	1914	1990	1987	1988	1925	1925	1925

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1914 - 2001	
ANNUAL TOTAL	471822		498316			
ANNUAL MEAN	1289		1365		1782	
HIGHEST ANNUAL MEAN					3069	1916
LOWEST ANNUAL MEAN					922	1925
HIGHEST DAILY MEAN	2700	Mar 15	5210	Apr 13	18800	Jul 2 1953
LOWEST DAILY MEAN	471	Sep 16	671	Sep 22	57	Sep 26 1975
ANNUAL SEVEN-DAY MINIMUM	806	Sep 16	807	Oct 9	277	Oct 18 1975
MAXIMUM PEAK FLOW			6320	Apr 13	19500	Apr 26 1960
MAXIMUM PEAK STAGE			7.84	Apr 13	14.15	Apr 26 1960
INSTANTANEOUS LOW FLOW					38	(a)
10 PERCENT EXCEEDS	1960		2040		3000	
50 PERCENT EXCEEDS	1190		1210		1460	
90 PERCENT EXCEEDS	794		807		843	

(a) Aug. 21, 1962, Sept. 26, 1975.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04063500 MENOMINEE RIVER AT TWIN FALLS NEAR IRON MOUNTAIN, MI

LOCATION.--Lat 45°52'17", long 88°04'12", in NE1/4 SE1/4 sec. 12, T.40 N., R.31 W., Michigan Meridian, Dickinson County, Hydrologic Unit 04030108, on left bank 150 ft downstream from Wisconsin Electric Power Company powerhouse at Twin Falls Dam, 3.6 mi north of Iron Mountain, and at mile 106.6.

DRAINAGE AREA.--1,800 mi^2.

PERIOD OF RECORD.--January 1914 to current year. Published as "near Florence, WI", October 1957 to September 1989. Records published for both sites July 1950 to September 1957, October 1989 to September 1996, October 1998 to current year.

REVISED RECORDS.--WDR MI-91-1: 1990(M). WDR MI-92-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,062 ft above sea level (levels by Wisconsin Electric Power Co.). Prior to September 1957, headwater and tailwater gages and generation data entered hourly in daily log sheets by company employees. October 1957 to September 1989, water-stage recorder at site 10.4 mi upstream at different datum. November 1989 to July 1993, water-stage recorder at site 150 ft upstream at same datum.

REMARKS.--Records good. Prior to September 1957, discharge determined from powerplant records computed on basis of load-discharge rating of hydroelectric units and rating for tailwater gage during periods of spill; ratings developed by U.S. Geological Survey. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre ft, by Peavy Pond, capacity, 33,860 acre-ft, on Michigamme River, and by many smaller reservoirs upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	897	963	992	1150	1500	1580	874	3000	1890	1390	1460	900
2	933	896	968	1260	1430	1440	1600	2850	1500	1290	1480	821
3	871	936	948	1320	1480	888	1450	2920	1420	1440	1500	806
4	788	945	819	1370	1470	849	1360	2650	1720	833	1080	827
5	865	855	851	1250	1450	1490	1660	2570	1770	1510	1230	793
6	941	865	910	788	1450	1600	1700	2570	1760	1290	1490	852
7	820	901	931	839	1420	1550	1440	2420	1530	788	1360	809
8	819	813	891	1260	1470	1580	1900	2060	1610	773	1380	1000
9	809	824	705	1390	1710	1520	2660	2020	805	1270	1130	1210
10	853	878	782	1340	1310	1120	3340	1770	900	1220	1020	1180
11	727	816	838	1220	1290	1170	3910	2420	1760	1240	926	961
12	752	792	809	1260	1640	1050	4250	2560	2050	1210	799	873
13	809	1180	809	797	1880	996	5340	1810	2350	1210	1000	887
14	698	1260	854	797	1670	896	5010	1870	2140	856	912	779
15	857	863	904	1210	1570	1210	5170	1960	2020	922	923	818
16	933	1140	886	1260	1810	1550	4780	1950	1590	772	984	751
17	997	1300	831	1310	1350	1510	3910	1880	1300	971	830	951
18	1010	863	989	1440	1140	1650	3170	2020	1610	862	785	914
19	945	680	1030	1270	1670	1510	2670	1590	2150	893	808	983
20	971	823	1080	1290	1690	1450	2030	1120	2150	1500	1030	1020
21	854	898	1160	1370	1620	1520	1830	1650	2290	1120	1000	979
22	900	951	1070	1420	1720	1640	2000	1950	1930	1310	1140	728
23	958	909	826	1470	1640	1650	2180	1860	1170	1180	1050	854
24	900	775	781	1510	1590	932	2820	2030	916	1280	907	1210
25	904	749	865	1500	1590	901	3940	2440	1580	1270	804	1210
26	879	848	1120	1440	1490	1660	4090	2120	1380	1320	791	1600
27	877	827	1100	957	1490	1460	3760	2210	1170	1130	940	1050
28	882	881	1120	900	1430	1500	3160	2230	1440	785	927	851
29	880	884	1280	1410	—	1620	3000	2200	1490	724	903	711
30	859	902	1270	1530	—	1600	2810	2110	1790	1450	924	804
31	807	—	1090	1550	—	824	—	1870	—	1440	852	—
TOTAL	26995	27217	29509	38878	42970	41916	87814	66680	49181	35249	32365	28132
MEAN	871	907	952	1254	1535	1352	2927	2151	1639	1137	1044	938
MAX	1010	1300	1280	1550	1880	1660	5340	3000	2350	1510	1500	1600
MIN	698	680	705	788	1140	824	874	1120	805	724	785	711

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2001, BY WATER YEAR (WY)

MEAN	1465	1591	1453	1404	1389	1607	3155	3032	2127	1606	1304	1398
MAX	3537	3465	2640	2253	2514	3544	8159	6319	5035	4309	2359	3149
(WY)	1986	1986	1984	1983	1984	1973	1916	1960	1916	1953	1972	1968
MIN	726	725	765	691	647	692	707	595	799	721	545	718
(WY)	1949	1964	1925	1924	1926	1914	1990	1987	1988	1925	1925	1925

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1914 - 2001	
ANNUAL TOTAL	482918		506906			
ANNUAL MEAN	1319		1389		1794	
HIGHEST ANNUAL MEAN					3069	1916
LOWEST ANNUAL MEAN					922	1925
HIGHEST DAILY MEAN	2760	Jul 10	5340	Apr 13	18100	Apr 26 1960
LOWEST DAILY MEAN	647	Sep 16	680	Nov 19	57	Sep 26 1975
ANNUAL SEVEN-DAY MINIMUM	781	Oct 8	781	Oct 8	277	Oct 18 1975
MAXIMUM PEAK FLOW			6990	Apr 13	(a)19500	Apr 26 1960
MAXIMUM PEAK STAGE			10.36	Apr 13	(b)12.54	Apr 27 1996
10 PERCENT EXCEEDS	2000		2140		3020	
50 PERCENT EXCEEDS	1230		1210		1470	
90 PERCENT EXCEEDS	821		809		853	

(a) Gage height 14.15 ft, site and datum then in use.
(b) Present site and datum.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04065106 MENOMINEE RIVER AT NIAGARA, WI

LOCATION.--Lat 45°46'04", long 87°58'50", in NE ¼ NE ¼ sec.15, T.38 N., R.20 E., Wisconsin Meridian, Marinette County, Hydrologic Unit 04030108, on right bank 0.7 mi downstream from Little Quinnesec Falls Dam, at Niagara, WI.

DRAINAGE AREA.--2,470 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 880 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft, on Michigamme River, and by smaller reservoirs upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	1190	e1200	e1400	e1600	e1700	1230	3540	2450	1790	1810	1060
2	1140	1200	e1200	e1400	e1500	e1400	1950	3580	2160	1650	1940	1040
3	1180	1210	e1200	e1600	e1700	e1200	1950	3570	1910	1770	1880	1090
4	1150	1190	e1100	e1600	e1700	e1100	1850	3410	2230	1340	1470	1070
5	1140	1170	e1100	e1300	e1600	e1400	2130	3050	2300	1890	1550	1050
6	1080	1140	e1100	e1100	e1600	e1700	2300	3090	2280	1570	1750	1070
7	1050	1190	e1100	e1100	e1500	e1700	2660	2990	2050	1130	1680	1070
8	1050	1180	e1100	e1300	e1600	e1700	3740	2630	1850	1120	1660	1340
9	1100	1170	e1000	e1400	e1700	e1600	4560	2460	1370	1450	1400	1670
10	1030	1170	e1000	e1500	e1500	e1400	5020	2510	1300	1530	1300	1590
11	1020	1180	e1100	e1500	e1400	e1300	5670	3180	2010	1500	1180	1500
12	1030	1170	e1100	e1300	e1600	e1200	6230	3020	2720	1430	1100	1210
13	1020	1560	e1100	e1100	e1800	e1200	6990	2350	2950	1460	1170	1250
14	1020	1680	e1000	e1100	e1700	e1300	7210	2330	2840	1170	1170	1210
15	1020	1290	e1100	e1300	e1700	e1400	7040	2420	2510	1080	1200	1050
16	1300	1670	e1100	e1500	e1600	e1600	6780	2380	2320	1090	1230	1090
17	1310	1710	e1100	e1600	e1400	e1600	5890	2320	1860	1180	1200	1070
18	1270	1290	e1200	e1600	e1300	e1900	4720	2420	2110	1200	1170	1150
19	1290	1120	e1200	e1400	e1500	e1600	3960	2150	2820	1200	1090	1210
20	1270	1110	e1300	e1500	e1700	e1700	3360	1450	3060	1760	1250	1380
21	1160	1190	e1300	e1600	e1700	e1700	3050	1970	3040	1700	1260	1300
22	1170	1260	e1200	e1600	e1700	e1800	3040	2430	2840	2070	1430	1120
23	1170	1210	e1000	e1700	e1700	e1700	3360	2480	2010	1780	1280	1160
24	1190	1130	e1100	e1700	e1600	1370	3940	2830	1720	1650	1230	1650
25	1200	1120	e1000	e1600	e1600	1240	5210	3160	1900	1640	1100	1680
26	1210	1090	e1200	e1400	e1700	1950	5340	2900	1960	1670	1100	1780
27	1220	1170	e1300	e1100	e1600	1890	4810	3090	1710	1520	1380	1540
28	1180	e1200	e1300	e1100	e1600	1800	4160	3080	1980	1130	1220	1230
29	1190	e1200	e1500	e1400	—	1800	3820	3120	1960	1100	1190	1080
30	1180	e1200	e1400	e1700	—	1880	3630	2880	2190	1710	1200	1030
31	1180	—	e1300	e1700	—	1300	—	2350	—	1770	1150	—
TOTAL	35670	37360	36000	44200	44900	48130	125600	85140	66410	46050	41740	37740
MEAN	1151	1245	1161	1426	1604	1553	4187	2746	2214	1485	1346	1258
MAX	1310	1710	1500	1700	1800	1950	7210	3580	3060	2070	1940	1780
MIN	1020	1090	1000	1100	1300	1100	1230	1450	1300	1080	1090	1030

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2001, BY WATER YEAR (WY)

MEAN	1678	1724	1701	1736	1898	2095	3477	3513	2493	2160	1624	1628
MAX	2810	2531	2458	2258	2286	2800	6167	7555	4184	3547	2290	2225
(WY)	1996	1993	1993	1993	1997	2000	1996	1996	1993	1999	1996	1994
MIN	1151	1245	1161	1369	1391	1553	1953	1175	1587	1264	1080	1248
(WY)	2001	2001	2001	1995	1995	2001	1994	1998	1998	1998	1998	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1993 - 2001	
ANNUAL TOTAL	635210		648940			
ANNUAL MEAN	1736		1778		2144	
HIGHEST ANNUAL MEAN					3135	1996
LOWEST ANNUAL MEAN					1707	1998
HIGHEST DAILY MEAN	3800	Jul 10	7210	Apr 14	16000	Apr 27 1996
LOWEST DAILY MEAN	1000	Dec 9	1000	Dec 9	917	May 27 1998
ANNUAL SEVEN-DAY MINIMUM	1030	Oct 9	1030	Oct 9	951	May 24 1998
MAXIMUM PEAK FLOW			7550	Apr 13	16100	Apr 27 1996
MAXIMUM PEAK STAGE			10.83	Apr 13	15.11	Apr 27 1996
10 PERCENT EXCEEDS	2790		3030		3370	
50 PERCENT EXCEEDS	1600		1460		1800	
90 PERCENT EXCEEDS	1120		1100		1200	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04065722 MENOMINEE RIVER NEAR VULCAN, MI

LOCATION.--Lat 45°44'12", long 87°51'48", sec.34, T.39 N., R.29 W., Michigan Meridian, Dickinson County, Hydrologic Unit 04030108, on left bank 0.35 mi downstream from Sturgeon Falls Dam, 3.0 mi south of Vulcan, and at mile 78.7.

DRAINAGE AREA.--2,900 mi^2.

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

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 820 ft above sea level, from topographic map.

REMARKS.--Records good. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft, on Michigamme River, and by smaller reservoirs upstream from station. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1290	1330	1470	1660	1940	2050	1480	4050	2860	2020	1760	1050
2	1300	1340	1440	1580	1810	1910	2370	4110	2560	1800	1970	1030
3	1290	1370	1420	1850	1950	1420	2460	4080	2120	2010	1840	1030
4	1300	1350	1350	1780	2020	1260	2340	3930	2550	1510	1530	1100
5	1270	1310	1280	1740	1910	1740	2810	3570	2650	1970	1500	1020
6	1230	1310	1300	1300	1910	1920	3150	3530	2640	1850	1800	1080
7	1140	1320	1250	1250	1800	1990	3750	3380	2390	1150	1670	1080
8	1210	1340	1260	1660	1920	2020	5210	3180	2090	1110	1670	1340
9	1230	1330	1220	1690	2010	2010	6270	2870	1570	1440	1390	1700
10	1170	1350	1170	1800	1960	1570	6800	2850	1470	1580	1250	1680
11	1130	1370	1200	1700	1670	1630	7400	3480	2150	1520	1080	1530
12	1150	1360	1310	1760	1960	1420	7980	3500	3130	1510	1050	1260
13	1160	1690	1280	1260	2310	1370	8640	2820	3580	1440	1140	1300
14	1170	2250	1240	1240	2130	1450	8900	2710	3510	1140	1070	1300
15	1160	1780	1240	1610	2100	1640	8520	2850	2960	1050	1150	1080
16	1410	2120	1270	1690	2100	1930	8230	2760	3020	1120	1190	1100
17	1510	2090	1250	1800	1910	1840	7280	2810	2540	1140	1200	1140
18	1470	1740	1390	1910	1610	2210	5840	2770	2760	1190	1120	1150
19	1440	1480	1430	1680	1970	1920	4990	2570	3420	1190	1090	1270
20	1450	1360	1490	1620	2160	1970	4300	1780	3700	1730	1210	1410
21	1310	1430	1570	1840	2060	2010	3780	2200	3660	1810	1230	1370
22	1270	1490	1500	1810	2100	2140	3780	2770	3430	2170	1410	1170
23	1370	1420	1240	1860	2070	2250	4090	3000	2520	1920	1220	1290
24	1320	1280	1290	2000	2030	1800	4680	3330	2090	1710	1220	1890
25	1350	1370	1170	1870	1950	1470	6100	3780	2190	1660	1160	1900
26	1430	1350	1540	1930	2020	2270	6240	3510	2240	1600	1090	1930
27	1380	1350	1580	1320	1930	2250	5740	3620	2070	1520	1400	1770
28	1370	1420	1570	1300	1810	2120	4870	3630	2170	1120	1270	1340
29	1360	1440	1720	1730	---	2120	4590	3600	2230	1070	1140	1200
30	1370	1460	1650	2080	---	2130	4190	3390	2450	1700	1310	1100
31	1310	---	1560	2020	---	1660	---	2740	---	1810	1170	---
TOTAL	40320	44600	42650	52340	55120	57490	156780	99170	78720	47560	41300	39610
MEAN	1301	1487	1376	1688	1969	1855	5226	3199	2624	1534	1332	1320
MAX	1510	2250	1720	2080	2310	2270	8900	4110	3700	2170	1970	1930
MIN	1130	1280	1170	1240	1610	1260	1480	1780	1470	1050	1050	1020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2001, BY WATER YEAR (WY)

MEAN	1904	2194	2082	1993	2047	2522	4262	3738	2811	2230	1672	1827
MAX	3401	4412	3008	2533	2548	3701	8159	8850	4832	4196	2598	2456
(WY)	1996	1989	1989	1993	1997	2000	1996	1996	1993	1999	1996	1994
MIN	1081	1382	1376	1489	1442	1855	1356	1344	1062	1100	1184	1223
(WY)	1990	1990	2001	1995	1995	2001	1990	1998	1988	1988	1998	1989

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1988 - 2001	
ANNUAL TOTAL	755120		755660			
ANNUAL MEAN	2063		2070		2478	
HIGHEST ANNUAL MEAN					3781	1996
LOWEST ANNUAL MEAN					1864	1990
HIGHEST DAILY MEAN	4800	Mar 9	8900	Apr 14	21500	Apr 27 1996
LOWEST DAILY MEAN	1130	Oct 11	1020	Sep 5	846	Aug 3 1988
ANNUAL SEVEN-DAY MINIMUM	1170	Oct 9	1060	Sep 1	932	Oct 1 1989
MAXIMUM PEAK FLOW			9200	Apr 14	22000	Apr 27 1996
MAXIMUM PEAK STAGE			11.53	Apr 14	17.39	Apr 27 1996
INSTANTANEOUS LOW FLOW			793	Jul 14	603	Aug 1 1992
10 PERCENT EXCEEDS	3340		3550		3990	
50 PERCENT EXCEEDS	1800		1680		2020	
90 PERCENT EXCEEDS	1280		1170		1300	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04066003 MENOMINEE RIVER BELOW PEMENE CREEK NEAR PEMBINE, WI

LOCATION.--Lat 45°34'46", long 87°47'13", in NE ¼, sec.29, T. 37 N., R.28 W., Michigan Meridian, Menominee County, Hydrologic Unit 04030108, on left bank 40 ft downstream from County Trunk Z bridge, 0.9 mi downstream from Pemene Creek, 3.9 mi west of Nathan, 10.6 mi southeast of Pembine, WI and at mile 64.3.

DRAINAGE AREA.--3,140 mi^2.

PERIOD OF RECORD.--October 1949 to current year. Published as "near Pembine" (04066000) prior to August 1982. Monthly discharges for some periods published in WSP 1307.

GAGE.--Water-stage recorder. Elevation of gage is 740 ft above sea level, from topographic map. October 1949 to Oct. 27, 1972, water-stage recorder at site 1.0 mi upstream at elevation 745 ft, from river-profile map, and Oct. 28, 1972 to August 1982, water-stage recorder at site 1.5 mi upstream at elevation 770 ft, from river-profile map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft, on the Michigamme River, and by many smaller reservoirs upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1330	1310	1560	e1600	e2000	e1900	1640	4180	2980	2180	1820	1160
2	1290	1350	1510	e1700	e1800	e2000	2150	4210	2780	1990	2020	1090
3	1290	1360	e1500	e1700	e1900	e1800	2650	4190	2300	2050	1910	1070
4	1250	1400	e1400	e1800	e1900	e1600	2500	4180	2610	1990	1750	1110
5	1220	1330	e1300	e1800	e2000	e1700	2990	3660	2830	1760	1530	1100
6	1220	1340	e1300	e1600	e2000	e1900	3330	3610	2780	2140	1790	1110
7	1180	1380	e1300	e1400	e1900	e1900	3940	3560	2610	1590	1680	1150
8	1190	1410	e1300	e1500	e1900	e1900	5310	3430	2110	1220	1460	1240
9	1250	1410	e1300	e1600	e1900	e1900	6700	3040	1990	1270	1540	1670
10	1190	1410	e1200	e1700	e2000	e1700	7380	2960	1600	1640	1340	1810
11	1140	1400	e1200	e1700	e1900	e1700	7890	3320	1940	1650	1240	1690
12	1130	1390	e1300	e1700	e1900	e1700	8470	3750	3060	1660	1150	1420
13	1130	1520	e1300	e1500	e2200	e1600	8890	3200	3790	1560	1110	1330
14	1150	2530	e1300	e1400	e2100	e1700	9480	2760	3700	1420	1190	1400
15	1180	2280	e1300	e1500	e2000	e1700	8930	2970	3100	1220	1180	1270
16	1260	2210	e1300	e1700	e2100	e1900	8750	2960	3410	1230	1240	1140
17	1470	2350	e1300	e1800	e2000	e2000	7830	3010	2800	1160	1260	1210
18	1480	2200	e1300	e1800	e1900	e2200	6330	2860	2900	1280	1210	1210
19	1430	1720	e1400	e1700	e1900	2250	5450	2830	3520	1300	1180	1310
20	1420	1460	e1500	e1600	e2100	e1900	4550	1950	3930	1540	1160	1430
21	1320	1520	e1500	e1800	e1900	e2000	4030	2140	3840	1870	1320	1480
22	1210	1540	e1500	e1900	e2000	e2100	4060	2830	3750	2190	1380	1390
23	1330	1550	e1400	e1900	e2100	2340	4050	3220	2790	2000	1410	1320
24	1350	1380	e1300	e2000	e2000	2190	4780	3370	2400	1790	1340	1710
25	1310	1400	e1400	e2000	e2000	1580	5990	4080	2190	1670	1330	1890
26	1370	1440	e1400	e1900	e2100	2010	6370	3880	2400	1720	1330	1840
27	1360	1410	e1600	e1800	e2000	2460	5920	3820	2260	1680	1250	1940
28	1400	1430	e1600	e1500	e1900	2220	5230	3830	2230	1340	1600	1500
29	1350	1490	e1600	e1700	---	2220	4750	3650	2410	1160	1150	1370
30	1360	1500	e1700	e1900	---	2140	4180	3660	2640	1440	1340	1230
31	1320	---	e1600	e2100	---	2010	---	2990	---	1860	1290	---
TOTAL	39880	47420	43470	53300	55400	60220	164520	104100	83650	50570	43500	41590
MEAN	1286	1581	1402	1719	1979	1943	5484	3358	2788	1631	1403	1386
MAX	1480	2530	1700	2100	2200	2460	9480	4210	3930	2190	2020	1940
MIN	1130	1310	1200	1400	1800	1580	1640	1950	1600	1160	1110	1070

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2001, BY WATER YEAR (WY)

MEAN	2444	2586	2272	2116	2105	2630	5525	4746	3349	2541	2074	2288
MAX	5660	5766	3939	3035	3810	7461	10000	12100	6118	6523	3505	5335
(WY)	1986	1986	1986	1986	1984	1973	1967	1960	1953	1953	1952	1968
MIN	1028	1043	1167	1080	1201	1461	1432	1341	1152	1201	1003	1009
(WY)	1977	1977	1977	1977	1964	1964	1990	1987	1988	1988	1977	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1950 - 2001	
ANNUAL TOTAL	782460		787620			
ANNUAL MEAN	2138		2158		2890	
HIGHEST ANNUAL MEAN					4318	1960
LOWEST ANNUAL MEAN					1778	1977
HIGHEST DAILY MEAN	5310	Mar 10	9480	Apr 14	26700	May 8 1960
LOWEST DAILY MEAN	1130	Oct 12	1070	Sep 3	840	Aug 14 1977
ANNUAL SEVEN-DAY MINIMUM	1170	Oct 9	1110	Sep 1	914	Aug 8 1977
MAXIMUM PEAK FLOW			9660	Apr 14	(a)26900	May 8 1960
MAXIMUM PEAK STAGE			11.79	Apr 14	(b)18.94	Dec 17 1985
10 PERCENT EXCEEDS	3590		3750		4900	
50 PERCENT EXCEEDS	1900		1700		2300	
90 PERCENT EXCEEDS	1300		1230		1430	

(a) Gage height, 13.90 ft, site and datum then in use.
(b) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04066030 MENOMINEE RIVER AT WHITE RAPIDS DAM NEAR BANAT, MI

LOCATION.--Lat 45°28'55", long 87°48'08", in SE ¼ SE ¼, sec.30, T. 36 N., R.28 W., Michigan Meridian, Menominee County, Hydrologic Unit 04030108, on left bank at powerplant at White Rapids Dam, 5.7 mi southwest of Banat.

DRAINAGE AREA.--3,190 mi^2.

PERIOD OF RECORD.--October 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 680.00 ft above sea level (levels by Wisconsin Electric Power Company).

REMARKS.--Records good. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft, on the Michigamme River, and by many smaller reservoirs upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1330	1390	1560	1630	2160	2020	1690	4350	3220	2330	1950	1260
2	1480	1400	1670	1870	2030	2110	2370	4140	2640	1990	1860	1200
3	1620	1480	1710	1840	1960	2020	2790	4300	2400	1960	2060	1140
4	1550	1660	1410	2100	2110	1410	2840	4250	2620	2030	1920	1090
5	1290	1380	1380	1830	2240	1550	3120	3730	2750	1540	1340	1040
6	1240	1390	1370	1650	2060	2160	3570	3700	3030	2430	2000	1050
7	1270	1590	1270	1680	2090	2320	4040	3500	2610	1500	1870	1060
8	1250	1490	1280	1390	2010	2110	5570	3590	1990	1410	1610	1210
9	1280	1510	1330	1830	2060	2180	6920	2860	2400	1300	1840	1870
10	1420	1660	1360	1910	2220	2070	7680	3250	1470	1500	1070	1880
11	1340	1630	1370	2060	1980	1540	8050	3020	2020	1780	1220	1620
12	1170	1640	1180	1990	1830	1920	8510	4050	3190	1730	1240	1520
13	1170	1690	1400	1710	2430	1440	9120	3190	3670	1620	1100	1180
14	1280	2740	1610	1510	2430	1690	9640	2660	3870	1520	1110	1260
15	1240	2470	1400	1300	2330	1720	9090	3130	3090	1300	1130	1380
16	1390	2040	1310	1820	2070	1920	9070	3060	3560	1170	1280	1150
17	1620	2860	1340	2040	2550	2100	7990	2980	2840	1230	1300	1100
18	1630	2380	1440	1930	1810	2250	6440	2990	2990	1270	1240	1140
19	1620	1660	1600	2080	1980	2240	5370	2750	3460	1290	1270	1270
20	1610	1670	1590	1620	2470	2110	4800	2190	4040	1780	1160	1480
21	1520	1760	1600	1900	2120	2100	4240	2210	3790	1870	1280	1590
22	1350	1560	1620	2010	2100	2360	3950	2760	3730	2360	1340	1370
23	1300	1780	1420	2040	2280	2510	4150	3330	3110	2050	1340	1350
24	1540	1580	1340	2080	2290	2360	5150	3470	2310	1830	1340	1820
25	1710	1420	1390	2070	2120	1760	5700	3980	2400	1700	1490	2150
26	1410	1570	1350	2220	2440	2000	6470	3950	2410	1880	1350	2050
27	1400	1660	1880	1840	1940	2570	5870	3760	2030	1640	1350	2080
28	1510	1680	1650	1350	2370	2580	5430	4220	2500	1610	1730	1320
29	1590	1570	1630	1770	—	2430	4840	3550	2270	1160	1290	1330
30	1410	1590	1860	2030	—	2220	4160	3770	2640	1170	1170	1330
31	1400	—	1950	2410	—	2260	—	3030	—	2090	1270	—
TOTAL	43940	51900	46270	57510	60480	64030	168630	105720	85050	52040	44520	42290
MEAN	1417	1730	1493	1855	2160	2065	5621	3410	2835	1679	1436	1410
MAX	1710	2860	1950	2410	2550	2580	9640	4350	4040	2430	2060	2150
MIN	1170	1380	1180	1300	1810	1410	1690	2190	1470	1160	1070	1040

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2001, BY WATER YEAR (WY)

MEAN	1524	1706	1562	1890	2267	2990	4134	3602	2667	2950	1898	1754
MAX	1597	1730	1672	2040	2345	4118	5621	5238	3081	4584	2511	2237
(WY)	2000	2001	2000	2000	1999	2000	2001	1999	1999	1999	1999	2000
MIN	1417	1659	1493	1774	2160	2065	3147	2156	2087	1679	1436	1410
(WY)	2001	1999	2001	1999	2001	2001	2000	2000	2000	2001	2001	2001

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1999 - 2001	
ANNUAL TOTAL	824910		822380			
ANNUAL MEAN	2254		2253		2411	
HIGHEST ANNUAL MEAN					2697	1999
LOWEST ANNUAL MEAN					2253	2001
HIGHEST DAILY MEAN	5650	Mar 10	9640	Apr 14	10600	Jul 16 1999
LOWEST DAILY MEAN	1170	Oct 12	1040	Sep 5	1040	Sep 5 2001
ANNUAL SEVEN-DAY MINIMUM	1270	Oct 7	1110	Sep 2	1110	Sep 2 2001
MAXIMUM PEAK FLOW			10400	Apr 13	12000	May 10 1999
MAXIMUM PEAK STAGE			11.17	Apr 13	11.70	May 10 1999
10 PERCENT EXCEEDS	3680		3760		4030	
50 PERCENT EXCEEDS	2000		1860		2000	
90 PERCENT EXCEEDS	1340		1270		1330	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04066800 MENOMINEE RIVER AT KOSS, MI

LOCATION.--Lat 45°23'14", long 87°42'07", in NE ¼, sec.36, T. 35 N., R.28 W., Michigan Meridian, Menominee County, Hydrologic Unit 04030108, on left upstream bank 30 ft from river and 18 ft west of County Trunk JJ (Koss) bridge, 0.3 mi southeast of Koss and 3.4 mi upstream of Grand Rapids Dam.

DRAINAGE AREA.--3,700 mi^2.

PERIOD OF RECORD.--July 1907 to March 1909 (published as "at Koss"), July 1913 to September 1981 (published as 04067000 Menominee River below Koss, MI), June 1998 to current year. Records prior to October 1913 published in WSP 244, 264, and 384.

REVISED RECORDS.--WDR WI-80-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 665 ft above sea level, from topographic map. June 1913 to September 1981, headwater and tailwater gages and generation data entered hourly in daily log sheet by Wisconsin Public Service Corp. employees at powerplant 4 mi downstream. Records of daily discharge furnished by Wisconsin Public Service Corp. Prior to June 1913, chain gage on railroad bridge at Koss.

REMARKS.--Records good except for estimated daily discharges and discharges for Nov. 19 to Dec. 4, which are fair. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft, on the Michigamme River, and by many smaller reservoirs upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1470	1470	1650	e2100	e2600	e2500	e2600	4650	3280	2730	2190	1420
2	1470	1520	1650	e1900	e2400	e2300	2160	4520	3300	2260	1800	1220
3	1570	1540	1820	e2100	e2300	e2400	2740	4930	2810	2100	1890	1190
4	1600	1600	1900	e2200	e2300	e2000	3100	4780	2660	2460	1970	1220
5	1560	1580	e1700	e2200	e2400	e1700	3270	4540	2970	1960	1710	1210
6	1450	1520	e1600	e2000	e2500	e2000	4440	4130	3040	2390	1460	1160
7	1490	1550	e1600	e1900	e2300	e2400	4750	4020	2980	2100	2060	1150
8	1460	1610	e1500	e1800	e2300	e2500	6170	4020	2680	1680	1640	1200
9	1440	1640	e1500	e1700	e2300	e2400	7830	3570	2230	1460	1720	1590
10	1440	1650	e1500	e2100	e2300	e2300	8890	3520	2140	1440	1440	1830
11	1470	1780	e1600	e2200	e2500	e2200	9260	3280	2030	1950	1230	2280
12	1400	1760	e1500	e2300	e2200	e1800	9850	4090	2870	1790	1340	1360
13	1200	1820	e1500	e2200	e2300	e2000	10400	3980	3920	1850	1280	1310
14	1170	2430	e1700	e1900	e2700	e1800	10900	3370	4200	1530	1270	1260
15	1340	3250	e1800	e1800	e2700	e1900	11000	3160	4000	1520	1220	1260
16	1410	2610	e1700	e1700	e2500	e2000	10600	3560	3640	1370	1230	1250
17	1470	2850	e1600	e2100	e2300	e2200	10100	3250	3590	1250	1280	1230
18	1540	2810	e1600	e2300	e2500	e2400	8770	3310	3330	1370	1230	1220
19	1560	2250	e1700	e2300	e1900	e2500	7170	3150	3560	1360	1250	1250
20	1510	1840	e1900	e2100	e2400	e2500	6140	2930	4180	1360	1270	1280
21	1540	1820	e1900	e2000	e2500	e2500	5360	2030	4580	2050	1270	1510
22	1470	2110	e1900	e2200	e2200	e2600	4800	2930	4120	1830	1350	1340
23	1430	1790	e1900	e2300	e2300	e2900	4760	3450	4350	2270	1220	1370
24	1470	1980	e1800	e2300	e2400	e3100	5250	3850	3010	1960	1240	1520
25	1700	1710	e1600	e2300	e2500	e2800	6090	4130	2850	1680	1450	2390
26	1660	1490	e1600	e2400	e2400	e2300	6780	4640	2790	1730	1630	2140
27	1470	1720	e1700	e2300	e2600	e2700	7000	4260	2520	1730	1330	2430
28	1510	1750	e2000	e2000	e2300	e3000	6290	4550	2610	1650	1510	1700
29	1620	1750	e1900	e1700	—	e3000	5550	4140	2570	1560	1710	1320
30	1570	1600	e1900	e2100	—	e2800	5100	4010	2430	1450	1260	1350
31	1480	—	e2100	e2400	—	e2900	—	3750	—	1640	1200	—
TOTAL	45940	56800	53320	64900	66900	74400	197120	118500	95240	55480	45650	43960
MEAN	1482	1893	1720	2094	2389	2400	6571	3823	3175	1790	1473	1465
MAX	1700	3250	2100	2400	2700	3100	11000	4930	4580	2730	2190	2430
MIN	1170	1470	1500	1700	1900	1700	2160	2030	2030	1250	1200	1150

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2001, BY WATER YEAR (WY)

MEAN	2539	2809	2190	1985	1887	2717	6575	5680	3860	2761	2147	2421
MAX	6178	5597	3588	3174	3176	7973	13650	13180	10780	6159	3800	5538
(WY)	1929	1917	1919	1969	1969	1973	1916	1960	1916	1953	1972	1928
MIN	1131	1170	1166	989	864	1199	2479	2220	1708	1111	731	1013
(WY)	1977	1977	1931	1926	1926	1934	1964	1977	1977	1934	1934	1933

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1913 - 2001	
ANNUAL TOTAL	909450		918210			
ANNUAL MEAN	2485		2516		3136	
HIGHEST ANNUAL MEAN					5262	1916
LOWEST ANNUAL MEAN					1642	1931
HIGHEST DAILY MEAN	6600	Mar 7	11000	Apr 15	33000	May 10 1960
LOWEST DAILY MEAN	1170	Oct 14	1150	Sep 7	162	Sep 15 1931
ANNUAL SEVEN-DAY MINIMUM	1350	Oct 10	1190	Sep 2	402	Sep 9 1931
MAXIMUM PEAK FLOW			11200	Apr 15		
MAXIMUM PEAK STAGE			13.82	Apr 15		
10 PERCENT EXCEEDS	4010		4190		5900	
50 PERCENT EXCEEDS	2180		2030		2330	
90 PERCENT EXCEEDS	1530		1340		1380	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04067500 MENOMINEE RIVER NEAR McALLISTER, WI

LOCATION.--Lat 45°19'33", long 87°39'48", in SW ¼ SE ¼ sec.17, T.33 N., R.23 E., Wisconsin Meridian, Marinette County, Hydrologic Unit 04030108, on right bank 85 ft downstream from bridge on County Highway JJ, 2.9 mi downstream from Grand Rapids Dam, 2.6 mi east of McAllister, 1.9 mi downstream from Little Cedar River, and at mile 22.6.

DRAINAGE AREA.--3,930 mi^2.

PERIOD OF RECORD.--March 1945 to September 1961; October 1961 to September 1979, miscellaneous measurements and peaks only; October 1979 to September 1986; October 1986 to March 1987, crest-stage partial-record station; April 1988 to September 1990; April 1993 to September 1995; October 1997 to current year.

REVISED RECORDS.--WDR WI-80-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 622.20 ft above sea level (Michigan Department of Transportation reference mark). Prior to May 15, 1945, nonrecording gage 1,400 ft downstream at same datum; May 16, 1945 to September 1961, water-stage recorder 1,000 ft downstream at same datum; October 1961 to September 1979, crest-stage gage 1,100 ft downstream at same datum; October 1979 to September 1986, water-stage recorder at same site and datum; October 1986 to March 1987, crest-stage gage at same site and datum. April 1988 to September 1990, and April 1993 to September 1995, water-stage recorder at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplants, by Michigamme Reservoir, capacity, 119,950 acre-ft, by Peavy Pond, capacity, 33,860 acre-ft on the Michigamme River, and by many smaller reservoirs upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1470	1610	1810	e2200	e2700	e2600	e2800	4930	3610	2880	2150	1320
2	1500	1560	1730	e2000	e2500	e2400	2660	4860	3750	2410	1880	1370
3	1660	1530	1800	e2200	e2400	e2500	3360	5140	3220	2170	2010	1260
4	1730	1690	1970	e2200	e2400	e2200	3830	5050	3020	2590	2120	1220
5	1690	1660	1370	e2300	e2400	e1900	3750	4910	3340	2010	1780	1170
6	1400	1520	e1300	e2200	e2600	e2200	4870	4430	3450	2240	1490	1170
7	1450	1580	e1600	e2000	e2400	e2500	5370	4290	3330	2280	2190	1170
8	1450	1690	e1600	e2000	e2500	e2600	6770	4350	2880	1770	1730	1170
9	1450	1720	e1600	e1700	e2300	e2500	8310	3930	2450	1610	1910	1520
10	1480	1720	e1600	e2200	e2400	e2500	9270	3780	2510	1500	1560	1850
11	1560	1840	e1700	e2300	e2500	e2400	9580	3530	2000	1800	1150	2100
12	1500	1820	e1700	e2400	e2200	e2000	10100	4130	2920	1900	1380	1650
13	1390	1930	e1600	e2300	e2600	e2100	10700	4290	4070	1850	1330	1550
14	1380	2420	e1800	e2100	e2900	e1800	11000	3600	4430	1650	1220	1360
15	1390	3390	e2000	e1900	e2800	e1900	11100	3290	4360	1620	1240	1450
16	1440	2890	e1800	e1900	e2600	e2000	10700	3960	3810	1440	1260	1460
17	1620	3000	e1700	e2300	e2400	e2300	10200	3700	3910	1300	1420	1280
18	1750	3220	e1700	e2400	e2700	e2500	9010	3700	3610	1410	1360	1240
19	1730	2520	e1800	e2500	e2000	e2600	7510	3470	3890	1380	1330	1280
20	1760	1990	e1900	e2400	e2400	e2700	6630	3250	4380	1460	1320	1460
21	1680	1890	e2000	e2200	e2600	e2700	5870	2400	4790	2170	1260	1670
22	1610	1990	e2000	e2300	e2400	e2700	5250	3170	4410	2010	1380	1560
23	1510	1820	e2000	e2400	e2400	e3100	5230	3690	4520	2450	1410	1560
24	1620	2080	e1900	e2400	e2600	e3200	5510	4250	3310	2150	1380	1570
25	1850	1850	e1600	e2400	e2600	e3000	6370	4500	2950	1820	1530	2270
26	1950	1660	e1700	e2500	e2500	e2600	6930	5060	2940	1780	1720	2150
27	1600	1830	e1800	e2300	e2800	e2800	7170	4680	2650	1890	1540	2300
28	1660	1880	e2200	e2100	e2300	e3300	6530	4930	2620	1670	1520	1970
29	1750	1890	e2000	e1700	—	e3300	5850	4630	2710	1560	1820	1420
30	1740	1760	e2100	e2200	—	e3000	5540	4370	2620	1290	1420	1460
31	1620	—	e2200	e2500	—	e3000	—	4250	—	1430	1240	—
TOTAL	49390	59950	55580	68500	69900	78900	207770	128520	102460	57490	48050	45980
MEAN	1593	1998	1793	2210	2496	2545	6926	4146	3415	1855	1550	1533
MAX	1950	3390	2200	2500	2900	3300	11100	5140	4790	2880	2190	2300
MIN	1380	1520	1300	1700	2000	1800	2660	2400	2000	1290	1150	1170

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2001, BY WATER YEAR (WY)

MEAN	2875	3170	2550	2381	2411	3093	6448	5207	3870	3165	2344	2626
MAX	6755	7332	4561	3777	4710	5687	12800	15930	6958	7127	4056	5952
(WY)	1986	1986	1986	1983	1984	1983	1951	1960	1993	1951	1952	1959
MIN	1195	1753	1532	1621	1245	1897	1869	1636	1296	1374	1312	1390
(WY)	1949	1990	1990	1949	1948	1956	1990	1998	1988	1988	1998	1989

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1945 - 2001	
ANNUAL TOTAL	958250		972490			
ANNUAL MEAN	2618		2664		3353	
HIGHEST ANNUAL MEAN					5496	1960
LOWEST ANNUAL MEAN					2118	1948
HIGHEST DAILY MEAN	6770	Mar 10	11100	Apr 15	31800	May 9 1960
LOWEST DAILY MEAN	1300	Dec 6	1150	Aug 11	810	Oct 26 1948
ANNUAL SEVEN-DAY MINIMUM	1450	Oct 10	1220	Sep 2	952	Oct 24 1948
MAXIMUM PEAK FLOW			11200	Apr 13	32500	May 9 1960
MAXIMUM PEAK STAGE			14.24	Apr 13	(a)20.00	May 9 1960
INSTANTANEOUS LOW FLOW					(b)538	Oct 6 1946
10 PERCENT EXCEEDS	4210		4510		6000	
50 PERCENT EXCEEDS	2300		2170		2600	
90 PERCENT EXCEEDS	1600		1420		1620	

(a) From graph based on gage readings.
(b) Observed.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04096015 GALIEN RIVER NEAR SAWYER, MI

LOCATION.--Lat 41°52'25", long 86°34'30", in SE1/4 sec.12, T.7 S., R.20 W., Berrien County, Hydrologic Unit 04040001, on right bank 10 ft downstream from bridge on Minnich Road, 1.3 mi southeast of Sawyer.

DRAINAGE AREA.--80.7 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 610 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	23	129	e44	240	141	55	44	94	34	21	21
2	20	23	84	e44	170	126	52	42	124	34	22	20
3	20	31	68	e43	e125	121	50	40	99	35	24	20
4	61	24	60	e45	95	109	48	39	72	36	22	19
5	52	20	58	e46	93	95	48	40	70	34	20	19
6	44	19	53	e45	91	86	124	37	95	31	19	18
7	40	22	52	e45	79	82	127	38	79	37	18	21
8	45	23	51	e44	118	82	85	39	67	36	18	20
9	51	26	49	e42	1040	77	93	37	58	32	18	23
10	43	52	48	e43	1230	73	101	35	52	31	20	25
11	37	40	e47	e45	573	76	94	38	453	29	19	21
12	33	34	e47	e50	349	77	77	38	455	27	17	20
13	30	42	e46	53	269	77	70	36	245	26	17	19
14	28	50	e46	57	261	72	66	36	123	26	17	19
15	28	40	e48	118	275	69	141	50	107	25	17	19
16	28	37	e50	142	192	71	209	53	87	24	20	19
17	27	34	e49	117	140	76	122	51	69	26	21	18
18	27	32	e48	102	112	78	98	42	61	28	19	20
19	27	30	e47	88	101	72	86	38	54	25	21	25
20	27	30	e46	e72	97	68	89	36	49	23	19	28
21	27	30	e45	e64	90	65	92	45	67	22	18	34
22	26	28	e44	57	79	63	93	86	97	23	32	31
23	28	28	e46	54	73	60	89	57	68	25	31	28
24	30	28	e47	52	93	58	72	54	58	51	25	30
25	30	28	e46	50	836	56	64	73	51	43	26	30
26	28	67	e45	e48	501	54	59	70	46	39	43	28
27	28	107	e45	e46	290	54	55	137	43	31	32	26
28	27	75	e44	e45	184	54	50	102	40	28	27	25
29	26	68	e44	e46	—	53	48	70	38	26	24	25
30	25	114	e45	162	—	53	46	59	36	24	22	24
31	25	—	e45	301	—	51	—	52	—	22	22	—
TOTAL	988	1205	1622	2210	7796	2349	2503	1614	3057	933	691	695
MEAN	31.9	40.2	52.3	71.3	278	75.8	83.4	52.1	102	30.1	22.3	23.2
MAX	61	114	129	301	1230	141	209	137	455	51	43	34
MIN	20	19	44	42	73	51	46	35	36	22	17	18
CFSM	.39	.50	.65	.88	3.45	.94	1.03	.65	1.26	.37	.28	.29
IN.	.46	.56	.75	1.02	3.59	1.08	1.15	.74	1.41	.43	.32	.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2001, BY WATER YEAR (WY)

MEAN	34.9	71.8	74.6	127	151	112	118	130	99.8	53.6	34.9	25.4
MAX	62.0	134	174	229	292	228	196	449	213	127	51.5	38.5
(WY)	1997	1997	1997	1998	1997	1998	1999	1996	1996	1996	1995	1997
MIN	17.5	20.7	34.0	33.0	59.0	44.1	64.1	52.1	35.8	26.5	17.4	14.2
(WY)	2000	2000	2000	2000	2000	2000	2000	2001	1998	1998	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1995 - 2001	
ANNUAL TOTAL	17889		25663			
ANNUAL MEAN	48.9		70.3		85.6	
HIGHEST ANNUAL MEAN					119	1996
LOWEST ANNUAL MEAN					44.5	2000
HIGHEST DAILY MEAN	701	Jun 25	1230	Feb 10	2640	May 10 1996
LOWEST DAILY MEAN	13	Sep 7	17	Aug 12	13	Sep 10 1999
ANNUAL SEVEN-DAY MINIMUM	14	Sep 2	18	Aug 9	14	Sep 20 1999
MAXIMUM PEAK FLOW			1500	Feb 9	3440	May 10 1996
MAXIMUM PEAK STAGE			12.00	Feb 9	14.13	May 10 1996
INSTANTANEOUS LOW FLOW			16	Aug 14	12	(a)
ANNUAL RUNOFF (CFSM)	.61		.87		1.06	
ANNUAL RUNOFF (INCHES)	8.25		11.83		14.41	
10 PERCENT EXCEEDS	77		117		151	
50 PERCENT EXCEEDS	38		45		47	
90 PERCENT EXCEEDS	22		21		22	

(a) Sept. 27, 1999; Jan. 17, 2000, result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04096405 ST. JOSEPH RIVER AT BURLINGTON, MI

LOCATION.--Lat 42°06'11", long 85°04'48", in SE1/4 SE1/4 sec.23, T.4 S., R.7 W., Calhoun County, Hydrologic Unit 04050001, on right bank 10 ft downstream from bridge on Elevenmile Road in Burlington, 4.1 mi upstream from Burnett Creek, 6.7 mi downstream from Tekonsha Creek, and at mile 161.

DRAINAGE AREA.--206 mi^2.

PERIOD OF RECORD.--October 1962 to current year. Published as "near Burlington" prior to October 1991.

GAGE.--Water-stage recorder. Elevation of gage is 905 ft above sea level, from topographic map. October 1962 to September 1990 water-stage recorder and October 1990 to September 1991 nonrecording gage at site 2.7 mi upstream at different datum (station 04096400).

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	126	228	e175	229	557	218	264	471	159	89	73
2	102	124	220	e170	231	585	219	245	482	150	85	69
3	97	123	202	e170	224	583	216	226	500	145	83	66
4	130	122	186	e165	217	543	211	206	478	143	76	62
5	154	124	184	e165	230	499	204	195	450	137	69	58
6	172	122	171	e165	223	450	211	186	452	131	63	55
7	177	121	166	e160	212	412	215	182	457	126	59	53
8	175	119	156	e160	207	387	223	182	446	123	55	56
9	169	120	145	e150	358	366	240	174	429	117	54	86
10	160	136	161	e155	726	343	257	171	409	111	54	91
11	147	145	149	e155	e800	334	269	167	387	104	60	88
12	137	150	95	e160	686	326	279	162	373	98	63	93
13	129	167	e160	e165	697	318	277	157	350	93	55	88
14	121	182	e165	e170	758	313	271	154	314	89	50	76
15	116	185	e170	e175	825	306	280	231	284	84	46	70
16	111	184	e175	e180	813	305	301	331	268	81	59	66
17	108	183	e180	e185	689	305	291	438	244	81	71	62
18	108	179	e185	e190	659	302	283	429	241	82	75	60
19	108	172	e190	e185	633	298	287	431	231	82	75	67
20	106	165	e195	e160	572	292	303	447	221	80	78	71
21	105	161	e190	e185	481	284	331	468	218	97	81	99
22	104	150	e185	e175	467	276	351	494	227	122	102	130
23	103	142	e180	e175	455	268	355	476	223	129	117	126
24	132	157	e180	e175	412	260	363	454	225	130	116	123
25	160	155	e185	e170	580	250	362	439	221	130	108	114
26	162	176	e190	e165	692	241	360	413	213	139	107	116
27	158	209	e190	e160	622	235	355	432	203	129	109	117
28	148	219	e190	e155	578	228	340	476	191	117	100	113
29	139	223	e185	e150	—	224	317	480	178	106	91	107
30	132	227	e180	178	—	219	291	470	168	100	84	97
31	129	—	e175	214	—	214	—	471	—	96	78	—
TOTAL	4106	4768	5513	5262	14276	10523	8480	10051	9554	3511	2412	2552
MEAN	132	159	178	170	510	339	283	324	318	113	77.8	85.1
MAX	177	227	228	214	825	585	363	494	500	159	117	130
MIN	97	119	95	150	207	214	204	154	168	80	46	53
CFSM	.64	.77	.86	.82	2.48	1.65	1.37	1.57	1.55	.55	.38	.41
IN.	.74	.86	1.00	.95	2.58	1.90	1.53	1.82	1.73	.63	.44	.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2001, BY WATER YEAR (WY)

MEAN	99.8	136	176	184	213	307	308	231	194	115	86.0	85.8
MAX	357	378	308	508	510	668	567	426	640	308	270	237
(WY)	1987	1993	1983	1993	2001	1982	1982	1983	1989	1968	1981	1981
MIN	16.4	26.3	26.7	34.6	36.0	74.0	140	96.4	48.9	23.8	16.2	14.5
(WY)	1964	1965	1964	1977	1963	1964	1964	1971	1964	1988	1964	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1963 - 2001	
ANNUAL TOTAL	63574		81008			
ANNUAL MEAN	174		222		178	
HIGHEST ANNUAL MEAN					270	1993
LOWEST ANNUAL MEAN					47.6	1964
HIGHEST DAILY MEAN	661	Jun 26	825	Feb 15	1330	(a)
LOWEST DAILY MEAN	66	Jan 31	46	Aug 15	8.0	Aug 9 1964
ANNUAL SEVEN-DAY MINIMUM	67	Jan 28	55	Aug 9	9.4	Aug 5 1964
MAXIMUM PEAK FLOW			(b)841	Feb 10	(c)1390	Jun 5 1989
MAXIMUM PEAK STAGE			(d)6.64	Feb 11	(f)6.64	Feb 11 2001
INSTANTANEOUS LOW FLOW			43	(g)	8.0	(h)
ANNUAL RUNOFF (CFSM)	.84		1.08		.86	
ANNUAL RUNOFF (INCHES)	11.48		14.63		11.71	
10 PERCENT EXCEEDS	344		453		352	
50 PERCENT EXCEEDS	136		175		144	
90 PERCENT EXCEEDS	74		81		46	

(a) Mar. 21, 1982, June 1, 5, 1989.
(b) Gage height 6.33 ft.
(c) Gage height 5.82 ft, site and datum then in use.
(d) Backwater from ice.
(e) Estimated.
(f) Present site and datum, backwater from ice.
(g) Aug. 15, 16.
(h) Aug. 9, 10, 11, 1964.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04096515 SOUTH BRANCH HOG CREEK NEAR ALLEN, MI

LOCATION.--Lat 41°56'55", long 84°49'40", in NE1/4 SE1/4 sec.13, T.6 S., R.5 W., Branch County, Hydrologic Unit 04050001, on left bank 12 ft downstream from bridge on U.S. Highway 12, 1.0 mi downstream from Little Hog Creek, and 3.1 mi west of Allen.

DRAINAGE AREA.--48.7 mi^2.

PERIOD OF RECORD.--October 1969 to current year. Prior to October 1987, published as Hog Creek near Allen.

GAGE.--Water-stage recorder. Elevation of gage is 1,010 ft above sea level, from topographic map. Prior to May 23, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	30	e32	62	147	45	49	92	22	11	9.7
2	14	14	27	e31	e60	120	48	47	95	19	10	8.7
3	14	13	e24	e31	e57	105	45	44	104	19	9.7	8.0
4	28	12	e22	e31	e54	95	43	41	106	20	8.4	7.3
5	40	12	e20	e32	51	86	41	37	100	18	7.6	6.8
6	41	11	e18	e32	48	79	56	34	98	16	7.0	6.2
7	39	12	e19	e32	46	73	69	31	100	15	6.5	6.1
8	35	12	e20	e32	45	69	66	34	97	15	6.0	6.5
9	31	14	e21	e30	108	66	65	32	88	14	5.7	7.9
10	28	40	e20	e32	e350	62	63	30	78	13	6.0	14
11	26	42	e20	e32	e510	62	60	28	70	12	5.7	11
12	24	35	e21	e33	e420	63	58	28	64	10	5.3	9.1
13	22	37	e22	e34	333	64	55	26	60	9.7	5.0	8.1
14	21	42	e24	e35	270	66	49	25	54	8.8	4.2	7.8
15	20	39	e26	e36	230	66	56	60	50	8.2	4.5	7.1
16	19	35	e28	e37	198	64	86	104	51	7.8	5.2	6.7
17	19	33	e30	e38	e165	65	100	131	46	7.7	7.3	6.3
18	19	30	e32	e39	e140	66	98	131	41	8.7	6.4	6.8
19	19	27	e35	e40	e120	65	88	114	41	8.4	7.4	10
20	19	25	e37	e40	e100	64	83	99	40	7.8	8.7	13
21	18	24	e39	e39	e88	62	89	88	42	9.4	6.9	15
22	e18	e23	e39	e37	e77	60	105	81	50	16	13	26
23	18	e21	e38	e35	e70	57	113	71	50	14	34	18
24	19	20	e38	e33	68	55	107	69	44	14	25	14
25	24	20	e37	e31	118	51	96	82	39	15	19	12
26	21	28	e36	e30	189	48	84	92	35	23	18	13
27	20	34	e35	e29	198	45	75	108	31	19	17	13
28	19	33	e34	e28	174	45	66	129	28	16	15	11
29	17	31	e33	e33	---	46	59	134	26	14	13	9.9
30	16	32	e32	41	---	46	53	120	24	13	11	8.9
31	15	---	e32	53	---	44	---	102	---	12	11	---
TOTAL	697	765	889	1068	4349	2106	2121	2201	1844	425.5	320.5	307.9
MEAN	22.5	25.5	28.7	34.5	155	67.9	70.7	71.0	61.5	13.7	10.3	10.3
MAX	41	42	39	53	510	147	113	134	106	23	34	26
MIN	14	11	18	28	45	44	41	25	24	7.7	4.2	6.1
CFSM	.46	.52	.59	.71	3.19	1.39	1.45	1.46	1.26	.28	.21	.21
IN.	.53	.58	.68	.82	3.32	1.61	1.62	1.68	1.41	.33	.24	.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2001, BY WATER YEAR (WY)

MEAN	20.8	32.6	42.4	48.0	56.3	85.1	80.7	54.9	48.1	21.5	17.9	17.5
MAX	75.0	110	80.2	159	155	220	163	114	159	62.4	67.9	60.3
(WY)	1987	1993	1991	1993	2001	1982	1978	1983	1989	1981	1981	1981
MIN	3.39	4.53	8.77	7.11	13.5	22.7	34.3	20.1	4.18	1.55	1.86	1.93
(WY)	2000	2000	1977	1977	1972	2000	1971	1971	1988	1988	1988	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1970 - 2001	
ANNUAL TOTAL	13456.4		17093.9			
ANNUAL MEAN	36.8		46.8		43.7	
HIGHEST ANNUAL MEAN					67.4	1993
LOWEST ANNUAL MEAN					23.8	1977
HIGHEST DAILY MEAN	308	Apr 22	510	Feb 11	629	Feb 25 1985
LOWEST DAILY MEAN	7.7	Aug 22	4.2	Aug 14	.58	Aug 4 1988
ANNUAL SEVEN-DAY MINIMUM	8.4	Aug 20	5.1	Aug 10	.84	Aug 3 1988
MAXIMUM PEAK FLOW			(e)530	Feb 11	(a)664	Feb 25 1985
MAXIMUM PEAK STAGE			(b)5.98	Feb 11	6.20	Jun 1 1989
INSTANTANEOUS LOW FLOW			3.9	Aug 14	.48	Aug 5 1988
ANNUAL RUNOFF (CFSM)	.75		.96		.90	
ANNUAL RUNOFF (INCHES)	10.28		13.06		12.19	
10 PERCENT EXCEEDS	73		99		94	
50 PERCENT EXCEEDS	24		32		30	
90 PERCENT EXCEEDS	9.7		8.7		7.0	

(a) Gage height 6.0 ft, from floodmark.
(b) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04097187 LONG LAKE NEAR KALAMAZOO, MI

LOCATION.--Lat 42°11'45", long 85°31'03", in SW1/4 NE1/4 sec. 19, T.3 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050001, on east side of lake, 1.7 mi southeast of Portage, and 5 mi south of Kalamazoo.

DRAINAGE AREA.--6.59 mi^2.

PERIOD OF RECORD. --April 1958 to March 1963, December 1963 to December 1970, September 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 847.59 ft above sea level (City of Portage bench mark). Prior to March 2000, nonrecording gage at different datums.

REMARKS.--The channel connecting Long Lake and Austin Lake is both an inlet and an outlet, depending on relative lake levels. Under natural conditions with fairly high water levels, flow will be from Long to Austin Lake. In recent years, the levels of Austin and West Lakes have been raised by water diverted from Gourdneck Creek plus water piped to Austin Lake from the nearby Pharmacia & Upjohn recharge ponds. Under these conditions flow has been from Austin to Long Lake. During the drought years of 1963-64, the channel was dry.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 8.68 ft, June 13-15, 1969, present datum; minimum, 2.63 ft, Apr. 7, 2000.

EXTREMES FOR CURRENT YEAR.--Maximum daily gage height, 6.90 ft, June 22; minimum, 4.41 ft, Oct. 2, 3.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.43	4.50	4.78	5.05	5.12	5.69	—	6.37	6.72	6.76	6.45	6.54
2	4.42	4.49	4.77	5.05	5.13	5.70	—	6.36	6.75	6.73	6.43	6.53
3	4.42	4.49	4.77	5.05	5.13	5.72	—	6.36	6.77	6.72	6.42	6.53
4	4.57	4.48	4.77	5.05	5.13	5.73	—	6.36	6.73	6.70	6.39	6.49
5	4.58	4.47	4.77	5.05	5.14	5.74	—	6.36	6.74	6.68	6.36	6.48
6	4.59	4.47	4.77	5.05	5.14	5.76	6.13	6.33	6.77	6.67	6.35	6.48
7	4.60	4.49	4.78	5.05	5.14	5.77	6.14	6.33	6.76	6.65	6.33	6.50
8	4.60	4.49	4.80	5.05	5.15	5.79	6.15	6.37	6.75	6.62	6.31	6.48
9	4.59	4.53	4.79	5.05	5.27	5.81	6.19	6.37	6.74	6.61	6.29	6.57
10	4.58	4.58	4.79	5.04	5.34	5.82	6.21	6.36	6.74	6.58	6.25	6.60
11	4.57	4.58	4.82	5.05	5.34	5.85	6.21	6.37	6.77	6.55	6.23	6.57
12	4.56	4.57	4.89	5.04	5.35	5.86	6.21	6.37	6.80	6.53	6.20	6.57
13	4.55	4.62	4.90	5.04	5.36	5.88	6.21	6.35	6.81	6.50	6.17	6.54
14	4.55	4.63	4.93	5.04	5.38	5.90	6.21	6.35	6.81	6.47	6.15	6.53
15	4.55	4.63	4.93	5.05	5.39	—	6.23	6.45	6.81	6.46	6.13	6.51
16	4.55	4.63	4.94	5.06	5.40	—	6.26	6.50	6.84	6.43	6.17	6.50
17	4.54	4.66	4.98	5.06	5.40	—	6.26	6.51	6.84	6.42	6.15	6.49
18	4.54	4.66	4.98	5.06	5.41	—	6.25	6.50	6.85	6.43	6.18	6.48
19	4.53	4.65	4.99	5.06	5.41	—	6.25	6.49	6.85	6.43	6.33	6.55
20	4.53	4.66	4.99	5.06	5.42	—	6.28	6.47	6.84	6.42	6.31	6.49
21	4.52	4.70	5.00	5.05	5.42	—	6.33	6.50	6.89	6.48	6.28	6.54
22	4.51	4.70	5.01	5.05	5.44	—	6.36	6.55	6.90	6.49	6.53	6.55
23	4.50	4.70	5.01	5.05	5.44	—	6.39	6.54	6.88	6.48	6.59	6.56
24	4.54	4.70	5.02	5.05	5.48	—	6.40	6.56	6.87	6.47	6.56	6.55
25	4.55	4.70	5.02	5.04	5.64	—	6.42	6.60	6.85	6.55	6.61	6.54
26	4.55	4.74	5.01	5.05	5.65	—	6.42	6.61	6.84	6.56	6.65	6.54
27	4.55	4.76	5.02	5.05	5.66	—	6.40	6.68	6.83	6.53	6.64	6.52
28	4.54	4.76	5.03	5.05	5.68	—	6.39	6.67	6.82	6.52	6.61	6.51
29	4.53	4.77	5.03	5.05	—	—	6.38	6.69	6.80	6.50	6.60	6.50
30	4.52	4.78	5.04	5.10	—	—	6.38	6.66	6.78	6.48	6.61	6.50
31	4.51	—	5.05	5.12	—	—	—	6.67	—	6.46	6.58	—
MEAN	4.54	4.62	4.92	5.05	5.36	—	—	6.47	6.80	6.54	6.38	6.52
MAX	4.60	4.78	5.05	5.12	5.68	—	—	6.69	6.90	6.76	6.65	6.60
MIN	4.42	4.47	4.77	5.04	5.12	—	—	6.33	6.72	6.42	6.13	6.48

STREAMS TRIBUTARY TO LAKE MICHIGAN

04097188 AUSTIN LAKE NEAR KALAMAZOO, MI

LOCATION.--Lat 42°11'04", long 85°32'35", in NW1/4 sec. 24, T.3 S., R 11 W., Kalamazoo County, Hydrologic Unit 04050001, at entrance of connecting channel to Long Lake, 1.5 mi southeast of Portage, and 5.0 mi south of Kalamazoo.

DRAINAGE AREA.--14.2 mi^2.

PERIOD OF RECORD.--July 1944 to July 1950, April 1958 to March 1963, December 1963 to September 1979, September 1998 to current year.

GAGE.--Nonrecording gage. Datum of gage is 849.83 ft above sea level (City of Portage bench mark). Prior to September 1998, nonrecording gage at different datums.

REMARKS.--Staff gage read by observer. The principal inlet is the diversion canal from Gourdneck Creek which flows through West Lake into the northwest side of Austin Lake. At times, depending on relative lake levels, water will flow through a connecting channel from Long Lake into the northeast side of Austin Lake. At other times the flow will be reversed, or if both lake levels are low, there will be no flow. Inflow to Austin Lake is also supplemented at times by water discharge from the nearby Pharmacia & Upjohn recharge ponds. The outlet leaves the southeast end of the lake and flows south about 1.5 mi to Gourdneck Creek. Surface area is 1,050 acres. Established legal level is 855.64 ft above sea level.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.04 ft, May 2-4, 1950, present datum; minimum observed, 2.55 ft, Oct. 20, Dec. 10, 1964, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 5.80 ft, June 15, 16; minimum observed, 4.74 ft, Oct. 1.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.74	4.78	---	---	5.34	5.64	---	5.66	5.70	5.60	5.34	5.54
2	---	4.78	---	---	---	5.64	---	---	---	5.58	---	5.52
3	---	---	5.08	---	---	5.66	5.66	---	5.72	5.57	---	5.52
4	---	---	---	5.34	5.34	5.66	5.66	5.62	5.70	5.56	---	5.50
5	4.84	---	---	---	---	---	5.66	5.60	5.72	---	5.22	5.48
6	---	4.76	5.10	5.32	---	---	5.68	5.56	---	5.50	---	5.46
7	---	4.78	---	5.32	5.34	---	---	5.60	5.74	5.48	5.15	---
8	4.88	4.78	5.12	5.32	5.32	---	5.68	---	5.74	5.48	---	5.46
9	---	4.81	5.12	---	5.42	---	5.70	5.60	---	---	---	5.58
10	4.86	---	5.12	5.30	---	---	5.70	5.60	---	5.44	---	5.60
11	4.86	4.86	5.18	5.30	5.46	---	5.70	5.60	5.74	5.40	---	5.60
12	4.86	4.86	5.24	5.30	---	---	---	5.58	5.78	5.38	---	5.60
13	4.84	---	---	---	5.46	---	---	5.58	5.78	5.36	---	5.56
14	---	4.94	5.28	5.32	5.48	---	5.66	5.56	5.76	---	---	5.54
15	4.84	---	---	---	5.48	5.69	5.70	5.64	5.80	5.34	---	5.52
16	4.84	---	5.28	---	---	---	---	5.68	5.80	5.30	---	5.52
17	4.84	---	---	5.30	---	---	5.68	5.66	5.76	5.34	---	5.51
18	4.84	4.98	5.34	5.30	---	---	5.68	5.66	---	---	---	5.50
19	4.82	4.98	5.34	5.30	---	---	5.68	5.64	5.76	5.32	5.34	---
20	4.82	---	5.36	---	5.48	---	5.68	---	5.74	5.30	---	5.50
21	4.82	---	5.36	---	---	5.68	---	---	5.74	5.36	---	5.60
22	4.80	---	---	---	5.48	5.68	5.72	5.70	---	5.32	5.56	5.58
23	4.80	---	5.36	---	5.48	---	---	5.66	5.74	5.32	5.56	5.58
24	4.82	---	---	---	---	---	5.76	5.66	5.72	---	5.56	---
25	4.82	---	5.38	---	5.62	---	---	5.68	5.70	5.46	5.64	---
26	4.82	---	---	---	5.64	5.68	---	5.68	5.70	5.44	---	5.58
27	4.84	---	---	---	5.64	5.68	5.70	---	5.68	5.42	---	5.58
28	4.84	---	5.36	5.28	5.64	---	5.68	5.72	5.66	5.38	5.62	---
29	4.80	---	---	5.28	---	5.68	---	5.72	5.64	---	5.62	5.56
30	4.80	---	5.36	5.32	---	---	---	5.70	5.64	5.38	5.60	5.56
31	4.78	---	5.36	5.34	---	5.66	---	5.68	---	---	---	---

STREAMS TRIBUTARY TO LAKE MICHIGAN

04097500 ST. JOSEPH RIVER AT THREE RIVERS, MI

LOCATION.--Lat 41°56'25", long 85°37'58", in SW1/4 SE1/4 sec.18, T.6 S., R.11 W., St. Joseph County, Hydrologic Unit 04050001, on right bank in Scidmore Park at Three Rivers, 250 ft downstream from Rocky River, and at mile 112.

DRAINAGE AREA.--1,350 mi^2.

PERIOD OF RECORD.--May 1953 to September 1983, October 1992 to current year.

REVISED RECORDS.--WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 781.34 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplant upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1918, 8,260 ft^3/s, Apr. 27, 1950.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	648	826	1370	e1150	1440	4320	1620	1810	2570	987	704	898
2	810	655	1380	e1100	1620	4050	1580	1620	2540	950	497	829
3	766	770	1290	e1100	1640	3640	1520	1570	2490	936	547	800
4	758	766	1190	e1100	1660	3310	1550	1550	2450	823	583	779
5	1150	739	1220	e1150	1710	3260	1520	1460	2450	654	541	736
6	1110	877	1190	e1150	1630	2970	1590	1420	2460	808	488	525
7	1200	834	1250	e1100	1610	2760	1690	1320	2460	773	491	362
8	1130	835	1220	e1050	1710	2620	1650	1390	2340	746	469	619
9	1070	858	1160	e1100	1990	2620	1730	1340	2060	705	452	758
10	1070	1190	1040	e1150	3110	2360	1820	1350	2120	579	445	861
11	1050	1170	1060	e1150	4380	2330	2060	1260	1960	559	436	949
12	958	1150	1140	1180	4830	2340	1810	1290	2050	628	434	1080
13	778	1140	787	1180	4950	2310	1930	1160	1950	549	393	987
14	837	1210	738	1150	4950	2240	1850	1080	1830	465	370	966
15	800	1240	979	1220	4780	2250	1820	1170	1820	440	348	863
16	777	1070	1080	1290	4560	2270	1840	1430	1780	436	363	841
17	734	1380	1140	1350	4060	2190	1920	1690	1720	439	422	826
18	713	1240	1070	1310	3750	2220	1980	2370	1500	483	464	781
19	742	1210	e1100	1330	3670	2170	1970	2340	1460	489	514	697
20	687	1260	e1150	1270	3200	2080	2070	2380	1370	476	512	745
21	655	1240	e1150	1220	3000	2000	2030	2370	1460	455	523	813
22	584	1220	e1150	1220	2930	2080	2030	2080	1480	501	826	835
23	808	1140	e1200	1220	2720	1960	2310	2100	1410	600	1370	916
24	546	1050	e1200	1180	2510	1860	2390	2070	1380	946	1040	961
25	501	1070	e1200	1150	3050	1850	2440	2130	1410	945	1260	983
26	783	1100	e1250	1060	3840	1810	2410	2210	1300	1000	1310	1050
27	1040	1160	e1250	1070	4420	1790	2350	2520	1240	1010	1290	900
28	801	1400	e1250	1070	4430	1660	1940	2540	1160	941	1280	810
29	708	1400	e1200	1020	—	1540	1900	2630	1020	927	1110	796
30	801	1400	e1200	1220	—	1660	1840	2700	1150	911	964	591
31	679	—	e1150	1280	—	1620	—	2710	—	806	957	—
TOTAL	25694	32600	35754	36290	88150	74140	57160	57060	54390	21967	21403	24557
MEAN	829	1087	1153	1171	3148	2392	1905	1841	1813	709	690	819
MAX	1200	1400	1380	1350	4950	4320	2440	2710	2570	1010	1370	1080
MIN	501	655	738	1020	1440	1540	1520	1080	1020	436	348	362
CFSM	.61	.80	.85	.87	2.33	1.77	1.41	1.36	1.34	.52	.51	.61
IN.	.71	.90	.99	1.00	2.43	2.04	1.58	1.57	1.50	.61	.59	.68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2001, BY WATER YEAR (WY)

MEAN	724	917	1101	1207	1373	1955	2029	1619	1199	802	650	641
MAX	1865	2582	2053	3493	3148	3969	3320	2870	2587	1780	1639	1628
(WY)	1994	1993	1983	1993	2001	1982	1982	1983	1980	1978	1981	1980
MIN	218	294	288	328	328	488	793	650	286	243	187	199
(WY)	1964	1965	1964	1963	1963	1964	1964	1964	1964	1964	1964	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1953 - 2001	
ANNUAL TOTAL	402928		529165			
ANNUAL MEAN	1101		1450		1187	
HIGHEST ANNUAL MEAN					1850	1993
LOWEST ANNUAL MEAN					365	1964
HIGHEST DAILY MEAN	3230	Jun 28	4950	Feb 13	7810	Mar 21 1982
LOWEST DAILY MEAN	377	Sep 8	348	Aug 15	78	Sep 12 1964
ANNUAL SEVEN-DAY MINIMUM	474	Jan 27	395	Aug 11	126	Sep 2 1964
MAXIMUM PEAK FLOW			5000	Feb 14	8180	Mar 21 1982
MAXIMUM PEAK STAGE			8.32	Feb 14	10.69	Mar 21 1982
INSTANTANEOUS LOW FLOW			276	Jul 15		
ANNUAL RUNOFF (CFSM)	.82		1.07		.88	
ANNUAL RUNOFF (INCHES)	11.10		14.58		11.95	
10 PERCENT EXCEEDS	2080		2470		2290	
50 PERCENT EXCEEDS	872		1200		965	
90 PERCENT EXCEEDS	507		584		405	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04097540 PRAIRIE RIVER NEAR NOTTAWA, MI

LOCATION.--Lat 41°53'18", long 85°24'34", in NW1/4 SW1/4 sec.6, T.7 S., R.9 W., St. Joseph County, Hydrologic Unit 04050001, on left bank 10 ft upstream from bridge on State Highway 66, 3.0 mi upstream from unnamed tributary, and 3.0 mi southeast of Nottawa.

DRAINAGE AREA.--106 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 850 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Since 1987, some diversion by pumping for sprinkler irrigation. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	55	78	e76	100	275	118	117	145	71	51	60
2	60	55	76	e75	105	249	118	114	147	68	47	56
3	59	54	75	e75	103	232	117	110	150	67	43	54
4	74	53	73	e74	101	218	115	105	154	69	40	51
5	81	52	71	e74	98	206	116	100	154	68	40	49
6	86	51	70	e73	96	195	133	96	155	67	38	47
7	85	54	69	e72	94	188	146	96	156	65	37	47
8	82	54	69	e71	95	181	147	104	158	64	36	50
9	78	58	69	e69	156	175	142	104	152	61	33	61
10	75	66	70	e70	314	169	137	98	145	56	33	81
11	74	68	e71	e71	e477	167	130	94	139	51	33	79
12	72	67	e72	e72	e464	164	123	92	136	47	32	70
13	69	72	e73	e73	419	162	117	90	129	42	29	64
14	67	77	e75	e74	363	160	113	88	120	41	26	60
15	65	78	e76	75	326	157	118	91	116	41	27	56
16	63	76	e77	76	304	159	134	104	119	39	33	54
17	62	74	e79	78	279	160	148	123	116	37	38	52
18	62	72	e80	79	257	157	151	136	111	37	41	54
19	62	69	e82	79	235	153	144	135	106	38	45	60
20	63	68	e83	e78	224	150	140	128	100	37	48	63
21	64	67	e82	e76	214	147	146	122	98	35	47	65
22	64	66	e81	74	204	143	157	117	101	38	64	64
23	61	64	e80	73	193	141	166	112	100	47	91	61
24	63	63	e80	72	194	138	171	115	99	60	97	59
25	65	62	e79	71	278	135	164	121	94	76	93	58
26	65	68	e79	e70	346	132	153	134	88	89	89	57
27	65	74	e78	69	357	128	142	148	83	84	81	57
28	63	76	e78	e69	315	125	133	156	78	76	74	55
29	60	77	e77	69	---	123	125	163	76	71	68	54
30	57	79	e77	78	---	120	119	157	73	66	63	53
31	55	---	e77	90	---	117	---	147	---	59	62	---
TOTAL	2081	1969	2356	2295	6711	5126	4083	3617	3598	1767	1579	1751
MEAN	67.1	65.6	76.0	74.0	240	165	136	117	120	57.0	50.9	58.4
MAX	86	79	83	90	477	275	171	163	158	89	97	81
MIN	55	51	69	69	94	117	113	88	73	35	26	47
CFSM	.63	.62	.72	.70	2.26	1.56	1.28	1.10	1.13	.54	.48	.55
IN.	.73	.69	.83	.81	2.36	1.80	1.43	1.27	1.26	.62	.55	.61

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2001, BY WATER YEAR (WY)

MEAN	63.6	82.5	104	108	118	153	157	121	100	65.1	53.8	54.9
MAX	150	222	177	258	240	336	259	226	254	144	148	135
(WY)	1987	1993	1983	1993	2001	1982	1978	1983	1989	1986	1981	1997
MIN	17.2	22.9	25.2	29.7	29.1	47.2	75.6	58.7	32.9	13.3	15.8	14.1
(WY)	1965	1965	1964	1963	1963	1964	1964	1963	1964	1988	1964	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1963 - 2001	
ANNUAL TOTAL	29903		36933			
ANNUAL MEAN	81.7		101		98.2	
HIGHEST ANNUAL MEAN					153	1993
LOWEST ANNUAL MEAN					33.5	1964
HIGHEST DAILY MEAN	210	May 21	477	Feb 11	782	Feb 26 1985
LOWEST DAILY MEAN	40	Aug 26	26	Aug 14	5.7	Aug 5 1988
ANNUAL SEVEN-DAY MINIMUM	43	Aug 22	30	Aug 9	7.9	Jul 31 1988
MAXIMUM PEAK FLOW			(e)486	Feb 11	797	Feb 26 1985
MAXIMUM PEAK STAGE			(a)5.60	Feb 11	6.30	Feb 26 1985
INSTANTANEOUS LOW FLOW			26	(b)	5.4	(c)
ANNUAL RUNOFF (CFSM)	.77		.95		.93	
ANNUAL RUNOFF (INCHES)	10.49		12.96		12.59	
10 PERCENT EXCEEDS	133		161		175	
50 PERCENT EXCEEDS	71		78		84	
90 PERCENT EXCEEDS	47		51		36	

(a) Backwater from ice.
(b) Aug. 13, 14, 15.
(c) Aug. 4, 5, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04099000 ST. JOSEPH RIVER AT MOTTVILLE, MI

LOCATION.--Lat 41°48'03", long 85°45'22", in SW1/4 sec.6, T.8 S., R.12 W., St. Joseph County, Hydrologic Unit 04050001, on right bank 575 ft upstream from bridge on U.S. Highway 12 in Mottville, 0.4 mi downstream from Indiana Michigan Power Co. hydroelectric plant, 4 mi upstream from Pigeon River, and at mile 96.

DRAINAGE AREA.--1,866 mi^2.

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1387: 1930, 1932, 1938, 1940-42, 1945. WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 755.3 ft above sea level (Indiana Michigan Power Co. bench mark). Prior to Oct. 1, 1951, at site 0.4 mi upstream at datum 4.2 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplants upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	978	1270	1920	e1650	1820	5490	2150	2420	3300	1350	1070	1310
2	1080	1120	1910	e1600	1970	5270	2110	2300	3270	1350	816	1210
3	1070	1240	1850	e1600	2070	4870	2000	2120	3250	1210	817	1190
4	1090	1250	1680	e1600	2060	4430	2030	2120	3200	1240	857	1150
5	1540	1170	1760	e1650	2180	4260	2010	2000	3180	1030	802	1060
6	1420	1280	1650	e1700	2110	4070	2230	1940	3220	1060	729	886
7	1590	1300	1720	e1650	2060	3680	2310	1880	3220	1190	732	752
8	1590	1250	1760	e1550	2090	3510	2360	1900	3130	1140	695	966
9	1500	1420	1670	e1600	2700	3460	2410	1880	2910	1070	660	1360
10	1480	1770	1540	e1600	3540	3290	2490	1900	2830	818	685	1370
11	1420	1750	1560	e1650	5060	3130	2720	1820	2730	794	648	1460
12	1330	1660	1420	e1650	5650	3140	2470	1810	2750	895	657	1560
13	1110	1720	1430	e1600	5910	3110	2550	1710	2750	787	590	1460
14	1210	1740	1100	e1600	6090	3020	2530	1620	2580	722	600	1380
15	1140	1780	1460	1660	6010	3000	2440	1630	2550	682	546	1280
16	1130	1580	1530	1700	5810	3020	2540	1760	e2450	655	647	1260
17	1100	1860	1730	1790	5370	2930	2570	2050	e2400	684	697	1230
18	1070	1810	1420	1710	4900	2950	2630	2710	e2200	715	769	1240
19	1110	1720	e1500	1710	4700	2920	2590	2980	e2100	726	863	1170
20	1060	1790	e1600	1620	4390	2830	2730	2950	1950	720	797	1200
21	1060	1820	e1650	1520	3920	2730	2760	3020	2010	679	817	1290
22	1020	1760	e1650	1560	3790	2750	2800	2820	2080	709	1260	1290
23	1220	1720	e1700	1580	3610	2710	2920	2730	2040	938	1900	1390
24	1030	1540	e1700	1550	3470	2560	3170	2720	1930	1280	1550	1410
25	898	1590	e1750	1500	3880	2510	3180	2840	1980	1330	2010	1420
26	1200	1690	e1800	1380	4750	2450	3150	2880	1840	1390	1960	1480
27	1480	1740	e1800	1410	5320	2430	3120	3110	1750	1350	1890	1360
28	1250	1870	e1750	1350	5550	2330	2870	3290	1640	1280	1830	1220
29	1120	1960	e1700	1400	—	1950	2520	3230	1480	1290	1640	1250
30	1230	1960	e1700	1640	—	2180	2520	3340	1590	1260	1390	1010
31	1120	—	e1650	1680	—	2140	—	3390	—	1170	1450	—
TOTAL	37646	48130	51060	49460	110780	99120	76880	74870	74310	31514	32374	37614
MEAN	1214	1604	1647	1595	3956	3197	2563	2415	2477	1017	1044	1254
MAX	1590	1960	1920	1790	6090	5490	3180	3390	3300	1390	2010	1560
MIN	898	1120	1100	1350	1820	1950	2000	1620	1480	655	546	752
CFSM	.65	.86	.88	.86	2.12	1.71	1.37	1.29	1.33	.54	.56	.67
IN.	.75	.96	1.02	.99	2.21	1.98	1.53	1.49	1.48	.63	.65	.75

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 2001, BY WATER YEAR (WY)

MEAN	1098	1336	1560	1739	1895	2558	2680	2137	1695	1171	956	964
MAX	3290	3378	4065	4589	3956	5335	7646	5009	5004	2953	2413	2286
(WY)	1987	1993	1928	1993	2001	1982	1950	1943	1989	1937	1981	1980
MIN	372	483	507	531	505	751	904	786	509	407	335	357
(WY)	1964	1965	1964	1963	1963	1964	1931	1931	1964	1988	1964	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1924 - 2001	
ANNUAL TOTAL	555297		723758			
ANNUAL MEAN	1517		1983		(a)1650	
HIGHEST ANNUAL MEAN					2856	1950
LOWEST ANNUAL MEAN					580	1964
HIGHEST DAILY MEAN	3890	Jun 28	6090	Feb 14	10700	Jun 4 1989
LOWEST DAILY MEAN	631	Sep 9	546	Aug 15	39	Oct 19 1963
ANNUAL SEVEN-DAY MINIMUM	755	Jan 28	625	Aug 10	278	Aug 1 1964
MAXIMUM PEAK FLOW			6320	Feb 15	(b)11400	Jun 4 1989
MAXIMUM PEAK STAGE			7.58	Feb 15	(c)10.76	Apr 27 1950
ANNUAL RUNOFF (CFSM)	.81		1.06		.88	
ANNUAL RUNOFF (INCHES)	11.07		14.43		12.01	
10 PERCENT EXCEEDS	2690		3220		3010	
50 PERCENT EXCEEDS	1270		1700		1390	
90 PERCENT EXCEEDS	792		922		642	

(a) Does not include water year 1924.
(b) Gage height 10.41 ft.
(c) Present datum.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04101000 ST. JOSEPH RIVER AT ELKHART, IN

LOCATION.--Lat 41°41'30", long 85°58'30", in SW1/4 NE1/4 sec.5, T.37 N., R.5 E., Elkhart County, Hydrologic Unit 04050001, on left bank 200 ft downstream from Elkhart River, 200 ft upstream from Main Street bridge in Elkhart, IN, 2,000 ft downstream from Christiana Creek, 0.5 mi downstream from Elkhart Hydroelectric Plant, and at mile 76.5.

DRAINAGE AREA.--3,370 mi^2.

PERIOD OF RECORD.--August 1947 to current year. Gage heights at site 0.8 mi downstream at different datum from September 1924 to March 1926 are available from the Indiana District Office.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above sea level.

REMARKS.--Records good. Flow regulated by Elkhart Hydroelectric Plant.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1700	1830	2710	2790	3390	8440	3460	3730	4340	2260	1660	2340
2	1600	1820	2670	2700	3400	8150	3390	3540	4350	2220	1500	2170
3	1770	1790	2620	2680	3320	7730	3290	3350	4350	2090	1420	2100
4	1840	1880	2470	2670	3360	7220	3240	3260	4290	2280	1400	2060
5	2190	1800	2490	2600	3430	6810	3230	3140	4290	2060	1380	1930
6	2170	1810	2390	2730	3390	6600	3780	3040	4470	1990	1270	1800
7	2300	1930	2400	2670	3310	6110	4500	3040	4530	2090	1220	1550
8	2340	1820	2500	2620	3310	5790	4490	3060	4400	2090	1240	1730
9	2220	2040	2420	2400	5400	5590	4300	3040	4150	1930	1190	2240
10	2200	2510	2380	2580	8820	5390	4290	3000	3900	1790	1230	2530
11	2170	2560	2300	2620	9480	5110	4400	2920	3850	1580	1200	2430
12	2070	2420	2650	2560	9190	5010	4330	2870	3810	1640	1190	2410
13	1900	2490	3570	2550	9470	4970	4280	2780	3820	1540	1160	2300
14	1880	2540	1830	2560	9390	4850	4230	2670	3590	1410	1060	2200
15	1860	2640	2290	2620	9480	4730	4200	2700	3540	1360	1040	2080
16	1830	2530	2600	2760	9410	4730	4390	3160	3680	1330	1260	2040
17	1850	2500	2630	2860	8960	4660	4350	3210	3530	1340	1290	2010
18	1750	2580	2740	2830	7810	4600	4330	3550	3310	1370	1370	2080
19	1780	2480	2610	2830	7780	4570	4220	3930	3040	1420	1490	2050
20	1780	2530	2550	2700	7570	4500	4260	3820	2920	1350	1460	2090
21	1720	2540	2930	2500	6850	4210	4420	3960	2950	1420	1470	2160
22	1700	2470	4600	2680	6410	4120	4500	3840	3110	1350	2490	2130
23	1730	2440	3480	2690	6130	4090	4520	3640	3090	1580	3680	2160
24	1860	2300	3310	2660	5940	4040	4920	3640	2940	2020	3730	2200
25	1580	2320	3290	2540	7790	3930	4770	3760	2920	2110	3440	2140
26	1760	2460	3440	2400	8850	3820	4680	3890	2810	2160	3410	2190
27	1990	2540	3310	2460	8750	3770	4580	4210	2680	2140	3160	2150
28	1990	2650	3160	2540	8700	3680	4350	4500	2580	1980	2970	1990
29	1720	2730	3020	2460	—	3420	3870	4360	2390	1950	2790	2000
30	1830	2730	2940	2740	—	3480	3830	4390	2460	1910	2500	1870
31	1770	—	2860	3210	—	3440	—	4380	—	1820	2460	—
TOTAL	58850	69680	87160	82210	189090	157560	125400	108380	106090	55580	58130	63130
MEAN	1898	2323	2812	2652	6753	5083	4180	3496	3536	1793	1875	2104
MAX	2340	2730	4600	3210	9480	8440	4920	4500	4530	2280	3730	2530
MIN	1580	1790	1830	2400	3310	3420	3230	2670	2390	1330	1040	1550
CFSM	.56	.69	.83	.79	2.00	1.51	1.24	1.04	1.05	.53	.56	.62
IN.	.65	.77	.96	.91	2.09	1.74	1.38	1.20	1.17	.61	.64	.70

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2001, BY WATER YEAR (WY)

MEAN	2176	2613	3176	3593	3913	5080	5189	4103	3279	2376	1969	1901
MAX	5752	5883	5795	9270	7039	10760	12690	7725	7535	4409	4180	3855
(WY)	1987	1993	1991	1993	1968	1982	1950	1956	1989	1968	1981	1981
MIN	791	856	958	1127	1120	1679	2633	1911	1280	898	737	721
(WY)	1964	1965	1964	1964	1963	1964	1958	1958	1988	1988	1964	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1948 - 2001	
ANNUAL TOTAL	912120		1161260			
ANNUAL MEAN	2492		3182		3276	
HIGHEST ANNUAL MEAN					5264	1950
LOWEST ANNUAL MEAN					1283	1964
HIGHEST DAILY MEAN	5970	Jun 26	9480	Feb 11	18500	Mar 21 1982
LOWEST DAILY MEAN	1240	Sep 8	1040	Aug 15	336	Aug 5 1964
ANNUAL SEVEN-DAY MINIMUM	1410	Aug 21	1150	Aug 9	561	Aug 2 1964
MAXIMUM PEAK FLOW			10300	Feb 11	18800	Feb 27 1985
MAXIMUM PEAK STAGE			23.61	Feb 11	27.91	Mar 21 1982
ANNUAL RUNOFF (CFSM)	.74		.94		.97	
ANNUAL RUNOFF (INCHES)	10.07		12.82		13.21	
10 PERCENT EXCEEDS	3970		4750		5810	
50 PERCENT EXCEEDS	2200		2670		2790	
90 PERCENT EXCEEDS	1560		1650		1390	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04101500 ST. JOSEPH RIVER AT NILES, MI

LOCATION.--Lat 41°49'45", long 86°15'35", in SW1/4 sec.26, T.7 S., R.17 W., Berrien County, Hydrologic Unit 04050001, on right bank 100 ft upstream from Main Street Bridge in Niles, 0.6 mi downstream from dam at French Paper Co., 1.3 mi upstream from Dowagiac River, and at mile 44.

DRAINAGE AREA.--3,666 mi^2.

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1387: 1931, 1933-36, 1940-43, 1945-46(M). WSP 1911: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 633.02 ft above sea level. Prior to Oct. 1, 1968, at datum 2.00 ft higher. Oct. 1, 1930 to Feb. 11, 1931, nonrecording gage on Main Street Bridge, and Feb. 12 to June 30, 1931, nonrecording gage 50 ft upstream from present site (gage heights referred to sea level datum). Oct. 1, 1943 to Apr. 12, 1970, auxiliary gage was headwater gage at hydroelectric plant at Buchanan Dam, 8 mi downstream from base gage at different datum. Since Apr. 13, 1970, auxiliary water-stage recorder at sewage-treatment plant, 1.1 mi downstream from base gage at same datum.

REMARKS.--Records good. Flow regulated by powerplants upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2000	2070	3230	2940	3930	9500	4020	4280	5190	2750	2010	2810
2	1910	2190	3180	2840	3830	9200	3950	4120	5060	2530	1920	2610
3	2020	1990	3100	2760	3760	8840	3890	3840	5070	2610	1760	2500
4	2430	2270	3050	2780	3740	8240	3740	3770	4930	2880	1750	2420
5	2440	2230	2810	2770	3770	7630	3750	3700	5040	2560	1610	2340
6	2550	2200	2840	2850	3780	7460	4610	3460	5230	2400	1460	2160
7	2630	2400	2850	2910	3710	7020	5330	3520	5340	2590	1660	1970
8	2800	2220	2840	2880	3680	6580	5400	3550	5160	2530	1340	1980
9	2710	2400	2830	2690	6300	6280	5200	3580	4930	2380	1560	2580
10	2550	2900	2790	2730	11700	6120	4950	3400	4540	2050	1360	2870
11	2550	3140	2730	2860	11700	5870	5070	3490	4870	1900	1380	2940
12	2450	2930	2390	2850	10700	5720	4980	3380	4630	1890	1410	2770
13	2330	3010	2400	2790	10600	5660	5030	3180	4560	1860	1410	2780
14	2180	3040	2020	2840	10600	5580	4910	3220	4310	1810	1400	2590
15	2240	3060	2310	2900	10700	5450	5040	3140	4250	1680	1360	2460
16	2150	2900	2850	3140	10500	5360	5140	3760	4480	1420	1430	2350
17	2150	2820	3030	3260	10200	5440	5070	3760	4260	1690	1500	2380
18	2100	2980	2580	3350	8720	5270	5060	3860	3920	1710	1620	2620
19	1990	2890	2680	3310	8540	5290	5000	4470	3610	1530	1830	2580
20	2100	2790	2790	3180	8400	5150	4850	4420	3470	1700	1820	2520
21	2040	2920	2940	2830	7700	4910	5180	4530	3430	1660	1790	2660
22	1970	2910	2840	2920	7090	4760	5280	4520	3590	1640	2980	2550
23	1900	2780	2930	3020	6790	4670	5160	4220	3550	1820	4410	2560
24	2320	2790	2880	3080	6680	4760	5480	4280	3480	2350	4530	2550
25	1870	2620	2870	2900	9300	4470	5460	4280	3350	2510	4000	2550
26	1990	2960	3230	2680	10800	4500	5310	4460	3310	2640	4250	2560
27	2180	3020	3160	2810	10300	4320	5240	4870	3170	2570	3710	2600
28	2370	3060	3090	2400	9910	4340	5030	5180	3030	2370	3600	2470
29	2040	3200	3030	2950	---	3970	4490	5020	2810	2260	3230	2300
30	2040	3290	3070	3140	---	3970	4330	5020	2750	2250	3080	2300
31	2170	---	2870	3800	---	3970	---	5010	---	2250	2890	---
TOTAL	69170	81980	88210	91160	217430	180300	145950	125290	125320	66790	70060	75330
MEAN	2231	2733	2845	2941	7765	5816	4865	4042	4177	2155	2260	2511
MAX	2800	3290	3230	3800	11700	9500	5480	5180	5340	2880	4530	2940
MIN	1870	1990	2020	2400	3680	3970	3740	3140	2750	1420	1340	1970
CFSM	.61	.75	.78	.80	2.12	1.59	1.33	1.10	1.14	.59	.62	.68
IN.	.70	.83	.90	.93	2.21	1.83	1.48	1.27	1.27	.68	.71	.76

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	2335	2739	3162	3608	3995	5254	5463	4418	3523	2548	2133	2067
MAX	6217	6564	6689	9810	7765	11560	13590	10760	8176	4989	4497	4103
(WY)	1987	1993	1991	1993	2001	1982	1950	1943	1989	1981	1981	1981
MIN	1056	932	1131	1239	1196	1857	2164	1579	1254	1033	828	885
(WY)	1964	1965	1964	1964	1964	1964	1931	1931	1934	1934	1941	1941

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	1068230		1336990			
ANNUAL MEAN	2919		3663		3433	
HIGHEST ANNUAL MEAN					5718	1950
LOWEST ANNUAL MEAN					1464	1964
HIGHEST DAILY MEAN	7140	Jun 26	11700	Feb 10	19800	Mar 21 1982
LOWEST DAILY MEAN	1360	Sep 9	1340	Aug 8	420	Aug 30 1931
ANNUAL SEVEN-DAY MINIMUM	1560	Aug 21	1390	Aug 10	728	Aug 26 1941
MAXIMUM PEAK FLOW			12500	Feb 10	20200	Apr 5 1950
MAXIMUM PEAK STAGE			11.53	Feb 10	(a)15.10	Apr 5 1950
ANNUAL RUNOFF (CFSM)	.80		1.00		.94	
ANNUAL RUNOFF (INCHES)	10.84		13.57		12.72	
10 PERCENT EXCEEDS	4730		5450		6140	
50 PERCENT EXCEEDS	2640		3010		2850	
90 PERCENT EXCEEDS	1830		1950		1500	

(a) Present datum.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04101800 DOWAGIAC RIVER AT SUMNERVILLE, MI

LOCATION.--Lat 41°54'48", long 86°12'47", in SE1/4 sec.30, T.6 S., R.16 W., Cass County, Hydrologic Unit 04050001, on right bank 30 ft upstream from bridge on Indian Lake Road, 0.3 mi west of Sumnerville.

DRAINAGE AREA.--255 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 692.62 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by millpond and lake-level control dam upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e150	183	381	239	373	433	273	238	286	176	163	189
2	e145	182	333	234	354	406	267	233	312	168	161	176
3	e140	182	295	220	326	389	260	225	319	172	165	167
4	e230	179	274	249	312	371	254	219	291	173	157	175
5	e250	177	263	245	303	348	250	217	276	167	151	167
6	e240	177	252	245	296	338	334	214	280	159	146	160
7	e230	190	253	245	284	336	338	215	269	178	140	157
8	e225	189	253	241	286	350	305	218	254	181	136	157
9	e220	195	247	222	686	339	327	208	237	171	133	185
10	e210	262	244	237	1020	325	328	201	228	162	145	204
11	e205	246	246	234	835	354	313	207	266	150	136	190
12	e200	232	242	231	619	359	309	209	330	142	132	184
13	e190	261	248	230	522	357	287	201	323	138	129	176
14	e180	292	268	235	501	347	276	199	278	131	120	171
15	e175	296	266	261	499	338	351	209	294	126	119	163
16	e175	281	267	286	450	340	423	215	399	124	138	157
17	e175	300	284	284	399	346	360	212	318	126	162	155
18	e180	306	259	278	360	343	330	206	287	153	157	157
19	e175	284	280	271	343	326	308	200	271	150	168	186
20	e170	275	271	253	339	314	303	193	244	144	174	209
21	e170	280	265	243	328	301	336	208	259	164	166	230
22	e170	278	218	240	309	290	356	256	335	204	221	233
23	e190	274	257	234	300	280	354	236	293	246	310	224
24	e220	267	263	232	322	270	333	252	265	372	258	243
25	e215	261	252	227	790	266	309	281	244	297	244	226
26	e210	368	244	223	744	265	291	273	225	287	331	212
27	e205	501	247	224	587	267	274	306	209	240	294	204
28	e200	453	237	214	495	268	262	304	199	212	256	195
29	e195	394	245	229	---	269	253	278	190	197	229	186
30	e190	417	244	306	---	266	244	254	184	184	210	179
31	e185	---	242	372	---	260	---	237	---	174	198	---
TOTAL	6015	8182	8140	7684	12982	10061	9208	7124	8165	5668	5649	5617
MEAN	194	273	263	248	464	325	307	230	272	183	182	187
MAX	250	501	381	372	1020	433	423	306	399	372	331	243
MIN	140	177	218	214	284	260	244	193	184	124	119	155
CFSM	.76	1.07	1.03	.97	1.82	1.27	1.20	.90	1.07	.72	.71	.73
IN.	.88	1.19	1.19	1.12	1.89	1.47	1.34	1.04	1.19	.83	.82	.82

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	254	305	327	316	338	403	399	328	271	219	194	209
MAX	530	490	513	548	508	629	552	490	414	333	326	401
(WY)	1987	1991	1992	1993	1985	1985	1993	1981	1996	1978	1992	1993
MIN	132	166	179	166	177	225	259	205	142	133	101	112
(WY)	1964	2000	1964	1963	1963	2000	2000	1964	1964	1988	1964	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	86854		94495			
ANNUAL MEAN	237		259		297	
HIGHEST ANNUAL MEAN					401	1993
LOWEST ANNUAL MEAN					177	1964
HIGHEST DAILY MEAN	586	Apr 21	1020	Feb 10	1550	Feb 25 1985
LOWEST DAILY MEAN	116	Sep 8	119	Aug 15	87	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	121	Sep 3	131	Aug 9	89	Aug 3 1964
MAXIMUM PEAK FLOW			1030	Feb 10	1590	Feb 24 1985
MAXIMUM PEAK STAGE			7.71	Feb 10	9.26	Feb 24 1985
INSTANTANEOUS LOW FLOW			116	Aug 15	(a)70	Jan 2 1999
ANNUAL RUNOFF (CFSM)	.93		1.02		1.16	
ANNUAL RUNOFF (INCHES)	12.67		13.79		15.81	
10 PERCENT EXCEEDS	338		352		452	
50 PERCENT EXCEEDS	220		245		275	
90 PERCENT EXCEEDS	163		162		162	

(a) Result of regulation.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04102500 PAW PAW RIVER AT RIVERSIDE, MI

LOCATION.--Lat 42°11'10", long 86°22'06", in SW1/4 SE1/4 sec.23, T.3 S., R.18 W., Berrien County, Hydrologic Unit 04050001, on left bank 40 ft upstream from bridge on Coloma Road, 0.8 mi east of Riverside.

DRAINAGE AREA.--390 mi^2.

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

REVISED RECORDS.--WSP 1337: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 588.80 ft above sea level. May 10, 1966 to July 11, 1967, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Diurnal fluctuation, principally during low flow, caused by paper mill upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	275	304	638	e400	495	1120	426	413	426	284	226	269
2	267	286	662	e400	528	1030	418	391	451	271	213	248
3	261	277	633	e390	534	875	410	375	486	267	218	240
4	313	270	581	e390	531	743	413	359	489	263	217	240
5	355	266	522	e390	528	653	405	342	474	257	205	235
6	361	270	470	e400	497	591	416	327	466	258	204	230
7	387	269	436	e410	473	551	426	328	456	255	202	238
8	399	265	418	e410	461	532	426	342	435	252	197	229
9	407	280	397	e400	648	517	430	329	421	249	186	259
10	395	317	404	e390	1580	502	445	319	406	245	187	282
11	386	332	412	e390	1360	498	458	327	409	238	194	279
12	377	340	e400	e390	1220	508	462	333	453	231	199	273
13	345	366	e400	e390	1630	521	464	337	534	223	187	264
14	316	404	e400	e400	1540	521	460	338	562	218	183	252
15	309	416	e410	412	1200	522	450	331	539	213	183	236
16	304	424	e420	430	1010	529	448	331	621	208	201	231
17	298	446	e430	445	877	540	443	342	689	208	212	230
18	282	483	e440	452	e800	543	432	361	574	213	218	230
19	281	498	e440	450	693	530	423	359	502	216	240	240
20	288	496	e430	448	639	516	422	325	468	220	256	261
21	290	500	e420	436	582	502	425	310	445	230	247	292
22	286	504	e410	397	530	484	474	344	445	253	245	329
23	277	497	e400	383	495	463	549	362	435	238	267	347
24	295	479	e410	373	483	447	631	378	427	235	329	396
25	324	459	e420	361	612	434	647	401	422	265	375	390
26	335	468	e420	353	924	424	666	423	399	330	415	369
27	355	537	e410	349	881	419	656	422	359	301	439	363
28	364	595	e400	335	925	415	581	447	329	298	428	351
29	359	583	e400	340	—	416	494	461	308	270	382	325
30	343	592	e400	368	—	418	444	449	295	251	328	304
31	325	—	e400	445	—	424	—	429	—	237	299	—
TOTAL	10159	12223	13833	12327	22676	17188	14244	11335	13725	7697	7882	8432
MEAN	328	407	446	398	810	554	475	366	458	248	254	281
MAX	407	595	662	452	1630	1120	666	461	689	330	439	396
MIN	261	265	397	335	461	415	405	310	295	208	183	229
CFSM	.84	1.04	1.14	1.02	2.08	1.42	1.22	.94	1.17	.64	.65	.72
IN.	.97	1.17	1.32	1.18	2.16	1.64	1.36	1.08	1.31	.73	.75	.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	373	440	502	507	544	668	642	503	402	317	282	300
MAX	1217	826	906	1038	1004	1234	961	799	686	581	557	569
(WY)	1987	1989	1991	1952	1997	1979	1985	1974	1969	1982	1980	1975
MIN	178	223	232	226	256	336	361	287	200	180	163	158
(WY)	1964	1954	1959	1959	1963	2000	1958	1958	1964	1963	1964	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	136974		151721			
ANNUAL MEAN	374		416		456	
HIGHEST ANNUAL MEAN					606	1991
LOWEST ANNUAL MEAN					273	1964
HIGHEST DAILY MEAN	1400	May 23	1630	Feb 13	3460	Oct 4 1986
LOWEST DAILY MEAN	189	Sep 8	183	Aug 14	120	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	197	Sep 3	188	Aug 9	134	Sep 7 1964
MAXIMUM PEAK FLOW			1820	Feb 10	3580	Oct 4 1986
MAXIMUM PEAK STAGE			9.42	Feb 10	10.90	Oct 4 1986
INSTANTANEOUS LOW FLOW			183	(a)	99	Jul 5 1964
ANNUAL RUNOFF (CFSM)	.96		1.07		1.17	
ANNUAL RUNOFF (INCHES)	13.07		14.47		15.89	
10 PERCENT EXCEEDS	539		581		748	
50 PERCENT EXCEEDS	338		400		400	
90 PERCENT EXCEEDS	235		237		230	

(a) Aug. 14, 15.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04102700 SOUTH BRANCH BLACK RIVER NEAR BANGOR, MI

LOCATION.--Lat 42°21'15", long 86°11'15", in NW1/4 sec.28, T.1 S., R.16 W., Van Buren County, Hydrologic Unit 04050002, on left bank 50 ft upstream from bridge on 66th Street, 4.9 mi northwest of Bangor.

DRAINAGE AREA.--83.6 mi^2.

PERIOD OF RECORD.--June 1966 to current year. Prior to October 1981, published as Black River near Bangor.

REVISED RECORDS.--WDR MI-81-1: 1973-75(M), 1979(M).

GAGE.--Water-stage recorder. Elevation of gage is 610 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Occasional regulation caused by mills upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	58	173	e76	174	229	92	78	90	43	30	39
2	46	58	147	e76	162	186	93	71	99	41	30	37
3	47	56	122	e75	e150	158	89	67	116	40	31	35
4	76	54	105	e75	e135	144	84	61	125	39	30	32
5	87	53	96	e77	124	132	80	58	123	37	29	29
6	78	51	89	e80	119	120	89	55	117	36	28	28
7	74	52	e87	e81	112	113	97	54	125	36	27	32
8	94	52	86	e80	111	114	94	60	126	36	27	34
9	97	54	84	e79	449	114	107	56	115	36	27	44
10	84	81	82	e78	1000	107	115	51	99	34	28	48
11	75	86	e81	e79	667	126	109	56	96	32	28	45
12	68	78	e80	e80	516	148	107	59	170	31	27	42
13	62	85	e78	e81	396	149	99	54	231	30	27	41
14	59	128	e77	83	314	145	90	52	177	30	27	40
15	56	155	e76	92	297	136	84	55	172	28	28	39
16	54	143	e75	114	249	140	82	68	248	28	34	36
17	53	174	e73	125	195	145	81	78	162	29	37	32
18	50	198	e71	122	166	135	77	70	137	31	34	32
19	49	164	e70	117	132	123	74	61	107	29	41	39
20	48	150	e72	106	121	114	76	55	98	29	46	49
21	48	148	e74	e100	114	108	116	53	92	29	40	58
22	47	140	e76	e90	104	103	199	79	105	34	44	64
23	47	130	e78	80	96	99	242	82	98	34	71	73
24	115	120	e80	77	100	95	216	76	84	38	79	94
25	152	112	e80	74	383	90	166	82	75	40	83	84
26	109	141	e80	71	500	88	132	92	66	41	79	74
27	90	231	e79	69	380	87	114	98	58	37	65	64
28	80	216	e78	67	296	89	100	108	53	34	54	55
29	71	187	e78	66	—	92	90	115	49	32	47	49
30	65	188	e77	89	—	93	83	110	46	31	43	45
31	61	—	e77	150	—	90	—	98	—	31	40	—
TOTAL	2192	3543	2681	2709	7562	3812	3277	2212	3459	1056	1261	1413
MEAN	70.7	118	86.5	87.4	270	123	109	71.4	115	34.1	40.7	47.1
MAX	152	231	173	150	1000	229	242	115	248	43	83	94
MIN	46	51	70	66	96	87	74	51	46	28	27	28
CFSM	.85	1.41	1.03	1.05	3.23	1.47	1.31	.85	1.38	.41	.49	.56
IN.	.98	1.58	1.19	1.21	3.36	1.70	1.46	.98	1.54	.47	.56	.63

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2001, BY WATER YEAR (WY)

MEAN	65.9	93.8	126	122	144	180	163	104	87.4	58.0	44.4	57.8
MAX	362	282	272	244	377	389	327	206	261	181	141	329
(WY)	1987	1991	1983	1973	1997	1979	1975	2000	1997	1986	1980	1986
MIN	28.5	27.6	39.9	41.2	49.0	52.9	68.9	44.4	31.7	28.4	22.5	20.1
(WY)	2000	2000	2000	2000	2000	2000	1971	1971	1971	1988	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1966 - 2001	
ANNUAL TOTAL	29660		35177			
ANNUAL MEAN	81.0		96.4		104	
HIGHEST ANNUAL MEAN					134	1997
LOWEST ANNUAL MEAN					61.2	1999
HIGHEST DAILY MEAN	705	May 19	1000	Feb 10	1810	Feb 22 1997
LOWEST DAILY MEAN	22	Sep 7	27	Aug 7	18	Sep 7 1999
ANNUAL SEVEN-DAY MINIMUM	24	Sep 3	27	Aug 7	19	Sep 15 1999
MAXIMUM PEAK FLOW			1120	Feb 10	(a)2390	Feb 21 1997
MAXIMUM PEAK STAGE			11.42	Feb 10	14.90	Feb 21 1997
INSTANTANEOUS LOW FLOW			26	(b)	16	Sep 7 1999
ANNUAL RUNOFF (CFSM)	.97		1.15		1.24	
ANNUAL RUNOFF (INCHES)	13.20		15.65		16.87	
10 PERCENT EXCEEDS	148		160		200	
50 PERCENT EXCEEDS	59		79		73	
90 PERCENT EXCEEDS	31		34		33	

(a) From rating curve extended above 1,800 ft^3/s.
(b) Aug. 9, 10, 14, 15.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04102776 MIDDLE BRANCH BLACK RIVER NEAR SOUTH HAVEN, MI

LOCATION.--Lat 42°25'57", long 86°12'25", in NE1/4 NE1/4 sec.32, T.1 N., R.16 W., Allegan County, Hydrologic Unit 04050002, on left bank 10 ft downstream from bridge on 68th Street, 4.0 mi northeast of South Haven.

DRAINAGE AREA.--83.0 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 590 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	58	188	e87	153	233	109	84	94	57	41	58
2	72	56	164	e86	147	197	110	79	115	55	41	54
3	66	55	140	e85	144	167	104	75	125	53	47	50
4	86	54	124	e86	145	155	98	70	113	52	42	50
5	102	53	113	e88	137	146	95	68	105	50	38	47
6	91	52	105	e91	125	137	98	65	120	46	37	43
7	91	55	e100	e92	116	132	100	62	124	46	35	55
8	111	56	e96	e90	118	133	96	73	110	46	33	60
9	114	58	e94	e90	264	131	93	69	100	45	33	56
10	105	93	e92	e89	563	125	91	66	94	43	32	72
11	99	91	e90	e89	428	132	95	81	124	41	32	69
12	91	82	e89	e89	509	143	116	88	165	39	31	62
13	84	91	e88	e90	355	149	100	78	194	39	30	56
14	78	118	e86	92	288	149	93	73	155	37	29	54
15	74	131	e84	101	258	145	89	75	152	35	27	51
16	69	128	e82	118	224	151	86	81	256	35	34	48
17	67	138	e80	119	186	153	83	84	207	35	40	46
18	64	148	e78	118	159	144	80	77	169	36	37	45
19	63	137	e75	115	150	134	77	71	171	36	68	54
20	62	137	e79	99	140	128	84	66	131	34	80	75
21	61	138	e84	e110	130	123	118	65	119	39	59	84
22	60	130	e86	e105	112	117	151	80	131	56	83	97
23	59	122	e88	91	116	112	203	76	115	68	153	93
24	69	115	e89	86	114	108	183	76	101	146	137	121
25	77	109	e90	82	231	103	163	83	91	99	124	112
26	73	122	e90	78	334	101	144	89	83	82	128	102
27	72	163	e89	80	309	101	124	97	76	66	106	95
28	69	162	e89	76	305	105	108	109	70	57	87	86
29	65	167	e88	77	—	109	98	103	65	52	74	79
30	62	185	e88	109	—	108	90	93	61	48	66	74
31	59	—	e87	147	—	105	—	83	—	44	61	—
TOTAL	2396	3204	3015	2955	6260	4176	3279	2439	3736	1617	1865	2048
MEAN	77.3	107	97.3	95.3	224	135	109	78.7	125	52.2	60.2	68.3
MAX	114	185	188	147	563	233	203	109	256	146	153	121
MIN	59	52	75	76	112	101	77	62	61	34	27	43
CFSM	.93	1.29	1.17	1.15	2.69	1.62	1.32	.95	1.50	.63	.72	.82
IN.	1.07	1.44	1.35	1.32	2.81	1.87	1.47	1.09	1.67	.72	.84	.92

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2001, BY WATER YEAR (WY)

MEAN	47.3	87.2	87.1	117	147	128	125	114	136	51.4	39.9	46.0
MAX	77.3	155	122	167	317	200	162	215	397	90.5	60.2	89.8
(WY)	2001	1995	1997	1997	1997	1998	1998	2000	1997	1997	2001	2000
MIN	23.5	26.4	47.8	50.7	54.1	56.7	79.0	70.4	40.2	28.4	23.5	17.6
(WY)	2000	2000	2000	2000	2000	2000	1996	1999	1998	1998	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1995 - 2001	
ANNUAL TOTAL	33473		36990			
ANNUAL MEAN	91.5		101		93.4	
HIGHEST ANNUAL MEAN					145	1997
LOWEST ANNUAL MEAN					63.0	1999
HIGHEST DAILY MEAN	657	May 19	563	Feb 10	2980	Jun 22 1997
LOWEST DAILY MEAN	28	Sep 7	27	Aug 15	16	Sep 4 1999
ANNUAL SEVEN-DAY MINIMUM	30	Sep 3	31	Aug 9	16	Sep 6 1999
MAXIMUM PEAK FLOW			644	Feb 10	(a)4340	Jun 21 1997
MAXIMUM PEAK STAGE			7.97	Feb 10	12.85	Jun 21 1997
INSTANTANEOUS LOW FLOW			28	Aug 15	15	Sep 11 1999
ANNUAL RUNOFF (CFSM)	1.10		1.22		1.13	
ANNUAL RUNOFF (INCHES)	15.00		16.58		15.29	
10 PERCENT EXCEEDS	163		153		158	
50 PERCENT EXCEEDS	72		90		75	
90 PERCENT EXCEEDS	36		46		29	

(a) From rating curve extended above 1,400 ft^3/s.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04103010 KALAMAZOO RIVER NEAR MARENGO, MI

LOCATION.--Lat 42°15'42", long 84°51'21", in SW1/4 SE1/4 sec.26, T.2 S., R.5 W., Calhoun County, Hydrologic Unit 04050003, on right bank at upstream side of bridge on B Drive North, 0.8 mi south of Marengo, and 5.0 mi west of Albion.

DRAINAGE AREA.--267 mi^2.

PERIOD OF RECORD.--October 1986 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 910 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some diversion by pumping for irrigation. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	172	e250	e195	241	546	261	239	446	221	171	167
2	144	170	e230	e190	241	477	269	241	451	215	167	163
3	144	168	e210	e190	230	428	268	231	478	213	169	159
4	221	165	e200	e190	235	403	261	224	493	210	164	156
5	228	164	192	e195	223	382	251	224	470	205	158	153
6	247	162	185	e200	219	358	261	216	452	201	154	151
7	247	165	184	e200	212	346	276	209	432	200	151	153
8	232	166	187	202	214	337	281	218	409	200	151	159
9	216	174	182	e190	430	326	e280	215	386	197	150	193
10	201	206	182	e180	743	314	e290	e215	360	193	159	202
11	188	207	e180	e190	812	316	288	e215	344	188	153	183
12	180	204	e170	e195	789	320	286	e210	333	185	151	180
13	174	225	e180	e190	728	329	264	e205	316	181	148	177
14	170	244	e190	e200	623	329	256	e200	298	179	146	174
15	167	241	e200	e205	550	327	273	385	295	174	144	167
16	172	234	e210	e210	501	327	307	689	307	171	168	162
17	169	225	e205	e210	450	324	313	705	293	171	170	159
18	167	217	e200	212	400	318	310	706	304	175	167	157
19	166	209	e205	211	369	313	288	642	292	174	177	168
20	165	206	e210	199	343	309	295	549	278	171	178	168
21	163	205	e220	198	330	301	342	482	295	170	175	202
22	167	201	e215	212	318	293	363	423	324	171	196	212
23	165	196	e210	200	298	284	387	366	309	176	208	211
24	199	198	e205	194	309	275	377	368	296	176	199	208
25	213	195	e200	189	615	268	342	390	280	208	193	198
26	212	219	e200	186	692	261	e310	404	263	200	190	191
27	206	249	e200	e180	699	256	e280	492	249	188	200	183
28	192	263	e200	176	633	253	264	559	241	181	216	180
29	185	259	e200	201	—	253	251	562	232	180	189	179
30	179	257	e195	212	—	253	243	528	226	189	181	172
31	175	—	e195	231	—	253	—	475	—	176	172	—
TOTAL	5796	6166	6192	6133	12447	10079	8737	11787	10152	5839	5315	5287
MEAN	187	206	200	198	445	325	291	380	338	188	171	176
MAX	247	263	250	231	812	546	387	706	493	221	216	212
MIN	142	162	170	176	212	253	243	200	226	170	144	151
CFSM	.70	.77	.75	.74	1.66	1.22	1.09	1.42	1.27	.71	.64	.66
IN.	.81	.86	.86	.85	1.73	1.40	1.22	1.64	1.41	.81	.74	.74

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 2001, BY WATER YEAR (WY)

MEAN	207	236	226	255	264	303	316	265	250	188	173	175
MAX	349	383	356	466	445	445	468	386	530	274	226	272
(WY)	1987	1989	1991	1993	2001	1990	1993	1990	1989	1993	1989	1993
MIN	128	129	160	140	150	169	225	177	126	111	116	111
(WY)	2000	2000	1996	2000	2000	2000	1987	1987	1988	1988	1996	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1987 - 2001	
ANNUAL TOTAL	73903		93930			
ANNUAL MEAN	202		257		238	
HIGHEST ANNUAL MEAN					332	1993
LOWEST ANNUAL MEAN					176	1996
HIGHEST DAILY MEAN	611	Jun 26	812	Feb 11	1140	Jun 3 1989
LOWEST DAILY MEAN	115	Feb 6	142	Oct 1	95	Jul 9 1988
ANNUAL SEVEN-DAY MINIMUM	120	Jan 26	150	Aug 9	98	Jul 4 1988
MAXIMUM PEAK FLOW			848	Feb 11	1160	Jun 3 1989
MAXIMUM PEAK STAGE			9.22	Feb 11	10.18	Jun 3 1989
INSTANTANEOUS LOW FLOW			(a)135	Jan 28	(a)86	Feb 12 2000
ANNUAL RUNOFF (CFSM)	.76		.96		.89	
ANNUAL RUNOFF (INCHES)	10.30		13.09		12.11	
10 PERCENT EXCEEDS	270		406		366	
50 PERCENT EXCEEDS	182		210		213	
90 PERCENT EXCEEDS	134		167		137	

(a) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04104945 WANADOGA CREEK NEAR BATTLE CREEK, MI

LOCATION.--Lat 42°23'47", long 85°07'54", in NW1/4 SE1/4 sec.9, T.1 S., R.7 W., Calhoun County, Hydrologic Unit 04050003, on right bank 30 ft upstream from bridge on State Highway 66, 5.0 mi north of Battle Creek.

DRAINAGE AREA.--48.3 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 830 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	22	67	e31	51	136	37	35	65	17	13	16
2	15	21	56	e32	53	104	38	32	64	16	12	15
3	14	21	46	e31	68	91	38	32	73	17	12	15
4	27	20	45	e30	71	85	36	27	78	17	12	14
5	35	20	32	e31	61	76	34	26	81	16	11	13
6	39	19	26	e32	54	67	35	25	71	15	12	12
7	40	20	27	e33	48	60	38	24	61	15	10	12
8	37	20	24	e34	46	56	39	32	53	16	9.7	16
9	33	23	23	e34	83	53	42	32	46	15	9.7	29
10	28	39	e22	e32	e200	49	50	28	41	14	14	46
11	24	45	e23	e30	e520	52	51	32	38	13	14	46
12	22	46	e24	e32	e360	56	49	32	38	12	13	42
13	21	50	e25	e33	e210	58	45	30	38	12	12	34
14	20	54	e26	e35	e145	59	41	27	35	12	11	28
15	21	58	e27	e37	e125	61	38	75	32	12	10	22
16	22	60	e28	40	e110	64	36	205	31	15	15	18
17	24	60	e29	41	e95	63	35	488	28	14	20	15
18	24	57	e30	41	e80	61	33	364	33	15	19	24
19	24	51	e32	43	e67	57	31	200	34	15	21	23
20	23	48	e33	40	e57	54	35	129	31	14	21	25
21	23	44	e34	e43	e50	51	48	93	30	24	19	29
22	23	40	e34	e40	e47	48	70	79	39	33	28	36
23	23	36	e34	e37	e45	46	84	70	40	37	36	33
24	28	33	e33	e35	45	43	100	69	37	47	32	36
25	32	31	e33	e34	106	41	103	79	31	44	27	39
26	34	41	e31	e33	246	38	91	81	25	38	26	37
27	34	62	e30	e32	261	36	72	87	22	30	24	34
28	32	76	e31	e31	190	35	57	101	20	23	26	32
29	27	83	e31	e30	---	36	47	107	19	18	23	30
30	25	77	e31	36	---	36	40	100	18	16	20	25
31	23	---	e31	43	---	36	---	78	---	14	18	---
TOTAL	813	1277	998	1086	3494	1808	1493	2819	1252	616	550.4	796
MEAN	26.2	42.6	32.2	35.0	125	58.3	49.8	90.9	41.7	19.9	17.8	26.5
MAX	40	83	67	43	520	136	103	488	81	47	36	46
MIN	14	19	22	30	45	35	31	24	18	12	9.7	12
CFSM	.54	.88	.67	.73	2.58	1.21	1.03	1.88	.86	.41	.37	.55
IN.	.63	.98	.77	.84	2.69	1.39	1.15	2.17	.96	.47	.42	.61

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2001, BY WATER YEAR (WY)

MEAN	21.8	35.1	34.4	43.6	61.4	55.7	61.1	56.9	33.6	20.1	17.0	18.3
MAX	35.0	69.0	60.0	66.1	125	86.8	86.6	90.9	45.8	25.2	24.4	27.6
(WY)	1995	1995	1995	1998	2001	1998	1998	2001	1997	1998	1995	1997
MIN	13.0	16.0	20.7	18.6	24.1	24.9	44.3	26.7	18.4	12.1	10.5	9.45
(WY)	2000	2000	2000	2000	2000	2000	2000	1999	1999	1996	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1995 - 2001	
ANNUAL TOTAL	11878.3		17002.4			
ANNUAL MEAN	32.5		46.6		38.1	
HIGHEST ANNUAL MEAN					46.6	2001
LOWEST ANNUAL MEAN					28.2	2000
HIGHEST DAILY MEAN	295	May 21	(e)520	Feb 11	(e)520	Feb 11 2001
LOWEST DAILY MEAN	9.5	Sep 3	9.7	Aug 8	7.9	Sep 10 1999
ANNUAL SEVEN-DAY MINIMUM	9.8	Sep 2	11	Aug 3	8.1	Sep 18 1999
MAXIMUM PEAK FLOW			(e)550	Feb 11	(e)550	Feb 11 2001
MAXIMUM PEAK STAGE			(a)8.17	Feb 11	(a)8.17	Feb 11 2001
INSTANTANEOUS LOW FLOW			9.1	Aug 9		
ANNUAL RUNOFF (CFSM)	.67		.96		.79	
ANNUAL RUNOFF (INCHES)	9.15		13.10		10.72	
10 PERCENT EXCEEDS	54		79		72	
50 PERCENT EXCEEDS	24		34		29	
90 PERCENT EXCEEDS	14		15		13	

(a) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04105000 BATTLE CREEK AT BATTLE CREEK, MI

LOCATION.--Lat 42°19'55", long 85°09'15", in NW1/4 sec.5, T.2 S., R.7 W., Calhoun County, Hydrologic Unit 04050003, on right bank 350 ft upstream from bridge on Emmett Street in Battle Creek, 3.0 mi upstream from mouth.

DRAINAGE AREA.--241 mi^2.

PERIOD OF RECORD.--October 1930 to September 1931, October 1932 to July 1933, January 1934 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1387: 1931, 1944. WSP 1507: 1956.

GAGE.--Water-stage recorder. Datum of gage is 823.24 ft above sea level (levels by Michigan Department of Natural Resources). Prior to May 14, 1951, nonrecording gage at same site and datum.

REMARKS.--Records good. Occasional slight regulation prior to November 1943. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	120	327	167	246	1230	219	292	444	123	82	71
2	90	116	299	169	284	1060	223	255	413	114	73	69
3	82	112	265	171	310	856	235	227	398	110	69	62
4	106	109	234	167	332	725	229	207	404	106	67	62
5	131	105	228	167	344	601	218	192	426	104	66	61
6	152	104	165	169	342	507	215	173	427	101	60	58
7	175	104	156	172	322	464	226	166	394	100	60	58
8	182	104	155	178	305	414	239	180	352	99	57	70
9	179	108	160	180	363	378	249	184	314	95	55	105
10	168	122	162	178	497	350	269	176	283	91	59	150
11	151	139	143	168	1140	339	283	176	252	86	57	159
12	136	156	101	170	2000	333	286	179	235	80	63	142
13	122	181	135	172	2020	335	281	174	219	82	61	122
14	112	200	136	172	1670	347	264	169	209	75	55	104
15	105	219	143	178	1330	357	249	260	200	70	55	90
16	102	243	153	187	1120	369	235	545	192	68	61	80
17	101	266	157	199	885	371	218	1230	187	69	73	81
18	100	273	160	215	706	365	207	1670	199	69	86	78
19	98	269	164	233	611	356	201	1550	210	69	84	86
20	94	257	168	239	546	343	205	1280	203	64	88	92
21	91	243	175	232	442	329	232	996	203	85	80	125
22	87	221	180	204	382	312	285	773	215	103	102	150
23	86	201	181	195	368	298	360	641	227	113	125	154
24	104	186	181	199	335	285	500	559	244	140	121	161
25	113	169	181	191	435	272	602	507	255	148	109	163
26	118	178	181	173	763	256	603	468	237	146	99	162
27	132	221	178	167	1460	240	540	468	204	125	97	153
28	138	258	176	158	1390	221	453	492	169	109	96	141
29	136	300	175	154	—	207	390	520	146	95	94	131
30	131	333	166	178	—	211	338	534	132	81	85	118
31	123	—	163	212	—	214	—	498	—	78	76	—
TOTAL	3745	5617	5548	5714	20948	12945	9054	15741	7993	2998	2415	3258
MEAN	121	187	179	184	748	418	302	508	266	96.7	77.9	109
MAX	182	333	327	239	2020	1230	603	1670	444	148	125	163
MIN	82	104	101	154	246	207	201	166	132	64	55	58
CFSM	.50	.78	.74	.76	3.10	1.73	1.25	2.11	1.11	.40	.32	.45
IN.	.58	.87	.86	.88	3.23	2.00	1.40	2.43	1.23	.46	.37	.50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	122	161	193	209	251	409	392	267	191	110	87.8	97.6
MAX	673	474	468	591	748	936	1162	825	678	281	313	276
(WY)	1987	1993	1991	1952	2001	1948	1947	1943	1943	1968	1994	1950
MIN	32.4	46.1	46.8	57.5	61.5	87.6	93.7	69.6	49.2	34.3	27.8	30.6
(WY)	1964	1964	1964	1964	1963	1931	1931	1931	1964	1936	1936	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	62911		95976			
ANNUAL MEAN	172		263		(a)211	
HIGHEST ANNUAL MEAN					394	1943
LOWEST ANNUAL MEAN					64.1	1964
HIGHEST DAILY MEAN	970	May 22	2020	Feb 13	3560	Apr 7 1947
LOWEST DAILY MEAN	58	Jan 29	55	Aug 9	22	Aug 14 1934
ANNUAL SEVEN-DAY MINIMUM	63	Sep 3	58	Aug 9	25	Aug 10 1936
MAXIMUM PEAK FLOW			2140	Feb 12	3640	Apr 7 1947
MAXIMUM PEAK STAGE			3.23	Feb 12	(b)4.48	Apr 7 1947
INSTANTANEOUS LOW FLOW			52	(c)	22	Aug 14 1934
ANNUAL RUNOFF (CFSM)	.71		1.09		.87	
ANNUAL RUNOFF (INCHES)	9.71		14.81		11.87	
10 PERCENT EXCEEDS	278		497		421	
50 PERCENT EXCEEDS	138		178		136	
90 PERCENT EXCEEDS	74		80		60	

(a) Does not include water year 1931.
(b) From floodmark.
(c) Aug. 9, 15, Sept. 8.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04105500 KALAMAZOO RIVER NEAR BATTLE CREEK, MI

LOCATION.--Lat 42°19'26", long 85°11'51", in SW1/4 sec.1, T.2 S., R.8 W., Calhoun County, Hydrologic Unit 04050003, on left bank 20 ft upstream from bridge on Kendall Street in Battle Creek.

DRAINAGE AREA.--824 mi^2.

PERIOD OF RECORD.--July 1937 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 924: 1938-39. WSP 1387: 1938, 1945-46, 1948.

GAGE.--Water-stage recorder. Elevation of gage is 815 ft above sea level, from topographic map. Prior to Oct. 1, 1957, water-stage recorder at site 4.7 mi downstream at different datum. Oct. 1, 1957 to June 15, 1959, nonrecording gage at bridge 1,800 ft upstream at different datum. June 16, 1959 to Oct. 13, 1960, nonrecording gage at same site and datum.

REMARKS.--Records fair. Diurnal fluctuation below 1,500 ft^3/s caused by powerplants upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	437	520	942	593	812	2520	752	778	1400	573	450	448
2	426	511	886	599	849	2200	765	727	1390	548	428	429
3	416	496	799	561	859	1900	781	686	1420	543	423	421
4	672	492	720	585	869	1710	753	644	1380	534	417	405
5	726	485	693	595	875	1520	723	622	1340	522	406	419
6	727	483	603	606	862	1380	750	583	1320	509	396	396
7	737	488	581	610	827	1290	789	598	1240	503	388	392
8	726	469	593	604	808	1200	779	634	1140	507	389	490
9	671	513	581	569	1360	1140	833	611	1040	493	378	606
10	642	584	577	548	2090	1070	846	594	963	481	416	776
11	589	618	540	587	2670	1080	836	638	913	466	407	666
12	552	620	379	600	3510	1080	811	631	908	454	396	640
13	520	718	452	586	3620	1050	799	598	847	452	389	579
14	501	750	537	592	3180	1070	774	594	792	442	377	540
15	478	773	644	631	2700	1060	801	1180	778	431	376	521
16	478	763	685	634	2310	1090	834	2060	772	421	420	494
17	482	773	649	656	1970	1070	e827	2840	751	416	474	492
18	470	764	602	673	1680	1040	e809	3320	822	419	510	481
19	465	727	621	692	1510	1020	e787	3130	797	431	536	547
20	457	706	683	688	1380	978	796	2700	745	421	495	553
21	451	701	695	645	1240	945	934	2240	792	554	468	792
22	442	666	681	635	1110	915	1080	1880	909	501	753	840
23	446	626	590	630	1040	888	1180	1590	887	526	801	790
24	671	593	659	606	1070	849	1360	1480	843	559	667	767
25	639	584	659	592	1790	833	1390	1520	813	672	598	741
26	614	695	635	564	2270	797	1310	1450	760	746	556	716
27	652	824	636	556	2870	767	1180	1560	687	587	535	670
28	617	877	661	549	2820	745	1010	1730	653	518	530	614
29	570	899	593	543	---	728	910	1660	599	473	532	588
30	552	954	600	666	---	720	847	1600	581	466	472	550
31	533	---	592	756	---	735	---	1480	---	466	457	---
TOTAL	17359	19672	19768	18951	48951	35390	27046	42358	28282	15634	14840	17363
MEAN	560	656	638	611	1748	1142	902	1366	943	504	479	579
MAX	737	954	942	756	3620	2520	1390	3320	1420	746	801	840
MIN	416	469	379	543	808	720	723	583	581	416	376	392
CFSM	.68	.80	.77	.74	2.12	1.39	1.09	1.66	1.14	.61	.58	.70
IN.	.78	.89	.89	.86	2.21	1.60	1.22	1.91	1.28	.71	.67	.78

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2001, BY WATER YEAR (WY)

MEAN	490	585	648	679	783	1111	1099	855	684	492	424	434
MAX	1446	1284	1248	1557	1748	2183	2834	1998	1703	1000	899	855
(WY)	1987	1993	1991	1993	2001	1948	1947	1943	1943	1943	1994	1975
MIN	173	204	215	229	218	317	441	336	238	186	189	167
(WY)	1964	1965	1964	1964	1964	1964	1946	1958	1964	1964	1964	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1937 - 2001	
ANNUAL TOTAL	231899		305614			
ANNUAL MEAN	634		837		690	
HIGHEST ANNUAL MEAN					1081	1943
LOWEST ANNUAL MEAN					250	1964
HIGHEST DAILY MEAN	1840	May 22	3620	Feb 13	7130	Apr 7 1947
LOWEST DAILY MEAN	323	Jan 22	376	Aug 15	86	Aug 5 1964
ANNUAL SEVEN-DAY MINIMUM	351	Jan 26	391	Aug 9	106	Aug 4 1964
MAXIMUM PEAK FLOW			3770	Feb 12	(a)7290	Apr 7 1947
MAXIMUM PEAK STAGE			6.56	Feb 12	(b)7.95	Feb 26 1985
INSTANTANEOUS LOW FLOW			(c)252	Dec 12	50	Sep 22 1939
ANNUAL RUNOFF (CFSM)	.77		1.02		.84	
ANNUAL RUNOFF (INCHES)	10.47		13.80		11.37	
10 PERCENT EXCEEDS	946		1410		1230	
50 PERCENT EXCEEDS	560		667		554	
90 PERCENT EXCEEDS	384		451		300	

(a) Gage height 9.13 ft, site and datum then in use.
(b) Present site and datum.
(c) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04105700 AUGUSTA CREEK NEAR AUGUSTA, MI

LOCATION.--Lat 42°21'12", long 85°21'14", in SW1/4 sec.27, T.1 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank 15 ft downstream from bridge on EF Road, 1.3 mi north of Augusta.

DRAINAGE AREA.--38.9 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 815 ft above sea level, from topographic map. Prior to June 15, 1965, nonrecording gage at same site and datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	28	53	e34	49	69	44	34	63	29	23	30
2	25	27	45	e34	45	63	44	33	73	27	23	28
3	24	27	38	e34	40	60	42	32	72	27	23	27
4	43	27	36	e35	42	59	40	31	63	28	22	26
5	45	26	34	35	39	56	39	30	54	27	20	25
6	42	26	33	35	38	51	42	30	53	26	20	24
7	40	30	34	35	36	49	45	30	51	26	19	23
8	37	30	34	34	37	50	42	35	47	26	19	27
9	34	38	34	34	97	50	51	32	42	25	18	38
10	32	56	33	36	122	47	55	31	40	23	22	50
11	30	50	30	33	116	53	54	34	41	22	21	44
12	29	42	32	33	98	56	50	35	50	21	20	37
13	28	48	e37	34	80	59	45	33	49	21	19	32
14	28	54	e36	34	71	59	41	31	43	20	18	30
15	27	53	e37	35	68	59	40	68	41	20	18	30
16	29	48	e38	38	62	62	40	98	42	19	31	28
17	28	50	e39	37	52	62	38	98	38	20	36	28
18	28	48	e40	36	46	57	36	83	46	22	36	27
19	27	43	e40	35	46	52	35	66	46	23	40	30
20	27	41	e41	32	44	50	41	51	39	23	35	34
21	26	44	e39	34	41	49	62	45	43	25	30	49
22	26	44	e40	32	39	47	75	48	56	30	64	54
23	25	43	e40	32	39	45	77	43	47	31	83	51
24	41	42	e39	32	44	44	73	45	40	38	77	57
25	38	40	e38	31	104	43	62	60	36	36	63	53
26	35	58	e37	30	115	42	52	58	34	36	55	49
27	34	70	e36	32	100	42	45	70	30	30	45	46
28	33	69	e35	29	80	42	40	79	27	27	49	41
29	30	63	e35	32	---	43	37	71	31	26	45	37
30	30	58	e35	41	---	42	35	60	31	25	36	34
31	29	---	e35	50	---	41	---	50	---	23	32	---
TOTAL	976	1323	1153	1068	1790	1603	1422	1544	1368	802	1062	1089
MEAN	31.5	44.1	37.2	34.5	63.9	51.7	47.4	49.8	45.6	25.9	34.3	36.3
MAX	45	70	53	50	122	69	77	98	73	38	83	57
MIN	24	26	30	29	36	41	35	30	27	19	18	23
CFSM	.81	1.13	.96	.89	1.64	1.33	1.22	1.28	1.17	.67	.88	.93
IN.	.93	1.27	1.10	1.02	1.71	1.53	1.36	1.48	1.31	.77	1.02	1.04

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	39.6	45.5	47.0	43.6	46.6	56.2	58.5	47.4	42.6	35.1	33.5	36.0
MAX	85.2	67.3	65.3	66.3	66.3	81.3	86.9	81.8	73.2	51.4	53.8	70.7
(WY)	1987	1986	1992	1993	1976	1985	1975	1975	1978	1986	1980	1986
MIN	18.9	23.4	31.9	26.9	30.1	33.4	38.5	30.0	23.9	17.4	17.9	17.5
(WY)	1965	1965	1965	1971	1970	2000	2000	1965	1988	1965	1984	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	12905		15200			
ANNUAL MEAN	35.3		41.6		44.3	
HIGHEST ANNUAL MEAN					57.5	1975
LOWEST ANNUAL MEAN					30.3	1965
HIGHEST DAILY MEAN	119	May 20	122	Feb 10	454	Jun 27 1978
LOWEST DAILY MEAN	16	Jul 27	18	Aug 9	14	Aug 24 1984
ANNUAL SEVEN-DAY MINIMUM	18	Jul 21	19	Aug 9	14	Aug 21 1984
MAXIMUM PEAK FLOW			136	Feb 11	560	Jun 27 1978
MAXIMUM PEAK STAGE			2.33	Feb 11	3.41	Jun 27 1978
INSTANTANEOUS LOW FLOW			(a)16	(b)	(a)6.3	Feb 8 2000
ANNUAL RUNOFF (CFSM)	.91		1.07		1.14	
ANNUAL RUNOFF (INCHES)	12.34		14.54		15.46	
10 PERCENT EXCEEDS	50		62		66	
50 PERCENT EXCEEDS	32		38		41	
90 PERCENT EXCEEDS	24		26		26	

(a) Result of freezeup.
(b) Dec. 11, 12.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106000 KALAMAZOO RIVER AT COMSTOCK, MI

LOCATION.--Lat 42°17'08", long 85°30'50", in NE1/4 sec.19, T.2 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank at downstream side of bridge on River Street in Comstock, 0.2 mi downstream from Comstock Creek.

DRAINAGE AREA.--1,010 mi^2, approximately.

PERIOD OF RECORD.--April to August 1931, October 1932 to December 1979, October 1984 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 824: 1933-36. WSP 1387: 1933, 1934(M), 1935, 1936(M), 1938(M), 1940(M), 1941.

GAGE.--Water-stage recorder. Datum of gage is 756.12 ft above sea level. Prior to Oct. 1, 1987, at datum 3.00 ft higher. Prior to November 1945, nonrecording gage at same site and datum.

REMARKS.--Records good. Flow regulated by powerplant 1.2 mi upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	570	661	1240	848	1040	3220	1160	1200	1900	786	701	629
2	612	674	1220	793	1050	2880	1160	1140	1860	935	714	730
3	553	658	1130	845	1060	2600	1150	1110	1820	838	642	708
4	639	691	1060	769	1090	2270	1150	1110	1770	763	618	581
5	889	585	1030	849	1120	2070	1130	1040	1770	679	616	723
6	945	598	1000	925	1120	1900	1070	961	1750	716	533	608
7	929	682	862	839	1110	1710	1140	934	1640	787	540	551
8	916	665	858	862	1100	1650	1170	1000	1630	695	647	730
9	827	692	827	712	1360	1570	1170	1020	1470	711	595	889
10	902	942	760	726	2020	1480	1240	908	1390	695	507	1060
11	814	931	862	959	2490	1460	1280	956	1370	717	510	1070
12	743	919	731	855	2790	1480	1220	1020	1350	659	510	959
13	655	911	501	837	3760	1470	1180	926	1350	542	525	809
14	692	968	547	831	4230	1480	1150	872	1250	730	542	810
15	749	1070	825	779	3820	1460	1150	1330	1160	588	533	795
16	644	1070	1070	938	3130	1560	1110	1840	1150	524	668	626
17	611	1080	989	850	2730	1550	1200	2210	1150	706	673	733
18	665	1080	704	929	2210	1470	1170	2890	1140	626	539	697
19	587	1070	740	860	2070	1440	1140	3510	1230	525	813	711
20	686	1060	964	906	1830	1440	1160	3470	1180	557	999	710
21	578	1050	936	873	1690	1370	1200	3190	1150	828	812	979
22	689	1040	799	844	1550	1340	1450	2850	1230	886	975	1130
23	578	1010	794	924	1450	1330	1510	2280	1310	631	1370	1130
24	840	904	869	808	1370	1280	1570	2050	1180	655	1220	1140
25	1000	909	904	776	1950	1210	1730	1900	1270	1000	987	1130
26	833	858	957	762	2350	1220	1670	1910	1170	1080	1010	1090
27	823	1000	857	730	2690	1160	1620	1930	1130	1120	1070	1070
28	854	1180	797	778	3160	1110	1490	2010	1090	1010	1100	1050
29	754	1230	881	768	---	1120	1370	2200	1050	785	1030	867
30	748	1260	842	787	---	1120	1220	2100	957	642	795	853
31	747	---	834	972	---	1110	---	2010	---	715	800	---
TOTAL	23072	27448	27390	25934	57340	49530	38130	53877	40867	23131	23594	25568
MEAN	744	915	884	837	2048	1598	1271	1738	1362	746	761	852
MAX	1000	1260	1240	972	4230	3220	1730	3510	1900	1120	1370	1140
MIN	553	585	501	712	1040	1110	1070	872	957	524	507	551
CFSM	.74	.91	.87	.83	2.03	1.58	1.26	1.72	1.35	.74	.75	.84
IN.	.85	1.01	1.01	.96	2.11	1.82	1.40	1.98	1.51	.85	.87	.94

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	678	795	857	918	998	1365	1350	1071	880	678	579	586
MAX	1990	1652	1674	1958	2048	2802	3018	2484	2063	1446	1217	1170
(WY)	1987	1993	1991	1993	2001	1985	1950	1943	1989	1943	1994	1975
MIN	268	285	347	371	370	461	617	405	302	269	235	278
(WY)	1964	1964	1964	1964	1964	1964	1964	1931	1934	1934	1934	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	293653		415881			
ANNUAL MEAN	802		1139		896	
HIGHEST ANNUAL MEAN					1387	1943
LOWEST ANNUAL MEAN					368	1964
HIGHEST DAILY MEAN	2050	May 23	4230	Feb 14	6830	Apr 8 1947
LOWEST DAILY MEAN	397	Jan 27	501	Dec 13	185	Aug 7 1934
ANNUAL SEVEN-DAY MINIMUM	467	Sep 2	532	Aug 9	217	Aug 1 1934
MAXIMUM PEAK FLOW			4250	Feb 14	6910	Apr 8 1947
MAXIMUM PEAK STAGE			8.64	Feb 14	(a)10.94	Apr 8 1947
INSTANTANEOUS LOW FLOW			168	Jul 15	106	Dec 24 1999
ANNUAL RUNOFF (CFSM)	.79		1.13		.89	
ANNUAL RUNOFF (INCHES)	10.82		15.32		12.06	
10 PERCENT EXCEEDS	1130		1880		1530	
50 PERCENT EXCEEDS	710		1000		750	
90 PERCENT EXCEEDS	498		641		412	

(a) Present datum.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106137 HAMPTON LAKE NEAR PORTAGE, MI

LOCATION.--Lat 42°11'24", long 85°37'50", in SE1/4 sec. 19, T.3 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank at outlet of Hampton Lake (Portage Creek), 1.8 mi south of Portage.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--November 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 855 ft above sea level, from topographic map.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.53 ft, Aug. 22, 2001; minimum, 1.89 ft, Apr. 6, 2000.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 3.53 ft, Aug. 22; minimum, 1.97 ft, Jan. 26.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.27	2.31	2.29	2.06	2.08	2.25	2.17	2.15	2.37	2.40	2.24	2.33
2	2.27	2.30	2.24	2.06	2.06	2.23	2.15	2.15	2.43	2.39	2.23	2.32
3	2.28	2.30	2.22	2.05	2.04	2.23	2.14	2.14	2.41	2.41	2.23	2.31
4	2.62	2.29	2.20	2.04	2.04	2.24	2.13	2.13	2.36	2.41	2.21	2.31
5	2.51	2.29	2.19	2.04	2.04	2.21	2.13	2.12	2.34	2.40	2.20	2.29
6	2.44	2.29	2.18	2.04	2.04	2.19	2.19	2.12	2.46	2.39	2.19	2.29
7	2.41	2.35	2.18	2.04	2.02	2.18	2.19	2.15	2.43	2.39	2.18	2.28
8	2.44	2.33	2.17	2.03	2.03	2.19	2.16	2.21	2.38	2.40	2.18	2.32
9	2.38	2.37	2.15	2.02	2.55	2.19	2.27	2.18	2.35	2.39	2.18	2.50
10	2.35	2.49	2.14	2.02	2.76	2.18	2.26	2.16	2.35	2.38	2.19	2.51
11	2.33	2.38	2.17	2.01	2.44	2.25	2.21	2.17	2.43	2.36	2.18	2.40
12	2.32	2.32	2.22	2.01	2.28	2.26	2.18	2.18	2.51	2.35	2.18	2.34
13	2.31	2.39	2.18	2.01	2.21	2.28	2.16	2.16	2.45	2.35	2.18	2.32
14	2.32	2.40	2.18	2.02	2.20	2.26	2.15	2.17	2.39	2.34	2.17	2.31
15	2.33	2.36	2.15	2.03	2.21	2.28	2.24	2.28	2.40	2.34	2.17	2.29
16	2.35	2.32	2.16	2.04	2.18	2.30	2.29	2.31	2.45	2.33	2.29	2.28
17	2.38	2.36	2.18	2.04	2.15	2.28	2.23	2.29	2.40	2.35	2.32	2.27
18	2.40	2.33	2.16	2.03	2.12	2.25	2.19	2.24	2.43	2.38	2.31	2.27
19	2.40	2.29	2.16	2.03	2.10	2.22	2.17	2.21	2.42	2.37	2.49	2.33
20	2.42	2.29	2.14	2.01	2.11	2.20	2.20	2.19	2.39	2.36	2.40	2.34
21	2.43	2.30	2.13	2.00	2.11	2.20	2.33	2.25	2.47	2.36	2.32	2.44
22	2.43	2.27	2.12	1.99	2.10	2.18	2.37	2.32	2.56	2.37	3.02	2.44
23	2.43	2.24	2.13	1.99	2.09	2.18	2.36	2.26	2.48	2.36	3.09	2.39
24	2.46	2.23	2.12	1.99	2.15	2.16	2.35	2.29	2.44	2.36	2.67	2.41
25	2.44	2.23	2.10	1.98	2.94	2.16	2.26	2.38	2.42	2.46	2.55	2.35
26	2.40	2.38	2.10	1.98	2.73	2.15	2.21	2.37	2.41	2.46	2.67	2.33
27	2.39	2.43	2.09	1.99	2.49	2.15	2.18	2.41	2.40	2.35	2.55	2.30
28	2.36	2.38	2.09	1.98	2.33	2.14	2.17	2.39	2.40	2.30	2.45	2.28
29	2.34	2.34	2.09	1.99	—	2.14	2.15	2.33	2.41	2.28	2.39	2.26
30	2.32	2.32	2.09	2.07	—	2.14	2.15	2.30	2.41	2.27	2.36	2.25
31	2.31	—	2.08	2.10	—	2.14	—	2.28	—	2.25	2.35	—
MEAN	2.38	2.33	2.15	2.02	2.24	2.21	2.21	2.24	2.42	2.36	2.36	2.34
MAX	2.62	2.49	2.29	2.10	2.94	2.30	2.37	2.41	2.56	2.46	3.09	2.51
MIN	2.27	2.23	2.08	1.98	2.02	2.14	2.13	2.12	2.34	2.25	2.17	2.25

CAL YR 2000 MEAN 2.19 MAX 2.85 MIN 1.91
WTR YR 2001 MEAN 2.27 MAX 3.09 MIN 1.98

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106180 PORTAGE CREEK AT PORTAGE, MI

LOCATION.--Lat 42°12'21", long 85°35'23", in SE1/4 sec.16, T.3 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on right bank 750 ft upstream from bridge on Westnedge Avenue in Portage.

DRAINAGE AREA.--16.5 mi^2.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 850 ft above sea level, from topographic map.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	12	18	14	16	20	18	17	21	13	11	16
2	11	12	16	13	15	19	17	16	24	13	11	15
3	11	12	15	13	15	19	17	16	21	13	11	15
4	29	12	14	14	15	20	16	16	18	13	11	15
5	20	12	14	14	14	18	17	15	18	13	10	15
6	17	12	14	14	14	18	19	15	25	12	10	15
7	17	14	15	14	14	17	19	17	21	13	10	15
8	18	13	15	13	15	18	18	18	19	13	10	17
9	15	18	14	e13	41	17	23	16	17	12	9.9	26
10	14	23	14	13	41	17	21	15	17	12	10	22
11	14	17	15	13	28	21	19	16	22	11	9.8	16
12	13	15	e16	13	23	21	18	16	26	11	9.6	14
13	13	21	15	13	20	21	17	15	20	11	9.6	14
14	13	19	15	13	21	20	16	17	17	11	9.4	14
15	13	18	15	14	20	21	22	20	20	11	9.4	14
16	12	16	15	14	18	22	21	21	20	11	14	13
17	12	19	16	14	17	21	19	19	17	12	13	13
18	12	17	15	14	16	20	18	17	21	12	13	13
19	12	16	15	14	15	19	17	16	18	12	19	15
20	12	16	15	13	16	18	19	15	16	11	15	15
21	12	17	15	13	15	18	26	20	22	12	13	19
22	12	16	e15	13	15	18	25	20	23	12	52	18
23	12	15	15	13	15	17	24	17	18	12	48	18
24	15	15	15	13	21	17	23	20	17	12	28	18
25	14	15	14	13	54	17	20	23	15	19	25	16
26	13	25	14	13	38	17	19	22	15	16	33	15
27	13	24	14	13	28	17	18	24	14	14	23	15
28	13	21	e14	13	22	17	17	22	14	13	20	15
29	13	20	14	13	—	17	17	18	14	12	18	14
30	12	19	14	17	—	17	17	17	14	12	17	14
31	12	—	14	17	—	17	—	16	—	11	16	—
TOTAL	430	501	459	421	602	576	577	552	564	385	518.7	474
MEAN	13.9	16.7	14.8	13.6	21.5	18.6	19.2	17.8	18.8	12.4	16.7	15.8
MAX	29	25	18	17	54	22	26	24	26	19	52	26
MIN	11	12	14	13	14	17	16	15	14	11	9.4	13
CFSM	.84	1.01	.90	.82	1.30	1.13	1.17	1.08	1.14	.75	1.01	.96
IN.	.97	1.13	1.03	.95	1.36	1.30	1.30	1.24	1.27	.87	1.17	1.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2001, BY WATER YEAR (WY)

MEAN	17.2	19.0	18.3	17.8	18.3	20.0	20.6	19.2	17.6	15.9	15.6	15.8
MAX	25.7	25.5	23.6	21.4	21.5	28.1	26.6	24.1	24.9	21.4	19.2	20.3
(WY)	1992	1991	1991	1992	2001	1985	1985	1983	1989	1986	1994	1993
MIN	10.5	11.2	13.0	12.0	12.2	12.0	14.7	15.5	13.3	12.2	11.0	10.7
(WY)	2000	2000	2000	2000	2000	2000	2000	1999	2000	2000	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1983 - 2001	
ANNUAL TOTAL	4980.2		6059.7			
ANNUAL MEAN	13.6		16.6		17.9	
HIGHEST ANNUAL MEAN					21.2	1991
LOWEST ANNUAL MEAN					12.7	2000
HIGHEST DAILY MEAN	43	May 19	54	Feb 25	87	Jun 21 1997
LOWEST DAILY MEAN	9.4	Sep 7	9.4	Aug 14	9.4	(a)
ANNUAL SEVEN-DAY MINIMUM	9.6	Sep 3	9.7	Aug 9	9.6	Oct 25 1999
MAXIMUM PEAK FLOW			78	Aug 22	(b)118	May 31 1989
MAXIMUM PEAK STAGE			3.55	Aug 22	4.11	Jun 21 1997
ANNUAL RUNOFF (CFSM)	.82		1.01		1.09	
ANNUAL RUNOFF (INCHES)	11.23		13.66		14.76	
10 PERCENT EXCEEDS	18		22		23	
50 PERCENT EXCEEDS	13		15		17	
90 PERCENT EXCEEDS	10		12		13	

(a) Sept. 7, 2000, Aug. 14, 15, 2001.
(b) Gage height 3.87 ft.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106300 PORTAGE CREEK NEAR KALAMAZOO, MI

LOCATION.--Lat 42°14'46", long 85°34'33", in SE1/4 sec.34, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on left bank 5 ft upstream from bridge on Lovers Lane, 3.0 mi south of Kalamazoo.

DRAINAGE AREA.--22.4 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 814.88 ft above sea level.

REMARKS.--Records good except for estimated daily discharges Aug. 22, 23, which are fair. Flow includes water which is pumped from groundwater sources by industry and discharged into stream 2.0 mi upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	27	32	24	26	37	40	40	51	36	35	34
2	28	26	30	22	25	33	40	40	49	38	34	43
3	35	25	28	25	24	31	39	41	46	38	34	44
4	72	26	27	20	25	35	39	39	43	39	35	44
5	44	25	33	20	25	33	37	39	41	30	34	42
6	39	19	29	19	25	32	47	39	52	29	34	42
7	47	32	29	19	24	31	45	46	47	29	34	37
8	48	31	28	19	26	32	44	44	42	30	28	52
9	44	43	27	19	84	31	54	37	40	29	33	69
10	41	52	27	20	57	37	47	39	42	29	30	57
11	39	39	29	20	42	36	45	41	54	29	31	49
12	36	36	28	19	37	34	43	38	63	29	33	46
13	38	49	30	19	34	42	41	37	49	26	31	44
14	39	38	29	20	34	42	39	42	44	24	33	41
15	38	38	28	22	34	38	53	55	51	25	33	35
16	33	37	28	22	32	44	49	50	45	22	44	37
17	33	40	28	23	30	43	45	40	41	26	39	35
18	30	33	26	22	28	41	44	38	50	30	45	39
19	25	32	23	21	28	41	42	36	41	34	47	45
20	24	32	21	20	28	41	47	36	40	28	43	45
21	24	32	21	20	26	36	60	53	53	e30	33	61
22	25	30	e20	19	28	38	52	44	47	e35	e145	53
23	24	29	20	19	27	38	51	40	42	e33	e110	57
24	37	29	20	19	43	37	49	46	40	25	68	51
25	29	30	19	18	110	36	41	52	40	44	66	46
26	28	43	20	17	60	37	40	48	39	35	79	43
27	28	39	20	18	47	34	40	52	36	37	60	40
28	26	36	20	18	40	36	41	47	38	33	52	43
29	26	37	19	20	—	37	40	42	39	34	48	42
30	26	37	20	30	—	38	40	40	36	32	47	41
31	26	—	22	26	—	39	—	40	—	33	39	—
TOTAL	1054	1022	781	639	1049	1140	1334	1321	1341	971	1457	1357
MEAN	34.0	34.1	25.2	20.6	37.5	36.8	44.5	42.6	44.7	31.3	47.0	45.2
MAX	72	52	33	30	110	44	60	55	63	44	145	69
MIN	22	19	19	17	24	31	37	36	36	22	28	34

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	36.7	38.8	38.9	38.6	41.2	45.9	48.3	44.2	41.4	38.4	37.4	36.6
MAX	56.0	56.4	53.5	48.9	53.0	61.4	63.3	57.5	55.3	54.0	50.3	51.9
(WY)	1992	1991	1992	1988	1971	1985	1991	1991	1989	1991	1980	1992
MIN	21.6	26.5	25.2	20.6	25.7	26.5	32.6	30.4	24.7	25.0	26.8	23.0
(WY)	2000	1972	2001	2001	1972	2000	2000	1977	1988	2000	1977	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	10975		13466			
ANNUAL MEAN	30.0		36.9		40.5	
HIGHEST ANNUAL MEAN					51.5	1991
LOWEST ANNUAL MEAN					28.6	2000
HIGHEST DAILY MEAN	89	May 19	145	Aug 22	257	May 31 1989
LOWEST DAILY MEAN	17	Jul 1	17	Jan 26	15	Sep 24 1999
ANNUAL SEVEN-DAY MINIMUM	20	Dec 23	18	Jan 22	17	Sep 21 1999
MAXIMUM PEAK FLOW			220	Aug 22	(a)407	May 30 1989
MAXIMUM PEAK STAGE			(b)		4.49	Jun 26 1978
INSTANTANEOUS LOW FLOW			15	Jan 26	(c)8.0	Jan 19 1965
10 PERCENT EXCEEDS	39		50		53	
50 PERCENT EXCEEDS	29		37		39	
90 PERCENT EXCEEDS	22		22		29	

(a) Gage height 3.09 ft.
(b) Not determined.
(c) Result of bridge construction upstream.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106320 WEST FORK PORTAGE CREEK NEAR OSHTEMO, MI

LOCATION.--Lat 42°14'07", long 85°38'54", in SE1/4 sec.1, T.3 S., R.12 W., Kalamazoo County, Hydrologic Unit 04050003, on right bank at upstream side of culvert on 12th Street, 2.1 mi southeast of Oshtemo.

DRAINAGE AREA.--13.0 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 868.86 ft above sea level (Kalamazoo County Road Commission bench mark).

REMARKS.--Records good. At times, flow is affected by ground-water withdrawals. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.99	3.1	5.1	2.9	3.6	5.4	3.2	1.8	3.6	2.1	1.9	2.8
2	.99	3.1	4.5	2.9	3.6	4.7	3.5	1.7	3.6	1.8	1.7	2.3
3	.96	3.1	4.0	3.0	3.3	4.3	4.4	1.6	3.8	1.8	1.7	1.9
4	1.7	3.1	3.7	3.1	3.2	3.8	4.3	1.5	4.1	1.7	1.7	1.7
5	2.2	3.1	3.5	3.3	3.1	3.6	4.1	1.4	4.0	1.6	1.6	1.6
6	2.6	3.1	3.3	3.2	3.0	3.4	4.4	1.3	4.4	1.6	1.4	1.5
7	2.8	3.7	3.4	3.2	2.8	3.2	4.2	1.2	4.2	1.6	1.3	1.4
8	3.0	3.9	3.4	3.0	2.7	3.1	4.0	1.2	3.8	1.5	1.2	1.5
9	2.8	4.4	3.2	2.8	5.2	3.1	3.9	1.1	3.5	1.4	1.1	1.9
10	2.5	5.3	3.1	2.9	8.0	2.9	3.8	1.0	3.6	1.4	1.0	2.1
11	2.2	5.1	3.2	3.1	7.6	3.1	3.6	1.2	3.9	1.3	.84	2.2
12	1.9	4.9	3.7	3.1	6.8	3.2	3.6	1.2	4.6	1.3	.73	2.2
13	1.8	5.5	3.6	3.2	5.6	3.5	3.1	1.3	4.3	1.2	.69	2.1
14	1.7	5.9	3.7	3.2	4.9	3.6	2.9	1.5	4.0	1.1	.64	1.9
15	1.6	5.7	3.5	3.3	4.5	3.6	3.0	1.8	3.9	1.1	.59	1.8
16	1.6	5.4	3.6	3.3	4.1	3.7	3.2	2.3	3.9	1.5	1.0	1.8
17	1.5	6.0	3.9	3.2	3.6	3.8	3.1	2.5	3.6	1.6	1.1	1.7
18	1.5	5.7	3.7	3.1	3.4	3.6	2.9	2.4	3.5	1.7	1.3	1.7
19	1.5	5.2	3.6	3.0	3.3	3.4	2.5	2.1	3.3	1.7	1.6	2.0
20	1.5	5.3	3.3	2.8	3.2	3.2	2.3	1.9	2.9	1.5	1.7	2.3
21	1.5	5.5	3.3	2.7	3.0	3.0	2.8	2.1	3.4	1.5	1.6	3.4
22	1.5	5.3	2.8	2.7	2.8	2.8	3.2	2.2	4.2	1.5	4.7	3.8
23	1.6	5.0	2.8	2.6	2.7	2.6	3.7	2.2	4.1	1.5	7.4	4.0
24	3.0	4.7	2.8	2.5	3.0	2.5	3.8	2.6	3.9	1.5	7.9	4.1
25	3.9	4.6	2.7	2.4	6.8	2.4	3.5	3.1	3.5	2.0	8.3	3.9
26	4.0	5.7	2.7	2.4	7.9	2.4	3.2	3.4	3.2	2.3	8.2	3.6
27	3.9	6.4	2.7	2.5	7.5	2.5	2.9	4.0	3.0	2.2	7.2	3.4
28	3.5	6.4	2.7	2.4	6.4	2.6	2.5	4.0	2.8	2.1	6.0	3.3
29	3.2	6.2	2.7	2.5	—	2.6	2.2	3.9	2.6	2.2	4.9	3.1
30	3.2	5.9	2.7	3.0	—	2.7	1.9	4.1	2.3	2.1	4.1	3.1
31	3.2	—	2.8	3.5	—	2.7	—	3.5	—	2.0	3.5	—
TOTAL	69.84	146.3	103.7	90.8	125.6	101.0	99.7	67.1	109.5	51.4	88.59	74.1
MEAN	2.25	4.88	3.35	2.93	4.49	3.26	3.32	2.16	3.65	1.66	2.86	2.47
MAX	4.0	6.4	5.1	3.5	8.0	5.4	4.4	4.1	4.6	2.3	8.3	4.1
MIN	.96	3.1	2.7	2.4	2.7	2.4	1.9	1.0	2.3	1.1	.59	1.4

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2001, BY WATER YEAR (WY)

MEAN	5.91	6.78	6.80	6.61	6.52	6.98	7.03	5.81	5.01	4.48	4.82	5.33
MAX	9.74	11.0	11.8	9.79	9.63	10.4	11.2	12.5	11.4	10.7	11.8	12.6
(WY)	1976	1986	1976	1973	1976	1973	1973	1973	1973	1973	1975	1975
MIN	1.82	2.54	3.35	2.93	2.91	3.17	3.32	2.16	1.13	1.20	1.24	1.18
(WY)	2000	2000	2001	2001	2000	2000	2001	2001	1988	1988	2000	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1972 - 2001	
ANNUAL TOTAL	1082.85		1127.63			
ANNUAL MEAN	2.96		3.09		5.97	
HIGHEST ANNUAL MEAN					10.0	1975
LOWEST ANNUAL MEAN					2.82	2000
HIGHEST DAILY MEAN	8.9	May 19	8.3	Aug 25	35	(a)
LOWEST DAILY MEAN	.41	Jul 27	.59	Aug 15	.34	Jul 27 1996
ANNUAL SEVEN-DAY MINIMUM	.49	Jul 23	.78	Aug 10	.49	Jul 23 2000
MAXIMUM PEAK FLOW			9.5	Aug 25	36	(b)
MAXIMUM PEAK STAGE			1.44	Aug 25	2.47	Dec 5 1992
INSTANTANEOUS LOW FLOW			.50	Aug 15	.20	Jul 27 1996
10 PERCENT EXCEEDS	5.1		4.9		9.5	
50 PERCENT EXCEEDS	2.8		3.1		5.7	
90 PERCENT EXCEEDS	1.1		1.5		2.7	

(a) Dec. 6, 1992, Oct. 28, 1994.
(b) Dec. 5, 1992, Oct. 28, 1994, Apr. 16, 1995.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106362 ASYLUM LAKE NEAR KALAMAZOO, MI

LOCATION.--Lat 42°15'57", long 85°38'20", in NE1/4 SW1/4 sec. 30, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on south side of lake, 0.5 mi west of Kalamazoo.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--October 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 863.69 ft above sea level (levels by City of Kalamazoo).

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 5.12 ft, Aug. 22, 2001; minimum, 4.33 ft, Aug. 22, 2000.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.12 ft, Aug. 22; minimum, 4.35 ft, Aug. 15, 16.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.44	4.46	4.60	4.55	4.53	4.70	4.58	4.59	4.67	4.55	4.54	4.82
2	4.43	4.45	4.58	4.54	4.53	4.68	4.58	4.59	4.70	4.52	4.52	4.80
3	4.42	4.45	4.56	4.54	4.52	4.66	4.58	4.58	4.69	4.52	4.51	4.78
4	4.56	4.44	4.55	4.53	4.52	4.65	4.57	4.57	4.67	4.52	4.49	4.76
5	4.56	4.43	4.54	4.53	4.52	4.64	4.57	4.56	4.66	4.50	4.48	4.74
6	4.56	4.42	4.54	4.52	4.52	4.63	4.61	4.55	4.67	4.48	4.47	4.73
7	4.56	4.45	4.54	4.51	4.51	4.62	4.62	4.55	4.67	4.47	4.46	4.72
8	4.56	4.45	4.54	4.50	4.51	4.62	4.61	4.58	4.65	4.47	4.45	4.73
9	4.54	4.48	4.53	4.50	4.67	4.62	4.62	4.56	4.64	4.47	4.44	4.79
10	4.52	4.53	4.52	4.50	4.75	4.61	4.62	4.56	4.65	4.46	4.44	4.80
11	4.51	4.51	4.55	4.49	4.72	4.63	4.62	4.59	4.70	4.44	4.42	4.78
12	4.49	4.50	4.62	4.49	4.69	4.63	4.62	4.59	4.76	4.42	4.40	4.76
13	4.48	4.55	4.59	4.48	4.67	4.63	4.60	4.57	4.74	4.40	4.39	4.75
14	4.48	4.57	4.62	4.48	4.66	4.63	4.59	4.57	4.71	4.39	4.37	4.74
15	4.47	4.57	4.61	4.49	4.65	4.63	4.61	4.67	4.72	4.38	4.35	4.72
16	4.47	4.56	4.61	4.49	4.64	4.64	4.62	4.70	4.73	4.38	4.45	4.71
17	4.46	4.61	4.63	4.49	4.62	4.65	4.60	4.70	4.70	4.38	4.50	4.70
18	4.45	4.59	4.61	4.49	4.60	4.64	4.59	4.67	4.71	4.40	4.49	4.69
19	4.44	4.58	4.61	4.48	4.59	4.63	4.58	4.65	4.70	4.39	4.52	4.74
20	4.44	4.60	4.59	4.47	4.58	4.62	4.61	4.63	4.67	4.39	4.52	4.77
21	4.43	4.63	4.59	4.47	4.57	4.62	4.67	4.65	4.70	4.44	4.50	4.88
22	4.42	4.62	4.59	4.47	4.56	4.61	4.70	4.67	4.73	4.50	4.90	4.90
23	4.41	4.60	4.58	4.46	4.55	4.61	4.72	4.65	4.70	4.50	5.12	4.90
24	4.54	4.58	4.58	4.46	4.58	4.60	4.71	4.66	4.68	4.50	5.06	4.92
25	4.55	4.57	4.57	4.45	4.83	4.59	4.68	4.70	4.65	4.60	5.04	4.89
26	4.54	4.62	4.56	4.45	4.80	4.59	4.66	4.70	4.63	4.66	5.04	4.87
27	4.54	4.63	4.56	4.46	4.76	4.59	4.65	4.71	4.62	4.62	5.00	4.86
28	4.52	4.62	4.55	4.45	4.73	4.58	4.63	4.71	4.60	4.60	4.96	4.84
29	4.50	4.62	4.56	4.46	—	4.58	4.62	4.69	4.59	4.58	4.92	4.82
30	4.49	4.62	4.56	4.51	—	4.58	4.60	4.67	4.57	4.56	4.88	4.80
31	4.48	—	4.55	4.53	—	4.57	—	4.65	—	4.55	4.86	—
MEAN	4.49	4.54	4.57	4.49	4.62	4.62	4.62	4.63	4.68	4.49	4.63	4.79
MAX	4.56	4.63	4.63	4.55	4.83	4.70	4.72	4.71	4.76	4.66	5.12	4.92
MIN	4.41	4.42	4.52	4.45	4.51	4.57	4.57	4.55	4.57	4.38	4.35	4.69

CAL YR 2000 MEAN 4.54 MAX 4.95 MIN 4.33
WTR YR 2001 MEAN 4.60 MAX 5.12 MIN 4.35

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106400 WEST FORK PORTAGE CREEK AT KALAMAZOO, MI

LOCATION.--Lat 42°14'40", long 85°36'50", in NE1/4 sec.5, T.3 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, on right bank 30 ft upstream from culvert on Oakland Drive, 2.5 mi upstream from mouth, and 3.7 mi southwest of main business district of Kalamazoo.

DRAINAGE AREA.--18.7 mi^2.

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

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 858.09 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records poor. At times, flow is affected by ground-water withdrawals. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.1	2.3	6.4	e3.1	e3.8	7.8	4.3	2.3	e4.8	e2.7	e2.5	4.4
2	e1.1	2.2	5.6	e3.1	e3.8	7.1	4.2	2.2	e4.7	e2.4	e2.3	3.8
3	e1.1	2.4	5.0	e3.0	e3.6	6.5	4.4	2.0	e4.8	e2.3	e2.2	3.2
4	e3.0	3.0	4.7	e3.2	e3.4	6.1	4.8	e1.9	e5.2	e2.1	e2.1	2.7
5	2.3	2.7	4.4	e3.3	e3.3	5.5	4.9	e1.8	e5.3	e2.0	e1.8	2.3
6	2.1	2.1	4.3	e3.4	e3.2	5.3	6.1	e1.8	e5.6	e1.9	e1.6	2.0
7	2.3	2.8	4.1	e3.4	e3.1	4.8	5.9	e1.7	e5.5	e1.9	e1.4	2.0
8	3.0	3.0	4.2	e3.3	e3.0	4.8	5.4	1.9	e5.1	e1.9	e1.3	2.3
9	3.1	3.8	3.7	e3.0	13	4.7	5.4	1.7	e4.8	e1.8	e1.3	e2.9
10	2.8	5.3	3.6	e3.0	15	4.8	5.3	1.7	e4.7	e1.8	e1.2	e3.2
11	2.6	5.1	3.2	e3.1	12	5.1	4.9	1.7	e5.1	e1.7	e1.2	e3.0
12	2.3	4.8	e3.7	e3.1	9.7	5.0	4.8	1.9	e6.4	e1.7	e1.2	e2.9
13	2.1	5.6	e3.9	e3.2	8.1	5.2	4.5	1.6	e5.8	e1.6	e1.2	2.8
14	1.8	6.1	e4.0	e3.3	7.2	5.1	4.1	1.8	e5.4	e1.5	e.98	2.6
15	1.7	6.0	e3.9	e3.4	6.7	5.4	4.6	3.2	e5.2	e1.5	e.82	2.5
16	1.6	5.7	e3.9	e3.5	6.0	5.9	5.0	4.5	e5.0	e1.4	e1.1	2.4
17	1.5	6.4	e4.1	e3.4	e5.4	5.9	4.6	4.1	e4.8	e1.4	1.4	2.3
18	1.4	6.2	e4.0	e3.3	4.9	5.6	4.3	3.0	e4.6	e1.4	2.0	2.3
19	1.3	5.8	e3.8	e3.2	4.5	5.2	4.0	2.2	e4.4	e2.2	e2.1	3.1
20	1.2	5.9	e3.6	e3.0	4.3	5.0	4.1	2.1	e3.9	e2.1	e2.2	3.5
21	1.2	6.6	e3.3	e2.9	e4.0	4.8	5.2	2.3	e4.4	e2.0	e2.2	e4.1
22	1.2	6.1	e3.1	e2.9	e3.7	4.8	5.9	e2.7	e5.4	e2.0	e6.0	e4.9
23	1.3	5.7	e3.1	e2.8	3.4	4.5	6.2	e3.0	e5.3	e2.0	e9.5	e5.6
24	3.0	5.2	e3.0	e2.7	4.7	4.1	5.8	e3.4	e5.0	e2.0	e12	e6.4
25	3.4	5.0	e3.0	e2.6	14	3.9	4.9	e4.0	e4.6	e2.6	e14	6.0
26	3.4	6.7	e2.9	e2.6	12	3.9	4.4	e4.5	e4.2	e2.9	12	5.5
27	3.4	7.6	e2.9	e2.6	9.9	3.8	4.0	e5.2	e3.9	e3.0	10	5.1
28	3.2	7.2	e2.9	e2.6	9.2	3.8	3.5	e5.2	e3.7	e2.9	8.6	4.8
29	2.9	7.1	e2.9	e2.7	—	3.8	3.1	e5.2	e3.4	e2.8	7.0	4.6
30	2.7	7.0	e2.9	e3.1	—	3.8	2.7	e5.2	e3.1	e2.8	6.0	4.3
31	2.5	—	e3.0	e3.6	—	3.9	—	e5.2	—	e2.7	5.1	—
TOTAL	67.6	151.4	117.1	95.4	184.9	155.9	141.3	91.0	144.1	65.0	124.30	107.5
MEAN	2.18	5.05	3.78	3.08	6.60	5.03	4.71	2.94	4.80	2.10	4.01	3.58
MAX	3.4	7.6	6.4	3.6	15	7.8	6.2	5.2	6.4	3.0	14	6.4
MIN	1.1	2.1	2.9	2.6	3.0	3.8	2.7	1.6	3.1	1.4	.82	2.0

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2001, BY WATER YEAR (WY)

MEAN	9.08	9.96	10.1	9.62	9.95	11.2	11.2	9.46	8.43	7.36	7.28	8.15
MAX	15.2	16.8	16.8	14.5	15.9	18.0	18.2	15.2	14.9	12.7	13.9	18.8
(WY)	1970	1986	1992	1993	1971	1971	1975	1975	1969	1970	1975	1975
MIN	1.77	2.32	3.78	3.08	3.30	3.78	4.71	2.94	2.36	1.74	1.55	1.30
(WY)	2000	2000	2001	2001	2000	2000	2001	2001	1988	2000	2000	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1959 - 2001	
ANNUAL TOTAL	1281.55		1445.50			
ANNUAL MEAN	3.50		3.96		9.31	
HIGHEST ANNUAL MEAN					14.1	1975
LOWEST ANNUAL MEAN					3.33	2000
HIGHEST DAILY MEAN	16	May 19	15	Feb 10	40	(a)
LOWEST DAILY MEAN	.53	Jul 27	.82	Aug 15	.34	Sep 27 1999
ANNUAL SEVEN-DAY MINIMUM	.61	Jul 23	1.1	Aug 10	.57	Sep 21 1999
MAXIMUM PEAK FLOW			17	Feb 9	46	Jun 21 1997
MAXIMUM PEAK STAGE			2.71	Feb 9	3.33	Jun 21 1997
INSTANTANEOUS LOW FLOW					.29	Sep 27 1999
10 PERCENT EXCEEDS	5.9		6.1		14	
50 PERCENT EXCEEDS	3.1		3.5		9.0	
90 PERCENT EXCEEDS	1.2		1.7		4.4	

(a) Dec. 7, 1992, June 21, 1997.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106906 KALAMAZOO RIVER AT PLAINWELL, MI

LOCATION.--Lat 42°26'55", long 85°38'58", in NW1/4 NE1/4 sec.30, T.1 N., R.11 W., Allegan County, Hydrologic Unit 04050003, on left bank 0.4 mi downstream from bridge on 10th Street in Plainwell, 0.4 mi upstream from bridge on U.S. Highway 131, and 2.2 mi upstream from Gun River.

DRAINAGE AREA.--1,260 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 2000 to Sepgember 2001.

GAGE.--Water-stage recorder. Elevation of gage is 720 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good. Flow regulated by powerplant upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	763	879	1550	1060	1300	3810	1370	1440	2540	977	1000	899
2	698	685	1510	979	1280	3580	1390	1390	2460	1000	800	735
3	846	875	1440	996	1280	3340	1360	1310	2360	1150	971	962
4	972	681	1290	950	1290	3010	1350	1280	2240	921	674	676
5	1080	781	1270	1000	1360	2760	1330	1270	2210	909	897	757
6	1270	608	1240	1010	1360	2520	1370	1170	2250	718	677	852
7	1240	731	1180	1120	1350	2290	1310	1010	2140	937	702	615
8	1240	877	945	999	1350	2110	1390	1220	2050	925	729	760
9	1200	722	1120	973	2060	2040	1440	1160	1930	743	929	1140
10	1050	1220	919	731	2520	1900	1470	1130	1730	936	693	1380
11	1150	1230	981	1030	2900	1860	1570	1040	1780	715	661	1300
12	922	1010	1180	1140	3080	1840	1520	1180	1850	892	671	1270
13	912	1310	633	977	3550	1850	1420	1130	1700	617	677	990
14	722	1110	647	995	4380	1850	1360	917	1620	695	708	966
15	929	1330	782	961	4510	1830	1380	1670	1510	822	701	938
16	894	1300	1330	1040	3990	1910	1360	2510	1520	548	980	843
17	612	1390	1390	1160	3480	1960	1350	2570	1420	710	1110	701
18	876	1320	1080	1010	3120	1880	1430	2930	1490	909	784	913
19	695	1290	846	1150	2620	1780	1300	3500	1510	619	1120	806
20	696	1290	1120	1010	2530	1780	1420	3860	1520	611	1290	968
21	806	1290	1280	999	2170	1740	1550	3770	1540	896	1350	1310
22	661	1260	1010	1100	2070	1630	1730	3710	1580	1410	1820	1540
23	820	1220	1060	983	1810	1620	2010	3100	1640	973	2340	1500
24	1030	1170	1040	1100	1780	1590	1930	2670	1620	727	1950	1540
25	1260	979	1170	726	2600	1450	2080	2570	1480	1290	1540	1410
26	1160	1330	1160	1100	2920	1450	2120	2390	1480	1350	1490	1370
27	1000	1180	1070	724	3060	1430	2060	2480	1400	1470	1390	1310
28	1010	1420	1000	907	3340	1320	1890	2480	1360	1370	1510	1260
29	936	1520	1150	899	—	1330	1730	2640	1300	1090	1380	1140
30	898	1590	1170	1040	—	1330	1550	2670	1240	955	1120	910
31	894	—	977	1120	—	1310	—	2510	—	762	1020	—
TOTAL	29242	33598	34540	30989	69060	62100	46540	64677	52470	28647	33684	31761
MEAN	943	1120	1114	1000	2466	2003	1551	2086	1749	924	1087	1059
MAX	1270	1590	1550	1160	4510	3810	2120	3860	2540	1470	2340	1540
MIN	612	608	633	724	1280	1310	1300	917	1240	548	661	615
CFSM	.75	.89	.88	.79	1.96	1.59	1.23	1.66	1.39	.73	.86	.84
IN.	.86	.99	1.02	.91	2.04	1.83	1.37	1.91	1.55	.85	.99	.94

SUMMARY STATISTICS FOR 2001 WATER YEAR

ANNUAL TOTAL	517308	
ANNUAL MEAN	1417	
HIGHEST DAILY MEAN	4510	Feb 15
LOWEST DAILY MEAN	548	Jul 16
ANNUAL SEVEN-DAY MINIMUM	702	Jul 14
MAXIMUM PEAK FLOW	4580	Feb 15
MAXIMUM PEAK STAGE	4.17	Feb 15
ANNUAL RUNOFF (CFSM)	1.12	
ANNUAL RUNOFF (INCHES)	15.27	
10 PERCENT EXCEEDS	2480	
50 PERCENT EXCEEDS	1270	
90 PERCENT EXCEEDS	730	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04106906 KALAMAZOO RIVER AT PLAINWELL, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February to September 2001.

REMARKS.--Cross-sectional samples for suspended sediment were collected from bridge 0.4 mi upstream from gage.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SEDIMENT, SUSPENDED (MG/L) (80154)
FEB 2001			
14...	1000	48	44
22...	1400	59	29
26...	1030	67	12
MAR			
13...	1230	79	24
13...	1235	81	13
28...	1220	87	29
APR			
17...	1100	84	14
27...	0900	86	29
MAY			
17...	1130	58	32
24...	1110	67	30
JUN			
01...	1300	85	26
13...	1120	70	39
JUL			
02...	1015	85	21
AUG			
09...	1100	61	47
SEP			
11...	1100	73	53

STREAMS TRIBUTARY TO LAKE MICHIGAN

04107850 KALAMAZOO RIVER NEAR ALLEGAN, MI

LOCATION.--Lat 42°28'56", long 85°47'54", in NW1/4 SW1/4 sec.12, T.1 N., R.13 W., Allegan County, Hydrologic Unit 04050003, on left bank 10 ft upstream from bridge on 26th Street, 600 ft downstream from Trowbridge Dam, and 4.0 mi southeast of Allegan.

DRAINAGE AREA.--1,530 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 2000 to September 2001.

GAGE.--Water-stage recorder. Elevation of gage is 680 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, Oct. 1-19, which are fair. Flow regulated by powerplant upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1050	1200	2170	1520	1990	4030	1770	1820	2900	1350	1120	1250
2	e970	1070	2060	1430	1950	4000	1800	1780	2940	1270	997	1050
3	e1100	1170	1960	e1400	1880	3710	1770	1690	2890	1450	1120	1210
4	e1300	1060	1790	e1400	1860	3450	1750	1630	2700	1250	922	1070
5	e1450	1160	1730	1410	1890	3160	1740	1610	2620	1210	1020	1040
6	e1700	993	1670	1450	1890	2940	1790	1510	2660	1060	907	1170
7	e1700	1090	1640	1570	1860	2760	1740	1390	2620	1200	880	999
8	e1700	1200	1450	1410	1900	2550	1810	1560	2460	1200	885	1040
9	e1650	1120	1540	e1350	3270	2490	1840	1500	2380	1070	1010	1360
10	e1450	1550	1390	e1200	4480	2370	1900	1480	2170	1170	903	1610
11	e1550	1590	1400	1410	3900	2350	2040	1420	2180	1020	869	1560
12	e1300	1420	1570	1580	3750	2360	2010	1570	2360	1140	865	1520
13	e1250	1650	1260	1390	3880	2370	1870	1530	2290	958	863	1330
14	e1000	1640	1170	1430	4600	2350	1810	1390	2150	938	868	1260
15	e1250	1840	1230	1460	5050	2330	1770	e2350	2010	1100	871	1230
16	e1200	1790	1630	1520	4650	2370	1760	3200	2080	893	995	1200
17	e950	1920	1810	1710	4010	2450	1720	3460	1900	929	1230	1030
18	e1200	1900	1620	1520	3580	2380	1830	3330	1950	1140	1030	1200
19	e1000	1810	1420	1680	3090	2250	1710	3640	1970	931	1150	1140
20	1060	1810	1530	1470	2940	2180	1800	4030	1950	901	1350	1270
21	1150	1830	1690	1510	2630	2120	2050	4180	1880	985	1430	1490
22	994	1800	e1500	1530	2500	2060	2330	4470	2030	1490	1740	2090
23	1150	1770	e1500	1400	2280	2050	2640	3730	2000	1230	2850	1910
24	1200	1730	e1500	1560	2240	2010	2500	3150	1970	1080	2290	2120
25	1500	1580	e1650	1230	3410	1900	2470	e3100	1820	1300	1930	1900
26	1470	2020	e1550	1530	3850	1870	2500	e2900	1840	1550	1850	1820
27	1300	2190	e1500	1240	3670	1870	2420	e3000	1720	1540	1710	1730
28	1320	2290	e1450	1360	3720	1780	2300	e3000	1670	1490	1770	1660
29	1300	2240	e1600	1370	---	1780	2130	e3050	1610	1300	1660	1600
30	1220	2240	e1650	1570	---	1770	1970	e3100	1550	1160	1470	1360
31	1210	---	e1550	1800	---	1760	---	2910	---	964	1310	---
TOTAL	39644	48673	49180	45410	86720	75820	59540	78480	65270	36269	39865	42219
MEAN	1279	1622	1586	1465	3097	2446	1985	2532	2176	1170	1286	1407
MAX	1700	2290	2170	1800	5050	4030	2640	4470	2940	1550	2850	2120
MIN	950	993	1170	1200	1860	1760	1710	1390	1550	893	863	999
CFSM	.84	1.06	1.04	.96	2.02	1.60	1.30	1.65	1.42	.76	.84	.92
IN.	.96	1.18	1.20	1.10	2.11	1.84	1.45	1.91	1.59	.88	.97	1.03

SUMMARY STATISTICS — FOR 2001 WATER YEAR

ANNUAL TOTAL	667090	
ANNUAL MEAN	1828	
HIGHEST DAILY MEAN	5050	Feb 15
LOWEST DAILY MEAN	863	Aug 13
ANNUAL SEVEN-DAY MINIMUM	891	Aug 10
MAXIMUM PEAK FLOW	5150	Feb 15
MAXIMUM PEAK STAGE	11.07	Feb 15
INSTANTANEOUS LOW FLOW	836	Jul 16
ANNUAL RUNOFF (CFSM)	1.19	
ANNUAL RUNOFF (INCHES)	16.22	
10 PERCENT EXCEEDS	2940	
50 PERCENT EXCEEDS	1650	
90 PERCENT EXCEEDS	1060	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04107850 KALAMAZOO RIVER NEAR ALLEGAN, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--June to September 2001.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June to September 2001.
WATER TEMPERATURE: June to September 2001.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval. Automatic suspended sediment pumping sampler since Feb. 13, 2001.

REMARKS.--Water-quality monitor sensors and automatic pump sampler intake located approximately 6 ft into channel from left bank. Cross-sectional samples for suspended sediment were collected from bridge 5 ft downstream from gage. Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 723 microsiemens, Aug. 8; minimum, 378 microsiemens, Aug. 23.
WATER TEMPERATURE: Maximum, 29.5°C, Aug. 9; minimum, 12.0°C, Sept. 29.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	525	512	522	679	653	664	675	628	652	635	620	628
2	524	505	517	679	663	671	691	628	651	652	616	629
3	527	505	521	675	647	660	698	670	682	646	612	625
4	540	525	534	659	635	648	695	657	673	652	616	627
5	538	531	535	658	640	649	702	653	678	676	652	662
6	536	527	533	661	633	643	680	630	648	667	642	652
7	535	527	531	670	650	658	720	680	698	678	634	653
8	545	530	539	655	614	634	723	687	702	670	643	662
9	540	513	534	640	610	624	707	664	685	665	622	642
10	544	528	537	654	608	635	675	631	656	627	558	604
11	534	494	522	660	620	630	678	651	666	635	591	620
12	592	501	547	677	645	661	672	642	653	625	602	613
13	588	545	575	---	---	---	652	631	641	627	596	611
14	600	579	592	---	---	---	683	652	671	626	612	621
15	609	583	599	---	---	---	692	669	680	627	612	621
16	592	567	582	---	---	---	679	656	668	637	615	627
17	610	584	600	---	---	---	672	553	608	656	616	631
18	602	586	596	---	---	---	658	632	643	658	637	643
19	598	572	587	691	642	656	677	621	657	648	618	628
20	607	593	602	694	668	682	637	585	613	649	612	634
21	602	595	599	716	662	699	641	623	633	641	588	620
22	596	574	586	697	576	623	632	440	585	603	463	559
23	604	584	596	651	602	623	537	378	452	618	577	604
24	601	594	597	670	607	632	576	537	568	579	555	570
25	619	590	602	677	627	655	565	551	558	589	563	580
26	624	600	611	627	530	579	567	545	556	607	581	597
27	634	607	624	628	598	615	593	549	572	606	592	601
28	646	622	631	626	610	619	602	574	589	635	600	620
29	653	620	642	622	606	613	599	580	592	634	615	625
30	681	642	660	642	619	630	612	588	603	647	612	631
31	---	---	---	671	635	646	636	606	625	---	---	---
MONTH	681	494	575	---	---	---	723	378	631	678	463	621

STREAMS TRIBUTARY TO LAKE MICHIGAN

04107850 KALAMAZOO RIVER NEAR ALLEGAN, MI--Continued

TEMPERATURE, WATER, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	15.0	15.5	25.5	22.5	24.5	27.5	25.0	26.5	22.5	20.0	21.5
2	15.0	14.0	14.5	23.5	20.5	22.0	27.0	25.5	26.0	22.0	19.0	20.5
3	14.5	13.5	14.0	23.0	21.5	22.0	27.5	24.5	26.0	23.0	20.0	21.5
4	14.5	13.0	14.0	24.5	21.0	22.5	28.0	24.5	26.0	23.5	21.0	22.5
5	15.0	14.0	14.5	23.5	21.0	22.0	27.5	24.5	26.0	23.0	20.0	21.5
6	15.0	14.5	14.5	22.0	19.0	20.5	28.0	25.0	26.5	23.0	20.0	21.5
7	16.0	14.5	15.0	22.0	20.5	21.5	28.0	25.5	26.5	24.0	21.0	22.5
8	18.0	15.0	16.5	25.0	21.0	23.0	29.0	26.0	27.5	24.0	22.0	23.0
9	19.5	16.0	17.5	26.5	22.5	24.0	29.5	26.5	28.0	23.0	21.5	22.5
10	19.5	18.5	19.0	26.5	23.0	24.5	28.0	26.0	27.0	22.5	20.5	21.5
11	23.0	19.5	21.0	25.0	21.0	22.5	26.5	23.5	25.0	22.0	20.0	21.0
12	23.0	21.0	22.0	24.5	21.5	23.0	26.5	23.5	25.0	22.5	20.0	21.0
13	25.0	21.5	23.0	—	—	—	26.0	23.5	24.5	21.5	18.5	20.0
14	26.5	23.5	24.5	—	—	—	25.0	21.5	23.5	19.0	17.0	18.0
15	25.5	23.5	25.0	—	—	—	24.0	21.5	23.0	18.5	17.0	17.5
16	25.0	22.5	23.5	—	—	—	23.5	21.5	22.0	19.0	16.0	17.5
17	25.0	22.5	23.5	—	—	—	21.5	20.5	21.0	18.0	16.5	17.5
18	24.0	22.5	23.5	—	—	—	21.5	20.5	21.0	19.5	17.0	18.0
19	25.5	22.5	24.0	26.5	23.5	25.0	21.0	20.0	20.5	18.5	18.0	18.0
20	24.5	23.0	23.5	27.0	24.0	25.5	22.5	19.5	21.0	19.0	17.5	18.0
21	23.0	20.5	21.5	27.0	25.0	26.0	22.5	20.0	21.0	18.0	17.0	17.5
22	22.0	19.5	20.5	28.0	25.0	26.5	21.5	20.0	20.5	18.5	16.5	17.0
23	22.0	20.0	21.0	27.5	25.0	26.0	21.5	20.0	20.5	17.5	17.0	17.0
24	23.0	20.0	21.5	27.0	23.5	25.0	22.0	21.0	21.5	17.0	15.0	16.0
25	24.0	20.5	22.0	26.0	24.0	24.5	22.0	21.0	21.5	15.0	13.5	14.0
26	25.0	22.0	23.5	25.5	23.0	24.0	23.0	21.0	22.0	13.5	13.0	13.0
27	26.0	22.5	24.0	25.0	22.0	23.5	23.5	21.5	22.5	13.0	12.5	13.0
28	26.0	23.5	24.5	24.5	22.0	23.5	24.5	22.0	23.0	13.0	12.5	12.5
29	26.5	24.0	25.0	26.0	23.0	24.5	24.0	21.5	22.5	14.5	12.0	13.0
30	27.0	24.0	25.5	26.5	23.5	25.0	24.5	22.0	23.0	15.5	12.5	14.0
31	—	—	—	27.5	23.5	25.5	24.5	22.5	23.5	—	—	—
MONTH	27.0	13.0	20.6	—	—	—	29.5	19.5	23.7	24.0	12.0	18.4

STREAMS TRIBUTARY TO LAKE MICHIGAN

04107850 KALAMAZOO RIVER NEAR ALLEGAN, MI—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SEDIMENT, SUSPENDED (MG/L) (80154)
FEB 2001			
13...	1615	79	81
13...	1630	51	40
22...	1115	40	15
26...	1215	94	21
26...	1230	66	25
27...	1315	64	20
MAR			
01...	1215	84	17
01...	1230	47	25
02...	1315	70	15
04...	1315	66	32
07...	1325	50	12
07...	1330	55	15
07...	1340	56	13
07...	1345	76	10
11...	1315	75	52
17...	1315	76	36
20...	1315	86	19
20...	1320	75	29
24...	1315	85	45
28...	1315	83	45
28...	1430	84	49
APR			
05...	1240	86	31
05...	1300	88	28
11...	1315	85	47
17...	1315	84	42
17...	1405	81	31
23...	1315	77	136
27...	1130	76	90
MAY			
02...	1200	72	45
02...	1215	92	29
06...	1315	85	50
13...	1315	84	43
15...	1315	93	71
16...	1315	93	244
16...	1615	95	202
17...	1400	88	29
17...	1415	81	38
22...	1230	46	44
22...	1250	73	39
22...	1255	74	37
JUN			
01...	1035	75	29
01...	1045	81	29
06...	1315	85	41
12...	1252	87	40
12...	1300	79	67
12...	1315	75	67
22...	1315	75	76
JUL			
02...	1200	77	32
02...	1230	68	50
16...	1315	88	33
18...	1200	78	30
22...	1315	77	63
25...	1315	79	34
AUG			
09...	1315	90	17
17...	1315	84	26
23...	1015	89	47
23...	1115	77	56
SEP			
03...	1315	68	47
11...	1315	76	29
18...	1315	78	39
22...	1315	78	24
28...	1045	74	44
28...	1050	83	33

STREAMS TRIBUTARY TO LAKE MICHIGAN

04108600 RABBIT RIVER NEAR HOPKINS, MI

LOCATION.--Lat 42°38'32", long 85°43'19", in SE1/4 sec.16, T.3 N., R.12 W., Allegan County, Hydrologic Unit 04050003, on left bank at downstream side of bridge on 18th Street, 2.5 mi northeast of Hopkins.

DRAINAGE AREA.--71.4 mi^2.

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 700 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	29	118	e60	150	109	55	46	80	32	18	27
2	44	28	93	e60	116	96	54	44	103	31	17	25
3	42	27	75	e59	94	89	52	41	108	30	18	23
4	58	26	67	e60	85	88	49	39	86	30	17	22
5	62	26	63	e64	74	81	48	38	74	28	16	21
6	54	25	58	e62	70	70	59	37	74	27	16	20
7	56	28	e59	e59	64	69	63	37	72	26	16	24
8	53	30	e60	e54	75	69	59	48	65	27	15	33
9	49	31	58	e48	536	68	57	40	59	26	15	29
10	45	106	57	e57	e590	64	58	39	56	24	19	36
11	41	76	55	e56	e340	83	78	104	61	23	18	31
12	39	51	47	e55	e250	91	124	109	82	23	16	27
13	37	71	e58	e55	182	102	84	66	83	22	15	25
14	36	129	e63	57	142	93	67	55	64	21	14	24
15	35	152	e60	71	146	91	60	178	e56	21	14	23
16	39	115	e64	104	125	113	56	e325	e62	20	17	22
17	37	161	e67	104	94	100	52	e440	e64	20	21	22
18	35	151	e70	92	e80	83	49	e245	e79	21	18	22
19	34	96	e69	81	e75	75	47	130	77	20	19	26
20	34	84	e68	64	72	71	52	86	58	20	19	33
21	33	89	e67	71	66	68	92	111	53	20	17	33
22	33	90	e66	56	60	66	142	245	61	23	54	37
23	32	87	e65	50	61	63	178	146	55	23	98	34
24	38	80	e64	49	63	60	128	97	49	33	49	52
25	40	72	e63	46	320	58	87	111	45	25	38	40
26	38	170	e62	43	312	56	70	110	42	25	40	37
27	37	302	e62	e44	215	58	62	161	39	22	36	38
28	35	221	e61	e43	140	59	55	306	36	21	32	35
29	32	148	e61	44	---	59	51	203	35	20	29	32
30	31	124	e60	92	---	57	48	116	34	20	27	30
31	30	---	e60	165	---	55	---	83	---	19	27	---
TOTAL	1257	2825	2020	2025	4597	2364	2136	3836	1912	743	785	883
MEAN	40.5	94.2	65.2	65.3	164	76.3	71.2	124	63.7	24.0	25.3	29.4
MAX	62	302	118	165	590	113	178	440	108	33	98	52
MIN	30	25	47	43	60	55	47	37	34	19	14	20
CFSM	.57	1.32	.91	.91	2.30	1.07	1.00	1.73	.89	.34	.35	.41
IN.	.65	1.47	1.05	1.06	2.40	1.23	1.11	2.00	1.00	.39	.41	.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2001, BY WATER YEAR (WY)

MEAN	39.4	57.8	69.8	66.9	78.9	105	95.0	65.8	58.0	33.6	28.2	33.7
MAX	119	171	131	146	192	227	152	152	183	99.0	86.8	123
(WY)	1987	1991	1976	1993	1997	1979	1993	2000	1997	1986	1994	1978
MIN	15.0	14.5	21.7	19.8	25.7	32.0	49.4	25.1	16.4	13.6	12.5	10.1
(WY)	1969	2000	1999	1970	1970	2000	1968	1977	1987	1987	1970	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1966 - 2001	
ANNUAL TOTAL	23127		25383			
ANNUAL MEAN	63.2		69.5		60.9	
HIGHEST ANNUAL MEAN					89.3	1993
LOWEST ANNUAL MEAN					32.5	1977
HIGHEST DAILY MEAN	855	May 19	590	Feb 10	2320	Jun 21 1997
LOWEST DAILY MEAN	17	Sep 7	14	Aug 14	7.9	Sep 12 1999
ANNUAL SEVEN-DAY MINIMUM	18	Sep 3	16	Aug 9	8.5	Sep 9 1999
MAXIMUM PEAK FLOW			1020	Feb 9	(a)3740	Jun 21 1997
MAXIMUM PEAK STAGE			8.86	Feb 9	11.11	Jun 21 1997
INSTANTANEOUS LOW FLOW			13	(b)		
ANNUAL RUNOFF (CFSM)	.88		.97		.85	
ANNUAL RUNOFF (INCHES)	12.05		13.22		11.59	
10 PERCENT EXCEEDS	116		124		114	
50 PERCENT EXCEEDS	39		57		42	
90 PERCENT EXCEEDS	21		22		19	

(a) From rating curve extended above 1,200 ft^3/s.
(b) Aug. 15, 16.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04108800 MACATAWA RIVER NEAR ZEELAND, MI

LOCATION.--Lat 42°46'40", long 86°01'06", in NW1/4 sec.31, T.5 N., R.14 W., Ottawa County, Hydrologic Unit 04050002, on left bank 20 ft upstream from bridge on State Road, 0.2 mi downstream from South Branch, and 2.5 mi south of Zeeland.

DRAINAGE AREA.--65.8 mi^2.

PERIOD OF RECORD.--October 1960 to current year. Prior to October 1978, published as Black River near Zeeland.

GAGE.--Water-stage recorder. Datum of gage is 585.7 ft above sea level (levels by Gove Associates, Inc.).

REMARKS.--Records fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	13	153	e82	352	65	35	16	51	11	16	41
2	19	12	78	e76	204	51	32	16	210	10	15	21
3	18	12	50	e70	129	47	28	15	204	9.9	14	16
4	25	12	42	e71	95	50	26	15	77	10	14	15
5	24	12	37	e73	83	42	25	15	50	9.0	13	13
6	23	11	35	e74	80	34	25	14	44	8.0	12	13
7	29	13	35	e75	68	34	26	14	41	7.5	12	18
8	26	13	34	e70	67	42	25	16	34	8.1	11	26
9	24	46	31	e65	1210	38	24	14	29	7.8	11	44
10	20	161	31	e60	1460	34	23	13	27	6.8	15	192
11	18	51	e32	e58	610	71	23	27	26	5.9	14	46
12	17	33	e44	e55	270	72	27	29	38	5.1	12	28
13	15	142	e53	e54	135	119	24	20	66	4.9	11	22
14	14	212	e51	65	131	64	21	18	36	4.7	9.7	18
15	14	203	e49	138	152	131	21	166	185	4.4	9.4	16
16	14	97	e47	318	102	205	21	295	379	4.4	12	15
17	13	450	e72	314	65	84	20	279	80	4.9	13	14
18	13	200	e97	241	e61	51	19	95	171	5.6	12	14
19	13	97	e110	162	e50	41	19	58	78	5.2	12	27
20	12	114	e115	97	e46	37	21	39	38	4.6	12	41
21	12	113	e115	79	45	35	33	26	34	5.2	11	73
22	12	126	e110	50	e41	32	46	27	38	5.3	92	111
23	13	138	e110	37	37	30	34	25	29	300	58	94
24	25	132	e110	35	58	29	39	33	24	858	25	191
25	21	109	e105	32	747	27	29	44	19	400	18	52
26	17	391	e105	e32	368	26	23	69	17	113	17	35
27	19	615	e100	e32	152	27	21	61	15	49	14	31
28	17	387	e100	e31	84	33	19	85	14	31	16	27
29	14	192	e97	e30	—	50	18	49	13	26	13	24
30	13	157	e94	e150	—	45	17	30	12	22	12	21
31	13	—	e89	453	—	34	—	24	—	18	93	—
TOTAL	548	4264	2331	3179	6902	1680	764	1647	2079	1965.3	619.1	1299
MEAN	17.7	142	75.2	103	246	54.2	25.5	53.1	69.3	63.4	20.0	43.3
MAX	29	615	153	453	1460	205	46	295	379	858	93	192
MIN	12	11	31	30	37	26	17	13	12	4.4	9.4	13
CFSM	.27	2.16	1.14	1.56	3.75	.82	.39	.81	1.05	.96	.30	.66
IN.	.31	2.41	1.32	1.80	3.90	.95	.43	.93	1.18	1.11	.35	.73

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2001, BY WATER YEAR (WY)

MEAN	28.7	75.6	94.4	86.9	118	162	105	64.7	48.6	23.3	17.1	32.9
MAX	152	333	328	278	408	499	206	308	295	185	122	252
(WY)	1987	1991	1983	1974	1997	1979	1993	2000	1997	1982	1994	1986
MIN	2.56	2.98	3.99	2.89	6.71	20.5	21.2	8.89	3.10	1.94	2.03	2.09
(WY)	1964	1977	1977	1977	1963	2000	1986	1968	1987	1965	1962	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1961 - 2001	
ANNUAL TOTAL	31132.2		27277.4			
ANNUAL MEAN	85.1		74.7		71.1	
HIGHEST ANNUAL MEAN					115	1993
LOWEST ANNUAL MEAN					24.6	1977
HIGHEST DAILY MEAN	2270	May 19	1460	Feb 10	5540	Jun 21 1997
LOWEST DAILY MEAN	5.2	Sep 7	4.4	Jul 15	1.2	Aug 2 1987
ANNUAL SEVEN-DAY MINIMUM	5.6	Sep 3	4.8	Jul 14	1.2	Aug 1 1987
MAXIMUM PEAK FLOW			2650	Feb 9	(a)8810	Jun 21 1997
MAXIMUM PEAK STAGE			12.79	Feb 9	(b)16.72	Jun 21 1997
INSTANTANEOUS LOW FLOW			4.1	(c)	.83	Aug 3 1988
ANNUAL RUNOFF (CFSM)	1.29		1.14		1.08	
ANNUAL RUNOFF (INCHES)	17.60		15.42		14.69	
10 PERCENT EXCEEDS	163		159		150	
50 PERCENT EXCEEDS	22		33		20	
90 PERCENT EXCEEDS	10		12		3.3	

(a) From rating curve extended above 2,000 ft^3/s.
(b) From floodmark.
(c) July 15, 16.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04109000 GRAND RIVER AT JACKSON, MI

LOCATION (REVISED).--Lat 42°17'01", long 84°24'32", in NW1/4 SE1/4 sec.22, T.2 S., R.1 W., Jackson County, Hydrologic Unit 04050004, on left bank on grounds of sewage-treatment plant, 1 mi north of Jackson, 2.2 mi upstream from Portage River, and at mile 216.

DRAINAGE AREA.--174 mi^2.

PERIOD OF RECORD.--April 1935 to current year.

REVISED RECORDS.--WSP 974: 1937(M). WSP 1387: 1936. WSP 1727: 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft above sea level (Fargo Engineering Co. bench mark). Prior to Sept. 24, 1935, nonrecording gage at same site and datum.

REMARKS.--Records good. Slight regulation by mills upstream from station. Flow includes about 20 ft^3/s as sewage effluent, which originates from ground-water sources, from the City of Jackson. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	89	154	117	135	439	152	129	252	79	49	61
2	68	88	153	119	132	405	153	124	249	75	65	57
3	68	86	195	119	118	374	158	117	220	79	54	56
4	186	81	202	122	134	319	207	111	215	71	49	56
5	163	77	135	121	138	298	215	110	209	68	45	53
6	178	78	104	115	134	285	230	114	254	67	50	50
7	190	81	107	114	131	276	228	115	298	70	49	55
8	183	81	106	115	136	265	215	120	293	70	48	60
9	149	117	96	107	367	252	194	111	277	71	54	105
10	122	113	101	113	394	238	181	105	260	67	64	84
11	101	103	93	113	374	270	176	102	226	63	43	71
12	108	99	86	112	417	293	185	99	169	62	40	102
13	100	129	115	111	445	300	223	94	149	61	42	100
14	93	118	111	110	450	291	214	93	138	60	40	94
15	100	116	109	120	425	288	193	183	152	59	39	85
16	114	114	132	120	412	290	176	284	127	58	66	59
17	108	116	131	122	391	286	168	278	114	66	48	58
18	102	111	119	124	367	279	165	291	134	60	58	57
19	107	107	129	127	363	275	164	305	114	57	52	117
20	109	107	126	112	352	269	189	303	121	56	51	79
21	102	104	127	122	296	215	e210	308	150	64	51	113
22	96	101	98	123	250	193	e240	304	196	58	75	84
23	89	93	120	118	239	189	e270	282	241	58	61	78
24	128	92	129	113	269	179	273	208	221	59	58	79
25	101	96	117	110	421	169	264	216	197	120	57	81
26	97	108	120	106	447	164	257	210	116	78	89	85
27	102	111	118	107	452	159	201	248	102	69	e75	80
28	93	112	113	101	445	158	176	315	96	62	e110	76
29	91	123	115	108	---	153	153	323	88	66	83	74
30	93	129	117	138	---	150	138	303	83	59	74	70
31	89	---	119	133	---	147	---	283	---	52	68	---
TOTAL	3496	3080	3797	3612	8634	7868	5968	6188	5461	2064	1807	2279
MEAN	113	103	122	117	308	254	199	200	182	66.6	58.3	76.0
MAX	190	129	202	138	452	439	273	323	298	120	110	117
MIN	66	77	86	101	118	147	138	93	83	52	39	50
CFSM	.65	.59	.70	.67	1.77	1.46	1.14	1.15	1.05	.38	.34	.44
IN.	.75	.66	.81	.77	1.85	1.68	1.28	1.32	1.17	.44	.39	.49

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 2001, BY WATER YEAR (WY)

MEAN	79.6	106	115	125	148	223	225	167	131	85.1	68.0	66.9
MAX	214	305	210	343	308	501	589	484	433	349	193	222
(WY)	1991	1993	1993	1993	2001	1976	1950	1943	1943	1968	1995	1975
MIN	23.4	25.5	27.7	27.2	31.5	73.2	64.3	54.7	34.3	19.5	15.1	25.2
(WY)	1964	1964	1964	1964	1964	1964	1935	1936	1936	1936	1936	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1935 - 2001	
ANNUAL TOTAL	45551		54254			
ANNUAL MEAN	124		149		129	
HIGHEST ANNUAL MEAN					216	1993
LOWEST ANNUAL MEAN					44.3	1964
HIGHEST DAILY MEAN	428	Jun 25	452	Feb 27	971	Jun 3 1943
LOWEST DAILY MEAN	55	Jan 1	39	Aug 15	12	Aug 23 1936
ANNUAL SEVEN-DAY MINIMUM	59	Jan 27	45	Aug 11	14	Aug 4 1936
MAXIMUM PEAK FLOW			530	May 16	(a)1070	Jun 25 1937
MAXIMUM PEAK STAGE			12.45	May 16	15.44	Jun 25 1968
INSTANTANEOUS LOW FLOW			19	Oct 11	9.2	Aug 22 1936
ANNUAL RUNOFF (CFSM)	.72		.85		.74	
ANNUAL RUNOFF (INCHES)	9.74		11.60		10.04	
10 PERCENT EXCEEDS	194		289		258	
50 PERCENT EXCEEDS	109		116		97	
90 PERCENT EXCEEDS	65		59		40	

(a) Gage height 13.50 ft.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04111000 GRAND RIVER NEAR EATON RAPIDS, MI

LOCATION.--Lat 42°32'05", long 84°37'23", in NE1/4 sec.26, T.2 N., R.3 W., Eaton County, Hydrologic Unit 04050004, on right bank 400 ft upstream from bridge on Petrieville Highway, 2 mi northeast of Eaton Rapids, 2.5 mi downstream from Spring Brook, 25 mi upstream from Red Cedar River, and at mile 178.

DRAINAGE AREA.--661 mi^2.

PERIOD OF RECORD.--October 1950 to September 1982, October 1995 to current year. Gage-height records collected in this vicinity 1905-28 (flood seasons only) are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1707: 1951 (m).

GAGE.--Water-stage recorder. Datum of gage is 852.68 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplant at Smithville Dam and mills at Eaton Rapids. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 4, 1950, reached a stage of 8.15 ft, discharge, 3,860 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	276	368	603	e440	700	1930	729	661	1070	420	175	188
2	259	342	594	e435	707	1660	703	652	1110	310	153	173
3	244	346	563	e425	e650	1600	708	604	1130	263	163	152
4	306	338	540	e420	612	1540	678	571	1120	269	165	141
5	456	334	511	e430	711	1440	691	541	1060	271	161	139
6	544	326	e480	e440	663	1340	646	516	1010	253	138	138
7	535	317	e460	e445	597	1270	706	455	950	247	137	132
8	521	326	e450	e450	599	1240	765	505	910	237	130	133
9	504	330	e440	e445	1200	1140	803	475	885	239	117	194
10	472	440	e430	e435	2320	1110	800	389	866	236	118	270
11	491	476	e420	e425	2530	1120	785	419	825	223	139	286
12	427	484	e415	e430	2890	1110	780	485	804	201	155	237
13	388	535	e410	e450	2560	1090	776	388	778	186	127	209
14	397	590	e410	e470	2000	1130	713	377	727	190	123	220
15	371	605	e410	e490	1770	1160	689	506	689	189	121	204
16	364	603	e420	e520	1730	1200	724	1230	673	187	150	203
17	365	587	e430	e550	1500	1120	753	1530	645	185	176	201
18	363	567	e450	e600	e1350	1040	748	1640	614	180	166	182
19	347	522	e470	e600	e1400	1040	723	1630	590	175	163	179
20	336	529	e490	e590	1430	1060	722	1320	564	170	160	228
21	330	522	e485	e450	e1200	976	830	1160	567	179	167	294
22	328	497	e480	e430	e1150	924	945	1100	656	182	e195	325
23	323	456	e480	e500	e1180	915	1050	973	658	175	e185	392
24	364	462	e475	e540	1160	908	1140	973	627	174	e200	364
25	401	448	e470	e570	1920	881	1040	999	582	177	186	343
26	428	474	e465	e480	2400	808	963	1010	557	177	180	325
27	428	569	e460	e420	2560	726	875	1080	545	227	172	292
28	414	601	e455	e440	2190	738	816	1340	531	206	184	290
29	383	594	e450	e420	—	730	761	1390	441	188	223	286
30	404	591	e450	512	—	703	714	1340	430	165	238	265
31	382	—	e445	628	—	701	—	1250	—	179	206	—
TOTAL	12151	14179	14511	14880	41679	34350	23776	27509	22614	6660	5073	6985
MEAN	392	473	468	480	1489	1108	793	887	754	215	164	233
MAX	544	605	603	628	2890	1930	1140	1640	1130	420	238	392
MIN	244	317	410	420	597	701	646	377	430	165	117	132
CFSM	.59	.72	.71	.73	2.25	1.68	1.20	1.34	1.14	.33	.25	.35
IN.	.68	.80	.82	.84	2.35	1.93	1.34	1.55	1.27	.37	.29	.39

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 2001, BY WATER YEAR (WY)

MEAN	242	338	425	472	596	930	933	662	423	277	201	196
MAX	875	670	877	1406	1489	1932	1561	1848	1041	1234	591	800
(WY)	1955	1952	1976	1952	2001	1974	1974	1956	1968	1968	2000	1975
MIN	64.6	94.7	86.0	96.5	111	223	378	200	138	94.7	78.8	64.6
(WY)	1964	1964	1964	1963	1964	1964	1964	1958	1964	1965	1963	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1951 - 2001	
ANNUAL TOTAL	184849		224367			
ANNUAL MEAN	505		615		474	
HIGHEST ANNUAL MEAN					769	1974
LOWEST ANNUAL MEAN					147	1964
HIGHEST DAILY MEAN	1340	Jun 28	2890	Feb 12	3400	Feb 22 1971
LOWEST DAILY MEAN	99	Feb 9	117	Aug 9	21	Oct 12 1963
ANNUAL SEVEN-DAY MINIMUM	186	Feb 3	129	Aug 9	52	Oct 10 1963
MAXIMUM PEAK FLOW			2980	Feb 12	(a)3500	Feb 21 1971
MAXIMUM PEAK STAGE			7.27	Feb 12	8.19	Jun 28 1968
INSTANTANEOUS LOW FLOW			108	Aug 9	14	(b)
ANNUAL RUNOFF (CFSM)	.76		.93		.72	
ANNUAL RUNOFF (INCHES)	10.40		12.63		9.74	
10 PERCENT EXCEEDS	846		1170		1010	
50 PERCENT EXCEEDS	450		480		333	
90 PERCENT EXCEEDS	250		178		120	

(a) Gage height 7.52 ft.
(b) Dec. 20, 1962, Oct. 14, 1966.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04111379 RED CEDAR RIVER NEAR WILLIAMSTON, MI

LOCATION.--Lat 42°40'59", long 84°13'09", in NE1/4 sec.4, T.3 N., R.2 E., Ingham County, Hydrologic Unit 04050004, on right bank 20 ft upstream from bridge on State Highway 52, 1.5 mi upstream from Squaw Creek, and 3.5 mi east of Williamston.

DRAINAGE AREA.--163 mi^2.

PERIOD OF RECORD.--July 1975 to September 1989, July to September 2001.

GAGE.--Water-stage recorder. Elevation of gage is 870 ft above seal level, from topographic map.

REMARKS.--Records good. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1975, reached a stage of 10.41 ft, from floodmark, and a discharge of 2,670 ft^3/s, Apr. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	43	24	16
2	---	---	---	---	---	---	---	---	---	42	21	14
3	---	---	---	---	---	---	---	---	---	40	19	15
4	---	---	---	---	---	---	---	---	---	39	16	14
5	---	---	---	---	---	---	---	---	---	39	17	14
6	---	---	---	---	---	---	---	---	---	35	16	13
7	---	---	---	---	---	---	---	---	---	32	15	12
8	---	---	---	---	---	---	---	---	---	34	13	16
9	---	---	---	---	---	---	---	---	---	33	14	32
10	---	---	---	---	---	---	---	---	---	31	14	48
11	---	---	---	---	---	---	---	---	---	28	13	42
12	---	---	---	---	---	---	---	---	---	28	10	31
13	---	---	---	---	---	---	---	---	---	26	12	25
14	---	---	---	---	---	---	---	---	---	24	11	23
15	---	---	---	---	---	---	---	---	---	24	11	21
16	---	---	---	---	---	---	---	---	---	23	14	20
17	---	---	---	---	---	---	---	---	---	22	19	19
18	---	---	---	---	---	---	---	---	---	22	19	19
19	---	---	---	---	---	---	---	---	---	23	23	25
20	---	---	---	---	---	---	---	---	---	21	33	31
21	---	---	---	---	---	---	---	---	---	19	28	38
22	---	---	---	---	---	---	---	---	---	20	25	63
23	---	---	---	---	---	---	---	---	---	20	28	55
24	---	---	---	---	---	---	---	---	---	20	27	49
25	---	---	---	---	---	---	---	---	---	20	25	46
26	---	---	---	---	---	---	---	---	---	22	22	48
27	---	---	---	---	---	---	---	---	---	20	22	50
28	---	---	---	---	---	---	---	---	---	18	20	45
29	---	---	---	---	---	---	---	---	---	17	20	40
30	---	---	---	---	---	---	---	---	---	28	17	37
31	---	---	---	---	---	---	---	---	---	28	17	---
TOTAL	---	---	---	---	---	---	---	---	---	841	585	921
MEAN	---	---	---	---	---	---	---	---	---	27.1	18.9	30.7
MAX	---	---	---	---	---	---	---	---	---	43	33	63
MIN	---	---	---	---	---	---	---	---	---	17	10	12
CFSM	---	---	---	---	---	---	---	---	---	.17	.12	.19
IN.	---	---	---	---	---	---	---	---	---	.19	.13	.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2001, BY WATER YEAR (WY)

MEAN	72.6	78.8	110	75.4	137	267	235	110	86.3	33.7	22.3	43.4
MAX	329	265	248	155	411	504	354	268	306	63.4	49.1	133
(WY)	1982	1989	1976	1985	1976	1982	1985	1983	1989	1989	1980	1975
MIN	16.9	26.9	27.2	22.3	33.9	130	108	40.8	16.6	10.8	9.27	11.3
(WY)	1980	1977	1977	1977	1979	1981	1987	1987	1988	1988	1984	1978

SUMMARY STATISTICS	WATER YEARS 1975 - 2001	
ANNUAL MEAN	105	
HIGHEST ANNUAL MEAN	157	1976
LOWEST ANNUAL MEAN	66.1	1977
HIGHEST DAILY MEAN	1700	Feb 26 1985
LOWEST DAILY MEAN	4.4	Jul 14 1988
ANNUAL SEVEN-DAY MINIMUM	5.7	Jul9 1988
MAXIMUM PEAK FLOW	1790	Feb 26 1985
MAXIMUM PEAK STAGE	9.07	Feb 26 1985
INSTANTANEOUS LOW FLOW	2.2	(a)
ANNUAL RUNOFF (CFSM)	.64	
ANNUAL RUNOFF (INCHES)	8.76	
10 PERCENT EXCEEDS	257	
50 PERCENT EXCEEDS	52	
90 PERCENT EXCEEDS	18	

(a) July 13, 14, 1988.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04111500 DEER CREEK NEAR DANSVILLE, MI

LOCATION.--Lat 42°36'30", long 84°19'15", in SE1/4 NE1/4 sec.33, T.3 N., R.1 E., Ingham County, Hydrologic Unit 04050004, on right bank 15 ft upstream from bridge on Clark Road, 3.5 mi north of Dansville, and 7.2 mi upstream from mouth.

DRAINAGE AREA.--16.3 mi^2.

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

REVISED RECORDS.--WSP 1727: 1954(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 889.08 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	6.1	15	e7.8	34	29	11	9.1	23	3.8	.77	.42
2	3.7	5.9	12	e7.6	30	26	11	8.4	32	3.3	.74	.46
3	3.4	5.5	9.8	e7.4	e25	26	9.9	7.4	30	3.3	.74	.43
4	13	5.3	8.6	e8.0	19	25	9.0	6.9	23	3.2	.65	.44
5	14	5.1	e8.0	e8.4	17	20	8.3	6.6	19	2.8	.64	.38
6	13	4.8	e7.2	e8.7	15	16	13	6.1	17	2.5	.59	.34
7	11	4.9	6.4	e8.9	14	15	20	6.0	16	2.5	.56	.28
8	8.7	4.8	5.9	e9.0	14	15	17	9.1	13	2.5	.55	.55
9	7.5	5.5	5.5	e9.0	252	15	15	7.2	11	2.2	.49	5.8
10	6.6	16	5.7	e8.8	e310	14	14	6.4	10	1.9	.53	9.0
11	5.8	12	4.0	e8.6	e150	17	13	8.6	10	1.7	.45	3.8
12	5.2	10	4.8	e8.4	91	18	13	8.2	9.4	1.6	.47	2.2
13	4.9	16	7.5	e9.0	63	22	10	6.8	8.2	1.6	.43	1.7
14	4.3	22	7.7	10	52	21	9.5	6.0	7.2	1.4	.36	1.5
15	4.1	20	6.6	12	48	22	9.1	42	7.0	1.4	.31	1.3
16	5.7	19	e7.0	18	37	21	9.2	344	7.7	1.3	.60	1.2
17	6.0	16	e8.0	19	30	18	8.2	193	6.3	1.3	.80	1.1
18	5.3	13	e10	19	25	15	7.6	85	6.0	1.3	.73	1.1
19	4.7	12	e11	18	19	14	7.2	51	5.4	1.2	1.0	2.3
20	4.3	11	e11	e15	17	14	9.5	32	4.7	1.1	1.1	3.3
21	4.1	9.3	e10	12	e16	14	23	27	8.5	1.2	.76	3.9
22	3.8	8.4	e9.7	11	e14	13	40	31	26	1.2	1.0	6.8
23	3.7	7.5	e9.5	9.8	12	12	49	23	15	1.1	1.2	4.3
24	12	7.2	e9.4	9.2	13	12	36	20	10	1.6	.97	5.2
25	12	7.2	e9.2	8.3	203	11	24	20	8.4	1.2	.84	4.2
26	9.6	10	e9.0	e7.9	124	9.9	18	25	7.0	1.1	.84	4.7
27	9.2	14	e8.8	7.4	68	9.5	15	54	5.9	.97	.77	4.8
28	8.8	13	e8.6	7.6	39	9.7	12	121	5.2	.91	.67	3.9
29	7.8	12	e8.4	7.6	—	10	11	58	4.7	.94	.59	3.2
30	7.1	14	e8.2	17	—	10	9.7	33	4.3	.98	.48	2.8
31	6.5	—	e8.0	38	—	10	—	23	—	.87	.44	—
TOTAL	219.9	317.5	260.5	356.4	1751	504.1	462.2	1284.8	360.9	53.97	21.07	81.40
MEAN	7.09	10.6	8.40	11.5	62.5	16.3	15.4	41.4	12.0	1.74	.68	2.71
MAX	14	22	15	38	310	29	49	344	32	3.8	1.2	9.0
MIN	3.4	4.8	4.0	7.4	12	9.5	7.2	6.0	4.3	.87	.31	.28
CFSM	.44	.65	.52	.71	3.84	1.00	.95	2.54	.74	.11	.04	.17
IN.	.50	.72	.59	.81	4.00	1.15	1.05	2.93	.82	.12	.05	.19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2001, BY WATER YEAR (WY)

MEAN	5.36	9.06	11.8	11.7	17.8	29.0	24.0	13.2	8.71	4.03	2.46	3.02
MAX	33.8	45.1	32.7	40.1	62.5	70.6	64.8	57.2	43.3	30.5	17.1	20.6
(WY)	1960	1993	1973	1974	2001	1982	1975	1956	1968	1957	1992	1992
MIN	.35	.65	.48	.88	1.65	3.00	5.93	2.58	1.03	.39	.19	.25
(WY)	1964	1964	1964	1977	1963	1964	1963	1958	1988	1965	1971	1979

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1954 - 2001	
ANNUAL TOTAL	3292.6		5673.74			
ANNUAL MEAN	9.00		15.5		11.6	
HIGHEST ANNUAL MEAN					22.8	1993
LOWEST ANNUAL MEAN					1.86	1964
HIGHEST DAILY MEAN	142	May 19	344	May 16	720	Apr 19 1975
LOWEST DAILY MEAN	1.0	Sep 7	.28	Sep 7	.05	Sep 9 1978
ANNUAL SEVEN-DAY MINIMUM	1.1	Sep 3	.39	Sep 1	.09	Sep 5 1978
MAXIMUM PEAK FLOW			479	Feb 9	(a)962	Apr 19 1975
MAXIMUM PEAK STAGE			(b)10.26	Feb 9	(b)12.18	Apr 19 1975
INSTANTANEOUS LOW FLOW			.25	(c)	.04	(d)
ANNUAL RUNOFF (CFSM)	.55		.95		.71	
ANNUAL RUNOFF (INCHES)	7.51		12.95		9.68	
10 PERCENT EXCEEDS	18		26		25	
50 PERCENT EXCEEDS	5.5		8.6		4.7	
90 PERCENT EXCEEDS	2.1		.93		.73	

(a) From rating curve extended above 610 ft^3/s.
(b) From floodmark.
(c) Sept. 7, 8.
(d) Sept. 8, 9, 12, 1978.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04112000 SLOAN CREEK NEAR WILLIAMSTON, MI

LOCATION.--Lat 42°40'33", long 84°21'50", in SE1/4 NE1/4 sec.1, T.3 N., R.1 W., Ingham County, Hydrologic Unit 04050004, on left bank 30 ft downstream from culvert on Meridian Road, 2.1 mi upstream from mouth, and 4.2 mi west of Williamston.

DRAINAGE AREA.--9.34 mi^2.

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

GAGE.--Water-stage recorder and concrete control with V-notch sharp-crested weir. Datum of gage is 862.12 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good except for estimated daily discharges, which are fair. At times, low flow is affected by pumpage for irrigation. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	2.2	7.2	3.5	25	18	3.5	4.3	8.4	1.3	.19	.07
2	2.1	2.1	5.7	3.5	20	14	3.5	3.8	23	1.1	e.18	.06
3	1.9	1.9	4.7	3.6	14	13	3.3	3.4	35	1.1	e.17	.06
4	7.1	1.8	4.1	3.8	11	12	3.1	3.2	17	1.1	e.16	.06
5	7.1	1.7	3.7	4.1	8.7	9.2	3.0	2.9	12	.91	e.15	.06
6	6.5	1.7	3.2	4.0	7.7	7.2	10	2.7	8.7	.79	e.14	e.05
7	5.6	1.7	3.0	4.3	7.0	6.4	12	2.6	7.5	.79	e.13	e.05
8	4.4	1.6	2.8	4.1	7.3	6.2	8.6	3.1	6.2	.80	e.13	e.15
9	3.6	2.2	2.4	4.3	261	5.8	7.9	2.6	5.2	.66	e.12	e.50
10	3.2	9.0	2.5	4.2	182	5.5	7.4	2.5	4.5	.58	e.12	.99
11	2.8	5.8	2.3	4.0	60	7.0	6.5	2.8	4.5	.51	e.11	.52
12	2.4	4.4	1.7	3.9	37	7.3	6.3	2.7	4.0	.48	e.10	.29
13	2.2	10	2.3	4.2	28	9.1	5.1	2.4	3.4	.49	e.09	.22
14	2.0	12	2.5	5.2	25	8.2	4.6	2.3	3.0	.44	e.09	.22
15	1.9	11	2.4	7.5	22	8.9	4.2	19	2.9	.39	e.08	.21
16	2.0	9.9	3.2	12	17	9.0	3.9	209	2.8	.35	e.14	.19
17	2.0	8.5	6.5	12	12	7.5	3.6	66	2.5	.33	e.19	.18
18	1.9	7.0	5.9	12	9.3	6.4	3.3	37	2.5	.37	e.18	.17
19	1.7	6.0	5.6	11	8.0	5.9	3.1	26	2.2	.34	e.20	e.40
20	1.7	5.3	4.9	8.0	7.2	5.7	3.6	18	1.9	.28	e.20	e.60
21	1.6	4.4	4.8	6.4	6.4	5.5	20	15	3.0	.28	e.15	e.70
22	1.4	3.9	4.4	5.2	5.7	5.2	28	11	10	.28	e.20	e1.0
23	1.4	3.4	4.4	4.8	5.0	4.8	29	8.4	5.8	.27	e.20	e.76
24	2.9	3.2	4.5	4.4	5.6	4.5	22	7.5	3.9	.28	e.16	e.90
25	3.4	3.1	4.0	3.9	127	4.0	14	6.8	3.0	e.27	e.14	.69
26	3.0	4.7	4.1	3.8	48	3.6	9.4	6.6	2.5	e.25	.12	.82
27	3.0	7.6	4.1	3.5	33	3.5	7.6	11	2.2	e.23	.12	.82
28	3.0	6.6	3.8	3.4	23	3.4	6.3	36	1.9	.21	.10	.63
29	2.8	5.9	3.9	3.4	—	3.5	5.4	20	1.7	.21	.09	.53
30	2.6	7.6	4.0	14	—	3.4	4.8	13	1.5	e.24	.08	.46
31	2.4	—	3.7	31	—	3.4	—	8.5	—	e.21	.07	—
TOTAL	92.1	156.2	122.3	203.0	1022.9	217.1	253.0	560.1	192.7	15.84	4.30	12.36
MEAN	2.97	5.21	3.95	6.55	36.5	7.00	8.43	18.1	6.42	.51	.14	.41
MAX	7.1	12	7.2	31	261	18	29	209	35	1.3	.20	1.0
MIN	1.4	1.6	1.7	3.4	5.0	3.4	3.0	2.3	1.5	.21	.07	.05
CFSM	.32	.56	.42	.70	3.91	.75	.90	1.93	.69	.05	.01	.04
IN.	.37	.62	.49	.81	4.07	.86	1.01	2.23	.77	.06	.02	.05

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2001, BY WATER YEAR (WY)

MEAN	2.63	4.12	5.65	5.41	8.83	15.9	12.7	6.24	4.51	1.86	1.09	1.46
MAX	20.9	21.9	24.9	21.4	36.5	39.9	47.2	37.6	35.3	26.5	8.15	7.19
(WY)	1960	1993	1973	1974	2001	1982	1975	1956	1968	1957	1980	1993
MIN	.082	.13	.11	.11	.12	.78	1.45	.94	.25	.074	.099	.046
(WY)	2000	2000	1964	1963	1963	1964	1963	1955	1988	1988	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1954 - 2001	
ANNUAL TOTAL	1304.05		2851.90			
ANNUAL MEAN	3.56		7.81		5.85	
HIGHEST ANNUAL MEAN					10.5	(a)
LOWEST ANNUAL MEAN					.72	1964
HIGHEST DAILY MEAN	76	May 19	261	Feb 9	536	Apr 19 1975
LOWEST DAILY MEAN	.17	Sep 7	(e).05	Sep 6	.02	Aug 3 1988
ANNUAL SEVEN-DAY MINIMUM	.20	Jan 27	.06	Sep 1	.03	Jul 29 1988
MAXIMUM PEAK FLOW			503	Feb 9	(b)1290	Apr 18 1975
MAXIMUM PEAK STAGE			6.30	Feb 9	9.99	Apr 18 1975
INSTANTANEOUS LOW FLOW					.01	(c)
ANNUAL RUNOFF (CFSM)	.38		.84		.63	
ANNUAL RUNOFF (INCHES)	5.19		11.36		8.52	
10 PERCENT EXCEEDS	7.0		13		13	
50 PERCENT EXCEEDS	1.8		3.5		1.7	
90 PERCENT EXCEEDS	.24		.19		.18	

(a) 1973, 1993.
(b) From rating curve extended above 660 ft^3/s on basis of computation of peak flow through culvert and over road embankment.
(c) Sept. 11, 1954, Jan. 18, 1957, Aug. 3, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04112500 RED CEDAR RIVER AT EAST LANSING, MI

LOCATION.--Lat 42°43'40", long 84°28'40", in SW1/4 sec.18, T.4 N., R.1 W., Ingham County, Hydrologic Unit 04050004, in left downstream bridge abutment of Farm Lane Bridge on Michigan State University Campus in East Lansing, 4.0 mi upstream from Sycamore Creek, and 5.6 mi upstream from mouth.

DRAINAGE AREA.--355 mi^2.

PERIOD OF RECORD.--August 1902 to December 1903, March 1931 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as Red Cedar River at Agricultural College, August 1902 to December 1903 and as Cedar River at East Lansing, March 1931 to September 1965. Gage-height records collected in this vicinity 1911-19, and 1920-28 (flood seasons only), are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1307: 1936(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 824.39 ft above sea level. August 1902 to December 1903 nonrecording gage at site 0.8 mi downstream at different datum. March 1931 to November 1940 water-stage recorder at site 250 ft upstream at present datum.

REMARKS.--Records good. Prior to April 1975, occasional regulation at low flow by mill at Williamston, 16 mi upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 24, 1904, reached a stage of 13.4 ft, discharge, 8,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	145	127	222	160	559	1110	196	202	399	100	49	30
2	128	120	221	159	586	882	199	196	406	91	44	30
3	119	114	201	154	464	748	203	190	536	88	40	29
4	155	112	178	154	430	673	204	184	586	88	36	28
5	224	114	170	155	391	600	203	179	527	84	32	27
6	256	113	135	157	328	524	250	166	454	78	30	26
7	240	111	122	160	287	456	334	164	408	72	30	31
8	220	105	152	166	265	403	375	178	356	68	28	37
9	194	117	124	166	702	361	392	178	294	67	28	70
10	173	172	137	155	2120	329	372	181	245	63	35	117
11	153	214	123	157	3110	320	342	192	234	59	30	111
12	139	210	83	157	3200	331	317	198	218	54	29	83
13	135	226	117	158	2390	354	293	193	204	54	27	61
14	129	271	138	170	1720	389	258	176	190	51	26	52
15	123	295	139	190	1370	411	234	324	205	48	25	48
16	123	295	142	232	1140	423	217	1310	218	47	41	44
17	120	291	166	286	927	414	207	1570	214	45	34	42
18	121	269	204	311	742	376	191	1460	193	45	36	39
19	114	243	214	314	675	338	176	1130	168	44	48	70
20	106	225	217	263	555	312	179	786	151	43	47	70
21	100	207	205	194	469	296	248	527	167	46	49	105
22	96	186	196	229	382	280	378	429	265	42	65	123
23	96	168	188	225	342	263	518	357	303	41	57	134
24	136	154	188	200	305	250	585	306	266	41	53	133
25	151	150	188	183	867	240	521	287	224	43	49	111
26	174	159	185	149	1540	222	436	291	184	46	44	110
27	183	188	185	160	1680	209	367	323	154	43	42	109
28	169	212	182	145	1450	203	303	501	137	39	40	103
29	155	218	179	155	—	201	247	625	118	48	37	91
30	145	220	174	217	—	201	218	583	108	49	35	80
31	136	—	164	383	—	200	—	461	—	46	32	—
TOTAL	4658	5606	5239	6064	28996	12319	8963	13847	8132	1773	1198	2144
MEAN	150	187	169	196	1036	397	299	447	271	57.2	38.6	71.5
MAX	256	295	222	383	3200	1110	585	1570	586	100	65	134
MIN	96	105	83	145	265	200	176	164	108	39	25	26
CFSM	.42	.53	.48	.55	2.92	1.12	.84	1.26	.76	.16	.11	.20
IN.	.49	.59	.55	.64	3.04	1.29	.94	1.45	.85	.19	.13	.22

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1902 - 2001, BY WATER YEAR (WY)

MEAN	103	143	180	212	296	496	467	288	180	90.0	61.1	75.7
MAX	571	735	494	739	1036	1162	1494	1310	627	578	366	426
(WY)	1982	1993	1995	1993	2001	1948	1947	1956	1968	1994	1992	1903
MIN	14.8	21.2	20.5	29.0	28.6	58.6	62.3	52.9	20.4	5.70	9.24	14.6
(WY)	1935	1964	1964	1940	1940	1934	1931	1931	1934	1934	1934	1939

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1902 - 2001	
ANNUAL TOTAL	60398		98939			
ANNUAL MEAN	165		271		217	
HIGHEST ANNUAL MEAN					431	1993
LOWEST ANNUAL MEAN					43.3	1964
HIGHEST DAILY MEAN	1110	May 20	3200	Feb 12	5720	Apr 20 1975
LOWEST DAILY MEAN	42	Sep 8	25	Aug 15	3.0	Jul 31 1931
ANNUAL SEVEN-DAY MINIMUM	45	Jan 25	29	Aug 9	3.9	Jul 15 1934
MAXIMUM PEAK FLOW			3380	Feb 12	5940	Apr 20 1975
MAXIMUM PEAK STAGE			8.93	Feb 12	11.95	Apr 20 1975
INSTANTANEOUS LOW FLOW			24	(a)	3.0	Jul 31 1931
ANNUAL RUNOFF (CFSM)	.46		.76		.61	
ANNUAL RUNOFF (INCHES)	6.33		10.37		8.29	
10 PERCENT EXCEEDS	291		522		505	
50 PERCENT EXCEEDS	127		182		105	
90 PERCENT EXCEEDS	49		43		30	

(a) Aug. 15, 16, Sept. 7.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04113000 GRAND RIVER AT LANSING, MI

LOCATION.--Lat 42°45'02", long 84°33'19", in NW1/4 sec.9, T.4 N., R.2 W., Ingham County, Hydrologic Unit 04050004, on right bank 30 ft upstream from bridge on North Grand River Avenue in Lansing, 2.0 mi downstream from Red Cedar River, and at mile 152.

DRAINAGE AREA.--1,230 mi^2, approximately.

PERIOD OF RECORD.--March 1901 to September 1906, October 1934 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as "at North Lansing" 1901-6. Gage-height records collected in this vicinity 1907-10 (flood seasons only), 1911-19, 1920-28 (flood seasons only), and since 1931 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1174: 1949. WSP 1387: 1901, 1903-4, 1935, 1937, 1942.

GAGE.--Water-stage recorder. Datum of gage is 805.53 ft above sea level (levels by Michigan Department of Natural Resources). Prior to August 1906, nonrecording gage at same site at different datum. November 1934 to June 1949 water-stage recorder at site 1.8 mi downstream at datum 2.42 ft lower.

REMARKS.--Records good. Large diurnal fluctuation at low and medium flow caused by powerplants upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	526	546	1020	701	1560	3860	1050	1050	1980	582	212	319
2	496	609	995	680	1730	3200	1080	1020	1840	560	294	220
3	454	523	930	686	1430	2740	1060	901	2110	381	187	237
4	636	521	861	658	1260	2630	1040	856	2060	419	296	170
5	732	560	813	687	1280	2460	986	851	1960	418	183	257
6	1010	487	662	712	1280	2110	1180	774	1740	394	214	168
7	934	601	699	727	1160	2060	1310	754	1640	366	239	281
8	927	435	749	753	1030	1950	1330	770	1480	325	189	382
9	805	624	598	692	2820	1820	1470	867	1390	389	192	440
10	820	810	734	732	5660	1670	1420	688	1260	363	211	396
11	659	846	672	685	6450	1700	1390	699	1300	293	185	515
12	799	877	330	682	6710	1750	1300	890	1150	358	183	446
13	505	1040	602	705	6460	1720	1250	742	1080	228	245	376
14	683	1080	546	740	5220	1760	1100	661	1040	316	170	235
15	577	1250	595	809	3910	1870	1090	1330	1170	232	170	367
16	640	1170	619	884	3440	1860	1050	3950	1180	312	321	255
17	582	1150	714	973	2970	1890	1070	4550	1000	253	209	325
18	579	1060	702	1070	2330	1690	1090	4200	985	295	317	276
19	565	990	828	1130	2400	1590	1040	3740	848	229	304	478
20	533	939	828	1050	2370	1590	1100	3120	784	251	293	341
21	523	907	794	749	2080	1580	1310	2180	915	370	204	477
22	476	834	790	719	1730	1360	1750	2010	1150	241	428	547
23	533	801	738	884	1830	1350	2110	1870	1250	305	271	650
24	687	695	780	804	1840	1330	2260	1610	1120	243	319	686
25	646	711	744	897	3240	1300	2110	1580	938	291	238	564
26	781	835	748	714	4680	1250	1830	1610	861	359	327	569
27	802	873	755	645	5060	1090	1570	1740	769	278	189	495
28	713	1040	774	696	4630	1060	1440	2260	754	457	291	484
29	694	1010	715	681	—	1060	1170	2540	690	348	235	461
30	619	993	711	873	—	1060	1120	2430	554	398	355	434
31	682	—	722	1260	—	1030	—	2120	—	289	251	—
TOTAL	20618	24817	22768	24678	86560	55390	40076	54363	36998	10543	7722	11851
MEAN	665	827	734	796	3091	1787	1336	1754	1233	340	249	395
MAX	1010	1250	1020	1260	6710	3860	2260	4550	2110	582	428	686
MIN	454	435	330	645	1030	1030	986	661	554	228	170	168
CFSM	.54	.67	.60	.65	2.51	1.45	1.09	1.43	1.00	.28	.20	.32
IN.	.62	.75	.69	.75	2.62	1.68	1.21	1.64	1.12	.32	.23	.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901 - 2001, BY WATER YEAR (WY)

MEAN	460	622	733	828	1057	1903	1772	1140	837	488	360	363
MAX	1880	2559	1666	2669	3091	7242	5113	3815	2803	2204	1178	1277
(WY)	1987	1993	1976	1993	2001	1904	1947	1956	1905	1902	1992	1903
MIN	88.5	138	124	150	158	348	488	330	168	98.3	61.1	93.6
(WY)	1964	1965	1964	1963	1963	1964	1935	1958	1936	1936	1936	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1901 - 2001	
ANNUAL TOTAL	293483		396384			
ANNUAL MEAN	802		1086		878	
HIGHEST ANNUAL MEAN					1638	1993
LOWEST ANNUAL MEAN					232	1964
HIGHEST DAILY MEAN	3230	May 20	6710	Feb 12	22700	Mar 26 1904
LOWEST DAILY MEAN	177	Jan 29	168	Sep 6	20	Aug 25 1941
ANNUAL SEVEN-DAY MINIMUM	257	Feb 4	194	Aug 9	44	Aug 15 1936
MAXIMUM PEAK FLOW			6900	Feb 12	(a)24500	Mar 26 1904
MAXIMUM PEAK STAGE			11.69	Feb 12	(b)15.43	Apr 20 1975
INSTANTANEOUS LOW FLOW					2.8	Sep 9 1963
ANNUAL RUNOFF (CFSM)	.65		.88		.71	
ANNUAL RUNOFF (INCHES)	8.88		11.99		9.70	
10 PERCENT EXCEEDS	1420		2090		1910	
50 PERCENT EXCEEDS	700		794		555	
90 PERCENT EXCEEDS	345		280		186	

(a) From rating curve extended above 15,000 ft^3/s; gage height, 18.60 ft, datum then in use.
(b) Present site and datum.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04114000 GRAND RIVER AT PORTLAND, MI

LOCATION.--Lat 42°51'23", long 84°54'44", in NW1/4 sec.4, T.5 N., R.5 W., Ionia County, Hydrologic Unit 04050004, on left bank at downstream side of bridge on Kent Street, 1.0 mi south of Portland, 1.9 mi upstream from Looking Glass River, and at mile 115.

DRAINAGE AREA.--1,385 mi^2.

PERIOD OF RECORD.--August 1952 to March 1982, June 1988 to current year. Gage-height records collected in this vicinity 1907-28 (flood seasons only) are contained in reports of the National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 705.00 ft above sea level (levels by Michigan Department of Natural Resources). Prior to July 6, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Slight diurnal fluctuation caused by powerplants upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	604	728	1090	e810	1700	4730	1170	1190	2220	639	258	326
2	595	600	1120	e790	1840	3960	1210	1130	2080	659	294	303
3	569	659	1060	e780	1790	3370	1200	1080	2260	638	316	262
4	579	566	993	e770	1470	2980	1180	987	2250	472	228	293
5	790	563	943	e760	1370	2800	1130	961	2150	478	273	197
6	883	600	868	e780	1350	2570	1230	913	1990	474	256	231
7	1060	542	803	e800	1320	2220	1410	880	1830	452	189	248
8	1000	642	774	e840	1200	2170	1540	914	1640	433	296	256
9	952	521	815	e860	2800	2100	1430	847	1540	371	230	522
10	881	975	660	e780	7570	1930	1600	969	1390	442	245	607
11	874	953	812	e830	7840	1850	1520	897	1430	414	265	488
12	726	985	686	e780	7510	1900	1530	828	1330	360	209	499
13	860	1030	634	e780	7450	1930	1410	989	1230	387	200	482
14	577	1330	e680	e820	6510	1910	1320	846	1150	311	257	439
15	737	1300	e620	891	5220	1960	1190	987	1070	337	188	305
16	647	1330	e670	1020	4160	2130	1150	4390	1450	277	200	387
17	708	1260	e700	1090	3730	2070	1170	5500	1140	360	356	351
18	645	1220	e800	1180	2970	1980	1150	5060	1090	273	280	322
19	639	1100	e800	1250	2650	1810	1170	4320	1060	367	358	392
20	620	1070	e940	1270	2630	1710	1140	3670	939	268	344	513
21	585	1020	e940	e1200	2500	1750	1290	2820	914	283	367	428
22	571	973	e920	e900	2090	1640	1620	2340	1280	449	227	608
23	527	916	e880	831	1960	1500	2180	2040	1310	293	462	612
24	643	854	e860	991	2030	1480	2440	1870	1290	357	347	782
25	761	775	e880	905	3700	1440	2400	1760	1120	245	303	735
26	729	861	e860	956	5430	1410	2070	1810	1010	331	304	663
27	850	1080	e850	777	5910	1330	1840	1830	913	280	302	644
28	873	1070	e860	742	5630	1200	1570	2390	865	290	260	552
29	778	1150	e880	782	—	1200	1450	2680	841	363	292	537
30	732	1150	e820	890	—	1190	1210	2690	770	354	240	515
31	678	—	e820	1320	—	1190	—	2390	—	400	380	—
TOTAL	22663	27823	26038	28175	102330	63410	43920	61978	41552	12057	8726	13499
MEAN	731	927	840	909	3655	2045	1464	1999	1385	389	281	450
MAX	1060	1330	1120	1320	7840	4730	2440	5500	2260	659	462	782
MIN	527	521	620	742	1200	1190	1130	828	770	245	188	197
CFSM	.53	.67	.61	.66	2.64	1.48	1.06	1.44	1.00	.28	.20	.32
IN.	.61	.75	.70	.76	2.75	1.70	1.18	1.66	1.12	.32	.23	.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	548	780	901	969	1203	2018	1945	1326	867	573	447	441
MAX	1766	2743	1975	2989	3655	4202	3936	4676	2587	2268	1297	1433
(WY)	1982	1993	1976	1993	2001	1974	1975	1956	1989	1968	1992	1975
MIN	132	174	161	184	186	382	683	373	258	155	166	133
(WY)	1964	1965	1964	1963	1963	1964	1964	1958	1988	1965	1965	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	342429		452171			
ANNUAL MEAN	936		1239		998	
HIGHEST ANNUAL MEAN					1830	1993
LOWEST ANNUAL MEAN					282	1964
HIGHEST DAILY MEAN	4750	May 19	7840	Feb 11	12200	Apr 21 1975
LOWEST DAILY MEAN	220	Jan 30	188	Aug 15	58	Oct 9 1963
ANNUAL SEVEN-DAY MINIMUM	307	Feb 5	223	Aug 10	85	Aug 18 1963
MAXIMUM PEAK FLOW			8120	Feb 11	12400	Apr 21 1975
MAXIMUM PEAK STAGE			11.12	Feb 11	12.98	Apr 21 1975
INSTANTANEOUS LOW FLOW					38	Oct 10 1963
ANNUAL RUNOFF (CFSM)	.68		.89		.72	
ANNUAL RUNOFF (INCHES)	9.20		12.14		9.79	
10 PERCENT EXCEEDS	1570		2290		2140	
50 PERCENT EXCEEDS	800		897		650	
90 PERCENT EXCEEDS	410		303		239	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04115000 MAPLE RIVER AT MAPLE RAPIDS, MI

LOCATION.--Lat 43°06'35", long 84°41'35", in sec.5, T.8 N., R.3 W., Clinton County, Hydrologic Unit 04050005, on right bank at downstream side of bridge on Maple Road in Maple Rapids, 50 ft upstream from Pine Creek, and 2.3 mi upstream from Hayworth Creek. Records include flow of Pine Creek.

DRAINAGE AREA.--434 mi^2.

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 1707: 1956.

GAGE.--Water-stage recorder. Datum of gage is 642.58 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 4, 1968, nonrecording gage at same site and datum.

REMARKS.--Records good. At times, water is pumped from the river about 8 mi upstream to fill the wetlands in the Maple River State Game Area. Some of the water is returned to the river at a later date, when water levels in the wetlands are lowered. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1904 reached a stage of 13.8 ft, from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	322	88	183	143	407	e1790	276	308	769	104	76	18
2	295	105	176	141	525	1520	277	288	784	85	64	20
3	270	96	166	138	605	e1320	290	267	846	73	54	22
4	248	85	153	137	622	e1180	288	250	883	67	46	29
5	227	89	142	138	597	e1060	286	231	856	62	40	27
6	204	109	129	138	559	e940	302	212	793	56	36	23
7	183	98	118	137	517	827	353	194	714	52	33	22
8	165	85	111	138	484	726	431	185	631	51	29	31
9	143	82	e100	e138	566	649	521	176	558	48	26	42
10	123	147	92	138	1440	e575	583	169	506	46	27	49
11	108	177	e87	137	1950	537	615	174	469	42	26	49
12	95	190	e83	136	e2200	520	612	170	434	39	25	48
13	85	212	e79	134	2260	509	627	161	401	36	24	46
14	76	239	79	136	2170	509	604	152	367	34	23	40
15	74	254	80	145	e1950	511	567	205	336	33	21	30
16	70	261	84	179	e1660	515	520	1020	317	32	23	28
17	66	259	96	227	e1380	506	486	1600	290	31	26	30
18	61	259	112	269	e1150	491	450	1640	268	31	32	31
19	63	255	126	309	e1000	473	417	1470	246	31	42	34
20	62	238	135	340	e875	456	380	1240	228	33	44	35
21	63	221	141	349	e760	440	358	1060	219	39	42	39
22	61	205	146	333	e660	426	348	1010	241	42	43	39
23	60	187	147	315	e575	410	344	912	240	42	43	39
24	76	170	147	296	518	393	359	808	233	39	36	45
25	94	154	148	277	769	375	374	836	225	37	29	45
26	108	149	146	259	1580	353	375	889	211	35	26	46
27	110	161	145	236	2000	335	372	889	193	31	27	47
28	112	171	146	219	2060	317	365	860	172	30	25	46
29	104	180	147	198	—	304	346	934	149	31	19	48
30	97	183	146	212	—	290	327	907	123	52	16	47
31	90	—	145	292	—	279	—	825	—	74	19	—
TOTAL	3915	5109	3935	6384	31839	19536	12453	20042	12702	1438	1042	1095
MEAN	126	170	127	206	1137	630	415	647	423	46.4	33.6	36.5
MAX	322	261	183	349	2260	1790	627	1640	883	104	76	49
MIN	60	82	79	134	407	279	276	152	123	30	16	18
CFSM	.29	.39	.29	.47	2.62	1.45	.96	1.49	.98	.11	.08	.08
IN.	.34	.44	.34	.55	2.73	1.67	1.07	1.72	1.09	.12	.09	.09

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 2001, BY WATER YEAR (WY)

MEAN	147	185	248	256	322	701	620	380	202	111	59.5	125
MAX	1461	837	813	1035	1137	2049	1582	1812	937	1243	361	1634
(WY)	1987	1991	1991	1973	2001	1985	1947	1956	1996	1994	1994	1986
MIN	9.77	21.8	20.9	17.3	16.9	103	139	74.1	24.6	10.6	8.47	11.4
(WY)	1967	1963	1963	1963	1963	1964	1945	1977	1977	1965	1965	1962

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1944 - 2001	
ANNUAL TOTAL	78795		119490			
ANNUAL MEAN	215		327		280	
HIGHEST ANNUAL MEAN					501	1976
LOWEST ANNUAL MEAN					65.1	1963
HIGHEST DAILY MEAN	3330	May 20	2260	Feb 13	6500	Mar 20 1948
LOWEST DAILY MEAN	13	Sep 7	16	Aug 30	4.2	Sep 11 1998
ANNUAL SEVEN-DAY MINIMUM	17	Sep 3	20	Aug 28	5.6	Sep 20 1979
MAXIMUM PEAK FLOW			2270	Feb 12	(a)8770	Sep 12 1986
MAXIMUM PEAK STAGE			8.99	Feb 12	(b)12.33	Sep 12 1986
ANNUAL RUNOFF (CFSM)	.50		.75		.64	
ANNUAL RUNOFF (INCHES)	6.75		10.24		8.76	
10 PERCENT EXCEEDS	459		840		667	
50 PERCENT EXCEEDS	96		174		120	
90 PERCENT EXCEEDS	33		32		23	

(a) Result of dam failure on Rainbow Lake (Pine Creek).
(b) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04115265 FISH CREEK NEAR CRYSTAL, MI

LOCATION.--Lat 43°14'59", long 84°58'52", in NW1/4 NE1/4 sec.23, T.10 N., R.6 W., Montcalm County, Hydrologic Unit 04050005, on left bank 10 ft downstream from bridge on Sidney Road, 3.5 mi southwest of Crystal.

DRAINAGE AREA.--39.7 mi^2.

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

REVISED RECORDS.--WDR MI-92-1: Drainage area. WDR MI-99-1: 1988-90, 1991 (M).

GAGE.--Water-stage recorder. Elevation of gage is 795 ft above sea level, from topographic map.

REMARKS.--Records good. At times, low flow is affected by pumpage for irrigation. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	21	25	22	34	42	34	26	59	17	15	19
2	20	21	22	e22	29	36	39	26	70	17	15	17
3	20	20	21	22	27	41	40	25	60	17	14	16
4	22	19	20	21	25	47	36	25	46	17	12	16
5	21	19	21	21	24	37	32	25	40	16	11	15
6	21	19	e20	21	23	33	41	24	38	15	11	15
7	21	22	e20	21	23	31	54	24	35	16	10	19
8	21	22	e20	21	24	32	46	24	31	16	9.8	21
9	21	27	e19	e21	57	33	39	23	28	15	9.2	20
10	20	48	e19	22	110	32	37	24	27	14	16	22
11	20	33	e19	20	e65	40	37	41	29	14	14	19
12	19	28	e20	20	e42	42	42	33	28	14	12	17
13	19	40	e21	20	36	43	35	27	26	14	12	17
14	19	44	e21	21	34	40	32	25	24	14	11	16
15	19	35	e21	22	33	49	31	52	25	13	11	16
16	19	31	e22	24	31	47	30	156	28	13	18	16
17	19	30	e22	24	28	42	29	151	24	13	20	16
18	19	28	e23	24	e27	39	28	56	24	14	17	16
19	18	27	e24	23	26	42	28	41	24	14	25	22
20	18	28	e24	e22	25	43	35	35	22	12	25	25
21	18	26	e24	21	24	44	48	35	28	16	18	24
22	18	24	e24	20	26	42	45	44	35	17	19	25
23	19	23	e24	19	23	39	40	34	28	14	20	22
24	22	23	e24	19	23	36	44	49	24	14	19	25
25	22	23	e24	19	70	32	35	91	22	13	19	23
26	21	30	e24	19	82	29	32	65	21	13	21	26
27	32	33	e23	19	59	29	31	56	20	11	18	24
28	27	29	e23	19	46	29	29	60	19	11	17	21
29	23	28	e23	19	---	31	27	43	18	13	16	19
30	22	27	e23	34	---	31	27	37	17	20	16	17
31	21	---	23	40	---	31	---	34	---	16	27	---
TOTAL	641	828	683	682	1076	1164	1083	1411	920	453	498.0	586
MEAN	20.7	27.6	22.0	22.0	38.4	37.5	36.1	45.5	30.7	14.6	16.1	19.5
MAX	32	48	25	40	110	49	54	156	70	20	27	26
MIN	18	19	19	19	23	29	27	23	17	11	9.2	15
CFSM	.52	.70	.55	.55	.97	.95	.91	1.15	.77	.37	.40	.49
IN.	.60	.78	.64	.64	1.01	1.09	1.01	1.32	.86	.42	.47	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2001, BY WATER YEAR (WY)

MEAN	28.4	36.8	31.7	32.1	37.2	49.0	44.0	37.1	30.6	22.1	22.6	22.1
MAX	39.2	59.5	46.1	48.9	61.2	75.9	66.6	45.9	44.3	50.9	41.7	33.8
(WY)	1992	1995	1992	1993	1997	1990	1991	1997	1994	1994	1994	1993
MIN	18.7	17.7	19.8	19.5	25.7	25.3	29.0	26.5	15.3	11.6	11.4	13.7
(WY)	2000	2000	1990	2000	1989	2000	2000	1999	1988	1998	1998	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1988 - 2001	
ANNUAL TOTAL	9624		10025.0			
ANNUAL MEAN	26.3		27.5		32.8	
HIGHEST ANNUAL MEAN					40.7	1993
LOWEST ANNUAL MEAN					23.0	1999
HIGHEST DAILY MEAN	166	Jun 13	156	May 16	450	Mar 12 1990
LOWEST DAILY MEAN	12	Jul 27	9.2	Aug 9	5.6	Aug 2 1999
ANNUAL SEVEN-DAY MINIMUM	13	Jul 21	11	Aug 3	7.7	Jul 28 1998
MAXIMUM PEAK FLOW			233	May 16	558	Mar 12 1990
MAXIMUM PEAK STAGE			4.72	May 16	5.53	Mar 12 1990
INSTANTANEOUS LOW FLOW			7.9	Aug 9		
ANNUAL RUNOFF (CFSM)	.66		.69		.83	
ANNUAL RUNOFF (INCHES)	9.02		9.39		11.21	
10 PERCENT EXCEEDS	37		42		52	
50 PERCENT EXCEEDS	22		23		28	
90 PERCENT EXCEEDS	17		16		17	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04116000 GRAND RIVER AT IONIA, MI

LOCATION.--Lat 42°58'20", long 85°04'13", in NW1/4 sec.30, T.7 N., R.6 W., Ionia County, Hydrologic Unit 04050006, on left bank 15 ft downstream from bridge on State Highway 66 in Ionia, 2.7 mi downstream from Prairie Creek, and at mile 87.

DRAINAGE AREA.--2,840 mi^2, approximately.

PERIOD OF RECORD.--March to June 1931, July 1951 to current year. Gage-height records collected in this vicinity 1907-28 (flood seasons only) are contained in reports of the National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 615.38 ft above sea level. Mar. 19 to Sept. 24, 1931, nonrecording gage at site 1.5 mi upstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Diurnal fluctuation below approximately 5,000 ft^3/s caused by powerplants upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1640	1120	2110	e1600	3370	9390	2380	2510	4490	1280	717	576
2	1610	1110	2020	e1550	3560	8190	2350	2550	4380	1080	598	559
3	1560	998	1970	e1500	3390	7130	2370	1920	4610	1100	581	511
4	1630	1080	1840	e1500	3240	6400	2300	1800	4700	1060	580	489
5	1590	950	1750	e1550	2930	5980	2320	1880	4500	850	508	485
6	1610	961	1550	e1600	2940	5500	2380	1780	4270	842	512	479
7	1840	1060	1400	e1650	2790	5050	2800	1710	3890	869	494	429
8	1770	994	1350	e1700	2740	4620	3160	1620	3640	794	461	511
9	1680	1090	1500	e1650	3690	4370	3290	1660	3400	689	503	573
10	1530	1490	1410	e1650	8940	4000	3590	1580	3150	744	532	909
11	1450	1960	1290	e1600	13100	3800	3340	1720	3030	735	483	942
12	1370	1700	e1300	e1600	13600	3770	3550	1650	2950	690	475	703
13	1210	1910	e1300	e1650	12500	3840	3480	1620	2760	645	469	720
14	1340	2400	e1300	e1750	11500	3740	3160	1560	2620	597	396	721
15	1010	2410	e1350	e1850	10200	3790	3010	1810	2450	596	408	594
16	1040	2450	e1450	e2000	8670	3800	2860	4370	2420	630	481	549
17	1140	2370	e1550	e2200	e7300	3910	2750	9310	2510	598	561	585
18	1100	2220	e1650	e2350	e6400	3780	2670	11800	2140	572	565	580
19	990	2150	e1900	e2500	e5700	3610	2610	10700	2160	537	642	614
20	906	2070	e1850	e2400	5440	3340	2530	8890	1890	595	609	634
21	918	2010	e1800	e2200	5070	3300	2660	7270	1810	628	663	718
22	980	1830	e1750	e1900	4440	3300	2900	6050	2130	699	698	755
23	882	1830	e1700	e1750	4020	3070	3300	5220	2370	661	622	885
24	1050	1670	e1750	e1900	3810	2890	3810	4510	2310	566	694	1000
25	1300	1570	e1750	e1800	5490	2890	3930	4150	2180	607	664	1030
26	1180	1550	e1700	e1900	9020	2750	3700	4020	1840	535	622	1050
27	1260	2000	e1700	e1600	10500	2700	3300	4060	1850	432	573	988
28	1290	2130	e1700	e1500	10300	2500	3010	4420	1630	558	572	907
29	1320	2090	e1650	e1550	—	2420	2750	4920	1510	625	494	796
30	1160	2150	e1650	e1900	—	2390	2570	5000	1420	629	504	790
31	1170	—	e1600	e2700	—	2310	—	4800	—	712	557	—
TOTAL	40526	51323	50590	56550	184650	128530	88830	126860	85010	22155	17238	21082
MEAN	1307	1711	1632	1824	6595	4146	2961	4092	2834	715	556	703
MAX	1840	2450	2110	2700	13600	9390	3930	11800	4700	1280	717	1050
MIN	882	950	1290	1500	2740	2310	2300	1560	1420	432	396	429
CFSM	.46	.60	.57	.64	2.32	1.46	1.04	1.44	1.00	.25	.20	.25
IN.	.53	.67	.66	.74	2.42	1.68	1.16	1.66	1.11	.29	.23	.28

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	1207	1594	1906	2001	2485	4326	4036	2642	1642	1069	782	927
MAX	7613	4931	4672	5715	6595	9398	7492	9715	4963	4468	2416	4613
(WY)	1987	1993	1991	1993	2001	1985	1993	1956	1989	1994	1994	1975
MIN	254	380	346	375	377	802	702	567	464	287	310	300
(WY)	1964	1965	1964	1963	1963	1964	1931	1931	1988	1965	1965	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	657165		873344			
ANNUAL MEAN	1796		2393		2059	
HIGHEST ANNUAL MEAN					3482	1993
LOWEST ANNUAL MEAN					631	1964
HIGHEST DAILY MEAN	15000	May 20	13600	Feb 12	21300	Apr 1 1960
LOWEST DAILY MEAN	420	Feb 8	396	Aug 14	109	Jul 16 1977
ANNUAL SEVEN-DAY MINIMUM	573	Feb 2	463	Aug 10	118	Jul 14 1977
MAXIMUM PEAK FLOW			13900	Feb 12	21500	Apr 1 1960
MAXIMUM PEAK STAGE			20.59	Feb 12	23.43	Apr 1 1960
INSTANTANEOUS LOW FLOW			363	Jul 27	40	May 13 1968
ANNUAL RUNOFF (CFSM)	.63		.84		.73	
ANNUAL RUNOFF (INCHES)	8.61		11.44		9.85	
10 PERCENT EXCEEDS	3090		4550		4440	
50 PERCENT EXCEEDS	1350		1750		1300	
90 PERCENT EXCEEDS	680		580		460	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04117000 QUAKER BROOK NEAR NASHVILLE, MI

LOCATION.--Lat 42°33'57", long 85°05'37", in NW1/4 sec.13, T.2 N., R.7 W., Barry County, Hydrologic Unit 04050007, on left bank 150 ft upstream from culvert on Clark Road, 500 ft upstream from unnamed tributary, and 2.5 mi south of Nashville.

DRAINAGE AREA.--7.60 mi^2.

PERIOD OF RECORD.--August 1954 to September 1975, October 1975 to September 1994 (operated as a crest-stage partial-record station), October 1994 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 821.89 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	3.9	7.5	5.2	11	11	7.6	4.9	14	4.0	3.2	3.1
2	3.2	3.8	5.7	5.0	8.9	11	7.1	4.8	16	3.9	3.3	3.0
3	3.2	3.8	4.6	5.2	7.5	11	6.4	4.6	15	4.2	3.3	3.0
4	10	3.7	4.3	5.4	7.0	11	5.8	4.4	10	4.3	3.0	2.9
5	7.9	3.6	4.4	5.7	6.5	8.5	5.5	4.3	8.5	3.9	2.8	2.8
6	6.5	3.6	4.3	5.7	6.2	7.9	11	4.1	8.8	3.6	2.8	2.7
7	5.4	4.0	4.4	5.7	5.9	8.2	9.9	4.6	8.5	3.8	2.8	2.9
8	4.8	4.0	4.4	5.0	6.4	8.7	7.3	7.3	7.6	3.9	2.8	3.5
9	4.4	7.3	4.4	4.7	116	8.0	11	4.8	6.5	3.5	2.9	9.7
10	4.0	21	4.4	5.2	63	7.3	10	4.4	6.1	3.4	5.2	12
11	3.8	9.9	4.1	5.1	24	11	7.6	7.0	9.5	3.2	3.5	5.2
12	3.6	6.4	5.1	5.0	17	10	7.1	5.9	12	3.1	3.2	4.0
13	3.6	12	5.2	5.2	14	11	6.0	4.6	8.2	3.1	3.0	3.6
14	3.5	13	5.3	5.5	13	9.5	5.6	4.7	6.2	3.0	2.9	3.5
15	3.7	11	5.3	6.4	13	11	5.6	80	6.0	3.0	2.8	3.4
16	6.8	7.9	6.0	7.2	11	12	5.3	86	6.9	2.9	7.8	3.3
17	5.2	9.0	6.4	6.8	9.3	10	5.2	30	5.5	3.0	7.7	3.2
18	4.3	7.9	6.6	6.5	8.0	8.8	4.9	17	9.2	3.3	5.0	3.3
19	4.0	6.6	6.4	6.2	7.1	8.2	4.7	11	7.4	3.2	8.6	4.6
20	3.8	6.2	6.0	5.2	7.5	8.1	8.6	8.6	5.6	3.0	5.9	4.8
21	3.6	6.1	6.0	5.1	7.3	7.9	14	9.5	9.5	6.4	4.0	6.8
22	3.5	5.7	5.5	4.7	6.5	7.5	17	13	17	6.2	8.4	7.2
23	3.6	5.2	5.6	4.8	6.1	7.2	18	8.6	8.6	7.6	11	6.4
24	9.2	5.1	5.7	4.8	7.4	6.8	16	11	6.4	8.5	5.5	11
25	6.8	5.1	5.2	4.7	82	6.2	9.1	17	5.6	4.7	5.1	7.0
26	5.2	15	5.5	4.6	29	5.6	7.2	14	5.1	4.3	5.7	7.2
27	5.3	17	5.6	4.5	19	5.7	6.1	21	4.6	3.7	4.6	5.6
28	4.7	9.6	4.9	4.5	13	6.0	5.5	21	4.4	3.5	4.0	4.7
29	4.1	7.6	5.2	4.5	---	6.7	5.2	12	4.3	3.4	3.6	4.3
30	4.0	8.0	5.4	9.8	---	6.5	5.0	8.9	4.1	3.3	3.3	4.0
31	3.9	---	5.6	12	---	6.3	---	7.6	---	3.2	3.2	---
TOTAL	148.9	233.0	165.0	175.9	532.6	264.6	245.3	446.6	247.1	124.1	140.9	148.7
MEAN	4.80	7.77	5.32	5.67	19.0	8.54	8.18	14.4	8.24	4.00	4.55	4.96
MAX	10	21	7.5	12	116	12	18	86	17	8.5	11	12
MIN	3.2	3.6	4.1	4.5	5.9	5.6	4.7	4.1	4.1	2.9	2.8	2.7
CFSM	.63	1.02	.70	.75	2.50	1.12	1.08	1.90	1.08	.53	.60	.65
IN.	.73	1.14	.81	.86	2.61	1.30	1.20	2.19	1.21	.61	.69	.73

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2001, BY WATER YEAR (WY)

MEAN	4.83	6.37	6.79	6.71	8.49	11.2	10.2	8.26	5.87	3.75	3.60	3.54
MAX	14.2	14.3	14.9	15.6	19.0	25.0	23.7	15.3	12.8	7.78	13.5	8.17
(WY)	1955	1995	1973	1974	2001	1974	1975	1973	1973	1969	1972	1972
MIN	1.59	2.33	2.11	2.78	2.36	4.23	4.07	2.97	2.05	1.22	1.36	1.52
(WY)	1964	1964	1964	1964	1964	1964	1963	1958	1959	1964	1964	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1954 - 2001	
ANNUAL TOTAL	2066.1		2872.7			
ANNUAL MEAN	5.65		7.87		6.59	
HIGHEST ANNUAL MEAN					11.1	1974
LOWEST ANNUAL MEAN					2.73	1964
HIGHEST DAILY MEAN	75	May 19	116	Feb 9	211	Apr 19 1975
LOWEST DAILY MEAN	2.0	Sep 6	2.7	Sep 6	.70	Jul 29 1964
ANNUAL SEVEN-DAY MINIMUM	2.1	Sep 2	2.9	Aug 3	.73	Aug 4 1964
MAXIMUM PEAK FLOW			239	Feb 9	470	Apr 19 1975
MAXIMUM PEAK STAGE			6.11	Feb 9	9.45	Apr 19 1975
INSTANTANEOUS LOW FLOW					(a).44	Nov 3 1966
ANNUAL RUNOFF (CFSM)	.74		1.04		.87	
ANNUAL RUNOFF (INCHES)	10.11		14.06		11.77	
10 PERCENT EXCEEDS	9.2		12		12	
50 PERCENT EXCEEDS	4.2		5.7		4.6	
90 PERCENT EXCEEDS	2.8		3.3		2.3	

(a) Result of freezeup.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04117500 THORNAPPLE RIVER NEAR HASTINGS, MI

LOCATION.--Lat 42°36'57", long 85°14'11", in SE1/4 sec.27, T.3 N., R.8 W., Barry County, Hydrologic Unit 04050007, on right bank 100 ft upstream from bridge on McKeown Road, 0.6 mi downstream from Cedar Creek, 2.0 mi downstream from Thornapple Lake, and 3.2 mi southeast of Hastings.

DRAINAGE AREA.--385 mi^2.

PERIOD OF RECORD.--October 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 786.71 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 1, 1965, nonrecording gage at same site and datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	289	197	483	244	483	1600	297	337	832	169	124	124
2	237	190	442	244	571	1440	306	304	820	157	120	119
3	206	183	394	244	552	1220	307	278	792	149	119	115
4	209	178	347	240	551	1030	302	262	770	145	115	111
5	234	176	316	241	564	877	290	247	745	141	110	109
6	249	175	275	246	508	754	296	231	695	136	105	106
7	249	172	254	255	448	651	339	217	608	131	101	107
8	239	171	254	259	404	575	371	227	522	130	98	123
9	227	179	245	252	575	525	382	228	449	129	96	163
10	212	253	237	250	1530	482	375	217	391	124	106	221
11	202	343	228	250	2580	471	377	234	361	120	108	236
12	189	376	188	247	3030	480	382	253	363	115	107	211
13	181	377	204	250	2880	492	383	247	366	110	104	176
14	172	412	225	256	2400	509	362	229	344	107	101	151
15	172	469	235	267	1910	522	337	493	309	103	97	136
16	178	492	241	296	1530	534	303	1090	284	102	106	127
17	189	493	252	331	1220	546	286	1600	267	102	125	122
18	194	475	254	365	975	543	269	1800	264	103	138	119
19	195	437	256	385	846	516	258	1720	266	104	161	122
20	188	396	261	351	744	479	260	1520	256	104	175	130
21	182	368	268	311	629	451	311	1270	242	129	174	145
22	175	339	266	302	528	428	417	1050	259	169	176	178
23	171	317	261	315	470	406	553	880	287	170	204	187
24	189	295	258	310	437	385	676	739	299	194	210	211
25	213	279	258	277	715	367	730	657	291	195	204	216
26	225	310	256	253	1360	344	716	610	259	179	189	212
27	230	434	252	254	1770	327	667	612	230	159	173	203
28	230	535	251	233	1720	311	571	700	208	144	159	189
29	219	563	248	237	—	307	473	802	192	135	146	177
30	209	527	247	264	—	306	391	830	179	131	136	163
31	202	—	245	356	—	298	—	835	—	129	131	—
TOTAL	6456	10111	8401	8585	31930	18176	11987	20719	12150	4215	4218	4709
MEAN	208	337	271	277	1140	586	400	668	405	136	136	157
MAX	289	563	483	385	3030	1600	730	1800	832	195	210	236
MIN	171	171	188	233	404	298	258	217	179	102	96	106
CFSM	.54	.88	.70	.72	2.96	1.52	1.04	1.74	1.05	.35	.35	.41
IN.	.62	.98	.81	.83	3.09	1.76	1.16	2.00	1.17	.41	.41	.45

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2001, BY WATER YEAR (WY)

MEAN	199	263	319	348	410	677	635	405	275	162	130	148
MAX	1072	939	895	1049	1140	1506	1914	1391	1011	410	385	358
(WY)	1987	1991	1991	1973	2001	1948	1947	1956	1989	1968	1980	1992
MIN	54.5	73.6	75.2	90.4	87.5	129	176	111	87.0	56.0	50.2	54.4
(WY)	1964	1964	1964	1964	1963	1964	1946	1958	1964	1964	1946	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1945 - 2001	
ANNUAL TOTAL	102271		141657			
ANNUAL MEAN	279		388		330	
HIGHEST ANNUAL MEAN					534	1993
LOWEST ANNUAL MEAN					99.2	1964
HIGHEST DAILY MEAN	2230	May 21	3030	Feb 12	6590	Apr 7 1947
LOWEST DAILY MEAN	77	Sep 7	96	Aug 9	35	Jul 31 1964
ANNUAL SEVEN-DAY MINIMUM	81	Sep 3	103	Aug 9	36	Aug 7 1964
MAXIMUM PEAK FLOW			3060	Feb 12	6810	Apr 7 1947
MAXIMUM PEAK STAGE			8.04	Feb 12	(a)10.20	Apr 7 1947
INSTANTANEOUS LOW FLOW			93	Aug 9	33	Aug 10 1964
ANNUAL RUNOFF (CFSM)	.73		1.01		.86	
ANNUAL RUNOFF (INCHES)	9.88		13.69		11.66	
10 PERCENT EXCEEDS	492		741		687	
50 PERCENT EXCEEDS	195		256		200	
90 PERCENT EXCEEDS	111		124		92	

(a) From graph based on gage readings.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04118500 ROGUE RIVER NEAR ROCKFORD, MI

LOCATION.--Lat 43°04'56", long 85°35'27", in NE1/4 sec.15, T.8 N., R.11 W., Kent County, Hydrologic Unit 04050006, on left bank at downstream side of bridge on Packer Drive, 2.2 mi upstream from mouth, and 3.0 mi southwest of Rockford.

DRAINAGE AREA.--234 mi^2.

PERIOD OF RECORD.--February 1952 to September 1982, October 1987 to current year.

GAGE.--Water-stage recorder. Datum of gage is 624.80 ft above sea level (levels by Johnson and Anderson, Inc.). Prior to Aug. 30, 1952, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some regulation caused by dam 2 mi upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 12, 1986, reached a stage of 11.35 ft, from floodmark, and discharge of approximately 6,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	143	304	e215	318	528	236	198	370	140	111	184
2	150	142	278	e215	305	466	231	191	383	139	106	178
3	144	141	248	e210	297	410	228	186	371	137	105	161
4	150	140	220	e205	269	387	223	180	370	135	106	150
5	148	139	e200	e205	268	368	217	176	352	135	103	143
6	146	137	e180	e205	261	335	230	173	337	132	100	139
7	143	146	e180	e210	233	329	258	176	306	127	98	165
8	145	150	e180	e220	228	313	275	189	275	122	97	185
9	147	209	e185	e230	559	297	310	205	252	119	96	215
10	149	289	e190	e220	661	284	302	205	234	119	110	243
11	145	283	e180	e210	e1050	297	281	233	230	116	109	224
12	141	289	e170	e200	e1050	296	271	227	231	112	112	214
13	139	318	e175	194	797	317	258	221	227	112	114	189
14	139	301	e180	196	616	321	252	209	214	109	111	167
15	136	285	e185	211	488	327	256	494	238	106	102	154
16	136	283	e190	231	421	327	249	1150	268	105	120	147
17	136	286	e195	251	332	320	228	1130	268	108	137	143
18	134	276	e200	266	e300	312	215	853	250	110	137	142
19	133	272	e200	260	e275	301	206	709	224	112	353	188
20	134	274	e200	235	e250	289	223	525	207	110	437	212
21	133	265	e190	211	e230	281	262	417	205	163	412	211
22	133	256	e185	187	e225	278	278	383	213	185	473	203
23	135	248	e195	196	224	272	298	343	207	171	395	205
24	151	239	e200	203	241	264	343	364	195	157	322	210
25	148	229	e205	e180	508	253	294	392	180	156	293	206
26	149	254	e210	e170	596	237	271	405	169	141	257	203
27	160	279	e215	e165	708	227	249	425	161	129	208	191
28	157	313	e220	e160	592	223	226	437	155	125	190	183
29	159	321	e220	170	---	227	211	431	148	120	170	176
30	152	316	e220	236	---	229	202	394	144	116	157	167
31	146	---	e215	280	---	230	---	379	---	115	205	---
TOTAL	4475	7223	6315	6547	12302	9545	7583	12000	7384	3983	5846	5498
MEAN	144	241	204	211	439	308	253	387	246	128	189	183
MAX	160	321	304	280	1050	528	343	1150	383	185	473	243
MIN	133	137	170	160	224	223	202	173	144	105	96	139
CFSM	.62	1.03	.87	.90	1.88	1.32	1.08	1.65	1.05	.55	.81	.78
IN.	.71	1.15	1.00	1.04	1.96	1.52	1.21	1.91	1.17	.63	.93	.87

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	184	237	244	234	257	391	386	297	216	155	152	159
MAX	528	525	557	512	567	944	836	620	457	362	317	556
(WY)	1982	1991	1992	1973	1976	1976	1967	1956	1989	1994	1994	1975
MIN	100	118	126	116	107	222	175	122	108	83.8	83.2	93.7
(WY)	1965	1965	1963	1970	1963	2000	1958	1958	1964	1964	1971	1966

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	85355		88701			
ANNUAL MEAN	233		243		242	
HIGHEST ANNUAL MEAN					360	(a)
LOWEST ANNUAL MEAN					155	1964
HIGHEST DAILY MEAN	1790	May 19	1150	May 16	3290	Mar 6 1976
LOWEST DAILY MEAN	117	Jul 26	96	Aug 9	49	Aug 27 1955
ANNUAL SEVEN-DAY MINIMUM	123	Jul 21	101	Aug 3	58	Aug 13 1958
MAXIMUM PEAK FLOW			1380	May 16	3540	Mar 6 1976
MAXIMUM PEAK STAGE			7.57	May 16	9.29	Mar 6 1976
INSTANTANEOUS LOW FLOW			93	Aug 9	28	Jan 22 1967
ANNUAL RUNOFF (CFSM)	1.00		1.04		1.04	
ANNUAL RUNOFF (INCHES)	13.57		14.10		14.07	
10 PERCENT EXCEEDS	358		374		419	
50 PERCENT EXCEEDS	186		211		192	
90 PERCENT EXCEEDS	131		133		110	

(a) 1976, 1991.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04119000 GRAND RIVER AT GRAND RAPIDS, MI

LOCATION.--Lat 42°57'52", long 85°40'35", in NE1/4 sec.25, T.7 N., R.12 W., Kent County, Hydrologic Unit 04050006, on right bank 500 ft upstream from bridge on Fulton Street in Grand Rapids, 1.7 mi upstream from Plaster Creek, and at mile 41.

DRAINAGE AREA.--4,900 mi^2, approximately.

PERIOD OF RECORD.--March 1901 to December 1905, January 1906 to August 1918 (gage heights only), October 1930 to current year. Monthly discharge only for some periods, published in WSP 1307. Gage-height records collected in this vicinity since 1907 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 924: 1938(M). WSP 1387: 1901-5, 1940.

GAGE.--Water-stage recorder. Datum of gage is 585.70 ft above sea level (levels by City of Grand Rapids). March 1901 to August 1918, nonrecording gage at Fulton Street Bridge and Oct. 1, 1930 to Oct. 26, 1953, water-stage recorder at sewage pumping station 1 mi downstream at datum 2.99 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Moderate diurnal fluctuation at low and medium flow caused by powerplants upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3850	2370	4540	e3050	5280	15500	4110	4060	8380	2470	1610	1750
2	3540	2290	4390	e3000	6250	15400	4110	3940	8480	2240	1630	1730
3	3240	2250	4170	e2950	6570	14400	4080	3730	8370	2120	1380	1560
4	3250	2130	4040	e2900	6330	13300	3990	3190	8210	2120	1410	1490
5	3290	2220	3850	e3000	5940	12100	3990	3010	7960	2040	1240	1450
6	3210	2090	3610	e3100	5410	10900	4140	3030	7660	1880	1220	1360
7	3270	2110	3340	e3200	4960	9930	4250	2940	7200	1790	1180	1550
8	3330	2170	3190	e3250	4690	8990	5080	2850	6490	1850	1170	1600
9	3280	2450	2730	e3250	6660	8240	5450	2780	5840	1800	1140	1780
10	3170	3310	2960	e3200	10700	7500	5770	2860	5380	1660	1310	2120
11	2770	3650	2820	e3150	12700	7080	5980	3180	5290	1610	1440	2280
12	3030	3920	1490	e3100	14800	6840	5970	3150	5140	1610	1220	2240
13	3230	4030	2250	e3150	18900	6900	6460	3100	4990	1610	1240	1990
14	2450	4400	2130	e3300	20800	7000	5750	2980	4650	1450	1180	1890
15	2480	4660	2550	3580	20400	6960	5260	8090	4630	1410	1080	1750
16	1940	4690	3100	3860	18600	7130	4350	11500	4610	1370	1180	1650
17	1870	4740	3690	3980	e16000	7120	4310	12400	4370	1460	1370	1630
18	2100	4640	3510	4130	e13700	7040	4330	13100	4280	1450	1440	1540
19	2180	4500	2960	4350	e12000	6840	4190	14600	3980	1350	1600	1810
20	2060	4440	e3250	e4450	10500	6460	4190	16000	3840	1390	1960	1820
21	2050	4220	e3400	e4250	e9100	6140	4370	15700	3570	1830	2110	1860
22	1920	4160	e3300	e3900	e8100	5960	4710	14400	3560	2040	2570	1840
23	2020	4020	e3300	e3500	e7100	5820	5380	12500	3790	1910	2550	2140
24	2610	3860	e3300	e3600	e6850	5400	6200	10600	3800	1890	2200	2180
25	2260	3760	e3300	e3400	8840	5160	6620	9010	3790	1720	2100	2300
26	2570	3790	e3300	e3500	11200	4970	6980	7850	3580	1700	2060	2300
27	2590	4180	e3250	e3200	12900	4700	6340	7380	3160	1470	1850	2310
28	2590	4520	e3200	e3100	14400	4430	5860	7810	3050	1330	1780	2200
29	2600	4600	e3200	e3000	—	4200	5160	8080	2740	1330	1680	2100
30	2610	4600	e3150	e3500	—	4180	4190	8270	2620	1450	1560	1970
31	2380	—	e3100	4100	—	4120	—	8370	—	1350	1930	—
TOTAL	83740	108770	100370	107000	299680	240710	151570	230460	153410	52700	49390	56190
MEAN	2701	3626	3238	3452	10700	7765	5052	7434	5114	1700	1593	1873
MAX	3850	4740	4540	4450	20800	15500	6980	16000	8480	2470	2570	2310
MIN	1870	2090	1490	2900	4690	4120	3990	2780	2620	1330	1080	1360
CFSM	.55	.74	.66	.70	2.18	1.58	1.03	1.52	1.04	.35	.33	.38
IN.	.64	.83	.76	.81	2.28	1.83	1.15	1.75	1.16	.40	.37	.43

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901 - 2001, BY WATER YEAR (WY)

MEAN	2399	2920	3359	3713	4398	7597	6990	4809	3401	2187	1735	1972
MAX	13630	7966	8794	12020	14720	21580	17900	15650	15670	7885	5225	7600
(WY)	1987	1991	1991	1973	1938	1904	1947	1956	1905	1994	1994	1975
MIN	906	1004	1080	1069	1079	1858	1759	1459	930	650	617	949
(WY)	1965	1931	1964	1963	1963	1931	1931	1931	1934	1934	1934	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1901 - 2001	
ANNUAL TOTAL	1315470		1633990			
ANNUAL MEAN	3594		4477		3784	
HIGHEST ANNUAL MEAN					6314	1943
LOWEST ANNUAL MEAN					1264	1931
HIGHEST DAILY MEAN	21000	May 22	20800	Feb 14	53300	Mar 27 1904
LOWEST DAILY MEAN	1270	Sep 6	1080	Aug 15	381	Aug 9 1936
ANNUAL SEVEN-DAY MINIMUM	1390	Jan 28	1230	Aug 9	438	Aug 8 1936
MAXIMUM PEAK FLOW			20900	Feb 14	54000	Mar 28 1904
MAXIMUM PEAK STAGE			16.07	Feb 14	(a)22.49	Mar 28 1904
INSTANTANEOUS LOW FLOW			1010	Aug 9		
ANNUAL RUNOFF (CFSM)	.73		.91		.77	
ANNUAL RUNOFF (INCHES)	9.99		12.40		10.49	
10 PERCENT EXCEEDS	6030		8370		7660	
50 PERCENT EXCEEDS	2920		3310		2580	
90 PERCENT EXCEEDS	1500		1580		1200	

(a) Present datum; from graph based on gage readings.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

442805084411001 HIGGINS LAKE NEAR ROSCOMMON, MI

LOCATION.--Lat 44°25'35", long 84°40'55", in NW1/4 SW1/4 sec.33, T.24 N., R.3 W., Roscommon County, Hydrologic Unit 04060102, at South Higgins Lake State Park, 6.7 mi southwest of Roscommon.

DRAINAGE AREA.--58 mi^2, approximately.

PERIOD OF RECORD.--September 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,148.74 ft above sea level. Sept. 1, 1942 to Nov. 27, 1942, nonrecording gage at different datum. Nov. 27, 1942 to June 9, 1988, water-stage recorder at same datum. June 9, 1988 to Nov. 6, 1998, nonrecording gage at same datum.

REMARKS.--Inlets are Big Creek and Little Creek. The outlet is "The Cut". Lake elevation controlled by dam. Established legal level; summer, 1,154.11 ft, winter, 1,153.61 ft, above sea level. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 6.23 ft, June 26, 1954; minimum 4.32 ft, Oct. 3, 4, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.55 ft, May 22, 25, 27, 28, June 3; minimum, 5.04 ft, Dec. 9, 13, 15.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.18	5.11	5.10	5.09	5.14	5.23	5.14	5.43	5.49	5.37	5.22	5.14
2	5.19	5.10	5.08	5.08	5.14	5.23	5.14	5.43	5.52	5.26	5.24	5.13
3	5.20	5.11	5.07	5.09	5.14	5.22	5.15	5.44	5.55	5.26	5.24	5.12
4	5.20	5.09	5.06	5.09	5.14	5.22	5.15	5.44	5.52	5.29	5.22	5.12
5	5.18	5.07	5.10	5.10	5.14	5.22	5.15	5.43	5.50	5.28	5.21	5.10
6	5.21	5.06	5.06	5.10	5.14	5.22	5.17	5.41	5.49	5.21	5.20	5.10
7	5.20	5.06	5.06	5.10	5.14	5.21	5.21	5.43	5.47	5.20	5.21	5.09
8	5.19	5.06	5.06	5.10	5.19	5.21	5.23	5.49	5.46	5.21	5.20	5.10
9	5.18	5.11	5.04	5.10	5.27	5.21	5.24	5.48	5.45	5.20	5.20	5.14
10	5.17	5.17	5.05	5.10	5.29	5.20	5.25	5.47	5.46	5.23	5.21	5.22
11	5.16	5.13	5.05	5.10	5.28	5.20	5.29	5.54	5.47	5.22	5.17	5.21
12	5.14	5.10	5.08	5.10	5.27	5.20	5.44	5.53	5.47	5.22	5.16	5.20
13	5.13	5.12	5.04	5.10	5.27	5.21	5.46	5.49	5.46	5.21	5.16	5.20
14	5.14	5.14	5.06	5.10	5.26	5.20	5.44	5.47	5.45	5.16	5.12	5.17
15	5.14	5.13	5.04	5.10	5.26	5.20	5.43	5.47	5.44	5.16	5.10	5.16
16	5.14	5.14	5.05	5.11	5.25	5.19	5.45	5.53	5.45	5.19	5.09	5.15
17	5.15	5.15	5.08	5.11	5.25	5.18	5.46	5.53	5.45	5.18	5.11	5.16
18	5.15	5.13	5.06	5.11	5.24	5.18	5.43	5.53	5.40	5.18	5.09	5.16
19	5.14	5.11	5.09	5.11	5.24	5.17	5.41	5.51	5.43	5.17	5.13	5.19
20	5.14	5.13	5.07	5.10	5.24	5.16	5.41	5.49	5.39	5.17	5.15	5.24
21	5.14	5.12	5.08	5.10	5.23	5.16	5.43	5.50	5.38	5.20	5.13	5.24
22	5.13	5.13	5.09	5.10	5.22	5.15	5.44	5.55	5.43	5.25	5.12	5.23
23	5.13	5.09	5.09	5.10	5.22	5.15	5.44	5.53	5.38	5.25	5.13	5.26
24	5.14	5.08	5.10	5.10	5.23	5.15	5.49	5.53	5.36	5.27	5.12	5.31
25	5.14	5.07	5.09	5.09	5.26	5.15	5.45	5.55	5.34	5.24	5.12	5.29
26	5.14	5.10	5.09	5.09	5.26	5.15	5.45	5.53	5.33	5.23	5.18	5.29
27	5.16	5.11	5.10	5.10	5.25	5.15	5.46	5.55	5.33	5.20	5.17	5.27
28	5.15	5.10	5.09	5.10	5.24	5.14	5.45	5.55	5.31	5.18	5.17	5.25
29	5.14	5.10	5.09	5.10	---	5.14	5.43	5.54	5.30	5.20	5.15	5.24
30	5.13	5.10	5.10	5.14	---	5.14	5.43	5.51	5.30	5.23	5.14	5.23
31	5.12	---	5.09	5.14	---	5.14	---	5.46	---	5.23	5.18	---
MEAN	5.16	5.11	5.07	5.10	5.22	5.18	5.35	5.49	5.43	5.22	5.16	5.19
MAX	5.21	5.17	5.10	5.14	5.29	5.23	5.49	5.55	5.55	5.37	5.24	5.31
MIN	5.12	5.06	5.04	5.08	5.14	5.14	5.14	5.41	5.30	5.16	5.09	5.09

STREAMS TRIBUTARY TO LAKE MICHIGAN

442400084472801 HOUGHTON LAKE NEAR HOUGHTON LAKE HEIGHTS, MI

LOCATION.--Lat 44°24'16", long 84°47'28", in NW1/4 NW1/4 sec.10, T.23 N., R.4 W., Roscommon County, Hydrologic Unit 04060102, on right bank of Muskegon River at upstream side of bridge on Old U.S. Highway 27, 0.4 mi downstream from Houghton Lake, and 5.2 mi north of Houghton Lake Heights.

DRAINAGE AREA.--222 mi^2.

PERIOD OF RECORD.--June 1942 to September 1991, September 1993 to current year, except winter period of 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,130.00 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Sept. 28, 1960, nonrecording gage at datum 6.21 ft higher. Water-stage recorder Sept. 28, 1960 to Sept. 30, 1991. September 1993 to Nov. 26, 1996, nonrecording gage.

REMARKS.--Backus Creek and "The Cut" from Higgins Lake, join about 1 mi upstream from Houghton Lake and become the major inlet. There are also many small tributaries which feed the lake. The outlet is Muskegon River. Houghton Lake is the largest inland lake in Michigan. Established legal level, summer, 1,138.1 ft, minimum winter, 1,137.6 ft, above sea level. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 10.18 ft, Apr. 23, 1985; minimum observed, 6.95 ft, Sept. 3, 5, Nov. 8, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 8.92 ft, June 6, 15; minimum, 7.45 ft, Jan. 29.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.17	7.67	7.67	7.58	7.49	7.69	7.94	8.83	8.80	8.42	8.29	8.09
2	8.12	7.67	7.66	7.57	7.49	7.69	7.95	8.83	8.83	8.57	8.23	8.11
3	8.05	7.60	7.66	7.57	7.50	7.68	7.96	8.82	8.83	8.56	8.21	8.09
4	8.04	7.53	7.65	7.56	7.50	7.69	7.98	8.79	8.85	8.49	8.22	8.07
5	8.03	7.54	7.64	7.56	7.50	7.71	7.99	8.81	8.88	8.41	8.21	8.10
6	7.98	7.61	7.64	7.55	7.49	7.71	8.01	8.85	8.90	8.47	8.19	8.12
7	7.93	7.69	7.63	7.55	7.49	7.71	8.04	8.81	8.90	8.49	8.15	8.14
8	7.94	7.58	7.63	7.54	7.50	7.72	8.07	8.71	8.87	8.47	8.15	8.16
9	7.93	7.54	7.62	7.54	7.55	7.73	8.11	8.69	8.86	8.45	8.13	8.12
10	7.91	7.49	7.62	7.54	7.61	7.75	8.15	8.71	8.88	8.38	8.08	8.12
11	7.91	7.55	7.61	7.53	7.65	7.76	8.20	8.67	8.88	8.32	8.10	8.14
12	7.92	7.61	7.62	7.52	7.65	7.76	8.43	8.63	8.86	8.31	8.09	8.12
13	7.92	7.65	7.63	7.52	7.64	7.76	8.36	8.65	8.87	8.27	8.01	8.10
14	7.91	7.63	7.63	7.51	7.64	7.77	8.48	8.67	8.88	8.29	8.03	8.11
15	7.88	7.61	7.63	7.52	7.64	7.76	8.53	8.74	8.85	8.32	8.01	8.12
16	7.88	7.65	7.62	7.52	7.64	7.67	8.51	8.80	8.79	8.35	8.05	8.11
17	7.87	7.61	7.62	7.51	7.65	7.68	8.47	8.77	8.74	8.35	7.97	8.10
18	7.84	7.62	7.61	7.52	7.65	7.71	8.52	8.73	8.80	8.35	8.04	8.11
19	7.81	7.67	7.62	7.50	7.66	7.74	8.62	8.76	8.73	8.34	8.01	8.17
20	7.83	7.61	7.63	7.50	7.65	7.77	8.69	8.78	8.72	8.33	8.03	8.14
21	7.81	7.55	7.63	7.49	7.64	7.80	8.70	8.83	8.71	8.33	8.08	8.16
22	7.80	7.58	7.64	7.49	7.64	7.83	8.62	8.81	8.63	8.35	8.10	8.18
23	7.80	7.60	7.63	7.48	7.64	7.83	8.73	8.81	8.64	8.38	8.09	8.19
24	7.76	7.64	7.63	7.47	7.64	7.85	8.64	8.83	8.65	8.32	8.11	8.08
25	7.75	7.64	7.62	7.47	7.67	7.88	8.71	8.82	8.67	8.34	8.13	8.12
26	7.76	7.65	7.62	7.47	7.68	7.89	8.76	8.84	8.68	8.33	8.10	8.17
27	7.71	7.68	7.61	7.46	7.68	7.91	8.77	8.79	8.68	8.34	8.11	8.19
28	7.66	7.68	7.60	7.46	7.68	7.92	8.77	8.74	8.67	8.34	8.09	8.22
29	7.67	7.68	7.60	7.46	—	7.92	8.83	8.73	8.66	8.30	8.12	8.24
30	7.68	7.68	7.59	7.48	—	7.91	8.83	8.71	8.62	8.27	8.14	8.26
31	7.67	—	7.58	7.49	—	7.92	—	8.76	—	8.29	8.06	—
MEAN	7.87	7.62	7.63	7.51	7.60	7.78	8.41	8.77	8.78	8.37	8.11	8.14
MAX	8.17	7.69	7.67	7.58	7.68	7.92	8.83	8.85	8.90	8.57	8.29	8.26
MIN	7.66	7.49	7.58	7.46	7.49	7.67	7.94	8.63	8.62	8.27	7.97	8.07

STREAMS TRIBUTARY TO LAKE MICHIGAN

441508085244001 LAKE MITCHELL-CADILLAC AT CADILLAC, MI

LOCATION.--Lat 44°14'21", long 85°27'17", in SW1/4 SW1/4 sec.6, T.21 N., R.9 W., Wexford County, Hydrologic Unit 04060102, on right bank of channel between lakes, at William Mitchell State Park, at Cadillac.

DRAINAGE AREA.--46.6 mi^2.

PERIOD OF RECORD.--August 1942 to December 1959, July 1960 to current year.

GAGE.--Nonrecording gage. Once daily reading by observer. Datum of gage is 1,283.41 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--The major inlet is Mitchell Creek. The outlet is Clam River. Lake elevation controlled by dam. Established legal levels; annual maximum level, 1,290.0 ft, minimum winter level, 1,288.9 ft, summer minimum level, 1,289.7 ft above sea level.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.86 ft, Sept. 6, 1975; minimum observed, 4.62 ft, Oct. 4, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 7.35 ft, Apr. 16; minimum observed, 6.03 ft, Sept. 18.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.17	6.11	6.55	6.33	6.11	6.29	6.37	6.95	7.15	6.57	6.31	6.23
2	6.15	6.11	6.57	6.31	6.11	6.25	6.41	6.93	7.21	6.55	6.29	6.21
3	6.15	6.09	6.57	6.31	6.11	6.25	6.43	6.87	7.21	6.53	6.27	6.19
4	6.15	6.09	6.57	6.31	6.11	6.25	6.47	6.85	7.17	6.53	6.25	6.17
5	6.15	6.07	6.57	6.29	6.11	6.25	6.51	6.81	7.15	6.51	6.23	6.17
6	6.17	6.07	6.57	6.29	6.11	6.25	6.57	6.79	7.13	6.49	6.21	6.13
7	6.17	6.05	6.55	6.27	6.11	6.25	6.67	6.79	7.09	6.49	6.19	6.11
8	6.17	6.05	6.55	6.27	6.13	6.25	6.81	6.79	7.07	6.47	6.17	6.15
9	6.17	6.13	6.55	6.25	6.25	6.25	6.85	6.77	7.05	6.45	6.15	6.17
10	6.17	6.17	6.55	6.23	6.27	6.25	6.89	6.77	7.03	6.43	6.13	6.15
11	6.15	6.21	6.55	6.23	6.29	6.25	6.97	6.77	7.03	6.41	6.11	6.15
12	6.15	6.23	6.55	6.23	6.25	6.25	7.09	6.75	6.99	6.39	6.09	6.15
13	6.17	6.23	6.55	6.21	6.23	6.25	7.27	6.75	6.95	6.37	6.07	6.13
14	6.17	6.25	6.55	6.21	6.25	6.25	7.31	6.69	6.91	6.35	6.05	6.11
15	6.17	6.27	6.55	6.21	6.25	6.25	7.33	6.87	6.87	6.33	6.05	6.09
16	6.17	6.27	6.53	6.19	6.27	6.25	7.35	7.11	6.83	6.31	6.07	6.07
17	6.17	6.29	6.51	6.19	6.29	6.23	7.33	7.17	6.81	6.29	6.13	6.05
18	6.17	6.33	6.49	6.17	6.29	6.23	7.29	7.21	6.79	6.27	6.15	6.03
19	6.17	6.35	6.49	6.17	6.29	6.21	7.27	7.23	6.77	6.27	6.21	6.17
20	6.15	6.35	6.47	6.15	6.27	6.21	7.25	7.19	6.75	6.25	6.23	6.21
21	6.15	6.39	6.45	6.15	6.27	6.23	7.25	7.23	6.71	6.29	6.21	6.23
22	6.15	6.39	6.43	6.13	6.25	6.25	7.25	7.25	6.71	6.39	6.21	6.23
23	6.15	6.41	6.43	6.13	6.25	6.25	7.21	7.25	6.69	6.39	6.19	6.21
24	6.15	6.41	6.41	6.13	6.29	6.25	7.19	7.23	6.67	6.37	6.17	6.25
25	6.15	6.43	6.41	6.13	6.29	6.25	7.15	7.25	6.67	6.35	6.15	6.23
26	6.15	6.45	6.39	6.11	6.29	6.27	7.11	7.27	6.65	6.31	6.15	6.23
27	6.13	6.49	6.37	6.11	6.27	6.29	7.07	7.25	6.65	6.29	6.13	6.25
28	6.13	6.51	6.37	6.11	6.27	6.29	7.03	7.25	6.61	6.27	6.23	6.27
29	6.13	6.51	6.35	6.11	—	6.31	6.99	7.21	6.59	6.25	6.23	6.29
30	6.13	6.53	6.35	6.11	—	6.31	6.97	7.17	6.57	6.27	6.21	6.29
31	6.13	—	6.33	6.11	—	6.33	—	7.15	—	6.29	6.23	—
MEAN	6.16	6.27	6.49	6.20	6.22	6.26	6.99	7.02	6.88	6.38	6.18	6.18
MAX	6.17	6.53	6.57	6.33	6.29	6.33	7.35	7.27	7.21	6.57	6.31	6.29
MIN	6.13	6.05	6.33	6.11	6.11	6.21	6.37	6.69	6.57	6.25	6.05	6.03

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121300 CLAM RIVER AT VOGEL CENTER, MI

LOCATION.--Lat 44°12'02", long 85°03'10", in SW1/4 NW1/4 sec.21, T.21 N., R.6 W., Missaukee County, Hydrologic Unit 04060102, on left bank 10 ft downstream from bridge on 8 Mile Road, 0.5 mi north of Vogel Center, and 3.5 mi southeast of Falmouth.

DRAINAGE AREA.--243 mi^2.

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,130 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some regulation at low flow by dams upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	59	78	99	103	119	160	e153	191	90	68	67
2	59	59	72	101	91	118	157	149	225	90	66	64
3	58	59	64	97	91	109	156	144	269	88	65	65
4	59	59	67	97	97	107	157	140	269	87	63	69
5	59	58	62	91	102	105	151	132	234	84	62	66
6	62	58	60	91	94	104	149	122	209	82	61	63
7	66	60	64	93	92	103	174	125	195	81	60	64
8	67	62	69	92	85	101	215	145	182	80	59	65
9	66	67	82	84	127	100	205	132	174	79	60	66
10	63	101	89	93	133	99	208	119	169	76	61	73
11	62	93	91	93	135	100	197	124	168	74	61	72
12	61	77	77	91	132	98	321	134	167	73	60	66
13	60	75	83	94	137	99	468	118	162	73	59	63
14	60	82	96	96	124	99	431	110	157	72	58	62
15	61	83	99	94	115	104	297	122	157	71	58	62
16	61	79	100	98	114	116	232	307	165	71	61	61
17	60	76	99	96	91	123	210	434	158	71	67	61
18	60	73	98	92	99	122	201	444	153	70	67	61
19	59	70	86	90	103	128	192	307	150	70	72	66
20	60	70	86	67	108	144	184	222	140	70	80	80
21	59	68	95	88	93	163	184	197	136	71	73	80
22	59	65	88	93	89	197	185	232	136	78	67	72
23	59	70	92	88	95	224	184	239	132	77	66	72
24	59	67	97	88	98	223	189	217	122	70	64	82
25	60	66	99	87	110	174	187	235	106	68	65	79
26	60	74	102	83	133	133	181	253	99	67	77	78
27	61	100	100	87	128	133	173	258	95	66	76	78
28	60	99	103	83	109	117	e163	264	93	65	68	73
29	59	89	102	88	—	125	e159	252	91	65	64	69
30	59	83	103	98	—	128	e156	214	89	70	63	69
31	59	—	103	109	—	144	—	189	—	72	66	—
TOTAL	1878	2201	2706	2841	3028	3959	6226	6233	4793	2321	2017	2068
MEAN	60.6	73.4	87.3	91.6	108	128	208	201	160	74.9	65.1	68.9
MAX	67	101	103	109	137	224	468	444	269	90	80	82
MIN	58	58	60	67	85	98	149	110	89	65	58	61
CFSM	.25	.30	.36	.38	.45	.53	.85	.83	.66	.31	.27	.28
IN.	.29	.34	.41	.43	.46	.61	.95	.95	.73	.36	.31	.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2001, BY WATER YEAR (WY)

MEAN	114	132	134	121	123	188	234	154	115	89.9	83.5	97.2
MAX	275	248	259	187	194	389	396	245	218	238	185	281
(WY)	1987	1986	1992	1993	1988	1976	1976	1976	1996	1969	1969	1985
MIN	60.6	70.3	64.5	62.7	63.5	100	104	67.9	57.0	53.0	58.1	59.9
(WY)	2001	1977	1977	1977	1977	1978	2000	1977	1977	1977	1978	1981

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1966 - 2001	
ANNUAL TOTAL	35081		40271			
ANNUAL MEAN	95.8		110		132	
HIGHEST ANNUAL MEAN					185	1992
LOWEST ANNUAL MEAN					81.2	1977
HIGHEST DAILY MEAN	443	May 14	468	Apr 13	1680	Mar 29 1989
LOWEST DAILY MEAN	57	Sep 8	58	Oct 3	47	Jul 31 1966
ANNUAL SEVEN-DAY MINIMUM	59	Oct 31	59	Oct 31	50	Jul 19 1966
MAXIMUM PEAK FLOW			499	May 17	1710	Mar 29 1989
MAXIMUM PEAK STAGE			4.91	May 17	7.31	Mar 29 1989
INSTANTANEOUS LOW FLOW			(a)48	Dec 5	(a)29	Nov 3 1969
ANNUAL RUNOFF (CFSM)	.39		.45		.54	
ANNUAL RUNOFF (INCHES)	5.37		6.16		7.40	
10 PERCENT EXCEEDS	137		191		220	
50 PERCENT EXCEEDS	81		91		109	
90 PERCENT EXCEEDS	61		61		66	

(a) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121500 MUSKEGON RIVER AT EVART, MI

LOCATION.--Lat 43°53'57", long 85°15'19", in NW1/4 NE1/4 sec.3, T.17 N., R.8 W., Osceola County, Hydrologic Unit 04060102, on right bank 500 ft downstream from bridge on U.S. Highway 10 in Evart, 0.4 mi upstream from Twin Creek, and at mile 123.9.

DRAINAGE AREA.--1,433 mi^2.

PERIOD OF RECORD.--October 1930 to September 1931, October 1933 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1437: 1934, 1947(M), WDR MI-96-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 977.72 ft above sea level. Prior to Nov. 7, 1956, nonrecording gages at sites 400 ft and 500 ft upstream at present datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some regulation at low flow by dams upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	493	554	922	e700	823	e1000	1500	1070	2140	706	389	e413
2	506	557	869	e730	810	1110	1510	e999	2240	e661	381	e405
3	516	553	762	e750	e680	1140	1550	e940	2310	639	372	e400
4	524	543	719	e750	e580	1080	1570	e876	2370	613	362	e396
5	526	537	758	e770	e670	e980	1550	844	2310	588	353	e399
6	539	535	650	e770	e720	992	1560	801	2220	564	347	391
7	546	558	630	e750	780	982	1970	842	2170	545	341	399
8	561	559	591	e700	743	962	2330	1120	2100	538	331	405
9	572	602	568	e660	904	958	2300	1050	1990	520	328	410
10	578	779	e550	e600	1250	965	2290	960	1890	504	336	e503
11	577	807	e540	e650	1300	962	2210	981	1800	481	e341	492
12	573	789	549	703	1370	978	2980	1010	1690	465	334	462
13	571	791	611	683	1330	892	3170	1010	1600	450	329	439
14	568	842	614	673	1360	905	3360	983	1530	432	319	e418
15	566	868	655	684	1380	1010	3290	1220	1510	422	314	e405
16	558	868	733	707	1200	1240	3050	2910	1530	419	329	e394
17	571	872	752	724	e1000	1340	2830	3860	1470	414	356	e381
18	567	846	748	734	e880	1350	2590	4110	1380	412	369	377
19	563	819	692	737	e820	1420	2390	3640	1290	408	594	400
20	561	803	e650	e650	e850	1560	2220	2970	1210	402	628	445
21	552	778	612	e520	e800	1750	2120	2470	1140	433	531	477
22	544	744	598	e550	e750	1920	1990	2480	1110	494	486	474
23	540	695	e580	e650	780	2020	1840	2430	1070	460	467	493
24	561	713	e590	673	993	2050	1740	2400	1020	437	434	603
25	560	704	e590	684	914	1950	1630	2570	973	420	424	586
26	561	702	e590	e640	1160	1730	1520	2600	926	416	478	593
27	590	823	e590	e600	1260	1570	1410	2690	882	397	496	590
28	578	938	e620	e580	e1100	1550	1320	2760	841	384	467	619
29	565	977	e680	611	---	1530	1210	2620	799	393	431	584
30	562	956	e700	682	---	1510	1140	2460	751	387	418	541
31	558	---	e700	772	---	1480	---	2240	---	385	428	---
TOTAL	17207	22112	20413	21087	27207	40886	62140	59916	46262	14789	12513	13894
MEAN	555	737	658	680	972	1319	2071	1933	1542	477	404	463
MAX	590	977	922	772	1380	2050	3360	4110	2370	706	628	619
MIN	493	535	540	520	580	892	1140	801	751	384	314	377
CFSM	.39	.51	.46	.47	.68	.92	1.45	1.35	1.08	.33	.28	.32
IN.	.45	.57	.53	.55	.71	1.06	1.61	1.56	1.20	.38	.32	.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	774	994	970	872	909	1577	2209	1361	984	680	550	632
MAX	2402	2656	2270	1700	2353	4115	3869	2709	2945	2901	1243	2269
(WY)	1987	1992	1992	1973	1938	1976	1971	1947	1945	1957	1969	1975
MIN	374	433	499	418	327	594	928	548	409	327	316	326
(WY)	1949	1950	1977	1936	1936	1940	2000	1977	1988	1934	1941	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	301770		358426			
ANNUAL MEAN	825		982		(a)1050	
HIGHEST ANNUAL MEAN					1532	1992
LOWEST ANNUAL MEAN					(b)613	1936
HIGHEST DAILY MEAN	3430	Feb 27	4110	May 18	8770	Mar 31 1989
LOWEST DAILY MEAN	385	Jul 26	314	Aug 15	252	Aug 28 1941
ANNUAL SEVEN-DAY MINIMUM	400	Jul 21	329	Aug 9	274	Aug 27 1941
MAXIMUM PEAK FLOW			4140	May 18	9040	Mar 31 1989
MAXIMUM PEAK STAGE			11.13	May 18	14.99	Mar 31 1989
INSTANTANEOUS LOW FLOW			309	Aug 15	(c)164	Dec 20 1947
ANNUAL RUNOFF (CFSM)	.58		.69		.73	
ANNUAL RUNOFF (INCHES)	7.83		9.30		9.96	
10 PERCENT EXCEEDS	1430		2130		1960	
50 PERCENT EXCEEDS	620		713		800	
90 PERCENT EXCEEDS	465		407		445	

(a) Does not include water years 1931, 1934.
(b) Estimated 584 ft^3/s, water year 1931.
(c) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121640 MUSKEGON RIVER NEAR BIG RAPIDS, MI

LOCATION.--Lat 43°43'45", long 85°29'15", in SW1/4 SE1/4 sec.34, T.16 N., R.10 W., Mecosta County, Hydrologic Unit 04060102, at White's Bridge in White Pines Trail State Park, 3.1 mi upstream from gaging station 04121650, 2.1 mi northwest of Big Rapids.

DRAINAGE AREA.--1,733 mi^2.

PERIOD OF RECORD.--February 2000 to current year.

REMARKS.--Cross-sectional samples were collected at bridge. Water-discharge measurements were made at time of sampling.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
APR 2001					
05...	1400	1920	6.5	62	19
10...	1700	3110	8.5	47	49
16...	1100	3610	4.5	30	25

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI

LOCATION.--Lat 43°41'37", long 85°28'03", in SE1/4 NE1/4 sec.14, T.15 N., R.10 W., Mecosta County, Hydrologic Unit 04060102, on right bank at sewage treatment plant in Big Rapids.

DRAINAGE AREA.--1,751 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 886 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	769	861	1360	e1100	1280	e1450	1950	1600	2790	1090	612	739
2	774	864	1310	e1100	1260	1550	1980	1550	2910	1010	608	694
3	794	870	1190	e1100	1210	1550	2020	1480	2970	963	598	689
4	812	859	1070	e1100	1160	e1500	2050	1450	2960	983	580	681
5	801	851	1150	e1100	1190	e1400	2010	1400	2930	900	565	692
6	820	847	e1000	e1030	1230	e1400	2030	1360	2830	863	555	688
7	851	872	e980	e1010	1200	1420	2400	1350	2730	830	550	721
8	880	904	e900	e980	1220	1430	3040	1680	2590	798	540	746
9	888	979	e850	e950	1670	1390	2900	1680	2450	778	547	769
10	883	1270	e850	e930	2050	1350	2900	1570	2340	756	563	940
11	875	1280	e850	e980	1890	1380	e2800	1580	2250	727	550	907
12	868	1240	e850	1010	1810	1420	e3550	1590	2170	707	548	844
13	866	1260	e900	1030	1820	1360	4040	1570	2050	691	542	807
14	867	1330	e950	1060	1870	1390	3890	1550	1960	677	529	771
15	865	1340	e980	1100	1770	1470	3850	1740	e1900	665	521	729
16	857	1340	e1100	1140	e1650	1690	3580	3270	e1920	662	554	690
17	855	1350	e1130	1140	e1500	1810	3370	4440	e1900	661	583	672
18	869	1320	e1100	1140	e1350	1820	3110	4580	e1800	655	615	664
19	855	1280	e1050	1110	e1200	1890	2890	4300	e1740	652	1010	718
20	856	1270	e1000	974	e1200	2030	2730	3650	e1660	643	1170	801
21	854	1220	e950	876	e1200	2240	2660	3140	1610	648	955	841
22	842	1170	e900	925	e1200	2430	2540	e3100	1580	737	862	831
23	839	1100	e900	1020	e1200	2540	2410	e3080	1540	720	853	872
24	914	1080	e900	1070	e1250	2580	2310	3010	1480	689	781	1130
25	900	1090	e900	1040	e1400	2490	2170	3310	1420	662	771	1040
26	890	1130	e900	997	1670	2250	2060	3380	1360	654	837	997
27	942	1260	e900	989	1710	2060	1950	3580	1310	629	838	999
28	915	1380	e950	965	e1450	1970	1840	3810	1260	610	802	983
29	881	1430	e1000	974	—	1970	1730	3380	1190	617	744	985
30	865	1400	e1080	1160	—	1930	1650	3120	1140	651	726	907
31	865	—	e1100	1280	—	1920	—	2870	—	618	774	—
TOTAL	26612	34447	31050	32380	40610	55080	78410	79170	60740	22946	21283	24547
MEAN	858	1148	1002	1045	1450	1777	2614	2554	2025	740	687	818
MAX	942	1430	1360	1280	2050	2580	4040	4580	2970	1090	1170	1130
MIN	769	847	850	876	1160	1350	1650	1350	1140	610	521	664
CFSM	.49	.66	.57	.60	.83	1.01	1.49	1.46	1.16	.42	.39	.47
IN.	.57	.73	.66	.69	.86	1.17	1.67	1.68	1.29	.49	.45	.52

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2001, BY WATER YEAR (WY)

MEAN	947	1080	1055	1013	1429	1801	2016	2408	1805	807	765	799
MAX	1035	1148	1107	1045	1450	1825	2614	2554	2025	873	843	818
(WY)	2000	2001	2000	2001	2001	2000	2001	2001	2001	2000	2000	2001
MIN	858	1011	1002	981	1408	1777	1418	2261	1586	740	687	779
(WY)	2001	2000	2001	2000	2000	2001	2000	2000	2000	2001	2001	2000

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 2000 - 2001	
ANNUAL TOTAL	456674		507275			
ANNUAL MEAN	1248		1390		1325	
HIGHEST ANNUAL MEAN					1390	2001
LOWEST ANNUAL MEAN					1260	2000
HIGHEST DAILY MEAN	4130	May 19	4580	May 18	4580	May 18 2001
LOWEST DAILY MEAN	672	Sep 9	521	Aug 15	521	Aug 15 2001
ANNUAL SEVEN-DAY MINIMUM	703	Sep 5	543	Aug 9	543	Aug 9 2001
MAXIMUM PEAK FLOW			(a)4690	May 18	(a)4690	May 18 2001
MAXIMUM PEAK STAGE			(b)9.38	Feb 22	(b)9.38	Feb 22 2001
INSTANTANEOUS LOW FLOW			507	Aug 16	507	Aug 16 2001
ANNUAL RUNOFF (CFSM)	.71		.79		.76	
ANNUAL RUNOFF (INCHES)	9.70		10.78		10.28	
10 PERCENT EXCEEDS	2040		2690		2270	
50 PERCENT EXCEEDS	1000		1100		1080	
90 PERCENT EXCEEDS	770		685		736	

(a) Gage height 7.92 ft.
(b) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1998 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1999 to September 2001.
WATER TEMPERATURE: October 1998 to current year.
DISSOLVED OXYGEN: October 1998 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals. Automatic suspended sediment pump sampler since December 22, 1999.

REMARKS.--Water-quality monitor sensors and automatic pump sampler intake located approximately 15 ft into channel from right bank. Cross-sectional samples for, water-quality, suspended sediment and bed-load were collected from bridge approximately 0.6 mi upstream from gage. Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 461 microsiemens, Feb. 16, 2000; minimum, 200 microsiemens, May 17, 2001.
WATER TEMPERATURE: Maximum, 29.0°C, Aug. 7, 8, 2001; minimum, -0.5°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 14.3 mg/L, Dec. 1, 17, 1999; minimum, 3.7 mg/L, July 5, 6, 2000.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 412 microsiemens, Sept. 5, 6; minimum, 200 microsiemens, May 17.
WATER TEMPERATURE: Maximum, 29.0°C, Aug. 7, 8; minimum, -0.5°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum recorded, 14.1 mg/L, Feb. 2, 3, but may have been higher during instrument malfunction Jan. 8 to Feb. 3; minimum, 5.1 mg/L, July 16.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	385	380	383	374	371	373	350	346	349	—	—	—
2	387	381	384	376	372	374	350	343	347	—	—	—
3	387	380	383	376	373	375	—	—	—	375	370	372
4	381	374	377	376	373	375	—	—	—	373	372	373
5	377	366	373	377	373	375	—	—	—	—	—	—
6	372	367	369	379	373	376	—	—	—	374	370	372
7	369	360	364	381	373	378	—	—	—	374	369	371
8	366	362	363	382	378	380	—	—	—	—	—	—
9	366	362	364	382	348	370	—	—	—	—	—	—
10	365	363	364	370	366	368	—	—	—	375	369	372
11	368	364	365	368	364	366	—	—	—	371	366	369
12	370	365	367	369	365	367	—	—	—	372	366	369
13	371	368	370	368	358	364	379	371	375	372	363	366
14	373	365	370	365	363	364	—	—	—	363	359	361
15	372	367	370	364	362	363	—	—	—	363	353	357
16	374	371	373	363	358	361	—	—	—	364	353	355
17	377	372	374	362	360	361	354	335	342	355	352	353
18	379	372	375	367	359	363	354	338	348	354	351	352
19	379	370	373	371	360	363	361	349	358	—	—	—
20	378	367	372	—	—	—	364	360	362	—	—	—
21	379	369	376	382	336	366	—	—	—	—	—	—
22	378	374	376	—	—	—	—	—	—	380	374	377
23	376	365	374	365	357	362	—	—	—	382	372	379
24	367	356	362	360	356	357	—	—	—	376	283	355
25	370	359	365	366	355	360	—	—	—	—	—	—
26	371	320	367	381	365	370	—	—	—	—	—	—
27	368	341	364	373	360	367	—	—	—	—	—	—
28	369	366	367	365	358	362	—	—	—	—	—	—
29	370	367	368	364	354	360	378	373	376	—	—	—
30	371	368	369	357	347	351	374	368	371	—	—	—
31	372	369	371	—	—	—	371	368	369	—	—	—
MONTH	387	320	371	—	—	—	—	—	—	—	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	357	332	343	---	---	---	281	274	278	302	296	299
2	---	---	---	347	316	328	281	278	280	---	---	---
3	---	---	---	316	307	312	280	276	277	---	---	---
4	352	335	347	311	305	308	277	273	274	---	---	---
5	364	350	355	---	---	---	273	269	271	336	327	332
6	352	345	349	---	---	---	273	268	270	341	335	337
7	365	344	348	317	311	314	271	263	267	343	312	338
8	---	---	---	318	312	314	264	239	248	340	321	332
9	---	---	---	315	310	312	242	237	240	332	325	329
10	---	---	---	320	310	316	242	234	239	339	281	316
11	---	---	---	324	317	320	---	---	---	340	280	319
12	---	---	---	324	318	320	---	---	---	341	335	338
13	308	295	304	328	319	324	---	---	---	336	326	332
14	311	299	305	334	327	329	---	---	---	330	325	327
15	309	295	301	331	325	328	---	---	---	327	269	316
16	299	289	295	326	312	320	---	---	---	313	234	277
17	---	---	---	313	306	309	---	---	---	234	200	212
18	---	---	---	310	305	307	---	---	---	210	202	206
19	---	---	---	309	304	307	219	211	214	225	210	216
20	324	312	316	304	296	301	225	216	221	242	224	232
21	---	---	---	296	288	291	232	221	227	257	239	248
22	320	304	311	288	276	281	241	231	236	---	---	---
23	327	314	317	276	265	269	249	240	244	---	---	---
24	---	---	---	---	---	---	257	249	253	262	253	258
25	---	---	---	---	---	---	264	257	260	262	252	259
26	360	325	338	---	---	---	269	263	267	258	254	256
27	325	320	322	---	---	---	278	269	273	256	242	248
28	---	---	---	266	261	263	283	276	279	249	240	245
29	---	---	---	279	264	268	288	282	285	253	249	251
30	---	---	---	280	264	273	296	287	292	256	251	253
31	---	---	---	279	273	276	---	---	---	258	254	256
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	265	241	259	360	343	352	404	391	398	402	392	399
2	267	261	264	352	336	346	405	398	401	404	390	396
3	264	261	262	339	331	335	408	396	403	401	388	395
4	---	---	---	339	322	330	406	395	401	409	394	400
5	262	259	261	349	339	344	408	395	402	412	401	407
6	262	260	261	353	346	349	409	394	403	412	401	407
7	262	260	261	356	351	353	411	395	403	411	376	401
8	263	260	261	366	352	358	411	395	404	406	396	401
9	266	262	264	370	358	365	411	394	396	408	365	396
10	269	265	267	390	358	375	402	389	396	391	378	384
11	279	269	273	389	368	375	409	394	401	392	382	386
12	286	273	281	368	355	361	409	394	402	390	384	386
13	291	286	289	363	354	358	407	394	401	394	388	391
14	295	291	292	360	351	354	409	397	403	396	391	393
15	---	---	---	356	345	351	410	398	404	401	392	396
16	---	---	---	356	346	351	408	385	398	402	395	399
17	---	---	---	364	351	359	406	398	402	405	398	402
18	---	---	---	377	361	366	407	350	392	407	398	403
19	---	---	---	384	370	376	381	346	364	407	381	396
20	---	---	---	393	376	387	368	338	360	402	388	395
21	326	323	325	394	381	388	379	359	368	402	395	398
22	333	322	328	388	350	371	387	310	377	400	392	395
23	337	329	335	378	366	373	393	384	389	395	346	383
24	342	337	339	388	376	381	400	388	393	376	363	369
25	345	338	342	393	379	386	402	384	393	374	367	371
26	349	340	345	392	383	388	400	389	394	375	368	372
27	354	344	349	397	380	391	406	396	401	379	375	376
28	360	349	355	396	384	390	403	392	398	380	376	378
29	366	356	361	403	324	386	405	392	400	384	376	378
30	367	352	360	398	378	386	409	340	399	387	374	378
31	---	---	---	400	384	394	400	381	394	---	---	---
MONTH	---	---	---	403	322	367	411	310	395	412	346	391

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	13.0	14.5	10.0	7.5	8.5	3.0	1.5	2.5	.0	-.5	-.5
2	17.0	14.5	15.5	10.5	8.5	9.5	2.0	.5	1.5	.0	-.5	-.5
3	16.5	13.5	15.0	10.0	8.0	9.0	.5	-.5	.0	.0	-.5	.0
4	16.5	14.0	15.0	9.0	7.5	8.0	.0	-.5	.0	.0	-.5	.0
5	14.0	12.0	12.5	8.5	6.0	7.0	.0	-.5	-.5	.0	.0	.0
6	12.0	10.5	11.5	7.5	6.0	7.0	-.5	-.5	-.5	.0	.0	.0
7	10.5	8.0	9.0	8.0	7.0	7.5	-.5	-.5	-.5	.0	-.5	.0
8	9.0	7.0	8.0	9.0	7.0	8.0	-.5	-.5	-.5	.0	-.5	-.5
9	9.5	7.0	8.0	8.0	7.0	7.5	-.5	-.5	-.5	.0	-.5	-.5
10	10.0	6.5	8.0	7.5	7.0	7.0	-.5	-.5	-.5	.0	-.5	.0
11	11.0	7.5	9.0	7.0	6.5	7.0	-.5	-.5	-.5	.0	.0	.0
12	11.5	8.0	9.5	6.5	6.0	6.5	-.5	-.5	-.5	.0	.0	.0
13	13.0	10.0	11.5	6.5	5.5	6.0	-.5	-.5	-.5	.0	.0	.0
14	14.5	12.0	13.0	5.5	4.5	5.0	-.5	-.5	-.5	.0	.0	.0
15	13.0	12.0	12.5	5.0	4.0	4.5	-.5	-.5	-.5	.0	.0	.0
16	12.5	11.0	12.0	4.0	3.5	4.0	.0	-.5	-.5	.0	.0	.0
17	12.5	10.5	11.5	3.5	3.0	3.5	.0	-.5	-.5	.0	.0	.0
18	12.5	10.0	11.0	3.0	2.0	2.5	.0	-.5	-.5	.0	.0	.0
19	13.0	10.0	11.5	2.5	1.5	2.0	.0	-.5	-.5	.0	-.5	.0
20	14.0	10.5	12.0	2.5	1.0	1.5	.0	-.5	-.5	.0	-.5	-.5
21	13.5	11.0	12.5	1.5	.5	1.0	.0	-.5	-.5	.5	-.5	.0
22	12.5	10.0	11.0	1.0	.0	.5	.0	-.5	-.5	.5	-.5	.0
23	11.5	10.5	11.0	.0	.0	.0	.0	-.5	-.5	.0	.0	.0
24	13.5	11.5	12.0	1.5	.0	.5	.0	-.5	-.5	.0	-.5	.0
25	12.5	11.5	12.0	1.5	.5	1.0	.0	-.5	-.5	.5	-.5	.0
26	14.0	11.5	13.0	2.5	1.5	2.0	.0	-.5	-.5	.0	-.5	.0
27	14.5	13.0	13.5	3.5	2.5	3.0	.0	-.5	-.5	.5	-.5	.0
28	13.0	10.0	11.5	3.5	3.0	3.0	-.5	-.5	-.5	.0	-.5	.0
29	10.5	8.0	9.0	3.5	3.0	3.0	.0	-.5	-.5	.5	.0	.0
30	9.5	7.0	8.0	3.5	3.0	3.0	.0	-.5	.0	.5	.0	.0
31	8.5	6.5	7.5	—	—	—	.0	-.5	.0	.5	.0	.0
MONTH	17.0	6.5	11.3	10.5	.0	4.6	3.0	-.5	-.3	.5	-.5	-.1

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	.5	1.0	1.0	-.5	.0	5.5	4.5	5.0	17.5	16.0	16.5
2	.5	-.5	.0	2.5	.5	1.0	6.5	4.5	5.5	—	—	—
3	-.5	-.5	-.5	3.0	.0	1.5	7.0	5.5	6.5	—	—	—
4	.0	-.5	.0	3.0	1.5	2.0	8.0	6.0	7.0	—	—	—
5	1.0	.0	.5	1.5	.0	.5	8.0	6.5	7.5	17.5	15.0	16.0
6	.5	.5	.5	1.0	-.5	.0	8.5	7.5	8.0	16.0	14.0	15.0
7	2.0	.0	.5	2.5	.5	1.5	9.0	8.0	8.5	17.0	14.0	15.5
8	1.5	.0	.5	2.5	1.0	1.5	9.5	8.5	9.0	17.5	14.5	16.0
9	1.5	.0	1.0	1.5	.5	1.0	9.5	9.0	9.5	18.0	14.5	16.5
10	.5	-.5	.0	2.5	-.5	1.0	10.0	8.5	9.0	18.5	16.0	17.0
11	.0	-.5	-.5	3.5	1.5	2.5	—	—	—	18.0	16.0	17.0
12	1.0	-.5	.0	2.0	1.0	1.0	—	—	—	17.5	14.0	15.5
13	1.0	.5	.5	1.5	1.0	1.5	—	—	—	16.5	13.5	15.0
14	1.0	.5	1.0	4.0	1.0	2.5	—	—	—	15.0	13.5	14.0
15	.5	-.5	.0	5.5	3.0	4.0	—	—	—	14.5	13.5	14.0
16	.5	-.5	.5	4.5	3.0	4.0	—	—	—	14.0	13.5	13.5
17	-.5	-.5	-.5	4.0	2.5	3.5	—	—	—	16.5	13.5	15.0
18	-.5	-.5	-.5	5.0	1.5	3.0	—	—	—	18.0	15.5	16.5
19	.0	-.5	-.5	5.0	2.0	3.5	10.0	8.5	9.0	19.0	16.0	17.5
20	1.5	-.5	.5	6.0	3.0	4.5	10.0	9.5	9.5	19.5	17.0	18.0
21	.0	-.5	-.5	5.0	3.5	4.5	11.0	10.0	10.5	18.5	17.5	18.0
22	.0	-.5	-.5	5.5	4.0	4.5	12.0	11.0	11.0	—	—	—
23	.5	-.5	.0	5.5	4.0	4.5	13.0	11.5	12.5	—	—	—
24	.0	-.5	-.5	—	—	—	13.0	12.0	12.5	16.0	14.0	15.0
25	1.0	.0	.5	—	—	—	13.0	12.0	12.5	14.5	13.5	14.0
26	2.0	.0	1.0	—	—	—	13.0	12.0	12.5	15.0	13.0	14.0
27	1.5	.0	1.0	—	—	—	14.0	12.5	13.5	14.5	13.5	14.0
28	.0	-.5	.0	2.5	1.0	2.0	14.5	13.0	13.5	16.0	13.0	14.5
29	—	—	—	3.0	2.5	2.5	15.0	13.5	14.0	17.0	14.5	15.5
30	—	—	—	4.5	2.5	3.5	16.0	14.5	15.0	17.0	14.0	15.5
31	—	—	—	5.5	4.0	4.5	—	—	—	16.0	14.0	15.0
MONTH	2.0	-.5	.2	—	—	—	—	—	—	—	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.5	13.0	14.0	23.0	19.5	21.5	26.5	23.5	25.0	20.0	15.5	18.0
2	14.0	12.5	13.0	21.5	17.5	19.5	25.0	23.0	24.0	20.5	16.0	18.0
3	13.5	13.0	13.0	22.0	18.5	20.0	26.5	21.5	23.5	22.0	17.0	19.0
4	---	---	---	23.5	19.5	21.5	27.0	21.0	24.0	21.0	17.5	19.0
5	13.0	11.5	12.5	22.5	19.0	20.5	27.5	22.0	24.5	21.5	16.5	19.0
6	15.0	12.5	13.5	22.0	17.5	19.5	28.0	22.5	25.0	21.0	16.5	19.0
7	16.5	13.5	15.0	23.0	19.0	21.0	29.0	24.0	26.0	21.5	18.0	19.5
8	18.0	14.5	16.0	25.5	20.5	23.0	29.0	24.0	26.5	22.5	19.0	20.5
9	18.5	15.5	17.0	26.5	21.5	24.0	28.5	24.5	26.0	20.5	18.5	19.5
10	17.5	16.0	17.0	26.5	22.0	24.0	25.5	22.5	24.0	20.0	17.0	18.5
11	20.5	16.5	18.5	23.5	20.0	22.0	24.0	20.0	22.0	20.0	16.0	18.0
12	21.5	18.0	20.0	23.0	19.0	21.0	24.5	19.5	22.0	20.5	16.5	18.5
13	23.5	19.5	21.5	23.5	18.5	21.0	24.5	20.0	22.0	18.5	15.5	17.0
14	24.5	21.5	23.0	23.5	18.5	21.0	23.5	18.0	20.5	17.0	13.5	15.5
15	---	---	---	24.0	20.0	21.5	22.0	18.0	20.0	17.5	13.5	15.5
16	---	---	---	24.5	20.0	22.0	20.0	18.0	19.0	17.0	13.5	15.0
17	---	---	---	23.0	20.5	22.0	18.5	17.0	17.5	15.5	13.5	14.5
18	---	---	---	23.0	20.0	21.5	20.0	16.5	18.0	17.0	14.0	15.5
19	---	---	---	25.5	20.5	23.0	18.5	17.0	17.5	16.0	15.0	15.5
20	---	---	---	25.0	22.0	23.5	20.5	16.0	18.0	15.0	14.0	14.5
21	22.0	18.5	19.5	26.0	22.0	24.0	20.5	17.0	19.0	16.5	13.5	14.5
22	21.0	17.5	19.5	26.0	22.5	24.5	19.5	18.0	18.5	16.5	14.5	15.5
23	22.0	18.0	20.0	25.5	23.5	24.5	21.5	17.5	19.0	15.0	14.0	15.0
24	22.5	18.5	20.5	27.5	23.0	25.0	21.5	19.0	20.0	14.0	11.5	12.5
25	23.5	19.0	21.0	25.0	22.5	23.5	20.0	19.0	19.5	11.5	10.0	10.5
26	24.0	20.5	22.5	24.5	20.5	22.5	23.0	19.0	20.5	10.5	9.5	10.0
27	25.0	21.0	23.0	23.5	18.5	21.0	22.5	19.5	21.0	10.5	9.5	10.0
28	26.0	21.5	23.5	22.5	19.5	21.0	22.5	19.0	20.5	11.5	10.0	10.5
29	25.5	22.0	23.5	24.0	20.5	22.0	22.0	18.0	20.0	13.5	9.5	11.0
30	25.0	22.0	23.5	25.5	20.5	22.5	22.0	18.5	20.0	14.5	10.5	12.0
31	---	---	---	27.0	21.5	24.0	21.0	18.0	20.0	---	---	---
MONTH	---	---	---	27.5	17.5	22.2	29.0	16.0	21.4	22.5	9.5	15.7

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.6	8.2	8.8	11.6	10.3	10.9	13.0	11.9	12.4	11.9	11.1	11.4
2	9.2	8.0	8.5	11.1	10.1	10.5	13.4	12.4	12.9	11.8	11.1	11.5
3	8.8	7.6	8.2	11.7	10.1	10.7	14.0	13.0	13.4	11.7	11.4	11.6
4	9.8	8.1	8.9	11.7	10.3	10.9	13.6	12.9	13.3	11.9	11.6	11.7
5	10.2	8.9	9.5	12.0	10.8	11.3	13.7	12.5	13.1	11.9	11.6	11.7
6	10.7	9.4	10.0	12.1	10.8	11.3	13.2	10.2	12.2	12.1	11.8	11.9
7	11.3	10.0	10.7	11.0	10.4	10.6	12.8	10.2	11.5	12.2	11.9	12.1
8	11.7	10.6	11.1	11.7	10.2	10.8	13.1	12.1	12.5	---	---	---
9	11.8	10.9	11.2	10.6	9.9	10.3	13.0	12.3	12.6	---	---	---
10	11.5	10.8	11.1	10.8	9.8	10.3	13.0	11.9	12.3	---	---	---
11	11.5	10.5	11.0	11.3	10.3	10.7	12.5	12.1	12.2	---	---	---
12	11.4	10.4	10.8	11.1	10.6	10.9	12.7	12.0	12.3	---	---	---
13	11.1	9.8	10.5	11.3	10.4	10.9	12.0	11.8	11.9	---	---	---
14	10.5	9.5	9.9	11.5	10.8	11.1	12.4	11.4	11.8	---	---	---
15	10.2	9.3	9.7	11.9	10.9	11.4	12.4	12.1	12.3	---	---	---
16	10.9	9.5	10.1	11.5	10.9	11.2	12.5	12.1	12.3	---	---	---
17	11.0	9.8	10.3	12.1	11.1	11.5	12.3	12.1	12.2	---	---	---
18	11.1	9.9	10.4	12.3	11.4	11.9	12.4	12.1	12.3	---	---	---
19	11.0	9.9	10.4	12.3	11.6	11.9	12.4	12.2	12.3	---	---	---
20	10.9	9.6	10.2	12.5	11.4	12.0	12.5	12.1	12.3	---	---	---
21	10.9	9.6	10.1	13.3	12.1	12.8	12.4	11.8	12.3	---	---	---
22	11.3	9.9	10.5	13.3	12.6	12.9	12.4	11.6	12.0	---	---	---
23	11.1	10.0	10.5	13.4	12.7	13.0	12.3	11.9	12.2	---	---	---
24	11.1	9.7	10.3	13.4	12.6	12.9	12.4	11.8	12.2	---	---	---
25	10.6	9.7	10.1	13.2	12.3	12.8	12.3	11.7	12.1	---	---	---
26	11.0	9.2	10.1	12.3	11.6	12.0	12.2	11.7	12.0	---	---	---
27	10.3	8.9	9.5	12.2	11.5	11.8	12.0	11.1	11.8	---	---	---
28	11.0	9.3	10.1	12.4	11.5	11.9	11.6	10.9	11.3	---	---	---
29	11.8	10.1	11.0	12.4	11.6	11.9	11.5	11.2	11.3	---	---	---
30	11.9	10.7	11.2	12.6	11.6	12.0	11.3	10.9	11.1	---	---	---
31	12.1	10.8	11.3	---	---	---	11.3	11.0	11.2	---	---	---
MONTH	12.1	7.6	10.2	13.4	9.8	11.5	14.0	10.2	12.2	---	---	---

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	11.8	11.2	11.5	9.4	8.7	9.0
2	---	---	---	13.6	13.2	13.4	11.9	11.2	11.6	---	---	---
3	---	---	---	13.7	13.0	13.3	11.6	11.0	11.3	---	---	---
4	13.8	13.4	13.6	13.6	12.8	13.2	11.6	10.9	11.2	---	---	---
5	13.6	13.3	13.4	14.0	13.1	13.6	11.1	10.4	10.9	9.5	8.3	8.9
6	13.6	13.2	13.4	14.0	13.5	13.7	10.6	10.2	10.4	9.6	8.4	9.0
7	13.8	13.3	13.5	13.8	13.1	13.5	10.4	9.6	10.0	9.2	8.1	8.6
8	13.8	13.2	13.5	13.7	12.9	13.3	9.8	9.3	9.6	8.9	8.1	8.5
9	13.6	12.8	13.1	14.0	13.2	13.6	9.4	9.1	9.3	9.0	8.0	8.5
10	13.4	12.9	13.2	14.0	13.0	13.6	9.9	9.2	9.6	9.0	7.8	8.4
11	13.8	12.7	13.5	13.7	12.7	13.2	---	---	---	8.9	7.8	8.3
12	---	---	---	13.9	13.0	13.3	---	---	---	9.5	8.2	8.8
13	13.5	13.1	13.3	13.3	12.7	13.0	9.8	9.5	9.6	9.6	8.5	9.0
14	13.2	13.0	13.1	13.6	12.6	13.1	9.8	9.3	9.6	9.3	8.4	8.8
15	13.5	13.2	13.4	13.2	12.3	12.7	9.8	9.3	9.5	9.0	8.4	8.7
16	13.5	13.0	13.3	13.1	12.2	12.6	9.9	9.3	9.7	8.6	8.0	8.4
17	---	---	---	13.3	12.2	12.7	10.4	9.7	10.1	8.0	7.4	7.8
18	---	---	---	13.4	12.5	12.9	11.1	10.0	10.6	7.4	7.0	7.3
19	13.5	13.1	13.3	13.3	12.3	12.8	11.4	10.4	11.0	7.3	7.0	7.2
20	13.4	13.1	13.2	12.9	11.9	12.4	11.1	10.5	10.8	7.5	7.1	7.3
21	---	---	---	13.0	11.8	12.4	11.0	10.1	10.6	7.5	7.2	7.4
22	---	---	---	12.9	12.5	12.7	10.8	9.8	10.3	---	---	---
23	13.4	12.8	13.1	12.7	12.4	12.6	10.1	9.5	9.9	---	---	---
24	13.5	13.1	13.3	---	---	---	10.1	9.5	9.8	8.6	8.2	8.4
25	13.1	12.6	12.9	---	---	---	10.2	9.7	10.0	8.8	8.6	8.7
26	13.5	12.9	13.2	---	---	---	10.3	9.7	10.0	9.0	8.7	8.8
27	13.9	13.0	13.5	---	---	---	10.3	9.6	9.9	8.9	8.6	8.8
28	---	---	---	13.3	12.4	12.9	10.3	9.6	10.0	8.9	8.5	8.8
29	---	---	---	13.0	12.4	12.7	10.3	9.5	9.8	8.8	8.5	8.6
30	---	---	---	12.6	11.9	12.3	10.0	9.1	9.5	9.0	8.5	8.8
31	---	---	---	12.1	11.5	11.9	---	---	---	9.2	8.6	8.9
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.0	8.7	8.8	9.9	6.4	8.3	9.1	6.8	7.9	10.0	8.4	9.1
2	9.3	9.0	9.1	10.4	7.4	8.9	8.6	7.0	7.8	10.2	8.6	9.3
3	9.5	9.1	9.3	9.6	7.2	8.4	9.5	7.4	8.4	10.2	8.3	9.0
4	---	---	---	9.1	7.0	7.9	9.5	7.4	8.3	9.8	8.0	8.9
5	9.6	9.3	9.5	9.3	7.4	8.3	9.5	7.3	8.3	9.8	8.1	8.8
6	9.6	9.1	9.4	10.0	7.5	8.6	9.3	7.2	8.1	9.8	8.0	8.8
7	9.4	8.8	9.1	9.4	7.5	8.4	9.2	7.0	7.9	9.3	7.7	8.4
8	9.2	8.5	8.9	9.1	7.2	8.1	9.2	7.0	7.9	9.2	7.5	8.2
9	9.0	8.4	8.7	8.3	6.9	7.6	9.3	6.9	7.8	9.1	7.5	8.1
10	8.8	8.3	8.5	8.5	6.7	7.7	9.5	7.0	8.2	9.5	7.9	8.6
11	8.9	8.1	8.5	7.5	5.8	6.9	9.9	7.7	8.7	9.9	8.3	9.0
12	8.6	7.7	8.1	6.9	5.9	6.4	9.9	7.9	8.8	9.9	8.2	8.9
13	8.6	7.5	8.0	7.5	5.7	6.4	9.9	7.8	8.8	10.1	8.1	9.0
14	8.5	7.2	7.7	7.5	5.5	6.6	10.0	8.1	9.0	10.4	8.8	9.5
15	---	---	---	7.5	5.5	6.6	10.1	8.2	9.0	10.2	8.8	9.4
16	---	---	---	7.7	5.1	6.4	---	---	---	10.2	8.8	9.4
17	---	---	---	8.1	6.2	7.2	---	---	---	10.2	8.8	9.3
18	---	---	---	8.4	6.6	7.4	---	---	---	10.4	8.8	9.4
19	---	---	---	8.5	6.8	7.6	---	---	---	9.2	8.6	8.8
20	---	---	---	8.3	6.3	7.3	---	---	---	9.6	8.6	9.0
21	8.5	7.6	8.0	8.4	6.7	7.4	---	---	---	10.3	8.9	9.4
22	9.8	7.9	8.8	8.4	6.6	7.3	---	---	---	9.9	8.7	9.3
23	10.2	7.9	8.9	8.3	6.4	7.4	---	---	---	9.3	8.6	8.9
24	10.6	7.6	9.1	8.6	6.7	7.6	---	---	---	10.1	8.9	9.5
25	11.1	7.7	9.2	8.1	6.4	7.2	10.3	8.3	9.5	10.4	9.5	9.9
26	10.9	7.5	9.1	8.6	6.6	7.6	9.3	7.7	8.4	10.6	9.8	10.2
27	10.9	7.3	9.0	9.4	7.2	8.2	8.8	7.2	7.9	11.0	10.0	10.4
28	10.6	7.0	8.7	9.3	7.4	8.2	9.8	7.2	8.4	11.1	10.0	10.4
29	10.3	6.9	8.5	9.5	7.0	8.2	9.3	7.3	8.1	11.2	9.9	10.5
30	9.9	7.1	8.3	9.4	6.8	8.2	9.2	7.4	8.2	11.0	9.7	10.2
31	---	---	---	9.1	7.2	8.1	9.8	7.9	8.8	---	---	---
MONTH	---	---	---	10.4	5.1	7.6	---	---	---	11.2	7.5	9.3

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

REMARKS.--Samples from automatic pump sampler.

DATE	TIME	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 2000			
01...	1300	8	80
04...	1300	14	--
07...	1300	12	--
10...	1300	9	--
13...	1300	6	--
16...	1300	18	--
19...	1300	44	--
24...	1300	14	--
27...	1300	14	--
30...	1300	20	--
NOV			
02...	1300	16	--
05...	1300	12	--
08...	1300	11	--
11...	1300	18	65
14...	1300	21	--
21...	1300	21	--
24...	1300	9	--
27...	1300	22	72
DEC			
03...	1300	18	--
05...	1300	42	--
07...	1300	47	83
10...	1300	20	--
14...	1300	22	--
19...	1300	23	--
20...	1300	9	93
24...	1300	39	--
29...	1300	28	--
JAN 2001			
01...	1300	46	82
04...	1300	10	--
07...	1300	27	--
09...	1300	71	--
13...	1300	63	--
21...	1300	40	--
FEB			
02...	1300	20	--
05...	1300	11	81
08...	1300	42	--
11...	1300	16	--
15...	1300	17	--
18...	1300	3	--
21...	1300	4	--
22...	1300	23	94
27...	1300	23	--
MAR			
03...	1300	4	--
08...	1300	11	95
11...	1300	2	--
14...	1300	4	--
17...	1300	4	--
19...	1300	8	79
21...	1300	22	--
23...	1300	26	86
27...	1300	28	--
30...	1300	9	--

DATE	TIME	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 2001			
02...	1300	11	--
05...	1300	20	87
07...	1942	84	88
08...	1300	41	--
10...	1300	25	87
11...	1342	23	87
12...	1300	100	92
16...	1300	27	85
19...	1300	13	--
22...	1300	16	--
25...	1300	15	--
28...	1300	19	--
MAY			
01...	1300	14	--
04...	1300	23	96
08...	1300	30	--
11...	1300	15	--
14...	1300	20	--
16...	1300	70	97
17...	1300	57	94
18...	1300	47	92
21...	1300	34	--
24...	1300	37	--
27...	1300	59	87
JUN			
04...	1300	11	95
11...	1300	22	--
19...	1300	30	--
26...	1300	18	--
JUL			
11...	1300	15	--
17...	1300	14	--
22...	1300	11	91
AUG			
04...	1300	11	--
10...	1300	9	--
17...	1300	11	--
20...	1300	23	98
23...	1300	12	83
27...	1300	12	89
31...	1300	21	--
SEP			
05...	1300	10	--
10...	1300	16	87
14...	1300	11	--
18...	1300	10	--
24...	1300	18	84
27...	1300	7	--
30...	1300	9	85

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121650 MUSKEGON RIVER AT BIG RAPIDS, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

REMARKS.--Cross-sectional samples collected at bridge approximately 0.6 mi upstream from gage.

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
NOV 2000					
15...	1300	1260	4.0	62	11
MAR 2001					
23...	1400	2550	4.5	24	106
APR					
05...	1800	2020	6.5	32	43
10...	1000	2920	7.5	30	102
16...	1330	3570	4.5	13	127
MAY					
17...	1335	4490	14.5	24	E66

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121660 MUSKEGON RIVER NEAR STANWOOD, MI

LOCATION.--Lat 43°36'47", long 85°28'40", in SE1/4 SW1/4 sec.11, T.14 N., R.10 W., Mecosta County, Hydrologic Unit 04060102, on left bank downstream from Rogers Dam, 2.8 mi northwest of Stanwood.

DRAINAGE AREA.--1,834 mi^2.

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1995 to current year.
DISSOLVED OXYGEN: October 1995 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.5°C, Aug. 8-10, 2001; minimum, -0.5°C, Feb. 25, 26, Mar. 10-12, 1999.
DISSOLVED OXYGEN: Maximum, 14.7 mg/L, Jan. 20, 2001; minimum, 4.9 mg/L, June 13, 14, 1999, Sept. 5, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 27.5°C, Aug. 8-10; minimum, 0.0°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 14.7 mg/L, Jan. 20; minimum, 5.4 mg/L, Aug. 11.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.0	13.0	13.0	9.5	8.5	9.0	3.0	3.0	3.0	.0	.0	.0
2	15.0	13.5	14.0	9.5	9.0	9.0	3.0	2.5	2.5	.0	.0	.0
3	15.5	15.0	15.0	9.5	9.0	9.5	2.5	1.5	2.0	.0	.0	.0
4	16.0	15.5	15.5	9.5	9.0	9.5	1.5	.5	1.0	.0	.0	.0
5	15.5	15.0	15.0	9.0	8.0	9.0	.5	.5	.5	.0	.0	.0
6	15.0	13.5	14.0	8.5	7.5	8.0	.5	.0	.5	.0	.0	.0
7	13.5	11.5	12.5	8.5	8.0	8.0	.0	.0	.0	.0	.0	.0
8	12.0	9.5	11.0	8.0	7.5	7.5	.0	.0	.0	.0	.0	.0
9	10.0	8.5	9.5	8.0	7.5	7.5	.0	.0	.0	.0	.0	.0
10	9.5	8.5	9.0	8.0	7.5	7.5	.0	.0	.0	.0	.0	.0
11	9.0	9.0	9.0	7.5	7.0	7.5	.0	.0	.0	.0	.0	.0
12	10.0	9.0	9.0	7.0	7.0	7.0	.0	.0	.0	.0	.0	.0
13	10.5	9.5	10.0	7.0	6.0	6.5	.0	.0	.0	.0	.0	.0
14	12.5	10.5	11.5	6.0	5.5	6.0	.0	.0	.0	.0	.0	.0
15	13.0	12.5	12.5	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0
16	13.0	12.5	12.5	4.5	4.0	4.5	.0	.0	.0	.0	.0	.0
17	12.5	12.0	12.5	4.0	3.5	4.0	.0	.0	.0	.0	.0	.0
18	12.0	11.5	12.0	3.5	3.0	3.5	.0	.0	.0	.0	.0	.0
19	12.0	11.5	12.0	3.0	2.5	2.5	.0	.0	.0	.0	.0	.0
20	12.5	11.5	12.0	2.5	1.5	2.0	.0	.0	.0	.0	.0	.0
21	13.5	12.5	13.0	1.5	1.5	1.5	.0	.0	.0	.0	.0	.0
22	13.0	12.5	12.5	1.5	1.0	1.0	.0	.0	.0	.0	.0	.0
23	13.0	11.5	12.0	1.0	.5	.5	.0	.0	.0	.0	.0	.0
24	13.0	11.5	12.0	.5	.5	.5	.0	.0	.0	.0	.0	.0
25	12.5	12.0	12.5	1.0	.5	.5	.0	.0	.0	.0	.0	.0
26	12.5	12.5	12.5	1.0	1.0	1.0	.0	.0	.0	.0	.0	.0
27	13.5	12.5	13.0	2.0	1.0	1.5	.0	.0	.0	.0	.0	.0
28	13.5	13.0	13.0	3.0	2.0	2.5	.0	.0	.0	.0	.0	.0
29	13.0	11.0	12.0	3.0	3.0	3.0	.0	.0	.0	.0	.0	.0
30	11.0	9.5	10.5	3.0	3.0	3.0	.0	.0	.0	.0	.0	.0
31	9.5	9.0	9.5	---	---	---	.0	.0	.0	.0	.0	.0
MONTH	16.0	8.5	12.1	9.5	.5	4.9	3.0	.0	.3	.0	.0	.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121660 MUSKEGON RIVER NEAR STANWOOD, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.0	.0	.0	5.0	4.0	4.5	17.0	16.0	16.5
2	.5	.0	.0	.0	.0	.0	5.0	4.5	4.5	18.5	17.0	17.5
3	.5	.0	.0	.5	.0	.5	7.0	5.0	6.0	19.5	18.0	18.5
4	.0	.0	.0	1.5	.5	1.0	8.0	6.5	7.0	20.0	18.5	19.5
5	.0	.0	.0	2.0	1.5	1.5	8.5	7.5	8.0	18.5	17.5	18.0
6	.0	.0	.0	1.5	.5	1.0	9.0	8.0	8.5	17.5	16.0	16.5
7	.0	.0	.0	.5	.0	.5	9.5	8.5	9.0	16.5	15.5	16.0
8	.0	.0	.0	1.5	.5	1.0	10.5	9.5	10.0	16.5	16.0	16.0
9	.5	.0	.5	2.0	1.5	1.5	10.5	10.0	10.5	17.5	16.0	16.5
10	1.0	.0	.5	1.5	1.0	1.5	10.0	9.5	9.5	18.0	17.0	17.5
11	.0	.0	.0	1.5	1.0	1.0	10.0	9.5	10.0	18.5	17.5	18.0
12	.0	.0	.0	2.5	1.5	2.0	10.0	9.5	10.0	18.0	16.5	17.5
13	.0	.0	.0	2.5	1.5	2.0	10.5	9.0	9.5	16.5	15.5	16.0
14	.0	.0	.0	1.5	1.5	1.5	10.5	10.0	10.0	16.5	15.0	16.0
15	.5	.0	.5	3.0	1.5	2.0	10.5	10.0	10.5	15.5	14.5	15.0
16	.5	.0	.0	4.0	2.5	3.5	10.5	9.5	10.0	15.0	14.0	14.5
17	.5	.0	.0	4.0	3.5	3.5	9.5	8.5	9.0	16.0	14.0	14.5
18	.0	.0	.0	3.5	3.0	3.5	9.0	8.5	9.0	17.5	16.0	16.5
19	.0	.0	.0	4.0	3.0	3.5	9.5	9.0	9.0	18.0	17.0	17.5
20	.0	.0	.0	4.5	3.5	4.0	10.0	9.5	10.0	19.0	18.0	18.5
21	.0	.0	.0	5.0	4.0	4.5	10.5	9.5	10.0	19.0	18.0	18.5
22	.0	.0	.0	5.5	4.5	5.0	12.0	10.5	11.5	18.0	17.0	17.5
23	.0	.0	.0	5.5	5.0	5.0	12.5	11.5	12.0	17.0	16.5	16.5
24	.0	.0	.0	5.0	4.0	4.5	13.0	12.5	12.5	16.5	15.0	16.0
25	.0	.0	.0	4.0	2.0	3.0	12.5	12.0	12.5	15.0	14.0	14.5
26	.0	.0	.0	2.0	1.0	1.5	12.5	12.0	12.5	14.5	14.0	14.0
27	.0	.0	.0	1.0	.5	1.0	13.5	12.5	13.0	14.5	14.0	14.5
28	.0	.0	.0	1.0	.5	1.0	14.0	13.0	13.5	15.0	13.5	14.0
29	—	—	—	2.0	1.0	1.5	14.5	13.5	14.0	16.0	15.0	15.5
30	—	—	—	3.0	2.0	2.5	16.0	14.0	14.5	16.0	15.5	16.0
31	—	—	—	4.0	2.5	3.5	—	—	—	16.0	15.5	16.0
MONTH	1.0	.0	.1	5.5	.0	2.2	16.0	4.0	10.0	20.0	13.5	16.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	14.5	15.5	25.0	23.5	24.5	25.5	24.5	24.5	21.5	20.0	21.0
2	14.5	13.5	14.0	23.5	21.0	22.0	25.5	25.0	25.0	20.0	19.5	20.0
3	14.0	13.5	13.5	21.5	21.0	21.0	26.0	25.0	25.0	20.5	19.5	20.0
4	13.5	13.0	13.5	22.0	21.0	21.5	25.5	25.0	25.0	21.0	20.0	20.5
5	13.0	12.5	12.5	22.5	21.5	22.0	25.5	25.0	25.5	20.5	20.0	20.0
6	14.0	12.5	13.0	22.0	20.5	21.5	26.0	25.5	25.5	20.5	20.0	20.0
7	15.5	14.0	14.5	21.5	20.5	21.0	27.0	26.0	26.5	20.5	20.0	20.5
8	17.0	15.5	16.0	23.0	21.5	22.0	27.5	26.5	26.5	21.5	20.5	21.0
9	18.0	17.0	17.5	24.0	23.0	23.5	27.5	27.0	27.0	21.5	21.0	21.5
10	18.5	17.5	18.0	25.0	23.5	24.5	27.5	26.5	27.0	21.0	20.0	20.5
11	19.5	17.5	18.0	24.5	23.5	24.0	26.5	25.0	26.0	20.5	19.0	20.0
12	21.0	19.5	20.0	24.0	23.0	23.5	25.0	24.5	24.5	20.0	19.0	19.5
13	22.0	20.5	21.0	23.5	22.0	23.0	24.5	24.0	24.5	20.0	19.5	20.0
14	24.0	22.0	22.5	23.0	21.5	22.5	24.0	23.0	23.5	19.5	17.5	18.5
15	24.0	23.5	24.0	22.5	22.0	22.5	23.0	22.5	23.0	17.5	17.0	17.5
16	24.0	22.0	23.0	23.0	22.5	22.5	22.5	21.5	22.5	17.0	16.5	17.0
17	—	—	—	23.0	22.5	23.0	21.5	20.5	21.0	17.0	16.5	16.5
18	—	—	—	23.5	23.0	23.0	20.5	20.0	20.0	17.0	16.5	16.5
19	—	—	—	23.5	23.0	23.0	20.5	19.5	20.0	17.0	16.5	16.5
20	—	—	—	23.5	23.5	23.5	19.5	18.5	19.0	16.5	16.0	16.0
21	22.5	21.0	22.0	24.5	23.5	24.0	19.5	18.5	19.0	16.5	15.0	16.0
22	21.0	20.0	20.5	25.5	24.5	24.5	20.0	19.0	19.5	16.0	15.5	15.5
23	21.0	20.0	20.5	25.5	25.0	25.0	20.0	19.5	20.0	16.5	15.5	16.0
24	22.0	20.0	21.0	26.0	25.5	25.5	20.5	20.0	20.5	16.0	15.0	15.5
25	22.5	20.5	21.5	26.0	25.5	26.0	20.5	20.5	20.5	15.0	12.5	13.5
26	23.5	22.0	22.5	25.5	24.5	25.0	21.5	20.0	21.0	12.5	11.5	12.0
27	24.0	22.5	23.0	24.5	23.5	24.0	21.5	21.0	21.0	11.5	11.0	11.0
28	25.0	23.5	24.0	23.5	22.5	23.0	22.5	21.5	22.0	11.5	10.5	11.0
29	25.0	24.0	24.5	23.5	22.5	23.0	22.0	21.0	21.5	12.0	11.0	11.0
30	25.0	24.0	24.5	23.5	23.0	23.0	22.0	21.0	21.5	12.0	11.5	11.5
31	—	—	—	24.5	23.5	23.5	22.5	21.5	22.0	—	—	—
MONTH	—	—	—	26.0	20.5	23.2	27.5	18.5	22.9	21.5	10.5	17.2

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121660 MUSKEGON RIVER NEAR STANWOOD, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.6	10.1	10.4	10.9	10.4	10.6	12.4	12.0	12.2	10.7	10.2	10.5
2	10.4	9.9	10.2	11.0	10.6	10.8	12.6	12.2	12.4	10.7	10.4	10.5
3	10.0	9.6	9.8	11.0	10.5	10.8	13.0	12.4	12.7	10.9	10.5	10.7
4	9.9	9.1	9.6	10.8	10.3	10.6	13.2	12.6	13.0	10.9	10.6	10.8
5	9.4	9.2	9.3	11.0	10.4	10.7	13.3	12.8	13.0	10.9	10.4	10.7
6	9.4	8.7	9.1	11.2	10.6	10.9	13.2	12.7	13.0	10.8	10.5	10.7
7	9.9	8.7	9.3	11.1	10.8	11.0	13.2	12.9	13.0	11.1	10.6	10.8
8	10.7	9.6	10.0	11.3	10.8	11.0	13.1	12.7	12.9	12.2	10.8	11.1
9	11.1	10.4	10.7	11.1	10.0	10.6	12.8	12.3	12.5	11.8	11.1	11.4
10	11.0	10.7	10.8	11.4	10.0	10.6	12.6	12.2	12.3	11.9	11.5	11.6
11	11.0	10.9	10.9	10.8	10.4	10.6	12.5	11.5	12.2	12.1	11.8	11.9
12	11.0	10.8	10.9	10.8	10.4	10.6	12.2	11.8	11.9	12.2	11.8	12.0
13	11.0	10.6	10.8	11.0	10.7	10.8	12.1	11.6	11.8	12.1	11.7	11.9
14	10.7	10.3	10.6	11.2	10.8	11.0	11.9	11.5	11.7	12.2	11.7	12.0
15	10.3	9.9	10.1	11.6	11.0	11.4	11.8	11.3	11.5	12.4	12.0	12.1
16	10.0	9.3	9.8	11.9	11.4	11.6	11.7	10.9	11.4	12.6	12.3	12.4
17	9.5	9.2	9.3	12.1	11.7	11.9	11.6	11.4	11.5	12.6	12.2	12.4
18	9.7	9.3	9.5	12.4	11.9	12.2	11.7	11.3	11.5	12.7	12.5	12.6
19	9.8	9.6	9.7	12.9	12.2	12.6	11.6	11.4	11.6	12.8	12.4	12.6
20	10.0	9.4	9.8	13.2	12.7	13.0	11.7	11.3	11.5	14.7	12.7	13.7
21	10.3	9.9	10.1	13.3	13.0	13.2	11.6	11.2	11.4	13.7	13.1	13.5
22	10.1	9.7	9.8	13.5	13.1	13.3	11.6	11.2	11.5	13.8	13.0	13.4
23	9.7	9.1	9.4	13.6	13.4	13.5	11.7	11.4	11.5	13.3	13.0	13.1
24	9.7	9.3	9.5	13.8	13.5	13.7	11.8	11.4	11.6	13.1	12.7	13.0
25	9.7	9.0	9.3	13.8	13.5	13.7	11.7	11.3	11.6	13.0	12.6	12.8
26	9.1	8.6	8.8	13.7	13.3	13.5	11.7	11.4	11.5	13.6	12.6	12.9
27	9.5	8.6	9.1	13.4	12.8	13.1	11.7	11.1	11.5	13.2	12.7	13.0
28	9.2	8.9	9.1	12.8	12.3	12.5	11.5	10.6	11.2	13.3	12.5	12.8
29	9.6	8.6	8.9	12.4	12.1	12.3	11.2	10.7	10.9	13.6	12.4	12.9
30	10.4	9.3	9.7	12.3	12.0	12.2	11.0	10.5	10.7	12.8	12.4	12.6
31	10.6	9.9	10.3	—	—	—	10.8	10.5	10.6	12.7	12.0	12.4
MONTH	11.1	8.6	9.8	13.8	10.0	11.8	13.3	10.5	11.9	14.7	10.2	12.1

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.3	12.0	12.2	12.2	11.9	12.1	12.1	11.5	11.9	9.2	8.3	8.9
2	12.2	12.0	12.1	12.3	12.0	12.1	11.6	11.3	11.5	9.3	8.3	8.8
3	12.2	11.9	12.1	12.0	11.8	11.9	11.8	11.3	11.5	10.2	7.9	9.0
4	12.4	12.2	12.3	12.0	11.8	11.9	11.6	11.0	11.3	10.2	8.5	9.5
5	12.6	12.1	12.3	12.0	11.8	11.9	11.4	10.7	11.0	9.8	7.7	8.6
6	12.3	12.0	12.1	12.5	12.0	12.2	10.9	10.4	10.6	9.8	8.3	9.0
7	12.0	11.7	11.9	12.6	12.4	12.5	10.5	10.0	10.3	9.3	8.2	8.8
8	12.1	11.9	12.0	12.6	12.4	12.5	10.1	9.5	9.8	9.3	8.4	9.0
9	12.2	11.8	12.1	12.5	12.2	12.3	9.6	9.1	9.4	9.5	8.3	9.1
10	12.2	11.7	11.9	12.6	12.4	12.5	9.7	9.2	9.5	9.5	8.3	8.9
11	12.5	12.0	12.2	12.8	12.6	12.7	9.8	9.4	9.6	9.4	8.2	9.0
12	12.4	12.1	12.3	12.7	12.4	12.6	9.6	9.3	9.4	8.6	8.0	8.3
13	12.3	11.8	12.1	12.7	12.5	12.6	9.4	9.1	9.2	9.0	7.7	8.5
14	12.0	11.6	11.8	12.7	12.5	12.6	9.3	9.0	9.1	9.6	8.2	9.0
15	11.8	11.6	11.7	12.7	12.5	12.6	9.3	8.7	9.0	9.8	8.3	8.9
16	12.0	11.7	11.9	12.7	12.2	12.4	9.3	8.9	9.1	9.2	8.7	8.9
17	12.0	11.7	11.8	12.5	12.1	12.3	9.8	9.2	9.5	8.7	8.2	8.3
18	12.1	11.9	12.0	12.6	12.3	12.5	9.9	9.5	9.7	8.2	7.6	7.8
19	12.2	12.0	12.1	12.6	12.2	12.4	10.0	9.6	9.8	7.6	7.3	7.4
20	12.1	11.7	11.9	12.5	12.2	12.3	9.8	9.4	9.6	7.5	7.2	7.4
21	11.9	11.7	11.8	12.4	11.0	12.2	9.5	9.2	9.4	7.5	7.3	7.4
22	11.9	11.7	11.8	12.1	11.7	11.9	9.4	8.9	9.1	7.9	7.5	7.6
23	12.2	11.8	11.9	11.9	11.6	11.8	9.1	8.5	8.9	7.9	7.6	7.8
24	11.8	11.6	11.7	12.0	11.7	11.8	8.6	8.2	8.4	8.1	7.6	7.8
25	12.0	11.6	11.8	12.6	11.9	12.3	9.2	8.4	9.0	8.2	8.0	8.1
26	11.9	11.4	11.7	13.2	12.4	12.9	9.3	9.1	9.2	8.4	8.2	8.3
27	11.8	11.4	11.6	13.6	13.1	13.4	9.3	9.0	9.2	8.5	8.1	8.3
28	12.0	11.6	11.8	13.5	13.1	13.3	9.2	8.8	9.0	8.4	8.2	8.4
29	—	—	—	13.3	12.8	13.2	9.2	8.7	9.0	8.4	8.0	8.2
30	—	—	—	12.9	12.4	12.7	9.4	8.6	9.0	8.3	8.1	8.2
31	—	—	—	12.6	12.1	12.4	—	—	—	8.4	8.2	8.3
MONTH	12.6	11.4	12.0	13.6	11.0	12.4	12.1	8.2	9.7	10.2	7.2	8.4

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121660 MUSKEGON RIVER NEAR STANWOOD, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	8.3	8.4	8.3	5.7	7.3	8.3	7.5	7.9	8.2	6.7	7.5
2	8.6	8.3	8.5	6.9	5.8	6.4	7.6	6.5	7.0	8.2	6.8	7.6
3	8.8	8.5	8.7	8.3	6.5	7.3	7.3	6.3	6.8	8.7	7.6	8.2
4	8.9	8.6	8.8	8.6	7.4	8.0	7.3	6.3	7.0	8.9	8.2	8.6
5	9.2	8.7	9.0	8.4	7.4	7.8	8.0	6.6	7.4	8.8	7.7	8.3
6	9.2	8.9	9.1	7.7	6.0	7.2	8.5	6.4	7.7	8.9	8.1	8.6
7	9.2	8.7	9.0	8.2	7.1	7.5	8.6	6.9	8.1	8.8	8.3	8.5
8	9.2	8.8	9.0	8.1	7.6	7.9	8.7	6.1	7.9	8.7	8.1	8.5
9	8.9	8.5	8.7	8.2	7.3	7.7	7.8	6.6	7.2	8.8	7.8	8.5
10	8.7	8.1	8.4	8.5	7.4	7.8	7.5	6.1	7.0	8.2	6.7	7.5
11	8.4	8.1	8.2	7.7	6.1	7.2	7.3	5.4	6.4	8.2	7.2	7.6
12	8.5	7.9	8.3	7.0	5.7	6.4	7.4	6.0	6.7	8.9	7.6	8.1
13	8.2	7.7	8.0	7.4	5.9	6.7	8.0	6.7	7.4	9.5	8.5	9.0
14	8.2	7.5	7.9	8.1	6.3	7.3	8.1	5.5	7.1	9.4	7.7	8.5
15	8.0	7.0	7.5	8.5	7.0	7.7	7.6	6.2	6.8	9.4	8.6	9.0
16	7.7	6.6	7.1	8.5	7.0	7.9	7.7	6.3	7.2	9.6	8.8	9.2
17	—	—	—	8.6	7.0	8.1	7.3	6.2	6.7	9.6	8.7	9.3
18	—	—	—	8.7	6.9	7.8	7.6	6.1	7.1	9.6	8.6	9.1
19	—	—	—	8.8	7.4	7.9	8.4	7.3	8.0	9.5	8.6	9.1
20	—	—	—	9.2	7.3	8.2	8.0	7.0	7.6	9.1	8.1	8.5
21	8.7	6.3	7.7	8.1	6.8	7.5	8.3	7.1	7.7	8.7	7.9	8.3
22	8.0	6.7	7.3	7.9	7.1	7.4	8.5	7.4	7.8	9.4	8.2	8.7
23	8.6	7.4	7.8	7.6	6.1	6.7	7.9	6.8	7.4	10.0	8.5	9.2
24	8.9	7.3	8.0	7.1	6.3	6.6	8.5	7.6	8.1	9.8	8.1	9.1
25	9.0	7.3	8.2	7.2	5.8	6.9	8.2	7.0	7.8	9.5	8.1	8.8
26	8.8	7.7	8.2	7.1	5.5	6.4	8.0	6.6	7.2	9.9	8.9	9.3
27	8.5	7.4	8.1	7.3	6.4	6.8	7.8	7.1	7.5	9.5	8.8	9.2
28	8.3	7.2	7.8	7.5	6.6	7.0	8.4	7.4	7.8	10.2	9.2	9.8
29	8.2	7.2	7.7	7.7	6.7	7.2	8.6	6.9	8.0	10.6	9.7	10.3
30	8.2	6.5	7.3	7.6	6.4	7.2	8.4	7.5	8.0	10.6	9.7	10.1
31	—	—	—	8.2	6.5	7.6	8.9	7.6	8.4	—	—	—
MONTH	—	—	—	9.2	5.5	7.3	8.9	5.4	7.4	10.6	6.7	8.7

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121680 MUSKEGON RIVER NEAR OXBOW, MI

LOCATION.--Lat 43°29'09", long 85°37'50", in SW1/4 SE1/4 sec.28, T.13 N., R.11 W., Newaygo County, Hydrologic Unit 04060102, on right bank downstream from Hardy Dam, 0.6 mi northwest of Oxbow.

DRAINAGE AREA.--1,931 mi^2.

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1995 to current year.
DISSOLVED OXYGEN: October 1995 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 22.0°C, on several days during summer periods, 1996, 1999; minimum, 0.5°C, on many days during winter periods, 1996, 1997.
DISSOLVED OXYGEN: Maximum, 14.6 mg/L, Feb. 22-24, 1999; minimum, 0.5 mg/L, Sept. 4, 5, 1998.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 21.0°C, Aug. 10, 13; minimum, 1.0°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 12.9 mg/L, Dec. 19; minimum, 0.7 mg/L, Sept. 16-18, 20, 21.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	17.0	16.5	17.0	13.5	12.5	13.0	6.5	6.5	6.5	2.5	1.5	2.0
2	17.0	16.0	16.5	13.5	12.5	13.0	6.5	6.5	6.5	3.0	1.5	2.0
3	17.0	16.0	16.5	13.0	12.5	13.0	6.5	6.0	6.0	2.5	1.5	2.0
4	17.0	15.5	16.5	13.0	12.5	13.0	6.0	6.0	6.0	2.5	1.5	2.0
5	16.5	15.5	16.0	13.0	12.5	13.0	6.0	5.5	5.5	3.0	1.5	2.0
6	16.5	15.5	16.0	13.0	12.5	13.0	5.5	5.0	5.5	3.0	1.5	2.0
7	16.0	15.0	15.5	13.0	12.5	13.0	5.5	5.0	5.0	2.5	1.5	2.0
8	16.0	15.0	15.5	13.0	12.5	12.5	5.0	4.5	5.0	2.5	1.5	2.0
9	15.5	15.0	15.5	12.5	12.5	12.5	5.0	4.5	4.5	3.0	1.5	2.0
10	15.5	15.0	15.0	12.5	12.5	12.5	4.5	4.5	4.5	2.5	1.5	2.0
11	15.5	14.5	15.0	12.5	12.0	12.0	4.5	4.0	4.0	2.5	1.5	2.0
12	15.5	15.0	15.0	12.0	12.0	12.0	4.0	3.5	3.5	3.0	1.5	2.0
13	15.5	15.0	15.0	12.0	11.5	12.0	3.5	3.5	3.5	3.0	1.5	2.0
14	15.0	14.5	15.0	11.5	11.5	11.5	3.5	3.0	3.0	3.0	1.5	2.0
15	15.0	14.5	14.5	11.5	11.0	11.0	3.5	3.0	3.0	3.0	1.5	2.0
16	14.5	14.0	14.5	11.0	10.5	10.5	3.5	3.0	3.0	3.0	1.5	2.0
17	14.5	13.5	14.0	10.5	10.0	10.5	3.0	2.5	3.0	3.0	1.5	2.0
18	14.0	13.0	13.5	10.5	10.0	10.0	3.0	2.5	3.0	3.0	1.5	2.0
19	14.0	12.5	13.5	10.0	9.5	10.0	3.0	1.5	2.0	3.0	1.5	2.0
20	14.0	12.5	13.5	9.5	9.0	9.5	2.5	2.0	2.0	3.0	1.5	2.0
21	14.0	12.5	13.5	9.5	9.0	9.0	2.5	2.0	2.0	3.0	1.5	2.0
22	14.0	12.5	13.5	9.0	8.5	8.5	2.5	1.5	2.0	3.0	1.5	2.0
23	14.0	12.5	13.5	8.5	8.0	8.5	2.5	1.5	2.0	3.0	1.5	2.0
24	14.0	12.5	13.5	8.5	8.0	8.0	2.5	1.5	2.0	3.0	1.5	2.0
25	14.0	12.5	13.5	8.0	7.5	8.0	2.5	1.5	2.0	3.5	1.5	2.0
26	14.0	12.5	13.5	8.0	7.5	7.5	2.5	1.5	2.0	3.5	1.5	2.0
27	14.0	12.5	13.5	7.5	7.5	7.5	2.5	1.5	2.0	3.5	1.5	2.0
28	14.0	12.5	13.5	7.5	7.0	7.0	2.5	1.5	2.0	3.5	1.5	2.0
29	13.5	12.5	13.0	7.0	7.0	7.0	2.5	1.5	2.0	3.5	1.5	2.0
30	13.5	12.5	13.0	7.0	6.5	6.5	2.5	1.5	2.0	3.5	1.5	2.0
31	13.5	12.5	13.0	---	---	---	2.5	1.5	2.0	3.0	1.5	2.0
MONTH	17.0	12.5	14.5	13.5	6.5	10.5	6.5	1.5	3.5	3.5	1.5	2.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121680 MUSKEGON RIVER NEAR OXBOW, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.0	1.5	2.0	2.5	1.0	1.5	3.0	2.5	3.0	10.0	8.0	9.0
2	3.0	1.5	2.0	2.5	1.0	1.5	3.5	3.0	3.0	10.0	8.0	9.0
3	3.0	1.5	2.0	2.5	1.0	1.5	3.5	3.0	3.0	10.5	8.5	10.0
4	3.0	1.5	2.0	2.5	1.0	1.5	3.5	3.0	3.0	12.0	8.5	11.0
5	3.5	1.5	2.0	2.5	1.0	1.5	3.5	3.0	3.0	12.0	9.0	11.0
6	2.5	1.5	1.5	2.5	1.0	1.5	3.5	3.0	3.0	12.5	8.5	11.5
7	2.5	1.5	1.5	3.0	1.0	1.5	3.5	2.5	3.0	12.0	8.5	11.0
8	3.0	1.0	1.5	2.5	1.0	1.5	3.5	3.0	3.5	11.5	9.0	10.5
9	3.0	1.0	1.5	2.5	1.0	1.5	4.0	3.5	4.0	12.0	9.0	11.0
10	1.0	1.0	1.0	2.5	1.0	1.5	4.5	4.0	4.5	12.0	9.5	11.0
11	1.5	1.0	1.0	2.5	1.0	1.5	5.5	4.5	5.5	13.0	9.0	11.5
12	1.5	1.0	1.0	2.5	1.0	1.5	5.5	4.5	5.0	13.0	9.0	12.0
13	1.5	1.0	1.0	2.5	1.0	1.5	6.0	5.0	5.5	13.0	9.0	11.5
14	1.5	1.0	1.0	2.5	1.0	1.5	6.0	5.5	6.0	12.5	9.0	11.5
15	1.0	1.0	1.0	2.5	1.0	1.5	6.5	6.0	6.5	13.0	9.0	12.0
16	1.5	1.0	1.0	2.5	1.0	1.5	7.0	6.5	7.0	13.0	10.0	13.0
17	2.0	1.0	1.0	2.5	1.5	1.5	8.0	7.0	7.5	13.5	13.0	13.0
18	2.5	1.0	1.5	2.0	1.5	1.5	7.5	7.0	7.0	14.0	13.5	14.0
19	2.5	1.0	1.5	2.5	1.5	1.5	7.5	7.0	7.0	14.5	14.0	14.0
20	2.5	1.0	1.5	2.5	1.5	1.5	8.0	7.0	7.5	14.5	14.0	14.0
21	2.5	1.0	1.5	2.5	1.5	2.0	8.0	7.0	7.5	14.5	14.0	14.5
22	2.5	1.0	1.5	2.5	1.5	2.0	8.5	7.5	8.0	14.0	13.5	13.5
23	2.0	1.0	1.5	2.0	1.5	2.0	8.5	7.0	8.0	14.5	13.5	14.0
24	2.5	1.0	1.5	2.5	2.0	2.0	9.0	7.0	8.0	14.5	14.0	14.5
25	2.5	1.0	1.5	2.0	2.0	2.0	8.5	7.5	8.5	15.0	14.0	14.5
26	2.0	1.0	1.0	2.0	2.0	2.0	9.0	7.5	8.5	15.0	14.5	14.5
27	2.5	1.0	1.5	2.5	2.0	2.0	9.5	7.5	9.0	15.0	14.5	15.0
28	2.5	1.0	1.5	2.5	2.0	2.0	10.0	8.0	9.5	15.5	15.0	15.5
29	—	—	—	2.5	2.0	2.5	10.0	8.0	9.5	16.0	15.0	15.5
30	—	—	—	2.5	2.5	2.5	10.0	8.0	9.0	16.0	15.0	15.5
31	—	—	—	3.0	2.5	2.5	—	—	—	15.5	15.0	15.5
MONTH	3.5	1.0	1.4	3.0	1.0	1.7	10.0	2.5	6.1	16.0	8.0	12.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	15.0	15.5	19.0	13.5	17.0	19.5	14.5	17.5	20.0	16.0	18.5
2	15.5	15.0	15.0	18.5	13.5	16.5	19.5	15.0	17.5	20.0	16.0	18.5
3	15.5	14.5	15.5	18.0	14.0	16.5	20.5	14.5	18.0	20.0	16.0	18.0
4	15.5	15.0	15.5	18.5	13.5	16.5	20.0	14.5	18.0	20.5	16.0	18.5
5	15.5	14.5	15.0	18.5	14.0	17.5	20.0	14.5	18.0	20.5	16.0	18.5
6	15.5	15.0	15.5	18.5	14.0	17.0	20.0	14.5	18.0	20.0	16.0	19.0
7	15.5	15.0	15.5	18.0	14.0	16.5	20.5	14.5	17.5	20.0	16.0	19.0
8	15.5	14.0	15.0	18.5	14.0	17.0	20.5	14.5	17.5	20.0	17.0	19.0
9	15.0	14.5	15.0	19.0	14.0	17.5	20.0	14.5	17.5	20.5	16.5	19.0
10	15.0	14.0	15.0	19.5	14.0	17.5	21.0	14.5	18.5	20.0	16.5	19.0
11	15.5	15.0	15.5	19.0	14.0	17.5	20.5	14.5	18.0	20.0	16.5	19.5
12	16.0	15.0	15.5	19.5	14.0	17.5	20.5	14.5	17.5	20.0	17.0	19.5
13	16.0	14.0	15.5	19.0	14.0	17.5	21.0	15.0	18.0	20.0	17.0	19.5
14	16.0	14.0	15.5	19.0	14.0	17.0	20.5	15.0	18.0	20.0	17.0	19.0
15	16.5	13.5	15.5	19.0	14.0	17.0	20.0	14.5	17.5	20.0	17.5	19.0
16	16.0	13.5	15.5	19.0	14.0	17.0	20.0	15.0	17.5	20.0	17.5	19.0
17	17.0	14.0	16.0	19.0	14.0	17.0	20.0	15.0	18.0	20.0	17.5	19.0
18	17.0	14.0	16.0	19.0	14.0	17.5	20.0	15.0	18.0	20.0	17.5	19.0
19	17.0	14.0	16.0	19.5	14.0	17.5	20.0	14.5	19.0	20.0	17.5	19.0
20	17.5	14.0	16.5	19.5	14.0	17.5	20.0	19.5	20.0	19.5	18.0	19.0
21	17.5	14.0	16.5	19.5	14.0	18.0	20.0	15.5	19.0	20.0	18.0	19.5
22	17.5	13.5	16.5	19.0	14.5	18.0	20.0	15.5	18.5	19.5	18.0	19.0
23	18.0	13.5	16.5	19.0	14.5	18.0	20.0	15.5	18.5	19.5	18.0	19.0
24	17.5	13.5	16.5	19.5	14.5	18.0	20.0	15.0	18.5	19.5	18.0	19.0
25	17.5	13.5	16.5	20.0	14.0	18.0	20.0	15.0	18.5	19.0	18.0	18.5
26	18.0	13.5	16.5	20.0	14.5	18.0	20.0	15.0	19.0	18.5	18.0	18.5
27	18.0	13.5	16.5	20.0	14.5	17.5	20.0	15.5	18.5	18.5	18.0	18.0
28	18.0	13.5	16.5	19.5	14.5	17.5	20.5	16.0	19.0	18.0	18.0	18.0
29	18.0	14.0	16.5	19.5	14.5	17.5	20.0	16.0	18.5	18.0	17.5	18.0
30	18.0	14.0	16.5	19.5	14.5	17.5	20.0	16.0	18.5	18.0	17.0	17.5
31	—	—	—	20.0	14.5	17.5	20.5	16.0	18.5	—	—	—
MONTH	18.0	13.5	15.8	20.0	13.5	17.4	21.0	14.5	18.2	20.5	16.0	18.8

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121680 MUSKEGON RIVER NEAR OXBOW, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	6.4	6.0	6.3	8.3	6.9	7.8	10.7	9.9	10.5	12.1	11.0	11.7
2	6.7	6.2	6.5	8.3	6.7	7.7	10.8	10.0	10.6	12.0	10.6	11.6
3	7.1	6.2	6.8	8.1	6.7	7.6	10.8	10.4	10.6	12.0	10.7	11.6
4	7.4	6.5	7.1	8.3	6.5	7.8	10.7	10.4	10.6	11.8	10.6	11.4
5	7.5	6.8	7.3	8.6	6.5	7.8	10.8	10.5	10.7	11.6	10.3	11.2
6	7.6	6.9	7.3	8.7	6.3	7.8	11.0	10.5	10.9	11.5	9.9	11.1
7	7.6	6.8	7.4	8.4	8.0	8.3	11.2	10.8	11.1	11.5	10.3	11.0
8	8.1	6.8	7.6	8.3	7.2	8.0	11.2	10.5	11.0	11.4	10.1	10.9
9	8.1	6.8	7.6	8.4	7.8	8.2	11.2	10.8	11.2	11.3	9.4	10.7
10	8.1	6.7	7.6	8.7	8.1	8.5	11.5	11.0	11.2	11.3	9.5	10.8
11	8.4	6.7	7.8	8.7	8.3	8.5	11.8	11.3	11.6	11.0	9.6	10.5
12	8.3	6.9	7.8	8.8	8.4	8.6	11.9	11.3	11.8	10.7	9.3	10.3
13	8.3	7.2	7.8	8.7	8.2	8.5	12.0	11.7	11.9	10.7	9.2	10.3
14	8.2	7.5	7.9	8.7	8.1	8.5	12.0	11.6	11.9	10.5	8.4	10.0
15	8.3	7.8	8.1	8.7	8.3	8.6	12.2	11.7	11.9	10.7	8.6	10.1
16	8.5	7.7	8.1	8.9	8.3	8.7	12.2	12.0	12.1	10.8	9.0	10.2
17	8.7	7.8	8.4	8.9	8.3	8.7	12.3	11.9	12.2	10.9	9.1	10.3
18	8.6	8.0	8.3	9.1	8.6	8.9	12.3	12.0	12.2	11.0	8.9	10.3
19	8.6	8.0	8.3	9.0	8.6	8.9	12.9	12.2	12.6	10.8	8.9	10.3
20	8.5	8.0	8.2	9.1	8.7	9.0	12.8	12.3	12.5	10.9	8.7	10.2
21	8.6	7.9	8.3	9.7	8.6	9.2	12.6	11.8	12.3	10.8	8.6	10.2
22	8.7	7.9	8.4	9.6	9.3	9.5	12.7	11.8	12.4	10.9	8.8	10.2
23	8.6	8.0	8.4	9.8	9.3	9.7	12.6	11.9	12.3	11.0	8.7	10.4
24	8.5	7.7	8.2	10.1	9.6	9.9	12.4	11.7	12.3	11.1	8.3	10.2
25	8.4	7.7	8.2	10.0	9.6	9.9	12.5	11.9	12.4	11.0	7.7	10.2
26	8.4	7.6	8.2	10.1	9.8	10.0	12.5	11.6	12.2	11.1	7.9	10.4
27	8.4	7.5	8.0	10.2	9.6	10.0	12.3	11.4	12.1	11.3	8.2	10.4
28	8.5	7.4	8.3	10.0	9.8	10.0	12.4	11.7	12.2	11.3	7.9	10.4
29	8.5	7.5	8.2	10.3	9.5	10.0	12.3	11.2	12.0	11.3	7.8	10.4
30	8.4	7.1	8.0	10.5	10.1	10.3	12.2	11.2	12.0	11.4	7.6	10.5
31	8.3	6.8	7.8	—	—	—	12.2	11.2	11.9	11.5	8.7	10.7
MONTH	8.7	6.0	7.8	10.5	6.3	8.8	12.9	9.9	11.7	12.1	7.6	10.6

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.7	8.8	10.9	12.0	8.9	11.1	11.9	11.2	11.7	9.9	9.0	9.5
2	11.7	8.5	10.8	12.0	9.1	11.1	11.9	11.1	11.7	9.4	8.6	9.1
3	11.8	8.7	10.9	12.0	9.3	11.2	12.0	11.3	11.8	9.4	8.1	9.0
4	11.8	8.7	11.0	11.9	9.0	11.0	11.9	11.4	11.7	9.4	8.4	9.0
5	12.0	8.2	11.0	11.8	8.6	11.0	11.8	11.2	11.6	9.4	8.4	9.0
6	12.0	8.8	11.3	11.8	8.6	10.9	12.0	11.1	11.7	9.3	8.2	8.9
7	12.0	8.9	11.2	11.9	8.0	10.9	12.0	10.7	11.5	9.2	7.8	8.8
8	11.9	7.8	11.0	11.9	8.5	10.9	11.5	10.8	11.3	9.0	8.1	8.7
9	11.9	8.3	11.0	11.9	7.7	11.0	11.8	11.1	11.6	9.0	8.3	8.7
10	11.9	11.8	11.8	11.9	8.8	11.1	11.8	11.5	11.7	8.9	8.0	8.5
11	11.9	11.6	11.8	11.9	8.3	11.0	11.6	11.1	11.4	9.1	8.1	8.7
12	11.9	11.5	11.8	11.9	8.3	11.0	11.5	11.1	11.4	9.0	7.9	8.6
13	11.9	11.3	11.7	11.9	8.9	11.0	11.5	11.2	11.3	9.0	7.9	8.5
14	11.9	11.3	11.7	11.8	8.7	11.0	11.4	11.1	11.3	8.9	7.7	8.5
15	12.0	11.7	11.9	11.9	7.7	10.9	11.2	10.9	11.1	8.7	7.4	8.3
16	12.0	11.5	11.8	11.8	8.5	10.9	11.1	10.7	10.9	8.9	7.6	8.7
17	11.9	10.5	11.7	11.9	8.2	11.0	10.8	10.5	10.7	8.9	8.6	8.8
18	11.9	9.4	11.4	11.8	9.3	11.2	10.8	10.5	10.7	9.0	8.8	8.9
19	11.8	9.0	11.1	11.8	9.0	11.1	10.8	10.4	10.6	9.0	8.5	8.7
20	11.9	8.2	10.9	11.9	9.5	11.2	10.8	10.3	10.6	8.7	8.4	8.5
21	11.8	8.7	10.9	11.8	9.1	11.2	10.6	10.0	10.3	8.5	8.1	8.3
22	11.7	8.8	11.0	11.9	9.2	11.3	10.2	9.6	10.0	8.2	7.7	7.9
23	11.8	9.3	11.0	11.6	10.3	11.5	10.2	9.4	9.9	8.1	7.8	7.9
24	11.7	8.3	10.8	11.8	9.9	11.3	10.2	9.6	9.9	8.0	7.8	7.9
25	11.5	8.4	10.6	11.6	10.1	11.4	10.1	9.0	9.8	7.9	7.5	7.7
26	11.7	8.9	11.1	11.7	11.1	11.6	10.0	9.2	9.7	7.6	7.4	7.5
27	12.1	8.8	11.1	12.0	10.7	11.7	9.9	9.0	9.6	7.5	7.2	7.4
28	11.9	8.1	11.1	12.1	11.3	11.9	10.3	8.9	9.9	7.4	7.2	7.3
29	—	—	—	12.1	11.3	12.0	10.2	9.1	9.7	7.2	6.9	7.1
30	—	—	—	12.1	11.6	11.9	9.8	9.0	9.4	7.1	6.8	7.0
31	—	—	—	12.0	11.4	11.8	—	—	—	7.0	6.7	6.9
MONTH	12.1	7.8	11.2	12.1	7.7	11.2	12.0	8.9	10.8	9.9	6.7	8.3

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121680 MUSKEGON RIVER NEAR OXBOW, MI—Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.2	6.6	6.9	6.1	3.6	5.3	4.0	1.5	3.0	4.0	1.0	2.7
2	6.9	6.6	6.7	6.0	3.4	5.0	3.7	1.3	2.9	3.5	1.0	2.3
3	7.1	6.6	6.9	5.5	3.5	4.8	5.0	1.5	3.4	3.1	1.0	1.9
4	7.1	6.8	7.0	5.5	3.1	4.6	4.6	1.5	3.4	4.1	1.0	2.6
5	7.0	6.7	6.9	5.7	3.1	4.9	4.2	1.5	3.0	3.9	1.1	2.5
6	7.1	6.7	6.9	5.4	3.3	4.7	3.8	1.6	2.8	4.1	1.1	2.9
7	7.0	6.5	6.8	5.1	2.9	4.4	4.3	1.4	2.9	3.4	.8	2.4
8	6.9	5.8	6.7	5.4	3.0	4.6	4.3	1.6	3.0	2.8	.9	2.2
9	6.9	5.7	6.4	5.4	2.9	4.6	3.7	1.4	2.4	3.8	.9	2.7
10	6.8	5.6	6.3	5.4	3.1	4.6	4.6	1.5	3.2	3.4	1.1	2.4
11	7.2	6.7	7.0	5.8	2.9	4.7	4.3	1.6	3.2	3.7	.9	2.9
12	7.4	6.6	7.0	5.6	2.3	4.5	4.3	1.5	3.0	3.5	1.1	2.8
13	7.2	6.0	6.9	5.6	2.6	4.6	4.7	1.4	3.2	3.9	.8	3.0
14	7.0	6.0	6.5	5.3	2.5	4.2	4.3	1.6	3.1	4.2	1.0	2.9
15	7.0	5.6	6.3	5.1	2.4	4.0	3.9	1.4	2.7	4.0	.9	2.6
16	6.7	5.4	6.3	5.3	2.5	4.0	4.0	1.3	2.8	4.0	.7	2.4
17	6.7	5.6	6.3	5.3	2.4	4.3	3.5	1.4	2.7	4.1	.7	2.5
18	6.4	5.4	6.1	5.4	2.3	4.2	4.1	1.4	3.0	4.1	.7	2.4
19	6.2	5.2	5.9	5.4	2.4	4.3	4.5	1.4	4.0	4.0	.8	2.9
20	6.4	5.3	6.0	5.0	2.2	4.0	4.5	4.0	4.4	3.7	.7	2.9
21	6.4	5.2	6.0	5.0	2.5	4.1	4.3	1.7	3.7	3.9	.7	2.9
22	6.4	4.8	5.9	4.9	2.4	4.1	3.9	1.8	3.3	3.4	.8	2.6
23	6.4	4.6	5.8	4.6	2.6	3.9	4.2	1.5	3.3	3.5	.8	2.7
24	6.2	4.4	5.6	4.9	2.2	3.9	4.3	1.5	3.3	6.1	1.2	4.5
25	6.2	4.3	5.7	5.4	2.2	4.2	4.3	1.5	3.4	6.0	2.3	4.8
26	6.5	4.2	5.6	5.3	2.4	4.3	4.0	1.6	3.2	6.4	4.8	5.7
27	6.5	4.1	5.6	5.3	2.3	4.1	3.6	1.6	2.8	6.1	5.2	5.7
28	6.3	4.0	5.4	5.2	2.2	4.0	4.3	1.5	3.3	6.1	5.3	5.8
29	5.9	4.4	5.2	4.8	2.2	3.6	4.1	1.5	3.1	6.6	5.6	6.3
30	5.4	4.0	4.8	4.8	2.2	3.7	3.5	1.0	2.1	6.3	4.9	5.9
31	—	—	—	4.8	1.8	3.4	4.2	1.0	2.6	—	—	—
MONTH	7.4	4.0	6.2	6.1	1.8	4.3	5.0	1.0	3.1	6.6	.7	3.3

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121944 LITTLE MUSKEGON RIVER NEAR OAK GROVE, MI

LOCATION.--Lat 43°25'51", long 85°35'44", in NE1/4 SW1/4 sec.14, T.13 N., R.11 W., Newaygo County, Hydrologic Unit 04060102, on left bank 1.6 mi downstream from Tamarack Creek, 3.2 mi east of Croton.

DRAINAGE AREA.--345 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR MI-98-1: 1996-97.

GAGE.--Water-stage recorder. Elevation of gage is 750 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	216	221	312	e260	386	e420	344	270	487	193	149	228
2	212	220	288	e260	354	e380	365	268	597	190	143	217
3	207	218	262	e260	327	410	380	263	664	189	144	202
4	208	215	252	e260	321	446	380	254	630	183	141	194
5	209	211	250	e260	309	449	363	251	524	178	134	188
6	209	209	e245	e260	289	413	379	243	463	176	128	184
7	210	215	e240	e260	276	380	446	244	423	170	125	193
8	214	225	e240	e260	287	362	474	254	390	168	122	200
9	213	252	e240	e260	522	360	432	251	358	165	e120	234
10	210	450	e240	e255	969	344	402	238	339	158	e133	342
11	206	454	240	e255	745	356	383	257	341	153	e143	330
12	201	376	e250	e255	e650	378	450	274	351	146	e139	268
13	201	345	e250	252	e600	392	454	252	360	139	e140	227
14	200	403	e250	257	546	394	403	235	339	139	131	187
15	201	396	e250	268	451	414	367	296	322	141	124	200
16	201	366	e250	291	410	465	345	583	357	142	140	204
17	205	358	e270	299	371	462	332	774	348	140	169	201
18	208	337	e250	296	401	428	319	699	327	145	185	191
19	206	322	e250	286	418	414	311	604	313	149	386	205
20	207	319	e255	273	345	422	315	437	291	146	415	345
21	206	319	e255	e265	316	432	346	376	275	146	337	345
22	203	306	e255	e260	380	437	386	423	290	145	287	296
23	202	297	e260	250	345	430	378	444	286	147	349	264
24	209	285	e260	243	294	409	400	430	265	149	343	310
25	212	274	e260	237	444	384	426	652	243	140	293	312
26	217	291	e260	224	723	350	394	754	234	143	254	292
27	240	358	e260	e220	e540	339	352	843	227	137	227	288
28	255	372	e260	e220	e480	329	325	897	212	136	213	273
29	242	351	e260	231	---	331	306	790	206	138	202	250
30	229	330	e260	282	---	337	279	666	193	147	197	241
31	223	---	e260	374	---	338	---	518	---	164	235	---
TOTAL	6582	9295	7934	8133	12499	12205	11236	13740	10655	4802	6248	7411
MEAN	212	310	256	262	446	394	375	443	355	155	202	247
MAX	255	454	312	374	969	465	474	897	664	193	415	345
MIN	200	209	240	220	276	329	279	235	193	136	120	184
CFSM	.62	.90	.74	.76	1.29	1.14	1.09	1.28	1.03	.45	.58	.72
IN.	.71	1.00	.86	.88	1.35	1.32	1.21	1.48	1.15	.52	.67	.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2001, BY WATER YEAR (WY)

MEAN	218	274	266	306	388	411	399	375	305	201	206	202
MAX	275	393	371	443	491	628	441	443	411	288	272	247
(WY)	1997	1996	1997	1997	1997	1997	1996	2001	1996	1999	1996	2001
MIN	190	195	204	215	314	270	331	256	183	131	133	152
(WY)	1998	2000	1998	2000	2000	1999	2000	1998	1998	1998	1998	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1996 - 2001	
ANNUAL TOTAL	99283		110740			
ANNUAL MEAN	271		303		295	
HIGHEST ANNUAL MEAN					352	1997
LOWEST ANNUAL MEAN					252	1998
HIGHEST DAILY MEAN	947	Apr 22	969	Feb 10	1080	Feb 23 1997
LOWEST DAILY MEAN	155	Jul 27	120	Aug 9	113	Aug 1 1998
ANNUAL SEVEN-DAY MINIMUM	162	Jul 21	129	Aug 4	116	Jul 28 1998
MAXIMUM PEAK FLOW			1050	Feb 10	1160	Feb 23 1997
MAXIMUM PEAK STAGE			5.96	Feb 10	6.28	Feb 23 1997
INSTANTANEOUS LOW FLOW			117	Aug 9	105	Jul 19 1998
ANNUAL RUNOFF (CFSM)	.79		.88		.86	
ANNUAL RUNOFF (INCHES)	10.71		11.94		11.63	
10 PERCENT EXCEEDS	376		446		466	
50 PERCENT EXCEEDS	235		265		254	
90 PERCENT EXCEEDS	190		156		177	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121944 LITTLE MUSKEGON RIVER NEAR OAK GROVE, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1995 to current year.
DISSOLVED OXYGEN: October 1995 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.0°C, June 26, 1998, July 6, 1999, July 24, Aug. 7-9, 2001; minimum, -0.5°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum recorded (more than 20 percent missing record), 16.5 mg/L, Dec. 7, 1995; minimum, 5.2 mg/L, Aug. 11, Sept. 2, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 25.0°C, July 24, Aug. 7-9; minimum, 0.0°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum 15.1 mg/L, Mar. 26; minimum, 7.0 mg/L, Aug. 9.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.5	13.0	13.5	10.0	8.5	9.0	4.0	2.5	3.0	.0	.0	.0
2	15.5	14.5	15.0	10.5	9.5	10.0	2.5	1.5	2.0	.0	.0	.0
3	15.0	14.0	14.5	10.0	8.5	9.0	1.5	.5	.5	.0	.0	.0
4	15.0	13.5	14.0	9.0	7.5	8.0	1.5	.5	1.0	.0	.0	.0
5	13.5	12.0	12.5	7.5	6.5	7.0	1.5	.0	.5	.0	.0	.0
6	12.0	10.5	11.5	7.5	6.0	7.0	.0	.0	.0	.0	.0	.0
7	10.5	8.5	9.0	8.5	7.5	8.0	.0	.0	.0	.0	.0	.0
8	8.5	8.0	8.0	9.0	8.0	8.5	.0	.0	.0	.0	.0	.0
9	8.5	7.0	8.0	8.0	7.5	8.0	.0	.0	.0	.0	.0	.0
10	8.5	7.0	8.0	8.0	7.5	7.5	.0	.0	.0	.0	.0	.0
11	9.5	7.5	8.5	7.5	7.0	7.0	.5	.0	.0	.0	.0	.0
12	9.5	8.0	9.0	7.0	6.5	7.0	.0	.0	.0	.5	.0	.5
13	12.0	9.5	11.0	6.5	6.5	6.5	.0	.0	.0	1.0	.5	1.0
14	13.5	12.0	12.5	6.5	5.0	5.5	.0	.0	.0	1.5	1.0	1.5
15	13.0	12.0	12.5	5.0	4.5	5.0	.0	.0	.0	1.5	1.5	1.5
16	12.5	12.0	12.5	4.5	4.5	4.5	.5	.0	.0	1.5	1.5	1.5
17	12.0	11.0	11.5	4.5	4.0	4.5	.5	.0	.5	1.5	1.0	1.5
18	11.5	10.0	11.0	4.0	3.0	3.5	.0	.0	.0	1.5	1.0	1.5
19	11.5	10.0	11.0	3.0	2.5	2.5	.0	.0	.0	1.5	.0	1.0
20	12.5	10.5	11.5	2.5	2.0	2.0	.0	.0	.0	.0	.0	.0
21	12.5	11.5	12.0	2.0	1.5	2.0	.0	.0	.0	.0	.0	.0
22	11.5	10.5	11.0	1.5	1.0	1.0	.0	.0	.0	.0	.0	.0
23	11.5	10.5	11.0	1.0	1.0	1.0	.0	.0	.0	.5	.0	.5
24	13.0	11.5	12.5	2.0	1.0	1.5	.0	.0	.0	1.5	.5	1.0
25	13.0	12.5	12.5	2.5	1.0	1.5	.0	.0	.0	1.0	.5	.5
26	14.0	12.5	13.0	3.5	2.5	3.0	.0	.0	.0	.5	.0	.0
27	14.5	13.5	14.0	4.0	3.5	4.0	.0	.0	.0	.5	.0	.0
28	13.5	10.5	12.0	4.0	4.0	4.0	.0	.0	.0	.5	.0	.0
29	10.5	8.5	9.0	4.0	4.0	4.0	.0	.0	.0	1.5	.5	1.0
30	8.5	7.5	8.0	4.0	3.5	4.0	.0	.0	.0	2.5	1.5	2.0
31	8.5	7.0	8.0	—	—	—	.0	.0	.0	2.0	2.0	2.0
MONTH	15.5	7.0	11.2	10.5	1.0	5.2	4.0	.0	.2	2.5	.0	.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121944 LITTLE MUSKEGON RIVER NEAR OAK GROVE, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	1.5	2.0	1.0	.0	.5	6.5	5.5	6.0	18.0	16.0	17.0
2	1.5	.0	.5	2.0	1.0	1.5	7.0	4.5	5.5	18.5	17.0	18.0
3	.0	.0	.0	3.0	1.0	2.0	8.5	6.0	7.5	19.5	17.0	18.5
4	1.0	.0	.0	3.5	2.0	3.0	9.0	6.5	8.0	19.0	16.0	17.5
5	1.5	1.0	1.5	3.0	1.5	2.0	9.5	7.5	8.5	17.0	15.0	16.0
6	1.5	1.0	1.0	1.5	.5	1.0	11.0	9.0	10.0	16.0	14.5	15.0
7	2.0	1.0	1.5	3.0	1.5	2.0	12.0	10.0	11.0	16.0	14.5	15.0
8	2.0	1.5	1.5	3.0	2.5	3.0	13.0	11.0	12.0	16.5	14.0	15.5
9	2.5	1.0	2.0	3.0	2.0	2.5	12.5	10.5	11.0	17.5	14.5	16.0
10	1.0	.0	.0	3.0	1.0	2.0	11.0	9.0	10.0	18.0	16.5	17.0
11	.0	.0	.0	4.0	3.0	3.5	10.5	9.5	10.0	17.5	15.5	16.5
12	.0	.0	.0	3.5	2.5	3.0	11.0	10.0	10.5	16.0	14.0	15.0
13	1.0	.0	.5	3.0	2.5	3.0	11.5	9.0	10.0	15.5	13.0	14.0
14	1.0	1.0	1.0	3.5	2.0	3.0	11.5	9.0	10.5	14.5	13.0	13.5
15	1.0	.0	.5	4.5	3.5	4.0	11.0	9.5	10.5	14.5	13.0	13.5
16	1.0	.5	1.0	4.5	3.5	4.0	10.5	8.5	9.5	14.5	14.0	14.0
17	.5	.0	.0	4.0	2.5	3.5	9.5	7.0	8.5	16.5	14.0	15.0
18	.0	.0	.0	4.0	2.0	3.5	9.5	7.0	8.5	18.0	16.0	17.0
19	.0	.0	.0	5.0	2.5	4.0	10.5	7.5	9.0	18.5	16.0	17.5
20	1.0	.0	.5	6.5	4.0	5.5	10.5	10.0	10.5	18.5	16.5	17.5
21	.5	.0	.0	7.0	5.0	6.0	12.5	10.0	11.5	18.5	16.5	17.5
22	.0	.0	.0	7.5	5.0	6.5	13.5	11.5	12.5	16.5	15.5	16.0
23	.5	.0	.0	7.5	5.5	6.5	14.5	13.0	13.5	15.5	14.0	15.0
24	.5	.0	.0	7.5	4.0	5.5	13.5	12.0	13.0	15.0	13.0	14.0
25	1.5	.5	1.0	4.0	1.5	3.0	13.0	10.5	12.0	13.0	12.5	12.5
26	1.5	.5	1.0	2.0	.5	1.0	13.5	10.5	12.5	13.0	12.5	12.5
27	1.5	.5	1.0	2.5	1.5	2.0	14.5	12.0	13.5	13.0	13.0	13.0
28	.5	.0	.0	4.0	1.0	2.5	14.5	11.5	13.0	15.0	13.0	13.5
29	—	—	—	4.5	3.5	4.0	15.0	12.5	14.0	15.5	14.5	15.0
30	—	—	—	6.0	4.5	5.0	16.5	13.0	15.0	15.0	13.5	14.5
31	—	—	—	6.5	5.0	6.0	—	—	—	15.0	13.0	14.0
MONTH	2.5	.0	.6	7.5	.0	3.4	16.5	4.5	10.6	19.5	12.5	15.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.5	12.5	13.5	22.0	18.5	20.5	23.5	21.5	22.5	18.0	16.0	17.0
2	12.5	12.0	12.5	18.5	15.5	17.0	22.5	21.5	22.0	17.0	15.0	16.0
3	13.0	12.0	12.5	19.5	17.0	18.0	23.5	20.5	22.0	18.0	16.0	17.0
4	12.5	12.0	12.5	21.5	18.0	19.5	23.5	20.0	21.5	18.5	16.5	17.5
5	12.5	11.5	12.0	20.5	17.5	19.0	23.5	20.0	22.0	18.0	16.0	17.0
6	13.5	12.0	12.5	19.0	15.5	17.5	24.0	20.5	22.5	18.0	15.5	17.0
7	14.5	13.0	14.0	20.0	17.5	18.5	25.0	22.0	23.0	19.0	17.0	18.0
8	16.5	13.5	15.0	22.5	18.5	20.5	25.0	21.5	23.0	20.0	18.5	19.5
9	17.5	15.0	16.5	23.5	20.0	21.5	—	—	—	19.0	18.0	18.5
10	17.5	16.5	17.0	23.5	20.0	21.5	—	—	—	18.5	17.0	18.0
11	19.0	16.5	17.5	21.0	18.5	20.0	—	—	—	17.5	16.0	17.0
12	20.0	18.0	19.0	20.5	17.0	19.0	—	—	—	17.5	16.0	17.0
13	21.5	19.0	20.0	20.5	16.5	18.5	—	—	—	17.5	15.0	16.5
14	22.5	20.5	21.5	20.5	16.5	18.5	19.5	17.0	18.5	15.0	13.0	14.0
15	22.0	20.5	21.5	21.0	17.5	19.0	18.5	16.0	17.5	14.5	13.0	14.0
16	21.0	19.0	20.0	21.5	18.5	20.0	18.0	17.0	17.5	14.5	13.0	13.5
17	21.0	18.5	20.0	20.0	18.5	19.5	18.0	17.0	17.0	14.0	13.0	14.0
18	20.5	19.5	20.0	20.5	18.5	19.5	17.5	16.5	17.0	15.5	14.0	15.0
19	21.5	19.5	20.5	22.5	19.0	20.5	17.5	17.0	17.0	15.5	15.0	15.5
20	20.5	19.5	20.0	22.0	20.0	21.0	18.0	16.5	17.5	15.5	14.5	15.0
21	19.5	17.0	18.0	22.5	20.0	21.0	18.5	16.5	17.5	15.0	14.0	14.5
22	18.5	16.0	17.0	24.0	20.5	22.0	18.0	17.0	17.5	15.0	14.0	14.5
23	19.0	16.5	18.0	23.5	22.0	22.5	19.0	17.5	18.0	14.5	14.0	14.5
24	19.5	17.0	18.5	25.0	21.5	23.0	19.5	18.0	19.0	14.0	12.5	13.0
25	20.0	17.5	19.0	23.0	20.5	21.5	19.5	18.5	19.0	12.5	10.5	11.5
26	21.0	19.0	20.0	21.5	19.0	20.0	20.5	19.0	19.5	10.5	10.0	10.5
27	22.0	19.5	20.5	20.0	17.0	19.0	20.0	19.0	19.5	11.0	10.0	10.5
28	22.5	20.0	21.0	20.0	17.5	19.0	20.0	18.5	19.5	11.5	10.5	11.0
29	23.0	20.0	21.5	21.5	19.0	20.0	19.0	17.5	18.5	11.5	10.0	11.0
30	23.0	20.5	21.5	22.0	19.0	20.5	20.0	18.0	19.0	12.0	10.5	11.5
31	—	—	—	23.5	20.5	22.0	20.0	18.0	19.0	—	—	—
MONTH	23.0	11.5	17.8	25.0	15.5	20.0	—	—	—	20.0	10.0	15.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121944 LITTLE MUSKEGON RIVER NEAR OAK GROVE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.9	9.7	10.3	11.5	9.8	10.4	13.6	12.7	13.1	13.7	13.4	13.6
2	10.6	9.3	9.9	10.7	9.4	9.9	14.1	13.3	13.7	14.0	13.7	13.8
3	10.7	9.1	9.8	11.0	9.3	9.9	14.7	13.8	14.2	13.7	13.5	13.6
4	10.6	8.8	9.5	11.0	9.6	10.1	14.3	13.4	13.9	13.5	13.3	13.4
5	10.8	9.3	9.9	11.4	9.8	10.5	14.5	13.3	13.9	13.4	13.2	13.3
6	11.2	9.7	10.3	11.2	9.8	10.4	13.6	12.2	12.7	13.5	13.2	13.3
7	12.0	10.2	11.0	10.3	9.3	9.6	12.3	11.7	12.0	13.6	13.2	13.4
8	12.2	10.8	11.4	10.8	9.2	9.8	14.4	11.3	12.6	14.2	13.6	14.0
9	12.6	11.1	11.7	9.8	9.4	9.6	14.0	12.7	13.3	14.4	14.1	14.3
10	12.4	11.0	11.5	9.5	9.0	9.2	14.0	13.7	13.8	14.1	13.8	14.0
11	12.3	10.8	11.3	9.6	9.1	9.4	14.1	13.7	13.9	14.0	13.5	13.8
12	12.3	10.6	11.2	9.7	9.2	9.5	14.4	13.7	14.0	13.9	13.5	13.7
13	11.7	9.6	10.6	9.8	9.3	9.5	14.4	14.0	14.2	13.6	13.4	13.5
14	10.7	9.1	9.7	10.3	9.5	10.0	14.3	13.9	14.1	13.6	13.2	13.4
15	10.6	9.0	9.7	10.8	10.0	10.5	14.4	13.9	14.1	13.3	13.1	13.2
16	10.7	9.2	9.7	10.6	10.1	10.4	13.9	13.3	13.6	13.6	13.2	13.4
17	10.6	9.1	9.8	11.3	10.4	10.9	13.7	13.3	13.5	13.5	13.3	13.4
18	10.8	9.2	9.8	11.8	11.1	11.4	14.3	13.1	13.9	13.6	13.2	13.3
19	10.5	9.1	9.6	12.1	11.7	11.9	14.3	13.7	14.0	13.6	13.2	13.4
20	10.9	9.1	9.9	12.2	11.7	11.9	14.3	13.9	14.1	—	—	—
21	10.6	9.2	9.8	12.9	12.0	12.4	14.3	14.0	14.1	—	—	—
22	11.5	10.0	10.6	13.1	12.5	12.8	14.1	14.0	14.1	—	—	—
23	10.9	9.7	10.3	13.1	12.5	12.8	14.2	13.9	14.1	13.7	13.2	13.6
24	10.9	9.3	9.9	13.0	12.4	12.7	14.2	13.7	13.9	13.5	13.2	13.3
25	10.6	9.2	9.7	13.8	12.5	13.2	14.1	13.7	13.9	13.9	13.3	13.6
26	10.8	9.0	9.7	12.8	11.8	12.3	13.9	13.6	13.8	13.8	13.3	13.5
27	10.3	8.7	9.3	12.3	11.7	11.9	13.7	13.4	13.6	13.7	13.2	13.5
28	10.4	8.7	9.5	12.8	11.9	12.3	13.8	13.6	13.7	13.8	13.0	13.5
29	11.2	9.4	10.2	12.7	12.1	12.4	13.6	13.2	13.4	13.5	12.7	13.2
30	11.3	9.8	10.4	13.1	12.3	12.7	13.4	13.2	13.3	12.7	12.0	12.4
31	11.7	10.0	10.6	—	—	—	13.5	13.2	13.4	13.0	12.0	12.4
MONTH	12.6	8.7	10.2	13.8	9.0	11.0	14.7	11.3	13.7	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.3	12.8	13.0	14.6	12.7	13.8	12.3	11.6	12.0	11.1	8.5	9.7
2	14.0	13.1	13.6	14.1	13.5	13.9	13.3	12.0	12.6	10.3	7.9	9.1
3	14.1	13.7	13.9	14.2	13.3	13.8	12.7	11.5	12.1	10.6	7.8	8.8
4	13.9	13.3	13.6	13.8	13.2	13.5	12.6	11.2	11.9	9.4	7.5	8.4
5	13.4	13.1	13.3	14.2	13.3	13.9	12.5	10.9	11.5	10.9	8.3	9.4
6	13.5	13.2	13.3	14.5	14.0	14.2	11.4	10.4	10.9	11.0	8.6	9.6
7	13.9	13.2	13.5	14.4	13.6	14.1	10.9	10.0	10.4	10.4	8.6	9.2
8	13.5	13.1	13.3	14.0	13.4	13.7	10.7	9.7	10.2	11.0	8.7	9.7
9	13.1	12.4	12.7	14.2	13.5	13.9	10.8	9.7	10.3	11.0	8.7	9.6
10	14.0	12.4	13.5	14.5	13.4	14.1	11.6	10.3	10.9	10.6	8.3	9.1
11	—	—	—	13.9	13.2	13.5	11.1	10.3	10.6	9.8	8.1	8.8
12	—	—	—	13.9	13.3	13.5	10.3	10.1	10.2	10.8	8.6	9.5
13	13.8	13.3	13.5	13.5	13.1	13.3	11.5	10.3	10.8	11.3	9.1	10.0
14	13.7	13.5	13.6	14.0	13.2	13.6	11.6	10.4	11.0	10.4	9.3	9.7
15	14.1	13.6	13.9	13.6	12.9	13.2	11.6	10.3	10.9	9.9	8.9	9.4
16	13.9	13.6	13.8	13.5	12.8	13.1	12.0	10.4	11.2	9.3	8.9	9.2
17	14.5	13.2	14.0	14.0	13.0	13.5	12.4	11.1	11.7	9.7	9.2	9.4
18	13.8	13.3	13.5	14.2	13.1	13.7	12.6	11.0	11.7	9.3	8.9	9.1
19	14.1	13.0	13.5	13.9	12.8	13.4	12.3	10.5	11.4	9.5	8.9	9.3
20	14.3	14.0	14.2	13.3	12.2	12.9	10.9	10.0	10.4	9.8	8.7	9.3
21	14.9	13.8	14.4	12.9	11.9	12.4	10.6	9.7	10.2	9.6	8.8	9.2
22	13.9	13.2	13.5	12.9	11.9	12.3	10.9	9.5	10.2	10.1	9.1	9.6
23	14.7	13.1	13.9	12.8	11.7	12.2	10.1	9.5	9.8	10.5	9.4	9.9
24	14.8	14.4	14.6	13.1	11.7	12.5	10.9	9.4	10.0	10.2	9.6	10.0
25	14.4	12.9	13.6	14.3	13.0	13.7	10.8	9.5	10.1	10.5	10.1	10.4
26	13.7	13.0	13.4	15.1	14.1	14.6	11.2	9.6	10.4	10.4	10.1	10.3
27	13.8	13.0	13.4	14.7	13.9	14.3	11.7	9.8	10.6	10.2	10.0	10.1
28	13.8	12.6	13.2	14.3	12.8	13.9	12.1	9.8	10.9	10.2	9.7	10.0
29	—	—	—	13.3	12.3	12.8	12.3	10.0	10.9	9.8	9.6	9.7
30	—	—	—	13.2	12.1	12.7	12.1	9.2	10.6	10.2	9.6	9.9
31	—	—	—	13.0	11.8	12.3	—	—	—	10.4	9.6	10.0
MONTH	—	—	—	15.1	11.7	13.4	13.3	9.2	10.9	11.3	7.5	9.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121944 LITTLE MUSKEGON RIVER NEAR OAK GROVE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	10.0	9.6	9.8	10.1	7.4	8.5	9.5	7.4	8.3	9.6	8.1	8.8
2	10.3	10.0	10.1	11.0	8.1	9.5	8.7	7.4	7.9	9.8	8.5	9.0
3	10.4	10.1	10.3	11.0	8.5	9.4	9.5	7.4	8.2	9.9	8.3	8.9
4	10.4	10.2	10.3	11.0	8.1	9.2	9.6	7.4	8.2	10.0	8.3	8.9
5	10.6	10.2	10.4	11.3	8.1	9.3	9.7	7.4	8.2	10.2	8.7	9.2
6	10.5	10.0	10.2	11.8	8.5	9.8	9.9	7.4	8.3	10.5	8.6	9.3
7	10.3	9.5	10.0	11.7	8.3	9.4	9.6	7.2	8.1	9.7	8.2	8.8
8	10.0	8.8	9.5	11.5	8.0	9.3	9.4	7.1	8.0	9.5	8.0	8.6
9	9.7	8.4	9.0	11.4	7.8	9.1	—	—	—	9.6	8.1	8.6
10	9.1	8.2	8.6	11.0	7.7	8.9	—	—	—	9.1	8.3	8.7
11	9.1	7.9	8.5	11.1	7.9	9.3	—	—	—	9.7	8.7	9.1
12	8.9	7.8	8.2	12.1	8.3	9.7	—	—	—	9.9	8.6	9.1
13	8.7	7.5	8.1	12.2	8.3	9.9	—	—	—	10.0	8.5	9.1
14	8.6	7.2	7.8	12.0	8.4	9.8	10.2	7.8	8.8	10.8	9.1	9.9
15	8.0	7.1	7.5	11.6	8.2	9.5	10.3	8.2	9.0	10.8	9.4	9.9
16	8.5	7.5	8.0	11.1	8.1	9.3	8.7	8.1	8.4	10.8	9.5	9.9
17	8.8	7.6	8.1	10.4	8.0	8.9	9.5	8.3	8.8	10.8	9.4	10.0
18	8.4	7.5	7.9	10.4	8.0	9.0	9.4	8.4	8.7	10.9	9.0	9.8
19	8.8	7.5	8.0	10.6	7.9	8.9	8.5	8.0	8.2	9.5	8.8	9.0
20	9.0	7.4	8.1	10.2	7.6	8.6	8.8	8.2	8.5	9.2	8.8	9.0
21	8.7	7.7	8.2	9.8	7.5	8.3	9.2	8.4	8.7	9.8	9.1	9.4
22	9.4	8.2	8.7	10.3	7.5	8.6	8.9	8.3	8.5	10.2	9.1	9.6
23	9.5	8.1	8.6	9.6	7.4	8.3	9.0	8.3	8.5	9.8	9.2	9.5
24	9.6	8.0	8.7	9.9	7.4	8.2	8.9	8.2	8.5	10.5	9.3	9.9
25	9.7	7.9	8.6	9.8	7.3	8.3	8.7	8.1	8.4	10.6	10.0	10.3
26	9.6	7.8	8.5	10.3	8.0	8.9	9.0	8.1	8.4	11.0	10.4	10.6
27	9.7	7.7	8.5	10.8	8.3	9.2	9.1	8.0	8.4	11.0	10.3	10.6
28	9.7	7.7	8.4	10.7	8.2	9.2	9.0	7.8	8.3	11.1	10.2	10.5
29	9.7	7.6	8.4	10.2	7.9	8.8	9.5	8.0	8.7	11.2	10.0	10.6
30	9.8	7.5	8.3	10.3	7.7	8.7	9.5	8.0	8.6	11.0	9.9	10.3
31	—	—	—	9.7	7.5	8.3	8.7	7.7	8.2	—	—	—
MONTH	10.6	7.1	8.8	12.2	7.3	9.0	—	—	—	11.2	8.0	9.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121970 MUSKEGON RIVER NEAR CROTON, MI

LOCATION.--Lat 43°26'05", long 85°39'55", in SE1/4 NE1/4 sec.18, T.12 N., R.11 W., Newaygo County, Hydrologic Unit 04060102, on right bank 75 ft downstream from Croton Drive, 0.4 mi southwest of Croton.

DRAINAGE AREA.--2,313 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 690 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good. Flow completely regulated by Croton Dam 1,000 ft upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	1160	1690	1670	2130	2380	2340	1820	3750	1380	910	1130
2	996	1160	1620	1730	2110	2410	2300	1760	4030	1260	904	1130
3	996	1170	1490	1740	1810	2350	2170	1740	4140	1190	908	1040
4	1050	1160	1390	1740	1650	2310	2270	1750	4050	1160	905	997
5	1080	1150	1380	1750	1770	2280	2310	1600	3920	1010	881	988
6	1100	1150	1350	1730	2110	2300	2340	1550	3690	935	862	1020
7	1090	1150	1260	1730	2200	2250	2500	1520	3420	962	766	1110
8	1090	1150	1120	1660	2150	2120	2740	1730	3140	965	821	1320
9	1090	1280	1070	1600	2900	2060	3090	2140	3100	985	870	1180
10	1100	1590	1070	1580	3540	2010	3230	2130	2960	985	1010	1540
11	1110	1700	1070	1630	3430	1960	3320	1970	3010	961	1010	1580
12	1120	1720	1170	1700	3050	1960	3900	1950	3050	940	888	1350
13	1120	1820	1200	1730	3000	1980	4250	1760	2840	907	820	1120
14	1130	1840	1210	1710	3090	2000	4550	1690	2510	864	796	997
15	1130	1780	1210	1740	3010	1940	4750	1800	2470	834	825	951
16	1130	1800	1350	1730	2870	1920	4900	4290	2540	821	905	900
17	1140	1850	1520	1730	2700	2220	4720	5370	2460	859	937	998
18	1140	1720	1690	1750	2350	2200	4240	6030	2440	874	923	973
19	1220	1670	1660	1760	2110	2210	3830	5900	2400	872	2170	1260
20	1270	1660	1380	1610	2170	2320	3700	4810	2270	890	2440	1430
21	1200	1670	1220	1380	2100	2430	3650	4410	2150	1020	1870	1380
22	1190	1670	1220	1410	2040	2670	3440	4170	2110	1040	1500	1310
23	1190	1660	1220	1570	2080	2850	3250	3990	1860	1030	1460	1390
24	1180	1580	1220	1650	2070	2890	2910	3950	1750	1010	1430	1570
25	1170	1450	1240	1700	2480	3020	2630	4550	1690	947	1440	1680
26	1170	1410	1230	1700	2890	3020	2520	4770	1500	943	1400	1740
27	1270	1290	1200	1610	2810	2880	2370	5030	1420	901	1310	1370
28	1290	1550	1340	1530	2430	2670	2100	5670	1420	850	1040	1220
29	1250	1740	1440	1510	---	2420	2040	5340	1450	838	977	1220
30	1190	1710	1500	1690	---	2230	2010	4490	1420	910	1070	1460
31	1170	---	1600	2040	---	2190	---	3950	---	931	1110	---
TOTAL	35382	45410	41330	51810	69050	72450	94370	103630	78960	30074	35158	37354
MEAN	1141	1514	1333	1671	2466	2337	3146	3343	2632	970	1134	1245
MAX	1290	1850	1690	2040	3540	3020	4900	6030	4140	1380	2440	1740
MIN	996	1150	1070	1380	1650	1920	2010	1520	1420	821	766	900
CFSM	.49	.65	.58	.72	1.07	1.01	1.36	1.45	1.14	.42	.49	.54
IN.	.57	.73	.66	.83	1.11	1.17	1.52	1.67	1.27	.48	.57	.60

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2001, BY WATER YEAR (WY)

MEAN	1346	1658	1592	2062	2410	2649	2661	2517	1981	1241	1182	1124
MAX	1702	2136	2231	2919	3046	3864	3322	3343	2946	1650	1382	1301
(WY)	1997	1996	1997	1997	1997	1997	1998	2001	1996	1999	1996	1997
MIN	1141	1243	1333	1515	1743	1787	1900	1373	1060	848	836	817
(WY)	2001	2000	2001	2000	2000	1999	2000	1999	1998	1998	1998	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1996 - 2001	
ANNUAL TOTAL	597635		694978			
ANNUAL MEAN	1633		1904		1865	
HIGHEST ANNUAL MEAN					2288	1997
LOWEST ANNUAL MEAN					1550	1999
HIGHEST DAILY MEAN	5760	May 19	6030	May 18	7010	Apr 3 1998
LOWEST DAILY MEAN	929	Jul 24	766	Aug 7	720	Sep 11 1998
ANNUAL SEVEN-DAY MINIMUM	936	Jul 21	859	Aug 3	723	Sep 7 1998
MAXIMUM PEAK FLOW			6390	May 18	7130	Apr 2 1998
MAXIMUM PEAK STAGE			8.49	May 18	9.12	Apr 2 1998
INSTANTANEOUS LOW FLOW			699	Oct 21	684	Jul 6 2000
ANNUAL RUNOFF (CFSM)	.71		.82		.81	
ANNUAL RUNOFF (INCHES)	9.61		11.18		10.95	
10 PERCENT EXCEEDS	2500		3360		3080	
50 PERCENT EXCEEDS	1440		1660		1610	
90 PERCENT EXCEEDS	1080		962		1010	

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121970 MUSKEGON RIVER NEAR CROTON, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1995 to current year.
DISSOLVED OXYGEN: October 1995 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.0°C, Aug. 10, 2001; minimum recorded, 0.5°C, on many days during winter periods, but may have been lower during instrument malfunction Jan. 3-29, Feb. 19, 1996.
DISSOLVED OXYGEN: Maximum, 14.4 mg/L, Mar. 12, 1998; minimum, 3.1 mg/L, Aug. 6, Sept. 3, 7, 2001.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 25.0°C, Aug. 10; minimum, 0.5°C, Feb. 21, 26, 27.
DISSOLVED OXYGEN: Maximum, 13.2 mg/L, Dec. 18, 25; minimum, 3.1 mg/L, Aug. 6, Sept. 3, 7.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	16.0	16.5	13.0	12.5	13.0	6.0	5.5	5.5	1.5	1.0	1.5
2	17.0	16.5	17.0	12.5	12.5	12.5	5.5	4.5	5.0	1.5	1.0	1.5
3	17.5	17.0	17.0	12.5	12.5	12.5	5.5	4.5	4.5	1.5	1.0	1.5
4	17.5	17.0	17.0	12.5	12.0	12.0	5.0	4.0	4.5	1.5	1.0	1.5
5	17.0	16.5	16.5	12.0	12.0	12.0	4.5	3.5	4.0	1.5	1.0	1.5
6	16.5	15.5	16.0	12.0	11.5	11.5	3.5	3.5	3.5	1.5	1.0	1.5
7	15.5	14.5	15.0	11.5	11.5	11.5	3.5	3.0	3.5	1.5	1.0	1.5
8	14.5	14.0	14.5	11.5	11.5	11.5	3.5	2.5	3.0	1.5	1.0	1.5
9	14.5	14.0	14.0	11.5	11.0	11.0	3.0	2.0	2.5	1.5	1.0	1.5
10	14.0	13.5	14.0	11.0	10.5	11.0	3.0	2.0	2.5	1.5	1.0	1.5
11	14.0	13.5	13.5	11.0	10.5	10.5	3.0	1.5	2.0	1.5	1.0	1.5
12	13.5	13.0	13.5	10.5	10.5	10.5	2.0	1.5	1.5	1.5	1.0	1.5
13	14.0	13.5	13.5	10.5	10.0	10.0	2.0	1.5	1.5	1.5	1.0	1.5
14	14.5	13.5	14.0	10.0	9.5	9.5	2.0	1.5	1.5	1.5	1.0	1.5
15	15.0	14.0	14.5	9.5	9.0	9.0	1.5	1.0	1.5	2.0	1.0	1.5
16	15.0	14.5	15.0	9.0	8.5	9.0	2.0	1.5	1.5	2.0	1.0	1.5
17	15.0	14.5	14.5	9.0	8.5	8.5	1.5	1.5	1.5	2.0	1.5	1.5
18	14.5	14.0	14.0	8.5	8.0	8.0	1.5	1.0	1.5	2.0	1.5	1.5
19	14.5	14.0	14.0	8.0	7.0	7.5	1.5	1.5	1.5	2.0	1.5	1.5
20	14.0	13.5	14.0	7.5	7.0	7.0	1.5	1.0	1.5	1.5	1.5	1.5
21	15.0	14.0	14.5	7.0	6.5	6.5	1.5	1.0	1.5	1.5	1.5	1.5
22	14.5	14.0	14.0	6.5	6.0	6.5	2.0	1.0	1.5	1.5	1.5	1.5
23	14.0	14.0	14.0	6.5	5.5	6.0	2.0	1.5	1.5	1.5	1.5	1.5
24	14.5	14.0	14.0	6.0	5.0	5.5	2.0	1.0	1.5	1.5	1.5	1.5
25	14.0	13.5	14.0	6.0	5.0	5.5	1.5	1.0	1.5	1.5	1.0	1.5
26	14.0	13.5	14.0	6.5	5.5	6.0	1.5	1.0	1.5	1.5	1.0	1.5
27	14.5	13.5	14.0	6.5	6.0	6.0	1.5	1.0	1.5	1.5	1.5	1.5
28	14.5	13.5	14.0	6.0	5.5	5.5	1.5	1.0	1.5	1.5	1.5	1.5
29	13.5	13.0	13.5	6.0	5.0	5.5	1.5	1.0	1.5	1.5	1.5	1.5
30	13.0	13.0	13.0	6.5	5.0	6.0	1.5	1.0	1.5	1.5	1.0	1.5
31	13.0	12.5	13.0	---	---	---	1.5	1.0	1.5	1.5	1.5	1.5
MONTH	17.5	12.5	14.5	13.0	5.0	8.9	6.0	1.0	2.3	2.0	1.0	1.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121970 MUSKEGON RIVER NEAR CROTON, MI–Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	1.5	1.5	1.5	1.0	1.0	3.0	3.0	3.0	12.5	10.5	11.5
2	2.0	1.5	1.5	1.5	1.0	1.5	3.5	3.0	3.5	13.0	11.5	12.5
3	2.0	1.5	1.5	1.5	1.0	1.5	4.0	3.5	3.5	14.0	12.0	13.0
4	2.0	1.5	1.5	1.5	1.0	1.5	4.5	4.0	4.0	15.5	14.0	14.5
5	1.5	1.5	1.5	1.5	1.5	1.5	5.5	4.5	4.5	14.5	13.5	14.0
6	1.5	1.0	1.5	2.0	1.5	1.5	5.5	5.5	5.5	14.5	13.5	14.0
7	1.5	1.0	1.5	2.0	1.5	2.0	6.0	5.5	5.5	14.0	12.5	13.5
8	1.5	1.5	1.5	1.5	1.5	1.5	7.0	5.5	6.5	14.0	12.0	13.0
9	1.5	1.5	1.5	1.5	1.5	1.5	7.5	6.5	7.0	14.0	13.0	13.5
10	1.5	1.5	1.5	2.0	1.5	1.5	7.0	6.5	7.0	14.5	13.0	13.5
11	1.5	1.0	1.5	2.0	1.5	1.5	7.0	6.0	6.5	15.5	14.5	15.0
12	1.5	1.0	1.0	2.0	1.5	2.0	7.0	6.0	6.5	15.5	14.5	15.0
13	1.0	1.0	1.0	2.0	1.5	2.0	8.0	7.0	7.5	14.5	13.5	14.0
14	1.0	1.0	1.0	2.0	2.0	2.0	7.5	6.5	7.0	14.0	13.5	14.0
15	1.5	1.0	1.0	2.0	1.5	2.0	7.5	7.0	7.5	—	—	—
16	1.5	1.0	1.0	2.0	1.5	2.0	7.5	6.5	7.0	15.0	14.0	14.5
17	1.5	1.0	1.0	2.0	2.0	2.0	7.5	7.0	7.0	14.5	14.0	14.5
18	1.5	1.0	1.0	2.5	2.0	2.5	7.5	7.0	7.5	15.5	14.5	15.0
19	1.0	1.0	1.0	2.5	2.5	2.5	8.0	7.5	7.5	15.5	15.0	15.0
20	1.0	1.0	1.0	3.0	2.5	2.5	8.5	8.0	8.5	16.0	15.0	15.5
21	1.0	.5	1.0	3.0	2.5	3.0	9.0	8.5	8.5	16.0	15.0	15.5
22	1.0	1.0	1.0	3.5	2.5	3.0	9.5	9.0	9.0	15.5	15.0	15.5
23	1.5	1.0	1.0	3.5	3.0	3.5	10.0	9.0	9.5	15.5	15.0	15.5
24	1.0	1.0	1.0	3.5	3.0	3.0	10.0	9.5	10.0	15.5	15.0	15.0
25	1.0	1.0	1.0	3.5	2.5	3.0	10.0	9.5	10.0	15.0	14.5	15.0
26	1.0	.5	1.0	3.0	2.0	2.5	10.5	9.5	10.0	15.0	14.5	14.5
27	1.0	.5	1.0	2.5	2.0	2.5	11.5	10.5	11.0	15.0	14.5	15.0
28	1.5	1.0	1.0	2.5	2.0	2.5	11.5	10.5	11.0	15.5	14.5	15.0
29	—	—	—	2.5	2.0	2.5	11.5	10.0	10.5	16.5	15.0	15.5
30	—	—	—	3.0	2.5	2.5	11.5	10.5	11.0	17.0	15.5	16.0
31	—	—	—	3.0	2.5	3.0	—	—	—	16.0	15.5	16.0
MONTH	2.0	.5	1.2	3.5	1.0	2.2	11.5	3.0	7.4	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	15.5	16.0	22.0	20.5	21.5	22.5	20.5	21.5	21.5	21.0	21.5
2	15.5	15.0	15.5	21.0	19.5	20.0	22.5	21.0	22.0	21.0	20.5	21.0
3	15.5	15.0	15.5	20.0	19.5	20.0	24.0	22.0	23.0	21.0	20.0	20.5
4	15.5	15.0	15.0	21.5	19.5	20.5	23.0	22.0	22.5	22.0	20.5	21.5
5	15.5	15.0	15.0	22.0	19.5	21.0	23.0	22.0	22.5	21.5	21.0	21.0
6	15.5	15.0	15.0	20.5	19.5	20.0	23.0	21.0	22.0	21.0	20.5	21.0
7	16.0	15.0	15.5	20.5	19.5	20.0	24.0	22.0	23.0	21.0	20.5	20.5
8	17.0	15.0	16.0	21.0	20.5	21.0	23.5	22.0	23.0	21.5	20.0	20.5
9	16.0	15.5	16.0	23.0	20.5	21.5	23.5	21.5	22.5	21.5	21.0	21.0
10	17.0	16.0	16.5	23.0	21.0	22.0	25.0	23.0	24.0	21.0	20.5	20.5
11	17.0	16.0	16.5	22.5	20.5	22.0	23.5	23.0	23.5	21.0	20.5	20.5
12	17.5	16.5	17.0	22.5	20.5	21.5	23.5	22.5	23.0	21.0	20.5	20.5
13	17.5	17.0	17.0	22.5	21.0	21.5	24.0	22.5	23.5	21.0	20.0	20.5
14	18.5	17.0	17.5	22.5	20.0	21.0	23.0	22.0	22.5	20.5	19.5	20.0
15	18.5	17.0	17.5	21.0	20.5	20.5	22.5	22.0	22.0	20.0	19.5	20.0
16	18.5	17.5	18.0	21.5	20.5	21.0	22.0	21.5	22.0	20.0	19.0	19.5
17	20.5	17.5	18.5	22.0	21.0	21.5	21.5	21.0	21.5	19.5	19.0	19.5
18	19.0	17.0	18.5	22.0	21.5	21.5	21.5	21.0	21.5	20.0	19.0	19.5
19	20.0	17.0	18.5	22.0	21.5	21.5	21.5	20.5	21.0	20.0	19.0	19.5
20	19.5	18.5	19.0	23.0	21.5	22.0	21.0	20.5	20.5	19.0	18.5	19.0
21	19.5	18.5	19.0	22.5	21.5	22.0	20.5	20.0	20.0	19.5	18.5	19.0
22	20.0	18.0	19.0	22.0	21.5	22.0	20.5	20.0	20.5	18.5	18.5	18.5
23	19.5	18.0	19.0	22.0	20.5	21.5	21.5	20.5	21.0	18.5	18.5	18.5
24	19.0	18.5	18.5	23.5	21.0	22.5	21.5	21.0	21.5	18.5	17.5	18.0
25	19.5	18.5	19.0	23.0	21.5	22.5	21.0	20.5	21.0	17.5	17.0	17.0
26	20.0	19.5	20.0	23.5	21.5	22.5	22.5	20.5	21.5	17.0	16.5	16.5
27	20.5	19.5	20.0	22.5	21.5	22.0	21.5	20.5	21.0	16.5	16.5	16.5
28	20.5	19.5	20.0	22.0	21.0	21.5	23.0	21.0	21.5	16.5	16.0	16.0
29	21.0	19.5	20.0	22.5	21.5	22.0	21.5	21.0	21.0	17.5	16.0	16.5
30	21.0	19.5	20.5	23.0	21.5	22.0	21.0	20.5	21.0	17.5	16.5	17.0
31	—	—	—	22.5	21.5	22.0	22.0	21.0	21.5	—	—	—
MONTH	21.0	15.0	17.6	23.5	19.5	21.4	25.0	20.0	21.9	22.0	16.0	19.4

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121970 MUSKEGON RIVER NEAR CROTON, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.9	7.1	7.5	9.1	8.7	8.9	12.1	11.6	11.9	11.6	11.2	11.4
2	8.1	7.1	7.7	8.9	8.6	8.8	12.3	11.7	12.0	11.6	11.1	11.4
3	8.2	7.0	7.5	9.1	8.6	8.8	12.4	11.8	12.1	11.5	11.2	11.3
4	8.2	7.3	7.7	9.2	8.7	8.9	12.2	11.4	11.9	11.5	11.2	11.3
5	8.0	7.2	7.5	9.1	8.6	8.8	12.4	11.5	11.9	11.5	11.2	11.3
6	7.7	6.9	7.3	9.0	8.6	8.8	12.4	11.6	11.9	11.6	11.2	11.4
7	7.8	7.1	7.4	9.1	8.8	8.9	12.0	11.4	11.7	11.5	11.0	11.3
8	8.1	7.1	7.5	9.2	8.7	8.9	12.2	11.1	11.5	11.4	11.0	11.2
9	7.8	6.9	7.5	8.9	8.6	8.8	11.8	11.0	11.4	11.3	10.9	11.1
10	8.0	7.1	7.5	9.2	8.9	9.0	11.7	11.0	11.4	11.3	10.9	11.1
11	8.4	7.3	7.6	9.3	8.9	9.1	11.8	11.2	11.6	11.4	10.8	11.1
12	8.0	7.4	7.7	9.2	8.9	9.0	12.5	11.5	12.1	11.3	10.9	11.1
13	8.5	7.6	8.0	9.1	8.8	9.0	12.4	12.1	12.2	11.3	10.9	11.1
14	8.4	7.5	8.0	9.2	8.9	9.0	12.5	12.0	12.2	11.3	10.9	11.1
15	9.4	7.7	8.5	9.3	9.1	9.1	12.4	12.1	12.3	11.2	10.8	11.0
16	9.4	8.5	9.0	9.4	9.1	9.3	12.8	12.0	12.5	11.2	10.8	11.1
17	9.1	8.6	8.8	9.6	9.2	9.4	13.1	12.5	12.8	11.4	10.9	11.1
18	9.4	8.6	9.0	9.6	9.3	9.4	13.2	12.7	13.0	11.3	10.9	11.1
19	9.3	8.5	8.9	9.9	9.4	9.6	12.9	11.7	12.2	11.3	10.9	11.1
20	9.0	8.2	8.7	9.8	9.6	9.7	12.0	11.6	11.8	11.4	10.9	11.2
21	9.0	8.3	8.6	10.2	9.8	10.0	12.0	11.6	11.8	11.5	11.1	11.3
22	9.1	8.4	8.8	10.3	9.8	10.1	11.9	11.5	11.7	11.6	11.2	11.4
23	8.9	8.5	8.7	10.4	10.0	10.2	11.8	11.5	11.7	11.5	11.1	11.3
24	8.9	8.5	8.7	10.7	10.2	10.4	11.9	11.4	11.7	11.6	11.1	11.4
25	8.6	8.4	8.5	10.6	10.1	10.4	13.2	11.4	11.8	11.7	11.0	11.4
26	9.0	8.2	8.6	10.5	10.0	10.2	11.7	11.3	11.5	11.5	10.9	11.2
27	9.2	8.2	8.7	10.7	10.1	10.4	11.8	11.4	11.6	11.5	10.9	11.2
28	9.1	8.7	8.8	11.8	10.7	11.3	11.8	11.4	11.6	11.5	11.0	11.3
29	9.0	8.5	8.7	12.2	11.3	11.7	11.7	11.3	11.5	11.5	11.1	11.3
30	8.9	8.5	8.7	11.9	11.6	11.7	11.7	11.3	11.5	11.5	10.9	11.3
31	9.1	8.7	8.8	—	—	—	11.6	11.2	11.4	11.6	10.9	11.3
MONTH	9.4	6.9	8.2	12.2	8.6	9.6	13.2	11.0	11.9	11.7	10.8	11.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.7	10.9	11.4	11.7	11.2	11.5	11.9	11.7	11.8	10.6	9.1	9.7
2	11.6	10.9	11.3	11.8	11.3	11.5	12.1	11.7	11.9	10.0	9.1	9.5
3	11.6	11.0	11.4	11.8	11.2	11.5	12.1	11.7	11.9	10.0	9.1	9.5
4	11.6	11.0	11.4	11.7	11.2	11.5	12.1	11.7	11.9	10.2	9.2	9.7
5	12.1	11.1	11.5	11.7	11.2	11.4	12.0	11.6	11.8	9.8	8.9	9.4
6	11.6	10.8	11.3	11.6	11.1	11.4	12.1	11.5	11.8	9.4	8.8	9.2
7	11.4	10.6	11.1	11.8	11.3	11.6	12.0	11.5	11.7	9.2	8.6	8.8
8	11.2	10.5	11.0	11.9	11.4	11.7	11.8	11.3	11.6	9.1	8.3	8.7
9	11.4	10.9	11.2	11.8	11.4	11.6	11.8	11.3	11.6	9.1	8.3	8.7
10	11.5	10.9	11.3	11.9	11.3	11.6	11.9	11.3	11.5	8.7	8.3	8.5
11	11.5	11.1	11.3	11.8	11.4	11.6	11.7	11.2	11.5	9.3	8.4	8.8
12	11.6	11.2	11.4	11.7	11.3	11.6	12.0	11.3	11.7	9.4	8.4	8.9
13	11.8	11.3	11.4	11.7	11.4	11.6	11.9	11.4	11.7	8.9	8.2	8.6
14	11.8	11.2	11.5	11.9	11.3	11.6	11.9	10.7	11.4	9.1	8.4	8.8
15	11.5	11.0	11.3	11.8	11.4	11.6	11.4	10.7	11.0	—	—	—
16	11.5	10.8	11.2	11.9	11.5	11.7	12.3	10.8	11.8	9.3	7.8	8.9
17	11.5	10.8	11.1	11.8	11.4	11.6	12.1	11.7	12.0	9.4	9.1	9.3
18	11.4	10.9	11.2	11.8	11.5	11.6	11.9	11.5	11.7	9.5	9.2	9.3
19	11.7	10.9	11.3	11.9	11.5	11.7	11.6	11.1	11.4	9.5	9.2	9.3
20	11.7	10.9	11.4	11.9	11.5	11.7	11.3	11.0	11.2	9.3	8.9	9.1
21	11.9	11.0	11.5	12.0	11.5	11.7	11.3	10.9	11.1	9.0	8.8	8.9
22	11.8	11.0	11.4	11.9	11.5	11.7	11.4	10.8	11.0	9.0	8.6	8.8
23	11.7	10.9	11.3	11.8	11.5	11.6	10.9	10.7	10.8	8.8	8.4	8.6
24	11.7	11.0	11.4	11.7	11.5	11.6	11.1	10.5	10.9	8.6	8.2	8.4
25	12.0	11.2	11.5	11.7	11.4	11.6	11.1	10.6	10.8	8.8	7.9	8.4
26	12.1	11.1	11.6	11.8	11.4	11.6	11.1	9.7	10.6	8.4	8.2	8.3
27	11.9	11.2	11.5	11.7	11.4	11.6	10.9	9.3	10.6	8.4	8.2	8.3
28	11.8	11.2	11.5	11.8	11.4	11.6	11.1	10.4	10.8	8.8	8.4	8.5
29	—	—	—	11.8	11.5	11.6	11.2	9.8	10.6	8.7	8.5	8.6
30	—	—	—	12.0	11.6	11.7	11.1	10.4	10.8	8.7	8.3	8.5
31	—	—	—	12.0	11.6	11.8	—	—	—	8.7	7.1	7.7
MONTH	12.1	10.5	11.3	12.0	11.1	11.6	12.3	9.3	11.4	—	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04121970 MUSKEGON RIVER NEAR CROTON, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.6	6.8	7.2	7.4	5.9	6.8	5.0	3.7	4.3	6.8	5.7	6.4
2	8.3	7.1	7.9	6.6	5.4	6.0	5.2	3.8	4.7	6.4	4.0	5.5
3	8.5	8.0	8.2	5.8	5.0	5.4	6.5	4.3	5.2	5.4	3.1	4.4
4	8.5	7.6	7.9	6.6	5.0	5.8	5.0	4.1	4.6	6.6	5.0	6.0
5	8.1	7.3	7.5	7.0	5.1	6.3	5.0	3.9	4.4	6.8	5.8	6.4
6	7.6	6.6	6.9	6.2	5.1	5.6	4.7	3.1	4.1	6.7	3.6	5.5
7	7.0	6.6	6.8	5.7	4.9	5.3	5.5	4.1	4.9	5.8	3.1	4.3
8	7.3	6.7	6.9	6.1	5.7	5.9	5.1	3.6	4.6	5.4	3.2	4.0
9	7.2	6.4	6.8	6.6	5.3	5.9	5.0	3.2	4.3	6.4	5.4	6.0
10	7.3	6.2	6.6	7.0	5.3	6.1	5.5	4.3	5.0	6.0	4.4	5.4
11	6.8	6.2	6.4	7.1	4.1	6.1	5.1	4.0	4.5	5.9	5.2	5.6
12	7.3	6.3	6.7	7.4	5.0	6.2	5.0	4.0	4.4	5.6	4.5	5.3
13	7.5	6.5	7.0	7.3	5.4	6.4	6.8	4.2	5.6	5.6	5.2	5.4
14	7.9	6.6	7.0	6.3	4.5	5.3	5.7	4.2	4.9	5.8	5.3	5.5
15	7.4	6.5	6.9	5.2	4.4	4.8	4.7	3.7	4.2	6.0	5.5	5.7
16	7.3	6.5	6.8	5.7	4.7	5.2	5.6	3.9	4.6	5.7	5.0	5.5
17	8.5	6.2	7.1	5.8	4.8	5.2	5.0	3.6	4.4	5.4	4.9	5.1
18	7.0	6.2	6.6	5.6	5.1	5.3	5.3	4.2	4.7	5.7	5.3	5.4
19	7.5	5.9	6.6	5.4	4.8	5.1	6.4	5.3	5.9	6.0	5.3	5.7
20	7.3	6.4	6.8	5.8	4.5	4.9	5.7	5.4	5.6	5.6	5.3	5.4
21	7.4	6.2	6.9	5.1	4.2	4.6	5.5	4.7	5.1	5.4	5.2	5.3
22	7.4	6.0	6.7	5.1	4.4	4.8	5.9	5.0	5.5	5.4	5.0	5.2
23	7.2	6.0	6.5	5.1	4.0	4.6	6.2	5.5	5.9	5.3	5.0	5.1
24	7.0	6.1	6.4	5.2	4.2	4.8	6.5	5.5	6.2	5.8	5.3	5.6
25	7.3	6.2	6.6	5.3	4.2	4.8	6.7	4.3	5.7	5.9	5.7	5.8
26	7.2	6.2	6.8	5.8	4.3	5.1	6.7	4.4	5.7	6.1	5.8	5.9
27	7.5	6.3	6.9	5.1	4.3	4.7	6.0	3.9	5.2	6.0	5.7	5.9
28	7.5	6.3	6.8	4.8	3.8	4.4	7.0	5.0	6.2	6.0	5.8	5.9
29	7.4	5.9	6.5	5.2	4.0	4.6	6.4	4.8	5.7	6.3	5.9	6.1
30	6.8	5.6	6.2	5.2	4.0	4.7	5.5	3.3	4.3	6.7	6.1	6.4
31	—	—	—	5.2	3.9	4.6	7.0	4.6	5.9	—	—	—
MONTH	8.5	5.6	6.9	7.4	3.8	5.3	7.0	3.1	5.0	6.8	3.1	5.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04122100 BEAR CREEK NEAR MUSKEGON, MI

LOCATION.--Lat 43°17'19", long 86°13'22", in SW1/4 NW1/4 sec.4, T.10 N., R.16 W., Muskegon County, Hydrologic Unit 04060102, on left bank at upstream side of bridge on North Getty Street, 1.5 mi upstream from Little Bear Creek, and 3.9 mi northeast of Muskegon.

DRAINAGE AREA.--16.7 mi^2.

PERIOD OF RECORD.--October 1965 to current year.

REVISED RECORDS.--WDR MI-80-1: 1976(M), 1978(M), 1979(P). WDR MI-97-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 590.00 ft above sea level (Michigan Department of Natural Resources bench mark). Prior to Mar. 17, 1978, at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some regulation during low flow by dams and irrigation upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	6.4	12	e10	22	24	16	15	29	7.0	3.1	5.5
2	4.8	6.2	11	e10	e19	23	15	15	38	6.7	3.7	5.1
3	5.0	5.9	10	e10	e17	23	14	14	32	7.5	3.3	4.8
4	5.7	5.9	10	e10	16	24	13	13	25	7.2	3.2	4.5
5	5.3	5.7	e10	e10	16	22	13	13	23	6.4	2.4	3.9
6	6.9	5.7	e10	10	16	20	29	12	23	5.9	2.9	3.9
7	6.0	7.7	e10	10	15	20	30	13	21	6.1	2.3	6.3
8	5.9	6.7	10	e10	19	21	24	15	19	5.8	2.9	5.0
9	5.7	13	9.7	e10	e70	20	24	13	17	5.6	2.3	5.2
10	5.2	14	9.8	e9.5	e80	18	23	12	16	4.9	3.4	5.8
11	5.0	9.3	10	9.6	e55	20	28	16	18	5.1	2.4	4.6
12	5.0	8.3	e10	9.4	39	20	165	14	23	4.8	3.0	4.1
13	5.1	13	e10	e9.2	e31	25	68	12	19	4.2	3.5	4.1
14	5.5	13	e10	e9.8	e28	22	40	14	15	4.6	2.8	3.8
15	5.6	12	e10	e11	e24	22	33	101	14	4.1	2.9	4.0
16	5.6	15	10	e12	e23	22	29	97	14	4.1	5.5	3.5
17	5.6	20	12	e13	e22	20	26	59	13	4.4	5.0	3.5
18	5.8	14	e10	e13	e21	18	24	37	14	5.3	4.3	3.9
19	6.2	13	e10	e12	e20	17	23	28	13	4.7	8.7	5.7
20	6.4	13	e10	e11	e20	17	27	23	12	3.9	5.5	5.6
21	6.5	13	e10	e10	e20	17	34	33	11	7.3	4.2	4.9
22	6.4	12	e11	10	e20	16	31	59	12	5.5	8.1	4.5
23	6.9	11	e11	9.7	e20	16	27	34	11	5.4	6.2	8.7
24	8.4	11	e11	9.5	20	15	25	35	10	5.0	5.3	7.7
25	7.5	11	e11	9.1	e36	15	22	39	9.5	4.6	6.2	5.5
26	7.1	16	e11	8.9	e33	15	20	49	8.9	5.0	5.9	5.1
27	7.7	17	e11	8.8	30	15	19	48	8.1	4.3	5.0	5.3
28	7.1	14	e10	8.6	27	16	18	57	7.9	3.9	4.5	5.1
29	6.7	14	e10	8.7	—	16	17	35	7.2	3.9	3.8	4.9
30	6.4	13	e10	22	—	15	16	26	7.4	3.6	4.1	4.7
31	6.5	—	e10	26	—	14	—	23	—	3.6	8.0	—
TOTAL	188.4	339.8	320.5	340.8	779	588	893	974	491.0	160.4	134.4	149.2
MEAN	6.08	11.3	10.3	11.0	27.8	19.0	29.8	31.4	16.4	5.17	4.34	4.97
MAX	8.4	20	12	26	80	25	165	101	38	7.5	8.7	8.7
MIN	4.8	5.7	9.7	8.6	15	14	13	12	7.2	3.6	2.3	3.5
CFSM	.36	.68	.62	.66	1.67	1.14	1.78	1.88	.98	.31	.26	.30
IN.	.42	.76	.71	.76	1.74	1.31	1.99	2.17	1.09	.36	.30	.33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2001, BY WATER YEAR (WY)

MEAN	13.0	17.7	19.5	18.1	20.8	29.3	27.5	19.0	12.1	6.93	7.91	8.43
MAX	45.2	55.2	40.5	31.3	47.8	87.9	50.6	45.2	23.6	17.6	30.2	43.0
(WY)	1987	1986	1992	1986	1976	1976	1982	1974	1993	1994	1980	1986
MIN	3.48	4.54	4.98	6.15	7.43	10.2	14.5	6.84	4.32	3.17	2.29	3.09
(WY)	1972	1972	1977	1977	1977	1999	1968	1977	1977	1971	1971	1971

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1966 - 2001	
ANNUAL TOTAL	4168.4		5358.5			
ANNUAL MEAN	11.4		14.7		16.7	
HIGHEST ANNUAL MEAN					27.4	1976
LOWEST ANNUAL MEAN					8.36	1977
HIGHEST DAILY MEAN	99	Apr 21	165	Apr 12	720	Mar 5 1976
LOWEST DAILY MEAN	2.8	Sep 7	2.3	Aug 7	1.6	(a)
ANNUAL SEVEN-DAY MINIMUM	3.4	Sep 3	2.7	Aug 5	2.0	Aug 4 1971
MAXIMUM PEAK FLOW			(b)244	Apr 12	(c)930	Mar 5 1976
MAXIMUM PEAK STAGE			(d)15.55	Feb 9	(d)16.61	Feb 20 1994
INSTANTANEOUS LOW FLOW			1.8	Aug 9	1.0	(f)
ANNUAL RUNOFF (CFSM)	.68		.88		1.00	
ANNUAL RUNOFF (INCHES)	9.29		11.94		13.56	
10 PERCENT EXCEEDS	20		27		31	
50 PERCENT EXCEEDS	9.4		10		12	
90 PERCENT EXCEEDS	4.9		4.3		4.5	

(a) Aug. 5, 1971, Aug. 2, 1998.
(b) Gage height 15.00 ft.
(c) Gage height 11.00 ft, datum then in use.
(d) Backwater from ice.
(e) Estimated.
(f) Aug. 5, 17, 22, 1971.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04122200 WHITE RIVER NEAR WHITEHALL, MI

LOCATION.--Lat 43°27'51", long 86°13'57", in SE1/4 NW1/4 sec.4, T.12 N., R.16 W., Muskegon County, Hydrologic Unit 04060101, on right bank 30 ft downstream from bridge on Fruitvale Road, 6.3 mi downstream from North Branch, and 6.9 mi northeast of Whitehall.

DRAINAGE AREA.--406 mi^2.

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

REVISED RECORDS.--WDR MI-83-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 594.10 ft above sea level. Nov. 18, 1957 to Oct. 22, 1958, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	273	278	454	e375	526	612	484	421	851	315	242	341
2	267	278	418	e375	489	551	500	413	799	316	237	317
3	266	275	389	e375	449	514	499	403	814	315	234	291
4	272	276	372	e375	473	514	489	382	820	313	232	277
5	273	272	365	e375	437	526	470	390	769	305	225	269
6	284	270	346	e375	402	513	474	383	709	299	221	263
7	291	283	343	e375	389	485	526	380	633	295	218	291
8	316	300	e340	e375	397	470	579	403	579	295	215	313
9	328	327	e340	e375	588	470	604	433	543	290	214	294
10	308	433	e340	e375	1060	460	599	432	511	283	241	293
11	296	503	e345	e375	1660	457	596	420	498	273	265	292
12	287	436	e345	e370	1270	472	689	416	513	269	255	299
13	281	409	e345	e370	1080	494	1390	396	513	266	259	279
14	277	439	e345	e370	910	521	1240	387	492	261	243	267
15	276	451	e345	e375	760	518	943	694	462	258	236	260
16	274	450	e345	e380	635	548	831	1830	445	255	253	255
17	271	505	e350	e380	574	586	718	2150	442	254	285	252
18	271	545	e350	e380	489	577	616	1610	449	261	276	253
19	267	482	e345	e375	524	551	563	1110	447	264	382	281
20	265	450	e345	e355	567	544	542	915	424	261	519	352
21	264	439	e345	e350	534	548	570	762	405	264	461	359
22	261	423	e345	e340	421	556	620	722	402	345	370	331
23	262	410	e350	e340	493	551	628	820	395	308	356	334
24	277	396	e350	e340	543	533	586	762	380	287	332	440
25	285	391	e350	e340	574	511	555	749	364	279	320	483
26	282	405	e355	e340	694	479	521	905	351	274	323	424
27	293	485	e355	e335	818	460	494	978	341	261	328	381
28	305	548	e355	e335	725	450	470	1070	332	253	310	355
29	296	524	e355	353	---	459	448	1300	324	251	287	340
30	290	488	e360	392	---	478	433	1090	318	250	278	324
31	282	---	e370	497	---	484	---	933	---	244	324	---
TOTAL	8740	12171	11057	11442	18481	15892	18677	24059	15325	8664	8941	9510
MEAN	282	406	357	369	660	513	623	776	511	279	288	317
MAX	328	548	454	497	1660	612	1390	2150	851	345	519	483
MIN	261	270	340	335	389	450	433	380	318	244	214	252
CFSM	.69	1.00	.88	.91	1.63	1.26	1.53	1.91	1.26	.69	.71	.78
IN.	.80	1.12	1.01	1.05	1.69	1.46	1.71	2.20	1.40	.79	.82	.87

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2001, BY WATER YEAR (WY)

MEAN	377	454	473	450	468	633	657	500	409	309	301	344
MAX	912	906	896	641	760	1449	1224	936	747	523	484	1071
(WY)	1987	1986	1992	1973	1985	1976	1967	1974	1989	1982	1982	1986
MIN	226	263	286	252	240	380	315	259	230	202	186	212
(WY)	1972	2000	1959	1959	1959	2000	1958	1958	1958	1964	1958	1957

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1957 - 2001	
ANNUAL TOTAL	124806		162959			
ANNUAL MEAN	341		446		448	
HIGHEST ANNUAL MEAN					635	1976
LOWEST ANNUAL MEAN					288	1958
HIGHEST DAILY MEAN	946	May 21	2150	May 17	4650	Sep 1 1975
LOWEST DAILY MEAN	198	Jul 26	214	Aug 9	164	Aug 18 1958
ANNUAL SEVEN-DAY MINIMUM	207	Jul 21	223	Aug 3	169	Aug 14 1958
MAXIMUM PEAK FLOW			2230	May 17	5400	Sep 1 1975
MAXIMUM PEAK STAGE			5.92	May 17	7.46	Sep 1 1975
INSTANTANEOUS LOW FLOW			212	(a)	163	(b)
ANNUAL RUNOFF (CFSM)	.84		1.10		1.10	
ANNUAL RUNOFF (INCHES)	11.44		14.93		14.99	
10 PERCENT EXCEEDS	473		694		696	
50 PERCENT EXCEEDS	320		375		391	
90 PERCENT EXCEEDS	243		265		251	

(a) Aug. 8, 9.
(b) Aug. 18, 19, 1958.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04122500 PERE MARQUETTE RIVER AT SCOTTVILLE, MI

LOCATION.--Lat 43°56'42", long 86°16'43", in NW1/4 NW1/4 sec.19, T.18 N., R.16 W., Mason County, Hydrologic Unit 04060101, on right bank 20 ft upstream from bridge on South Main Street at south edge of Scottville, 1.4 mi upstream from India Creek, and 5.6 mi downstream from Big South Branch.

DRAINAGE AREA.--681 mi^2.

PERIOD OF RECORD.--August 1939 to current year. Prior to October 1942, published as "at Custer".

REVISED RECORDS.--WSP 1437: 1941(M), 1943(M), 1949(M), 1950. WDR MI-81-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 597.66 ft above sea level. Prior to June 12, 1943, nonrecording gage at bridge 4.5 mi upstream at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	464	470	899	e700	836	1000	870	782	1690	591	434	546
2	453	467	845	e700	837	965	894	768	1490	586	424	542
3	444	462	782	e700	786	899	919	757	1420	583	423	510
4	441	458	722	e700	723	870	913	743	1420	588	418	487
5	438	457	673	e700	719	864	898	729	1410	587	406	483
6	455	453	661	e700	723	862	885	716	1330	565	396	475
7	474	464	e660	e700	694	829	1030	708	1210	547	390	475
8	517	481	e660	e650	694	796	1120	713	1100	546	384	476
9	544	562	e660	e600	974	786	1180	756	1010	536	388	493
10	548	673	e660	e600	1240	777	1290	818	941	523	439	495
11	525	746	e660	e650	1540	767	1280	793	898	513	470	488
12	505	790	e660	e700	1700	773	1410	747	868	504	448	482
13	487	768	e660	e700	1690	805	1440	741	864	493	437	465
14	476	749	e660	e700	1580	831	1800	718	874	485	422	453
15	471	770	e660	736	1400	878	2170	834	844	480	412	446
16	471	789	e660	786	1250	953	1910	1140	808	473	429	443
17	472	796	e660	803	1140	1010	1570	1380	807	468	459	441
18	471	800	660	788	1060	1050	1380	1620	808	472	492	446
19	471	806	675	760	e950	1050	1260	1830	787	476	640	504
20	464	792	686	729	e900	1040	1150	1680	761	469	710	573
21	457	774	e680	e700	855	1060	1090	1420	732	477	742	595
22	454	749	e670	e650	861	1090	1060	1250	714	486	644	595
23	454	722	e660	e650	849	1110	1060	1170	711	480	596	608
24	466	702	e650	e650	884	1110	1050	1210	691	474	608	663
25	507	685	e650	642	890	1080	1020	1370	665	481	558	690
26	534	723	e650	601	966	1020	994	1570	647	471	562	694
27	514	811	e650	606	1100	914	937	1700	627	460	590	643
28	499	894	e650	610	1100	841	883	1810	610	448	551	611
29	495	944	e650	603	---	823	839	1870	596	444	506	579
30	487	939	e650	656	---	830	806	1930	585	445	486	551
31	480	---	e650	748	---	848	---	1910	---	440	514	---
TOTAL	14938	20696	21073	21218	28941	28531	35108	36183	27918	15591	15378	15952
MEAN	482	690	680	684	1034	920	1170	1167	931	503	496	532
MAX	548	944	899	803	1700	1110	2170	1930	1690	591	742	694
MIN	438	453	650	600	694	767	806	708	585	440	384	441
CFSM	.71	1.01	1.00	1.01	1.52	1.35	1.72	1.71	1.37	.74	.73	.78
IN.	.82	1.13	1.15	1.16	1.58	1.56	1.92	1.98	1.53	.85	.84	.87

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2001, BY WATER YEAR (WY)

MEAN	600	706	730	706	727	970	1033	791	678	532	495	547
MAX	1507	1523	1311	1129	1301	1779	1732	1167	1296	1232	826	1880
(WY)	1987	1986	1992	1985	1984	1976	1993	2001	1993	1969	1994	1986
MIN	379	439	449	427	440	526	550	425	408	368	354	369
(WY)	1957	1945	1945	1945	1958	1940	1945	1958	1964	1963	1941	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1939 - 2001	
ANNUAL TOTAL	222407		281527			
ANNUAL MEAN	608		771		709	
HIGHEST ANNUAL MEAN					1087	1986
LOWEST ANNUAL MEAN					472	1958
HIGHEST DAILY MEAN	1600	May 22	2170	Apr 15	6020	Sep 13 1986
LOWEST DAILY MEAN	388	Jul 26	384	Aug 8	310	Aug 9 1941
ANNUAL SEVEN-DAY MINIMUM	401	Jul 20	401	Aug 3	322	Aug 5 1941
MAXIMUM PEAK FLOW			2210	Apr 15	6440	Sep 13 1986
MAXIMUM PEAK STAGE			4.96	Apr 15	8.07	Sep 13 1986
INSTANTANEOUS LOW FLOW			380	Aug 9	209	Dec 11 1962
ANNUAL RUNOFF (CFSM)	.89		1.13		1.04	
ANNUAL RUNOFF (INCHES)	12.15		15.38		14.15	
10 PERCENT EXCEEDS	812		1220		1070	
50 PERCENT EXCEEDS	550		700		630	
90 PERCENT EXCEEDS	437		460		428	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

444351084561801 BEAR LAKE NEAR KALKASKA, MI

LOCATION.--Lat 44°43'22", long 84°56'51", in NW1/4 SE1/4 sec. 17, T.27 N., R.5 W., Kalkaska County, Hydrologic Unit 04060103, on south shore of Bear Lake, 11.7 mi east of Kalkaska.

DRAINAGE AREA.--Not determined.

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

GAGE.--Nonrecording gage. Elevation of gage is 1,180 ft above sea level, from topographic map. August 1994 to Sept. 30, 1997, at datum 3.00 ft lower. Oct. 1, 1997 to Sept. 30, 1999, at datum 2.00 ft lower. Prior to June 19, 2000 at site on east shore.

REMARKS.--Staff gage read by observer. No inlets or outlets.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 4.68 ft, Aug. 26, 28, 1994, present datum; minimum observed, 0.96 ft, Nov. 12, 2000.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 2.16 ft, June 18-20; minimum observed, 0.96 ft, Nov. 12.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.14	.98	1.14	—	—	1.58	—	1.56	2.04	2.10	1.83	1.66
2	1.14	.98	1.16	—	—	1.60	1.44	1.58	2.06	2.10	1.82	1.66
3	1.12	.98	1.16	—	1.52	—	1.46	1.60	2.08	2.08	1.82	1.66
4	1.12	.98	1.16	—	—	1.60	1.46	1.62	2.08	2.08	1.82	1.66
5	1.14	1.00	1.18	—	—	—	1.48	1.66	2.08	2.08	1.80	1.66
6	1.12	1.00	1.18	1.28	—	—	1.50	1.66	2.08	2.06	1.80	1.66
7	1.12	.98	1.18	—	—	—	1.50	1.66	2.08	2.06	1.79	1.66
8	1.16	.98	1.18	—	—	—	—	1.70	2.08	2.04	1.78	1.66
9	1.14	.98	—	—	—	—	1.50	1.70	2.08	2.02	1.76	1.66
10	1.12	.98	—	—	1.55	1.60	—	1.70	2.10	2.00	1.76	1.66
11	1.12	.98	—	—	—	—	1.52	1.70	2.10	1.98	1.76	1.65
12	1.10	.96	1.25	—	—	—	—	1.70	2.12	1.96	1.74	1.64
13	1.10	.98	—	1.32	—	—	—	1.70	2.12	1.96	—	1.64
14	1.08	.98	—	—	—	—	—	1.76	2.12	1.94	1.74	1.65
15	1.08	.98	—	—	—	1.60	—	1.86	2.14	1.92	1.74	1.63
16	1.08	—	—	—	—	—	—	1.88	—	1.92	1.72	1.62
17	1.06	—	—	—	1.60	1.58	—	1.90	2.14	1.92	1.72	1.62
18	1.04	.98	—	—	—	—	—	1.90	2.16	1.90	1.72	1.64
19	1.04	.98	—	—	—	1.56	—	1.88	2.16	1.90	1.72	1.66
20	1.02	.98	—	1.40	—	—	—	1.88	2.16	1.90	1.72	1.68
21	1.02	1.00	—	—	1.60	—	—	1.90	2.14	1.88	1.70	1.70
22	1.02	1.00	1.38	—	—	—	—	1.90	2.14	1.88	—	1.70
23	1.02	1.00	—	—	—	1.52	—	—	2.14	1.88	1.72	1.74
24	1.02	1.04	—	—	1.60	—	—	1.94	2.12	1.86	1.70	1.76
25	1.02	1.06	—	—	—	—	1.46	—	2.12	1.86	—	1.76
26	1.00	1.08	—	—	1.60	—	—	1.98	2.12	1.85	1.70	—
27	1.00	1.08	1.28	1.45	—	—	1.53	1.98	2.12	1.85	1.68	—
28	1.00	1.10	—	—	—	1.50	1.54	2.00	2.10	1.84	1.68	1.74
29	.98	1.12	—	—	—	—	1.54	2.00	2.10	1.84	—	1.74
30	.98	1.14	—	—	—	—	1.52	2.00	2.10	1.84	1.68	1.74
31	.98	—	—	—	—	1.46	—	—	—	1.84	1.66	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124000 MANISTEE RIVER NEAR SHERMAN, MI

LOCATION.--Lat 44°26'11", long 85°41'55", in NE1/4 NE1/4 sec.36, T.24 N., R.12 W., Wexford County, Hydrologic Unit 04060103, on right bank 50 ft downstream from bridge on State Highway 37, 200 ft upstream from Wheeler Creek, 0.9 mi north of Sherman, and at mile 60.8.

DRAINAGE AREA.--857 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1903 to May 1916, October 1930 to September 1931, October 1933 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1004: 1936(M). WSP 1307: 1911, 1913-14(M), 1934(M), 1936(M), 1937, 1939-40(M). WSP 1437: 1911, 1913(M), 1937. WDR MI-88-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 804.24 ft above sea level. Prior to Apr. 13, 1934, at various datums. Apr. 14, 1934 to Oct. 25, 1990, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	710	732	977	e900	943	908	1060	1070	1190	863	750	759
2	710	733	944	e900	923	903	1120	1050	1330	852	744	742
3	707	735	907	e900	892	893	1160	1050	1440	847	738	740
4	706	733	871	e900	881	884	1200	1050	1530	842	723	745
5	706	730	885	e900	884	883	1280	1030	1510	836	714	740
6	747	733	860	e900	877	876	1450	1020	1410	822	710	733
7	800	738	e860	e880	864	856	1720	1040	1270	811	709	735
8	833	745	e860	e840	873	855	2010	1070	1170	807	702	735
9	839	812	e860	771	995	850	2120	1040	1110	805	697	748
10	837	972	e860	800	1160	842	2200	1040	1080	798	702	788
11	809	1000	e860	e900	e1000	848	2160	1060	1080	791	713	787
12	784	979	e860	e900	e1000	846	2350	1160	1100	784	709	776
13	767	960	e860	e920	1050	852	2610	1330	1090	779	701	763
14	767	968	e860	e910	1020	851	2660	1330	1050	774	690	746
15	770	984	e860	907	979	857	2680	1240	1030	767	687	734
16	766	986	e860	902	946	878	2350	1970	1050	770	699	728
17	760	981	e860	891	921	889	1940	2400	1060	770	722	725
18	753	949	e860	883	840	880	1690	2140	1070	770	757	735
19	748	928	e860	873	e820	883	1540	1870	1070	766	798	793
20	745	923	e850	789	e900	907	1430	1530	1040	768	807	910
21	738	917	e830	794	893	969	1370	1290	1010	839	785	953
22	734	905	e800	e850	797	1050	1330	1300	989	859	771	902
23	730	884	e780	e900	e700	1120	1290	1320	991	803	760	912
24	733	884	e750	900	e900	1160	1280	1290	976	796	741	991
25	736	885	e720	857	e1000	1120	1240	1360	948	778	737	970
26	742	896	e700	834	1010	1030	1200	1460	932	767	817	958
27	749	945	e700	831	982	981	1170	1620	913	755	865	980
28	744	989	e700	809	937	962	1140	1650	898	750	824	933
29	734	1010	e700	830	---	953	1120	1470	884	747	791	883
30	732	1000	e800	878	---	970	1090	1300	875	744	768	848
31	731	---	e900	938	---	1010	---	1180	---	752	771	---
TOTAL	23367	26636	25854	26987	25987	28766	48960	41730	33096	24612	23102	24493
MEAN	754	888	834	871	928	928	1632	1346	1103	794	745	816
MAX	839	1010	977	938	1160	1160	2680	2400	1530	863	865	991
MIN	706	730	700	771	700	842	1060	1020	875	744	687	725
CFSM	.88	1.04	.97	1.02	1.08	1.08	1.90	1.57	1.29	.93	.87	.95
IN.	1.01	1.16	1.12	1.17	1.13	1.25	2.13	1.81	1.44	1.07	1.00	1.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1903 - 2001, BY WATER YEAR (WY)

MEAN	973	1050	1034	999	986	1198	1531	1204	1054	937	883	912
MAX	1803	1597	1417	1224	1458	1811	2198	1742	1603	1336	1200	1610
(WY)	1987	1989	1912	1916	1938	1913	1916	1904	1954	1994	1903	1986
MIN	754	780	834	754	604	808	943	834	802	740	722	717
(WY)	2001	1982	2001	1936	1936	1940	2000	1958	1958	1936	1964	1966

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1903 - 2001	
ANNUAL TOTAL	322194		353590			
ANNUAL MEAN	880		969		(a)1062	
HIGHEST ANNUAL MEAN					1261	1912
LOWEST ANNUAL MEAN					888	1958
HIGHEST DAILY MEAN	1760	Feb 28	2680	Apr 15	3500	Mar 25 1913
LOWEST DAILY MEAN	674	Aug 21	687	Aug 15	540	Feb 21 1936
ANNUAL SEVEN-DAY MINIMUM	680	Aug 19	700	Aug 9	549	Feb 19 1936
MAXIMUM PEAK FLOW			2720	Apr 15	(b)3570	Mar 25 1913
MAXIMUM PEAK STAGE			15.30	Apr 15	(c)15.30	Apr 15 2001
ANNUAL RUNOFF (CFSM)	1.03		1.13		1.24	
ANNUAL RUNOFF (INCHES)	13.99		15.35		16.84	
10 PERCENT EXCEEDS	1080		1300		1420	
50 PERCENT EXCEEDS	845		881		980	
90 PERCENT EXCEEDS	710		733		820	

(a) Does not include water years 1931, 1934.
(b) Gage height 7.1 ft, from graph based on gage readings, datum then in use.
(c) Does not include water years 1903-1990.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124000 MANISTEE RIVER NEAR SHERMAN, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1996 to current year.
DISSOLVED OXYGEN: October 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 24.5°C, Aug. 7, 8, 2001; minimum, -0.5°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 15.4 mg/L, Mar. 1, 2001; minimum, 5.4 mg/L, Oct. 30, 1996.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 24.5°C, Aug. 7, 8; minimum, -0.5°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 15.4 mg/L, Mar. 1; minimum, 6.9 mg/L, Aug. 9.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.5	11.5	12.5	8.0	6.5	7.0	3.5	2.5	3.0	.0	-.5	-.5
2	14.5	13.0	13.5	8.5	7.5	8.0	2.5	2.0	2.5	.0	-.5	-.5
3	14.0	13.0	13.5	8.0	7.5	7.5	2.0	.5	1.0	.0	-.5	-.5
4	13.5	12.0	13.0	8.0	7.0	7.5	1.0	.5	.5	.0	-.5	-.5
5	12.0	10.5	11.0	7.0	5.5	6.5	1.0	-.5	.0	.0	-.5	.0
6	10.5	9.5	10.0	7.0	5.5	6.0	-.5	-.5	-.5	.0	-.5	-.5
7	9.5	8.0	8.5	7.0	6.5	7.0	.0	-.5	-.5	.0	-.5	.0
8	8.0	7.0	7.5	7.5	7.0	7.0	.0	-.5	-.5	.0	-.5	-.5
9	7.5	6.0	7.0	7.0	6.5	7.0	.0	-.5	.0	.0	-.5	-.5
10	8.0	6.0	7.0	7.0	6.5	7.0	.0	.0	.0	.0	-.5	-.5
11	8.5	6.5	7.5	6.5	6.0	6.5	.0	-.5	-.5	.0	-.5	.0
12	9.0	7.0	8.0	6.5	6.0	6.0	-.5	-.5	-.5	.0	-.5	.0
13	11.0	8.5	9.5	6.0	5.5	5.5	-.5	-.5	-.5	.0	.0	.0
14	12.5	10.5	11.5	5.5	4.0	4.5	-.5	-.5	-.5	1.0	.0	.0
15	12.0	11.5	11.5	4.5	4.0	4.0	-.5	-.5	-.5	2.0	1.0	1.5
16	11.5	10.5	11.0	4.0	3.5	4.0	.0	-.5	-.5	2.0	2.0	2.0
17	10.5	10.0	10.5	3.5	3.0	3.5	.0	-.5	.0	2.0	1.5	2.0
18	10.5	9.0	9.5	3.0	2.5	2.5	.0	-.5	-.5	2.0	1.5	1.5
19	10.0	8.5	9.5	2.5	2.0	2.5	.0	-.5	-.5	1.5	.0	1.0
20	11.0	9.0	10.0	2.0	1.5	2.0	.0	-.5	-.5	.0	-.5	-.5
21	11.0	9.5	10.0	1.5	1.0	1.0	.0	-.5	-.5	-.5	-.5	-.5
22	10.0	8.5	9.5	1.0	.5	.5	.0	-.5	-.5	.0	-.5	.0
23	10.0	9.0	9.5	.5	.0	.5	.0	-.5	-.5	.0	.0	.0
24	11.0	10.0	10.5	1.5	.5	1.0	.0	-.5	-.5	.5	.0	.0
25	11.0	10.0	10.5	2.0	.5	1.0	.0	-.5	-.5	.5	.0	.0
26	12.0	10.5	11.0	3.0	2.0	2.5	.0	-.5	-.5	.0	-.5	.0
27	12.0	11.0	12.0	3.5	3.0	3.5	.0	-.5	-.5	.5	.0	.0
28	11.0	9.0	10.0	4.0	3.0	3.5	.0	-.5	-.5	.0	-.5	.0
29	9.0	7.0	8.0	4.0	3.5	3.5	.0	-.5	-.5	1.5	.0	.5
30	7.5	6.0	6.5	3.5	3.5	3.5	.0	-.5	-.5	2.5	1.5	2.0
31	6.5	5.5	6.0	---	---	---	.0	-.5	-.5	2.5	2.0	2.5
MONTH	14.5	5.5	9.9	8.5	.0	4.4	3.5	-.5	-.1	2.5	-.5	.3

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124000 MANISTEE RIVER NEAR SHERMAN, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	2.0	2.5	1.0	-.5	.0	5.5	4.5	5.0	15.5	14.0	14.5
2	2.0	.5	1.0	1.5	.5	1.0	6.0	5.0	5.5	16.5	15.0	15.5
3	.5	.0	.0	3.0	1.0	2.0	6.0	5.0	5.5	16.5	15.0	15.5
4	1.0	-.5	.0	3.0	2.0	2.5	7.0	4.5	5.5	15.0	14.0	14.5
5	1.0	.5	1.0	2.5	1.0	1.5	7.0	5.5	6.0	14.5	13.0	13.5
6	1.5	1.0	1.5	1.0	.5	1.0	7.0	6.5	6.5	14.0	12.5	13.5
7	2.0	1.0	1.5	2.5	1.0	1.5	7.5	6.0	6.5	14.5	12.5	13.5
8	2.0	1.0	1.5	3.0	2.0	2.5	8.0	6.5	7.5	15.5	13.0	14.0
9	2.0	1.0	2.0	3.0	2.0	2.5	7.5	6.5	7.0	16.0	13.0	14.5
10	1.0	.5	.5	3.0	1.0	2.0	8.0	6.5	7.0	17.0	14.5	15.5
11	.5	-.5	.0	3.0	2.0	2.5	8.0	7.0	7.5	17.0	14.0	15.5
12	.5	-.5	.0	2.5	1.5	1.5	8.0	7.5	8.0	14.5	12.5	13.5
13	1.0	.0	.5	2.0	2.0	2.0	9.0	7.5	8.0	13.5	11.5	12.5
14	1.5	1.0	1.5	4.0	2.0	3.0	9.5	7.5	8.5	13.5	11.5	12.5
15	2.0	1.0	1.5	5.5	3.5	4.5	9.5	8.0	8.5	13.0	12.5	12.5
16	1.5	.5	1.0	5.5	3.5	4.5	9.0	8.0	8.5	13.5	13.0	13.0
17	.5	-.5	.0	5.0	3.5	4.0	8.5	7.0	8.0	15.5	13.5	14.5
18	.0	-.5	-.5	5.0	2.5	4.0	8.5	6.5	7.5	16.5	14.5	15.5
19	.0	-.5	.0	5.0	2.5	4.0	9.0	6.5	8.0	17.5	15.0	16.5
20	1.0	.0	.0	6.0	3.5	5.0	9.0	8.5	8.5	18.0	15.5	17.0
21	.0	-.5	.0	6.5	4.5	5.5	11.0	9.0	10.0	17.5	16.5	16.5
22	-.5	-.5	-.5	6.5	4.5	5.5	11.5	10.0	11.0	16.5	15.0	15.5
23	.0	-.5	-.5	6.0	4.5	5.5	13.0	11.5	12.0	15.5	14.0	14.5
24	-.5	-.5	-.5	5.5	4.0	4.5	13.0	11.0	12.0	14.0	13.5	13.5
25	.5	-.5	.5	4.0	2.0	3.0	12.0	10.0	11.5	13.5	12.5	13.0
26	1.5	.0	.5	2.0	.5	1.0	11.5	10.5	11.0	13.5	12.5	13.0
27	1.5	.5	1.0	1.5	.5	1.0	12.0	9.5	11.0	13.5	12.5	13.0
28	.5	-.5	.0	3.0	.5	1.5	12.5	9.5	11.0	15.0	12.0	13.5
29	—	—	—	3.5	2.5	3.0	13.5	10.5	12.0	16.0	13.5	14.5
30	—	—	—	5.0	3.5	4.0	15.0	12.0	13.5	15.5	13.5	14.5
31	—	—	—	6.0	4.5	5.0	—	—	—	15.0	13.0	14.0
MONTH	2.5	-.5	.6	6.5	-.5	2.9	15.0	4.5	8.6	18.0	11.5	14.3

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.5	12.5	13.0	21.0	18.0	19.5	22.5	20.5	21.5	16.5	14.5	15.5
2	12.5	11.5	11.5	18.5	16.0	17.5	22.0	20.5	21.5	16.5	14.0	15.5
3	11.5	11.0	11.0	18.0	16.0	17.0	22.5	19.5	21.0	17.0	15.0	16.0
4	11.0	10.5	10.5	19.5	16.5	18.0	22.5	19.0	21.0	17.0	15.0	16.0
5	11.5	10.5	11.0	19.0	16.5	18.0	22.5	19.5	21.0	17.0	14.0	15.5
6	14.5	11.0	12.5	18.5	15.5	17.0	23.5	20.0	22.0	17.5	14.5	16.0
7	16.0	13.0	14.0	19.0	16.5	18.0	24.5	21.5	23.0	18.5	16.5	17.5
8	17.0	14.0	15.5	21.0	17.5	19.5	24.5	22.0	23.0	19.0	17.5	18.0
9	17.0	15.0	16.0	22.0	18.5	20.5	24.0	22.0	23.0	18.5	17.0	17.5
10	17.0	15.0	16.0	22.0	19.5	20.5	23.0	20.5	21.5	17.5	16.0	16.5
11	18.0	15.0	16.5	20.5	18.0	19.5	21.0	18.5	19.5	17.0	15.0	16.0
12	19.0	16.5	17.5	20.0	17.0	18.5	20.0	17.5	19.0	16.5	15.0	16.0
13	21.0	17.5	19.0	20.0	16.5	18.5	20.0	18.0	19.0	16.0	14.0	14.5
14	22.0	19.0	20.5	19.5	16.5	18.0	19.0	16.5	18.0	14.0	12.0	13.0
15	21.5	20.0	21.0	19.0	17.5	18.5	18.5	16.0	17.5	14.0	12.0	13.0
16	21.0	18.5	20.0	21.0	17.5	19.0	18.0	16.5	17.0	13.5	11.5	12.5
17	20.5	18.0	19.5	20.0	18.0	19.0	16.5	15.5	16.0	13.0	12.0	12.5
18	20.0	18.5	19.0	19.5	18.0	18.5	16.0	14.5	15.5	13.5	12.0	13.0
19	19.5	17.5	18.5	20.5	17.5	19.0	16.0	15.0	15.5	13.5	12.5	13.0
20	20.0	17.5	18.5	20.0	18.5	19.0	17.0	14.5	16.0	13.0	13.0	13.0
21	19.0	17.0	17.5	21.0	18.5	19.5	17.5	15.0	16.5	13.0	12.5	13.0
22	17.0	16.0	16.5	22.0	19.0	20.5	17.0	15.5	16.5	14.0	12.5	13.0
23	18.0	14.5	16.5	22.5	20.5	21.5	18.5	16.0	17.5	13.5	12.5	13.0
24	19.0	15.5	17.0	23.5	21.0	22.0	19.0	17.0	18.0	12.5	11.5	12.0
25	20.0	16.5	18.5	22.5	20.5	21.5	18.5	17.0	17.5	11.5	10.0	10.5
26	21.0	18.0	19.5	21.5	19.0	20.5	19.5	17.0	18.0	10.0	9.0	9.5
27	21.5	18.5	20.0	20.0	17.5	19.0	18.5	17.0	18.0	9.5	9.0	9.0
28	22.0	19.0	20.5	19.0	17.5	18.5	19.0	16.5	18.0	10.5	9.0	10.0
29	22.0	19.5	21.0	20.0	17.5	19.0	18.5	16.0	17.5	11.5	9.0	10.5
30	22.0	20.0	21.0	20.5	18.0	19.0	19.0	16.5	18.0	11.5	10.0	11.0
31	—	—	—	22.0	18.5	20.5	18.0	16.5	17.0	—	—	—
MONTH	22.0	10.5	17.0	23.5	15.5	19.2	24.5	14.5	18.8	19.0	9.0	13.7

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124000 MANISTEE RIVER NEAR SHERMAN, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	11.0	10.4	10.8	11.6	11.1	11.4	13.1	12.4	12.7	13.5	13.3	13.3
2	10.6	10.0	10.3	11.1	10.8	10.9	13.4	12.9	13.2	13.6	13.5	13.5
3	10.8	10.1	10.4	11.2	10.7	10.9	13.9	13.3	13.6	13.7	13.5	13.6
4	11.2	10.2	10.7	11.3	10.8	11.0	13.8	13.4	13.6	13.7	13.5	13.6
5	11.6	10.9	11.2	11.7	11.1	11.4	13.6	12.9	13.1	13.7	13.5	13.6
6	12.0	11.1	11.6	11.8	11.3	11.5	13.1	12.9	13.0	13.9	13.7	13.8
7	12.4	11.6	12.0	11.3	11.0	11.1	12.9	12.8	12.9	14.0	13.8	13.9
8	12.7	12.1	12.4	11.4	10.9	11.1	13.0	12.8	12.9	14.5	14.0	14.3
9	12.9	12.5	12.7	11.1	10.8	10.9	13.3	12.9	13.1	14.5	14.3	14.4
10	12.8	12.3	12.6	11.1	10.8	10.9	13.2	12.9	13.1	14.5	14.2	14.4
11	12.5	12.1	12.3	11.3	11.0	11.1	13.3	13.0	13.1	14.4	14.1	14.3
12	12.3	11.7	12.1	11.2	11.1	11.1	13.2	12.9	13.1	14.2	14.0	14.1
13	11.7	11.0	11.5	11.3	11.1	11.2	13.2	13.0	13.1	14.2	14.0	14.1
14	11.0	10.3	10.7	11.7	11.2	11.4	13.2	12.8	12.9	15.0	14.1	14.5
15	10.5	10.2	10.3	12.0	11.7	11.8	13.0	12.7	12.8	14.9	14.4	14.6
16	10.9	10.2	10.6	11.9	11.8	11.8	12.9	12.6	12.7	14.6	14.3	14.5
17	11.1	10.5	10.8	12.4	11.8	12.1	12.7	12.4	12.5	14.6	14.5	14.6
18	11.3	10.7	10.9	12.6	12.2	12.4	13.1	12.7	12.9	14.5	14.4	14.5
19	11.3	10.7	11.0	12.7	12.5	12.6	13.2	13.0	13.1	14.9	14.1	14.6
20	10.9	10.4	10.7	12.8	12.4	12.6	13.6	13.0	13.3	14.3	13.8	14.0
21	10.9	10.1	10.5	13.3	12.8	13.0	13.6	13.4	13.5	14.0	13.8	13.9
22	11.2	10.4	10.8	13.6	12.9	13.2	13.7	13.4	13.5	13.9	13.7	13.8
23	10.9	10.4	10.7	13.6	12.9	13.2	13.7	13.4	13.5	14.1	13.7	13.9
24	10.7	10.3	10.4	13.5	13.1	13.3	13.6	13.3	13.4	14.3	13.7	14.0
25	10.6	10.0	10.3	13.3	12.9	13.2	13.6	13.3	13.5	14.6	13.6	14.0
26	10.4	9.8	10.1	12.9	12.2	12.5	13.6	13.4	13.5	14.0	13.2	13.6
27	10.0	9.5	9.8	12.3	12.0	12.1	13.4	13.2	13.3	14.2	13.1	13.6
28	10.9	9.9	10.4	12.4	12.1	12.3	13.4	13.2	13.3	13.7	13.0	13.3
29	11.5	10.6	11.1	12.4	12.2	12.3	13.3	13.1	13.2	14.0	13.2	13.6
30	11.8	11.2	11.5	12.6	12.2	12.3	13.4	13.1	13.2	13.4	12.4	12.9
31	11.9	11.5	11.6	—	—	—	13.3	13.2	13.2	12.6	12.2	12.4
MONTH	12.9	9.5	11.1	13.6	10.7	11.9	13.9	12.4	13.2	15.0	12.2	13.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.9	12.4	12.7	15.4	14.0	14.6	11.8	11.5	11.6	9.2	8.7	9.0
2	13.5	12.9	13.1	14.8	13.9	14.3	11.8	11.4	11.6	8.9	8.6	8.7
3	13.2	12.7	13.0	13.9	12.7	13.5	11.8	11.5	11.7	9.0	8.4	8.7
4	13.9	12.7	13.2	12.7	12.3	12.5	12.0	11.6	11.8	9.3	8.8	9.0
5	13.6	13.3	13.4	12.8	12.1	12.4	11.7	11.3	11.6	9.6	9.1	9.3
6	13.4	13.1	13.3	13.1	12.5	12.8	11.3	11.1	11.2	9.8	9.3	9.5
7	13.6	13.2	13.4	12.9	12.3	12.7	11.3	10.8	11.1	9.6	9.2	9.4
8	13.7	13.3	13.4	12.5	12.1	12.3	11.0	10.6	10.8	9.5	9.1	9.3
9	13.4	12.9	13.1	12.6	12.0	12.3	11.0	10.6	10.9	9.3	8.6	9.1
10	13.8	13.1	13.5	12.8	12.2	12.5	11.0	10.8	10.9	9.2	8.4	8.9
11	14.0	13.0	13.6	12.7	12.1	12.4	10.9	10.8	10.9	9.1	8.4	8.7
12	14.1	11.8	13.3	12.7	12.3	12.5	10.8	10.3	10.5	9.8	9.0	9.3
13	14.1	13.6	13.9	12.4	12.1	12.2	10.4	10.3	10.3	9.9	9.5	9.7
14	13.8	13.5	13.7	12.6	11.8	12.2	10.3	10.0	10.2	9.9	9.5	9.7
15	14.0	13.6	13.8	12.0	11.6	11.8	10.2	10.0	10.1	9.8	9.5	9.7
16	14.1	13.8	13.9	12.0	11.5	11.7	10.3	10.0	10.1	9.5	8.8	9.1
17	14.2	13.2	13.7	12.3	11.6	11.9	10.8	10.3	10.6	8.8	8.5	8.6
18	13.9	13.5	13.7	12.4	11.9	12.1	11.1	10.6	10.9	8.5	8.1	8.4
19	13.8	13.5	13.6	12.5	11.8	12.2	10.9	10.4	10.7	8.4	8.1	8.3
20	14.8	13.6	14.2	12.2	11.6	11.9	10.4	10.1	10.3	8.6	8.2	8.4
21	14.4	13.6	14.0	11.9	11.5	11.7	10.1	9.7	10.0	8.4	8.2	8.3
22	14.1	13.7	13.9	11.7	11.3	11.6	10.1	9.6	9.9	—	—	—
23	14.1	13.7	13.9	11.6	11.3	11.4	9.7	9.3	9.5	—	—	—
24	14.1	13.8	14.0	11.9	11.4	11.7	9.7	9.2	9.5	—	—	—
25	14.4	13.8	14.1	12.6	11.9	12.3	10.0	9.5	9.8	—	—	—
26	15.0	14.0	14.5	13.3	12.6	13.0	10.0	9.7	9.8	—	—	—
27	15.0	14.5	14.8	13.4	13.1	13.3	10.2	9.7	9.9	—	—	—
28	14.9	13.9	14.5	13.4	12.7	13.2	10.2	9.7	10.0	—	—	—
29	—	—	—	12.7	12.3	12.5	10.0	9.4	9.8	—	—	—
30	—	—	—	12.3	11.8	12.2	9.5	9.0	9.4	—	—	—
31	—	—	—	11.9	11.6	11.7	—	—	—	—	—	—
MONTH	15.0	11.8	13.7	15.4	11.3	12.4	12.0	9.0	10.5	—	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124000 MANISTEE RIVER NEAR SHERMAN, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.1	8.9	9.0	8.6	7.3	7.9	8.4	7.6	7.9	9.0	8.3	8.6
2	9.4	9.1	9.3	9.0	8.1	8.5	8.1	7.5	7.7	9.0	8.3	8.6
3	9.7	9.4	9.6	8.9	8.1	8.4	8.3	7.6	7.9	8.6	8.2	8.4
4	9.9	9.6	9.7	8.7	7.9	8.3	8.3	7.5	7.9	8.8	8.2	8.5
5	9.8	9.6	9.7	8.7	7.8	8.2	8.1	7.4	7.7	9.1	8.4	8.7
6	9.7	9.3	9.6	8.7	7.8	8.2	8.0	7.3	7.6	9.0	8.4	8.6
7	9.3	8.8	9.1	8.3	7.8	8.0	7.9	7.1	7.4	8.5	8.0	8.2
8	9.1	8.7	8.8	8.2	7.5	7.8	7.7	7.0	7.3	8.2	7.8	8.0
9	8.9	8.5	8.7	7.9	7.2	7.5	7.6	6.9	7.2	8.2	7.8	8.0
10	8.8	8.4	8.6	8.1	7.1	7.6	8.1	7.0	7.5	8.4	7.8	8.1
11	8.9	8.5	8.6	8.1	7.3	7.7	8.6	7.6	8.1	8.5	7.9	8.2
12	8.5	8.0	8.3	8.5	7.7	8.0	8.8	7.9	8.3	8.3	7.9	8.1
13	8.2	7.7	8.0	8.5	7.8	8.1	8.7	8.0	8.3	9.2	7.9	8.6
14	7.8	7.4	7.6	8.6	7.7	8.2	8.9	8.1	8.5	9.6	8.7	9.1
15	7.7	7.1	7.4	8.6	7.9	8.2	8.8	8.2	8.5	9.8	9.2	9.5
16	8.0	7.5	7.7	8.8	7.9	8.3	8.4	8.0	8.2	9.9	9.2	9.5
17	8.3	7.6	7.9	8.7	8.0	8.3	8.7	8.2	8.4	9.9	9.2	9.5
18	8.2	7.6	7.9	8.8	8.0	8.4	8.8	8.4	8.6	9.8	9.3	9.6
19	8.5	7.9	8.1	8.9	8.2	8.5	8.8	8.3	8.5	9.5	9.1	9.2
20	8.6	7.9	8.2	8.6	8.0	8.3	8.8	8.4	8.6	9.3	8.7	9.1
21	8.7	8.0	8.3	8.4	7.8	8.1	9.0	8.4	8.6	9.6	8.9	9.4
22	9.1	8.5	8.8	8.1	7.5	7.8	8.8	8.3	8.5	9.9	9.4	9.6
23	9.2	8.6	8.9	8.1	7.6	7.8	8.7	8.2	8.4	9.5	8.8	9.4
24	8.9	8.3	8.6	8.1	7.4	7.7	8.6	8.0	8.3	9.4	8.4	9.0
25	8.7	8.1	8.4	8.2	7.4	7.7	8.3	8.0	8.1	9.9	9.3	9.5
26	8.5	7.8	8.1	8.3	7.5	7.9	8.3	7.9	8.1	10.2	9.4	9.9
27	8.4	7.6	7.9	8.6	7.8	8.2	8.2	7.8	8.0	10.3	9.8	10.0
28	8.4	7.6	7.9	8.5	7.8	8.2	8.4	7.9	8.1	10.4	10.1	10.2
29	8.3	7.4	7.8	8.6	7.9	8.2	8.6	8.0	8.3	10.7	10.1	10.3
30	8.0	7.3	7.6	8.8	7.9	8.3	8.4	7.9	8.1	10.5	9.5	10.1
31	—	—	—	8.6	8.0	8.3	8.5	7.9	8.2	—	—	—
MONTH	9.9	7.1	8.5	9.0	7.1	8.1	9.0	6.9	8.1	10.7	7.8	9.1

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124200 MANISTEE RIVER NEAR MESICK, MI

LOCATION.--Lat 44°21'47", long 85°49'15", in SE1/4 NE1/4 sec.25, T.23 N., R.13 W., Manistee County, Hydrologic Unit 04060103, on right bank 200 ft downstream from Hodenpyl Dam, 6.2 mi southwest of Mesick.

DRAINAGE AREA.--1,018 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1996 to current year.

GAGE.--Water-stage recorder. Datum of gage is 732.22 ft above sea level (Consumers Energy benchmark).

REMARKS.--Water-discharge records good. Flow completely regulated by Hodenpyl Dam 200 ft upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	845	855	1100	1070	1050	1020	1260	1160	1340	948	867	908
2	846	855	1100	1060	1060	1040	1310	1150	1410	961	869	837
3	874	858	1050	975	1020	1040	1310	1260	1590	984	866	838
4	890	858	960	961	989	1040	1340	1250	1600	993	866	838
5	875	858	946	1040	990	1050	1460	1100	1550	994	832	839
6	891	882	980	1040	990	1030	1630	1090	1540	955	810	838
7	950	937	793	1040	990	957	1950	1110	1470	921	814	899
8	991	920	866	1010	1060	988	2170	1210	1290	921	816	940
9	990	1050	1000	880	1290	1050	2380	1150	1210	921	811	886
10	958	1090	1040	798	1290	1040	2180	1150	1210	922	813	848
11	928	1010	1040	875	1120	1030	2300	1320	1210	923	814	848
12	928	1050	911	1050	1110	979	2800	1230	1210	922	814	939
13	929	1110	836	1110	1170	1010	2770	1270	1210	907	806	921
14	930	1140	927	1090	1180	1020	2770	1490	1180	887	788	792
15	925	1140	969	1020	1150	996	2950	1540	1130	886	756	817
16	909	1140	1110	1000	1080	997	2690	1970	1160	884	846	878
17	895	1110	1100	1010	1030	1040	2020	2580	1170	884	858	836
18	896	1060	1040	1010	937	1070	1650	2400	1230	884	864	814
19	895	1010	977	1010	941	1070	1560	1880	1260	884	1040	973
20	868	1060	880	922	1030	1050	1600	1670	1180	884	903	1120
21	852	1050	932	790	1010	1060	1600	1470	1140	906	828	1080
22	853	1010	847	777	846	1150	1410	1340	1110	1080	857	1010
23	854	1020	780	988	793	1280	1330	1390	1080	969	880	1070
24	880	1010	852	1090	1030	1350	1390	1470	1080	907	867	1150
25	890	998	808	1010	1150	1270	1320	1570	1070	906	922	1060
26	890	999	795	958	1140	1200	1240	1620	1070	880	921	1040
27	916	1050	815	886	1170	1150	1300	1610	1070	847	941	1110
28	931	1100	832	948	1060	1110	1320	1680	1050	847	901	1110
29	906	1100	895	990	---	1120	1220	1670	1010	849	915	997
30	887	1100	897	1010	---	1120	1170	1440	953	861	902	937
31	867	---	957	1030	---	1150	---	1390	---	867	878	---
TOTAL	27939	30430	29035	30448	29676	33477	53400	45530	36783	28384	26665	28173
MEAN	901	1014	937	982	1060	1080	1780	1469	1226	916	860	939
MAX	991	1140	1110	1110	1290	1350	2950	2580	1600	1080	1040	1150
MIN	845	855	780	777	793	957	1170	1090	953	847	756	792
CFSM	.89	1.00	.92	.96	1.04	1.06	1.75	1.44	1.20	.90	.84	.92
IN.	1.02	1.11	1.06	1.11	1.08	1.22	1.95	1.66	1.34	1.04	.97	1.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2001, BY WATER YEAR (WY)

MEAN	1021	1060	1078	1118	1182	1260	1560	1329	1121	997	933	938
MAX	1094	1126	1266	1359	1328	1435	1954	1761	1226	1155	1042	1006
(WY)	1998	1998	1997	1997	1997	1997	1997	1997	2001	1999	1997	1997
MIN	901	988	937	982	1060	1080	1042	1076	1061	897	860	884
(WY)	2001	2000	2001	2001	2001	2001	2000	1999	1998	2000	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1997 - 2001	
ANNUAL TOTAL	369185		399940			
ANNUAL MEAN	1009		1096		1094	
HIGHEST ANNUAL MEAN					1149	1998
LOWEST ANNUAL MEAN					1022	2000
HIGHEST DAILY MEAN	1750	Feb 27	2950	Apr 15	2950	Apr 15 2001
LOWEST DAILY MEAN	745	Jan 18	756	Aug 15	706	Dec 25 1999
ANNUAL SEVEN-DAY MINIMUM	818	Dec 22	800	Aug 9	800	Aug 9 2001
MAXIMUM PEAK FLOW			3060	Apr 15	3060	Apr 15 2001
MAXIMUM PEAK STAGE			6.37	Apr 15	6.46	Mar 31 1998
INSTANTANEOUS LOW FLOW			449	Aug 31	449	Aug 31 2001
ANNUAL RUNOFF (CFSM)	.99		1.08		1.08	
ANNUAL RUNOFF (INCHES)	13.49		14.61		14.61	
10 PERCENT EXCEEDS	1180		1450		1450	
50 PERCENT EXCEEDS	989		1010		1060	
90 PERCENT EXCEEDS	853		847		883	

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: December 1996 to current year.
DISSOLVED OXYGEN: December 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 23.5°C, Aug. 13, 2001; minimum, 0.0°C, Feb. 10-13, 1997.
DISSOLVED OXYGEN: Maximum, 15.3 mg/L, Mar. 15, 1999; minimum, 6.4 mg/L, July 9, 10, 1998.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 23.5°C, Aug. 13; minimum, 0.5°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 14.9 mg/L, Feb. 23, 24; minimum, 7.2 mg/L, June 25-27.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.0	13.5	13.5	11.5	11.0	11.5	2.0	2.0	2.0	1.0	1.0	1.0
2	13.5	13.0	13.5	11.0	11.0	11.0	2.5	2.0	2.0	1.0	1.0	1.0
3	13.5	13.5	13.5	11.0	11.0	11.0	2.0	2.0	2.0	1.0	1.0	1.0
4	14.0	13.5	13.5	11.0	11.0	11.0	2.0	2.0	2.0	1.0	.5	1.0
5	13.5	13.5	13.5	11.0	10.5	10.5	2.0	2.0	2.0	1.0	.5	.5
6	13.5	13.5	13.5	10.5	10.5	10.5	2.0	2.0	2.0	.5	.5	.5
7	13.5	13.0	13.0	10.5	10.0	10.0	2.0	2.0	2.0	.5	.5	.5
8	13.0	13.0	13.0	10.0	10.0	10.0	2.0	2.0	2.0	.5	.5	.5
9	13.0	12.5	13.0	10.0	9.5	10.0	2.0	2.0	2.0	.5	.5	.5
10	13.0	12.5	12.5	9.5	9.5	9.5	2.0	1.5	2.0	.5	.5	.5
11	12.5	12.5	12.5	9.5	9.5	9.5	1.5	1.5	1.5	.5	.5	.5
12	12.5	12.0	12.0	9.5	9.0	9.0	1.5	1.5	1.5	.5	.5	.5
13	12.0	11.5	12.0	9.0	8.5	9.0	1.5	1.5	1.5	.5	.5	.5
14	11.5	11.0	11.5	8.5	8.0	8.5	1.5	1.5	1.5	.5	.5	.5
15	11.5	11.5	11.5	8.0	8.0	8.0	1.5	1.5	1.5	.5	.5	.5
16	11.5	11.0	11.5	8.0	7.5	7.5	1.5	1.5	1.5	.5	.5	.5
17	11.5	11.0	11.5	7.5	7.0	7.0	1.5	1.5	1.5	.5	.5	.5
18	11.5	11.0	11.0	7.0	6.5	7.0	1.5	1.0	1.5	.5	.5	.5
19	11.5	11.0	11.0	6.5	6.0	6.0	1.5	1.0	1.0	.5	.5	.5
20	11.5	11.0	11.0	6.0	5.5	6.0	1.0	1.0	1.0	.5	.5	.5
21	12.0	11.5	11.5	5.5	5.0	5.0	1.0	1.0	1.0	.5	.5	.5
22	11.5	11.5	11.5	5.0	4.5	5.0	1.0	1.0	1.0	1.0	.5	.5
23	11.5	11.5	11.5	4.5	4.5	4.5	1.0	1.0	1.0	1.0	.5	1.0
24	12.0	11.5	11.5	4.5	4.0	4.0	1.0	1.0	1.0	1.0	.5	1.0
25	12.0	11.5	11.5	4.0	3.5	4.0	1.0	1.0	1.0	1.0	1.0	1.0
26	11.5	11.5	11.5	3.5	3.0	3.5	1.0	1.0	1.0	1.0	1.0	1.0
27	12.0	11.5	12.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0
28	12.0	11.5	12.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0
29	11.5	11.5	11.5	3.0	2.5	2.5	1.0	1.0	1.0	1.0	1.0	1.0
30	11.5	11.5	11.5	2.5	2.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
31	11.5	11.5	11.5	—	—	—	1.0	1.0	1.0	1.0	1.0	1.0
MONTH	14.0	11.0	12.1	11.5	2.0	7.3	2.5	1.0	1.5	1.0	.5	.7

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124200 MANISTEE RIVER NEAR MESICK, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	1.0	1.0	1.0	1.0	1.0	3.5	3.5	3.5	12.0	11.5	11.5
2	1.0	1.0	1.0	1.0	1.0	1.0	3.5	3.5	3.5	12.5	12.0	12.0
3	1.0	1.0	1.0	1.0	1.0	1.0	3.5	3.0	3.5	13.5	12.5	13.0
4	1.0	1.0	1.0	1.0	1.0	1.0	3.5	3.0	3.5	14.0	13.5	13.5
5	1.0	1.0	1.0	1.0	1.0	1.0	3.5	3.5	3.5	14.0	13.5	14.0
6	1.0	1.0	1.0	1.0	1.0	1.0	3.5	3.5	3.5	14.0	14.0	14.0
7	1.0	1.0	1.0	1.0	1.0	1.0	4.0	3.5	3.5	14.5	14.0	14.0
8	1.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0	4.0	14.5	14.0	14.0
9	1.0	1.0	1.0	1.0	1.0	1.0	4.5	4.0	4.0	14.5	14.5	14.5
10	1.0	1.0	1.0	1.0	1.0	1.0	5.5	4.5	4.5	15.0	14.0	14.5
11	1.0	1.0	1.0	1.0	1.0	1.0	7.0	5.5	6.5	15.0	15.0	15.0
12	1.0	1.0	1.0	1.5	1.0	1.5	7.0	6.0	6.5	15.5	15.0	15.0
13	1.0	1.0	1.0	1.5	1.5	1.5	7.5	7.0	7.0	15.5	15.0	15.0
14	1.0	1.0	1.0	1.5	1.5	1.5	7.5	7.0	7.5	15.5	15.0	15.0
15	1.0	1.0	1.0	1.5	1.5	1.5	8.5	7.5	8.0	15.5	15.0	15.5
16	1.0	1.0	1.0	1.5	1.5	1.5	8.0	8.0	8.0	15.5	15.5	15.5
17	1.0	1.0	1.0	1.5	1.5	1.5	8.5	8.0	8.0	16.0	15.5	15.5
18	1.5	1.0	1.0	2.0	1.5	1.5	8.5	8.0	8.0	16.0	15.5	16.0
19	1.5	1.0	1.0	2.0	1.5	2.0	8.5	8.0	8.0	16.0	15.5	16.0
20	1.5	1.0	1.0	2.0	2.0	2.0	8.5	8.5	8.5	16.0	15.5	15.5
21	1.0	1.0	1.0	2.0	2.0	2.0	9.0	8.5	8.5	16.0	15.5	16.0
22	1.5	1.0	1.5	2.0	2.0	2.0	9.5	9.0	9.0	15.5	15.0	15.5
23	1.5	1.5	1.5	2.5	2.0	2.0	9.5	9.0	9.0	16.0	15.5	15.5
24	1.5	1.0	1.5	2.5	2.5	2.5	10.5	9.5	10.0	16.0	15.5	16.0
25	1.0	1.0	1.0	2.5	2.5	2.5	10.0	10.0	10.0	16.0	16.0	16.0
26	1.0	1.0	1.0	3.0	2.5	2.5	10.5	10.0	10.0	16.0	15.5	16.0
27	1.0	1.0	1.0	3.0	3.0	3.0	11.5	10.5	11.0	16.0	16.0	16.0
28	1.0	1.0	1.0	3.0	3.0	3.0	11.5	11.0	11.0	16.0	15.5	16.0
29	—	—	—	3.5	3.0	3.5	11.5	11.0	11.0	16.0	15.5	15.5
30	—	—	—	3.5	3.5	3.5	11.5	11.0	11.5	16.0	15.5	15.5
31	—	—	—	3.5	3.5	3.5	—	—	—	15.5	15.0	15.5
MONTH	1.5	1.0	1.1	3.5	1.0	1.8	11.5	3.0	7.1	16.0	11.5	14.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.5	15.0	15.5	20.5	19.5	20.0	21.5	21.0	21.0	19.5	19.0	19.5
2	15.0	15.0	15.0	20.0	20.0	20.0	21.5	21.0	21.5	19.5	19.0	19.5
3	15.0	15.0	15.0	20.0	20.0	20.0	22.0	21.5	21.5	19.5	19.0	19.0
4	15.0	14.5	15.0	20.5	20.0	20.0	22.0	21.5	22.0	19.5	19.0	19.5
5	15.0	14.5	14.5	20.5	20.0	20.0	22.0	21.5	21.5	19.5	19.0	19.5
6	15.0	14.5	14.5	20.0	20.0	20.0	21.5	21.0	21.5	19.5	19.0	19.0
7	15.0	14.0	14.5	20.0	20.0	20.0	22.0	21.5	22.0	19.0	18.5	19.0
8	15.0	14.0	14.0	20.0	20.0	20.0	22.0	22.0	22.0	19.0	18.5	18.5
9	14.0	13.5	14.0	20.5	20.0	20.0	22.5	21.5	22.0	19.0	18.5	19.0
10	14.0	13.5	14.0	21.0	20.0	20.5	23.0	22.0	22.5	18.5	18.0	18.5
11	14.5	14.0	14.0	21.0	20.5	20.5	22.5	22.5	22.5	19.0	18.5	18.5
12	15.0	14.5	14.5	21.0	20.5	20.5	22.5	22.5	22.5	18.5	18.5	18.5
13	15.0	14.5	14.5	21.0	20.5	20.5	23.5	22.5	23.0	19.0	18.5	18.5
14	15.0	14.5	14.5	20.5	20.5	20.5	23.0	23.0	23.0	18.5	18.5	18.5
15	15.5	15.0	15.0	21.0	20.5	20.5	23.0	22.5	22.5	18.5	18.5	18.5
16	16.0	15.5	15.5	20.5	20.5	20.5	22.5	22.0	22.5	18.5	18.5	18.5
17	16.5	15.5	16.0	20.5	20.5	20.5	22.0	22.0	22.0	18.5	18.0	18.0
18	17.0	16.5	16.5	21.0	20.5	20.5	22.0	21.5	21.5	18.0	18.0	18.0
19	17.0	16.5	16.5	21.0	20.5	21.0	21.5	21.0	21.5	18.0	17.5	17.5
20	17.5	17.0	17.5	21.0	20.5	21.0	21.5	21.0	21.0	17.5	16.5	17.0
21	18.0	17.5	18.0	21.0	21.0	21.0	21.0	20.5	21.0	16.5	16.5	16.5
22	18.0	18.0	18.0	21.0	20.5	21.0	20.5	20.0	20.0	16.5	16.0	16.0
23	18.5	18.0	18.0	21.0	20.5	21.0	20.5	19.5	20.0	16.5	16.0	16.0
24	18.0	18.0	18.0	21.5	21.0	21.0	20.0	19.5	20.0	16.0	15.5	16.0
25	18.0	18.0	18.0	22.0	21.0	21.5	20.0	19.0	19.5	15.5	15.0	15.5
26	18.5	18.0	18.5	22.0	21.5	21.5	20.0	19.0	19.5	15.0	15.0	15.0
27	19.0	18.5	18.5	22.0	21.5	21.5	19.5	19.0	19.5	15.0	14.5	14.5
28	19.0	19.0	19.0	21.5	21.5	21.5	20.0	19.5	19.5	14.5	14.5	14.5
29	19.5	19.0	19.0	22.0	21.5	21.5	19.5	19.0	19.5	14.5	14.0	14.0
30	19.5	19.0	19.5	22.0	21.5	21.5	19.5	19.0	19.0	14.0	13.5	14.0
31	—	—	—	21.5	21.5	21.5	20.0	19.0	19.5	—	—	—
MONTH	19.5	13.5	16.2	22.0	19.5	20.7	23.5	19.0	21.2	19.5	13.5	17.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124200 MANISTEE RIVER NEAR MESICK, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.0	9.8	9.8	10.1	10.0	10.1	13.3	13.1	13.2	14.0	12.6	13.1
2	9.9	9.7	9.8	10.1	10.0	10.1	13.3	13.0	13.1	13.2	13.0	13.1
3	10.0	9.8	9.9	10.2	10.0	10.1	13.2	13.1	13.2	13.9	13.0	13.4
4	10.0	9.6	9.8	10.2	10.1	10.1	13.3	13.2	13.2	13.9	12.9	13.3
5	9.7	9.4	9.5	10.2	10.1	10.2	13.3	13.2	13.2	13.0	12.8	12.9
6	9.6	9.4	9.5	10.3	10.1	10.2	13.2	13.1	13.2	13.0	12.8	12.9
7	9.5	9.3	9.4	10.4	10.2	10.3	13.6	13.1	13.4	13.0	12.8	12.9
8	9.7	9.5	9.6	10.5	10.3	10.4	13.6	13.1	13.3	13.1	12.8	13.0
9	9.7	9.6	9.6	10.5	10.2	10.3	13.3	12.3	13.2	13.9	13.0	13.6
10	9.6	9.4	9.5	10.6	10.2	10.5	13.2	12.0	13.0	13.9	13.8	13.8
11	9.7	9.5	9.6	10.7	10.5	10.6	13.2	11.9	12.3	13.8	13.0	13.5
12	9.7	9.6	9.6	10.6	10.5	10.5	13.4	12.0	12.8	13.8	12.5	12.8
13	9.7	9.6	9.7	10.6	10.4	10.5	13.2	12.2	12.5	12.7	12.6	12.6
14	9.8	9.7	9.7	10.6	10.5	10.6	13.3	12.1	12.5	12.7	12.5	12.6
15	10.0	9.7	9.8	10.8	10.6	10.7	13.3	13.2	13.3	12.8	12.6	12.6
16	10.0	9.9	9.9	11.0	10.8	10.9	13.2	11.8	12.3	12.7	12.6	12.7
17	10.1	9.9	10.0	11.1	10.9	11.0	12.9	11.8	12.0	12.7	12.6	12.7
18	10.0	9.9	9.9	11.3	10.1	11.1	12.8	11.8	12.2	12.7	12.5	12.6
19	10.0	9.9	9.9	11.4	11.2	11.3	13.8	12.3	12.6	12.7	12.5	12.6
20	9.9	9.8	9.9	11.5	11.3	11.4	13.9	13.7	13.9	13.0	12.6	12.8
21	9.9	9.8	9.9	11.8	11.5	11.6	13.9	13.2	13.5	13.5	12.9	13.3
22	10.1	9.9	9.9	11.9	11.7	11.8	14.0	13.2	13.7	13.5	12.8	13.2
23	10.1	9.9	10.0	12.0	10.9	11.9	14.0	13.9	14.0	12.9	12.2	12.5
24	10.0	9.8	9.9	12.2	10.9	12.0	14.1	13.9	14.0	12.4	12.1	12.3
25	9.9	9.7	9.8	12.2	12.1	12.2	14.1	14.0	14.1	12.7	12.4	12.5
26	9.9	9.7	9.8	12.4	12.2	12.3	14.1	13.9	14.0	13.2	12.5	12.6
27	9.9	9.7	9.8	12.5	11.5	12.4	14.0	13.9	13.9	13.4	13.2	13.3
28	10.0	9.8	9.9	12.7	11.9	12.5	14.0	13.9	13.9	13.4	12.5	12.9
29	10.0	9.9	10.0	12.9	12.6	12.8	13.9	13.2	13.8	12.7	12.4	12.5
30	10.2	10.0	10.1	13.1	12.8	12.9	14.4	13.3	13.8	12.4	12.0	12.2
31	10.2	10.1	10.1	---	---	---	14.0	12.5	13.6	12.1	11.5	11.9
MONTH	10.2	9.3	9.8	13.1	10.0	11.1	14.4	11.8	13.2	14.0	11.5	12.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.4	12.0	12.1	14.8	14.3	14.6	12.4	12.3	12.3	9.9	9.6	9.7
2	12.2	12.0	12.1	14.6	14.5	14.6	12.5	12.3	12.4	9.9	9.7	9.8
3	12.3	12.1	12.2	14.6	14.5	14.5	12.5	12.3	12.4	9.7	9.4	9.6
4	12.4	12.2	12.3	14.6	14.5	14.5	12.7	12.4	12.5	9.7	9.4	9.6
5	12.4	12.3	12.4	14.6	14.4	14.5	12.6	12.5	12.5	9.9	9.5	9.7
6	12.5	12.4	12.4	14.6	14.4	14.5	12.6	12.4	12.5	9.8	9.6	9.7
7	12.7	12.5	12.5	14.7	14.5	14.6	12.4	12.2	12.3	9.7	9.5	9.6
8	12.7	12.4	12.5	14.7	14.2	14.4	12.2	12.0	12.1	9.6	9.2	9.4
9	12.5	12.4	12.4	14.4	14.2	14.3	12.1	11.8	11.9	9.5	9.1	9.2
10	12.7	12.5	12.6	14.4	14.2	14.3	11.9	11.6	11.7	9.2	9.0	9.1
11	13.0	12.7	12.8	14.4	14.2	14.3	11.7	11.3	11.4	9.0	8.7	8.8
12	13.0	12.8	12.9	14.3	14.1	14.2	11.3	11.1	11.2	9.2	8.8	9.0
13	13.0	12.8	12.9	14.1	14.0	14.1	11.2	11.1	11.2	9.1	8.9	9.0
14	13.0	12.9	12.9	14.2	13.9	14.0	11.2	10.9	11.0	8.9	8.8	8.9
15	13.3	13.0	13.1	14.2	13.9	14.1	10.9	10.7	10.8	9.0	8.8	8.8
16	13.5	13.2	13.3	14.2	14.0	14.1	10.8	10.6	10.7	8.9	8.8	8.9
17	13.6	13.5	13.5	14.1	13.8	13.9	10.7	10.6	10.7	8.9	8.6	8.8
18	14.4	13.6	14.0	13.9	13.8	13.8	10.6	10.5	10.5	8.8	8.6	8.7
19	14.3	13.7	14.0	13.9	13.7	13.8	10.6	10.3	10.5	8.8	8.6	8.7
20	13.9	13.7	13.8	13.8	13.6	13.7	10.4	10.2	10.3	8.8	8.6	8.7
21	14.1	13.8	14.0	13.8	13.5	13.7	10.3	10.0	10.2	8.7	8.4	8.6
22	14.7	14.0	14.4	13.6	13.1	13.4	10.2	10.0	10.1	8.5	8.2	8.3
23	14.9	14.7	14.8	13.2	12.8	13.0	10.1	9.7	9.9	8.3	8.0	8.1
24	14.9	13.9	14.3	12.9	12.8	12.8	10.0	9.8	9.9	8.1	7.7	7.9
25	14.3	13.9	14.1	12.9	12.7	12.8	10.0	9.8	9.9	7.9	7.7	7.8
26	14.4	14.2	14.3	12.9	12.8	12.8	10.0	9.7	9.8	7.8	7.5	7.6
27	14.4	14.3	14.3	13.2	12.8	13.0	10.0	9.7	9.8	7.8	7.6	7.6
28	14.8	14.4	14.6	13.0	12.9	12.9	9.8	9.7	9.7	7.7	7.5	7.6
29	---	---	---	12.9	12.7	12.8	10.0	9.6	9.8	7.8	7.5	7.6
30	---	---	---	12.8	12.7	12.8	9.8	9.6	9.7	7.8	7.5	7.7
31	---	---	---	12.7	12.3	12.5	---	---	---	8.1	7.6	7.8
MONTH	14.9	12.0	13.3	14.8	12.3	13.8	12.7	9.6	11.0	9.9	7.5	8.7

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124200 MANISTEE RIVER NEAR MESICK, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.1	8.0	8.1	7.8	7.5	7.7	7.8	7.6	7.8	8.3	7.7	8.0
2	8.2	8.0	8.1	7.8	7.7	7.8	7.9	7.6	7.7	8.2	8.0	8.1
3	8.2	8.0	8.1	7.8	7.7	7.7	7.9	7.7	7.8	8.2	7.9	8.1
4	8.3	8.2	8.2	7.7	7.6	7.7	7.9	7.8	7.9	8.5	8.0	8.3
5	8.3	8.1	8.2	7.9	7.6	7.7	8.1	7.8	8.0	8.4	7.9	8.2
6	8.2	8.0	8.1	7.9	7.7	7.8	8.1	7.9	8.0	8.2	7.9	8.1
7	8.3	8.0	8.1	7.8	7.7	7.7	8.1	7.9	8.0	8.2	7.6	7.9
8	8.5	8.1	8.3	7.8	7.7	7.7	8.1	7.9	8.0	7.8	7.6	7.7
9	8.6	8.3	8.5	7.9	7.7	7.8	8.0	7.8	7.9	8.1	7.7	7.9
10	8.6	8.4	8.5	7.9	7.7	7.8	7.9	7.8	7.8	8.2	8.0	8.1
11	8.6	8.4	8.5	7.9	7.8	7.9	8.0	7.8	7.9	8.3	8.1	8.2
12	8.6	8.4	8.5	8.0	7.9	7.9	8.1	7.7	7.9	8.3	7.8	8.0
13	8.5	8.4	8.5	8.1	8.0	8.0	8.6	7.9	8.3	10.0	7.8	9.0
14	8.5	8.4	8.4	8.1	7.9	8.0	8.6	8.4	8.6	10.1	9.3	9.7
15	8.4	8.3	8.4	8.0	7.9	8.0	8.6	8.4	8.5	9.7	9.3	9.5
16	8.4	8.1	8.2	8.1	7.9	8.0	8.6	7.6	8.4	9.3	9.0	9.2
17	8.1	7.9	8.1	8.0	7.9	8.0	8.7	8.5	8.6	9.1	8.8	9.0
18	8.1	7.6	7.8	8.0	7.6	7.8	8.8	8.6	8.7	9.1	8.8	8.9
19	7.9	7.5	7.7	7.7	7.5	7.6	8.8	7.8	8.1	8.9	8.0	8.5
20	7.8	7.7	7.8	7.7	7.6	7.6	9.0	8.1	8.6	8.1	7.9	8.0
21	7.8	7.5	7.6	7.6	7.5	7.6	9.2	8.7	9.0	8.2	7.9	8.1
22	7.6	7.5	7.6	7.5	7.3	7.4	9.1	8.4	8.9	8.4	8.1	8.3
23	7.6	7.4	7.5	7.7	7.3	7.5	9.2	8.3	8.9	8.4	8.0	8.2
24	7.6	7.3	7.4	7.8	7.6	7.7	9.3	8.7	9.1	8.3	8.1	8.2
25	7.4	7.2	7.3	7.7	7.6	7.7	9.3	8.4	8.9	8.5	8.1	8.3
26	7.3	7.2	7.3	7.9	7.6	7.7	9.3	8.4	8.9	8.4	8.2	8.3
27	7.5	7.2	7.3	8.0	7.8	7.9	9.4	8.4	8.9	8.3	8.2	8.2
28	7.5	7.4	7.5	7.9	7.8	7.9	10.0	8.6	9.0	8.4	8.2	8.3
29	7.7	7.5	7.6	7.9	7.8	7.9	9.8	8.5	9.2	8.7	8.3	8.5
30	7.7	7.5	7.6	7.9	7.7	7.8	8.7	8.2	8.4	8.7	8.4	8.5
31	---	---	---	7.8	7.7	7.7	8.4	7.7	8.1	---	---	---
MONTH	8.6	7.2	8.0	8.1	7.3	7.8	10.0	7.6	8.4	10.1	7.6	8.4

STREAMS TRIBUTARY TO LAKE MICHIGAN

04124500 EAST BRANCH PINE RIVER NEAR TUSTIN, MI

LOCATION.--Lat 44°06'09", long 85°31'02", in NE1/4 NW1/4 sec. 28, T.20 N., R.10 W., Osceola County, Hydrologic Unit 04060103, on left bank 75 ft downstream from bridge on Marion Road, 3.0 mi west of Tustin.

DRAINAGE AREA.--60.0 mi^2.

PERIOD OF RECORD.--July 1952 to September 1963, October 1963 to September 1991 (operated as a crest-stage partial-record station), October 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,077.65 ft above sea level (levels by Michigan Department of Natural Resources).

REMARKS.--Records good.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	12	35	18	34	41	95	33	77	15	8.9	11
2	13	12	28	17	30	37	96	31	92	13	9.0	11
3	13	12	22	17	29	35	105	28	99	12	9.1	10
4	13	11	22	18	27	35	105	27	83	11	8.7	11
5	13	11	19	18	25	33	99	26	70	11	8.5	10
6	18	11	19	19	24	32	101	24	60	11	8.4	10
7	22	13	19	19	23	31	201	24	49	10	8.3	11
8	23	14	19	18	20	31	166	30	41	10	8.3	12
9	21	30	19	18	63	30	156	27	36	10	8.5	12
10	18	52	19	18	73	28	134	26	33	10	9.9	19
11	15	41	18	18	73	29	141	32	32	9.8	9.2	16
12	14	32	18	17	65	28	437	30	31	9.5	8.8	13
13	13	35	19	18	54	30	267	26	28	9.4	8.8	12
14	14	41	19	19	47	30	192	23	26	9.2	8.4	11
15	14	41	20	20	42	36	144	58	26	9.2	8.6	11
16	13	38	21	22	40	46	116	266	27	9.3	9.8	10
17	13	35	22	22	36	47	100	173	25	9.2	12	10
18	12	31	21	22	37	45	79	123	24	10	12	11
19	12	28	20	19	36	52	65	94	25	8.9	25	15
20	12	27	21	20	34	65	61	68	21	10	23	24
21	12	26	20	19	31	86	66	69	22	21	16	23
22	11	25	20	19	29	105	64	97	25	19	14	18
23	11	24	19	18	28	114	62	71	22	14	14	23
24	12	24	18	18	26	108	70	73	18	13	12	36
25	13	23	18	17	46	80	61	105	16	11	20	27
26	13	32	18	16	53	66	54	99	15	11	28	24
27	13	50	18	15	52	56	49	101	14	10	21	23
28	13	48	17	16	45	47	42	93	13	10	15	20
29	12	44	17	16	---	50	37	76	12	9.8	13	17
30	12	39	18	30	---	60	34	60	15	9.6	12	15
31	12	---	18	35	---	80	---	48	---	9.4	13	---
TOTAL	434	862	621	596	1122	1593	3399	2061	1077	345.3	391.2	476
MEAN	14.0	28.7	20.0	19.2	40.1	51.4	113	66.5	35.9	11.1	12.6	15.9
MAX	23	52	35	35	73	114	437	266	99	21	28	36
MIN	11	11	17	15	20	28	34	23	12	8.9	8.3	10
CFSM	.23	.48	.33	.32	.67	.86	1.89	1.11	.60	.19	.21	.26
IN.	.27	.53	.39	.37	.70	.99	2.11	1.28	.67	.21	.24	.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	25.1	32.3	25.4	23.0	27.6	54.5	80.4	39.3	24.5	17.4	18.3	15.5
MAX	99.9	90.8	83.8	48.4	54.4	93.6	190	75.4	70.4	45.1	68.5	44.2
(WY)	1992	1993	1992	1997	1994	1992	1959	1960	1993	1994	1956	1993
MIN	9.54	12.3	12.4	10.1	9.39	18.7	31.6	10.7	8.90	7.22	6.29	6.82
(WY)	1956	1954	1956	1956	1963	1956	2000	1958	1959	1959	1957	1955

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	10441.3		12977.5			
ANNUAL MEAN	28.5		35.6		31.9	
HIGHEST ANNUAL MEAN					54.5	1992
LOWEST ANNUAL MEAN					16.0	1958
HIGHEST DAILY MEAN	223	May 18	437	Apr 12	753	Aug 4 1956
LOWEST DAILY MEAN	7.1	Jul 18	8.3	Aug 7	5.3	Aug 4 1958
ANNUAL SEVEN-DAY MINIMUM	7.3	Jul 14	8.5	Aug 3	5.5	Aug 1 1959
MAXIMUM PEAK FLOW			544	Apr 12	(a)1410	Aug 4 1956
MAXIMUM PEAK STAGE			5.24	Apr 12	6.23	Aug 4 1956
INSTANTANEOUS LOW FLOW			6.6	Jul 19	(b)4.1	Mar 13 1958
ANNUAL RUNOFF (CFSM)	.48		.59		.53	
ANNUAL RUNOFF (INCHES)	6.47		8.05		7.22	
10 PERCENT EXCEEDS	48		78		66	
50 PERCENT EXCEEDS	21		22		19	
90 PERCENT EXCEEDS	11		10		8.6	

(a) From rating curve extended above 450 ft^3/s.
(b) Result of freezeup.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125460 PINE RIVER NEAR HOXEYVILLE, MI

LOCATION.--Lat 44°11'36", long 85°46'11", in NW1/4 NE1/4 sec.28, T.21 N., R.12 W., Wexford County, Hydrologic Unit 04060103, on right bank 75 ft downstream from High School Bridge on S 5 1/2 Road, 2.5 mi west of Hoxeyville.

DRAINAGE AREA.--245 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1952 to September 1982, October 1996 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 850 ft above sea level, from topographic map. July 1952 to September 1982 water-stage recorder at site 3.5 mi downstream at different datum (station 04125500).

REMARKS.--Water-discharge records good. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	217	215	297	228	297	302	400	285	356	231	203	224
2	214	214	274	221	278	289	415	283	479	229	202	215
3	211	214	254	230	258	272	429	275	479	225	203	211
4	211	216	241	228	257	267	443	271	440	224	201	214
5	212	214	244	232	253	268	435	267	392	220	203	214
6	226	214	238	231	247	258	436	260	364	218	202	210
7	256	219	233	232	242	256	603	273	343	219	201	211
8	272	220	241	227	248	253	768	309	314	219	200	215
9	258	251	236	222	370	251	650	287	294	218	202	215
10	241	354	235	e230	480	248	594	272	284	216	208	225
11	232	354	238	239	425	249	502	320	282	215	208	229
12	226	297	231	228	398	249	891	316	279	214	204	219
13	222	287	233	229	371	253	1310	290	272	213	203	212
14	224	325	235	232	339	256	790	270	262	212	201	210
15	221	330	233	238	312	268	574	313	262	211	199	209
16	221	319	235	245	296	298	484	637	271	210	207	208
17	221	307	237	245	280	310	439	829	270	209	216	209
18	217	291	238	240	252	302	408	615	262	210	221	210
19	215	277	235	237	e250	313	381	453	263	210	286	228
20	214	278	232	215	267	349	371	391	257	210	308	259
21	215	276	239	223	254	397	392	371	248	216	252	278
22	214	271	226	e225	232	444	393	495	254	244	229	253
23	214	266	222	225	e240	465	e375	480	254	233	229	259
24	217	262	241	224	247	457	383	423	245	225	219	304
25	224	257	224	222	286	404	379	501	238	219	220	296
26	223	272	e225	221	e359	340	356	512	233	212	255	268
27	220	338	e225	222	350	340	337	479	230	208	247	259
28	218	364	e230	220	299	305	320	507	227	205	228	250
29	217	339	e240	221	---	308	303	434	224	206	219	239
30	216	317	250	253	---	319	291	383	224	211	214	e231
31	217	---	234	306	---	358	---	347	---	205	222	---
TOTAL	6926	8358	7396	7191	8387	9648	14852	12148	8802	6717	6812	6984
MEAN	223	279	239	232	300	311	495	392	293	217	220	233
MAX	272	364	297	306	480	465	1310	829	479	244	308	304
MIN	211	214	222	215	232	248	291	260	224	205	199	208
CFSM	.91	1.14	.97	.95	1.22	1.27	2.02	1.60	1.20	.88	.90	.95
IN.	1.05	1.27	1.12	1.09	1.27	1.46	2.26	1.84	1.34	1.02	1.03	1.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	261	276	272	256	267	346	434	316	275	246	242	246
MAX	373	339	408	350	361	629	670	436	391	427	393	504
(WY)	1955	1976	1966	1973	1976	1976	1959	1960	1974	1969	1956	1975
MIN	219	227	223	205	208	254	258	222	206	196	197	203
(WY)	1964	1954	1964	1961	1959	1978	2000	1958	1964	1966	1998	1955

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	95972		104221			
ANNUAL MEAN	262		286		286	
HIGHEST ANNUAL MEAN					356	1976
LOWEST ANNUAL MEAN					233	1958
HIGHEST DAILY MEAN	773	May 19	1310	Apr13	1830	Aug 5 1956
LOWEST DAILY MEAN	199	Jul 26	199	Aug15	170	Oct 3 1996
ANNUAL SEVEN-DAY MINIMUM	203	Jul 20	202	Aug 2	180	Jan 21 1961
MAXIMUM PEAK FLOW			1470	Apr 13	(a)2440	Aug 6 1956
MAXIMUM PEAK STAGE			7.45	Apr 13	7.45	Apr 13 2001
INSTANTANEOUS LOW FLOW			197	Aug 15	161	Feb 2 1961
ANNUAL RUNOFF (CFSM)	1.07		1.17		1.17	
ANNUAL RUNOFF (INCHES)	14.57		15.82		15.87	
10 PERCENT EXCEEDS	331		411		387	
50 PERCENT EXCEEDS	238		247		252	
90 PERCENT EXCEEDS	211		211		214	

(a) From rating curve extended above 1,000 ft^3/s; gage height 6.82 ft, site and datum then in use.
(e) Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: December 1996 to current year.
DISSOLVED OXYGEN: December 1996 to to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum recorded, 21.0°C, July 25, 1999, but may have been higher during instrument malfunction July 23, 24, 1999; minimum, -0.5°C, on several days during winter periods.
DISSOLVED OXYGEN: Maximum, 15.6 mg/L, Mar. 23, 1999; minimum, 6.9 mg/L, July 6, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 20.0°C, Aug. 7; minimum, -0.5°C , Dec. 23, 25, 27, 28, Jan. 10.
DISSOLVED OXYGEN: Maximum, 15.4 mg/L, Dec. 22, 23; minimum, 7.4 mg/L, May 1, June 15.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.5	11.0	11.5	8.5	7.5	8.0	4.0	3.0	3.5	1.5	.5	1.0
2	13.0	12.0	12.5	9.0	8.0	8.5	3.0	2.5	3.0	1.0	.0	.5
3	12.5	11.5	12.0	8.5	7.5	8.0	2.5	2.0	2.0	1.0	.5	.5
4	12.0	10.5	11.5	8.0	7.0	7.5	3.0	2.0	2.5	2.0	1.0	1.5
5	10.5	9.5	10.0	7.0	5.5	6.5	3.0	1.0	1.5	3.0	2.0	2.5
6	9.5	8.5	9.0	7.0	6.0	6.5	1.0	.5	.5	3.0	2.5	3.0
7	8.5	7.5	7.5	7.5	7.0	7.5	1.0	.0	.5	3.5	2.5	3.0
8	7.5	6.5	7.0	8.0	7.5	7.5	1.5	1.0	1.0	2.5	.0	1.0
9	7.5	6.0	7.0	7.5	7.0	7.0	2.0	1.0	1.5	.5	.0	.0
10	7.5	6.0	7.0	7.5	7.0	7.0	2.0	2.0	2.0	1.0	-.5	.5
11	8.0	6.5	7.0	7.0	6.5	7.0	2.0	.5	1.5	2.5	.5	1.5
12	8.5	6.5	7.5	6.5	6.5	6.5	1.0	.5	.5	4.0	2.5	3.5
13	10.5	8.5	9.0	6.5	6.0	6.5	1.0	.5	1.0	4.0	4.0	4.0
14	11.5	10.5	11.0	6.0	4.5	5.0	1.5	.5	1.0	4.0	4.0	4.0
15	11.0	10.5	10.5	5.0	4.5	4.5	2.5	1.5	2.0	4.0	4.0	4.0
16	10.5	9.5	10.0	4.5	4.5	4.5	3.0	2.0	2.5	4.0	3.5	3.5
17	10.0	9.0	9.5	4.5	4.0	4.0	3.0	2.5	3.0	3.5	3.0	3.0
18	9.5	8.5	9.0	4.0	3.0	3.5	2.5	1.5	2.0	3.0	2.5	2.5
19	9.0	8.0	8.5	3.5	3.0	3.0	1.5	1.0	1.0	3.0	1.0	2.5
20	10.5	8.5	9.5	3.0	3.0	3.0	1.0	.5	1.0	1.0	.0	.5
21	10.5	9.0	9.5	3.0	2.5	2.5	1.0	.5	.5	1.0	.0	.5
22	9.5	8.5	9.0	2.5	2.0	2.0	.5	.0	.0	2.0	.5	1.5
23	10.0	9.0	9.5	2.0	1.5	2.0	.5	-.5	.0	2.5	2.0	2.5
24	11.0	10.0	10.5	3.0	2.0	2.5	.5	.0	.0	3.0	2.5	2.5
25	10.5	10.0	10.5	3.5	2.5	3.0	.5	-.5	.0	2.5	2.0	2.5
26	12.0	10.0	11.0	4.5	3.5	4.0	.5	.0	.0	2.0	1.5	1.5
27	11.5	10.5	11.5	5.0	4.5	4.5	.5	-.5	.0	2.0	1.5	2.0
28	10.5	8.0	9.5	4.5	4.0	4.0	.0	-.5	.0	2.0	1.0	1.5
29	8.0	6.5	7.0	4.5	4.0	4.5	.5	.0	.0	3.5	2.0	2.5
30	7.0	6.0	6.5	4.5	4.0	4.5	1.0	.5	.5	4.0	3.5	3.5
31	7.5	6.0	7.0	—	—	—	1.5	.5	1.0	4.0	3.5	4.0
MONTH	13.0	6.0	9.3	9.0	1.5	5.2	4.0	-.5	1.1	4.0	-.5	2.2

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125460 PINE RIVER NEAR HOXEYVILLE, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.5	2.5	3.0	2.0	.5	1.0	5.5	4.5	5.0	15.0	13.0	14.0
2	2.5	1.0	1.5	3.0	2.0	2.5	5.5	4.0	5.0	15.5	13.5	15.0
3	1.0	.5	1.0	4.0	2.0	3.0	6.5	4.5	5.5	15.0	14.0	14.5
4	2.0	1.0	1.5	4.0	3.0	3.5	6.5	4.5	6.0	14.0	12.5	13.5
5	3.0	2.0	2.5	3.0	2.0	2.5	6.5	5.5	6.0	13.5	11.5	12.5
6	3.0	3.0	3.0	2.5	1.5	2.0	8.0	6.5	7.0	12.5	11.0	12.0
7	3.5	2.5	3.0	4.0	2.5	3.0	8.5	6.5	7.5	13.0	11.5	12.5
8	3.5	1.5	2.5	4.0	3.5	3.5	9.0	7.0	8.0	14.0	11.5	13.0
9	2.5	2.0	2.5	3.5	3.0	3.5	9.0	8.0	8.5	14.5	11.5	13.0
10	2.0	.5	1.0	3.5	2.0	3.0	9.0	7.0	8.0	15.0	13.0	14.0
11	1.0	.0	.5	4.5	3.0	3.5	9.0	8.0	8.5	14.5	12.5	13.5
12	1.5	.0	1.0	3.5	2.5	3.0	9.5	9.0	9.0	13.0	11.0	12.0
13	2.5	1.5	2.0	3.5	3.0	3.5	9.5	8.5	9.0	12.5	10.0	11.5
14	3.0	2.5	2.5	5.0	3.0	4.0	10.0	8.0	9.0	12.0	10.5	11.0
15	2.5	1.5	2.0	6.0	4.5	5.0	10.0	8.5	9.0	12.0	10.5	11.5
16	2.5	1.5	2.0	5.5	4.0	4.5	10.0	7.5	8.5	13.0	12.0	12.5
17	1.5	.5	1.0	4.5	3.5	4.0	8.0	6.5	7.0	15.5	13.0	14.0
18	1.5	.0	.5	4.5	2.5	3.5	8.0	6.0	7.0	16.5	14.5	15.5
19	2.0	.0	1.0	5.0	3.0	4.0	9.0	6.5	7.5	16.0	14.0	15.0
20	2.5	1.5	2.0	5.5	3.5	4.5	8.5	8.5	8.5	15.5	14.0	15.0
21	2.0	.0	1.0	5.5	4.0	4.5	11.0	8.5	9.5	15.0	14.0	14.5
22	1.0	.0	.0	5.0	3.5	4.0	11.5	10.0	10.5	14.5	13.0	13.5
23	1.5	.5	1.0	4.5	3.5	4.0	—	—	—	14.0	12.5	13.0
24	2.0	.5	1.0	4.0	2.5	3.0	12.0	10.0	11.0	12.5	11.5	12.0
25	2.5	2.0	2.5	2.5	1.0	1.5	10.5	9.0	10.0	11.5	11.0	11.5
26	—	—	—	1.5	.5	1.0	11.0	9.0	10.0	12.5	11.0	12.0
27	2.5	1.5	2.0	2.5	1.5	2.0	12.0	9.5	11.0	12.5	11.5	12.0
28	1.5	.0	.5	3.5	1.5	2.5	12.0	9.5	11.0	14.0	11.5	12.5
29	—	—	—	4.5	3.5	4.0	12.5	10.0	11.5	14.0	12.5	13.5
30	—	—	—	5.5	3.5	4.5	14.0	11.0	12.5	13.5	11.5	12.5
31	—	—	—	6.0	4.5	5.5	—	—	—	12.5	11.0	12.0
MONTH	—	—	—	6.0	.5	3.3	—	—	—	16.5	10.0	13.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	12.0	10.5	11.5	16.0	14.5	15.5	18.0	16.5	17.5	13.5	12.0	13.0
2	11.0	10.5	10.5	14.5	12.0	13.5	18.0	16.5	17.0	14.0	12.0	13.0
3	11.0	10.5	10.5	15.0	13.5	14.0	18.0	15.5	17.0	14.5	12.5	13.5
4	11.0	10.5	10.5	16.5	13.5	15.0	18.0	15.5	16.5	14.5	13.0	13.5
5	11.0	10.0	10.5	16.0	14.0	15.0	18.0	15.5	17.0	14.0	12.5	13.5
6	13.0	11.0	12.0	15.0	12.5	14.0	19.0	16.0	17.5	14.5	12.5	13.5
7	14.0	12.0	13.0	16.0	14.0	15.0	20.0	17.5	18.5	15.0	14.0	14.5
8	15.0	12.0	13.5	17.5	14.5	16.0	19.0	17.5	18.5	16.0	14.5	15.0
9	14.5	13.0	14.0	18.0	15.5	17.0	19.0	17.5	18.0	15.5	14.0	14.5
10	14.0	13.5	13.5	18.5	16.0	17.0	18.0	16.5	17.0	14.5	13.5	14.0
11	16.0	13.0	14.0	17.0	14.5	15.5	16.5	14.5	15.5	14.0	13.0	13.5
12	16.5	14.5	15.5	16.0	14.0	15.0	16.5	14.0	15.0	14.0	13.0	13.5
13	18.0	15.0	16.5	16.0	13.5	15.0	16.5	14.5	15.5	14.0	12.0	13.0
14	18.5	16.5	17.5	16.0	13.5	15.0	15.5	13.0	14.5	12.0	10.0	11.0
15	18.0	16.5	17.0	15.5	14.5	15.0	15.0	13.0	14.0	12.0	10.5	11.0
16	17.0	15.0	16.0	17.5	14.5	16.0	14.5	13.5	14.0	11.5	10.0	11.0
17	17.0	14.5	16.0	16.5	15.5	16.0	13.5	13.0	13.0	11.5	10.5	11.0
18	16.5	15.0	15.5	15.5	14.5	15.0	13.5	12.5	13.0	12.0	11.0	11.5
19	17.0	15.0	16.0	16.5	14.5	15.5	14.0	13.5	13.5	12.0	12.0	12.0
20	16.5	15.0	16.0	17.0	15.5	16.0	15.5	13.5	14.5	12.0	12.0	12.0
21	16.0	13.5	14.5	17.0	15.5	16.5	15.0	13.5	14.5	12.5	11.5	12.0
22	14.0	13.0	13.5	17.5	16.0	16.5	14.5	13.5	14.0	12.5	11.5	12.0
23	15.5	12.5	14.0	18.0	17.0	17.5	15.5	13.5	14.5	12.5	11.5	12.0
24	16.0	13.0	14.5	19.5	16.5	18.0	16.0	14.5	15.0	11.5	10.5	11.0
25	17.0	14.0	15.5	18.5	16.5	17.0	15.0	14.0	14.5	10.5	9.0	10.0
26	17.5	15.0	16.0	17.0	15.0	16.0	16.5	14.5	15.5	9.5	9.0	9.0
27	18.0	15.0	16.5	16.0	14.0	15.5	16.0	15.0	15.5	9.5	9.0	9.5
28	18.0	15.5	17.0	15.5	14.5	15.0	15.5	14.0	15.0	10.5	9.5	10.0
29	18.0	16.0	17.0	16.0	14.5	15.5	15.5	13.5	14.5	10.5	9.0	10.0
30	17.0	16.0	16.5	17.5	15.0	16.0	15.5	14.0	14.5	—	—	—
31	—	—	—	18.0	15.5	16.5	15.0	13.5	14.5	—	—	—
MONTH	18.5	10.0	14.5	19.5	12.0	15.7	20.0	12.5	15.5	—	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125460 PINE RIVER NEAR HOXEYVILLE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.4	9.1	9.6	11.2	9.6	10.2	13.4	12.5	12.9	14.2	13.5	13.8
2	9.8	8.7	9.1	10.2	9.3	9.7	13.8	13.0	13.4	14.6	13.9	14.2
3	10.8	8.6	9.6	11.1	9.2	10.1	14.2	13.4	13.7	14.2	13.6	13.9
4	10.6	9.0	9.6	11.4	9.9	10.5	13.6	13.0	13.4	13.9	12.9	13.5
5	10.6	9.0	9.8	11.8	10.2	10.8	14.5	13.0	13.7	13.1	12.6	12.8
6	10.4	9.5	9.9	11.8	10.0	10.7	14.6	14.1	14.3	13.2	12.4	12.7
7	11.2	9.7	10.4	10.4	9.0	9.8	14.9	14.2	14.4	13.1	12.3	12.6
8	11.6	10.1	10.8	11.2	9.7	10.3	14.7	14.0	14.3	14.2	12.5	13.5
9	11.6	9.9	10.7	10.4	9.3	10.0	14.8	14.0	14.4	14.0	11.9	13.0
10	10.4	9.5	10.0	10.8	9.3	10.0	14.1	13.8	13.9	14.1	12.6	13.5
11	10.5	9.2	9.8	10.7	9.8	10.1	14.4	13.8	14.1	13.7	12.9	13.4
12	10.3	8.8	9.5	10.9	10.3	10.6	15.3	14.0	14.6	12.9	12.1	12.6
13	—	—	—	10.9	10.5	10.7	15.0	14.5	14.7	12.3	11.9	12.1
14	—	—	—	11.5	10.8	11.2	15.2	14.4	14.8	12.4	11.8	12.0
15	—	—	—	11.8	11.3	11.5	14.4	13.8	14.1	12.0	11.6	11.8
16	—	—	—	11.6	11.2	11.4	13.8	13.3	13.6	12.5	11.7	12.1
17	—	—	—	12.1	11.4	11.7	14.0	13.1	13.5	12.8	12.1	12.4
18	—	—	—	12.3	11.7	11.9	14.6	13.7	14.2	12.6	12.1	12.3
19	—	—	—	12.4	11.9	12.1	15.1	14.2	14.6	13.2	12.1	12.6
20	—	—	—	12.6	11.9	12.2	15.2	14.4	14.7	13.7	12.7	13.2
21	—	—	—	13.1	12.3	12.6	15.1	14.4	14.6	13.6	12.5	13.1
22	—	—	—	13.2	12.5	12.8	15.4	14.6	14.9	13.4	12.5	13.1
23	—	—	—	13.3	12.7	12.9	15.4	14.3	14.9	12.5	12.0	12.3
24	—	—	—	13.2	12.6	12.8	15.0	14.3	14.6	12.8	11.9	12.3
25	—	—	—	13.3	12.3	12.8	15.1	12.1	14.0	13.0	12.1	12.5
26	10.1	8.5	9.2	12.4	11.9	12.1	14.9	12.8	14.1	13.0	12.2	12.5
27	10.1	8.5	9.2	12.2	11.7	12.0	14.7	14.1	14.4	13.1	12.0	12.5
28	11.0	8.2	9.9	12.6	12.0	12.3	14.3	12.1	12.8	13.0	11.8	12.5
29	11.6	10.2	10.7	12.7	12.2	12.4	14.4	12.7	14.0	12.4	11.5	11.9
30	11.5	10.1	10.6	12.8	12.2	12.5	14.5	13.8	14.1	11.9	11.2	11.5
31	11.7	10.0	10.7	—	—	—	14.3	13.6	13.9	11.5	11.2	11.3
MONTH	—	—	—	13.3	9.0	11.4	15.4	12.1	14.1	14.6	11.2	12.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.2	11.4	11.8	14.6	13.2	14.0	11.7	11.1	11.4	8.8	7.4	8.1
2	13.0	11.9	12.5	13.3	12.7	13.1	11.9	11.4	11.7	9.3	7.8	8.6
3	13.4	12.7	13.0	13.6	12.6	13.1	11.9	11.4	11.6	9.3	8.3	8.9
4	13.2	12.4	12.8	13.6	12.4	12.9	11.9	11.2	11.6	9.6	8.9	9.2
5	12.7	12.2	12.4	13.7	12.5	13.2	11.6	11.1	11.4	10.0	9.2	9.6
6	12.7	12.1	12.4	14.0	13.1	13.6	11.2	10.7	11.0	10.0	9.2	9.6
7	13.3	12.3	12.7	13.5	12.3	13.0	11.2	9.7	10.7	9.8	9.0	9.4
8	13.2	12.3	12.8	12.9	12.1	12.5	10.7	9.9	10.3	9.6	8.9	9.3
9	13.0	12.5	12.8	13.1	12.3	12.7	10.6	10.1	10.3	9.8	8.8	9.3
10	13.9	13.0	13.6	13.3	12.1	12.8	10.7	10.2	10.4	9.5	8.6	9.0
11	14.3	13.9	14.0	13.1	12.0	12.6	10.3	9.9	10.2	9.3	8.5	8.9
12	14.1	13.4	13.8	13.3	12.3	12.8	10.2	8.8	9.7	10.0	9.0	9.5
13	13.5	13.1	13.3	13.1	12.5	12.8	10.1	8.8	9.6	10.2	9.3	9.7
14	13.1	12.6	12.9	13.4	12.4	12.8	10.1	9.3	9.7	10.0	9.3	9.6
15	13.6	13.0	13.3	12.7	11.8	12.4	10.5	9.7	10.2	10.7	8.5	9.4
16	13.5	13.2	13.3	12.6	11.8	12.3	10.4	9.7	9.9	8.7	8.5	8.6
17	14.4	13.4	14.0	13.0	12.0	12.5	10.5	9.9	10.2	8.8	8.3	8.5
18	14.6	14.1	14.3	13.3	12.2	12.7	10.6	9.9	10.3	8.3	8.0	8.2
19	14.8	13.7	14.1	13.3	12.2	12.8	10.4	9.6	10.1	8.5	8.0	8.2
20	14.0	13.5	13.8	13.5	12.5	13.0	9.7	9.3	9.5	8.4	7.9	8.1
21	14.7	13.7	14.3	13.0	12.5	12.8	9.8	9.1	9.4	8.4	7.9	8.1
22	14.5	13.3	14.2	13.3	12.8	13.1	9.4	8.8	9.1	8.8	8.3	8.6
23	14.8	14.3	14.5	13.4	13.0	13.2	—	—	—	9.0	8.5	8.8
24	14.7	14.0	14.4	13.7	12.9	13.4	9.8	8.7	9.4	9.3	8.9	9.1
25	14.3	13.6	13.9	14.3	13.7	14.0	10.2	9.4	9.8	9.5	9.2	9.3
26	—	—	—	14.4	13.6	14.1	9.9	9.4	9.7	9.4	8.9	9.2
27	14.4	14.0	14.2	14.1	13.1	13.7	9.7	9.1	9.5	9.2	8.9	9.0
28	14.8	14.3	14.6	13.6	12.1	13.0	10.0	9.2	9.6	9.2	8.8	9.1
29	—	—	—	12.5	11.9	12.2	9.8	8.8	9.5	9.1	8.6	8.9
30	—	—	—	12.2	11.2	11.6	9.6	8.0	9.1	9.4	8.7	9.0
31	—	—	—	11.5	11.1	11.3	—	—	—	9.3	8.7	9.0
MONTH	—	—	—	14.6	11.1	12.9	—	—	—	10.7	7.4	9.0

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125460 PINE RIVER NEAR HOXEYVILLE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.4	8.8	9.1	9.8	8.2	8.9	9.5	8.0	8.7	9.3	8.2	8.7
2	9.7	9.2	9.5	10.2	8.7	9.3	9.1	8.2	8.6	9.2	8.1	8.6
3	9.7	9.3	9.6	9.8	8.7	9.2	9.2	8.3	8.7	8.8	7.6	8.2
4	9.7	9.3	9.5	9.8	8.4	9.0	9.7	8.4	9.0	9.1	7.6	8.2
5	9.7	9.0	9.3	9.8	8.2	8.9	9.8	8.6	9.1	9.6	8.1	8.7
6	9.2	8.6	8.9	9.9	8.5	9.1	9.6	8.0	8.8	9.7	8.5	8.9
7	9.0	8.2	8.6	9.4	8.3	8.8	8.9	7.8	8.3	9.3	8.3	8.7
8	9.0	8.2	8.6	9.8	8.5	9.0	9.2	7.6	8.3	9.2	8.3	8.7
9	8.7	8.0	8.4	9.6	8.3	8.9	9.0	7.7	8.2	9.2	8.2	8.7
10	8.6	8.0	8.3	9.4	8.1	8.6	9.2	7.7	8.4	9.7	8.5	9.1
11	9.0	8.3	8.7	9.4	8.1	8.7	9.5	8.1	8.7	10.0	8.9	9.3
12	8.9	8.0	8.5	9.4	8.4	8.8	9.6	8.2	8.8	10.0	9.0	9.4
13	8.9	7.7	8.3	9.4	8.4	8.8	9.4	8.3	8.7	10.4	9.0	9.6
14	8.4	7.5	7.9	9.4	8.3	8.8	9.6	8.4	8.9	10.9	9.6	10.2
15	8.3	7.4	7.8	9.2	8.3	8.7	9.5	8.5	8.9	10.7	9.8	10.2
16	8.7	7.8	8.2	9.2	8.2	8.7	9.1	8.4	8.7	11.0	9.9	10.4
17	9.0	7.9	8.3	9.0	8.1	8.6	9.5	8.7	9.1	11.0	10.0	10.4
18	8.8	7.9	8.3	9.5	8.3	8.8	9.7	8.8	9.2	10.9	9.0	10.0
19	9.2	8.1	8.6	9.3	8.2	8.7	8.9	8.6	8.7	9.2	8.6	8.9
20	9.6	7.7	8.8	9.0	8.1	8.5	8.7	8.2	8.5	9.0	8.5	8.8
21	9.3	8.4	8.9	9.0	7.9	8.4	9.2	8.2	8.7	9.4	8.9	9.1
22	9.9	8.9	9.3	9.0	8.0	8.4	9.2	8.4	8.7	9.7	9.1	9.4
23	10.2	8.7	9.4	8.7	7.8	8.2	9.4	8.5	8.9	9.5	9.0	9.2
24	10.2	8.6	9.3	9.0	7.7	8.2	9.1	8.2	8.6	10.3	9.5	10.0
25	10.2	8.5	9.2	8.9	7.8	8.3	9.3	8.3	8.6	10.5	9.9	10.2
26	9.9	8.3	9.0	9.3	8.0	8.7	9.2	8.3	8.6	10.5	9.8	10.1
27	9.9	8.2	8.9	9.9	8.3	9.1	9.0	7.9	8.6	10.4	9.8	10.0
28	9.7	8.1	8.8	9.6	8.5	9.0	9.0	8.2	8.5	10.8	9.5	10.0
29	9.6	8.0	8.7	9.2	8.3	8.7	9.5	8.1	8.7	10.5	9.4	9.8
30	9.2	7.9	8.6	9.5	8.3	8.8	9.2	8.4	8.7	---	---	---
31	---	---	---	9.3	8.0	8.6	9.4	8.0	8.6	---	---	---
MONTH	10.2	7.4	8.8	10.2	7.7	8.7	9.8	7.6	8.7	---	---	---

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125550 MANISTEE RIVER NEAR WELLSTON, MI

LOCATION.--Lat 44°15'34", long 85°56'30", in NE1/4 SE1/4 sec.36, T.22 N., R.14 W., Manistee County, Hydrologic Unit 04060103, on right bank 700 ft downstream from Tippy Dam, at public access site, 3.2 mi north of Wellston, and 5.0 mi southeast of Brethren.

DRAINAGE AREA.--1,451 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1996 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good. Flow completely regulated by Tippy Dam 700 ft upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1250	1250	1540	1380	1470	1560	1860	1590	2200	1350	1250	1340
2	1250	1280	1570	1550	1550	1550	1950	1600	2200	1360	1250	1290
3	1260	1270	1470	1460	1490	1510	2010	1680	2400	1460	1250	1230
4	1280	1260	1390	1270	1460	1530	2140	1730	2450	1470	1250	1230
5	1280	1260	1410	1410	1450	1520	2160	1560	2240	1370	1250	1250
6	1340	1310	1470	1470	1430	1540	2320	1570	2170	1340	1170	1260
7	1450	1330	1320	1470	1390	1480	2790	1560	2050	1390	1180	1310
8	1440	1340	1210	1390	1490	1450	3200	1650	1870	1390	1310	1450
9	1390	1580	1370	1260	1880	1520	3360	1680	1720	1350	1060	1370
10	1400	1720	1510	1180	2040	1500	3110	1590	1670	1390	1200	1250
11	1360	1550	1480	1210	1790	1500	3020	1790	1660	1240	1210	1240
12	e1330	1510	1370	1440	1630	1480	3750	1740	1690	1320	1210	1370
13	e1300	1610	1240	1500	1630	1450	4130	1670	1690	1320	1200	1400
14	1320	1610	1310	1480	1630	1490	3930	1930	1620	1310	1190	1250
15	1320	1600	1370	1440	1590	1520	3700	e2180	1590	1310	1180	1170
16	1290	1630	1510	1410	1550	1560	3540	e2980	1620	1280	1180	1240
17	1300	1620	1480	1450	1500	1580	2650	3630	1700	1290	1280	1290
18	1310	1550	1480	1440	1460	1590	2400	3540	1770	1280	1390	1270
19	1290	1510	1460	1420	1400	1570	2210	2690	1720	1260	1620	1410
20	1300	1560	1340	1360	1420	1600	2190	2370	1610	1270	1420	1720
21	1300	1520	1340	1230	1460	1600	2240	2070	1600	1320	1290	1570
22	1210	1470	1250	1160	1320	1730	2030	2090	1590	1510	1320	1530
23	1240	1520	1150	1280	1200	2080	1880	2230	1570	1500	1330	1580
24	1290	1420	1290	1470	1440	2120	1850	2240	1570	1300	1310	1650
25	1320	1390	1240	1440	1600	1960	1880	2310	1550	1300	1330	1610
26	1340	1470	1180	1410	1670	1680	1730	2660	1530	1310	1460	1590
27	1330	1550	1200	1260	1620	1620	1710	2420	1540	1240	1370	1570
28	1340	1600	1230	1320	1520	1630	1750	2510	1530	1240	1410	1550
29	1350	1600	1270	1450	—	1560	1650	2480	1520	1270	1340	1500
30	1320	1570	1380	1570	—	1580	1610	2120	1470	1280	1340	1360
31	1310	—	1350	1450	—	1700	—	2000	—	1280	1340	—
TOTAL	40810	44460	42180	43030	43080	49760	74750	65860	53110	41300	39890	41850
MEAN	1316	1482	1361	1388	1539	1605	2492	2125	1770	1332	1287	1395
MAX	1450	1720	1570	1570	2040	2120	4130	3630	2450	1510	1620	1720
MIN	1210	1250	1150	1160	1200	1450	1610	1560	1470	1240	1060	1170
CFSM	.91	1.02	.94	.96	1.06	1.11	1.72	1.46	1.22	.92	.89	.96
IN.	1.05	1.14	1.08	1.10	1.10	1.28	1.92	1.69	1.36	1.06	1.02	1.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2001, BY WATER YEAR (WY)

MEAN	1478	1549	1538	1557	1668	1751	2128	1830	1573	1412	1343	1349
MAX	1579	1691	1722	1823	1856	1999	2512	2150	1770	1675	1453	1409
(WY)	1997	1997	1997	1997	1997	1997	1997	1997	2001	1999	1997	1997
MIN	1316	1422	1361	1388	1539	1605	1508	1504	1487	1332	1287	1268
(WY)	2001	2000	2001	2001	2001	2001	2000	1999	1998	2001	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1997 - 2001	
ANNUAL TOTAL	535840		580080			
ANNUAL MEAN	1464		1589		1597	
HIGHEST ANNUAL MEAN					1758	1997
LOWEST ANNUAL MEAN					1484	2000
HIGHEST DAILY MEAN	2980	May 19	4130	Apr 13	4240	Apr 2 1998
LOWEST DAILY MEAN	1150	Jan 18	1060	Aug 9	1060	Aug 9 2001
ANNUAL SEVEN-DAY MINIMUM	1220	Dec 22	1180	Aug 9	1180	Aug 9 2001
MAXIMUM PEAK FLOW			4290	Apr 13	6130	Mar 31 1998
MAXIMUM PEAK STAGE			10.11	Apr 13	10.91	Mar 31 1998
INSTANTANEOUS LOW FLOW			637	Jul 10	83	Mar 31 1998
ANNUAL RUNOFF (CFSM)	1.01		1.10		1.10	
ANNUAL RUNOFF (INCHES)	13.74		14.87		14.95	
10 PERCENT EXCEEDS	1640		2150		2040	
50 PERCENT EXCEEDS	1400		1470		1520	
90 PERCENT EXCEEDS	1260		1250		1270	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125550 MANISTEE RIVER NEAR WELLSTON, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1996 to current year.
DISSOLVED OXYGEN: October 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 24.0°C, Aug. 9, 10, 2001; minimum, 0.0°C, on several days during winter periods.
DISSOLVED OXYGEN: Maximum, 16.0 mg/L, Mar. 11, 12, 1997; minimum, 6.4 mg/L, June 23, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 24.0°C, Aug. 9, 10; minimum, 0.5°C, on several days during winter period.
DISSOLVED OXYGEN: Maximum, 13.5 mg/L, Feb. 27, 28; minimum, 6.9 mg/L, July 13, 14.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.0	14.5	14.5	11.5	11.0	11.0	3.5	3.5	3.5	.5	.5	.5
2	15.0	14.0	14.5	11.0	11.0	11.0	3.5	3.5	3.5	.5	.5	.5
3	14.5	14.0	14.5	11.0	10.5	11.0	3.5	3.0	3.5	.5	.5	.5
4	14.5	14.0	14.5	10.5	10.5	10.5	3.0	3.0	3.0	.5	.5	.5
5	14.5	14.0	14.0	10.5	10.0	10.0	3.0	2.5	3.0	.5	.5	.5
6	14.0	13.5	13.5	10.0	10.0	10.0	3.0	2.5	2.5	.5	.5	.5
7	13.5	13.0	13.0	10.0	10.0	10.0	2.5	2.0	2.0	.5	.5	.5
8	13.0	12.5	13.0	10.0	10.0	10.0	2.0	2.0	2.0	1.0	.5	.5
9	12.5	12.5	12.5	10.0	9.5	9.5	2.0	2.0	2.0	1.0	.5	1.0
10	12.5	12.0	12.0	9.5	9.5	9.5	2.0	2.0	2.0	1.0	1.0	1.0
11	12.0	11.5	12.0	9.5	9.0	9.0	2.0	1.5	1.5	1.0	1.0	1.0
12	---	---	---	9.0	9.0	9.0	1.5	1.5	1.5	1.0	1.0	1.0
13	---	---	---	9.0	8.5	9.0	1.5	1.5	1.5	1.0	1.0	1.0
14	12.0	11.5	12.0	8.5	8.5	8.5	1.5	1.5	1.5	1.0	.5	1.0
15	12.5	12.0	12.0	8.5	8.0	8.0	1.5	1.5	1.5	1.0	1.0	1.0
16	12.5	12.0	12.0	8.0	7.5	8.0	1.5	1.5	1.5	1.0	1.0	1.0
17	12.0	12.0	12.0	7.5	7.0	7.5	1.5	1.5	1.5	1.0	1.0	1.0
18	12.0	11.5	12.0	7.0	7.0	7.0	1.5	1.5	1.5	1.5	1.0	1.5
19	12.0	11.5	12.0	7.0	6.5	6.5	1.5	1.5	1.5	1.5	1.0	1.5
20	12.0	11.5	12.0	6.5	6.0	6.0	1.5	1.5	1.5	1.5	1.0	1.5
21	12.0	12.0	12.0	6.0	5.5	5.5	1.5	1.5	1.5	1.5	1.0	1.5
22	12.0	11.5	12.0	5.5	5.0	5.5	1.5	1.5	1.5	1.5	1.0	1.0
23	12.0	11.5	11.5	5.0	5.0	5.0	1.5	1.0	1.0	1.0	1.0	1.0
24	11.5	11.5	11.5	5.0	4.5	4.5	1.0	1.0	1.0	1.0	1.0	1.0
25	11.5	11.5	11.5	4.5	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0
26	12.5	11.5	12.0	4.0	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0
27	12.5	11.5	12.0	4.0	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0
28	12.0	11.5	11.5	4.0	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0
29	11.5	11.5	11.5	4.0	3.5	4.0	1.0	.5	1.0	1.0	1.0	1.0
30	11.5	11.0	11.5	3.5	3.5	3.5	1.0	.5	.5	1.0	1.0	1.0
31	11.5	11.0	11.5	---	---	---	.5	.5	.5	1.0	1.0	1.0
MONTH	---	---	---	11.5	3.5	7.5	3.5	.5	1.7	1.5	.5	.9

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125550 MANISTEE RIVER NEAR WELLSTON, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	1.0	1.0	1.5	1.0	1.5	3.5	3.0	3.0	13.0	12.0	12.5
2	1.5	1.0	1.0	1.5	1.5	1.5	3.5	3.5	3.5	14.0	13.0	13.5
3	1.5	1.5	1.5	1.5	1.5	1.5	4.0	3.5	3.5	14.0	13.5	13.5
4	1.5	1.5	1.5	1.5	1.5	1.5	4.0	3.5	4.0	14.0	13.5	13.5
5	1.5	1.5	1.5	1.5	1.5	1.5	4.5	4.0	4.0	14.5	13.5	14.0
6	1.5	1.0	1.0	1.5	1.5	1.5	4.5	4.5	4.5	14.5	14.0	14.5
7	1.0	1.0	1.0	2.0	1.5	1.5	5.0	4.5	4.5	14.5	14.0	14.0
8	1.0	1.0	1.0	1.5	1.5	1.5	5.5	5.0	5.0	14.0	13.5	14.0
9	1.5	1.0	1.5	1.5	1.5	1.5	6.0	5.5	6.0	14.5	14.0	14.0
10	1.5	1.5	1.5	1.5	1.5	1.5	7.5	6.0	6.5	15.0	14.5	15.0
11	1.5	1.5	1.5	1.5	1.5	1.5	7.0	7.0	7.0	15.0	14.5	14.5
12	1.5	1.5	1.5	2.0	1.5	2.0	7.0	6.5	7.0	15.0	14.5	14.5
13	1.5	1.0	1.0	2.0	1.5	1.5	7.0	6.5	7.0	15.0	14.5	15.0
14	1.0	1.0	1.0	2.0	1.5	2.0	7.5	7.0	7.0	15.0	14.5	15.0
15	1.0	1.0	1.0	2.0	2.0	2.0	8.5	7.5	8.0	—	—	—
16	1.0	1.0	1.0	2.0	2.0	2.0	8.0	8.0	8.0	—	—	—
17	1.5	1.0	1.5	2.0	2.0	2.0	8.5	8.0	8.0	15.0	14.5	15.0
18	1.5	1.0	1.5	2.5	2.0	2.0	8.0	8.0	8.0	16.0	15.0	15.5
19	1.5	1.5	1.5	2.5	2.5	2.5	8.5	8.0	8.0	16.5	15.5	16.0
20	1.5	1.0	1.5	3.0	2.5	2.5	9.0	8.5	9.0	17.0	15.5	16.5
21	1.5	1.0	1.0	3.0	2.5	3.0	9.0	9.0	9.0	17.5	16.0	17.0
22	1.0	1.0	1.0	3.5	3.0	3.0	10.0	9.0	9.5	16.5	16.0	16.5
23	1.5	1.0	1.0	3.5	3.0	3.5	10.0	9.5	10.0	16.5	16.0	16.5
24	1.5	1.0	1.0	3.5	3.5	3.5	10.5	10.0	10.0	16.0	15.5	16.0
25	1.5	1.0	1.0	3.5	3.5	3.5	10.5	10.0	10.0	15.5	15.0	15.5
26	1.0	1.0	1.0	3.5	3.0	3.5	11.0	10.5	10.5	15.0	15.0	15.0
27	1.0	1.0	1.0	3.5	3.0	3.0	11.5	11.0	11.0	15.0	14.5	14.5
28	1.5	1.0	1.0	3.0	3.0	3.0	11.5	11.0	11.0	14.5	14.5	14.5
29	—	—	—	3.0	2.5	3.0	12.0	11.0	11.5	15.5	14.5	15.0
30	—	—	—	3.0	2.5	3.0	12.5	12.0	12.0	15.5	14.5	15.0
31	—	—	—	3.0	3.0	3.0	—	—	—	16.0	15.0	15.5
MONTH	1.5	1.0	1.2	3.5	1.0	2.3	12.5	3.0	7.5	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	15.0	15.5	20.5	18.5	19.5	23.0	22.5	22.5	20.0	19.5	19.5
2	15.5	14.5	15.0	20.5	19.5	20.0	23.0	22.0	22.0	19.5	19.5	19.5
3	14.5	14.5	14.5	20.0	19.5	20.0	23.0	22.0	22.5	19.5	19.5	19.5
4	14.5	14.5	14.5	20.0	19.0	19.5	23.0	22.0	22.5	19.5	19.0	19.5
5	14.5	14.0	14.5	20.0	19.0	19.5	22.5	22.0	22.5	20.0	19.0	19.5
6	15.0	14.0	14.5	20.5	20.0	20.0	23.0	22.5	22.5	20.0	19.0	19.5
7	15.0	14.0	14.5	20.5	20.0	20.0	23.0	22.5	23.0	20.0	19.5	20.0
8	15.0	14.0	14.5	20.5	20.0	20.0	23.5	22.5	23.0	20.0	19.5	19.5
9	16.0	14.5	15.0	21.0	20.0	20.5	24.0	23.0	23.5	19.5	18.5	19.5
10	16.0	15.0	15.5	21.0	20.0	20.5	24.0	23.0	23.5	19.0	18.5	19.0
11	16.0	15.5	15.5	21.0	20.5	21.0	23.5	23.0	23.5	19.5	19.0	19.0
12	16.5	15.5	16.0	21.5	20.5	21.0	23.5	22.5	23.0	19.0	18.5	19.0
13	17.5	16.5	17.0	21.5	20.5	21.0	23.0	22.5	22.5	19.0	18.0	18.5
14	18.0	17.0	17.5	21.5	20.5	21.0	23.0	22.0	22.5	18.5	18.0	18.0
15	18.0	17.0	17.5	21.5	21.0	21.5	22.5	22.0	22.5	18.0	17.5	18.0
16	17.5	16.5	17.0	21.5	21.0	21.5	22.0	21.5	22.0	18.0	17.5	17.5
17	18.0	17.0	17.5	22.0	21.5	21.5	21.5	21.0	21.5	17.5	17.5	17.5
18	18.5	18.0	18.5	22.0	21.5	22.0	21.5	21.0	21.0	17.5	17.0	17.5
19	18.0	17.0	17.5	22.0	21.5	21.5	21.0	20.0	20.5	17.5	17.0	17.0
20	18.5	17.5	18.0	22.0	21.5	21.5	20.5	20.0	20.0	17.0	16.0	16.5
21	18.5	17.5	18.0	22.0	21.5	21.5	20.5	20.0	20.5	16.5	16.0	16.5
22	18.0	17.5	17.5	22.0	21.5	21.5	20.5	20.0	20.5	16.5	16.5	16.5
23	18.0	17.5	18.0	22.0	21.5	22.0	21.0	20.0	20.5	16.5	16.0	16.5
24	18.5	17.5	18.0	22.0	21.0	21.5	21.0	20.0	20.5	16.0	15.5	15.5
25	19.0	18.0	18.5	22.5	22.0	22.0	20.5	20.5	20.5	15.5	15.0	15.0
26	19.0	19.0	19.0	23.0	22.0	22.5	20.5	20.0	20.0	15.0	14.5	14.5
27	19.5	19.0	19.0	23.0	22.0	22.5	20.5	20.0	20.5	14.5	14.0	14.5
28	20.0	19.0	19.5	22.5	22.0	22.0	20.5	20.0	20.0	14.5	14.0	14.0
29	20.0	19.5	20.0	22.0	21.5	22.0	20.5	20.0	20.0	14.0	13.5	14.0
30	20.5	19.5	20.0	22.0	21.5	22.0	20.5	20.0	20.5	14.0	13.5	14.0
31	—	—	—	22.5	21.5	22.0	20.5	19.5	20.0	—	—	—
MONTH	20.5	14.0	16.9	23.0	18.5	21.1	24.0	19.5	21.6	20.0	13.5	17.5

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125550 MANISTEE RIVER NEAR WELLSTON, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.0	7.7	8.1	9.6	9.4	9.5	12.5	12.3	12.4	13.2	13.0	13.1
2	8.0	7.3	7.7	9.5	9.3	9.4	12.5	12.3	12.4	13.2	12.9	13.0
3	8.4	7.5	7.8	9.6	9.0	9.3	12.6	12.4	12.4	13.1	12.9	13.0
4	8.7	7.8	8.3	9.6	9.1	9.3	12.6	12.4	12.5	13.3	13.0	13.1
5	8.7	8.4	8.5	9.6	9.3	9.4	12.6	12.3	12.4	13.2	13.0	13.1
6	8.7	8.3	8.5	9.7	9.3	9.5	12.5	12.4	12.5	13.1	13.0	13.1
7	8.9	8.4	8.6	9.6	9.4	9.5	12.7	12.5	12.6	13.1	13.0	13.0
8	8.9	8.6	8.8	9.5	9.2	9.4	12.9	12.6	12.8	13.3	12.9	13.1
9	8.8	7.9	8.6	9.6	9.2	9.5	12.9	12.7	12.8	13.3	13.1	13.2
10	8.8	8.3	8.6	9.9	9.4	9.7	12.8	12.6	12.7	13.4	13.1	13.2
11	9.0	8.6	8.8	10.2	9.8	10.0	12.7	12.6	12.7	13.4	13.1	13.2
12	—	—	—	10.2	9.8	10.0	12.8	12.7	12.8	13.3	13.2	13.2
13	—	—	—	10.1	9.9	10.0	12.9	12.7	12.8	13.2	13.0	13.1
14	9.5	9.2	9.4	10.3	9.9	10.1	12.9	12.7	12.8	13.2	13.0	13.1
15	9.6	9.2	9.4	10.3	10.0	10.2	12.9	12.8	12.8	13.3	13.0	13.1
16	9.7	9.3	9.6	10.3	10.0	10.2	12.8	12.6	12.7	13.1	13.0	13.1
17	9.9	9.3	9.7	10.6	10.1	10.4	12.7	12.6	12.6	13.1	12.9	13.0
18	9.8	9.4	9.6	10.7	10.5	10.6	12.8	12.7	12.7	13.0	12.7	12.9
19	9.9	9.2	9.6	10.9	10.6	10.7	12.8	12.7	12.8	13.0	12.7	12.8
20	9.8	9.5	9.6	11.1	10.6	10.9	12.9	12.7	12.8	12.9	12.7	12.8
21	9.9	8.6	9.3	11.3	10.9	11.1	12.8	12.7	12.7	12.9	12.6	12.8
22	9.1	8.5	8.8	11.3	11.1	11.2	12.9	12.7	12.7	12.8	12.5	12.7
23	9.2	8.5	8.8	11.5	11.2	11.4	12.9	12.6	12.8	12.8	12.6	12.7
24	9.8	9.0	9.5	11.7	11.3	11.5	13.0	12.8	12.9	12.9	12.7	12.8
25	9.7	9.0	9.5	11.8	11.5	11.7	13.1	12.9	13.0	13.0	12.8	12.9
26	9.8	9.5	9.6	11.9	11.6	11.8	13.0	12.9	12.9	12.9	12.7	12.8
27	9.6	9.4	9.5	12.3	11.7	12.0	13.2	12.9	13.1	12.9	12.6	12.8
28	9.8	9.6	9.7	12.3	12.1	12.2	13.1	12.9	13.0	12.9	12.6	12.8
29	9.8	9.6	9.7	12.4	12.2	12.3	13.1	12.9	13.0	12.8	12.6	12.7
30	9.8	9.6	9.7	12.5	12.2	12.4	13.2	13.0	13.0	12.7	12.5	12.6
31	9.8	9.5	9.7	—	—	—	13.2	13.0	13.1	12.6	12.4	12.5
MONTH	—	—	—	12.5	9.0	10.5	13.2	12.3	12.7	13.4	12.4	12.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.6	12.5	12.5	13.4	13.3	13.4	12.1	11.9	12.0	9.4	8.9	9.2
2	12.5	12.3	12.4	13.4	13.2	13.3	11.9	11.6	11.8	9.5	9.1	9.4
3	12.5	12.3	12.4	13.4	13.2	13.3	12.0	11.7	11.9	9.4	9.2	9.3
4	12.4	12.3	12.4	13.3	13.2	13.3	12.3	11.7	12.0	9.4	9.1	9.3
5	12.4	12.3	12.4	13.4	13.2	13.3	12.1	11.1	11.7	9.3	9.1	9.2
6	12.6	12.3	12.5	13.3	13.2	13.2	11.9	10.7	11.3	9.2	9.0	9.1
7	12.6	12.5	12.6	13.2	13.0	13.1	11.5	10.5	11.1	9.3	9.0	9.1
8	12.6	12.5	12.5	13.2	13.0	13.1	11.5	11.0	11.2	9.2	8.9	9.1
9	12.6	12.4	12.4	13.2	13.0	13.1	11.5	11.1	11.3	9.3	8.9	9.1
10	12.6	12.4	12.5	13.2	13.0	13.1	11.3	10.7	11.0	9.1	8.7	8.9
11	12.7	12.5	12.6	13.2	12.9	13.0	11.0	10.5	10.8	9.0	8.7	8.9
12	12.8	12.6	12.7	13.0	12.8	12.9	11.2	10.7	11.0	9.0	8.7	8.9
13	12.8	12.6	12.7	12.9	12.8	12.9	11.3	10.9	11.1	9.0	8.7	8.8
14	12.9	12.7	12.8	12.9	12.8	12.9	11.3	10.5	11.0	9.0	8.4	8.8
15	12.9	12.8	12.9	13.0	12.8	12.9	11.0	10.3	10.7	—	—	—
16	12.9	12.7	12.8	12.9	12.7	12.8	11.0	10.6	10.8	—	—	—
17	13.0	12.9	12.9	12.9	12.7	12.8	11.0	10.3	10.6	8.9	8.7	8.8
18	13.0	12.9	12.9	12.8	12.6	12.7	10.6	9.8	10.3	8.9	8.7	8.8
19	13.0	12.8	12.9	12.8	12.6	12.7	10.1	9.7	9.9	8.8	8.6	8.7
20	13.1	13.0	13.0	12.7	12.5	12.6	10.2	9.6	9.8	8.7	8.6	8.6
21	13.2	13.0	13.1	12.6	12.4	12.5	10.1	9.5	9.8	8.6	8.4	8.5
22	13.3	13.0	13.2	12.6	12.1	12.4	10.1	9.2	9.6	8.6	8.3	8.4
23	13.3	13.0	13.2	12.3	11.9	12.2	9.7	9.0	9.3	9.2	8.5	8.7
24	13.3	13.1	13.2	12.2	11.8	12.0	9.7	8.8	9.2	8.7	8.5	8.6
25	13.3	13.1	13.2	12.2	11.9	12.0	9.9	8.8	9.4	8.5	8.4	8.5
26	13.3	13.2	13.3	12.4	12.0	12.2	9.6	9.1	9.3	8.5	8.4	8.4
27	13.5	13.2	13.4	12.4	12.1	12.3	9.9	8.9	9.3	8.5	8.4	8.4
28	13.5	13.4	13.4	12.5	12.1	12.4	9.7	8.8	9.2	8.6	8.3	8.4
29	—	—	—	12.5	12.2	12.3	9.3	8.8	9.1	8.6	8.4	8.5
30	—	—	—	12.4	12.2	12.3	9.6	8.8	9.2	8.6	8.5	8.5
31	—	—	—	12.3	11.9	12.1	—	—	—	8.6	8.4	8.5
MONTH	13.5	12.3	12.8	13.4	11.8	12.7	12.3	8.8	10.5	—	—	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04125550 MANISTEE RIVER NEAR WELLSTON, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.6	8.4	8.5	7.6	7.4	7.5	7.6	7.3	7.4	8.2	7.6	7.8
2	8.6	8.3	8.4	7.7	7.4	7.6	7.5	7.3	7.4	8.2	7.7	7.8
3	8.7	8.5	8.6	7.6	7.3	7.5	7.5	7.2	7.4	8.0	7.6	7.7
4	8.6	8.5	8.6	7.4	7.2	7.3	7.6	7.3	7.5	8.2	7.6	7.7
5	8.7	8.5	8.6	7.5	7.2	7.3	7.6	7.3	7.5	8.4	7.6	7.8
6	8.7	8.5	8.6	7.5	7.3	7.4	7.6	7.4	7.5	8.2	7.6	7.8
7	8.8	8.4	8.6	7.4	7.2	7.3	7.6	7.3	7.4	7.9	7.5	7.7
8	8.7	8.4	8.6	7.4	7.2	7.3	7.6	7.3	7.4	7.8	7.5	7.7
9	9.3	8.3	8.6	7.4	7.1	7.3	7.7	7.3	7.4	7.6	7.5	7.6
10	8.6	8.3	8.4	7.4	7.0	7.2	7.6	7.3	7.4	8.0	7.4	7.6
11	8.4	8.1	8.2	7.4	7.0	7.2	7.7	7.4	7.5	8.2	7.5	7.7
12	8.3	7.9	8.2	7.2	7.0	7.1	7.7	7.2	7.5	8.1	7.6	7.7
13	8.2	7.8	8.0	7.3	6.9	7.1	7.6	7.2	7.4	7.9	7.6	7.7
14	8.1	7.5	7.8	7.2	6.9	7.1	7.6	7.2	7.4	7.8	7.2	7.5
15	7.9	7.4	7.6	7.2	7.0	7.1	7.6	7.2	7.4	7.7	7.3	7.5
16	8.8	7.3	7.9	7.2	7.0	7.1	7.4	7.1	7.3	8.3	7.4	7.8
17	8.2	7.7	8.0	7.2	7.0	7.1	7.3	7.1	7.2	8.3	8.0	8.1
18	8.0	7.8	7.9	7.3	7.1	7.2	7.4	7.2	7.3	8.4	8.1	8.3
19	8.0	7.6	7.8	7.3	7.1	7.2	7.5	7.2	7.3	8.5	8.2	8.3
20	8.1	7.7	7.9	7.3	7.0	7.1	7.6	7.1	7.3	8.5	8.0	8.3
21	8.0	7.8	7.9	7.2	7.0	7.1	7.7	7.3	7.4	8.7	8.5	8.6
22	7.9	7.7	7.8	7.2	7.0	7.1	7.6	7.4	7.5	8.7	8.5	8.7
23	8.0	7.7	7.9	7.3	7.0	7.1	7.7	7.4	7.5	8.8	8.6	8.7
24	8.0	7.7	7.9	7.3	7.0	7.1	7.8	7.4	7.6	9.0	8.7	8.8
25	7.9	7.6	7.8	7.3	7.0	7.2	7.7	7.5	7.6	9.0	8.8	8.9
26	7.8	7.6	7.7	7.5	7.2	7.3	7.7	7.3	7.5	9.0	8.8	8.9
27	7.7	7.5	7.6	7.5	7.2	7.4	7.9	7.3	7.5	9.0	8.8	8.9
28	7.7	7.5	7.6	7.5	7.2	7.3	7.8	7.3	7.5	9.2	8.9	9.1
29	7.7	7.5	7.6	7.4	7.2	7.3	8.0	7.4	7.6	9.5	9.2	9.3
30	7.7	7.5	7.6	7.4	7.2	7.3	8.0	7.5	7.6	9.6	9.4	9.5
31	—	—	—	7.6	7.3	7.4	7.8	7.4	7.6	—	—	—
MONTH	9.3	7.3	8.1	7.7	6.9	7.2	8.0	7.1	7.4	9.6	7.2	8.2

STREAMS TRIBUTARY TO LAKE MICHIGAN

04126740 PLATTE RIVER AT HONOR, MI

LOCATION.--Lat 44°40'05", long 86°02'05", in SW1/4 NW1/4 sec.8, T.26 N., R.14 W., Benzie County, Hydrologic Unit 04060104, on right bank 20 ft downstream from bridge on U.S. Highway 31, 1.0 mi west of Honor.

DRAINAGE AREA.--118 mi^2.

PERIOD OF RECORD.--April 1990 to current year.

GAGE.--Water-stage recorder. Datum of gage is 589.73 ft above sea level (Michigan Department of Transportation bench mark).

REMARKS.--Records good except for estimated daily discharges, which are fair. Some diversion for fish hatchery 6 mi upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	90	101	96	100	98	105	102	138	106	97	110
2	94	90	99	96	99	97	106	104	154	104	99	117
3	94	89	98	97	98	97	111	106	135	105	98	107
4	93	89	99	96	98	97	110	134	125	107	97	105
5	93	88	99	99	97	98	112	113	122	104	97	105
6	100	89	98	98	97	98	127	108	119	104	96	104
7	103	91	99	97	96	97	155	106	116	103	96	116
8	102	89	98	97	99	97	139	105	114	102	96	122
9	99	117	98	96	140	97	122	103	115	101	96	144
10	96	112	98	97	117	97	117	107	116	101	96	141
11	95	102	97	96	107	98	163	116	115	100	96	120
12	94	99	98	96	104	97	149	106	114	99	96	115
13	94	105	98	97	103	100	127	103	111	99	94	113
14	95	112	98	99	102	99	121	102	110	97	94	109
15	94	109	97	104	101	100	118	130	113	98	95	108
16	94	115	98	105	100	99	118	219	115	98	103	106
17	93	111	99	101	98	97	115	131	113	97	111	106
18	93	105	98	100	e98	96	112	119	123	98	138	106
19	91	105	98	99	98	97	110	113	120	98	131	172
20	91	109	98	97	97	98	109	111	114	98	109	217
21	90	107	98	94	96	101	109	138	112	100	105	151
22	89	105	98	95	e96	103	107	135	112	101	105	134
23	90	103	99	95	96	104	106	118	111	101	104	156
24	93	103	100	95	96	102	107	124	111	99	103	154
25	93	103	99	94	112	98	105	144	109	98	112	133
26	93	112	99	94	105	97	104	155	108	97	145	142
27	92	109	99	94	101	96	103	133	108	95	120	134
28	91	107	98	93	98	97	101	124	107	97	115	125
29	91	105	97	95	—	98	102	119	106	101	111	121
30	91	103	96	115	—	101	101	115	107	98	111	119
31	90	—	97	105	—	104	—	113	—	97	110	—
TOTAL	2904	3073	3046	3032	2849	3055	3491	3756	3493	3103	3276	3812
MEAN	93.7	102	98.3	97.8	102	98.5	116	121	116	100	106	127
MAX	103	117	101	115	140	104	163	219	154	107	145	217
MIN	89	88	96	93	96	96	101	102	106	95	94	104
CFSM	.79	.87	.83	.83	.86	.84	.99	1.03	.99	.85	.90	1.08
IN.	.92	.97	.96	.96	.90	.96	1.10	1.18	1.10	.98	1.03	1.20

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 2001, BY WATER YEAR (WY)

MEAN	121	125	123	124	123	130	139	131	127	121	116	124
MAX	148	150	151	147	144	164	169	155	165	152	135	158
(WY)	1992	1993	1992	1992	1992	1992	1992	1997	1993	1993	1991	1993
MIN	93.7	96.3	98.3	97.8	102	98.5	96.0	95.6	98.5	93.2	96.2	99.6
(WY)	2001	2000	2001	2001	2001	2001	2000	2000	2000	2000	1998	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1990 - 2001	
ANNUAL TOTAL	36801		38890			
ANNUAL MEAN	101		107		125	
HIGHEST ANNUAL MEAN					147	1993
LOWEST ANNUAL MEAN					101	2000
HIGHEST DAILY MEAN	228	Sep 2	219	May 16	386	Oct 25 1991
LOWEST DAILY MEAN	87	Jul 17	88	Nov 5	87	Jul 17 2000
ANNUAL SEVEN-DAY MINIMUM	88	Jul 14	89	Oct 31	88	Jul 14 2000
MAXIMUM PEAK FLOW			309	May 16	516	Oct 25 1991
MAXIMUM PEAK STAGE			2.42	May 16	(a)4.04	Jan 19 1994
INSTANTANEOUS LOW FLOW			75	Aug 13	75	Aug 13 2001
ANNUAL RUNOFF (CFSM)	.85		.90		1.06	
ANNUAL RUNOFF (INCHES)	11.60		12.26		14.37	
10 PERCENT EXCEEDS	111		124		152	
50 PERCENT EXCEEDS	99		101		125	
90 PERCENT EXCEEDS	91		94		98	

(a) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

445331085564501 GLEN LAKE NEAR GLEN ARBOR, MI

LOCATION.--Lat 44°51'31", long 85°59'46", in SW1/4 NW1/4 sec. 3, T.28 N., R.14 W., Leelanau County, Hydrologic Unit 04060104, at bridge on State Highway 22, 2.6 mi south of Glen Arbor.

DRAINAGE AREA.--30.8 mi^2.

PERIOD OF RECORD.--June 1942 to current year.

GAGE.--Non recording gage. Datum of gage is 596.00 ft above sea level.

REMARKS.--Staff gage read by observer. There is one small inlet on the south side near Burdickville. The outlet is the Crystal River. Lake elevation controlled by dam. Established legal level 596.75 ft above sea level.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 1.90 ft, June 23, 1943; minimum observed, 0.34 ft, Nov. 8, 2000.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 1.19 ft, June 19, 20; minimum observed, 0.34 ft, Nov. 8.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.69	.41	—	—	—	—	—	.78	1.13	—	—	.79
2	.68	.40	.45	—	—	—	—	.78	—	.86	.68	.75
3	.66	.39	.43	—	—	—	—	.80	1.16	.82	.68	.72
4	.66	.37	.43	.42	—	.50	.47	—	1.14	.82	—	.70
5	.62	.35	.42	—	—	—	.47	—	1.15	.81	.68	.69
6	.63	—	.41	—	—	.51	.48	—	1.15	.80	.67	.68
7	.61	—	—	—	—	—	.52	—	1.15	.79	.68	.68
8	.60	.34	.40	—	—	—	.54	.88	1.14	.78	.66	.70
9	.60	—	—	—	—	.50	.51	.91	1.14	.78	.66	.81
10	.60	.38	.40	—	—	—	.54	.90	1.16	.78	.68	.89
11	.60	.38	—	—	—	.51	.57	.90	1.16	.77	.68	.86
12	.59	.37	.40	—	—	—	.62	—	1.14	.76	.65	.84
13	.59	.40	.39	—	—	—	.67	.87	1.14	.75	.64	—
14	.57	.46	.40	—	.52	.54	.72	.87	—	.75	.62	.79
15	.56	.46	—	—	.52	.54	.73	—	—	.72	.60	.76
16	.54	—	.41	—	—	—	.73	1.00	—	.72	.62	.75
17	.54	—	.41	.42	—	.52	—	1.01	1.14	.72	.63	.73
18	.52	.47	—	—	—	—	.75	1.03	1.13	.70	.63	.72
19	.51	.47	—	—	—	—	.73	1.02	1.19	.70	—	—
20	.50	.47	—	—	—	.52	.73	1.00	1.19	.72	.66	.90
21	.50	.50	—	—	—	—	—	1.04	—	.74	.67	.89
22	.48	—	—	.46	—	.52	.73	1.03	1.13	.74	.66	.88
23	.47	.50	—	—	.48	—	.73	1.03	1.10	.75	.65	.91
24	.48	.48	—	—	—	.52	.77	1.03	1.06	.75	.65	—
25	.49	.46	—	—	—	—	.78	1.05	1.05	.73	.65	.92
26	—	—	—	—	—	—	.78	1.08	1.02	—	.90	—
27	.48	.46	—	—	—	.52	.78	1.10	1.00	.70	.90	.90
28	.46	.46	—	—	—	.52	.77	1.11	.96	—	.88	.90
29	.45	.46	—	—	—	—	.77	1.10	.96	.70	.87	.90
30	.44	.45	—	.44	—	—	.77	1.09	.92	—	.84	.88
31	.40	—	—	—	—	.49	—	1.08	—	.68	.84	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04126970 BOARDMAN RIVER AT BROWN BRIDGE ROAD NEAR MAYFIELD, MI

LOCATION.--Lat 44°39'24", long 85°26'12", in NE1/4 NE1/4 sec.18, T.26 N., R.9 W., Grand Traverse County, Hydrologic Unit 04060105, on right bank 200 ft upstream from Brown Bridge Road, 5.1 mi northeast of Mayfield.

DRAINAGE AREA.--141 mi^2.

PERIOD OF RECORD.--October 1997 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 830 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	76	92	77	87	89	106	124	155	103	87	84
2	75	75	90	77	87	90	109	122	166	103	87	82
3	75	74	86	77	88	88	113	125	191	103	86	83
4	73	74	87	77	87	88	120	138	188	104	83	87
5	75	74	87	78	86	87	133	135	170	105	82	85
6	80	74	83	77	85	87	178	132	158	103	81	83
7	86	75	83	78	85	86	241	130	144	e100	81	85
8	91	75	84	74	88	86	292	128	135	e100	80	85
9	89	87	83	79	106	86	297	123	132	e100	78	88
10	86	100	83	79	103	85	273	121	133	100	79	95
11	82	95	82	78	100	86	271	124	135	96	79	90
12	82	92	81	77	97	82	366	123	136	e94	79	88
13	80	93	82	78	99	85	420	120	131	e94	79	86
14	78	94	81	79	98	84	380	118	125	e93	79	83
15	77	95	81	79	96	85	292	131	132	e93	79	82
16	77	95	82	80	95	85	241	251	140	e92	84	82
17	77	94	83	79	90	84	210	269	132	92	87	82
18	77	91	82	79	91	84	189	235	131	92	87	85
19	76	90	81	79	92	85	174	186	131	93	90	94
20	76	90	80	77	89	87	165	167	124	102	90	114
21	76	90	80	83	88	92	160	153	120	102	86	118
22	75	88	77	81	91	97	155	164	118	100	85	114
23	75	88	80	79	92	100	152	170	118	97	84	125
24	76	89	81	79	87	103	151	161	114	95	83	134
25	76	88	78	78	95	97	146	175	111	93	84	124
26	76	94	78	79	94	92	144	197	105	90	99	130
27	76	98	79	80	90	93	141	210	107	89	93	118
28	75	98	76	79	88	90	134	197	103	90	90	111
29	74	97	82	79	---	91	131	175	103	91	87	105
30	74	95	79	92	---	93	127	158	103	89	86	100
31	74	---	78	90	---	101	---	144	---	88	85	---
TOTAL	2414	2638	2541	2457	2574	2768	6011	4906	3991	2986	2619	2922
MEAN	77.9	87.9	82.0	79.3	91.9	89.3	200	158	133	96.3	84.5	97.4
MAX	91	100	92	92	106	103	420	269	191	105	99	134
MIN	73	74	76	74	85	82	106	118	103	88	78	82
CFSM	.55	.62	.58	.56	.65	.63	1.42	1.12	.94	.68	.60	.69
IN.	.64	.70	.67	.65	.68	.73	1.59	1.29	1.05	.79	.69	.77

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2001, BY WATER YEAR (WY)

MEAN	93.0	97.1	96.8	95.8	104	111	152	122	112	98.3	85.6	87.4
MAX	110	114	107	113	118	130	200	158	133	122	95.4	97.4
(WY)	1998	1998	1998	1998	1999	1998	2001	2001	2001	1999	1999	2001
MIN	77.9	83.7	82.0	79.3	91.9	89.3	89.4	94.6	95.2	82.8	80.5	83.7
(WY)	2001	2000	2001	2001	2001	2001	2000	2000	2000	2000	2000	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1998 - 2001	
ANNUAL TOTAL	32459		38827			
ANNUAL MEAN	88.7		106		104	
HIGHEST ANNUAL MEAN					113	1998
LOWEST ANNUAL MEAN					90.4	2000
HIGHEST DAILY MEAN	184	Feb 28	420	Apr 13	423	Apr 2 1998
LOWEST DAILY MEAN	73	Oct 4	73	Oct 4	73	Oct 4 2000
ANNUAL SEVEN-DAY MINIMUM	74	Oct 29	74	Oct 29	74	Oct 29 2000
MAXIMUM PEAK FLOW			434	Apr 13	449	Apr 2 1998
MAXIMUM PEAK STAGE			5.21	Apr 13	5.44	Apr 2 1998
INSTANTANEOUS LOW FLOW			66	Jan 20	66	(a)
ANNUAL RUNOFF (CFSM)	.63		.75		.74	
ANNUAL RUNOFF (INCHES)	8.56		10.24		10.07	
10 PERCENT EXCEEDS	99		155		132	
50 PERCENT EXCEEDS	87		90		97	
90 PERCENT EXCEEDS	77		77		80	

(a) Feb. 8, 2000, Jan. 20, 2001.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

443903085312101 ARBUTUS LAKE NEAR MAYFIELD, MI

LOCATION.--Lat 44°39'03", long 85°31'21", in SW1/4 NE1/4 sec. 16, T.26 N., R.10 W., Grand Traverse County, Hydrologic Unit 04060105, on south side of lake at Pine Hurst Trail, 1.8 mi north of Mayfield.

DRAINAGE AREA.--Not determined.

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

GAGE.--Nonrecording gage. Elevation of gage is 794 ft above sea level, from topographic map.

REMARKS.--Staff gage read by observer. No inlets or outlets.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.07 ft, Feb. 13, 1995; minimum observed, 2.62 ft, Sept. 2, 3, 30, 2000, Sept. 8, 15, 16, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 3.42 ft, June 3, 9; minimum observed, 2.62 ft, Sept. 8, 15, 16, but may have been lower during period of missing record.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	—	—	—	—	—	—	—	—	3.26	3.20	—	2.74
2	—	—	—	3.00	—	—	2.98	—	3.26	3.18	—	2.72
3	—	—	—	—	—	—	3.08	—	3.42	3.16	—	2.70
4	—	—	—	2.86	—	—	3.32	—	3.38	3.16	—	2.70
5	—	—	—	—	—	—	3.30	—	3.36	3.14	—	2.68
6	—	—	—	—	—	3.18	3.28	—	3.36	3.12	—	2.66
7	—	—	—	—	3.08	—	3.26	—	3.36	3.10	—	2.64
8	—	—	—	—	—	—	3.26	—	3.38	3.10	—	2.62
9	—	—	—	3.00	—	—	3.25	3.14	3.42	3.09	—	2.68
10	—	—	—	—	—	—	3.24	3.16	3.40	3.08	—	2.66
11	—	—	—	—	—	—	3.24	3.17	3.38	3.06	—	2.66
12	—	—	—	—	—	—	3.22	3.16	3.37	3.04	—	2.64
13	—	—	—	—	3.10	3.16	3.22	3.16	3.37	3.02	2.76	2.64
14	—	—	—	—	—	—	3.21	3.14	3.36	3.00	—	2.74
15	—	—	—	3.00	—	—	3.20	3.14	3.36	3.00	—	2.62
16	—	—	—	—	—	—	3.22	3.32	3.34	2.98	2.72	2.62
17	—	—	—	—	—	—	3.21	3.30	3.32	2.98	2.72	2.63
18	—	—	—	—	—	—	3.20	3.32	3.32	2.97	2.76	2.64
19	—	—	—	—	—	—	3.19	3.26	3.31	2.97	2.76	2.64
20	—	—	—	—	3.14	3.16	3.19	3.24	3.31	—	2.74	2.72
21	—	—	—	—	—	—	3.18	3.24	3.30	—	2.73	2.74
22	—	2.80	—	—	—	—	3.18	3.26	3.30	—	2.72	2.74
23	—	—	—	3.00	3.00	—	3.18	3.26	3.29	—	2.72	2.84
24	—	—	—	—	—	—	3.17	3.24	3.28	—	2.82	2.84
25	—	—	—	—	—	—	3.16	3.26	3.28	—	2.82	2.92
26	—	—	—	—	—	—	3.16	3.28	3.27	—	2.80	2.94
27	—	—	—	—	3.18	3.14	3.14	3.30	3.26	—	2.78	2.94
28	—	—	—	—	—	—	3.13	3.28	3.25	—	2.76	2.94
29	—	—	—	—	—	—	3.14	3.28	3.24	—	2.76	2.94
30	—	—	—	3.00	—	—	3.14	3.28	3.22	—	2.74	2.94
31	—	—	—	—	—	—	—	3.27	—	—	2.74	—

STREAMS TRIBUTARY TO LAKE MICHIGAN

04127800 JORDAN RIVER NEAR EAST JORDAN, MI

LOCATION.--Lat 45°06'09", long 85°05'53", in NW1/4 NW1/4 sec.7, T.31 N., R.6 W., Antrim County, Hydrologic Unit 04060105, on right bank 300 ft downstream from Webster Bridge, 4.2 mi south of East Jordan, and 4.5 mi upstream from mouth.

DRAINAGE AREA.--67.9 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1960-65. October 1966 to current year.

REVISED RECORDS.--WDR MI-83-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 596.43 ft above sea level (Antrim County Road Commission bench mark). Nov. 19, 1959 to Sept. 30, 1966, nonrecording gage at site 600 ft upstream at same datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some regulation at low flow by fish hatchery upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	156	159	176	e167	180	173	212	172	228	156	150	145
2	160	160	171	e168	174	173	216	172	233	154	151	145
3	159	160	166	169	172	173	222	173	217	157	150	146
4	158	160	e167	170	172	174	232	256	187	156	147	149
5	159	159	e168	172	172	172	237	191	178	152	146	144
6	183	160	e169	171	171	172	291	176	174	152	146	143
7	204	161	e170	171	170	172	300	178	169	152	146	146
8	177	161	170	163	172	172	291	192	167	153	144	146
9	167	204	e168	e170	241	172	227	175	174	153	145	150
10	163	217	e167	e170	219	171	206	173	178	167	148	184
11	162	173	e166	e170	189	e170	213	183	185	155	146	154
12	160	167	e166	169	180	170	439	176	173	153	145	151
13	160	181	e166	170	177	173	245	174	168	152	144	153
14	164	191	e167	172	176	173	208	172	163	151	143	148
15	162	188	169	178	173	177	197	192	191	151	144	148
16	161	189	171	184	172	176	193	313	200	153	153	146
17	160	194	174	175	170	174	195	202	173	152	173	147
18	160	178	172	173	e168	173	189	182	174	153	154	150
19	160	174	172	172	170	177	185	174	180	153	152	166
20	159	178	170	e170	169	185	184	171	165	154	151	198
21	158	176	170	e170	167	200	184	174	163	160	145	192
22	158	175	168	171	e167	209	180	203	170	194	145	164
23	159	172	168	167	e167	214	180	176	163	163	146	205
24	169	172	169	167	167	204	187	173	159	159	145	260
25	163	173	e168	167	205	185	180	188	157	154	145	178
26	162	201	168	166	205	181	178	189	156	152	200	199
27	161	208	169	e166	184	178	182	189	154	150	155	176
28	160	190	169	166	176	177	175	179	154	152	149	170
29	160	184	e167	166	---	185	173	171	153	158	146	166
30	160	181	e166	198	---	191	172	167	154	153	147	164
31	160	---	e167	193	---	205	---	166	---	151	146	---
TOTAL	5064	5346	5234	5321	5025	5601	6473	5772	5260	4825	4647	4933
MEAN	163	178	169	172	179	181	216	186	175	156	150	164
MAX	204	217	176	198	241	214	439	313	233	194	200	260
MIN	156	159	166	163	167	170	172	166	153	150	143	143
CFSM	2.41	2.62	2.49	2.53	2.64	2.66	3.18	2.74	2.58	2.29	2.21	2.42
IN.	2.77	2.93	2.87	2.92	2.75	3.07	3.55	3.16	2.88	2.64	2.55	2.70

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2001, BY WATER YEAR (WY)

MEAN	185	190	186	180	181	208	221	193	182	172	171	180
MAX	235	226	217	202	209	281	273	237	230	210	203	223
(WY)	1987	1993	1983	1997	1984	1979	1979	1983	1969	1975	1972	1986
MIN	163	163	163	157	157	174	163	164	160	151	150	150
(WY)	2001	1982	1982	1971	1982	1972	2000	1982	1982	1981	2001	1981

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1967 - 2001	
ANNUAL TOTAL	62503		63501			
ANNUAL MEAN	171		174		187	
HIGHEST ANNUAL MEAN					204	1979
LOWEST ANNUAL MEAN					170	2000
HIGHEST DAILY MEAN	374	Feb 26	439	Apr 12	840	Sep 29 1972
LOWEST DAILY MEAN	148	Jul 18	143	Aug 14	130	Jan 19 1971
ANNUAL SEVEN-DAY MINIMUM	151	Jul 12	145	Aug 8	136	Dec 28 1968
MAXIMUM PEAK FLOW			599	Apr 12	1360	Jul 19 1975
MAXIMUM PEAK STAGE			5.21	Apr 12	6.51	Jul 19 1975
INSTANTANEOUS LOW FLOW			141	(a)	(b)91	Mar 8 1982
ANNUAL RUNOFF (CFSM)	2.52		2.56		2.76	
ANNUAL RUNOFF (INCHES)	34.24		34.79		37.51	
10 PERCENT EXCEEDS	189		200		220	
50 PERCENT EXCEEDS	165		170		179	
90 PERCENT EXCEEDS	155		150		159	

(a) Aug. 14, Sept. 3, 6, 7.
(b) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE MICHIGAN

451540084560301 WALLOON LAKE AT WALLOON LAKE, MI

LOCATION.--Lat 45°15'40", long 84°56'03", in NW1/4 NW1/4 sec.16, T.33 N., R.5 W., Charlevoix County, Hydrologic Unit 04060105, on left upstream wingwall of dam at outlet of Walloon Lake (Bear River), 0.1 mi south of Walloon Lake.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--July 1942 to September 1950, September 1995 to current year.

GAGE.--Nonrecording gage. Datum of gage is 684.60 ft above sea level, (Charlevoix Abstract & Engineering Co.). Prior to September 30, 1950, nonrecording gage at approximately same elevation.

REMARKS.--Staff gage read by observer. Lake level maintained by a fix-crest concrete dam. Crest of dam is divided into two parts. The right sill is about 22 ft wide and has its crest at elevation 2.64 ft, gage datum. The left sill, 13 ft wide, is at elevation 1.93 ft, gage datum. There is a steel grate on top of weir to prevent migration of fish into lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 3.47 ft, Apr. 3, 1998; minimum observed, 2.14 ft, Sept. 10, 1947, Oct. 7, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 3.20 ft, Feb. 9, 11, 14, Apr. 14, 17; minimum observed, 2.34 ft, Oct. 2.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	2.40	---	3.00	---	3.13	---	3.11	---	2.87	---	2.63
2	2.34	2.40	---	3.00	3.13	3.15	2.95	---	---	---	---	---
3	---	---	---	---	---	---	---	3.10	---	---	2.67	---
4	2.36	2.40	---	---	---	---	---	3.14	---	---	2.66	---
5	---	---	---	3.01	---	---	2.98	---	3.11	---	2.66	2.60
6	---	---	---	---	3.12	3.10	---	3.15	---	2.81	---	---
7	2.40	2.40	---	---	---	---	---	---	---	---	---	2.58
8	---	---	---	3.10	3.13	---	3.09	---	3.09	---	---	---
9	---	---	---	---	3.20	---	---	3.14	---	2.73	---	---
10	2.36	---	---	---	---	3.07	---	---	---	---	---	---
11	---	---	---	3.07	3.20	---	---	---	3.14	---	2.53	2.66
12	---	---	---	---	---	---	3.15	---	---	2.74	---	---
13	---	2.50	---	3.05	---	---	---	---	3.07	---	---	2.64
14	2.36	---	---	---	3.20	3.04	3.20	3.05	3.15	2.72	2.47	---
15	---	---	---	---	---	3.05	---	---	---	2.67	---	---
16	---	2.54	2.89	3.08	---	---	---	3.15	---	---	---	2.60
17	---	---	---	---	---	---	3.20	---	3.16	---	---	2.60
18	2.38	---	---	---	3.18	---	---	3.13	3.15	2.67	---	---
19	---	---	---	---	---	3.00	---	3.12	---	---	---	---
20	---	---	---	3.08	---	---	---	---	---	---	---	2.64
21	2.38	---	2.93	---	---	---	3.14	---	---	---	2.44	---
22	---	2.65	---	3.08	3.15	---	---	3.14	---	2.75	---	---
23	---	2.70	3.00	3.06	---	---	---	---	3.14	2.75	2.44	---
24	2.40	---	---	---	---	2.99	---	---	---	---	---	---
25	---	2.70	---	---	---	---	3.19	---	3.07	---	2.42	2.80
26	---	---	---	3.04	3.17	---	---	3.16	---	---	---	---
27	2.40	---	---	---	---	2.98	---	---	---	2.68	2.68	2.82
28	---	2.70	3.00	---	---	---	---	---	---	---	---	2.79
29	---	---	---	3.08	---	---	---	---	2.98	---	2.66	---
30	2.40	---	3.01	3.12	---	2.96	---	---	---	2.66	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE HURON

04127918 PINE RIVER NEAR RUDYARD, MI

LOCATION.--Lat 46°11'09", long 84°35'52", in NW1/4 NE1/4 sec.30, T.44 N., R.2 W., Chippewa County, Hydrologic Unit 04070002, on right bank 15 ft upstream from bridge on Mackinac Trail, 3.2 mi south of Rudyard.

DRAINAGE AREA.--184 mi^2.

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 601.50 ft above sea level. Prior to Aug. 4, 1972, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	55	75	e58	e75	e125	e190	186	136	63	51	57
2	48	55	e72	e58	e75	e125	e220	184	163	59	50	54
3	47	55	e68	e58	e70	e120	e260	406	213	59	49	53
4	47	55	e64	e58	e70	e120	e320	386	209	60	47	51
5	46	54	e58	e58	e70	e115	e400	306	175	61	46	49
6	47	54	54	e58	e70	e110	e700	248	149	59	45	48
7	53	54	e55	e58	e70	e105	e900	241	129	60	45	48
8	55	57	e55	e58	e70	e105	e1300	686	115	67	47	48
9	55	69	e56	e58	e70	e105	1720	385	104	62	51	57
10	59	126	e56	e58	e70	e100	1300	296	105	58	58	259
11	56	116	e58	e60	e70	e95	1130	356	109	56	53	281
12	54	96	e60	e60	e70	e94	3010	320	110	55	48	226
13	62	91	e58	e60	e70	e94	2540	260	102	54	57	223
14	102	122	e58	e60	e70	e90	1680	222	93	52	59	179
15	99	123	e58	e60	e70	e90	1130	200	91	51	51	145
16	86	111	e58	e60	e70	e90	853	220	117	58	52	123
17	78	107	e58	e60	e70	e90	772	251	104	73	75	107
18	72	99	e58	e60	e70	e95	743	224	93	72	89	97
19	66	90	e58	e60	e70	e100	644	194	143	66	73	101
20	63	90	e58	e60	e70	e110	479	168	149	66	63	353
21	61	73	e58	e60	e70	e130	461	151	116	64	56	400
22	59	e75	e58	e60	e70	e140	475	292	101	66	52	324
23	57	e80	e58	e60	e75	e160	420	296	96	77	50	375
24	58	e80	e58	e60	e85	e180	372	241	86	64	50	865
25	60	81	e58	e60	e100	e180	321	361	78	57	50	532
26	58	82	e58	e60	e125	e180	282	380	74	54	94	420
27	58	85	e58	e60	e125	e180	257	287	69	52	97	354
28	56	88	e58	e62	e125	e175	225	239	68	50	79	284
29	54	92	e58	e64	---	e170	203	200	67	51	67	234
30	53	89	e58	e70	---	e175	198	169	65	54	60	199
31	54	---	e58	e75	---	e180	---	146	---	52	58	---
TOTAL	1871	2504	1833	1871	2185	3928	23505	8501	3429	1852	1822	6546
MEAN	60.4	83.5	59.1	60.4	78.0	127	784	274	114	59.7	58.8	218
MAX	102	126	75	75	125	180	3010	686	213	77	97	865
MIN	46	54	54	58	70	90	190	146	65	50	45	48
CFSM	.33	.45	.32	.33	.42	.69	4.26	1.49	.62	.32	.32	1.19
IN.	.38	.51	.37	.38	.44	.79	4.75	1.72	.69	.37	.37	1.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2001, BY WATER YEAR (WY)

MEAN	213	270	174	118	111	268	793	257	169	108	101	148
MAX	452	807	328	248	217	544	1589	633	432	261	349	383
(WY)	1997	1989	1983	1980	1984	1973	1985	1972	1974	1979	1973	1996
MIN	60.4	72.7	59.1	60.3	65.9	90.7	189	83.7	73.6	59.7	48.7	55.3
(WY)	2001	1977	2001	1977	1979	1978	2000	2000	2000	2001	2000	2000

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1972 - 2001	
ANNUAL TOTAL	45357		59847			
ANNUAL MEAN	124		164		226	
HIGHEST ANNUAL MEAN					344	1985
LOWEST ANNUAL MEAN					138	1998
HIGHEST DAILY MEAN	1200	Mar 9	3010	Apr 12	4050	Apr 21 1985
LOWEST DAILY MEAN	42	Aug 29	45	Aug 6	42	Aug 29 2000
ANNUAL SEVEN-DAY MINIMUM	43	Aug 25	47	Aug 2	43	Aug 25 2000
MAXIMUM PEAK FLOW			(a)3450	Apr 12	4500	Mar 30 1986
MAXIMUM PEAK STAGE			14.87	Apr 12	18.44	Mar 30 1986
INSTANTANEOUS LOW FLOW			44	(b)	(c)33	Nov 16 1989
ANNUAL RUNOFF (CFSM)	.67		.89		1.23	
ANNUAL RUNOFF (INCHES)	9.17		12.10		16.66	
10 PERCENT EXCEEDS	241		320		451	
50 PERCENT EXCEEDS	74		72		121	
90 PERCENT EXCEEDS	51		53		68	

(a) Discharge measurement.
(b) Aug. 5, 6, 7.
(c) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04127937 EAST LAKE NEAR FIBRE, MI

LOCATION.--Lat 46°07'56", long 84°47'31", in SE1/4 SW1/4 sec.10, T.43 N., R.4 W., Mackinac County, Hydrologic Unit 04070002, 5.9 mi southwest of Fibre.

DRAINAGE AREA.--5.87 mi^2.

PERIOD OF RECORD.--July 1967 to September 1971, June 1990 to current year.

REVISED RECORDS.--WDR MI-96-1: 1991 (M).

GAGE.--Nonrecording gage. Elevation of gage is 805 ft above sea level, from topographic map. July 12, 1967 to Sept. 1, 1971, nonrecording gage at different datum.

REMARKS.--Staff gage read by observer. The inlet to East Lake is a small unnamed stream draining a marsh at the north end of the lake. The outlet is the East Lake Branch of the Carp River. Surface area of lake is 995 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.62 ft, Dec. 2, 1991; minimum observed, 3.18 ft, Sept. 5-7, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 4.56 ft, Apr. 18, 19; minimum observed, 3.18 ft, Sept. 5-7.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.66	—	—	—	—	—	—	4.34	4.02	3.62	3.44	3.26
2	3.60	—	—	—	—	—	—	—	4.02	3.58	—	3.24
3	3.62	—	—	—	—	—	—	—	4.04	3.58	3.38	3.22
4	3.60	—	—	—	—	—	—	—	4.04	3.58	3.30	3.20
5	3.60	—	—	—	—	—	—	—	4.02	3.56	3.30	3.18
6	3.60	—	—	—	—	—	—	—	4.02	3.54	3.30	3.18
7	3.60	3.60	—	—	3.90	—	—	—	4.00	3.54	3.28	3.18
8	3.60	—	—	—	—	—	—	—	3.98	3.54	3.28	—
9	3.60	—	—	—	—	—	—	—	3.96	3.54	3.28	3.20
10	3.60	—	—	—	—	—	—	4.20	3.96	3.52	3.28	3.40
11	3.58	—	—	—	—	—	—	4.22	3.96	3.52	3.28	3.38
12	3.58	—	—	—	—	—	—	4.22	3.94	3.50	—	—
13	3.60	—	—	—	—	—	—	4.22	3.92	3.48	—	3.44
14	3.60	—	—	—	—	—	—	4.22	3.90	3.46	—	3.42
15	3.68	—	—	—	—	—	—	4.20	3.90	3.44	—	3.40
16	3.68	—	—	—	—	—	—	4.20	3.88	3.46	—	3.40
17	3.68	—	—	—	—	—	—	4.16	3.88	3.48	—	3.38
18	3.68	—	—	—	—	—	4.56	4.12	3.86	3.48	—	3.38
19	3.68	—	—	—	—	—	4.56	4.12	3.84	3.48	—	3.38
20	3.68	—	—	—	—	—	4.54	4.10	3.84	3.48	—	3.48
21	3.66	—	—	—	—	—	4.52	—	3.82	3.48	—	3.50
22	3.66	—	—	—	—	—	4.52	4.12	3.80	3.56	3.29	3.52
23	3.66	—	—	—	—	—	4.46	4.10	3.80	3.50	3.26	3.54
24	3.66	—	—	—	—	—	4.47	4.10	—	3.48	3.24	3.60
25	3.64	—	—	—	—	—	4.40	4.08	3.74	3.48	3.24	3.62
26	3.64	—	—	—	—	—	—	4.08	3.74	3.48	3.28	3.62
27	3.64	—	3.88	—	—	3.98	4.38	4.06	3.72	3.46	3.30	3.64
28	3.62	—	—	—	—	—	4.36	4.04	3.70	3.46	3.30	3.64
29	—	—	—	—	—	—	4.36	—	3.70	3.46	3.28	3.64
30	—	—	—	—	—	—	4.34	4.04	3.66	3.44	3.28	3.64
31	—	—	—	—	—	—	—	4.00	—	3.44	3.28	—

STREAMS TRIBUTARY TO LAKE HURON

452600084472001 CROOKED LAKE NEAR CONWAY, MI

LOCATION.--Lat 45°23'52", long 84°49'22", in NE1/4 SW1/4 sec.29, T.35 N., R.4 W., Emmet County, Hydrologic Unit 04070004, at Minnehaha Creek Inlet on Channel Road, 2.5 mi southeast of Conway.

DRAINAGE AREA.--101 mi^2.

PERIOD OF RECORD.--June 1942 to July 1945 (summer months only), August 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 593.38 ft above sea level. Prior to June 13, 1960, nonrecording gage at datum 1.00 ft higher. June 13, 1960 to June 29, 1964, nonrecording gage at same datum.

REMARKS.--Crooked Lake is the upstream end of the navigable inland water route. Major inlets are Minnehaha Creek, Round Lake Outlet, and Pickerel Lake Outlet. The outlet is Crooked River. Lake elevation controlled by dam and boat lock at Alanson. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 3.60 ft, Apr. 12, 1948, present datum; minimum, 0.54 ft, Mar. 30, 1982, possibly affected by ice in well.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 2.61 ft, Sept. 24; minimum, 1.09 ft, Nov. 27, 28.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.09	1.70	1.24	1.64	1.86	1.62	1.61	1.90	2.28	2.12	1.96	2.19
2	2.09	1.65	1.28	1.65	1.86	1.62	1.63	1.92	2.33	2.07	2.00	2.17
3	2.10	1.54	1.32	1.66	1.86	1.62	1.65	1.94	2.36	2.06	2.00	2.18
4	2.10	1.47	1.37	1.67	1.86	1.63	1.67	2.03	2.35	2.07	1.99	2.22
5	2.10	1.41	1.45	1.69	1.86	1.63	1.69	2.06	2.34	2.05	1.97	2.21
6	2.12	1.35	1.49	1.69	1.86	1.63	1.75	2.07	2.34	2.03	1.95	2.20
7	2.16	1.31	1.55	1.71	1.85	1.63	1.81	2.09	2.31	2.02	1.95	2.20
8	2.16	1.25	1.59	1.71	1.84	1.63	1.87	2.16	2.29	2.01	1.96	2.21
9	2.15	1.25	1.63	1.71	1.88	1.62	1.88	2.18	2.28	2.00	1.96	2.23
10	2.15	1.26	1.67	1.72	1.89	1.62	1.87	2.19	2.29	2.00	1.96	2.31
11	2.15	1.22	1.71	1.72	1.82	1.63	1.87	2.23	2.30	1.99	1.95	2.37
12	2.16	1.19	1.75	1.72	1.77	1.63	2.02	2.22	2.30	1.97	1.93	2.38
13	2.16	1.18	1.78	1.72	1.72	1.64	2.09	2.21	2.29	1.96	1.92	2.40
14	2.19	1.17	1.81	1.73	1.68	1.64	2.09	2.22	2.27	1.94	1.91	2.38
15	2.21	1.14	1.80	1.75	1.65	1.64	2.08	2.23	2.27	1.94	1.89	2.36
16	2.15	1.14	1.78	1.77	1.63	1.64	2.04	2.28	2.30	1.96	1.92	2.34
17	2.08	1.15	1.75	1.77	1.61	1.63	2.02	2.29	2.27	1.97	1.94	2.32
18	1.97	1.15	1.72	1.77	1.59	1.63	1.97	2.29	2.27	1.97	1.95	2.32
19	1.87	1.19	1.72	1.77	1.57	1.63	1.91	2.28	2.25	1.97	1.93	2.35
20	1.76	1.19	1.69	1.77	1.55	1.63	1.86	2.28	2.25	1.97	1.92	2.40
21	1.68	1.18	1.67	1.77	1.52	1.63	1.79	2.28	2.24	1.96	1.91	2.41
22	1.61	1.19	1.65	1.77	1.50	1.65	1.73	2.30	2.23	2.01	1.92	2.41
23	1.54	1.15	1.63	1.76	1.48	1.67	1.70	2.30	2.21	2.02	1.93	2.46
24	1.51	1.12	1.63	1.76	1.48	1.68	1.73	2.31	2.19	2.00	1.94	2.57
25	1.53	1.11	1.62	1.76	1.54	1.66	1.76	2.31	2.17	2.00	1.94	2.56
26	1.56	1.10	1.62	1.76	1.59	1.65	1.77	2.30	2.16	1.99	2.18	2.57
27	1.59	1.10	1.62	1.76	1.61	1.63	1.82	2.30	2.15	1.97	2.21	2.56
28	1.61	1.10	1.63	1.76	1.62	1.61	1.85	2.29	2.13	1.96	2.21	2.53
29	1.63	1.14	1.63	1.76	—	1.59	1.86	2.28	2.12	1.97	2.20	2.50
30	1.65	1.19	1.64	1.81	—	1.59	1.87	2.25	2.11	1.97	2.19	2.47
31	1.67	—	1.64	1.84	—	1.60	—	2.24	—	1.97	2.21	—
MEAN	1.92	1.24	1.62	1.74	1.70	1.63	1.84	2.20	2.26	2.00	1.99	2.36
MAX	2.21	1.70	1.81	1.84	1.89	1.68	2.09	2.31	2.36	2.12	2.21	2.57
MIN	1.51	1.10	1.24	1.64	1.48	1.59	1.61	1.90	2.11	1.94	1.89	2.17

STREAMS TRIBUTARY TO LAKE HURON

453345084401501 DOUGLAS LAKE NEAR PELLSTON, MI

LOCATION.--Lat 45°33'45", long 84°40'15", in NW1/4 NE1/4 sec.33, T.37 N., R.3 W., Cheboygan County, Hydrologic Unit 04070004, in boat well in Laboratory building at University of Michigan Biological Station.

DRAINAGE AREA.--26.5 mi^2 at outlet.

PERIOD OF RECORD.--June 1942 to December 1959, October 1994 to current year.

GAGE.--Nonrecording gage. Datum of gage is 710.00 ft above sea level (Doyle Civil Engineers bench mark). June 1942 to December 1959 at same site at datum 2.34 ft higher.

REMARKS.--Staff gage read by observer. Beavertail Creek flows into the lake from the northeast and Lancaster Creek flows into the lake from the northwest. East Branch Maple River flows from the southwest side of lake into Maple River, then into Burt Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.68 ft, May 7, 1959, from floodmark, present datum; minimum observed, 0.78 ft, Oct. 15, 1955, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 3.12 ft, Apr. 23, May 1, 7; minimum observed, 1.50 ft, Nov. 2.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.72	---	---	---	1.84	---	---	3.12	---	---	---	---
2	---	1.50	1.59	1.70	---	2.00	---	---	---	---	---	---
3	1.70	---	---	---	---	---	2.10	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	1.72	---	2.00	---	---	---	---	2.34	2.06
6	---	---	1.60	---	1.84	---	---	---	3.00	---	---	---
7	---	---	---	---	---	---	---	3.12	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	2.28	---
9	---	---	---	---	---	---	2.36	---	---	2.44	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	2.06
12	---	---	---	---	1.92	---	---	---	2.96	---	2.32	---
13	1.61	---	---	---	---	2.04	---	---	---	---	---	---
14	---	1.55	1.66	1.74	---	---	---	3.10	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	2.14	---
16	---	---	---	---	---	---	---	---	---	---	---	2.00
17	---	---	---	1.78	---	---	---	---	2.94	2.38	---	---
18	---	---	---	---	---	---	3.06	---	---	2.38	---	1.98
19	1.60	---	1.70	---	1.91	---	3.06	3.11	---	---	---	---
20	---	1.62	---	---	---	2.04	---	---	---	---	---	2.06
21	---	---	---	---	---	---	---	---	---	---	2.12	---
22	---	---	---	---	---	---	---	---	2.85	---	---	---
23	1.58	---	---	1.76	1.94	---	3.12	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	1.76	---	---	---	---	---	---	---	---
26	---	---	---	---	2.00	2.04	---	3.04	---	---	---	---
27	---	---	1.72	---	---	---	---	---	2.74	2.30	2.20	---
28	---	1.60	---	---	---	---	---	---	---	---	---	---
29	1.54	---	---	---	---	---	---	---	---	---	---	2.18
30	---	---	---	---	---	2.04	---	---	2.70	2.22	---	---
31	---	---	---	---	---	---	---	2.98	---	---	---	---

STREAMS TRIBUTARY TO LAKE HURON

04127997 STURGEON RIVER AT WOLVERINE, MI

LOCATION.--Lat 45°16'28", long 84°36'00", in SE1/4 SW1/4 sec.6, T.33 N., R.2 W., Cheboygan County, Hydrologic Unit 04070004, on right bank at Cedar Street in Wolverine, 0.2 mi downstream from West Branch, and 11.7 mi upstream from mouth.

DRAINAGE AREA.--192 mi^2.

PERIOD OF RECORD.--April 1942 to current year. Published as "near Wolverine" prior to October 1994.

REVISED RECORDS.--WSP 1307: 1944(M), 1948(M). WSP 1727: 1951(M). WDR MI-83-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 770 ft above sea level, from topographic map. Prior to June 15, 1942, nonrecording gages at site 1.7 mi downstream and June 16, 1942 to Sept. 30, 1958, at site 2.0 mi downstream at different datums. Oct. 1, 1958 to Sept. 30, 1994, water-stage recorder at site 2.7 mi downstream at different datum (Station 04128000).

REMARKS.--Records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	153	153	183	e165	185	177	215	167	201	137	130	147
2	154	153	172	e165	174	173	222	170	247	137	139	146
3	155	154	173	e165	e173	171	233	164	249	139	136	158
4	150	151	170	166	173	171	262	212	211	139	130	183
5	150	151	170	170	171	167	278	203	193	135	127	159
6	162	151	172	170	170	166	346	175	182	133	127	153
7	191	156	e170	170	169	167	362	186	170	131	125	151
8	191	157	e170	e170	171	167	405	241	161	132	126	154
9	171	195	e170	e170	220	168	335	191	161	130	128	154
10	163	287	e168	e170	236	166	270	177	180	138	126	e191
11	162	206	168	e170	e200	e167	259	191	205	133	125	176
12	159	187	e168	169	e175	e168	662	184	180	130	124	164
13	159	197	e168	172	184	e170	575	171	169	128	126	165
14	160	215	e170	174	179	171	316	165	160	126	123	156
15	159	211	172	177	174	172	273	166	161	125	120	153
16	161	204	174	178	174	173	234	194	189	129	134	150
17	164	206	178	173	172	169	222	190	168	130	163	148
18	163	195	173	171	e170	168	210	171	165	132	148	152
19	163	187	175	170	e170	172	200	161	176	131	152	170
20	159	186	e175	e170	171	176	196	157	159	152	146	242
21	150	184	e175	e170	e166	188	197	159	153	170	139	212
22	147	181	e175	e170	e166	199	193	212	157	151	135	178
23	150	177	e172	169	e166	208	193	180	155	144	136	211
24	156	175	e172	165	e170	204	206	168	148	139	135	336
25	155	176	e170	163	210	184	196	179	143	139	135	234
26	153	188	e170	160	216	174	185	186	141	129	289	289
27	154	219	e168	e160	190	176	181	178	139	127	192	223
28	151	206	e168	161	e185	172	175	191	138	128	160	191
29	151	197	e165	161	—	182	171	176	136	137	151	175
30	153	190	e165	194	—	189	168	162	136	136	152	166
31	153	—	e165	203	—	201	—	157	—	137	153	—
TOTAL	4922	5595	5304	5281	5080	5476	7940	5584	5133	4204	4432	5487
MEAN	159	186	171	170	181	177	265	180	171	136	143	183
MAX	191	287	183	203	236	208	662	241	249	170	289	336
MIN	147	151	165	160	166	166	168	157	136	125	120	146
CFSM	.83	.97	.89	.89	.94	.92	1.38	.94	.89	.71	.74	.95
IN.	.95	1.08	1.03	1.02	.98	1.06	1.54	1.08	.99	.81	.86	1.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2001, BY WATER YEAR (WY)

MEAN	212	224	212	201	198	244	308	237	208	185	181	201
MAX	326	301	306	295	275	354	431	353	272	255	301	290
(WY)	1984	1993	1972	1973	1984	1976	1971	1983	1969	1994	1972	1986
MIN	153	164	157	133	130	172	179	154	149	130	134	141
(WY)	1957	1950	1949	1957	1957	1954	2000	1958	1958	1981	1944	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1942 - 2001	
ANNUAL TOTAL	64305		64438			
ANNUAL MEAN	176		177		217	
HIGHEST ANNUAL MEAN					268	1972
LOWEST ANNUAL MEAN					167	1958
HIGHEST DAILY MEAN	496	Feb 27	662	Apr 12	1080	Sep 29 1972
LOWEST DAILY MEAN	128	Jul 18	120	Aug 15	113	Aug 6 1958
ANNUAL SEVEN-DAY MINIMUM	130	Jul 13	125	Aug 9	118	Aug 3 1958
MAXIMUM PEAK FLOW			(a)730	Apr 12	1290	Sep 29 1972
MAXIMUM PEAK STAGE			(b)5.13	Jan 10	(c)6.42	(d)
INSTANTANEOUS LOW FLOW			120	Aug 15	93	Mar 18 1993
ANNUAL RUNOFF (CFSM)	.92		.92		1.13	
ANNUAL RUNOFF (INCHES)	12.46		12.48		15.39	
10 PERCENT EXCEEDS	211		211		291	
50 PERCENT EXCEEDS	168		170		201	
90 PERCENT EXCEEDS	146		136		158	

(a) Gage height 4.80 ft.
(b) Backwater from ice.
(c) From floodmark, backwater from ice; peak stage at previous site and datum, 4.48 ft, Sept. 14, 1961.
(d) Date unknown, occurred during period of no gage height record Jan. 4-14, 1999.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04128990 PIGEON RIVER NEAR VANDERBILT, MI

LOCATION.--Lat 45°09'24", long 84°28'00", in NW1/4 NW1/4 sec.20, T.32 N., R.1 W., Otsego County, Hydrologic Unit 04070004, on left bank at Sturgeon Valley Road, 9.7 mi east of Vanderbilt, 1.0 mi downstream from Lansing Club Dam, and 28.5 mi upstream from Mullett Lake.

DRAINAGE AREA.--57.7 mi^2.

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 909.03 ft above sea level (Wade-Trim Inc. bench mark). September 1950 to October 1990, water-stage recorder at site 2.5 mi downstream at different datum (Station 04129000).

REMARKS.--Records good except for estimated daily discharges, which are fair. Prior to May 16, 1957, and since Apr. 22, 1958, regulation by Lansing Club Dam 1.0 mi upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	57	65	e55	73	62	82	70	98	41	45	53
2	55	57	64	55	70	63	74	72	100	50	47	51
3	55	58	62	57	68	60	110	73	160	48	52	51
4	54	54	61	65	63	61	97	148	81	39	44	62
5	57	54	64	69	66	64	122	102	81	46	46	59
6	59	59	64	70	64	60	161	71	70	41	45	50
7	66	56	66	72	63	53	160	76	59	49	43	51
8	74	56	62	63	65	56	194	132	55	e42	44	54
9	70	75	64	50	75	58	140	81	55	e43	42	49
10	55	161	65	74	110	58	106	71	66	50	39	94
11	64	83	67	68	85	56	97	98	67	40	42	82
12	57	73	66	71	73	57	355	74	56	42	45	66
13	60	80	61	67	75	67	253	64	57	43	41	59
14	53	85	56	63	61	51	127	67	55	42	40	56
15	59	74	65	70	62	64	89	68	52	39	42	54
16	60	70	67	71	65	54	99	78	58	41	43	52
17	52	75	67	73	65	58	90	82	54	42	57	50
18	63	71	66	65	62	58	80	58	52	42	49	56
19	53	69	68	58	62	57	85	61	61	42	55	67
20	59	67	63	64	62	68	87	57	51	63	48	114
21	55	63	69	61	62	67	73	60	53	58	53	91
22	52	60	66	69	62	77	87	92	56	49	46	64
23	61	60	66	68	61	81	86	65	44	53	45	89
24	54	60	66	65	65	77	104	65	51	55	47	260
25	59	62	60	56	79	75	81	81	50	51	46	123
26	59	68	66	60	79	61	80	67	48	49	126	158
27	53	97	66	62	68	59	80	67	44	42	67	96
28	61	90	56	61	64	63	77	85	41	51	56	90
29	53	76	e55	63	—	62	73	61	49	56	53	65
30	56	73	e55	77	—	68	70	58	41	46	51	62
31	56	—	e55	85	—	72	—	55	—	54	52	—
TOTAL	1797	2143	1963	2027	1929	1947	3419	2359	1865	1449	1551	2328
MEAN	58.0	71.4	63.3	65.4	68.9	62.8	114	76.1	62.2	46.7	50.0	77.6
MAX	74	161	69	85	110	81	355	148	160	63	126	260
MIN	52	54	55	50	61	51	70	55	41	39	39	49
CFSM	1.00	1.24	1.10	1.13	1.19	1.09	1.98	1.32	1.08	.81	.87	1.34
IN.	1.16	1.38	1.27	1.31	1.24	1.26	2.20	1.52	1.20	.93	1.00	1.50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 2001, BY WATER YEAR (WY)

MEAN	77.8	82.1	76.1	71.0	70.8	88.2	118	86.5	70.8	65.0	64.0	72.9
MAX	112	112	105	94.9	90.1	136	164	142	94.5	106	116	120
(WY)	1987	1989	1972	1973	1984	1976	1960	1983	1993	1994	1995	1961
MIN	56.6	63.1	61.1	55.1	55.7	62.8	69.8	54.4	50.7	46.7	42.6	53.2
(WY)	1964	2000	1959	1959	1957	2001	2000	1958	1958	2000	1958	1966

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1951 - 2001	
ANNUAL TOTAL	23902		24777			
ANNUAL MEAN	65.3		67.9		78.6	
HIGHEST ANNUAL MEAN					90.7	1985
LOWEST ANNUAL MEAN					62.3	1958
HIGHEST DAILY MEAN	225	Feb 27	355	Apr 12	829	Aug 18 1995
LOWEST DAILY MEAN	37	Jul 19	39	Jul 4	24	Jan 8 1957
ANNUAL SEVEN-DAY MINIMUM	41	Jul 15	41	Jul 11	38	Aug 2 1958
MAXIMUM PEAK FLOW			498	Apr 12	(a)1500	May 15 1957
MAXIMUM PEAK STAGE			4.49	Apr 12	6.49	Aug 18 1995
INSTANTANEOUS LOW FLOW			(b)18	Jan 8	(b)8.4	Feb 17 1993
ANNUAL RUNOFF (CFSM)	1.13		1.18		1.36	
ANNUAL RUNOFF (INCHES)	15.41		15.97		18.51	
10 PERCENT EXCEEDS	82		89		109	
50 PERCENT EXCEEDS	61		62		70	
90 PERCENT EXCEEDS	49		46		55	

(a) From rating curve extended above 500 ft^3/s, result of failure of Lansing Club Dam; gage height 6.80 ft, from floodmark, site and datum then in use.
(b) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

442409084274001 LAKE ST. HELEN AT ST. HELEN, MI

LOCATION.--Lat 44°22'27", long 84°25'17", in SE1/4 NW1/4 sec.22, T.23 N., R.1 W., Roscommon County, Hydrologic Unit 04070007, at Marina, at end of Monroe Sreet, in St. Helen.

DRAINAGE AREA.--72.2 mi^2 at outlet.

PERIOD OF RECORD.--June 1942 to December 1959, August 1993 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,149.01 ft above sea level. June 18, 1942 to May 21, 1947, nonrecording gage at Artesia Beach at same datum. May 22, 1947 to Dec. 31, 1959, and Aug. 17, 1993 to May 21, 1998, nonrecording gage at outlet at same datum.

REMARKS.--Inlets are Marsh Creek, Russell Creek and Cameron Creek. The outlet is South Branch of the Au Sable River. Lake elevation controlled by dam. Established legal level; 1,155.25 ft, minimum winter level 1,154.75 ft, above sea level. Prior to May 5, 1998, established legal level; 1,154.15 ft, minimum winter level 1,153.65 ft, above sea level. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 7.26 ft, Apr. 1, 1949, May 24, 2000; minimum observed, 4.64 ft, Jan. 21, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 7.12 ft, Apr. 23; minimum, 5.74 ft, Jan. 28, 29, 30, Aug. 16, 18, 19.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.10	5.87	6.19	5.94	5.78	5.99	6.22	6.84	6.79	6.37	5.99	6.02
2	6.11	5.87	6.18	5.93	5.78	5.99	6.24	6.83	6.82	6.32	5.98	6.02
3	6.08	5.90	6.17	5.92	5.77	5.98	6.26	6.79	6.88	6.32	5.95	6.03
4	6.07	5.88	6.16	5.92	5.77	5.98	6.29	6.76	6.88	6.32	5.94	6.01
5	6.03	5.86	6.16	5.91	5.77	5.98	6.31	6.71	6.88	6.31	5.93	6.01
6	6.07	5.84	6.14	5.90	5.77	5.98	6.36	6.66	6.87	6.27	5.94	6.01
7	6.05	5.85	6.13	5.90	5.76	5.97	6.44	6.66	6.86	6.25	5.90	6.01
8	6.03	5.88	6.12	5.89	5.82	5.97	6.52	6.71	6.85	6.25	5.89	6.02
9	6.03	5.91	6.10	5.88	5.90	5.96	6.57	6.68	6.83	6.24	5.89	6.05
10	6.03	6.01	6.09	5.87	5.93	5.96	6.63	6.66	6.84	—	5.86	6.12
11	6.01	6.00	6.09	5.85	5.94	5.96	6.67	6.70	6.84	—	—	6.09
12	6.01	6.00	6.10	5.84	5.94	5.95	6.90	6.68	6.83	—	—	6.10
13	6.00	6.05	6.08	5.84	5.95	5.95	6.93	6.67	6.80	6.15	—	6.07
14	6.01	6.10	6.08	5.83	5.96	5.95	6.96	6.65	6.77	6.12	—	6.07
15	5.96	6.11	6.06	5.83	5.96	5.94	6.97	6.64	6.75	6.11	5.78	6.07
16	5.97	6.12	6.06	5.84	5.96	5.95	7.01	6.71	6.75	6.11	5.77	6.07
17	5.96	6.16	6.06	5.83	5.97	5.95	6.99	6.74	6.70	6.09	5.80	6.06
18	5.97	6.16	6.05	5.82	5.97	5.95	7.00	6.74	6.67	6.08	5.77	6.06
19	5.95	6.15	6.06	5.81	5.97	5.96	6.99	6.72	6.67	6.08	5.84	6.09
20	5.97	6.19	6.05	5.80	5.97	5.98	6.96	6.69	6.61	6.08	5.94	6.20
21	5.92	6.17	6.05	5.80	5.96	6.00	7.00	6.69	6.58	6.09	5.94	6.19
22	5.91	6.17	6.04	5.79	5.95	6.04	6.96	6.77	6.57	6.10	5.95	6.19
23	5.91	6.16	6.04	5.78	5.95	6.08	6.99	6.75	6.53	6.10	5.95	6.21
24	5.90	6.16	6.04	5.77	5.95	6.12	7.01	6.74	6.50	6.10	5.94	6.25
25	5.90	6.16	6.02	5.76	5.99	6.15	6.97	6.78	6.47	6.06	5.95	6.29
26	5.90	6.18	6.01	5.76	5.99	6.17	6.97	6.79	6.45	6.02	6.03	6.34
27	5.91	6.20	6.00	5.76	5.99	6.18	6.94	6.80	6.43	6.01	6.03	6.35
28	5.88	6.20	5.99	5.75	5.99	6.19	6.91	6.84	6.41	5.99	6.03	6.35
29	5.88	6.20	5.98	5.74	—	6.19	6.89	6.82	6.40	5.99	6.02	6.36
30	5.88	6.20	5.97	5.77	—	6.20	6.86	6.80	6.40	6.00	6.03	6.36
31	5.87	—	5.96	5.78	—	6.21	—	6.76	—	5.99	6.04	—
MEAN	5.98	6.06	6.07	5.83	5.91	6.03	6.76	6.73	6.69	—	—	6.14
MAX	6.11	6.20	6.19	5.94	5.99	6.21	7.01	6.84	6.88	—	—	6.36
MIN	5.87	5.84	5.96	5.74	5.76	5.94	6.22	6.64	6.40	—	—	6.01

STREAMS TRIBUTARY TO LAKE HURON

04135700 SOUTH BRANCH AU SABLE RIVER NEAR LUZERNE, MI

LOCATION.--Lat 44°36'53", long 84°27'20", in SE1/4 SE1/4 sec.29, T.26 N., R.1 W., Crawford County, Hydrologic Unit 04070007, on right bank 10 ft upstream from Smith Bridge, 400 ft downstream from bridge on State Highway 72, 4.6 mi upstream from mouth, and 9.1 mi west of Luzerne.

DRAINAGE AREA.--401 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1951-66. October 1966 to September 1989, October 1990 to current year.

REVISED RECORDS.--WSP 2111: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,070 ft above sea level, from topographic map. Apr. 19, 1951 to Nov. 14, 1966, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Occasional regulation by dam upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	119	191	e150	152	e155	227	255	246	133	102	108
2	125	116	177	e130	e145	e155	233	244	274	129	102	107
3	123	113	e145	e145	e135	157	244	235	297	126	101	109
4	122	110	e150	e140	e140	170	261	226	300	124	100	107
5	121	110	e155	e135	145	166	276	219	303	121	98	107
6	125	113	e150	138	145	174	304	211	331	117	97	105
7	133	112	e145	139	145	170	353	228	334	115	96	104
8	134	112	e150	e130	143	164	382	303	287	115	96	105
9	131	121	e150	e140	174	162	392	279	260	113	101	115
10	128	147	e150	141	185	160	405	259	269	113	106	143
11	124	159	e145	137	e175	170	410	287	275	111	101	155
12	122	146	e135	136	e160	149	598	272	257	110	99	146
13	120	141	e140	136	e180	175	635	264	254	108	97	122
14	120	149	147	138	195	163	600	253	234	105	95	113
15	119	154	147	141	188	163	553	239	214	105	93	107
16	121	152	149	143	188	173	484	275	207	113	96	103
17	121	148	e150	145	e155	175	427	295	198	113	105	99
18	119	146	e150	145	e130	173	385	288	196	110	107	95
19	118	143	e150	145	e145	175	355	276	197	107	118	105
20	118	141	e135	e125	e150	182	331	258	190	110	131	130
21	118	139	e150	e130	e145	196	318	240	185	120	131	143
22	117	129	e145	140	e115	219	307	287	183	123	123	139
23	117	e130	e135	136	e140	239	297	284	178	122	114	134
24	118	e130	e145	136	e130	254	295	274	173	114	109	150
25	118	133	e145	135	e145	250	293	291	178	111	107	156
26	118	149	e140	133	e150	224	298	291	171	107	125	172
27	118	179	e145	133	e155	209	302	286	158	105	124	169
28	120	198	e120	131	e150	193	291	287	150	103	125	164
29	120	200	e140	132	---	212	279	274	138	103	114	149
30	118	197	e145	141	---	207	267	257	134	104	109	137
31	120	---	e145	149	---	214	---	240	---	103	108	---
TOTAL	3771	4236	4566	4275	4305	5748	10802	8177	6771	3513	3330	3798
MEAN	122	141	147	138	154	185	360	264	226	113	107	127
MAX	134	200	191	150	195	254	635	303	334	133	131	172
MIN	117	110	120	125	115	149	227	211	134	103	93	95
CFSM	.30	.35	.37	.34	.38	.46	.90	.66	.56	.28	.27	.32
IN.	.35	.39	.42	.40	.40	.53	1.00	.76	.63	.33	.31	.35

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2001, BY WATER YEAR (WY)

MEAN	207	233	230	195	185	256	392	282	208	164	147	170
MAX	456	444	373	275	251	508	596	398	307	251	255	379
(WY)	1987	1992	1992	1973	1984	1976	1985	1983	1993	1969	1994	1975
MIN	120	141	147	132	141	159	178	145	124	107	107	111
(WY)	1967	2001	2001	1977	1978	1978	2000	1999	1977	1977	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1967 - 2001	
ANNUAL TOTAL	57682		63292			
ANNUAL MEAN	158		173		222	
HIGHEST ANNUAL MEAN					280	1992
LOWEST ANNUAL MEAN					158	1977
HIGHEST DAILY MEAN	337	May 21	635	Apr 13	1110	Mar 29 1976
LOWEST DAILY MEAN	94	Aug 21	93	Aug 15	93	Aug 15 2001
ANNUAL SEVEN-DAY MINIMUM	98	Aug 17	98	Aug 11	98	Aug 17 2000
MAXIMUM PEAK FLOW			656	Apr 12	(a)1120	Mar 28 1976
MAXIMUM PEAK STAGE			6.12	Apr 12	(b)7.75	Jan 28 1986
INSTANTANEOUS LOW FLOW			92	(c)	(d)78	Feb 12 1981
ANNUAL RUNOFF (CFSM)	.39		.43		.55	
ANNUAL RUNOFF (INCHES)	5.35		5.87		7.54	
10 PERCENT EXCEEDS	240		287		349	
50 PERCENT EXCEEDS	141		145		196	
90 PERCENT EXCEEDS	110		107		132	

(a) Gage height 7.30 ft.
(b) Backwater from ice.
(c) Aug. 15, 16.
(d) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

445512084415301 OTSEGO LAKE NEAR GAYLORD, MI

LOCATION.--Lat 44°55'52", long 84°41'33", in SW1/4 SE1/4 sec.5, T.29 N., R.3 W., Otsego County, Hydrologic Unit 04070007, at Otsego Lake State Park, 200 ft northwest of boat ramp, 6.7 mi south of Gaylord.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--August 1942 to current year, except for winter months 1942-43, 1943-44, 1977-78.

GAGE.--Water-stage recorder. Datum of gage is 1,270.03 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Aug. 18, 1958, nonrecording gage at datum 2.00 ft higher.

REMARKS.--Otsego Lake has no natural inlets or outlets. In December 1972 an outlet tube and pump system was installed connecting the lake with the North Branch Au Sable River to lower lake levels. Established legal level; maximum, 1,273.5 ft, minimum, 1,272.0 ft, above sea level.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 5.10 ft, May 6, 7, 1972; minimum, 0.96 ft, Aug. 14, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 2.30 ft, Apr. 17; minimum, 1.09 ft, Sept. 8, 18, 19.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.72	1.59	1.76	1.87	1.88	2.02	1.98	2.14	2.14	1.90	1.51	1.20
2	1.73	1.57	1.75	1.87	1.89	2.02	1.98	2.16	2.17	1.83	1.51	1.17
3	1.73	1.57	1.75	1.87	1.88	2.01	1.98	2.18	2.19	1.81	1.51	1.15
4	1.73	1.57	1.75	1.87	1.88	2.01	1.98	2.24	2.18	1.80	1.48	1.17
5	1.71	1.56	1.78	1.88	1.88	2.01	1.98	2.21	2.17	1.79	1.46	1.17
6	1.73	1.55	1.80	1.88	1.88	2.01	2.01	2.18	2.17	1.74	1.44	1.17
7	1.76	1.54	1.80	1.89	1.88	2.01	2.04	2.17	2.16	1.72	1.45	1.14
8	1.76	1.54	1.81	1.88	1.90	2.00	2.05	2.20	2.14	1.72	1.42	1.10
9	1.74	1.60	1.81	1.88	1.96	2.00	2.06	2.19	2.13	1.71	1.39	1.11
10	1.73	1.67	1.82	1.87	1.99	2.00	2.06	2.17	2.14	1.72	1.40	1.14
11	1.73	1.64	1.83	1.87	1.99	2.02	2.07	2.23	2.16	1.69	1.38	1.15
12	1.70	1.63	1.84	1.87	1.99	2.02	2.21	2.21	2.15	1.67	1.35	1.14
13	1.69	1.64	1.83	1.87	1.98	2.02	2.23	2.19	2.14	1.64	1.34	1.14
14	1.70	1.66	1.84	1.87	1.98	2.02	2.23	2.17	2.12	1.62	1.31	1.14
15	1.70	1.67	1.83	1.87	1.98	2.02	2.23	2.16	2.12	1.60	1.28	1.12
16	1.70	1.69	1.84	1.87	1.98	2.02	2.23	2.18	2.13	1.58	1.27	1.11
17	1.69	1.71	1.84	1.87	1.98	2.01	2.25	2.20	2.12	1.57	1.29	1.10
18	1.68	1.70	1.85	1.87	1.98	2.01	2.22	2.19	2.09	1.56	1.28	1.09
19	1.67	1.70	1.87	1.87	1.98	2.00	2.20	2.18	2.08	1.55	1.30	1.09
20	1.65	1.74	1.86	1.86	1.98	2.00	2.19	2.15	2.07	1.58	1.29	1.11
21	1.67	1.74	1.87	1.86	1.98	1.99	2.18	2.14	2.06	1.62	1.26	1.14
22	1.65	1.75	1.87	1.86	1.98	1.99	2.20	2.17	2.05	1.62	1.24	1.16
23	1.64	1.75	1.87	1.85	1.98	1.99	2.17	2.15	2.03	1.62	1.25	1.17
24	1.65	1.74	1.88	1.85	1.99	1.99	2.23	2.16	2.01	1.65	1.23	1.22
25	1.64	1.74	1.88	1.85	2.01	1.99	2.20	2.16	1.99	1.62	1.22	1.25
26	1.63	1.76	1.88	1.85	2.02	1.99	2.18	2.15	1.98	1.59	1.29	1.26
27	1.65	1.77	1.88	1.85	2.03	1.99	2.21	2.16	1.96	1.56	1.27	1.27
28	1.64	1.76	1.88	1.85	2.02	1.99	2.19	2.17	1.94	1.53	1.27	1.28
29	1.62	1.76	1.88	1.85	—	1.99	2.16	2.16	1.91	1.54	1.24	1.28
30	1.61	1.76	1.88	1.87	—	1.98	2.14	2.13	1.89	1.54	1.21	1.28
31	1.60	—	1.87	1.89	—	1.98	—	2.10	—	1.53	1.24	—
MEAN	1.69	1.67	1.84	1.87	1.96	2.00	2.13	2.17	2.09	1.65	1.33	1.17
MAX	1.76	1.77	1.88	1.89	2.03	2.02	2.25	2.24	2.19	1.90	1.51	1.28
MIN	1.60	1.54	1.75	1.85	1.88	1.98	1.98	2.10	1.89	1.53	1.21	1.09

STREAMS TRIBUTARY TO LAKE HURON

04136000 AU SABLE RIVER NEAR RED OAK, MI

LOCATION.--Lat 44°40'37", long 84°17'33", in SE1/4 NE1/4 sec.3, T.26 N., R.1 E., Oscoda County, Hydrologic Unit 04070007, at Parmalee Bridge Campground, 4.5 mi northwest of Luzerne, on County Road 489, and 85.0 mi upstream from mouth.

DRAINAGE AREA.--1,108 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1908 to May 1916, December 1930 to June 1931, October 1995 to current year. Prior to October 1914, published as "near Lovells".

REVISED RECORDS.--WDR MI-96-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft above sea level, from topographic map. October 1908 to May 1916, nonrecording gage at site 5 mi upstream, datum of gage 1,004.69 ft above sea level (levels by Fargo Engineering Co.). December 1930 to June 1931, nonrecording gage at present site at different datum.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	527	523	659	e560	596	627	742	790	802	574	521	510
2	525	525	631	e500	582	635	759	771	961	566	520	506
3	528	519	e550	e590	e550	622	794	755	1040	565	521	501
4	529	511	e580	e600	e570	623	855	774	969	562	510	509
5	530	508	601	e600	571	614	912	774	901	554	503	497
6	552	509	e560	e590	572	603	1070	751	869	543	497	491
7	566	516	e500	e580	565	612	1250	758	858	541	494	490
8	585	519	e540	e520	579	605	1360	1090	802	541	491	490
9	576	547	e570	e460	662	607	1340	977	751	536	494	508
10	565	706	587	e600	740	598	1250	869	778	541	525	653
11	552	685	561	e620	e670	610	1200	1090	838	535	507	619
12	539	636	e530	e600	e680	594	2070	1100	802	530	500	596
13	531	616	e500	e580	698	607	2220	952	763	522	492	555
14	536	641	e560	e620	663	611	1850	868	733	518	486	529
15	530	642	e570	564	639	611	1530	822	697	516	485	518
16	531	627	577	567	629	623	1330	872	689	527	495	507
17	531	618	587	566	600	625	1190	910	683	531	529	501
18	528	604	574	562	e510	618	1090	901	670	525	532	498
19	527	591	580	558	e600	626	1020	833	675	520	546	524
20	526	585	e450	e460	616	644	956	788	658	529	567	653
21	522	580	e580	e490	e560	680	933	757	650	554	549	647
22	519	559	e540	e540	e460	727	923	879	654	555	538	618
23	519	560	e500	556	e600	773	909	884	647	547	523	603
24	523	570	e570	545	e550	797	936	839	630	583	508	669
25	527	563	e500	538	e650	761	899	897	621	566	504	664
26	527	615	e560	e500	665	707	877	898	619	546	587	749
27	528	716	e600	e530	647	702	884	868	601	531	592	710
28	527	729	e520	531	616	680	861	865	588	519	572	666
29	524	703	e540	540	---	681	834	840	581	529	537	614
30	523	679	e640	574	---	694	810	788	575	540	519	576
31	522	---	e590	604	---	716	---	748	---	533	514	---
TOTAL	16575	17902	17407	17245	17040	20233	33654	26708	22105	16779	16158	17171
MEAN	535	597	562	556	609	653	1122	862	737	541	521	572
MAX	585	729	659	620	740	797	2220	1100	1040	583	592	749
MIN	519	508	450	460	460	594	742	748	575	516	485	490
CFSM	.48	.54	.51	.50	.55	.59	1.01	.78	.67	.49	.47	.52
IN.	.56	.60	.58	.58	.57	.68	1.13	.90	.74	.56	.54	.58

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 2001, BY WATER YEAR (WY)

MEAN	764	829	824	751	740	881	1301	1083	882	716	688	704
MAX	1156	1289	1336	1004	900	1349	1747	1592	1380	1093	1129	1223
(WY)	1912	1912	1912	1912	1912	1913	1913	1912	1912	1912	1912	1912
MIN	535	597	562	556	609	653	639	668	693	537	521	531
(WY)	2001	2001	2001	2001	2001	2001	2000	1999	1998	2000	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1909 - 2001	
ANNUAL TOTAL	227029		238977			
ANNUAL MEAN	620		655		847	
HIGHEST ANNUAL MEAN					1207	1912
LOWEST ANNUAL MEAN					636	2000
HIGHEST DAILY MEAN	1160	Feb 27	2220	Apr 13	3220	Apr 1 1998
LOWEST DAILY MEAN	450	Dec 20	450	Dec 20	450	Dec 20 2000
ANNUAL SEVEN-DAY MINIMUM	494	Aug 16	498	Sep 2	488	Sep 4 1999
MAXIMUM PEAK FLOW			2410	Apr 12	(a)3300	Apr 1 1998
MAXIMUM PEAK STAGE			5.60	Apr 12	(b)6.85	Jan 26 1996
INSTANTANEOUS LOW FLOW			(c)420	Dec 20	(c)420	Dec 20 2000
ANNUAL RUNOFF (CFSM)	.56		.59		.76	
ANNUAL RUNOFF (INCHES)	7.62		8.02		10.39	
10 PERCENT EXCEEDS	781		881		1240	
50 PERCENT EXCEEDS	590		587		755	
90 PERCENT EXCEEDS	516		509		586	

(a) Does not include water years 1909 to 1916, 1931.
(b) Backwater from ice; does not include water years 1909 to 1916, 1931.
(c) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04136000 AU SABLE RIVER NEAR RED OAK, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 1996 to current year.
DISSOLVED OXYGEN: July 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 24.5°C, July 5, 1999, Aug. 7, 2001; minimum, -0.5°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum recorded, 15.1 mg/L, Dec. 17, 19, 1999, but may have been higher during instrument malfunction Dec. 19, 1999; minimum, 6.2 mg/L, July 24, 2001.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 24.5°C, Aug. 7; minimum, -0.5°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 14.1 mg/L, Feb. 28, Mar. 6; minimum, 6.2 mg/L, July 24.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.5	12.5	13.5	7.5	5.5	6.5	3.0	1.5	2.5	.0	.0	.0
2	14.5	14.0	14.0	8.5	7.0	8.0	1.5	.5	1.0	.0	.0	.0
3	14.5	13.0	13.5	8.5	7.5	8.0	.5	-.5	.0	.0	.0	.0
4	13.0	12.0	12.5	7.5	7.0	7.5	.5	-.5	.0	.0	.0	.0
5	12.0	9.5	10.0	7.0	5.5	6.0	.5	-.5	.5	.0	.0	.0
6	9.5	8.5	9.5	6.5	5.0	5.5	.0	-.5	.0	.0	.0	.0
7	8.5	7.0	7.5	7.5	6.5	7.0	.0	-.5	.0	.0	.0	.0
8	7.0	6.5	7.0	8.0	7.0	7.5	.0	-.5	.0	.0	.0	.0
9	7.5	6.0	7.0	7.5	6.5	7.0	.0	.0	.0	.0	.0	.0
10	8.0	6.0	7.0	7.0	6.5	7.0	.0	.0	.0	.0	.0	.0
11	9.0	7.0	8.0	6.5	5.0	5.0	.0	-.5	.0	.0	.0	.0
12	9.0	7.5	8.5	5.0	5.0	5.0	.0	-.5	.0	.0	.0	.0
13	11.0	9.0	10.0	5.5	5.0	5.5	.0	-.5	.0	.5	.0	.0
14	13.0	11.0	12.0	5.5	4.5	5.0	.0	-.5	.0	2.0	.5	1.5
15	12.5	10.5	11.5	4.5	3.5	4.0	.0	.0	.0	2.5	2.0	2.0
16	10.5	10.0	10.0	3.5	3.0	3.5	1.0	.0	.5	3.0	2.5	2.5
17	10.5	9.5	10.0	3.5	3.0	3.0	1.5	1.0	1.5	2.5	1.5	2.0
18	9.5	8.5	9.0	3.0	2.5	3.0	1.0	.0	.5	1.5	1.5	1.5
19	9.5	8.5	9.0	2.5	2.0	2.5	.0	-.5	.0	1.5	-.5	1.0
20	11.5	8.5	10.0	3.0	2.0	2.5	.0	-.5	.0	.0	-.5	.0
21	11.5	9.5	10.5	2.5	.5	1.5	.0	-.5	.0	.0	-.5	.0
22	9.5	7.5	8.5	.5	.0	.0	.0	-.5	.0	.0	.0	.0
23	9.5	7.5	8.5	.5	-.5	.0	.0	-.5	.0	.5	.0	.0
24	11.0	9.5	10.5	2.0	.5	1.5	.0	-.5	.0	1.5	.5	1.0
25	11.5	10.0	11.0	2.5	1.5	2.0	.0	-.5	.0	1.0	.5	1.0
26	12.5	11.0	12.0	4.0	2.5	3.5	.0	-.5	.0	.5	.0	.0
27	13.0	11.5	12.5	4.0	4.0	4.0	.0	-.5	.0	.5	.0	.5
28	11.5	8.0	9.5	4.0	3.5	3.5	.0	.0	.0	1.0	.0	.5
29	8.0	5.5	6.0	3.5	3.5	3.5	.0	-.5	.0	2.0	1.0	1.5
30	5.5	4.5	5.0	3.5	3.0	3.5	.0	.0	.0	3.0	2.0	2.5
31	5.5	4.5	5.0	---	---	---	.0	.0	.0	3.0	2.5	3.0
MONTH	14.5	4.5	9.6	8.5	-.5	4.4	3.0	-.5	.2	3.0	-.5	.7

STREAMS TRIBUTARY TO LAKE HURON

04136000 AU SABLE RIVER NEAR RED OAK, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.0	2.0	2.5	1.0	.0	.5	5.5	4.5	5.0	15.5	14.5	15.5
2	2.0	.0	1.0	3.0	1.0	2.0	5.5	5.0	5.5	17.5	15.0	16.5
3	.0	-.5	.0	4.5	2.5	3.5	6.5	5.0	6.0	17.5	15.5	16.5
4	1.0	-.5	.5	4.5	3.5	4.0	7.5	5.0	6.5	15.5	13.5	14.0
5	2.0	1.0	1.5	3.5	1.0	2.0	7.5	6.0	7.0	14.5	12.5	13.5
6	2.0	2.0	2.0	1.5	.5	1.0	7.5	6.5	7.0	14.0	12.5	13.0
7	2.5	1.5	2.0	3.5	1.5	2.5	6.5	5.5	6.0	15.0	12.5	13.5
8	2.5	1.0	1.5	3.5	3.0	3.5	8.5	6.0	7.0	15.5	13.5	14.5
9	2.5	1.5	2.0	3.5	2.5	3.0	8.0	6.5	7.0	15.5	13.0	14.5
10	1.5	.0	.5	3.5	1.5	2.5	7.0	5.5	6.0	17.5	14.5	16.0
11	.0	-.5	.0	4.0	2.5	3.5	7.0	6.0	6.5	17.5	14.5	16.0
12	.5	-.5	.0	3.0	1.0	1.5	8.0	6.5	7.5	14.5	12.0	13.5
13	2.0	.5	1.0	2.5	1.0	2.0	9.0	6.5	7.5	14.0	11.5	12.0
14	2.0	1.5	2.0	4.5	2.0	3.0	9.0	7.0	8.0	12.0	10.5	11.5
15	1.5	.5	1.0	6.0	4.5	5.0	9.0	7.5	8.0	12.0	11.5	12.0
16	1.0	.5	1.0	5.5	4.0	4.5	9.0	7.5	8.0	14.5	11.5	12.5
17	.5	-.5	.0	4.0	3.0	3.5	8.0	6.0	7.0	18.0	14.5	16.0
18	.0	-.5	.0	4.5	2.0	3.5	8.5	6.0	7.5	18.0	16.5	17.5
19	.0	.0	.0	5.0	3.0	4.0	10.0	7.0	8.5	17.5	15.5	16.5
20	1.5	.0	.5	6.5	4.5	5.5	10.0	9.0	9.5	18.0	15.5	17.0
21	.5	-.5	.0	6.5	5.0	6.0	11.5	9.0	10.0	17.5	16.0	16.5
22	.0	-.5	.0	6.5	4.5	5.5	12.5	10.5	11.5	16.0	14.5	15.0
23	.0	-.5	.0	6.5	5.0	6.0	13.5	12.0	13.0	15.0	13.0	14.0
24	.0	-.5	.0	6.0	2.5	4.5	13.5	11.0	11.5	14.0	13.0	13.5
25	1.0	.0	.5	2.5	1.0	1.5	11.0	9.0	9.5	14.0	13.0	13.5
26	1.5	.5	1.0	1.0	.0	.5	10.5	9.0	10.0	14.0	13.0	13.5
27	2.0	1.0	1.5	1.5	1.0	1.0	12.0	9.5	11.0	14.0	12.0	12.5
28	1.0	.0	.5	3.0	.5	2.0	12.0	10.0	11.0	16.0	12.0	14.0
29	—	—	—	4.0	3.0	3.5	13.0	10.0	11.5	16.5	14.5	15.5
30	—	—	—	6.0	3.5	4.5	15.5	12.0	13.5	16.0	13.5	14.5
31	—	—	—	5.5	5.0	5.5	—	—	—	14.5	12.5	14.0
MONTH	3.0	-.5	.8	6.5	.0	3.3	15.5	4.5	8.4	18.0	10.5	14.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.5	11.5	13.0	21.0	17.0	19.0	22.5	21.0	22.0	15.5	13.5	14.5
2	11.5	10.5	11.0	17.0	14.5	16.0	22.0	21.0	21.5	16.0	13.5	15.0
3	12.0	11.0	11.5	18.0	16.5	17.0	22.0	19.5	21.0	17.0	15.0	16.0
4	12.0	11.0	11.5	20.0	17.0	18.5	22.0	19.5	20.5	16.5	15.0	16.0
5	12.5	11.0	12.0	19.0	17.0	18.0	22.0	19.5	21.0	16.0	14.0	15.0
6	16.0	12.0	14.0	18.0	15.5	17.0	23.5	20.0	21.5	16.5	14.5	15.5
7	16.5	14.0	15.5	19.0	17.5	18.5	24.5	22.0	23.5	18.5	16.0	17.0
8	17.0	15.0	16.0	21.0	17.5	19.0	23.5	21.5	22.5	19.5	18.0	18.5
9	16.5	15.0	15.5	21.0	19.0	20.5	23.5	21.5	22.5	19.0	17.0	18.0
10	16.0	14.5	15.5	21.0	19.0	20.0	22.0	19.0	20.5	17.0	16.0	16.5
11	19.0	15.5	17.0	20.0	18.0	18.5	19.0	17.0	18.0	16.0	14.5	15.5
12	20.5	18.0	19.0	19.0	16.5	17.5	19.0	17.0	18.0	16.0	14.5	15.5
13	22.0	19.0	20.0	19.0	16.5	18.0	19.0	17.5	18.5	15.5	13.0	14.0
14	23.5	20.5	22.0	19.5	17.0	18.5	18.0	15.5	17.0	13.0	11.0	12.0
15	23.0	21.5	22.5	19.0	17.0	18.0	18.0	16.0	17.0	13.5	11.5	12.5
16	21.5	19.0	20.5	18.5	16.5	17.5	17.5	15.5	16.5	13.5	11.5	12.5
17	20.5	18.5	19.5	20.0	17.5	18.5	15.5	15.0	15.5	13.0	12.0	12.5
18	20.0	18.0	18.5	19.5	18.5	19.0	16.0	14.0	15.0	14.5	12.5	13.0
19	20.5	17.5	19.0	20.0	18.0	19.0	15.5	14.5	15.0	14.0	13.5	13.5
20	20.5	18.0	19.0	19.5	18.5	19.0	16.5	14.0	15.0	13.5	13.0	13.5
21	19.0	16.5	17.5	21.0	18.0	19.5	18.0	15.0	16.5	14.0	13.0	13.5
22	18.0	15.0	16.5	22.0	19.5	21.0	18.0	16.5	17.0	14.0	13.0	13.5
23	19.0	16.5	18.0	23.0	21.0	22.5	19.5	17.5	18.5	14.0	12.5	13.5
24	20.0	16.5	18.5	23.5	21.5	22.5	19.5	18.0	19.0	12.5	10.0	11.0
25	21.0	18.0	19.5	22.5	20.5	21.0	19.0	16.5	17.5	10.0	8.0	9.0
26	22.5	19.5	21.0	20.5	18.5	19.5	19.0	16.5	17.5	8.5	7.5	8.0
27	22.5	20.0	21.5	19.0	16.5	17.5	18.5	17.0	17.5	9.5	8.5	9.0
28	23.0	20.0	21.5	18.0	16.5	17.0	18.0	16.5	17.5	11.0	9.5	10.5
29	22.0	20.5	21.5	18.0	16.0	17.0	17.5	15.5	16.5	11.0	9.5	10.5
30	21.5	20.0	20.5	20.0	17.5	18.5	18.0	16.5	17.0	11.5	10.0	11.0
31	—	—	—	22.0	19.0	20.5	17.5	15.5	17.0	—	—	—
MONTH	23.5	10.5	17.6	23.5	14.5	18.8	24.5	14.0	18.5	19.5	7.5	13.5

STREAMS TRIBUTARY TO LAKE HURON

04136000 AU SABLE RIVER NEAR RED OAK, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.4	8.8	9.5	12.0	11.1	11.6	12.6	11.7	12.1	13.8	13.4	13.5
2	9.8	8.4	9.1	11.6	10.6	11.1	13.0	12.3	12.6	14.0	13.7	13.8
3	10.5	8.6	9.5	11.7	10.3	11.0	13.2	12.7	13.0	14.0	13.4	13.5
4	10.7	9.0	9.8	11.8	10.7	11.2	13.1	12.5	12.8	13.5	13.0	13.2
5	11.1	9.5	10.3	12.5	11.1	11.7	13.1	12.2	12.6	13.3	12.8	13.0
6	11.1	9.9	10.5	12.4	11.3	11.8	13.3	12.9	13.1	13.2	12.8	12.9
7	11.7	10.4	11.0	11.6	10.9	11.2	13.1	12.9	13.0	13.1	12.5	12.8
8	12.0	10.8	11.4	11.7	10.7	11.2	13.2	12.8	13.0	13.8	13.0	13.3
9	12.1	11.0	11.5	11.2	10.7	10.9	13.3	12.9	13.1	13.8	13.4	13.6
10	12.0	10.9	11.4	11.5	10.7	11.0	13.0	12.6	12.8	13.5	13.0	13.1
11	11.7	10.5	11.1	12.4	11.3	11.8	13.3	12.8	13.0	13.0	12.6	12.8
12	11.7	10.4	11.0	12.2	11.7	11.9	13.5	13.1	13.2	12.9	12.5	12.7
13	11.1	10.0	10.5	12.0	11.4	11.8	13.6	13.3	13.4	12.7	12.2	12.4
14	10.4	9.3	9.8	12.4	11.5	11.9	13.4	13.1	13.2	12.6	12.3	12.5
15	10.3	9.1	9.7	12.5	11.8	12.2	13.3	12.9	13.1	12.5	12.2	12.4
16	11.1	9.8	10.4	12.4	11.9	12.2	13.1	12.6	12.8	12.5	12.0	12.3
17	11.3	9.9	10.6	12.8	12.0	12.4	12.7	12.2	12.5	13.1	12.3	12.7
18	11.6	10.1	10.8	13.0	12.2	12.6	13.5	12.7	13.1	12.8	12.4	12.6
19	11.6	10.3	10.9	12.8	12.3	12.6	13.7	13.3	13.5	13.2	12.4	12.7
20	11.3	10.2	10.7	12.7	12.1	12.4	13.8	13.6	13.7	13.6	13.2	13.4
21	11.2	9.5	10.4	13.3	12.3	12.8	13.7	13.4	13.5	13.3	13.0	13.2
22	11.9	10.4	11.1	13.5	12.9	13.2	13.8	13.4	13.5	13.1	12.7	12.9
23	11.6	10.7	11.1	13.6	13.1	13.4	13.8	13.6	13.7	12.8	12.4	12.6
24	11.1	10.1	10.6	13.1	12.6	12.8	13.7	13.5	13.6	12.6	12.2	12.4
25	11.3	10.0	10.6	13.1	12.3	12.7	13.8	13.6	13.7	12.9	12.3	12.5
26	10.7	9.6	10.2	12.4	11.4	11.8	13.9	13.4	13.6	12.9	12.5	12.6
27	10.6	9.3	10.0	11.6	11.2	11.4	13.6	13.2	13.4	13.0	12.4	12.6
28	11.8	9.9	10.8	11.8	11.2	11.5	13.5	13.3	13.4	12.9	12.5	12.7
29	12.7	11.2	12.0	11.8	11.5	11.6	13.5	13.0	13.2	12.6	12.1	12.4
30	12.9	12.0	12.4	12.0	11.4	11.7	13.2	12.9	13.1	12.1	11.6	11.8
31	12.6	11.8	12.2	—	—	—	13.5	13.1	13.2	11.9	11.3	11.6
MONTH	12.9	8.4	10.7	13.6	10.3	11.9	13.9	11.7	13.1	14.0	11.3	12.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.4	11.7	12.0	13.9	13.4	13.6	11.8	10.8	11.3	8.7	7.8	8.2
2	13.1	12.1	12.6	13.4	12.7	13.1	11.8	10.9	11.3	8.9	7.8	8.3
3	13.3	12.8	13.0	13.2	12.3	12.7	11.9	11.0	11.4	8.7	7.6	8.1
4	13.0	12.6	12.8	13.1	12.1	12.6	11.9	10.8	11.2	9.4	8.1	8.8
5	12.7	12.2	12.4	13.8	12.5	13.1	11.4	10.4	10.9	9.9	8.8	9.3
6	12.5	12.0	12.2	14.1	13.3	13.7	10.9	10.3	10.6	9.8	8.6	9.2
7	13.0	12.2	12.5	14.0	12.8	13.3	10.8	10.7	10.7	9.7	8.6	9.0
8	13.0	12.3	12.6	13.3	12.4	12.8	10.7	10.4	10.6	9.0	8.2	8.6
9	12.7	12.0	12.3	13.6	12.5	13.0	11.0	10.3	10.7	9.4	8.3	8.8
10	13.3	12.0	12.7	13.8	12.9	13.2	11.2	10.8	11.0	9.1	8.1	8.6
11	13.7	12.7	13.3	13.7	12.5	13.0	11.0	10.7	10.9	8.6	7.7	8.2
12	13.4	12.9	13.2	13.7	12.8	13.2	10.8	9.7	10.2	9.7	8.5	9.1
13	13.1	12.6	12.9	13.0	12.2	12.5	10.2	9.7	10.0	9.9	8.7	9.3
14	12.7	12.3	12.5	13.0	12.0	12.4	10.2	9.8	10.0	10.2	9.1	9.6
15	13.3	12.4	12.9	12.5	11.4	11.8	10.4	9.7	10.1	9.5	8.8	9.1
16	13.2	12.7	12.9	12.8	11.2	12.0	10.5	9.9	10.2	9.5	8.8	9.1
17	13.8	13.0	13.4	13.2	11.7	12.4	11.0	10.3	10.7	9.2	8.1	8.6
18	13.6	12.3	13.4	13.3	12.0	12.6	11.0	10.3	10.6	8.9	7.6	8.2
19	13.5	13.0	13.2	12.8	11.7	12.2	10.7	9.9	10.4	9.2	7.8	8.5
20	13.3	12.8	13.0	12.6	11.2	11.8	10.0	9.6	9.8	9.2	7.9	8.5
21	14.0	12.9	13.5	12.4	11.0	11.6	9.8	9.4	9.7	8.7	7.9	8.3
22	13.9	13.4	13.7	12.3	11.0	11.5	9.9	9.2	9.5	9.3	8.1	8.6
23	13.7	13.1	13.4	12.1	10.8	11.4	9.2	8.7	9.0	9.6	8.5	9.0
24	13.9	13.5	13.7	12.3	10.8	11.6	9.7	8.5	9.1	9.7	8.8	9.2
25	13.6	12.7	13.0	13.2	12.0	12.6	10.0	9.2	9.6	9.8	8.8	9.2
26	13.6	12.6	13.1	13.4	12.6	13.0	10.1	9.4	9.7	9.7	8.9	9.3
27	13.6	12.9	13.2	13.1	12.6	12.8	9.9	9.1	9.4	9.6	8.8	9.2
28	14.1	13.2	13.6	13.1	12.3	12.7	9.9	8.8	9.3	9.7	8.6	9.2
29	—	—	—	12.3	11.6	11.9	9.7	8.7	9.1	9.6	8.1	8.8
30	—	—	—	12.2	11.2	11.7	9.0	8.2	8.6	10.2	8.5	9.3
31	—	—	—	11.8	10.9	11.3	—	—	—	10.3	8.8	9.6
MONTH	14.1	11.7	13.0	14.1	10.8	12.5	11.9	8.2	10.2	10.3	7.6	8.9

STREAMS TRIBUTARY TO LAKE HURON

04136000 AU SABLE RIVER NEAR RED OAK, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.5	8.6	9.0	9.3	6.9	8.1	8.8	6.7	7.7	10.7	8.5	9.4
2	9.9	9.2	9.5	10.2	8.1	9.1	8.4	6.6	7.4	10.7	8.7	9.6
3	9.8	9.3	9.5	9.6	7.8	8.7	8.9	6.9	7.8	9.7	8.3	9.0
4	10.3	9.4	9.8	9.6	7.8	8.7	8.9	6.7	7.7	10.2	8.1	9.1
5	10.4	9.6	10.0	9.8	7.4	8.6	9.0	6.7	7.8	10.6	8.5	9.5
6	10.3	9.3	9.7	9.9	7.9	8.8	8.8	6.7	7.7	10.5	8.3	9.3
7	10.1	8.7	9.3	9.2	7.5	8.3	8.6	6.4	7.5	9.9	8.2	8.9
8	10.1	8.4	9.2	9.2	7.3	8.2	8.8	6.5	7.6	9.5	7.7	8.5
9	9.8	8.5	9.1	8.8	6.9	7.8	8.7	6.6	7.5	9.1	7.7	8.3
10	9.7	8.6	9.1	8.9	6.8	7.9	9.2	6.8	8.0	9.5	8.1	8.8
11	9.7	8.4	9.0	9.0	7.0	8.0	9.8	7.6	8.6	10.3	8.4	9.2
12	9.5	7.8	8.5	9.3	7.4	8.3	9.7	7.7	8.7	10.0	8.5	9.2
13	9.4	7.6	8.4	9.3	7.4	8.3	9.4	7.5	8.5	10.3	8.4	9.3
14	9.1	7.2	8.1	9.1	7.3	8.1	10.2	8.0	9.0	10.8	9.2	9.9
15	8.5	6.9	7.7	8.5	7.0	7.8	10.1	8.1	9.0	10.5	9.1	9.7
16	9.5	7.2	8.3	9.0	7.4	8.2	8.9	7.9	8.4	10.5	9.0	9.7
17	9.4	7.5	8.4	8.9	7.2	8.0	9.6	8.3	8.9	10.3	8.8	9.5
18	9.1	7.5	8.3	8.8	6.9	7.8	10.1	8.5	9.2	10.8	8.8	9.6
19	9.5	7.7	8.5	8.6	7.0	7.8	9.3	8.3	8.8	9.2	8.5	8.9
20	9.6	7.5	8.5	8.3	6.8	7.6	10.1	8.5	9.2	9.4	8.7	9.0
21	9.5	7.6	8.6	8.7	7.0	7.7	10.2	8.1	9.1	10.0	8.8	9.4
22	10.1	8.4	9.2	8.2	6.8	7.5	9.9	7.9	8.8	10.4	9.0	9.5
23	10.0	7.9	8.9	8.2	6.4	7.3	9.6	7.6	8.6	9.5	8.8	9.2
24	10.0	7.9	8.8	8.2	6.2	7.1	9.8	7.6	8.6	10.7	9.3	9.9
25	9.8	7.4	8.5	8.3	6.3	7.3	9.1	7.6	8.4	10.9	10.2	10.5
26	9.5	7.2	8.3	9.0	6.8	7.9	9.5	7.8	8.5	11.2	10.5	10.8
27	9.2	6.9	8.0	9.5	7.4	8.4	9.4	7.6	8.5	11.3	10.4	10.8
28	9.1	6.8	7.9	9.1	7.4	8.3	9.7	7.7	8.7	11.1	9.9	10.5
29	8.7	6.7	7.7	8.9	7.6	8.3	10.0	8.0	8.9	11.3	10.0	10.6
30	8.7	6.9	7.8	9.4	7.5	8.4	9.6	7.7	8.6	11.2	9.8	10.4
31	—	—	—	9.2	7.0	8.0	9.7	7.6	8.6	—	—	—
MONTH	10.4	6.7	8.7	10.2	6.2	8.1	10.2	6.4	8.4	11.3	7.7	9.5

STREAMS TRIBUTARY TO LAKE HURON

04136500 AU SABLE RIVER AT MIO, MI

LOCATION.--Lat 44°39'36", long 84°07'52", in SE1/4 NE1/4 sec.12, T.26 N., R.2 E., Oscoda County, Hydrologic Unit 04070007, on right bank 150 ft upstream from bridge on State Highway 33 in Mio, 500 ft downstream from Mio hydroelectric plant, 9.5 mi downstream from Big Creek, and 73.0 mi upstream from mouth.

DRAINAGE AREA.--1,361 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WDR MI-96-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 929.60 ft above sea level.

REMARKS.--Water-discharge records good. Flow regulated by Mio Dam 500 ft upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	645	646	802	714	770	767	891	986	1040	708	620	626
2	647	662	779	637	747	771	910	964	1240	683	631	617
3	651	652	705	737	691	774	939	941	1320	690	626	658
4	639	657	729	742	749	761	1000	947	1240	709	618	626
5	626	652	764	742	748	755	1070	952	1150	680	620	616
6	669	650	711	734	730	755	1270	936	1100	683	615	606
7	683	662	624	735	720	757	1430	929	1090	684	598	616
8	690	652	744	648	762	747	1560	1310	1030	668	598	631
9	691	755	741	576	859	748	1490	1200	984	660	614	647
10	692	858	769	755	901	736	1420	1090	1020	676	666	789
11	674	849	750	771	802	745	1400	1410	1090	664	625	759
12	654	792	650	737	822	744	2490	1350	1070	645	609	723
13	661	785	624	720	860	738	2520	1190	980	639	601	671
14	664	799	757	780	818	771	2170	1090	958	640	594	649
15	652	793	789	736	791	752	1810	1040	910	635	593	634
16	648	796	757	739	775	763	1600	1090	909	651	610	627
17	652	769	776	725	755	782	1440	1140	888	667	653	628
18	643	759	744	727	648	761	1320	1150	889	634	661	629
19	655	743	716	722	788	768	1220	1040	868	639	731	675
20	652	747	564	574	794	801	1220	988	832	653	694	820
21	645	727	720	601	716	851	1170	977	831	681	668	812
22	646	711	673	795	563	900	1150	1080	833	684	666	772
23	643	695	636	751	795	946	1170	1130	818	685	648	756
24	660	713	703	717	672	964	1220	1040	797	682	638	831
25	661	713	637	700	875	912	1160	1130	785	700	621	844
26	661	772	679	689	824	842	1120	1150	783	642	732	913
27	684	863	740	702	801	836	1110	1110	763	653	755	884
28	660	874	640	699	771	821	1060	1100	738	635	701	824
29	655	842	677	694	---	809	1040	1070	735	651	656	774
30	655	819	784	741	---	845	998	996	730	652	634	737
31	659	---	736	772	---	861	---	942	---	638	633	---
TOTAL	20417	22407	22120	22112	21547	24783	40368	33468	28421	20611	19929	21394
MEAN	659	747	714	713	770	799	1346	1080	947	665	643	713
MAX	692	874	802	795	901	964	2520	1410	1320	709	755	913
MIN	626	646	564	574	563	736	891	929	730	634	593	606
CFSM	.48	.55	.52	.52	.57	.59	.99	.79	.70	.49	.47	.52
IN.	.56	.61	.60	.60	.59	.68	1.10	.91	.78	.56	.54	.58

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	938	992	964	897	886	1087	1458	1157	989	870	822	870
MAX	1779	1430	1303	1321	1152	1813	2241	1636	1422	1520	1195	1575
(WY)	1987	1992	1967	1973	1973	1976	1971	1983	1954	1994	1994	1986
MIN	659	738	711	697	660	733	799	723	683	655	578	661
(WY)	2001	1964	1964	1965	1958	1956	2000	1958	1958	1958	1958	1958

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	280019		297577			
ANNUAL MEAN	765		815		994	
HIGHEST ANNUAL MEAN					1213	1986
LOWEST ANNUAL MEAN					746	1958
HIGHEST DAILY MEAN	1300	Feb 27	2520	Apr 13	4230	Apr 1 1998
LOWEST DAILY MEAN	564	Dec 20	563	Feb 22	21	Aug 9 1977
ANNUAL SEVEN-DAY MINIMUM	604	Aug 16	612	Aug 11	420	Aug 8 1977
MAXIMUM PEAK FLOW			3280	Apr 12	4380	(a)
MAXIMUM PEAK STAGE			5.37	Apr 12	6.37	Apr 1 1998
INSTANTANEOUS LOW FLOW			278	Dec 5	7.0	Aug 4 1977
ANNUAL RUNOFF (CFSM)	.56		.60		.73	
ANNUAL RUNOFF (INCHES)	7.65		8.13		9.92	
10 PERCENT EXCEEDS	949		1110		1350	
50 PERCENT EXCEEDS	742		744		923	
90 PERCENT EXCEEDS	640		634		714	

(a) Sept. 30, 1986, Apr. 1, 1998.

STREAMS TRIBUTARY TO LAKE HURON

04136500 AU SABLE RIVER AT MIO, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 1996 to current year.
DISSOLVED OXYGEN: July 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 26.0°C, Aug. 9, 2001; minimum, 0.0°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 14.3 mg/L, Feb. 23-25, 1999; minimum, 5.8 mg/L, July 27, 2001.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 26.0°C, Aug. 9; minimum, 0.0°C, Feb. 25-28.
DISSOLVED OXYGEN: Maximum, 13.2 mg/L, on several days during winter period; minimum, 5.8 mg/L, July 27.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.5	11.5	11.5	9.0	8.0	8.0	3.5	3.5	3.5	.5	.5	.5
2	13.0	12.0	12.0	8.5	7.5	7.5	3.5	3.0	3.0	.5	.5	.5
3	13.5	12.5	12.5	8.5	7.5	7.5	3.0	2.5	2.5	.5	.5	.5
4	14.0	13.5	13.5	7.5	7.5	7.5	2.5	2.5	2.5	.5	.5	.5
5	14.0	13.5	13.5	7.5	7.0	7.0	2.5	1.5	1.5	.5	.5	.5
6	13.5	13.0	13.0	7.5	7.0	7.0	1.5	1.5	1.5	.5	.5	.5
7	13.0	12.0	12.0	7.5	7.5	7.5	1.5	1.0	1.0	.5	.5	.5
8	12.0	10.5	10.5	7.5	7.5	7.5	1.5	1.0	1.0	.5	.5	.5
9	10.5	9.5	9.5	7.5	7.0	7.0	1.0	1.0	1.0	.5	.5	.5
10	9.5	8.5	8.5	7.0	7.0	7.0	1.0	.5	.5	.5	.5	.5
11	8.5	8.0	8.0	7.0	6.5	6.5	.5	.5	.5	.5	.5	.5
12	8.5	8.0	8.0	6.5	6.5	6.5	.5	.5	.5	.5	.5	.5
13	9.0	8.5	8.5	6.5	6.0	6.0	.5	.5	.5	.5	.5	.5
14	10.0	9.0	9.0	6.0	5.0	5.0	.5	.5	.5	.5	.5	.5
15	10.0	10.0	10.0	5.0	4.5	4.5	.5	.5	.5	.5	.5	.5
16	11.0	10.0	10.0	4.5	4.5	4.5	.5	.5	.5	.5	.5	.5
17	11.5	11.0	11.0	4.5	4.0	4.0	.5	.5	.5	1.0	.5	.5
18	11.5	11.0	11.0	4.0	3.0	3.0	.5	.5	.5	1.5	.5	1.0
19	11.5	11.0	11.0	3.0	3.0	3.0	.5	.5	.5	1.5	1.5	1.5
20	11.5	11.0	11.0	3.0	2.5	2.5	1.0	.5	.5	1.5	1.5	1.5
21	11.0	10.5	10.5	2.5	1.5	1.5	.5	.5	.5	1.5	1.5	1.5
22	11.0	10.5	10.5	1.5	1.0	1.0	.5	.5	.5	1.5	1.5	1.5
23	11.0	10.5	10.5	1.5	1.5	1.5	.5	.5	.5	1.5	1.0	1.0
24	11.0	10.5	10.5	1.5	1.5	1.5	.5	.5	.5	1.5	.5	1.0
25	11.0	10.5	10.5	1.5	1.5	1.5	.5	.5	.5	1.0	.5	1.0
26	11.0	10.5	10.5	1.5	1.5	1.5	.5	.5	.5	1.0	.5	.5
27	11.5	10.5	10.5	1.5	1.5	1.5	.5	.5	.5	1.0	.5	.5
28	11.0	10.5	10.5	2.5	1.5	1.5	.5	.5	.5	1.0	.5	.5
29	10.5	10.0	10.0	3.0	2.5	2.5	.5	.5	.5	1.0	.5	1.0
30	10.5	10.0	10.0	3.5	3.0	3.0	.5	.5	.5	1.0	.5	.5
31	10.0	9.0	9.0	—	—	—	.5	.5	.5	1.0	.5	.5
MONTH	14.0	8.0	10.5	9.0	1.0	4.5	3.5	.5	.9	1.5	.5	.7

STREAMS TRIBUTARY TO LAKE HURON

04136500 AU SABLE RIVER AT MIO, MI--Continued

WATER-QUALITY RECORDS

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	.5	1.0	.5	.5	.5	4.0	3.0	3.5	14.5	13.0	13.5
2	2.0	1.0	1.5	1.0	.5	1.0	4.5	4.0	4.0	16.0	14.0	15.0
3	2.0	2.0	2.0	1.0	.5	1.0	4.5	4.5	4.5	16.0	15.5	15.5
4	2.0	2.0	2.0	1.0	.5	.5	5.0	4.5	4.5	16.0	15.5	15.5
5	2.0	1.0	1.5	1.5	.5	1.0	5.5	5.0	5.0	16.0	15.5	15.5
6	1.5	1.0	1.0	2.5	1.5	2.0	7.0	5.5	6.5	15.5	15.0	15.0
7	1.0	1.0	1.0	2.5	2.0	2.5	7.5	6.5	7.0	15.0	14.5	14.5
8	1.5	1.0	1.0	2.0	1.5	2.0	7.5	7.0	7.5	15.5	15.0	15.0
9	2.0	1.5	1.5	1.5	1.5	1.5	7.5	7.5	7.5	16.0	14.5	15.0
10	1.5	1.5	1.5	2.0	1.5	2.0	7.5	7.5	7.5	16.5	15.5	15.5
11	1.5	1.5	1.5	2.5	2.0	2.0	7.5	7.0	7.0	16.5	15.5	16.0
12	1.5	1.0	1.5	2.5	2.0	2.0	7.5	7.0	7.5	16.5	15.5	16.0
13	1.0	1.0	1.0	2.5	2.0	2.0	8.5	7.5	8.0	16.0	15.0	16.0
14	1.0	.5	.5	2.5	2.0	2.5	9.0	8.0	8.5	15.0	14.0	14.5
15	1.0	.5	.5	2.0	1.5	2.0	9.0	8.5	8.5	14.0	13.0	13.5
16	1.0	.5	1.0	2.0	1.5	2.0	9.0	8.5	8.5	13.5	13.0	13.0
17	1.5	1.0	1.5	3.0	2.0	2.5	8.5	8.0	8.0	16.5	13.0	14.5
18	1.5	1.0	1.5	3.5	3.0	3.0	8.5	7.5	8.0	17.0	15.0	15.5
19	1.0	1.0	1.0	3.5	3.0	3.5	8.5	7.5	8.0	17.0	16.0	16.5
20	1.0	.5	.5	3.5	3.5	3.5	8.5	8.5	8.5	17.0	16.5	16.5
21	1.0	.5	.5	3.5	3.5	3.5	10.0	8.5	9.5	17.5	17.0	17.0
22	1.0	.5	.5	4.0	3.5	4.0	10.5	10.0	10.0	18.0	17.5	17.5
23	.5	.5	.5	4.0	4.0	4.0	12.5	10.0	11.5	17.5	16.5	17.0
24	1.0	.5	.5	4.5	4.0	4.0	12.0	11.5	12.0	16.5	15.5	16.0
25	.5	.0	.5	4.5	4.0	4.0	12.5	12.0	12.0	15.5	15.0	15.5
26	.5	.0	.5	4.0	3.0	3.5	12.0	12.0	12.0	15.0	14.5	14.5
27	1.0	.0	.5	3.0	2.0	2.5	12.0	11.5	11.5	14.5	14.5	14.5
28	1.0	.0	.5	2.0	1.5	2.0	11.5	11.0	11.5	15.5	14.5	14.5
29	—	—	—	2.0	1.5	1.5	12.5	11.0	12.0	16.0	14.5	15.0
30	—	—	—	2.0	1.5	2.0	14.0	12.0	13.0	15.5	14.5	15.0
31	—	—	—	3.0	2.0	2.5	—	—	—	15.5	15.0	15.0
MONTH	2.0	.0	1.0	4.5	.5	2.3	14.0	3.0	8.4	18.0	13.0	15.3

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.0	15.0	15.0	23.5	22.0	23.0	22.5	20.0	21.5	19.0	18.5	19.0
2	15.0	14.0	14.5	22.0	21.5	22.0	22.5	21.5	22.0	19.5	18.0	18.5
3	14.0	13.5	14.0	21.5	20.5	21.0	23.0	22.5	22.5	19.0	18.5	18.5
4	13.5	12.0	12.5	21.5	20.5	21.0	23.5	23.0	23.0	18.5	17.5	18.0
5	12.5	12.0	12.0	20.5	20.0	20.5	24.0	22.5	23.0	18.5	17.5	18.0
6	13.0	12.0	12.5	20.5	19.5	20.0	25.0	23.0	24.0	18.5	17.5	18.0
7	14.5	13.0	13.5	20.5	19.5	20.0	24.5	23.5	24.0	19.0	17.5	18.5
8	16.0	14.0	15.0	21.0	19.5	20.0	25.5	24.0	24.5	19.5	18.0	18.5
9	17.5	15.5	16.5	21.5	20.0	21.0	26.0	24.5	25.0	19.0	18.5	18.5
10	17.0	16.0	16.5	22.5	21.0	21.5	25.0	24.5	24.5	19.0	18.5	19.0
11	—	—	—	21.5	21.0	21.5	24.5	23.5	24.0	19.5	18.5	18.5
12	—	—	—	21.5	20.5	21.0	23.5	22.5	23.5	19.0	18.5	18.5
13	19.5	18.0	18.5	21.5	20.5	21.0	22.5	22.0	22.0	18.5	17.5	18.0
14	21.5	18.5	20.5	21.5	20.5	21.0	22.0	21.0	21.5	17.5	16.0	17.0
15	22.5	20.5	21.5	21.0	20.0	20.5	22.5	20.5	21.5	17.0	16.0	16.5
16	23.5	22.0	22.5	21.0	19.5	20.0	21.0	20.0	20.5	16.5	15.5	16.0
17	23.5	22.5	23.0	20.5	19.5	20.0	20.5	19.5	20.0	15.5	15.0	15.5
18	22.5	22.0	22.5	20.0	19.5	19.5	19.5	18.5	19.0	15.0	14.5	14.5
19	22.5	21.5	22.0	21.0	20.0	20.0	18.5	17.5	18.0	14.5	13.5	14.0
20	22.0	20.5	21.5	21.0	20.0	20.5	18.0	17.5	18.0	15.0	14.5	15.0
21	20.5	20.5	20.5	21.5	20.5	21.0	18.5	17.5	18.0	15.0	14.5	14.5
22	21.0	20.0	20.5	22.5	21.0	21.5	19.0	17.0	18.0	15.5	14.5	15.0
23	20.5	19.5	20.5	23.5	21.5	22.5	18.5	17.0	17.5	15.0	14.5	14.5
24	20.5	19.5	20.0	24.5	22.5	23.0	18.5	17.5	18.0	14.5	14.0	14.0
25	21.0	19.5	20.0	23.0	22.5	23.0	19.0	18.5	18.5	14.0	12.5	13.0
26	22.0	20.0	21.0	23.0	22.5	23.0	20.5	19.0	19.5	12.5	11.5	12.0
27	23.0	21.0	21.5	22.5	22.0	22.5	20.5	19.5	20.0	11.5	10.0	10.5
28	23.5	22.0	22.5	22.0	21.0	21.5	20.0	19.5	19.5	10.0	9.5	9.5
29	24.0	22.5	23.5	21.5	20.5	21.0	20.5	19.5	20.0	10.0	9.5	10.0
30	24.0	23.0	23.5	21.5	20.0	20.5	20.5	19.5	20.0	12.0	10.0	11.0
31	—	—	—	21.0	20.0	20.5	20.0	19.0	19.5	—	—	—
MONTH	—	—	—	24.5	19.5	21.1	26.0	17.0	21.0	19.5	9.5	15.7

STREAMS TRIBUTARY TO LAKE HURON

04136500 AU SABLE RIVER AT MIO, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.1	10.0	10.0	11.3	10.3	10.9	11.7	11.5	11.6	13.0	12.8	12.9
2	10.6	9.9	10.2	11.9	11.1	11.5	11.8	11.5	11.6	13.1	12.7	12.9
3	10.4	9.8	10.2	11.8	11.4	11.6	12.0	11.7	11.9	13.1	12.9	13.0
4	9.9	9.7	9.9	12.5	11.5	11.8	12.3	11.9	12.1	13.2	12.9	13.0
5	9.8	9.6	9.7	12.1	11.5	11.8	12.9	12.3	12.7	13.2	13.1	13.2
6	9.7	9.5	9.6	12.3	11.1	11.7	13.0	12.9	13.0	13.1	12.9	13.0
7	9.7	9.4	9.5	11.5	10.8	11.1	13.0	12.8	12.9	13.0	12.8	12.9
8	9.8	9.4	9.6	11.6	10.9	11.1	13.0	12.8	12.9	12.8	12.6	12.7
9	10.5	9.8	10.1	11.5	10.9	11.2	13.0	12.8	12.9	12.7	12.5	12.6
10	11.1	10.5	10.8	11.6	11.0	11.3	13.0	12.9	13.0	12.7	12.6	12.6
11	11.4	11.0	11.2	11.9	10.8	11.2	13.0	12.8	12.9	12.8	12.6	12.7
12	11.6	11.4	11.5	11.7	10.5	11.0	12.9	12.8	12.8	13.0	12.8	12.9
13	11.7	11.4	11.6	10.9	10.4	10.7	12.9	12.7	12.8	13.0	12.5	12.9
14	11.5	11.3	11.4	11.2	10.8	11.0	12.8	12.4	12.8	12.9	12.8	12.8
15	11.6	11.1	11.3	11.5	11.1	11.3	12.9	12.7	12.8	12.8	12.6	12.7
16	11.2	10.6	10.9	11.5	11.3	11.4	12.9	12.6	12.9	12.7	12.5	12.6
17	10.7	10.2	10.5	11.6	11.4	11.5	13.0	12.8	12.9	12.6	12.3	12.5
18	10.3	10.1	10.2	11.9	11.6	11.8	12.9	12.8	12.9	12.4	12.0	12.2
19	10.3	10.1	10.2	12.0	11.7	12.0	12.9	12.6	12.7	12.3	12.2	12.2
20	10.5	10.1	10.3	12.3	11.7	12.2	12.6	12.3	12.5	12.3	12.2	12.3
21	10.5	10.1	10.4	12.6	12.3	12.5	12.7	12.5	12.6	12.5	12.2	12.4
22	10.6	10.3	10.5	12.8	12.6	12.7	12.9	12.7	12.8	12.6	12.4	12.5
23	10.7	10.5	10.6	12.8	12.7	12.7	13.1	12.6	12.9	12.8	12.5	12.6
24	10.8	10.5	10.6	12.8	12.6	12.7	13.2	12.9	13.1	12.8	12.5	12.7
25	10.6	10.4	10.5	13.0	12.7	12.8	13.1	13.0	13.1	12.8	12.5	12.7
26	10.6	10.3	10.5	13.0	12.9	13.0	13.1	13.0	13.0	12.7	12.3	12.6
27	10.6	10.4	10.5	13.0	12.7	12.9	13.1	13.0	13.0	12.6	12.4	12.5
28	10.5	10.3	10.4	12.8	12.3	12.6	13.1	12.9	13.1	12.7	12.4	12.6
29	10.6	10.2	10.4	12.3	11.8	12.0	13.1	12.9	13.0	12.7	12.4	12.6
30	10.4	10.1	10.3	11.8	11.6	11.7	13.1	12.9	13.0	12.8	12.6	12.7
31	10.6	10.1	10.2	---	---	---	13.0	12.8	12.9	12.8	12.4	12.7
MONTH	11.7	9.4	10.4	13.0	10.3	11.8	13.2	11.5	12.7	13.2	12.0	12.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.7	12.5	12.6	12.7	12.4	12.6	12.5	12.2	12.3	9.7	8.9	9.4
2	12.5	12.1	12.3	12.8	12.5	12.7	12.2	11.8	12.0	9.5	8.7	9.1
3	12.2	12.0	12.1	13.0	12.7	12.9	11.8	11.5	11.6	9.1	8.5	8.9
4	12.2	12.0	12.1	13.0	12.7	12.9	11.5	11.3	11.4	9.1	8.2	8.7
5	12.5	12.2	12.4	12.9	12.4	12.6	11.4	11.3	11.3	8.9	8.4	8.6
6	12.9	12.4	12.6	12.4	12.0	12.2	11.3	11.0	11.2	8.9	8.4	8.7
7	12.9	12.1	12.7	12.1	11.8	12.0	11.3	10.9	11.1	9.4	8.8	9.1
8	12.8	12.2	12.6	12.4	12.0	12.2	10.9	10.6	10.8	9.6	9.1	9.3
9	12.7	12.3	12.5	12.6	12.4	12.5	10.8	10.6	10.7	9.3	9.0	9.2
10	12.7	12.3	12.5	12.5	12.2	12.4	10.7	10.1	10.3	9.0	8.5	8.7
11	12.9	12.3	12.6	12.2	12.1	12.2	10.3	10.1	10.2	8.6	8.3	8.5
12	12.8	12.2	12.5	12.2	12.0	12.1	11.1	10.3	10.7	8.4	8.2	8.3
13	13.1	12.4	12.8	12.2	12.1	12.2	11.2	9.7	10.3	8.3	8.1	8.2
14	13.2	12.8	13.0	12.3	12.1	12.2	9.7	9.4	9.5	8.4	8.1	8.3
15	13.2	12.7	12.9	12.4	12.1	12.3	9.5	9.4	9.4	8.7	8.4	8.6
16	12.9	12.6	12.8	12.4	12.2	12.3	9.5	9.4	9.4	9.0	8.7	8.8
17	12.7	12.5	12.7	12.2	12.1	12.2	9.8	9.4	9.7	9.4	8.9	9.1
18	12.8	12.6	12.7	12.1	11.9	12.0	10.0	9.7	9.9	9.2	8.8	9.1
19	12.9	12.7	12.8	12.0	11.8	11.9	10.2	10.0	10.1	8.9	8.5	8.8
20	13.0	12.8	12.9	12.2	12.0	12.1	10.2	10.0	10.1	8.5	7.7	8.2
21	13.2	13.0	13.1	12.3	12.2	12.3	10.0	9.6	9.9	7.8	7.5	7.7
22	13.2	12.8	13.0	12.3	12.1	12.2	9.8	9.5	9.7	8.2	7.7	7.9
23	13.0	12.9	12.9	12.1	11.6	11.9	9.6	9.2	9.4	7.8	7.3	7.5
24	13.1	12.8	13.0	11.7	11.5	11.6	9.3	9.1	9.2	8.1	7.2	7.8
25	13.1	13.0	13.0	11.6	11.5	11.5	9.1	8.8	9.1	8.3	8.0	8.1
26	13.0	12.6	12.9	11.8	11.4	11.6	9.1	8.8	8.9	8.4	8.3	8.3
27	12.9	12.6	12.8	12.1	11.8	11.9	9.2	8.9	9.0	8.5	8.3	8.4
28	12.8	12.5	12.7	12.3	12.1	12.2	9.4	9.2	9.3	8.8	8.4	8.6
29	---	---	---	12.6	12.3	12.5	9.7	9.3	9.4	8.9	8.4	8.6
30	---	---	---	12.6	12.5	12.6	10.0	9.2	9.5	9.2	7.4	8.8
31	---	---	---	12.6	12.5	12.6	---	---	---	8.9	7.1	8.1
MONTH	13.2	12.0	12.7	13.0	11.4	12.2	12.5	8.8	10.2	9.7	7.1	8.6

STREAMS TRIBUTARY TO LAKE HURON

04136500 AU SABLE RIVER AT MIO, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.7	8.2	8.5	8.1	7.6	7.8	7.7	7.1	7.4	8.0	7.2	7.6
2	8.7	8.4	8.6	7.7	7.5	7.6	7.4	7.1	7.3	8.8	7.1	8.0
3	8.8	8.4	8.6	7.8	7.4	7.6	7.1	6.8	7.0	8.7	8.0	8.3
4	9.0	8.7	8.9	8.1	7.4	7.8	7.3	6.5	7.0	8.1	7.7	7.8
5	9.0	8.7	8.9	8.2	7.7	8.0	6.9	6.2	6.6	8.5	8.0	8.2
6	9.1	8.8	9.0	8.3	7.4	7.8	7.8	6.2	7.0	8.4	7.7	8.1
7	9.3	9.0	9.1	8.4	7.7	8.0	6.9	6.5	6.7	8.4	7.6	8.0
8	9.2	7.6	8.9	7.8	7.3	7.6	7.4	6.6	6.9	8.0	7.6	7.8
9	9.1	8.6	8.9	7.6	7.3	7.5	8.0	6.8	7.4	8.7	7.6	8.0
10	8.7	8.0	8.5	8.2	7.4	7.8	7.4	6.7	7.0	8.9	8.3	8.7
11	—	—	—	8.5	8.0	8.2	7.5	6.8	7.0	8.5	8.0	8.3
12	—	—	—	8.2	7.7	8.0	7.0	6.3	6.7	8.4	7.9	8.1
13	8.6	8.1	8.4	8.3	7.4	8.0	7.4	6.4	6.8	8.0	7.6	7.8
14	8.6	8.1	8.3	7.8	7.2	7.5	7.7	7.2	7.4	8.2	7.7	7.9
15	8.2	7.7	8.0	7.6	7.1	7.3	8.6	7.2	7.9	8.7	7.9	8.3
16	8.0	7.6	7.8	7.7	6.7	7.2	8.0	7.2	7.4	8.8	8.3	8.6
17	8.0	7.4	7.7	7.2	6.5	6.9	8.0	7.3	7.6	9.3	8.5	8.9
18	7.5	6.8	7.1	6.8	6.4	6.6	7.5	7.1	7.3	9.0	8.4	8.7
19	7.7	6.8	7.4	7.4	6.7	7.1	7.6	7.0	7.2	8.8	7.9	8.6
20	7.6	6.7	7.3	7.4	7.0	7.2	8.2	7.6	7.7	8.9	8.6	8.8
21	7.5	6.8	7.2	7.4	6.9	7.2	9.1	8.2	8.6	8.6	8.1	8.5
22	8.1	7.4	7.8	7.3	6.8	7.0	9.7	8.3	8.9	8.6	8.3	8.5
23	8.1	7.4	7.9	7.3	6.7	7.0	9.2	8.6	8.8	8.3	7.8	8.0
24	8.2	7.6	8.0	7.2	6.6	6.9	9.1	8.6	8.8	8.1	7.7	7.9
25	8.0	7.7	7.9	7.0	6.2	6.7	9.0	8.5	8.7	8.4	8.0	8.2
26	8.0	7.6	7.9	6.8	6.1	6.5	9.0	8.4	8.6	8.5	8.3	8.4
27	8.1	7.7	7.9	7.0	5.8	6.5	8.7	7.7	8.4	8.8	8.5	8.6
28	8.1	7.8	8.0	6.4	5.9	6.3	8.1	7.6	7.8	9.3	8.8	9.1
29	8.0	7.6	7.9	7.5	6.1	6.9	8.5	7.6	8.0	9.3	9.1	9.3
30	7.9	7.6	7.7	7.6	6.8	7.2	8.3	7.5	7.9	9.4	9.2	9.3
31	—	—	—	7.6	7.0	7.3	7.8	7.3	7.6	—	—	—
MONTH	—	—	—	8.5	5.8	7.3	9.7	6.2	7.6	9.4	7.1	8.3

STREAMS TRIBUTARY TO LAKE HURON

04136900 AU SABLE RIVER NEAR MC KINLEY, MI

LOCATION.--Lat 44°36'46", long 83°50'16", in SE1/4 SW1/4 sec.28, T.26 N., R.5 E., Alcona County, Hydrologic Unit 04070007, on right bank, upstream side of U.S. Forest Service 4001 bridge on Au Sable River Road, 5.5 mi southeast of McKinley.

DRAINAGE AREA.--1,513 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1996 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 830 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	796	799	976	e830	893	e905	1020	1120	1100	830	758	783
2	801	801	953	e760	871	911	1030	1090	1320	787	760	773
3	789	818	901	e810	831	927	1050	1060	1410	798	758	782
4	797	802	873	e840	848	910	1110	1060	1360	814	762	822
5	779	806	919	e840	874	e900	1170	1070	1250	820	753	770
6	815	803	879	e840	848	899	1360	1050	1190	816	752	755
7	831	816	e780	e840	840	898	1530	1050	1180	821	731	758
8	839	827	843	e790	865	901	1700	1320	1140	804	731	761
9	847	852	e910	e690	982	893	1620	1330	1100	792	749	779
10	839	1040	900	e830	e930	889	1600	1210	1100	790	769	893
11	830	1010	e880	e890	e940	892	1510	1460	1180	787	774	931
12	811	954	e790	e860	954	894	2350	1540	1190	769	745	870
13	808	933	e750	e840	998	890	2540	1340	1100	769	738	820
14	820	950	e820	e890	960	916	2260	1220	1080	784	728	791
15	810	946	e950	e860	931	902	1890	1160	1050	782	729	770
16	802	951	e890	e850	911	908	1700	1170	1040	786	740	756
17	807	936	e890	e840	e890	932	1580	1220	1010	796	781	756
18	803	913	e880	844	e770	920	1500	1240	993	772	798	753
19	799	900	e840	845	914	908	1380	1170	997	761	852	788
20	807	905	e720	e720	929	953	1390	1100	952	774	880	927
21	797	896	e730	e710	882	997	1310	1090	968	803	823	944
22	798	891	e840	e870	e730	1070	1290	1140	986	835	810	910
23	795	866	e740	894	e860	1130	1290	1220	986	826	791	892
24	805	888	e790	841	e840	1130	1360	1160	e940	814	774	955
25	808	895	e730	823	e940	1070	1310	1200	e920	834	763	977
26	808	927	e760	e800	999	1000	1250	1230	e900	790	848	1030
27	829	1040	e830	812	953	983	1230	1210	e880	784	900	1030
28	810	1060	e820	e810	e910	968	1200	1180	e870	767	848	947
29	802	1030	e700	810	---	952	1160	1190	867	771	804	902
30	803	1000	e870	850	---	969	1130	1120	850	789	788	862
31	802	---	e850	886	---	993	---	1070	---	780	788	---
TOTAL	25087	27255	26004	25615	25093	29410	43820	36790	31909	24645	24225	25487
MEAN	809	908	839	826	896	949	1461	1187	1064	795	781	850
MAX	847	1060	976	894	999	1130	2540	1540	1410	835	900	1030
MIN	779	799	700	690	730	889	1020	1050	850	761	728	753
CFSM	.53	.60	.55	.55	.59	.63	.97	.78	.70	.53	.52	.56
IN.	.62	.67	.64	.63	.62	.72	1.08	.90	.78	.61	.60	.63

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2001, BY WATER YEAR (WY)

MEAN	974	1014	1014	993	1041	1147	1553	1229	1081	925	874	870
MAX	1074	1098	1229	1179	1162	1380	2300	1662	1117	1020	1020	1022
(WY)	1997	1997	1997	1997	1997	1998	1997	1997	1997	1999	1997	1997
MIN	809	908	839	826	896	949	979	967	1054	795	781	799
(WY)	2001	2001	2001	2001	2001	2001	2000	1999	2000	2001	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1997 - 2001	
ANNUAL TOTAL	338281		345340			
ANNUAL MEAN	924		946		1059	
HIGHEST ANNUAL MEAN					1260	1997
LOWEST ANNUAL MEAN					945	2000
HIGHEST DAILY MEAN	1560	Feb 27	2540	Apr 13	4790	Apr 1 1998
LOWEST DAILY MEAN	700	Jan 22	690	Jan 9	690	Jan 9 2001
ANNUAL SEVEN-DAY MINIMUM	759	Dec 20	746	Aug 10	745	Sep 4 1999
MAXIMUM PEAK FLOW			(a)3110	Apr 12	(b)4990	Apr 1 1998
MAXIMUM PEAK STAGE			(c)13.92	Dec 14	(c)14.40	Jan 1 1999
INSTANTANEOUS LOW FLOW			(d)654	Jan 20	(d)654	Jan 20 2001
ANNUAL RUNOFF (CFSM)	.61		.63		.70	
ANNUAL RUNOFF (INCHES)	8.32		8.49		9.51	
10 PERCENT EXCEEDS	1100		1210		1300	
50 PERCENT EXCEEDS	889		880		997	
90 PERCENT EXCEEDS	797		769		808	

(a) Gage height 9.58 ft.
(b) Gage height 10.73 ft.
(c) Backwater from ice.
(d) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04136900 AU SABLE RIVER NEAR MC KINLEY, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1996 to current year.
DISSOLVED OXYGEN: October 1996 to current year.

INSTRUMENTATION.--Water-quality monitor, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 26.0°C, Aug. 7, 2001; minimum, -0.5°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 16.2 mg/L, Feb. 26, 2001, minimum, 5.2 mg/L, Aug. 28, 1998, July 28, 31, 1999.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 26.0°C, Aug. 7; minimum, -0.5°C, on several days during winter period.
DISSOLVED OXYGEN: Maximum, 16.2 mg/L, Feb. 26; minimum, 5.3 mg/L, Aug. 7.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.0	11.5	13.0	9.5	8.0	9.0	3.0	2.0	2.5	.0	.0	.0
2	14.0	12.5	13.5	9.0	7.5	8.5	2.5	1.5	2.0	.0	.0	.0
3	13.5	11.5	13.0	9.0	7.5	8.0	1.5	.0	1.0	.0	.0	.0
4	14.0	12.0	13.0	8.0	7.0	7.5	2.5	1.0	1.5	.0	.0	.0
5	12.5	10.5	11.5	7.0	5.5	6.0	2.5	.5	1.5	.0	.0	.0
6	12.0	11.0	11.5	7.5	5.5	6.5	.5	.0	.0	.0	.0	.0
7	11.0	9.5	10.0	8.0	7.0	7.5	.0	-.5	.0	.0	.0	.0
8	10.5	9.5	10.0	8.0	7.0	7.5	.5	.0	.0	.0	.0	.0
9	10.0	8.5	9.5	7.5	6.5	7.0	.5	.0	.0	.0	.0	.0
10	9.5	7.5	9.0	7.0	6.0	7.0	.5	.0	.5	.0	.0	.0
11	10.0	7.5	9.0	6.0	5.0	5.5	.5	.0	.0	.0	.0	.0
12	10.0	7.0	8.5	6.0	5.5	6.0	.0	.0	.0	.0	.0	.0
13	10.5	9.0	9.5	6.0	6.0	6.0	.0	.0	.0	.0	.0	.0
14	12.5	10.0	11.0	6.0	5.0	5.5	.0	.0	.0	.0	.0	.0
15	11.0	9.5	10.0	5.0	4.0	4.5	.0	.0	.0	1.5	.0	.0
16	11.0	9.0	10.0	4.0	3.5	3.5	1.0	.0	.5	1.5	1.0	1.0
17	11.0	9.5	10.5	4.0	3.0	3.5	1.0	.0	.5	1.0	.0	.5
18	11.0	9.0	10.0	4.0	3.0	3.5	.0	-.5	.0	1.0	.5	.5
19	11.0	9.0	10.0	3.0	2.5	2.5	.0	-.5	.0	1.0	-.5	.5
20	12.5	9.5	11.0	3.0	2.5	3.0	.0	.0	.0	.0	.0	.0
21	12.5	10.0	11.0	2.5	1.0	1.5	.0	.0	.0	.5	.0	.0
22	10.0	8.0	9.5	1.0	.0	.5	.0	.0	.0	1.5	.5	1.0
23	11.0	9.0	10.0	1.5	.0	.5	.0	.0	.0	1.0	.5	1.0
24	12.0	10.5	11.0	2.0	1.0	1.5	.0	.0	.0	1.0	.5	1.0
25	11.5	9.5	10.5	2.5	.5	1.5	.0	.0	.0	1.0	.0	.0
26	11.5	10.5	11.0	2.5	2.0	2.5	.0	.0	.0	.5	.0	.0
27	12.0	11.0	11.5	2.5	2.0	2.0	.0	.0	.0	.5	.0	.0
28	11.0	8.5	9.5	2.5	2.0	2.0	.0	.0	.0	.5	.0	.0
29	8.5	6.5	8.0	3.0	2.0	2.5	.0	.0	.0	1.5	.5	1.0
30	8.5	6.5	8.0	3.0	2.5	3.0	.0	.0	.0	2.0	1.0	1.5
31	9.0	6.5	8.0	—	—	—	.0	.0	.0	2.0	1.0	1.5
MONTH	14.0	6.5	10.4	9.5	.0	4.5	3.0	-.5	.3	2.0	-.5	.3

STREAMS TRIBUTARY TO LAKE HURON

04136900 AU SABLE RIVER NEAR MC KINLEY, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	.5	1.0	1.0	.0	.0	4.5	2.0	3.0	15.0	13.0	14.0
2	1.0	-.5	.0	3.0	.5	1.5	5.0	3.5	4.5	17.5	13.5	15.5
3	1.0	-.5	.5	3.0	1.0	2.5	6.5	3.5	5.0	16.5	15.0	16.0
4	2.0	.5	1.5	3.0	1.0	1.5	7.5	3.5	5.5	15.5	14.0	14.5
5	2.0	1.5	2.0	1.5	-.5	.5	7.0	4.0	5.5	16.5	13.0	15.0
6	2.0	1.5	1.5	2.0	.0	1.0	7.0	5.0	6.0	15.5	13.0	14.5
7	2.0	.5	1.5	4.0	1.5	2.5	7.0	6.0	6.5	17.0	13.0	15.0
8	1.5	.0	.5	3.5	2.0	3.0	9.0	7.0	8.0	17.0	13.5	15.5
9	2.5	1.0	1.5	3.0	1.5	2.0	8.0	6.5	7.0	17.0	13.0	15.0
10	1.5	-.5	.5	4.0	.0	2.0	8.5	6.0	7.0	18.0	14.0	16.0
11	.5	.0	.0	4.0	2.0	3.0	7.5	6.0	7.0	17.5	15.0	16.0
12	2.0	.0	.5	2.5	.5	1.5	8.5	7.0	7.5	17.0	14.0	15.5
13	2.0	1.0	1.5	3.0	2.5	2.5	9.5	7.0	8.0	16.5	13.0	15.0
14	1.5	.5	1.0	4.5	2.0	3.0	9.5	7.0	8.0	15.5	13.0	14.5
15	1.0	-.5	.5	5.0	3.0	4.0	9.5	7.0	8.5	14.5	12.5	13.5
16	1.0	.0	.5	4.0	1.5	2.5	8.5	7.0	8.0	15.5	12.0	14.0
17	.0	-.5	.0	3.0	1.0	2.5	9.0	6.5	8.0	17.5	13.0	15.5
18	.5	.0	.0	5.0	1.0	3.0	9.5	6.0	8.0	17.5	15.0	16.5
19	1.0	.0	.5	5.5	2.0	4.0	10.5	6.0	8.5	18.0	14.0	16.0
20	2.0	.5	1.0	6.0	3.0	5.0	9.5	7.5	8.5	19.0	14.5	17.0
21	1.0	-.5	.0	6.0	3.0	5.0	11.0	8.0	9.5	18.0	15.0	16.0
22	.0	.0	.0	6.0	2.5	4.5	12.0	9.5	11.0	18.0	15.0	16.5
23	1.0	.0	.0	6.0	3.0	5.0	13.5	10.0	11.5	17.0	14.5	16.0
24	.0	-.5	.0	5.5	2.5	3.5	12.5	10.5	11.0	16.5	14.5	16.0
25	2.0	.0	1.0	3.5	1.5	2.5	12.5	9.0	11.0	16.0	14.0	15.0
26	1.5	.0	.5	3.5	1.0	2.5	13.0	10.0	11.5	16.0	13.5	14.5
27	1.5	.0	.5	3.0	2.0	2.5	13.5	10.0	12.0	14.5	13.0	13.5
28	.5	-.5	.0	4.0	1.0	3.0	13.0	9.0	11.5	17.0	13.5	15.0
29	—	—	—	3.5	2.0	3.0	13.5	8.5	11.5	17.0	13.5	15.5
30	—	—	—	5.0	2.0	3.5	15.5	11.0	13.5	16.5	12.5	15.0
31	—	—	—	4.5	2.0	3.5	—	—	—	17.0	12.5	15.0
MONTH	2.5	-.5	.6	6.0	-.5	2.8	15.5	2.0	8.4	19.0	12.0	15.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	13.0	13.5	23.0	19.0	21.0	23.0	21.0	22.0	18.5	15.0	17.0
2	15.0	13.0	14.0	21.5	16.5	19.0	23.5	21.5	22.5	19.0	16.0	17.5
3	14.5	13.0	14.0	21.5	18.5	20.5	23.5	20.5	22.0	20.0	17.0	18.5
4	13.5	12.5	13.0	22.0	18.5	20.5	23.5	20.0	22.0	19.0	16.5	17.5
5	14.0	11.5	12.5	20.5	18.0	19.5	24.0	20.5	22.5	18.0	14.5	17.0
6	15.5	11.5	13.5	21.0	16.5	19.0	25.5	21.5	23.5	19.0	16.0	17.5
7	17.0	11.5	14.0	21.0	18.0	20.0	26.0	23.5	25.0	20.0	17.0	18.5
8	17.5	12.5	15.0	22.0	18.5	20.5	24.5	22.0	23.5	20.0	18.5	19.0
9	17.5	13.5	16.0	22.0	19.0	21.0	25.5	23.0	24.0	19.5	18.0	18.5
10	18.0	15.0	16.5	22.0	19.0	20.5	24.0	21.5	22.5	19.0	16.5	18.0
11	19.0	16.0	17.5	21.0	18.5	20.0	23.5	19.5	21.5	19.0	16.0	17.5
12	20.0	16.5	18.5	21.5	18.0	20.0	23.5	20.0	22.0	19.0	16.5	18.0
13	22.0	17.5	20.0	21.5	17.5	20.0	22.5	20.5	21.5	18.0	15.0	16.0
14	23.0	18.5	21.0	22.0	18.0	20.5	21.5	18.0	20.0	16.0	13.5	15.0
15	23.0	20.0	21.5	21.5	19.0	20.5	21.0	18.0	20.0	16.5	14.0	15.5
16	23.5	19.0	21.5	21.5	18.5	20.0	20.5	18.5	19.5	16.5	13.5	15.0
17	23.0	19.5	21.5	21.0	19.0	20.0	19.0	17.5	18.0	16.0	13.5	15.0
18	22.0	20.0	21.0	21.0	18.5	20.0	18.5	17.0	18.0	15.5	14.5	15.0
19	23.0	20.0	21.5	21.5	18.5	20.0	18.5	16.5	17.5	15.0	13.5	14.0
20	22.5	19.5	21.0	21.0	19.0	20.0	19.5	16.0	17.5	14.5	13.5	14.0
21	21.5	18.5	19.0	22.5	19.5	21.0	20.0	16.0	18.0	16.0	14.0	15.0
22	21.5	17.5	19.5	22.5	20.5	22.0	19.5	16.5	18.0	16.0	13.5	15.0
23	21.5	18.0	20.0	24.5	21.0	22.5	20.0	18.0	19.0	15.5	13.5	14.5
24	22.0	18.0	20.0	24.5	22.0	23.5	19.5	17.0	18.5	13.5	12.0	12.5
25	22.5	18.5	21.0	23.5	20.5	22.0	18.5	17.0	18.0	12.0	10.5	11.5
26	23.0	19.0	21.5	22.0	19.5	21.0	20.5	18.0	19.0	11.5	10.5	11.0
27	23.5	19.5	22.0	21.0	18.0	20.0	20.0	17.5	19.0	11.5	10.5	11.0
28	24.5	20.5	22.5	20.5	18.5	20.0	20.5	18.0	19.5	11.5	10.5	11.0
29	24.0	21.0	22.5	22.0	19.0	20.5	20.0	17.0	18.5	11.5	8.5	10.0
30	23.5	21.5	22.5	23.0	19.5	21.5	20.0	17.5	19.0	12.0	8.5	10.5
31	—	—	—	23.5	20.0	22.0	20.0	17.5	19.0	—	—	—
MONTH	24.5	11.5	18.6	24.5	16.5	20.6	26.0	16.0	20.3	20.0	8.5	15.2

STREAMS TRIBUTARY TO LAKE HURON

04136900 AU SABLE RIVER NEAR MC KINLEY, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.9	9.2	9.9	10.7	9.4	10.0	14.4	13.1	13.6	12.8	11.5	12.0
2	10.2	9.0	9.6	11.1	9.8	10.3	14.0	13.4	13.6	12.6	11.9	12.1
3	10.4	8.5	9.5	10.8	9.7	10.2	14.3	13.1	13.7	12.4	11.8	12.1
4	10.3	8.7	9.5	10.9	9.7	10.3	14.2	12.7	13.5	12.2	11.7	11.9
5	10.7	9.1	9.8	11.3	10.3	10.7	14.6	12.6	13.7	12.0	11.4	11.7
6	10.4	9.0	9.7	11.1	10.2	10.6	14.9	13.3	13.9	11.7	11.4	11.5
7	11.2	9.7	10.4	10.7	9.9	10.3	13.9	12.1	12.9	11.7	11.3	11.4
8	11.6	9.9	10.7	11.2	10.0	10.6	14.6	12.6	13.7	12.0	11.3	11.5
9	11.4	10.3	10.8	11.0	9.7	10.6	14.5	12.1	13.7	12.1	11.0	11.5
10	11.5	10.3	10.9	11.6	10.1	10.9	14.3	13.2	13.8	12.3	11.5	12.0
11	11.6	10.4	11.0	11.8	11.0	11.4	13.9	12.7	13.2	12.1	11.4	11.9
12	11.7	10.3	11.0	11.4	11.0	11.1	14.2	12.0	12.9	12.0	11.1	11.7
13	11.3	9.9	10.6	11.9	10.9	11.3	14.3	11.4	12.7	12.0	11.1	11.5
14	10.7	9.6	10.1	12.4	11.3	11.8	14.1	12.0	13.1	11.8	10.9	11.5
15	11.0	9.3	10.1	12.8	12.0	12.3	14.7	13.1	13.7	13.4	10.2	11.4
16	11.3	10.0	10.5	12.9	12.2	12.5	15.6	13.7	15.0	14.8	13.2	13.7
17	11.0	9.6	10.3	13.4	12.5	12.9	15.7	14.6	15.1	15.0	14.1	14.6
18	10.7	9.6	10.1	13.8	12.8	13.2	15.3	12.8	14.1	14.6	14.0	14.3
19	10.8	9.5	10.0	13.9	13.1	13.5	15.4	12.8	13.9	14.4	11.6	13.8
20	10.0	8.6	9.5	13.6	13.0	13.3	15.3	12.1	13.6	13.5	11.2	12.2
21	10.3	8.5	9.4	14.4	13.3	13.8	13.5	11.2	12.1	14.8	11.3	13.0
22	10.8	9.5	10.2	14.7	13.6	14.1	11.6	11.0	11.2	15.2	14.5	14.8
23	10.7	9.1	9.9	14.9	13.6	14.2	11.9	10.7	11.2	14.6	14.1	14.4
24	9.9	8.6	9.2	14.5	13.9	14.1	12.4	11.0	11.7	14.6	14.0	14.2
25	10.2	9.0	9.5	14.6	13.7	14.2	11.8	11.0	11.4	14.3	12.1	13.7
26	9.6	8.6	9.0	13.9	13.5	13.7	11.6	10.5	11.1	14.2	11.0	12.9
27	9.4	8.1	8.7	14.0	13.4	13.7	11.6	10.6	10.8	14.4	12.8	13.5
28	10.4	8.6	9.6	14.2	13.6	13.8	11.1	10.4	10.6	14.4	12.3	13.5
29	11.2	9.8	10.5	14.0	13.4	13.7	11.6	10.6	11.2	13.8	13.1	13.5
30	11.0	9.7	10.3	13.7	13.1	13.4	12.0	11.4	11.7	13.7	12.9	13.3
31	10.9	9.6	10.1	---	---	---	12.0	11.4	11.7	13.7	13.0	13.4
MONTH	11.7	8.1	10.0	14.9	9.4	12.2	15.7	10.4	12.8	15.2	10.2	12.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.7	13.3	13.5	15.8	10.2	13.8	12.1	11.0	11.6	9.6	8.3	9.0
2	13.7	11.4	12.9	14.9	13.7	14.5	12.0	10.8	11.3	10.0	8.1	9.1
3	13.9	11.1	12.9	14.7	13.4	14.1	12.1	10.5	11.4	9.6	7.9	8.6
4	14.0	12.9	13.4	14.9	13.4	14.1	12.1	10.5	11.3	9.6	8.0	8.8
5	13.9	13.0	13.5	15.8	11.0	14.4	12.0	10.5	11.2	9.9	8.3	9.0
6	13.6	12.8	13.3	14.9	13.5	14.3	11.5	10.5	10.9	10.1	8.2	9.0
7	13.9	13.1	13.5	14.1	12.5	13.4	11.1	10.4	10.8	9.8	8.2	8.9
8	13.6	12.1	13.2	13.9	12.5	13.2	11.1	10.1	10.6	9.8	7.9	9.0
9	13.4	12.6	13.0	14.6	12.9	13.8	11.2	10.3	10.8	9.8	8.3	9.1
10	13.8	10.9	12.8	14.1	12.1	13.5	11.2	10.6	10.8	9.7	8.3	8.9
11	13.9	10.3	12.3	13.7	12.1	13.0	10.7	10.0	10.5	9.4	8.0	8.6
12	13.9	10.8	12.9	14.3	12.6	13.5	10.7	9.8	10.1	10.2	8.5	9.3
13	13.4	12.8	13.0	13.0	11.3	12.1	10.7	9.9	10.4	10.1	8.6	9.3
14	13.0	12.5	12.8	12.4	11.1	11.7	10.2	9.3	9.9	9.8	8.6	9.2
15	13.4	10.8	12.5	12.2	10.9	11.5	9.7	9.2	9.5	9.5	8.6	9.0
16	13.9	12.0	12.9	12.6	10.9	11.8	9.5	9.2	9.3	10.6	8.6	9.6
17	13.7	10.2	12.1	12.7	11.3	12.0	10.2	9.2	9.8	10.3	8.8	9.4
18	13.5	10.0	11.5	12.3	10.8	11.7	10.3	9.6	9.9	10.8	8.5	9.6
19	13.6	12.1	12.9	12.4	10.8	11.6	10.3	9.3	9.9	10.1	8.7	9.4
20	13.9	13.1	13.5	12.1	10.7	11.4	10.1	9.3	9.7	9.9	8.4	9.2
21	14.2	10.2	12.2	12.1	10.6	11.4	10.1	9.2	9.8	10.0	8.1	8.8
22	13.9	9.8	12.3	12.1	10.7	11.4	11.0	8.8	10.1	9.6	8.1	8.8
23	15.0	12.7	13.8	12.1	10.7	11.4	10.7	8.6	9.8	9.4	7.8	8.6
24	14.0	10.9	12.8	12.1	10.8	11.5	9.8	8.5	9.2	9.5	7.9	8.6
25	14.2	13.1	13.8	12.0	11.1	11.5	9.9	8.9	9.5	9.8	7.9	8.9
26	16.2	14.1	15.1	12.1	11.1	11.6	9.8	8.7	9.2	10.7	8.8	9.7
27	16.1	14.6	15.3	12.2	11.1	11.7	10.2	8.7	9.5	10.2	8.9	9.5
28	15.8	11.2	14.0	12.4	11.2	11.9	10.5	9.1	9.8	10.3	8.7	9.5
29	---	---	---	12.0	11.1	11.6	10.5	8.8	9.8	11.0	7.8	9.5
30	---	---	---	12.2	10.9	11.6	9.9	8.3	9.2	9.3	7.4	8.4
31	---	---	---	12.3	10.9	11.6	---	---	---	10.4	7.9	9.0
MONTH	16.2	9.8	13.1	15.8	10.2	12.5	12.1	8.3	10.2	11.0	7.4	9.1

STREAMS TRIBUTARY TO LAKE HURON

04136900 AU SABLE RIVER NEAR MC KINLEY, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.9	8.4	9.3	8.6	6.3	7.4	8.6	6.4	7.4	9.7	7.6	8.6
2	10.9	8.8	9.8	8.4	7.0	7.7	8.3	6.2	7.2	9.8	7.7	8.6
3	10.6	9.0	9.8	8.6	6.7	7.6	8.4	6.4	7.3	9.4	7.4	8.3
4	11.5	9.4	10.4	8.8	6.8	7.8	8.5	6.5	7.4	9.5	7.6	8.4
5	11.7	8.5	10.3	9.9	6.4	7.8	8.9	6.1	7.4	9.5	7.7	8.6
6	10.0	8.1	9.0	9.2	6.6	7.9	8.2	6.1	7.2	9.8	7.8	8.8
7	9.0	7.6	8.3	9.2	7.3	8.1	7.6	5.3	6.4	10.0	7.5	8.8
8	8.7	7.4	8.1	9.0	7.0	8.1	7.9	5.7	6.9	9.8	7.9	8.7
9	8.6	7.2	7.9	9.4	7.0	8.0	8.6	5.7	7.1	9.6	8.0	8.8
10	8.3	6.9	7.5	9.2	7.0	8.2	9.1	5.5	7.6	10.8	8.3	9.6
11	8.3	6.7	7.4	9.3	7.4	8.3	9.2	7.1	8.0	10.8	9.0	9.8
12	8.2	6.6	7.3	9.3	7.3	8.4	8.9	6.6	7.7	10.4	8.8	9.5
13	8.1	6.5	7.3	9.3	7.4	8.3	8.6	6.3	7.5	10.4	8.3	9.5
14	8.0	6.3	7.2	9.3	7.2	8.2	9.1	6.7	7.7	11.3	9.2	10.1
15	8.0	6.1	6.9	9.1	7.1	8.0	9.1	6.5	7.6	11.0	9.2	10.0
16	8.1	6.1	7.2	9.2	7.1	8.1	7.7	6.1	7.1	10.8	9.1	9.9
17	8.2	6.2	7.2	9.1	6.7	7.9	9.0	7.0	8.0	10.7	8.8	9.6
18	7.8	6.2	7.0	8.6	6.7	7.6	9.4	7.4	8.5	10.3	8.3	9.2
19	8.2	6.3	7.2	9.1	6.8	7.8	8.8	7.1	8.0	9.1	8.3	8.7
20	8.2	6.4	7.3	8.9	6.7	7.8	9.4	7.8	8.4	9.5	8.4	8.9
21	8.1	6.4	7.2	9.5	6.9	8.0	9.8	7.7	8.6	10.3	8.6	9.3
22	8.4	6.6	7.5	9.2	7.0	8.0	10.0	7.2	8.6	10.3	8.6	9.3
23	8.5	6.8	7.6	9.4	6.9	8.0	10.3	7.2	8.5	9.4	8.5	8.9
24	8.3	6.6	7.5	9.3	6.7	8.0	10.1	7.5	8.6	10.3	8.7	9.4
25	8.1	6.5	7.3	9.5	6.9	8.1	9.4	7.5	8.4	9.9	9.0	9.4
26	8.2	6.4	7.3	9.7	7.4	8.4	9.5	7.2	8.2	10.3	9.2	9.6
27	8.7	6.4	7.6	9.8	7.3	8.5	9.4	7.2	8.3	10.8	9.3	10.0
28	8.5	6.5	7.5	9.4	7.4	8.2	9.1	6.7	8.0	10.9	9.6	10.2
29	8.0	6.3	7.3	9.5	7.1	8.2	8.9	7.0	7.9	11.1	9.6	10.4
30	7.9	6.3	7.2	9.3	7.1	8.1	9.0	6.6	7.8	11.1	9.4	10.2
31	—	—	—	9.2	6.9	8.0	9.0	7.0	8.0	—	—	—
MONTH	11.7	6.1	7.9	9.9	6.3	8.0	10.3	5.3	7.8	11.3	7.4	9.3

STREAMS TRIBUTARY TO LAKE HURON

04137005 AU SABLE RIVER NEAR CURTISVILLE, MI

LOCATION.--Lat 44°33'39", long 83°48'10", in SW1/4 NW1/4 sec.14, T.25 N., R.5 E., Alcona County, Hydrologic Unit 04070007, on left bank 200 ft upstream from Bamfield Road, 3.2 mi east of Curtisville.

DRAINAGE AREA.--1,598 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1996 to current year.

GAGE.--Water-stage recorder. Datum of gage is 778.11 ft above sea level (levels by Consumers Energy Co.).

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Flow completely regulated by Alcona Dam 300 ft upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	829	836	998	842	948	974	1080	1170	1170	e870	e800	804
2	833	824	968	807	924	986	1100	1170	1380	e840	e800	802
3	833	844	925	854	873	987	1120	e1100	1410	e840	e800	814
4	828	824	882	937	892	979	1190	e1100	1380	e860	e820	856
5	803	800	954	970	936	965	1250	e1100	e1300	e860	e800	801
6	849	843	903	894	903	957	1460	e1100	e1250	e860	e800	786
7	896	859	788	924	887	955	1650	e1190	e1200	e860	e780	790
8	870	841	848	800	947	967	1860	e1400	e1200	e860	e780	805
9	871	907	927	692	1110	939	1720	e1440	e1150	e820	e800	e820
10	876	1150	926	833	1100	981	1670	e1300	e1170	e820	e820	e920
11	867	1070	898	1030	1030	922	1560	e1550	e1200	e810	e800	973
12	846	998	791	936	996	948	2570	e1600	e1250	e810	e780	890
13	843	974	751	907	1050	953	2980	e1450	e1150	e820	e780	e880
14	843	993	863	917	1030	966	2510	e1350	1060	e820	e760	823
15	841	980	994	968	1010	955	2070	e1220	1060	e830	e760	827
16	836	995	989	921	950	963	1800	e1230	1040	e840	780	800
17	842	983	977	888	913	977	1580	e1320	1000	e830	805	e810
18	843	947	907	894	873	969	1500	e1300	999	801	820	816
19	821	928	880	880	941	960	1370	e1210	1010	787	927	880
20	826	920	735	749	982	987	1370	e1170	973	789	928	990
21	839	916	759	746	926	1100	1330	e1150	979	824	842	1000
22	811	927	887	896	767	1100	1270	e1200	974	887	840	973
23	830	876	743	961	893	1200	1320	e1300	967	866	808	985
24	835	896	845	881	954	1220	1380	e1220	961	833	795	1020
25	837	914	727	860	1040	1170	1350	e1270	960	833	788	1070
26	859	948	786	843	1130	1070	1280	e1300	965	832	889	1100
27	870	1050	900	863	1010	1040	1270	e1300	961	824	927	1120
28	841	1080	833	865	965	1010	1280	e1250	940	833	904	1030
29	830	1070	796	853	---	1000	1170	e1200	936	e800	841	987
30	828	1040	956	908	---	1010	1200	e1200	e900	e820	821	939
31	840	---	954	945	---	1040	---	e1200	---	e820	809	---
TOTAL	26106	28233	27090	27264	26980	31250	46260	39060	32895	25799	25404	27111
MEAN	842	941	874	879	964	1008	1542	1260	1096	832	819	904
MAX	886	1150	998	1030	1130	1220	2980	1600	1410	887	928	1120
MIN	803	800	727	692	767	922	1080	1100	900	787	760	786
CFSM	.53	.59	.55	.55	.60	.63	.96	.79	.69	.52	.51	.57
IN.	.61	.66	.63	.63	.63	.73	1.08	.91	.77	.60	.59	.63

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2001, BY WATER YEAR (WY)

MEAN	1018	1053	1061	1067	1120	1219	1623	1298	1133	957	903	917
MAX	1118	1153	1227	1236	1235	1474	2390	1786	1225	1083	1054	1098
(WY)	1999	1998	1997	1997	1997	1998	1997	1997	1997	1997	1997	1997
MIN	842	941	874	879	964	1008	1020	993	1096	832	819	837
(WY)	2001	2001	2001	2001	2001	2001	2000	1999	2001	2001	2001	2000

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1997 - 2001	
ANNUAL TOTAL	352041		363452			
ANNUAL MEAN	962		996		1113	
HIGHEST ANNUAL MEAN					1320	1997
LOWEST ANNUAL MEAN					985	2000
HIGHEST DAILY MEAN	1710	Feb 27	2980	Apr 13	5410	Apr 1 1998
LOWEST DAILY MEAN	727	Dec 25	692	Jan 9	692	Jan 9 2001
ANNUAL SEVEN-DAY MINIMUM	783	Dec 20	781	Aug 11	781	Aug 11 2001
MAXIMUM PEAK FLOW			3520	Apr 12	5520	Apr 1 1998
MAXIMUM PEAK STAGE			11.78	Apr 12	13.56	Apr 1 1998
INSTANTANEOUS LOW FLOW			612	Jan 9	525	Jan 31 2000
ANNUAL RUNOFF (CFSM)	.60		.62		.70	
ANNUAL RUNOFF (INCHES)	8.20		8.46		9.47	
10 PERCENT EXCEEDS	1160		1280		1370	
50 PERCENT EXCEEDS	947		927		1050	
90 PERCENT EXCEEDS	806		800		837	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04137005 AU SABLE RIVER NEAR CURTISVILLE, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1996 to current year.
DISSOLVED OXYGEN: October 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 26.5°C, Aug. 8, 2001; minimum, -0.5°C, Feb. 18, 21, 2000.
DISSOLVED OXYGEN: Maximum, 13.7 mg/L, Mar. 3, 4, 2001; minimum, 5.2 mg/L, June 24, Aug. 12, 2001.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 26.5°C, Aug. 8; minimum, 0.5°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 13.7 mg/L, Mar. 3, 4; minimum, 5.2 mg/L, June 24, Aug. 12.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.0	12.0	12.5	9.5	9.0	9.5	2.0	2.0	2.0	.5	.5	.5
2	13.5	12.5	13.0	9.5	8.5	9.0	2.5	2.0	2.5	.5	.5	.5
3	13.5	13.0	13.5	9.5	9.0	9.5	2.5	2.5	2.5	.5	.5	.5
4	14.5	13.5	14.0	9.5	9.0	9.0	2.5	2.5	2.5	.5	.5	.5
5	13.5	13.5	13.5	9.0	8.5	8.5	2.5	2.0	2.5	.5	.5	.5
6	13.5	13.0	13.0	8.5	8.5	8.5	2.0	2.0	2.0	.5	.5	.5
7	13.0	12.0	12.5	8.5	8.5	8.5	2.0	2.0	2.0	.5	.5	.5
8	12.0	11.5	11.5	8.5	8.0	8.0	2.0	1.5	1.5	.5	.5	.5
9	11.5	11.0	11.5	8.0	8.0	8.0	1.5	1.5	1.5	.5	.5	.5
10	11.0	10.5	11.0	8.0	7.5	7.5	1.5	1.0	1.5	.5	.5	.5
11	11.0	10.5	10.5	7.5	7.0	7.0	1.0	1.0	1.0	.5	.5	.5
12	10.5	10.0	10.5	7.0	6.5	7.0	1.0	.5	1.0	.5	.5	.5
13	10.5	10.0	10.0	7.0	6.5	6.5	1.0	.5	1.0	.5	.5	.5
14	11.0	10.0	10.5	6.5	6.0	6.5	1.0	.5	1.0	.5	.5	.5
15	11.5	11.0	11.0	6.0	5.0	5.5	1.0	.5	.5	.5	.5	.5
16	11.0	10.5	11.0	5.0	5.0	5.0	.5	.5	.5	.5	.5	.5
17	11.0	11.0	11.0	5.0	4.5	4.5	.5	.5	.5	.5	.5	.5
18	11.0	10.5	11.0	4.5	3.5	4.0	.5	.5	.5	.5	.5	.5
19	11.0	10.5	10.5	3.5	3.5	3.5	.5	.5	.5	.5	.5	.5
20	11.0	10.5	10.5	3.5	3.0	3.5	.5	.5	.5	.5	.5	.5
21	11.5	11.0	11.0	3.0	2.0	2.5	.5	.5	.5	.5	.5	.5
22	11.0	10.5	11.0	2.0	1.5	1.5	.5	.5	.5	.5	.5	.5
23	11.0	10.5	10.5	1.5	1.5	1.5	.5	.5	.5	.5	.5	.5
24	11.5	11.0	11.0	1.5	1.5	1.5	.5	.5	.5	.5	.5	.5
25	11.0	10.5	11.0	1.5	1.5	1.5	.5	.5	.5	.5	.5	.5
26	11.0	11.0	11.0	1.5	1.5	1.5	.5	.5	.5	.5	.5	.5
27	12.5	11.0	11.5	1.5	1.5	1.5	.5	.5	.5	.5	.5	.5
28	12.0	11.0	11.5	2.0	1.5	1.5	.5	.5	.5	.5	.5	.5
29	11.0	10.5	10.5	2.0	2.0	2.0	.5	.5	.5	.5	.5	.5
30	10.5	10.0	10.5	2.0	2.0	2.0	.5	.5	.5	.5	.5	.5
31	10.0	9.5	10.0	—	—	—	.5	.5	.5	.5	.5	.5
MONTH	14.5	9.5	11.4	9.5	1.5	5.2	2.5	.5	1.1	.5	.5	.5

STREAMS TRIBUTARY TO LAKE HURON

04137005 AU SABLE RIVER NEAR CURTISVILLE, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	.5	.5	1.0	.5	.5	3.5	3.5	3.5	—	—	—
2	1.0	.5	.5	1.0	.5	1.0	3.5	3.5	3.5	—	—	—
3	1.0	.5	1.0	1.0	.5	.5	4.0	3.5	4.0	—	—	—
4	1.0	1.0	1.0	1.0	.5	.5	4.0	4.0	4.0	—	—	—
5	1.0	1.0	1.0	1.0	.5	1.0	4.5	4.0	4.0	—	—	—
6	1.0	1.0	1.0	1.5	1.0	1.5	4.5	4.5	4.5	—	—	—
7	1.0	1.0	1.0	1.5	1.5	1.5	4.5	4.5	4.5	—	—	—
8	1.0	1.0	1.0	1.5	1.5	1.5	5.0	4.5	5.0	—	—	—
9	1.0	1.0	1.0	1.5	1.5	1.5	5.5	5.0	5.0	—	—	—
10	1.5	1.0	1.0	2.0	1.5	1.5	6.0	5.0	6.0	—	—	—
11	1.5	1.0	1.0	2.0	2.0	2.0	6.5	6.0	6.0	—	—	—
12	1.0	1.0	1.0	2.5	2.0	2.0	7.0	6.0	6.5	—	—	—
13	1.0	1.0	1.0	2.5	2.0	2.0	8.5	7.0	8.0	—	—	—
14	1.0	1.0	1.0	2.5	2.0	2.0	9.0	8.0	8.5	—	—	—
15	1.0	1.0	1.0	2.5	2.0	2.0	9.0	8.5	8.5	—	—	—
16	1.0	1.0	1.0	2.5	2.5	2.5	8.5	8.0	8.5	—	—	—
17	1.0	1.0	1.0	2.5	2.5	2.5	8.0	7.5	8.0	—	—	—
18	1.0	1.0	1.0	3.0	2.5	3.0	8.5	7.5	8.0	—	—	—
19	1.0	1.0	1.0	3.0	3.0	3.0	8.5	7.5	8.0	—	—	—
20	1.0	.5	1.0	3.0	3.0	3.0	8.5	8.5	8.5	—	—	—
21	1.0	.5	.5	3.5	3.0	3.0	9.5	8.5	8.5	—	—	—
22	1.0	.5	.5	3.5	3.5	3.5	9.5	9.0	9.5	—	—	—
23	1.0	.5	1.0	4.0	3.5	4.0	11.0	9.5	10.0	—	—	—
24	1.0	.5	.5	4.0	4.0	4.0	11.0	10.5	11.0	—	—	—
25	1.0	.5	.5	4.0	4.0	4.0	11.5	10.5	11.0	—	—	—
26	.5	.5	.5	4.0	4.0	4.0	11.5	11.0	11.0	—	—	—
27	.5	.5	.5	4.0	3.5	3.5	12.5	11.0	11.5	—	—	—
28	.5	.5	.5	3.5	3.0	3.5	12.0	11.0	11.5	—	—	—
29	—	—	—	3.0	3.0	3.0	12.5	11.0	11.5	—	—	—
30	—	—	—	3.0	3.0	3.0	13.5	12.0	12.5	—	—	—
31	—	—	—	3.5	3.0	3.0	—	—	—	—	—	—
MONTH	1.5	.5	.8	4.0	.5	2.4	13.5	3.5	7.7	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	—	—	—	24.0	22.0	23.5	23.0	21.5	22.0	20.5	20.0	20.0
2	—	—	—	23.5	21.5	22.5	24.0	22.0	23.0	20.0	19.5	20.0
3	—	—	—	22.0	21.0	22.0	24.0	22.5	23.5	20.0	19.0	19.5
4	—	—	—	23.0	21.0	22.0	24.0	22.5	23.0	20.0	19.0	19.5
5	—	—	—	22.5	21.0	21.5	24.0	22.5	23.0	20.0	19.0	19.5
6	—	—	—	22.0	20.5	21.0	25.0	22.5	24.0	19.5	19.0	19.0
7	—	—	—	21.5	20.5	21.0	25.5	23.5	24.5	19.5	18.5	19.0
8	—	—	—	22.5	20.5	21.5	26.5	24.0	25.0	20.0	18.5	19.0
9	—	—	—	23.0	21.0	22.0	26.0	24.0	25.0	—	—	—
10	—	—	—	23.5	21.0	22.0	25.5	24.0	25.0	—	—	—
11	—	—	—	23.0	21.5	22.0	25.5	24.0	24.5	20.5	19.5	20.0
12	—	—	—	23.0	21.0	22.0	24.5	23.5	24.0	20.0	19.5	19.5
13	—	—	—	23.0	21.0	21.5	25.0	23.0	23.5	20.0	19.0	19.5
14	—	—	—	22.5	20.5	21.5	24.5	22.5	23.5	19.0	18.5	18.5
15	—	—	—	22.5	21.0	21.5	23.0	22.5	22.5	18.5	17.5	18.0
16	—	—	—	22.5	20.5	21.5	23.0	22.0	22.0	17.5	17.0	17.0
17	—	—	—	22.0	21.0	21.5	22.0	21.5	22.0	17.0	17.0	17.0
18	—	—	—	22.0	21.0	21.5	21.5	20.5	21.0	17.0	16.5	16.5
19	—	—	—	22.5	21.0	21.5	20.5	20.5	20.5	16.5	16.0	16.0
20	22.5	22.0	22.0	22.0	21.0	21.5	21.0	20.0	20.5	16.5	16.0	16.5
21	22.0	21.5	22.0	23.0	21.5	22.0	20.5	19.5	20.0	17.0	16.5	16.5
22	22.5	21.0	21.5	23.5	21.5	22.5	19.5	19.0	19.5	16.5	16.0	16.5
23	22.0	20.5	21.0	23.0	22.0	22.5	20.5	19.5	20.0	16.5	15.5	16.0
24	22.0	20.5	21.0	25.0	23.0	23.5	20.0	19.5	20.0	16.5	14.5	15.5
25	22.0	20.5	21.5	24.0	23.0	23.0	20.0	19.5	19.5	14.5	13.5	14.0
26	22.5	21.0	21.5	23.5	22.0	23.0	21.0	19.5	20.5	13.5	13.0	13.5
27	23.0	21.5	22.0	23.5	22.0	22.5	20.5	20.5	20.5	13.0	12.5	13.0
28	23.0	22.0	22.5	22.5	21.5	22.0	21.0	20.5	20.5	12.5	12.0	12.5
29	24.0	22.5	23.0	22.5	21.5	21.5	20.5	20.5	20.5	12.5	11.5	12.0
30	24.5	22.5	23.5	22.0	21.0	21.5	21.0	20.0	20.5	12.0	12.0	12.0
31	—	—	—	22.5	21.0	21.5	21.5	20.5	21.0	—	—	—
MONTH	—	—	—	25.0	20.5	22.0	26.5	19.0	22.1	—	—	—

STREAMS TRIBUTARY TO LAKE HURON

04137005 AU SABLE RIVER NEAR CURTISVILLE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.2	8.8	9.0	10.2	9.9	10.1	12.3	12.2	12.3	12.4	12.2	12.3
2	9.1	8.9	9.0	10.4	10.2	10.3	12.3	12.2	12.2	12.3	12.1	12.2
3	9.1	9.0	9.1	10.6	10.3	10.5	12.3	12.2	12.2	12.2	12.1	12.2
4	9.2	8.9	9.1	10.8	10.5	10.7	12.4	12.2	12.3	12.3	12.1	12.2
5	9.1	9.0	9.1	10.8	10.5	10.7	12.4	12.2	12.3	12.3	12.2	12.2
6	9.3	9.0	9.1	10.9	10.7	10.7	—	—	—	12.4	12.2	12.3
7	9.1	9.0	9.0	10.8	10.5	10.7	—	—	—	12.3	12.2	12.3
8	9.5	9.0	9.2	10.8	10.6	10.7	—	—	—	12.4	12.2	12.3
9	9.4	9.2	9.3	10.9	10.6	10.7	—	—	—	12.4	12.2	12.3
10	9.6	9.1	9.3	11.2	10.8	11.0	—	—	—	12.4	12.2	12.3
11	9.6	9.4	9.5	11.2	11.0	11.1	—	—	—	12.3	12.2	12.3
12	9.6	9.4	9.5	11.1	11.0	11.1	—	—	—	12.6	12.3	12.4
13	9.9	9.6	9.7	11.0	10.9	10.9	—	—	—	12.6	12.4	12.5
14	10.0	9.6	9.8	11.2	10.9	11.0	—	—	—	12.6	12.4	12.5
15	9.9	9.8	9.8	11.4	11.2	11.3	—	—	—	12.6	12.5	12.5
16	10.0	9.7	9.9	11.5	11.3	11.4	—	—	—	12.7	12.6	12.6
17	9.9	9.7	9.8	11.6	11.4	11.5	—	—	—	12.8	12.6	12.7
18	10.0	9.6	9.8	11.8	11.5	11.7	—	—	—	12.9	12.7	12.8
19	9.8	9.5	9.7	11.9	11.8	11.8	—	—	—	12.9	12.7	12.8
20	9.7	9.4	9.5	12.1	11.8	11.9	—	—	—	13.1	12.8	12.9
21	10.0	9.7	9.8	12.6	12.1	12.4	12.3	12.1	12.3	13.1	12.8	13.0
22	9.8	9.6	9.7	12.9	12.4	12.7	12.4	12.2	12.3	13.2	13.0	13.1
23	9.9	9.7	9.8	12.8	12.6	12.8	12.4	12.3	12.4	13.3	13.0	13.1
24	10.0	9.8	9.9	12.7	12.6	12.7	12.6	12.4	12.5	13.5	13.0	13.2
25	9.9	9.3	9.6	12.9	12.6	12.8	12.6	12.5	12.5	13.4	12.8	13.0
26	9.8	9.5	9.7	13.0	12.8	12.9	12.6	12.4	12.5	13.3	12.6	12.9
27	10.1	9.7	9.9	12.9	12.7	12.8	12.5	12.4	12.5	13.1	12.6	12.8
28	10.2	9.8	10.0	12.7	12.5	12.6	12.5	12.4	12.5	13.0	12.5	12.7
29	10.2	10.1	10.1	12.5	12.4	12.5	12.5	12.4	12.5	13.3	12.6	12.8
30	10.3	10.0	10.1	12.4	12.3	12.3	12.4	12.3	12.3	13.2	12.5	12.7
31	10.1	9.9	10.0	—	—	—	12.4	12.2	12.3	13.2	12.5	12.7
MONTH	10.3	8.8	9.6	13.0	9.9	11.5	—	—	—	13.5	12.1	12.6

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.9	12.2	12.6	13.1	12.2	12.5	12.1	11.9	12.0	—	—	—
2	13.0	12.2	12.5	13.3	12.3	12.6	12.3	11.9	12.1	—	—	—
3	12.8	11.9	12.2	13.7	12.3	12.7	12.2	11.9	12.1	—	—	—
4	12.7	11.9	12.1	13.7	12.4	12.7	12.3	11.9	12.2	—	—	—
5	12.8	11.9	12.2	13.3	12.2	12.5	12.2	11.9	12.1	—	—	—
6	12.4	12.0	12.2	13.0	12.1	12.4	12.1	11.8	12.0	—	—	—
7	12.7	12.0	12.4	13.3	12.3	12.5	11.9	11.6	11.7	—	—	—
8	12.3	11.7	12.0	13.3	12.3	12.5	11.7	11.4	11.5	—	—	—
9	12.4	11.5	11.9	13.3	12.3	12.6	11.5	11.2	11.3	—	—	—
10	12.6	12.1	12.4	13.3	12.1	12.4	11.4	11.0	11.2	—	—	—
11	12.7	12.0	12.4	13.1	12.0	12.3	11.2	10.8	11.0	—	—	—
12	12.2	11.8	12.0	12.7	12.1	12.3	11.6	10.8	11.1	—	—	—
13	12.3	11.8	12.1	12.8	11.7	12.1	11.5	11.1	11.2	—	—	—
14	12.1	11.9	12.0	11.7	11.6	11.6	11.4	11.0	11.2	—	—	—
15	12.3	11.8	12.0	11.8	11.5	11.7	11.1	10.6	10.9	—	—	—
16	12.1	11.6	11.9	11.7	11.5	11.6	10.9	10.6	10.8	—	—	—
17	12.2	11.7	12.0	11.6	11.3	11.5	11.1	10.6	10.8	—	—	—
18	12.3	12.0	12.1	11.6	11.3	11.5	11.3	10.8	11.1	—	—	—
19	12.3	12.0	12.1	11.8	11.5	11.6	11.2	11.0	11.1	—	—	—
20	12.6	11.9	12.3	11.9	11.5	11.8	11.3	11.1	11.2	—	—	—
21	12.6	12.3	12.4	12.0	11.6	11.8	11.2	10.9	11.1	—	—	—
22	12.5	12.2	12.3	12.0	11.7	11.8	11.3	10.9	11.2	—	—	—
23	12.4	12.0	12.2	11.8	11.5	11.6	11.3	10.9	11.1	—	—	—
24	12.4	12.0	12.2	11.6	11.4	11.5	11.3	10.9	11.2	—	—	—
25	12.7	12.3	12.5	11.6	11.3	11.5	11.2	10.9	11.1	—	—	—
26	12.8	12.5	12.6	11.6	11.3	11.5	11.0	10.7	10.9	—	—	—
27	12.9	12.5	12.6	11.8	11.4	11.6	11.4	10.8	11.0	—	—	—
28	13.0	12.3	12.6	11.9	11.7	11.8	11.2	10.8	11.0	—	—	—
29	—	—	—	12.0	11.7	11.9	11.2	9.3	10.4	—	—	—
30	—	—	—	12.1	11.7	11.9	11.4	9.4	10.2	—	—	—
31	—	—	—	12.1	11.8	11.9	—	—	—	—	—	—
MONTH	13.0	11.5	12.2	13.7	11.3	12.0	12.3	9.3	11.3	—	—	—

STREAMS TRIBUTARY TO LAKE HURON

04137005 AU SABLE RIVER NEAR CURTISVILLE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	--	--	--	7.0	6.0	6.5	7.4	6.5	7.1	7.7	6.6	7.3
2	--	--	--	6.7	6.2	6.5	7.4	6.5	7.0	7.4	6.1	6.8
3	--	--	--	6.4	5.3	5.8	7.7	6.7	7.2	7.8	5.7	6.7
4	--	--	--	6.7	5.8	6.1	7.5	6.3	6.9	7.7	6.3	7.1
5	--	--	--	7.3	6.5	6.8	7.2	6.1	6.7	7.7	6.4	7.1
6	--	--	--	7.1	6.6	6.8	6.9	6.2	6.5	7.1	5.8	6.6
7	--	--	--	6.8	6.0	6.3	6.8	5.9	6.2	6.7	5.7	6.2
8	--	--	--	6.5	6.0	6.2	6.7	5.8	6.3	6.8	5.5	6.2
9	--	--	--	6.6	5.9	6.3	7.0	5.9	6.3	--	--	--
10	--	--	--	6.7	6.1	6.4	6.9	5.8	6.3	--	--	--
11	--	--	--	6.8	6.1	6.5	6.9	5.8	6.4	7.5	6.2	7.1
12	--	--	--	6.8	6.2	6.5	6.0	5.2	5.5	7.6	5.5	6.7
13	--	--	--	6.7	6.3	6.5	6.7	5.3	6.2	7.9	6.2	7.3
14	--	--	--	6.6	5.5	6.2	7.1	5.6	6.4	7.5	6.1	6.8
15	--	--	--	6.3	5.4	5.7	6.8	6.0	6.4	7.3	5.9	6.8
16	--	--	--	6.2	6.0	6.1	6.6	5.8	6.3	7.7	6.1	7.1
17	--	--	--	6.4	6.0	6.2	7.3	6.3	6.8	8.1	6.6	7.5
18	--	--	--	6.4	5.7	6.0	7.2	6.3	6.8	8.3	7.0	7.8
19	--	--	--	6.1	5.3	5.8	7.6	6.2	6.9	8.2	7.0	7.7
20	6.3	5.8	6.1	6.0	5.6	5.8	8.1	6.1	7.4	8.5	7.0	8.0
21	6.3	6.0	6.1	6.0	5.5	5.8	7.5	6.8	7.2	8.6	7.6	8.3
22	6.4	5.8	6.2	6.5	5.7	6.1	8.8	6.8	7.1	8.5	7.2	8.0
23	6.0	5.3	5.7	6.0	5.5	5.8	8.2	6.8	7.6	9.1	7.3	8.0
24	6.2	5.2	5.6	--	--	--	8.1	7.1	7.7	9.4	7.8	8.7
25	6.4	5.8	6.2	--	--	--	8.2	7.1	7.6	9.4	8.4	8.9
26	6.6	5.9	6.3	--	--	--	8.1	7.1	7.6	9.3	8.3	8.8
27	6.6	5.6	6.3	--	--	--	7.9	6.9	7.4	9.7	8.4	9.0
28	6.6	6.1	6.4	--	--	--	7.8	6.7	7.3	9.6	8.5	9.0
29	6.6	6.2	6.4	--	--	--	8.0	6.7	7.4	9.5	8.5	9.0
30	6.4	5.5	6.0	--	--	--	8.2	6.6	7.2	9.6	8.3	9.0
31	--	--	--	7.9	6.4	7.3	8.5	6.8	7.5	--	--	--
MONTH	--	--	--	--	--	--	8.8	5.2	6.9	--	--	--

STREAMS TRIBUTARY TO LAKE HURON

04137020 AU SABLE RIVER NEAR SOUTH BRANCH, MI

LOCATION.--Lat 44°27'48", long 83°43'17", in SW1/4 NW1/4 sec.21, T.24 N., R.6 E., Iosco County, Hydrologic Unit 04070007, on right bank 75 ft downstream from Loud Dam, 8.4 mi east of South Branch.

DRAINAGE AREA.--1,689 mi^2.

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 1996 to current year.
DISSOLVED OXYGEN: July 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8, 9, 2001; minimum, 0.0°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 14.3 mg/L, Nov. 27, 2000; minimum, 4.0 mg/L, July 22, 1999.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8, 9; minimum, 0.0°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 14.3 mg/L, Nov. 27; minimum, 4.1 mg/L, Aug. 7.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.5	13.0	13.5	9.5	9.5	9.5	2.0	1.5	2.0	.0	.0	.0
2	14.5	13.5	14.0	9.5	9.5	9.5	2.0	1.5	1.5	.0	.0	.0
3	14.5	14.0	14.5	10.0	9.5	9.5	2.0	1.5	1.5	.0	.0	.0
4	15.0	14.0	14.5	9.5	9.0	9.5	1.5	1.5	1.5	.0	.0	.0
5	14.5	14.0	14.0	9.0	9.0	9.0	1.5	1.5	1.5	.0	.0	.0
6	14.0	13.0	13.5	9.0	8.5	8.5	1.5	1.0	1.5	.0	.0	.0
7	13.0	12.5	13.0	8.5	8.5	8.5	1.0	1.0	1.0	.0	.0	.0
8	12.5	11.5	11.5	8.5	8.0	8.5	1.0	1.0	1.0	.0	.0	.0
9	11.5	10.5	11.0	8.0	8.0	8.0	1.0	.5	.5	.0	.0	.0
10	10.5	10.0	10.5	8.0	8.0	8.0	.5	.5	.5	.0	.0	.0
11	10.5	10.0	10.5	8.0	7.5	7.5	.5	.5	.5	.0	.0	.0
12	11.0	10.0	10.5	7.5	7.0	7.0	.5	.5	.5	.0	.0	.0
13	11.5	10.5	11.0	7.0	6.5	6.5	.5	.5	.5	.0	.0	.0
14	12.0	11.0	11.5	6.5	6.0	6.0	.5	.5	.5	.0	.0	.0
15	12.0	11.5	11.5	6.0	5.5	5.5	.5	.0	.0	.0	.0	.0
16	12.0	11.5	12.0	5.5	5.0	5.0	.0	.0	.0	.0	.0	.0
17	12.0	11.5	12.0	5.0	4.0	4.5	.5	.0	.0	.0	.0	.0
18	12.0	11.5	11.5	4.0	3.5	4.0	.5	.0	.5	.0	.0	.0
19	12.0	11.5	11.5	3.5	3.5	3.5	.5	.0	.5	.0	.0	.0
20	12.0	11.0	11.5	3.5	3.0	3.0	.5	.0	.0	.0	.0	.0
21	12.0	11.5	11.5	3.0	2.0	2.5	.0	.0	.0	.0	.0	.0
22	11.5	11.0	11.5	2.0	1.5	2.0	.0	.0	.0	.0	.0	.0
23	11.5	11.0	11.5	1.5	1.5	1.5	.0	.0	.0	.0	.0	.0
24	12.0	11.0	11.5	1.5	1.0	1.0	.0	.0	.0	.0	.0	.0
25	11.5	11.0	11.0	1.5	1.0	1.0	.0	.0	.0	.0	.0	.0
26	11.5	11.5	11.5	1.5	1.5	1.5	.0	.0	.0	.0	.0	.0
27	12.0	11.5	12.0	1.5	1.5	1.5	.0	.0	.0	.0	.0	.0
28	11.5	11.0	11.5	2.0	1.5	2.0	.0	.0	.0	.0	.0	.0
29	11.0	10.5	11.0	2.0	2.0	2.0	.0	.0	.0	.0	.0	.0
30	10.5	10.0	10.5	2.0	2.0	2.0	.0	.0	.0	.0	.0	.0
31	10.0	9.5	9.5	---	---	---	.0	.0	.0	.0	.0	.0
MONTH	15.0	9.5	11.8	10.0	1.0	5.3	2.0	.0	.5	.0	.0	.0

STREAMS TRIBUTARY TO LAKE HURON

04137020 AU SABLE RIVER NEAR SOUTH BRANCH, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.5	.0	.0	3.5	3.5	3.5	14.5	13.0	14.0
2	.0	.0	.0	.0	.0	.0	3.5	3.5	3.5	15.5	14.0	15.0
3	.0	.0	.0	.0	.0	.0	3.5	3.5	3.5	16.0	15.0	15.5
4	.0	.0	.0	.5	.0	.5	4.0	3.5	4.0	15.5	15.5	15.5
5	.0	.0	.0	.5	.5	.5	4.5	4.0	4.0	15.5	15.0	15.0
6	.0	.0	.0	—	—	—	5.0	4.5	4.5	15.5	15.0	15.0
7	.0	.0	.0	.5	.5	.5	5.0	4.5	5.0	15.5	15.0	15.0
8	.0	.0	.0	.5	.5	.5	5.5	5.0	5.0	16.5	15.5	16.0
9	.5	.0	.0	1.0	.5	.5	6.0	5.0	5.5	17.0	16.0	16.5
10	.0	.0	.0	1.0	1.0	1.0	5.5	5.0	5.5	17.5	16.5	17.0
11	.5	.0	.5	1.0	1.0	1.0	6.0	5.5	5.5	17.5	17.0	17.0
12	.5	.0	.0	1.5	1.0	1.0	7.0	6.0	6.5	17.0	16.5	16.5
13	.5	.0	.0	1.5	1.5	1.5	7.5	7.0	7.5	17.0	16.0	16.5
14	.0	.0	.0	1.5	1.5	1.5	8.5	7.5	8.0	16.5	16.0	16.0
15	.5	.0	.5	1.5	1.5	1.5	9.0	8.5	8.5	16.5	16.0	16.0
16	.5	.5	.5	2.0	1.5	2.0	8.5	8.0	8.5	16.0	15.5	16.0
17	.5	.0	.5	2.5	2.0	2.5	8.0	7.5	8.0	17.5	16.0	16.5
18	.5	.0	.0	2.5	2.5	2.5	8.5	7.0	7.5	18.5	17.0	18.0
19	.0	.0	.0	2.5	2.0	2.5	9.0	7.5	8.0	18.0	17.5	17.5
20	.0	.0	.0	3.0	2.5	2.5	9.0	8.5	8.5	18.0	17.0	17.5
21	.0	.0	.0	3.5	3.0	3.0	9.5	9.0	9.0	18.0	17.5	17.5
22	.5	.0	.0	3.5	3.5	3.5	10.0	9.0	9.5	18.0	17.0	17.5
23	.5	.0	.0	3.5	3.5	3.5	11.5	10.0	10.5	17.0	16.5	17.0
24	.0	.0	.0	4.0	3.5	3.5	11.0	10.5	11.0	17.0	16.5	16.5
25	.0	.0	.0	3.5	3.0	3.5	11.5	10.5	11.0	16.5	16.5	16.5
26	.0	.0	.0	3.0	2.5	3.0	11.5	10.5	11.0	16.5	16.5	16.5
27	.0	.0	.0	2.5	2.5	2.5	12.5	11.0	11.5	16.5	16.0	16.0
28	.5	.0	.0	2.5	2.5	2.5	12.5	11.5	11.5	17.0	16.0	16.5
29	—	—	—	3.0	2.5	2.5	13.0	12.0	12.5	17.5	16.0	17.0
30	—	—	—	3.0	3.0	3.0	13.5	12.5	13.0	17.5	16.5	17.0
31	—	—	—	3.5	3.0	3.0	—	—	—	17.0	16.5	16.5
MONTH	.5	.0	.1	—	—	—	13.5	3.5	7.7	18.5	13.0	16.3

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	16.0	16.5	24.5	23.5	24.0	25.0	23.0	24.0	21.0	20.5	21.0
2	16.0	15.5	16.0	23.5	22.5	23.0	25.5	23.5	24.5	20.5	20.0	20.5
3	15.5	15.0	15.5	23.0	22.0	22.5	25.5	24.0	24.5	21.0	20.0	20.5
4	15.0	14.5	15.0	22.5	22.0	22.5	25.0	24.0	24.5	20.5	20.0	20.0
5	15.5	15.0	15.0	22.5	21.5	22.0	25.5	24.5	25.0	20.5	19.5	20.0
6	15.5	15.0	15.0	22.0	21.5	21.5	26.5	24.5	25.5	20.5	20.0	20.0
7	16.5	15.5	16.0	22.0	21.5	21.5	26.5	25.0	25.5	21.0	20.0	20.5
8	17.5	16.0	16.5	23.0	21.5	22.0	27.0	25.5	26.0	21.0	20.5	20.5
9	18.0	16.5	17.0	23.5	21.5	22.5	27.0	25.5	26.5	21.0	20.5	21.0
10	17.5	16.5	17.0	23.5	22.0	23.0	26.5	26.0	26.0	21.0	20.5	20.5
11	18.0	17.0	17.5	23.0	22.5	22.5	26.0	25.0	25.5	20.5	20.0	20.0
12	19.0	17.5	18.5	23.0	22.0	22.5	25.5	25.0	25.0	20.5	19.5	20.0
13	20.0	18.5	19.5	22.5	22.0	22.0	25.0	24.5	24.5	20.0	19.0	19.5
14	21.5	19.5	20.5	23.0	22.0	22.0	24.5	23.5	24.0	19.5	18.5	19.0
15	23.5	20.5	21.5	22.5	22.0	22.0	24.0	23.5	23.5	18.5	18.0	18.5
16	23.0	21.5	22.0	23.0	22.0	22.5	24.0	23.0	23.5	18.5	18.0	18.0
17	23.0	21.5	22.0	22.5	22.0	22.5	23.0	22.5	22.5	18.0	18.0	18.0
18	22.0	21.5	22.0	22.5	22.0	22.5	22.5	21.5	22.0	18.0	17.5	18.0
19	22.5	22.0	22.0	23.0	22.5	22.5	21.5	21.0	21.0	17.5	17.5	17.5
20	22.5	21.5	22.0	23.0	22.5	22.5	21.0	20.5	21.0	17.5	17.0	17.0
21	22.5	22.0	22.5	23.5	22.5	23.0	21.0	20.0	20.5	17.0	16.5	17.0
22	22.0	21.5	22.0	24.5	22.5	23.5	21.0	20.5	21.0	17.0	16.5	17.0
23	22.0	21.0	21.5	25.0	23.0	24.0	21.5	21.0	21.0	17.0	17.0	17.0
24	22.5	21.5	22.0	25.5	23.5	24.5	21.0	20.5	21.0	17.0	15.5	16.0
25	23.5	22.0	22.5	24.5	24.0	24.5	21.0	21.0	21.0	15.5	14.0	15.0
26	24.0	22.0	23.0	24.0	23.5	24.0	22.0	21.0	21.5	14.0	12.5	13.5
27	24.5	22.0	23.5	23.5	23.0	23.0	21.5	21.0	21.0	12.5	12.0	12.5
28	25.0	22.5	23.5	23.0	22.5	22.5	22.0	21.0	21.5	12.5	12.0	12.5
29	25.5	23.0	24.5	22.5	22.5	22.5	21.5	21.0	21.5	13.5	12.5	13.0
30	25.5	23.5	24.5	23.5	22.5	22.5	21.5	21.0	21.5	13.5	13.0	13.0
31	—	—	—	24.5	22.5	23.5	21.5	21.0	21.5	—	—	—
MONTH	25.5	14.5	19.9	25.5	21.5	22.8	27.0	20.0	23.1	21.0	12.0	17.9

STREAMS TRIBUTARY TO LAKE HURON

04137020 AU SABLE RIVER NEAR SOUTH BRANCH, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.8	9.7	9.8	10.6	10.3	10.4	13.8	11.2	12.1	13.7	13.4	13.5
2	9.7	9.0	9.4	10.7	10.4	10.5	13.8	11.6	12.3	13.5	12.4	13.1
3	9.5	9.2	9.4	10.7	9.9	10.5	13.0	12.0	12.6	13.2	12.7	13.0
4	9.6	9.3	9.5	10.9	9.9	10.5	13.9	12.2	13.2	13.2	13.0	13.1
5	9.4	9.1	9.3	10.8	10.5	10.6	13.7	13.2	13.4	13.2	12.9	13.0
6	9.5	9.1	9.3	11.2	10.5	10.7	13.7	12.6	13.1	13.0	12.8	12.9
7	9.6	9.2	9.5	10.9	9.9	10.6	13.0	10.8	12.8	13.0	12.4	12.8
8	10.0	9.5	9.7	10.9	10.6	10.7	13.1	12.3	12.9	12.9	12.3	12.7
9	10.2	9.5	10.0	11.4	10.2	10.7	13.1	12.3	12.9	12.8	11.4	12.2
10	10.5	10.1	10.3	11.0	10.4	10.8	13.1	11.9	12.7	13.0	11.6	12.5
11	10.6	7.5	9.9	11.0	10.1	10.7	13.1	12.9	13.0	13.0	12.7	12.9
12	10.5	7.9	9.1	11.2	10.6	10.9	13.1	12.8	13.0	13.0	12.7	12.8
13	10.7	8.0	9.3	11.3	10.2	11.1	13.2	12.4	13.0	12.9	12.6	12.7
14	10.7	7.9	9.2	11.5	10.3	11.2	13.4	12.4	13.2	12.9	12.6	12.7
15	10.6	8.1	9.4	11.6	10.7	11.4	13.4	13.2	13.3	12.8	12.6	12.7
16	10.7	8.3	9.4	11.9	10.4	11.5	13.5	13.1	13.4	12.8	12.5	12.7
17	10.4	8.4	9.3	12.0	11.4	11.7	13.5	13.0	13.4	12.7	12.5	12.6
18	10.4	8.6	9.5	12.4	11.7	12.0	13.4	13.1	13.3	12.7	12.5	12.6
19	10.5	8.9	9.6	12.5	11.5	12.3	13.4	13.2	13.3	13.0	12.6	12.8
20	10.7	9.2	9.8	12.7	12.3	12.5	13.4	11.9	12.9	12.9	11.1	12.1
21	10.9	9.0	10.0	13.0	11.9	12.7	13.4	12.1	13.0	12.7	11.4	12.3
22	10.8	9.5	10.2	13.8	12.2	13.1	13.4	13.1	13.3	13.1	12.4	12.9
23	11.3	9.9	10.4	13.4	12.0	12.9	13.5	12.9	13.2	13.3	12.8	13.1
24	10.6	10.0	10.2	12.8	12.2	12.6	13.4	12.8	13.2	13.1	12.9	13.0
25	10.6	10.1	10.3	12.9	12.4	12.7	13.5	13.0	13.3	13.1	12.9	13.0
26	10.5	10.1	10.3	13.7	12.2	13.1	13.4	13.0	13.2	13.1	12.7	12.9
27	10.3	9.8	10.1	14.3	13.0	13.6	13.6	13.0	13.4	13.3	12.8	13.1
28	10.1	9.8	9.9	13.5	13.0	13.2	13.6	13.4	13.6	13.4	13.2	13.3
29	10.2	9.8	9.9	13.2	11.6	12.4	13.6	13.3	13.5	13.3	13.1	13.2
30	10.3	9.9	10.1	13.3	11.3	12.4	13.6	13.3	13.5	13.3	13.0	13.2
31	10.6	10.1	10.2	---	---	---	13.6	13.4	13.5	13.3	13.1	13.2
MONTH	11.3	7.5	9.8	14.3	9.9	11.7	13.9	10.8	13.1	13.7	11.1	12.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.2	13.0	13.1	13.7	13.5	13.6	12.1	11.8	11.9	11.1	10.6	10.8
2	13.2	12.9	13.1	13.8	13.5	13.6	12.1	11.9	12.0	10.8	10.4	10.6
3	13.1	12.8	13.0	13.8	13.5	13.6	12.1	11.9	12.0	10.4	10.1	10.3
4	13.2	12.8	13.0	13.6	13.3	13.4	12.1	12.0	12.0	10.2	9.8	10.0
5	13.4	12.9	13.2	13.4	13.1	13.3	12.1	11.2	11.8	9.8	9.3	9.6
6	13.4	13.0	13.2	---	---	---	12.0	10.7	11.8	9.8	9.3	9.5
7	13.3	13.1	13.2	13.5	13.2	13.4	12.0	11.7	11.8	9.8	9.3	9.6
8	13.3	13.0	13.1	13.7	13.1	13.3	11.8	11.6	11.7	9.9	9.4	9.7
9	13.3	13.0	13.2	13.4	13.1	13.2	11.7	11.4	11.6	9.5	9.2	9.4
10	13.4	12.9	13.2	13.2	12.9	13.0	11.5	11.3	11.5	9.4	8.5	9.1
11	13.1	12.9	13.0	13.5	12.8	13.0	11.5	11.3	11.4	9.4	8.5	9.0
12	13.4	13.0	13.2	13.4	12.6	13.0	11.7	11.1	11.4	9.1	8.8	8.9
13	13.5	13.3	13.4	12.9	12.2	12.6	11.4	11.1	11.2	9.6	8.7	9.1
14	13.6	13.3	13.4	12.3	12.1	12.2	11.2	10.8	11.0	9.3	8.7	9.1
15	13.6	13.3	13.5	12.2	11.9	12.0	10.9	10.5	10.7	9.4	8.2	8.8
16	13.7	13.4	13.5	11.9	11.7	11.8	10.6	10.4	10.5	9.3	8.3	9.0
17	13.7	13.4	13.6	11.9	11.7	11.9	10.7	10.2	10.5	9.0	7.7	8.7
18	13.7	13.3	13.6	12.1	11.9	12.0	10.7	9.9	10.5	9.2	7.6	8.8
19	13.9	13.4	13.7	12.2	12.0	12.1	10.7	10.1	10.5	8.9	7.6	8.4
20	13.9	13.6	13.7	12.1	11.9	12.0	10.6	9.7	10.3	9.2	7.6	8.8
21	13.9	13.2	13.5	12.1	11.8	12.0	10.4	9.3	10.1	9.2	8.5	8.8
22	13.9	12.5	13.2	12.1	11.6	11.9	10.3	9.4	9.9	9.0	7.9	8.6
23	13.9	12.5	13.5	11.9	10.8	11.4	10.2	9.0	9.7	8.6	7.3	7.8
24	13.9	13.6	13.8	11.6	10.6	11.3	10.3	8.9	9.9	8.3	6.5	7.5
25	14.1	13.5	13.7	11.6	11.1	11.4	10.3	9.7	10.0	8.3	7.2	7.9
26	13.7	13.4	13.6	11.9	11.1	11.6	10.7	9.8	10.4	8.2	6.7	7.5
27	13.5	13.2	13.4	11.9	11.8	11.8	10.9	10.4	10.6	8.1	6.8	7.4
28	13.5	13.3	13.4	12.0	11.8	11.9	11.0	10.6	10.7	8.5	7.1	7.8
29	---	---	---	12.0	11.8	12.0	11.0	10.6	10.8	8.7	7.1	8.1
30	---	---	---	12.0	11.7	11.9	10.9	10.6	10.8	9.4	7.9	8.8
31	---	---	---	12.0	11.7	11.9	---	---	---	9.3	8.7	8.9
MONTH	14.1	12.5	13.4	---	---	---	12.1	8.9	11.0	11.1	6.5	8.9

STREAMS TRIBUTARY TO LAKE HURON

04137020 AU SABLE RIVER NEAR SOUTH BRANCH, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.3	8.6	9.0	7.9	5.1	6.5	8.6	5.4	6.9	8.2	5.4	7.0
2	9.1	7.6	8.4	7.7	4.8	6.4	8.8	5.1	6.7	8.0	6.1	6.9
3	8.5	7.3	8.1	7.9	5.6	6.5	8.3	4.6	6.4	8.1	6.2	7.0
4	8.1	6.9	7.8	8.2	5.1	6.6	8.5	4.5	6.4	7.5	6.3	6.8
5	8.2	6.9	7.5	8.1	5.7	6.8	8.3	5.1	6.7	7.3	6.3	6.8
6	8.2	7.1	7.6	8.1	5.6	6.7	8.7	4.9	6.5	7.1	6.1	6.7
7	8.7	7.5	8.1	8.1	5.0	6.6	8.4	4.1	6.4	7.3	6.5	6.9
8	8.6	7.5	8.2	8.4	5.5	6.8	8.7	4.3	5.9	7.3	6.4	6.8
9	8.5	7.5	8.0	8.6	5.6	7.2	8.5	4.5	6.4	6.9	6.0	6.5
10	8.8	7.8	8.4	8.5	5.3	6.9	8.4	5.2	6.7	6.8	5.9	6.3
11	9.1	7.6	8.3	8.3	5.2	6.7	8.0	5.6	6.6	6.2	5.5	5.9
12	9.3	7.3	8.9	8.2	5.7	6.7	7.8	4.9	6.3	6.7	5.7	6.3
13	9.5	8.8	9.2	7.8	5.7	6.5	8.1	5.3	6.4	6.5	5.8	6.2
14	—	—	—	8.0	5.5	6.6	7.9	5.4	6.5	6.9	5.8	6.2
15	—	—	—	8.3	5.3	6.6	8.4	5.8	6.9	6.8	5.9	6.4
16	—	—	—	8.2	5.3	6.8	8.4	5.5	6.9	6.8	6.0	6.5
17	—	—	—	7.9	5.3	6.4	8.4	6.1	7.2	8.8	5.9	6.9
18	—	—	—	8.4	5.5	6.9	8.4	6.3	7.1	8.8	5.9	7.2
19	—	—	—	8.6	6.0	7.1	8.2	5.8	7.0	8.5	6.1	7.1
20	8.1	7.6	7.8	8.7	5.5	7.1	8.7	6.4	7.7	8.3	6.3	7.1
21	8.1	6.9	7.4	8.7	5.1	6.9	8.8	6.2	7.5	8.2	6.1	7.2
22	7.4	6.0	6.7	8.4	5.2	6.7	8.5	5.9	7.4	8.1	6.4	7.2
23	6.8	5.5	6.1	8.4	4.8	6.9	8.8	7.0	7.8	8.5	6.6	7.5
24	7.1	6.2	6.6	8.6	5.1	6.8	8.3	6.9	7.5	8.6	6.9	7.7
25	7.8	4.9	6.4	8.5	5.2	6.8	8.6	6.4	7.6	8.6	7.0	7.8
26	8.5	4.4	6.4	8.1	5.7	6.8	8.5	6.8	7.7	8.9	7.2	8.2
27	8.4	4.5	6.5	7.8	5.4	6.6	8.6	6.7	7.6	9.2	7.6	8.4
28	8.1	4.5	6.3	7.9	5.7	7.1	8.7	6.6	7.7	9.5	7.8	8.5
29	8.2	5.3	6.6	8.2	7.1	7.7	8.7	6.6	7.6	9.6	8.0	8.6
30	7.9	4.8	6.2	8.3	5.5	7.4	8.5	6.6	7.4	9.7	7.9	8.7
31	—	—	—	8.6	5.1	6.9	8.5	5.5	7.1	—	—	—
MONTH	—	—	—	8.7	4.8	6.8	8.8	4.1	7.0	9.7	5.4	7.1

STREAMS TRIBUTARY TO LAKE HURON

04137025 AU SABLE RIVER NEAR GLENNIE, MI

LOCATION.--Lat 44°27'15", long 83°40'28", in SW1/4 SE1/4 sec.23, T.24 N., R.6 E., Iosco County, Hydrologic Unit 04070007, center of bridge on State Highway 65, 400 ft downstream from Five-Channels Dam, 7.6 mi southeast of Glennie.

DRAINAGE AREA.--1,696 mi^2.

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 1996 to current year.
DISSOLVED OXYGEN: July 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8-10, 2001; minimum, 0.0°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 13.6 mg/L, Jan. 7, 8, 1998, Jan. 1, 2000; minimum, 3.0 mg/L, June 16, 17, 1998.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8-10; minimum, 0.0°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 13.5 mg/L, on several days in February; minimum, 5.1 mg/L, July 26.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.5	13.5	13.5	10.0	10.0	10.0	2.0	1.5	1.5	.0	.0	.0
2	14.5	13.5	14.0	10.0	9.5	10.0	1.5	1.5	1.5	.0	.0	.0
3	14.5	14.0	14.0	10.0	9.5	9.5	1.5	1.5	1.5	.0	.0	.0
4	14.5	14.0	14.5	9.5	9.5	9.5	1.5	1.5	1.5	.0	.0	.0
5	14.5	14.0	14.0	9.5	9.0	9.0	1.5	1.5	1.5	.0	.0	.0
6	14.0	13.5	14.0	9.0	9.0	9.0	1.5	1.0	1.0	.0	.0	.0
7	13.5	13.0	13.0	9.0	8.5	8.5	1.0	1.0	1.0	.0	.0	.0
8	13.0	12.0	12.5	9.0	8.5	8.5	1.0	1.0	1.0	.0	.0	.0
9	12.0	11.5	12.0	8.5	8.5	8.5	1.0	1.0	1.0	.0	.0	.0
10	11.5	11.0	11.0	8.5	8.0	8.0	1.0	.5	.5	.0	.0	.0
11	11.0	10.5	11.0	8.0	7.5	8.0	.5	.5	.5	.0	.0	.0
12	10.5	10.5	10.5	7.5	7.5	7.5	.5	.5	.5	.0	.0	.0
13	11.0	10.5	10.5	7.5	7.0	7.0	.5	.5	.5	.0	.0	.0
14	11.5	11.0	11.0	7.0	6.5	6.5	.5	.5	.5	.0	.0	.0
15	11.5	11.0	11.5	6.5	6.0	6.0	.5	.0	.5	.0	.0	.0
16	11.5	11.5	11.5	6.0	5.0	5.5	.0	.0	.0	.0	.0	.0
17	12.0	11.5	11.5	5.0	5.0	5.0	.0	.0	.0	.0	.0	.0
18	12.0	11.5	12.0	5.0	4.5	4.5	.0	.0	.0	.0	.0	.0
19	12.0	11.5	11.5	4.5	3.5	4.0	.0	.0	.0	.0	.0	.0
20	12.0	11.5	11.5	3.5	3.5	3.5	.0	.0	.0	.0	.0	.0
21	12.0	11.5	11.5	3.5	2.5	3.0	.0	.0	.0	.5	.0	.0
22	11.5	11.5	11.5	2.5	2.0	2.0	.0	.0	.0	.0	.0	.0
23	11.5	11.0	11.5	2.0	1.5	2.0	.0	.0	.0	.0	.0	.0
24	11.5	11.5	11.5	1.5	1.5	1.5	.0	.0	.0	.5	.0	.0
25	11.5	11.5	11.5	1.5	1.5	1.5	.0	.0	.0	.0	.0	.0
26	11.5	11.5	11.5	1.5	1.0	1.5	.0	.0	.0	.0	.0	.0
27	12.0	11.5	11.5	1.5	1.5	1.5	.0	.0	.0	.5	.0	.0
28	11.5	11.5	11.5	1.5	1.5	1.5	.0	.0	.0	.5	.0	.0
29	11.5	11.0	11.0	1.5	1.5	1.5	.0	.0	.0	.0	.0	.0
30	11.0	10.5	10.5	2.0	1.5	1.5	.0	.0	.0	.5	.0	.0
31	10.5	10.0	10.0	—	—	—	.0	.0	.0	.0	.0	.0
MONTH	14.5	10.0	11.9	10.0	1.0	5.5	2.0	.0	.5	.5	.0	.0

STREAMS TRIBUTARY TO LAKE HURON

04137025 AU SABLE RIVER NEAR GLENNIE, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.0	.0	.0	.5	.0	.5	3.5	3.5	3.5	14.0	13.0	13.5
2	.5	.0	.0	.5	.5	.5	4.0	3.5	3.5	15.5	14.0	14.5
3	.5	.0	.0	.5	.5	.5	4.0	3.5	4.0	16.0	15.0	15.5
4	.5	.0	.5	.5	.5	.5	4.0	4.0	4.0	15.5	15.5	15.5
5	.5	.0	.5	.5	.5	.5	4.5	4.0	4.5	15.5	15.5	15.5
6	.0	.0	.0	.5	.5	.5	5.0	4.5	4.5	15.5	15.5	15.5
7	.0	.0	.0	1.0	.5	.5	5.0	5.0	5.0	15.5	15.5	15.5
8	.0	.0	.0	1.0	.5	.5	6.0	5.0	5.5	16.5	15.5	16.0
9	.0	.0	.0	.5	.5	.5	6.0	5.5	5.5	17.0	16.0	16.5
10	.5	.0	.5	1.0	.5	.5	6.0	5.5	5.5	17.0	16.5	17.0
11	.5	.0	.5	1.0	1.0	1.0	6.0	5.5	6.0	17.0	17.0	17.0
12	.5	.5	.5	1.0	1.0	1.0	6.5	5.5	6.0	17.0	16.5	17.0
13	.5	.5	.5	1.0	1.0	1.0	8.0	6.5	7.5	17.0	16.5	17.0
14	.5	.0	.5	1.5	1.0	1.5	8.5	7.5	8.0	16.5	16.5	16.5
15	.5	.0	.0	1.5	1.5	1.5	9.0	8.5	8.5	16.5	16.5	16.5
16	.5	.0	.5	1.5	1.5	1.5	9.0	8.5	9.0	16.5	16.0	16.0
17	.5	.5	.5	2.0	1.5	2.0	8.5	8.5	8.5	16.5	16.5	16.5
18	.5	.5	.5	2.5	2.0	2.0	8.5	8.0	8.0	18.0	16.5	17.5
19	.5	.5	.5	2.5	2.5	2.5	8.5	8.0	8.5	18.0	17.5	17.5
20	.5	.5	.5	2.5	2.5	2.5	8.5	8.5	8.5	18.0	17.5	18.0
21	.5	.0	.5	3.0	2.5	2.5	9.5	8.5	9.0	18.5	18.0	18.0
22	.5	.0	.0	3.5	3.0	3.0	9.5	9.0	9.5	18.0	18.0	18.0
23	.5	.0	.0	3.5	3.5	3.5	11.0	9.5	10.0	18.0	17.0	17.5
24	.5	.0	.5	3.5	3.5	3.5	11.0	10.5	10.5	17.5	17.0	17.0
25	.5	.0	.0	3.5	3.5	3.5	11.5	10.5	11.0	17.0	17.0	17.0
26	.0	.0	.0	3.5	3.0	3.0	11.5	11.0	11.0	17.0	16.5	16.5
27	.0	.0	.0	3.0	3.0	3.0	12.0	11.0	11.5	16.5	16.5	16.5
28	.0	.0	.0	3.0	2.5	3.0	11.5	11.5	11.5	17.0	16.0	16.5
29	—	—	—	3.0	2.5	3.0	12.5	11.5	12.0	17.0	16.5	17.0
30	—	—	—	3.0	3.0	3.0	13.5	12.5	13.0	17.5	16.5	17.0
31	—	—	—	3.5	3.0	3.5	—	—	—	17.0	16.5	17.0
MONTH	.5	.0	.2	3.5	.0	1.8	13.5	3.5	7.8	18.5	13.0	16.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	16.5	17.0	25.5	24.0	24.5	24.5	23.5	24.0	21.5	21.0	21.0
2	16.5	16.0	16.5	24.0	23.5	23.5	25.5	24.5	25.0	21.5	21.0	21.0
3	16.0	16.0	16.0	23.5	23.0	23.5	25.5	24.5	25.0	21.5	21.0	21.0
4	16.0	15.0	15.5	23.5	22.5	23.0	25.0	25.0	25.0	21.0	21.0	21.0
5	15.0	15.0	15.0	23.0	22.0	22.5	26.0	25.0	25.0	21.0	20.5	20.5
6	15.5	15.0	15.5	22.5	22.0	22.0	26.5	25.0	25.5	21.0	20.5	20.5
7	16.0	15.5	16.0	22.5	22.0	22.0	26.5	26.0	26.0	21.0	20.5	20.5
8	17.0	16.0	16.5	23.0	22.0	22.5	27.0	26.0	26.5	21.0	20.5	21.0
9	17.5	17.0	17.0	23.0	22.5	22.5	27.0	26.5	26.5	21.0	21.0	21.0
10	17.5	17.0	17.0	23.5	22.5	23.0	27.0	26.0	26.5	21.5	21.0	21.0
11	18.0	17.5	17.5	23.5	22.5	23.0	26.5	25.5	26.0	21.0	20.5	21.0
12	18.5	17.5	18.0	23.0	22.5	23.0	26.0	25.5	25.5	21.0	20.5	20.5
13	19.0	18.5	19.0	23.0	22.5	23.0	25.5	25.0	25.5	20.5	20.0	20.0
14	20.5	19.0	19.5	23.0	22.0	22.5	25.0	24.5	25.0	20.0	19.0	19.5
15	21.5	20.5	21.0	22.5	22.5	22.5	25.0	24.0	24.5	19.5	19.0	19.0
16	22.5	21.5	22.0	23.0	22.5	22.5	24.5	24.0	24.0	19.0	19.0	19.0
17	23.0	22.0	22.5	23.0	22.5	22.5	24.0	23.0	23.5	19.0	18.5	18.5
18	22.5	22.0	22.5	23.0	22.5	23.0	23.0	22.5	23.0	18.5	18.5	18.5
19	23.0	22.0	22.5	23.0	23.0	23.0	22.5	22.0	22.5	18.5	18.0	18.0
20	22.5	22.0	22.5	23.5	23.0	23.0	22.0	21.5	21.5	18.0	17.5	18.0
21	22.5	22.0	22.5	24.0	23.0	23.5	21.5	21.0	21.5	17.5	17.5	17.5
22	22.5	22.0	22.5	24.0	23.0	23.5	21.5	21.0	21.0	17.5	17.0	17.5
23	22.5	22.0	22.0	25.0	24.0	24.5	21.5	21.0	21.5	17.5	17.0	17.0
24	22.5	22.0	22.5	25.5	24.5	25.0	21.5	21.0	21.5	17.0	16.0	16.5
25	23.0	22.5	22.5	25.0	24.5	25.0	21.5	21.0	21.5	16.0	15.5	15.5
26	23.5	22.5	23.0	24.5	24.0	24.5	22.0	21.5	21.5	15.5	14.0	15.0
27	24.5	23.0	23.5	24.0	23.5	24.0	22.0	21.5	21.5	14.0	13.5	14.0
28	25.0	23.5	24.0	23.5	23.5	23.5	22.0	21.5	21.5	13.5	13.0	13.0
29	25.0	24.0	24.5	23.5	23.0	23.5	22.0	21.5	21.5	13.0	13.0	13.0
30	25.5	24.5	25.0	23.5	23.0	23.0	22.0	21.5	21.5	13.5	13.0	13.0
31	—	—	—	24.0	23.0	23.5	22.0	21.5	22.0	—	—	—
MONTH	25.5	15.0	20.0	25.5	22.0	23.2	27.0	21.0	23.6	21.5	13.0	18.4

STREAMS TRIBUTARY TO LAKE HURON

04137025 AU SABLE RIVER NEAR GLENNIE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.1	8.7	8.8	9.4	8.8	9.0	13.0	12.8	12.9	13.3	13.2	13.2
2	9.4	8.6	9.0	9.7	9.2	9.4	13.0	12.8	12.9	13.3	13.0	13.1
3	9.4	8.7	9.0	9.9	9.5	9.7	13.0	12.9	12.9	13.1	13.0	13.1
4	9.2	8.6	8.9	9.9	9.7	9.8	13.0	12.8	12.9	13.1	12.9	13.0
5	9.1	8.4	8.8	10.1	9.9	10.0	13.2	12.9	13.0	13.1	13.0	13.0
6	8.9	8.4	8.6	10.2	9.2	10.0	13.2	13.0	13.2	13.1	12.9	13.0
7	8.8	8.4	8.6	10.1	9.9	10.0	13.3	12.8	13.1	13.0	12.8	12.9
8	8.8	8.4	8.7	10.2	9.9	10.1	13.2	13.1	13.1	12.9	12.7	12.8
9	8.9	8.5	8.7	10.4	9.7	10.2	13.3	13.1	13.2	12.8	12.6	12.7
10	8.9	8.5	8.8	10.6	10.4	10.5	13.4	13.2	13.3	12.7	12.7	12.7
11	9.0	8.7	8.8	10.7	10.5	10.6	13.3	13.1	13.2	12.8	12.7	12.7
12	9.4	8.8	9.1	10.7	10.5	10.7	13.2	13.1	13.2	12.9	12.7	12.8
13	9.6	8.8	9.2	10.9	10.6	10.8	13.2	13.1	13.1	12.9	12.6	12.8
14	9.6	8.9	9.2	11.1	10.8	10.9	13.2	13.1	13.1	12.8	12.6	12.6
15	9.6	8.8	9.2	11.3	11.0	11.2	13.2	13.1	13.2	12.7	12.5	12.6
16	9.5	8.8	9.1	11.4	11.3	11.3	13.4	13.1	13.3	12.7	12.5	12.6
17	9.5	8.6	9.0	11.6	11.3	11.4	13.3	13.2	13.3	12.7	12.6	12.6
18	9.3	8.4	8.8	11.8	11.5	11.6	13.3	13.1	13.3	12.7	12.6	12.6
19	9.7	8.5	9.4	12.0	11.7	11.8	13.3	13.1	13.2	12.7	12.6	12.6
20	9.6	9.2	9.4	12.1	11.9	12.0	13.2	13.1	13.2	12.8	12.6	12.7
21	9.7	9.2	9.5	12.5	12.1	12.3	13.2	13.1	13.2	12.8	12.6	12.7
22	9.6	9.3	9.5	12.7	12.4	12.5	13.3	13.1	13.2	12.8	12.7	12.8
23	9.6	9.2	9.5	12.8	12.6	12.7	13.3	13.2	13.3	12.9	12.7	12.8
24	9.5	9.3	9.4	12.9	12.8	12.9	13.3	13.2	13.3	13.0	12.8	12.9
25	9.5	9.2	9.4	13.2	12.9	13.0	13.4	13.2	13.3	13.0	12.9	12.9
26	9.3	9.1	9.2	13.2	13.1	13.2	13.4	13.3	13.4	12.9	12.7	12.8
27	9.3	9.1	9.2	13.3	13.1	13.2	13.4	13.3	13.4	12.8	12.7	12.8
28	9.2	9.1	9.1	13.2	13.0	13.1	13.4	13.3	13.3	13.0	12.7	12.9
29	9.2	8.8	9.0	13.1	12.9	13.0	13.4	13.2	13.3	13.1	12.9	13.0
30	9.1	8.9	9.0	13.0	12.8	12.9	13.3	13.2	13.3	13.1	12.9	13.0
31	9.1	8.8	8.9	—	—	—	13.4	13.2	13.3	13.0	12.9	12.9
MONTH	9.7	8.4	9.1	13.3	8.8	11.3	13.4	12.8	13.2	13.3	12.5	12.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.1	12.9	12.9	13.3	13.1	13.2	12.2	12.1	12.1	10.0	9.7	9.9
2	13.0	12.9	12.9	13.3	13.1	13.2	12.2	12.1	12.1	9.9	9.7	9.8
3	13.0	12.8	12.9	13.4	13.2	13.3	12.1	12.0	12.1	9.7	9.4	9.6
4	12.9	12.9	12.9	13.3	13.2	13.3	12.1	12.0	12.0	9.4	9.0	9.3
5	13.1	12.9	13.0	13.2	13.1	13.2	12.1	12.0	12.0	9.1	8.7	8.9
6	13.2	12.9	13.1	13.1	13.0	13.0	12.2	12.0	12.1	8.8	8.4	8.6
7	13.2	13.0	13.1	13.1	12.9	13.0	12.1	12.0	12.1	8.4	8.2	8.3
8	13.1	13.0	13.0	13.1	13.0	13.1	12.0	11.8	11.9	8.3	8.1	8.3
9	13.1	12.9	13.0	13.1	12.9	13.1	11.8	11.6	11.7	8.3	7.9	8.1
10	13.1	12.9	13.0	13.0	12.9	12.9	11.6	11.4	11.5	8.0	7.8	7.9
11	13.3	13.0	13.2	12.9	12.8	12.8	11.4	11.3	11.4	7.8	7.5	7.7
12	13.1	12.9	13.0	12.8	12.7	12.8	11.3	11.2	11.3	7.9	7.6	7.7
13	13.1	12.9	13.0	12.9	12.4	12.7	11.4	11.1	11.2	7.8	7.6	7.7
14	13.3	13.0	13.2	12.8	12.4	12.6	11.2	10.8	11.0	8.1	7.7	7.8
15	13.4	13.2	13.3	12.7	12.6	12.6	10.8	10.5	10.6	8.1	7.1	7.6
16	13.4	13.3	13.3	12.6	12.5	12.5	10.6	10.4	10.5	8.0	7.9	7.9
17	13.4	13.2	13.3	12.5	12.4	12.4	10.5	10.4	10.4	8.2	7.9	8.0
18	13.3	13.2	13.3	12.4	12.3	12.3	10.5	10.4	10.4	8.4	7.8	8.2
19	13.4	13.3	13.4	12.5	12.3	12.4	10.5	10.4	10.4	7.9	7.5	7.7
20	13.5	13.3	13.4	12.6	12.4	12.5	10.5	10.4	10.5	8.2	7.8	7.9
21	13.5	13.4	13.5	12.6	12.5	12.5	10.6	10.4	10.5	8.4	8.0	8.2
22	13.5	13.4	13.4	12.6	12.3	12.5	10.5	10.3	10.4	8.3	8.0	8.1
23	13.4	13.3	13.4	12.4	12.2	12.3	10.3	10.2	10.2	8.1	7.8	7.9
24	13.4	13.3	13.3	12.3	12.2	12.3	10.2	10.1	10.2	7.9	7.6	7.7
25	13.5	13.4	13.5	12.2	12.1	12.2	10.2	10.0	10.1	8.3	7.7	8.1
26	13.5	13.4	13.5	12.1	12.0	12.1	10.1	9.9	10.0	8.4	8.1	8.2
27	13.5	13.4	13.5	12.1	12.1	12.1	10.2	9.9	10.0	8.4	8.1	8.3
28	13.4	13.3	13.3	12.2	12.1	12.2	10.1	9.9	10.0	8.4	8.2	8.3
29	—	—	—	12.2	12.2	12.2	10.1	10.0	10.1	8.7	8.3	8.4
30	—	—	—	12.2	12.1	12.2	10.1	9.9	10.0	8.9	8.4	8.6
31	—	—	—	12.2	12.1	12.2	—	—	—	8.8	8.5	8.6
MONTH	13.5	12.8	13.2	13.4	12.0	12.6	12.2	9.9	11.0	10.0	7.1	8.3

STREAMS TRIBUTARY TO LAKE HURON

04137025 AU SABLE RIVER NEAR GLENNIE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.9	8.5	8.7	7.7	6.3	7.3	8.0	7.2	7.7	7.7	6.8	7.4
2	8.9	8.6	8.8	7.6	6.3	7.1	7.9	7.2	7.6	7.8	7.2	7.5
3	9.2	8.4	9.0	7.7	6.6	7.3	7.7	6.4	7.3	8.0	7.2	7.6
4	9.1	8.5	8.8	7.6	5.8	7.0	7.7	6.6	7.4	7.8	7.3	7.6
5	8.6	8.5	8.6	7.7	6.0	7.0	7.6	6.8	7.3	7.8	7.7	7.7
6	8.7	8.5	8.6	7.8	6.2	7.2	7.6	6.8	7.2	8.0	7.7	7.9
7	9.1	8.7	8.9	7.7	7.1	7.4	7.4	6.7	7.1	8.1	7.7	7.9
8	9.2	9.0	9.1	7.8	7.0	7.4	7.3	6.5	7.0	8.0	7.8	7.9
9	9.3	9.1	9.2	7.7	7.1	7.4	7.3	6.5	6.9	8.1	7.8	8.0
10	9.2	9.1	9.2	7.7	6.3	7.3	7.3	5.8	6.7	8.2	7.9	8.0
11	9.2	9.0	9.1	7.7	6.3	7.2	7.3	6.0	6.8	8.1	7.9	8.0
12	9.2	9.0	9.1	7.5	6.4	7.2	7.2	6.0	6.8	8.1	7.7	7.9
13	9.1	8.9	9.0	7.7	6.8	7.3	7.0	5.9	6.6	7.9	7.7	7.8
14	9.1	8.9	9.0	7.4	6.4	7.2	7.0	5.9	6.5	8.0	7.8	7.9
15	9.1	8.8	8.9	7.4	6.8	7.1	7.3	6.1	6.7	8.1	7.7	8.0
16	9.0	8.7	8.8	7.4	6.7	7.2	6.9	6.4	6.7	8.2	7.9	8.0
17	8.8	8.0	8.5	7.4	6.8	7.1	6.8	6.3	6.7	8.6	8.1	8.3
18	8.0	7.7	7.8	7.4	6.6	7.1	6.9	6.5	6.7	8.8	8.2	8.5
19	8.1	7.8	7.9	7.4	6.5	7.0	6.9	6.5	6.7	8.8	8.2	8.6
20	7.8	7.4	7.7	7.3	6.6	7.0	6.9	6.4	6.7	8.7	8.1	8.6
21	7.8	7.4	7.6	7.4	6.6	7.0	6.9	6.5	6.7	8.6	8.1	8.4
22	7.7	7.5	7.6	7.4	6.8	7.1	7.3	6.6	6.9	8.6	8.1	8.4
23	7.7	7.2	7.5	7.5	6.8	7.2	7.4	6.8	7.1	8.5	8.0	8.3
24	7.7	7.4	7.6	7.5	6.5	7.1	7.5	6.9	7.3	8.7	7.8	8.4
25	10.3	7.5	8.2	7.4	5.7	6.8	7.6	6.9	7.3	8.9	8.2	8.7
26	9.5	7.7	8.8	7.2	5.1	6.6	7.8	6.9	7.4	8.9	8.5	8.8
27	8.4	7.0	7.9	7.2	5.8	6.8	7.8	7.1	7.4	9.2	8.5	8.9
28	8.1	6.7	7.6	7.2	6.3	7.0	7.7	7.1	7.4	9.3	8.8	9.1
29	8.0	6.8	7.6	7.2	7.0	7.1	7.8	7.2	7.6	9.6	8.9	9.3
30	7.8	6.5	7.5	7.5	6.8	7.2	7.8	6.9	7.5	9.7	9.1	9.5
31	—	—	—	7.9	6.9	7.5	7.9	6.9	7.5	—	—	—
MONTH	10.3	6.5	8.4	7.9	5.1	7.1	8.0	5.8	7.1	9.7	6.8	8.2

STREAMS TRIBUTARY TO LAKE HURON

04137030 AU SABLE RIVER NEAR SIDTOWN, MI

LOCATION.--Lat 44°28'22", long 83°34'16", in NW1/4 SE1/4 sec.15, T.24 N., R.7 E., Iosco County, Hydrologic Unit 04070007, on right bank 100 ft downstream from Cooke Dam, 2 mi northeast of Sidtown.

DRAINAGE AREA.--1,718 mi^2.

PERIOD OF RECORD.--Water years 1996 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 1996 to current year.
DISSOLVED OXYGEN: July 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.5°C, Aug. 9, 2001; minimum, 0.0°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 14.8 mg/L, Mar. 31, Apr. 1, 1999; minimum, 3.7 mg/L, June 27, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 27.5°C, Aug. 9; minimum, 0.0°C, on many days during winter period.
DISSOLVED OXYGEN: Maximum, 14.4 mg/L, Feb. 17, 20; minimum, 4.8 mg/L, July 22.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	15.5	15.5	11.5	11.5	11.5	2.0	1.5	2.0	.5	.5	.5
2	16.0	15.5	15.5	11.5	11.5	11.5	2.0	1.5	2.0	.5	.5	.5
3	16.0	15.5	15.5	11.5	11.5	11.5	2.0	2.0	2.0	.5	.5	.5
4	16.0	15.0	15.5	11.5	11.0	11.0	2.0	2.0	2.0	.5	.5	.5
5	15.0	15.0	15.0	11.0	10.5	11.0	2.0	2.0	2.0	.5	.5	.5
6	15.0	14.5	15.0	10.5	10.5	10.5	2.0	1.5	2.0	.5	.0	.5
7	14.5	14.0	14.5	10.5	10.5	10.5	2.0	1.5	1.5	.5	.0	.5
8	14.0	13.5	14.0	10.5	10.0	10.5	2.0	1.5	2.0	.5	.0	.0
9	13.5	13.5	13.5	10.5	10.0	10.0	2.0	1.5	2.0	.0	.0	.0
10	13.5	13.0	13.5	10.0	9.5	10.0	1.5	1.5	1.5	.5	.0	.0
11	13.5	13.0	13.0	9.5	9.5	9.5	1.5	1.5	1.5	.5	.0	.5
12	13.0	13.0	13.0	9.5	9.0	9.0	1.5	1.5	1.5	.5	.0	.5
13	13.0	13.0	13.0	9.0	8.5	9.0	1.5	1.5	1.5	.5	.0	.0
14	13.5	13.0	13.0	8.5	8.5	8.5	1.5	1.5	1.5	.5	.0	.0
15	13.0	12.5	12.5	8.5	7.5	8.0	1.5	1.0	1.5	.0	.0	.0
16	13.0	12.5	12.5	7.5	7.5	7.5	1.0	1.0	1.0	.0	.0	.0
17	12.5	12.5	12.5	7.5	7.0	7.0	1.0	1.0	1.0	.0	.0	.0
18	12.5	12.5	12.5	7.0	6.5	6.5	1.0	1.0	1.0	.5	.0	.0
19	12.5	12.0	12.5	6.5	6.0	6.0	1.0	1.0	1.0	.0	.0	.0
20	12.5	12.0	12.5	6.0	5.5	6.0	1.0	1.0	1.0	.0	.0	.0
21	12.5	12.5	12.5	5.5	4.5	5.0	1.0	1.0	1.0	.0	.0	.0
22	12.5	12.0	12.0	4.5	4.0	4.5	1.0	.5	.5	.5	.0	.5
23	12.5	12.0	12.0	4.0	3.5	4.0	.5	.5	.5	.5	.0	.0
24	12.5	12.5	12.5	3.5	3.5	3.5	.5	.5	.5	.5	.0	.0
25	12.5	12.5	12.5	3.5	3.0	3.5	.5	.5	.5	.5	.0	.5
26	12.5	12.5	12.5	3.0	3.0	3.0	.5	.5	.5	.5	.0	.5
27	13.0	12.5	12.5	3.5	3.0	3.0	.5	.5	.5	.5	.0	.0
28	12.5	12.0	12.5	3.0	2.0	2.5	.5	.5	.5	.5	.0	.5
29	12.0	11.5	12.0	2.5	2.0	2.0	.5	.5	.5	.5	.0	.5
30	11.5	11.5	11.5	2.5	2.0	2.5	.5	.5	.5	.5	.0	.5
31	11.5	11.5	11.5	---	---	---	.5	.5	.5	.5	.0	.5
MONTH	16.0	11.5	13.2	11.5	2.0	7.3	2.0	.5	1.2	.5	.0	.3

STREAMS TRIBUTARY TO LAKE HURON

04137030 AU SABLE RIVER NEAR SIDTOWN, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.5	.0	.5	.5	.5	.5	2.5	2.5	2.5	13.5	12.5	13.0
2	.5	.0	.0	.5	.5	.5	2.5	2.5	2.5	14.5	13.0	13.5
3	.5	.0	.5	.5	.5	.5	3.0	2.5	3.0	15.0	13.5	14.0
4	.5	.5	.5	.5	.5	.5	3.0	3.0	3.0	14.5	14.0	14.5
5	.5	.0	.5	.5	.5	.5	3.5	3.0	3.0	14.5	13.5	14.0
6	.5	.0	.5	.5	.5	.5	3.5	3.5	3.5	14.5	14.0	14.0
7	.5	.0	.0	.5	.5	.5	3.5	3.5	3.5	15.5	14.5	14.5
8	.5	.0	.0	.5	.5	.5	4.0	3.5	4.0	16.0	15.0	15.5
9	.5	.0	.0	.5	.5	.5	4.0	4.0	4.0	17.0	15.5	16.0
10	.0	.0	.0	.5	.5	.5	4.5	4.0	4.0	16.5	16.0	16.0
11	.5	.0	.0	.5	.5	.5	4.5	4.5	4.5	16.5	16.5	16.5
12	.5	.0	.0	.5	.5	.5	5.0	4.5	4.5	16.5	16.0	16.5
13	.5	.0	.0	.5	.5	.5	6.0	4.5	5.5	17.0	16.0	16.5
14	.5	.0	.0	.5	.5	.5	7.5	6.0	6.5	16.5	16.0	16.5
15	.5	.0	.0	.5	.5	.5	7.5	7.0	7.0	16.5	16.5	16.5
16	.5	.0	.5	.5	.5	.5	7.5	7.0	7.5	16.5	16.0	16.5
17	.5	.0	.0	.5	.5	.5	7.5	7.0	7.5	17.0	16.5	17.0
18	.5	.0	.5	1.0	.5	1.0	7.5	7.0	7.5	18.5	17.0	17.5
19	.5	.5	.5	1.0	1.0	1.0	8.5	7.5	7.5	17.5	17.0	17.5
20	.5	.5	.5	1.0	1.0	1.0	8.0	8.0	8.0	18.0	17.0	17.5
21	.5	.0	.5	1.0	1.0	1.0	9.0	8.0	8.5	18.0	16.5	17.5
22	.5	.5	.5	1.5	1.0	1.5	9.0	8.5	8.5	18.5	17.5	18.0
23	.5	.5	.5	1.5	1.5	1.5	10.0	8.5	9.5	18.0	17.5	18.0
24	.5	.5	.5	2.0	1.5	1.5	10.0	9.5	10.0	18.0	17.5	18.0
25	.5	.5	.5	2.0	2.0	2.0	10.5	9.5	10.0	17.5	17.5	17.5
26	.5	.5	.5	2.0	2.0	2.0	10.5	10.0	10.5	17.5	17.5	17.5
27	.5	.5	.5	2.5	2.0	2.5	11.0	10.5	10.5	17.5	17.0	17.0
28	.5	.5	.5	2.5	2.5	2.5	11.0	10.5	10.5	18.0	17.0	17.5
29	—	—	—	2.5	2.5	2.5	12.0	10.5	11.0	18.0	17.0	17.5
30	—	—	—	2.5	2.5	2.5	12.5	11.5	12.0	18.0	17.0	17.5
31	—	—	—	2.5	2.5	2.5	—	—	—	17.0	17.0	17.0
MONTH	.5	.0	.3	2.5	.5	1.1	12.5	2.5	6.7	18.5	12.5	16.3

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	16.5	17.0	25.0	23.5	24.5	25.5	24.5	25.0	22.5	22.0	22.0
2	17.0	16.5	16.5	23.5	23.0	23.5	26.0	24.0	25.0	22.5	22.0	22.0
3	17.0	16.5	16.5	24.0	23.0	23.5	26.0	24.5	25.0	22.5	22.0	22.0
4	16.5	16.5	16.5	24.0	23.0	23.5	25.0	24.5	25.0	22.0	22.0	22.0
5	16.5	16.5	16.5	23.5	23.0	23.0	26.0	25.0	25.5	22.0	21.5	21.5
6	16.5	16.5	16.5	23.5	22.5	23.0	26.5	25.0	26.0	22.0	21.5	21.5
7	17.0	16.5	16.5	23.5	22.5	23.0	26.5	25.5	26.0	22.5	21.5	22.0
8	17.5	16.5	17.0	24.0	22.5	23.0	27.0	25.5	26.5	22.0	22.0	22.0
9	18.0	17.0	17.5	23.5	22.5	23.0	27.5	26.0	26.5	22.0	22.0	22.0
10	17.5	17.0	17.5	24.0	23.0	23.5	26.5	26.0	26.5	22.0	22.0	22.0
11	17.5	17.5	17.5	23.5	23.0	23.0	26.5	25.5	26.0	22.0	21.5	21.5
12	18.5	17.5	18.0	23.0	22.5	23.0	26.5	25.5	26.0	21.5	21.5	21.5
13	19.0	18.5	18.5	23.0	22.5	23.0	26.5	25.5	26.0	21.5	21.0	21.0
14	20.5	19.0	19.5	23.5	22.5	23.0	25.5	25.0	25.5	21.0	20.5	20.5
15	22.5	19.5	20.0	23.0	23.0	23.0	25.5	25.0	25.5	21.0	20.5	20.5
16	22.0	20.5	21.0	23.0	22.5	23.0	25.5	25.0	25.0	20.5	20.0	20.5
17	22.0	20.5	21.0	23.0	23.0	23.0	25.0	24.5	24.5	20.5	20.0	20.0
18	22.0	20.5	21.0	23.5	23.0	23.0	24.5	24.0	24.0	20.0	20.0	20.0
19	23.5	21.5	22.5	23.5	23.0	23.0	24.0	23.5	24.0	20.0	19.5	19.5
20	22.0	21.5	22.0	23.5	23.0	23.5	23.5	23.5	23.5	19.5	19.5	19.5
21	22.0	21.5	21.5	24.0	23.5	23.5	23.5	23.0	23.0	19.5	19.0	19.5
22	22.0	21.5	21.5	24.5	23.5	24.0	23.5	23.0	23.0	19.5	19.0	19.0
23	22.0	21.5	22.0	25.5	23.5	24.5	23.0	23.0	23.0	19.0	19.0	19.0
24	23.0	21.5	22.0	26.0	24.0	25.0	23.0	22.5	22.5	19.0	18.0	18.5
25	23.0	22.0	22.5	25.0	24.5	24.5	23.0	22.5	22.5	18.0	17.0	17.5
26	23.5	22.0	22.5	24.5	24.0	24.5	23.0	22.5	23.0	17.0	16.5	17.0
27	24.0	22.0	23.0	24.5	24.0	24.0	23.0	22.5	23.0	16.5	16.0	16.5
28	24.0	22.5	23.0	24.0	24.0	24.0	23.0	22.5	22.5	16.0	15.5	16.0
29	25.0	22.5	23.5	24.0	24.0	24.0	23.0	22.5	22.5	16.0	15.0	15.5
30	25.5	22.5	24.0	24.5	24.0	24.0	23.0	22.5	22.5	15.5	15.0	15.5
31	—	—	—	24.5	24.0	24.5	23.0	22.5	22.5	—	—	—
MONTH	25.5	16.5	19.8	26.0	22.5	23.6	27.5	22.5	24.4	22.5	15.0	19.9

STREAMS TRIBUTARY TO LAKE HURON

04137030 AU SABLE RIVER NEAR SIDTOWN, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.5	8.3	8.4	9.8	9.6	9.7	12.8	12.3	12.5	13.3	12.8	13.1
2	8.8	8.0	8.5	9.7	9.4	9.6	13.3	12.2	13.0	13.3	12.5	13.0
3	9.0	6.4	8.3	9.9	8.7	9.6	13.6	13.1	13.3	13.3	12.6	13.0
4	9.1	6.2	7.8	9.8	9.6	9.7	13.6	13.1	13.4	13.3	12.6	12.9
5	9.7	6.6	9.1	9.8	9.6	9.7	14.2	12.4	13.2	13.0	12.7	12.9
6	9.6	9.1	9.4	9.8	9.5	9.7	13.1	12.5	12.8	13.0	12.7	12.8
7	9.7	9.2	9.6	9.8	9.6	9.8	12.9	9.7	12.0	13.0	12.6	12.8
8	9.7	8.6	9.5	10.3	9.7	9.8	12.8	11.8	12.4	12.9	12.5	12.7
9	9.8	9.3	9.6	10.0	9.3	9.8	12.8	11.9	12.5	12.8	12.5	12.6
10	9.8	9.2	9.6	10.1	9.7	9.9	13.5	12.0	13.0	12.7	12.4	12.6
11	9.8	9.2	9.6	10.1	9.9	10.0	13.6	13.3	13.4	12.7	12.4	12.6
12	9.8	9.2	9.6	10.0	9.9	10.0	13.5	13.2	13.4	12.5	12.3	12.4
13	9.9	8.9	9.6	10.1	9.8	9.9	13.7	13.3	13.5	12.5	12.3	12.4
14	9.9	8.9	9.6	10.2	9.8	10.0	13.6	13.3	13.5	12.5	12.2	12.3
15	9.9	9.2	9.6	10.4	10.0	10.2	13.6	13.4	13.5	12.4	12.1	12.3
16	10.0	9.2	9.6	10.4	9.2	10.1	13.6	13.4	13.5	12.4	12.1	12.2
17	9.9	9.1	9.6	10.7	9.4	9.8	13.6	13.4	13.5	12.3	12.1	12.2
18	10.1	9.2	9.7	10.9	9.7	10.5	13.6	13.4	13.5	12.7	12.1	12.2
19	10.0	9.4	9.8	11.0	10.0	10.7	13.6	13.3	13.5	12.2	12.0	12.1
20	9.9	9.4	9.7	11.0	9.8	10.5	13.6	13.2	13.4	12.4	12.0	12.2
21	10.0	9.3	9.7	11.0	10.2	10.6	13.6	13.3	13.4	12.2	11.8	12.1
22	9.8	9.3	9.6	11.6	10.5	11.1	13.6	13.4	13.5	12.2	11.9	12.1
23	9.9	9.2	9.6	12.0	11.0	11.7	13.6	13.4	13.5	12.2	11.9	12.0
24	9.9	9.2	9.7	11.6	11.0	11.3	13.8	13.4	13.6	12.4	12.0	12.2
25	9.9	9.7	9.8	12.0	11.1	11.4	13.8	13.5	13.6	12.6	12.1	12.3
26	9.9	9.6	9.7	11.9	10.9	11.6	13.8	13.5	13.7	12.5	12.2	12.4
27	9.9	9.5	9.7	12.2	11.3	11.8	13.8	13.5	13.6	12.7	12.2	12.5
28	9.8	9.6	9.7	12.5	11.9	12.3	14.0	13.5	13.8	12.8	12.5	12.6
29	9.8	9.5	9.7	12.6	12.0	12.4	13.9	13.6	13.8	13.0	12.4	12.7
30	9.8	9.6	9.7	12.5	12.0	12.4	13.8	13.5	13.7	13.0	12.7	12.8
31	9.8	9.6	9.7	—	—	—	13.7	13.0	13.5	12.9	12.6	12.8
MONTH	10.1	6.2	9.4	12.6	8.7	10.5	14.2	9.7	13.3	13.3	11.8	12.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.2	12.8	13.0	13.4	12.8	13.1	11.6	11.5	11.6	9.8	9.4	9.6
2	13.3	12.8	13.1	13.6	12.8	13.1	11.7	11.5	11.6	9.6	9.3	9.5
3	13.3	13.0	13.1	13.3	12.6	13.0	11.7	11.6	11.6	9.4	9.3	9.3
4	13.4	13.0	13.2	13.2	12.5	13.0	11.7	11.6	11.6	9.3	8.4	9.1
5	13.4	13.1	13.3	13.3	12.7	13.0	11.7	11.6	11.7	9.2	8.4	9.0
6	13.6	13.0	13.4	13.0	12.5	12.9	11.7	11.5	11.6	9.2	8.7	9.0
7	13.7	13.2	13.4	13.1	12.6	12.8	11.7	11.6	11.6	9.2	8.8	9.0
8	13.7	13.2	13.4	12.9	12.2	12.7	11.8	11.6	11.7	9.5	9.1	9.2
9	13.6	13.3	13.5	12.8	12.1	12.6	11.7	11.6	11.6	9.5	9.0	9.2
10	13.7	13.2	13.5	12.6	12.1	12.4	11.8	11.6	11.7	9.4	8.8	9.0
11	13.7	13.4	13.6	12.6	11.7	12.3	11.6	11.3	11.5	9.2	8.6	9.0
12	13.8	13.6	13.7	12.6	12.0	12.3	11.5	10.0	11.4	9.1	8.4	8.7
13	14.0	13.4	13.7	12.4	11.7	12.0	11.4	11.3	11.4	8.7	8.3	8.5
14	13.9	13.6	13.7	11.7	11.5	11.6	11.3	11.1	11.2	8.8	8.1	8.3
15	14.2	13.8	13.9	11.6	11.5	11.6	11.1	10.9	11.0	8.4	7.4	8.0
16	14.3	13.7	13.9	11.5	11.4	11.5	11.1	10.7	10.8	8.6	7.8	8.2
17	14.4	13.8	14.0	11.5	11.3	11.5	11.0	10.7	10.8	8.8	7.8	8.2
18	14.2	13.8	14.0	11.5	11.4	11.5	10.9	10.7	10.8	9.0	8.0	8.4
19	14.1	13.7	14.0	11.5	11.2	11.5	10.8	10.3	10.6	8.6	8.0	8.3
20	14.4	13.7	13.9	11.4	11.2	11.4	10.5	10.3	10.4	8.9	7.7	8.2
21	14.1	13.4	13.8	11.4	11.3	11.3	10.5	10.2	10.3	8.7	6.9	7.8
22	13.8	13.5	13.7	11.5	11.3	11.4	10.3	10.1	10.2	8.6	7.9	8.3
23	13.8	13.5	13.7	11.5	11.4	11.4	10.2	9.9	10.1	8.5	7.8	8.1
24	13.8	13.2	13.5	11.4	11.3	11.4	10.2	9.9	10.0	8.6	7.8	8.2
25	13.8	13.1	13.5	11.5	11.3	11.4	10.0	9.6	9.8	8.6	7.8	8.2
26	13.7	13.3	13.5	11.5	11.4	11.5	9.9	9.6	9.7	8.3	7.3	7.6
27	13.7	13.0	13.4	11.6	11.4	11.5	9.9	9.5	9.6	8.2	7.6	7.9
28	13.5	12.8	13.1	11.6	11.4	11.5	9.7	8.8	9.5	8.6	7.7	8.1
29	—	—	—	11.5	11.4	11.5	9.5	8.7	9.3	9.2	7.8	8.3
30	—	—	—	11.6	11.4	11.5	9.7	9.1	9.5	8.8	7.8	8.2
31	—	—	—	11.6	11.5	11.6	—	—	—	8.8	7.8	8.2
MONTH	14.4	12.8	13.6	13.6	11.2	12.0	11.8	8.7	10.8	9.8	6.9	8.5

STREAMS TRIBUTARY TO LAKE HURON

04137030 AU SABLE RIVER NEAR SIDTOWN, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.8	7.8	8.1	7.1	5.5	6.6	7.2	6.0	6.7	7.8	6.8	7.4
2	8.6	7.9	8.1	6.7	6.2	6.5	7.3	5.7	6.6	8.0	7.0	7.5
3	8.6	7.9	8.2	7.0	6.2	6.6	7.3	6.0	6.7	8.0	6.8	7.6
4	8.6	7.6	8.2	7.2	6.0	6.6	7.2	5.8	6.8	7.9	7.1	7.6
5	8.4	7.9	8.2	7.1	6.2	6.7	7.3	6.2	6.9	7.8	7.6	7.7
6	8.7	8.1	8.3	7.0	5.6	6.5	7.5	5.7	6.8	8.0	7.6	7.8
7	9.2	8.1	8.5	6.9	5.8	6.4	7.3	5.7	6.8	8.0	7.5	7.8
8	9.5	8.1	8.8	6.8	5.1	6.2	7.8	5.4	6.9	7.9	7.6	7.7
9	9.5	8.6	9.0	6.8	5.6	6.2	7.5	6.7	7.0	7.8	7.5	7.7
10	9.4	8.1	8.7	7.1	5.7	6.4	7.3	6.7	7.0	7.9	7.7	7.8
11	9.1	7.9	8.3	7.1	5.8	6.5	7.3	6.8	7.1	7.8	7.6	7.8
12	9.2	7.8	8.3	6.9	5.9	6.5	7.4	6.9	7.1	8.0	7.6	7.8
13	8.7	8.1	8.4	7.2	6.2	6.7	7.3	6.6	7.0	7.9	7.7	7.8
14	8.5	8.2	8.4	7.0	5.7	6.6	7.6	5.9	6.9	7.8	7.5	7.7
15	8.3	7.7	8.1	6.9	5.9	6.5	7.4	6.7	7.0	7.8	7.5	7.7
16	8.0	7.7	7.8	6.7	5.9	6.4	7.1	6.3	6.8	7.8	7.7	7.8
17	7.9	7.6	7.7	6.7	5.8	6.4	7.0	6.5	6.7	7.9	7.3	7.7
18	7.8	7.5	7.6	6.8	5.9	6.5	6.9	6.5	6.7	8.0	7.1	7.6
19	8.0	7.4	7.7	6.9	5.8	6.5	6.9	6.3	6.7	7.8	7.3	7.6
20	7.4	7.2	7.3	6.8	5.9	6.5	6.9	6.5	6.7	7.8	7.3	7.6
21	7.4	7.1	7.2	7.1	4.9	6.4	7.2	6.2	6.8	7.9	7.2	7.6
22	7.3	7.0	7.1	6.9	4.8	6.4	7.7	6.4	7.0	8.0	7.3	7.7
23	7.2	6.9	7.1	7.1	5.5	6.6	7.4	6.0	6.9	7.9	7.2	7.7
24	7.1	6.8	7.0	7.2	5.7	6.5	7.4	6.3	6.9	8.0	7.3	7.7
25	7.1	6.5	6.9	6.9	5.8	6.5	7.4	6.5	7.0	8.0	7.4	7.8
26	7.2	5.9	6.7	6.9	6.1	6.5	7.6	6.4	7.1	8.0	7.6	7.9
27	7.1	5.4	6.5	6.9	6.2	6.6	7.8	6.4	7.2	8.0	7.5	7.8
28	7.0	5.7	6.4	7.0	6.4	6.8	7.8	6.7	7.2	8.1	7.6	7.9
29	6.9	5.0	6.4	7.0	6.7	6.9	8.0	6.9	7.4	8.1	7.5	8.0
30	7.0	5.4	6.3	7.1	6.4	6.9	7.9	6.7	7.3	8.4	7.5	8.0
31	—	—	—	7.0	6.0	6.7	7.9	6.9	7.4	—	—	—
MONTH	9.5	5.0	7.7	7.2	4.8	6.5	8.0	5.4	6.9	8.4	6.8	7.7

STREAMS TRIBUTARY TO LAKE HURON

04137500 AU SABLE RIVER NEAR AU SABLE, MI

LOCATION (REVISED).--Lat 44°26'11", long 83°26'02", in NE1/4 NW1/4 sec.35, T.24 N., R.8 E., Iosco County, Hydrologic Unit 04070007, at bridge on Rea Road, 5.5 mi northwest of Au Sable, and 10.4 mi upstream from mouth.

DRAINAGE AREA.--1,739 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1987 to current year. Records for July 1939 to September 1940, published in WSP 874, 894, and 1307, have been found to be unreliable and should not be used.

REVISED RECORDS.--WDR MI-96-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 583.93 ft above sea level.

REMARKS.--Water-discharge records good. Flow regulated by Foote Dam 0.6 mi upstream. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	868	767	1160	1120	1140	958	1310	1410	1430	920	984	911
2	931	814	1160	999	1110	1030	1420	1450	1770	911	867	851
3	1010	945	1160	966	1020	1100	1510	1410	1870	815	801	847
4	991	993	1110	1060	944	1140	1510	1290	1810	943	800	941
5	933	951	1040	1080	1020	1170	1600	1160	1660	1100	804	1100
6	910	899	993	1110	1110	1170	1920	1120	1410	1100	802	1080
7	912	876	901	1080	1100	1150	2150	1180	1230	1040	805	920
8	938	878	814	964	1170	1120	2290	1630	1230	954	875	854
9	954	965	910	815	1370	1140	2390	1870	1220	842	968	855
10	1030	1460	1020	833	1320	1110	2320	1840	1520	799	930	1110
11	1040	1530	1050	1060	1180	1050	2120	1840	1710	770	925	1310
12	909	1310	962	1140	1210	1030	2510	1820	1650	734	926	1280
13	897	1290	848	1130	1210	1010	3220	1780	1400	776	938	1090
14	1010	1210	954	1140	1220	1090	3070	1680	1180	878	848	990
15	1080	1150	1130	1140	1220	1180	2730	1230	1180	920	728	924
16	1020	1150	1180	1120	1220	1160	2150	1710	1180	922	681	802
17	940	1150	1190	1100	1170	1230	1840	1560	1170	918	682	749
18	870	1110	1110	1000	1090	1270	1720	1490	1180	918	765	752
19	804	1040	1080	922	1120	1210	1680	1450	1340	926	1070	1020
20	804	990	936	771	1190	1140	1620	1400	1290	924	1450	1300
21	824	953	848	690	1050	1180	1640	1370	1060	850	1280	1290
22	850	963	913	1000	949	1500	1620	1510	961	816	917	1290
23	847	956	852	1160	1070	1640	1570	1600	1010	925	937	1280
24	882	970	815	1090	1200	1500	1740	1360	1080	985	910	1280
25	1000	994	833	1010	1370	1530	1740	1400	1050	1040	876	1420
26	1070	1090	833	973	1430	1410	1560	1640	964	1060	957	1600
27	1100	1160	910	969	1190	1250	1440	1570	904	993	1040	1770
28	1020	1160	1000	1030	1000	1200	1440	1500	877	876	1110	1550
29	927	1170	1000	1110	—	1190	1440	1490	857	820	1110	1220
30	884	1160	1040	1180	—	1220	1420	1470	863	923	1110	1140
31	826	—	1090	1180	—	1270	—	1310	—	986	1050	—
TOTAL	29081	32054	30842	31942	32393	37348	56690	46540	38056	28384	28946	33526
MEAN	938	1068	995	1030	1157	1205	1890	1501	1269	916	934	1118
MAX	1100	1530	1190	1180	1430	1640	3220	1870	1870	1100	1450	1770
MIN	804	767	814	690	944	958	1310	1120	857	734	681	749
CFSM	.54	.61	.57	.59	.67	.69	1.09	.86	.73	.53	.54	.64
IN.	.62	.69	.66	.68	.69	.80	1.21	1.00	.81	.61	.62	.72

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 2001, BY WATER YEAR (WY)

MEAN	1360	1493	1412	1351	1333	1634	2038	1598	1399	1280	1260	1232
MAX	1770	1944	1870	1596	1618	2097	2749	2084	1952	2205	1834	1605
(WY)	1992	1992	1992	1997	1997	1990	1997	1997	1993	1994	1994	1994
MIN	938	1068	995	990	1157	1205	1187	1111	1104	916	934	988
(WY	2001	2001	2001	2000	2001	2001	2000	1999	1988	2001	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1987 - 2001	
ANNUAL TOTAL	409355		425802			
ANNUAL MEAN	1118		1167		1447	
HIGHEST ANNUAL MEAN					1640	1994
LOWEST ANNUAL MEAN					1148	2000
HIGHEST DAILY MEAN	2160	Feb 27	3220	Apr 13	5740	Apr 1 1998
LOWEST DAILY MEAN	767	Nov 1	681	Aug 16	455	Oct 29 1993
ANNUAL SEVEN-DAY MINIMUM	840	Oct 18	795	Aug 12	656	Jun 7 1988
MAXIMUM PEAK FLOW			3490	Apr 13	5850	Mar 28 1991
MAXIMUM PEAK STAGE			12.78	Apr 13	16.27	Mar 28 1991
INSTANTANEOUS LOW FLOW			615	(a)	135	Aug 27 1993
ANNUAL RUNOFF (CFSM)	.64		.67		.83	
ANNUAL RUNOFF (INCHES)	8.76		9.11		11.30	
10 PERCENT EXCEEDS	1440		1610		1980	
50 PERCENT EXCEEDS	1080		1090		1350	
90 PERCENT EXCEEDS	904		848		1000	

(a) Jan. 20, 21.

STREAMS TRIBUTARY TO LAKE HURON

04137500 AU SABLE RIVER NEAR AU SABLE, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978-94, 1996 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1978 to September 1981.
WATER TEMPERATURE: April 1978 to September 1981, July 1996 to current year.
DISSOLVED OXYGEN: July 1996 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter from July 11, 1996, set for one hour measurement intervals.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1978-79): Maximum daily, 346 microsiemens, Nov. 21, 1978; minimum daily, 229 microsiemens, Apr. 19, 21, 1979.
WATER TEMPERATURE (water years 1979-80, 1996-2001): Maximum measured, 28.0°C, Aug. 8, 1979; minimum, 0.0°C, on many days during winter periods.
DISSOLVED OXYGEN: Maximum, 13.6 mg/L, on several days during December and January, water year 1998; minimum, 5.8 mg/L, Aug. 13, 1999.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--Specific conductance of 354 microsiemens was measured Feb. 3, 1988.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8, 9; minimum, 0.0°C on several days during winter period.
DISSOLVED OXYGEN: Maximum, 13.1 mg/L, Feb. 21; minimum, 6.2 mg/L, July 26-29.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	16.0	16.0	12.0	11.5	12.0	3.5	3.0	3.5	1.0	.5	.5
2	16.5	16.0	16.0	12.0	11.5	12.0	3.0	2.5	3.0	.5	.5	.5
3	16.5	16.0	16.0	12.0	11.5	11.5	3.0	2.5	2.5	.5	.5	.5
4	16.5	16.0	16.0	11.5	11.5	11.5	2.5	2.0	2.5	.5	.5	.5
5	16.0	15.5	16.0	11.5	11.0	11.0	2.5	2.0	2.0	.5	.5	.5
6	16.0	15.0	15.5	11.0	11.0	11.0	2.0	1.0	1.5	.5	.5	.5
7	15.0	14.5	15.0	11.0	11.0	11.0	1.0	1.0	1.0	.5	.5	.5
8	14.5	14.0	14.5	11.0	10.5	11.0	1.5	1.0	1.0	.5	.5	.5
9	14.0	13.5	14.0	11.0	10.5	10.5	1.0	1.0	1.0	.5	.5	.5
10	14.0	13.5	13.5	10.5	10.0	10.5	1.0	1.0	1.0	.5	.5	.5
11	14.0	13.5	13.5	10.0	10.0	10.0	1.0	1.0	1.0	.5	.5	.5
12	14.0	13.0	13.5	10.0	9.5	9.5	1.5	1.0	1.0	.5	.5	.5
13	14.0	13.5	13.5	9.5	9.0	9.5	1.5	1.0	1.5	.5	.5	.5
14	14.0	13.5	13.5	9.0	9.0	9.0	1.5	1.0	1.5	.5	.5	.5
15	13.5	13.5	13.5	9.0	8.5	8.5	1.5	1.5	1.5	.5	.5	.5
16	13.5	13.5	13.5	8.5	8.0	8.0	1.5	1.5	1.5	.5	.5	.5
17	13.5	13.0	13.5	8.0	7.5	8.0	1.5	1.0	1.5	.5	.5	.5
18	13.5	13.0	13.5	7.5	7.0	7.5	1.5	1.0	1.0	.5	.5	.5
19	13.5	13.0	13.0	7.0	6.5	7.0	1.0	1.0	1.0	.5	.5	.5
20	13.5	13.0	13.0	6.5	6.5	6.5	1.0	1.0	1.0	.5	.0	.5
21	13.5	13.0	13.0	6.5	5.5	6.0	1.0	1.0	1.0	.5	.0	.5
22	13.0	12.5	13.0	5.5	5.0	5.0	1.0	1.0	1.0	.5	.5	.5
23	13.0	13.0	13.0	5.0	4.5	4.5	1.0	1.0	1.0	.5	.5	.5
24	13.0	13.0	13.0	4.5	4.0	4.5	1.0	1.0	1.0	.5	.5	.5
25	13.0	13.0	13.0	4.5	4.0	4.0	1.0	1.0	1.0	.5	.5	.5
26	13.0	13.0	13.0	4.5	4.0	4.5	1.0	1.0	1.0	.5	.5	.5
27	13.5	13.0	13.0	4.5	4.0	4.0	1.0	1.0	1.0	.5	.5	.5
28	13.0	12.5	13.0	4.0	4.0	4.0	1.0	1.0	1.0	.5	.5	.5
29	12.5	12.0	12.5	4.0	4.0	4.0	1.0	.5	1.0	.5	.5	.5
30	12.5	12.0	12.0	4.0	3.5	3.5	1.0	.5	1.0	.5	.5	.5
31	12.0	12.0	12.0	---	---	---	1.0	.5	.5	.5	.5	.5
MONTH	16.5	12.0	13.8	12.0	3.5	8.0	3.5	.5	1.4	1.0	.0	.5

STREAMS TRIBUTARY TO LAKE HURON

04137500 AU SABLE RIVER NEAR AU SABLE, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	.5	.5	.5	.5	.5	.5	2.0	2.0	2.0	12.5	11.0	11.5
2	.5	.5	.5	1.0	.5	.5	2.0	2.0	2.0	13.5	12.0	12.5
3	.5	.5	.5	1.0	.5	.5	2.5	2.0	2.0	14.0	13.0	13.0
4	.5	.5	.5	.5	.5	.5	2.5	2.0	2.0	14.0	13.0	13.5
5	.5	.5	.5	.5	.5	.5	2.5	2.0	2.5	13.5	12.5	13.0
6	.5	.5	.5	.5	.5	.5	3.0	2.5	2.5	13.0	12.5	12.5
7	.5	.5	.5	1.0	.5	.5	3.0	2.5	3.0	13.5	12.5	13.0
8	.5	.0	.5	.5	.5	.5	3.5	3.0	3.0	15.0	13.5	14.0
9	.5	.5	.5	.5	.5	.5	3.5	3.5	3.5	15.5	14.5	15.0
10	.5	.5	.5	1.0	.5	.5	4.0	3.5	4.0	15.5	15.0	15.5
11	.5	.5	.5	1.0	.5	.5	4.0	4.0	4.0	16.0	15.5	15.5
12	.5	.5	.5	.5	.5	.5	4.5	3.5	4.0	16.0	15.5	15.5
13	.5	.5	.5	.5	.5	.5	4.5	4.0	4.5	16.5	15.5	16.0
14	.5	.5	.5	1.0	.5	.5	5.0	4.5	4.5	16.0	15.5	15.5
15	.5	.5	.5	1.0	.5	.5	5.5	5.0	5.0	16.0	15.5	15.5
16	.5	.5	.5	1.0	.5	.5	5.5	5.5	5.5	16.0	15.5	15.5
17	.5	.0	.5	1.0	.5	.5	6.0	5.5	5.5	16.5	15.5	16.5
18	.5	.0	.5	1.0	.5	1.0	6.0	5.5	5.5	18.0	16.5	17.5
19	.5	.5	.5	1.0	1.0	1.0	7.0	6.0	6.5	18.0	17.0	17.5
20	.5	.5	.5	1.5	1.0	1.0	6.5	6.5	6.5	18.0	17.0	17.5
21	.5	.5	.5	1.5	1.0	1.0	7.5	6.5	7.0	17.5	16.0	17.0
22	.5	.0	.5	1.5	1.0	1.0	7.5	7.0	7.5	17.5	16.5	17.0
23	.5	.5	.5	1.5	1.0	1.5	9.0	7.5	8.5	18.0	17.0	17.5
24	.5	.5	.5	1.5	1.0	1.5	9.0	8.5	8.5	17.5	17.0	17.5
25	.5	.5	.5	1.5	1.5	1.5	9.5	8.5	9.0	17.5	17.0	17.5
26	.5	.5	.5	1.5	1.5	1.5	10.0	9.0	9.5	17.5	17.0	17.0
27	.5	.5	.5	1.5	1.5	1.5	10.0	9.5	9.5	17.5	17.0	17.0
28	.5	.5	.5	2.0	1.5	1.5	10.0	10.0	10.0	18.0	17.0	17.5
29	—	—	—	2.0	1.5	2.0	11.0	10.0	10.5	18.0	17.0	17.5
30	—	—	—	2.0	2.0	2.0	11.5	10.5	11.0	18.0	17.0	17.5
31	—	—	—	2.0	2.0	2.0	—	—	—	17.5	17.0	17.5
MONTH	.5	.0	.5	2.0	.5	.9	11.5	2.0	5.6	18.0	11.0	15.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	16.5	17.0	24.5	23.5	24.5	25.0	24.0	24.5	22.5	22.0	22.5
2	17.0	16.5	17.0	24.0	22.5	23.0	26.0	24.5	25.5	23.0	22.0	22.5
3	17.0	16.5	17.0	23.0	22.5	22.5	26.0	25.0	25.5	22.5	22.0	22.0
4	17.0	16.5	16.5	23.5	22.5	23.0	25.5	25.0	25.5	22.0	21.5	22.0
5	17.0	16.5	17.0	23.0	22.0	22.5	26.0	25.0	25.5	22.0	21.5	22.0
6	17.0	16.5	17.0	22.5	22.0	22.0	26.5	25.0	26.0	22.5	21.5	22.0
7	17.5	16.5	17.0	22.5	22.0	22.0	26.5	26.0	26.5	22.5	21.5	22.0
8	18.0	17.0	17.5	23.0	22.0	22.5	27.0	26.0	26.5	22.5	22.0	22.0
9	18.5	17.5	18.0	23.0	22.5	22.5	27.0	26.0	26.5	22.5	22.0	22.0
10	18.5	18.0	18.5	23.5	22.5	23.0	26.5	26.0	26.5	22.0	22.0	22.0
11	18.5	18.0	18.0	23.5	23.0	23.0	26.0	25.5	26.0	22.0	21.5	22.0
12	19.5	18.0	18.5	23.0	22.5	23.0	26.0	25.5	25.5	22.0	21.5	22.0
13	20.0	18.5	19.0	23.0	22.5	22.5	25.5	25.0	25.5	21.5	21.0	21.5
14	21.0	19.0	20.0	23.0	22.5	22.5	25.5	24.5	25.0	21.0	20.5	20.5
15	21.0	19.5	20.5	23.0	22.5	22.5	25.5	24.5	24.5	21.0	20.5	20.5
16	22.5	21.0	22.0	23.0	22.5	22.5	24.5	24.0	24.5	21.0	20.0	20.5
17	23.0	21.5	22.0	23.0	22.5	22.5	24.0	23.5	24.0	20.5	20.0	20.5
18	22.0	21.0	21.5	23.0	22.5	23.0	24.0	23.5	23.5	20.5	20.0	20.0
19	23.5	21.0	22.5	23.5	23.0	23.0	23.5	23.0	23.0	20.0	20.0	20.0
20	22.5	21.0	21.5	23.5	23.0	23.5	23.0	22.5	23.0	20.0	19.5	20.0
21	22.0	21.0	21.5	24.0	23.5	23.5	23.0	22.5	22.5	20.0	19.5	19.5
22	22.0	21.5	21.5	24.5	23.5	24.0	23.0	22.5	23.0	20.0	19.5	19.5
23	22.0	21.5	21.5	25.0	24.0	24.5	23.0	22.5	23.0	19.5	19.0	19.5
24	22.5	21.5	22.0	26.5	25.0	25.5	23.0	22.5	23.0	19.0	18.0	18.5
25	23.0	21.5	22.0	25.5	24.0	25.0	23.0	22.5	23.0	18.0	17.0	17.5
26	23.0	22.0	22.5	24.5	24.0	24.0	23.0	23.0	23.0	17.0	16.5	17.0
27	24.0	22.5	23.0	24.0	23.5	24.0	23.5	23.0	23.0	16.5	16.5	16.5
28	24.0	23.0	23.5	24.0	23.5	23.5	23.5	23.0	23.0	16.5	16.0	16.0
29	25.0	23.0	24.0	24.0	23.5	23.5	23.5	22.5	23.0	16.5	16.0	16.0
30	25.0	24.0	24.5	24.5	23.5	24.0	23.5	22.5	23.0	16.5	16.0	16.0
31	—	—	—	24.5	24.0	24.0	23.0	22.5	23.0	—	—	—
MONTH	25.0	16.5	20.1	26.5	22.0	23.3	27.0	22.5	24.4	23.0	16.0	20.1

STREAMS TRIBUTARY TO LAKE HURON

04137500 AU SABLE RIVER NEAR AU SABLE, MI–Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.2	8.6	8.9	9.3	8.7	9.1	11.9	11.6	11.8	12.8	12.7	12.8
2	9.1	8.6	8.8	9.1	8.7	8.9	12.0	11.8	11.9	12.9	12.7	12.8
3	9.1	8.6	8.8	9.3	8.8	9.0	12.1	11.8	11.9	12.9	12.7	12.8
4	9.3	8.6	8.9	9.8	8.9	9.1	12.2	11.9	12.0	12.7	12.3	12.5
5	9.1	8.6	8.8	9.4	9.0	9.2	12.4	11.9	12.2	12.6	12.3	12.4
6	9.2	8.6	8.8	9.5	9.1	9.2	12.4	12.1	12.3	12.4	12.3	12.4
7	9.2	8.8	8.9	9.4	9.1	9.3	12.6	12.3	12.5	12.4	12.2	12.3
8	9.4	8.8	9.1	9.7	9.3	9.5	12.7	12.6	12.6	12.5	12.2	12.3
9	9.4	9.0	9.2	9.5	9.3	9.4	12.9	12.6	12.8	12.4	12.2	12.3
10	9.5	9.0	9.2	9.7	9.4	9.6	12.9	12.7	12.8	12.3	12.0	12.2
11	9.5	9.1	9.2	9.9	9.7	9.8	12.8	12.7	12.7	12.1	11.8	12.0
12	9.6	9.2	9.3	10.1	9.9	10.0	12.8	12.6	12.7	11.9	11.7	11.8
13	9.5	9.2	9.3	10.2	10.0	10.1	12.9	12.6	12.8	11.9	11.7	11.8
14	9.6	9.0	9.3	10.3	10.1	10.2	12.9	12.6	12.8	11.8	11.6	11.7
15	9.2	8.9	9.0	10.4	10.3	10.3	12.9	12.7	12.8	11.7	11.4	11.5
16	9.4	9.0	9.1	10.4	10.2	10.3	12.8	12.6	12.7	11.6	11.4	11.5
17	9.4	8.9	9.1	10.7	10.3	10.5	12.7	12.5	12.7	11.6	11.4	11.5
18	9.5	9.0	9.1	10.9	10.6	10.7	12.8	12.6	12.7	11.5	11.3	11.4
19	9.3	9.0	9.1	10.8	10.7	10.8	12.9	12.7	12.8	11.5	11.3	11.4
20	9.5	9.0	9.2	11.0	10.8	10.9	12.9	12.7	12.8	11.5	11.2	11.4
21	9.4	9.0	9.1	11.3	11.0	11.2	12.9	12.8	12.8	11.5	11.2	11.3
22	9.6	9.1	9.3	11.5	11.2	11.4	12.9	12.7	12.8	11.3	10.9	11.1
23	9.6	9.2	9.4	11.6	11.5	11.6	13.0	12.8	12.9	11.0	10.8	10.9
24	9.5	9.2	9.3	11.7	11.5	11.6	12.9	12.8	12.9	11.1	10.8	10.9
25	9.4	9.1	9.3	11.6	11.4	11.5	13.0	12.8	12.9	11.0	10.6	10.8
26	9.4	8.9	9.1	11.5	11.4	11.4	12.9	12.8	12.8	10.9	10.6	10.7
27	9.4	8.8	9.1	11.5	11.4	11.5	12.9	12.7	12.8	11.0	10.7	10.8
28	9.3	8.9	9.1	11.7	11.4	11.5	12.9	12.8	12.9	11.0	10.8	10.9
29	9.6	9.2	9.4	11.6	11.5	11.6	12.9	12.7	12.8	11.1	10.8	10.9
30	9.6	9.3	9.4	11.6	11.5	11.6	12.8	12.6	12.7	11.0	10.8	10.9
31	9.6	9.2	9.4	—	—	—	12.7	12.6	12.7	11.1	10.8	11.0
MONTH	9.6	8.6	9.1	11.7	8.7	10.4	13.0	11.6	12.6	12.9	10.6	11.6

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.3	11.0	11.1	12.7	12.4	12.6	12.2	12.0	12.1	10.1	9.8	9.9
2	11.4	11.1	11.3	12.6	12.3	12.5	12.3	12.0	12.2	11.2	9.8	10.3
3	11.6	11.2	11.4	12.6	12.3	12.4	12.4	12.2	12.2	10.7	9.5	10.0
4	11.8	11.3	11.6	12.4	12.1	12.3	12.5	12.2	12.4	10.2	9.3	9.8
5	11.7	11.4	11.5	12.4	12.1	12.2	12.3	12.2	12.3	10.7	9.2	9.7
6	11.7	11.4	11.6	12.3	12.1	12.2	12.4	12.1	12.3	10.2	9.3	9.7
7	11.9	11.5	11.7	12.3	12.0	12.2	12.4	12.2	12.3	10.4	9.0	9.4
8	11.8	11.7	11.8	12.2	11.9	12.1	12.4	12.3	12.3	9.9	8.9	9.3
9	11.8	11.6	11.7	12.2	11.8	12.0	12.5	12.3	12.4	9.5	8.8	9.1
10	12.2	11.8	12.0	12.1	11.8	12.0	12.6	12.4	12.5	9.7	8.5	9.1
11	12.3	12.0	12.2	12.2	11.7	12.0	12.5	12.2	12.4	9.5	8.4	8.7
12	12.4	12.1	12.2	12.1	11.8	12.0	12.4	12.1	12.2	9.1	8.2	8.6
13	12.5	12.1	12.3	11.9	11.5	11.7	12.3	12.1	12.2	9.7	8.6	8.9
14	12.5	12.2	12.4	11.7	11.3	11.5	12.2	11.9	12.1	9.1	8.2	8.6
15	12.6	12.3	12.5	11.6	11.4	11.5	11.9	11.7	11.8	9.3	8.0	8.4
16	12.7	12.5	12.6	11.7	11.4	11.6	11.8	11.6	11.7	9.1	8.0	8.4
17	13.0	12.6	12.8	11.6	11.4	11.6	11.8	11.7	11.7	9.3	7.8	8.4
18	13.0	12.8	12.9	11.7	11.3	11.5	11.8	11.6	11.7	9.4	8.2	8.6
19	12.9	12.6	12.8	11.8	11.5	11.6	11.6	11.4	11.5	9.4	8.2	8.6
20	12.9	12.5	12.7	11.8	11.6	11.7	11.5	11.3	11.4	9.5	8.3	8.9
21	13.1	12.6	12.8	11.8	11.6	11.7	11.3	10.9	11.2	9.3	8.0	8.7
22	13.0	12.7	12.9	11.7	11.4	11.6	11.1	10.9	11.0	9.2	8.2	8.8
23	13.0	12.6	12.8	11.7	11.5	11.6	11.0	10.7	10.8	9.9	8.2	8.9
24	12.8	12.5	12.6	11.8	11.6	11.7	10.9	10.7	10.7	9.4	8.0	8.6
25	12.6	12.3	12.4	11.9	11.7	11.8	10.9	10.6	10.7	9.1	7.9	8.4
26	12.5	12.1	12.3	12.0	11.7	11.9	10.9	10.5	10.8	9.3	8.3	8.8
27	12.8	12.2	12.5	12.1	11.8	11.9	10.7	10.6	10.6	9.2	8.2	8.6
28	12.8	12.5	12.6	12.1	11.8	11.9	10.6	10.4	10.6	9.2	8.1	8.7
29	—	—	—	12.2	12.0	12.1	10.5	10.3	10.4	9.5	8.2	8.8
30	—	—	—	12.1	11.9	12.0	10.3	10.0	10.1	9.3	8.2	8.8
31	—	—	—	12.2	12.0	12.1	—	—	—	9.3	8.4	8.8
MONTH	13.1	11.0	12.2	12.7	11.3	11.9	12.6	10.0	11.6	11.2	7.8	9.0

STREAMS TRIBUTARY TO LAKE HURON

04137500 AU SABLE RIVER NEAR AU SABLE, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.4	8.1	8.8	7.6	6.8	7.3	7.5	6.3	6.9	8.1	7.5	7.7
2	9.5	8.7	9.1	7.8	6.8	7.2	7.7	6.5	7.1	8.2	7.5	7.7
3	9.5	8.8	9.1	7.6	6.8	7.1	7.8	6.6	7.1	8.1	7.4	7.7
4	9.6	8.9	9.2	7.7	6.9	7.3	7.8	6.6	7.0	8.0	7.5	7.8
5	9.7	8.5	9.2	7.9	7.0	7.5	7.7	6.4	6.9	8.2	7.6	7.8
6	9.4	8.5	9.0	7.9	7.3	7.6	7.7	6.3	6.9	8.1	7.6	7.8
7	9.3	8.1	8.8	7.8	7.2	7.4	7.5	6.4	7.1	8.3	7.6	7.9
8	9.6	8.3	9.1	7.9	7.0	7.3	7.4	6.4	6.8	8.3	7.5	7.8
9	10.0	8.4	9.3	7.7	6.9	7.2	7.9	6.4	7.0	8.2	7.5	7.8
10	10.1	8.4	9.5	7.8	6.8	7.3	7.7	6.8	7.1	8.1	7.6	7.8
11	9.8	8.7	9.3	7.8	7.0	7.4	7.7	6.6	7.1	8.0	7.5	7.7
12	9.7	8.1	9.1	7.9	7.0	7.4	7.6	6.7	7.0	8.2	7.5	7.7
13	9.4	8.1	8.8	8.1	6.9	7.4	7.8	6.8	7.2	7.9	7.5	7.7
14	8.8	8.1	8.4	8.0	7.0	7.5	7.8	6.9	7.2	8.3	7.6	7.8
15	8.5	7.6	8.2	8.1	7.1	7.4	7.9	6.7	7.2	8.2	7.6	7.8
16	8.3	7.8	8.1	7.9	6.8	7.3	7.2	6.7	6.9	8.1	7.6	7.8
17	8.2	7.7	8.0	7.8	6.9	7.3	7.6	6.7	7.1	8.4	7.5	7.9
18	7.8	7.2	7.5	8.0	6.9	7.5	7.7	6.8	7.2	8.2	7.7	7.9
19	8.0	7.2	7.7	8.2	6.8	7.4	7.2	6.8	6.9	8.0	7.7	7.9
20	7.6	6.9	7.3	8.1	6.8	7.4	7.5	6.8	7.1	7.9	7.7	7.8
21	7.4	6.9	7.2	8.4	6.8	7.5	7.6	7.0	7.2	8.0	7.6	7.8
22	7.9	7.0	7.5	8.2	6.7	7.3	7.8	7.0	7.4	8.2	7.5	7.8
23	7.8	7.1	7.5	7.8	6.5	7.2	8.1	7.1	7.5	8.0	7.5	7.7
24	7.8	7.2	7.5	7.8	6.3	7.0	7.9	7.0	7.4	8.1	7.5	7.8
25	7.8	7.2	7.4	7.5	6.3	6.8	7.7	6.9	7.3	8.0	7.8	7.9
26	7.8	7.1	7.4	7.6	6.2	6.7	8.1	7.2	7.6	8.2	7.9	8.0
27	7.8	7.0	7.4	7.9	6.2	6.9	8.3	7.4	7.8	8.3	8.0	8.1
28	7.7	6.9	7.2	7.6	6.2	6.9	8.4	7.7	8.0	8.4	8.1	8.2
29	7.5	6.7	7.2	8.1	6.2	7.1	8.3	7.4	7.8	8.5	8.2	8.3
30	7.4	6.9	7.2	7.9	6.4	7.0	8.3	7.4	7.8	8.6	8.2	8.3
31	—	—	—	7.5	6.5	6.9	8.1	7.4	7.7	—	—	—
MONTH	10.1	6.7	8.2	8.4	6.2	7.2	8.4	6.3	7.2	8.6	7.4	7.9

STREAMS TRIBUTARY TO LAKE HURON

04142000 RIFLE RIVER NEAR STERLING, MI

LOCATION.--Lat 44°04'21", long 84°01'12", in NE1/4 SW1/4 sec.5, T.19 N., R.4 E., Arenac County, Hydrologic Unit 04080101, on left bank 30 ft downstream from bridge on Melita Road, 2.8 mi north of Sterling, and 20 mi upstream from mouth.

DRAINAGE AREA.--320 mi^2, approximately.

PERIOD OF RECORD.--November 1905 to December 1908 (gage heights and discharge measurements only), October 1936 to current year. Monthly discharge only for some periods, published in WSP 1307. Published as Rifle River at Michigan Highway 70 near Sterling 1936-61.

REVISED RECORDS.--WSP 1437: 1937(M), 1939-40(M).

GAGE.--Water-stage recorder. Datum of gage is 649.48 ft above sea level. November 1905 to December 1908, nonrecording gage at site 400 ft downstream at different datum. Jan. 13, 1937 to Jan. 10, 1939, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Occasional regulation by dams upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	161	182	e230	e200	e290	e420	473	243	346	176	133	149
2	159	197	e200	e200	e280	e360	469	244	763	170	131	140
3	160	193	e180	e200	e270	e360	457	242	1040	167	131	139
4	160	179	e170	e200	e260	422	477	236	749	167	127	166
5	159	188	e160	e200	e250	432	477	230	565	162	123	176
6	162	210	e150	e200	e240	381	491	233	458	155	121	149
7	168	213	e160	e200	e240	333	661	222	357	156	119	146
8	174	221	e170	e200	e240	320	899	496	315	157	118	157
9	174	226	e190	e200	e350	343	809	527	312	155	124	182
10	167	545	e200	e205	e750	327	740	356	352	148	140	200
11	163	461	e200	e210	e640	316	572	344	379	146	132	173
12	160	325	e190	e220	e560	309	627	437	335	142	124	152
13	159	337	e180	e230	e500	327	905	324	291	141	120	148
14	158	383	e200	e240	e450	344	679	277	265	139	118	145
15	157	367	e220	e250	e410	456	473	264	262	138	115	142
16	157	336	e230	e260	e370	623	405	351	304	154	125	141
17	159	307	e240	e260	e340	601	372	395	275	162	151	139
18	158	281	e240	e250	e320	532	339	321	248	151	156	139
19	159	261	e220	e240	e310	593	315	268	242	149	181	174
20	161	e240	e210	e230	e300	731	300	242	232	143	263	263
21	164	e220	e200	e220	e250	900	305	240	220	146	201	243
22	156	e200	e200	e210	e280	1040	309	449	234	164	159	197
23	157	e180	e200	e205	e260	1040	299	454	232	233	174	183
24	164	e170	e200	e200	e240	954	418	334	218	183	162	261
25	166	e180	e200	e195	e350	703	407	403	201	156	151	272
26	166	239	e200	e190	e600	e480	332	605	192	149	176	304
27	195	388	e200	e185	e560	e420	317	600	185	142	224	281
28	203	370	e200	e180	e500	393	299	533	180	137	169	223
29	176	309	e200	e180	---	399	267	439	174	138	152	197
30	170	279	e200	e180	---	400	253	367	171	139	143	184
31	170	---	e200	e300	---	452	---	301	---	138	147	---
TOTAL	5122	8187	6140	6640	10410	15711	14146	10977	10097	4803	4610	5565
MEAN	165	273	198	214	372	507	472	354	337	155	149	186
MAX	203	545	240	300	750	1040	905	605	1040	233	263	304
MIN	156	170	150	180	240	309	253	222	171	137	115	139
CFSM	.52	.85	.62	.67	1.16	1.58	1.47	1.11	1.05	.48	.46	.58
IN.	.60	.95	.71	.77	1.21	1.83	1.64	1.28	1.17	.56	.54	.65

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2001, BY WATER YEAR (WY)

MEAN	238	292	284	253	290	556	631	392	289	195	181	204
MAX	741	826	579	538	741	1035	1160	859	842	335	339	712
(WY)	1987	1993	1992	1973	1938	1991	1959	1983	1945	1969	1995	1986
MIN	142	160	156	152	150	206	262	175	124	126	122	124
(WY)	1964	1964	1964	1956	1956	1964	1945	1977	1964	1966	1964	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1937 - 2001	
ANNUAL TOTAL	95546		102408			
ANNUAL MEAN	261		281		(a)318	
HIGHEST ANNUAL MEAN					501	1991
LOWEST ANNUAL MEAN					166	1964
HIGHEST DAILY MEAN	1610	May 19	1040	Mar 22	4500	Mar 28 1950
LOWEST DAILY MEAN	147	Jul 26	115	Aug 15	98	Jul 30 1964
ANNUAL SEVEN-DAY MINIMUM	153	Jul 21	123	Aug 3	105	Jul 26 1964
MAXIMUM PEAK FLOW			1100	Jun 3	(b)5340	Mar 28 1950
MAXIMUM PEAK STAGE			4.67	Jun 3	13.74	Mar 28 1950
INSTANTANEOUS LOW FLOW			115	(c)	(d)75	Nov 22 1964
ANNUAL RUNOFF (CFSM)	.82		.88		.99	
ANNUAL RUNOFF (INCHES)	11.11		11.90		13.48	
10 PERCENT EXCEEDS	392		484		559	
50 PERCENT EXCEEDS	200		221		230	
90 PERCENT EXCEEDS	160		146		150	

(a) Does not include water year 1937.
(b) From rating curve extended above 3,800 ft^3/s.
(c) Aug. 14, 15, 16.
(d) Result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04143830 SHIAWASSEE RIVER AT HOLLY, MI

LOCATION.--Lat 42°47'52", long 83°38'55", in SW1/4 SW1/4 sec.28, T.5 N., R.7 E., Oakland County, Hydrologic Unit 04080203, on right bank upstream of culvert-road crossing on Fish Lake Road, 0.8 mi east of Holly.

DRAINAGE AREA.--49.2 mi^2.

PERIOD OF RECORD.--June to September 2001.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June to September 2001.
WATER TEMPERATURE: June to September 2001.

INSTRUMENTATION.--Water-quality monitor from June 4, 2001, set for 15 minute measurement interval.

REMARKS--Interruptions in the water-quality record were due to instrument malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 628 microsiemens, Aug. 14, 2001; minimum, 406 microsiemens, Aug. 24, 2001.
WATER TEMPERATURE: Maximum, 30.0°C, Aug. 8, 2001; minimum, 11.0°C, Sept. 27, 2001.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	520	471	509	594	484	544	516	421	507
2	---	---	---	528	479	516	587	462	526	505	418	508
3	---	---	---	536	486	518	566	469	535	523	420	521
4	---	---	---	540	482	522	593	467	551	583	454	535
5	500	486	493	535	484	515	579	462	551	597	519	553
6	524	490	501	543	480	516	597	495	557	594	518	553
7	518	498	508	539	470	517	617	533	581	595	512	553
8	518	500	508	539	470	519	596	528	576	603	479	547
9	514	488	505	546	478	519	590	537	579	554	439	509
10	523	488	507	561	482	526	576	508	566	544	479	509
11	516	492	505	566	488	531	569	517	567	546	485	510
12	---	---	---	569	478	531	564	477	553	539	482	511
13	---	---	---	574	491	542	590	495	569	561	492	516
14	---	---	---	568	474	541	628	492	578	560	495	523
15	---	---	---	561	474	540	597	500	572	562	475	529
16	---	---	---	576	489	543	607	453	559	573	472	534
17	---	---	---	593	484	544	568	488	554	581	509	541
18	---	---	---	575	486	539	611	472	549	592	505	548
19	---	---	---	574	487	538	556	457	534	588	487	519
20	---	---	---	585	481	539	562	479	527	609	478	518
21	---	---	---	584	466	544	551	472	519	608	485	533
22	490	450	476	570	466	542	520	437	488	542	452	479
23	477	450	469	582	473	543	462	417	457	527	471	508
24	474	448	467	595	478	553	508	406	455	506	483	496
25	484	452	472	610	509	550	517	446	510	498	476	483
26	492	464	481	571	492	540	522	442	505	493	470	482
27	501	470	490	590	483	545	524	458	514	492	472	483
28	517	474	497	580	467	547	530	457	513	511	476	489
29	520	484	507	584	465	541	529	458	518	514	481	503
30	520	477	509	566	464	526	542	464	523	526	485	509
31	---	---	---	592	491	547	536	443	518	---	---	---
MONTH	---	---	---	610	464	534	628	406	537	609	418	517

STREAMS TRIBUTARY TO LAKE HURON

04143830 SHIAWASSEE RIVER AT HOLLY, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	—	—	—	27.5	23.5	25.5	28.5	25.0	27.0	23.0	19.0	21.5
2	—	—	—	25.5	20.0	22.5	27.5	25.5	26.5	23.5	18.5	21.0
3	—	—	—	24.5	21.5	23.0	28.5	25.0	26.5	24.0	19.5	22.0
4	—	—	—	26.0	22.0	23.5	28.0	23.5	26.0	24.0	20.5	22.0
5	17.0	14.5	15.5	24.5	20.5	23.0	28.0	23.5	26.0	22.0	17.5	20.0
6	16.5	15.5	16.0	25.0	18.5	22.0	28.5	24.0	26.5	22.0	17.5	20.0
7	20.0	14.5	17.0	23.5	21.0	22.0	29.5	25.0	27.5	24.5	19.0	21.5
8	22.0	16.0	18.5	27.0	22.0	24.5	30.0	25.5	28.0	24.0	21.0	22.5
9	23.5	17.5	20.5	27.5	23.0	25.5	29.5	26.5	28.5	23.0	21.0	22.0
10	23.5	19.5	21.0	28.0	24.0	26.0	28.0	25.0	26.5	22.5	19.5	21.0
11	25.0	20.5	—	26.0	22.0	24.0	26.0	22.5	24.5	22.5	18.0	20.5
12	25.0	—	—	25.0	20.5	23.0	26.0	23.0	24.5	23.0	18.0	20.5
13	28.0	—	—	25.0	20.5	23.0	25.0	22.5	24.0	21.5	17.5	19.5
14	29.0	—	—	25.5	20.5	23.0	24.5	20.0	22.5	19.0	15.5	17.0
15	29.5	—	—	26.0	22.0	24.0	24.5	20.0	22.5	19.5	14.5	17.0
16	28.0	—	—	26.5	23.0	25.0	24.0	21.0	22.0	19.5	14.5	17.0
17	27.5	—	—	26.5	23.5	25.0	22.5	20.5	21.5	19.5	15.0	17.5
18	—	—	—	27.0	23.5	25.5	22.5	20.0	21.0	20.0	16.5	18.5
19	—	—	—	27.5	24.5	26.5	22.5	20.0	21.5	19.0	17.5	18.0
20	—	—	—	28.0	25.0	26.5	22.0	20.0	21.0	18.5	17.0	18.0
21	—	—	—	27.0	25.0	26.0	23.5	18.5	21.0	18.0	16.5	17.0
22	23.0	19.5	21.0	28.5	25.0	27.0	22.5	20.0	20.5	19.5	15.5	17.5
23	23.5	19.5	21.5	28.5	26.0	27.5	23.0	21.0	21.5	19.5	16.0	18.0
24	25.5	20.5	22.5	29.5	26.0	27.5	24.5	21.0	22.5	18.0	14.5	16.0
25	26.5	21.0	23.5	27.5	23.5	25.0	24.5	21.0	22.5	14.5	12.0	13.5
26	27.5	22.0	25.0	25.5	22.0	23.5	24.0	22.5	23.0	12.5	12.0	12.0
27	28.0	23.5	26.0	25.0	20.0	22.5	25.5	20.5	23.0	13.0	11.0	12.0
28	29.0	24.5	26.5	26.0	21.5	23.5	25.5	22.0	23.5	13.5	11.5	12.5
29	29.5	24.5	27.0	26.0	23.0	24.5	25.0	20.5	23.0	16.0	11.5	13.5
30	29.0	25.5	27.5	26.5	22.5	24.5	26.0	21.0	23.5	16.5	11.5	14.0
31	—	—	—	28.0	23.5	26.0	24.5	22.5	23.5	—	—	—
MONTH	—	—	—	29.5	18.5	24.5	30.0	18.5	23.9	24.5	11.0	18.1

STREAMS TRIBUTARY TO LAKE HURON

04143900 SHIAWASSEE RIVER AT LINDEN, MI

LOCATION.--Lat 42°48'56", long 83°48'08", in SW1/4 sec.19, T.5 N., R.6 E., Genesee County, Hydrologic Unit 04080203, on right bank at upstream side of bridge on Hogan Road, 1.0 mi west of Linden.

DRAINAGE AREA.--83.7 mi^2.

PERIOD OF RECORD.--October 1967 to September 1994, March to September 2001.

REVISED RECORDS--WDR MI-87-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 844.96 ft above sea level.

REMARKS--Records good. Flow regulated by dam at Linden since 1967.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	82	43	137	69	14	21
2	---	---	---	---	---	---	78	42	141	60	14	20
3	---	---	---	---	---	---	74	39	143	26	14	19
4	---	---	---	---	---	---	80	32	140	21	13	17
5	---	---	---	---	---	---	81	31	138	20	12	17
6	---	---	---	---	---	---	84	30	133	20	11	16
7	---	---	---	---	---	---	85	29	130	21	9.5	15
8	---	---	---	---	---	---	84	30	129	21	8.3	14
9	---	---	---	---	---	---	86	23	121	21	8.1	17
10	---	---	---	---	---	---	92	8.4	119	20	8.5	19
11	---	---	---	---	---	---	110	11	119	21	7.8	18
12	---	---	---	---	---	---	66	18	105	20	6.9	17
13	---	---	---	---	---	---	85	20	98	20	6.5	17
14	---	---	---	---	---	---	103	22	94	20	6.3	17
15	---	---	---	---	---	---	104	26	61	20	5.7	17
16	---	---	---	---	---	---	98	57	51	16	6.1	17
17	---	---	---	---	---	---	75	80	48	3.8	6.4	16
18	---	---	---	---	---	---	70	81	48	3.5	7.0	16
19	---	---	---	---	---	---	68	80	48	3.3	10	19
20	---	---	---	---	---	---	69	78	47	3.0	10	20
21	---	---	---	---	---	---	e78	70	81	50	3.1	10	22
22	---	---	---	---	---	---	85	70	96	62	3.3	11	25
23	---	---	---	---	---	---	107	69	97	72	3.4	13	26
24	---	---	---	---	---	---	108	70	96	75	3.6	14	28
25	---	---	---	---	---	---	102	68	97	74	4.2	14	31
26	---	---	---	---	---	---	79	68	97	73	5.0	15	46
27	---	---	---	---	---	---	35	69	99	72	5.8	15	54
28	---	---	---	---	---	---	52	74	104	71	4.9	16	55
29	---	---	---	---	---	---	73	74	112	70	7.5	15	53
30	---	---	---	---	---	---	82	64	119	70	17	15	50
31	---	---	---	---	---	---	82	---	133	---	15	27	---
TOTAL	---	---	---	---	---	---	2370	1911.4	2739	502.4	350.1	739
MEAN	---	---	---	---	---	---	79.0	61.7	91.3	16.2	11.3	24.6
MAX	---	---	---	---	---	---	110	133	143	69	27	55
MIN	---	---	---	---	---	---	64	8.4	47	3.0	5.7	14
CFSM	---	---	---	---	---	---	.94	.74	1.09	.19	.13	.29
IN.	---	---	---	---	---	---	1.05	.85	1.22	.22	.16	.33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2001, BY WATER YEAR (WY)

MEAN	49.5	62.5	68.7	64.5	66.8	110	118	70.3	50.8	35.1	24.9	36.0
MAX	158	118	121	135	140	208	234	149	117	89.6	77.6	144
(WY)	1982	1989	1976	1973	1976	1976	1975	1974	1989	1994	1992	1975
MIN	16.1	23.1	39.7	26.4	24.8	55.8	76.2	28.9	12.0	7.70	3.28	5.91
(WY)	1979	1979	1970	1984	1980	1969	1968	1977	1971	1988	1971	1969

SUMMARY STATISTICS	WATER YEARS 1968 - 2001	
ANNUAL MEAN	63.2	
HIGHEST ANNUAL MEAN	89.7	1976
LOWEST ANNUAL MEAN	41.3	1978
HIGHEST DAILY MEAN	472	Apr 22 1975
LOWEST DAILY MEAN	.91	May 22 1971
ANNUAL SEVEN-DAY MINIMUM	1.4	Jul 26 1971
MAXIMUM PEAK FLOW	476	Apr 22 1975
MAXIMUM PEAK STAGE	7.43	Apr 22 1975
INSTANTANEOUS LOW FLOW	.74	(a)
ANNUAL RUNOFF (CFSM)	.75	
ANNUAL RUNOFF (INCHES)	10.25	
10 PERCENT EXCEEDS	122	
50 PERCENT EXCEEDS	51	
90 PERCENT EXCEEDS	17	

(a) May 22, 23, 1971.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04144500 SHIAWASSEE RIVER AT OWOSSO, MI

LOCATION.--Lat 43°00'54", long 84°10'52", in SW1/4 sec.12, T.7 N., R.2 E., Shiawassee County, Hydrologic Unit 04080203, on right bank on grounds of sewage-treatment plant, 1.5 mi north of Owosso.

DRAINAGE AREA.--538 mi^2.

PERIOD OF RECORD.--March 1931 to current year. Gage-height records for flood seasons collected in this vicinity 1904, 1910-30 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1307: 1949(M). WSP 1337: 1932, 1934, 1936-38, 1944.

GAGE.--Water-stage recorder. Datum of gage is 707.25 ft above sea level. Prior to Oct. 15, 1933, at site 1.5 mi upstream at datum 5.46 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. Flow regulated below approximately 800 ft^3/s by powerplant at Shiawasseetown prior to February 1953; occasional regulation at low stages since. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	782	260	359	e290	e800	1420	321	376	892	276	142	66
2	606	300	340	e290	e760	1430	341	339	909	245	206	63
3	528	317	311	e280	e680	1280	368	304	1210	211	173	64
4	488	298	e270	e280	e600	1160	408	268	1080	185	117	72
5	449	267	e230	e280	e550	1020	408	230	929	175	93	65
6	419	256	e180	e280	e500	877	656	215	890	153	78	53
7	439	261	e180	e290	e500	787	791	223	883	128	71	78
8	455	250	e190	e300	e500	670	695	238	780	122	63	81
9	483	270	e180	e300	e2100	633	747	245	648	118	58	154
10	468	304	e170	e290	e4100	612	795	259	548	114	66	118
11	419	296	e160	e290	2950	622	662	266	500	108	60	121
12	351	290	e100	e280	2470	619	588	261	403	105	58	135
13	297	325	e170	e280	2590	636	540	253	382	106	58	103
14	276	365	e210	e290	2610	644	495	251	362	102	60	84
15	256	389	e250	e320	2240	666	456	269	350	92	53	80
16	231	455	e230	e400	1910	700	427	648	351	84	77	86
17	223	433	e240	e460	e1550	672	417	794	370	79	65	78
18	222	405	e300	e520	e1200	631	404	769	355	98	66	77
19	208	364	e350	e540	e950	593	393	741	320	78	90	111
20	201	319	e370	e520	e820	566	392	666	293	79	77	87
21	203	269	e360	e480	e780	552	403	569	287	76	98	102
22	196	e230	e340	e430	e650	538	428	538	341	83	136	143
23	191	e220	e330	e390	e580	518	481	530	384	73	151	179
24	243	e210	e330	e350	e540	491	559	528	414	62	202	211
25	247	e220	e320	e300	1820	469	570	496	428	58	187	218
26	263	e250	e320	e280	1900	456	579	515	416	60	145	313
27	312	295	e320	e260	1500	438	543	524	383	59	101	335
28	321	353	e320	e250	1430	411	478	698	347	53	81	274
29	296	371	e310	e250	—	386	425	973	322	96	85	184
30	278	362	e300	e400	—	316	389	1080	298	121	71	176
31	263	—	e290	e670	—	300	—	914	—	87	77	—
TOTAL	10614	9204	8330	10840	39580	21113	15159	14980	16075	3486	3065	3911
MEAN	342	307	269	350	1414	681	505	483	536	112	98.9	130
MAX	782	455	370	670	4100	1430	795	1080	1210	276	206	335
MIN	191	210	100	250	500	300	321	215	287	53	53	53
CFSM	.64	.57	.50	.65	2.63	1.27	.94	.90	1.00	.21	.18	.24
IN.	.73	.64	.58	.75	2.74	1.46	1.05	1.04	1.11	.24	.21	.27

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	195	262	316	353	466	756	717	460	279	166	124	150
MAX	1442	985	922	1066	1728	1682	2060	1950	1051	868	578	922
(WY)	1982	1993	1976	1993	1938	1948	1947	1956	1989	1994	1992	1975
MIN	32.6	52.1	56.6	66.9	65.5	119	162	119	34.0	24.0	13.2	25.0
(WY)	1964	1964	1964	1940	1940	1964	1931	1958	1934	1934	1931	1931

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	125459		156357			
ANNUAL MEAN	343		428		355	
HIGHEST ANNUAL MEAN					629	1993
LOWEST ANNUAL MEAN					97.7	1964
HIGHEST DAILY MEAN	2500	May 19	4100	Feb 10	5920	Apr 6 1947
LOWEST DAILY MEAN	75	Jul 27	53	Jul 28	2.0	Jul 28 1934
ANNUAL SEVEN-DAY MINIMUM	81	Jul 21	59	Aug 9	7.7	Aug 11 1936
MAXIMUM PEAK FLOW			(e)4200	Feb 10	6240	Apr 6 1947
MAXIMUM PEAK STAGE			(a)		10.35	Apr 6 1947
INSTANTANEOUS LOW FLOW			49	(b)	.20	Jul 27 1934
ANNUAL RUNOFF (CFSM)	.64		.80		.66	
ANNUAL RUNOFF (INCHES)	8.67		10.81		8.97	
10 PERCENT EXCEEDS	583		789		796	
50 PERCENT EXCEEDS	225		316		202	
90 PERCENT EXCEEDS	116		81		65	

(a) Not determined.
(b) July 29, Aug. 15, 16, Sept. 7.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04146000 FARMERS CREEK NEAR LAPEER, MI

LOCATION.--Lat 43°02'41", long 83°20'14", in sec.6, T.7 N., R.10 E., Lapeer County, Hydrologic Unit 04080204, on left bank on grounds of Oakdale Regional Center for Developmental Disabilities, 2.0 mi west of Lapeer.

DRAINAGE AREA.--55.3 mi^2.

PERIOD OF RECORD.--October 1932 to current year. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 924: 1940. WSP 1084: 1942(M), 1943. WSP 1337: 1934-38, 1940(M), 1944(M), 1945, 1946(M), 1948-51(M). WSP 1727: 1952(M). WDR MI-78-1: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Oct. 12, 1938. Datum of gage is 805.79 ft above sea level. Prior to May 25, 1954, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Prior to 1941, occasional regulation caused by dam upstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	32	39	e30	e50	171	36	7.0	72	14	1.6	1.9
2	39	30	37	28	e60	133	35	6.9	65	11	1.5	1.6
3	31	28	32	e29	e68	112	37	6.0	63	8.7	1.5	1.5
4	28	26	33	e29	e72	98	39	5.7	65	7.4	1.3	1.4
5	27	25	27	e29	e74	88	40	5.3	67	6.4	1.2	1.3
6	28	22	21	e29	e72	81	51	4.5	64	5.6	1.2	1.3
7	28	20	e20	e29	69	76	63	4.5	58	5.1	1.2	1.2
8	28	19	e19	e28	69	70	68	5.2	50	4.7	1.1	1.4
9	27	20	e17	e28	191	66	72	4.3	40	4.6	1.2	3.2
10	25	23	e16	e28	308	62	71	4.0	38	4.2	1.4	3.5
11	24	23	e14	e28	e525	62	69	6.9	43	4.0	1.1	3.4
12	23	23	13	e29	e500	61	65	6.8	38	3.8	.98	3.1
13	22	23	e16	e30	e400	65	59	8.9	34	3.3	.94	3.2
14	20	24	e18	e32	e350	68	54	11	29	3.1	.88	3.2
15	18	25	e20	e32	e250	73	47	14	26	2.7	.82	2.7
16	22	25	e21	e34	e180	76	41	18	27	2.4	1.2	2.2
17	27	25	e23	e35	e150	77	38	22	30	2.3	1.2	2.1
18	28	24	e25	e39	e120	76	35	24	27	2.3	1.1	1.9
19	36	24	e28	e40	e110	73	33	23	23	2.4	1.6	3.4
20	42	24	e30	36	e100	69	32	21	19	2.3	2.3	4.0
21	40	23	e32	e40	e80	64	33	19	20	2.3	2.7	5.4
22	46	20	e33	e40	e70	61	30	21	49	2.4	2.9	5.4
23	51	18	e34	e40	67	58	26	22	64	2.4	2.7	6.4
24	53	24	e34	e37	81	55	25	20	79	2.1	2.5	8.5
25	54	25	e33	34	99	52	24	21	74	2.0	2.5	9.5
26	57	29	e32	34	111	48	17	24	60	1.9	2.6	11
27	58	32	e32	e33	150	44	12	26	42	1.7	2.7	10
28	53	34	e31	32	177	42	10	30	30	1.6	3.5	9.7
29	46	38	e31	30	—	40	8.5	45	22	1.5	2.7	9.2
30	40	40	e30	e35	—	38	7.4	63	18	1.8	2.2	8.4
31	36	—	e30	e45	—	36	—	76	—	1.7	2.1	—
TOTAL	1108	768	821	1022	4553	2195	1177.9	576.0	1336	121.7	54.42	131.0
MEAN	35.7	25.6	26.5	33.0	163	70.8	39.3	18.6	44.5	3.93	1.76	4.37
MAX	58	40	39	45	525	171	72	76	79	14	3.5	11
MIN	18	18	13	28	50	36	7.4	4.0	18	1.5	.82	1.2
CFSM	.65	.46	.48	.60	2.94	1.28	.71	.34	.81	.07	.03	.08
IN.	.75	.52	.55	.69	3.06	1.48	.79	.39	.90	.08	.04	.09

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 2001, BY WATER YEAR (WY)

MEAN	19.3	25.4	29.0	32.3	44.2	73.1	68.6	39.1	23.0	11.0	9.48	15.5
MAX	134	101	93.3	132	174	154	226	188	127	48.8	49.8	226
(WY)	1987	1986	1951	1973	1938	1948	1947	1956	1943	1994	1937	1985
MIN	2.36	3.84	3.99	3.58	5.62	14.2	19.2	7.49	2.12	1.60	1.48	.89
(WY)	1939	1939	1964	1940	1940	1964	1946	1988	1988	1941	1944	1941

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1933 - 2001	
ANNUAL TOTAL	10777.3		13864.02			
ANNUAL MEAN	29.4		38.0		(a)32.4	
HIGHEST ANNUAL MEAN					71.7	1985
LOWEST ANNUAL MEAN					9.05	1964
HIGHEST DAILY MEAN	306	May 21	525	Feb 11	1300	Sep 9 1985
LOWEST DAILY MEAN	3.8	Sep 8	.82	Aug 15	.26	Sep 16 1970
ANNUAL SEVEN-DAY MINIMUM	4.7	Sep 4	1.0	Aug 11	.50	Jul 3 1988
MAXIMUM PEAK FLOW			586	Feb 11	1380	Sep 9 1985
MAXIMUM PEAK STAGE			19.18	Feb 11	(b)20.95	Sep 9 1985
INSTANTANEOUS LOW FLOW			.65	(c)	.14	(d)
ANNUAL RUNOFF (CFSM)	.53		.69		.59	
ANNUAL RUNOFF (INCHES)	7.25		9.33		7.96	
10 PERCENT EXCEEDS	56		72		74	
50 PERCENT EXCEEDS	18		28		17	
90 PERCENT EXCEEDS	8.0		2.1		3.8	

(a) Does not include water year 1933.
(b) From floodmark.
(c) Aug. 15, 16.
(d) Sept. 16, 18, 1970.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04146063 SOUTH BRANCH FLINT RIVER NEAR COLUMBIAVILLE, MI

LOCATION.--Lat 43°09'34", long 83°21'03", in NE1/4 NE1/4 sec.36, T.9 N., R.9 E., Lapeer County, Hydrologic Unit 04080204, on right bank at upstream side of bridge on Columbiaville Road, 3.0 mi east of Columbiaville, and 3.2 mi upstream from confluence of North and South Branches.

DRAINAGE AREA.--221 mi^2.

PERIOD OF RECORD.--March 1980 to current year.

REVISED RECORDS.--WDR MI-00-1: 1999 (M)

GAGE.--Water-stage recorder. Elevation of gage is 765 ft above sea level, from topographic map. Jan. 9, 1996 to Jan. 15, 1997, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	99	131	e124	e259	566	158	91	286	81	26	25
2	141	94	123	e122	e290	482	158	88	263	72	25	24
3	119	90	112	e121	e310	426	165	84	304	65	25	22
4	107	86	e103	e120	e320	381	177	80	336	62	25	25
5	114	84	e95	e120	e335	347	177	80	320	59	23	22
6	123	83	86	e120	e290	304	190	74	284	55	22	23
7	124	81	e83	e121	e260	269	280	70	240	52	21	22
8	118	82	e84	e121	202	254	336	76	197	53	20	21
9	111	85	e83	e121	400	237	325	74	168	51	20	33
10	102	106	e82	e121	e1120	229	321	69	145	48	24	56
11	95	124	e82	e122	e1890	244	279	82	236	46	22	50
12	90	126	e81	e123	e1600	264	256	86	234	45	21	37
13	87	124	e82	e125	e1300	283	236	92	181	44	19	32
14	85	126	e84	e126	e990	333	212	86	146	42	20	30
15	82	129	e89	e130	779	342	190	81	125	42	25	28
16	82	127	e100	e140	622	341	174	97	156	40	31	25
17	81	124	e110	e150	511	318	163	111	186	38	33	24
18	83	118	e120	e178	433	291	154	110	162	38	28	28
19	84	114	e127	e182	410	265	146	107	130	39	36	31
20	89	111	e135	e180	335	252	142	94	110	38	42	52
21	91	107	e144	e172	261	244	160	86	98	36	48	56
22	89	100	e145	e170	247	239	181	163	282	36	42	62
23	92	90	e144	e169	259	232	174	230	437	34	40	53
24	120	99	e141	e160	244	219	163	220	348	33	36	57
25	148	92	e138	e151	403	206	154	210	265	30	33	57
26	151	99	e135	e143	736	190	143	181	198	29	31	75
27	159	131	e132	e135	734	175	129	163	153	31	29	72
28	159	145	e130	e130	627	166	114	168	117	31	44	66
29	133	144	e128	e125	---	163	104	234	102	30	38	59
30	119	138	e128	e155	---	164	97	284	89	29	29	53
31	113	---	e125	e200	---	162	---	287	---	27	27	---
TOTAL	3465	3258	3482	4377	16167	8588	5658	3958	6298	1356	905	1220
MEAN	112	109	112	141	577	277	189	128	210	43.7	29.2	40.7
MAX	174	145	145	200	1890	566	336	287	437	81	48	75
MIN	81	81	81	120	202	162	97	69	89	27	19	21
CFSM	.51	.49	.51	.64	2.61	1.25	.85	.58	.95	.20	.13	.18
IN.	.58	.55	.59	.74	2.72	1.45	.95	.67	1.06	.23	.15	.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 2001, BY WATER YEAR (WY)

MEAN	144	173	173	176	235	331	307	170	129	77.7	68.2	124
MAX	583	474	349	354	577	712	630	327	325	206	166	635
(WY)	1987	1986	1988	1993	2001	1985	1985	1996	1996	1994	1992	1985
MIN	44.2	50.8	65.5	70.2	89.4	99.5	151	82.4	31.2	39.1	26.8	25.2
(WY)	1999	1999	1999	2000	1982	2000	2000	1999	1988	1988	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1980 - 2001	
ANNUAL TOTAL	45403		58732			
ANNUAL MEAN	124		161		174	
HIGHEST ANNUAL MEAN					295	1985
LOWEST ANNUAL MEAN					83.2	1999
HIGHEST DAILY MEAN	790	May 20	1890	Feb 11	2950	Sep 10 1985
LOWEST DAILY MEAN	25	Sep 8	19	Aug 13	14	Aug 27 1984
ANNUAL SEVEN-DAY MINIMUM	31	Sep 4	21	Aug 8	16	Jul 10 1988
MAXIMUM PEAK FLOW					(a)3090	Sep 9 1985
MAXIMUM PEAK STAGE			(b)8.21	Feb 11	(b)9.61	Feb 26 1985
INSTANTANEOUS LOW FLOW			16	Sep 8	12	Jul 11 1988
ANNUAL RUNOFF (CFSM)	.56		.73		.79	
ANNUAL RUNOFF (INCHES)	7.64		9.89		10.71	
10 PERCENT EXCEEDS	238		304		353	
50 PERCENT EXCEEDS	87		121		116	
90 PERCENT EXCEEDS	53		30		46	

(a) Gage height 9.60 ft.
(b) Backwater from ice.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04147500 FLINT RIVER NEAR OTISVILLE, MI

LOCATION.--Lat 43°06'40", long 83°31'10", in SE1/4 sec.9, T.8 N., R.8 E., Genesee County, Hydrologic Unit 04080204, on left bank 20 ft downstream from bridge on State Highway 15, 1.5 mi downstream from Holloway Reservoir, 3.5 mi upstream from Powers-Cullen Drain, and 3.8 mi south of Otisville.

DRAINAGE AREA.--530 mi^2.

PERIOD OF RECORD.--October 1952 to September 1989, October 1990 to current year.

REVISED RECORDS.--WDR MI-78-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 721.39 ft above sea level.

REMARKS.--Records good. Flow regulated by Holloway Reservoir, 1.5 mi upstream from station. From 1954 to 1991 annual mean discharge and runoff figures adjusted for change in contents in Holloway Reservoir. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	215	402	249	241	448	1670	105	233	383	169	77	69
2	221	392	237	237	558	1480	106	221	514	151	78	69
3	219	390	221	235	595	1280	108	213	677	137	76	69
4	216	387	195	233	618	1140	108	208	619	122	75	69
5	218	382	196	234	661	1030	108	200	607	109	75	69
6	207	381	171	232	649	941	109	182	587	105	75	69
7	205	377	157	234	597	724	115	169	407	102	75	69
8	202	374	165	238	556	579	149	162	323	107	74	69
9	202	373	163	241	851	616	438	153	325	103	75	68
10	204	372	157	238	1690	591	721	161	311	101	73	72
11	203	370	166	237	2500	593	787	179	355	93	73	72
12	203	367	181	238	3800	613	675	184	409	93	72	70
13	204	367	155	238	3740	670	679	175	436	90	73	69
14	205	363	164	242	2870	753	619	178	420	89	73	70
15	206	362	165	247	2280	820	484	183	392	89	71	70
16	205	396	176	268	1940	874	361	196	364	87	71	69
17	205	383	211	299	1630	866	380	194	375	86	71	69
18	205	324	227	330	1300	831	351	199	355	86	71	69
19	206	292	249	354	1040	781	330	195	309	85	71	70
20	206	349	265	358	821	725	297	184	291	83	72	68
21	205	335	279	339	820	672	280	170	260	83	72	68
22	205	264	282	334	697	628	335	171	279	83	72	69
23	203	218	280	334	535	596	337	223	407	81	72	71
24	176	197	278	320	485	561	360	275	509	81	72	71
25	123	189	270	301	e726	525	358	306	496	81	72	71
26	122	194	264	277	1220	483	330	331	439	82	71	71
27	120	205	259	263	1620	442	334	300	366	81	e71	71
28	124	223	254	254	1790	405	301	285	301	79	e71	71
29	122	245	247	236	—	261	269	312	236	79	e69	71
30	133	249	249	263	—	151	249	348	191	78	69	71
31	243	—	245	331	—	104	—	380	—	77	70	—
TOTAL	5933	9722	6776	8426	37037	22405	10183	6870	11943	2972	2252	2093
MEAN	191	324	219	272	1323	723	339	222	398	95.9	72.6	69.8
MAX	243	402	282	358	3800	1670	787	380	677	169	78	72
MIN	120	189	155	232	448	104	105	153	191	77	69	68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2001, BY WATER YEAR (WY)

MEAN	214	278	304	301	406	789	637	377	259	165	134	212
MAX	1688	911	900	1153	1323	1984	1549	1789	1668	839	369	1507
(WY)	1987	1993	1988	1973	2001	1976	1960	1956	1996	1994	1994	1986
MIN	59.4	19.1	14.0	49.7	66.4	76.5	175	43.6	20.3	47.4	36.3	42.3
(WY)	1966	1972	1972	1961	1964	1964	1964	1977	1977	1977	1977	1954

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1953 - 2001	
ANNUAL TOTAL	88847		126612			
ANNUAL MEAN	243		347		339	
HIGHEST ANNUAL MEAN					638	1985
LOWEST ANNUAL MEAN					82.7	1964
HIGHEST DAILY MEAN	1620	May 22	3800	Feb 12	7240	Jun 24 1996
LOWEST DAILY MEAN	32	Apr 23	68	Sep 9	2.1	Oct 11 1971
ANNUAL SEVEN-DAY MINIMUM	40	Apr 17	69	Sep 3	3.6	Dec 1 1971
MAXIMUM PEAK FLOW			4160	Feb 12	7470	Jun 24 1996
MAXIMUM PEAK STAGE			13.60	Feb 12	15.73	Jun 24 1996
INSTANTANEOUS LOW FLOW			67	Sep 8	2.1	(a)
10 PERCENT EXCEEDS	432		676		780	
50 PERCENT EXCEEDS	172		235		180	
90 PERCENT EXCEEDS	89		71		66	

(a) Oct. 11, 12, 1971.

STREAMS TRIBUTARY TO LAKE HURON

04148140 KEARSLEY CREEK NEAR DAVISON, MI

LOCATION.--Lat 43°02'01", long 83°34'53", in NE1/4 sec.12, T.7 N., R.7 E., Genesee County, Hydrologic Unit 04080204, on right bank 10 ft upstream from bridge on Davison Road, 1.4 mi downstream from Black Creek, and 3.3 mi west of Davison.

DRAINAGE AREA.--99.4 mi^2.

PERIOD OF RECORD.--October 1965 to current year.

REVISED RECORDS.--WDR MI-78-1: Drainage area. WDR MI-85-1: 1968(M), 1973(M), 1975, 1982(P).

GAGE.--Water-stage recorder. Datum of gage is 747.39 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor. Some diurnal fluctuation caused by small dams, and occasional diversion for irrigation upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	44	59	e59	e115	274	63	40	171	20	4.0	3.2
2	72	41	55	e59	e120	226	64	36	136	17	3.7	2.9
3	61	40	46	e58	e125	206	74	34	125	16	3.7	2.7
4	51	43	e42	e58	130	185	80	33	132	14	3.2	2.6
5	48	44	36	e58	113	159	87	32	140	13	3.0	2.6
6	59	43	e35	e58	105	140	256	29	127	11	2.9	5.3
7	65	39	e35	e59	95	127	298	28	90	12	2.9	17
8	65	36	e35	e59	105	100	239	38	69	10	2.9	6.9
9	58	37	35	e59	627	89	218	33	70	9.7	2.8	8.6
10	50	45	36	e59	1170	93	198	31	72	11	6.3	7.0
11	47	45	e37	e59	796	107	168	43	92	8.6	3.1	4.6
12	45	47	38	e59	698	109	156	43	79	7.8	2.9	3.2
13	43	51	e39	e60	588	156	129	44	67	7.1	2.8	2.5
14	41	52	e42	e62	489	164	106	40	54	6.3	2.7	2.2
15	35	51	e45	e66	374	164	88	36	48	5.7	2.6	2.3
16	31	48	e51	e72	278	157	79	64	44	5.2	5.6	2.3
17	29	48	e55	e80	208	144	70	64	42	5.0	4.5	2.7
18	28	45	e60	e86	165	130	57	74	40	5.1	3.6	2.6
19	29	45	e65	e86	166	117	55	68	40	5.1	5.1	11
20	30	44	e68	e80	153	107	63	55	34	5.0	8.8	6.9
21	31	43	e70	e80	126	95	58	51	33	4.9	5.1	19
22	30	37	e68	e78	e115	87	68	54	76	5.1	7.4	17
23	27	e36	e67	e74	e105	84	78	53	90	4.7	7.7	15
24	50	e36	e66	e72	100	83	81	51	113	4.4	6.7	19
25	45	35	e63	e68	428	79	73	48	98	4.3	6.2	23
26	59	40	e62	e66	423	77	70	46	67	5.2	6.2	27
27	85	51	e62	e62	356	70	66	53	40	4.8	6.1	21
28	72	56	e61	e60	316	65	56	72	31	4.2	8.7	20
29	57	58	e60	e69	---	64	48	158	26	4.6	5.0	19
30	49	60	e60	e90	---	63	45	162	22	4.6	3.8	15
31	45	---	e60	e110	---	64	---	180	---	4.2	3.6	---
TOTAL	1522	1340	1613	2125	8589	3785	3191	1793	2268	245.6	143.6	294.1
MEAN	49.1	44.7	52.0	68.5	307	122	106	57.8	75.6	7.92	4.63	9.80
MAX	85	60	70	110	1170	274	298	180	171	20	8.8	27
MIN	27	35	35	58	95	63	45	28	22	4.2	2.6	2.2
CFSM	.49	.45	.52	.69	3.09	1.23	1.07	.58	.76	.08	.05	.10
IN.	.57	.50	.60	.80	3.21	1.42	1.19	.67	.85	.09	.05	.11

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2001, BY WATER YEAR (WY)

MEAN	42.2	60.1	73.0	71.3	99.1	163	153	78.8	49.3	27.7	21.8	43.7
MAX	236	181	213	192	307	317	350	200	159	93.2	107	314
(WY)	1982	1986	1976	1973	2001	1973	1975	1974	1996	1994	1975	1985
MIN	8.01	13.8	16.7	15.6	24.3	41.2	71.4	24.7	7.39	5.48	4.63	6.34
(WY)	1999	1999	1999	1970	1970	2000	2000	1977	1988	1966	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1966 - 2001	
ANNUAL TOTAL	20227.1		26909.3			
ANNUAL MEAN	55.3		73.7		73.3	
HIGHEST ANNUAL MEAN					122	1985
LOWEST ANNUAL MEAN					32.4	1999
HIGHEST DAILY MEAN	461	May 19	1170	Feb 10	1370	Sep 9 1985
LOWEST DAILY MEAN	6.2	Jul 27	2.2	Sep 14	2.1	Jul 7 1988
ANNUAL SEVEN-DAY MINIMUM	7.5	Jul 21	2.5	Sep 12	2.3	Jul 5 1988
MAXIMUM PEAK FLOW			1280	Feb 10	1500	Sep 9 1985
MAXIMUM PEAK STAGE			11.38	Feb 10	(a)11.85	Sep 9 1985
INSTANTANEOUS LOW FLOW			2.0	(b)	1.6	Jul 9 1988
ANNUAL RUNOFF (CFSM)	.56		.74		.74	
ANNUAL RUNOFF (INCHES)	7.57		10.07		10.02	
10 PERCENT EXCEEDS	98		148		169	
50 PERCENT EXCEEDS	36		51		40	
90 PERCENT EXCEEDS	13		4.6		11	

(a) From floodmark.
(b) Sept. 14, 15.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04148500 FLINT RIVER NEAR FLINT, MI

LOCATION.--Lat 43°02'20", long 83°46'18", in SW1/4 sec.4, T.7 N., R.6 E., Genesee County, Hydrologic Unit 04080204, on left bank on grounds of sewage-treatment plant, 1.2 mi upstream from Pirnie Creek, and 5.0 mi downstream from Swartz Creek.

DRAINAGE AREA.--956 mi^2.

PERIOD OF RECORD.--September 1903 to March 1904 (gage heights only), August 1932 to current year. Gage-height records for flood seasons collected in this vicinity 1911-32, are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 954: 1941. WSP 1337: 1933-34(M), 1935-37. WDR MI-78-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 678.80 ft above sea level (levels by the National Weather Service and City of Flint).

REMARKS.--Records good. Some regulation by small reservoirs upstream from station and by Holloway Reservoir. From 1954 to 1991 annual mean discharge and runoff figures adjusted for change in contents in Holloway Reservoir. Occasional diversion for industrial use. Since Dec. 17, 1967, flow contains up to 50 ft^3/s as sewage effluent which originates outside the basin. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	535	477	433	489	1880	2650	338	429	1020	318	123	119
2	497	516	422	426	1470	2390	381	418	1180	280	123	114
3	498	507	395	515	1250	2090	455	400	2030	262	128	113
4	565	505	461	605	1230	1820	433	408	1460	248	119	117
5	473	498	347	556	1200	1650	401	398	1170	216	113	123
6	460	500	318	494	1210	1910	1450	357	1090	179	113	120
7	430	523	415	474	1130	1110	1710	342	902	195	115	114
8	452	512	287	494	1230	895	1010	534	631	187	116	119
9	412	595	283	491	5260	915	1300	361	567	182	114	278
10	398	783	352	505	9200	929	1570	350	561	178	142	275
11	382	501	299	490	6030	1070	1360	503	709	174	118	155
12	364	477	306	478	5400	1110	1290	439	681	159	113	134
13	352	655	280	468	6400	1360	1210	382	700	154	116	125
14	338	551	295	487	5400	1600	1100	367	583	150	115	121
15	346	614	286	554	4230	1500	961	420	609	148	115	116
16	325	610	364	708	3340	1370	736	1360	616	149	131	114
17	320	687	555	765	2540	1320	724	913	621	153	142	115
18	282	474	691	787	2330	1290	650	631	536	216	125	118
19	303	432	534	846	1660	1250	584	546	456	156	127	160
20	286	410	571	771	1370	1190	606	478	439	146	139	180
21	305	521	707	710	1200	1020	629	553	431	142	136	175
22	290	442	582	653	1070	976	654	794	690	157	131	178
23	308	377	557	640	938	927	722	485	705	139	139	143
24	689	344	585	623	834	888	848	539	701	136	127	169
25	376	333	556	586	3870	837	720	653	819	132	121	190
26	309	448	536	548	3400	796	603	644	762	136	123	264
27	481	619	542	531	2880	730	627	726	585	126	130	174
28	374	501	531	478	2980	710	558	914	482	121	138	150
29	302	441	553	478	—	641	518	1150	418	121	129	140
30	293	429	537	896	—	421	455	994	354	146	121	135
31	297	—	524	1400	—	308	—	947	—	130	122	—
TOTAL	12042	15282	14104	18946	80932	37673	24603	18435	22508	5336	3864	4548
MEAN	388	509	455	611	2890	1215	820	595	750	172	125	152
MAX	689	783	707	1400	9200	2650	1710	1360	2030	318	142	278
MIN	282	333	280	426	834	308	338	342	354	121	113	113

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 2001, BY WATER YEAR (WY)

MEAN	346	469	545	596	813	1492	1299	762	486	276	237	347
MAX	2764	1734	1739	2008	2890	3514	4209	3575	2512	1294	868	2635
(WY)	1987	1993	1976	1973	2001	1985	1947	1956	1996	1994	1975	1986
MIN	60.6	69.9	70.8	84.8	87.6	187	335	110	81.3	56.1	31.3	45.9
(WY)	1936	1965	1964	1940	1940	1964	1946	1958	1934	1936	1936	1941

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1932 - 2001	
ANNUAL TOTAL	185625		258273			
ANNUAL MEAN	507		708		637	
HIGHEST ANNUAL MEAN					1258	1985
LOWEST ANNUAL MEAN					153	1964
HIGHEST DAILY MEAN	4630	Sep 23	9200	Feb 10	14500	Apr 6 1947
LOWEST DAILY MEAN	111	Jul 26	113	Aug 5	14	Aug 7 1934
ANNUAL SEVEN-DAY MINIMUM	121	Jul 20	117	Aug 3	23	Aug 14 1936
MAXIMUM PEAK FLOW			10200	Feb 10	14900	Apr 6 1947
MAXIMUM PEAK STAGE			15.87	Feb 10	16.95	Sep 6 1985
INSTANTANEOUS LOW FLOW					9.0	Aug 7 1934
10 PERCENT EXCEEDS	910		1340		1480	
50 PERCENT EXCEEDS	329		489		339	
90 PERCENT EXCEEDS	165		127		102	

STREAMS TRIBUTARY TO LAKE HURON

04150500 CASS RIVER AT CASS CITY, MI

LOCATION.--Lat 43°35'03", long 83°10'34", in NE1/4 NE1/4 sec.4, T.13 N., R.11 E., Tuscola County, Hydrologic Unit 04080205, on left bank 600 ft downstream from bridge on Cemetery Road, 0.3 mi downstream from confluence of North and South Branches, and 1.1 mi south of Cass City.

DRAINAGE AREA.--359 mi^2.

PERIOD OF RECORD.--October 1947 to September 1997, August to September 2001. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 1337: 1949-50. WSP 1727: 1948(M), 1950. WDR MI-78-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 697.92 ft above sea level. Prior to Nov. 14, 1952, nonrecording gage at site 600 ft upstream at present datum.

REMARKS.--Records good. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	9.3	7.1
2	---	---	---	---	---	---	---	---	---	---	8.0	6.8
3	---	---	---	---	---	---	---	---	---	---	7.0	7.2
4	---	---	---	---	---	---	---	---	---	---	6.4	15
5	---	---	---	---	---	---	---	---	---	---	6.3	24
6	---	---	---	---	---	---	---	---	---	---	5.7	25
7	---	---	---	---	---	---	---	---	---	---	5.0	16
8	---	---	---	---	---	---	---	---	---	---	4.7	17
9	---	---	---	---	---	---	---	---	---	---	5.4	19
10	---	---	---	---	---	---	---	---	---	---	6.2	32
11	---	---	---	---	---	---	---	---	---	---	5.5	30
12	---	---	---	---	---	---	---	---	---	---	5.1	26
13	---	---	---	---	---	---	---	---	---	---	4.6	20
14	---	---	---	---	---	---	---	---	---	---	4.5	16
15	---	---	---	---	---	---	---	---	---	---	4.5	14
16	---	---	---	---	---	---	---	---	---	---	5.1	12
17	---	---	---	---	---	---	---	---	---	---	6.3	9.6
18	---	---	---	---	---	---	---	---	---	---	6.2	8.7
19	---	---	---	---	---	---	---	---	---	---	13	13
20	---	---	---	---	---	---	---	---	---	---	34	25
21	---	---	---	---	---	---	---	---	---	---	34	42
22	---	---	---	---	---	---	---	---	---	---	23	41
23	---	---	---	---	---	---	---	---	---	---	16	31
24	---	---	---	---	---	---	---	---	---	---	14	28
25	---	---	---	---	---	---	---	---	---	---	9.2	31
26	---	---	---	---	---	---	---	---	---	---	8.0	72
27	---	---	---	---	---	---	---	---	---	---	7.7	103
28	---	---	---	---	---	---	---	---	---	---	11	96
29	---	---	---	---	---	---	---	---	---	---	8.8	85
30	---	---	---	---	---	---	---	---	---	---	7.5	70
31	---	---	---	---	---	---	---	---	---	---	7.3	---
TOTAL	---	---	---	---	---	---	---	---	---	---	299.3	942.4
MEAN	---	---	---	---	---	---	---	---	---	---	9.65	31.4
MAX	---	---	---	---	---	---	---	---	---	---	34	103
MIN	---	---	---	---	---	---	---	---	---	---	4.5	6.8
CFSM	---	---	---	---	---	---	---	---	---	---	.03	.09
IN.	---	---	---	---	---	---	---	---	---	---	.03	.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2001, BY WATER YEAR (WY)

MEAN	87.9	149	199	188	287	755	524	241	133	70.4	35.2	103
MAX	952	683	653	840	1100	2260	1296	1157	1087	629	201	2239
(WY)	1987	1993	1985	1952	1997	1985	1960	1996	1996	1994	1953	1986
MIN	2.58	7.23	6.26	5.16	6.36	59.8	100	27.5	12.9	5.04	2.48	1.33
(WY)	1949	1950	1959	1959	1959	1964	1964	1958	1964	1966	1963	1948

SUMMARY STATISTICS	WATER YEARS 1948 - 2001	
ANNUAL MEAN	(a)231	
HIGHEST ANNUAL MEAN	471	1985
LOWEST ANNUAL MEAN	27.6	1964
HIGHEST DAILY MEAN	11800	Sep 12 1986
LOWEST DAILY MEAN	.50	Sep 26 1948
ANNUAL SEVEN-DAY MINIMUM	.76	Sep 21 1948
MAXIMUM PEAK FLOW	12500	Sep 12 1986
MAXIMUM PEAK STAGE	(b)19.82	Sep 12 1986
INSTANTANEOUS LOW FLOW	.50	Sep 26 1948
ANNUAL RUNOFF (CFSM)	.64	
ANNUAL RUNOFF (INCHES)	8.73	
10 PERCENT EXCEEDS	554	
50 PERCENT EXCEEDS	64	
90 PERCENT EXCEEDS	8.0	

(a) Does not include water year 1948.
(b) From floodmark.

STREAMS TRIBUTARY TO LAKE HURON

04151500 CASS RIVER AT FRANKENMUTH, MI

LOCATION.--Lat 43°19'40", long 83°44'53", in NW1/4 SE1/4 sec.27, T.11 N., R.6 E., Saginaw County, Hydrologic Unit 04080205, on right bank 2,000 ft downstream from dam in Frankenmuth, 3,600 ft upstream from highway bridge on Dehmel Road, 3.4 mi upstream from Dead Creek, and 17 mi upstream from mouth.

DRAINAGE AREA.--841 mi^2.

PERIOD OF RECORD.--February 1908 to March 1909, July 1935 to September 1936, June 1939 to current year.

REVISED RECORDS.--WSP 1307: 1936(M), 1940(M). WSP 1727: 1952. WSP 1911: 1952. WDR MI-78-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 583.96 ft above sea level (levels by Michigan Department of Natural Resources). February 1908 to March 1909, nonrecording gage at site 2,000 ft upstream at datum 1.81 ft lower. July 18 to Sept. 11, 1935, nonrecording gage, Sept. 12, 1935 to Sept. 30, 1936, and June 20, 1939 to Sept. 30, 1949, water-stage recorder, at site 3,600 ft downstream at datum 0.04 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. Occasional regulation by dams upstream from station. Prior to 1950, regulation at low and medium flows by mill upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	204	176	317	e330	1460	2520	579	320	331	136	38	49
2	182	168	287	e330	1690	1740	566	301	361	127	37	46
3	184	163	e220	e330	1560	1390	562	285	539	119	35	48
4	182	157	e190	e330	1360	1460	553	265	670	113	32	54
5	176	153	e200	e330	1170	1660	515	247	794	123	30	49
6	166	150	e160	e330	1010	1420	535	233	612	107	42	47
7	162	148	e140	e330	878	1150	750	227	474	100	34	51
8	196	153	e160	e330	809	1020	979	255	384	96	29	65
9	229	169	e190	e330	2150	928	984	257	324	91	29	71
10	210	258	e180	e330	7480	854	891	234	301	84	30	88
11	198	282	e180	e330	9810	959	861	228	506	76	25	78
12	185	280	e200	e330	9150	1330	803	228	1380	71	24	74
13	175	300	e220	e330	6360	1520	724	213	1370	67	22	74
14	166	364	e210	e340	3680	2090	616	201	854	64	19	72
15	157	347	e200	e350	2360	2240	537	191	582	61	19	68
16	154	330	e190	e370	1800	2190	486	215	486	59	27	62
17	146	324	e240	e400	1380	1780	457	219	613	58	31	59
18	142	308	e320	e450	1160	1410	436	199	734	56	30	58
19	140	293	e350	e470	1100	1190	418	178	611	55	32	66
20	136	283	e370	e490	1030	1150	418	164	445	54	49	72
21	129	273	e390	e480	838	1160	476	162	337	52	43	80
22	127	248	e400	e470	627	1140	583	195	307	52	39	82
23	126	197	e390	e450	707	1090	609	306	303	51	43	91
24	180	223	e390	e440	572	1010	679	485	430	49	45	103
25	222	219	e380	e420	2110	913	687	378	365	47	45	113
26	198	221	e370	e400	5520	782	580	348	282	33	45	149
27	208	269	e360	e370	6470	687	506	361	229	25	44	175
28	221	324	e360	e350	3880	635	441	364	192	38	45	194
29	194	345	e350	e340	—	617	385	356	169	41	43	199
30	183	339	e340	e360	—	613	347	354	150	41	43	184
31	181	—	e340	e600	—	593	—	379	—	39	50	—
TOTAL	5459	7464	8594	11840	78121	39241	17963	8348	15135	2185	1099	2621
MEAN	176	249	277	382	2790	1266	599	269	504	70.5	35.5	87.4
MAX	229	364	400	600	9810	2520	984	485	1380	136	50	199
MIN	126	148	140	330	572	593	347	162	150	25	19	46
CFSM	.21	.30	.33	.45	3.32	1.51	.71	.32	.60	.08	.04	.10
IN.	.24	.33	.38	.52	3.46	1.74	.79	.37	.67	.10	.05	.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 2001, BY WATER YEAR (WY)

MEAN	224	330	421	454	685	1633	1151	652	380	189	107	229
MAX	2637	1374	1335	2185	2790	4943	3122	2715	3217	1884	523	5000
(WY)	1987	1993	1985	1973	2001	1976	1947	1996	1996	1994	1953	1986
MIN	31.7	43.1	50.7	45.1	55.6	179	202	104	60.4	20.4	20.1	23.5
(WY)	1947	1965	1940	1959	1959	1964	1946	1941	1964	1936	1944	1941

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1908 - 2001	
ANNUAL TOTAL	128381		198070			
ANNUAL MEAN	351		543		533	
HIGHEST ANNUAL MEAN					1063	1985
LOWEST ANNUAL MEAN					96.6	1964
HIGHEST DAILY MEAN	4240	May 20	9810	Feb 11	21700	Sep 12 1986
LOWEST DAILY MEAN	43	Jul 27	19	Aug 14	(a)1.5	Aug 6 1944
ANNUAL SEVEN-DAY MINIMUM	54	Jul 21	24	Aug 10	4.4	Jul 6 1936
MAXIMUM PEAK FLOW			9980	Feb 11	22200	Sep 12 1986
MAXIMUM PEAK STAGE			20.40	Feb 11	27.52	Sep 12 1986
INSTANTANEOUS LOW FLOW			16	Jul 27		
ANNUAL RUNOFF (CFSM)	.42		.65		.63	
ANNUAL RUNOFF (INCHES)	5.68		8.76		8.62	
10 PERCENT EXCEEDS	706		1150		1250	
50 PERCENT EXCEEDS	210		285		189	
90 PERCENT EXCEEDS	86		47		49	

(a) Approximately.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04152238 SOUTH BRANCH TOBACCO RIVER NEAR BEAVERTON, MI

LOCATION.--Lat 43°52'01", long 84°32'43", in SE1/4 NE1/4 sec.16, T.17 N., R.2 W., Gladwin County, Hydrologic Unit 04080201, on left bank 40 ft upstream from bridge on Grout Road, 3.0 mi upstream from Ross Lake, and 3.2 mi southwest of Beaverton.

DRAINAGE AREA.--160 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 709.92 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	59	92	e74	e115	e150	126	87	211	57	46	59
2	47	61	85	e74	e110	e140	135	85	392	57	44	56
3	46	60	e80	e74	e105	e220	130	82	543	56	44	55
4	49	58	e78	e74	e100	e320	138	79	313	55	43	56
5	50	54	e74	e74	e96	e280	127	78	220	55	43	55
6	50	53	e72	e74	e94	e190	126	76	188	52	41	52
7	53	55	e70	e74	e90	145	181	74	170	51	39	51
8	54	63	e68	e74	e96	122	312	76	146	50	37	55
9	54	69	e70	e74	e150	130	237	74	123	50	37	67
10	56	160	e74	e76	e280	124	216	71	120	48	41	99
11	56	172	e72	e78	e250	152	186	74	130	50	44	107
12	54	116	e62	e80	e210	180	188	77	122	47	42	78
13	53	106	e68	e84	e180	182	198	73	108	45	39	69
14	52	171	e78	e88	e160	176	161	69	102	44	38	67
15	56	160	e84	e92	e140	280	133	72	93	43	37	63
16	55	137	e88	e94	e120	353	127	365	94	43	38	59
17	54	128	e84	e94	e100	298	118	676	90	43	50	58
18	54	122	e80	e92	e90	228	111	479	87	44	53	61
19	54	107	e76	e88	e80	216	104	230	84	45	58	63
20	54	105	e74	e86	e74	222	101	160	79	43	131	131
21	55	e101	e74	e84	e68	230	113	126	74	43	102	139
22	55	e95	e74	e82	e70	229	121	358	74	50	73	104
23	54	e88	e74	e80	e68	212	115	321	72	53	99	86
24	60	e82	e74	e78	e62	192	178	225	69	49	86	99
25	73	80	e74	e76	e120	164	181	448	68	46	72	107
26	69	84	e74	e74	e220	e125	135	435	68	43	72	101
27	74	110	e74	e72	e210	e115	117	336	66	41	78	108
28	87	119	e74	e70	e180	110	96	443	66	42	68	93
29	79	108	e74	e74	—	112	95	382	62	42	61	84
30	67	100	e74	e80	—	118	91	229	57	47	59	78
31	71	—	e74	e95	—	123	—	174	—	50	58	—
TOTAL	1802	2983	2343	2483	3638	5838	4397	6534	4091	1484	1773	2360
MEAN	58.1	99.4	75.6	80.1	130	188	147	211	136	47.9	57.2	78.7
MAX	87	172	92	95	280	353	312	676	543	57	131	139
MIN	46	53	62	70	62	110	91	69	57	41	37	51
CFSM	.36	.62	.47	.50	.81	1.18	.92	1.32	.85	.30	.36	.49
IN.	.42	.69	.54	.58	.85	1.36	1.02	1.52	.95	.35	.41	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 2001, BY WATER YEAR (WY)

MEAN	102	145	122	108	133	211	218	146	121	70.0	72.6	73.7
MAX	202	364	253	176	213	296	478	240	282	92.3	86.6	127
(WY)	1991	1993	1992	1993	2000	1991	1991	2000	1996	1992	1996	1992
MIN	58.1	62.7	61.2	67.6	74.4	115	115	77.6	57.2	47.9	52.2	49.7
(WY)	2001	2000	1990	1994	1993	1999	1987	1999	1988	2001	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1987 - 2001	
ANNUAL TOTAL	40745		39726			
ANNUAL MEAN	111		109		128	
HIGHEST ANNUAL MEAN					184	1991
LOWEST ANNUAL MEAN					98.9	1999
HIGHEST DAILY MEAN	1300	Feb 26	676	May 17	1340	Apr 16 1991
LOWEST DAILY MEAN	42	Jul 26	37	Aug 8	36	Sep 8 1999
ANNUAL SEVEN-DAY MINIMUM	45	Jul 15	40	Aug 8	36	Sep 7 1999
MAXIMUM PEAK FLOW			762	May 17	(a)1450	Apr 16 1991
MAXIMUM PEAK STAGE			8.91	May 17	(b)11.06	Mar 12 1990
INSTANTANEOUS LOW FLOW			36	Aug 9	36	(c)
ANNUAL RUNOFF (CFSM)	.70		.68		.80	
ANNUAL RUNOFF (INCHES)	9.47		9.24		10.89	
10 PERCENT EXCEEDS	166		210		226	
50 PERCENT EXCEEDS	74		79		90	
90 PERCENT EXCEEDS	54		49		58	

(a) Gage height 10.74 ft.
(b) Backwater from ice.
(c) Aug. 3, 1998, Sept. 8-12, 1999, Aug. 9, 2001.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04154000 CHIPPEWA RIVER NEAR MOUNT PLEASANT, MI

LOCATION.--Lat 43°37'32", long 84°42'28", in NW1/4 NW1/4 sec.8, T.14 N., R.3 W., Isabella County, Hydrologic Unit 04080202, on right bank 12 ft downstream from bridge on South Leaton Road, 3.8 mi northeast of Mount Pleasant, and 36 mi upstream from mouth.

DRAINAGE AREA.--416 mi^2.

PERIOD OF RECORD.--October 1930 to September 1931, October 1932 to current year. Gage-height records for flood seasons collected in this vicinity 1910-27, are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 744: Drainage area. WSP 1337: 1931, 1933-40, 1945, 1948-49.

GAGE.--Water-stage recorder. Datum of gage is 710.38 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Oct. 21, 1938, nonrecording gage at site 30 ft upstream at present datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Diurnal fluctuation below 750 ft^3/s caused by powerplant at Mount Pleasant prior to 1962, occasional regulation at low flow since. Since July 30, 1968, occasional regulation by control structures on lake outlets. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	186	201	275	e220	e310	418	339	282	735	192	168	215
2	180	194	262	e220	e320	379	359	275	837	180	154	188
3	175	191	248	e220	e320	416	382	263	924	176	143	177
4	173	186	235	e220	e300	490	390	252	877	215	130	174
5	168	179	227	e220	284	419	383	245	733	200	123	167
6	164	178	e220	e220	274	363	411	233	656	190	120	164
7	164	181	e215	e220	261	337	457	223	597	181	112	172
8	164	191	e210	e220	263	329	517	221	539	177	108	176
9	162	214	e210	e220	432	327	514	219	488	173	105	188
10	166	403	e220	e220	798	311	516	218	443	168	113	236
11	165	420	e220	e230	e730	343	502	241	425	162	109	278
12	163	378	e200	e240	601	375	497	241	447	153	107	260
13	162	375	e220	e250	526	375	512	227	429	147	108	232
14	161	447	e240	e260	489	368	540	221	391	142	103	210
15	161	405	e250	e270	440	455	566	291	364	138	98	196
16	162	372	e260	e280	393	512	526	1200	350	136	109	188
17	163	356	e250	e280	e370	496	464	1650	329	136	121	181
18	162	335	e240	e270	e340	468	411	1510	317	141	146	176
19	162	317	e230	e260	e330	464	378	1240	310	145	381	194
20	160	307	e220	e250	e310	469	365	1010	291	143	538	282
21	161	295	e220	e240	e270	487	373	857	279	142	453	344
22	156	278	e220	e230	e300	504	380	1020	273	139	368	315
23	160	263	e220	e220	e280	506	389	822	259	137	364	285
24	184	250	e220	e215	e250	498	484	711	253	133	352	297
25	203	244	e220	e210	426	471	454	748	242	127	307	307
26	213	242	e220	e205	614	425	409	759	235	123	314	327
27	237	268	e220	e200	572	383	375	748	224	116	271	319
28	259	288	e220	e200	492	351	340	1010	214	112	239	286
29	237	290	e220	203	—	336	311	942	206	130	211	268
30	221	285	e220	e240	—	332	296	831	199	182	192	257
31	207	—	e220	e280	—	330	—	750	—	183	241	—
TOTAL	5561	8533	7072	7233	11295	12737	12840	19460	12866	4819	6408	7059
MEAN	179	284	228	233	403	411	428	628	429	155	207	235
MAX	259	447	275	280	798	512	566	1650	924	215	538	344
MIN	156	178	200	200	250	311	296	218	199	112	98	164
CFSM	.43	.68	.55	.56	.97	.99	1.03	1.51	1.03	.37	.50	.57
IN.	.50	.76	.63	.65	1.01	1.14	1.15	1.74	1.15	.43	.57	.63

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	250	303	301	279	335	567	582	390	286	194	175	225
MAX	1058	836	627	655	1401	1709	1204	934	711	694	585	1682
(WY)	1987	1986	1992	1973	1938	1976	1967	1974	1943	1969	1972	1986
MIN	117	151	144	112	124	204	231	175	117	77.3	70.6	97.7
(WY)	1947	1939	1931	1945	1940	1937	1945	1977	1941	1936	1931	1931

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	104634		115883			
ANNUAL MEAN	286		317		324	
HIGHEST ANNUAL MEAN					585	1976
LOWEST ANNUAL MEAN					163	1931
HIGHEST DAILY MEAN	1200	Feb 27	1650	May 17	6210	Sep 12 1986
LOWEST DAILY MEAN	103	Jul 26	98	Aug 15	19	Aug 16 1936
ANNUAL SEVEN-DAY MINIMUM	109	Jul 21	106	Aug 9	49	Aug 10 1936
MAXIMUM PEAK FLOW			1690	May 17	6660	Sep 12 1986
MAXIMUM PEAK STAGE			7.92	May 17	(a)15.58	Sep 12 1986
INSTANTANEOUS LOW FLOW			94	Aug 16	12	Aug 18 1945
ANNUAL RUNOFF (CFSM)	.69		.76		.78	
ANNUAL RUNOFF (INCHES)	9.36		10.36		10.57	
10 PERCENT EXCEEDS	447		515		585	
50 PERCENT EXCEEDS	220		253		244	
90 PERCENT EXCEEDS	159		158		133	

(a) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04155000 PINE RIVER AT ALMA, MI

LOCATION.--Lat 43°22'46", long 84°39'20", in SW1/4 SE1/4 sec.34, T.12 N., R.3 W., Gratiot County, Hydrologic Unit 04080202, on right bank 270 ft downstream from Superior Street Bridge in Alma, 0.6 mi downstream from municipal reservoir, and 38 mi upstream from mouth.

DRAINAGE AREA.--288 mi^2.

PERIOD OF RECORD.--October 1930 to current year. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 744: Drainage area. WSP 1307: 1945(M). WSP 1337: 1931, 1932-34(M), 1936, 1939, 1945, 1949.

GAGE.--Water-stage recorder. Datum of gage is 718.37 ft above sea level. Prior to Dec. 10, 1930, nonrecording gage at Superior Street Bridge at different datum. Dec. 10, 1930 to June 15, 1938, nonrecording gage at site 70 ft downstream from bridge, and June 16 to Oct. 25, 1938, nonrecording gage at bridge at present datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by dam 0.6 mi upstream from station, and by variable backwater from powerplant at St. Louis, 5.2 mi downstream. Approximately 1.3 ft^3/s diverted upstream from station for municipal use; sewage effluent is returned downstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	117	145	178	e140	349	571	280	200	497	94	163	148
2	114	136	156	e120	387	547	262	198	456	90	134	183
3	110	132	134	e110	372	533	291	194	517	90	111	138
4	112	135	104	e120	276	495	303	183	531	90	110	116
5	109	136	e110	e150	231	415	305	176	529	88	102	110
6	112	136	e120	e160	256	367	305	177	504	83	92	104
7	112	126	e100	e150	284	355	338	180	420	87	80	105
8	110	120	e90	e160	235	309	394	183	348	95	70	113
9	111	138	e110	e160	446	282	412	170	300	89	76	121
10	126	185	e130	e140	864	270	410	159	248	80	88	142
11	132	194	e150	e130	679	284	358	177	251	61	98	170
12	130	251	e150	e140	562	317	360	203	251	61	112	190
13	126	298	e110	e160	563	361	333	218	232	65	98	146
14	125	271	e120	e160	721	364	326	190	234	71	77	118
15	120	267	e130	e160	576	376	297	233	232	83	77	107
16	119	278	e140	e160	402	376	268	1380	186	93	92	124
17	116	260	e150	e150	345	402	234	1400	164	110	112	125
18	121	226	e160	e140	293	384	213	1340	156	124	140	94
19	124	208	e150	e140	211	377	214	1210	147	114	161	117
20	128	193	e140	e130	270	345	232	932	156	102	160	118
21	125	e170	e130	e120	303	350	268	730	172	122	203	157
22	122	e160	e150	e110	171	351	306	768	185	139	275	195
23	120	e145	e140	e130	169	349	333	601	170	123	204	177
24	121	143	e130	e160	185	335	328	588	159	106	191	160
25	123	145	e120	150	725	308	335	620	159	105	155	153
26	129	157	e110	139	825	277	347	613	148	97	135	169
27	151	164	e110	122	782	240	299	662	131	90	118	188
28	150	181	e130	132	648	238	256	689	114	86	119	181
29	151	203	e150	121	---	242	228	603	104	107	112	165
30	158	212	e170	211	---	255	210	567	96	163	103	153
31	164	---	e170	286	---	271	---	547	---	156	138	---
TOTAL	3888	5515	4142	4561	12130	10946	9045	16091	7797	3064	3906	4287
MEAN	125	184	134	147	433	353	302	519	260	98.8	126	143
MAX	164	298	178	286	864	571	412	1400	531	163	275	195
MIN	109	120	90	110	169	238	210	159	96	61	70	94
CFSM	.44	.64	.46	.51	1.50	1.23	1.05	1.80	.90	.34	.44	.50
IN.	.50	.71	.54	.59	1.57	1.41	1.17	2.08	1.01	.40	.50	.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	162	209	212	196	246	468	432	285	191	111	97.6	139
MAX	894	574	488	680	997	1214	1054	677	575	420	276	1364
(WY)	1987	1993	1983	1973	1938	1976	1967	1956	1989	1994	1994	1986
MIN	66.4	82.6	78.4	66.6	72.6	161	159	109	50.8	35.6	34.7	47.5
(WY)	1939	1931	1940	1945	1940	1937	1945	1949	1934	1934	1936	1932

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	76567		85372			
ANNUAL MEAN	209		234		229	
HIGHEST ANNUAL MEAN					398	1986
LOWEST ANNUAL MEAN					97.8	1931
HIGHEST DAILY MEAN	1100	May 19	1400	May 17	4960	Sep 12 1986
LOWEST DAILY MEAN	73	Jul 3	61	Jul 11	.40	Sep 6 1964
ANNUAL SEVEN-DAY MINIMUM	90	Jan 26	73	Jul 9	10	Jul 6 1988
MAXIMUM PEAK FLOW			1620	May 16	5160	Sep 12 1986
MAXIMUM PEAK STAGE			7.34	May 16	(a)12.82	Sep 12 1986
INSTANTANEOUS LOW FLOW					(b).40	Sep 6 1964
ANNUAL RUNOFF (CFSM)	.73		.81		.79	
ANNUAL RUNOFF (INCHES)	9.89		11.03		10.79	
10 PERCENT EXCEEDS	364		450		471	
50 PERCENT EXCEEDS	150		160		152	
90 PERCENT EXCEEDS	105		104		69	

(a) From floodmark.
(b) Caused by closing dam during construction of waterworks.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04155500 PINE RIVER NEAR MIDLAND, MI

LOCATION.--Lat 43°33'52", long 84°22'09", in SW1/4 NW1/4 sec.4, T.13 N., R.1 E., Midland County, Hydrologic Unit 04080202, on left bank at downstream side of bridge on Meridian Road, 7.2 mi southwest of Midland, and 7.8 mi upstream from Chippewa River.

DRAINAGE AREA.--390 mi^2, approximately.

PERIOD OF RECORD.--May 1934 to September 1938, February 1948 to September 1997, October 2000 to September 2001.

REVISED RECORDS.--WSP 1207: Drainage area. WSP 1307: 1935(M). WSP 1337: 1936-38, 1948-1949.

GAGE.--Water-stage recorder. Datum of gage is 623.94 ft above sea level. Prior to Sept. 30, 1938, nonrecording gage at same site at datum 5.55 ft lower. Feb. 3, 1948 to Dec. 13, 1951, nonrecording gage at present site and datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. Regulation at low and medium flows by hydroelectric powerplant at St. Louis. Some diversion upstream from station for irrigation. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	228	150	279	e220	e300	e900	281	239	744	113	133	124
2	189	154	242	e230	e450	e850	373	210	746	113	131	126
3	174	142	273	e190	e520	e900	325	207	748	113	129	234
4	182	130	283	e160	e520	e940	364	205	827	110	85	181
5	168	130	e130	e150	e400	e800	361	190	712	108	79	113
6	166	135	e110	e170	e320	e720	371	171	697	103	81	112
7	164	138	e140	e190	e350	e640	417	172	632	89	70	114
8	161	133	e160	e220	e390	e540	455	180	514	79	74	104
9	158	145	e130	e200	e600	e430	477	196	424	91	59	129
10	134	204	e120	e220	e1200	385	480	196	448	95	53	128
11	134	339	e150	e200	e1100	403	481	194	267	97	52	124
12	147	236	e190	e190	e900	414	456	182	308	78	49	145
13	144	299	e200	e180	e800	460	431	179	331	68	60	233
14	139	447	e200	e190	e740	504	373	221	294	56	97	183
15	137	354	e150	e200	e1000	504	371	232	292	48	73	134
16	128	316	e160	e220	e800	547	349	1690	369	44	64	101
17	130	323	e170	e220	e600	439	321	2260	299	43	71	85
18	121	315	e190	e220	e380	530	304	1770	273	45	70	179
19	115	268	e200	e210	e450	467	219	1550	256	80	98	108
20	115	263	e210	e200	e400	492	217	1240	174	89	156	142
21	119	239	e200	e190	e320	443	270	1050	177	81	213	128
22	122	239	e190	e180	e440	467	309	1110	208	59	218	143
23	123	256	e180	e170	e300	458	351	923	288	103	620	249
24	128	208	e200	e160	e240	448	443	776	238	116	102	209
25	122	170	e190	e190	e280	428	389	835	159	79	306	209
26	121	167	e180	e250	e1000	370	359	918	169	72	200	206
27	133	204	e170	e200	e1100	365	420	880	170	73	191	169
28	147	214	e160	e170	e1000	270	328	1010	162	71	148	233
29	158	215	e150	e160	—	271	283	786	147	61	118	218
30	158	218	e170	e160	—	262	256	753	135	68	119	184
31	151	—	e190	e160	—	274	—	672	—	182	137	—
TOTAL	4516	6761	5667	5970	16900	15921	10834	21197	11208	2627	4056	4747
MEAN	146	225	183	193	604	514	361	684	374	84.7	131	158
MAX	228	447	283	250	1200	940	481	2260	827	182	620	249
MIN	115	130	110	150	240	262	217	171	135	43	49	85
CFSM	.37	.58	.47	.49	1.55	1.32	.93	1.75	.96	.22	.34	.41
IN.	.43	.64	.54	.57	1.61	1.52	1.03	2.02	1.07	.25	.39	.45

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 2001, BY WATER YEAR (WY)

MEAN	226	276	298	265	355	687	617	370	253	149	134	199
MAX	1238	784	647	865	1356	1725	1549	980	900	655	421	2034
(WY)	1987	1993	1983	1973	1938	1976	1967	1956	1989	1994	1972	1986
MIN	72.0	94.8	96.9	70.5	91.3	207	212	106	43.9	35.5	37.4	58.0
(WY)	1949	1950	1963	1977	1963	1964	1963	1958	1934	1934	1936	1948

SUMMARY STATISTICS	FOR 2001 WATER YEAR		WATER YEARS 1934 - 2001	
ANNUAL TOTAL	110404			
ANNUAL MEAN	302		319	
HIGHEST ANNUAL MEAN			541	1986
LOWEST ANNUAL MEAN			150	1963
HIGHEST DAILY MEAN	2260	May 17	8750	Sep 12 1986
LOWEST DAILY MEAN	43	Jul 17	7.8	Jul 2 1988
ANNUAL SEVEN-DAY MINIMUM	55	Jul 12	17	Aug 13 1936
MAXIMUM PEAK FLOW	2870	May 16	(a)9360	Sep 12 1986
MAXIMUM PEAK STAGE	(b)7.09	Feb 10	(b)13.81	Feb 22 1997
INSTANTANEOUS LOW FLOW	40	Jul 17	(c)7.6	(d)
ANNUAL RUNOFF (CFSM)	.78		.82	
ANNUAL RUNOFF (INCHES)	10.53		11.11	
10 PERCENT EXCEEDS	703		661	
50 PERCENT EXCEEDS	200		200	
90 PERCENT EXCEEDS	96		84	

(a) Gage height 11.74 ft.
(b) Backwater from ice.
(c) Does not include water years 1934 to 1952.
(d) July 1, 2, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04156000 TITTABAWASSEE RIVER AT MIDLAND, MI

LOCATION.--Lat 43°35'43", long 84°14'08", in NW1/4 NE1/4 sec.28, T.14 N., R.2 E., Midland County, Hydrologic Unit 04080201, on right bank 2,000 ft downstream from dam at Dow Chemical Co. in Midland, 0.7 mi upstream from Bullock Creek, 1.4 mi downstream from Chippewa River, and 23 mi upstream from mouth.

DRAINAGE AREA.--2,400 mi^2, approximately.

PERIOD OF RECORD.--March 1936 to current year. Gage-height records for flood seasons collected in this vicinity 1910-26, 1928, are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1045: 1945. WSP 1144: 1948.

GAGE.--Water-stage recorder. Datum of gage is 580.08 ft above sea level (levels by Wade-Trim Assoc.). Prior to Sept. 30, 1955, at datum 10.20 ft higher, Oct. 1, 1955 to Sept. 30, 1993, at datum 0.20 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. Approximately 9.0 ft^3/s diverted upstream from station for industrial use, flow partially returned to river 0.25 mi downstream from station, remainder returned 1 mi downstream. Prior to 1992 water year, diversion was used in computing annual mean discharge and runoff figures, extremes and daily discharge were not adjusted for diversion. Prior to May 20, 1970, discharge below 4,000 ft^3/s regulated by dam 2,000 ft upstream from station; fixed crest dam since. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	388	938	1520	e690	2580	4040	1710	1730	3210	570	586	612
2	674	825	e890	e1200	2520	3070	1500	1210	4490	535	451	506
3	531	872	e440	e1700	2240	2740	1800	1060	8140	590	521	503
4	697	452	e900	e1750	e1400	3350	1720	1250	7550	604	385	790
5	698	367	e990	e1500	e1500	3500	1810	881	5340	657	282	599
6	606	684	e790	e680	1880	2880	1760	784	4050	567	400	446
7	342	921	e630	e520	1670	2540	2350	1180	3210	535	316	692
8	296	618	e720	e1250	1660	1880	3250	1560	2410	478	364	498
9	621	824	e390	e1450	2460	2170	2800	1150	2250	463	291	464
10	509	1630	e330	e1550	5960	2200	2800	1250	2030	470	343	900
11	631	2140	e920	e1650	6410	2040	2760	1240	2750	520	282	839
12	463	1220	e1000	e2100	5540	2550	2920	1200	2330	443	240	701
13	469	1650	e840	e1100	4210	3010	2910	804	2120	384	344	828
14	316	2260	e1400	e440	3460	3080	2770	1020	1860	318	305	697
15	269	2450	e1200	e1050	2620	3600	2650	1230	1560	289	273	514
16	594	1820	e600	e1250	2710	4460	1950	4710	1740	266	380	432
17	674	1790	e440	e1500	2290	4070	1980	11500	1160	331	512	497
18	523	1540	e1170	e2050	e1650	3410	1940	10000	1590	367	358	574
19	638	905	e1330	e2100	e1000	3270	1580	6560	1340	404	487	808
20	651	1500	e1400	e1050	e1750	3450	1910	4100	1100	461	1040	749
21	346	1650	e1800	e620	e1650	3400	1650	3470	1070	469	1180	995
22	298	1410	e2000	e1050	e1350	3380	1280	5300	1130	444	1130	641
23	622	715	e700	e1200	e1500	3320	1880	5640	872	788	1290	618
24	634	1310	e520	e1350	e1250	2960	2500	4370	887	860	1310	1090
25	736	1390	e1000	e1350	e2250	2690	2370	4930	1010	561	784	1020
26	771	687	e1400	e1150	5060	2280	2090	5800	963	366	712	1260
27	1050	1140	e1900	e460	5280	1930	2080	5680	867	430	939	1130
28	553	1160	e2400	e490	4490	1750	1600	5320	832	308	920	1250
29	502	1500	e3000	e990	—	1730	1130	5540	741	256	668	719
30	782	1680	e2250	1500	—	1690	1240	4390	624	393	607	583
31	664	—	e540	2150	—	1670	—	3050	—	432	856	—
TOTAL	17548	38048	35410	38890	78340	88110	62690	107909	69226	14559	18556	21955
MEAN	566	1268	1142	1255	2798	2842	2090	3481	2308	470	599	732
MAX	1050	2450	3000	2150	6410	4460	3250	11500	8140	860	1310	1260
MIN	269	367	330	440	1000	1670	1130	784	624	256	240	432
CFSM	.24	.53	.48	.52	1.17	1.18	.87	1.45	.96	.20	.25	.30
IN.	.27	.59	.55	.60	1.21	1.37	.97	1.67	1.07	.23	.29	.34

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1936 - 2001, BY WATER YEAR (WY)

MEAN	1053	1458	1518	1415	1796	3864	3643	2174	1414	730	600	902
MAX	6318	6097	3907	5564	6455	10660	8096	5573	5270	4492	2236	10300
(WY)	1987	1986	1992	1973	1938	1976	1967	1956	1945	1957	1972	1986
MIN	344	493	462	388	466	1027	969	567	355	234	217	250
(WY)	1949	1950	1964	1945	1963	1964	1945	1977	1964	1941	1936	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1936 - 2001	
ANNUAL TOTAL	519456		591241			
ANNUAL MEAN	1419		1620		1719	
HIGHEST ANNUAL MEAN					3318	1986
LOWEST ANNUAL MEAN					699	1964
HIGHEST DAILY MEAN	13700	May 19	11500	May 17	36200	Sep 13 1986
LOWEST DAILY MEAN	269	Oct 15	240	Aug 12	111	Aug 21 1949
ANNUAL SEVEN-DAY MINIMUM	407	Jul 15	297	Aug 9	126	Aug 11 1936
MAXIMUM PEAK FLOW			12200	May 17	38700	Sep 13 1986
MAXIMUM PEAK STAGE			20.87	May 17	(a)33.89	Sep 13 1986
INSTANTANEOUS LOW FLOW			175	Jul 17	39	Oct 1 1942
ANNUAL RUNOFF (CFSM)	.59		.67		.72	
ANNUAL RUNOFF (INCHES)	8.05		9.16		9.73	
10 PERCENT EXCEEDS	2490		3390		3930	
50 PERCENT EXCEEDS	974		1160		954	
90 PERCENT EXCEEDS	437		431		376	

(a) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04157000 SAGINAW RIVER AT SAGINAW, MI

LOCATION.--Lat 43°24'46", long 83°57'47", in NW1/4 SE1/4 sec.26, T.12 N., R.4 E., Saginaw County, Hydrologic Unit 04080206, on right bank 1,000 ft downstream from bridge on Rust Avenue in Saginaw, 1.9 mi downstream from Tittabawassee River, and 20.3 mi upstream from mouth.

DRAINAGE AREA.--6,060 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1904, 1908-9, 1912-13, 1916, 1918-19, 1929-30, and 1942 (flood discharge for certain periods only) in WSP 1084; December 1942 to September 1991 and October 1994 to September 1996, daily discharges greater than 10,000 ft^3/s only; no daily discharges greater than 10,000 ft^3/s water years 1944, 1949, 1953, 1955, 1958, 1961, 1963, 1964, 1966. Continuous-record station October 1991 to July 1994, and October 1996 to current year. Gage-height records for flood seasons 1910-20 are contained in reports of National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 565.05 ft, International Great Lakes datum. Prior to Oct. 1, 1972, nonrecording gage at site 1.9 mi downstream at same datum. Auxiliary water-stage recorder, Saginaw River at Essexville (04157065).

REMARKS.--Water-discharge records fair. Minimum flows affected by wind direction and seiche on Saginaw Bay, 20.3 mi downstream. Considerable diversion through metropolitan area of Saginaw. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1490	e2000	3710	e2000	e7800	e15000	2910	2720	6090	1040	520	e1000
2	998	e2100	3210	e2700	e7200	13600	3130	2290	6710	1640	e1100	e900
3	1740	e2200	2830	e3100	e6400	11500	4370	1910	9330	e900	1420	e850
4	1930	2520	1300	e3300	e5400	10900	4460	3370	e12000	e1400	1100	e1600
5	2550	1340	2050	e2500	e5200	10500	4390	3420	e10000	1080	e700	e1000
6	1360	2320	e1700	e2000	e5200	9800	4370	2520	8680	e1400	e800	e800
7	e1000	2380	e1500	e1900	e4700	8680	6220	e2500	7330	e1200	e450	e1100
8	2370	1670	e1400	e2500	e5000	7080	7630	e3500	5680	e1100	e300	e900
9	1210	2520	e1300	e2800	e7000	6210	7680	e2500	5230	e1000	e600	e1200
10	e2000	2460	e1200	e3000	16100	5870	7650	e2300	4530	946	e700	e1700
11	e1800	3900	e1500	e3100	23000	6270	7140	e2600	5070	1480	e700	e1400
12	e1500	4040	e1900	e3600	27200	6950	6330	3260	4960	1380	e500	e1200
13	e1300	3590	e2100	e2500	e23000	7880	6230	1950	5330	754	e650	e1400
14	e1100	3430	e2400	e1800	e18000	8270	6160	2140	4230	e900	e600	e1100
15	2150	3660	e2000	e2500	e14000	9250	6000	2300	3390	509	e550	e900
16	1170	3610	e1600	e3100	e11000	10100	4960	4930	3260	e1000	e700	e800
17	2190	3550	e2000	e3500	e9000	10100	4800	10900	3480	1520	e900	e900
18	830	2960	e2600	e4200	e7000	8860	4810	12800	3330	826	e700	e1000
19	954	2970	e2900	e4500	e6000	7780	3880	11700	2030	645	e900	e1400
20	e1100	e2500	e3300	e3000	e5200	7810	3430	8760	3370	e800	e1500	e1300
21	1280	2280	e3700	e2700	e4700	7560	3450	6520	2730	e700	e1900	e1600
22	1600	2520	e3900	e3000	e4300	7070	3860	6820	2940	e600	e1700	e1300
23	706	e2200	e2300	e3200	e3900	7230	3080	7440	2860	e1200	e1900	e1200
24	1700	e1800	e2200	e3200	e3700	6860	4660	7000	2070	e1500	e2000	e2000
25	1870	e2500	e2500	e3000	e13000	6220	5450	6860	1840	1330	e1700	e1800
26	2590	e1700	e3200	e2500	e20000	5450	4110	7520	2050	e700	e1200	e2300
27	1570	e2300	e3700	e1900	e22000	4530	5220	8000	3070	e800	e1500	e2000
28	e2000	2600	e4300	e1800	e18000	4360	4600	8030	1380	485	e1400	e2200
29	2810	e3100	e4800	e2500	—	3550	3340	8390	e1000	e800	e1100	e1500
30	1250	e3500	e3000	e3600	—	4500	2900	7810	e2000	1490	e1000	e1300
31	1600	—	e2100	e5400	—	3620	—	6730	—	1090	e1300	—
TOTAL	49718	80220	78200	90400	303000	243360	147220	169490	135970	32215	32090	39650
MEAN	1604	2674	2523	2916	10820	7850	4907	5467	4532	1039	1035	1322
MAX	2810	4040	4800	5400	27200	15000	7680	12800	12000	1640	2000	2300
MIN	706	1340	1200	1800	3700	3550	2900	1910	1000	485	300	800
CFSM	.26	.44	.42	.48	1.79	1.30	.81	.90	.75	.17	.17	.22
IN.	.31	.49	.48	.55	1.86	1.49	.90	1.04	.83	.20	.20	.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 2001, BY WATER YEAR (WY)

MEAN	2791	4146	4006	5156	6913	9002	8447	5367	3519	2833	2154	2461
MAX	4471	11430	7638	10950	12550	14310	16440	8214	5792	7758	4133	5202
(WY)	1994	1993	1992	1993	1997	1997	1993	2000	1993	1994	1992	1992
MIN	1326	1210	2035	1769	3197	3715	3631	2595	1998	1039	1035	1031
(WY)	2000	2000	2000	2000	2000	1999	2000	1999	1999	2001	2001	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1992 - 2001	
ANNUAL TOTAL	1134932		1401533			
ANNUAL MEAN	3101		3840		(a)4696	
HIGHEST ANNUAL MEAN					6769	1993
LOWEST ANNUAL MEAN					2916	2000
HIGHEST DAILY MEAN	25500	May 21	27200	Feb 12	(b)67800	Mar 29 1904
LOWEST DAILY MEAN	169	Sep 11	300	Aug 8	-1980	Jun 19 1992
ANNUAL SEVEN-DAY MINIMUM	660	Sep 7	557	Aug 7	557	Aug 7 2001
MAXIMUM PEAK FLOW					(b)68000	Mar 29 1904
MAXIMUM PEAK STAGE			17.59	Feb 12	(b)24.90	Mar 29 1904
ANNUAL RUNOFF (CFSM)	.51		.63		.77	
ANNUAL RUNOFF (INCHES)	6.97		8.60		10.53	
10 PERCENT EXCEEDS	5830		7840		11000	
50 PERCENT EXCEEDS	2200		2520		3500	
90 PERCENT EXCEEDS	995		900		1150	

(a) Does not include water years 1995, 1996.
(b) Includes water years 1904-1991.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE HURON

04157000 SAGINAW RIVER AT SAGINAW, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967, 1975-86, 1989 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1974 to September 1981.

WATER TEMPERATURE: November 1974 to September 1981.

INSTRUMENTATION.--Water-quality monitor from Nov. 6, 1976 to Sept. 30, 1981.

REMARKS.--Cross-sectional samples were collected at Rust Avenue bridge.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1975, 1977, 1979): Maximum recorded (more than 20 percent missing record), 1,230 microsiemens, Jan. 5, 1977; minimum recorded (more than 20 percent missing record), 224 microsiemens, Mar. 13, 1977.

WATER TEMPERATURE (water years 1975-77, 1979): Maximum, 30.0°C, July 10, 14, 20, 1977; minimum, 0.0°C, on many days during winter periods.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT 19...	1200	870	91.1	9.5	8.2	706	13.5	275	42	71.6
MAR 20...	1330	7610	102	13.5	7.7	593	4.0	258	74	70.4
MAY 22...	1145	7080	75.3	7.0	8.0	564	18.5	252	59	69.1
AUG 08...	1200	E294	96.2	7.5	8.4	699	28.0	212	65	51.8

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	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)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT 19...	23.2	3.87	39.5	233	284	73.6	.3	3.7	47.3	.72
MAR 20...	19.9	2.67	22.1	184	224	47.3	.2	5.2	47.6	.65
MAY 22...	19.1	2.89	20.2	241	294	41.0	E.1	6.6	35.6	.70
AUG 08...	19.9	3.69	53.0	149	182	98.0	.3	2.5	45.1	1.0

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	TUR-BID-ITY (NTU) (00076)
OCT 19...	E.040	1.08	.012	<.060	.022	.077	.6	970	413	--
MAR 20...	.066	2.71	.013	<.060	E.010	.061	.5	7640	372	17
MAY 22...	.053	3.00	.052	E.033	E.016	E.041	.5	6770	354	33
AUG 08...	<.040	.558	.016	<.060	<.020	.101	.5	--	396	--

STREAMS TRIBUTARY TO LAKE HURON

04157000 SAGINAW RIVER AT SAGINAW, MI--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TURBIDITY LAB HACH 2100AN (NTU) (99872)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	FECAL STREP, KF STRP MF, WATER (COL/ 100 ML) (31673)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	COBALT, DISSOLVED (UG/L AS CO) (01035)	IRON, DISSOLVED (UG/L AS FE) (01046)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)
OCT 19...	--	75	76	E11	49.9	<13.0	20	5.0	15.0
MAR 20...	--	K25	K32	23	38.4	<13.0	50	E2.5	15.3
MAY 22...	--	190	130	E13	44.8	<13.0	40	E3.3	7.9
AUG 08...	48	K23	K6	E11	40.2	<13.0	M	4.8	<3.0

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 19...	<45.0	E1.59	<2.4	<.2	290	<8.0	31	73	93
MAR 20...	<45.0	E1.47	<2.4	<.2	228	<8.0	22	452	88
MAY 22...	<50.0	<2.00	<2.0	<.2	236	<8.0	72	1380	93
AUG 08...	<50.0	4.74	<2.0	<.2	267	<8.0	36	--	97

STREAMS TRIBUTARY TO ST. CLAIR RIVER

04159492 BLACK RIVER NEAR JEDDO, MI

LOCATION.--Lat 43°09'09", long 82°37'27", in SE1/4 SE1/4 sec.6, T.8 N., R.16 E., St. Clair County, Hydrologic Unit 04090001, on right bank 650 ft upstream from bridge on Jeddo Road, 0.4 mi downstream from Silver Creek, and 2.2 mi west of Jeddo.

DRAINAGE AREA.--464 mi^2.

PERIOD OF RECORD.--February 1944 to current year. Published as "near Fargo" prior to October 1991.

REVISED RECORDS.--WSP 1307: 1950(M). WSP 1627: 1956-58. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 655 ft above sea level, from topographic map. Prior to July 9, 1954, nonrecording gage and July 10, 1954 to September 1991 water-stage recorder, at site 7.6 mi downstream, at different datum (station 04159500).

REMARKS.--Records good except for estimated daily discharges, which are poor. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	52	e85	124	e300	e370	224	112	120	92	20	15
2	65	52	e74	124	e450	e600	213	109	112	82	20	14
3	60	51	e60	123	e430	655	209	103	185	75	20	15
4	60	50	e52	123	e390	905	213	96	411	72	20	26
5	58	48	e48	120	e350	880	202	90	325	80	19	23
6	58	47	e47	121	e330	610	203	85	228	76	17	26
7	58	46	e47	126	e300	444	327	80	170	69	17	22
8	76	46	e48	135	418	411	534	78	135	64	17	24
9	153	53	52	141	2290	380	495	78	116	58	21	48
10	153	143	53	142	8420	372	579	75	114	55	16	102
11	121	195	51	138	e6600	575	453	73	1080	53	12	104
12	101	150	e47	136	e4200	839	402	74	1220	50	14	58
13	87	111	e43	134	2460	1260	360	72	617	47	15	35
14	75	136	41	135	e1300	1940	265	68	369	46	15	24
15	69	165	41	148	e1000	1400	217	66	247	45	15	21
16	65	141	44	e150	e700	1080	197	65	315	43	17	19
17	59	120	53	e170	e500	753	197	66	e422	34	19	16
18	57	109	79	e190	e400	541	187	65	e320	34	18	16
19	57	98	107	e190	e300	488	176	63	e225	39	23	19
20	55	89	e112	e180	e240	509	168	60	166	39	25	27
21	53	83	e115	e140	e200	524	204	56	132	40	27	45
22	49	67	e118	e160	e160	513	277	57	1230	43	25	43
23	47	60	e119	e150	e150	488	259	67	1580	43	23	36
24	49	70	e120	e140	e200	450	227	89	705	41	20	30
25	49	62	e120	e135	1780	383	196	84	391	38	19	35
26	52	63	e120	e130	5360	306	167	82	259	37	18	131
27	53	74	e120	e130	3390	270	148	87	185	38	16	189
28	58	99	e120	e120	1360	238	135	103	144	24	17	118
29	64	102	e120	e107	---	226	125	137	118	22	15	88
30	56	96	e120	e107	---	231	119	195	104	21	15	68
31	53	---	e120	e135	---	231	---	154	---	20	14	---
TOTAL	2139	2678	2496	4304	43978	18872	7678	2689	11745	1520	569	1437
MEAN	69.0	89.3	80.5	139	1571	609	256	86.7	392	49.0	18.4	47.9
MAX	153	195	120	190	8420	1940	579	195	1580	92	27	189
MIN	47	46	41	107	150	226	119	56	104	20	12	14
CFSM	.15	.19	.17	.30	3.39	1.31	.55	.19	.84	.11	.04	.10
IN.	.17	.21	.20	.35	3.53	1.51	.62	.22	.94	.12	.05	.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 2001, BY WATER YEAR (WY)

MEAN	111	169	249	264	455	985	635	302	186	80.3	59.8	114
MAX	1316	972	1031	1315	1855	3218	2102	1511	1625	517	559	2237
(WY)	1987	1993	1951	1952	1954	1985	1947	1956	1996	1994	1953	1986
MIN	7.62	10.5	10.3	8.37	15.8	48.9	54.2	40.4	22.4	13.1	8.34	5.53
(WY)	1964	1945	1959	1945	1959	1964	1946	1958	1949	1966	1948	1948

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1944 - 2001	
ANNUAL TOTAL	61001		100105			
ANNUAL MEAN	167		274		301	
HIGHEST ANNUAL MEAN					705	1985
LOWEST ANNUAL MEAN					28.6	1964
HIGHEST DAILY MEAN	3790	May 19	8420	Feb 10	10100	Apr 6 1947
LOWEST DAILY MEAN	22	Jan 26	12	Aug 11	2.0	Aug 17 1948
ANNUAL SEVEN-DAY MINIMUM	23	Jan 21	15	Aug 10	2.7	Sep 13 1946
MAXIMUM PEAK FLOW			8960	Feb 10	(a)14400	Apr 5 1947
MAXIMUM PEAK STAGE			15.41	Feb 10	(b)16.72	Feb 22 1997
INSTANTANEOUS LOW FLOW			11	Aug 11	(c)1.8	(d)
ANNUAL RUNOFF (CFSM)	.36		.59		.65	
ANNUAL RUNOFF (INCHES)	4.89		8.03		8.82	
10 PERCENT EXCEEDS	316		504		664	
50 PERCENT EXCEEDS	70		104		65	
90 PERCENT EXCEEDS	31		22		16	

(a) From rating curve extended above 9,500 ft^3/s.
(b) Present site and datum; peak stage observed at previous site and datum, 18.05 ft, Feb. 20, 1951, backwater from ice.
(c) Observed; site then in use.
(d) Sept. 18, 19, 1946.
(e) Estimated.

STREAMS TRIBUTARY TO ST. CLAIR RIVER

04159900 MILL CREEK NEAR AVOCA, MI

LOCATION.--Lat 43°03'16", long 82°44'05", in NW1/4 sec.8, T.7 N., R.15 E., St. Clair County, Hydrologic Unit 04090001, on left bank at downstream side of bridge on Bricker Road, 0.2 mi upstream from Gleason Drain, and 2.3 mi west of Avoca.

DRAINAGE AREA.--169 mi^2.

PERIOD OF RECORD.--April 1963 to September 1975, October 1975 to September 1979 (operated as a crest-stage partial-record station), October 1987 to current year. Also operated as a low-flow partial-record station in water year 1979.

GAGE.--Water-stage recorder. Datum of gage is 711.31 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are poor. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	32	69	e86	e340	450	62	35	70	23	7.1	6.7
2	32	29	59	e86	e345	323	60	33	52	20	6.6	6.1
3	33	31	47	e86	e300	270	63	33	98	18	5.8	5.9
4	34	29	42	e85	e280	271	71	30	195	18	5.5	11
5	30	30	e39	e85	e250	251	68	28	160	18	5.4	9.8
6	30	26	e38	e86	e230	193	75	27	122	16	5.2	7.9
7	25	25	e37	e86	e220	156	132	27	88	14	5.1	7.3
8	29	25	e36	e86	e200	139	228	26	63	15	5.4	7.3
9	39	30	e36	e88	e200	134	224	28	46	17	5.7	13
10	41	105	e36	e95	e700	134	264	25	45	15	5.5	22
11	38	175	e37	e87	e1900	169	212	24	97	13	5.2	19
12	35	138	e38	e85	e1890	214	176	23	138	12	4.7	15
13	32	103	e40	e84	e1300	336	140	24	123	11	4.6	12
14	26	110	e44	e84	e1000	478	111	22	84	9.8	4.7	9.9
15	25	120	e46	e84	e830	398	90	20	57	9.1	4.9	8.5
16	38	102	e52	e90	e660	318	78	19	96	8.6	5.9	7.9
17	41	86	e60	e100	e590	239	69	22	90	8.8	6.8	7.7
18	33	73	e84	e120	e510	179	60	22	88	8.7	5.6	7.7
19	27	64	e88	e130	e430	152	52	17	71	8.1	7.2	10
20	27	57	e92	e120	e190	143	50	16	49	7.7	7.7	12
21	22	51	e94	e110	e134	129	66	16	37	7.5	7.7	14
22	20	37	e98	e108	e130	113	94	42	254	7.2	8.2	17
23	17	48	e98	e100	e200	107	91	143	389	8.3	8.0	18
24	21	41	e98	e95	235	99	81	111	259	8.6	8.6	16
25	34	38	e96	e90	713	89	69	90	169	8.3	6.9	16
26	66	37	e94	e88	1110	73	59	81	125	7.3	6.5	18
27	59	54	e92	e84	896	75	52	68	87	6.8	6.5	21
28	50	84	e90	e82	616	67	46	47	57	6.2	6.8	22
29	45	87	e88	e82	—	65	42	55	39	6.0	6.4	17
30	38	79	e88	e90	—	64	38	117	29	6.3	6.1	15
31	35	—	e86	e160	—	64	—	94	—	6.7	7.2	—
TOTAL	1058	1946	2042	2942	16399	5892	2923	1365	3277	350.0	193.5	380.7
MEAN	34.1	64.9	65.9	94.9	586	190	97.4	44.0	109	11.3	6.24	12.7
MAX	66	175	98	160	1900	478	264	143	389	23	8.6	22
MIN	17	25	36	82	130	64	38	16	29	6.0	4.6	5.9
CFSM	.20	.38	.39	.56	3.47	1.12	.58	.26	.65	.07	.04	.08
IN.	.23	.43	.45	.65	3.61	1.30	.64	.30	.72	.08	.04	.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2001, BY WATER YEAR (WY)

MEAN	20.0	55.6	84.2	110	160	268	222	98.9	76.3	22.9	15.3	16.1
MAX	67.4	261	266	404	586	664	715	328	659	78.1	57.3	95.9
(WY)	1991	1993	1988	1974	2001	1973	1975	1974	1996	1996	1973	1992
MIN	2.76	5.25	3.72	6.03	6.21	11.2	26.1	16.2	5.91	2.36	3.17	2.39
(WY)	1964	1965	1964	1964	1964	1964	1964	1964	1964	1963	1964	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1963 - 2001	
ANNUAL TOTAL	23368.6		38768.2			
ANNUAL MEAN	63.8		106		96.6	
HIGHEST ANNUAL MEAN					174	1974
LOWEST ANNUAL MEAN					7.84	1964
HIGHEST DAILY MEAN	962	May 19	1900	Feb 11	3940	Apr 19 1975
LOWEST DAILY MEAN	5.5	Sep 9	4.6	Aug 13	.90	Aug 9 1964
ANNUAL SEVEN-DAY MINIMUM	6.3	Sep 3	5.0	Aug 9	1.2	Jul 6 1963
MAXIMUM PEAK FLOW				(a)	4570	Apr 19 1975
MAXIMUM PEAK STAGE			(b)9.33	Feb 10	(b)9.33	Feb 10 2001
INSTANTANEOUS LOW FLOW					.80	(c)
ANNUAL RUNOFF (CFSM)	.38		.63		.57	
ANNUAL RUNOFF (INCHES)	5.14		8.53		7.77	
10 PERCENT EXCEEDS	134		226		231	
50 PERCENT EXCEEDS	30		52		27	
90 PERCENT EXCEEDS	11		7.3		5.4	

(a) Not determined.
(b) Backwater from ice.
(c) Aug. 9, 10, 11, 1964.
(e) Estimated.

STREAMS TRIBUTARY TO ST. CLAIR RIVER

04160570 NORTH BRANCH BELLE RIVER AT IMLAY CITY, MI

LOCATION.--Lat 43°01'49", long 83°04'02", in SW1/4 NW1/4 sec.16, T.7 N., R.12 E., Lapeer County, Hydrologic Unit 04090001, on left bank 12 ft upstream from bridge on State Highway 21, 0.6 mi northeast of Imlay City.

DRAINAGE AREA.--18.0 mi^2.

PERIOD OF RECORD.--August 1965 to September 2001 (discontinued).

GAGE.--Water-stage recorder. Concrete control Aug. 20, 1965 to Nov. 2, 1981. Datum of gage is 789.69 ft above sea level (levels by Boldt, McLeod, and Johnson, Inc.). Prior to Feb. 24, 1985, at datum 2.00 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are poor. Some diversion by pumping for sprinkler irrigation. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	11	13	e7.5	e50	36	11	4.6	56	4.4	.81	1.4
2	5.5	10	11	e7.5	e40	31	11	4.6	71	4.0	.77	1.2
3	5.5	11	e9.0	e7.5	e35	33	12	4.5	107	3.9	.73	1.1
4	8.9	9.3	e6.2	e7.5	24	31	12	4.2	102	3.9	.64	1.3
5	8.1	9.6	e6.2	e7.5	20	26	11	4.2	90	3.5	.62	1.1
6	8.5	9.9	e4.8	e7.5	19	20	18	3.9	78	3.3	.58	1.1
7	7.9	10	e3.8	e7.5	17	19	28	3.7	70	3.1	.79	1.1
8	7.8	12	e4.0	e8.0	20	17	22	4.0	60	3.1	1.2	1.4
9	7.8	17	e3.8	e11	179	17	21	4.3	51	2.8	.87	7.2
10	7.8	46	e3.7	e9.0	284	18	18	4.3	50	2.7	1.1	6.6
11	7.2	27	e4.3	e7.5	183	27	14	8.7	101	2.5	.95	4.5
12	7.0	20	e5.0	e7.5	106	24	13	17	83	2.4	.91	3.3
13	7.0	24	e3.6	e7.5	81	55	9.8	16	67	2.3	.75	2.6
14	6.9	28	e4.0	e7.5	67	46	8.6	15	55	2.2	.69	2.2
15	6.4	23	e6.0	e8.0	56	41	7.9	15	44	2.0	.68	1.6
16	6.8	20	e7.0	e9.0	45	33	7.6	21	44	1.9	1.4	1.6
17	6.9	18	e12	e11	34	26	7.1	23	44	1.7	1.2	1.5
18	7.4	16	e13	e13	32	21	6.5	21	33	1.6	.95	1.5
19	7.5	14	e14	e14	24	20	6.2	17	24	1.5	2.1	4.2
20	7.6	13	e14	e14	e20	21	6.7	16	17	1.5	2.7	4.6
21	7.6	12	e15	e14	e18	27	9.4	41	21	1.4	2.2	8.4
22	7.4	12	e15	e13	e19	20	9.2	110	118	1.4	1.7	8.0
23	7.2	11	14	e13	16	17	8.2	86	72	1.3	1.7	5.4
24	27	8.6	e11	e12	16	17	7.1	69	41	1.3	1.6	4.8
25	22	8.5	e11	e11	124	14	6.3	62	22	1.2	1.4	6.2
26	17	16	e10	e10	95	13	5.8	56	13	1.2	1.4	9.9
27	16	22	e9.5	e9.0	71	11	5.6	51	7.8	1.0	1.4	7.9
28	13	19	e9.0	e8.0	48	11	5.2	54	6.1	.92	3.5	6.3
29	12	17	e8.5	e7.5	—	12	4.8	78	5.4	.96	2.0	5.5
30	11	15	e8.0	e11	—	11	4.7	67	4.8	1.1	1.6	4.3
31	11	—	e8.0	e40	—	11	—	57	—	.86	1.5	—
TOTAL	295.5	489.9	267.4	328.0	1743	726	317.7	943.0	1558.1	66.94	40.44	117.8
MEAN	9.53	16.3	8.63	10.6	62.2	23.4	10.6	30.4	51.9	2.16	1.30	3.93
MAX	27	46	15	40	284	55	28	110	118	4.4	3.5	9.9
MIN	5.5	8.5	3.6	7.5	16	11	4.7	3.7	4.8	.86	.58	1.1
CFSM	.53	.91	.48	.59	3.46	1.30	.59	1.69	2.89	.12	.07	.22
IN.	.61	1.01	.55	.68	3.60	1.50	.66	1.95	3.22	.14	.08	.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	7.42	10.3	11.6	11.3	17.8	28.5	22.7	13.1	12.4	5.20	3.77	6.23
MAX	36.8	31.0	28.2	32.9	62.2	60.5	59.6	37.9	59.4	18.3	13.0	38.4
(WY)	1987	1986	1988	1973	2001	1973	1975	2000	1996	2000	2000	1986
MIN	.82	2.49	2.71	2.64	3.24	5.30	8.40	2.76	1.21	.41	.57	.64
(WY)	1967	1966	1977	1977	1980	2000	2000	1977	1988	1966	1966	1965

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	5433.7		6893.78			
ANNUAL MEAN	14.8		18.9		12.5	
HIGHEST ANNUAL MEAN					20.6	1986
LOWEST ANNUAL MEAN					5.13	1966
HIGHEST DAILY MEAN	199	May 19	284	Feb 10	307	Apr 19 1975
LOWEST DAILY MEAN	1.2	Jul 26	.58	Aug 6	.01	Jul 14 1965
ANNUAL SEVEN-DAY MINIMUM	1.4	Jul 21	.71	Aug 1	.14	Jul 16 1966
MAXIMUM PEAK FLOW			314	Feb 10	(a)354	Jun 12 1986
MAXIMUM PEAK STAGE			8.58	Feb 10	8.58	Feb 10 2001
INSTANTANEOUS LOW FLOW					.00	(b)
ANNUAL RUNOFF (CFSM)	.82		1.05		.69	
ANNUAL RUNOFF (INCHES)	11.23		14.25		9.44	
10 PERCENT EXCEEDS	36		50		28	
50 PERCENT EXCEEDS	6.5		9.2		6.2	
90 PERCENT EXCEEDS	2.3		1.4		1.8	

(a) From rating curve extended above 100 ft^3/s.
(b) Part of each day June 27, 28, 1977, June 26-28, 1979, June 30, 1988, caused by irrigation pumpage.
(e) Estimated.

STREAMS TRIBUTARY TO ST. CLAIR RIVER

04160600 BELLE RIVER AT MEMPHIS, MI

LOCATION.--Lat 42°54'03", long 82°46'09", in NW1/4 SE1/4 sec.35, T.6 N., R.14 E., St. Clair County, Hydrologic Unit 04090001, on right downstream side of bridge on State Highway 19 at Memphis.

DRAINAGE AREA.--151 mi^2.

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 705.41 ft above sea level (Michigan Department of Transportation bench mark).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1947 reached a stage of about 9 ft, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	45	88	e80	e300	267	68	55	68	e34	9.8	10
2	61	43	75	e79	e340	197	67	56	69	e31	10	8.8
3	48	42	63	e76	e300	211	67	55	105	e29	9.9	8.1
4	56	41	51	e77	e250	230	76	54	167	e28	9.5	7.9
5	80	37	e47	e79	e190	210	78	52	148	e27	9.0	7.9
6	81	35	e43	e81	163	155	92	51	110	e25	9.1	8.7
7	71	34	e41	e84	153	127	175	45	85	e24	8.7	8.6
8	65	35	e39	e88	144	117	226	42	70	e24	8.7	9.7
9	72	41	e38	e86	778	114	172	42	60	e23	9.8	17
10	79	243	e38	e84	e3230	120	178	41	61	e21	10	24
11	68	324	e37	e82	e2100	176	154	43	127	e17	11	32
12	56	185	37	e80	e1530	206	154	47	167	17	10	21
13	48	123	e38	e84	971	332	153	49	111	16	8.8	17
14	43	136	e42	e75	483	479	115	44	77	15	7.7	14
15	39	155	e45	e70	390	325	99	40	61	15	7.5	12
16	37	131	e50	e72	326	259	89	39	86	14	9.3	11
17	36	112	e70	e76	246	202	83	40	83	13	11	9.8
18	35	98	e90	e90	176	157	76	43	61	14	14	9.4
19	34	83	e100	e105	156	133	70	39	51	14	14	14
20	34	71	e110	e108	137	124	68	34	44	14	14	22
21	37	66	e117	e102	122	119	84	32	39	13	15	36
22	36	58	e115	e97	105	118	108	50	48	14	14	46
23	35	47	e102	e90	e98	107	103	156	156	12	14	31
24	62	55	e98	e88	94	100	95	116	143	12	13	22
25	165	50	e92	e85	656	91	85	84	94	11	12	21
26	132	49	e90	e82	1310	80	74	71	67	12	11	26
27	96	113	e90	e80	731	73	67	68	e53	11	9.7	33
28	81	155	e90	e80	408	69	62	64	e47	11	10	29
29	70	126	e90	e81	---	67	56	65	e43	11	13	24
30	56	103	e88	e90	---	70	53	96	e38	9.7	13	20
31	49	---	e83	e160	---	69	---	86	---	9.7	11	---
TOTAL	1937	2836	2197	2691	15887	5104	3047	1799	2539	541.4	337.5	560.9
MEAN	62.5	94.5	70.9	86.8	567	165	102	58.0	84.6	17.5	10.9	18.7
MAX	165	324	117	160	3230	479	226	156	167	34	15	46
MIN	34	34	37	70	94	67	53	32	38	9.7	7.5	7.9
CFSM	.41	.63	.47	.57	3.76	1.09	.67	.38	.56	.12	.07	.12
IN.	.48	.70	.54	.66	3.91	1.26	.75	.44	.63	.13	.08	.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2001, BY WATER YEAR (WY)

MEAN	40.9	67.2	90.2	87.6	150	252	199	91.8	59.3	27.7	20.4	34.2
MAX	330	375	247	315	567	595	617	270	300	82.3	91.3	256
(WY)	1982	1986	1988	1973	2001	1973	1975	1974	1996	1967	1992	1985
MIN	5.00	7.62	5.50	8.92	8.00	15.8	25.9	20.9	6.44	5.21	5.08	5.54
(WY)	1964	1965	1964	1964	1963	1964	1964	1977	1964	1965	1963	1979

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1963 - 2001	
ANNUAL TOTAL	32595		39476.8			
ANNUAL MEAN	89.1		108		92.9	
HIGHEST ANNUAL MEAN					168	1985
LOWEST ANNUAL MEAN					11.3	1964
HIGHEST DAILY MEAN	1280	Sep 24	3230	Feb 10	3320	Apr 19 1975
LOWEST DAILY MEAN	14	Jan 24	7.5	Aug 15	2.4	Sep 6 1978
ANNUAL SEVEN-DAY MINIMUM	14	Jan 24	8.5	Sep 2	2.6	Sep 5 1978
MAXIMUM PEAK FLOW			4100	Feb 10	4520	Apr 19 1975
MAXIMUM PEAK STAGE			8.98	Feb 10	8.98	Feb 10 2001
INSTANTANEOUS LOW FLOW			7.2	(a)	2.3	(b)
ANNUAL RUNOFF (CFSM)	.59		.72		.62	
ANNUAL RUNOFF (INCHES)	8.03		9.73		8.36	
10 PERCENT EXCEEDS	187		175		219	
50 PERCENT EXCEEDS	41		67		32	
90 PERCENT EXCEEDS	17		11		9.4	

(a) Aug. 15, Sept. 5.
(b) Sept. 6, 10, 1978

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04160800 SASHABAW CREEK NEAR DRAYTON PLAINS, MI

LOCATION.--Lat 42°43'12", long 83°21'13", in SE1/4 sec.26, T.4 N., R.9 E., Oakland County, Hydrologic Unit 04090003, on right bank at upstream side of culverts on Maybee Road, 1.1 mi upstream from mouth, and 2.5 mi northeast of Drayton Plains.

DRAINAGE AREA.--20.9 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Metal V-notch weir Aug. 30, 1961 to Mar. 6, 1968. Elevation of gage is 970 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	13	13	e6.9	19	49	21	13	30	7.9	1.5	.98
2	25	13	11	e6.4	e18	40	23	11	35	6.5	1.4	.96
3	23	12	10	e6.1	e17	39	23	9.9	37	5.8	1.5	.92
4	30	11	9.1	e5.6	e16	38	23	8.7	33	5.1	1.3	.91
5	31	11	8.9	e5.8	16	36	22	7.9	30	4.5	1.2	.89
6	29	9.9	10	e6.1	16	33	25	7.2	28	4.1	1.1	.90
7	26	11	6.9	e6.3	15	30	29	6.6	26	3.8	1.0	.83
8	24	11	7.0	e6.9	15	28	28	7.5	23	3.7	.98	.90
9	23	13	8.7	e7.1	50	27	28	6.4	21	3.4	.93	2.7
10	21	20	6.3	e7.0	109	26	29	6.0	20	3.1	1.1	7.6
11	19	18	e6.0	e7.4	e95	28	26	8.9	20	2.8	.94	3.3
12	18	17	e5.4	e7.7	e60	28	26	11	19	2.6	.89	2.3
13	17	17	e5.3	e8.1	49	34	24	8.4	17	2.4	.88	2.0
14	17	17	e5.4	e9.2	46	35	21	7.4	15	2.3	.79	1.7
15	16	17	e6.9	e11	45	36	19	8.4	13	2.2	.72	1.6
16	16	16	e11	14	43	35	18	14	14	2.1	1.1	1.5
17	16	16	e14	14	46	32	18	14	12	2.0	1.3	1.5
18	15	15	e16	14	48	29	17	14	10	2.0	1.3	1.4
19	15	14	e15	14	41	27	15	14	9.2	2.0	2.1	4.2
20	15	14	e13	e13	36	27	16	12	9.3	2.0	3.0	5.9
21	14	13	e12	e12	41	26	21	13	11	1.9	2.2	5.1
22	14	11	e11	11	41	26	25	18	19	1.2	1.9	8.1
23	14	9.3	e11	9.7	27	26	24	17	17	1.2	2.0	5.1
24	20	9.0	e10	9.0	29	25	23	18	15	1.7	1.9	5.3
25	20	9.2	e9.7	e9.4	66	23	20	22	14	1.4	1.7	5.2
26	18	12	e9.1	e9.8	73	22	18	24	13	1.7	1.6	7.6
27	17	14	e8.7	10	58	21	17	26	12	1.4	1.5	5.8
28	16	14	e8.3	13	58	20	16	39	11	1.4	1.3	4.5
29	15	14	e7.9	10	---	21	15	46	9.8	1.4	1.2	4.5
30	14	14	e8.1	14	---	21	14	39	8.8	1.7	1.1	3.9
31	14	---	e7.6	19	---	20	---	32	---	1.6	1.1	---
TOTAL	599	405.4	292.3	303.5	1193	908	644	490.3	552.1	86.9	42.53	98.09
MEAN	19.3	13.5	9.43	9.79	42.6	29.3	21.5	15.8	18.4	2.80	1.37	3.27
MAX	31	20	16	19	109	49	29	46	37	7.9	3.0	8.1
MIN	14	9.0	5.3	5.6	15	20	14	6.0	8.8	1.2	.72	.83
CFSM	.92	.65	.45	.47	2.04	1.40	1.03	.76	.88	.13	.07	.16
IN.	1.07	.72	.52	.54	2.12	1.62	1.15	.87	.98	.15	.08	.17

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2001, BY WATER YEAR (WY)

MEAN	6.96	10.4	12.6	12.7	15.4	26.1	28.2	18.2	11.5	6.07	4.64	6.18
MAX	38.4	38.2	28.2	36.5	42.6	61.2	45.5	41.6	28.5	15.0	19.5	34.9
(WY)	1982	1986	1988	1993	2001	1976	1975	1974	1996	2000	1975	2000
MIN	.37	1.02	.95	1.46	2.15	6.28	11.7	8.03	1.58	.74	.30	.41
(WY)	1964	1965	1964	1961	1964	1964	2000	1988	1988	1965	1984	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1960 - 2001	
ANNUAL TOTAL	5655.0		5615.12			
ANNUAL MEAN	15.5		15.4		13.2	
HIGHEST ANNUAL MEAN					21.5	1975
LOWEST ANNUAL MEAN					4.12	1964
HIGHEST DAILY MEAN	82	Sep 12	109	Feb 10	146	Oct 1 1981
LOWEST DAILY MEAN	3.8	Sep 8	.72	Aug 15	.04	Jul 9 1988
ANNUAL SEVEN-DAY MINIMUM	4.2	Feb 12	.89	Aug 9	.04	Jul 9 1988
MAXIMUM PEAK FLOW			133	Feb 10	181	Oct 1 1981
MAXIMUM PEAK STAGE			4.21	Feb 10	4.53	Oct 1 1981
INSTANTANEOUS LOW FLOW			.64	(a)	.03	(b)
ANNUAL RUNOFF (CFSM)	.74		.74		.63	
ANNUAL RUNOFF (INCHES)	10.07		9.99		8.59	
10 PERCENT EXCEEDS	29		31		30	
50 PERCENT EXCEEDS	12		13		9.4	
90 PERCENT EXCEEDS	5.0		1.5		1.7	

(a) Aug. 15, 16.
(b) July 9, 16, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04160800 SASHABAW CREEK NEAR DRAYTON PLAINS, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--June to September 2001.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June to September 2001.
WATER TEMPERATURE: July to September 2001.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 760 microsiemens, Sept. 9, 2001; minimum, 545 microsiemens, Sept. 20, 2001.
WATER TEMPERATURE: Maximum, 30.5°C, Aug. 8, 2001; minimum, 9.5°C, Sept. 26, 2001.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	---	---	---	645	624	633	686	656	671
2	---	---	---	659	---	---	645	617	630	695	657	674
3	---	---	---	660	645	652	640	622	631	699	661	677
4	---	---	---	665	654	659	640	618	629	694	663	677
5	---	---	---	662	654	659	646	616	632	699	666	681
6	---	---	---	661	613	656	647	606	628	704	666	681
7	---	---	---	662	651	656	640	607	625	702	665	679
8	---	---	---	664	655	660	649	609	628	695	663	675
9	---	---	---	659	645	652	647	596	624	760	635	678
10	---	---	---	648	640	645	640	590	611	682	623	635
11	---	---	---	645	625	640	654	609	630	654	630	646
12	---	---	---	639	630	635	653	615	634	654	620	637
13	---	---	---	635	574	624	659	610	631	646	619	632
14	---	---	---	639	627	632	655	611	631	653	625	635
15	---	---	---	639	624	630	647	608	625	653	627	638
16	---	---	---	638	620	628	625	574	608	673	631	653
17	---	---	---	636	623	628	712	572	646	672	608	635
18	---	---	---	636	609	626	701	667	677	649	621	630
19	---	---	---	642	622	627	707	660	688	678	596	644
20	---	---	---	644	622	631	691	654	669	631	545	594
21	---	---	---	662	599	628	693	671	681	648	621	633
22	---	---	---	688	602	646	694	680	689	624	589	606
23	---	---	---	662	645	653	695	681	687	631	617	626
24	---	---	---	673	648	659	699	680	688	630	615	621
25	---	---	---	668	653	659	694	669	684	644	626	633
26	---	---	---	686	650	664	694	671	682	652	634	643
27	---	---	---	669	653	659	688	667	679	652	640	646
28	---	---	---	663	643	652	693	663	678	656	643	648
29	---	---	---	659	636	645	686	658	672	656	641	646
30	---	---	---	656	636	641	685	655	671	663	640	650
31	---	---	---	656	624	636	685	659	672	---	---	---
MONTH	---	---	---	---	---	---	712	572	651	760	545	647

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04160800 SASHABAW CREEK NEAR DRAYTON PLAINS, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	--	--	--	25.0	19.5	23.0	27.5	21.0	24.5	22.0	16.5	19.0
2	--	--	--	22.0	16.5	19.5	26.0	22.5	24.5	22.0	15.0	18.0
3	--	--	--	21.5	18.5	20.0	28.5	22.5	25.0	23.0	15.5	19.0
4	--	--	--	24.5	19.5	21.5	27.5	20.5	24.0	23.0	17.5	20.0
5	--	--	--	23.5	18.5	20.5	27.0	19.5	23.5	22.0	15.0	18.0
6	--	--	--	23.0	15.5	19.5	28.0	20.5	24.5	22.0	14.5	18.0
7	--	--	--	20.0	18.0	19.0	29.5	22.5	26.0	24.5	17.0	20.5
8	--	--	--	26.5	19.5	22.5	30.5	23.0	26.5	24.5	20.5	22.0
9	--	--	--	26.5	20.0	23.0	30.0	24.0	26.5	22.5	20.5	21.5
10	--	--	--	27.5	21.0	24.0	28.5	22.5	25.0	22.0	19.0	20.5
11	--	--	--	24.0	19.0	21.5	27.0	19.5	23.0	21.5	16.5	18.5
12	--	--	--	24.0	17.0	20.5	26.0	20.0	22.5	21.5	15.5	18.5
13	--	--	--	23.5	16.5	20.0	26.0	20.0	22.0	18.5	14.5	17.0
14	--	--	--	24.5	17.0	20.5	25.0	17.0	20.5	16.5	12.5	14.5
15	--	--	--	26.0	18.0	21.5	25.0	16.5	20.0	17.0	11.5	14.0
16	--	--	--	26.5	20.0	23.0	20.0	18.5	19.5	17.0	11.0	14.5
17	--	--	--	26.0	20.5	23.0	21.5	18.0	19.5	17.0	12.0	15.0
18	22.5	--	--	27.0	21.0	23.5	21.5	17.5	19.5	18.5	14.5	16.5
19	26.0	21.0	23.5	27.0	21.0	24.0	20.5	18.5	19.5	17.0	16.0	16.5
20	24.0	21.5	22.5	27.5	21.5	24.5	21.5	18.0	19.0	17.5	16.0	16.5
21	21.5	18.0	19.5	26.0	21.5	23.5	22.5	16.5	19.5	17.0	14.5	15.5
22	20.5	17.5	19.0	28.0	21.5	24.5	19.0	17.5	18.5	17.5	14.0	16.0
23	22.0	18.5	20.5	27.0	23.5	25.0	21.5	18.5	19.5	17.5	14.5	16.0
24	24.0	19.0	21.5	30.0	23.5	26.0	23.0	18.0	20.5	16.5	12.5	14.5
25	24.5	19.5	22.0	25.0	20.0	22.0	23.0	18.0	21.0	12.5	10.0	11.5
26	25.5	20.5	23.0	24.5	18.5	21.0	23.5	20.5	21.5	11.0	9.5	10.5
27	25.5	21.5	23.5	24.0	16.5	20.0	23.5	18.0	21.0	12.5	10.5	11.5
28	27.0	22.5	24.5	24.5	17.0	21.0	24.5	20.0	22.0	14.5	11.5	12.5
29	27.0	22.5	25.0	26.0	19.0	22.5	23.5	17.0	20.0	15.0	11.5	13.0
30	27.0	23.0	25.0	25.5	20.0	23.0	24.0	17.0	21.0	15.0	11.0	13.0
31	--	--	--	27.5	20.5	24.0	24.5	20.0	21.5	--	--	--
MONTH	--	--	--	30.0	15.5	22.2	30.5	16.5	22.0	24.5	9.5	16.4

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04160900 CLINTON RIVER NEAR DRAYTON PLAINS, MI

LOCATION.--Lat 42°39'37", long 83°23'25", in NE1/4 sec.21, T.3 N., R.9 E., Oakland County, Hydrologic Unit 04090003, on left bank at downstream side of bridge on State Highway 59, 2.0 mi south of Drayton Plains.

DRAINAGE AREA.--79.2 mi^2.

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 940 ft above sea level, from topographic map. Jan. 29 to July 9, 1964, nonrecording gage at same site and datum.

REMARKS.--Records good. Some regulation and occasional diversion for lake-level control at many lakes upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	68	51	59	53	156	84	25	140	19	6.0	4.5
2	118	67	51	60	54	162	81	27	141	19	6.3	4.4
3	111	65	50	60	55	158	79	28	139	18	6.3	4.4
4	114	64	50	59	56	153	77	37	137	18	6.5	4.3
5	106	63	49	57	58	149	76	49	133	14	6.7	4.1
6	102	62	48	54	58	145	82	47	130	9.9	6.5	4.0
7	101	62	48	54	59	142	84	46	121	10	5.9	4.1
8	101	61	47	53	60	139	82	32	86	9.7	5.9	4.7
9	98	62	47	54	89	137	85	16	51	9.1	6.1	9.5
10	92	63	45	53	99	132	85	17	52	9.0	6.2	5.9
11	48	61	43	52	107	129	83	32	62	9.1	5.4	4.9
12	21	60	e44	51	122	126	81	47	73	9.3	5.2	5.1
13	24	60	45	50	133	126	59	47	72	8.8	5.2	4.9
14	27	59	46	49	140	122	34	46	71	8.3	5.4	4.6
15	29	61	46	49	143	121	33	48	72	8.3	5.4	4.4
16	48	61	48	48	146	119	30	62	71	8.1	6.2	4.3
17	63	61	51	49	146	118	27	70	64	8.4	5.5	4.2
18	62	62	53	48	144	114	27	70	58	9.0	5.9	4.3
19	61	63	55	49	141	113	28	70	57	8.5	6.9	7.9
20	60	63	56	49	137	112	32	70	55	8.9	5.7	5.3
21	60	62	57	50	131	109	67	73	56	8.7	5.3	6.9
22	59	61	59	50	127	108	111	72	57	7.0	5.5	16
23	35	60	59	50	123	103	109	73	56	6.4	5.3	29
24	21	59	59	49	122	100	106	75	55	6.2	5.1	29
25	23	57	59	49	143	100	103	80	55	6.7	4.9	39
26	26	56	59	49	142	99	98	82	55	6.3	5.1	59
27	47	54	59	49	148	98	61	83	56	5.9	4.8	57
28	72	52	60	49	152	97	23	91	46	6.0	4.7	57
29	71	52	59	48	---	95	22	121	21	6.1	4.8	41
30	70	52	60	51	---	92	24	141	21	6.3	4.8	21
31	69	---	60	52	---	87	---	140	---	6.1	4.7	---
TOTAL	2066	1813	1623	1603	3088	3761	1973	1917	2263	294.1	174.2	454.7
MEAN	66.6	60.4	52.4	51.7	110	121	65.8	61.8	75.4	9.49	5.62	15.2
MAX	127	68	60	60	152	162	111	141	141	19	6.9	59
MIN	21	52	43	48	53	87	22	16	21	5.9	4.7	4.0
CFSM	.84	.76	.66	.65	1.39	1.53	.83	.78	.95	.12	.07	.19
IN.	.97	.85	.76	.75	1.45	1.77	.93	.90	1.06	.14	.08	.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2001, BY WATER YEAR (WY)

MEAN	37.4	51.6	60.1	56.9	59.7	83.7	90.0	62.2	45.7	29.6	25.4	30.5
MAX	114	107	109	114	115	188	168	137	115	82.0	68.9	129
(WY)	1982	1986	1986	1973	1974	1976	1974	1974	1996	1968	2000	1975
MIN	4.08	7.90	15.6	15.5	16.6	28.8	27.3	22.9	6.47	5.79	5.62	4.80
(WY)	1999	1965	1964	1964	1964	1964	2000	1988	1988	1988	2001	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1960 - 2001	
ANNUAL TOTAL	20788.9		21030.0			
ANNUAL MEAN	56.8		57.6		52.6	
HIGHEST ANNUAL MEAN					87.9	1974
LOWEST ANNUAL MEAN					20.0	1964
HIGHEST DAILY MEAN	178	Sep 15	162	Mar 2	274	Mar 12 1974
LOWEST DAILY MEAN	4.8	Apr 6	4.0	Sep 6	3.1	Sep 18 1963
ANNUAL SEVEN-DAY MINIMUM	5.0	Apr 1	4.3	Sep 1	3.5	Sep 16 1963
MAXIMUM PEAK FLOW			163	Mar 1	276	Mar 12 1974
MAXIMUM PEAK STAGE			4.11	Mar 1	4.95	Mar 12 1974
INSTANTANEOUS LOW FLOW					2.4	May 31 1961
ANNUAL RUNOFF (CFSM)	.72		.73		.66	
ANNUAL RUNOFF (INCHES)	9.76		9.88		9.03	
10 PERCENT EXCEEDS	113		124		104	
50 PERCENT EXCEEDS	49		55		46	
90 PERCENT EXCEEDS	19		5.9		11	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161540 PAINT CREEK AT ROCHESTER, MI

LOCATION.--Lat 42°41'18", long 83°08'35", in NW1/4 SE1/4 sec.10, T.3 N., R.11 E., Oakland County, Hydrologic Unit 04090003, on right bank at upstream side of bridge on Ludlow Street in Rochester, 1.5 mi upstream from mouth.

DRAINAGE AREA.--70.9 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 755.11 ft above sea level.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Occasional regulation by Lake Orion. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72	51	54	e24	85	162	60	38	107	28	14	12
2	66	61	51	e22	72	147	63	36	148	26	15	11
3	58	67	48	e22	65	142	65	34	130	26	16	11
4	115	58	47	e20	61	131	63	29	99	26	14	11
5	87	55	48	e23	61	121	62	28	84	25	13	10
6	78	54	49	e24	61	114	97	28	78	24	13	10
7	67	70	49	e25	58	108	110	28	72	24	12	11
8	60	64	44	e28	59	102	100	31	64	24	12	22
9	56	76	44	e28	516	98	98	28	56	23	13	63
10	52	107	41	e27	597	94	98	27	59	23	13	51
11	49	75	e36	e30	215	100	90	35	68	22	12	24
12	45	66	e30	e30	198	99	98	38	54	22	12	18
13	42	69	e25	e32	204	138	86	32	47	21	12	16
14	39	70	e26	e37	201	124	79	36	43	20	11	16
15	38	67	e35	e47	192	115	74	40	62	20	11	15
16	40	61	64	60	166	112	72	59	92	19	18	14
17	38	60	75	59	142	108	69	48	51	20	21	14
18	37	57	e67	56	127	103	65	50	41	20	17	14
19	37	56	e58	54	115	98	60	46	39	18	38	89
20	36	56	e51	55	111	93	61	41	42	18	29	49
21	35	55	e47	e46	104	89	101	165	40	18	21	39
22	34	52	e42	e47	95	87	92	301	73	19	18	39
23	35	50	e39	46	90	84	80	142	51	18	18	29
24	73	51	e35	46	94	81	78	113	45	18	17	38
25	57	50	e32	46	378	78	72	e100	41	19	16	38
26	50	62	e29	54	231	74	69	e99	38	22	16	56
27	50	67	e28	46	179	72	64	e95	37	17	14	44
28	52	60	e26	45	164	70	57	e122	36	16	14	49
29	51	57	e27	44	—	70	52	e142	34	16	12	40
30	50	56	e28	72	—	67	46	e115	31	16	12	33
31	49	—	e26	92	—	63	—	101	—	15	12	—
TOTAL	1648	1860	1301	1287	4641	3144	2281	2227	1862	643	486	886
MEAN	53.2	62.0	42.0	41.5	166	101	76.0	71.8	62.1	20.7	15.7	29.5
MAX	115	107	75	92	597	162	110	301	148	28	38	89
MIN	34	50	25	20	58	63	46	27	31	15	11	10
CFSM	.75	.87	.59	.59	2.34	1.43	1.07	1.01	.88	.29	.22	.42
IN.	.86	.98	.68	.68	2.44	1.65	1.20	1.17	.98	.34	.25	.46

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2001, BY WATER YEAR (WY)

MEAN	38.5	45.5	50.8	51.1	62.5	95.0	96.7	64.1	47.6	29.7	25.9	35.0
MAX	123	120	103	127	166	204	194	146	125	58.0	66.7	104
(WY)	1982	1986	1976	1973	2001	1976	1975	1974	1996	1992	1975	1975
MIN	8.50	11.0	14.5	14.9	15.4	25.9	37.2	28.5	13.5	11.7	12.0	12.2
(WY)	1964	1964	1965	1964	1963	1964	1964	1977	1988	1963	1965	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1960 - 2001	
ANNUAL TOTAL	20600		22266			
ANNUAL MEAN	56.3		61.0		53.4	
HIGHEST ANNUAL MEAN					86.7	1976
LOWEST ANNUAL MEAN					20.4	1964
HIGHEST DAILY MEAN	449	Jun 25	597	Feb 10	660	Feb 2 1968
LOWEST DAILY MEAN	11	Sep 7	10	Sep 5	6.8	Aug 15 1988
ANNUAL SEVEN-DAY MINIMUM	13	Sep 2	11	Sep 1	7.9	Oct 4 1963
MAXIMUM PEAK FLOW			(a)1200	Feb 9	(a)1200	Feb 9 2001
MAXIMUM PEAK STAGE			5.27	Feb 9	(b)5.95	Feb 10 1965
INSTANTANEOUS LOW FLOW			9.6	Sep 6	(c)1.2	Aug 19 1974
ANNUAL RUNOFF (CFSM)	.79		.86		.75	
ANNUAL RUNOFF (INCHES)	10.81		11.68		10.24	
10 PERCENT EXCEEDS	106		110		104	
50 PERCENT EXCEEDS	41		50		40	
90 PERCENT EXCEEDS	24		16		16	

(a) From rating curve extended above 500 ft^3/s.
(b) Backwater from ice.
(c) Result of regulation due to bridge construction.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161540 PAINT CREEK AT ROCHESTER, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--June to September 2001.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June to September 2001.
WATER TEMPERATURE: June to September 2001.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval.

REMARKS.--Interruption in the water-quality record was due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 3,910 microsiemens, Aug. 12, 2001; minimum, 216 microsiemens, Sept. 8, 2001.
WATER TEMPERATURE: Maximum, 25.0°C, June 15, 2001; minimum, 10.5°C, Sept. 25, 26, 27, 2001.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	—	—	—	1120	741	759	769	749	756	—	—	—
2	—	—	—	777	763	770	779	731	752	—	—	—
3	—	—	—	895	766	777	852	721	753	—	—	—
4	—	—	—	789	769	777	764	703	750	—	555	—
5	—	—	—	784	765	775	853	739	754	600	558	574
6	—	—	—	864	761	770	764	731	745	617	573	590
7	—	—	—	783	762	768	820	694	737	652	559	588
8	—	—	—	821	764	771	746	716	729	619	216	549
9	—	—	—	772	756	762	743	528	713	534	221	428
10	—	—	—	831	752	760	802	643	712	517	428	476
11	—	—	—	765	746	753	742	709	721	588	515	556
12	—	—	—	767	745	753	3910	714	804	804	569	706
13	—	—	—	817	752	766	741	698	712	830	752	771
14	—	—	—	790	767	772	3060	700	761	863	772	802
15	803	363	706	858	762	776	718	679	702	906	782	841
16	641	551	602	784	762	771	712	493	656	2180	810	891
17	683	639	666	854	713	771	3260	665	728	915	814	859
18	709	669	689	820	788	804	707	274	666	1460	813	858
19	719	649	706	814	744	792	2610	505	618	836	452	623
20	751	526	707	891	767	788	586	510	543	684	531	577
21	720	631	704	800	766	782	982	580	613	2140	512	688
22	1260	660	699	866	772	782	640	600	626	695	639	667
23	716	690	702	798	782	788	644	612	626	1140	440	713
24	1510	698	721	865	780	793	846	617	630	720	659	692
25	724	708	713	811	646	740	635	607	619	765	647	691
26	2020	709	741	739	698	716	796	596	615	680	659	671
27	728	710	716	821	719	735	619	604	611	700	661	688
28	735	713	719	751	720	738	674	509	605	664	638	650
29	2180	723	757	857	711	746	—	—	—	681	662	671
30	754	730	735	753	730	741	—	—	—	709	680	687
31	—	—	—	824	736	749	—	—	—	—	—	—
MONTH	—	—	—	1120	646	766	—	—	—	—	—	—

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161540 PAINT CREEK AT ROCHESTER, MI–Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	—	—	—	21.0	17.5	20.0	22.0	19.0	20.5	18.0	15.5	17.0
2	—	—	—	17.5	15.0	16.5	21.5	20.0	21.0	17.5	14.5	16.0
3	—	—	—	18.0	15.5	17.0	23.0	20.5	21.5	18.5	14.5	16.5
4	—	—	—	19.5	16.5	18.0	22.0	19.5	20.5	18.5	16.0	17.5
5	—	—	—	18.5	16.5	17.5	21.5	18.5	20.0	17.0	14.5	15.5
6	—	—	—	18.0	14.5	16.5	22.5	19.0	20.5	17.0	14.0	15.5
7	—	—	—	17.0	15.5	16.5	24.0	20.5	22.0	19.5	15.0	17.5
8	—	—	—	20.0	16.5	18.5	24.5	21.5	23.0	23.0	18.0	19.5
9	—	—	—	20.5	17.5	19.0	24.5	22.0	23.0	22.5	19.5	21.0
10	—	—	—	21.0	18.5	20.0	23.0	20.5	22.0	20.5	18.0	19.5
11	—	—	—	19.5	17.5	18.5	21.0	19.0	20.0	18.5	16.5	17.5
12	—	—	—	19.0	16.5	17.5	20.0	18.5	19.5	18.0	15.5	16.5
13	—	—	—	18.5	15.5	17.0	20.5	18.0	19.0	17.0	14.5	16.0
14	—	—	—	19.0	15.5	17.5	19.0	16.5	17.5	14.5	13.0	14.0
15	25.0	19.5	21.0	19.5	16.5	18.0	19.0	15.5	17.5	14.0	12.0	13.0
16	21.5	20.0	21.0	20.0	17.5	19.0	19.0	17.0	18.0	14.5	11.5	13.0
17	21.0	19.5	20.0	20.5	18.5	19.5	19.0	17.5	18.0	14.5	12.0	13.5
18	19.5	18.5	18.5	22.0	19.0	20.0	20.0	17.0	18.0	16.0	13.5	14.5
19	21.0	18.0	19.5	22.0	19.5	20.5	19.5	18.0	18.5	18.0	15.0	16.5
20	21.0	18.5	19.5	22.0	19.5	21.0	18.5	17.5	18.0	16.5	15.5	16.0
21	18.5	16.5	17.5	21.0	19.5	20.5	19.0	16.5	17.5	16.0	15.0	15.5
22	17.5	16.0	16.5	22.0	19.5	21.0	18.0	17.0	17.0	16.0	14.5	15.0
23	18.5	16.5	17.5	22.5	20.5	21.5	18.0	17.0	17.5	18.5	14.0	15.0
24	19.5	17.0	18.5	24.0	21.0	22.5	19.5	17.0	18.0	16.0	12.5	14.5
25	20.0	17.5	19.0	22.5	19.0	20.5	19.5	17.5	18.5	12.5	10.5	11.5
26	20.5	18.0	19.0	20.5	18.0	19.0	20.0	18.5	19.0	10.5	10.5	10.5
27	21.0	18.5	20.0	19.0	16.0	17.5	20.0	17.5	18.5	12.0	10.5	11.0
28	21.5	19.0	20.5	19.5	16.5	18.0	20.5	18.0	19.0	13.5	12.0	13.0
29	21.5	19.5	20.5	20.0	18.0	19.0	19.0	16.0	17.5	14.0	12.5	13.0
30	22.0	20.0	21.0	21.0	18.5	19.5	19.5	16.0	18.0	13.0	11.5	12.5
31	—	—	—	21.5	19.0	20.0	19.5	17.5	18.5	—	—	—
MONTH	—	—	—	24.0	14.5	18.9	24.5	15.5	19.3	23.0	10.5	15.2

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161580 STONY CREEK NEAR ROMEO, MI

LOCATION.--Lat 42°48'03", long 83°05'25", in SW1/4 sec.31, T.5 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on right bank at upstream side of culvert on 32 Mile Road, 4.0 mi west of Romeo.

DRAINAGE AREA.--25.6 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 861.64 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	11	17	e6.1	31	54	21	10	36	5.3	2.3	2.1
2	20	14	14	e5.5	29	50	22	10	32	8.9	2.4	2.0
3	16	15	13	e5.3	30	48	25	9.9	34	5.7	2.5	2.0
4	26	21	13	e4.9	24	45	22	9.7	29	5.2	2.4	2.1
5	25	20	12	e5.2	22	41	19	9.4	23	4.6	2.3	2.1
6	22	18	12	e5.7	21	35	33	9.0	21	4.2	2.2	2.0
7	18	18	12	e5.9	20	33	41	8.9	19	4.1	2.6	2.1
8	17	18	11	e6.7	20	29	38	9.5	16	4.2	3.7	2.4
9	16	19	6.7	e7.0	73	28	38	9.0	14	3.9	2.6	4.2
10	15	35	7.2	e6.8	120	27	38	8.3	13	3.9	2.7	6.9
11	14	25	6.6	e7.4	e140	33	36	12	18	3.4	2.3	3.5
12	13	19	e6.0	e7.7	e115	33	38	14	17	3.2	2.3	2.9
13	13	19	e5.5	e8.1	92	43	29	11	14	3.0	2.3	e2.6
14	12	21	e5.8	e9.6	77	46	19	9.7	15	3.0	2.1	e2.4
15	12	23	e7.6	12	67	47	17	9.9	18	2.9	2.0	e2.3
16	12	21	13	14	58	44	16	16	34	2.8	2.7	e2.3
17	12	20	17	15	50	39	15	14	25	3.0	3.4	e2.6
18	12	17	17	15	45	35	14	14	17	4.1	2.7	e2.7
19	11	16	24	14	35	35	13	14	13	3.0	4.6	e9.9
20	11	16	25	13	33	35	14	10	11	3.0	4.4	e11
21	9.1	15	24	13	32	35	20	25	10	2.9	3.3	e7.8
22	9.7	13	e19	12	30	34	21	61	18	2.9	3.0	e9.8
23	9.7	18	e15	12	24	33	19	49	15	2.8	3.0	e7.3
24	25	17	e13	12	23	31	18	44	12	2.8	2.8	e8.2
25	21	17	e11	11	74	26	15	40	9.8	2.8	2.5	e8.7
26	15	22	e9.0	11	85	24	13	38	9.1	3.1	2.5	e11
27	13	24	e8.0	12	80	22	13	36	7.4	2.9	2.4	e12
28	12	22	e7.4	12	67	22	12	43	6.3	2.6	2.3	e12
29	12	20	e7.1	12	—	23	11	62	5.4	2.5	2.2	e11
30	11	18	e7.0	18	—	22	11	55	5.5	2.6	2.1	e8.2
31	11	—	e6.6	25	—	22	—	43	—	2.5	2.2	—
TOTAL	476.5	572	372.5	324.9	1517	1074	661	714.3	517.5	111.8	82.8	166.1
MEAN	15.4	19.1	12.0	10.5	54.2	34.6	22.0	23.0	17.2	3.61	2.67	5.54
MAX	31	35	25	25	140	54	41	62	36	8.9	4.6	12
MIN	9.1	11	5.5	4.9	20	22	11	8.3	5.4	2.5	2.0	2.0
CFSM	.60	.74	.47	.41	2.12	1.35	.86	.90	.67	.14	.10	.22
IN.	.69	.83	.54	.47	2.20	1.56	.96	1.04	.75	.16	.12	.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	10.3	15.5	17.2	16.4	21.5	34.5	33.6	18.9	13.9	8.11	6.82	9.11
MAX	25.1	46.2	41.3	47.7	62.9	79.7	75.1	57.1	49.5	20.0	48.5	41.2
(WY)	1982	1986	1976	1973	1976	1976	1975	1974	1996	1969	1975	1975
MIN	1.79	2.06	3.56	5.26	7.22	8.40	9.57	5.82	2.67	1.47	1.63	1.52
(WY)	1967	1965	1965	1965	1979	2000	2000	1977	1988	1965	1965	1966

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	5433.7		6590.4			
ANNUAL MEAN	14.8		18.1		17.1	
HIGHEST ANNUAL MEAN					31.5	1975
LOWEST ANNUAL MEAN					9.06	1999
HIGHEST DAILY MEAN	132	Sep 24	140	Feb 11	245	Apr 20 1975
LOWEST DAILY MEAN	2.7	Jan 31	2.0	Aug 15	.92	Oct 9 1966
ANNUAL SEVEN-DAY MINIMUM	2.8	Jan 31	2.1	Sep 1	1.2	Sep 13 1966
MAXIMUM PEAK FLOW			(a)150	Feb 11	290	Apr 19 1975
MAXIMUM PEAK STAGE			(b)4.11	Feb 11	5.19	Apr 19 1975
INSTANTANEOUS LOW FLOW					(c).88	Aug 3 1999
ANNUAL RUNOFF (CFSM)	.58		.71		.67	
ANNUAL RUNOFF (INCHES)	7.90		9.58		9.09	
10 PERCENT EXCEEDS	30		38		37	
50 PERCENT EXCEEDS	9.7		13		11	
90 PERCENT EXCEEDS	3.4		2.6		3.3	

(a) Gage height 3.81 ft.
(b) Backwater from ice.
(c) Result of regulation from unknown source.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161790 STONY LAKE NEAR WASHINGTON, MI

LOCATION.--Lat 42°42'58", long 83°05'58", in SE1/4 sec.31, T.4 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank 1,000 ft east of bridge over dam on Stony Creek, 2.7 mi west of Washington.

DRAINAGE AREA.--68.0 mi^2.

PERIOD OF RECORD.--February 1963 to current year. Prior to October 1996 monthend elevations and contents only.

REVISED RECORDS.--WDR MI-77-1: 1976.

GAGE.--Water-stage recorder. Datum of gage is 790.00 ft above sea level (levels by Huron-Clinton Metropolitan Authority).

REMARKS.--Records good. Lake is formed by an earthfill dam with concrete spillway completed in 1962. The spillway section includes a drum gate and 2 sluices, one on each side, with valve controls capable of draining lake. The lake began filling February 1963 and is used for recreational purposes.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 13.65 ft, Apr. 20, 1975; minimum recorded, 4.71 ft, Nov. 21, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 12.70 ft, May 30; minimum, 9.81 ft, Feb. 22.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.49	12.24	11.60	10.04	10.16	10.17	9.95	12.28	12.61	12.19	12.09	12.09
2	12.44	12.23	11.34	10.04	10.18	10.12	9.98	12.26	12.61	12.16	12.09	12.09
3	12.38	12.23	11.28	10.03	10.15	10.08	10.17	12.26	12.61	12.17	12.10	12.09
4	12.40	12.23	11.24	10.02	10.16	10.06	10.37	12.25	12.57	12.17	12.09	12.09
5	12.40	12.25	10.94	10.02	10.15	10.03	10.54	12.23	12.52	12.17	12.08	12.07
6	12.39	12.27	10.61	10.02	10.14	10.01	10.76	12.21	12.49	12.15	12.08	12.07
7	12.36	12.28	10.42	10.02	10.12	9.97	11.07	12.21	12.45	12.14	12.07	12.07
8	12.33	12.29	10.13	10.03	10.11	9.94	11.40	12.21	12.41	12.15	12.08	12.11
9	12.32	12.31	10.00	10.01	10.35	9.92	11.71	12.22	12.38	12.15	12.07	12.22
10	12.31	12.42	9.95	10.00	10.67	9.91	12.00	12.22	12.37	12.15	12.09	12.27
11	12.29	12.43	9.96	9.99	10.50	9.92	12.24	12.24	12.39	12.13	12.08	12.24
12	12.27	12.41	10.01	9.99	10.37	9.94	12.39	12.27	12.37	12.12	12.08	12.20
13	12.26	12.38	9.97	9.99	10.27	10.00	12.45	12.26	12.34	12.11	12.08	12.17
14	12.25	12.36	10.00	9.99	10.17	10.04	12.45	12.26	12.32	12.11	12.06	12.15
15	12.25	12.36	9.99	10.00	10.09	10.07	12.42	12.27	12.30	12.11	12.06	12.13
16	12.25	12.35	10.00	10.02	10.03	10.07	12.40	12.31	12.36	12.11	12.08	12.13
17	12.24	12.35	10.04	10.04	9.97	10.06	12.38	12.33	12.39	12.11	12.10	12.12
18	12.24	12.34	10.05	10.04	9.91	10.03	12.35	12.33	12.37	12.11	12.11	12.12
19	12.23	12.33	10.06	10.04	9.90	10.01	12.33	12.31	12.33	12.10	12.14	12.19
20	12.23	12.26	10.07	10.02	9.89	9.98	12.34	12.29	12.32	12.10	12.15	12.26
21	12.22	12.17	10.08	10.01	9.85	9.97	12.40	12.29	12.30	12.10	12.15	12.27
22	12.21	12.16	10.07	10.00	9.85	9.96	12.48	12.54	12.32	12.10	12.14	12.28
23	12.20	12.11	10.05	10.00	10.09	9.95	12.49	12.63	12.33	12.10	12.15	12.26
24	12.28	12.12	10.06	10.00	10.33	9.93	12.48	12.61	12.31	12.10	12.14	12.27
25	12.32	12.12	10.06	9.99	10.55	9.92	12.45	12.58	12.29	12.10	12.14	12.25
26	12.34	12.16	10.05	9.99	10.49	9.90	12.41	12.55	12.26	12.11	12.14	12.28
27	12.34	12.16	10.05	10.00	10.39	9.91	12.38	12.54	12.24	12.08	12.13	12.28
28	12.30	12.02	10.05	9.99	10.26	9.94	12.34	12.58	12.22	12.08	12.13	12.28
29	12.27	11.99	10.04	9.99	—	9.95	12.31	12.68	12.22	12.09	12.12	12.26
30	12.25	11.88	10.04	10.04	—	9.95	12.29	12.69	12.21	12.10	12.11	12.24
31	12.24	—	10.04	10.11	—	9.95	—	12.64	—	12.10	12.11	—
MEAN	12.30	12.24	10.27	10.02	10.18	9.99	11.86	12.37	12.37	12.12	12.10	12.18
MAX	12.49	12.43	11.60	10.11	10.67	10.17	12.49	12.69	12.61	12.19	12.15	12.28
MIN	12.20	11.88	9.95	9.99	9.85	9.90	9.95	12.21	12.21	12.08	12.06	12.07

CAL YR 2000 MEAN 11.40 MAX 12.80 MIN 6.16
WTR YR 2001 MEAN 11.50 MAX 12.69 MIN 9.85

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161800 STONY CREEK NEAR WASHINGTON, MI

LOCATION.--Lat 42°42'55", long 83°05'31", in SW1/4 sec.31, T.4 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank at downstream side of bridge on Mt. Vernon Road, 500 ft downstream from Stony Lake Dam, and 2.9 mi west of Washington.

DRAINAGE AREA.--68.2 mi^2.

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 772.59 ft above sea level (levels by Huron-Clinton Metropolitan Authority).

REMARKS.--Records good. Occasional diurnal fluctuation caused by mills upstream from station prior to February 1963; occasional regulation by Stony Lake since (see preceding page). From 1963 to 1991 annual mean discharge and runoff figures adjusted for change in contents in Stony Lake. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	30	101	46	64	143	54	34	119	21	7.0	7.7
2	71	29	86	46	69	129	28	32	120	15	7.3	6.4
3	58	30	45	46	63	117	13	31	120	16	8.7	6.1
4	63	29	86	46	63	110	14	32	107	17	7.8	6.2
5	63	32	126	45	62	102	16	29	92	16	5.6	5.9
6	59	35	82	45	59	94	18	26	81	14	5.4	5.1
7	50	34	101	44	56	83	16	25	72	13	5.3	4.9
8	45	34	77	43	55	75	15	25	63	14	5.5	8.0
9	41	41	45	43	146	69	16	25	56	14	5.5	21
10	39	75	32	39	361	65	18	25	53	14	5.7	29
11	35	76	27	e38	318	66	34	29	57	11	5.9	24
12	31	76	28	e37	280	71	58	34	54	10	5.8	18
13	29	74	31	e38	236	86	74	32	49	9.0	5.7	16
14	28	68	33	e40	199	99	71	32	43	8.8	5.5	12
15	27	63	34	e44	174	108	64	32	41	8.2	4.2	9.5
16	27	61	39	e46	149	111	57	39	54	8.0	4.0	8.7
17	26	60	47	e45	122	105	56	43	60	8.5	4.5	8.2
18	23	58	46	43	100	97	47	43	54	8.5	4.9	8.3
19	22	56	47	43	94	89	43	40	45	8.1	5.5	16
20	21	58	49	39	89	83	44	35	43	7.8	9.5	26
21	22	61	51	37	76	80	58	37	40	7.7	11	28
22	19	53	51	36	34	76	75	95	43	7.5	11	28
23	18	51	49	35	11	73	78	122	45	7.3	12	26
24	32	47	47	34	16	70	75	116	41	7.4	12	29
25	43	44	47	34	221	66	67	104	36	8.2	11	25
26	51	50	47	32	249	63	60	96	30	12	11	29
27	52	54	47	33	212	49	55	91	27	7.5	10	30
28	48	63	47	33	169	51	46	110	25	7.4	11	30
29	36	65	47	33	—	54	40	140	25	7.2	8.8	27
30	33	111	47	43	—	56	36	143	23	7.0	8.1	24
31	31	—	47	54	—	54	—	128	—	7.0	8.8	—
TOTAL	1226	1618	1689	1260	3747	2594	1346	1825	1718	328.1	234.0	523.0
MEAN	39.5	53.9	54.5	40.6	134	83.7	44.9	58.9	57.3	10.6	7.55	17.4
MAX	83	111	126	54	361	143	78	143	120	21	12	30
MIN	18	29	27	32	11	49	13	25	23	7.0	4.0	4.9

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2001, BY WATER YEAR (WY)

MEAN	31.3	42.6	44.9	41.1	50.3	76.0	75.3	50.5	36.8	21.5	19.0	25.1
MAX	85.8	105	94.0	115	144	199	142	132	120	50.7	76.0	97.7
(WY)	1982	1986	1976	1973	1976	1976	1975	1974	1989	1969	1975	1975
MIN	10.3	10.2	5.02	3.03	9.79	5.14	10.0	17.2	6.93	4.41	4.00	4.72
(WY)	1963	1964	1999	2000	1963	1964	1963	1963	1964	1988	1964	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1958 - 2001	
ANNUAL TOTAL	13834.6		18108.1			
ANNUAL MEAN	37.8		49.6		42.8	
HIGHEST ANNUAL MEAN					79.1	1976
LOWEST ANNUAL MEAN					12.0	1963
HIGHEST DAILY MEAN	190	Sep 25	361	Feb 10	407	Feb 2 1968
LOWEST DAILY MEAN	2.6	Sep 7	4.0	Aug 16	1.3	Jul 31 1964
ANNUAL SEVEN-DAY MINIMUM	2.7	Jan 5	4.9	Aug 13	2.2	Jul 31 1964
MAXIMUM PEAK FLOW			373	Feb 10	(a)552	Jun 10 1988
MAXIMUM PEAK STAGE			5.47	Feb 10	(b)6.71	Mar 6 1959
INSTANTANEOUS LOW FLOW			3.9	(c)	.90	Jul 10 1963
10 PERCENT EXCEEDS	85		100		87	
50 PERCENT EXCEEDS	29		41		31	
90 PERCENT EXCEEDS	3.2		8.0		9.3	

(a) From rating curve extended above 380 ft^3/s; result of momentary release of water from Stony Lake; gage height 6.44 ft.
(b) Backwater from ice.
(c) Aug. 15, 16.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161820 CLINTON RIVER AT STERLING HEIGHTS, MI

LOCATION.--Lat 42°36'52", long 83°01'36", in NE1/4 SW1/4 sec.3, T.2 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on right bank at downstream side of bridge on Riverland Road in Sterling Heights.

DRAINAGE AREA.--309 mi^2.

PERIOD OF RECORD.--October 1978 to December 1982, March 1996 to May 1998, July to September 2001.

GAGE.--Water-stage recorder. Elevation of gage is 625 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	e130	49	56
2	---	---	---	---	---	---	---	---	---	e140	48	51
3	---	---	---	---	---	---	---	---	---	e120	52	49
4	---	---	---	---	---	---	---	---	---	e80	53	49
5	---	---	---	---	---	---	---	---	---	e75	48	47
6	---	---	---	---	---	---	---	---	---	e72	45	44
7	---	---	---	---	---	---	---	---	---	e66	44	46
8	---	---	---	---	---	---	---	---	---	e66	45	66
9	---	---	---	---	---	---	---	---	---	e65	44	336
10	---	---	---	---	---	---	---	---	---	e60	62	353
11	---	---	---	---	---	---	---	---	---	e54	52	172
12	---	---	---	---	---	---	---	---	---	e55	52	124
13	---	---	---	---	---	---	---	---	---	e56	53	104
14	---	---	---	---	---	---	---	---	---	e55	68	99
15	---	---	---	---	---	---	---	---	---	e58	58	74
16	---	---	---	---	---	---	---	---	---	e57	68	59
17	---	---	---	---	---	---	---	---	---	e56	111	55
18	---	---	---	---	---	---	---	---	---	e55	65	57
19	---	---	---	---	---	---	---	---	---	e60	210	281
20	---	---	---	---	---	---	---	---	---	65	169	304
21	---	---	---	---	---	---	---	---	---	62	97	214
22	---	---	---	---	---	---	---	---	---	64	72	237
23	---	---	---	---	---	---	---	---	---	59	80	161
24	---	---	---	---	---	---	---	---	---	60	69	253
25	---	---	---	---	---	---	---	---	---	64	65	171
26	---	---	---	---	---	---	---	---	---	87	67	244
27	---	---	---	---	---	---	---	---	---	63	71	178
28	---	---	---	---	---	---	---	---	---	54	61	171
29	---	---	---	---	---	---	---	---	---	51	55	180
30	---	---	---	---	---	---	---	---	---	54	53	171
31	---	---	---	---	---	---	---	---	---	54	56	---
TOTAL	---	---	---	---	---	---	---	---	---	2117	2142	4406
MEAN	---	---	---	---	---	---	---	---	---	68.3	69.1	147
MAX	---	---	---	---	---	---	---	---	---	140	210	353
MIN	---	---	---	---	---	---	---	---	---	51	44	44
CFSM	---	---	---	---	---	---	---	---	---	.22	.22	.48
IN.	---	---	---	---	---	---	---	---	---	.25	.26	.53

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 2001, BY WATER YEAR (WY)

MEAN	234	237	266	241	319	454	483	320	276	157	139	195
MAX	574	345	370	315	514	672	619	444	511	243	268	317
(WY)	1982	1982	1997	1997	1997	1982	1982	1996	1996	1997	1980	1981
MIN	145	159	187	155	141	266	361	216	164	68.3	69.1	83.0
(WY)	1983	1979	1979	1981	1979	1996	1981	1998	1981	2001	2001	1979

SUMMARY STATISTICS	WATER YEARS 1979 - 2001	
ANNUAL MEAN	278	
HIGHEST ANNUAL MEAN	342	1997
LOWEST ANNUAL MEAN	212	1979
HIGHEST DAILY MEAN	2000	Feb 21 1997
LOWEST DAILY MEAN	44	Aug 7 2001
ANNUAL SEVEN-DAY MINIMUM	47	Aug 3 2001
ANNUAL RUNOFF (CFSM)	.90	
ANNUAL RUNOFF (INCHES)	12.24	
10 PERCENT EXCEEDS	500	
50 PERCENT EXCEEDS	221	
90 PERCENT EXCEEDS	110	

(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161830 CLINTON RIVER AT YATES, MI

LOCATION.--Lat 42°40'18", long 83°05'47", in NE1/4 SE1/4 sec.13, T.3 N., R.11 E., Oakland County, Hydrologic Unit 04090003, on left bank at downstream side of bridge on Avon Road in Yates.

DRAINAGE AREA.--299 mi^2.

PERIOD OF RECORD.--June to September 2001.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June to September 2001.
WATER TEMPERATURE: June to September 2001.

INSTRUMENTATION.--Water-quality monitor, set for 15 minute measurement interval.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 1,060 microsiemens, July 23, 2001; minimum, 343 microsiemens, Sept. 9, 2001.
WATER TEMPERATURE: Maximum, 28.0°C, July 24, Aug. 8, 2001; minimum, 11.5°C, Sept. 26, 2001.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	892	860	874	990	941	962	928	893	911
2	---	---	---	896	842	865	979	953	965	945	903	925
3	---	---	---	909	851	870	1000	948	968	991	903	943
4	---	---	---	966	876	905	990	919	966	956	893	930
5	---	---	---	948	907	929	995	914	962	941	893	924
6	---	---	---	958	910	933	1020	918	978	990	919	946
7	---	---	---	939	903	919	1020	925	984	977	908	947
8	---	---	---	960	923	940	1020	916	982	957	514	879
9	---	---	---	969	920	942	1020	896	971	749	343	503
10	---	---	---	955	921	940	1000	869	948	701	420	574
11	---	---	---	947	923	936	1000	904	962	720	690	702
12	---	---	---	969	931	951	1000	929	962	755	704	732
13	813	800	803	1030	932	957	987	922	948	808	741	776
14	838	790	805	1020	945	983	984	876	928	837	798	815
15	809	460	767	997	948	976	920	878	896	819	793	804
16	738	523	666	1010	954	995	928	756	886	903	819	879
17	742	733	736	1040	992	1020	905	704	792	914	872	902
18	772	734	747	1030	960	1010	916	844	891	909	880	898
19	788	751	764	1010	928	987	900	492	626	913	373	674
20	766	640	741	1050	834	981	897	509	773	696	446	619
21	798	736	771	1010	942	984	899	877	889	699	532	646
22	815	691	748	1020	923	967	953	898	915	742	533	662
23	806	782	790	1060	951	992	968	887	914	745	588	722
24	793	773	784	993	950	973	927	887	909	727	541	643
25	815	789	804	968	895	947	931	901	916	740	698	730
26	844	789	827	987	844	919	951	898	922	712	628	672
27	841	827	833	939	897	920	947	889	921	739	688	723
28	852	829	839	965	935	951	937	891	910	737	707	714
29	886	823	836	974	918	957	929	900	917	746	699	714
30	934	883	900	979	933	958	954	922	940	709	699	705
31	---	---	---	1000	944	979	963	908	937	---	---	---
MONTH	---	---	---	1060	834	950	1020	492	917	991	343	774

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04161830 CLINTON RIVER AT YATES, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	24.0	20.5	23.0	25.5	21.0	23.5	20.5	17.5	19.0
2	---	---	---	21.0	17.5	19.5	25.0	22.5	23.5	19.5	16.5	18.0
3	---	---	---	21.0	18.5	19.5	26.5	22.5	24.0	20.5	16.5	18.5
4	---	---	---	23.0	19.0	20.5	25.5	21.5	23.5	20.5	18.5	19.5
5	---	---	---	22.5	19.0	20.5	25.0	20.5	23.0	19.5	16.5	18.0
6	---	---	---	21.5	16.5	19.0	25.5	21.0	23.5	19.0	15.5	17.5
7	---	---	---	19.5	18.0	19.0	27.5	22.5	25.0	21.0	17.0	19.0
8	---	---	---	24.0	19.0	21.0	28.0	24.0	26.0	22.5	20.0	21.0
9	---	---	---	24.5	20.0	22.0	27.0	24.5	26.0	22.5	21.0	21.5
10	---	---	---	24.5	21.0	23.0	26.0	23.5	24.5	22.0	19.5	20.5
11	---	---	---	22.5	20.0	21.5	24.0	21.0	22.5	20.0	18.0	19.0
12	---	---	---	22.5	18.5	20.5	23.5	20.5	22.0	20.0	17.5	18.5
13	---	---	---	22.0	17.5	19.5	23.0	20.0	21.5	19.5	17.0	18.5
14	24.5	21.5	23.0	22.5	18.0	20.0	22.0	18.5	20.5	17.0	15.5	16.5
15	25.5	22.5	24.0	23.0	18.5	21.0	22.0	18.0	20.0	16.5	14.5	15.5
16	24.0	21.5	23.0	23.5	20.0	21.5	21.0	19.5	20.0	17.0	13.5	15.5
17	24.0	22.0	23.0	23.5	20.5	22.0	21.0	19.0	20.0	17.0	14.0	15.5
18	23.0	21.0	22.0	24.5	21.0	22.5	21.0	18.5	19.5	18.5	15.5	17.0
19	24.5	21.0	22.5	24.5	21.5	23.0	20.0	19.5	20.0	18.5	17.0	17.5
20	23.5	21.5	22.0	25.5	22.0	23.5	20.5	19.0	19.5	18.0	17.0	17.5
21	21.5	18.5	20.0	23.5	22.0	23.0	21.5	18.5	20.0	17.5	16.0	16.5
22	19.5	18.0	18.5	25.0	21.5	23.5	20.0	18.5	19.0	18.0	16.0	17.0
23	21.5	18.5	20.0	26.0	23.0	24.5	21.0	19.0	19.5	17.9	16.0	17.0
24	23.0	19.5	21.0	28.0	23.5	25.5	22.0	19.0	20.5	18.0	14.5	16.5
25	23.5	19.5	21.5	26.0	21.0	23.0	22.0	19.0	20.5	14.5	12.0	13.5
26	24.0	20.5	22.0	23.5	19.5	21.0	22.5	20.5	21.0	12.0	11.5	12.0
27	24.5	21.0	22.5	22.5	18.0	20.0	22.5	20.0	21.0	13.5	12.0	12.5
28	24.5	22.0	23.0	22.5	18.0	20.5	23.0	20.0	21.5	14.5	13.0	14.0
29	25.0	22.0	23.5	23.0	20.0	21.5	21.0	18.5	20.0	15.5	13.5	14.5
30	25.5	22.5	24.0	24.0	20.5	22.0	22.0	18.0	20.0	15.5	13.0	14.5
31	---	---	---	25.5	21.0	23.0	22.0	20.0	21.0	---	---	---
MONTH	---	---	---	28.0	16.5	21.6	28.0	18.0	21.7	22.5	11.5	17.0

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04163400 PLUM BROOK AT UTICA, MI

LOCATION.--Lat 42°36'05", long 83°04'27", in SE1/4 NE1/4 sec.7, T.2 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on left bank at downstream side of bridge on Ryan Road, 1.0 mi southwest of Utica.

DRAINAGE AREA.--16.5 mi^2.

PERIOD OF RECORD.--July 1965 to July 1998, October 1999 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 619.79 ft above sea level (levels by Johnson and Anderson, Inc.).

REMARKS.--Records good except for estimated daily discharges, which are fair. Prior to 1998, occasional diversion for sprinkler irrigation. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	5.0	8.0	6.4	56	21	9.3	7.5	28	3.2	2.4	2.5
2	5.7	4.8	7.2	6.6	34	19	12	7.3	65	2.8	2.5	2.2
3	5.6	4.8	6.1	6.3	20	18	11	6.8	49	3.7	2.4	2.2
4	46	4.5	5.7	6.1	15	17	10	6.7	22	3.6	2.3	2.2
5	21	4.4	e5.0	6.8	14	15	9.0	6.5	14	3.2	2.2	2.2
6	13	4.1	4.7	7.0	15	14	57	5.8	11	2.7	2.1	1.9
7	9.1	6.5	4.6	7.0	13	13	51	5.7	10	2.8	2.2	1.9
8	7.7	6.3	4.8	7.2	15	13	30	6.6	8.5	2.8	2.3	9.7
9	7.1	12	4.6	e6.5	285	13	22	5.7	7.3	2.7	2.3	48
10	6.6	64	4.3	6.5	235	12	20	5.2	9.8	2.5	4.2	44
11	5.8	19	e4.0	6.7	67	16	15	11	18	2.2	4.0	11
12	5.5	10	e3.7	7.0	39	16	28	12	9.9	2.1	4.3	6.8
13	5.5	9.9	e3.5	7.5	28	51	19	6.7	7.4	2.1	8.2	5.3
14	5.4	11	e3.6	8.3	30	34	13	5.3	6.0	2.0	4.3	4.7
15	5.1	13	e5.0	14	38	23	11	6.3	8.0	1.8	3.2	4.3
16	10	10	14	29	27	21	11	15	15	2.0	6.7	4.0
17	7.3	8.7	50	29	22	22	10	9.5	7.4	1.9	9.3	3.9
18	5.9	7.2	31	21	17	22	8.8	22	6.0	2.0	5.9	3.8
19	5.2	6.5	21	16	15	20	9.5	15	5.7	2.1	25	58
20	5.1	6.2	16	11	15	17	12	7.4	8.5	5.1	9.2	38
21	5.3	5.7	14	8.5	14	15	29	11	7.2	8.9	5.3	17
22	5.2	5.1	e12	7.5	12	14	31	43	14	5.7	4.5	16
23	4.7	4.7	e11	6.8	11	13	21	12	8.4	3.5	5.5	13
24	24	4.7	9.6	6.6	17	12	17	7.8	7.1	3.5	4.7	43
25	14	5.0	e9.0	6.2	274	10	12	7.5	5.2	4.6	4.0	13
26	8.0	16	e9.0	e6.0	74	9.7	10	12	4.7	8.4	4.7	24
27	17	17	8.6	e6.0	38	9.7	9.7	16	4.0	4.6	5.3	11
28	9.1	12	8.4	5.9	26	9.4	8.7	67	3.7	3.0	4.2	7.7
29	6.1	9.4	8.0	5.6	---	9.1	8.2	114	3.5	2.4	3.3	6.2
30	5.5	9.2	7.3	41	---	9.1	7.8	28	3.3	2.6	2.9	5.6
31	5.2	---	6.8	76	---	8.8	---	14	---	2.5	2.9	---
TOTAL	292.3	306.7	310.5	392.0	1466	516.8	523.0	506.3	377.6	103.0	152.3	413.1
MEAN	9.43	10.2	10.0	12.6	52.4	16.7	17.4	16.3	12.6	3.32	4.91	13.8
MAX	46	64	50	76	285	51	57	114	65	8.9	25	58
MIN	4.7	4.1	3.5	5.6	11	8.8	7.8	5.2	3.3	1.8	2.1	1.9
CFSM	.57	.62	.61	.77	3.17	1.01	1.06	.99	.76	.20	.30	.83
IN.	.66	.69	.70	.88	3.31	1.17	1.18	1.14	.85	.23	.34	.93

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2001, BY WATER YEAR (WY)

MEAN	7.45	11.7	14.9	12.7	19.8	30.1	24.6	15.5	11.4	8.24	6.21	6.79
MAX	33.7	39.8	37.7	40.7	60.3	83.6	47.4	39.9	51.9	53.6	30.4	26.8
(WY)	1982	1986	1973	1993	1976	1982	1979	1968	1996	2000	2000	2000
MIN	.82	1.45	1.99	1.23	2.62	7.24	8.30	3.46	1.51	.29	.43	.44
(WY)	1967	1966	1977	1977	1980	2000	1971	1971	1988	1965	1965	1969

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1965 - 2001	
ANNUAL TOTAL	6965.1		5359.6			
ANNUAL MEAN	19.0		14.7		14.1	
HIGHEST ANNUAL MEAN					20.5	1968
LOWEST ANNUAL MEAN					6.67	1970
HIGHEST DAILY MEAN	360	Jul 30	285	Feb 9	707	Jun 26 1968
LOWEST DAILY MEAN	2.4	Jun 10	1.8	Jul 15	.04	Jul 19 1966
ANNUAL SEVEN-DAY MINIMUM	3.0	Feb 7	2.0	Jul 12	.09	Aug 22 1969
MAXIMUM PEAK FLOW			488	Feb 9	(a)1290	Jun 18 1996
MAXIMUM PEAK STAGE			7.52	Feb 9	10.62	Jun 18 1996
INSTANTANEOUS LOW FLOW			1.6	Jul 14	.00	(b)
ANNUAL RUNOFF (CFSM)	1.15		.89		.85	
ANNUAL RUNOFF (INCHES)	15.70		12.08		11.59	
10 PERCENT EXCEEDS	43		28		30	
50 PERCENT EXCEEDS	7.6		8.2		6.1	
90 PERCENT EXCEEDS	3.7		3.0		1.4	

(a) From rating curve extended above 800 ft^3/s.
(b) Part of each day July 19, 28, 1966, Aug. 22-28, Sept. 3, 11, 1969.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04164000 CLINTON RIVER NEAR FRASER, MI

LOCATION.--Lat 42°34'38", long 82°57'05", in SE1/4 NE1/4 sec.19, T.2 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on right bank 50 ft downstream from bridge on Garfield Road, 2.8 mi north of Fraser, and 4.0 mi upstream from North Branch.

DRAINAGE AREA.--444 mi^2.

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 577.71 ft above sea level (Macomb County bench mark). Prior to Nov. 17, 1949, and from May 29 to July 31, 1990, nonrecording gage at same site and datum. Nov. 17, 1949 to Apr. 5, 1990, water-stage recorder at site 800 ft downstream at same datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 5 or 6, 1947, reached a stage of 20 ft, from floodmark, and discharge of approximately 9,000 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	415	288	e340	e180	800	815	378	273	863	161	91	97
2	400	288	e320	e160	613	754	436	237	1140	165	89	88
3	428	281	e280	e170	481	726	395	209	1140	188	91	84
4	994	275	e260	e140	440	692	364	192	741	167	91	87
5	778	271	e270	e170	436	663	331	172	618	154	83	86
6	662	295	e290	e200	444	631	978	163	554	128	81	82
7	513	433	e280	e180	411	611	963	165	509	120	81	84
8	466	367	e270	e210	440	588	614	249	429	118	81	242
9	371	456	e250	e220	2190	565	737	207	388	117	88	861
10	384	996	e240	e200	3740	550	589	187	329	116	168	1000
11	379	548	e220	e220	2080	583	488	354	536	112	99	310
12	326	426	e180	e240	1310	580	592	398	404	104	88	198
13	271	415	e140	e240	1010	904	483	246	345	101	167	167
14	225	448	e150	e280	959	800	412	230	314	100	111	161
15	206	461	e210	e400	986	671	398	271	325	99	104	128
16	316	413	518	572	833	667	408	505	634	104	290	104
17	243	381	925	537	737	697	354	369	389	100	268	101
18	211	350	580	453	652	675	333	465	326	100	122	107
19	210	311	458	409	608	632	319	462	301	98	649	766
20	251	e290	403	358	578	541	388	368	421	106	390	972
21	297	e280	382	298	561	567	590	456	308	449	181	569
22	291	e290	336	e290	508	550	713	1110	544	247	145	489
23	300	e280	315	e280	441	524	557	991	359	122	168	287
24	693	e270	e270	e270	467	459	548	620	330	111	131	570
25	502	e270	e230	e250	2460	424	477	578	271	136	115	321
26	385	540	e200	e240	1900	417	411	627	234	196	175	539
27	492	e450	e220	e260	1260	402	371	598	212	118	163	328
28	353	e360	e200	e250	945	384	357	928	204	99	124	258
29	269	e330	e200	264	---	366	312	1360	186	92	107	250
30	251	e320	e240	760	---	380	284	901	166	138	97	241
31	255	---	e210	967	---	381	---	668	---	100	97	---
TOTAL	12137	11383	9387	9668	28290	18199	14580	14559	13520	4266	4735	9577
MEAN	392	379	303	312	1010	587	486	470	451	138	153	319
MAX	994	996	925	967	3740	904	978	1360	1140	449	649	1000
MIN	206	270	140	140	411	366	284	163	166	92	81	82
CFSM	.88	.85	.68	.70	2.28	1.32	1.09	1.06	1.02	.31	.34	.72
IN.	1.02	.95	.79	.81	2.37	1.52	1.22	1.22	1.13	.36	.40	.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2001, BY WATER YEAR (WY)

MEAN	269	332	384	385	467	659	646	464	362	270	230	249
MAX	1021	834	837	975	1119	1313	1237	1382	942	664	597	758
(WY)	1982	1986	1968	1950	1976	1976	1950	1956	1996	1957	2000	1975
MIN	72.3	78.2	93.1	91.8	112	217	259	127	120	87.1	69.5	73.3
(WY)	1954	1954	1959	1961	1963	1964	1958	1958	1949	1955	1954	1954

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1947 - 2001	
ANNUAL TOTAL	159569		150301			
ANNUAL MEAN	436		412		392	
HIGHEST ANNUAL MEAN					595	1976
LOWEST ANNUAL MEAN					189	1964
HIGHEST DAILY MEAN	2860	Jul 31	3740	Feb 10	6930	May 11 1948
LOWEST DAILY MEAN	114	Sep 8	81	Aug 6	49	Sep 6 1955
ANNUAL SEVEN-DAY MINIMUM	128	Apr 1	85	Aug 3	59	Sep 3 1954
MAXIMUM PEAK FLOW			4060	Feb 10	8840	Oct 1 1981
MAXIMUM PEAK STAGE			16.22	Feb 10	19.56	Oct 1 1981
INSTANTANEOUS LOW FLOW			73	(a)	47	Sep 6 1955
ANNUAL RUNOFF (CFSM)	.98		.93		.88	
ANNUAL RUNOFF (INCHES)	13.37		12.59		11.99	
10 PERCENT EXCEEDS	827		756		750	
50 PERCENT EXCEEDS	290		328		281	
90 PERCENT EXCEEDS	147		107		117	

(a) Aug. 8, 9.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04164100 EAST POND CREEK AT ROMEO, MI

LOCATION.--Lat 42°49'21", long 83°01'13", in NE1/4 SE1/4 sec.27, T.5 N., R.12 E., Macomb County, Hydrologic Unit 04090003, on right bank at upstream side of bridge on Van Dyke Road, 1.4 mi north of Romeo.

DRAINAGE AREA.--21.8 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 780 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Occasional regulation by lakes upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	12	15	e7.7	26	48	18	17	22	11	3.1	2.1
2	30	12	14	e7.0	24	45	18	16	27	9.5	3.1	2.0
3	25	12	14	e6.8	28	43	22	14	29	9.3	3.0	2.0
4	33	11	13	e6.4	21	39	20	12	25	9.0	2.6	1.9
5	29	10	14	e6.7	21	36	18	10	23	8.1	2.5	1.8
6	22	10	18	e7.2	21	32	25	10	21	7.3	1.9	1.9
7	17	10	14	e7.5	19	29	31	10	20	6.9	2.3	2.0
8	15	10	12	e8.2	20	27	26	11	19	7.0	3.6	2.8
9	14	12	15	e8.6	81	26	27	10	17	6.8	3.2	6.0
10	11	26	12	e8.5	175	25	27	9.8	16	6.6	3.2	7.4
11	9.6	18	e11	e9.2	141	27	24	13	19	6.0	2.9	5.4
12	8.5	14	e10	e9.8	124	26	26	13	17	5.5	2.7	4.4
13	7.9	16	e8.6	e11	77	35	22	11	14	5.3	2.5	4.8
14	7.6	18	e8.3	e13	65	35	20	10	13	5.1	2.3	4.1
15	7.0	18	e9.8	16	60	34	21	10	12	4.4	2.1	3.5
16	7.9	17	e15	18	52	33	23	14	16	4.2	2.8	3.2
17	9.4	16	e18	18	47	32	23	14	14	4.0	3.6	3.1
18	9.6	15	e17	18	47	30	21	13	13	3.8	3.5	3.1
19	9.1	15	e18	18	43	29	20	12	11	3.8	5.0	8.4
20	8.8	15	e17	e17	32	27	19	11	13	3.9	4.9	11
21	7.9	14	e16	e16	32	26	23	14	12	3.8	4.5	9.1
22	7.5	14	e14	e15	39	25	22	30	19	3.8	4.2	9.4
23	10	19	e13	e15	24	24	21	22	15	3.6	4.1	8.4
24	33	13	e12	e14	32	23	21	17	13	3.5	3.6	9.1
25	30	13	e11	e14	93	24	19	17	11	3.5	3.2	8.3
26	22	17	e10	e14	75	25	17	19	10	3.6	3.2	10
27	18	18	e9.5	e15	59	24	15	21	10	3.5	2.8	8.5
28	15	17	e9.1	e14	58	22	14	27	14	3.3	2.5	7.7
29	14	16	e8.9	17	—	21	14	40	15	3.4	2.2	7.0
30	13	15	e8.8	19	—	20	16	28	11	3.3	2.0	6.3
31	12	—	e8.3	25	—	19	—	22	—	3.1	2.2	—
TOTAL	496.8	443	394.3	400.6	1536	911	633	497.8	491	165.9	95.3	164.7
MEAN	16.0	14.8	12.7	12.9	54.9	29.4	21.1	16.1	16.4	5.35	3.07	5.49
MAX	33	26	18	25	175	48	31	40	29	11	5.0	11
MIN	7.0	10	8.3	6.4	19	19	14	9.8	10	3.1	1.9	1.8
CFSM	.74	.68	.58	.59	2.52	1.35	.97	.74	.75	.25	.14	.25
IN.	.85	.76	.67	.68	2.62	1.55	1.08	.85	.84	.28	.16	.28

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2001, BY WATER YEAR (WY)

MEAN	10.2	13.7	15.0	14.8	19.6	31.7	30.6	19.2	14.0	9.00	7.12	9.05
MAX	35.1	45.0	35.7	42.6	54.9	67.9	71.4	52.2	52.9	22.9	35.0	52.3
(WY)	1987	1986	1988	1973	2001	1976	1975	1974	1989	1969	1975	1985
MIN	1.92	2.32	1.64	2.89	2.93	7.81	12.8	7.77	2.76	2.07	1.30	2.02
(WY)	1964	1964	1964	1959	1964	1964	2000	1977	1963	1964	1965	1966

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1958 - 2001	
ANNUAL TOTAL	5501.0		6229.4			
ANNUAL MEAN	15.0		17.1		16.1	
HIGHEST ANNUAL MEAN					29.0	1975
LOWEST ANNUAL MEAN					4.99	1964
HIGHEST DAILY MEAN	128	Sep 23	175	Feb 10	302	Feb 1 1968
LOWEST DAILY MEAN	3.9	Jul 27	1.8	Sep 5	.90	Jul 29 1964
ANNUAL SEVEN-DAY MINIMUM	4.5	Jul 22	2.0	Sep 1	.99	Jul 27 1964
MAXIMUM PEAK FLOW			210	Feb 10	(a)358	Feb 10 1965
MAXIMUM PEAK STAGE			3.98	Feb 10	(b)4.56	Mar 12 1962
INSTANTANEOUS LOW FLOW			1.5	Aug 6	.80	(c)
ANNUAL RUNOFF (CFSM)	.69		.78		.74	
ANNUAL RUNOFF (INCHES)	9.39		10.63		10.06	
10 PERCENT EXCEEDS	27		30		32	
50 PERCENT EXCEEDS	11		14		11	
90 PERCENT EXCEEDS	6.8		3.4		3.4	

(a) Gage height 4.48 ft.
(b) Backwater from ice.
(c) July 30, 31, 1964, Aug. 6, 7, 1965.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04164300 EAST BRANCH COON CREEK AT ARMADA, MI

LOCATION.--Lat 42°50'45", long 82°53'06", in NE1/4 sec.23, T.5 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on right bank at downstream side of bridge on Prospect Street in Armada.

DRAINAGE AREA.--13.0 mi^2.

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

REVISED RECORDS.--WDR MI-83-1: 1982.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 735 ft above sea level, from topographic map.

REMARKS.--Records good except for estimated daily discharges and those below 1.0 ft^3/s, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	2.6	4.6	e1.3	68	14	3.5	1.6	1.9	.56	.05	.22
2	4.1	2.5	3.8	e1.2	55	12	3.2	1.5	6.7	.45	.04	.22
3	3.5	2.2	3.2	e1.1	36	18	4.1	1.3	19	.42	.07	.22
4	14	2.2	2.8	e1.2	23	19	4.0	1.2	12	.37	.07	.27
5	12	1.8	2.9	e1.3	17	14	3.5	1.2	6.4	.28	.10	.28
6	7.8	1.8	2.3	e1.4	17	7.4	14	1.0	4.1	.23	.09	.34
7	5.7	1.8	2.1	e1.5	15	6.1	21	.95	3.0	.22	.21	.36
8	6.0	1.8	e1.9	e1.6	17	5.7	16	1.1	2.3	.20	.17	1.4
9	11	3.0	e1.5	e1.7	247	6.2	11	1.0	1.8	.16	.23	2.9
10	9.1	65	e1.4	1.9	306	8.0	10	1.0	2.0	.16	.25	.91
11	6.1	31	e1.2	e2.4	e160	19	7.7	2.0	7.4	.15	.25	.22
12	4.6	15	1.1	e2.5	e58	15	15	1.8	7.0	.20	.27	.17
13	4.0	10	1.2	e2.3	e24	54	10	1.3	3.4	.13	.26	.22
14	3.7	12	1.4	e2.5	20	38	6.0	1.1	2.3	.10	.28	.18
15	3.4	11	1.6	e3.1	21	24	4.4	1.1	2.5	.11	.32	.26
16	3.3	8.8	2.3	e4.0	15	18	4.0	1.4	5.3	.08	.52	.28
17	3.1	7.1	6.0	e3.8	9.8	12	3.4	1.2	5.2	.08	.23	.28
18	2.9	5.4	9.6	e4.2	7.2	9.5	2.8	1.1	2.7	.09	.32	.35
19	2.6	4.6	11	e5.0	5.8	9.1	2.4	.92	2.0	.10	.69	2.3
20	2.6	4.2	e11	e5.2	6.8	8.2	3.2	.81	1.6	.11	.34	.72
21	2.5	3.9	e9.5	e5.2	6.5	7.3	12	1.2	2.8	.16	.21	1.1
22	2.2	3.0	e8.6	e6.8	5.4	6.6	12	1.3	9.6	.14	.22	3.4
23	2.3	2.5	e5.6	e6.6	3.9	6.1	7.4	1.1	5.1	.17	.28	2.9
24	15	2.3	e4.0	e6.4	3.4	5.6	5.9	.93	2.6	.05	.28	1.1
25	16	2.3	e3.2	e6.2	161	4.5	4.1	1.3	1.6	.08	.28	.97
26	8.7	4.8	e2.5	6.0	94	3.6	3.3	1.6	1.2	.08	.24	1.2
27	5.9	11	e2.3	5.6	46	3.5	2.9	1.6	.90	.06	.17	1.5
28	4.2	9.3	e2.0	4.9	24	3.4	2.4	1.7	1.4	.05	.36	.92
29	3.5	7.1	e1.8	4.7	—	3.4	1.9	2.8	.83	.05	.13	.65
30	3.0	5.7	e1.7	16	—	3.5	1.6	2.2	.73	.06	.12	.50
31	2.8	—	e1.4	49	—	3.4	—	1.5	—	.07	.15	—
TOTAL	180.4	245.7	115.5	166.6	1472.8	368.1	202.7	41.81	125.36	5.17	7.20	26.34
MEAN	5.82	8.19	3.73	5.37	52.6	11.9	6.76	1.35	4.18	.17	.23	.88
MAX	16	65	11	49	306	54	21	2.8	19	.56	.69	3.4
MIN	2.2	1.8	1.1	1.1	3.4	3.4	1.6	.81	.73	.05	.04	.17
CFSM	.45	.63	.29	.41	4.05	.91	.52	.10	.32	.01	.02	.07
IN.	.52	.70	.33	.48	4.21	1.05	.58	.12	.36	.01	.02	.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2001, BY WATER YEAR (WY)

MEAN	2.23	5.10	7.88	6.65	12.1	23.6	15.3	5.77	4.46	1.84	1.42	2.43
MAX	24.1	43.3	35.7	37.6	60.3	75.2	47.1	23.5	21.9	19.7	12.3	33.9
(WY)	1982	1986	1973	1974	1976	1982	1967	1974	1989	1967	1975	1985
MIN	.047	.088	.074	.078	.087	.23	.83	.61	.059	.047	.055	.056
(WY)	1964	1964	1964	1961	1964	1964	1964	1977	1964	1964	1963	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1959 - 2001	
ANNUAL TOTAL	3116.08		2957.68			
ANNUAL MEAN	8.51		8.10		7.38	
HIGHEST ANNUAL MEAN					14.9	1985
LOWEST ANNUAL MEAN					.36	1964
HIGHEST DAILY MEAN	320	Sep 23	306	Feb 10	497	Apr 19 1975
LOWEST DAILY MEAN	.32	Jul 26	.04	Aug 2	.00	(a)
ANNUAL SEVEN-DAY MINIMUM	.40	Jul 21	.05	Jul 27	.00	Jan 25 1961
MAXIMUM PEAK FLOW			564	Feb 9	910	Apr 19 1975
MAXIMUM PEAK STAGE			5.87	Feb 9	6.69	Apr 19 1975
ANNUAL RUNOFF (CFSM)	.65		.62		.57	
ANNUAL RUNOFF (INCHES)	8.92		8.46		7.71	
10 PERCENT EXCEEDS	18		15		15	
50 PERCENT EXCEEDS	2.0		2.6		1.1	
90 PERCENT EXCEEDS	.62		.20		.11	

(a) Jan. 25 to Feb. 9, 1961, result of freezeup.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04164500 NORTH BRANCH CLINTON RIVER NEAR MOUNT CLEMENS, MI

LOCATION.--Lat 42°37'45", long 82°53'25", in SW1/4 sec.35, T.3 N., R.13 E., Macomb County, Hydrologic Unit 04090003, on left bank at upstream side of bridge on State Highway 59, 2 mi north of Mount Clemens, and 3.6 mi upstream from mouth.

DRAINAGE AREA.--199 mi^2.

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1437: 1948. WSP 1557: Drainage area.

GAGE.--Water-stage recorder. Concrete control since September 1961. Datum of gage is 576.38 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Nov. 15, 1949 and Oct. 3, 1997 to Apr. 22, 1998, nonrecording gage at same site and datum.

REMARKS.--Records fair. Some regulation at times by mill upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 5 or 6, 1947, reached a stage of 20.0 ft, from floodmark.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	199	79	117	e75	e360	389	88	68	81	39	e2.1	1.8
2	144	75	107	e66	e400	284	86	65	100	34	1.6	2.0
3	97	71	93	e59	e370	241	88	59	247	30	1.1	1.8
4	113	67	81	e56	e320	252	125	53	348	29	.47	1.0
5	223	64	75	e54	e210	249	126	48	267	31	.37	.38
6	225	61	101	e55	e190	216	136	42	157	26	e.30	.29
7	170	60	80	e52	e170	171	287	41	112	22	.26	.27
8	132	63	71	e46	e165	150	389	40	91	23	.27	1.0
9	123	67	61	e45	e360	150	322	40	74	19	1.3	11
10	146	147	61	e44	e1800	150	272	39	64	12	2.7	41
11	134	213	59	e51	e3500	166	245	38	66	10	e1.6	37
12	107	151	49	e66	e2900	230	205	53	91	8.7	e.80	23
13	88	147	e45	e84	e1800	297	254	61	89	6.7	e.50	14
14	78	136	e43	e100	e850	537	202	49	65	4.9	.24	11
15	71	134	e51	e130	628	554	139	41	51	4.2	.16	12
16	68	136	83	e175	474	360	118	45	47	4.6	.31	8.8
17	65	130	117	e210	309	278	112	54	57	3.6	e1.2	7.7
18	67	125	105	e210	236	224	104	54	56	2.3	3.6	6.1
19	66	117	114	e225	210	215	91	46	43	1.7	24	15
20	62	107	147	e210	194	204	86	40	40	1.5	16	35
21	58	99	164	e175	183	179	106	38	42	1.1	15	53
22	55	95	169	e145	148	163	284	47	43	7.4	13	44
23	53	79	164	e125	157	148	305	96	66	13	10	43
24	78	80	e145	e120	117	131	204	86	70	9.0	9.1	52
25	259	73	e125	e110	542	118	155	62	49	9.1	8.5	42
26	285	81	e110	e108	1700	105	117	61	34	9.4	8.0	39
27	228	124	e100	e109	1390	97	96	74	29	e7.2	7.7	43
28	175	124	e95	e107	682	95	82	90	31	e5.1	6.7	39
29	129	121	e91	e100	—	92	73	159	39	e4.0	4.1	30
30	101	122	e90	e140	—	94	68	162	53	e3.3	5.1	25
31	87	—	e86	e220	—	92	—	111	—	e2.7	2.3	—
TOTAL	3886	3148	2999	3472	20365	6631	4965	1962	2602	384.5	148.38	640.14
MEAN	125	105	96.7	112	727	214	166	63.3	86.7	12.4	4.79	21.3
MAX	285	213	169	225	3500	554	389	162	348	39	24	53
MIN	53	60	43	44	117	92	68	38	29	1.1	.16	.27
CFSM	.63	.53	.49	.56	3.65	1.07	.83	.32	.44	.06	.02	.11
IN.	.73	.59	.56	.65	3.81	1.24	.93	.37	.49	.07	.03	.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2001, BY WATER YEAR (WY)

MEAN	50.4	88.9	131	130	210	349	265	139	80.6	35.0	26.7	42.6
MAX	479	595	460	507	766	928	560	790	448	127	247	484
(WY)	1982	1986	1968	1974	1976	1982	1975	1956	1996	1992	1975	1985
MIN	3.71	7.12	5.63	5.55	8.77	29.6	72.6	25.9	7.08	3.44	2.14	3.12
(WY)	1964	1964	1959	1961	1963	1964	1963	1958	1988	1955	1955	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1947 - 2001	
ANNUAL TOTAL	47825		51203.02			
ANNUAL MEAN	131		140		128	
HIGHEST ANNUAL MEAN					230	1986
LOWEST ANNUAL MEAN					25.4	1964
HIGHEST DAILY MEAN	2500	Sep 24	3500	Feb 11	5040	Apr 20 1975
LOWEST DAILY MEAN	13	Jul 27	.16	Aug 15	.09	Jul 7 1988
ANNUAL SEVEN-DAY MINIMUM	18	Jul 21	.58	Aug 3	.10	Jul 3 1988
MAXIMUM PEAK FLOW			4990	Feb 10	6700	Feb 2 1968
MAXIMUM PEAK STAGE			(a)18.61	Feb 10	18.62	Feb 2 1968
INSTANTANEOUS LOW FLOW					.08	(b)
ANNUAL RUNOFF (CFSM)	.66		.70		.64	
ANNUAL RUNOFF (INCHES)	8.94		9.57		8.76	
10 PERCENT EXCEEDS	284		250		305	
50 PERCENT EXCEEDS	65		80		42	
90 PERCENT EXCEEDS	21		4.2		7.4	

(a) From floodmark.
(b) Part of each day July 4-10, 14, 15, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ST. CLAIR

04165500 CLINTON RIVER AT MOUNT CLEMENS, MI

LOCATION.--Lat 42°35'45", long 82°54'32" (revised), Macomb County, Hydrologic Unit 04090003, on left bank at downstream side of bridge on Moravian Drive, 0.2 mi downstream from North Branch, and 0.5 mi west of Mount Clemens.

DRAINAGE AREA.--734 mi^2.

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

REVISED RECORDS.--WSP 1084: 1943, 1945-46. WSP 1937: 1935, 1936(M), 1937-39, 1949(M), 1950. WSP 1557: Drainage area. WSP 1727: 1952(M), 1954(M).

GAGE.--Water-stage recorder and acoustic doppler current meter. Datum of gage is 570.43 ft above sea level. May 10, 1934 to Jan. 11, 1939, nonrecording gage at same site and datum. Mar. 15, 1938 to Jan. 3, 1952, auxiliary nonrecording gage 1.6 mi downstream from base gage at same datum. Jan. 4, 1952 to June 27, 2000, auxiliary water-stage recorder on right bank 2.0 mi downstream from base gage at same datum.

REMARKS.--Records fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	601	e371	580	241	1470	1220	507	e361	e1250	e199	105	151
2	559	e382	563	196	1390	1030	530	e314	e1630	e201	100	147
3	575	e375	469	232	1160	967	500	e280	e1730	e226	104	133
4	1450	e369	403	177	885	936	540	e252	e1180	e207	104	131
5	1470	e371	465	267	716	906	545	e222	e935	e191	99	137
6	1300	e396	479	283	668	846	1210	e209	e817	e159	96	141
7	944	e565	424	227	623	796	1410	e210	e735	e145	97	125
8	782	518	461	293	648	764	1110	e303	e626	e140	104	e288
9	690	622	415	316	3320	737	1120	e270	e549	e138	110	e969
10	683	1820	329	259	10200	712	958	e245	e462	e137	170	e1300
11	676	1340	353	317	7580	772	802	e426	e704	e133	127	e470
12	581	1110	248	341	3450	811	930	e503	e580	e123	109	300
13	497	855	172	347	1970	1300	869	e338	e488	e122	169	254
14	454	799	194	365	1510	1430	745	e294	e436	e119	128	236
15	388	823	351	541	1480	1230	628	e309	e440	e116	126	204
16	e500	717	681	923	1210	1030	644	e582	e791	e124	231	171
17	e385	634	1540	950	1050	985	556	e510	e566	e120	318	167
18	e315	564	1000	858	876	918	511	e629	e454	e118	158	166
19	e300	498	823	826	831	863	488	e639	e396	e115	655	705
20	e338	473	726	714	809	763	587	e535	e530	e122	422	1160
21	e393	508	666	518	760	758	823	e636	e420	e454	244	617
22	e397	484	573	470	697	725	1150	e1430	e679	e326	196	602
23	e404	451	490	408	666	700	e904	e1500	e502	e167	220	396
24	e853	439	417	372	633	676	e833	e1020	e450	e134	189	680
25	e719	422	333	350	3510	626	e707	e891	e366	e153	176	435
26	e561	759	249	334	4210	600	e596	e923	e310	e212	213	597
27	e663	782	317	342	2940	600	e521	e890	e275	e139	239	443
28	e503	688	305	333	1720	475	e487	e1320	e260	106	177	355
29	e379	578	254	306	—	438	e425	e1970	e236	106	148	334
30	e339	548	364	926	—	458	e384	e1460	e210	137	144	315
31	e333	—	270	1480	—	479	—	e1060	—	112	154	—
TOTAL	19032	19261	14914	14512	56982	25551	22020	20531	19007	5001	5632	12129
MEAN	614	642	481	468	2035	824	734	662	634	161	182	404
MAX	1470	1820	1540	1480	10200	1430	1410	1970	1730	454	655	1300
MIN	300	369	172	177	623	438	384	209	210	106	96	125
CFSM	.84	.87	.66	.64	2.77	1.12	1.00	.90	.86	.22	.25	.55
IN.	.96	.98	.76	.74	2.89	1.29	1.12	1.04	.96	.25	.29	.61

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 2001, BY WATER YEAR (WY)

MEAN	316	420	532	556	771	1129	1046	691	487	305	258	284
MAX	1550	1492	1615	1739	2407	2255	3090	2747	1543	865	907	1144
(WY)	1982	1986	1968	1993	1938	1982	1947	1943	1989	1969	2000	1975
MIN	64.1	79.0	84.3	93.9	118	263	249	164	52.9	50.9	51.7	52.5
(WY)	1935	1945	1945	1945	1940	1964	1946	1958	1934	1934	1934	1941

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1934 - 2001	
ANNUAL TOTAL	242555		234572			
ANNUAL MEAN	663		643		567	
HIGHEST ANNUAL MEAN					929	1974
LOWEST ANNUAL MEAN					230	1964
HIGHEST DAILY MEAN	4220	Apr 21	10200	Feb 10	19200	Apr 6 1947
LOWEST DAILY MEAN	135	Sep 8	96	Aug 6	25	Aug 24 1934
ANNUAL SEVEN-DAY MINIMUM	161	Sep 2	101	Aug 2	28	Aug 22 1934
MAXIMUM PEAK FLOW			12600	Feb 10	21200	Apr 6 1947
MAXIMUM PEAK STAGE			16.59	Feb 10	(a)23.55	Apr 6 1947
ANNUAL RUNOFF (CFSM)	.90		.88		.77	
ANNUAL RUNOFF (INCHES)	12.29		11.89		10.49	
10 PERCENT EXCEEDS	1460		1190		1200	
50 PERCENT EXCEEDS	430		487		330	
90 PERCENT EXCEEDS	180		141		120	

(a) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166000 RIVER ROUGE AT BIRMINGHAM, MI

LOCATION.--Lat 42°32'45", long 83°13'25", in NW1/4 sec.36, T.2 N., R.10 E., Oakland County, Hydrologic Unit 04090004, on left bank 25 ft downstream from mouth of Quarton Lake outlet, and 100 ft upstream from bridge on Maple Road in Birmingham.

DRAINAGE AREA.--33.3 mi^2. Prior to water year 1971, drainage area was 36.9 mi^2. An area of 3.6 mi^2 noncontributing since then.

PERIOD OF RECORD.--June 1950 to current year.

REVISED RECORDS.--WSP 1387: 1951-52(M). WSP 1557: Drainage area.

GAGE.--Water-stage recorder. Concrete control since July 27, 1962. Datum of gage is 715.94 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Occasional regulation by Quarton Lake upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	14	17	e14	50	41	23	15	59	9.2	5.9	6.0
2	20	14	16	e14	36	39	26	15	98	8.4	5.8	5.6
3	19	14	15	e13	27	38	24	15	67	11	5.9	5.5
4	69	13	14	e13	24	37	22	14	45	14	5.6	5.9
5	35	13	14	e14	24	34	20	13	37	14	5.0	5.5
6	32	12	13	e15	24	32	74	13	34	9.9	4.8	5.3
7	24	15	13	e14	22	31	61	13	32	8.8	4.5	5.7
8	22	16	e12	e14	25	30	39	15	28	9.1	4.5	13
9	21	21	e12	e14	376	30	33	14	26	8.9	4.3	96
10	20	51	e11	e15	335	28	30	12	29	8.8	6.3	74
11	19	23	e10	e16	87	33	27	22	38	8.5	6.2	21
12	18	18	e9.8	e16	56	34	41	25	27	7.5	5.0	14
13	18	21	e9.5	17	47	71	28	15	23	7.2	4.5	11
14	17	23	e10	18	50	48	24	13	21	7.1	4.1	9.0
15	16	26	e11	23	53	40	23	16	31	6.9	3.9	8.4
16	31	22	21	32	43	39	22	44	49	6.8	9.6	8.1
17	18	19	54	30	38	39	20	23	25	6.7	14	8.4
18	16	17	43	26	32	37	19	26	22	6.4	12	8.1
19	13	16	35	23	31	36	18	21	21	6.5	69	94
20	12	15	28	19	31	34	23	14	25	7.5	29	48
21	12	14	22	17	31	32	56	158	23	12	13	38
22	12	14	e20	16	30	30	54	252	36	10	11	33
23	11	13	e19	e15	29	28	42	55	24	9.2	12	29
24	38	13	e18	e15	40	28	34	41	19	8.9	9.5	53
25	23	14	e16	e14	386	25	27	41	14	8.3	8.2	23
26	17	23	e15	e14	111	24	25	39	12	12	11	34
27	23	25	e15	e15	60	23	23	55	11	8.1	15	20
28	17	21	e15	e14	48	23	19	82	11	6.8	9.3	15
29	17	18	e14	15	—	23	16	95	10	8.4	7.3	13
30	15	18	e16	53	—	22	15	50	9.4	7.1	6.6	11
31	15	—	e15	68	—	22	—	37	—	6.6	6.5	—
TOTAL	659	556	553.3	616	2146	1031	908	1263	906.4	270.6	319.3	721.5
MEAN	21.3	18.5	17.8	19.9	76.6	33.3	30.3	40.7	30.2	8.73	10.3	24.0
MAX	69	51	54	68	386	71	74	252	98	14	69	96
MIN	11	12	9.5	13	22	22	15	12	9.4	6.4	3.9	5.3
CFSM	.64	.56	.54	.60	2.30	1.00	.91	1.22	.91	.26	.31	.72
IN.	.74	.62	.62	.69	2.40	1.15	1.01	1.41	1.01	.30	.36	.81

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 2001, BY WATER YEAR (WY)

MEAN	12.3	16.5	20.1	20.0	25.9	39.0	36.1	26.9	20.5	13.6	11.3	11.9
MAX	50.7	47.7	51.5	56.0	76.6	82.5	63.6	98.1	84.0	48.2	39.6	47.1
(WY)	1982	1993	1988	1993	2001	1982	1974	1956	1989	1968	2000	2000
MIN	1.48	2.11	1.88	2.18	2.21	7.59	10.4	5.82	4.33	1.42	1.58	1.42
(WY)	1965	1965	1964	1963	1963	1964	1963	1958	1966	1966	1954	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1950 - 2001	
ANNUAL TOTAL	10314.1		9950.1			
ANNUAL MEAN	28.2		27.3		(a)21.2	
HIGHEST ANNUAL MEAN					35.7	1968
LOWEST ANNUAL MEAN					4.55	1964
HIGHEST DAILY MEAN	405	Jun 25	386	Feb 25	902	Jun 26 1968
LOWEST DAILY MEAN	7.9	Jul 26	3.9	Aug 15	.20	Jul 31 1964
ANNUAL SEVEN-DAY MINIMUM	9.5	Jul 21	4.9	Aug 9	.34	Jul 27 1964
MAXIMUM PEAK FLOW			741	Feb 9	1390	Jun 26 1968
MAXIMUM PEAK STAGE			5.92	Feb 9	8.70	Jun 26 1968
INSTANTANEOUS LOW FLOW			3.4	Aug 14	.10	(b)
ANNUAL RUNOFF (CFSM)	.85		.82		.64	
ANNUAL RUNOFF (INCHES)	11.52		11.12		8.64	
10 PERCENT EXCEEDS	50		48		43	
50 PERCENT EXCEEDS	17		19		13	
90 PERCENT EXCEEDS	10		7.5		3.3	

(a) Annual mean, water years 1951-70, 15.3 ft^3/s, 5.63 in/yr; water years 1971-01, 24.9 ft^3/s, 10.15 in/yr.
(b) Aug. 8, 9, 1963.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166100 RIVER ROUGE AT SOUTHFIELD, MI

LOCATION.--Lat 42°26'52", long 83°17'52", in SW1/4 sec.32, T.1 N., R.10 E., Oakland County, Hydrologic Unit 04090004, on right bank at downstream side of bridge on Beech Road in Southfield.

DRAINAGE AREA.--87.9 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 609.62 ft above sea level (City of Southfield bench mark). Prior to Sept. 30, 1958, nonrecording gage at same site and datum.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	37	44	e40	147	109	70	44	140	21	15	14
2	41	36	38	e40	106	101	85	42	235	19	16	13
3	40	34	36	e38	85	98	74	39	186	21	19	13
4	180	33	35	e38	74	94	69	36	117	26	14	12
5	109	32	33	e40	68	89	62	34	95	28	12	12
6	102	31	37	e44	70	85	213	32	87	21	11	12
7	69	50	34	e41	63	82	239	32	81	18	10	14
8	57	44	34	e41	73	79	125	56	71	19	9.8	45
9	52	59	33	e41	756	80	137	38	63	19	10	244
10	48	122	33	e44	1310	77	105	34	80	19	21	233
11	46	70	32	e48	296	88	88	51	112	18	13	63
12	43	48	e30	e47	158	87	131	89	76	17	11	33
13	41	53	e28	e50	131	192	92	46	60	16	11	25
14	40	61	e29	e52	132	138	76	36	51	15	9.5	22
15	39	67	e31	e66	151	107	80	50	66	14	8.9	19
16	92	59	e57	e94	117	106	84	177	130	14	26	17
17	59	48	e150	e91	101	110	70	86	65	14	34	16
18	49	42	129	e77	93	103	60	77	58	14	20	16
19	41	39	107	e68	93	100	57	70	49	14	170	203
20	38	38	89	e56	83	93	74	46	65	20	83	166
21	36	35	e68	e50	81	88	137	133	55	23	33	135
22	34	33	e58	e48	79	84	146	617	107	23	34	100
23	34	36	e53	e48	75	79	125	130	62	20	34	54
24	136	32	e50	e46	81	75	103	92	53	19	24	147
25	84	32	e44	e42	947	71	79	104	37	19	20	61
26	55	61	e41	e41	426	66	70	106	31	21	31	107
27	76	70	e42	e44	163	64	64	180	28	18	37	63
28	57	54	e42	e41	124	63	55	221	26	15	23	37
29	44	50	e40	e41	—	64	49	266	24	15	18	29
30	41	56	e45	e140	—	62	46	129	22	43	15	24
31	39	—	e44	e210	—	61	—	95	—	18	15	—
TOTAL	1863	1462	1566	1807	6083	2795	2865	3188	2332	601	808.2	1949
MEAN	60.1	48.7	50.5	58.3	217	90.2	95.5	103	77.7	19.4	26.1	65.0
MAX	180	122	150	210	1310	192	239	617	235	43	170	244
MIN	34	31	28	38	63	61	46	32	22	14	8.9	12
CFSM	.68	.55	.57	.66	2.47	1.03	1.09	1.17	.88	.22	.30	.74
IN.	.79	.62	.66	.76	2.57	1.18	1.21	1.35	.99	.25	.34	.82

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2001, BY WATER YEAR (WY)

MEAN	42.8	57.3	67.1	65.2	84.8	130	117	80.7	67.9	42.0	38.8	41.3
MAX	207	164	178	203	254	327	225	191	241	118	142	147
(WY)	1982	1993	1988	1993	1976	1982	1977	1983	1989	1968	1995	1986
MIN	4.08	7.24	6.92	8.95	9.14	38.9	38.5	19.6	13.7	5.52	3.77	3.37
(WY)	1964	1964	1964	1961	1963	1964	1963	1958	1971	1964	1963	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1958 - 2001	
ANNUAL TOTAL	29425		27319.2			
ANNUAL MEAN	80.4		74.8		69.9	
HIGHEST ANNUAL MEAN					105	1993
LOWEST ANNUAL MEAN					20.4	1964
HIGHEST DAILY MEAN	1120	Jun 25	1310	Feb 10	3210	Jun 26 1968
LOWEST DAILY MEAN	20	Jul 26	8.9	Aug 15	.30	Jul 31 1964
ANNUAL SEVEN-DAY MINIMUM	23	Jul 21	12	Aug 9	.66	Jul 26 1964
MAXIMUM PEAK FLOW			1970	Feb 10	4900	Jun 26 1968
MAXIMUM PEAK STAGE			13.52	Feb 10	19.04	Jun 26 1968
INSTANTANEOUS LOW FLOW			8.5	(a)	.10	Aug 2 1964
ANNUAL RUNOFF (CFSM)	.91		.85		.79	
ANNUAL RUNOFF (INCHES)	12.45		11.56		10.80	
10 PERCENT EXCEEDS	130		134		135	
50 PERCENT EXCEEDS	47		51		39	
90 PERCENT EXCEEDS	29		18		12	

(a) Aug. 15, 16.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166100 RIVER ROUGE AT SOUTHFIELD, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 2001 to current year.
WATER TEMPERATURE: April 1999 to current year.
DISSOLVED OXYGEN: April 1999 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 1,750 microsiemens, July 25, 2001; minimum, 497 microsiemens, Sept. 9, 2001
WATER TEMPERATURE: Maximum, 26.0°C, several days during July 1999 and July, Aug. 2001; minimum, 2.0°C, Nov. 18, 1999.
DISSOLVED OXYGEN: Maximum, 14.6 mg/L, Mar. 30, 2001; minimum, 4.4 mg/L, July 4, 1999, July 21, 2001

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 1,750 microsiemens, July 25; minimum, 497 microsiemens, Sept. 9.
WATER TEMPERATURE: Maximum 26.0°C, several days in July and August; minimum, 4.0°C, Mar. 30, Apr. 2.
DISSOLVED OXYGEN: Maximum, 14.6 mg/L, Mar. 30; minimum, 4.4 mg/L, July 21.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	---	---	---	1360	1090	1140	1270	1160	1200
2	---	---	---	---	---	---	1310	1130	1200	1320	1180	1220
3	---	---	---	---	---	---	1360	1180	1250	1300	1180	1230
4	---	---	---	---	---	---	1300	1200	1230	1350	1200	1240
5	---	---	---	---	---	---	1300	1200	1230	1320	1180	1230
6	---	---	---	---	---	---	1340	1210	1240	1380	1180	1240
7	---	---	---	---	---	---	1380	1230	1270	1400	951	1200
8	---	---	---	---	---	---	1360	1260	1290	1330	746	1160
9	---	---	---	---	---	---	1420	693	1290	817	497	645
10	---	---	---	---	---	---	1480	749	1270	750	547	689
11	---	---	---	---	---	---	1470	1270	1350	860	750	794
12	---	---	---	---	---	---	1340	1260	1290	964	849	897
13	---	---	---	---	---	---	1330	1270	1290	1160	921	959
14	---	---	---	---	---	---	1360	1270	1290	1070	972	1020
15	---	---	---	---	---	---	1420	1260	1300	1070	1010	1040
16	---	---	---	---	---	---	1570	814	1180	1080	1030	1050
17	---	---	---	1500	1340	1380	1240	1040	1130	1090	1040	1060
18	---	---	---	1510	1340	1390	1470	661	1080	1100	1050	1070
19	---	---	---	1460	1350	1380	1090	592	749	1090	535	808
20	---	---	---	1450	815	1280	935	748	863	841	603	774
21	---	---	---	1630	1050	1240	1110	922	975	890	605	770
22	---	---	---	1310	1150	1210	1130	811	1030	830	646	744
23	---	---	---	1360	1260	1300	1140	978	1040	1020	828	895
24	---	---	---	1370	1280	1320	1120	1010	1040	1020	667	749
25	---	---	---	1750	1100	1300	1120	1040	1070	938	819	886
26	---	---	---	1450	1290	1370	1680	925	1110	1060	876	949
27	---	---	---	1380	1220	1270	1270	998	1070	996	874	928
28	---	---	---	1370	1220	1270	1120	966	1020	1080	992	1040
29	---	---	---	1340	842	1240	1250	1040	1090	1180	1080	1120
30	---	---	---	1390	1110	1220	1260	1110	1150	1260	1120	1170
31	---	---	---	1200	1100	1120	1440	1140	1180	---	---	---
MONTH	---	---	---	---	---	---	1680	592	1150	1400	497	993

STREAMS TRIBUTARY TO DETROIT RIVER

04166100 RIVER ROUGE AT SOUTHFIELD, MI–Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.0	12.0	13.0	9.0	8.0	8.5	---	---	---	---	---	---
2	16.0	14.0	15.0	10.0	8.0	9.0	---	---	---	---	---	---
3	16.5	15.0	16.0	11.0	10.0	10.5	---	---	---	---	---	---
4	15.5	14.5	15.0	10.5	8.5	9.5	---	---	---	---	---	---
5	15.0	13.5	14.0	8.5	7.5	8.0	---	---	---	---	---	---
6	13.5	12.0	13.0	8.5	7.0	7.5	---	---	---	---	---	---
7	12.0	10.0	11.0	10.0	8.5	9.0	---	---	---	---	---	---
8	10.0	9.0	9.5	11.0	10.0	10.5	---	---	---	---	---	---
9	9.5	8.5	9.0	12.5	11.0	11.5	---	---	---	---	---	---
10	10.0	8.5	9.5	12.5	10.5	11.5	---	---	---	---	---	---
11	10.5	9.0	10.0	10.5	8.5	9.0	---	---	---	---	---	---
12	10.5	9.0	10.0	8.5	8.0	8.0	---	---	---	---	---	---
13	12.0	10.5	11.5	8.0	7.5	8.0	---	---	---	---	---	---
14	13.5	12.0	12.5	7.5	5.5	6.5	---	---	---	---	---	---
15	13.5	13.0	13.0	---	5.0	---	---	---	---	---	---	---
16	14.0	13.0	13.5	---	---	---	---	---	---	---	---	---
17	13.5	13.0	13.5	---	---	---	---	---	---	---	---	---
18	13.5	13.0	13.0	---	---	---	---	---	---	---	---	---
19	13.0	11.5	12.5	---	---	---	---	---	---	---	---	---
20	13.0	11.5	12.5	---	---	---	---	---	---	---	---	---
21	13.5	12.0	12.5	---	---	---	---	---	---	---	---	---
22	13.0	11.5	12.5	---	---	---	---	---	---	---	---	---
23	13.0	11.0	12.0	---	---	---	---	---	---	---	---	---
24	14.5	13.0	14.0	---	---	---	---	---	---	---	---	---
25	15.0	14.0	14.5	---	---	---	---	---	---	---	---	---
26	16.0	14.5	15.0	---	---	---	---	---	---	---	---	---
27	16.0	15.0	15.5	---	---	---	---	---	---	---	---	---
28	15.5	11.5	13.5	---	---	---	---	---	---	---	---	---
29	11.5	9.5	10.0	---	---	---	---	---	---	---	---	---
30	9.5	8.0	9.0	---	---	---	---	---	---	---	---	---
31	9.0	7.5	8.5	---	---	---	---	---	---	---	---	---
MONTH	16.5	7.5	12.4	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	6.0	5.0	5.0	17.5	14.0	16.0
2	---	---	---	---	---	---	7.5	4.0	6.0	19.5	16.0	18.0
3	---	---	---	---	---	---	8.5	7.0	7.5	20.5	17.0	19.0
4	---	---	---	---	---	---	9.5	6.0	8.0	20.5	17.5	19.0
5	---	---	---	---	---	---	10.0	7.0	8.5	18.5	16.0	17.0
6	---	---	---	---	---	---	10.5	8.5	9.5	16.5	14.5	15.5
7	---	---	---	---	---	---	10.5	9.0	10.0	16.5	14.5	15.5
8	---	---	---	---	---	---	14.0	10.5	12.0	17.5	15.5	16.5
9	---	---	---	---	---	---	14.0	10.0	11.5	18.5	15.5	17.0
10	---	---	---	---	---	---	10.0	9.5	9.5	17.0	15.5	16.5
11	---	---	---	---	---	---	10.5	9.5	10.0	18.0	16.5	17.0
12	---	---	---	---	---	---	14.0	10.5	12.0	17.5	15.0	16.0
13	---	---	---	---	---	---	13.5	11.0	12.5	15.0	12.5	14.0
14	---	---	---	---	---	---	13.0	10.5	12.0	15.0	13.0	14.0
15	---	---	---	---	---	---	11.5	9.0	10.0	15.0	14.0	14.0
16	---	---	---	---	---	---	9.0	7.5	8.5	15.0	13.5	14.0
17	---	---	---	---	---	---	8.5	6.0	7.0	17.5	15.0	16.0
18	---	---	---	---	---	---	9.5	6.0	7.5	17.5	16.5	17.0
19	---	---	---	---	---	---	11.5	7.5	9.5	18.0	16.0	17.0
20	---	---	---	---	---	---	10.5	10.0	10.0	18.0	16.0	17.0
21	---	---	---	---	---	---	13.0	9.5	10.5	19.0	17.0	17.5
22	---	---	---	---	---	---	14.5	12.5	13.5	18.5	17.0	18.0
23	---	---	---	---	---	---	17.0	14.0	15.5	17.0	15.0	15.5
24	---	---	---	---	---	---	17.0	13.0	14.5	15.0	14.5	14.5
25	---	---	---	---	---	---	14.0	11.0	12.5	14.5	13.5	14.0
26	---	---	---	---	---	---	14.0	11.0	12.5	14.0	13.0	13.5
27	---	---	---	---	---	---	16.5	13.0	14.5	14.0	13.5	13.5
28	---	---	---	---	---	---	15.0	12.0	13.5	15.5	13.5	14.0
29	---	---	---	5.5	---	---	15.0	11.0	13.0	16.0	15.0	15.0
30	---	---	---	6.5	4.0	5.5	16.0	12.0	14.0	15.0	13.5	14.5
31	---	---	---	6.5	5.5	6.0	---	---	---	15.0	13.5	14.5
MONTH	---	---	---	---	---	---	17.0	4.0	10.7	20.5	12.5	15.8

STREAMS TRIBUTARY TO DETROIT RIVER

04166100 RIVER ROUGE AT SOUTHFIELD, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.0	14.0	14.5	23.5	20.0	22.0	24.0	21.0	22.5	20.5	18.0	19.0
2	14.5	13.5	14.0	20.0	17.5	18.5	23.5	22.0	22.5	18.5	16.5	18.0
3	14.0	13.5	13.5	19.0	17.0	18.0	24.5	22.5	23.5	19.0	16.5	18.0
4	14.5	13.5	14.0	22.0	18.5	19.5	24.0	21.5	23.0	20.0	18.5	19.0
5	14.5	14.0	14.0	21.0	19.0	20.0	23.5	20.5	22.0	19.0	17.0	18.0
6	14.5	14.5	14.5	19.5	17.0	18.5	24.0	21.0	22.5	18.0	16.0	17.0
7	16.0	14.0	15.0	19.0	18.0	18.5	25.0	22.5	23.5	22.0	17.0	18.5
8	17.0	15.0	16.0	22.0	18.5	20.0	26.0	23.5	25.0	22.5	19.5	21.0
9	18.0	15.5	16.5	22.5	20.0	21.0	26.0	23.5	25.0	23.0	21.0	22.0
10	19.0	16.5	17.5	23.5	20.5	22.0	25.0	23.0	24.0	22.5	20.0	21.0
11	20.0	18.0	19.0	22.5	20.0	21.0	23.0	21.0	22.0	20.0	18.5	19.0
12	21.0	19.5	20.0	21.0	18.5	20.0	22.0	21.0	21.5	19.0	17.0	18.0
13	22.0	19.5	21.0	20.5	18.0	19.5	22.0	20.5	21.5	18.5	16.5	18.0
14	23.0	20.5	22.0	21.0	18.0	19.5	21.0	18.5	20.0	16.5	15.0	15.5
15	24.0	21.5	23.0	21.5	18.5	20.0	22.0	17.5	19.0	15.0	14.0	14.5
16	23.5	22.0	23.0	22.5	20.0	21.5	20.5	19.0	19.5	15.0	13.0	14.0
17	23.0	21.5	22.0	22.5	20.5	21.5	20.0	19.0	19.5	15.5	13.5	14.5
18	21.5	20.0	20.5	23.0	21.0	22.0	20.5	18.5	19.5	17.0	15.0	16.0
19	23.0	20.0	21.5	23.5	21.5	22.5	20.5	19.5	20.0	18.5	16.5	17.5
20	22.0	21.0	21.5	24.0	21.5	22.5	20.0	19.5	19.5	18.0	17.0	17.5
21	21.0	18.0	19.5	23.0	21.5	22.5	20.0	18.5	19.5	17.0	16.0	16.5
22	19.0	17.5	18.0	24.5	21.5	23.0	19.5	18.5	19.0	16.5	15.5	16.0
23	20.0	18.0	19.0	25.0	23.0	24.0	20.0	19.0	19.5	17.0	15.5	16.0
24	21.0	18.5	19.5	26.0	23.5	24.5	21.0	19.5	20.0	17.5	14.5	16.0
25	21.0	18.5	20.0	25.0	21.0	23.0	21.5	19.5	20.5	14.5	11.5	13.0
26	21.5	19.5	20.5	22.0	20.0	21.0	22.0	20.5	21.0	11.5	11.0	11.5
27	22.0	20.0	21.0	21.0	18.5	20.0	21.5	20.0	21.0	12.0	11.5	12.0
28	23.0	21.0	22.0	21.0	18.0	20.0	22.0	20.5	21.0	13.5	12.0	12.5
29	24.0	21.5	22.5	22.5	19.5	21.0	21.0	19.0	20.0	13.5	12.5	13.0
30	24.0	22.0	23.0	22.0	20.5	21.5	21.0	18.5	20.0	13.5	12.0	13.0
31	---	---	---	23.5	21.0	22.0	21.0	20.0	20.5	---	---	---
MONTH	24.0	13.5	18.9	26.0	17.0	21.0	26.0	17.5	21.2	23.0	11.0	16.5

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.1	8.3	8.7	11.1	9.7	10.3	---	---	---	---	---	---
2	8.5	7.8	8.2	10.9	9.2	10.1	---	---	---	---	---	---
3	8.6	7.7	8.1	10.3	8.5	9.2	---	---	---	---	---	---
4	8.2	7.8	8.0	11.0	8.7	9.7	---	---	---	---	---	---
5	8.4	7.8	8.1	11.5	9.5	10.3	---	---	---	---	---	---
6	8.7	8.3	8.5	11.9	9.8	10.7	---	---	---	---	---	---
7	9.6	8.7	9.2	10.4	8.9	9.5	---	---	---	---	---	---
8	10.0	9.5	9.8	10.9	8.5	9.5	---	---	---	---	---	---
9	10.4	9.9	10.1	9.2	7.8	8.6	---	---	---	---	---	---
10	10.3	9.8	10.0	9.1	7.8	8.5	---	---	---	---	---	---
11	10.4	9.7	10.0	10.8	9.0	9.9	---	---	---	---	---	---
12	10.5	9.6	10.0	10.7	9.7	10.2	---	---	---	---	---	---
13	10.6	9.1	9.7	10.5	9.9	10.1	---	---	---	---	---	---
14	10.1	8.6	9.2	11.2	9.9	10.5	---	---	---	---	---	---
15	9.1	8.3	8.6	11.5	10.6	---	---	---	---	---	---	---
16	8.7	7.7	8.1	---	---	---	---	---	---	---	---	---
17	9.1	7.9	8.3	---	---	---	---	---	---	---	---	---
18	9.2	8.2	8.5	---	---	---	---	---	---	---	---	---
19	9.4	8.2	8.7	---	---	---	---	---	---	---	---	---
20	9.1	7.8	8.5	---	---	---	---	---	---	---	---	---
21	8.6	7.5	8.0	---	---	---	---	---	---	---	---	---
22	9.1	7.9	8.4	---	---	---	---	---	---	---	---	---
23	9.3	8.1	8.6	---	---	---	---	---	---	---	---	---
24	8.3	6.9	7.6	---	---	---	---	---	---	---	---	---
25	7.9	7.1	7.6	---	---	---	---	---	---	---	---	---
26	8.3	7.3	7.7	---	---	---	---	---	---	---	---	---
27	7.9	7.2	7.5	---	---	---	---	---	---	---	---	---
28	8.5	6.9	7.7	---	---	---	---	---	---	---	---	---
29	9.9	8.4	9.2	---	---	---	---	---	---	---	---	---
30	10.5	9.4	9.9	---	---	---	---	---	---	---	---	---
31	11.0	9.6	10.2	---	---	---	---	---	---	---	---	---
MONTH	11.0	6.9	8.7	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO DETROIT RIVER

04166100 RIVER ROUGE AT SOUTHFIELD, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	13.0	11.2	12.1	---	7.8	---
2	---	---	---	---	---	---	14.2	11.3	12.6	10.6	6.9	8.5
3	---	---	---	---	---	---	13.1	10.2	11.6	10.4	6.7	8.2
4	---	---	---	---	---	---	13.4	10.2	11.6	9.6	6.4	7.8
5	---	---	---	---	---	---	12.7	9.6	10.9	10.3	6.8	8.4
6	---	---	---	---	---	---	9.9	8.0	8.8	11.1	7.6	9.1
7	---	---	---	---	---	---	8.7	7.9	8.3	10.8	7.8	9.0
8	---	---	---	---	---	---	8.3	6.5	7.6	8.6	6.5	7.7
9	---	---	---	---	---	---	7.9	5.8	6.8	9.7	7.1	8.1
10	---	---	---	---	---	---	8.6	7.4	7.9	9.3	7.1	8.0
11	---	---	---	---	---	---	9.2	7.7	8.3	8.4	6.6	7.6
12	---	---	---	---	---	---	8.2	7.5	7.9	8.5	6.6	7.7
13	---	---	---	---	---	---	9.6	7.4	8.4	10.2	8.2	9.1
14	---	---	---	---	---	---	9.9	7.5	8.6	10.6	8.7	9.4
15	---	---	---	---	---	---	9.8	8.4	9.0	9.0	8.4	8.7
16	---	---	---	---	---	---	11.3	9.2	10.1	9.6	8.8	9.3
17	---	---	---	---	---	---	12.5	10.0	11.1	9.5	8.5	9.1
18	---	---	---	---	---	---	12.7	10.6	11.5	9.1	8.1	8.4
19	---	---	---	---	---	---	12.5	10.1	11.1	9.1	8.1	8.5
20	---	---	---	---	---	---	10.3	9.4	9.7	9.2	8.3	8.7
21	---	---	---	---	---	---	10.1	8.7	9.5	8.5	6.8	8.0
22	---	---	---	---	---	---	9.5	8.4	9.0	8.0	6.6	7.3
23	---	---	---	---	---	---	9.7	8.0	8.7	8.8	8.0	8.5
24	---	---	---	---	---	---	10.7	7.7	9.1	9.1	8.6	8.9
25	---	---	---	---	---	---	11.9	9.4	10.5	9.6	9.1	9.3
26	---	---	---	---	---	---	12.2	9.5	10.7	9.9	9.3	9.6
27	---	---	---	---	---	---	11.8	9.1	10.2	9.8	9.4	9.6
28	---	---	---	---	---	---	---	---	---	10.0	9.1	9.8
29	---	---	---	13.7	---	---	---	---	---	9.5	9.0	9.3
30	---	---	---	14.6	11.7	13.0	---	---	---	9.9	8.6	9.4
31	---	---	---	13.9	11.1	12.4	---	---	---	9.6	9.0	9.3
MONTH	---	---	---	---	---	---	---	---	---	---	6.4	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.2	8.9	9.0	7.4	6.5	6.9	9.4	6.4	7.5	8.8	7.2	7.9
2	9.7	8.9	9.3	8.2	7.2	7.7	8.7	6.3	7.2	9.1	7.8	8.3
3	9.8	9.3	9.6	8.2	7.5	7.8	8.6	5.8	6.9	9.2	7.8	8.3
4	9.8	9.4	9.6	7.8	7.0	7.3	9.4	6.1	7.3	9.2	7.4	8.1
5	9.7	9.4	9.6	---	---	---	10.1	6.3	7.7	9.6	7.9	8.6
6	9.6	9.3	9.4	---	---	---	10.2	6.2	7.6	10.1	8.2	8.9
7	9.7	9.1	9.5	---	---	---	10.0	6.0	7.5	9.7	7.7	8.5
8	9.4	8.9	9.2	---	---	---	9.5	5.9	7.0	7.7	5.8	6.7
9	9.0	8.5	8.9	---	---	---	9.1	5.6	6.8	7.5	6.4	6.8
10	8.7	7.1	8.3	---	---	---	6.8	5.0	5.7	7.4	6.8	7.2
11	7.9	6.9	7.6	---	6.9	---	8.4	5.1	6.7	7.9	7.4	7.7
12	7.8	7.4	7.5	8.7	6.8	7.7	8.4	6.5	7.2	8.1	7.7	7.9
13	7.8	7.1	7.5	9.5	7.6	8.5	8.8	6.1	7.4	8.1	7.7	7.9
14	7.6	7.1	7.3	10.3	8.3	9.1	9.4	6.8	7.9	8.8	8.1	8.5
15	7.6	5.9	7.0	---	8.7	---	10.0	7.4	8.3	9.2	8.6	8.9
16	6.9	5.6	6.5	---	6.9	---	8.3	6.8	7.6	9.3	8.8	9.0
17	7.2	6.7	7.0	9.0	6.5	7.4	8.5	6.8	7.7	9.4	8.8	9.0
18	7.6	7.1	7.3	9.5	6.6	7.7	9.2	7.5	8.2	9.1	8.4	8.8
19	7.6	7.2	7.4	9.6	6.5	7.6	8.3	7.5	7.9	8.4	7.8	8.1
20	7.4	6.6	7.0	9.1	6.2	7.1	8.7	8.0	8.4	8.2	7.8	8.0
21	8.2	7.4	7.7	7.4	4.4	6.1	9.2	8.3	8.7	8.9	8.0	8.5
22	8.4	7.6	8.0	8.4	5.7	6.9	9.1	8.0	8.6	8.8	8.5	8.7
23	7.8	7.5	7.6	8.3	6.1	6.9	8.8	7.9	8.5	8.9	8.5	8.7
24	7.9	7.2	7.6	8.3	5.5	6.6	9.0	8.3	8.6	9.1	8.3	8.6
25	8.1	7.2	7.5	7.1	5.8	6.4	9.1	7.9	8.6	9.9	9.1	9.5
26	7.9	7.2	7.6	8.3	5.9	7.0	8.4	6.2	8.0	10.3	9.9	10.2
27	7.8	7.2	7.5	9.2	6.9	7.8	---	---	---	10.2	9.9	10.1
28	7.8	7.0	7.3	10.0	7.2	8.2	---	---	---	10.0	9.6	9.9
29	7.7	6.9	7.2	9.9	7.0	8.1	8.6	---	---	9.9	9.6	9.7
30	7.4	6.6	6.9	7.5	6.3	6.9	8.6	7.4	7.8	10.0	9.6	9.8
31	---	---	---	9.1	6.4	7.3	8.1	7.1	7.5	---	---	---
MONTH	9.8	5.6	8.0	---	---	---	---	---	---	10.3	5.8	8.6

STREAMS TRIBUTARY TO DETROIT RIVER

04166200 EVANS DITCH AT SOUTHFIELD, MI

LOCATION.--Lat 42°27'28", long 83°16'03", in SE1/4 sec.28, T.1 N., R.10 E., Oakland County, Hydrologic Unit 04090004, on right bank 70 ft upstream from bridge on Nine Mile Road in Southfield, 1.6 mi upstream from mouth.

DRAINAGE AREA.--9.49 mi^2.

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

REVISED RECORDS.--WSP 1912: 1963.

GAGE.--Water-stage recorder. Datum of gage is 615.07 ft above sea level (City of Southfield bench mark).

REMARKS.--Records good. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	2.0	2.1	2.5	12	8.4	6.3	3.3	22	1.8	1.3	1.1
2	2.3	2.0	1.8	2.3	8.2	7.9	4.7	3.1	50	1.7	1.6	1.0
3	2.3	2.0	1.7	2.2	4.8	7.3	4.4	3.1	14	3.5	1.4	1.0
4	40	2.0	1.7	2.3	4.4	6.7	3.5	2.9	8.4	4.0	1.3	.92
5	11	1.9	1.8	3.4	5.0	6.6	3.5	2.7	5.6	2.1	1.1	.79
6	7.4	1.9	1.8	3.5	5.7	6.5	42	2.6	4.7	1.5	1.2	1.0
7	4.2	7.0	1.5	3.0	4.6	6.1	33	2.6	4.1	1.5	1.3	2.7
8	4.1	1.9	2.0	2.7	8.3	5.9	10	7.8	3.4	1.7	1.7	12
9	3.4	10	1.7	2.4	175	5.9	25	2.6	2.8	1.6	5.2	32
10	3.1	12	1.5	2.4	43	5.5	10	2.4	12	2.3	9.4	11
11	3.2	2.4	1.6	2.5	14	8.1	8.6	6.7	8.1	1.4	1.7	1.5
12	2.9	2.0	1.7	2.7	11	8.6	15	5.8	2.8	1.3	1.3	1.2
13	2.9	4.9	1.7	2.9	10	24	7.3	2.3	2.4	1.3	1.3	1.2
14	3.0	2.6	2.0	3.2	16	9.1	6.1	2.2	2.2	1.3	1.6	1.2
15	3.0	4.2	2.1	9.1	13	7.3	9.6	10	17	1.3	1.2	1.0
16	10	2.3	15	12	10	9.3	7.4	25	5.4	1.3	12	1.0
17	2.8	2.1	19	9.0	8.0	10	5.4	3.9	2.8	1.3	2.4	1.0
18	2.6	1.8	9.1	6.2	6.8	8.2	4.8	6.1	5.6	1.3	8.4	1.0
19	2.7	1.9	6.1	4.5	6.6	7.4	4.5	3.8	3.5	1.3	55	65
20	2.5	1.7	4.4	3.3	6.7	6.7	9.6	2.4	11	49	3.5	4.1
21	2.6	1.8	4.1	2.7	6.2	e6.1	23	101	11	5.0	2.0	23
22	2.5	1.7	3.3	2.4	5.4	e5.6	9.9	16	9.2	2.3	5.0	3.1
23	2.7	1.7	2.6	2.4	5.1	5.2	8.4	6.5	2.9	2.1	2.2	6.9
24	29	1.7	2.8	2.4	29	4.9	7.2	8.6	2.4	1.9	1.5	5.8
25	3.2	1.7	2.5	2.1	126	4.7	5.0	9.6	2.3	4.5	1.4	2.7
26	2.5	7.5	2.4	2.1	15	4.4	4.6	8.0	2.2	2.1	6.8	10
27	3.6	4.9	2.4	2.6	12	4.3	4.3	20	2.1	1.6	2.2	2.4
28	2.3	2.7	2.4	2.1	9.6	4.3	3.6	24	2.0	1.4	1.4	1.8
29	2.1	4.2	2.3	2.2	---	4.2	3.5	27	2.3	4.9	1.3	1.5
30	2.1	3.4	2.5	27	---	4.1	3.4	7.5	2.3	7.0	1.1	1.5
31	2.1	---	2.7	22	---	4.0	---	5.5	---	1.5	1.2	---
TOTAL	170.5	99.9	110.3	152.1	581.4	217.3	293.6	335.0	226.5	116.8	140.0	200.41
MEAN	5.50	3.33	3.56	4.91	20.8	7.01	9.79	10.8	7.55	3.77	4.52	6.68
MAX	40	12	19	27	175	24	42	101	50	49	55	65
MIN	2.1	1.7	1.5	2.1	4.4	4.0	3.4	2.2	2.0	1.3	1.1	.79
CFSM	.58	.35	.37	.52	2.19	.74	1.03	1.14	.80	.40	.48	.70
IN.	.67	.39	.43	.60	2.28	.85	1.15	1.31	.89	.46	.55	.79

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2001, BY WATER YEAR (WY)

MEAN	5.87	7.51	8.57	7.44	9.98	13.9	13.5	9.54	9.82	7.31	7.16	6.63
MAX	23.3	19.8	25.4	26.7	32.1	32.6	27.4	27.1	30.5	23.7	22.4	20.0
(WY)	1982	1993	1968	1974	1971	1974	1977	1968	1968	1992	1995	1986
MIN	.44	1.13	.71	.49	.79	3.71	3.27	2.35	1.68	.73	1.35	.58
(WY)	1964	1964	1964	1963	1963	2000	1971	1962	1959	1962	1960	1965

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1958 - 2001	
ANNUAL TOTAL	3644.3		2643.81			
ANNUAL MEAN	9.96		7.24		8.93	
HIGHEST ANNUAL MEAN					16.9	1968
LOWEST ANNUAL MEAN					3.12	1963
HIGHEST DAILY MEAN	273	Apr 20	175	Feb 9	442	Oct 1 1981
LOWEST DAILY MEAN	1.2	Jul 26	.79	Sep 5	.00	(a)
ANNUAL SEVEN-DAY MINIMUM	1.4	Jul 21	1.0	Aug 31	.27	Dec 15 1963
MAXIMUM PEAK FLOW			500	May 21	(b)1200	Oct 1 1981
MAXIMUM PEAK STAGE			11.43	May 21	(c)15.03	Oct 1 1981
INSTANTANEOUS LOW FLOW			.57	Aug 3		
ANNUAL RUNOFF (CFSM)	1.05		.76		.94	
ANNUAL RUNOFF (INCHES)	14.29		10.36		12.78	
10 PERCENT EXCEEDS	15		12		18	
50 PERCENT EXCEEDS	2.7		3.3		3.4	
90 PERCENT EXCEEDS	1.7		1.4		1.2	

(a) June 13-15, 1986, result of regulation from unknown source.
(b) From rating curve extended above 500 ft^3/s.
(c) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166300 UPPER RIVER ROUGE AT FARMINGTON, MI

LOCATION.--Lat 42°27'52", long 83°22'11", in NW1/4 sec.27, T.1 N., R.9 E., Oakland County, Hydrologic Unit 04090004, on left bank 800 ft downstream from bridge on Shiawassee Road in Farmington.

DRAINAGE AREA.--17.5 mi^2.

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

REVISED RECORDS.--WSP 1912: 1959(M), 1960(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 690.4 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	9.8	12	e9.3	43	25	13	11	23	6.1	5.4	4.3
2	7.9	9.5	10	e9.4	30	22	15	11	44	5.6	5.6	4.0
3	7.6	9.3	9.0	e8.9	e21	20	13	10	39	6.1	6.2	4.1
4	51	8.8	8.8	e9.0	e18	18	12	10	26	7.8	4.4	4.6
5	36	8.4	8.5	e9.3	16	17	11	11	19	6.6	3.3	3.9
6	30	8.1	7.6	e10	16	15	57	9.0	17	4.8	3.2	3.7
7	18	12	7.4	e9.5	14	15	75	9.2	15	4.5	3.0	3.6
8	13	11	7.7	e9.5	17	14	39	18	13	4.9	3.2	9.6
9	11	17	7.3	e9.6	301	13	37	11	11	4.4	3.5	46
10	9.7	43	7.6	e10	292	13	26	9.7	13	4.5	5.0	41
11	8.8	21	7.8	e11	91	17	20	15	18	4.3	3.3	16
12	8.2	15	e7.4	e12	e47	17	23	21	13	4.3	2.8	9.2
13	8.0	16	e7.1	e13	e36	43	17	12	11	4.1	2.8	7.4
14	7.7	15	e7.8	14	e36	31	15	9.3	9.3	4.1	2.5	6.5
15	7.3	18	e10	19	39	23	19	15	e13	3.9	2.4	5.8
16	27	16	22	25	28	21	19	70	e23	3.4	6.4	5.5
17	18	13	39	23	21	22	15	34	e12	3.4	e8.3	5.3
18	17	12	28	19	19	20	13	27	12	3.5	e5.9	5.0
19	13	11	27	17	17	19	14	19	11	e3.8	32	49
20	11	10	23	e14	16	17	19	14	11	e6.4	19	47
21	9.8	9.5	e17	e13	15	16	40	34	13	e6.7	9.8	47
22	8.9	8.9	e14	e11	14	15	45	e110	24	e5.7	11	32
23	8.7	8.2	e13	e10	12	14	37	e30	15	e5.4	11	22
24	50	8.4	e11	e9.5	26	13	26	21	15	e4.9	7.8	29
25	30	8.0	e9.5	e8.6	246	12	19	27	12	e5.4	6.1	16
26	19	15	e9.0	e8.5	83	11	16	28	9.6	e6.1	7.0	27
27	26	16	e9.3	e9.1	46	11	14	55	8.4	e5.6	8.9	20
28	15	14	e9.2	e8.7	30	11	12	58	7.8	e5.7	7.4	14
29	12	13	e9.2	10	—	11	11	52	7.1	7.9	6.0	11
30	11	15	e10	44	—	11	11	28	6.2	21	6.0	9.7
31	10	—	e10	57	—	10	—	20	—	7.6	5.5	—
TOTAL	518.7	399.9	386.2	450.9	1590	537	703	809.2	471.4	178.5	214.7	509.2
MEAN	16.7	13.3	12.5	14.5	56.8	17.3	23.4	26.1	15.7	5.76	6.93	17.0
MAX	51	43	39	57	301	43	75	110	44	21	32	49
MIN	7.3	8.0	7.1	8.5	12	10	11	9.0	6.2	3.4	2.4	3.6
CFSM	.96	.76	.71	.83	3.24	.99	1.34	1.49	.90	.33	.40	.97
IN.	1.10	.85	.82	.96	3.38	1.14	1.49	1.72	1.00	.38	.46	1.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2001, BY WATER YEAR (WY)

MEAN	8.23	11.1	12.6	13.2	18.0	26.6	24.0	16.7	13.9	8.24	7.76	8.45
MAX	42.2	31.3	29.0	39.8	56.8	63.6	42.3	38.7	63.9	24.8	32.2	42.3
(WY)	1982	1993	1991	1974	2001	1982	1977	1983	1989	1992	1998	2000
MIN	1.10	1.69	1.70	2.06	2.20	6.81	9.10	3.46	2.13	1.00	.97	1.00
(WY)	1965	1965	1964	1961	1963	1964	1971	1971	1971	1964	1963	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1958 - 2001	
ANNUAL TOTAL	7378.0		6768.7			
ANNUAL MEAN	20.2		18.5		14.1	
HIGHEST ANNUAL MEAN					22.6	1997
LOWEST ANNUAL MEAN					4.54	1964
HIGHEST DAILY MEAN	381	Jun 25	301	Feb 9	653	Jun 26 1968
LOWEST DAILY MEAN	3.5	Sep 6	2.4	Aug 15	.32	Aug 10 1964
ANNUAL SEVEN-DAY MINIMUM	3.9	Sep 3	3.2	Aug 9	.61	Sep 12 1964
MAXIMUM PEAK FLOW			589	Feb 9	1500	Jun 25 1968
MAXIMUM PEAK STAGE			6.21	Feb 9	8.70	Jun 25 1968
INSTANTANEOUS LOW FLOW					(a).07	Aug 30 1966
ANNUAL RUNOFF (CFSM)	1.15		1.06		.81	
ANNUAL RUNOFF (INCHES)	15.68		14.39		10.97	
10 PERCENT EXCEEDS	38		36		29	
50 PERCENT EXCEEDS	10		12		7.8	
90 PERCENT EXCEEDS	6.1		5.4		2.3	

(a) Result of regulation.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166315 UPPER RIVER ROUGE AT CLARENCEVILLE, MI

LOCATION.--Lat 42°26'48", long 83°20'12", in NW1/4 SW1/4 sec.36, T.1 N., R.9 E., Oakland County, Hydrologic Unit 04090004, on left bank at downstream side of bridge on Middlebelt Road, in Clarenceville.

DRAINAGE AREA.--19.8 mi^2.

PERIOD OF RECORD.--June to September 2001.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June to September 2001.
WATER TEMPERATURE: June to September 2001.

INSTRUMENTATION.--Water-quality monitor, set for 15 minute measurement interval.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 3,850 microsiemens, Sept. 13, 2001; minimum, 468 microsiemens, Sept. 10, 2001.
WATER TEMPERATURE: Maximum, 26.0°C, Aug. 8, 2001; minimum, 11.5°C, Sept. 26, 27, 2001.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	1870	1110	1160	1590	1450	1500	1530	1280	1390
2	---	---	---	1180	889	1110	1450	1430	1440	1420	1330	1370
3	---	---	---	1290	1100	1150	1440	1430	1440	1340	1290	1310
4	---	---	---	1390	1050	1120	1440	1400	1430	1350	1120	1220
5	1210	1180	1190	1480	1040	1110	1400	1340	1370	1200	1170	1190
6	1230	1200	1210	1220	1060	1100	1340	1300	1320	1190	1130	1160
7	1230	1190	1210	1160	1110	1120	1320	1300	1310	1170	1000	1130
8	1260	1180	1210	1170	1110	1140	1330	1300	1310	1380	703	1090
9	1240	1200	1220	1280	1110	1140	1300	1250	1270	935	552	766
10	1240	869	1140	1480	1070	1140	1270	1200	1250	642	468	530
11	1180	954	1060	1210	1050	1130	1290	1180	1240	715	576	656
12	1050	947	993	1220	1090	1120	1230	1210	1210	921	715	787
13	1070	958	1010	1240	1080	1160	1290	1210	1250	3850	919	1080
14	1060	974	1020	2080	1160	1270	1370	1290	1340	2750	1140	1220
15	1360	594	972	2390	1170	1240	1370	1290	1340	1220	1190	1200
16	970	603	692	1220	1160	1210	1380	1300	1340	3490	1200	1300
17	828	604	716	2010	1190	1240	1300	1140	1200	1260	1160	1240
18	1280	761	996	2940	1120	1250	1500	1170	1230	1260	1180	1240
19	1170	604	1010	2270	1120	1210	1500	873	1100	3220	556	1140
20	1260	674	1100	1430	1020	1170	945	866	905	557	524	537
21	1360	796	1140	1810	858	1120	1170	945	1040	1090	530	699
22	1120	801	970	1780	1160	1280	1530	1030	1220	666	554	619
23	1160	975	1080	1330	1230	1260	1420	1170	1290	1100	550	639
24	1230	1030	1150	1300	1260	1280	1170	1110	1140	1060	708	787
25	1180	1070	1120	1420	1270	1330	1330	1140	1220	841	689	712
26	1120	965	1090	1570	1420	1500	2520	1230	1430	1070	828	1020
27	1150	1100	1120	1670	1560	1630	1490	1280	1370	1020	952	996
28	1140	1120	1130	1780	1670	1730	1310	1240	1270	955	782	848
29	1160	1060	1130	1900	1780	1840	1260	1220	1230	786	759	770
30	3230	1110	1280	1880	1800	1840	1440	1220	1320	818	780	798
31	---	---	---	1800	1590	1690	1350	1240	1320	---	---	---
MONTH	---	---	---	2940	858	1280	2520	866	1280	3850	468	981

STREAMS TRIBUTARY TO DETROIT RIVER

04166315 UPPER RIVER ROUGE AT CLARENCEVILLE, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	—	—	—	22.5	19.0	21.5	23.0	21.0	22.0	19.5	17.5	18.5
2	—	—	—	19.0	16.0	17.5	23.0	21.5	22.5	18.5	16.0	17.0
3	—	—	—	18.5	16.5	17.5	24.0	22.0	23.0	19.5	16.0	17.5
4	—	—	—	22.5	18.0	19.0	23.5	21.0	22.5	19.5	18.0	18.5
5	14.0	13.0	13.5	22.5	18.0	19.0	23.0	20.5	21.5	18.5	16.5	17.5
6	14.0	14.0	14.0	19.5	16.0	17.5	24.0	20.5	22.0	18.5	15.5	16.5
7	15.5	13.0	14.0	18.0	17.0	17.5	25.0	22.0	23.5	22.5	17.0	18.5
8	16.0	14.0	15.0	21.5	18.0	19.5	26.0	23.5	24.5	24.5	19.5	21.0
9	17.0	14.5	16.0	22.0	19.5	20.5	25.5	24.0	25.0	23.5	20.5	22.0
10	19.0	15.5	17.0	23.0	20.5	21.5	25.0	22.5	24.0	22.0	19.5	20.5
11	21.5	17.0	18.5	21.5	19.5	20.0	22.5	20.5	22.0	19.5	18.0	18.5
12	20.0	18.5	19.0	20.5	18.0	19.0	22.0	20.5	21.5	19.0	17.0	18.0
13	21.5	18.5	20.0	20.0	17.5	18.5	22.5	20.5	21.5	18.5	16.5	17.5
14	22.0	20.0	21.0	20.5	17.5	19.0	21.0	18.5	20.0	16.5	14.5	15.5
15	25.0	20.5	22.0	21.5	18.0	19.5	20.5	17.5	19.0	15.0	13.5	14.5
16	23.0	20.5	21.5	22.5	19.5	20.5	21.5	18.5	20.0	16.0	13.0	14.5
17	21.5	19.5	20.5	22.5	20.5	21.0	19.5	18.5	19.0	15.5	14.0	15.0
18	20.5	19.0	19.5	23.0	20.5	21.5	22.0	18.5	19.5	17.0	15.5	16.0
19	23.0	19.0	20.5	23.0	21.0	22.0	21.0	19.0	20.0	19.0	16.5	18.0
20	23.0	20.0	20.5	24.5	21.5	22.5	19.5	18.5	19.0	18.0	17.0	17.5
21	20.0	17.5	18.5	23.5	21.5	22.5	19.5	18.0	19.0	17.0	16.0	16.5
22	18.5	16.5	17.5	24.5	21.5	23.0	20.0	18.0	19.0	18.0	15.5	16.5
23	19.5	17.5	18.5	24.5	23.0	23.5	20.0	18.5	19.0	18.0	15.5	16.5
24	20.0	17.5	19.0	25.5	23.0	24.0	20.5	19.0	20.0	17.0	14.0	16.0
25	20.5	18.0	19.0	24.5	21.0	22.5	20.5	19.0	20.0	14.0	12.0	12.5
26	21.0	18.5	19.5	22.0	19.5	20.5	23.5	20.5	21.0	12.0	11.5	11.5
27	21.5	19.5	20.5	20.5	18.0	19.0	21.0	19.5	20.5	14.0	11.5	12.0
28	22.0	20.0	21.0	21.0	18.0	19.5	21.5	20.0	20.5	13.5	12.0	12.5
29	22.5	20.5	21.5	23.0	19.5	21.0	20.5	18.0	19.5	14.0	12.5	13.0
30	23.0	21.0	22.0	23.0	20.0	21.0	20.5	18.0	19.5	13.5	12.0	13.0
31	—	—	—	22.5	20.5	21.5	20.5	19.5	20.0	—	—	—
MONTH	—	—	—	25.5	16.0	20.4	26.0	17.5	21.0	24.5	11.5	16.4

STREAMS TRIBUTARY TO DETROIT RIVER

04166470 UPPER RIVER ROUGE AT DETROIT, MI

LOCATION.--Lat 42°23'38", long 83°16'35", in SW1/4 NE1/4 sec.20, T.1 S., R.8 E., Wayne County, Hydrologic Unit 04090004, on left bank 1,000 ft upstream from bridge on Telegraph Road in Detroit.

DRAINAGE AREA.--67.3 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1997 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	22	37	e26	146	67	35	26	88	12	15	9.4
2	17	24	29	e26	90	61	48	25	175	11	11	8.6
3	17	21	24	e25	60	58	34	23	134	14	16	8.2
4	220	21	21	e25	55	54	29	21	67	16	11	7.5
5	102	24	23	e26	51	51	27	21	51	18	8.2	9.0
6	107	20	22	e28	55	46	181	20	43	11	6.7	7.1
7	57	44	24	e27	50	45	199	19	38	9.6	6.2	13
8	42	33	20	e26	59	42	100	64	32	13	6.4	42
9	33	48	20	e26	565	41	128	30	27	9.9	7.1	213
10	29	103	20	e28	1040	39	94	21	27	13	51	250
11	25	56	19	29	358	51	61	23	51	10	12	56
12	22	37	e19	30	111	52	94	44	31	8.3	8.7	30
13	20	38	e18	33	85	141	61	24	23	7.8	7.5	22
14	21	44	e20	37	98	90	50	20	21	7.5	7.4	20
15	20	52	e27	59	116	61	82	47	51	7.2	6.2	16
16	83	51	75	88	75	61	84	215	71	8.1	39	14
17	41	40	170	78	57	67	55	84	25	6.5	36	14
18	36	31	100	60	51	61	46	104	36	6.9	23	13
19	26	28	67	49	49	54	44	63	35	7.0	135	218
20	22	25	71	32	41	50	63	36	60	12	58	172
21	20	23	51	e30	38	46	125	134	47	18	26	162
22	19	21	e40	27	50	44	116	280	90	11	43	100
23	18	19	e31	23	37	40	96	87	40	7.3	44	50
24	199	20	e29	23	71	36	78	52	32	7.1	22	94
25	84	20	e26	e23	712	33	55	82	23	10	17	41
26	51	59	e24	e24	461	31	46	83	18	16	42	65
27	54	61	e26	24	118	29	39	164	16	9.3	43	49
28	41	44	e26	e23	78	29	33	179	14	7.3	21	32
29	29	40	e25	21	—	29	30	173	14	17	15	24
30	25	51	e29	169	—	28	27	75	14	103	11	21
31	24	—	e29	221	—	27	—	51	—	29	10	—
TOTAL	1518	1120	1162	1366	4777	1564	2160	2290	1394	443.8	765.4	1780.8
MEAN	49.0	37.3	37.5	44.1	171	50.5	72.0	73.9	46.5	14.3	24.7	59.4
MAX	220	103	170	221	1040	141	199	280	175	103	135	250
MIN	14	19	18	21	37	27	27	19	14	6.5	6.2	7.1
CFSM	.73	.55	.56	.65	2.54	.75	1.07	1.10	.69	.21	.37	.88
IN.	.84	.62	.64	.76	2.64	.86	1.19	1.27	.77	.25	.42	.98

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2001, BY WATER YEAR (WY)

MEAN	33.6	27.4	36.8	56.0	94.6	65.2	85.9	66.1	61.8	44.9	60.8	51.9
MAX	49.0	37.3	44.5	83.8	171	132	113	93.7	91.6	85.6	118	107
(WY)	2001	2001	2000	1999	2001	1998	1999	2000	2000	2000	1998	2000
MIN	22.9	19.5	25.7	24.4	35.4	30.2	66.6	45.8	30.3	14.3	24.7	15.8
(WY)	2000	2000	1999	2000	2000	2000	2000	1998	1998	2001	2001	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1998 - 2001	
ANNUAL TOTAL	22344.3		20341.0			
ANNUAL MEAN	61.0		55.7		56.8	
HIGHEST ANNUAL MEAN					62.2	1998
LOWEST ANNUAL MEAN					51.3	1999
HIGHEST DAILY MEAN	859	Sep 11	1040	Feb 10	1180	Feb 18 1998
LOWEST DAILY MEAN	8.7	Jul 27	6.2	Aug 7	6.2	Aug 3 1998
ANNUAL SEVEN-DAY MINIMUM	9.9	Jul 21	7.3	Jul 13	7.1	Jul 29 1998
MAXIMUM PEAK FLOW			1200	Feb 10	1490	Aug 6 1998
MAXIMUM PEAK STAGE			11.87	Feb 10	13.08	Aug 6 1998
INSTANTANEOUS LOW FLOW			5.4	(a)	5.4	(a)
ANNUAL RUNOFF (CFSM)	.91		.83		.84	
ANNUAL RUNOFF (INCHES)	12.35		11.24		11.47	
10 PERCENT EXCEEDS	110		103		114	
50 PERCENT EXCEEDS	28		33		28	
90 PERCENT EXCEEDS	15		11		12	

(a) Aug. 7, 8, 9, 15, 2001.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166470 UPPER RIVER ROUGE AT DETROIT, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 1999 to current year.
DISSOLVED OXYGEN: April 1999 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum recorded, 27.5°C, July 24, Aug. 8, 2001; minimum, 2.5°C, Nov. 18, 1999.
DISSOLVED OXYGEN: Maximum 15.9 mg/L, Mar. 28, 2001; minimum, 0.4 mg/L, July 3, 9, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 27.5°C, July 24, Aug. 8; minimum, 3.5°C, Mar. 29, 30.
DISSOLVED OXYGEN: Maximum, 15.9 mg/L, Mar. 28; minimum, 1.8 mg/L, June 15.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.0	12.0	13.5	10.0	8.0	9.0	---	---	---	---	---	---
2	16.0	14.0	15.0	11.0	8.5	9.5	---	---	---	---	---	---
3	16.5	15.0	15.5	11.5	10.0	10.5	---	---	---	---	---	---
4	16.0	14.5	15.0	10.5	9.0	10.0	---	---	---	---	---	---
5	14.5	13.5	14.0	10.0	8.0	9.0	---	---	---	---	---	---
6	13.5	12.0	13.0	9.5	7.5	8.5	---	---	---	---	---	---
7	12.0	10.5	11.0	11.5	9.0	9.5	---	---	---	---	---	---
8	10.5	9.0	10.0	11.5	10.0	10.5	---	---	---	---	---	---
9	10.0	8.5	9.5	14.0	11.0	12.0	---	---	---	---	---	---
10	11.0	8.5	9.5	13.0	10.5	12.0	---	---	---	---	---	---
11	11.5	9.0	10.0	10.5	9.0	9.5	---	---	---	---	---	---
12	11.5	9.0	10.5	9.0	8.0	8.5	---	---	---	---	---	---
13	12.5	10.5	11.5	8.5	8.0	8.0	---	---	---	---	---	---
14	14.0	11.5	12.5	8.0	6.0	7.0	---	---	---	---	---	---
15	13.5	13.0	13.0	---	5.0	---	---	---	---	---	---	---
16	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
17	14.0	13.5	13.5	---	---	---	---	---	---	---	---	---
18	14.0	13.0	13.5	---	---	---	---	---	---	---	---	---
19	13.5	12.0	13.0	---	---	---	---	---	---	---	---	---
20	14.0	12.0	13.0	---	---	---	---	---	---	---	---	---
21	14.0	12.0	13.0	---	---	---	---	---	---	---	---	---
22	13.5	11.5	12.5	---	---	---	---	---	---	---	---	---
23	13.0	11.5	12.5	---	---	---	---	---	---	---	---	---
24	15.5	13.0	14.5	---	---	---	---	---	---	---	---	---
25	15.5	14.5	15.0	---	---	---	---	---	---	---	---	---
26	16.0	15.0	15.5	---	---	---	---	---	---	---	---	---
27	16.5	15.0	16.0	---	---	---	---	---	---	---	---	---
28	15.5	12.0	13.5	---	---	---	---	---	---	---	---	---
29	12.0	10.0	11.0	---	---	---	---	---	---	---	---	---
30	10.5	8.5	9.5	---	---	---	---	---	---	---	---	---
31	10.0	8.0	9.0	---	---	---	---	---	---	---	---	---
MONTH	16.5	8.0	12.7	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO DETROIT RIVER

04166470 UPPER RIVER ROUGE AT DETROIT, MI—Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	5.5	5.0	5.0	17.5	13.0	15.5
2	—	—	—	—	—	—	8.0	4.5	6.0	19.5	15.5	17.5
3	—	—	—	—	—	—	8.5	6.5	7.5	20.5	16.5	18.5
4	—	—	—	—	—	—	10.0	6.0	8.0	20.5	17.5	18.5
5	—	—	—	—	—	—	10.5	6.5	8.5	18.0	16.0	17.0
6	—	—	—	—	—	—	10.5	8.5	9.5	17.0	14.5	16.0
7	—	—	—	—	—	—	10.5	9.5	10.0	17.0	15.0	16.0
8	—	—	—	—	—	—	14.0	10.5	12.5	17.5	14.0	16.0
9	—	—	—	—	—	—	13.5	9.5	11.5	18.5	15.5	17.0
10	—	—	—	—	—	—	10.0	9.0	9.5	18.0	15.5	17.0
11	—	—	—	—	—	—	10.5	9.0	9.5	18.0	16.5	17.5
12	—	—	—	—	—	—	13.5	10.0	12.0	17.0	14.5	16.0
13	—	—	—	—	—	—	14.5	11.0	12.5	15.5	13.0	14.5
14	—	—	—	—	—	—	13.0	11.0	12.0	15.5	13.0	14.0
15	—	—	—	—	—	—	11.5	8.5	10.0	14.5	13.5	14.0
16	—	—	—	—	—	—	9.0	7.5	8.0	14.0	13.5	14.0
17	—	—	—	—	—	—	8.5	6.5	7.0	17.0	14.0	15.5
18	—	—	—	—	—	—	9.5	5.5	7.5	17.0	16.5	16.5
19	—	—	—	—	—	—	11.5	7.0	9.5	18.5	16.0	17.0
20	—	—	—	—	—	—	10.0	9.5	10.0	18.5	16.0	17.0
21	—	—	—	—	—	—	13.0	9.5	11.0	19.5	16.5	17.5
22	—	—	—	—	—	—	14.5	13.0	14.0	18.5	16.5	17.5
23	—	—	—	—	—	—	17.0	14.0	15.5	16.5	15.0	15.5
24	—	—	—	—	—	—	16.0	13.0	14.5	15.0	14.0	14.5
25	—	—	—	—	—	—	14.0	11.0	12.5	15.0	13.5	14.0
26	—	—	—	—	—	—	14.5	10.5	12.5	14.0	13.5	13.5
27	—	—	—	—	—	—	16.0	12.5	14.0	13.5	13.0	13.5
28	—	—	—	5.0	—	—	15.5	12.0	13.5	14.5	13.5	14.0
29	—	—	—	5.0	3.5	4.5	15.0	11.0	13.0	15.0	14.5	15.0
30	—	—	—	7.0	3.5	5.5	16.5	11.5	14.0	15.0	13.5	14.0
31	—	—	—	6.5	5.0	6.0	—	—	—	15.0	13.0	14.0
MONTH	—	—	—	—	—	—	17.0	4.5	10.7	20.5	13.0	15.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.0	13.5	14.0	23.5	20.0	22.0	25.0	21.5	23.5	20.5	18.0	19.5
2	14.0	13.0	13.5	20.0	17.5	19.0	24.5	23.0	23.5	20.5	17.0	18.5
3	14.0	13.5	13.5	20.0	17.5	19.0	25.0	23.0	24.0	21.0	17.0	19.0
4	14.5	13.0	13.5	22.0	18.5	20.0	24.5	21.5	23.0	21.0	19.0	20.0
5	14.5	13.5	14.0	21.0	18.5	20.0	24.5	21.5	23.0	20.0	17.0	18.5
6	14.5	14.0	14.0	20.5	17.0	19.0	25.5	22.0	24.0	20.0	16.5	18.0
7	16.5	13.5	15.0	19.5	18.0	19.0	27.0	23.5	25.0	23.0	18.5	20.0
8	17.5	14.5	16.0	23.0	19.0	20.5	27.5	24.5	26.0	23.0	21.0	22.0
9	18.5	15.0	16.5	23.5	20.0	21.5	27.0	25.5	26.5	23.0	22.0	22.5
10	18.5	16.0	17.5	24.0	21.0	22.5	26.5	23.5	24.5	22.5	20.0	21.0
11	20.0	17.0	18.5	22.5	20.0	21.5	24.0	22.0	23.0	20.0	18.5	19.5
12	21.0	18.5	19.5	22.0	18.5	20.5	23.5	22.0	22.5	20.0	17.5	19.0
13	22.5	19.0	20.5	21.5	18.0	20.0	23.5	21.5	22.5	19.0	16.5	18.0
14	23.5	20.5	22.0	22.5	18.5	20.5	22.0	19.5	20.5	16.5	15.5	16.0
15	24.5	21.5	22.5	23.0	19.0	21.0	22.0	18.5	20.0	16.0	14.5	15.0
16	23.5	21.5	22.5	24.0	20.5	22.5	21.5	20.0	20.5	16.0	13.5	15.0
17	23.0	20.5	21.5	23.5	21.5	22.5	21.5	19.5	20.5	16.5	14.0	15.0
18	21.5	19.5	20.5	24.5	21.5	23.0	21.5	19.5	20.5	17.5	15.5	16.5
19	23.0	19.5	21.0	25.0	22.0	23.5	21.0	20.0	20.0	19.0	16.5	18.0
20	21.5	20.5	21.0	25.0	22.5	23.5	20.0	19.5	19.5	18.5	17.0	18.0
21	20.5	18.0	19.5	24.0	22.0	23.0	21.0	18.5	19.5	17.0	16.5	16.5
22	18.5	17.5	18.0	25.5	22.0	24.0	20.0	19.0	19.5	17.0	16.0	16.5
23	20.0	17.5	19.0	26.5	24.0	25.0	20.5	19.0	20.0	18.0	15.5	16.5
24	21.0	18.0	19.5	27.5	24.5	26.0	22.0	19.5	20.5	18.0	14.5	16.5
25	21.5	18.5	20.0	26.5	21.5	23.5	22.5	20.0	21.0	14.5	12.0	13.0
26	22.5	19.0	20.5	23.0	20.5	21.5	23.0	21.0	21.5	12.0	11.5	12.0
27	23.0	20.0	21.5	22.0	19.0	20.5	23.0	21.0	22.0	12.5	11.5	12.0
28	23.5	21.0	22.0	23.0	19.0	21.0	22.5	21.0	22.0	13.5	12.0	12.5
29	24.5	21.0	22.5	24.5	21.0	22.0	22.0	19.5	20.5	14.0	12.0	13.0
30	24.5	22.0	23.0	22.0	21.0	21.5	22.5	19.0	20.5	14.5	12.0	13.0
31	—	—	—	24.0	21.0	22.5	22.0	20.5	21.0	—	—	—
MONTH	24.5	13.0	18.8	27.5	17.0	21.7	27.5	18.5	22.0	23.0	11.5	17.0

STREAMS TRIBUTARY TO DETROIT RIVER

04166470 UPPER RIVER ROUGE AT DETROIT, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.6	8.1	8.3	---	---	---	---	---	---	---	---	---
2	8.4	7.6	8.1	10.0	7.3	8.5	---	---	---	---	---	---
3	8.9	7.6	8.4	10.1	7.4	8.4	---	---	---	---	---	---
4	8.5	6.8	7.6	9.5	7.6	8.5	---	---	---	---	---	---
5	8.2	7.4	7.9	9.3	7.9	8.4	---	---	---	---	---	---
6	8.5	7.9	8.2	10.0	7.9	8.9	---	---	---	---	---	---
7	8.9	8.5	8.7	9.5	6.6	8.1	---	---	---	---	---	---
8	8.7	8.2	8.5	9.5	7.2	7.6	---	---	---	---	---	---
9	8.2	7.5	8.0	8.1	5.3	7.0	---	---	---	---	---	---
10	7.6	---	---	8.3	6.0	7.4	---	---	---	---	---	---
11	---	---	---	9.1	7.8	8.5	---	---	---	---	---	---
12	---	---	---	9.4	8.6	8.9	---	---	---	---	---	---
13	---	---	---	9.4	8.3	8.9	---	---	---	---	---	---
14	---	---	---	9.7	8.6	9.2	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	8.8	---	---	---	---	---	---	---	---	---	---	---
21	10.4	8.7	9.7	---	---	---	---	---	---	---	---	---
22	10.6	9.5	10.0	---	---	---	---	---	---	---	---	---
23	10.3	9.1	9.6	---	---	---	---	---	---	---	---	---
24	9.6	7.4	8.4	---	---	---	---	---	---	---	---	---
25	8.8	4.7	7.4	---	---	---	---	---	---	---	---	---
26	8.8	7.6	8.1	---	---	---	---	---	---	---	---	---
27	8.8	6.5	7.7	---	---	---	---	---	---	---	---	---
28	8.7	6.3	8.3	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	12.1	10.4	11.2	11.9	8.5	10.1
2	---	---	---	---	---	---	13.3	10.4	11.6	11.1	7.7	9.0
3	---	---	---	---	---	---	13.2	9.9	11.3	10.8	7.0	8.5
4	---	---	---	---	---	---	14.1	10.0	11.7	9.8	6.5	7.8
5	---	---	---	---	---	---	14.0	9.9	11.5	10.8	6.7	8.5
6	---	---	---	---	---	---	10.1	8.5	8.9	11.1	7.2	8.9
7	---	---	---	---	---	---	8.8	8.4	8.6	10.2	7.3	8.6
8	---	---	---	---	---	---	9.2	8.1	8.6	8.2	5.0	6.5
9	---	---	---	---	---	---	8.1	7.1	7.6	7.9	5.7	6.9
10	---	---	---	---	---	---	8.3	7.4	7.8	8.7	6.4	7.5
11	---	---	---	---	---	---	9.6	7.9	8.6	8.1	6.5	7.1
12	---	---	---	---	---	---	8.6	7.4	8.1	8.2	6.4	7.5
13	---	---	---	---	---	---	10.7	7.5	8.9	9.3	7.9	8.5
14	---	---	---	---	---	---	11.4	8.2	9.6	9.9	8.1	9.0
15	---	---	---	---	---	---	9.8	8.7	9.2	9.1	7.7	8.4
16	---	---	---	---	---	---	11.4	9.4	10.2	9.5	7.8	8.9
17	---	---	---	---	---	---	13.6	10.3	11.7	9.6	9.0	9.3
18	---	---	---	---	---	---	14.2	10.9	12.2	9.5	8.6	9.0
19	---	---	---	---	---	---	14.2	10.3	11.9	9.5	8.8	9.2
20	---	---	---	---	---	---	10.5	8.6	9.5	---	---	---
21	---	---	---	---	---	---	9.1	8.4	8.8	---	---	---
22	---	---	---	---	---	---	9.3	8.3	8.7	---	---	---
23	---	---	---	---	---	---	9.8	7.8	8.6	---	---	---
24	---	---	---	---	---	---	10.0	7.5	8.7	---	---	---
25	---	---	---	---	---	---	11.9	8.7	10.1	---	8.5	---
26	---	---	---	---	---	---	12.3	9.1	10.4	9.0	8.7	8.9
27	---	---	---	---	---	---	11.7	8.4	9.8	9.0	8.7	8.9
28	---	---	---	---	---	---	12.0	8.6	10.1	9.0	8.5	8.8
29	---	---	---	13.6	11.2	12.2	13.1	9.6	11.0	8.5	8.1	8.2
30	---	---	---	14.7	10.8	12.4	12.7	9.5	10.8	8.8	8.2	8.4
31	---	---	---	14.1	10.6	12.0	---	---	---	8.8	8.4	8.6
MONTH	---	---	---	---	---	---	14.2	7.1	9.9	---	---	---

STREAMS TRIBUTARY TO DETROIT RIVER

04166470 UPPER RIVER ROUGE AT DETROIT, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	8.1	8.3	6.1	5.0	5.5	6.4	5.5	5.8	6.6	5.9	6.2
2	8.7	8.1	8.4	6.6	5.4	6.2	5.8	5.0	5.5	6.6	5.9	6.2
3	8.9	8.2	8.8	9.6	6.0	6.6	6.5	3.3	5.5	6.5	5.8	6.1
4	9.0	8.7	8.9	6.7	4.7	5.9	5.4	2.9	4.5	5.9	5.2	5.6
5	8.9	8.7	8.8	6.8	5.7	6.3	5.9	4.1	5.2	6.0	5.3	5.8
6	—	8.6	—	6.8	6.2	6.5	5.5	4.5	5.0	6.7	5.5	6.1
7	—	—	—	6.5	5.9	6.2	5.4	4.0	4.8	6.4	3.6	5.7
8	—	—	—	6.6	4.3	5.8	6.1	4.3	5.1	6.0	3.0	4.7
9	—	—	—	6.0	4.8	5.6	6.5	4.3	5.3	5.9	5.0	5.4
10	—	—	—	6.0	5.1	5.6	5.9	3.2	4.6	7.8	5.3	6.8
11	7.1	—	—	5.9	5.2	5.6	4.0	3.1	3.5	8.0	6.9	7.9
12	7.2	6.8	7.0	6.1	5.3	5.7	4.2	3.2	3.8	8.0	7.4	7.8
13	7.2	6.7	7.0	6.3	5.7	6.0	4.9	3.5	4.3	7.7	7.3	7.5
14	7.3	6.8	7.1	6.4	5.7	6.1	5.9	4.6	5.3	8.0	7.1	7.7
15	8.8	1.8	5.9	6.4	5.7	6.0	5.9	4.9	5.4	8.3	7.8	8.1
16	—	—	—	6.2	5.1	5.8	7.0	4.8	5.9	8.5	7.9	8.2
17	—	—	—	6.0	4.9	5.5	7.1	5.6	6.3	8.4	7.9	8.1
18	—	—	—	5.8	4.9	5.4	7.2	5.2	5.9	8.1	7.7	7.9
19	—	—	—	6.0	4.7	5.4	7.6	6.7	7.2	7.8	6.8	7.2
20	—	5.6	—	7.0	4.2	5.3	7.6	7.2	7.4	7.9	6.9	7.6
21	7.3	5.6	6.1	5.4	3.2	4.4	7.6	7.0	7.3	8.4	7.3	7.8
22	7.5	7.2	7.3	4.0	3.2	3.6	7.7	6.6	7.1	8.1	7.8	8.0
23	7.2	6.7	7.0	4.2	2.5	3.4	7.7	6.8	7.1	8.2	7.4	8.1
24	6.9	5.2	6.7	5.1	3.1	4.2	7.2	6.6	6.9	8.5	7.3	8.0
25	6.8	6.2	6.6	5.1	4.1	4.5	6.8	6.3	6.6	9.4	8.4	8.9
26	6.5	5.9	6.3	5.7	3.1	5.0	7.2	6.0	6.5	9.6	8.9	9.2
27	6.2	5.5	6.0	5.4	4.7	5.1	7.2	5.9	6.6	9.3	9.0	9.2
28	5.9	5.5	5.7	5.7	4.7	5.1	6.5	5.9	6.3	9.1	8.6	8.9
29	5.8	5.3	5.6	6.8	3.8	5.1	6.8	6.1	6.4	8.7	8.2	8.5
30	5.7	5.2	5.5	6.9	5.5	6.4	6.7	5.8	6.3	8.5	8.1	8.3
31	—	—	—	6.7	5.6	6.4	6.2	5.7	6.0	—	—	—
MONTH	—	—	—	9.6	2.5	5.5	7.7	2.9	5.8	9.6	3.0	7.4

STREAMS TRIBUTARY TO DETROIT RIVER

04166500 RIVER ROUGE AT DETROIT, MI

LOCATION.--Lat 42°22'20", long 83°15'20", in SW1/4 sec.27, T.1 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 500 ft upstream from bridge on Plymouth Road in Detroit, 4 mi upstream from Middle River Rouge.

DRAINAGE AREA.--187 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1930 to current year.

REVISED RECORDS.--WSP 1034: 1933(M). WSP 1054: 1939, 1943, 1945(M). WSP 1437: 1931-32, 1934, 1936(M), 1937-38, 1944(M), 1945. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 584.00 ft above sea level. Prior to Oct. 16, 1948, nonrecording gage at site 1 mi downstream at datum 4.6 ft lower.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	63	78	e79	379	206	98	85	234	43	37	25
2	63	63	68	e79	240	182	135	85	439	40	30	23
3	63	60	63	e77	141	171	106	79	464	42	40	21
4	475	59	57	e74	150	162	104	75	233	51	32	20
5	307	58	60	e77	118	148	92	72	168	65	27	21
6	280	55	59	e85	120	136	359	69	140	43	24	21
7	138	83	61	e81	110	132	544	67	128	36	23	22
8	98	87	58	e79	117	124	327	130	111	40	22	65
9	84	88	59	e78	877	122	298	91	99	36	22	370
10	80	254	56	e84	2730	118	303	72	99	41	98	657
11	73	157	56	95	1140	133	172	76	198	35	36	152
12	68	86	e56	98	370	146	245	150	127	31	26	70
13	66	79	e54	106	271	346	195	92	95	28	27	52
14	65	104	e58	113	267	305	136	72	84	27	24	45
15	65	105	e67	148	352	188	170	94	107	26	21	37
16	190	109	140	236	237	171	215	451	250	27	62	34
17	119	85	421	219	186	199	137	242	113	25	108	32
18	86	75	321	164	139	184	118	192	95	25	53	31
19	75	69	250	127	163	162	106	173	99	25	341	339
20	67	65	204	114	134	148	128	98	152	54	218	528
21	64	62	e140	120	125	137	267	206	105	109	75	314
22	62	60	e120	97	101	129	343	789	233	41	65	303
23	59	51	e100	78	122	120	267	384	116	36	94	111
24	376	59	e93	75	137	112	221	165	89	35	52	250
25	236	55	e83	71	1380	105	156	209	77	36	38	124
26	112	96	e76	71	1320	100	126	234	65	50	61	163
27	103	133	e78	77	403	99	113	346	57	35	93	142
28	118	93	e80	69	253	96	102	500	52	29	50	84
29	76	82	e76	70	—	96	93	534	50	29	34	67
30	70	94	e86	302	—	95	87	277	49	169	28	59
31	66	—	e87	527	—	93	—	172	—	64	25	—
TOTAL	3868	2589	3265	3770	12082	4665	5763	6281	4328	1373	1886	4182
MEAN	125	86.3	105	122	432	150	192	203	144	44.3	60.8	139
MAX	475	254	421	527	2730	346	544	789	464	169	341	657
MIN	59	51	54	69	101	93	87	67	49	25	21	20
CFSM	.67	.46	.56	.65	2.31	.80	1.03	1.08	.77	.24	.33	.75
IN.	.77	.52	.65	.75	2.40	.93	1.15	1.25	.86	.27	.38	.83

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	68.5	90.9	114	122	172	234	231	170	117	72.8	63.6	63.8
MAX	450	322	321	456	519	488	965	683	478	385	280	284
(WY)	1982	1993	1968	1950	1938	1950	1947	1943	1968	1957	1998	2000
MIN	8.35	16.3	16.6	13.6	18.2	59.5	49.3	23.9	7.92	6.46	5.58	7.03
(WY)	1964	1954	1940	1961	1963	1931	1931	1934	1934	1934	1931	1931

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	58142		54052			
ANNUAL MEAN	159		148		126	
HIGHEST ANNUAL MEAN					222	1968
LOWEST ANNUAL MEAN					25.7	1931
HIGHEST DAILY MEAN	2160	Sep 11	2730	Feb 10	7380	Apr 6 1947
LOWEST DAILY MEAN	33	Jul 26	20	Sep 4	1.8	Aug 1 1964
ANNUAL SEVEN-DAY MINIMUM	37	Jul 21	22	Sep 1	2.7	Aug 2 1963
MAXIMUM PEAK FLOW			3100	Feb 10	13000	Apr 5 1947
MAXIMUM PEAK STAGE			16.76	Feb 10	21.40	Jun 26 1968
INSTANTANEOUS LOW FLOW			19	(a)	1.8	(b)
ANNUAL RUNOFF (CFSM)	.85		.79		.67	
ANNUAL RUNOFF (INCHES)	11.57		10.75		9.16	
10 PERCENT EXCEEDS	294		303		268	
50 PERCENT EXCEEDS	79		95		64	
90 PERCENT EXCEEDS	48		35		17	

(a) Sept. 4, 5, 6, 7.
(b) Aug. 1, 2, 1964.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04166500 RIVER ROUGE AT DETROIT, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 1999 to current year.
DISSOLVED OXYGEN: April 1999 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 9, 2001; minimum, 2.0°C, Mar. 28, 2001.
DISSOLVED OXYGEN: Maximum, 16.9 mg/L, Mar. 28, 2001; minimum, 1.2 mg/L, June 14, 25, 1999.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 9; minimum, 2.0°C, Mar. 28.
DISSOLVED OXYGEN: Maximum, 16.9 mg/L, Mar. 28; minimum, 2.2 mg/L, July 11, 12.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.5	12.5	13.0	10.0	8.0	9.0	—	—	—	—	—	—
2	15.5	14.0	14.5	10.0	8.5	9.5	—	—	—	—	—	—
3	16.0	15.0	15.5	11.5	10.0	10.5	—	—	—	—	—	—
4	16.0	14.5	15.0	10.5	9.5	10.0	—	—	—	—	—	—
5	14.5	14.0	14.5	10.0	8.5	9.0	—	—	—	—	—	—
6	14.0	12.5	13.5	9.0	8.0	8.5	—	—	—	—	—	—
7	12.5	11.0	11.5	11.0	8.5	9.5	—	—	—	—	—	—
8	11.0	9.5	10.0	11.0	9.5	10.5	—	—	—	—	—	—
9	10.5	9.0	9.5	13.0	10.5	11.5	—	—	—	—	—	—
10	11.0	9.0	9.5	13.0	11.0	12.0	—	—	—	—	—	—
11	11.0	9.0	10.0	11.0	9.5	10.0	—	—	—	—	—	—
12	11.5	9.5	10.0	10.0	8.5	8.5	—	—	—	—	—	—
13	12.0	10.5	11.0	9.0	8.0	8.0	—	—	—	—	—	—
14	13.0	11.5	12.5	8.0	6.5	7.0	—	—	—	—	—	—
15	13.5	13.0	13.0	7.0	—	—	—	—	—	—	—	—
16	14.0	13.5	13.5	—	—	—	—	—	—	—	—	—
17	14.0	13.5	13.5	—	—	—	—	—	—	—	—	—
18	13.5	13.0	13.5	—	—	—	—	—	—	—	—	—
19	13.5	12.5	13.0	—	—	—	—	—	—	—	—	—
20	13.0	12.0	13.0	—	—	—	—	—	—	—	—	—
21	13.5	12.5	13.0	—	—	—	—	—	—	—	—	—
22	13.0	12.0	12.5	—	—	—	—	—	—	—	—	—
23	13.0	12.0	12.5	—	—	—	—	—	—	—	—	—
24	15.0	13.0	14.5	—	—	—	—	—	—	—	—	—
25	15.0	14.5	15.0	—	—	—	—	—	—	—	—	—
26	15.5	15.0	15.5	—	—	—	—	—	—	—	—	—
27	16.5	15.0	15.5	—	—	—	—	—	—	—	—	—
28	16.0	13.0	14.5	—	—	—	—	—	—	—	—	—
29	13.0	11.0	11.5	—	—	—	—	—	—	—	—	—
30	11.0	9.0	10.0	—	—	—	—	—	—	—	—	—
31	9.5	8.5	9.0	—	—	—	—	—	—	—	—	—
MONTH	16.5	8.5	12.7	—	—	—	—	—	—	—	—	—

STREAMS TRIBUTARY TO DETROIT RIVER

04166500 RIVER ROUGE AT DETROIT, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	6.5	5.0	5.5	17.0	14.0	15.5
2	—	—	—	—	—	—	7.5	4.5	6.0	21.0	15.5	17.5
3	—	—	—	—	—	—	8.0	6.5	7.0	20.0	16.5	18.5
4	—	—	—	—	—	—	9.0	7.0	8.0	19.5	17.5	19.0
5	—	—	—	—	—	—	10.0	7.0	8.5	19.0	16.5	17.5
6	—	—	—	—	—	—	10.0	9.0	9.5	17.5	15.5	16.5
7	—	—	—	—	—	—	10.0	10.0	10.0	16.5	15.5	16.0
8	—	—	—	—	—	—	13.0	10.0	11.5	17.0	15.0	16.0
9	—	—	—	—	—	—	13.0	8.5	11.5	18.0	16.0	16.5
10	—	—	—	—	—	—	10.0	9.5	9.5	18.0	16.5	17.0
11	—	—	—	—	—	—	10.0	9.5	9.5	18.0	15.0	17.5
12	—	—	—	—	—	—	13.0	10.0	11.5	17.5	15.5	16.5
13	—	—	—	—	—	—	14.0	12.0	12.5	15.5	14.0	14.5
14	—	—	—	—	—	—	13.0	11.5	12.0	15.0	13.5	14.5
15	—	—	—	—	—	—	12.0	9.0	10.5	15.0	13.5	14.5
16	—	—	—	—	—	—	9.0	8.0	8.5	14.0	13.5	13.5
17	—	—	—	—	—	—	8.0	6.5	7.5	16.5	14.0	15.0
18	—	—	—	—	—	—	9.0	6.0	7.5	17.0	16.0	16.5
19	—	—	—	—	—	—	11.0	7.5	9.0	18.0	16.5	17.0
20	—	—	—	—	—	—	10.5	9.5	10.0	18.0	16.5	17.0
21	—	—	—	—	—	—	12.5	10.0	10.5	19.0	17.0	17.5
22	—	—	—	—	—	—	14.0	12.5	13.5	18.5	17.5	18.0
23	—	—	—	—	—	—	16.5	13.5	15.0	17.5	15.5	16.5
24	—	—	—	—	—	—	16.0	14.0	15.0	15.5	14.5	15.0
25	—	—	—	—	—	—	14.0	12.0	13.0	14.5	14.0	14.5
26	—	—	—	—	—	—	14.0	11.5	12.5	14.0	13.5	13.5
27	—	—	—	—	—	—	15.5	13.0	14.0	13.5	13.0	13.5
28	—	—	—	4.0	2.0	—	15.0	12.5	14.0	14.5	13.5	14.0
29	—	—	—	5.0	3.5	4.0	14.5	12.0	13.5	15.5	14.5	15.0
30	—	—	—	7.0	4.0	5.5	15.5	12.0	14.0	15.0	14.0	14.5
31	—	—	—	6.5	5.5	6.0	—	—	—	15.0	13.5	14.0
MONTH	—	—	—	—	—	—	16.5	4.5	10.7	21.0	13.0	15.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.5	14.0	14.0	23.5	21.0	22.5	23.5	22.5	23.0	20.5	19.0	19.5
2	14.0	13.5	14.0	21.0	18.0	19.5	23.5	22.0	23.5	19.0	18.0	18.5
3	13.5	13.5	13.5	19.5	17.5	19.0	24.5	22.0	23.5	19.5	18.0	19.0
4	14.0	13.5	13.5	20.5	18.5	19.5	24.0	22.0	23.5	20.5	19.0	19.5
5	14.5	13.5	14.0	20.0	19.0	20.0	23.5	22.5	23.0	19.5	18.0	18.5
6	14.5	14.0	14.5	19.5	18.5	19.0	24.5	22.5	23.5	18.5	17.5	18.0
7	16.0	14.0	14.5	19.5	18.0	19.0	25.5	22.5	24.5	20.5	17.5	19.0
8	16.5	14.5	15.5	21.0	18.0	20.0	26.5	23.5	25.5	22.0	20.0	21.0
9	17.5	15.5	16.5	21.5	20.5	21.0	27.0	24.0	26.0	23.0	22.0	22.5
10	18.0	16.5	17.5	22.5	19.0	21.5	26.0	23.5	24.5	22.5	20.5	21.5
11	19.5	17.5	18.5	22.5	20.5	21.5	24.0	23.0	23.0	20.5	19.5	20.0
12	20.5	17.0	19.5	21.0	19.5	20.5	23.0	21.5	22.5	19.5	18.5	19.0
13	21.5	20.0	20.5	20.5	19.5	20.0	22.5	19.0	21.5	19.5	17.5	18.5
14	23.0	21.0	21.5	21.0	18.5	20.0	21.5	20.0	21.0	17.5	16.0	16.5
15	23.5	20.5	22.5	21.5	19.0	20.5	21.0	19.5	20.5	16.0	15.0	15.5
16	23.5	22.0	22.5	22.5	20.0	21.5	21.5	19.5	20.5	15.5	14.5	15.0
17	22.5	21.5	22.0	23.0	21.0	22.0	20.5	20.0	20.5	15.5	15.0	15.0
18	22.0	20.0	21.0	23.5	22.0	22.5	21.0	20.0	20.5	16.5	15.5	16.0
19	22.5	20.0	21.0	24.0	22.0	23.0	20.5	20.0	20.5	18.5	16.5	17.5
20	22.0	19.5	21.0	24.5	22.0	23.5	20.0	20.0	20.0	18.5	17.5	18.0
21	21.0	18.0	20.0	24.0	21.5	23.0	20.0	18.5	19.5	17.5	16.5	17.0
22	18.5	17.5	18.0	24.0	22.5	23.5	20.0	19.0	19.5	17.0	16.0	16.5
23	19.5	17.5	18.5	25.0	24.0	24.5	20.0	19.0	19.5	17.0	16.0	16.5
24	20.5	18.0	19.5	26.0	23.0	25.0	21.0	19.5	20.0	17.0	15.5	16.5
25	21.0	18.5	20.0	25.5	19.0	23.5	21.5	20.5	21.0	15.5	12.5	14.0
26	21.5	19.0	20.5	22.0	20.5	22.0	22.5	20.0	21.5	12.5	11.5	12.0
27	22.0	20.0	21.5	21.5	20.0	21.0	22.0	21.0	21.5	13.0	11.5	12.0
28	23.0	21.5	22.0	21.5	19.5	20.5	22.0	21.0	21.5	13.0	12.0	12.5
29	23.0	20.5	22.5	22.5	21.0	22.0	21.5	20.5	21.0	13.5	12.5	13.0
30	23.5	21.0	23.0	22.0	21.0	21.5	21.0	19.5	20.5	13.5	12.5	13.0
31	—	—	—	23.0	20.5	22.0	21.5	20.5	21.0	—	—	—
MONTH	23.5	13.5	18.8	26.0	17.5	21.4	27.0	18.5	21.9	23.0	11.5	17.0

STREAMS TRIBUTARY TO DETROIT RIVER

04166500 RIVER ROUGE AT DETROIT, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.3	7.8	8.0	9.4	8.1	8.9	---	---	---	---	---	---
2	7.8	7.2	7.6	9.2	7.4	8.7	---	---	---	---	---	---
3	7.4	7.0	7.2	8.8	7.9	8.4	---	---	---	---	---	---
4	7.6	6.4	7.1	9.0	7.9	8.5	---	---	---	---	---	---
5	7.9	7.2	7.4	9.6	8.4	8.9	---	---	---	---	---	---
6	7.9	7.5	7.7	10.0	8.7	9.3	---	---	---	---	---	---
7	8.5	7.8	8.2	9.6	7.2	8.4	---	---	---	---	---	---
8	9.1	8.5	8.9	7.8	6.9	7.4	---	---	---	---	---	---
9	9.4	9.0	9.3	7.4	6.2	7.1	---	---	---	---	---	---
10	9.5	8.4	9.2	7.5	6.2	6.9	---	---	---	---	---	---
11	9.3	8.9	9.1	8.6	7.5	8.1	---	---	---	---	---	---
12	9.3	8.8	9.0	9.2	8.5	8.9	---	---	---	---	---	---
13	9.1	8.5	8.8	9.2	8.9	9.1	---	---	---	---	---	---
14	8.6	7.8	8.3	9.7	8.9	9.4	---	---	---	---	---	---
15	7.8	7.4	7.6	---	---	---	---	---	---	---	---	---
16	7.4	5.7	6.7	---	---	---	---	---	---	---	---	---
17	6.6	5.6	6.2	---	---	---	---	---	---	---	---	---
18	7.1	6.4	6.7	---	---	---	---	---	---	---	---	---
19	7.4	6.5	6.9	---	---	---	---	---	---	---	---	---
20	7.4	6.4	7.0	---	---	---	---	---	---	---	---	---
21	7.0	6.1	6.5	---	---	---	---	---	---	---	---	---
22	6.9	6.2	6.5	---	---	---	---	---	---	---	---	---
23	7.0	6.5	6.8	---	---	---	---	---	---	---	---	---
24	7.1	5.2	6.1	---	---	---	---	---	---	---	---	---
25	6.3	5.7	5.9	---	---	---	---	---	---	---	---	---
26	6.4	5.7	6.0	---	---	---	---	---	---	---	---	---
27	6.3	5.6	5.8	---	---	---	---	---	---	---	---	---
28	6.4	5.5	6.0	---	---	---	---	---	---	---	---	---
29	7.8	6.0	7.1	---	---	---	---	---	---	---	---	---
30	8.7	7.1	8.2	---	---	---	---	---	---	---	---	---
31	9.2	8.1	8.7	---	---	---	---	---	---	---	---	---
MONTH	9.5	5.2	7.4	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	13.3	11.2	12.2	10.9	8.4	---
2	---	---	---	---	---	---	15.5	10.9	12.9	9.7	6.9	8.1
3	---	---	---	---	---	---	14.3	10.7	12.3	9.1	5.8	7.3
4	---	---	---	---	---	---	15.8	10.3	12.8	7.8	5.2	6.4
5	---	---	---	---	---	---	15.7	10.4	12.9	8.3	4.8	6.3
6	---	---	---	---	---	---	12.3	8.6	9.6	8.4	5.4	6.8
7	---	---	---	---	---	---	9.6	9.0	9.3	7.8	5.7	6.7
8	---	---	---	---	---	---	9.6	9.1	9.4	7.0	4.2	5.4
9	---	---	---	---	---	---	10.1	7.9	8.8	6.5	4.3	5.5
10	---	---	---	---	---	---	9.5	8.9	9.1	7.0	5.2	5.9
11	---	---	---	---	---	---	10.4	9.2	9.7	6.7	5.2	5.6
12	---	---	---	---	---	---	9.7	8.0	9.0	6.8	4.8	5.9
13	---	---	---	---	---	---	10.0	7.8	8.7	8.1	6.2	6.9
14	---	---	---	---	---	---	11.2	8.1	9.5	8.1	7.0	7.5
15	---	---	---	---	---	---	9.4	8.4	8.9	7.6	6.3	7.1
16	---	---	---	---	---	---	11.5	8.7	10.1	8.1	6.2	7.5
17	---	---	---	---	---	---	13.8	10.8	12.2	8.2	7.2	7.7
18	---	---	---	---	---	---	14.3	11.9	13.0	7.6	6.3	6.9
19	---	---	---	---	---	---	14.6	11.4	12.9	7.0	6.3	6.7
20	---	---	---	---	---	---	12.3	9.7	10.7	7.1	6.4	6.6
21	---	---	---	---	---	---	9.9	8.7	9.4	7.0	4.9	6.3
22	---	---	---	---	---	---	9.2	7.8	8.7	6.5	4.9	5.8
23	---	---	---	---	---	---	9.6	8.4	9.1	7.4	6.5	6.9
24	---	---	---	---	---	---	9.6	8.1	8.8	8.0	7.4	7.6
25	---	---	---	---	---	---	11.6	9.0	10.1	8.3	7.5	7.8
26	---	---	---	---	---	---	12.2	9.8	10.8	8.3	7.7	8.1
27	---	---	---	---	---	---	12.0	9.4	10.5	8.6	8.1	8.4
28	---	---	---	16.9	---	---	12.5	8.9	10.6	8.8	8.6	8.7
29	---	---	---	15.2	12.4	13.7	13.2	9.1	11.0	8.7	7.7	8.1
30	---	---	---	16.8	11.5	13.8	13.0	9.4	10.9	8.5	8.0	8.2
31	---	---	---	15.3	11.5	13.2	---	---	---	8.8	8.2	8.4
MONTH	---	---	---	---	---	---	15.8	7.8	10.5	10.9	4.2	---

STREAMS TRIBUTARY TO DETROIT RIVER

04166500 RIVER ROUGE AT DETROIT, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.6	7.5	8.1	9.9	8.1	8.3	5.5	4.5	5.0	6.8	5.7	6.3
2	8.5	7.8	8.1	9.1	8.0	8.3	5.7	4.1	4.6	7.6	6.3	6.7
3	8.6	8.3	8.5	8.1	7.0	7.6	5.8	4.4	5.1	7.0	6.5	6.7
4	9.0	8.6	8.7	7.6	6.0	6.7	5.6	3.9	4.5	7.1	6.3	6.6
5	8.9	8.5	8.6	7.1	5.7	6.2	6.0	3.7	4.5	7.1	6.3	6.7
6	8.9	8.5	8.5	7.0	4.3	6.6	5.7	4.4	5.0	7.6	6.7	7.0
7	8.7	8.2	8.5	6.8	6.2	6.4	6.0	4.3	5.1	7.3	6.6	6.8
8	8.6	7.9	8.2	6.4	5.8	6.1	6.0	4.3	5.0	7.1	4.0	5.6
9	8.5	7.5	7.9	5.9	5.1	5.4	6.2	4.0	5.0	6.5	2.4	5.1
10	8.2	7.4	7.6	5.6	5.1	5.3	5.5	2.6	3.6	7.0	5.4	6.3
11	7.6	4.9	6.4	5.8	2.2	4.1	3.8	2.7	3.2	7.4	6.8	7.0
12	7.6	6.1	6.4	4.0	2.2	2.8	4.5	2.9	3.4	7.2	6.6	7.0
13	6.7	5.7	6.0	4.2	3.0	3.6	5.8	2.9	4.0	7.2	6.5	6.9
14	5.9	5.2	5.6	4.9	3.8	4.4	5.6	3.5	4.3	7.7	6.7	7.3
15	6.1	2.8	4.9	5.4	4.5	5.0	5.0	3.8	4.5	7.9	7.1	7.6
16	4.2	3.1	3.8	5.7	4.8	5.3	6.6	4.4	5.1	8.4	7.7	7.9
17	5.2	3.8	4.2	---	---	---	5.9	4.7	5.2	8.3	7.8	8.0
18	5.5	4.1	4.5	5.7	4.1	---	7.4	4.7	5.3	8.0	7.7	7.8
19	5.5	4.4	5.0	5.2	4.1	4.7	7.3	2.8	6.1	8.0	6.8	7.5
20	6.1	3.6	4.6	---	4.2	---	7.0	6.6	6.7	7.8	7.3	7.5
21	6.3	4.0	4.7	---	---	---	7.2	6.4	6.7	8.1	7.0	7.7
22	6.6	5.5	6.1	---	---	---	7.0	5.8	6.5	8.2	7.8	8.0
23	7.0	6.0	6.3	---	---	---	6.9	6.1	6.5	8.2	7.8	8.0
24	6.9	6.0	6.2	---	---	---	6.8	5.9	6.2	8.0	7.4	7.8
25	6.9	6.0	6.3	---	---	---	6.7	5.7	6.0	8.9	8.0	8.5
26	7.9	6.1	6.6	---	3.1	---	7.1	5.5	5.9	9.5	8.8	9.2
27	9.2	6.6	7.1	5.3	3.6	4.7	6.4	5.5	6.0	9.6	9.1	9.5
28	9.5	7.2	7.7	5.8	4.4	5.0	6.6	5.3	5.7	9.4	9.1	9.3
29	10.3	7.8	8.3	6.4	4.8	5.2	6.5	5.4	5.9	9.2	8.8	9.1
30	10.4	7.9	8.4	6.5	3.1	5.5	6.8	5.8	6.2	9.1	8.8	8.9
31	---	---	---	6.2	5.2	5.6	6.4	5.7	6.0	---	---	---
MONTH	10.4	2.8	6.7	---	---	---	7.4	2.6	5.3	9.6	2.4	7.5

STREAMS TRIBUTARY TO DETROIT RIVER

04167000 MIDDLE RIVER ROUGE NEAR GARDEN CITY, MI

LOCATION (REVISED).--Lat 42°20'53", long 83°18'42", in SW1/4 NW1/4 sec.6, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 200 ft downstream from bridge on Inkster Road, 1.8 mi northeast of Garden City, and 6.0 mi upstream from mouth.

DRAINAGE AREA.--99.9 mi^2.

PERIOD OF RECORD.--October 1930 to September 1933 (published as "at Detroit"), June 1947 to September 1977, October 1977 to September 1983 (operated as a crest-stage partial-record station), October 1983 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 600.95 ft above sea level. Nov. 21, 1930 to Sept. 30, 1933, nonrecording gage at site 4.8 mi downstream at datum 17.48 ft lower. June 6, 1947 to Oct. 18, 1948, nonrecording gage at site 200 ft upstream at present datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Regulation by storm water retention structures; and occasional regulation by reservoirs upstream from station since 1956. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	49	76	59	246	182	76	58	172	33	41	21
2	26	47	65	63	187	154	89	56	265	29	30	20
3	25	45	56	60	126	144	77	53	268	35	29	20
4	382	43	51	51	105	134	68	51	167	31	24	19
5	251	41	49	56	96	124	63	50	122	29	20	18
6	241	40	47	62	96	113	179	49	99	27	18	18
7	140	73	45	60	88	102	319	46	87	28	18	32
8	87	57	47	60	95	97	223	111	77	46	18	97
9	64	84	44	e58	599	94	169	67	65	26	19	244
10	54	135	42	56	1300	89	222	51	59	28	79	287
11	46	119	43	54	803	101	151	52	66	25	27	88
12	40	77	e40	55	473	109	174	50	58	22	21	45
13	36	72	e39	59	286	223	118	49	51	21	19	37
14	34	73	e42	63	267	201	91	44	48	20	17	36
15	32	80	50	93	286	151	196	82	e68	20	16	27
16	64	80	117	133	221	135	228	325	e120	20	84	24
17	70	70	227	128	174	143	127	220	e66	20	62	23
18	58	61	150	107	130	125	95	155	e62	20	47	23
19	53	56	114	91	114	106	79	177	60	21	162	296
20	43	53	92	75	107	101	102	111	109	21	79	274
21	39	52	84	69	104	94	193	231	87	30	42	200
22	35	50	e75	59	90	87	207	278	155	23	74	184
23	34	47	e65	55	83	83	184	134	95	24	74	96
24	292	45	e63	54	137	77	158	124	84	31	45	111
25	216	47	e59	52	709	70	109	135	95	36	32	87
26	119	98	61	50	693	66	88	140	61	35	80	83
27	84	109	63	53	405	63	78	248	48	22	60	79
28	88	87	62	48	252	62	70	266	41	20	36	57
29	66	81	59	49	---	64	64	286	38	59	27	43
30	56	97	63	e225	---	64	60	195	36	198	23	37
31	52	---	62	e285	---	62	---	132	---	85	24	---
TOTAL	2855	2068	2152	2442	8272	3420	4057	4026	2829	1085	1347	2626
MEAN	92.1	68.9	69.4	78.8	295	110	135	130	94.3	35.0	43.5	87.5
MAX	382	135	227	285	1300	223	319	325	268	198	162	296
MIN	25	40	39	48	83	62	60	44	36	20	16	18
CFSM	.92	.69	.69	.79	2.96	1.10	1.35	1.30	.94	.35	.43	.88
IN.	1.06	.77	.80	.91	3.08	1.27	1.51	1.50	1.05	.40	.50	.98

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2001, BY WATER YEAR (WY)

MEAN	41.7	57.9	74.1	82.2	111	147	134	95.4	69.4	46.5	40.5	46.1
MAX	124	178	177	269	324	313	313	310	225	179	144	199
(WY)	1955	1993	1988	1952	1976	1976	1950	1956	1968	1957	1998	2000
MIN	7.83	9.46	10.4	9.65	14.2	42.3	32.6	21.9	17.8	8.85	5.64	4.97
(WY)	1932	1965	1964	1961	1963	1931	1931	1958	1959	1931	1931	1931

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1931 - 2001	
ANNUAL TOTAL	38300		37179			
ANNUAL MEAN	105		102		78.4	
HIGHEST ANNUAL MEAN					133	1976
LOWEST ANNUAL MEAN					20.8	1931
HIGHEST DAILY MEAN	1200	Sep 11	1300	Feb 10	2060	Jun 26 1968
LOWEST DAILY MEAN	23	Jul 24	16	Aug 15	1.4	Aug 21 1931
ANNUAL SEVEN-DAY MINIMUM	24	Jul 21	20	Aug 31	3.0	Aug 30 1933
MAXIMUM PEAK FLOW			1530	Feb 10	(a)2330	Jun 26 1968
MAXIMUM PEAK STAGE			9.61	Feb 10	(b)10.50	May 10 1948
INSTANTANEOUS LOW FLOW					.90	Aug 16 1956
ANNUAL RUNOFF (CFSM)	1.05		1.02		.78	
ANNUAL RUNOFF (INCHES)	14.26		13.84		10.66	
10 PERCENT EXCEEDS	207		221		166	
50 PERCENT EXCEEDS	57		66		44	
90 PERCENT EXCEEDS	30		26		14	

(a) Gage height 9.96 ft.
(b) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04167150 MIDDLE RIVER ROUGE AT DEARBORN HEIGHTS, MI

LOCATION.--Lat 42°19'50", long 83°14'53", in SW1/4 sec.10, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank at downstream side of bridge on Hines Drive in Dearborn Heights.

DRAINAGE AREA.--110 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1997 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 585 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Regulation by storm water retention structures and occasional regulation by reservoirs upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	63	68	e62	255	166	67	66	149	31	39	20
2	e30	56	56	e62	174	138	87	63	260	30	29	17
3	e23	52	48	e52	111	128	76	60	318	30	28	17
4	e300	49	44	e52	98	120	70	56	159	30	24	16
5	e330	48	43	e57	89	111	62	54	112	30	22	16
6	e240	46	41	e65	88	103	176	54	92	28	20	17
7	123	70	e42	e65	84	96	356	48	82	27	19	17
8	85	75	40	e64	85	92	236	93	73	46	19	70
9	68	77	39	e62	555	e96	167	78	60	27	19	226
10	57	148	36	e60	1540	e93	216	57	51	27	72	428
11	48	125	37	e57	1120	e100	134	56	82	26	29	115
12	42	82	e38	e58	472	e110	154	73	62	22	22	55
13	38	73	e40	e64	262	e220	134	61	45	21	20	38
14	35	84	e42	74	234	e220	97	47	38	21	18	39
15	34	85	e48	90	283	133	147	67	56	20	17	29
16	76	88	97	134	209	116	209	305	137	20	53	26
17	71	69	246	133	167	128	115	215	61	19	76	25
18	53	59	171	109	128	119	93	126	55	20	39	24
19	46	64	123	91	120	102	82	149	61	20	182	231
20	39	59	103	74	115	96	92	95	99	20	122	389
21	35	56	92	e68	107	91	175	148	68	46	47	202
22	32	52	e82	e60	92	86	235	455	149	26	51	217
23	31	46	e70	56	92	81	186	231	91	21	80	98
24	242	46	e67	51	112	77	162	109	72	32	49	128
25	213	45	e63	48	797	71	118	130	82	35	32	97
26	119	81	e64	59	1020	67	98	141	60	43	52	94
27	93	104	e67	52	434	64	89	218	49	27	72	94
28	100	87	e67	56	226	61	82	305	41	23	34	67
29	80	78	e63	50	---	62	76	326	36	26	26	48
30	70	87	e67	180	---	63	71	198	32	153	23	40
31	65	---	e66	326	---	60	---	122	---	77	23	---
TOTAL	2857	2154	2170	2491	9069	3270	4062	4206	2732	1024	1358	2900
MEAN	92.2	71.8	70.0	80.4	324	105	135	136	91.1	33.0	43.8	96.7
MAX	330	148	246	326	1540	220	356	455	318	153	182	428
MIN	23	45	36	48	84	60	62	47	32	19	17	16
CFSM	.84	.65	.64	.73	2.94	.96	1.23	1.23	.83	.30	.40	.88
IN.	.97	.73	.73	.84	3.07	1.11	1.37	1.42	.92	.35	.46	.98

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2001, BY WATER YEAR (WY)

MEAN	57.8	52.2	70.6	99.5	175	125	147	115	113	81.3	101	97.6
MAX	92.2	71.8	91.5	141	324	242	173	154	171	141	160	220
(WY)	2001	2001	1998	1998	2001	1998	1999	2000	2000	2000	1998	2000
MIN	43.1	32.1	51.3	43.2	58.7	55.7	113	84.3	65.3	33.0	43.7	35.1
(WY)	2000	2000	1999	2000	2000	2000	2000	1999	1998	2001	1999	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1998 - 2001	
ANNUAL TOTAL	41076		38293			
ANNUAL MEAN	112		105		102	
HIGHEST ANNUAL MEAN					114	1998
LOWEST ANNUAL MEAN					86.2	1999
HIGHEST DAILY MEAN	1260	Sep 11	1540	Feb 10	1540	Feb 10 2001
LOWEST DAILY MEAN	22	Jul 24	16	Sep 4	14	Oct 2 1998
ANNUAL SEVEN-DAY MINIMUM	23	Jul 21	17	Sep 1	16	Sep 23 1998
MAXIMUM PEAK FLOW			1810	Feb 10	(a)1810	Feb 10 2001
MAXIMUM PEAK STAGE			12.10	Feb 10	12.24	Feb 18 1998
ANNUAL RUNOFF (CFSM)	1.02		.95		.93	
ANNUAL RUNOFF (INCHES)	13.89		12.95		12.66	
10 PERCENT EXCEEDS	219		216		209	
50 PERCENT EXCEEDS	62		69		61	
90 PERCENT EXCEEDS	32		26		26	

(a) Gage height 12.10 ft.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04167150 MIDDLE RIVER ROUGE AT DEARBORN HEIGHTS, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 1999 to current year.
DISSOLVED OXYGEN: April 1999 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 28.0°C, July 24, Aug. 9, 2001; minimum, 2.5°C, Mar. 28, 2001.
DISSOLVED OXYGEN: Maximum, 18.8 mg/L, Mar. 30, 2001; minimum, 1.1 mg/L, May 11, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum 28.0°C, July 24, Aug. 9; minimum, 2.5°C, Mar. 28.
DISSOLVED OXYGEN: Maximum 18.8 mg/L, Mar. 30; minimum, 2.2 mg/L, Aug. 10.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.0	13.5	14.5	11.5	9.5	10.5	---	---	---	---	---	---
2	17.5	15.0	16.0	12.0	10.0	11.0	---	---	---	---	---	---
3	17.5	16.5	17.0	12.5	11.0	12.0	---	---	---	---	---	---
4	17.0	15.0	15.5	12.0	10.0	11.0	---	---	---	---	---	---
5	15.5	15.0	15.0	10.0	9.0	9.5	---	---	---	---	---	---
6	15.0	13.5	14.0	10.0	8.5	9.0	---	---	---	---	---	---
7	14.0	12.0	13.0	12.0	9.5	10.5	---	---	---	---	---	---
8	12.5	11.0	12.0	11.5	11.0	11.5	---	---	---	---	---	---
9	11.0	10.5	11.0	14.0	11.5	12.0	---	---	---	---	---	---
10	11.5	10.5	11.0	14.0	11.0	12.5	---	---	---	---	---	---
11	12.0	10.0	11.0	11.0	9.0	10.0	---	---	---	---	---	---
12	12.5	10.0	11.5	9.5	9.0	9.0	---	---	---	---	---	---
13	13.5	11.5	12.5	9.0	8.5	8.5	---	---	---	---	---	---
14	14.5	12.5	13.5	9.0	7.0	8.0	---	---	---	---	---	---
15	14.5	13.5	14.0	---	6.0	---	---	---	---	---	---	---
16	14.5	14.0	14.0	---	---	---	---	---	---	---	---	---
17	14.0	13.5	14.0	---	---	---	---	---	---	---	---	---
18	14.0	13.0	13.5	---	---	---	---	---	---	---	---	---
19	14.0	12.0	13.0	---	---	---	---	---	---	---	---	---
20	14.5	12.5	13.5	---	---	---	---	---	---	---	---	---
21	14.0	13.0	13.5	---	---	---	---	---	---	---	---	---
22	14.0	12.5	13.5	---	---	---	---	---	---	---	---	---
23	14.0	12.5	13.0	---	---	---	---	---	---	---	---	---
24	15.5	14.0	15.0	---	---	---	---	---	---	---	---	---
25	15.5	14.5	15.0	---	---	---	---	---	---	---	---	---
26	15.5	15.0	15.5	---	---	---	---	---	---	---	---	---
27	16.0	15.0	15.5	---	---	---	---	---	---	---	---	---
28	15.5	13.0	14.5	---	---	---	---	---	---	---	---	---
29	13.0	11.0	12.0	---	---	---	---	---	---	---	---	---
30	12.0	10.0	11.0	---	---	---	---	---	---	---	---	---
31	11.5	9.5	10.5	---	---	---	---	---	---	---	---	---
MONTH	17.5	9.5	13.5	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO DETROIT RIVER

04167150 MIDDLE RIVER ROUGE AT DEARBORN HEIGHTS, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	6.0	5.0	5.5	18.5	14.0	16.5
2	---	---	---	---	---	---	7.0	4.5	6.0	20.5	16.5	18.5
3	---	---	---	---	---	---	8.5	6.5	7.5	21.5	18.0	19.5
4	---	---	---	---	---	---	9.5	6.5	8.0	21.5	18.5	20.0
5	---	---	---	---	---	---	10.5	7.0	8.5	19.5	17.5	18.5
6	---	---	---	---	---	---	10.0	8.5	9.5	18.0	16.0	17.0
7	---	---	---	---	---	---	10.5	9.0	10.0	18.0	16.0	17.0
8	---	---	---	---	---	---	13.5	10.5	12.0	18.0	16.0	17.0
9	---	---	---	---	---	---	13.5	11.5	12.5	19.0	17.0	18.0
10	---	---	---	---	---	---	11.5	11.0	11.0	19.5	17.0	18.5
11	---	---	---	---	---	---	11.5	10.5	11.0	19.5	18.0	18.5
12	---	---	---	---	---	---	13.5	11.5	12.5	18.5	16.5	17.5
13	---	---	---	---	---	---	13.5	12.0	13.0	17.0	14.5	15.5
14	---	---	---	---	---	---	13.5	12.0	12.5	17.5	14.5	16.0
15	---	---	---	---	---	---	12.0	9.0	11.0	17.0	15.5	16.0
16	---	---	---	---	---	---	9.5	8.5	9.0	15.5	14.0	14.5
17	---	---	---	---	---	---	9.0	8.0	9.0	17.5	15.5	16.5
18	---	---	---	---	---	---	10.0	8.0	9.0	18.0	17.0	18.0
19	---	---	---	---	---	---	11.5	9.0	10.5	18.0	16.5	17.5
20	---	---	---	---	---	---	11.0	10.0	10.5	18.5	17.5	18.0
21	---	---	---	---	---	---	13.0	10.0	11.0	19.5	17.5	18.5
22	---	---	---	---	---	---	14.0	13.0	13.5	19.5	18.0	18.5
23	---	---	---	---	---	---	15.0	13.0	14.0	18.0	16.5	17.5
24	---	---	---	---	---	---	15.0	13.5	14.5	17.0	15.5	16.5
25	---	---	---	---	---	---	14.0	12.5	13.0	16.0	15.0	15.5
26	---	---	---	---	---	---	14.5	12.5	13.5	16.0	15.0	15.0
27	---	---	---	4.0	---	---	16.5	13.5	15.0	15.5	14.0	14.5
28	---	---	---	5.5	2.5	4.0	16.0	13.5	14.5	16.0	14.5	15.0
29	---	---	---	6.5	4.5	5.5	16.0	12.0	14.0	16.5	15.5	15.5
30	---	---	---	7.0	4.5	6.0	17.0	12.5	14.5	15.5	14.5	15.0
31	---	---	---	7.5	5.5	6.0	---	---	---	16.0	15.0	15.5
MONTH	---	---	---	---	---	---	17.0	4.5	11.2	21.5	14.0	17.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	14.5	15.0	25.0	21.5	23.5	26.0	23.5	24.5	21.0	19.5	20.0
2	14.5	14.0	14.5	21.5	19.5	20.5	25.5	24.0	25.0	20.0	18.5	19.0
3	15.0	14.5	14.5	20.5	19.0	20.0	26.0	24.5	25.0	20.5	18.5	19.5
4	15.0	14.5	15.0	22.5	20.0	21.0	25.0	23.5	24.5	21.0	20.0	20.5
5	15.0	15.0	15.0	22.0	20.5	21.0	25.0	22.5	24.0	20.0	18.5	19.0
6	15.5	14.5	15.0	21.0	19.0	20.0	26.0	23.0	24.5	20.0	17.5	19.0
7	16.5	14.5	15.5	20.5	19.5	20.0	26.5	24.0	25.5	22.0	19.0	20.5
8	18.0	15.5	17.0	23.5	20.5	22.0	27.5	25.0	26.5	24.0	21.5	22.5
9	19.5	17.0	18.0	24.0	21.5	23.0	28.0	25.0	27.0	23.5	23.0	23.0
10	20.5	17.0	19.0	25.0	22.5	24.0	26.0	24.5	25.5	23.0	21.5	22.0
11	22.0	19.0	20.5	23.5	21.5	22.5	24.5	23.0	24.0	21.5	20.0	21.0
12	23.0	20.5	22.0	22.5	20.5	21.5	24.5	23.0	24.0	21.5	19.5	20.5
13	24.5	21.0	22.5	22.0	19.5	21.0	24.0	22.5	23.5	20.5	18.5	19.5
14	25.5	22.0	23.5	22.5	19.5	21.0	22.5	20.5	21.5	18.5	16.5	17.5
15	26.0	23.0	24.5	23.0	20.0	21.5	22.0	19.5	21.0	16.5	15.5	16.0
16	24.5	23.0	23.5	24.5	21.5	23.0	22.0	21.0	21.0	16.5	15.0	16.0
17	24.5	22.0	23.0	24.5	22.5	23.5	22.0	21.0	21.5	17.0	15.5	16.0
18	23.5	21.0	22.0	25.0	23.0	24.0	22.0	20.5	21.0	18.0	16.5	17.5
19	24.0	21.0	22.5	25.5	23.0	24.0	21.5	21.0	21.0	19.0	17.5	18.5
20	23.5	21.5	22.5	25.5	23.5	24.5	21.0	20.5	21.0	19.0	18.5	18.5
21	22.0	19.0	20.5	25.0	23.5	24.0	22.0	20.0	21.0	18.5	17.5	18.0
22	19.5	19.0	19.0	26.0	23.5	24.5	21.0	20.0	20.5	18.0	17.0	17.5
23	21.5	19.5	21.0	26.5	25.0	25.5	21.0	20.5	21.0	18.0	17.5	17.5
24	22.0	20.5	21.0	28.0	25.5	26.5	22.5	20.5	21.5	17.5	15.0	17.0
25	23.0	21.0	22.0	26.5	22.5	24.5	23.0	20.5	22.0	15.0	13.0	14.0
26	24.0	21.5	22.5	23.5	21.5	22.5	23.0	22.0	22.5	13.5	12.5	13.0
27	25.0	21.5	23.5	22.5	20.0	21.0	23.5	22.5	23.0	13.5	12.5	13.0
28	25.5	22.5	24.0	23.0	20.5	21.5	23.5	22.0	22.5	14.5	13.0	13.5
29	26.0	23.0	24.5	23.5	21.5	22.5	22.5	20.5	21.5	15.0	13.0	14.0
30	26.0	24.0	25.0	23.5	22.0	22.5	22.5	20.5	21.5	14.5	12.5	13.5
31	---	---	---	24.5	23.5	24.0	22.5	21.0	22.0	---	---	---
MONTH	26.0	14.0	20.3	28.0	19.0	22.6	28.0	19.5	22.9	24.0	12.5	17.9

STREAMS TRIBUTARY TO DETROIT RIVER

04167150 MIDDLE RIVER ROUGE AT DEARBORN HEIGHTS, MI—Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.8	8.0	8.4	8.8	8.1	8.6	—	—	—	—	—	—
2	8.6	7.6	8.1	8.9	8.2	8.5	—	—	—	—	—	—
3	8.3	7.6	7.8	8.8	8.1	8.3	—	—	—	—	—	—
4	8.6	7.2	7.6	9.2	8.1	8.6	—	—	—	—	—	—
5	7.9	7.1	7.6	9.9	8.7	9.2	—	—	—	—	—	—
6	8.1	7.7	7.9	10.3	9.1	9.6	—	—	—	—	—	—
7	8.7	8.1	8.4	9.1	6.5	8.1	—	—	—	—	—	—
8	9.1	8.5	8.8	7.8	6.3	7.3	—	—	—	—	—	—
9	9.4	9.1	9.2	7.9	5.7	7.5	—	—	—	—	—	—
10	9.2	9.0	9.1	7.5	5.3	6.3	—	—	—	—	—	—
11	9.2	8.9	9.0	9.3	7.5	8.7	—	—	—	—	—	—
12	9.1	8.8	8.9	9.5	9.1	9.3	—	—	—	—	—	—
13	9.1	8.5	8.8	9.4	8.9	9.3	—	—	—	—	—	—
14	8.6	7.9	8.4	9.8	8.7	9.3	—	—	—	—	—	—
15	8.3	7.8	8.0	—	9.8	—	—	—	—	—	—	—
16	8.0	5.8	7.0	—	—	—	—	—	—	—	—	—
17	7.9	5.8	7.3	—	—	—	—	—	—	—	—	—
18	8.0	7.5	7.8	—	—	—	—	—	—	—	—	—
19	8.0	7.6	7.8	—	—	—	—	—	—	—	—	—
20	7.8	6.7	7.4	—	—	—	—	—	—	—	—	—
21	7.4	6.7	7.0	—	—	—	—	—	—	—	—	—
22	7.7	6.6	7.1	—	—	—	—	—	—	—	—	—
23	7.8	6.8	7.3	—	—	—	—	—	—	—	—	—
24	7.0	3.3	5.2	—	—	—	—	—	—	—	—	—
25	7.0	3.8	6.1	—	—	—	—	—	—	—	—	—
26	6.9	6.5	6.8	—	—	—	—	—	—	—	—	—
27	6.6	6.3	6.5	—	—	—	—	—	—	—	—	—
28	7.3	6.2	6.7	—	—	—	—	—	—	—	—	—
29	8.1	7.2	7.7	—	—	—	—	—	—	—	—	—
30	8.2	7.9	8.1	—	—	—	—	—	—	—	—	—
31	8.8	8.0	8.5	—	—	—	—	—	—	—	—	—
MONTH	9.4	3.3	7.8	—	—	—	—	—	—	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	15.3	13.2	14.1	8.8	6.5	8.1
2	—	—	—	—	—	—	17.0	13.2	14.8	8.0	5.8	6.9
3	—	—	—	—	—	—	15.2	11.4	12.9	7.6	5.4	6.3
4	—	—	—	—	—	—	14.8	10.7	12.4	7.2	5.3	6.0
5	—	—	—	—	—	—	14.5	10.6	12.2	8.2	5.6	6.9
6	—	—	—	—	—	—	11.1	9.0	9.7	9.2	6.9	8.0
7	—	—	—	—	—	—	9.6	8.8	9.4	9.5	7.5	8.5
8	—	—	—	—	—	—	10.2	9.0	9.6	8.1	5.1	6.6
9	—	—	—	—	—	—	9.8	8.4	9.0	6.2	4.5	5.5
10	—	—	—	—	—	—	9.3	9.0	9.2	5.8	5.2	5.5
11	—	—	—	—	—	—	9.7	9.1	9.3	5.6	3.9	5.0
12	—	—	—	—	—	—	9.4	8.1	8.9	6.4	4.7	5.6
13	—	—	—	—	—	—	10.5	8.1	9.3	7.8	6.2	6.9
14	—	—	—	—	—	—	11.5	8.8	10.1	7.9	5.9	7.0
15	—	—	—	—	—	—	10.4	9.2	9.7	6.9	3.0	5.6
16	—	—	—	—	—	—	10.1	9.5	9.8	7.9	4.5	6.9
17	—	—	—	—	—	—	12.1	9.9	10.9	7.4	6.0	6.5
18	—	—	—	—	—	—	13.3	10.4	11.7	6.7	5.1	5.9
19	—	—	—	—	—	—	13.8	10.3	11.9	6.9	5.8	6.3
20	—	—	—	—	—	—	11.2	9.6	10.2	6.7	5.2	6.1
21	—	—	—	—	—	—	9.8	8.6	9.4	6.6	3.5	4.8
22	—	—	—	—	—	—	10.2	8.3	9.3	6.7	4.5	5.5
23	—	—	—	—	—	—	11.4	9.3	10.1	7.2	4.6	6.3
24	—	—	—	—	—	—	10.8	8.1	9.5	7.8	5.5	6.8
25	—	—	—	—	—	—	12.3	9.0	10.5	7.8	6.9	7.4
26	—	—	—	—	—	—	12.4	9.3	10.7	8.0	6.6	7.6
27	—	—	—	—	—	—	11.1	9.1	9.9	8.5	6.8	8.0
28	—	—	—	17.9	12.6	14.9	11.3	8.7	9.9	8.4	6.8	7.9
29	—	—	—	17.2	13.2	14.7	11.2	9.2	10.0	8.0	6.5	7.6
30	—	—	—	18.8	13.1	15.5	10.8	8.4	9.4	8.7	7.4	8.0
31	—	—	—	17.4	13.3	15.0	—	—	—	8.5	6.9	7.7
MONTH	—	—	—	—	—	—	17.0	8.1	10.5	9.5	3.0	6.7

STREAMS TRIBUTARY TO DETROIT RIVER

04167150 MIDDLE RIVER ROUGE AT DEARBORN HEIGHTS, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	6.3	7.7	7.1	6.2	6.6	6.8	5.6	6.2	7.3	6.2	6.7
2	9.1	8.3	8.7	7.7	6.9	7.3	6.7	5.8	6.1	7.8	6.7	7.2
3	9.3	8.8	9.0	8.0	5.8	7.5	6.9	4.9	6.1	7.9	6.9	7.3
4	9.4	9.0	9.2	7.1	5.7	6.6	6.9	4.3	5.8	7.6	6.5	7.0
5	9.7	8.9	9.3	7.8	6.5	7.1	7.6	5.8	6.6	8.0	6.8	7.2
6	10.0	9.0	9.5	8.3	7.1	7.7	7.6	6.0	6.6	8.1	6.9	7.4
7	10.0	8.1	9.2	8.1	7.2	7.6	8.1	5.9	6.8	8.1	6.6	7.3
8	9.8	7.5	8.6	7.3	4.3	5.7	7.8	5.7	6.5	6.8	3.2	5.2
9	9.5	6.4	8.3	6.9	4.1	5.7	8.2	5.6	6.6	5.5	4.2	4.7
10	9.4	6.6	8.2	7.1	5.3	6.2	6.8	2.2	3.8	6.3	5.0	5.8
11	8.7	5.7	7.3	6.6	5.9	6.2	5.4	3.7	4.6	6.9	6.1	6.6
12	8.2	5.8	6.6	7.1	5.7	6.4	7.6	5.2	6.3	6.9	6.7	6.8
13	6.0	5.6	5.8	8.1	6.7	7.4	7.8	5.2	6.7	7.5	6.6	7.0
14	6.0	5.4	5.7	8.3	7.2	7.6	8.2	6.4	7.2	7.7	6.7	7.3
15	6.1	3.1	5.5	8.5	7.0	7.6	8.0	6.7	7.2	8.4	7.3	7.8
16	3.8	2.3	3.4	8.4	6.7	7.3	6.7	4.7	6.0	8.6	7.7	8.1
17	5.4	3.6	4.8	7.9	6.2	6.9	5.7	4.4	5.2	8.7	7.9	8.2
18	6.0	4.9	5.7	8.1	6.1	6.9	7.5	5.7	6.6	8.5	7.6	8.0
19	5.7	5.1	5.5	8.5	6.1	7.0	6.7	5.6	5.9	7.7	6.8	7.2
20	5.6	4.5	5.0	7.5	5.6	6.4	6.8	5.9	6.4	7.3	6.9	7.1
21	7.0	5.0	5.8	6.8	2.6	4.9	7.3	6.5	6.8	7.8	7.1	7.4
22	7.0	6.2	6.6	5.5	3.2	4.6	7.0	5.8	6.6	7.7	7.3	7.5
23	7.3	6.9	7.1	5.7	4.6	5.2	6.5	5.8	6.3	7.9	7.5	7.7
24	7.6	6.3	7.2	7.0	5.0	5.8	7.1	6.4	6.7	8.1	6.9	7.5
25	7.3	6.9	7.1	7.0	4.0	5.1	7.3	6.2	6.7	8.9	8.1	8.6
26	7.1	6.7	6.9	5.5	3.2	4.8	6.8	5.3	6.0	8.9	8.6	8.8
27	6.9	6.5	6.8	6.5	5.5	6.1	5.8	5.3	5.6	9.2	8.9	9.1
28	6.9	6.3	6.6	7.7	6.1	6.8	6.3	5.5	6.0	9.1	8.9	9.0
29	6.9	6.3	6.6	7.6	5.9	6.8	7.0	6.0	6.5	8.9	8.6	8.8
30	6.9	6.2	6.5	6.1	3.2	5.0	7.1	5.9	6.5	9.2	8.4	8.9
31	—	—	—	6.3	5.8	6.1	6.9	6.0	6.4	—	—	—
MONTH	10.0	2.3	7.0	8.5	2.6	6.4	8.2	2.2	6.2	9.2	3.2	7.4

STREAMS TRIBUTARY TO DETROIT RIVER

04168000 LOWER RIVER ROUGE AT INKSTER, MI

LOCATION.--Lat 42°18'00", long 83°18'00", in SW1/4 SE1/4 sec.19, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 10 ft downstream from bridge on John Daly Road, 0.6 mi northeast of Inkster, and 4.8 mi upstream from mouth.

DRAINAGE AREA.--83.2 mi^2.

PERIOD OF RECORD.--June 1947 to current year.

REVISED RECORDS.--WSP 1174: 1948(M). WSP 1437: 1949. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 593.14 ft above sea level. Prior to Oct. 20, 1948, nonrecording gage at same site and datum.

REMARKS.--Records fair. Since 1995, flow contains effluent from sewage-treatment plant which originates outside the basin. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	54	83	65	309	e120	e66	e51	e120	e40	e44	31
2	43	54	71	65	225	e110	e77	e53	e180	e36	e36	31
3	43	53	61	63	133	e99	e79	e55	e270	e40	e40	35
4	390	52	58	62	112	e92	e63	e51	e150	e39	e34	37
5	205	52	57	64	100	e87	e62	e51	e98	e38	e32	33
6	225	51	54	68	99	e77	e105	e47	e89	e35	e31	32
7	119	72	54	70	98	e74	e175	e48	e92	e37	e32	37
8	84	61	56	71	97	e71	e130	e67	e72	e39	e32	39
9	74	75	56	72	516	e70	e110	e45	e57	e39	e34	80
10	68	115	50	70	1760	e66	e125	e53	e69	e51	e89	135
11	62	95	52	69	718	e72	e115	e60	e53	e36	e43	75
12	55	71	53	67	199	e75	e125	e49	e47	e31	e34	53
13	51	70	52	66	147	e150	e115	e41	e46	e29	e33	45
14	50	73	55	70	141	e170	e82	e39	e44	e32	35	48
15	51	61	55	86	192	e115	e175	e61	e43	e30	34	43
16	57	66	79	130	144	e100	e320	e220	e68	e30	67	40
17	53	66	179	153	115	e110	e185	e140	e48	e31	63	38
18	52	62	146	143	94	e100	e120	e82	e49	e35	56	38
19	50	55	124	128	84	e100	e97	e115	e52	e32	137	74
20	50	54	108	105	81	e93	e100	e74	e70	e25	81	145
21	49	52	101	92	76	e86	e180	e140	e87	e60	54	99
22	49	52	95	84	71	e82	e230	e210	e130	e66	70	98
23	48	51	89	78	71	e76	e175	e110	e97	e41	71	70
24	243	49	77	76	69	e70	e140	e98	e99	e50	55	58
25	142	48	73	72	e520	e64	e105	e90	e58	e86	47	55
26	95	75	67	71	e620	e59	e88	e91	e48	e67	57	62
27	83	86	66	69	e245	e57	e76	e165	e44	e42	56	72
28	70	82	66	69	e165	e58	e65	e210	e41	e33	44	62
29	62	78	64	65	---	e60	e63	e155	e40	e51	42	56
30	58	92	64	122	---	e63	e60	e81	e40	e135	44	53
31	56	---	65	284	---	e56	---	e76	---	e61	37	---
TOTAL	2779	1977	2330	2769	7201	2682	3608	2828	2401	1397	1564	1774
MEAN	89.6	65.9	75.2	89.3	257	86.5	120	91.2	80.0	45.1	50.5	59.1
MAX	390	115	179	284	1760	170	320	220	270	135	137	145
MIN	42	48	50	62	69	56	60	39	40	25	31	31

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2001, BY WATER YEAR (WY)

MEAN	24.1	39.2	61.7	61.9	94.7	134	115	62.9	41.6	24.4	20.0	25.3
MAX	110	176	179	294	307	301	280	183	221	95.8	104	160
(WY)	1982	1986	1968	1952	1976	1982	1950	1983	1968	1969	1998	2000
MIN	2.11	3.23	2.32	1.86	4.18	19.4	22.2	4.47	2.75	2.26	.83	1.86
(WY)	1949	1964	1964	1961	1964	1964	1958	1958	1949	1948	1950	1952

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1947 - 2001	
ANNUAL TOTAL	34741		33310			
ANNUAL MEAN	94.9		91.3		(a)58.5	
HIGHEST ANNUAL MEAN					107	1998
LOWEST ANNUAL MEAN					15.9	1964
HIGHEST DAILY MEAN	1210	Sep 12	1760	Feb 10	2520	Jun 26 1968
LOWEST DAILY MEAN	27	Jul 22	25	Jul 20	.30	Sep 13 1955
ANNUAL SEVEN-DAY MINIMUM	36	Jul 20	31	Jul 14	.53	Aug 2 1950
MAXIMUM PEAK FLOW			2340	Feb 10	3600	Jun 26 1968
MAXIMUM PEAK STAGE			12.27	Feb 10	13.62	Jun 26 1968
INSTANTANEOUS LOW FLOW					.20	(b)
10 PERCENT EXCEEDS	148		146		129	
50 PERCENT EXCEEDS	61		67		21	
90 PERCENT EXCEEDS	42		39		2.8	

(a) Annual mean, water years 1948-95, 54.1 ft^3/s, 8.83 in/yr; water years 1996-01, 93.9 ft^3/s.
(b) Sept. 13, 1955, Jan. 23, 1961.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04168400 LOWER RIVER ROUGE AT DEARBORN, MI

LOCATION.--Lat 42°18'31", long 83°15'10", in NE1/4 sec.22, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 100 ft upstream from bridge on Military Road in Dearborn.

DRAINAGE AREA.--91 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1997 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 585 ft above sea level, from topographic map.

REMARKS.--Water-discharge records fair. Flow contains effluent from sewage-treatment plant, which originates outside the basin. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	56	82	65	290	132	68	63	128	40	44	36
2	43	55	69	63	228	116	80	59	198	36	36	37
3	43	54	60	62	149	104	71	58	300	40	40	38
4	392	52	57	60	125	96	65	53	159	39	34	38
5	254	52	56	66	106	91	65	52	103	38	32	34
6	253	51	52	70	109	80	112	48	93	35	31	33
7	151	73	54	69	102	77	189	49	96	37	32	36
8	96	63	55	73	107	73	140	69	76	39	32	104
9	78	81	53	73	690	73	112	46	60	39	34	177
10	71	125	48	72	1620	68	131	54	75	52	91	210
11	63	105	52	70	943	76	124	61	62	36	43	72
12	55	73	51	69	282	79	135	50	50	31	33	52
13	50	70	50	71	216	164	122	42	48	29	31	47
14	48	75	52	79	200	179	87	40	45	31	31	49
15	48	65	53	107	259	122	188	64	44	29	31	42
16	57	67	108	173	203	109	349	241	70	28	73	40
17	50	68	221	188	153	116	200	153	49	28	68	38
18	49	64	168	165	114	107	130	86	50	27	80	39
19	47	56	136	141	97	105	103	124	54	29	195	244
20	46	54	110	105	93	98	110	78	73	24	91	216
21	46	52	101	94	87	90	197	152	91	60	56	132
22	46	51	90	81	80	85	251	225	138	67	74	95
23	45	49	e85	75	80	79	190	113	101	42	77	62
24	255	47	72	72	125	72	152	103	103	51	58	55
25	178	47	66	67	734	66	111	95	59	89	50	50
26	105	77	66	65	772	61	92	97	49	69	66	62
27	87	89	68	67	280	59	79	179	45	42	61	68
28	74	84	66	61	181	60	68	227	41	34	47	55
29	65	79	64	62	---	62	67	166	41	52	44	48
30	60	92	66	183	---	65	67	85	40	142	47	46
31	58	---	65	301	---	58	---	80	---	62	40	---
TOTAL	2956	2026	2396	2969	8425	2822	3855	3012	2541	1397	1702	2255
MEAN	95.4	67.5	77.3	95.8	301	91.0	128	97.2	84.7	45.1	54.9	75.2
MAX	392	125	221	301	1620	179	349	241	300	142	195	244
MIN	43	47	48	60	80	58	65	40	40	24	31	33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2001, BY WATER YEAR (WY)

MEAN	61.2	50.2	64.4	110	180	134	164	97.4	103	70.4	80.1	85.5
MAX	95.4	67.5	77.3	163	301	285	201	150	133	88.2	117	175
(WY)	2001	2001	2001	1999	2001	1998	1999	2000	2000	1999	2000	2000
MIN	46.7	40.9	43.2	50.1	70.4	62.1	125	66.7	63.4	45.1	45.9	43.0
(WY)	1998	1999	1999	2000	2000	2000	2000	1999	1998	2001	1999	1998

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1998 - 2001	
ANNUAL TOTAL	36677		36356			
ANNUAL MEAN	100		99.6		99.4	
HIGHEST ANNUAL MEAN					116	1998
LOWEST ANNUAL MEAN					89.5	1999
HIGHEST DAILY MEAN	1270	Sep 12	1620	Feb 10	1620	Feb 18 1998
LOWEST DAILY MEAN	30	Jul 22	24	Jul 20	23	(a)
ANNUAL SEVEN-DAY MINIMUM	38	Jul 21	28	Jul 14	27	Dec 26 1998
MAXIMUM PEAK FLOW			1980	Feb 10	1980	Feb 10 2001
MAXIMUM PEAK STAGE			10.30	Feb 10	10.30	Feb 10 2001
10 PERCENT EXCEEDS	172		185		194	
50 PERCENT EXCEEDS	62		68		59	
90 PERCENT EXCEEDS	42		39		36	

(a) Jan. 1, Oct. 10, 1999.
(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04168400 LOWER RIVER ROUGE AT DEARBORN, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 1999 to current year.
DISSOLVED OXYGEN: April 1999 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 26.0°C, on several days in 1999 and 2001; minimum 4.0°C, Mar. 27, 28, 2001.
DISSOLVED OXYGEN: Maximum, 21.0 mg/L, Mar. 28, 2001; minimum, 1.1 mg/L, Aug. 10, 2001.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum 26.0°C, on several days during July, Aug.; minimum, 4.0°C, Mar. 27, 28.
DISSOLVED OXYGEN: Maximum 21.0 mg/L, Mar. 28; minimum, 1.1 mg/L, Aug. 10.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	17.5	15.5	16.0	12.5	11.0	12.0	---	---	---	---	---	---
2	18.5	17.0	17.5	13.5	11.5	12.5	---	---	---	---	---	---
3	18.5	17.5	18.0	14.5	13.5	14.0	---	---	---	---	---	---
4	18.0	15.5	16.0	14.0	12.5	13.0	---	---	---	---	---	---
5	15.5	15.0	15.5	12.5	11.0	11.5	---	---	---	---	---	---
6	15.0	13.5	14.5	12.0	10.5	11.0	---	---	---	---	---	---
7	13.5	12.0	12.5	13.5	11.5	12.5	---	---	---	---	---	---
8	12.0	11.5	12.0	14.0	13.0	13.5	---	---	---	---	---	---
9	12.0	11.0	11.5	16.0	13.5	14.5	---	---	---	---	---	---
10	13.0	11.5	12.0	15.5	12.5	14.0	---	---	---	---	---	---
11	14.0	11.5	12.5	12.5	11.0	11.5	---	---	---	---	---	---
12	14.0	12.0	13.0	11.0	10.5	10.5	---	---	---	---	---	---
13	15.0	13.5	14.0	11.0	10.5	10.5	---	---	---	---	---	---
14	16.5	14.5	15.5	10.5	9.0	9.5	---	---	---	---	---	---
15	16.5	15.5	16.0	---	8.0	---	---	---	---	---	---	---
16	16.5	16.0	16.0	---	---	---	---	---	---	---	---	---
17	16.0	15.5	15.5	---	---	---	---	---	---	---	---	---
18	16.0	15.0	15.5	---	---	---	---	---	---	---	---	---
19	15.5	14.0	15.0	---	---	---	---	---	---	---	---	---
20	16.0	14.0	15.0	---	---	---	---	---	---	---	---	---
21	16.0	15.0	15.5	---	---	---	---	---	---	---	---	---
22	16.0	14.5	15.0	---	---	---	---	---	---	---	---	---
23	16.0	14.0	15.0	---	---	---	---	---	---	---	---	---
24	16.5	16.0	16.0	---	---	---	---	---	---	---	---	---
25	16.5	16.0	16.5	---	---	---	---	---	---	---	---	---
26	17.5	16.5	17.0	---	---	---	---	---	---	---	---	---
27	18.0	16.5	17.0	---	---	---	---	---	---	---	---	---
28	17.0	14.0	15.5	---	---	---	---	---	---	---	---	---
29	14.0	12.0	12.5	---	---	---	---	---	---	---	---	---
30	12.5	11.0	12.0	---	---	---	---	---	---	---	---	---
31	12.5	10.5	11.5	---	---	---	---	---	---	---	---	---
MONTH	18.5	10.5	14.7	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO DETROIT RIVER

04168400 LOWER RIVER ROUGE AT DEARBORN, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	9.0	7.5	8.0	18.0	14.0	16.0
2	---	---	---	---	---	---	10.0	7.0	8.5	19.5	16.0	18.0
3	---	---	---	---	---	---	10.5	8.5	9.5	20.0	17.5	19.0
4	---	---	---	---	---	---	11.5	8.0	10.0	20.0	17.5	19.0
5	---	---	---	---	---	---	12.0	8.5	10.5	19.0	16.5	17.5
6	---	---	---	---	---	---	13.0	10.0	11.5	17.0	15.0	16.0
7	---	---	---	---	---	---	12.5	10.0	11.5	17.0	15.5	16.0
8	---	---	---	---	---	---	16.0	12.0	14.0	17.5	15.5	16.5
9	---	---	---	---	---	---	15.0	12.5	13.5	18.0	16.0	17.0
10	---	---	---	---	---	---	12.5	10.5	11.5	18.5	16.5	17.5
11	---	---	---	---	---	---	11.5	10.0	10.5	18.5	17.0	18.0
12	---	---	---	---	---	---	14.5	11.5	12.5	18.0	16.0	16.5
13	---	---	---	---	---	---	15.0	12.5	13.5	16.0	13.5	15.0
14	---	---	---	---	---	---	14.0	12.0	13.0	16.0	14.0	15.0
15	---	---	---	---	---	---	13.0	9.0	11.0	16.0	14.5	15.5
16	---	---	---	---	---	---	9.0	8.0	8.5	15.0	14.0	14.5
17	---	---	---	---	---	---	8.5	7.5	8.0	17.5	15.0	16.0
18	---	---	---	---	---	---	10.0	7.0	8.5	18.0	17.0	17.5
19	---	---	---	---	---	---	12.0	8.0	10.0	18.5	16.5	17.5
20	---	---	---	---	---	---	11.5	10.5	11.0	18.5	16.5	17.5
21	---	---	---	---	---	---	14.0	11.0	12.0	19.5	17.5	18.0
22	---	---	---	---	---	---	15.5	13.5	15.0	19.0	17.5	18.5
23	---	---	---	---	---	---	17.0	15.0	16.0	17.5	16.0	16.5
24	---	---	---	---	---	---	16.0	14.0	15.0	16.0	15.0	15.5
25	---	---	---	---	---	---	14.5	12.0	13.5	16.0	14.5	15.0
26	---	---	---	---	---	---	15.0	11.5	13.5	15.0	14.0	14.5
27	---	---	---	5.0	---	---	16.5	13.5	15.0	15.0	14.0	14.5
28	---	---	---	7.5	4.0	5.5	16.0	12.5	14.5	15.0	14.0	14.5
29	---	---	---	8.0	6.0	7.0	15.5	12.0	14.0	15.5	14.5	15.0
30	---	---	---	10.0	6.5	8.0	17.0	12.5	14.5	15.5	14.0	15.0
31	---	---	---	9.5	8.0	8.5	---	---	---	15.5	13.5	14.5
MONTH	---	---	---	---	---	---	17.0	7.0	11.9	20.0	13.5	16.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.0	14.5	15.0	23.5	20.5	22.0	24.5	22.5	23.5	21.5	19.5	20.0
2	15.0	14.0	14.5	20.5	18.0	19.0	24.0	23.0	23.5	20.0	18.5	19.0
3	14.5	14.0	14.5	19.5	18.0	19.0	24.0	23.0	24.0	21.0	18.5	19.5
4	15.0	14.0	14.5	21.0	19.5	20.0	24.0	22.5	23.5	21.0	20.5	20.5
5	15.5	14.0	15.0	21.0	19.5	20.0	23.5	22.0	23.0	20.5	19.0	19.5
6	15.5	15.0	15.0	20.0	18.0	19.0	24.5	22.5	23.5	20.0	18.0	19.0
7	17.0	15.0	16.0	20.0	18.5	19.0	25.5	23.5	24.5	22.0	19.5	20.5
8	18.0	15.5	17.0	22.0	19.5	20.5	26.0	24.5	25.0	23.0	22.0	22.0
9	19.0	16.0	17.5	22.5	21.0	21.5	26.0	25.0	25.5	23.5	22.5	22.5
10	20.5	17.0	18.5	23.0	21.5	22.5	25.5	23.5	24.5	22.5	20.5	22.0
11	21.0	18.5	19.5	22.5	20.5	21.5	24.0	22.5	23.0	20.5	19.5	20.0
12	21.0	19.5	20.5	21.5	19.5	20.5	23.5	22.0	22.5	20.5	18.5	19.5
13	22.5	19.5	21.0	20.5	19.0	20.0	23.0	22.0	22.5	20.5	18.0	19.0
14	23.0	20.5	22.0	21.0	19.0	20.0	22.0	20.5	21.0	18.0	16.5	17.0
15	23.5	21.5	22.5	22.0	19.5	20.5	21.0	19.5	20.5	17.0	15.5	16.5
16	23.0	21.0	22.0	23.0	21.0	22.0	21.5	20.5	21.0	17.0	15.5	16.5
17	22.5	20.5	21.5	23.0	22.0	22.5	21.5	20.5	21.0	17.5	16.0	17.0
18	22.0	20.0	20.5	23.0	22.0	22.5	21.5	20.0	20.5	19.0	17.5	18.0
19	23.0	20.0	21.5	23.5	22.0	23.0	21.0	20.5	21.0	19.5	19.0	19.0
20	22.0	20.5	21.0	23.5	22.5	23.0	21.0	20.0	20.5	19.0	18.0	19.0
21	21.0	18.5	19.5	24.0	23.0	23.5	21.0	19.0	20.0	18.0	17.5	18.0
22	19.0	18.0	18.5	25.0	23.0	24.0	21.0	19.5	20.0	18.0	17.0	17.5
23	20.0	18.5	19.5	25.0	24.0	24.5	21.0	20.0	20.5	18.5	17.0	17.5
24	21.5	19.0	20.0	26.0	23.5	25.0	22.0	20.5	21.0	18.5	15.5	17.0
25	22.0	19.5	20.5	25.5	21.5	23.5	22.5	20.5	21.5	15.5	13.0	14.0
26	22.5	19.5	21.0	22.5	21.0	21.5	22.5	21.5	22.0	13.5	13.0	13.0
27	23.0	20.5	21.5	21.5	19.5	21.0	23.0	21.5	22.5	14.0	13.0	13.5
28	23.5	21.5	22.5	22.0	20.0	21.0	23.0	21.5	22.0	15.0	13.5	14.5
29	23.5	21.5	22.5	22.5	21.5	22.0	22.0	20.5	21.0	15.5	14.0	15.0
30	23.5	22.0	23.0	23.0	21.5	22.0	22.5	19.5	21.0	16.0	14.0	15.0
31	---	---	---	24.0	21.5	23.0	22.5	21.0	21.5	---	---	---
MONTH	23.5	14.0	19.3	26.0	18.0	21.6	26.0	19.0	22.2	23.5	13.0	18.0

STREAMS TRIBUTARY TO DETROIT RIVER

04168400 LOWER RIVER ROUGE AT DEARBORN, MI—Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.4	6.9	7.3	8.5	7.6	8.0	—	—	—	—	—	—
2	7.3	6.7	6.9	8.7	7.4	8.0	—	—	—	—	—	—
3	7.3	6.7	7.0	8.4	7.0	7.6	—	—	—	—	—	—
4	8.5	5.1	7.7	8.9	7.1	7.9	—	—	—	—	—	—
5	8.1	7.5	7.8	9.9	7.8	8.7	—	—	—	—	—	—
6	8.4	7.6	7.9	10.6	8.1	9.2	—	—	—	—	—	—
7	8.6	8.1	8.4	9.2	6.2	7.1	—	—	—	—	—	—
8	8.8	8.6	8.7	7.6	6.1	6.8	—	—	—	—	—	—
9	9.1	8.7	8.9	6.8	4.3	6.2	—	—	—	—	—	—
10	8.9	8.4	8.7	7.5	4.3	6.2	—	—	—	—	—	—
11	8.6	8.0	8.4	8.4	7.5	8.1	—	—	—	—	—	—
12	8.4	7.7	8.2	8.6	7.9	8.3	—	—	—	—	—	—
13	7.9	7.3	7.7	8.3	7.7	8.0	—	—	—	—	—	—
14	7.4	6.6	7.2	9.1	7.5	8.5	—	—	—	—	—	—
15	6.9	6.5	6.7	—	—	—	—	—	—	—	—	—
16	6.6	3.8	5.5	—	—	—	—	—	—	—	—	—
17	6.7	5.9	6.3	—	—	—	—	—	—	—	—	—
18	7.0	6.0	6.6	—	—	—	—	—	—	—	—	—
19	7.2	6.4	6.8	—	—	—	—	—	—	—	—	—
20	6.6	5.6	6.3	—	—	—	—	—	—	—	—	—
21	5.9	5.2	5.5	—	—	—	—	—	—	—	—	—
22	6.2	5.1	5.7	—	—	—	—	—	—	—	—	—
23	6.6	5.6	6.0	—	—	—	—	—	—	—	—	—
24	6.2	4.9	5.6	—	—	—	—	—	—	—	—	—
25	6.4	6.1	6.3	—	—	—	—	—	—	—	—	—
26	6.4	6.1	6.3	—	—	—	—	—	—	—	—	—
27	6.4	5.8	6.2	—	—	—	—	—	—	—	—	—
28	6.8	5.9	6.5	—	—	—	—	—	—	—	—	—
29	8.0	6.5	7.4	—	—	—	—	—	—	—	—	—
30	8.2	7.4	7.8	—	—	—	—	—	—	—	—	—
31	8.5	7.3	7.9	—	—	—	—	—	—	—	—	—
MONTH	9.1	3.8	7.1	—	—	—	—	—	—	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	14.4	9.7	11.6	16.3	8.6	12.1
2	—	—	—	—	—	—	17.5	8.8	12.7	14.3	7.8	10.8
3	—	—	—	—	—	—	17.6	8.9	12.9	11.6	6.7	9.1
4	—	—	—	—	—	—	18.3	8.9	13.1	9.3	6.0	7.6
5	—	—	—	—	—	—	16.7	9.1	12.9	9.1	5.8	7.4
6	—	—	—	—	—	—	12.2	7.0	8.6	8.6	6.2	7.4
7	—	—	—	—	—	—	8.4	7.4	8.1	7.6	5.9	6.7
8	—	—	—	—	—	—	10.9	7.9	9.1	8.2	5.0	6.2
9	—	—	—	—	—	—	9.5	7.4	8.2	7.9	5.3	6.5
10	—	—	—	—	—	—	9.1	7.8	8.5	8.2	6.3	7.2
11	—	—	—	—	—	—	10.4	8.5	9.3	7.1	5.9	6.5
12	—	—	—	—	—	—	9.8	8.1	8.9	7.0	5.0	6.1
13	—	—	—	—	—	—	11.6	7.6	9.3	8.0	6.6	7.3
14	—	—	—	—	—	—	12.8	7.9	10.2	8.1	6.4	7.5
15	—	—	—	—	—	—	10.1	7.8	8.7	7.1	5.9	6.7
16	—	—	—	—	—	—	10.8	9.3	10.1	8.6	6.3	8.0
17	—	—	—	—	—	—	12.5	10.5	11.0	8.6	7.6	8.1
18	—	—	—	—	—	—	13.8	11.0	12.0	7.6	7.1	7.4
19	—	—	—	—	—	—	14.3	10.2	11.9	7.7	7.1	7.4
20	—	—	—	—	—	—	11.2	8.8	9.5	7.6	6.8	7.3
21	—	—	—	—	—	—	10.8	7.5	8.4	6.9	4.6	6.4
22	—	—	—	—	—	—	8.7	7.8	8.3	7.3	6.3	6.9
23	—	—	—	—	—	—	9.1	7.8	8.3	7.8	7.3	7.6
24	—	—	—	—	—	—	9.7	7.2	8.3	7.9	7.0	7.6
25	—	—	—	—	—	—	11.2	8.2	9.6	7.9	7.1	7.6
26	—	—	—	—	—	—	11.8	8.4	9.9	8.1	7.6	8.0
27	—	—	—	—	—	—	12.1	7.7	9.7	8.7	7.2	8.3
28	—	—	—	21.0	—	—	13.0	7.5	10.0	9.1	8.3	8.9
29	—	—	—	18.6	11.3	14.9	13.2	7.7	10.4	8.7	8.2	8.5
30	—	—	—	20.6	10.5	15.4	17.7	7.6	11.6	9.1	8.2	8.6
31	—	—	—	17.6	9.9	13.9	—	—	—	9.2	8.3	8.8
MONTH	—	—	—	—	—	—	18.3	7.0	10.0	16.3	4.6	7.8

STREAMS TRIBUTARY TO DETROIT RIVER

04168400 LOWER RIVER ROUGE AT DEARBORN, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	6.8	8.0	5.3	3.0	4.2	5.3	3.7	4.5	5.6	3.7	4.7
2	8.7	7.7	8.4	6.4	4.1	5.3	4.5	3.2	3.9	5.9	4.2	5.0
3	9.1	8.7	8.9	6.4	4.8	5.5	5.0	2.7	3.9	5.8	4.4	5.0
4	9.2	8.7	9.0	5.7	3.9	5.0	4.7	2.9	3.8	5.5	3.5	4.7
5	8.9	8.2	8.7	5.7	3.6	4.7	4.9	2.8	4.0	6.1	4.1	5.1
6	8.4	7.4	8.2	5.9	3.9	4.8	5.2	3.1	3.8	6.0	4.6	5.3
7	8.6	7.6	8.1	6.3	3.9	5.3	4.4	2.7	3.6	5.8	4.5	5.2
8	8.0	7.0	7.7	5.8	2.2	4.4	4.4	3.0	3.6	5.3	2.5	4.5
9	7.5	6.2	7.0	5.0	3.2	4.1	4.0	2.8	3.5	5.6	3.1	4.4
10	7.2	1.3	5.8	5.5	2.8	3.9	4.3	1.1	3.6	6.3	5.5	5.9
11	5.7	4.3	5.2	5.2	2.2	3.6	4.8	3.5	4.1	6.4	5.4	5.9
12	5.7	4.4	5.0	4.8	3.0	3.9	4.9	3.3	4.2	6.8	5.5	6.2
13	5.6	4.2	5.0	4.8	3.3	4.1	5.1	3.3	4.2	6.8	5.7	6.3
14	5.4	4.1	4.8	5.4	3.6	4.6	5.7	3.5	4.7	7.4	6.3	6.9
15	5.1	3.6	4.5	4.8	3.2	4.0	6.2	3.9	4.8	7.8	6.8	7.4
16	5.6	3.6	4.8	5.2	3.1	4.0	4.7	3.5	4.1	7.9	6.9	7.4
17	5.7	4.1	5.1	5.8	2.5	4.0	4.9	4.1	4.5	7.8	6.7	7.3
18	6.2	4.5	5.4	4.8	3.0	4.0	6.1	4.1	4.7	7.3	6.8	7.0
19	6.2	2.8	5.6	4.9	2.9	3.9	5.9	4.7	5.6	7.5	5.4	7.0
20	5.6	1.9	4.7	4.6	2.9	3.6	5.8	4.7	5.4	7.8	7.0	7.4
21	6.4	4.7	5.4	4.1	1.3	3.0	5.4	4.4	5.0	7.5	6.9	7.2
22	7.1	6.4	6.8	4.0	2.8	3.5	5.3	3.6	4.8	7.7	7.2	7.5
23	7.4	6.2	6.7	4.4	2.8	3.6	5.3	3.9	4.9	7.8	6.8	7.4
24	6.8	5.8	6.3	5.1	2.9	4.0	4.8	3.4	4.2	7.7	6.7	7.2
25	6.7	4.9	5.7	5.4	2.3	4.1	4.7	2.9	4.0	8.8	7.3	8.3
26	5.8	4.3	5.2	5.5	4.0	4.9	5.0	2.9	4.0	9.1	8.5	8.8
27	5.4	4.2	4.8	5.7	3.9	5.0	4.9	3.4	4.4	9.1	8.5	8.9
28	5.6	3.7	4.6	5.5	3.8	4.6	4.7	3.2	4.0	8.9	8.0	8.5
29	5.1	3.3	4.2	5.3	2.7	4.2	5.9	3.5	4.7	8.6	7.5	8.1
30	4.8	2.9	4.0	6.0	3.9	5.4	5.7	4.4	5.1	8.4	7.4	7.9
31	—	—	—	6.1	4.1	5.2	5.2	3.8	4.6	—	—	—
MONTH	9.2	1.3	6.1	6.4	1.3	4.3	6.2	1.1	4.3	9.1	2.5	6.6

STREAMS TRIBUTARY TO DETROIT RIVER

04168530 RIVER ROUGE AT ALLEN PARK, MI

LOCATION.--Lat 42°18'03", long 83°11'58", in private claim 142, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, on right bank 10 ft downstream from bridge on Rotunda Drive in Allen Park, 2.3 mi downstream from Lower River Rouge, and 5.5 mi upstream from mouth.

DRAINAGE AREA.--410 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May to September 2001.

GAGE.--Water-stage recorder and acoustic doppler current meter. Elevation of gage is 611 ft above sea level, from topographic map.

REMARKS.--Water-discharge records poor. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	226	e640	e120	e130	e87
2	---	---	---	---	---	---	---	203	e1000	e115	e100	e83
3	---	---	---	---	---	---	---	e200	e1150	e120	e115	e81
4	---	---	---	---	---	---	---	e195	e540	e130	e95	e79
5	---	---	---	---	---	---	---	e190	e400	e140	e87	e95
6	---	---	---	---	---	---	---	e185	e340	e120	e80	e80
7	---	---	---	---	---	---	---	e180	e310	e110	e79	104
8	---	---	---	---	---	---	---	e320	e280	e135	e78	257
9	---	---	---	---	---	---	---	e230	e240	e110	e80	588
10	---	---	---	---	---	---	---	e200	324	e130	e290	1550
11	---	---	---	---	---	---	---	e230	400	e105	e110	e220
12	---	---	---	---	---	---	---	e300	304	e92	e87	e160
13	---	---	---	---	---	---	---	e210	e195	e89	e82	e140
14	---	---	---	---	---	---	---	e170	e180	e87	e78	e120
15	---	---	---	---	---	---	---	e260	e230	e86	e76	e115
16	---	---	---	---	---	---	---	e1100	e600	e85	e220	e110
17	---	---	---	---	---	---	---	e600	e230	e84	e270	e100
18	---	---	---	---	---	---	---	e430	e220	e83	e190	e850
19	---	---	---	---	---	---	---	e480	e250	e100	e720	1310
20	---	---	---	---	---	---	---	e290	e350	110	e400	1520
21	---	---	---	---	---	---	---	684	e280	e230	e190	e750
22	---	---	---	---	---	---	---	1650	e550	e150	e230	e650
23	---	---	---	---	---	---	---	e450	e320	e110	e270	e300
24	---	---	---	---	---	---	---	e400	e270	e130	e160	e480
25	---	---	---	---	---	---	---	e470	e220	151	129	e310
26	---	---	---	---	---	---	---	e540	e180	176	e200	e370
27	---	---	---	---	---	---	---	e850	e160	e110	e250	e350
28	---	---	---	---	---	---	---	e1100	e140	e90	124	e230
29	---	---	---	---	---	---	---	e1080	e135	e130	e110	e190
30	---	---	---	---	---	---	---	e540	e125	e500	e100	e170
31	---	---	---	---	---	---	---	e400	---	e200	e92	---
TOTAL	---	---	---	---	---	---	---	14363	10563	4128	5222	11449
MEAN	---	---	---	---	---	---	---	463	352	133	168	382
MAX	---	---	---	---	---	---	---	1650	1150	500	720	1550
MIN	---	---	---	---	---	---	---	170	125	83	76	79

(e) Estimated.

STREAMS TRIBUTARY TO DETROIT RIVER

04168530 RIVER ROUGE AT ALLEN PARK, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April to September 2001.
DISSOLVED OXYGEN: April to September 2001.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 28.0°C, Aug. 9, 2001; minimum, 12.0°C, Sept. 27, 2001.
DISSOLVED OXYGEN: Maximum, 11.9 mg/L, Apr. 30, 2001; minimum, 0.6 mg/L, Aug. 10, 2001.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	16.5	15.0	16.0
2	---	---	---	---	---	---	---	---	---	18.5	16.5	17.5
3	---	---	---	---	---	---	---	---	---	20.0	18.0	19.0
4	---	---	---	---	---	---	---	---	---	21.0	19.0	19.5
5	---	---	---	---	---	---	---	---	---	20.0	17.5	19.0
6	---	---	---	---	---	---	---	---	---	18.5	16.5	17.5
7	---	---	---	---	---	---	---	---	---	18.0	16.0	17.0
8	---	---	---	---	---	---	---	---	---	18.0	16.5	17.0
9	---	---	---	---	---	---	---	---	---	18.5	16.5	17.5
10	---	---	---	---	---	---	---	---	---	19.0	17.5	18.0
11	---	---	---	---	---	---	---	---	---	19.5	17.5	18.5
12	---	---	---	---	---	---	---	---	---	18.0	16.5	17.5
13	---	---	---	---	---	---	---	---	---	17.0	15.0	16.0
14	---	---	---	---	---	---	---	---	---	17.0	15.0	15.5
15	---	---	---	---	---	---	---	---	---	15.5	14.5	15.5
16	---	---	---	---	---	---	---	---	---	15.0	14.0	14.5
17	---	---	---	---	---	---	---	---	---	16.5	14.5	15.5
18	---	---	---	---	---	---	---	---	---	18.0	16.5	17.0
19	---	---	---	---	---	---	---	---	---	18.0	16.5	17.5
20	---	---	---	---	---	---	---	---	---	19.0	17.0	18.0
21	---	---	---	---	---	---	---	---	---	19.5	17.5	18.0
22	---	---	---	---	---	---	---	---	---	19.0	17.5	18.5
23	---	---	---	---	---	---	16.0	---	---	17.5	15.5	17.0
24	---	---	---	---	---	---	15.5	14.0	15.0	16.5	15.5	16.0
25	---	---	---	---	---	---	14.5	13.0	13.5	15.5	15.0	15.0
26	---	---	---	---	---	---	14.5	12.5	13.5	15.0	14.5	14.5
27	---	---	---	---	---	---	15.5	13.5	14.5	14.5	14.0	14.0
28	---	---	---	---	---	---	15.0	14.0	14.5	15.0	13.5	14.5
29	---	---	---	---	---	---	15.0	13.5	14.0	15.5	14.5	15.0
30	---	---	---	---	---	---	15.5	14.0	14.5	15.5	14.5	15.0
31	---	---	---	---	---	---	---	---	---	15.5	14.5	15.0
MONTH	---	---	---	---	---	---	---	---	---	21.0	13.5	16.6

STREAMS TRIBUTARY TO DETROIT RIVER

04168530 RIVER ROUGE AT ALLEN PARK, MI—Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.5	14.5	15.0	24.5	22.5	23.5	25.0	23.5	24.0	22.5	20.0	21.0
2	15.0	14.0	14.5	23.0	20.5	21.5	25.0	23.5	24.0	21.5	19.5	20.5
3	14.5	14.0	14.0	21.5	19.5	20.5	26.0	23.5	24.5	21.5	19.0	20.0
4	14.5	14.0	14.5	22.5	19.5	20.5	26.0	23.5	24.5	22.5	19.5	21.0
5	15.0	14.5	14.5	22.5	20.0	21.0	25.5	23.0	24.0	21.5	19.5	20.5
6	15.0	14.5	15.0	22.0	19.0	20.5	25.5	23.0	24.0	21.5	19.0	20.0
7	16.5	14.5	15.5	20.5	19.0	20.0	26.5	23.5	25.0	22.5	19.0	20.0
8	17.5	15.5	16.5	22.5	20.0	21.0	27.0	24.5	25.5	23.0	20.5	21.5
9	18.5	16.5	17.5	24.0	21.0	22.0	28.0	25.5	26.5	23.5	22.5	22.5
10	19.0	17.5	18.5	24.5	22.0	23.0	26.5	24.5	25.5	22.5	21.0	22.0
11	20.5	18.5	19.5	24.0	21.5	23.0	25.5	23.5	24.5	21.0	20.0	20.5
12	21.5	20.0	20.5	23.5	21.0	22.0	25.0	23.0	24.0	21.0	19.5	20.0
13	23.0	20.5	21.5	22.5	20.5	21.5	25.0	22.5	23.5	20.5	18.0	19.5
14	24.0	21.5	22.5	23.0	20.0	21.5	23.5	22.0	22.5	19.0	17.0	18.0
15	25.5	22.5	23.5	23.0	20.5	21.5	23.0	21.0	22.0	17.5	16.0	17.0
16	24.0	22.5	23.5	23.5	21.0	22.0	22.0	21.0	21.0	18.0	15.5	16.5
17	24.0	22.0	23.0	23.5	21.0	22.5	22.0	20.5	21.0	17.5	15.5	16.5
18	23.0	21.5	22.0	24.5	22.5	23.5	22.0	19.5	21.0	18.5	16.0	17.0
19	23.5	21.5	22.5	25.5	23.0	24.0	21.0	20.5	20.5	19.5	17.0	18.5
20	22.5	21.5	22.0	25.5	23.5	24.0	20.5	20.0	20.5	18.5	18.0	18.5
21	21.5	19.5	20.5	25.0	23.5	24.0	21.5	20.0	20.5	18.0	17.0	17.5
22	19.5	18.5	19.0	25.5	23.0	24.0	20.5	20.0	20.0	17.5	16.5	17.0
23	20.5	18.5	19.5	26.5	24.0	25.0	21.0	20.0	20.5	18.0	17.0	17.0
24	21.5	19.5	20.5	27.5	24.5	26.0	22.0	20.5	21.0	17.5	16.0	16.5
25	22.0	20.5	21.5	25.5	23.0	24.5	23.0	21.0	22.0	16.0	13.5	14.5
26	23.0	21.5	22.0	24.0	22.0	23.0	23.0	21.5	22.0	13.5	12.5	13.0
27	24.0	22.0	22.5	23.5	21.0	22.0	23.5	22.0	22.5	13.0	12.0	12.5
28	25.0	22.0	23.5	23.5	20.5	22.0	24.0	22.0	23.0	14.0	12.5	13.0
29	25.5	22.5	24.0	24.0	21.5	22.0	23.5	21.5	22.0	15.0	13.5	14.0
30	25.5	23.0	24.0	23.0	22.0	22.5	23.0	20.5	21.5	15.5	13.5	14.0
31	—	—	—	24.5	22.0	23.0	23.0	21.0	22.0	—	—	—
MONTH	25.5	14.0	19.8	27.5	19.0	22.5	28.0	19.5	22.7	23.5	12.0	18.0

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	—	—	—	11.5	9.4	10.4
2	—	—	—	—	—	—	—	—	—	11.4	8.9	10.0
3	—	—	—	—	—	—	—	—	—	11.2	8.3	9.5
4	—	—	—	—	—	—	—	—	—	10.1	7.7	8.8
5	—	—	—	—	—	—	—	—	—	9.3	6.7	8.2
6	—	—	—	—	—	—	—	—	—	9.7	7.8	8.7
7	—	—	—	—	—	—	—	—	—	10.1	8.2	9.0
8	—	—	—	—	—	—	—	—	—	8.8	7.0	8.2
9	—	—	—	—	—	—	—	—	—	7.4	6.2	6.8
10	—	—	—	—	—	—	—	—	—	7.9	6.2	7.0
11	—	—	—	—	—	—	—	—	—	7.3	5.9	6.7
12	—	—	—	—	—	—	—	—	—	8.0	5.7	6.8
13	—	—	—	—	—	—	—	—	—	8.2	7.0	7.5
14	—	—	—	—	—	—	—	—	—	8.3	6.8	7.7
15	—	—	—	—	—	—	—	—	—	7.4	7.0	7.2
16	—	—	—	—	—	—	—	—	—	8.3	6.5	7.6
17	—	—	—	—	—	—	—	—	—	8.4	8.1	8.3
18	—	—	—	—	—	—	—	—	—	8.1	6.8	7.9
19	—	—	—	—	—	—	—	—	—	7.7	7.2	7.6
20	—	—	—	—	—	—	—	—	—	7.9	7.3	7.6
21	—	—	—	—	—	—	—	—	—	7.5	5.2	6.9
22	—	—	—	—	—	—	—	—	—	7.3	5.4	6.6
23	—	—	—	—	—	—	9.4	—	—	10.2	7.3	7.7
24	—	—	—	—	—	—	9.4	8.2	8.8	8.2	7.7	8.0
25	—	—	—	—	—	—	10.7	8.8	9.7	8.3	8.0	8.2
26	—	—	—	—	—	—	11.0	9.4	10.2	8.6	8.1	8.4
27	—	—	—	—	—	—	11.2	9.3	10.2	8.8	8.1	8.6
28	—	—	—	—	—	—	11.2	9.2	10.2	9.1	8.8	9.0
29	—	—	—	—	—	—	11.8	9.7	10.7	9.0	8.5	8.7
30	—	—	—	—	—	—	11.9	9.9	10.8	8.9	8.6	8.8
31	—	—	—	—	—	—	—	—	—	9.0	8.6	8.8
MONTH	—	—	—	—	—	—	—	—	—	11.5	5.2	8.1

STREAMS TRIBUTARY TO DETROIT RIVER

04168530 RIVER ROUGE AT ALLEN PARK, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.6	7.4	8.3	7.0	4.8	5.7	6.2	4.3	5.1	7.7	5.2	6.2
2	8.6	7.7	8.3	8.0	5.5	6.7	5.7	3.7	4.5	6.8	4.5	5.3
3	8.9	8.6	8.8	7.0	5.3	6.0	6.2	1.9	4.0	6.4	4.7	5.4
4	9.1	8.9	9.0	7.3	5.8	6.4	7.1	3.4	4.6	7.3	4.9	6.0
5	9.0	8.8	8.9	7.4	5.4	6.4	6.6	2.9	4.3	6.9	4.9	5.7
6	8.8	8.4	8.7	7.2	5.5	6.2	7.5	2.9	4.5	7.8	4.9	5.8
7	9.1	8.2	8.6	6.6	5.4	6.0	7.4	3.2	4.7	7.3	4.9	5.7
8	8.5	7.8	8.3	6.3	3.6	5.4	6.8	3.1	4.4	7.9	2.9	5.8
9	8.3	7.4	7.9	6.0	3.5	4.6	8.4	2.6	4.8	6.6	4.6	5.6
10	7.9	3.5	6.9	6.2	3.4	4.8	5.4	.6	4.0	7.1	5.7	6.4
11	7.5	5.3	6.7	6.5	3.7	5.2	5.2	2.4	3.6	7.6	7.1	7.4
12	6.9	6.2	6.6	6.9	4.4	5.5	5.0	2.1	3.4	7.8	7.1	7.4
13	6.9	5.9	6.4	7.1	4.2	5.3	6.0	2.1	3.6	7.5	6.9	7.2
14	6.8	5.6	6.1	7.9	4.4	5.9	6.1	2.3	3.8	7.9	6.2	7.4
15	7.2	5.2	6.0	7.7	4.5	6.0	6.4	3.0	4.4	8.2	7.2	7.6
16	6.4	5.1	5.5	9.1	4.6	6.2	5.7	3.2	4.2	8.5	6.3	7.6
17	5.9	5.0	5.4	8.6	4.8	6.2	5.8	4.2	5.4	8.2	7.1	7.6
18	6.0	4.9	5.4	9.8	4.9	6.6	7.8	4.4	4.9	8.3	7.2	7.6
19	6.4	5.4	5.9	10.6	5.1	6.9	6.5	3.2	5.9	7.3	6.3	7.0
20	6.0	4.7	5.4	11.6	5.0	7.3	7.1	6.4	6.9	8.1	7.1	7.7
21	6.3	5.0	5.6	8.3	.7	5.2	7.0	6.1	6.6	8.3	7.4	8.0
22	7.2	5.7	6.7	5.0	1.3	3.5	6.5	5.1	6.0	8.5	8.0	8.4
23	7.3	6.5	7.1	5.7	2.4	3.7	7.2	5.7	6.7	8.8	8.3	8.6
24	6.9	6.2	6.6	7.8	3.1	5.7	7.4	6.6	7.0	8.8	8.2	8.5
25	7.3	6.3	6.8	6.5	2.6	5.0	7.2	5.5	6.4	9.2	8.7	9.0
26	7.2	6.0	6.5	6.7	4.3	5.6	6.5	4.0	5.4	9.6	8.9	9.4
27	7.5	5.9	6.7	6.8	4.8	5.9	6.6	5.7	6.2	9.9	9.6	9.7
28	6.6	5.4	6.2	7.5	5.4	6.1	6.2	5.1	5.6	9.8	9.4	9.6
29	6.2	4.9	5.4	7.6	4.6	5.7	6.0	4.8	5.3	9.7	9.0	9.4
30	6.4	4.7	5.4	6.1	3.0	5.5	6.4	4.6	5.3	9.6	8.9	9.1
31	—	—	—	6.7	5.3	6.0	7.2	4.4	5.8	—	—	—
MONTH	9.1	3.5	6.9	11.6	.7	5.7	8.4	.6	5.1	9.9	2.9	7.4

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI

LOCATION.--Lat 42°34'44", long 83°37'36", in NE1/4 sec.16, T.2 N., R.7 E., Oakland County, Hydrologic Unit 04090005, on left bank 40 ft downstream from bridge on General Motors Road, 0.5 mi downstream from Sherwood Creek, and 0.5 mi west of Milford.

DRAINAGE AREA.--132 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1337: 1952(m). WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 880.00 ft above sea level. Prior to Apr. 1, 1970, at site 240 ft upstream at same datum.

REMARKS.--Water-discharge records good. Flow below about 300 ft^3/s regulated by powerplant 1.5 mi upstream from station prior to May 20, 1957; occasional regulation for lake level control since. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	162	124	127	106	134	291	125	87	182	68	53	33
2	154	120	119	102	126	263	134	85	192	64	48	30
3	147	119	114	102	120	253	134	81	206	61	46	28
4	171	125	110	101	115	244	129	78	197	59	41	27
5	182	126	107	101	111	230	125	78	184	53	36	27
6	179	124	106	101	110	215	142	72	174	48	31	26
7	173	128	104	101	109	201	175	68	166	45	25	27
8	161	129	102	101	108	188	179	75	158	42	24	28
9	150	132	100	98	184	181	168	71	150	38	23	38
10	142	137	98	99	328	175	159	68	139	37	24	49
11	134	135	101	98	404	174	156	72	134	35	22	42
12	127	121	109	98	386	176	154	81	124	34	21	34
13	121	118	107	100	331	183	154	76	105	34	21	33
14	115	119	109	101	279	195	150	74	93	33	21	34
15	113	125	106	104	261	196	145	76	87	32	23	33
16	127	126	110	108	245	194	145	133	104	30	28	31
17	129	123	126	109	225	189	143	150	104	28	33	31
18	119	122	127	108	209	185	139	136	101	28	31	32
19	117	120	125	106	196	182	137	124	95	27	56	55
20	116	119	121	102	188	179	136	111	91	25	71	80
21	112	120	121	99	183	176	154	112	86	24	59	83
22	108	117	117	97	175	172	176	135	106	23	58	86
23	106	114	116	95	166	167	172	140	104	23	62	78
24	135	110	115	95	169	161	157	140	96	25	60	84
25	150	110	113	94	276	155	145	149	100	25	54	79
26	141	120	113	93	370	145	132	160	91	29	52	89
27	127	128	117	93	379	135	124	176	81	30	56	94
28	119	127	113	92	334	128	115	206	74	27	51	88
29	112	129	112	92	---	127	107	224	72	34	46	79
30	113	130	112	111	---	125	92	211	72	54	44	71
31	118	---	109	133	---	123	---	190	---	60	39	---
TOTAL	4180	3697	3486	3140	6221	5708	4303	3639	3668	1175	1259	1549
MEAN	135	123	112	101	222	184	143	117	122	37.9	40.6	51.6
MAX	182	137	127	133	404	291	179	224	206	68	71	94
MIN	106	110	98	92	108	123	92	68	72	23	21	26
CFSM	1.02	.93	.85	.77	1.68	1.39	1.09	.89	.93	.29	.31	.39
IN.	1.18	1.04	.98	.88	1.75	1.61	1.21	1.03	1.03	.33	.35	.44

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2001, BY WATER YEAR (WY)

MEAN	81.0	97.2	109	106	115	155	160	116	89.2	67.0	55.7	66.9
MAX	283	179	218	211	226	337	389	340	197	233	142	247
(WY)	1982	1993	1951	1993	1951	1976	1950	1956	1996	1968	1968	1975
MIN	32.6	34.0	35.8	42.5	42.0	66.9	66.3	51.8	28.8	19.3	26.5	27.2
(WY)	1965	1964	1964	1964	1963	1964	2000	1988	1988	1988	1971	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1948 - 2001	
ANNUAL TOTAL	40481		42025			
ANNUAL MEAN	111		115		101	
HIGHEST ANNUAL MEAN					157	1974
LOWEST ANNUAL MEAN					44.6	1964
HIGHEST DAILY MEAN	417	Sep 14	404	Feb 11	632	Oct 3 1981
LOWEST DAILY MEAN	25	Jul 27	21	Aug 12	5.2	Oct 21 1971
ANNUAL SEVEN-DAY MINIMUM	37	Jul 22	22	Aug 9	11	Jul 9 1988
MAXIMUM PEAK FLOW			415	Feb 11	(a)648	Oct 3 1981
MAXIMUM PEAK STAGE			6.97	Feb 11	8.26	Jun 28 1968
INSTANTANEOUS LOW FLOW			19	Aug 13		
ANNUAL RUNOFF (CFSM)	.84		.87		.77	
ANNUAL RUNOFF (INCHES)	11.41		11.84		10.45	
10 PERCENT EXCEEDS	182		184		185	
50 PERCENT EXCEEDS	104		112		86	
90 PERCENT EXCEEDS	57		33		38	

(a) Gage height 7.87 ft.

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2000 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 2000 to current year.
pH: March 2000 to current year.
WATER TEMPERATURE: March 2000 to current year.
DISSOLVED OXYGEN: March 2000 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 974 microsiemens, Aug. 20, 2001; minimum, 510 microsiemens, Aug. 1, 2001.
pH: Maximum, 8.5 std. units, Apr. 29, 2000, July 27, 2001; minimum, 6.7 std. units, May 25, 2001.
WATER TEMPERATURE: Maximum, 29.5°C, Aug. 8, 2001; minimum, 6.0°C, Apr. 10, 12, 2000
DISSOLVED OXYGEN: Maximum, 13.6 mg/L, Apr. 10, 12, 2000; minimum, 2.0 mg/L, July 26, 2001.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 974 microsiemens, Aug. 20; minimum, 510 microsiemens, Aug. 1.
pH: Maximum, 8.5 std. units, July 27; minimum, 6.7 std. units, May 25.
WATER TEMPERATURE: Maximum, 29.5°C, Aug. 8; minimum 6.5°C, Nov. 15.
DISSOLVED OXYGEN: Maximum, 12.6 mg/L, Aug. 18; minimum, 2.0 mg/L, July 26.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	635	616	629	761	727	739	---	---	---	---	---	---
2	649	625	636	768	738	752	---	---	---	---	---	---
3	662	645	654	773	740	755	---	---	---	---	---	---
4	667	646	654	767	738	752	---	---	---	---	---	---
5	662	634	650	754	743	749	---	---	---	---	---	---
6	661	633	643	755	738	748	---	---	---	---	---	---
7	691	615	651	758	747	753	---	---	---	---	---	---
8	702	624	669	770	751	760	---	---	---	---	---	---
9	709	669	687	771	746	761	---	---	---	---	---	---
10	732	678	696	753	743	747	---	---	---	---	---	---
11	751	676	709	751	744	747	---	---	---	---	---	---
12	774	685	728	748	736	741	---	---	---	---	---	---
13	768	697	732	744	734	739	---	---	---	---	---	---
14	765	707	742	756	741	749	---	---	---	---	---	---
15	774	734	752	---	---	---	---	---	---	---	---	---
16	778	727	753	---	---	---	---	---	---	---	---	---
17	787	721	751	---	---	---	---	---	---	---	---	---
18	777	700	735	---	---	---	---	---	---	---	---	---
19	767	701	740	---	---	---	---	---	---	---	---	---
20	766	696	743	---	---	---	---	---	---	---	---	---
21	763	719	745	---	---	---	---	---	---	---	---	---
22	778	722	750	---	---	---	---	---	---	---	---	---
23	778	704	745	---	---	---	---	---	---	---	---	---
24	775	715	742	---	---	---	---	---	---	---	---	---
25	757	696	731	---	---	---	---	---	---	---	---	---
26	721	690	708	---	---	---	---	---	---	---	---	---
27	733	704	719	---	---	---	---	---	---	---	---	---
28	750	695	724	---	---	---	---	---	---	---	---	---
29	775	699	733	---	---	---	---	---	---	---	---	---
30	761	695	734	---	---	---	---	---	---	---	---	---
31	762	710	731	---	---	---	---	---	---	---	---	---
MONTH	787	615	710	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	818	---	---
5	---	---	---	---	---	---	---	---	---	825	800	811
6	---	---	---	---	---	---	---	---	---	828	811	819
7	---	---	---	---	---	---	---	---	---	838	816	828
8	---	---	---	---	---	---	---	---	---	842	824	831
9	---	---	---	---	---	---	---	---	---	855	828	837
10	---	---	---	---	---	---	---	---	---	867	844	854
11	---	---	---	---	---	---	---	---	---	860	822	839
12	---	---	---	---	---	---	---	---	---	828	811	821
13	---	---	---	---	---	---	---	---	---	836	818	826
14	---	---	---	---	---	---	---	---	---	842	825	832
15	---	---	---	---	---	---	---	---	---	835	821	829
16	---	---	---	---	---	---	---	---	---	833	804	814
17	---	---	---	---	---	---	---	---	---	811	761	784
18	---	---	---	---	---	---	---	---	---	762	739	751
19	---	---	---	---	---	---	---	---	---	753	733	744
20	---	---	---	---	---	---	713	703	---	763	736	747
21	---	---	---	---	---	---	722	702	716	796	748	762
22	---	---	---	---	---	---	726	717	720	800	776	786
23	---	---	---	---	---	---	717	705	711	786	767	774
24	---	---	---	---	---	---	713	702	706	769	756	760
25	---	---	---	---	---	---	725	707	716	766	753	760
26	---	---	---	---	---	---	---	---	---	761	747	752
27	---	---	---	---	---	---	---	---	---	751	732	741
28	---	---	---	---	---	---	---	---	---	732	708	721
29	---	---	---	---	---	---	---	---	---	711	700	704
30	---	---	---	---	---	---	---	---	---	708	698	703
31	---	---	---	---	---	---	---	---	---	736	705	715
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	741	730	736	795	754	772	694	510	589	826	782	806
2	735	717	727	773	744	755	830	534	588	852	805	823
3	723	715	719	755	733	746	838	804	821	857	800	837
4	724	713	718	764	739	746	840	816	827	856	822	842
5	728	715	721	749	721	737	842	815	833	874	839	853
6	735	722	726	759	728	743	851	817	838	880	852	868
7	746	730	738	781	750	764	863	828	850	889	835	872
8	759	742	750	784	752	770	854	835	845	889	757	869
9	769	748	756	793	764	779	871	826	847	904	815	870
10	768	748	760	803	784	794	867	847	858	913	880	895
11	765	758	762	811	789	801	884	835	864	910	878	895
12	775	758	765	824	793	809	888	849	873	897	856	877
13	810	765	772	828	787	816	891	852	876	889	853	873
14	817	786	805	831	801	819	904	871	888	876	857	867
15	817	776	803	842	804	826	915	884	901	882	847	864
16	824	782	809	839	822	831	943	878	913	875	852	864
17	823	779	804	838	803	817	960	920	941	873	855	863
18	807	759	787	857	801	829	944	877	925	892	855	871
19	803	772	787	877	827	844	943	879	920	909	818	876
20	807	769	787	905	874	883	974	921	944	929	897	912
21	787	760	773	910	871	895	921	877	892	911	848	882
22	783	761	774	921	885	901	903	847	870	865	827	843
23	774	751	760	932	892	911	873	836	852	844	---	---
24	780	742	755	930	905	918	873	849	862	---	832	---
25	779	736	760	928	900	916	849	803	828	816	802	808
26	793	735	758	930	889	912	833	782	809	807	799	802
27	799	771	784	929	893	913	809	790	797	810	802	806
28	800	763	785	925	885	907	799	778	791	809	784	798
29	807	764	788	913	563	876	807	767	794	797	783	791
30	803	775	790	904	868	889	808	782	795	802	782	792
31	---	---	---	874	670	798	806	788	799	---	---	---
MONTH	824	713	765	932	563	830	974	510	840	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.1	8.0	8.1	8.1	7.9	7.9	---	---	---	---	---	---
2	8.1	8.0	8.1	8.1	7.9	8.0	---	---	---	---	---	---
3	8.2	8.0	8.0	8.1	7.9	7.9	---	---	---	---	---	---
4	8.0	7.9	8.0	8.1	7.9	8.0	---	---	---	---	---	---
5	7.9	7.8	7.9	8.1	7.9	8.0	---	---	---	---	---	---
6	7.9	7.8	7.8	8.1	7.9	8.0	---	---	---	---	---	---
7	7.9	7.8	7.9	8.0	7.9	8.0	---	---	---	---	---	---
8	7.9	7.8	7.8	8.0	7.8	7.9	---	---	---	---	---	---
9	8.0	7.8	7.9	7.9	7.8	7.9	---	---	---	---	---	---
10	8.0	7.8	7.9	7.9	7.8	7.9	---	---	---	---	---	---
11	8.0	7.8	7.9	8.0	7.9	7.9	---	---	---	---	---	---
12	7.9	7.7	7.8	8.0	7.9	7.9	---	---	---	---	---	---
13	7.9	7.7	7.8	7.9	7.9	7.9	---	---	---	---	---	---
14	8.0	7.7	7.8	7.9	7.9	7.9	---	---	---	---	---	---
15	7.9	7.7	7.8	---	7.9	---	---	---	---	---	---	---
16	8.0	7.7	7.8	---	---	---	---	---	---	---	---	---
17	7.9	7.7	7.8	---	---	---	---	---	---	---	---	---
18	7.9	7.7	7.7	---	---	---	---	---	---	---	---	---
19	8.0	7.7	7.8	---	---	---	---	---	---	---	---	---
20	7.9	7.7	7.8	---	---	---	---	---	---	---	---	---
21	8.0	7.7	7.8	---	---	---	---	---	---	---	---	---
22	8.1	7.8	7.9	---	---	---	---	---	---	---	---	---
23	8.1	7.8	7.9	---	---	---	---	---	---	---	---	---
24	7.8	7.7	7.8	---	---	---	---	---	---	---	---	---
25	7.9	7.7	7.8	---	---	---	---	---	---	---	---	---
26	7.9	7.8	7.8	---	---	---	---	---	---	---	---	---
27	7.9	7.8	7.8	---	---	---	---	---	---	---	---	---
28	8.0	7.8	7.9	---	---	---	---	---	---	---	---	---
29	8.0	7.8	7.9	---	---	---	---	---	---	---	---	---
30	8.0	7.8	7.9	---	---	---	---	---	---	---	---	---
31	8.1	7.8	7.9	---	---	---	---	---	---	---	---	---
MONTH	8.2	7.7	7.9	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	7.9	7.8	7.9
2	---	---	---	---	---	---	---	---	---	8.0	7.8	7.9
3	---	---	---	---	---	---	---	---	---	8.0	7.9	7.9
4	---	---	---	---	---	---	---	---	---	8.1	7.9	8.0
5	---	---	---	---	---	---	---	---	---	8.1	7.9	8.0
6	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9
7	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9
8	---	---	---	---	---	---	---	---	---	8.0	7.8	7.9
9	---	---	---	---	---	---	---	---	---	8.0	7.9	7.9
10	---	---	---	---	---	---	---	---	---	8.0	7.8	7.9
11	---	---	---	---	---	---	---	---	---	7.9	7.8	7.8
12	---	---	---	---	---	---	---	---	---	7.9	7.7	7.8
13	---	---	---	---	---	---	---	---	---	7.9	7.7	7.8
14	---	---	---	---	---	---	---	---	---	7.9	7.8	7.9
15	---	---	---	---	---	---	---	---	---	7.8	7.7	7.8
16	---	---	---	---	---	---	---	---	---	7.8	7.7	7.7
17	---	---	---	---	---	---	---	---	---	7.8	7.8	7.8
18	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9
19	---	---	---	---	---	---	---	---	---	8.1	8.0	8.0
20	---	---	---	---	---	---	7.8	7.6	---	8.3	7.9	8.1
21	---	---	---	---	---	---	7.7	7.7	7.7	8.2	7.8	8.1
22	---	---	---	---	---	---	7.7	7.7	7.7	7.9	7.8	7.9
23	---	---	---	---	---	---	7.7	7.7	7.7	7.9	7.9	7.9
24	---	---	---	---	---	---	7.8	7.7	7.7	7.9	7.7	7.8
25	---	---	---	---	---	---	7.8	7.5	7.8	7.8	6.7	7.7
26	---	---	---	---	---	---	7.8	7.7	7.8	7.8	7.8	7.8
27	---	---	---	---	---	---	7.9	7.8	7.9	7.8	7.8	7.8
28	---	---	---	---	---	---	7.9	7.8	7.9	7.8	7.8	7.8
29	---	---	---	---	---	---	7.9	7.8	7.9	7.8	7.8	7.8
30	---	---	---	---	---	---	7.9	7.8	7.9	7.9	7.8	7.8
31	---	---	---	---	---	---	---	---	---	7.9	7.8	7.9
MONTH	---	---	---	---	---	---	---	---	---	8.3	6.7	7.9

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.9	7.7	7.8	8.2	7.9	8.0	8.3	7.9	8.1	8.0	7.8	7.9
2	7.7	7.7	7.7	8.3	7.9	8.1	8.1	7.9	8.0	8.0	7.8	7.9
3	7.7	7.7	7.7	8.2	8.0	8.1	8.3	7.8	8.1	8.0	7.8	7.8
4	7.7	7.7	7.7	8.2	7.9	8.0	8.4	7.9	8.1	8.1	7.8	7.9
5	7.8	7.7	7.7	8.4	8.0	8.2	8.3	7.9	8.1	8.1	7.8	7.9
6	7.8	7.7	7.7	8.3	7.9	8.1	8.2	7.9	8.0	8.1	7.8	7.9
7	7.8	7.7	7.7	8.1	7.9	8.0	8.3	7.8	8.0	8.1	7.8	7.9
8	7.9	7.8	7.8	8.3	7.9	8.0	8.3	7.9	8.1	8.1	7.8	7.9
9	7.9	7.9	7.9	8.3	7.9	8.1	8.2	7.8	8.0	8.0	7.8	7.9
10	7.9	7.9	7.9	8.3	7.9	8.0	8.1	7.8	7.9	8.0	7.8	7.9
11	8.0	7.8	7.9	8.3	7.9	8.1	8.1	7.8	7.9	8.0	7.8	7.9
12	8.0	7.8	7.9	8.3	7.9	8.1	8.1	7.8	7.9	8.1	7.8	7.9
13	8.0	7.8	7.9	8.2	7.8	8.0	8.1	7.7	7.9	8.1	7.8	7.9
14	7.9	7.8	7.9	8.2	7.9	8.0	8.0	7.7	7.8	8.0	7.8	7.9
15	8.0	7.8	7.8	8.3	7.9	8.1	8.0	7.7	7.8	8.1	7.8	7.9
16	7.9	7.8	7.8	8.3	7.9	8.1	7.7	7.6	7.7	8.1	7.8	7.9
17	8.0	7.8	7.9	8.4	7.8	8.0	7.9	7.6	7.7	8.1	7.8	7.9
18	7.9	7.8	7.8	8.4	7.7	8.0	7.9	7.7	7.8	8.2	7.8	8.0
19	7.9	7.8	7.8	8.2	7.7	7.9	7.9	7.7	7.8	8.0	7.8	7.9
20	8.0	7.8	7.9	8.3	7.6	7.9	7.9	7.8	7.8	8.0	7.8	7.9
21	7.9	7.8	7.9	8.2	7.7	7.9	7.9	7.8	7.8	8.0	7.8	7.9
22	7.8	7.7	7.8	8.2	7.6	7.8	7.8	7.8	7.8	7.9	7.8	7.8
23	7.9	7.7	7.8	8.1	7.6	7.8	7.9	7.8	7.8	—	7.8	—
24	7.9	7.7	7.8	8.3	7.6	7.9	8.0	7.8	7.9	7.9	—	—
25	8.0	7.8	7.9	8.1	7.8	7.9	7.9	7.8	7.9	7.9	7.8	7.9
26	8.0	7.8	7.9	8.4	7.8	8.0	8.0	7.8	7.9	7.9	7.8	7.9
27	8.0	7.8	7.9	8.5	7.9	8.1	8.0	7.8	7.9	8.0	7.9	7.9
28	8.1	7.8	7.9	8.4	7.9	8.1	8.1	7.8	7.9	8.0	7.9	7.9
29	8.1	7.8	8.0	8.4	7.9	8.1	8.0	7.8	7.9	8.0	7.9	7.9
30	8.1	7.9	8.0	8.3	7.9	8.1	8.0	7.8	7.9	8.2	8.0	8.0
31	—	—	—	8.2	7.9	8.1	8.1	7.8	7.9	—	—	—
MONTH	8.1	7.7	7.8	8.5	7.6	8.0	8.4	7.6	7.9	—	—	—

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	15.5	16.0	12.5	11.5	11.5	—	—	—	—	—	—
2	17.0	16.5	16.5	12.5	11.5	12.0	—	—	—	—	—	—
3	18.0	17.0	17.0	12.5	11.5	12.0	—	—	—	—	—	—
4	17.5	16.5	17.0	12.0	11.0	11.5	—	—	—	—	—	—
5	16.5	15.0	16.0	11.0	10.5	11.0	—	—	—	—	—	—
6	15.0	14.0	14.5	11.0	10.0	10.5	—	—	—	—	—	—
7	14.0	12.5	13.0	10.5	10.0	10.5	—	—	—	—	—	—
8	12.5	11.5	12.0	11.5	10.5	11.0	—	—	—	—	—	—
9	12.0	11.0	11.5	12.0	11.0	11.5	—	—	—	—	—	—
10	12.0	11.0	11.5	11.5	10.0	11.0	—	—	—	—	—	—
11	12.5	11.0	11.5	10.5	9.5	10.0	—	—	—	—	—	—
12	12.5	11.5	12.0	9.5	9.0	9.5	—	—	—	—	—	—
13	13.5	12.0	12.5	9.0	8.0	8.5	—	—	—	—	—	—
14	14.0	13.0	13.5	8.0	7.0	7.5	—	—	—	—	—	—
15	14.5	14.0	14.0	—	6.5	—	—	—	—	—	—	—
16	14.5	14.0	14.0	—	—	—	—	—	—	—	—	—
17	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
18	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
19	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
20	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
21	15.5	14.0	14.5	—	—	—	—	—	—	—	—	—
22	15.0	13.5	14.0	—	—	—	—	—	—	—	—	—
23	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
24	14.5	14.0	14.5	—	—	—	—	—	—	—	—	—
25	15.0	14.5	14.5	—	—	—	—	—	—	—	—	—
26	15.5	15.0	15.0	—	—	—	—	—	—	—	—	—
27	16.0	15.0	15.5	—	—	—	—	—	—	—	—	—
28	15.5	14.0	15.0	—	—	—	—	—	—	—	—	—
29	14.5	12.5	13.5	—	—	—	—	—	—	—	—	—
30	13.0	12.0	12.5	—	—	—	—	—	—	—	—	—
31	13.0	11.5	12.0	—	—	—	—	—	—	—	—	—
MONTH	18.0	11.0	14.0	—	—	—	—	—	—	—	—	—

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	—	—	—	18.5	16.0	17.5
2	—	—	—	—	—	—	—	—	—	19.5	17.5	18.5
3	—	—	—	—	—	—	—	—	—	21.5	19.0	20.0
4	—	—	—	—	—	—	9.5	—	—	23.0	20.0	21.0
5	—	—	—	—	—	—	10.5	8.0	9.0	21.5	19.0	20.0
6	—	—	—	—	—	—	10.0	9.0	9.5	20.5	17.5	19.0
7	—	—	—	—	—	—	10.5	10.0	10.5	20.0	17.5	18.5
8	—	—	—	—	—	—	13.0	10.0	11.5	20.0	18.0	19.0
9	—	—	—	—	—	—	13.0	12.0	12.5	21.0	18.5	19.5
10	—	—	—	—	—	—	—	—	—	20.5	19.0	19.5
11	—	—	—	—	—	—	—	—	—	20.5	19.0	19.5
12	—	—	—	—	—	—	—	—	—	20.0	17.5	18.5
13	—	—	—	—	—	—	—	—	—	20.0	17.0	18.0
14	—	—	—	—	—	—	—	—	—	19.5	17.0	18.0
15	—	—	—	—	—	—	—	—	—	18.0	17.0	17.5
16	—	—	—	—	—	—	—	—	—	17.0	16.5	17.0
17	—	—	—	—	—	—	—	—	—	18.5	16.5	17.5
18	—	—	—	—	—	—	—	—	—	20.5	18.5	19.5
19	—	—	—	—	—	—	—	—	—	21.5	19.0	20.0
20	—	—	—	—	—	—	11.0	—	—	22.0	19.5	20.5
21	—	—	—	—	—	—	12.0	10.5	11.0	20.5	19.5	20.0
22	—	—	—	—	—	—	14.0	12.0	13.0	19.5	19.0	19.5
23	—	—	—	—	—	—	15.0	13.5	14.5	19.0	18.0	18.5
24	—	—	—	—	—	—	15.5	14.0	15.0	18.0	17.0	17.5
25	—	—	—	—	—	—	14.5	13.0	13.5	17.5	16.5	17.0
26	—	—	—	—	—	—	14.5	13.0	13.5	17.0	16.5	17.0
27	—	—	—	—	—	—	17.0	14.0	15.5	16.5	15.5	16.0
28	—	—	—	—	—	—	17.0	14.5	15.5	16.5	15.5	16.0
29	—	—	—	—	—	—	16.5	14.5	15.5	17.0	16.5	17.0
30	—	—	—	—	—	—	17.5	15.0	16.0	17.5	16.5	17.0
31	—	—	—	—	—	—	—	—	—	18.0	16.5	17.0
MONTH	—	—	—	—	—	—	—	—	—	23.0	15.5	18.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.5	16.0	17.0	26.5	23.0	25.0	27.0	24.0	25.5	24.5	20.5	22.0
2	16.0	15.5	16.0	25.5	22.0	23.5	26.0	24.5	25.0	24.0	20.0	21.5
3	15.5	15.5	15.5	24.0	22.0	22.5	28.0	24.5	26.0	24.0	20.0	21.5
4	16.5	15.5	16.0	24.5	22.0	23.0	28.5	24.0	26.0	24.5	20.5	22.0
5	16.5	16.0	16.0	25.0	21.0	22.5	28.5	23.5	25.5	24.0	19.5	21.5
6	16.5	16.0	16.5	25.0	20.5	22.0	28.5	23.5	25.5	24.0	19.5	21.0
7	18.0	16.0	17.0	22.5	21.0	22.0	28.5	24.0	26.0	24.0	20.5	22.0
8	19.5	17.0	18.5	26.5	21.5	23.5	29.5	24.5	26.5	24.0	21.5	22.5
9	20.5	18.5	19.5	26.5	22.0	24.0	28.5	25.0	26.5	23.5	22.0	22.5
10	21.5	20.0	20.5	27.5	23.0	24.5	28.5	24.0	26.0	23.5	21.0	21.5
11	23.0	20.5	22.0	25.5	22.0	23.5	27.5	23.0	25.0	23.5	20.5	21.5
12	24.0	22.0	23.0	26.0	21.5	23.0	26.5	23.0	24.5	23.5	20.0	21.0
13	25.5	22.5	24.0	25.5	21.0	23.0	27.0	22.0	24.0	21.5	19.0	20.5
14	27.0	24.0	25.5	26.0	20.5	23.0	26.5	21.0	23.5	20.5	18.0	19.0
15	27.5	25.0	26.0	26.5	21.5	23.5	26.0	21.0	23.0	21.0	17.5	18.5
16	27.0	25.0	26.0	26.5	22.0	24.0	23.0	21.5	22.5	21.0	17.0	18.5
17	26.5	24.5	25.5	26.5	22.5	24.0	23.5	21.0	22.0	20.5	17.0	18.5
18	25.0	24.0	24.5	26.5	22.5	24.5	23.0	21.0	21.5	21.0	18.0	19.0
19	25.5	23.5	24.5	27.5	23.0	25.0	22.5	21.0	21.5	19.0	18.5	18.5
20	25.5	24.0	24.5	27.5	23.0	25.0	22.0	20.5	21.0	19.0	18.0	18.5
21	24.0	22.0	23.5	27.0	23.0	24.5	22.5	20.0	21.0	18.5	17.5	18.0
22	23.0	21.5	22.0	28.5	23.0	25.0	21.0	20.5	21.0	18.5	17.0	17.5
23	23.5	21.5	22.0	27.0	24.0	25.0	22.5	20.5	21.0	18.5	—	—
24	24.0	21.5	22.5	29.0	24.0	26.0	23.5	21.0	22.0	17.0	16.0	—
25	25.0	22.5	23.5	24.5	23.0	24.0	23.0	21.0	22.0	16.0	14.0	15.0
26	25.5	23.0	24.0	26.0	22.0	23.5	23.5	21.5	22.5	14.0	13.0	13.5
27	26.5	23.5	25.0	26.5	21.5	23.5	24.5	21.5	22.5	13.5	13.0	13.0
28	27.5	24.5	25.5	26.0	21.0	23.5	25.0	22.0	23.0	14.0	13.0	13.5
29	27.5	25.0	26.0	26.5	22.0	23.5	25.0	21.5	23.0	15.5	13.0	14.0
30	27.5	25.5	26.0	26.0	22.5	24.0	25.0	21.5	23.0	16.0	13.5	14.5
31	—	—	—	26.5	23.5	25.0	25.0	22.0	23.0	—	—	—
MONTH	27.5	15.5	21.9	29.0	20.5	23.8	29.5	20.0	23.6	24.5	—	—

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.6	8.6	9.0	10.8	9.4	9.9	---	---	---	---	---	---
2	9.4	8.4	8.8	11.0	9.4	9.9	---	---	---	---	---	---
3	9.6	8.4	8.8	10.6	9.4	9.7	---	---	---	---	---	---
4	9.5	8.4	8.8	10.7	9.4	9.9	---	---	---	---	---	---
5	9.1	8.6	8.8	11.0	9.7	10.2	---	---	---	---	---	---
6	9.5	8.8	9.1	11.2	10.0	10.4	---	---	---	---	---	---
7	10.2	9.1	9.6	10.9	10.1	10.3	---	---	---	---	---	---
8	10.5	9.6	10.0	11.0	9.7	10.2	---	---	---	---	---	---
9	11.0	9.9	10.3	10.1	9.4	9.7	---	---	---	---	---	---
10	11.2	10.0	10.4	10.2	9.4	9.8	---	---	---	---	---	---
11	11.4	10.0	10.5	10.8	9.9	10.2	---	---	---	---	---	---
12	11.5	9.9	10.4	10.8	10.0	10.2	---	---	---	---	---	---
13	11.4	9.3	10.2	10.3	9.8	10.0	---	---	---	---	---	---
14	11.6	9.1	10.0	10.1	9.5	9.8	---	---	---	---	---	---
15	11.0	9.1	9.6	---	9.1	---	---	---	---	---	---	---
16	10.8	9.1	9.6	---	---	---	---	---	---	---	---	---
17	10.9	9.1	9.6	---	---	---	---	---	---	---	---	---
18	11.0	9.0	9.6	---	---	---	---	---	---	---	---	---
19	11.2	9.0	9.7	---	---	---	---	---	---	---	---	---
20	11.1	8.9	9.6	---	---	---	---	---	---	---	---	---
21	11.3	8.8	9.6	---	---	---	---	---	---	---	---	---
22	11.5	9.1	9.8	---	---	---	---	---	---	---	---	---
23	11.4	9.0	9.6	---	---	---	---	---	---	---	---	---
24	9.9	8.8	9.3	---	---	---	---	---	---	---	---	---
25	9.6	8.5	8.9	---	---	---	---	---	---	---	---	---
26	9.5	8.3	8.7	---	---	---	---	---	---	---	---	---
27	9.5	8.3	8.6	---	---	---	---	---	---	---	---	---
28	9.9	8.3	8.9	---	---	---	---	---	---	---	---	---
29	10.4	8.7	9.3	---	---	---	---	---	---	---	---	---
30	10.6	9.1	9.6	---	---	---	---	---	---	---	---	---
31	10.8	9.3	9.8	---	---	---	---	---	---	---	---	---
MONTH	11.6	8.3	9.5	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	8.1	8.0	---	---	---	---
5	---	---	---	---	---	---	8.1	8.0	8.1	10.4	7.8	8.9
6	---	---	---	---	---	---	8.1	8.0	8.1	11.0	8.3	9.3
7	---	---	---	---	---	---	8.0	7.9	8.0	11.0	8.6	9.5
8	---	---	---	---	---	---	8.0	7.9	8.0	10.9	8.6	9.6
9	---	---	---	---	---	---	8.0	8.0	8.0	10.7	8.5	9.5
10	---	---	---	---	---	---	---	---	---	10.5	8.6	9.4
11	---	---	---	---	---	---	---	---	---	9.3	7.9	8.6
12	---	---	---	---	---	---	---	---	---	10.1	8.0	9.0
13	---	---	---	---	---	---	---	---	---	10.3	8.2	9.1
14	---	---	---	---	---	---	---	---	---	10.6	8.4	9.3
15	---	---	---	---	---	---	---	---	---	9.6	8.3	8.9
16	---	---	---	---	---	---	---	---	---	9.9	9.1	9.5
17	---	---	---	---	---	---	---	---	---	10.0	8.6	9.5
18	---	---	---	---	---	---	---	---	---	9.1	8.1	8.7
19	---	---	---	---	---	---	---	---	---	9.2	8.0	8.5
20	---	---	---	---	---	---	10.3	---	---	9.4	7.8	8.5
21	---	---	---	---	---	---	10.1	9.7	9.9	8.6	7.7	8.0
22	---	---	---	---	---	---	9.9	9.1	9.5	9.0	7.9	8.4
23	---	---	---	---	---	---	9.4	8.6	9.1	9.1	8.2	8.6
24	---	---	---	---	---	---	9.2	8.6	8.9	9.0	8.2	8.6
25	---	---	---	---	---	---	9.8	8.9	9.4	10.3	8.3	8.9
26	---	---	---	---	---	---	9.6	8.9	9.3	9.7	9.0	9.3
27	---	---	---	---	---	---	9.5	8.7	9.1	9.7	9.3	9.4
28	---	---	---	---	---	---	9.6	8.6	9.1	10.1	9.4	9.7
29	---	---	---	---	---	---	9.6	8.6	9.1	10.0	9.5	9.8
30	---	---	---	---	---	---	9.4	8.2	8.8	10.3	9.6	9.9
31	---	---	---	---	---	---	---	---	---	10.4	9.7	10.0
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04170000 HURON RIVER AT MILFORD, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.9	9.2	9.5	10.4	6.4	7.8	11.1	5.2	7.6	9.7	6.6	7.8
2	9.7	9.2	9.4	10.8	6.0	8.3	10.7	4.8	7.3	9.9	6.8	7.9
3	10.0	9.3	9.6	—	—	—	11.0	5.7	7.8	10.0	6.6	7.9
4	10.1	9.5	9.8	—	—	—	10.5	5.5	7.5	10.4	6.6	8.0
5	10.1	9.5	9.8	—	—	—	10.1	5.4	7.3	10.7	7.1	8.3
6	10.2	9.5	9.7	—	—	—	10.6	5.2	7.3	9.5	6.1	7.7
7	10.2	9.3	9.7	—	—	—	9.7	4.5	6.8	9.4	6.1	7.3
8	9.9	8.8	9.4	—	—	—	9.3	4.3	6.3	9.3	6.0	7.1
9	9.7	8.6	9.1	—	—	—	9.5	4.3	6.4	8.6	6.2	7.0
10	9.5	8.3	8.9	—	—	—	9.3	4.6	6.4	9.2	6.5	7.6
11	9.4	7.8	8.7	—	—	—	8.9	5.0	6.6	—	6.5	—
12	9.4	7.8	8.5	—	—	—	9.3	5.1	6.8	—	—	—
13	9.5	7.3	8.3	—	—	—	9.6	5.4	6.9	9.9	—	—
14	8.9	6.7	7.8	—	—	—	10.0	5.4	7.2	9.8	7.0	8.1
15	8.8	6.5	7.3	—	—	—	10.4	5.8	7.5	10.6	7.2	8.4
16	8.9	6.6	7.6	10.7	—	—	7.7	5.8	6.7	10.8	7.2	8.5
17	9.2	7.0	7.9	11.7	4.9	7.1	10.3	6.5	8.4	11.2	7.2	8.6
18	9.3	7.1	7.9	12.5	5.1	7.8	12.6	8.4	11.1	10.5	7.2	8.3
19	9.5	7.4	8.2	—	—	—	11.6	9.3	10.9	8.7	7.3	8.0
20	8.6	6.7	7.6	11.9	—	—	—	—	—	9.7	8.2	8.8
21	8.0	6.7	7.3	11.0	3.5	6.7	—	—	—	9.7	8.6	8.9
22	8.9	7.3	8.0	10.9	3.5	6.3	—	—	—	9.8	8.8	9.2
23	9.3	7.6	8.4	10.6	3.5	6.0	—	—	—	—	8.9	—
24	9.7	7.9	8.6	11.1	2.5	6.2	8.8	—	—	9.6	—	—
25	9.9	7.9	8.6	7.4	2.1	4.8	9.0	6.8	7.7	9.9	8.8	9.3
26	10.1	7.7	8.8	11.8	2.0	6.7	8.8	6.8	7.5	10.7	9.2	9.9
27	9.9	6.5	8.2	12.5	5.0	7.7	9.2	6.9	7.8	11.1	9.8	10.2
28	9.9	6.3	7.6	12.1	4.8	7.6	9.4	6.9	7.8	11.1	9.6	10.2
29	10.2	6.3	7.8	11.9	4.7	7.3	9.1	6.6	7.6	11.2	9.4	10.1
30	10.0	6.4	7.7	10.3	6.1	7.8	9.3	6.5	7.6	11.5	9.2	10.1
31	—	—	—	10.6	5.5	7.9	9.5	6.5	7.5	—	—	—
MONTH	10.2	6.3	8.5	—	—	—	—	—	—	—	—	—

STREAMS TRIBUTARY TO LAKE ERIE

04170490 KENT LAKE NEAR NEW HUDSON, MI

LOCATION.--Lat 42°30'45", long 83°40'34", in sec.1, T.1 N., R.6 E., Livingston County, Hydrologic Unit 04090005, at Kent Lake Dam, 2 mi upstream from Woodruff Creek, and 3 mi west of New Hudson.

DRAINAGE AREA.--148 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 868.00 ft above sea level (Huron-Clinton Metropolitan Authority bench mark).

REMARKS.--Records fair. The inlet and outlet is the Huron River which enters the northeast end of the lake and leaves the southwest end of the lake. Streamflow records are currently collected on the Huron River at sites about 1 mi upstream (04170000) and 150 ft downstream (04170500) from Kent Lake. Maximum depth, 38 ft, surface area, 1,200 acres. A concrete dam with steel drum spillway is used to control the lake level.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 16.68 ft, Apr. 6, 1950; minimum observed, 9.46 ft, Jan. 9, 1996, due to construction, but may have been lower during period of no gage-height record Dec. 30, 1995 to Jan. 20, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 15.77 ft, May 29; minimum, 12.60 ft, Jan. 9, 25, 26, 27, 28, 29.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.71	15.42	12.73	12.66	12.72	13.18	13.47	15.24	15.71	15.37	15.43	15.36
2	15.69	15.17	12.72	12.66	12.72	13.13	13.53	15.26	15.73	15.34	15.40	15.33
3	15.68	15.03	12.70	12.65	12.71	13.10	13.58	15.27	15.74	15.33	15.39	15.32
4	15.72	14.98	12.68	12.65	12.70	13.07	13.60	15.31	15.74	15.32	15.37	15.31
5	15.74	14.95	12.67	12.64	12.69	13.05	13.69	15.32	15.72	15.32	15.35	15.30
6	15.74	14.87	12.66	12.64	12.68	13.03	13.80	15.31	15.70	15.30	15.32	15.29
7	15.71	14.63	12.66	12.63	12.67	13.00	13.89	15.31	15.67	15.28	15.30	15.28
8	15.70	14.45	12.66	12.63	12.67	12.97	13.93	15.35	15.64	15.28	15.30	15.28
9	15.67	14.20	12.65	12.62	12.77	12.95	13.97	15.35	15.61	15.27	15.28	15.33
10	15.65	14.10	12.64	12.62	13.01	12.92	13.95	15.35	15.59	15.27	15.29	15.37
11	15.62	14.08	12.66	12.62	13.14	12.92	13.93	15.37	15.57	15.26	15.27	15.36
12	15.60	14.07	12.70	12.62	13.22	12.92	13.94	15.39	15.54	15.25	15.27	15.33
13	15.59	14.01	12.69	12.62	13.23	12.93	14.26	15.37	15.51	15.25	15.26	15.32
14	15.56	13.78	12.69	12.63	13.18	12.95	14.48	15.37	15.47	15.25	15.24	15.31
15	15.55	13.62	12.69	12.63	13.13	12.97	14.61	15.39	15.45	15.25	15.24	15.29
16	15.56	13.39	12.69	12.64	13.09	12.98	14.53	15.49	15.47	15.25	15.27	15.28
17	15.56	13.24	12.73	12.65	13.04	12.97	14.49	15.55	15.47	15.25	15.29	15.28
18	15.54	13.04	12.73	12.65	13.01	12.95	14.58	15.58	15.46	15.25	15.31	15.28
19	15.53	12.94	—	12.65	12.98	12.94	14.65	15.56	15.45	15.25	15.38	15.33
20	15.52	12.87	—	12.64	12.96	12.93	14.73	15.53	15.46	15.24	15.43	15.38
21	15.51	12.81	—	12.63	12.94	12.92	14.93	15.53	15.45	15.23	15.44	15.43
22	15.49	12.76	—	12.62	12.92	12.92	15.09	15.55	15.48	15.24	15.44	15.45
23	15.48	12.73	—	12.62	12.90	12.91	15.14	15.56	15.48	15.24	15.46	15.44
24	15.55	12.70	—	12.61	12.90	12.94	15.18	15.58	15.47	15.24	15.45	15.46
25	15.58	12.69	—	12.61	13.04	12.96	15.16	15.59	15.46	15.25	15.44	15.44
26	15.59	12.70	—	12.61	13.15	12.99	15.12	15.62	15.45	15.26	15.45	15.45
27	15.58	12.72	12.68	12.61	13.22	13.08	15.11	15.66	15.43	15.24	15.45	15.46
28	15.56	12.72	12.69	12.60	13.22	13.13	15.09	15.71	15.41	15.24	15.44	15.46
29	15.52	12.73	12.68	12.60	—	13.20	15.10	15.76	15.39	15.29	15.41	15.44
30	15.50	12.73	12.68	12.64	—	13.26	15.19	15.75	15.38	15.46	15.39	15.42
31	15.50	—	12.67	12.68	—	13.38	—	15.73	—	15.44	15.38	—
MEAN	15.60	13.67	—	12.63	12.95	13.02	14.42	15.47	15.54	15.28	15.36	15.36
MAX	15.74	15.42	—	12.68	13.23	13.38	15.19	15.76	15.74	15.46	15.46	15.46
MIN	15.48	12.69	—	12.60	12.67	12.91	13.47	15.24	15.38	15.23	15.24	15.28

STREAMS TRIBUTARY TO LAKE ERIE

04170500 HURON RIVER NEAR NEW HUDSON, MI

LOCATION.--Lat 42°30'45", long 83°40'35", in NE1/4 sec.1, T.1 N., R.6 E., Livingston County, Hydrologic Unit 04090005, on right bank 150 ft downstream from Kent Lake Dam, 2 mi upstream from Woodruff Creek, and 3 mi west of New Hudson.

DRAINAGE AREA.--148 mi^2.

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 868.00 ft above sea level (Huron-Clinton Metropolitan Authority bench mark).

REMARKS.--Records good. Occasional regulation by Kent Lake (see preceding page). Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	182	239	154	128	133	321	111	76	216	86	87	58
2	172	229	149	123	135	300	125	84	226	74	82	53
3	168	172	143	122	133	283	135	81	237	71	81	48
4	186	153	139	120	129	268	106	84	238	68	75	48
5	193	145	136	120	126	252	99	87	224	65	70	44
6	192	240	134	118	124	242	130	80	213	57	64	43
7	185	234	133	116	121	223	157	76	206	50	59	42
8	179	257	132	115	120	211	167	92	195	49	55	43
9	166	250	129	112	150	204	178	95	181	43	51	56
10	159	181	126	113	241	195	171	93	176	43	53	66
11	152	160	131	114	315	192	166	102	171	39	48	63
12	146	145	142	114	346	191	66	108	163	36	45	57
13	140	214	140	112	346	195	24	104	154	34	43	55
14	137	224	141	113	326	201	66	102	139	33	40	51
15	133	257	140	115	303	207	121	109	127	31	38	48
16	137	225	139	118	283	210	193	139	135	31	44	46
17	136	235	148	121	256	207	125	157	132	33	49	45
18	135	207	150	121	237	203	94	165	129	35	53	48
19	130	175	150	119	219	199	113	160	124	36	72	64
20	125	175	150	116	208	196	73	151	126	35	86	77
21	125	174	149	115	200	192	89	151	124	34	85	93
22	119	160	148	110	195	189	138	159	134	34	87	99
23	114	152	146	107	187	170	155	161	132	33	91	99
24	139	144	142	104	185	163	165	165	127	33	88	106
25	146	141	137	103	246	163	159	170	123	36	82	97
26	148	144	137	103	313	130	148	179	118	38	84	102
27	146	149	134	104	339	123	142	193	111	33	83	105
28	139	150	132	102	339	116	127	211	103	32	80	104
29	129	153	132	101	—	118	76	236	96	48	74	99
30	124	153	133	111	—	92	63	240	91	102	66	93
31	124	—	131	125	—	85	—	229	—	93	64	—
TOTAL	4606	5637	4327	3535	6255	6041	3682	4239	4671	1465	2079	2052
MEAN	149	188	140	114	223	195	123	137	156	47.3	67.1	68.4
MAX	193	257	154	128	346	321	193	240	238	102	91	106
MIN	114	141	126	101	120	85	24	76	91	31	38	42

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2001, BY WATER YEAR (WY)

MEAN	96.2	152	134	123	131	163	140	124	104	75.5	65.6	77.2
MAX	262	234	248	236	252	315	357	379	228	219	165	231
(WY)	1982	1995	1951	1951	1951	1974	1950	1956	1996	1957	2000	1975
MIN	35.1	70.1	63.2	53.8	53.7	49.8	42.9	34.5	33.6	21.6	27.9	31.5
(WY)	1964	1964	1961	1964	1964	2000	1966	1988	1988	1988	1963	1966

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1948 - 2001	
ANNUAL TOTAL	45838		48589			
ANNUAL MEAN	125		133		115	
HIGHEST ANNUAL MEAN					181	1974
LOWEST ANNUAL MEAN					52.3	1964
HIGHEST DAILY MEAN	382	Sep 15	346	Feb 12	582	Apr 6 1950
LOWEST DAILY MEAN	22	Apr 18	24	Apr 13	6.4	May 7 1963
ANNUAL SEVEN-DAY MINIMUM	35	Apr 13	33	Jul 12	12	Jul 10 1988
MAXIMUM PEAK FLOW			353	Feb 12	(a)1080	Dec 29 1950
MAXIMUM PEAK STAGE			2.68	Feb 12	5.05	Dec 29 1950
INSTANTANEOUS LOW FLOW			14	Apr 12	2.6	May 27 1963
10 PERCENT EXCEEDS	226		223		204	
50 PERCENT EXCEEDS	118		129		103	
90 PERCENT EXCEEDS	46		48		44	

(a) From rating curve extended above 600 ft^3/s.

STREAMS TRIBUTARY TO LAKE ERIE

04172000 HURON RIVER NEAR HAMBURG, MI

LOCATION.--Lat 42°27'55", long 83°48'00", in sec.24, T.1 N., R.5 E., Livingston County, Hydrologic Unit 04090005, on right bank at downstream side of bridge on Hamburg Road, 1.1 mi north of Hamburg, and 3 mi upstream from Strawberry Lake.

DRAINAGE AREA.--308 mi^2.

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

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 850.00 ft above sea level (levels by Michigan Department of Natural Resources). Prior to Aug. 12, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Occasional regulation by Kent Lake (station 04170490) 11 mi upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	300	197	254	e220	232	685	234	194	436	143	128	126
2	283	223	250	e210	245	657	253	188	432	130	126	119
3	268	275	241	e210	260	615	268	187	429	119	122	112
4	277	e231	231	e200	256	576	274	184	425	112	117	107
5	291	e223	227	e200	245	541	255	181	426	105	109	102
6	306	e221	220	e200	239	510	255	175	422	97	101	99
7	310	237	216	e200	236	480	291	167	412	90	95	96
8	307	285	213	e200	232	451	322	174	395	86	93	95
9	299	306	209	e200	273	426	341	181	375	81	89	99
10	287	332	204	e190	389	401	354	182	350	76	88	119
11	271	318	206	e190	535	384	359	189	333	71	85	130
12	255	277	e210	e200	873	371	357	204	317	66	82	129
13	241	247	e220	e200	999	373	294	210	302	62	81	122
14	227	254	e230	e200	973	377	234	208	284	58	78	113
15	217	300	e220	e200	895	394	237	209	270	54	76	105
16	215	323	e220	204	802	417	272	258	268	52	77	101
17	215	344	e230	206	e728	439	318	309	261	51	85	97
18	212	338	e240	209	e668	451	305	344	246	52	90	95
19	207	336	e240	212	e606	455	261	361	233	60	101	106
20	199	314	e240	222	e552	442	256	357	218	62	121	131
21	190	290	e240	e220	453	425	249	356	210	62	138	154
22	182	279	e240	e220	415	408	274	374	223	60	150	178
23	175	261	e240	e210	385	383	e338	381	230	59	160	190
24	203	244	e240	211	365	378	e376	381	225	59	164	197
25	236	232	e230	195	407	355	e371	382	214	59	161	196
26	248	230	e230	203	481	337	339	381	201	61	158	197
27	252	238	e230	200	594	304	323	392	189	61	158	198
28	248	245	e220	205	672	280	297	408	177	60	156	197
29	235	249	e220	215	—	266	269	425	165	e68	149	192
30	219	253	e220	201	—	260	222	437	154	e85	141	184
31	205	—	e220	214	—	240	—	442	—	e112	134	—
TOTAL	7580	8102	7051	6367	14010	13081	8798	8821	8822	2373	3613	4086
MEAN	245	270	227	205	500	422	293	285	294	76.5	117	136
MAX	310	344	254	222	999	685	376	442	436	143	164	198
MIN	175	197	204	190	232	240	222	167	154	51	76	95
CFSM	.79	.88	.74	.67	1.62	1.37	.95	.92	.95	.25	.38	.44
IN.	.92	.98	.85	.77	1.69	1.58	1.06	1.07	1.07	.29	.44	.49

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	162	240	229	225	244	347	328	266	206	153	130	136
MAX	490	425	355	499	500	705	626	895	406	534	343	424
(WY)	1982	1993	1976	1993	2001	1974	1974	1956	1989	1968	2000	1975
MIN	52.0	100	102	84.5	89.5	122	144	92.3	82.0	41.9	49.6	53.8
(WY)	1965	1964	1961	1961	1964	1964	1964	1958	1965	1965	1965	1964

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	84226		92704			
ANNUAL MEAN	230		254		222	
HIGHEST ANNUAL MEAN					337	1974
LOWEST ANNUAL MEAN					97.2	1964
HIGHEST DAILY MEAN	573	Sep 17	999	Feb 13	1560	May 15 1956
LOWEST DAILY MEAN	90	Jul 26	51	Jul 17	27	Jul 15 1988
ANNUAL SEVEN-DAY MINIMUM	100	Jul 22	56	Jul 13	28	Jul 10 1988
MAXIMUM PEAK FLOW			1010	Feb 13	(a)1560	May 15 1956
MAXIMUM PEAK STAGE			7.22	Feb 13	8.46	Jun 30 1968
INSTANTANEOUS LOW FLOW					26	(b)
ANNUAL RUNOFF (CFSM)	.75		.82		.72	
ANNUAL RUNOFF (INCHES)	10.17		11.20		9.80	
10 PERCENT EXCEEDS	376		423		393	
50 PERCENT EXCEEDS	217		230		194	
90 PERCENT EXCEEDS	115		95		85	

(a) Gage height 8.35 ft.
(b) July 15, 16, 1988.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

04173500 MILL CREEK NEAR DEXTER, MI

LOCATION.--Lat 42°18'00", long 83°53'55", in SW1/4 sec.18, T.2 S., R.5 E., Washtenaw County, Hydrologic Unit 04090005, on left bank 12 ft downstream from bridge on Parker Road, 2.5 mi south of Dexter, and 4 mi upstream from mouth.

DRAINAGE AREA.--128 mi^2.

PERIOD OF RECORD.--February 1952 to December 1982, October 1994 to current year.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 850 ft above sea level, from topographic map. Prior to May 23, 1958, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	52	105	e62	144	286	69	73	123	43	29	26
2	40	50	90	e60	135	235	86	68	181	40	28	25
3	39	48	72	e60	142	207	79	63	240	40	32	25
4	123	46	62	e61	112	191	73	58	185	40	28	24
5	150	43	60	e63	102	169	68	55	144	38	26	23
6	156	42	54	e66	98	139	77	51	132	36	25	23
7	129	46	52	e68	92	128	97	50	127	36	24	22
8	104	50	50	e68	93	114	97	71	107	37	23	21
9	87	53	60	e67	451	102	90	61	92	36	22	24
10	76	72	48	e67	1090	91	110	53	81	33	25	37
11	67	70	42	69	985	99	117	49	74	31	23	27
12	60	61	61	67	685	106	114	47	69	31	23	24
13	56	63	63	69	552	131	100	44	64	30	23	23
14	51	77	63	71	e372	142	89	43	57	29	22	24
15	49	75	61	79	e293	132	103	73	54	28	21	23
16	65	68	e60	95	e250	126	184	450	90	28	25	22
17	63	65	e66	101	e230	120	151	644	67	27	32	21
18	59	63	e69	102	e210	114	124	500	57	29	28	21
19	56	59	e72	e88	e200	124	109	360	56	28	47	37
20	55	57	e74	e74	e194	120	113	235	59	27	37	46
21	53	55	e72	e60	185	114	181	174	59	27	31	43
22	51	52	e69	e56	161	104	241	174	136	28	34	55
23	49	47	e67	68	149	97	200	137	113	27	43	41
24	86	47	e67	e77	146	89	168	125	96	26	34	43
25	101	46	e66	69	579	79	137	132	78	29	31	40
26	85	78	e65	58	675	68	119	125	63	33	34	41
27	75	110	e64	58	515	65	105	189	54	28	37	42
28	e68	101	e65	58	380	62	92	308	49	26	36	38
29	e62	91	e64	71	—	66	84	241	46	26	32	36
30	e58	100	e63	e96	—	66	78	172	45	e30	29	34
31	e57	—	e62	139	—	65	—	130	—	33	27	—
TOTAL	2271	1887	2008	2267	9220	3751	3455	4955	2798	980	911	931
MEAN	73.3	62.9	64.8	73.1	329	121	115	160	93.3	31.6	29.4	31.0
MAX	156	110	105	139	1090	286	241	644	240	43	47	55
MIN	39	42	42	56	92	62	68	43	45	26	21	21
CFSM	.57	.49	.51	.57	2.57	.95	.90	1.25	.73	.25	.23	.24
IN.	.66	.55	.58	.66	2.68	1.09	1.00	1.44	.81	.28	.26	.27

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2001, BY WATER YEAR (WY)

MEAN	41.3	59.3	80.4	76.4	110	178	156	102	68.4	41.3	36.3	34.5
MAX	193	122	192	251	337	423	271	265	256	165	146	180
(WY)	1955	1996	1958	1974	1976	1982	1969	1956	1968	1968	1995	1975
MIN	11.0	14.6	13.8	18.8	18.4	47.7	73.8	29.7	20.9	16.0	12.9	11.0
(WY)	1964	1964	1964	1964	1964	1964	1963	1958	1958	1965	1963	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1952 - 2001	
ANNUAL TOTAL	29652		35434			
ANNUAL MEAN	81.0		97.1		81.4	
HIGHEST ANNUAL MEAN					142	1974
LOWEST ANNUAL MEAN					29.9	1964
HIGHEST DAILY MEAN	612	Jun 26	1090	Feb 10	1380	Jun 27 1968
LOWEST DAILY MEAN	28	Jan 29	21	Aug 15	9.5	Oct 7 1963
ANNUAL SEVEN-DAY MINIMUM	28	Jan 27	23	Sep 12	9.9	Oct 5 1963
MAXIMUM PEAK FLOW			1160	Feb 10	1500	Jun 26 1968
MAXIMUM PEAK STAGE			11.99	Feb 10	12.95	Jun 26 1968
INSTANTANEOUS LOW FLOW			20	(a)	7.3	Dec 13 1963
ANNUAL RUNOFF (CFSM)	.63		.76		.64	
ANNUAL RUNOFF (INCHES)	8.62		10.30		8.64	
10 PERCENT EXCEEDS	145		177		173	
50 PERCENT EXCEEDS	60		65		48	
90 PERCENT EXCEEDS	33		27		20	

(a) Aug. 15, 16, Sept. 8.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI

LOCATION.--Lat 42°17'10", long 83°44'00", in NW1/4 sec.28, T.2 S., R.6 E., Washtenaw County, Hydrologic Unit 04090005, on left bank 100 ft upstream from bridge on Wall Street in Ann Arbor, 0.7 mi downstream from Argo Dam, and 4.2 mi upstream from Geddes Dam.

DRAINAGE AREA.--729 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1904 to current year. Monthly discharge only for February 1904 to September 1914 and October 1947 to July 1948, published in WSP 1307. Published as "at Geddes" February 1904 to December 1914 and as "at Barton" January 1914 to September 1940.

REVISED RECORDS.--WSP 874: 1938. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.81 ft above sea level (levels by Michigan Department of Natural Resources). February 1904 to December 1914 at Geddes Dam, 4.2 mi downstream, and January 1914 to September 1947 at Barton Dam, 2.6 mi upstream, flow computed from records of operation of powerplants and records of depth of flow over dam and/or flow through undersluices.

REMARKS.--Water-discharge records fair. Prior to 1955 diversion upstream from station for Ann Arbor municipal supply had negligible effect on natural flow; annual mean discharge and runoff figures adjusted for diversion from 1955 to 1991. Flow regulated by powerplants prior to May 1962. From June 1962 to 1975 occasional regulation for lake level control operations upstream from station. Since 1975 extensive regulation of flow exists due to automation of gates at dams upstream from station. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	484	416	490	494	529	1610	606	556	907	358	93	197
2	481	470	536	513	521	1570	595	448	1080	484	104	189
3	461	462	509	499	484	1540	598	372	1200	381	148	183
4	704	447	496	465	504	1500	589	384	1110	331	124	98
5	711	450	481	464	488	1380	588	373	846	239	122	81
6	697	445	458	460	492	1300	611	376	838	190	113	92
7	651	453	386	453	489	1240	663	383	933	206	110	100
8	600	454	372	450	552	1090	677	414	859	189	100	118
9	570	458	365	479	1390	1070	687	399	782	164	121	207
10	566	484	378	433	2250	1010	727	378	740	193	123	191
11	542	599	399	416	2310	955	741	238	704	201	112	151
12	511	575	368	415	1880	976	742	311	674	184	100	142
13	463	576	389	419	1830	1040	684	353	604	140	96	149
14	404	544	392	432	1910	1040	675	349	587	97	86	151
15	391	493	388	442	2200	1040	671	498	616	89	78	142
16	429	542	442	455	2020	1050	668	966	574	78	176	137
17	426	581	478	464	1800	1040	659	1250	558	78	101	128
18	414	676	468	467	1590	1010	635	1210	554	93	120	117
19	405	644	477	462	1240	1020	626	1050	571	77	197	285
20	383	617	482	418	1330	1000	635	915	555	62	165	268
21	375	571	491	436	1260	930	725	888	568	55	126	283
22	371	518	626	432	1100	919	813	936	557	111	190	287
23	347	438	622	421	913	898	781	869	e539	47	210	292
24	468	369	559	418	1080	874	786	804	e518	71	203	297
25	527	387	581	416	1790	833	748	835	e505	88	205	322
26	538	423	554	405	1880	735	706	854	e514	88	250	320
27	548	456	547	417	1880	687	709	986	536	67	294	311
28	552	455	597	394	1680	682	681	1130	490	60	260	301
29	517	474	524	408	—	679	627	1070	431	100	247	286
30	429	468	513	462	—	662	595	980	256	123	226	288
31	418	—	505	510	—	606	—	912	—	107	212	—
TOTAL	15383	14945	14873	13819	37392	31986	20248	21487	20206	4751	4812	6113
MEAN	496	498	480	446	1335	1032	675	693	674	153	155	204
MAX	711	676	626	513	2310	1610	813	1250	1200	484	294	322
MIN	347	369	365	394	484	606	588	238	256	47	78	81

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1915 - 2001, BY WATER YEAR (WY)

MEAN	269	387	424	451	554	861	858	605	405	245	188	218
MAX	904	1018	1080	1257	1431	2308	2647	2085	1341	1130	689	919
(WY)	1982	1993	1951	1950	1976	1918	1947	1943	1943	1968	2000	1975
MIN	71.6	109	123	131	145	189	274	187	72.0	31.5	21.1	55.8
(WY)	1935	1935	1935	1925	1934	1934	1931	1925	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1915 - 2001	
ANNUAL TOTAL	172930		206015			
ANNUAL MEAN	472		564		(a)455	
HIGHEST ANNUAL MEAN					824	1974
LOWEST ANNUAL MEAN					171	1931
HIGHEST DAILY MEAN	1530	Jun 25	2310	Feb 11	5840	Mar 14 1918
LOWEST DAILY MEAN	78	Mar 27	47	Jul 23	(b)4.0	(c)
ANNUAL SEVEN-DAY MINIMUM	103	Feb 7	73	Jul 19	13	Jul 28 1934
MAXIMUM PEAK FLOW			2800	Feb 11		
MAXIMUM PEAK STAGE			15.66	Feb 11	(d)17.50	Jun 26 1968
10 PERCENT EXCEEDS	802		1050		931	
50 PERCENT EXCEEDS	458		484		334	
90 PERCENT EXCEEDS	191		122		120	

(a) Does not include water year 1948.
(b) Plant leakage, but doubtful due to possible change in leakage.
(c) Aug. 2, Sept. 11, 1931.
(d) Present site and datum.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2000 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 2000 to current year.
pH: April 2000 to current year.
WATER TEMPERATURE: April 2000 to current year.
DISSOLVED OXYGEN: April 2000 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 778 microsiemens, July 14, 2001; minimum, 323 microsiemens, June 30, 2001.
pH: Maximum, 8.7 std. units, Apr. 10, 11, 12, 2001; minimum, 7.5 std. units, July 29, 30, 31, 2001.
WATER TEMPERATURE: Maximum, 31.0°C, July 24, 2001; minimum, 6.0°C, Apr. 12, 2000.
DISSOLVED OXYGEN: Maximum, 13.9 mg/L, Apr. 13, 2000; minimum, 4.5 mg/L, May 12, June 29, 2000.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 778 microsiemens, July 14; minimum, 323 microsiemens, June 30.
pH: Maximum, 8.7 std. units, Apr. 10, 11, 12; minimum, 7.5 std. units, July 29, 30, 31.
WATER TEMPERATURE: Maximum, 31.0°C, July 24; minimum, 6.5°C, Apr. 5.
DISSOLVED OXYGEN: Maximum, 11.6 mg/L, Sept. 14; minimum, 5.0 mg/L, July 6.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	591	586	589	686	674	680	---	---	---	---	---	---
2	590	586	588	687	684	685	---	---	---	---	---	---
3	587	580	584	686	680	683	---	---	---	---	---	---
4	---	---	---	681	676	679	---	---	---	---	---	---
5	---	---	---	677	674	676	---	---	---	---	---	---
6	---	---	---	681	676	678	---	---	---	---	---	---
7	---	---	---	681	678	680	---	---	---	---	---	---
8	---	---	---	689	681	---	---	---	---	---	---	---
9	---	---	---	688	684	686	---	---	---	---	---	---
10	---	---	---	690	686	688	---	---	---	---	---	---
11	---	---	---	697	690	695	---	---	---	---	---	---
12	---	---	---	701	696	699	---	---	---	---	---	---
13	688	---	---	696	692	693	---	---	---	---	---	---
14	688	685	686	695	692	694	---	---	---	---	---	---
15	690	669	688	---	---	---	---	---	---	---	---	---
16	692	669	690	---	---	---	---	---	---	---	---	---
17	694	691	693	---	---	---	---	---	---	---	---	---
18	693	688	690	---	---	---	---	---	---	---	---	---
19	690	687	688	---	---	---	---	---	---	---	---	---
20	690	686	688	---	---	---	---	---	---	---	---	---
21	688	685	687	---	---	---	---	---	---	---	---	---
22	687	685	686	---	---	---	---	---	---	---	---	---
23	688	683	686	---	---	---	---	---	---	---	---	---
24	683	652	676	---	---	---	---	---	---	---	---	---
25	682	679	681	---	---	---	---	---	---	---	---	---
26	682	677	679	---	---	---	---	---	---	---	---	---
27	679	677	678	---	---	---	---	---	---	---	---	---
28	679	673	675	---	---	---	---	---	---	---	---	---
29	673	669	671	---	---	---	---	---	---	---	---	---
30	671	669	670	---	---	---	---	---	---	---	---	---
31	674	670	672	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	702	690	695
6	---	---	---	---	---	---	---	---	---	709	700	705
7	---	---	---	---	---	---	---	---	---	710	683	706
8	---	---	---	---	---	---	---	---	---	708	668	704
9	---	---	---	---	---	---	---	---	---	710	707	708
10	---	---	---	---	---	---	669	658	---	710	707	709
11	---	---	---	---	---	---	666	660	662	731	708	715
12	---	---	---	---	---	---	701	654	662	719	710	714
13	---	---	---	---	---	---	659	648	652	721	709	715
14	---	---	---	---	---	---	655	649	651	731	719	727
15	---	---	---	---	---	---	663	631	646	727	703	719
16	---	---	---	---	---	---	651	640	645	711	632	691
17	---	---	---	---	---	---	655	645	651	680	589	630
18	---	---	---	---	---	---	657	648	653	589	579	583
19	---	---	---	---	---	---	658	652	656	610	587	599
20	---	---	---	---	---	---	---	---	---	631	610	622
21	---	---	---	---	---	---	---	---	---	641	559	634
22	---	---	---	---	---	---	---	---	---	653	641	647
23	---	---	---	---	---	---	---	---	---	664	652	657
24	---	---	---	---	---	---	---	---	---	666	651	658
25	---	---	---	---	---	---	---	---	---	671	666	668
26	---	---	---	---	---	---	---	---	---	672	663	670
27	---	---	---	---	---	---	---	---	---	668	662	665
28	---	---	---	---	---	---	---	---	---	664	657	661
29	---	---	---	---	---	---	---	---	---	658	652	655
30	---	---	---	---	---	---	---	---	---	671	654	660
31	---	---	---	---	---	---	---	---	---	677	669	673
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	681	674	679	440	344	389	752	684	---	737	688	720
2	680	649	674	504	398	455	765	684	734	749	696	723
3	673	653	663	601	477	548	743	690	721	750	688	723
4	657	651	653	704	544	579	728	694	709	755	692	725
5	663	655	659	745	681	712	737	689	717	762	589	731
6	692	642	675	753	702	725	751	697	716	756	615	702
7	695	689	692	762	709	729	757	689	723	737	645	695
8	690	686	688	759	703	733	---	690	---	706	570	682
9	686	684	685	767	723	746	---	---	---	696	506	645
10	---	---	---	773	726	748	738	663	712	669	618	647
11	---	---	---	765	713	742	749	697	717	665	630	652
12	---	---	---	---	---	---	755	680	720	672	656	663
13	---	---	---	772	709	---	755	689	722	685	662	674
14	---	---	---	778	608	---	752	692	724	709	677	688
15	---	---	---	733	614	667	739	697	722	704	642	692
16	---	---	---	750	702	---	751	640	718	707	687	697
17	---	---	---	753	710	733	759	702	---	704	683	694
18	---	---	---	753	705	735	765	587	720	704	682	691
19	---	---	---	755	707	735	758	557	707	705	517	654
20	---	---	---	761	719	---	741	681	710	718	648	684
21	---	---	---	765	729	---	732	680	712	675	655	668
22	709	---	---	767	728	---	732	596	694	740	675	687
23	711	685	700	---	---	---	723	667	697	708	665	694
24	713	688	701	759	722	---	727	678	707	678	645	654
25	710	688	698	768	655	---	738	686	716	675	657	665
26	707	683	695	749	718	---	749	671	709	695	675	684
27	717	672	693	754	727	---	731	680	705	704	694	700
28	722	670	691	754	723	---	725	673	699	704	700	702
29	727	652	688	756	502	---	731	668	697	704	699	701
30	715	323	---	751	688	715	738	665	707	701	695	698
31	---	---	---	749	699	---	753	682	719	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	762	506	688

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.4	8.4	8.4	8.1	8.0	8.1	---	---	---	---	---	---
2	8.4	8.4	8.4	8.1	8.0	8.1	---	---	---	---	---	---
3	8.4	8.4	8.4	8.1	8.0	8.1	---	---	---	---	---	---
4	---	---	---	8.1	8.0	8.1	---	---	---	---	---	---
5	---	---	---	8.2	8.0	8.1	---	---	---	---	---	---
6	---	---	---	8.2	8.1	8.1	---	---	---	---	---	---
7	---	---	---	8.1	8.1	8.1	---	---	---	---	---	---
8	---	---	---	8.3	8.1	8.2	---	---	---	---	---	---
9	---	---	---	8.2	8.1	8.1	---	---	---	---	---	---
10	---	---	---	8.2	8.1	8.2	---	---	---	---	---	---
11	---	---	---	8.3	8.1	8.2	---	---	---	---	---	---
12	---	---	---	8.3	8.2	8.3	---	---	---	---	---	---
13	8.4	8.3	---	8.3	8.2	8.3	---	---	---	---	---	---
14	8.4	8.3	8.4	8.3	8.2	8.3	---	---	---	---	---	---
15	8.4	8.3	8.3	8.3	8.2	---	---	---	---	---	---	---
16	8.4	8.3	8.3	---	---	---	---	---	---	---	---	---
17	8.3	8.3	8.3	---	---	---	---	---	---	---	---	---
18	8.3	8.2	8.3	---	---	---	---	---	---	---	---	---
19	8.3	8.2	8.3	---	---	---	---	---	---	---	---	---
20	8.4	8.2	8.3	---	---	---	---	---	---	---	---	---
21	8.4	8.2	8.3	---	---	---	---	---	---	---	---	---
22	8.4	8.3	8.3	---	---	---	---	---	---	---	---	---
23	8.4	8.3	8.3	---	---	---	---	---	---	---	---	---
24	8.3	8.2	8.3	---	---	---	---	---	---	---	---	---
25	8.5	8.2	8.4	---	---	---	---	---	---	---	---	---
26	8.4	8.3	8.3	---	---	---	---	---	---	---	---	---
27	8.3	8.2	8.2	---	---	---	---	---	---	---	---	---
28	8.3	8.1	8.2	---	---	---	---	---	---	---	---	---
29	8.2	8.1	8.2	---	---	---	---	---	---	---	---	---
30	8.2	8.1	8.1	---	---	---	---	---	---	---	---	---
31	8.2	8.0	8.1	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	8.0	7.9	8.0
2	---	---	---	---	---	---	---	---	---	8.0	7.9	8.0
3	---	---	---	---	---	---	---	---	---	8.1	7.9	8.0
4	---	---	---	---	---	---	8.2	8.1	---	8.1	7.9	---
5	---	---	---	---	---	---	8.2	8.1	8.1	8.1	7.9	8.0
6	---	---	---	---	---	---	8.1	8.1	8.1	8.1	7.9	8.0
7	---	---	---	---	---	---	8.1	8.1	8.1	8.1	8.0	8.0
8	---	---	---	---	---	---	8.1	8.0	8.1	8.1	8.0	8.1
9	---	---	---	---	---	---	8.1	8.0	8.1	8.1	8.0	8.1
10	---	---	---	---	---	---	8.7	8.0	8.4	8.1	8.0	8.0
11	---	---	---	---	---	---	8.7	8.6	8.6	8.2	7.9	8.0
12	---	---	---	---	---	---	8.7	8.4	8.5	8.1	7.9	8.0
13	---	---	---	---	---	---	8.6	8.4	8.5	8.1	8.0	8.0
14	---	---	---	---	---	---	8.4	8.3	8.4	8.1	7.9	8.0
15	---	---	---	---	---	---	8.3	8.3	8.3	8.0	7.9	8.0
16	---	---	---	---	---	---	8.3	8.2	8.2	8.0	7.9	8.0
17	---	---	---	---	---	---	8.2	8.1	8.2	7.9	7.8	7.9
18	---	---	---	---	---	---	8.2	8.1	8.1	7.8	7.8	7.8
19	---	---	---	---	---	---	8.1	8.0	8.0	7.8	7.8	7.8
20	---	---	---	---	---	---	8.0	7.9	---	7.9	7.8	7.8
21	---	---	---	---	---	---	7.9	7.9	7.9	7.9	7.8	7.8
22	---	---	---	---	---	---	7.9	7.8	7.9	7.9	7.9	7.9
23	---	---	---	---	---	---	7.9	7.8	7.9	7.9	7.8	7.9
24	---	---	---	---	---	---	8.1	7.8	7.9	7.9	7.9	7.9
25	---	---	---	---	---	---	8.0	7.9	7.9	8.0	7.9	7.9
26	---	---	---	---	---	---	8.0	7.9	8.0	8.0	7.9	7.9
27	---	---	---	---	---	---	8.0	7.9	8.0	8.0	7.9	7.9
28	---	---	---	---	---	---	8.0	7.9	8.0	8.0	7.9	8.0
29	---	---	---	---	---	---	8.0	7.9	8.0	8.0	7.9	8.0
30	---	---	---	---	---	---	8.0	7.9	8.0	8.0	7.9	8.0
31	---	---	---	---	---	---	---	---	---	8.0	7.9	7.9
MONTH	---	---	---	---	---	---	---	---	---	8.2	7.8	---

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.0	7.9	7.9	8.0	7.8	7.9	8.1	7.6	7.8	8.1	7.8	7.9
2	7.9	7.9	7.9	8.0	7.9	8.0	8.0	7.7	7.9	8.1	7.8	7.9
3	8.0	7.9	7.9	7.9	7.8	7.9	8.1	7.7	7.8	8.1	7.8	7.9
4	8.0	7.9	7.9	8.0	7.9	8.0	8.0	7.7	7.8	8.3	7.8	8.0
5	8.0	7.9	7.9	8.1	7.9	8.0	8.0	7.6	7.7	8.4	7.8	8.0
6	7.9	7.9	7.9	8.3	8.0	8.1	7.9	7.6	7.7	8.2	7.8	8.0
7	8.0	7.9	7.9	8.1	7.9	8.0	8.1	7.6	7.8	8.3	7.8	8.0
8	8.0	7.9	7.9	8.0	7.8	7.9	8.1	7.7	---	8.2	7.8	7.9
9	8.0	7.9	7.9	8.2	7.8	7.9	8.1	7.7	7.9	8.0	7.8	7.9
10	---	---	---	8.0	7.8	7.9	8.0	7.6	7.8	8.1	7.8	7.9
11	8.0	---	---	8.3	7.8	7.9	8.1	7.6	7.8	8.1	7.8	7.9
12	8.0	7.9	7.9	---	7.9	---	8.2	7.6	7.8	8.1	7.8	7.9
13	7.9	7.9	7.9	8.1	7.8	---	8.2	7.7	7.9	8.0	7.8	7.9
14	7.9	7.8	7.9	8.2	7.8	7.9	8.2	7.7	7.9	8.2	7.8	7.9
15	7.9	7.8	7.8	8.0	7.8	7.9	8.2	7.7	7.9	8.1	7.8	7.9
16	7.9	7.7	7.8	8.0	7.8	7.9	7.9	7.7	7.8	8.0	7.8	7.9
17	7.8	7.7	7.8	8.1	7.8	7.9	8.0	7.7	---	8.2	7.8	7.9
18	7.8	7.7	7.7	8.0	7.7	7.8	8.1	7.7	7.9	8.2	7.8	7.9
19	7.8	---	---	8.0	7.8	7.9	8.0	7.7	7.8	7.9	7.8	7.9
20	7.8	---	---	8.1	7.8	7.9	8.0	7.7	7.8	8.0	7.8	7.9
21	---	---	---	---	7.8	---	8.2	7.8	7.9	8.0	7.9	7.9
22	8.0	7.9	---	---	7.8	---	7.9	7.8	7.8	8.0	7.8	7.9
23	8.0	7.8	7.9	---	7.9	---	7.9	7.7	7.8	7.9	7.8	7.9
24	7.9	7.8	7.9	8.1	7.9	---	---	7.7	---	7.8	7.8	7.8
25	7.9	7.8	7.9	8.0	7.8	---	---	---	---	7.9	7.8	7.9
26	8.0	7.8	7.9	7.9	7.7	7.8	---	---	---	7.9	7.8	7.9
27	7.8	7.8	7.8	8.1	7.7	7.9	---	---	---	8.0	7.9	7.9
28	7.9	7.7	7.8	8.1	7.8	7.9	---	---	---	8.0	7.9	7.9
29	7.8	7.7	7.8	8.1	7.5	7.8	---	---	---	8.0	7.9	8.0
30	8.5	7.7	7.9	7.7	7.5	7.6	8.1	7.8	---	8.1	7.9	8.0
31	---	---	---	7.8	7.5	7.6	8.0	7.8	7.9	---	---	---
MONTH	---	---	---	---	7.5	---	---	---	---	8.4	7.8	7.9

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	16.5	15.0	16.0	12.0	11.0	11.5	---	---	---	---	---	---
2	17.0	16.0	16.5	12.0	11.5	11.5	---	---	---	---	---	---
3	17.5	16.5	17.0	12.5	11.5	12.0	---	---	---	---	---	---
4	---	---	---	12.0	11.5	12.0	---	---	---	---	---	---
5	---	---	---	12.0	11.0	11.5	---	---	---	---	---	---
6	---	---	---	11.0	10.5	10.5	---	---	---	---	---	---
7	---	---	---	11.0	10.5	10.5	---	---	---	---	---	---
8	---	---	---	11.5	10.5	11.0	---	---	---	---	---	---
9	---	---	---	11.5	11.0	11.5	---	---	---	---	---	---
10	---	---	---	11.5	10.5	11.0	---	---	---	---	---	---
11	---	---	---	11.0	10.5	10.5	---	---	---	---	---	---
12	---	---	---	10.5	9.5	10.0	---	---	---	---	---	---
13	13.0	---	---	9.5	9.0	9.5	---	---	---	---	---	---
14	14.0	12.5	13.0	9.0	8.0	8.5	---	---	---	---	---	---
15	14.0	13.5	13.5	---	---	---	---	---	---	---	---	---
16	14.0	14.0	14.0	---	---	---	---	---	---	---	---	---
17	14.5	14.0	14.0	---	---	---	---	---	---	---	---	---
18	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
19	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
20	14.5	13.0	14.0	---	---	---	---	---	---	---	---	---
21	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
22	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
23	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
24	14.5	14.0	14.5	---	---	---	---	---	---	---	---	---
25	15.0	14.5	14.5	---	---	---	---	---	---	---	---	---
26	15.5	14.5	15.0	---	---	---	---	---	---	---	---	---
27	16.5	15.0	15.5	---	---	---	---	---	---	---	---	---
28	16.0	14.5	15.0	---	---	---	---	---	---	---	---	---
29	14.5	13.5	14.0	---	---	---	---	---	---	---	---	---
30	13.5	12.5	13.0	---	---	---	---	---	---	---	---	---
31	12.5	11.5	12.0	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	18.0	15.0	16.5
2	---	---	---	---	---	---	---	---	---	19.0	16.5	18.0
3	---	---	---	---	---	---	---	---	---	20.0	17.5	19.0
4	---	---	---	---	---	---	8.5	---	---	21.0	19.0	---
5	---	---	---	---	---	---	9.0	6.5	8.0	20.5	19.0	19.5
6	---	---	---	---	---	---	10.0	8.0	9.0	20.0	18.5	19.0
7	---	---	---	---	---	---	10.5	9.0	9.5	19.0	18.0	18.5
8	---	---	---	---	---	---	12.5	10.0	11.5	20.0	18.0	19.0
9	---	---	---	---	---	---	12.0	11.5	12.0	20.0	18.5	19.5
10	---	---	---	---	---	---	12.0	10.0	11.0	20.0	19.0	19.5
11	---	---	---	---	---	---	10.5	10.0	10.0	21.0	19.5	20.0
12	---	---	---	---	---	---	13.0	10.0	11.0	20.0	18.5	19.0
13	---	---	---	---	---	---	13.0	10.5	11.5	20.0	18.0	19.0
14	---	---	---	---	---	---	12.5	11.0	11.5	19.0	18.0	18.5
15	---	---	---	---	---	---	11.5	10.5	11.0	18.5	17.0	18.0
16	---	---	---	---	---	---	10.5	9.0	10.0	17.0	16.5	17.0
17	---	---	---	---	---	---	9.5	8.0	8.5	18.0	16.5	17.0
18	---	---	---	---	---	---	9.5	7.5	8.5	19.0	17.5	18.0
19	---	---	---	---	---	---	10.5	8.0	9.5	20.5	18.0	19.0
20	---	---	---	---	---	---	13.0	9.5	10.5	20.5	19.0	19.5
21	---	---	---	---	---	---	11.5	10.5	11.0	20.5	19.0	20.0
22	---	---	---	---	---	---	13.0	11.5	12.0	20.5	19.0	19.5
23	---	---	---	---	---	---	15.5	12.5	14.0	19.5	18.0	18.5
24	---	---	---	---	---	---	15.5	14.0	14.5	18.0	17.0	17.5
25	---	---	---	---	---	---	14.5	12.5	13.5	18.0	16.5	17.0
26	---	---	---	---	---	---	15.0	12.0	13.5	17.5	16.5	17.0
27	---	---	---	---	---	---	16.0	13.5	14.5	16.5	16.0	16.5
28	---	---	---	---	---	---	16.0	14.0	15.0	16.5	15.5	16.0
29	---	---	---	---	---	---	16.0	13.5	15.0	17.0	16.0	16.0
30	---	---	---	---	---	---	17.0	14.0	15.5	17.5	15.5	16.5
31	---	---	---	---	---	---	---	---	---	17.5	16.0	16.5
MONTH	---	---	---	---	---	---	---	---	---	21.0	15.0	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	16.0	16.5	27.0	25.5	26.5	28.0	25.0	26.5	24.5	22.0	23.0
2	16.5	15.5	16.0	25.5	24.0	25.0	27.5	26.0	26.5	24.0	22.0	23.0
3	15.5	15.0	15.5	25.0	23.5	24.0	29.0	26.0	27.0	24.0	22.0	23.0
4	15.5	14.5	15.0	24.5	23.5	24.0	29.0	26.0	27.5	25.5	22.0	23.5
5	16.0	15.0	15.5	25.0	23.0	24.0	28.5	25.5	27.0	25.5	21.0	22.5
6	16.0	15.5	15.5	25.0	22.5	23.5	29.0	26.0	27.0	24.0	21.0	22.5
7	17.5	15.5	16.5	23.5	23.0	23.5	29.5	26.5	28.0	25.0	22.0	23.0
8	19.0	16.0	17.5	26.5	23.0	24.5	30.5	27.0	28.5	25.0	23.0	23.5
9	20.0	17.5	18.5	26.0	24.0	25.0	30.0	27.5	28.5	24.0	23.0	23.5
10	20.0	18.0	19.0	26.5	24.0	25.0	30.5	27.0	28.5	24.0	22.0	23.0
11	22.0	19.0	20.5	26.0	22.5	24.5	29.5	26.0	27.5	24.5	21.5	22.5
12	22.5	20.5	21.5	---	---	---	28.0	26.0	27.0	24.0	21.5	22.5
13	24.0	21.5	22.5	26.5	---	---	28.5	25.0	26.5	22.5	21.0	22.0
14	24.5	22.0	23.5	26.0	23.0	---	28.5	24.0	26.0	22.0	19.5	20.5
15	25.5	23.5	24.5	27.0	23.5	25.0	27.5	23.5	25.0	21.0	19.0	20.0
16	26.5	24.0	25.0	27.0	24.5	25.5	24.5	23.5	24.0	21.5	18.5	19.5
17	26.5	24.5	25.5	27.0	24.5	25.5	25.0	23.0	---	20.5	19.0	19.5
18	25.5	24.0	25.0	26.5	24.5	25.5	25.5	22.5	23.5	21.5	19.0	20.0
19	26.0	24.0	25.0	28.0	25.0	26.0	24.5	22.5	23.0	19.5	18.5	19.0
20	---	---	---	28.0	25.0	---	23.5	22.0	22.5	19.5	18.0	18.5
21	---	---	---	---	---	---	25.0	21.5	23.0	19.0	18.5	18.5
22	23.5	---	---	27.5	25.5	---	22.5	21.5	22.0	19.0	18.0	18.5
23	23.0	21.5	22.5	---	---	---	23.0	21.5	22.0	18.5	18.0	18.5
24	24.0	21.5	22.5	31.0	27.0	---	23.5	21.5	22.5	18.5	16.5	17.5
25	24.5	22.0	23.5	27.5	26.0	---	23.5	22.0	22.5	16.5	15.0	15.5
26	25.0	22.5	24.0	27.5	25.0	---	23.0	22.5	22.5	15.0	14.5	14.5
27	26.0	23.5	25.0	28.0	24.0	---	24.0	22.0	23.0	14.5	14.0	14.0
28	27.0	24.5	25.5	28.0	23.5	---	25.0	23.0	24.0	14.0	13.5	13.5
29	27.0	25.5	26.5	27.5	23.5	---	24.5	23.0	23.5	15.0	13.0	14.0
30	27.0	26.0	---	27.0	24.5	25.5	24.5	22.5	23.5	15.5	14.0	14.5
31	---	---	---	27.5	25.0	26.0	24.5	23.0	24.0	---	---	---
MONTH	---	---	---	---	---	---	30.5	21.5	---	25.5	13.0	19.8

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.3	8.8	9.0	10.7	9.3	9.9	---	---	---	---	---	---
2	9.1	8.6	8.8	10.3	9.3	9.7	---	---	---	---	---	---
3	9.1	8.5	8.7	10.3	9.4	9.7	---	---	---	---	---	---
4	---	---	---	10.5	9.4	9.8	---	---	---	---	---	---
5	---	---	---	10.6	9.5	9.9	---	---	---	---	---	---
6	---	---	---	11.1	9.8	10.2	---	---	---	---	---	---
7	---	---	---	10.8	9.9	10.2	---	---	---	---	---	---
8	---	---	---	10.9	9.5	---	---	---	---	---	---	---
9	---	---	---	9.6	8.9	9.2	---	---	---	---	---	---
10	---	---	---	9.8	8.9	9.3	---	---	---	---	---	---
11	---	---	---	10.0	9.2	9.6	---	---	---	---	---	---
12	---	---	---	10.0	9.4	9.7	---	---	---	---	---	---
13	---	---	---	10.2	9.8	9.9	---	---	---	---	---	---
14	10.3	---	---	10.3	9.9	10.1	---	---	---	---	---	---
15	9.8	8.9	9.2	10.4	10.1	---	---	---	---	---	---	---
16	9.4	8.8	9.0	---	---	---	---	---	---	---	---	---
17	9.5	8.6	8.9	---	---	---	---	---	---	---	---	---
18	9.6	8.4	8.8	---	---	---	---	---	---	---	---	---
19	9.5	8.5	8.8	---	---	---	---	---	---	---	---	---
20	9.9	8.6	8.9	---	---	---	---	---	---	---	---	---
21	9.9	8.5	8.9	---	---	---	---	---	---	---	---	---
22	10.0	8.6	9.1	---	---	---	---	---	---	---	---	---
23	10.0	8.4	8.9	---	---	---	---	---	---	---	---	---
24	9.1	8.3	8.5	---	---	---	---	---	---	---	---	---
25	8.8	8.0	8.3	---	---	---	---	---	---	---	---	---
26	8.3	7.9	8.0	---	---	---	---	---	---	---	---	---
27	8.6	7.9	8.1	---	---	---	---	---	---	---	---	---
28	9.2	8.1	8.5	---	---	---	---	---	---	---	---	---
29	9.2	8.5	8.8	---	---	---	---	---	---	---	---	---
30	10.0	9.0	9.4	---	---	---	---	---	---	---	---	---
31	10.5	9.3	9.8	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	9.5	8.6	9.0
2	---	---	---	---	---	---	---	---	---	9.5	8.2	8.8
3	---	---	---	---	---	---	---	---	---	9.8	7.9	8.7
4	---	---	---	---	---	---	---	---	---	9.9	8.0	---
5	---	---	---	---	---	---	---	---	---	10.8	8.4	9.2
6	---	---	---	---	---	---	---	---	---	10.7	8.5	9.2
7	---	---	---	---	---	---	---	---	---	10.6	8.5	9.1
8	---	---	---	---	---	---	---	---	---	10.3	8.6	9.2
9	---	---	---	---	---	---	---	---	---	10.0	8.4	9.0
10	---	---	---	---	---	---	---	---	---	9.8	8.1	8.8
11	---	---	---	---	---	---	9.8	---	---	10.3	8.0	---
12	---	---	---	---	---	---	10.7	9.0	9.6	10.2	8.3	9.1
13	---	---	---	---	---	---	10.1	9.3	9.7	10.0	8.8	9.2
14	---	---	---	---	---	---	10.1	9.3	9.7	10.0	8.8	9.2
15	---	---	---	---	---	---	9.9	9.5	9.7	9.2	8.8	9.0
16	---	---	---	---	---	---	10.3	9.6	10.0	9.1	8.9	9.0
17	---	---	---	---	---	---	10.9	10.0	10.5	9.3	8.8	9.0
18	---	---	---	---	---	---	11.2	10.5	10.9	8.8	8.1	8.6
19	---	---	---	---	---	---	11.3	10.7	11.0	8.4	8.0	8.2
20	---	---	---	---	---	---	10.9	10.1	---	8.5	8.0	8.2
21	---	---	---	---	---	---	10.1	9.5	9.8	8.3	7.9	8.1
22	---	---	---	---	---	---	9.9	9.2	9.5	8.6	8.1	8.3
23	---	---	---	---	---	---	9.6	8.8	9.2	8.9	8.3	8.6
24	---	---	---	---	---	---	9.5	8.3	8.9	9.1	8.5	8.8
25	---	---	---	---	---	---	9.6	8.7	9.2	9.9	8.9	---
26	---	---	---	---	---	---	9.4	8.7	9.1	9.5	8.9	9.2
27	---	---	---	---	---	---	9.5	8.5	8.9	9.2	8.9	9.0
28	---	---	---	---	---	---	9.5	8.5	9.0	9.6	9.1	9.3
29	---	---	---	---	---	---	9.6	8.7	9.1	9.4	9.1	9.3
30	---	---	---	---	---	---	9.7	8.7	9.1	9.5	9.0	9.2
31	---	---	---	---	---	---	---	---	---	9.5	8.9	9.1
MONTH	---	---	---	---	---	---	---	---	---	10.8	7.9	---

STREAMS TRIBUTARY TO LAKE ERIE

04174500 HURON RIVER AT ANN ARBOR, MI—Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	10.9	8.0	—	8.5	6.7	7.7	9.8	6.2	7.8	9.4	7.0	7.8
2	10.5	7.7	9.8	8.7	7.8	8.1	9.6	6.2	7.5	9.4	7.0	7.9
3	9.8	9.3	9.6	8.5	7.6	7.9	9.6	6.2	7.4	9.2	6.8	7.7
4	9.5	8.9	9.3	8.6	7.4	7.9	9.3	6.4	7.5	10.3	6.1	7.7
5	9.1	8.4	8.8	8.8	6.1	—	9.8	6.3	7.6	10.9	5.8	7.7
6	8.9	7.9	8.4	8.9	5.0	7.5	9.9	6.3	7.7	10.8	5.9	8.0
7	9.7	8.1	8.7	9.0	6.7	8.2	10.6	6.2	7.5	11.5	7.4	8.8
8	9.4	8.7	9.1	9.3	8.0	8.6	9.9	5.3	—	11.0	7.7	—
9	9.3	8.5	8.9	9.8	5.7	8.8	10.1	5.6	7.3	—	—	—
10	—	—	—	9.8	5.5	8.9	9.5	5.6	7.3	—	—	—
11	9.1	8.3	—	9.9	6.3	9.1	10.1	5.9	7.6	10.0	7.4	—
12	8.8	7.9	8.3	9.3	8.4	—	10.3	5.7	7.5	10.1	7.5	8.4
13	8.7	7.6	8.0	10.3	—	—	10.4	6.0	7.7	9.8	7.6	8.2
14	8.4	7.4	7.8	10.0	8.0	—	10.9	6.0	7.9	11.6	7.8	8.8
15	8.2	6.7	7.4	10.8	8.3	9.4	10.8	6.2	8.2	10.6	7.9	8.7
16	7.8	6.4	7.1	9.9	7.7	—	8.1	6.5	7.3	10.1	7.7	8.6
17	7.3	6.4	6.8	9.9	7.7	8.5	9.8	7.2	—	10.8	7.6	8.6
18	7.3	5.9	6.6	9.8	7.9	8.8	10.8	7.0	8.4	11.5	7.5	9.1
19	7.7	5.6	—	9.9	7.8	—	9.6	7.2	7.9	9.5	8.7	9.1
20	—	—	—	9.2	7.7	—	9.8	7.5	8.4	10.1	9.1	9.5
21	—	—	—	—	—	—	11.1	7.4	8.6	10.1	9.1	9.4
22	7.4	7.0	—	—	—	—	8.9	7.4	8.1	10.4	9.2	9.6
23	7.4	6.7	7.0	—	—	—	9.6	7.6	8.3	10.4	9.2	9.7
24	7.8	7.0	7.4	8.9	6.1	—	9.7	7.3	8.2	10.3	9.3	9.8
25	8.0	7.3	7.6	—	6.1	—	10.0	7.4	8.2	10.7	9.9	10.3
26	8.2	7.0	7.8	8.3	5.9	—	9.4	7.5	8.0	11.1	10.3	10.5
27	8.4	7.6	8.0	8.9	5.6	—	9.2	7.7	8.3	11.0	9.9	10.4
28	8.4	7.5	7.9	9.3	5.7	—	9.9	7.7	8.4	10.8	10.0	10.3
29	8.5	7.5	7.9	9.6	6.5	—	9.7	7.7	8.4	11.1	10.2	10.5
30	8.6	6.6	7.6	8.8	6.4	—	9.4	7.1	8.1	11.2	10.0	10.4
31	—	—	—	9.4	6.5	—	9.0	6.8	7.6	—	—	—
MONTH	—	—	—	—	—	—	11.1	5.3	—	—	—	—

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI

LOCATION.--Lat 42°15'53", long 83°41'18", in SE1/4 sec.35, T.2 S., R.6 E., Washtenaw County, Hydrologic Unit 04090005, on right bank 250 ft upstream from bridge on Chalmers Drive in Ann Arbor.

DRAINAGE AREA.--10.9 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to August 1975 (operated as a crest-stage partial-record station), April 1999 to current year. Prior to August 1975, published as Pittsfield-Ann Arbor Drain at Ann Arbor.

GAGE.--Water-stage recorder. Elevation of gage is 760 ft above sea level, from topographic map.

REMARKS.--Water-discharge records good. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	1.8	4.0	3.3	15	5.8	8.3	3.4	21	2.9	2.9	2.5
2	2.8	1.8	2.9	3.1	9.5	5.8	6.6	3.3	65	2.9	5.2	2.4
3	2.6	1.8	2.4	2.9	5.9	5.7	4.0	3.2	27	2.9	7.8	2.3
4	77	1.8	2.2	3.1	5.3	5.4	3.2	3.2	11	2.8	3.2	2.3
5	24	1.7	2.2	3.4	5.5	4.8	2.8	3.1	7.8	2.6	2.7	2.2
6	17	1.6	2.1	3.8	6.4	4.6	19	2.9	11	2.6	2.5	2.2
7	6.4	5.9	2.1	3.7	5.7	4.2	25	16	6.4	2.7	2.4	2.2
8	4.6	2.6	2.5	3.3	9.6	4.0	6.5	24	5.1	2.6	2.3	13
9	3.7	8.1	3.0	3.1	232	4.0	7.6	4.8	4.5	2.6	3.1	42
10	3.3	8.7	2.4	2.9	74	3.8	34	3.6	4.0	2.6	9.8	26
11	3.0	2.7	2.5	2.9	14	6.0	10	5.0	3.8	2.7	3.1	5.0
12	2.8	2.1	3.0	3.3	8.7	6.9	9.2	3.8	3.6	2.6	2.8	3.5
13	2.6	6.3	2.5	3.9	7.2	29	5.2	3.0	3.4	2.7	2.6	4.8
14	2.6	4.5	3.0	4.3	17	9.4	4.1	2.8	3.2	2.6	2.4	4.4
15	2.6	3.4	2.6	10	14	6.6	50	41	25	2.5	2.4	4.4
16	9.5	2.8	18	12	8.3	8.9	25	117	17	2.5	22	3.4
17	3.2	4.2	30	9.2	5.8	12	9.0	23	4.5	2.7	6.5	2.8
18	2.4	3.0	12	6.9	4.4	9.1	6.0	12	9.6	2.9	7.6	2.6
19	2.4	2.3	7.9	5.4	4.4	8.0	5.0	7.0	11	2.7	19	74
20	2.4	2.2	5.7	4.1	5.2	6.3	15	4.9	28	2.7	8.9	15
21	2.2	2.1	5.2	3.3	4.8	5.4	50	28	30	2.7	3.8	15
22	2.2	2.0	4.9	2.9	3.9	4.6	20	9.8	27	2.6	29	7.8
23	2.6	1.9	4.0	3.0	3.8	4.0	14	5.3	7.9	2.8	10	5.8
24	43	1.8	3.9	3.1	37	3.6	12	13	8.3	3.6	4.3	6.1
25	6.0	4.4	3.4	2.9	143	3.1	6.1	16	4.9	15	3.4	5.0
26	3.6	16	3.3	2.8	21	2.8	4.9	14	3.8	7.4	16	8.3
27	2.7	7.9	3.3	3.3	10	2.9	4.4	61	3.3	5.5	6.9	6.6
28	2.2	4.3	3.1	2.9	6.8	2.7	3.9	25	3.1	6.3	4.1	3.9
29	1.9	7.4	3.2	3.1	—	2.7	3.6	10	3.0	18	3.1	3.3
30	2.0	8.3	3.6	39	—	2.9	3.4	6.7	3.0	19	2.7	3.0
31	1.8	—	3.6	33	—	2.8	—	6.2	—	3.7	2.8	—
TOTAL	247.9	125.4	154.5	193.9	688.2	187.8	377.8	482.0	366.2	140.4	205.3	281.8
MEAN	8.00	4.18	4.98	6.25	24.6	6.06	12.6	15.5	12.2	4.53	6.62	9.39
MAX	77	16	30	39	232	29	50	117	65	19	29	74
MIN	1.8	1.6	2.1	2.8	3.8	2.7	2.8	2.8	3.0	2.5	2.3	2.2
CFSM	.73	.38	.46	.57	2.25	.56	1.16	1.43	1.12	.42	.61	.86
IN.	.85	.43	.53	.66	2.35	.64	1.29	1.64	1.25	.48	.70	.96

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2001, BY WATER YEAR (WY)

MEAN	6.37	3.91	7.09	4.92	15.0	4.95	13.7	13.2	16.5	8.90	9.14	8.58
MAX	8.00	4.18	9.19	6.25	24.6	6.06	18.3	15.9	27.6	13.1	15.6	10.9
(WY)	2001	2001	2000	2001	2001	2001	1999	2000	2000	2000	2000	2000
MIN	4.74	3.64	4.98	3.58	5.75	3.84	10.4	8.25	9.61	4.53	5.21	5.42
(WY)	2000	2000	2001	2000	2000	2000	2000	1999	1999	2001	1999	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1999 - 2001	
ANNUAL TOTAL	3772.6		3451.2			
ANNUAL MEAN	10.3		9.46		9.90	
HIGHEST ANNUAL MEAN					10.3	2000
LOWEST ANNUAL MEAN					9.46	2001
HIGHEST DAILY MEAN	410	Jun 25	232	Feb 9	410	Jun 25 2000
LOWEST DAILY MEAN	1.4	Jan 27	1.6	Nov 6	1.3	Sep 27 1999
ANNUAL SEVEN-DAY MINIMUM	1.5	Jan 25	1.8	Oct 31	1.5	Jan 25 2000
MAXIMUM PEAK FLOW			370	Feb 9	(a)1560	Jun 25 2000
MAXIMUM PEAK STAGE			5.62	Feb 9	9.32	Jun 25 2000
INSTANTANEOUS LOW FLOW					1.1	(b)
ANNUAL RUNOFF (CFSM)	.95		.87		.91	
ANNUAL RUNOFF (INCHES)	12.88		11.78		12.34	
10 PERCENT EXCEEDS	23		20		23	
50 PERCENT EXCEEDS	3.4		4.0		3.7	
90 PERCENT EXCEEDS	1.9		2.4		2.0	

(a) From rating curve extended above 300 ft^3/s on basis of contracted-opening measurement of peak flow.
(b) Sept. 26, 27, 1999.

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2000 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 2000 to current year.
pH: March 2000 to current year.
WATER TEMPERATURE: March 2000 to current year.
DISSOLVED OXYGEN: March 2000 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15 minute measurement interval, not operated during winter months.

REMARKS.--Interruptions in the water-quality record were due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 2,680 microsiemens, Apr. 10, 2000; minimum, 201 microsiemens, Sept. 11, 2000.
pH: Maximum, 8.5 std. units, Mar. 30, 2000, Apr. 8, 2001; minimum, 7.5 std. units, on several days during 2000 and 2001 water years.
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8, 2001; minimum, 3.5°C, Apr. 12, 2000.
DISSOLVED OXYGEN: Maximum, 15.2 mg/L, Apr. 13, 2000; minimum, 0.8 mg/L, May 15, 16, 2000.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 2,360 microsiemens, Apr. 4; minimum, 277 microsiemens, Sept. 19.
pH: Maximum, 8.5 std. units, Apr. 8; minimum, 7.5 std. units, Oct. 24.
WATER TEMPERATURE: Maximum, 27.0°C, Aug. 8; minimum, 5.0°C, Nov. 15.
DISSOLVED OXYGEN: Maximum, 13.2 mg/L, Nov. 6; minimum, 4.2 mg/L, June 15.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	1360	1340	1350	1280	1240	1270	---	---	---	---	---	---
2	1370	1350	1360	1300	1270	1280	---	---	---	---	---	---
3	1370	1350	1360	1300	1280	1290	---	---	---	---	---	---
4	1350	377	725	1310	1280	1290	---	---	---	---	---	---
5	863	603	772	1310	1290	1300	---	---	---	---	---	---
6	833	637	754	1320	1290	1300	---	---	---	---	---	---
7	957	833	907	1300	933	1140	---	---	---	---	---	---
8	1070	957	1010	1120	1010	1080	---	---	---	---	---	---
9	1140	1070	1110	1120	456	1020	---	---	---	---	---	---
10	1190	1140	1160	971	565	847	---	---	---	---	---	---
11	1230	1190	1210	1040	971	1010	---	---	---	---	---	---
12	1250	1230	1240	1140	1040	1090	---	---	---	---	---	---
13	1260	1240	1250	1150	831	1040	---	---	---	---	---	---
14	1280	1260	1270	1000	831	959	---	---	---	---	---	---
15	1300	1270	1290	---	---	---	---	---	---	---	---	---
16	1270	812	989	---	---	---	---	---	---	---	---	---
17	1140	1070	1110	---	---	---	---	---	---	---	---	---
18	1210	1140	1170	---	---	---	---	---	---	---	---	---
19	1220	1190	1210	---	---	---	---	---	---	---	---	---
20	1270	1210	1250	---	---	---	---	---	---	---	---	---
21	1290	1250	1280	---	---	---	---	---	---	---	---	---
22	1310	1280	1290	---	---	---	---	---	---	---	---	---
23	1320	1290	1310	---	---	---	---	---	---	---	---	---
24	1300	457	736	---	---	---	---	---	---	---	---	---
25	948	814	886	---	---	---	---	---	---	---	---	---
26	1070	948	986	---	---	---	---	---	---	---	---	---
27	1160	1070	1100	---	---	---	---	---	---	---	---	---
28	1170	1110	1130	---	---	---	---	---	---	---	---	---
29	1230	1170	1200	---	---	---	---	---	---	---	---	---
30	1250	1230	1240	---	---	---	---	---	---	---	---	---
31	1260	1220	1240	---	---	---	---	---	---	---	---	---
MONTH	1370	377	1130	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	2170	1960	2060	---	---	---
6	---	---	---	---	---	---	2050	1060	1630	---	---	---
7	---	---	---	---	---	---	2140	1280	1900	---	---	---
8	---	---	---	---	---	---	2000	1760	1870	---	---	---
9	---	---	---	---	---	---	1760	1430	1640	---	---	---
10	---	---	---	---	---	---	1960	1070	1650	---	---	---
11	---	---	---	---	---	---	1970	1830	1900	1570	---	---
12	---	---	---	---	---	---	1880	1640	1750	1570	1460	1500
13	---	---	---	---	---	---	1750	1680	1720	1610	1570	1600
14	---	---	---	---	---	---	1750	1670	1710	1600	1550	1580
15	---	---	---	---	---	---	1700	650	1430	1560	872	1210
16	---	---	---	---	---	---	1530	1490	1500	1360	543	1060
17	---	---	---	---	---	---	1530	1500	1520	1340	1180	1260
18	---	---	---	---	---	---	1540	1490	1520	1440	1150	1350
19	---	---	---	---	---	---	1510	1460	1490	1460	1160	1340
20	---	---	---	---	---	---	1480	1150	1340	1520	1450	1490
21	---	---	---	---	---	---	1580	599	1300	1550	681	1270
22	---	---	---	---	---	---	1410	1330	1380	1380	1250	1320
23	---	---	---	---	---	---	1460	1260	1410	1480	1380	1430
24	---	---	---	---	---	---	1480	1300	1380	1500	831	1190
25	---	---	---	---	---	---	1560	1480	1520	1330	817	1120
26	---	---	---	---	---	---	1580	---	---	1390	883	1270
27	---	---	---	---	---	---	---	---	---	1090	620	915
28	---	---	---	---	---	---	---	---	---	1260	1040	1160
29	---	---	---	---	---	---	---	---	---	1420	1260	1360
30	---	---	---	---	---	---	---	---	---	1560	1410	1450
31	---	---	---	---	---	---	---	---	---	1510	975	1370
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	1530	664	1160	1510	1500	1500	1380	1320	1350	1360	1320	1340
2	1270	548	905	1520	1500	1510	1410	1210	1380	1380	1360	1370
3	1130	910	1030	1530	1510	1520	1370	1160	1210	1390	1380	1380
4	1300	1130	1240	1530	1520	1520	1270	1200	1240	1390	1380	1390
5	1390	1300	1350	1580	1520	1540	1290	1270	1280	1400	1390	1390
6	1420	603	1260	1580	1570	1580	1320	1280	1310	1440	1390	1410
7	1380	1030	1200	1580	1570	1580	1340	1320	1330	1440	1420	1430
8	1440	1380	1410	1580	1570	1580	1360	1330	1340	1440	504	1220
9	1490	1430	1470	1580	1570	1580	1370	1070	1350	1160	330	846
10	1510	1480	1490	1580	1560	1570	1270	550	899	963	560	846
11	1510	1490	1500	1570	1560	1570	1220	1050	1170	1170	960	1010
12	1510	1490	1510	1580	1560	1570	1310	1220	1270	1170	1090	1110
13	1510	1480	1500	1580	1560	1570	1340	1300	1330	1190	901	1130
14	1560	1510	1530	1600	1580	1590	1370	1340	1360	1240	1040	1120
15	1550	426	1340	1590	1580	1590	1380	1360	1370	1260	1060	1150
16	1280	1110	1230	1590	1580	1590	1380	590	1080	1280	1220	1240
17	1380	1280	1320	1590	1580	1590	1220	1010	1160	1260	1220	1240
18	1410	906	1200	1660	1590	1620	1280	606	1200	1380	1260	1300
19	1400	568	1280	1610	1580	1600	1220	581	827	1380	277	738
20	1240	496	1110	1610	1560	1590	1090	857	971	866	662	778
21	1300	462	1080	1580	1560	1570	1170	1090	1130	939	574	803
22	1120	794	1000	1560	1540	1550	1220	449	949	945	649	826
23	1250	1120	1180	1560	1540	1550	1100	923	1030	1040	883	980
24	1280	1230	1250	1580	1000	1470	1160	1100	1120	1080	842	953
25	1330	1270	1300	1320	549	914	1220	1160	1200	1110	1010	1050
26	1380	1330	1370	1130	996	1080	1240	627	1020	1060	846	995
27	1440	1380	1410	996	935	961	1080	849	995	1030	909	968
28	1480	1440	1450	935	603	749	1190	1080	1120	1130	1020	1070
29	1490	1470	1490	1520	352	1090	1210	1180	1200	1200	1130	1170
30	1500	1490	1500	1240	713	1160	1280	1210	1250	1260	1190	1230
31	---	---	---	1320	1240	1270	1320	1280	1300	---	---	---
MONTH	1560	426	1300	1660	352	1440	1410	449	1190	1440	277	1120

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.2	8.1	8.1	8.3	8.2	8.3	---	---	---	---	---	---
2	8.1	8.0	8.1	8.3	8.2	8.2	---	---	---	---	---	---
3	8.1	8.0	8.1	8.3	8.2	8.2	---	---	---	---	---	---
4	8.1	7.8	8.0	8.4	8.2	8.3	---	---	---	---	---	---
5	8.0	7.8	7.9	8.3	8.2	8.3	---	---	---	---	---	---
6	8.0	7.8	7.9	8.3	8.2	8.3	---	---	---	---	---	---
7	8.0	7.9	8.0	8.2	7.9	8.1	---	---	---	---	---	---
8	8.1	8.0	8.0	8.0	7.9	7.9	---	---	---	---	---	---
9	8.1	8.0	8.1	8.0	7.7	7.9	---	---	---	---	---	---
10	8.1	8.0	8.1	7.9	7.7	7.8	---	---	---	---	---	---
11	8.1	8.0	8.1	8.1	7.9	8.0	---	---	---	---	---	---
12	8.1	8.0	8.1	8.1	7.9	8.0	---	---	---	---	---	---
13	8.2	8.0	8.1	8.1	7.8	8.0	---	---	---	---	---	---
14	8.2	8.0	8.1	8.0	7.8	7.9	---	---	---	---	---	---
15	8.1	8.0	8.1	---	7.9	---	---	---	---	---	---	---
16	8.1	7.8	7.8	---	---	---	---	---	---	---	---	---
17	7.9	7.8	7.9	---	---	---	---	---	---	---	---	---
18	8.0	7.9	8.0	---	---	---	---	---	---	---	---	---
19	8.1	7.9	8.0	---	---	---	---	---	---	---	---	---
20	8.1	8.0	8.0	---	---	---	---	---	---	---	---	---
21	8.1	7.9	8.0	---	---	---	---	---	---	---	---	---
22	8.1	8.0	8.0	---	---	---	---	---	---	---	---	---
23	8.1	8.0	8.0	---	---	---	---	---	---	---	---	---
24	8.0	7.5	7.7	---	---	---	---	---	---	---	---	---
25	7.9	7.8	7.8	---	---	---	---	---	---	---	---	---
26	8.1	7.8	7.9	---	---	---	---	---	---	---	---	---
27	8.1	7.9	8.0	---	---	---	---	---	---	---	---	---
28	8.1	8.0	8.1	---	---	---	---	---	---	---	---	---
29	8.3	8.1	8.2	---	---	---	---	---	---	---	---	---
30	8.3	8.2	8.2	---	---	---	---	---	---	---	---	---
31	8.4	8.2	8.3	---	---	---	---	---	---	---	---	---
MONTH	8.4	7.5	8.0	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	7.8	7.7	7.7
2	---	---	---	---	---	---	---	---	---	7.8	7.7	7.7
3	---	---	---	---	---	---	---	---	---	7.7	7.6	7.7
4	---	---	---	---	---	---	8.3	---	---	7.7	7.6	7.7
5	---	---	---	---	---	---	8.4	8.0	8.2	7.8	7.7	7.7
6	---	---	---	---	---	---	8.1	8.0	8.1	7.8	7.7	7.7
7	---	---	---	---	---	---	8.3	8.0	8.1	---	7.7	---
8	---	---	---	---	---	---	8.5	8.0	8.2	7.8	7.6	---
9	---	---	---	---	---	---	8.3	8.1	8.2	7.9	7.7	7.8
10	---	---	---	---	---	---	8.1	7.9	---	7.9	7.7	7.8
11	---	---	---	---	---	---	8.3	8.0	8.1	7.8	7.7	7.8
12	---	---	---	---	---	---	8.4	8.0	8.1	7.9	7.8	7.8
13	---	---	---	---	---	---	8.4	8.0	8.2	7.9	7.8	7.9
14	---	---	---	---	---	---	8.3	8.0	8.1	7.9	7.8	7.9
15	---	---	---	---	---	---	8.1	7.8	8.0	7.8	7.6	7.7
16	---	---	---	---	---	---	8.2	7.9	8.0	7.7	7.6	7.7
17	---	---	---	---	---	---	8.3	8.0	8.1	7.8	7.7	7.8
18	---	---	---	---	---	---	8.4	8.0	8.2	7.9	7.7	7.8
19	---	---	---	---	---	---	8.4	8.0	8.2	8.0	7.7	7.9
20	---	---	---	---	---	---	8.1	7.9	8.0	8.0	7.9	8.0
21	---	---	---	---	---	---	8.0	7.8	8.0	8.0	7.6	7.8
22	---	---	---	---	---	---	8.1	7.8	7.9	7.9	7.8	7.9
23	---	---	---	---	---	---	8.2	7.8	8.0	8.0	7.9	8.0
24	---	---	---	---	---	---	8.2	7.8	8.0	8.0	7.7	7.9
25	---	---	---	---	---	---	8.2	7.8	8.0	7.9	7.7	7.8
26	---	---	---	---	---	---	8.0	7.8	7.9	7.9	7.8	7.8
27	---	---	---	---	---	---	8.0	7.7	7.8	7.8	7.7	7.8
28	---	---	---	---	---	---	7.9	7.8	7.8	7.9	7.8	7.9
29	---	---	---	---	---	---	7.9	7.8	7.8	8.0	7.9	7.9
30	---	---	---	---	---	---	7.8	7.7	7.8	8.1	7.8	8.0
31	---	---	---	---	---	---	---	---	---	8.0	8.0	8.0
MONTH	---	---	---	---	---	---	---	---	---	---	7.6	---

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.0	7.6	—	8.0	7.8	7.9	8.0	7.9	7.9	8.1	8.0	8.0
2	7.8	7.6	7.7	8.0	7.9	7.9	8.0	7.8	8.0	8.1	8.0	8.0
3	7.8	7.7	7.8	8.0	7.9	8.0	7.9	7.8	7.8	8.1	8.0	8.0
4	7.9	7.8	7.9	8.0	7.9	7.9	8.0	7.8	7.9	8.0	8.0	8.0
5	7.9	7.9	7.9	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.9	8.0
6	7.9	7.7	7.8	8.1	7.9	8.0	8.0	7.9	8.0	8.0	7.9	8.0
7	7.9	7.8	7.8	8.1	7.9	8.0	8.1	7.9	8.0	8.0	7.9	8.0
8	7.9	7.9	7.9	8.0	7.9	7.9	8.1	8.0	8.0	8.0	7.6	7.9
9	7.9	7.9	7.9	7.9	7.9	7.9	8.0	7.9	8.0	7.9	7.6	7.8
10	7.9	7.8	7.9	7.9	7.9	7.9	7.9	7.6	7.7	7.9	7.7	7.8
11	7.9	7.8	7.9	7.9	7.9	7.9	7.9	7.7	7.8	7.9	7.9	7.9
12	7.9	7.9	7.9	7.9	7.8	7.9	8.0	7.8	7.9	8.0	7.9	7.9
13	7.9	7.8	7.9	7.9	7.8	7.9	8.0	7.9	7.9	8.0	7.8	7.9
14	8.0	7.8	7.9	7.9	7.8	7.9	8.0	7.9	8.0	8.0	7.9	7.9
15	8.0	7.6	7.8	7.9	7.8	7.9	8.1	8.0	8.0	8.0	7.9	7.9
16	7.8	7.7	7.8	7.9	7.8	7.9	8.0	7.6	7.8	8.0	8.0	8.0
17	8.0	7.8	7.9	7.9	7.9	7.9	7.9	7.7	7.8	8.1	7.9	8.0
18	7.9	7.8	7.8	8.1	7.9	8.0	8.0	7.7	7.9	8.1	8.0	8.0
19	8.0	7.7	7.9	8.0	7.9	8.0	7.8	7.6	7.7	8.0	7.6	7.8
20	7.8	7.7	7.8	8.0	7.9	8.0	7.9	7.7	7.8	7.9	7.8	7.9
21	7.8	7.6	7.7	7.9	7.9	7.9	7.9	7.8	7.9	7.9	7.7	7.8
22	7.8	7.6	7.7	8.0	7.9	8.0	7.9	7.6	7.7	7.9	7.7	7.8
23	7.8	7.8	7.8	8.0	8.0	8.0	7.8	7.7	7.7	8.0	7.8	7.9
24	7.9	7.8	7.8	8.0	7.9	8.0	8.0	7.8	7.9	7.9	7.8	7.9
25	7.9	7.8	7.8	7.9	7.7	7.8	8.0	7.8	7.9	8.0	7.9	7.9
26	7.9	7.8	7.9	7.9	7.8	7.9	7.9	7.6	7.8	8.0	7.9	7.9
27	7.9	7.8	7.9	7.9	7.9	7.9	7.8	7.7	7.8	8.0	7.9	7.9
28	8.0	7.8	7.9	8.1	7.7	7.8	7.9	7.8	7.8	8.0	7.9	8.0
29	8.0	7.9	7.9	8.0	7.6	7.9	8.0	7.8	7.9	8.1	8.0	8.0
30	8.0	7.8	7.9	7.9	7.7	7.8	8.0	7.9	7.9	8.1	8.0	8.0
31	—	—	—	8.0	7.8	7.9	8.0	7.9	8.0	—	—	—
MONTH	8.0	7.6	—	8.1	7.6	7.9	8.1	7.6	7.9	8.1	7.6	7.9

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	15.5	12.5	14.0	10.5	7.5	9.0	—	—	—	—	—	—
2	17.0	15.0	16.0	12.0	9.0	10.5	—	—	—	—	—	—
3	17.0	15.5	16.5	12.5	11.0	11.5	—	—	—	—	—	—
4	16.5	15.0	16.0	11.0	8.5	9.5	—	—	—	—	—	—
5	15.5	14.0	14.5	9.5	7.0	8.5	—	—	—	—	—	—
6	14.0	12.0	13.5	9.0	6.5	8.0	—	—	—	—	—	—
7	12.0	9.5	10.5	11.5	9.0	10.5	—	—	—	—	—	—
8	10.0	9.0	9.5	12.0	11.0	11.5	—	—	—	—	—	—
9	10.5	8.5	9.5	14.0	11.0	12.0	—	—	—	—	—	—
10	11.0	8.5	10.0	13.5	9.5	11.5	—	—	—	—	—	—
11	12.0	9.0	10.5	9.5	8.0	8.5	—	—	—	—	—	—
12	12.5	9.0	11.0	8.5	8.0	8.5	—	—	—	—	—	—
13	13.5	11.0	12.0	9.0	8.0	8.5	—	—	—	—	—	—
14	15.0	12.0	13.5	8.0	5.5	6.5	—	—	—	—	—	—
15	14.5	13.0	14.0	—	5.0	—	—	—	—	—	—	—
16	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
17	14.5	13.5	14.0	—	—	—	—	—	—	—	—	—
18	14.0	12.0	13.0	—	—	—	—	—	—	—	—	—
19	14.0	11.0	12.5	—	—	—	—	—	—	—	—	—
20	14.5	11.5	13.0	—	—	—	—	—	—	—	—	—
21	14.0	12.0	13.0	—	—	—	—	—	—	—	—	—
22	14.0	11.5	12.5	—	—	—	—	—	—	—	—	—
23	14.0	11.5	12.5	—	—	—	—	—	—	—	—	—
24	16.0	14.0	15.0	—	—	—	—	—	—	—	—	—
25	16.5	15.0	15.5	—	—	—	—	—	—	—	—	—
26	16.5	15.5	16.0	—	—	—	—	—	—	—	—	—
27	17.5	15.0	16.0	—	—	—	—	—	—	—	—	—
28	15.5	11.0	13.0	—	—	—	—	—	—	—	—	—
29	11.0	8.5	10.0	—	—	—	—	—	—	—	—	—
30	10.5	7.5	9.0	—	—	—	—	—	—	—	—	—
31	10.0	7.0	9.0	—	—	—	—	—	—	—	—	—
MONTH	17.5	7.0	12.9	—	—	—	—	—	—	—	—	—

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	—	—	—	—	—	—	—	—	—	19.5	13.5	16.5
2	—	—	—	—	—	—	—	—	—	21.0	15.5	18.5
3	—	—	—	—	—	—	—	—	—	21.5	16.0	19.0
4	—	—	—	—	—	—	12.0	—	—	21.0	17.0	18.5
5	—	—	—	—	—	—	12.0	6.0	9.0	18.5	15.5	17.0
6	—	—	—	—	—	—	13.0	9.0	11.0	17.5	14.0	16.0
7	—	—	—	—	—	—	13.5	10.0	12.0	—	14.5	—
8	—	—	—	—	—	—	18.0	12.5	15.0	19.5	—	—
9	—	—	—	—	—	—	14.5	11.0	12.5	19.5	16.5	18.0
10	—	—	—	—	—	—	11.0	9.5	10.5	19.5	15.5	17.5
11	—	—	—	—	—	—	11.5	9.5	10.5	19.0	17.5	18.0
12	—	—	—	—	—	—	15.5	11.0	13.0	17.5	14.0	16.0
13	—	—	—	—	—	—	15.5	10.0	12.5	16.0	12.0	14.0
14	—	—	—	—	—	—	14.0	10.0	12.0	16.0	12.0	14.5
15	—	—	—	—	—	—	11.0	8.5	9.5	15.5	14.5	15.0
16	—	—	—	—	—	—	10.0	8.0	9.0	15.5	14.0	15.0
17	—	—	—	—	—	—	9.5	6.0	7.5	19.0	15.0	16.5
18	—	—	—	—	—	—	11.5	6.0	8.5	19.0	17.0	18.0
19	—	—	—	—	—	—	14.0	7.0	10.0	18.5	15.5	17.0
20	—	—	—	—	—	—	10.5	10.0	10.5	19.5	16.0	17.5
21	—	—	—	—	—	—	14.0	10.5	12.0	19.5	17.0	18.5
22	—	—	—	—	—	—	15.5	13.0	14.5	18.5	16.0	17.5
23	—	—	—	—	—	—	18.5	13.5	16.0	16.0	14.5	15.5
24	—	—	—	—	—	—	16.5	12.0	13.5	15.0	14.0	14.5
25	—	—	—	—	—	—	16.0	10.0	12.5	16.0	13.5	14.5
26	—	—	—	—	—	—	16.5	10.0	13.0	15.5	13.5	14.5
27	—	—	—	—	—	—	18.5	13.0	15.0	15.0	14.0	14.5
28	—	—	—	—	—	—	17.0	11.0	13.5	17.0	13.5	15.0
29	—	—	—	—	—	—	17.5	10.5	13.5	16.5	14.5	15.0
30	—	—	—	—	—	—	19.0	11.0	15.0	15.5	13.0	14.0
31	—	—	—	—	—	—	—	—	—	16.0	13.0	14.5
MONTH	—	—	—	—	—	—	—	—	—	—	—	—

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.0	14.0	14.5	23.0	18.5	21.5	25.0	22.0	23.5	20.0	17.5	18.5
2	14.5	13.0	14.0	19.0	16.0	17.5	25.0	23.0	24.0	19.0	16.0	17.5
3	14.0	13.0	13.5	20.0	17.0	18.5	25.0	23.0	24.0	20.0	16.5	18.5
4	15.0	13.0	14.0	22.0	19.0	20.0	25.0	21.5	23.0	20.5	19.0	19.5
5	15.0	14.0	14.5	20.5	18.0	19.5	24.0	20.5	22.5	19.0	16.5	18.0
6	15.0	14.5	14.5	20.0	15.5	18.0	24.5	21.0	23.0	19.0	16.0	17.5
7	17.0	14.5	15.5	19.5	17.0	18.0	25.5	22.5	24.0	21.5	18.0	19.5
8	18.5	14.5	16.5	23.0	19.5	21.0	27.0	24.0	25.5	24.0	20.5	21.5
9	19.0	15.0	17.0	22.5	19.5	21.5	26.5	24.5	25.5	23.5	22.0	22.5
10	20.0	16.5	18.0	24.0	21.0	22.0	26.0	22.5	24.0	22.0	20.5	21.0
11	21.5	18.5	20.0	22.0	19.0	20.5	23.5	21.0	22.0	21.0	18.5	19.5
12	21.5	19.0	20.5	21.0	18.0	19.5	23.0	21.0	22.0	20.5	17.5	19.0
13	23.0	19.0	21.0	20.5	17.5	19.0	22.5	20.5	21.5	19.5	17.0	18.0
14	23.5	20.0	22.0	21.0	17.5	19.5	21.0	18.5	19.5	17.0	14.5	15.5
15	25.0	21.0	23.0	22.0	18.0	20.0	20.5	17.0	19.0	16.0	13.5	15.0
16	23.5	21.5	23.0	23.0	19.5	21.5	21.5	19.0	20.0	16.0	14.0	15.0
17	23.0	20.5	22.0	22.5	20.5	21.5	21.0	19.5	20.5	16.5	13.5	15.0
18	21.5	19.5	20.5	23.0	20.5	22.0	21.5	19.0	20.0	18.0	16.0	17.0
19	24.5	21.0	22.0	24.0	21.0	22.5	21.5	20.0	20.5	19.0	17.0	18.5
20	22.5	21.0	22.0	24.5	21.5	23.0	21.0	19.5	20.0	18.5	17.5	18.0
21	21.0	18.5	19.5	23.5	22.0	23.0	21.0	18.5	19.5	18.0	16.5	17.0
22	21.0	18.5	19.5	25.0	22.0	23.5	20.5	18.5	19.5	17.5	16.0	16.5
23	20.5	19.0	20.0	25.0	23.0	24.0	21.0	20.0	20.5	17.5	15.5	16.5
24	21.0	19.0	20.0	26.5	23.0	24.5	21.5	20.0	20.5	18.0	13.0	15.5
25	22.5	19.5	21.0	24.5	21.5	22.5	22.0	19.5	20.5	13.0	11.0	12.0
26	23.0	19.5	21.0	22.5	20.5	21.5	23.0	21.0	21.5	12.0	11.0	11.5
27	23.5	20.0	22.0	22.5	19.0	20.5	22.5	20.5	21.5	13.0	12.0	12.5
28	24.5	21.0	22.5	23.5	19.0	21.5	23.0	20.5	22.0	14.0	12.5	13.0
29	24.0	21.0	22.5	23.0	21.0	22.0	21.0	18.5	20.0	14.0	12.0	13.0
30	24.5	22.0	23.0	23.5	21.5	22.5	22.0	18.5	20.0	14.0	11.5	13.0
31	—	—	—	24.5	22.5	23.5	21.5	20.0	21.0	—	—	—
MONTH	25.0	13.0	19.3	26.5	15.5	21.1	27.0	17.0	21.6	24.0	11.0	16.8

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.7	6.9	7.8	11.7	9.0	10.0	---	---	---	---	---	---
2	8.3	6.4	7.3	12.3	9.0	10.4	---	---	---	---	---	---
3	8.1	6.4	7.1	11.8	8.8	9.8	---	---	---	---	---	---
4	7.6	6.6	7.3	12.7	8.9	10.4	---	---	---	---	---	---
5	7.6	7.2	7.4	12.9	9.5	10.8	---	---	---	---	---	---
6	8.2	7.5	8.0	13.2	9.4	10.8	---	---	---	---	---	---
7	9.2	8.1	8.9	9.5	7.3	8.6	---	---	---	---	---	---
8	9.6	8.9	9.3	9.1	7.0	7.8	---	---	---	---	---	---
9	10.0	8.9	9.5	8.2	6.9	7.4	---	---	---	---	---	---
10	9.8	8.6	9.2	8.3	6.9	7.8	---	---	---	---	---	---
11	9.6	8.3	9.0	9.9	8.1	8.9	---	---	---	---	---	---
12	9.6	8.1	8.9	10.0	8.4	9.0	---	---	---	---	---	---
13	9.4	7.5	8.5	9.1	8.1	8.6	---	---	---	---	---	---
14	9.0	7.0	8.0	9.9	8.3	9.2	---	---	---	---	---	---
15	8.5	7.1	7.6	---	9.3	---	---	---	---	---	---	---
16	7.4	5.6	6.4	---	---	---	---	---	---	---	---	---
17	7.3	5.7	6.6	---	---	---	---	---	---	---	---	---
18	8.2	6.8	7.4	---	---	---	---	---	---	---	---	---
19	8.7	7.0	7.7	---	---	---	---	---	---	---	---	---
20	8.6	6.7	7.6	---	---	---	---	---	---	---	---	---
21	8.7	6.8	7.5	---	---	---	---	---	---	---	---	---
22	9.0	7.1	7.8	---	---	---	---	---	---	---	---	---
23	9.0	7.2	7.8	---	---	---	---	---	---	---	---	---
24	7.7	6.3	7.3	---	---	---	---	---	---	---	---	---
25	7.5	6.9	7.1	---	---	---	---	---	---	---	---	---
26	7.6	6.9	7.2	---	---	---	---	---	---	---	---	---
27	8.0	6.9	7.3	---	---	---	---	---	---	---	---	---
28	8.8	7.2	8.0	---	---	---	---	---	---	---	---	---
29	9.8	8.3	9.0	---	---	---	---	---	---	---	---	---
30	10.1	8.8	9.3	---	---	---	---	---	---	---	---	---
31	10.2	8.9	9.4	---	---	---	---	---	---	---	---	---
MONTH	10.2	5.6	8.0	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	10.3	7.1	8.5
2	---	---	---	---	---	---	---	---	---	9.6	6.5	7.9
3	---	---	---	---	---	---	---	---	---	9.0	6.3	7.3
4	---	---	---	---	---	---	12.7	---	---	8.4	6.2	6.9
5	---	---	---	---	---	---	12.5	8.1	10.2	8.4	6.3	7.1
6	---	---	---	---	---	---	---	---	---	8.2	6.4	7.1
7	---	---	---	---	---	---	---	---	---	---	6.4	---
8	---	---	---	---	---	---	---	---	---	8.8	---	---
9	---	---	---	---	---	---	---	---	---	9.1	7.4	8.0
10	---	---	---	---	---	---	---	---	---	9.3	7.5	8.2
11	---	---	---	---	---	---	---	---	---	7.8	7.2	7.6
12	---	---	---	---	---	---	---	---	---	8.9	7.4	8.1
13	---	---	---	---	---	---	---	---	---	9.6	8.1	8.8
14	---	---	---	---	---	---	---	---	---	9.7	8.2	8.8
15	---	---	---	---	---	---	---	---	---	9.0	8.3	8.7
16	---	---	---	---	---	---	---	---	---	9.4	8.9	9.1
17	---	---	---	---	---	---	---	---	---	9.2	8.1	8.8
18	---	---	---	---	---	---	---	---	---	8.7	7.8	8.3
19	---	---	---	---	---	---	---	---	---	9.0	7.8	8.4
20	---	---	---	---	---	---	---	---	---	8.9	8.0	8.4
21	---	---	---	---	---	---	---	---	---	8.2	7.8	8.0
22	---	---	---	---	---	---	---	---	---	8.9	8.0	8.5
23	---	---	---	---	---	---	---	---	---	9.3	8.5	8.9
24	---	---	---	---	---	---	---	---	---	9.2	8.6	8.9
25	---	---	---	---	---	---	---	---	---	9.6	8.4	8.9
26	---	---	---	---	---	---	11.4	---	---	9.5	8.5	9.1
27	---	---	---	---	---	---	11.8	8.3	9.5	9.4	8.9	9.3
28	---	---	---	---	---	---	11.7	8.4	9.6	9.7	8.6	9.3
29	---	---	---	---	---	---	11.4	8.1	9.4	9.4	8.6	9.1
30	---	---	---	---	---	---	10.7	7.5	8.9	9.8	9.1	9.4
31	---	---	---	---	---	---	---	---	---	9.7	9.0	9.3
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

STREAMS TRIBUTARY TO LAKE ERIE

04174518 MALLETTS CREEK AT ANN ARBOR, MI--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.2	8.8	9.1	8.5	6.6	7.3	8.4	6.8	7.5	9.4	7.7	8.5
2	9.7	9.1	9.5	9.4	7.4	8.3	7.8	6.8	7.3	9.7	8.4	8.9
3	9.9	9.5	9.7	9.4	7.3	8.3	7.8	7.0	7.3	9.6	8.0	8.7
4	10.0	9.3	9.7	8.8	6.8	7.6	8.0	6.9	7.4	9.2	8.0	8.4
5	9.7	9.3	9.5	9.0	7.0	7.8	8.5	7.0	7.6	9.8	8.3	9.0
6	9.6	9.1	9.3	9.1	7.5	8.0	8.4	6.9	7.6	9.9	8.2	9.1
7	9.6	8.8	9.2	8.7	7.6	8.1	8.3	6.5	7.3	9.1	7.5	8.3
8	9.3	8.4	8.8	8.5	7.0	7.7	7.9	6.3	6.9	8.5	6.9	7.7
9	9.1	7.9	8.5	8.5	7.0	7.6	8.0	6.4	7.0	7.7	7.0	7.4
10	8.8	7.4	8.2	8.1	6.9	7.4	6.9	6.2	6.5	8.4	7.7	8.0
11	8.3	7.3	7.7	8.8	6.9	7.8	8.0	6.6	7.1	8.5	7.7	8.1
12	8.3	7.3	7.6	9.0	7.6	8.1	8.1	6.8	7.3	8.5	7.6	8.0
13	8.3	6.8	7.5	9.1	7.6	8.2	8.3	6.9	7.5	8.7	7.6	8.2
14	8.5	6.8	7.5	9.1	7.2	8.1	8.8	7.3	8.0	9.1	8.3	8.8
15	8.4	4.2	7.4	9.0	7.2	8.0	9.0	7.5	8.2	9.7	8.7	9.2
16	7.8	6.8	7.3	8.6	7.0	7.7	8.1	7.4	7.7	9.6	8.8	9.2
17	8.0	6.7	7.2	8.6	7.0	7.6	8.5	7.5	7.9	10.0	8.6	9.2
18	8.3	6.8	7.3	8.1	6.5	7.3	8.4	7.4	7.8	9.2	8.1	8.7
19	7.9	6.6	7.2	8.6	6.8	7.5	8.2	7.5	7.8	8.5	7.8	8.3
20	7.6	7.1	7.4	8.6	6.8	7.4	8.4	7.8	8.0	8.8	8.4	8.6
21	8.1	7.1	7.6	8.0	6.9	7.4	8.5	7.6	8.0	8.9	8.3	8.6
22	8.3	7.4	8.0	8.4	6.9	7.5	8.2	7.7	8.0	9.1	8.4	8.7
23	8.1	7.5	7.8	8.0	6.9	7.4	8.4	7.8	8.1	9.0	8.1	8.6
24	8.4	7.3	7.9	8.0	6.9	7.3	8.7	7.6	8.0	9.2	8.1	8.7
25	8.2	7.2	7.6	7.9	7.1	7.5	8.9	7.5	8.0	10.1	9.1	9.7
26	8.2	7.0	7.6	8.2	7.7	7.9	7.9	7.4	7.6	10.2	9.8	10.0
27	8.3	6.9	7.5	8.6	7.8	8.2	8.4	7.6	7.9	10.0	9.4	9.8
28	8.3	6.8	7.4	8.6	7.3	8.0	8.3	7.4	7.8	9.8	9.1	9.5
29	8.5	6.7	7.4	7.9	7.2	7.7	8.9	7.8	8.3	9.9	9.2	9.5
30	8.3	6.6	7.2	8.3	7.3	7.9	8.9	7.3	8.2	10.3	9.3	9.7
31	—	—	—	8.2	7.2	7.6	8.6	7.4	7.8	—	—	—
MONTH	10.0	4.2	8.1	9.4	6.5	7.7	9.0	6.2	7.7	10.3	6.9	8.8

STREAMS TRIBUTARY TO LAKE ERIE

04175600 RIVER RAISIN NEAR MANCHESTER, MI

LOCATION.--Lat 42°10'05", long 84°04'34", in NE1/4 SE1/4 sec.33, T.3 S., R.3 E., Washtenaw County, Hydrologic Unit 04100002, on left bank at downstream side of bridge on Sharon Valley Road, 2.5 mi northwest of Manchester.

DRAINAGE AREA.--132 mi^2.

PERIOD OF RECORD.--January 1970 to September 1981, January 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above sea level, from topographic map. Prior to July 30, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Occasional regulation caused by many dams upstream from station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	48	85	e87	107	255	115	122	169	77	20	28
2	40	47	78	e84	104	237	130	115	206	69	19	26
3	40	46	74	e84	100	228	124	107	229	63	19	24
4	76	44	70	e81	102	222	117	100	213	61	24	22
5	109	41	67	e80	90	214	112	91	198	56	26	20
6	117	39	70	e80	89	201	119	83	187	49	23	18
7	109	41	63	e76	e85	192	131	80	180	44	22	17
8	96	47	63	e75	e85	185	144	100	170	44	19	17
9	85	48	71	e69	e210	175	144	88	156	41	18	21
10	76	67	67	e73	e396	165	157	79	148	38	21	42
11	69	68	79	e75	e373	169	159	75	146	34	21	36
12	63	60	e48	e76	e363	166	160	70	140	30	20	30
13	60	65	e85	e81	321	181	149	64	132	26	19	27
14	58	78	e97	e83	293	183	131	60	123	24	17	26
15	56	77	e90	e85	295	176	137	111	119	21	15	24
16	54	70	e92	88	286	170	193	251	137	20	16	22
17	54	70	e95	84	270	173	186	289	129	20	22	21
18	54	66	e98	84	267	173	171	263	122	21	22	20
19	52	61	e100	87	280	177	156	239	117	21	23	32
20	54	62	e102	89	230	172	156	205	108	20	26	52
21	51	61	e99	e88	217	166	e175	184	107	19	23	46
22	44	56	e95	84	237	159	e185	179	148	19	23	55
23	45	56	e93	79	182	152	e186	159	148	19	30	55
24	61	52	e93	73	172	146	e190	156	138	19	29	62
25	70	50	e96	77	290	137	193	164	121	20	27	55
26	67	70	e99	80	353	126	179	167	109	24	33	53
27	65	81	e98	79	322	120	164	198	101	22	40	49
28	61	79	e97	79	286	115	149	243	94	19	46	42
29	55	75	e94	77	---	115	139	224	88	21	39	39
30	52	82	e90	83	---	113	130	200	83	25	33	35
31	50	---	e87	104	---	112	---	176	---	23	31	---
TOTAL	1985	1807	2635	2524	6405	5275	4581	4642	4266	1009	766	1016
MEAN	64.0	60.2	85.0	81.4	229	170	153	150	142	32.5	24.7	33.9
MAX	117	82	102	104	396	255	193	289	229	77	46	62
MIN	40	39	48	69	85	112	112	60	83	19	15	17
CFSM	.49	.46	.64	.62	1.73	1.29	1.16	1.13	1.08	.25	.19	.26
IN.	.56	.51	.74	.71	1.81	1.49	1.29	1.31	1.20	.28	.22	.29

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2001, BY WATER YEAR (WY)

MEAN	63.3	90.0	107	111	129	197	186	125	94.3	54.7	47.9	53.4
MAX	169	212	160	280	241	356	275	191	249	114	116	142
(WY)	1987	1993	1991	1993	1976	1976	1978	1974	1989	1981	1981	1981
MIN	24.8	25.1	30.7	27.6	45.0	84.3	116	52.7	13.9	10.4	12.4	12.6
(WY)	1980	1972	1977	1977	1972	2000	1987	1971	1988	1988	1971	1999

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1970 - 2001	
ANNUAL TOTAL	32043		36911			
ANNUAL MEAN	87.5		101		105	
HIGHEST ANNUAL MEAN					155	1993
LOWEST ANNUAL MEAN					61.8	1977
HIGHEST DAILY MEAN	382	Apr 22	396	Feb 10	690	Feb 24 1985
LOWEST DAILY MEAN	21	Jul 27	15	Aug 15	5.7	(a)
ANNUAL SEVEN-DAY MINIMUM	29	Sep 4	18	Aug 10	6.1	Jul 3 1988
MAXIMUM PEAK FLOW			434	Feb 10	869	Feb 24 1985
MAXIMUM PEAK STAGE			5.57	Feb 10	7.21	Feb 24 1985
INSTANTANEOUS LOW FLOW			15	(b)	(c)4.0	(d)
ANNUAL RUNOFF (CFSM)	.66		.77		.80	
ANNUAL RUNOFF (INCHES)	9.03		10.40		10.82	
10 PERCENT EXCEEDS	149		198		210	
50 PERCENT EXCEEDS	72		83		85	
90 PERCENT EXCEEDS	43		22		26	

(a) July 9, 15, 1988.
(b) Aug. 15, 16.
(c) Observed; but may have been less during periods of no gage-height record July 3-11, 14-16, 1988.
(d) Oct. 20, 23, 1999.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

04176000 RIVER RAISIN NEAR ADRIAN, MI

LOCATION.--Lat 41°54'15", long 83°58'50", in NW1/4 sec.5, T.7 S., R.4 E., Lenawee County, Hydrologic Unit 04100002, on right bank at downstream side of bridge on Academy Road, 1.7 mi east of Adrian, and 2.6 mi downstream from South Branch.

DRAINAGE AREA.--463 mi^2.

PERIOD OF RECORD.--October 1953 to September 1978, October 1978 to September 1984 (operated as a crest-stage partial-record station), October 1984 to current year. Records for October 1930 to August 1931 and October 1932 to April 1938, published as "Raisin River" in WSP 714, 744, 759, 784, 804, 824, and 854, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 693.2 ft above sea level.

REMARKS.--Records fair. Diurnal fluctuation caused by powerplant at Tecumseh, 11 mi upstream from station, prior to June 27, 1968. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	117	150	262	e307	e720	999	362	415	631	223	122	117
2	112	149	269	e298	e640	838	388	354	656	211	114	111
3	108	146	258	e299	e550	752	396	354	786	205	157	107
4	143	143	235	e291	e500	696	398	348	869	198	111	104
5	186	141	228	e292	e411	659	385	314	764	189	102	100
6	285	140	233	292	375	624	433	325	721	179	99	97
7	276	148	212	297	358	590	551	312	738	149	99	95
8	272	148	208	289	344	543	631	342	688	166	98	100
9	244	149	185	e267	684	542	586	335	577	162	96	175
10	218	160	208	283	e3350	522	635	324	521	147	98	209
11	197	159	201	283	e5100	511	671	304	468	135	93	149
12	181	171	e160	278	2820	507	624	294	441	135	94	142
13	171	179	e230	266	e1850	515	572	276	415	132	95	134
14	162	183	e270	251	e1450	574	503	263	390	127	93	132
15	157	184	e270	253	e1200	605	540	410	367	122	91	121
16	154	189	e270	278	e1050	582	874	943	352	118	94	118
17	151	187	e330	316	e970	564	1060	1930	332	116	100	114
18	165	178	e377	336	e870	553	886	2100	329	111	101	112
19	231	172	e350	339	e790	557	688	1590	311	114	171	182
20	163	167	e357	e300	e730	e560	615	1080	298	112	137	203
21	146	162	e345	e290	703	e540	668	912	313	111	123	186
22	146	158	e333	e280	640	e515	889	861	418	111	144	209
23	149	154	e324	315	590	495	978	724	429	110	165	186
24	157	148	e325	266	577	475	853	616	407	107	140	193
25	160	146	e335	240	1000	455	730	661	363	110	134	264
26	166	176	e344	237	1730	433	641	654	321	117	130	206
27	178	205	e345	235	1750	413	568	775	294	111	128	179
28	178	238	e344	237	1320	399	505	947	271	108	126	165
29	169	251	e334	233	---	391	459	885	253	106	130	161
30	164	263	e321	259	---	389	443	768	236	147	129	147
31	158	---	e309	e500	---	379	---	684	---	141	125	---
TOTAL	5464	5144	8772	8907	33072	17177	18532	21100	13959	4330	3639	4518
MEAN	176	171	283	287	1181	554	618	681	465	140	117	151
MAX	285	263	377	500	5100	999	1060	2100	869	223	171	264
MIN	108	140	160	233	344	379	362	263	236	106	91	95
CFSM	.38	.37	.61	.62	2.55	1.20	1.33	1.47	1.00	.30	.25	.33
IN.	.44	.41	.70	.72	2.66	1.38	1.49	1.70	1.12	.35	.29	.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2001, BY WATER YEAR (WY)

MEAN	181	277	357	390	497	709	619	400	296	177	142	136
MAX	576	941	871	1271	1181	1517	1115	939	1025	609	520	420
(WY)	1991	1993	1988	1993	2001	1986	1978	1956	1989	1968	1995	1992
MIN	52.1	57.9	66.6	65.6	74.1	179	239	144	69.7	46.1	47.5	46.0
(WY)	1964	1965	1964	1963	1964	1964	1963	1964	1988	1988	1963	1955

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1954 - 2001	
ANNUAL TOTAL	118664		144614			
ANNUAL MEAN	324		396		348	
HIGHEST ANNUAL MEAN					605	1993
LOWEST ANNUAL MEAN					99.8	1964
HIGHEST DAILY MEAN	3020	May 20	5100	Feb 11	5350	Feb 25 1985
LOWEST DAILY MEAN	108	Oct 3	91	Aug 15	25	Oct 26 1964
ANNUAL SEVEN-DAY MINIMUM	119	Jan 26	94	Aug 10	27	Oct 25 1964
MAXIMUM PEAK FLOW			5930	Feb 11	6660	Mar 15 1982
MAXIMUM PEAK STAGE			(a)14.92	Feb 11	15.77	Mar 15 1982
INSTANTANEOUS LOW FLOW					18	Aug 10 1964
ANNUAL RUNOFF (CFSM)	.70		.86		.75	
ANNUAL RUNOFF (INCHES)	9.53		11.62		10.20	
10 PERCENT EXCEEDS	570		757		738	
50 PERCENT EXCEEDS	207		276		224	
90 PERCENT EXCEEDS	135		114		79	

(a) From floodmark.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

04176500 RIVER RAISIN NEAR MONROE, MI

LOCATION.--Lat 41°57'38", long 83°31'52", Monroe County, Hydrologic Unit 04100002, on left bank 0.8 mi downstream from bridge on Ida Maybee Road, 5.0 mi downstream from Saline River, and 7.5 mi west of Monroe.

DRAINAGE AREA.--1,042 mi^2.

PERIOD OF RECORD.--September 1937 to current year. Published as "Raisin River at Monroe" 1937-52 and as "River Raisin at Monroe" 1952-53.

REVISED RECORDS.--WSP 954: 1938-40(M), 1941. WSP 1437: 1939, 1948. WSP 2112: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 616.26 ft above sea level. Prior to Oct. 1, 1953, at site 9 mi downstream at datum 46.26 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. Diurnal fluctuation caused by powerplants upstream from station prior to June 27, 1968. At times, flow is affected by irrigation pumpage. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	216	257	555	e456	1490	2990	549	696	1210	388	168	135
2	203	251	527	e430	1750	2570	527	662	1080	333	178	133
3	189	244	474	e406	2060	1990	512	609	1270	309	152	127
4	237	236	442	e381	1820	1550	519	545	1350	287	148	118
5	448	231	441	e395	1470	1310	510	511	1490	265	176	119
6	828	227	423	e410	1220	1150	537	481	1320	249	152	115
7	1110	237	353	e424	1050	1060	747	445	1160	238	125	112
8	1140	237	370	e428	927	969	931	449	1090	228	109	109
9	943	248	389	e423	2680	896	992	458	1060	203	106	116
10	697	296	330	e430	6620	828	1090	467	936	193	103	126
11	527	314	310	e433	7510	801	1140	463	803	185	92	174
12	433	288	315	e433	7970	776	1150	440	702	173	91	235
13	378	290	e354	e435	7850	841	1110	405	632	154	100	204
14	340	304	371	e424	6270	977	988	380	581	143	101	172
15	308	315	402	e426	5100	1000	992	408	544	139	100	152
16	289	317	415	e448	3970	1020	1960	1990	521	137	97	141
17	274	315	e544	e497	3270	996	1700	3150	524	134	94	134
18	268	312	e599	e555	2700	981	1710	3060	485	135	98	125
19	260	303	e629	e599	2190	1010	1630	3540	452	126	177	156
20	257	298	e651	e602	1740	1060	1430	3370	434	121	143	197
21	299	281	e638	e592	1430	1060	1320	2980	461	121	182	271
22	281	271	e606	e581	1250	994	1740	2450	965	124	191	344
23	241	258	e585	e582	1140	907	1760	1840	1320	121	180	322
24	233	257	e563	e529	1000	828	1780	1460	1340	115	188	324
25	241	253	e555	e492	2240	763	1630	1160	1240	115	234	274
26	264	270	e558	e486	2960	697	1400	1050	1010	113	217	263
27	267	323	e559	e475	3150	651	1160	1530	729	119	182	290
28	263	340	e556	e484	3190	609	980	2070	564	118	161	258
29	263	352	e540	e490	---	575	848	2030	515	123	151	228
30	269	399	e514	493	---	559	746	1950	480	136	140	203
31	266	---	e484	949	---	551	---	1530	---	141	136	---
TOTAL	12232	8524	15052	15188	86017	32969	34088	42579	26268	5486	4472	5677
MEAN	395	284	486	490	3072	1064	1136	1374	876	177	144	189
MAX	1140	399	651	949	7970	2990	1960	3540	1490	388	234	344
MIN	189	227	310	381	927	551	510	380	434	113	91	109
CFSM	.38	.27	.47	.47	2.95	1.02	1.09	1.32	.84	.17	.14	.18
IN.	.44	.30	.54	.54	3.07	1.18	1.22	1.52	.94	.20	.16	.20

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2001, BY WATER YEAR (WY)

MEAN	296	484	724	816	1119	1663	1464	944	654	349	233	243
MAX	1678	2267	2618	3058	3296	4440	4055	4678	2770	1453	1161	2666
(WY)	1982	1993	1968	1952	1976	1982	1947	1943	1989	1951	1980	1981
MIN	57.2	74.6	87.5	106	107	343	313	248	99.2	60.3	40.3	45.2
(WY)	1964	1965	1964	1964	1963	1964	1946	1941	1988	1988	1941	1963

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1937 - 2001	
ANNUAL TOTAL	244947		288552			
ANNUAL MEAN	669		791		747	
HIGHEST ANNUAL MEAN					1374	1943
LOWEST ANNUAL MEAN					178	1964
HIGHEST DAILY MEAN	5440	May 22	7970	Feb 12	14600	Mar 16 1982
LOWEST DAILY MEAN	138	Sep 9	91	Aug 12	9.0	Sep 30 1941
ANNUAL SEVEN-DAY MINIMUM	152	Sep 4	96	Aug 11	18	Sep 26 1941
MAXIMUM PEAK FLOW			8260	Feb 13	(a)15300	Mar 16 1982
MAXIMUM PEAK STAGE			8.97	Feb 13	(b)11.16	Mar 15 1982
INSTANTANEOUS LOW FLOW			86	Aug 18	(c)2.0	(d)
ANNUAL RUNOFF (CFSM)	.64		.76		.72	
ANNUAL RUNOFF (INCHES)	8.74		10.30		9.74	
10 PERCENT EXCEEDS	1330		1740		1840	
50 PERCENT EXCEEDS	334		452		362	
90 PERCENT EXCEEDS	186		135		108	

(a) Gage height 10.4 ft.
(b) Backwater from ice.
(c) Approximately, site then in use.
(d) Sept. 4, 1938, Sept. 19, 20, 1941.
(e) Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

04176605 OTTER CREEK AT LA SALLE, MI

LOCATION.--Lat 41°52'01", long 83°27'13", in NW1/4 NW1/4 sec.23 (private claim 47), T.7 S., R.8 E., Monroe County, Hydrologic Unit 04100001, on right bank 150 ft upstream from bridge on State Highway 125 in La Salle, 2.3 mi downstream from South Branch, and 4.6 mi southwest of Monroe.

DRAINAGE AREA.--51.0 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 571.07 ft above sea level.

REMARKS.--Records good except for estimated daily discharges, which are fair. Several measurements of water temperature were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	5.4	35	13	272	67	23	23	59	10	1.7	1.1
2	3.3	5.2	27	12	163	57	24	21	106	7.7	1.3	1.0
3	3.3	5.2	19	11	97	52	22	20	114	6.8	2.9	.90
4	20	5.0	16	11	64	47	20	18	72	6.5	3.5	.86
5	54	5.0	14	11	53	43	19	16	52	5.8	2.0	.79
6	100	4.8	11	12	55	37	30	14	52	4.6	1.3	.72
7	53	5.4	e10	13	48	35	115	14	73	3.9	.92	.73
8	32	6.1	9.4	13	58	33	101	15	55	3.7	.91	.86
9	22	7.5	8.4	12	675	30	74	14	40	3.5	.84	2.5
10	17	17	8.1	e11	916	28	100	13	32	2.9	.79	8.7
11	14	19	8.9	11	308	29	97	13	28	2.5	.69	6.3
12	11	15	19	11	161	29	80	16	24	2.1	.79	3.8
13	9.5	13	e20	11	118	51	63	15	21	1.9	.72	2.6
14	8.6	18	e21	12	146	67	47	15	18	1.7	.59	2.1
15	7.9	17	22	16	252	55	47	30	15	1.5	.55	1.9
16	7.8	15	72	33	157	47	109	356	14	1.3	.56	1.8
17	7.7	13	e130	e40	101	45	82	280	12	1.2	.59	1.4
18	7.8	12	e100	e45	66	54	57	134	11	1.3	.82	1.3
19	7.6	9.9	e70	e41	54	84	46	85	9.9	1.3	3.4	5.1
20	7.2	9.1	e60	e33	47	69	44	58	10	1.2	4.8	18
21	6.7	6.3	e50	e28	40	57	118	58	18	1.2	3.5	13
22	6.3	5.1	e42	e22	35	47	162	151	99	1.3	3.1	25
23	6.1	5.4	e34	e19	33	40	102	88	91	1.2	4.2	15
24	6.4	5.0	32	e15	29	35	72	56	184	2.2	4.4	45
25	7.3	5.7	26	e13	277	30	53	51	73	2.0	3.4	27
26	7.5	10	23	e12	199	26	45	53	38	2.2	2.8	16
27	7.5	13	20	e12	123	24	35	113	24	1.8	2.3	13
28	7.0	13	18	e11	88	23	29	126	20	1.2	1.9	11
29	6.3	13	16	11	---	23	26	98	16	1.1	1.7	8.3
30	6.0	20	15	48	---	22	24	66	13	2.0	1.3	6.9
31	5.6	---	14	264	---	22	---	45	---	2.5	1.1	---
TOTAL	470.1	304.1	970.8	827	4635	1308	1866	2075	1393.9	90.1	59.37	242.66
MEAN	15.2	10.1	31.3	26.7	166	42.2	62.2	66.9	46.5	2.91	1.92	8.09
MAX	100	20	130	264	916	84	162	356	184	10	4.8	45
MIN	3.3	4.8	8.1	11	29	22	19	13	9.9	1.1	.55	.72
CFSM	.30	.20	.61	.52	3.25	.83	1.22	1.31	.91	.06	.04	.16
IN.	.34	.22	.71	.60	3.38	.95	1.36	1.51	1.02	.07	.04	.18

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2001, BY WATER YEAR (WY)

MEAN	13.0	30.2	44.7	60.9	79.7	87.7	93.4	60.2	55.4	10.3	7.33	7.38
MAX	53.3	144	168	181	217	199	152	149	234	55.1	26.1	46.2
(WY)	1993	1993	1991	1993	1998	1993	1993	2000	1997	1989	1998	1992
MIN	.33	1.93	1.37	1.83	10.6	12.9	35.4	9.47	.58	.17	.15	.14
(WY)	1995	2000	2000	2000	2000	2000	1997	1988	1988	1988	1988	1991

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR		FOR 2001 WATER YEAR		WATER YEARS 1988 - 2001	
ANNUAL TOTAL	11436.08		14242.03			
ANNUAL MEAN	31.2		39.0		45.6	
HIGHEST ANNUAL MEAN					74.9	1993
LOWEST ANNUAL MEAN					26.8	2000
HIGHEST DAILY MEAN	1560	May 19	916	Feb 10	2330	Jun 3 1997
LOWEST DAILY MEAN	.70	Jan 1	.55	Aug 15	.00	(a)
ANNUAL SEVEN-DAY MINIMUM	.89	Jan 27	.64	Aug 11	.00	Jun 21 1988
MAXIMUM PEAK FLOW			1260	Feb 10	(b)3010	Jun 2 1997
MAXIMUM PEAK STAGE			9.66	Feb 10	11.60	Jun 2 1997
ANNUAL RUNOFF (CFSM)	.61		.77		.89	
ANNUAL RUNOFF (INCHES)	8.34		10.39		12.14	
10 PERCENT EXCEEDS	58		97		104	
50 PERCENT EXCEEDS	9.1		16		16	
90 PERCENT EXCEEDS	1.2		1.5		.87	

(a) On several days in water years 1988, 1991, 1992, 1994, 1996.
(b) From rating curve extended above 1,000 ft^3/s.
(e) Estimated.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in time of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at crest-stage partial-record stations are presented in the following table. Discharge measurements made at miscellaneous sites and for special studies are given in separate tables.

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Maximum discharge at crest-stage partial-record stations

Station name and number	Location and drainage area	Period of record	Water year 2001 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
STREAMS TRIBUTARY TO LAKE SUPERIOR								
Two Hearted River near Paradise, MI (04044813)	Lat 46°41'15", long 85°26'26", in SE1/4 NW1/4 sec.33, T.50 N., R.9 W., Luce County, Hydrologic Unit 04020201, on right bank 300 ft downstream from end of two-track road, 3.2 mi upstream from mouth, and 20 mi northwest of Paradise. Drainage area is 200 mi^2.	1973-01	04-12-01	10.19	1,130	04-25-85	a8.42	3,210
West Branch Waiska River near Brimley, MI (04045538) (locally known as Waishkey River)	Lat 46°21'18", long 84°35'35", in SW1/4 NW1/4 sec.29, T.46 N., R.2 W., Chippewa County, Hydrologic Unit 04020203, at Tilson Road, 3.2 mi upstream from mouth, and 3.5 mi south of Brimley. Drainage area is 40.7 mi^2.	1973-01	04-12-01	8.22	642	04-18-74	b9.19	1,200
STREAMS TRIBUTARY TO LAKE MICHIGAN								
Tenmile Creek at Perronville, MI (04059400)	Lat 45°48'38", long 87°22'00", in NW1/4 NW1/4 sec.2, T.39 N., R.25 W., Menominee County, Hydrologic Unit 04030109, at county road, 1.0 mi northwest of Perronville, and 11.5 mi upstream from Ford River. Drainage area is 38.4 mi^2.	1971-77‡, 1978-01	04-07-01	4.80	423	04-24-75	c5.42	810

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Maximum discharge at crest-stage partial-record stations--Continued

Station name and number	Location and drainage area	Period of record	Water year 2001 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued								
Portage River near Vicksburg, MI (04097170)	Lat 42°06'53", long 85°29'08", in SW1/4 sec.16, T.4 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050001, at W Avenue, 2.4 mi east of Vicksburg. Datum of gage is 839.94 ft above sea level. Drainage area is 68.2 mi^2.	1946-51‡, 1965-80‡, 1980-01	02-11-01	4.84	214	06-02-89	d5.81	416
Rabbit River at Hamilton, MI (04108645)	Lat 42°40'31", long 86°00'13", in NE1/4 sec.6, T.3 N., R.14 W., Allegan County, Hydrologic Unit 04050003, at State Highway 40 in Hamilton. Drainage area is 274 mi^2.	1979-01	02-09-01	16.08	2,820	06-21-97	e21.60	12,000
Sycamore Creek near Mason, MI (04112700)	Lat 42°36'40", long 84°27'58", in NE1/4 NE1/4 sec.31, T.3 N., R.1 W., Ingham County, Hydrologic Unit 04050004, at Harper Road, 0.7 mi downstream from Aurelius and Vevay Drain, and 2.6 mi northwest of Mason. Drainage area is 39.5 mi^2.	1975-01	02-10-01	11.46	765	04-19-75	12.53	1,080
Flat River at Smyrna, MI (04116500)	Lat 43°03'10", long 85°15'53", in NW1/4 sec.28, T.8 N., R.8 W., Ionia County, Hydrologic Unit 04050006, on right bank at downstream side of bridge on Ingalls Road, 0.5 mi south of Smyrna. Datum of gage is 729.53 ft above sea level. Drainage area is 528 mi^2.	1951-86‡, 1993-01	02-12-01	f5.33	1,270	09-13-86	9.05	4,700
Thornapple River near Caledonia, MI (04118000)	Lat 42°48'40", long 85°29'00", in NW1/4 sec.22, T.5 N., R.10 W., Kent County, Hydrologic Unit 04050007, on right bank 200 ft downstream from LaBarge powerplant, 200 ft upstream from 84th Street, 2.3 mi northeast of Caledonia, and 3.3 mi downstream from Coldwater River. Datum of gage is 676.31 ft above sea level. Drainage area is 773 mi^2.	1931-38‡, 1952-82‡, 1984-94‡, 1995-01	02-15-01 05-15-01	9.37 9.37	4,610 4,610	02-27-85	11.43	6,700

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Maximum discharge at crest-stage partial-record stations--Continued

Station name and number	Location and drainage area	Period of record	Water year 2001 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued								
Grand River at Ada, MI (04118105)	Lat 42°57'19", long 85°28'35", in NE1/4 sec.34, T.7 N., R.10 W., Kent County, Hydrologic Unit 04050006, on left bank at downstream side of bridge on State Highway 21 in Ada, 0.15 mi downstream from Thornapple River, and at mile 62. Datum of gage is 603.95 ft above sea level. Drainage area is 4,473 mi^2.	1999-01	02-13-01	18.26	18,700	05-21-00	18.84	20,300
Plaster Creek at Grand Rapids, MI (04119055)	Lat 42°54'46", long 85°39'02", in SE1/4 sec.7, T.6 N., R.11 W., Kent County, Hydrologic Unit 04050006, at 28th Street in Grand Rapids. Drainage area is 46.6 mi^2.	1974-01	05-17-01	13.22	2,210	02-22-97	13.43	2,300
Buck Creek at Grandville, MI (04119160)	Lat 42°54'09", long 85°45'46", in SE1/4 sec.18, T.6 N., R.12 W., Kent County, Hydrologic Unit 04050006, at Wilson Avenue in Grandville. Drainage area is 50.5 mi^2.	1974-01	05-17-01	9.56	1,200	05-12-81	10.30	1,580
North Branch Pentwater River near Pentwater, MI (04122230)	Lat 43°47'42", long 86°21'30", in NE1/4 SE1/4 sec.8, T.16 N., R.17 W., Oceana County, Hydrologic Unit 04060101, at Oceana Drive, 3.5 mi northeast of Pentwater. Drainage area is 42.3 mi^2.	1975-01	04-13-01	3.44	290	09-11-86	6.33	2,860
Betsie River near Benzonia, MI (04126600)	Lat 44°36'02", long 86°05'57", in NW1/4 NW1/4 sec.2, T.25 N., R.15 W., Benzie County, Hydrologic Unit 04060104, at U.S. Highway 31, 1.2 mi south of Benzonia. Datum of gage is 602.15 ft above sea level. Drainage area is approximately 170 mi^2.	1975-01	04-12-01	4.05	644	03-28-89	5.46	993
STREAMS TRIBUTARY TO LAKE HURON								
Rifle River at Selkirk, MI (04140500)	Lat 44°18'48", long 84°04'10", in SE1/4 NE1/4 sec.9, T.22 N., R.3 E., Ogemaw County, Hydrologic Unit 04080101, at State Road in Selkirk. Datum of gage is 828.47 ft above sea level. Drainage area is 117 mi^2.	1950-82‡, 1983-01	06-03-01	g	h480	05-20-59	6.76	2,760

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Maximum discharge at crest-stage partial-record stations--Continued

Station name and number	Location and drainage area	Period of record	Water year 2001 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
STREAMS TRIBUTARY TO LAKE HURON--Continued								
North Branch Flint River near Columbiaville, MI (04146450)	Lat 43°11'18", long 83°22'03", in NW1/4 sec. 24, T.9 N., R.9 E., Lapeer County, Hydrologic Unit 04080204, at Barnes Lake Road, 2.9 mi northeast of Columbiaville. Drainage area is 223 mi^2.	1987-01	02-11-01	i16.98	j	06-21-96	20.25	4,800
Swartz Creek at Flint, MI (04148300)	Lat 42°59'16", long 83°43'57", in NW1/4 sec. 26, T.7 N., R.6 E., Genesee County, Hydrologic Unit 04080204, at South Ballenger Highway in Flint, 3.6 mi upstream from mouth. Datum of gage is 727.05 ft above sea level. Drainage area is 115 mi^2.	1970-84‡, 1991-01	02-09-01	9.21	3,380	02-09-01	9.21	3,380
Thread Creek near Flint, MI (04148440)	Lat 42°58'30", long 83°38'09", in SE1/4 SE1/4 sec. 28, T.7 N., R.7 E., Genesee County, Hydrologic Unit 04080204, at Bristol Road, 4.0 mi southeast of Flint, and 6.0 mi upstream from mouth. Datum of gage is 764.36 ft above sea level. Drainage area is 54.4 mi^2.	1970-84‡, 1991-01	02-11-01	6.93	748	04-19-75	e7.65	1,260
STREAMS TRIBUTARY TO ST. CLAIR RIVER								
Pine River near Rattle Run, MI (04160350)	Lat 42°52'49", long 82°34'04", in NE1/4 sec.9, T.5 N., R.16 E., St. Clair County, Hydrologic Unit 04090001, at Gratiot Road, 1.9 mi northeast of Rattle Run. Drainage area is 135 mi^2.	1974-01	02-10-01	i22.68	h2,500	06-22-96	24.24	5,730
STREAMS TRIBUTARY TO LAKE ST. CLAIR								
West Branch Stony Creek near Washington, MI (04161760)	Lat 42°43'53", long 83°06'02", in SE1/4 sec.25, T.4 N., R.11 E., Oakland County, Hydrologic Unit 04090003, at Huron-Clinton Metropolitan Park Road, 3.4 mi west of Washington. Drainage area is 22.5 mi^2.	1965-01	02-10-01	i4.11	h225	04-19-75	k4.42	470

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Maximum discharge at crest-stage partial-record stations--Continued

Station name and number	Location and drainage area	Period of record	Water year 2001 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
STREAMS TRIBUTARY TO LAKE ST. CLAIR--Continued								
North Branch Clinton River at Almont, MI (04164010)	Lat 42°54'59", long 83°02'42", in NE1/4 sec.28, T.6 N., R.12 E., Lapeer County, Hydrologic Unit 04090003, at State Highway 53 in Almont. Drainage area is 9.56 mi^2.	1959-62, 1963-68‡, 1969-01	02-10-01	6.81	604	09-06-85	m8.60	818
North Branch Clinton River near Romeo, MI (04164050)	Lat 42°49'11", long 82°58'35", in NW1/4 sec.31, T.5 N., R.13 E., Macomb County, Hydrologic Unit 04090003, at 33 Mile Road, 2.2 mi northeast of Romeo. Drainage area is 49.7 mi^2.	1959-64, 1965-69‡, 1970-01	02-10-01	4.74	1,280	04-19-75	n5.44	3,500
North Branch Clinton River near Meade, MI (04164150)	Lat 42°43'50", long 82°54'23", in NE1/4 sec.34, T.4 N., R.13 E., Macomb County, Hydrologic Unit 04090003, at 27 Mile Road, 1.9 mi northwest of Meade. Drainage area is 89.6 mi^2.	1959-67, 1968-72‡, 1973-01	02-10-01	8.28	2,610	04-19-75	o7.76	4,500
Coon Creek near Armada, MI (04164200)	Lat 42°47'41", long 82°52'58", in SW1/4 sec.1, T.4 N., R.13 E., Macomb County, Hydrologic Unit 04090003, at North Road, 3.4 mi south of Armada. Drainage area is 10.0 mi^2.	1959-65, 1966-70‡, 1971-01	02-09-01	5.29	286	04-19-75	p6.25	480
Highbank Creek near Armada, MI (04164350)	Lat 42°48'24", long 82°51'08", in NW1/4 sec.6, T.4 N., R.14 E., Macomb County, Hydrologic Unit 04090003, at 32 Mile Road, 3.0 mi southeast of Armada. Drainage area is 14.9 mi^2.	1959-65, 1965-70‡, 1971-01	02-09-01	16.87	1,960	09-06-85	q16.77	2,240
East Branch Coon Creek near New Haven, MI (04164360)	Lat 42°45'46", long 82°50'57", in SW1/4 sec.18, T.4 N., R.14 E., Macomb County, Hydrologic Unit 04090003, at 29 Mile Road, 3.4 mi northwest of New Haven. Drainage area is 36.1 mi^2.	1959-67, 1968-72‡, 1973-01	02-09-01	9.87	2,250	04-19-75	r8.95	2,700
Deer Creek near Meade, MI (04164400)	Lat 42°42'39", long 82°51'32", in NW1/4 sec.6, T.3 N., R.14 E., Macomb County, Hydrologic Unit 04090003, at 25 1/2 Mile Road, 0.9 mi southeast of Meade. Drainage area is 12.7 mi^2.	1959-60, 1960-65‡, 1966-01	02-09-01	9.09	721	02-09-01	9.09	721

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Maximum discharge at crest-stage partial-record stations--Continued

Station name and number	Location and drainage area	Period of record	Water year 2001 maximum			Period of record maximum		
			Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
STREAMS TRIBUTARY TO LAKE ST. CLAIR--Continued								
McBride Drain near Macomb, MI (04164450)	Lat 42°41'14", long 82°55'14", in NE1/4 NE1/4 sec.16, T.3 N., R.13 E., Macomb County, Hydrologic Unit 04090003, at 24 Mile Road, 2.2 mi southeast of Macomb. Drainage area is 5.79 mi^2.	1960-64‡, 1965-01	02-09-01	9.18	217	02-10-65	s8.82	220
Middle Branch Clinton River near Macomb, MI (04164600)	Lat 42°42'03", long 82°59'44", in SE1/4 sec.2, T.3 N., R.12 E., Macomb County, Hydrologic Unit 04090003, at Schoenherr Road, 2.0 mi west of Macomb. Drainage area is 22.2 mi^2.	1959-64, 1965-69‡, 1971-01	02-09-01	11.93	744	06-26-68	12.17	1,400
STREAMS TRIBUTARY TO DETROIT RIVER								
Frank and Poet Drain at Trenton, MI (04168660)	Lat 42°09'19", long 83°12'22", in NW1/4 sec.13, T.4 S., R.10 E., Wayne County, Hydrologic Unit 04090004, at King Road in Trenton. Drainage area is 19.3 mi^2.	1972-01	02-10-01	8.09	270	09-07-90	9.55	655
STREAMS TRIBUTARY TO LAKE ERIE								
Saline River near Saline, MI (04176400)	Lat 42°07'50", long 83°46'35", in SW1/4 sec.18, T.4 S., R.6 E., Washtenaw County, Hydrologic Unit 04100002, 50 ft upstream from Maple Road, 2.8 mi south of Saline. Drainage area is 94.6 mi^2.	1966-77‡, 1978-01	02-10-01	12.26	2,440	06-26-68	13.37	3,990

‡ Operated as a continuous-record gaging station.
a Maximum gage height, 12.36 ft, Apr. 9, 1991, present site and datum.
b Maximum gage height, 9.84 ft, Apr. 6, 1988.
c Maximum gage height, 8.94 ft, Mar. 30, 1977, backwater from ice.
d Maximum gage height, 5.86 ft, Dec. 31, 1988, backwater from ice.
e From floodmark.
f Maximum gage height, 7.84 ft, Dec. 22, backwater from ice.
g Maximum gage height, 3.49 ft, Feb. 10, backwater from ice.
h Estimated.
i Backwater from ice.
j Not determined.
k Maximum gage height, 5.93 ft, Jan. 27, 1974, backwater from ice.
m Maximum gage height, 8.62 ft, Apr. 19, 1975.
n Maximum gage height, 7.1 ft, Mar. 12 or 13, 1962, backwater from ice; site and datum then in use.
o Maximum gage height, 8.28 ft, Feb. 10, 2001.
p Maximum gage height, 6.95 ft, Sept. 6, 1985.
q Maximum gage height, 16.87 ft, Feb. 9, 2001.
r Maximum gage height, 9.87 ft, Feb. 9, 2001.
s Maximum gage height, 9.55 ft, June 26, 1968.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Special study and miscellaneous sites

Discharge measurements in the following table were made at special study and miscellaneous sites throughout the State.

Discharge measurements made at special study and miscellaneous sites during water year 2001

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE SUPERIOR				
04034100	Bond Falls Lower By-Pass	Middle Branch Ontonagon River	Lat 46°24'27", long 89°07'44", in SE1/4 SW1/4 sec.1, T.46 N., R.39 W., Ontonagon County, Hydrologic Unit 04020102, at Bond Falls Road, 2.2 mi west of Calderwood.	--	1942,1945, 1963-64, 1967,1969, 1971-72, 1974, 1979-81, 1983-84, 1987-00	06-05-01	a40.0
04040450	Tioga River	Sturgeon River	Lat 46°34'32", long 88°20'25", in NW1/4 NW1/4 sec.8, T.48 N., R.32 W., Baraga County, Hydrologic Unit 04020104, at State Highway 28, 10.0 mi east of Covington.	18.5	1957-58, 1976	08-28-01	*1.69
04044400	Carp River	Lake Superior	Lat 46°31'29", long 87°34'25", in SE1/4 sec.29, T.48 N., R.26 W., Marquette County, Hydrologic Unit 04020105, at U.S. Highway 41, 2.0 mi northeast of Negaunee.	51.4	1961-86‡, 1987-92†, 1993-00	05-23-01 07-11-01 08-23-01 09-18-01	79 *39.6 *27.0 *23.3
			STREAMS TRIBUTARY TO LAKE MICHIGAN				
04058120	Green Creek	Middle Branch Escanaba River	Lat 46°22'22", long 87°36'21", in NW1/4 sec.19, T.46 N., R.26 W., Marquette County, Hydrologic Unit 04030110, at County Highway 565, 4.5 mi south of Palmer.	8.42	1961-65, 1970-92†, 1993-00	05-22-01 07-02-01 08-21-01 09-18-01	a3.81 a9.99 a3.89 a3.57
04058500	East Branch Escanaba River	Escanaba River	Lat 46°16'56", long 87°26'07", in NE1/4 sec.21, T.45 N., R.25 W., Marquette County, Hydrologic Unit 04030110, at State Highway M-35 in Gwinn.	124	1955-80‡, 1981	05-03-01	154
04059034	Escanaba River	Lake Michigan	Lat 45°48'22", long 87°05'51", in SW1/4 NW1/4 sec.1, T.39 N., R.23 W., Delta County, Hydrologic Unit 04030110, 600 ft downstream from Bichler Creek, 2.5 mi upstream from mouth, and 2.0 mi northwest of Wells.	b920	1981-92†, 1993-00	06-05-01 07-09-01 08-14-01 09-20-01	a745 a358 a220 a341

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04061500	Paint River	Brule River	Lat 46°06'21", long 88°20'05", in SE1/4 sec.20, T.43 N., R.32 W., Iron County, Hydrologic Unit 04030106, downstream from City of Crystal Falls powerplant, 0.9 mi upstream from State Highway 69 in Crystal Falls.	597	1944-96‡, 1997-98c 1999-00	10-23-00 04-16-01 04-19-01 05-18-01 09-06-01	a286 a3,280 a1,780 a543 a156
04062400	Michigamme River	Menominee River	Lat 46°14'48", long 88°00'45", in NW1/4 NW1/4 sec.1, T.44 N., R.30 W., Dickinson County, Hydrologic Unit 04030107, on left bank 20 ft upstream from bridge on unnamed county road, 800 ft downstream from State Highway 95, 2.0 mi south of Witch Lake.	316	1964-80‡, 1997-98c 1999-00	10-23-00 04-18-01 05-18-01 07-24-01 08-28-01	a127 a1,900 a411 a527 a80.4
04096517	South Branch Hog Creek Tributary	South Branch Hog Creek	Lat 41°57'33", long 84°49'33", in SW1/4 SW1/4 sec.7, T.6 S., R.4 W., Hillsdale County, Hydrologic Unit 04050001, at Squires Road, 0.3 mi upstream from mouth, 3.0 mi west of Allen.	2.61	1969-00	10-30-00 04-19-01 05-23-01 06-27-01	2.82 2.40 1.67 *1.56
04096890	Pine Creek	Prairie River	Lat 42°08'02", long 85°13'50", in NE1/4 SW1/4 sec.10, T.4 S., R.8 W., Calhoun County, Hydrologic Unit 04050001, at 0 Drive South, 3.0 mi north of Athens.	--	2000	10-04-00 04-12-01 05-30-01	39.9 46.6 70.1
04096891	Unnamed Tributary	Pine Creek	Lat 42°07'32", long 85°16'21", in SW1/4 NW1/4 sec.17, T.4 S., R.8 W., Calhoun County, Hydrologic Unit 04050001, north of Q Drive South, west of One and One Half Mile Road, 2.0 mi northwest of Athens.	--	--	04-12-01	2.33
04096894	Unnamed Tributary	Pine Creek	Lat 42°06'25", long 85°15'45", in NW1/4 SE1/4 sec.20, T.4 S., R.8 W., Calhoun County, Hydrologic Unit 04050001, at lane west from X Avenue, 2.0 mi northwest of Athens.	--	--	10-04-00 04-12-01 05-30-01	5.61 2.01 2.60
04096950	Bear Creek	Nottawa Creek	Lat 42°04'32", long 85°19'58", in SW1/4 sec.35, T.4 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050001, at 44th Street, 3.0 mi south of Fulton.	10.8	1964-67, 1986-87	08-07-01	*4.04

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04097040	Little Portage Creek	St. Joseph River	Lat 42°09'55", long 85°20'18", in NE1/4 sec.34, T.3 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050001, at TS Avenue, 5.0 mi south of Climax.	10.1	1964-67, 1986-87	08-07-01	*1.81
04097060	Little Portage Creek	St. Joseph River	Lat 42°05'19", long 85°23'29", in SW1/4 sec.29, T.4 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050001, at 38th Street, 2.8 mi southwest of Fulton.	27.0	1964, 1965-67‡ 1972-79c 1987	08-07-01	*7.75
04097120	Portage River	St. Joseph River	Lat 42°10'21", long 85°28'19", in SE1/4 sec.28, T.3 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050001, at S Avenue, 2.7 mi southwest of Scotts.	32.8	1964-67, 1986-87	08-08-01	*15.8
04097205	Gourdneck Creek	Portage Creek	Lat 42°08'58", long 85°32'24", in SW1/4 sec.1, T.4 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050001, at 23rd Street, 2.0 mi north of Vicksburg.	13.1	1964-69, 1986-87	08-08-01	*8.36
04097207	Austin Lake Outlet	Gourdneck Creek	Lat 42°09'03", long 85°31'59", in SE1/4 sec.1, T.4 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050001, at TU Avenue, 2.0 mi north of Vicksburg.	15.6	1964, 1966-67, 1986-87	08-08-01	*0.46
04097210	Portage Creek	Portage River	Lat 42°06'52", long 85°32'05", in NE1/4 sec.24, T.4 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050001, at W Avenue, in Vicksburg.	35.2	1964, 1966-67, 1986-87	08-07-01	*9.04
04097240	Portage Creek	Portage River	Lat 42°04'26", long 85°30'25", in SW1/4 sec.32, T.4 S., R. 10 W., Kalamazoo County, Hydrologic Unit 04050001, at Z Avenue, 3.4 mi southeast of Vicksburg.	57.7	1964, 1966-67, 1986-87	08-07-01	*29.0
04097340	Portage River	St. Joseph River	Lat 42°00'52", long 85°32'52", in SE1/4 sec.23, T.5 S., R.11 W., St. Joseph County, Hydrologic Unit 04050001, at Parkville Road., in Parkville.	--	1963	08-07-01	*63.8
04097370	Flowerfield Creek	Rocky River	Lat 42°03'50", long 85°39'44", in SW1/4 sec.1, T.5 S., R.12 W., St. Joseph County, Hydrologic Unit 04050001, at Flowerfield Road in Flowerfield.	42.6	1964-79c, 1986-87	08-07-01	*9.86

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04101537	Unnamed Tributary	Pine Lake	Lat 41°59'52", long 86°05'33", in NW1/4 NE1/4 sec.31, T.5 S., R.15 W., Cass County, Hydrologic Unit 04050001, at West Railroad Street in Dowagiac.	--	--	08-07-01 08-30-01	*d1.15 d0.80
04102023	Unnamed Tributary	Farmers Creek	Lat 41°59'08", long 86°18'48", in SE1/4 SW1/4 sec.32, T.5 S., R.17 W., Berrien County, Hydrologic Unit 04050001, at State Highway 62, 0.2 mi west of Eau Claire.	--	--	07-19-01	d0.00
04102025	Farmers Creek	St. Joseph River	Lat 41°58'49", long 86°19'59", in SE1/4 NW1/4 sec.6, T.6 S., R.17 W., Berrien County, Hydrologic Unit 04050001, at Hipps Hollow Road, 1.7 mi west of Eau Claire.	--	1967, 1973	07-19-01 09-06-01	*d4.67 *d3.92
04102035	Pipestone Creek	St. Joseph River	Lat 42°03'15", long 86°15'41", in SE1/4 NE1/4 sec.10, T.5 S., R.17 W., Berrien County, Hydrologic Unit 04050001, at State Highway 140, 3.8 mi northeast of Eau Claire.	--	--	07-19-01 09-06-01	*d4.59 *d4.13
04102040	Pipestone Creek	St. Joseph River	Lat 42°01'53", long 86°18'02", in SE1/4 SE1/4 sec.17, T.5 S, R.17 W., Berrien County, Hydrologic Unit 04050001, at Old Pipestone Road, 3.1 mi north of Eau Claire.	--	1967	07-19-01 09-06-01	*d12.6 *d12.3
04102060	Pipestone Creek	St. Joseph River	Lat 42°03'37", long 86°23'16", in SW1/4 SE1/4 sec.3, T.5 S., R.18 W., Berrien County, Hydrologic Unit 04050001, at Pipestone Road, 1.3 mi northeast of Kings Landing.	--	1971	07-19-01 09-06-01	*d22.3 *d20.5
04102065	Hickory Creek	St. Joseph River	Lat 41°58'19", long 86°29'34", in NW1/4 NW1/4 sec.11, T.6 S., R.19 W., Berrien County, Hydrologic Unit 04050001, at Hinchman Road, 1.0 mi north of Baroda.	--	1999	07-19-01 09-06-01	*d13.4 *d10.2
04102125	Unnamed Tributary	South Branch Paw Paw River	Lat 42°09'49", long 85°51'48", in NE1/4 SE1/4 sec.31, T.3 S., R.13 W., Van Buren County, Hydrologic Unit 04050001, at Ewing Road, 0.8 mi southwest of Lawton.	--	--	08-07-01	*d2.63

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04102178	East Branch Paw Paw River	South Branch Paw Paw River	Lat 42°11'48", long 85°50'33", in NW1/4 sec.21, T.3 S., R.13 W., Van Buren County, Hydrologic Unit 04050001, at 30th Street, 1.5 mi north of Lawton.	26.9	1966, 1980-82	08-07-01	*12.9
04102207	Unnamed Tributary	Campbell Creek	Lat 42°17'43", long 85°47'37", in NW1/4 SE1/4 sec.14, T.2 S., R.13 W., Van Buren County, Hydrologic Unit 04050001, at State Highway 43, 0.1 mi north of the Wolf Lake State Fish Hatchery, 2.5 mi northeast of Almena.	--	--	08-07-01	*d0.72
04102217	Unnamed Tributary	North Branch Paw Paw River	Lat 42°15'58", long 85°51'49", in SW1/4 sec.29, T.2 S., R.13 W., Van Buren County, Hydrologic Unit 04050001, at 32nd Street, 3.5 mi northeast of Paw Paw.	17.6	1980-82	08-07-01	*8.12
04105671	Eagle Lake Drain	Kalamazoo River	Lat 42°20'13", long 85°20'10", in SW1/4 sec.35, T.1 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050003, at River Road, 0.8 mi east of Augusta.	7.26	1986-87	08-07-01	*5.02
04105800	Gull Creek	Kalamazoo River	Lat 42°18'54", long 85°24'04", in NE1/4 sec.7, T.2 S., R.9 W., Kalamazoo County, Hydrologic Unit 04050003, at 37th Street, 2.0 mi northeast of Galesburg.	38.1	1965-73‡ 1973-74c, 1986-87	08-07-01	*9.91
04105990	Comstock Creek	Kalamazoo River	Lat 42°18'10", long 85°30'16", in NW1/4 sec.17, T.2 S., R.10 W., Kalamazoo County, Hydrologic Unit 04050003, at E. Main Street, 4.3 mi east of Kalamazoo.	18.3	1964-71 1986-87	08-07-01	*3.42
04106050	Davis Creek	Kalamazoo River	Lat 42°16'27", long 85°32'17", in SE1/4 sec.24, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, at Olmstead Road in Kalamazoo.	15.2	1964-67e 1986-87	08-07-01	*4.64
04106501	Portage Creek	Kalamazoo River	Lat 42°16'39", long 85°34'36", in SE1/4 sec.22, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, at Stockbridge Avenue, in Kalamazoo.	--	--	08-07-01	*41.9

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04106513	Arcadia Creek	Kalamazoo River	Lat 42°17'40", long 85°35'28", in SE1/4 sec.16, T.2 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, at Kalamazoo Avenue in Kalamazoo.	20.0	1986-87	08-07-01	*1.99
04106750	Spring Brook	Kalamazoo River	Lat 42°21'24", long 85°33'05", in SW1/4 NW1/4 sec.25, T.1 S., R.11 W., Kalamazoo County, Hydrologic Unit 04050003, at Riverview Drive, 0.6 mi north of East Cooper.	31.1	1942, 1964-71, 1984, 1986-88	08-07-01	*14.6
04107710	Sand Creek	Pine Creek	Lat 42°21'02", long 85°44'43", in SW1/4 sec.29, T.1 S., R.12 W., Kalamazoo County, Hydrologic Unit 04050003, at 2nd Street, 2.0 mi southwest of Alamo.	21.2	1964, 1966-67, 1986-87	08-07-01	*7.21
04107750	Rupert Lake Outlet	Pine Creek	Lat 42°24'53", long 85°44'17", in NE1/4 sec.5, T.1 S., R.12 W., Kalamazoo County, Hydrologic Unit 04050003, at AB Avenue, 5.5 mi southwest of Plainwell.	5.27	1964-67, 1986-87	08-07-01	*6.60
04108870	Pigeon River	Lake Michigan	Lat 42°55'31", long 86°06'07", in NE1/4 NE1/4 sec.8, T.6 N., R.15 W., Ottawa County, Hydrologic Unit 04050002, at 128th Avenue, 1.4 mi northwest of Olive Center.	--	1998-00	05-16-01	d191
04108898	Grand River	Lake Michigan	Lat 42°08'20", long 84°21'11", in SW1/4 NE1/4 sec. 7, T.4 S., R.1 E., Jackson County, Hydrologic Unit 04050004, at Reed Road, 5 mi north of Brooklyn.	--	--	07-25-01	12.4
04109495	Unnamed Tributary	Portage River	Lat 42°19'08", long 84°09'56", in NE1/4 NW1/4 sec.11, T.2 S., R.2 E., Jackson County, Hydrologic Unit 04050004, at Maute Road, 3 mi southwest of Waterloo.	--	--	08-01-01 09-05-01	*d3.11 *d2.81
04110609	Wildcat Creek	Portage River	Lat 42°17'56", long 84°19'39", in NW1/4 SW1/4 sec.16, T.2 S., R.1 E., Jackson County, Hydrologic Unit 04050004, at Trumble Road, 7.5 mi northeast of Jackson.	--	--	09-05-01	*d0.50

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04110649	Huntoon Creek	Grand River	Lat 42°26'36", long 84°25'56", in NW1/4 SE1/4 sec.28, T.1 N., R.1 W., Ingham County, Hydrologic Unit 04050004, near Leslie WWTP, in Leslie.	--	--	04-26-01 08-01-01	d14.0 *d2.31
04111040	Unnamed Tributary	Whaley Drain	Lat 42°40'09", long 84°40'29", in NE1/4 NW1/4 sec.9, T.3 N., R.3 W., Eaton County, Hydrologic Unit 04050004, at Billwood Highway, 2.5 mi northwest of Diamondale.	--	--	08-21-01	*d0.22
04111041	Unnamed Tributary	Whaley Drain	Lat 42°39'37", long 84°40'03", in NW1/4 SE1/4 sec.9, T.3 N., R.3 W., Eaton County, Hydrologic Unit 04050004, at Jacaranda Estates, 2 mi northwest of Diamondale.	--	--	08-21-01	*d0.01
04111262	Unnamed Tributary	West Branch Red Cedar River	Lat 42°38'41", long 84°08'51", in SW1/4 SW1/4 sec.18, T.3 N., R.2 E., Livingston County, Hydrologic Unit 04050004, at Wallace Road, 2.5 mi southeast of Webberville.	--	--	08-15-01	d0.00
04111300	Kalamink Creek	Red Cedar River	Lat 42°40'23", long 84°10'45", in SE1/4 SE1/4, sec.2, T.3 N., R.2 E., Ingham County, Hydrologic Unit 04050004, at Pardee Road, 0.5 mi north of Webberville.	16.5	1964-67	08-15-01	*d0.37
04111401	Doan Deer Creek	Deer Creek	Lat 42°33'52", long 84°17'58", in SE1/4 NE1/4 sec.15, T.2 N., R.1 E., Ingham County, Hydrologic Unit 04050004, at Williamston Road, 0.6 mi north of Dansville.	--	--	08-15-01	d0.00
04111460	Brown Drain	Deer Creek	Lat 42°34'18", long 84°18'55", in SW1/4 SW1/4 sec.10, T.2 N., R.1 E., Ingham County, Hydrologic Unit 04050004, at West Road, 1.1 mi northwest of Dansville.	--	--	08-15-01	d0.00
04111520	Sweeney Drain	Deer Creek	Lat 42°35'05", long 84°18'12", in NW1/4 NE1/4 sec.10, T.2 N., R.1 E., Ingham County, Hydrologic Unit 04050004, at Columbia Road, 2.0 mi north of Dansville.	--	--	08-15-01	d0.00

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04112715	Mud Creek	Sycamore Creek	Lat 42°32'12", long 84°22'45", in NW1/4 NW1/4 sec.25, T.2 N., R.1 W., Ingham County, Hydrologic Unit 04050004, at Rolf Road, 6.3 mi southeast of Mason.	--	--	08-15-01	*d0.29
04113977	Parker Extension Drain	Cryderman Lake	Lat 42°46'17", long 84°53'46", in SE1/4 SE1/4 sec.33, T.5 N., R.5 W., Ionia County, Hydrologic Unit 04050004, at Charlotte Highway, 1.1 mi north of Mulliken.	--	--	08-15-01	d0.08
04113978	Cryderman Lake Drain	Grand River	Lat 42°47'06", long 84°52'50", in NW1/4 NE1/4 sec.34, T.5 N., R.5 W., Ionia County, Hydrologic Unit 04050004, at Tupper Lake Road, 1.5 mi northeast of Mulliken.	--	--	08-15-01	d0.46
0411848620	Unnamed Tributary	Rogue River	Lat 43°07'26", long 85°34'33", in NW1/4 SE1/4 sec.35, T.9 N., R.11 W., Kent County, Hydrologic Unit 04050006, north of 10-Mile Road, 0.8 mi west of Rockford.	--	--	05-08-01 05-15-01	*d0.11 d0.43
0411848640	Unnamed Tributary	Rogue River	Lat 43°07'15", long 85°34'08", in SW1/4 SW1/4 sec.36, T.9 N., R.11 W., Kent County, Hydrologic Unit 04050006, north of 10-Mile Road, 0.5 mi west from Rockford.	--	--	05-08-01 05-21-01	*d0.11 *d0.11
0411848660	Unnamed Tributary	Rogue River	Lat 43°07'08", long 85°33'52", in SE1/4 SW1/4 sec.36, T.9 N., R.11 W., Kent County, Hydrologic Unit 04050006, north of 10-Mile Road in Rockford.	--	--	05-08-01 05-21-01	*d0.30 *d0.30
04119146	Buck Creek	Grand River	Lat 42°52'25", long 85°41'21", in NW1/4 SE1/4 sec.26, T.6 N., R.12 W., Kent County, Hydrologic Unit 04050006, at footbridge at L.E. Kaufman Golf Course, in Wyoming.	--	--	06-14-01 07-18-01 08-01-01	*d43.5 *d25.2 *d25.5
04120327	Little Black Creek	Mona Lake	Lat 43°12'29", long 86°12'53", in SE1/4 SW1/4 sec.33, T.10 N., R.16 W., Muskegon County, Hydrologic Unit 04060101, at Roberts Street, in Muskegon.	--	1991	07-26-01 09-17-01	*d1.67 *d1.51

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04120329	Little Black Creek	Mona Lake	Lat 43°11'53", long 86°13'50", in NW1/4 SE1/4 sec.5, T.9 N., R.16 W., Muskegon County, Hydrologic Unit 04060101, at Summit Avenue, in Muskegon.	--	--	07-26-01 09-17-01	*d4.50 *d3.24
04121237	Clam River	Muskegon River	Lat 44°15'20", long 85°24'24", in SE1/4 SW1/4 sec.33, T.22 N., R.9 W., Wexford County, Hydrologic Unit 04060102, at Lake Street, in Cadillac.	--	1970, 1973, 1975	08-09-01 09-11-01	*d4.21 *d3.84
04121239	Clam River	Muskegon River	Lat 44°15'49", long 85°24'04", in NE1/4 NE1/4 sec.33, T.22 N., R.9 W., Wexford County, Hydrologic Unit 04060102, 1.0 mi downstream from dam at outlet of Lake Cadillac, at Smith Street in Cadillac.	b48	1983-84†, 1986-92†, 1993-00	12-01-00 03-29-01 06-20-01 09-05-01	4.63 26.9 60.3 5.70
04121241	Clam River	Muskegon River	Lat 44°16'02", long 85°23'48", in SE1/4 SE1/4 sec.28, T.22 N., R.9 W., Wexford County, Hydrologic Unit 04060102, at Plett Road, in Cadillac.	--	1975, 1983-84	08-09-01 09-11-01	*d8.07 *d7.43
04121304	North Branch Creek	West Branch Clam River	Lat 44°11'37", long 85°12'25", in SE1/4 SW1/4 sec.19, T.21 N., R.7 W., Missaukee County, Hydrologic Unit 04060102, at Maple Street, in McBain.	--	--	08-09-01 09-11-01	*d0.08 *d0.71
04121403	Middle Branch River	Muskegon River	Lat 44°05'55", long 85°09'03" in SE1/4 NE1/4 sec.28, T.20 N., R.7 W., Osceola County, Hydrologic Unit 04060102, at fairgrounds pedestrian bridge, in Marion.	--	--	08-09-01 09-11-01	*d24.4 *d33.8
04121404	Unnamed Tributary	Middle Branch River	Lat 44°05'43", long 85°08'51", in NE1/4 SE1/4 sec.28, T.20 N., R.7 W., Osceola County, Hydrologic Unit 04060102, at State Highway M-66, 0.5 mi south of Marion.	--	--	08-09-01 09-11-01	*d0.01 *d0.21
04121605	Hersey River	Muskegon River	Lat 43°52'15", long 85°29'39", in NE1/4 NW1/4 sec.15, T.17 N., R.10 W., Osceola County, Hydrologic Unit 04060102, at Business U.S. Highway 10, in Reed City.	--	1972	08-09-01 09-11-01	*d46.6 *d88.8

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE MICHIGAN--Continued				
04121620	Hersey River	Muskegon River	Lat 43°51'00", long 85°26'10", in NW1/4 SE1/4 sec.19, T.17 N., R.9 W., Osceola County, Hydrologic Unit 04060102, 200 ft upstream from Vance Road, 0.6 mi east of Hersey.	--	1979	07-30-01	51.6
04121920	Tamarack Creek	Little Muskegon River	Lat 43°24'01", long 85°28'02", in NW1/4 SE1/4 sec.26, T.12 N., R.10 W., Montcalm County, Hydrologic Unit 04060102, at Federal Road in Howard City.	--	--	08-02-01 09-17-01	*d19.0 d32.5
04121921	Indian Creek Drain	Tamarack Creek	Lat 43°24'17", long 85°28'21", in SE1/4 NW1/4 sec.26, T.12 N., R.10 W., Montcalm County, Hydrologic Unit 04060102, at Muenscher Road, 0.3 mi north of Howard City.	--	--	08-02-01 09-17-01	*d0.75 d1.40
04121997	Unnamed Tributary	Penoyer Creek	Lat 43°27'35", long 85°49'35", in SW1/4 NE1/4 sec.2, T.12 N., R.13 W., Newaygo County, Hydrologic Unit 04060102, at footbridge 500 ft upstream from Kimball Lake, 2.5 mi north of Newaygo.	--	--	06-14-01 07-25-01 08-02-01	*d8.82 *d1.37 *d1.28
04122087	Ruddiman Creek	Muskegon Lake	Lat 43°12'38", long 86°16'36", in NE1/4 SW1/4 sec.36, T.10 N., R.17 W., Muskegon County, Hydrologic Unit 04060102, at Glenside Boulevard, in Muskegon.	3.37	1973	07-06-01 09-17-01	*d2.08 *d2.15
04127200	Boardman River	Lake Michigan	Lat 44°40'30", long 85°37'49", in SW1/4 sec.3, T.26 N., R.11 W., Grand Traverse County, Hydrologic Unit 04060105, at Beitner Road, 6 mi south of Traverse City.	--	--	07-31-01	*182
			STREAMS TRIBUTARY TO LAKE HURON				
04149683	Donald Drain	Duff Creek	Lat 43°19'42", long 83°02'58", in NW1/4 NE1/4 sec.3, T.11 N., R.12 E., Sanilac County, Hydrologic Unit 04080205, at Marlette Road, 1.0 mi east of Marlette.	--	2000	07-25-01 08-29-01	d0.24 *d0.09
04149690	Duff Creek	South Branch Cass River	Lat 43°20'46", long 83°02'42", in SW1/4 SW1/4 sec.27, T.11 N., R.12 E., Sanilac County, Hydrologic Unit 04080205, at Decker Road, 2.1 mi northeast of Marlette.	8.86	1980-81	07-25-01 08-29-01	d1.08 *d0.70

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 2001--Continued

Station No.	Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
						Date	Discharge (ft^3/s)
			STREAMS TRIBUTARY TO LAKE HURON--Continued				
04150587	Alder Creek	South Branch White Creek	Lat 43°25'38", long 83°11'47", in NE1/4 NW1/4 sec.32, T.12 N., R.11 E., Tuscola County, Hydrologic Unit 04080205, at Rossman Road, 1.0 mi northwest of Kingston.	--	--	07-25-01 08-29-01	d0.38 *d0.28
04150852	Beach Drain	Krueger Drain	Lat 43°21'03", long 83°23'37", in SE1/4 SW1/4 sec.22, T.11 N., R.9 E., Tuscola County, Hydrologic Unit 04080205, at Snover Road, 3.4 mi east of Juniata.	--	--	07-25-01 08-29-01	*d0.07 *d0.07
04152420	Cedar River	Tobacco River	Lat 44°01'00", long 84°34'15", in SE1/4 SE1/4 sec.20, T.19 N., R.2 W., Gladwin County, Hydrologic Unit 04080201, at Eagleson Road, 5.0 mi south of Skeels.	96.1	1958, 1964-65	10-03-00 10-17-00	*d57.9 *d62.0
04152427	Cedar River	Tobacco River	Lat 44°00'19", long 84°31'32", in SW1/4 SW1/4 sec.26, T.19 N., R.2 W., Gladwin County, Hydrologic Unit 04080201, at Chappel Dam Road, 2.5 mi northwest of Gladwin.	--	--	10-03-00 10-17-00	*d59.2 *d60.8
04152430	Cedar River	Tobacco River	Lat 43°58'50", long 84°29'46", in NE1/4 SW1/4 sec.1, T.18 N., R.2 W., Gladwin County, Hydrologic Unit 04080201, at State Highway M-61, in Gladwin.	--	1976	10-03-00 10-17-00	*d69.0 *d66.3
			STREAMS TRIBUTARY TO DETROIT RIVER				
04168579	Ecorse River	Detroit River	Lat 42°16'28", long 83°15'38", in NE1/4 SW1/4 sec.33, T.2 S., R.10 E., Wayne County, Hydrologic Unit 04090004, at Heather Park in Dearborn Heights.	--	--	08-08-01 09-05-01	*d0.45 *d1.43
04168677	Blakely Drain	Marsh Creek	Lat 42°10'49", long 83°18'22", in NE1/4 NE1/4 sec.1, T.4 S., R.9 E., Wayne County, Hydrologic Unit 04090004, at Inkster Road, 5 mi southwest of Taylor.	--	--	09-05-01	*d0.09

* Base flow.
† Operated as a low-flow partial-record station.
‡ Operated as a continuous-record gaging station.
a Affected by regulation and/or diversion.
b Approximately.
c Operated as a crest-stage partial-record station.
d Discharge measurement made by employees of Michigan Department of Environmental Quality.
e Previously published as Allen Creek.

Figure 8. Location of ground-water wells published in this report.

GROUND-WATER LEVELS

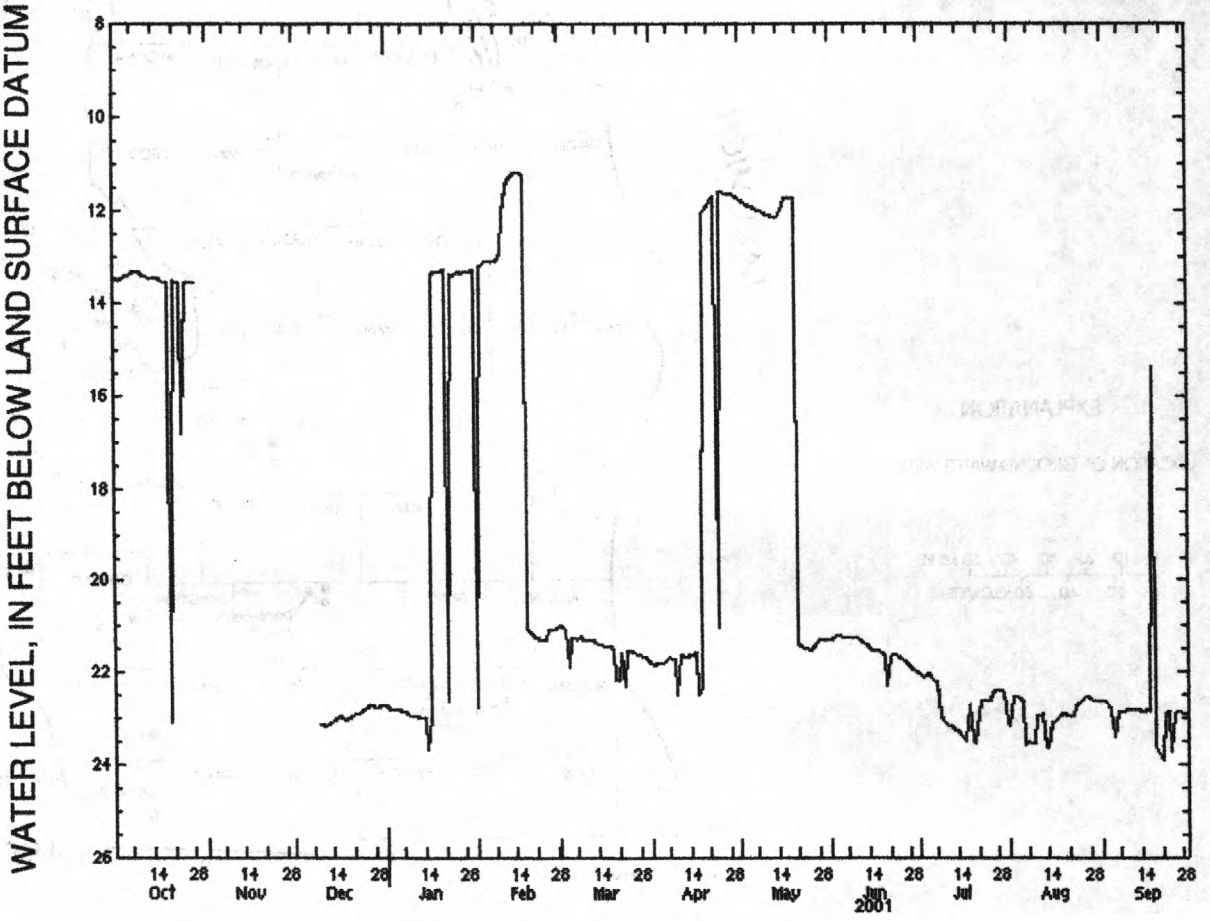
BRANCH COUNTY

415602084593701. Local number, 6S 6W 22CABA.
LOCATION.--Lat 41°56'02", long 84°59'37", Hydrologic Unit 04050001, at Bennett and Tibbits Streets in Coldwater. Owner: City of Coldwater.
AQUIFER.--Sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in, depth 113 ft, screened 108 ft to 113 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 970 ft above sea level, from topographic map. Measuring point: Plywood shelter base, 2.5 ft above land-surface datum.
REMARKS.--Water levels affected by nearby pumping.
PERIOD OF RECORD.--January 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.77 ft below land-surface datum, June 4, 1989; lowest recorded, 25.9 ft below land-surface datum, May 25, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	13.40	—	—	22.79	13.11	21.24	21.79	11.89	21.25	22.14	22.63	23.38
10	13.34	—	23.13	22.92	12.04	21.31	22.49	12.06	21.25	23.11	22.94	22.81
15	13.45	—	22.98	23.65	11.20	21.41	21.61	12.09	21.52	23.35	23.06	22.83
20	23.07	—	22.93	13.31	21.22	22.17	11.96	11.72	22.28	23.53	22.93	23.76
25	13.54	—	22.74	13.36	21.06	21.52	11.60	21.51	21.69	22.60	22.63	22.90
EOM	—	—	22.71	13.27	21.04	21.76	11.66	21.32	21.99	23.09	22.62	22.89

WTR YR 2001 HIGHEST 10.68 FEB 26 LOWEST 23.90 SEP 21



GROUND-WATER LEVELS

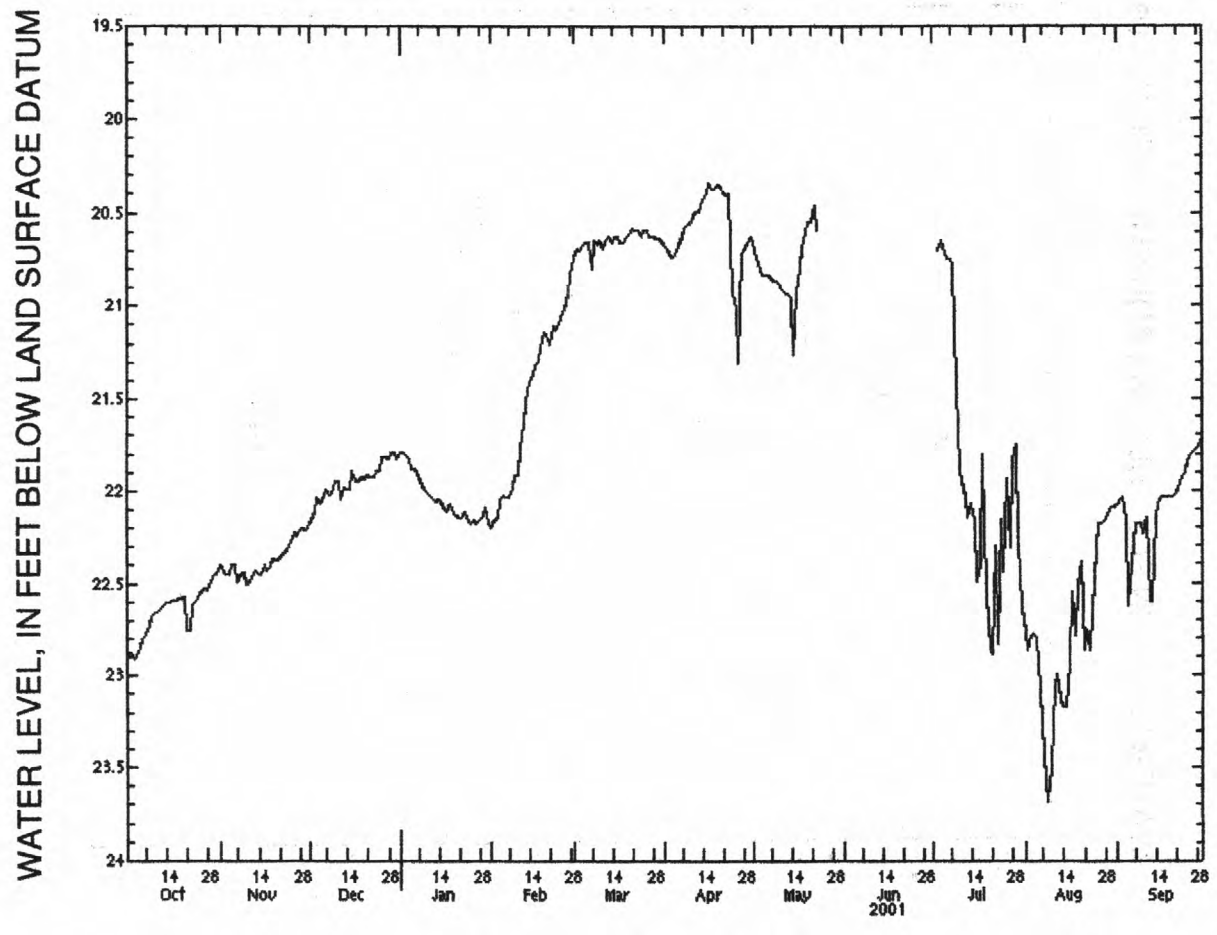
CALHOUN COUNTY

422032085091801. Local number, 1S 7W 32BDCC1.
LOCATION.--Lat 42°20'31", long 85°09'19", Hydrologic Unit 04050003, at Hopkins Street and State Highway 66 in Battle Creek. Owner: Pennfield Township.
AQUIFER.--Marshall Formation.
WELL CHARACTERISTICS.--Drilled well, diameter 6 in, depth 95 ft, cased to about 40 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 845 ft above sea level, from topographic map. Measuring point: Top of shelter base, 1.0 ft above land-surface datum.
REMARKS--Water levels affected by nearby pumping.
PERIOD OF RECORD.--February 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 15.6 ft below land-surface datum, April 1974; lowest recorded, 27.0 ft below land-surface datum, August 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	22.84	22.40	22.07	21.88	22.02	20.66	20.70	20.83	---	20.71	22.80	22.62
10	22.66	22.50	21.95	22.00	21.91	20.65	20.55	20.88	---	21.89	23.50	22.23
15	22.60	22.45	21.99	22.06	21.37	20.63	20.39	21.26	---	22.17	23.17	22.07
20	22.57	22.37	21.94	22.13	21.17	20.61	20.36	20.55	---	22.86	22.38	22.04
25	22.56	22.27	21.89	22.18	21.03	20.59	21.01	---	---	22.44	22.31	21.84
EOM	22.45	22.21	21.83	22.17	20.83	20.65	20.62	---	---	22.64	22.09	21.72

WTR YR 2001 HIGHEST 20.27 APR 23 LOWEST 23.68 AUG 9



GROUND-WATER LEVELS

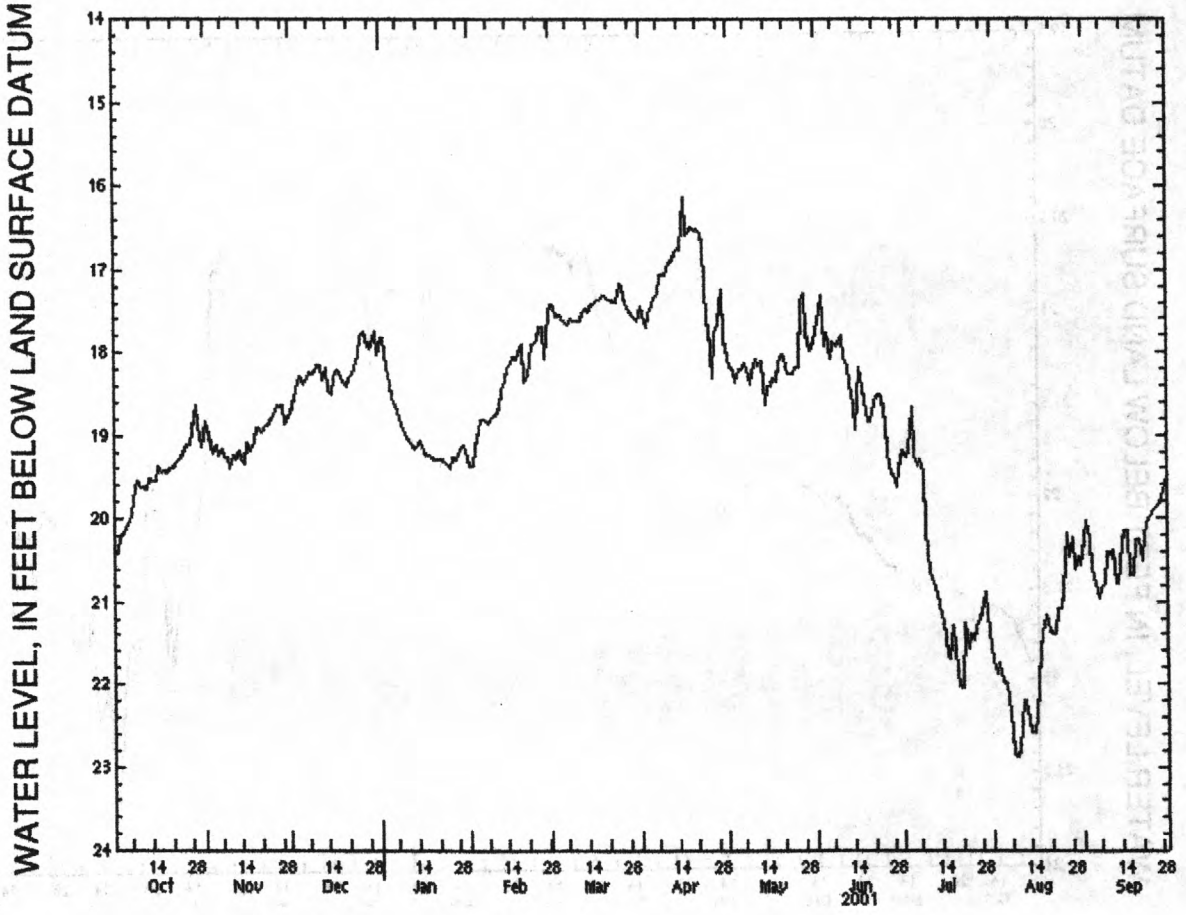
CALHOUN COUNTY

422033085082601. Local number, 1S 7W 33BCBC.
LOCATION.--Lat 42°20'33", long 85°08'26", Hydrologic Unit 04050003, at Verona Well Field in Battle Creek. Owner: City of Battle Creek.
AQUIFER.--Marshall Formation.
WELL CHARACTERISTICS.--Drilled well, diameter 6 in, depth 120 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 835.7 ft above sea level. Measuring point: Top of casing, 3.1 ft above land-surface datum.
REMARKS--Water levels affected by nearby pumping.
PERIOD OF RECORD.--July 2000 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 15.88 ft below land-surface datum, Apr 17, 2001; lowest recorded, 22.89 ft below land-surface datum, Aug. 9, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	20.09	19.10	18.37	18.54	18.80	17.59	17.40	18.19	17.77	19.24	21.99	20.79
10	19.61	19.38	18.14	19.01	18.76	17.61	17.05	18.23	17.78	20.63	22.77	20.42
15	19.53	19.33	18.49	19.06	18.12	17.42	16.76	18.40	18.92	21.23	22.57	20.14
20	19.40	18.92	18.41	19.28	18.34	17.32	16.53	18.01	18.84	22.01	21.33	20.24
25	19.15	18.75	17.79	19.38	17.70	17.16	17.70	18.17	18.85	21.47	20.89	19.90
EOM	19.14	18.75	18.03	19.27	17.51	17.62	17.85	17.88	19.39	21.55	20.55	19.48

WTR YR 2001 HIGHEST 15.88 APR 17 LOWEST 22.89 AUG 9



GROUND-WATER LEVELS

CHEBOYGAN COUNTY

454427084424001. Local number, 39N 3W 29CBCB1
LOCATION.--Lat 45°44'27", long 84°42'40", Hydrologic Unit 04070003, at Stimpson Road, 3 mi southeast of Mackinaw City. Owner: U.S. Geological Survey.
AQUIFER.--Dundee Formation of Devonian age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in, depth 121 ft, cased to 104 ft, open bottom.
INSTRUMENTATION.--Periodic measurement.
DATUM.--Elevation of land-surface datum is 705 ft above sea level, from topographic map. Measuring point: Top of casing, 1.9 ft above land-surface datum.
PERIOD OF RECORD.--January 1979 to May 1992, December 1997 to current year. Records for the 1992 water year are unpublished and available in files of the U.S. Geological Survey.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.66 ft below land-surface datum, Apr. 21, 2000; lowest measured, 11.68 ft below land-surface datum, Feb. 11, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	9.41	JAN 23	9.20	MAY 16	4.72	JUL 23	7.18	SEP 4	7.58	SEP 13	7.60
DEC 21	9.08	MAR 7	7.96	JUN 11	5.14						

454427084424002. Local number, 39N 3W 29CBCB2.
LOCATION.--Lat 45°44'27", long 84°42'40", Hydrologic Unit 04070003, at Stimpson Road, 3 mi southeast of Mackinaw City. Owner: U.S. Geological Survey.
AQUIFER.--Sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 6 in, depth 55 ft, screened 40 to 55 ft.
INSTRUMENTATION.--Periodic measurements; water-level recorder Sept. 6-30, 2001.
DATUM.--Elevation of land-surface datum is 705 ft above sea level, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.
PERIOD OF RECORD.--February 1979 to May 1992, December 1997 to current year. Records for the 1992 water year are unpublished and available in files of the U.S. Geological Survey.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.80 ft below land-surface datum, Apr. 8, 1986; lowest measured, 6.58 ft below land-surface datum, Nov. 2, 2000, Jan. 23, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	6.58	JUL 23	4.83	SEP 10	*5.23	SEP 16	*5.23	SEP 21	*4.67	SEP 26	*3.72
DEC 21	6.34	SEP 4	5.14	SEP 11	*5.17	SEP 17	*5.25	SEP 22	*4.67	SEP 27	*3.78
JAN 23	6.58	SEP 6	*5.20	SEP 13	5.14	SEP 18	*5.27	SEP 23	*4.67	SEP 28	*3.83
MAR 7	5.70	SEP 7	*5.21	SEP 14	*5.18	SEP 19	*5.27	SEP 24	*3.87	SEP 29	*3.86
MAY 16	2.76	SEP 8	*5.24	SEP 15	*5.20	SEP 20	*4.75	SEP 25	*3.83	SEP 30	*3.90
JUN 11	3.05	SEP 9	*5.24								

* Lowest value, from water-level recorder.

GROUND-WATER LEVELS

EATON COUNTY

424058084380301. Local number, 3N 3W 2BA.
LOCATION.--Lat 42°40'58", long 84°38'03", Hydrologic Unit 04050004, on Stiefel Farm grounds, 1.6 mi north of Dimondale. Owner: City of Lansing.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 1.25 in, depth 66 ft, screened 63 ft to 66 ft.
INSTRUMENTATION.--Periodic measurements.
DATUM.--Elevation of land-surface datum is 839 ft above sea level. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--April 1964 to September 1998 (water-level recorder), October 1998 to current year (periodic measurements).
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.98 ft below land-surface datum, June 11, 1986; lowest recorded, 18.0 ft below land-surface datum, November 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	10.60	APR 26	7.28	JUN 06	7.26	JUL 11	7.83	AUG 30	5.60

GROUND-WATER LEVELS

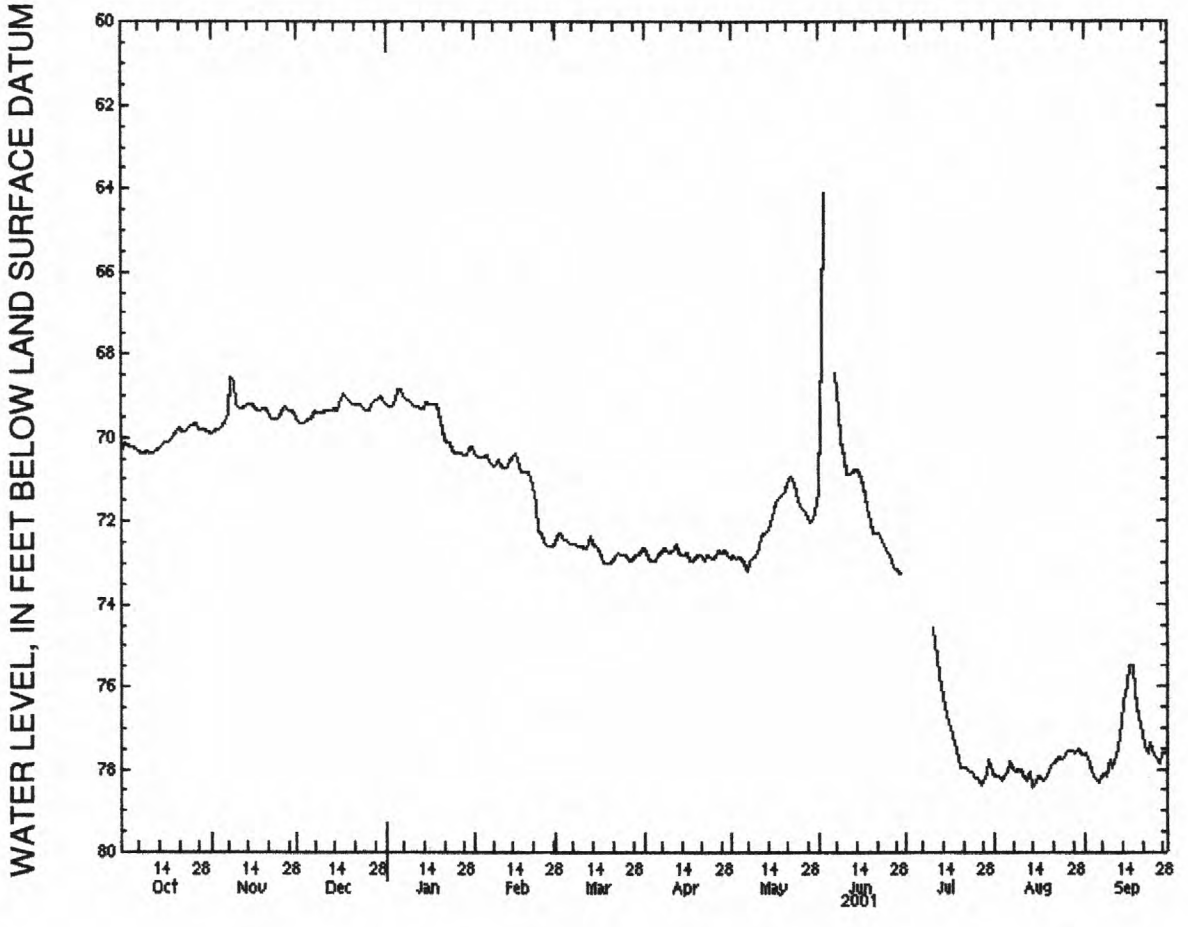
EATON COUNTY

424435084365001. Local number, 4N 3W 12CDAD.
LOCATION.--Lat 42°44'35", long 84°36'50", Hydrologic Unit 04050004, at Robins Road in Delta Township, 0.5 mi west of Lansing. Owner: F. Wheeler.
AQUIFER.--Saginaw Formation of Pennsylvanian age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in, depth 381 ft, cased to 140 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 861.91 ft above sea level. Measuring point: Plywood instrument shelf, 1.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--October 1953 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 55.19 ft below land-surface datum, June 24, 25, 26, 1996; lowest recorded, 103.6 ft below land-surface datum, Aug. 28, 1969.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	70.21	69.72	69.56	68.87	70.42	72.46	72.97	72.89	---	---	78.05	78.24
10	70.33	69.18	69.39	69.21	70.67	72.59	72.75	72.87	70.49	---	78.04	77.78
15	70.19	69.23	69.34	69.15	70.37	72.58	72.78	72.03	70.80	76.48	78.30	76.38
20	69.86	69.30	69.19	69.59	70.83	73.01	72.82	71.26	72.28	77.99	77.92	76.74
25	69.73	69.49	69.34	70.35	72.52	72.79	72.92	71.55	72.74	78.21	77.74	77.66
EOM	69.85	69.42	69.08	70.22	72.59	72.72	72.79	71.57	73.33	78.07	77.60	77.54

WTR YR 2001 HIGHEST 59.78 JUN 4 LOWEST 78.44 AUG 14



GROUND-WATER LEVELS

GRAND TRAVERSE COUNTY

443921085213501. Local number, 26N 9W 14ABAA.
LOCATION.--Lat 44°39'21", long 85°21'35", Hydrologic Unit 04060105, 5.5 mi north of Fife Lake. Owner: U.S. Geological Survey.
AQUIFER.--Sand of Pleistocene age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 6 in, depth 80 ft, PVC pipe and screen.
INSTRUMENTATION.--Water-level recorder June 1976 to September 1991. Periodic measurements August 2000 to September 2001.
DATUM.--Elevation of land-surface datum is 960 ft above sea level, from topographic map. Measuring point: Top of casing, 1.24 ft above land-surface datum.
PERIOD OF RECORD.--June 1976 to September 1991, August 2000 to September 2001.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 21.32 ft below land-surface datum, Oct. 22, 26, 27, 1986; lowest measured, 29.24 ft below land-surface datum, Feb. 23, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR, AUGUST 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG 3, 2000	27.39	JAN 4	28.97	MAY 16	26.40	AUG 13	26.34	SEP 14	26.68
NOV 22	28.71	FEB 23	29.24	JUN 27	26.28				

GROUND-WATER LEVELS

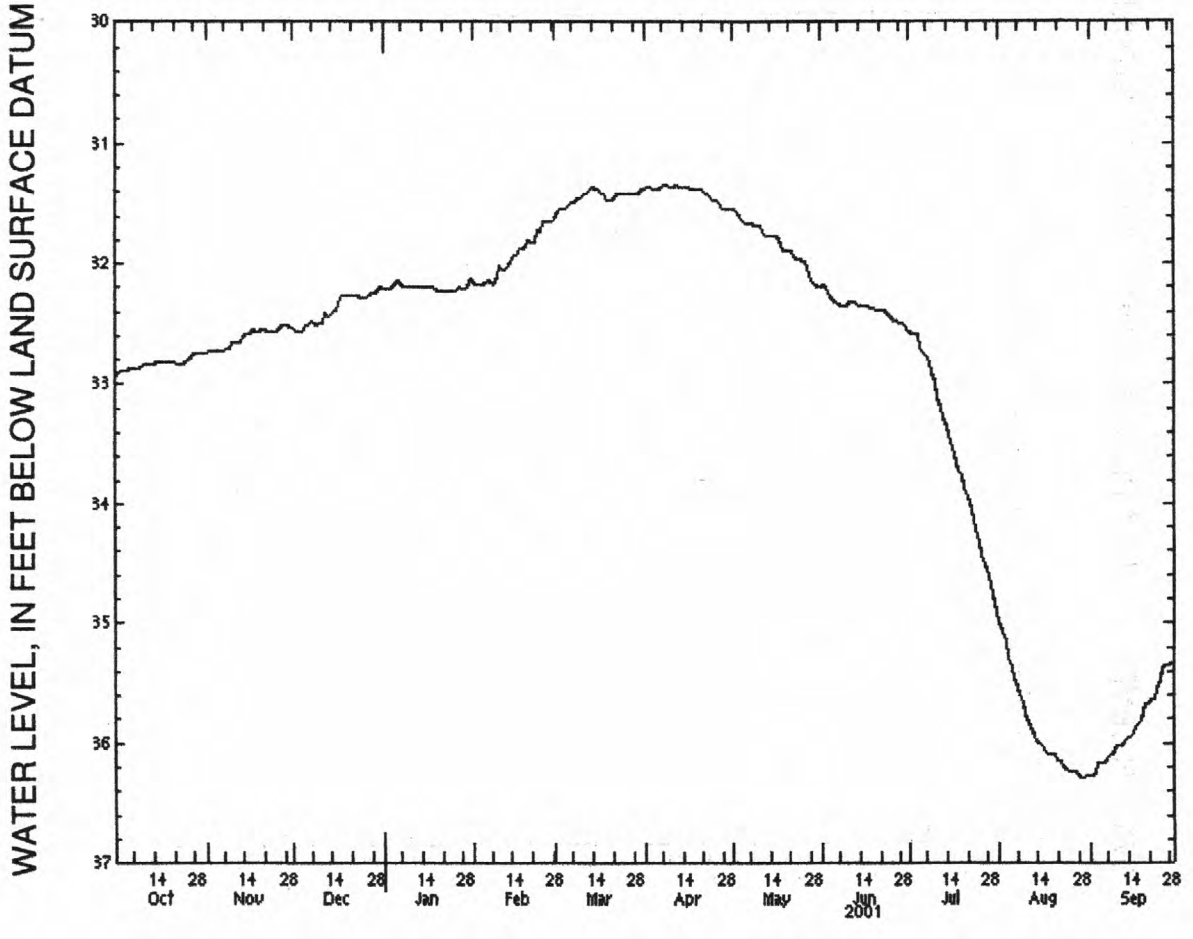
HURON COUNTY

434103083130301. Local number, 15N 11E 32BBCB.
LOCATION.--Lat 43°41'03", long 83°13'03", Hydrologic Unit 04080103, 2 mi northeast of Gagetown at Gagetown State Game Area. Owner: Huron County.
AQUIFER.--Sand of Pleistocene age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 4 in, depth 91 ft, screened 87 ft to 91 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 746 ft above sea level, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.
PERIOD OF RECORD.--February 1991 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 30.38 ft below land-surface datum, May 6, 1991; lowest recorded, 36.29 ft below land-surface datum, Aug. 29, 30, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	32.88	32.72	32.52	32.15	32.16	31.53	31.37	31.64	32.30	32.70	35.37	36.16
10	32.85	32.65	32.50	32.19	32.02	31.45	31.36	31.68	32.36	32.98	35.76	36.03
15	32.82	32.59	32.39	32.20	31.92	31.37	31.36	31.76	32.36	33.41	36.01	35.95
20	32.81	32.54	32.26	32.23	31.81	31.46	31.38	31.90	32.38	33.86	36.09	35.67
25	32.81	32.56	32.28	32.23	31.65	31.42	31.47	31.97	32.44	34.32	36.23	35.48
EOM	32.74	32.53	32.20	32.13	31.65	31.38	31.54	32.19	32.52	34.90	36.28	35.33

WTR YR 2001 HIGHEST 31.30 APR 12 LOWEST 36.29 AUG 29, 30



GROUND-WATER LEVELS

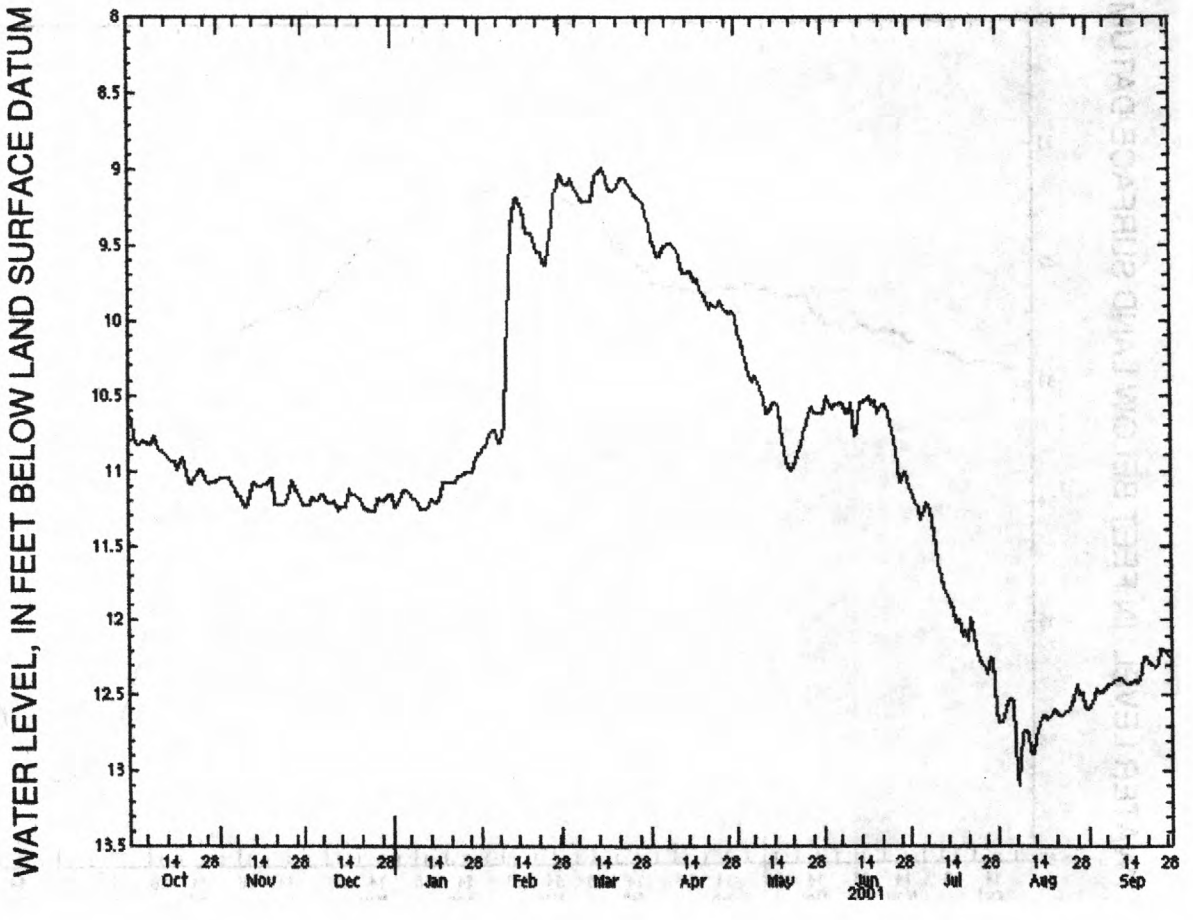
HURON COUNTY

434323082561901. Local number, 15N 13E 22BBCC.
LOCATION.--Lat.43°43'23", long 82°56'19", Hydrologic Unit 04080205, on State Highway 19, 1 mi north of Ubly. Owner: Huron County.
AQUIFER.--Napoleon Sandstone Member of Marshall Formation.
WELL CHARACTERISTICS.--Rotary drilled observation well, diameter 4 in, depth 170 ft, cased to 70 ft at the top of Napoleon Sandstone.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 795 ft above sea level, from topographic map. Measuring point: Top of casing, 2.81 ft above land-surface datum.
PERIOD OF RECORD.--December 1988 to September 1989, December 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.92 ft below land-surface datum, June 23, 1996; lowest recorded, 16.38 ft below land-surface datum, July 26, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	10.83	11.05	11.20	11.13	10.73	9.05	9.57	10.29	10.56	11.32	12.53	12.48
10	10.77	11.23	11.21	11.22	10.24	9.21	9.50	10.45	10.62	11.50	12.73	12.40
15	10.92	11.10	11.24	11.19	9.23	9.01	9.67	10.55	10.54	11.87	12.69	12.42
20	10.91	11.05	11.19	11.08	9.46	9.14	9.82	10.99	10.61	12.06	12.60	12.25
25	11.02	11.22	11.27	11.03	9.50	9.10	9.90	10.75	10.74	12.26	12.61	12.29
EOM	11.07	11.19	11.16	10.88	9.10	9.29	9.93	10.62	11.00	12.60	12.58	12.24

WTR YR 2001 HIGHEST 8.97 MAR 16, 17 LOWEST 13.10 AUG 8



GROUND-WATER LEVELS

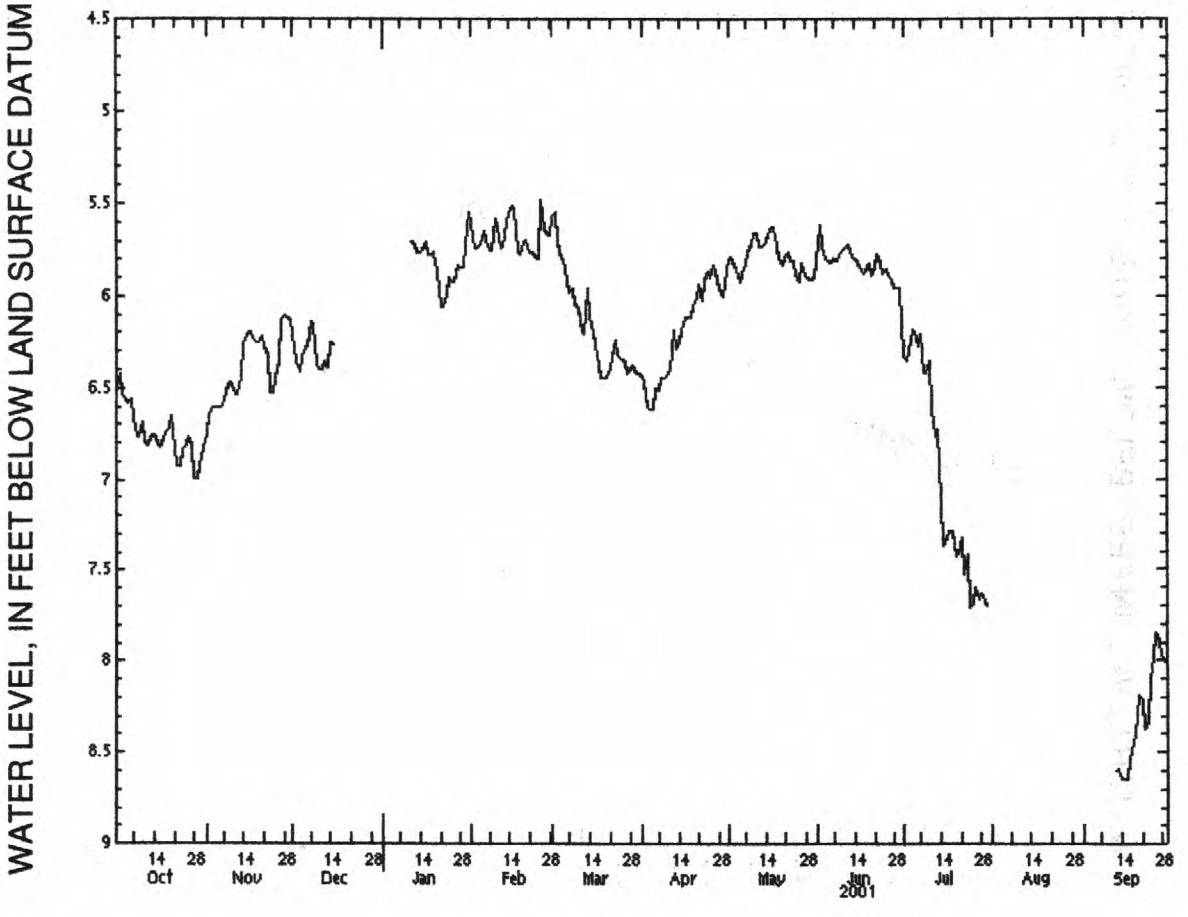
HURON COUNTY

434947083233301. Local number, 16N 9E 2CDCA.
LOCATION.--Lat 43°49'47", long 83°23'33", Hydrologic Unit 04080103, 6 mi west of Pigeon at Wildfowl Bay State Wildlife Area. Owner: Huron County.
AQUIFER.--Saginaw, Marshall Formation (Pennsylvanian, Mississippian age).
WELL CHARACTERISTICS.--Drilled artesian well, diameter 4 in, depth 180 ft, cased to 147 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 582 ft above sea level, from topographic map. Measuring point: Top of casing, 2.2 ft above land-surface datum.
PERIOD OF RECORD.--February 1991 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 3.12 ft below land-surface datum, Apr. 20, 1993; lowest recorded, 9.21 ft below land-surface datum, Aug. 4, 1998.
EXTREMES OUTSIDE PERIOD OF RECORD.--Lowest water level measured, 12.30 ft below land-surface datum, June 2, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	6.58	6.61	6.27	---	5.65	5.80	6.62	5.92	5.81	6.19	---	---
10	6.69	6.48	6.40	---	5.63	6.06	6.44	5.66	5.75	6.36	---	---
15	6.80	6.21	6.26	5.75	5.51	6.20	6.18	5.66	5.80	7.37	---	8.64
20	6.65	6.22	---	5.87	5.69	6.45	6.01	5.83	5.89	7.41	---	8.19
25	6.81	6.45	---	5.92	5.48	6.34	5.90	5.89	5.85	7.69	---	7.99
EOM	6.82	6.13	---	5.54	5.67	6.42	5.92	5.90	5.95	---	---	7.99

WTR YR 2001 HIGHEST 5.24 FEB 25 LOWEST 8.65 SEP 14



GROUND-WATER LEVELS

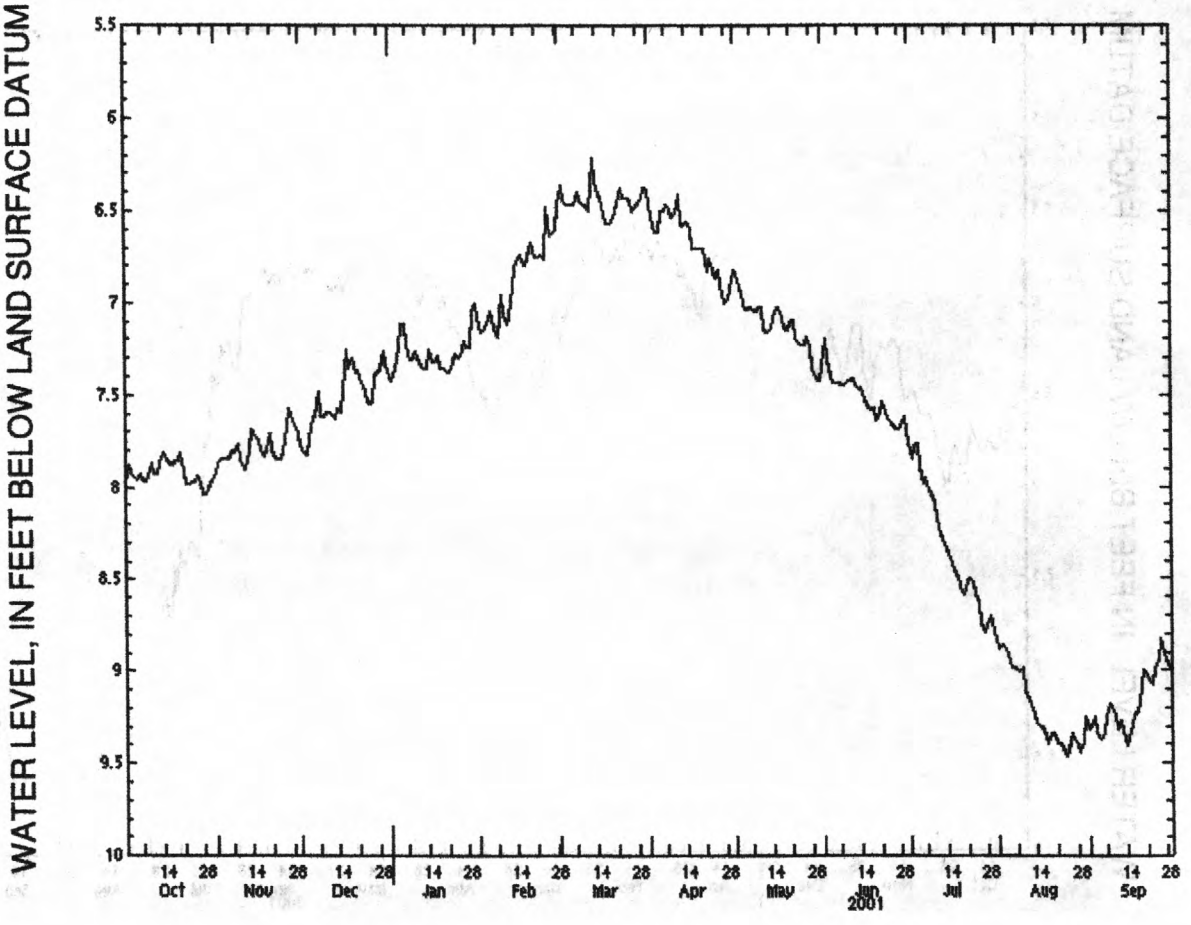
HURON COUNTY

435736083094801. Local number, 18N 11E 27AADD.
LOCATION.--Lat 43°57'36", long 83°09'48", Hydrologic Unit 04080103, 6 mi northeast of Caseville at Rush Lake State Game Area. Owner: Huron County.
AQUIFER.--Marshall Sandstone.
WELL CHARACTERISTICS.--Rotary drilled observation well, diameter 4 in, depth 200 ft, cased to 179 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 600 ft above sea level, from topographic map. Measuring Point: Top of casing, 4.03 ft above land-surface datum.
PERIOD OF RECORD.--October 1988 to August 1989, December 1992 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 4.71 ft below land-surface datum, Mar. 21, 1997; lowest recorded, 9.91 ft below land-surface datum, Nov. 30, 1999.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	7.96	7.84	7.62	7.11	7.05	6.46	6.61	7.04	7.43	7.89	8.98	9.37
10	7.87	7.84	7.59	7.26	7.06	6.46	6.53	7.02	7.42	8.08	9.11	9.23
15	7.85	7.72	7.59	7.25	6.75	6.41	6.56	7.08	7.46	8.36	9.30	9.36
20	7.81	7.71	7.38	7.35	6.67	6.56	6.71	7.15	7.64	8.58	9.35	9.00
25	7.97	7.80	7.55	7.30	6.48	6.43	6.87	7.23	7.65	8.63	9.43	8.95
EOM	7.96	7.71	7.33	7.00	6.60	6.38	6.92	7.42	7.62	8.83	9.25	8.95

WTR YR 2001 HIGHEST 6.12 MAR 13 LOWEST 9.46 AUG 24



GROUND-WATER LEVELS

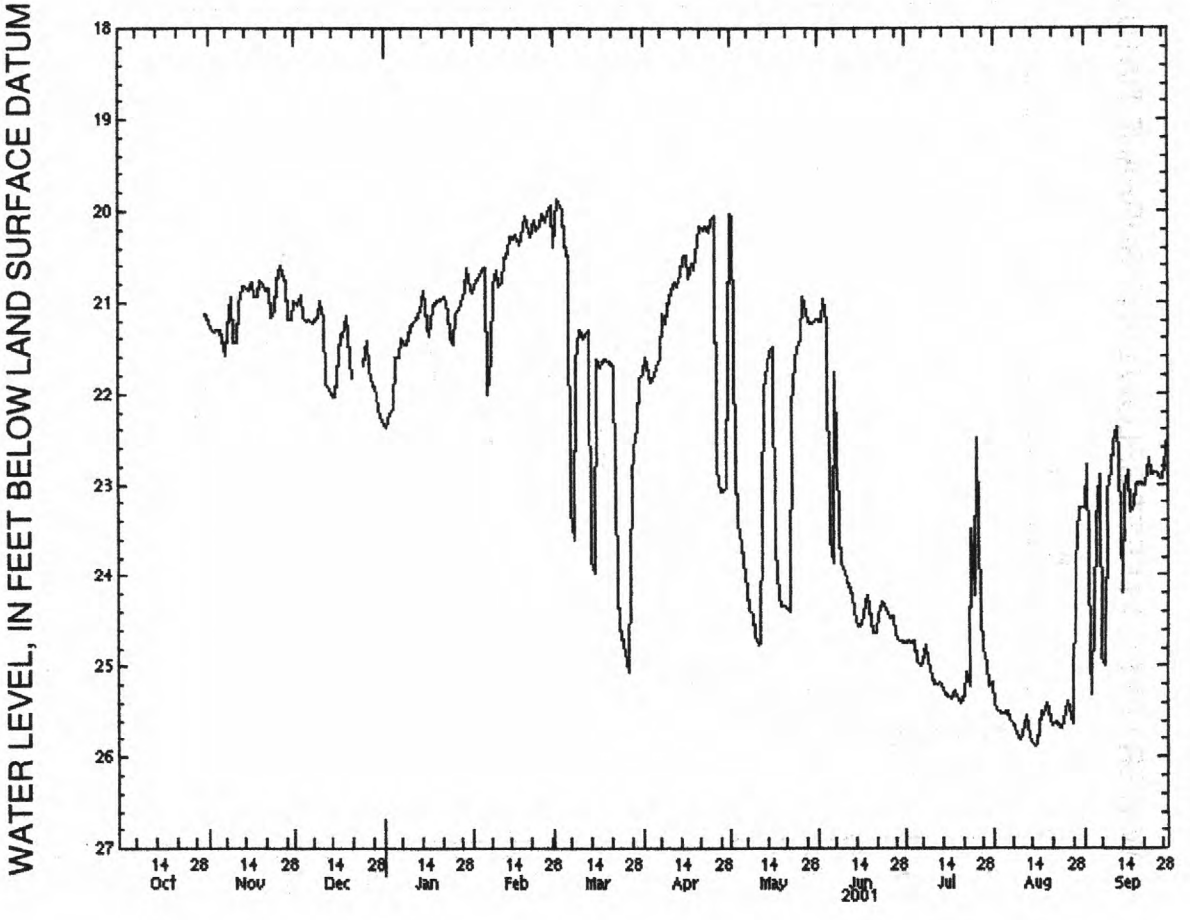
INGHAM COUNTY

423127084321901. Local number, 4N 2W 16DAAA.
LOCATION.--Lat 42°43'57", long 84°32'51", Hydrologic Unit 04050004, between Cedar Street and Museum Drive, Lansing Township in Lansing. Owner: City of Lansing.
AQUIFER.--Saginaw Formation.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 12 in, depth 417 ft, cased.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 829.10 ft above sea level. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--September 1945 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 17.59 ft below land-surface datum, May 13, 1999; lowest recorded, 67.0 ft below land-surface datum, August 1949.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	21.29	21.21	21.60	20.62	20.35	21.79	23.64	23.60	24.95	25.49	23.44
10	---	21.43	20.98	21.28	20.83	21.31	21.05	24.64	23.95	25.11	25.81	22.85
15	---	20.87	22.02	20.86	20.30	23.97	20.50	21.52	24.55	25.31	25.87	23.05
20	---	20.79	21.60	20.98	20.14	21.63	20.32	24.34	24.62	25.41	25.59	22.98
25	---	20.78	21.69	21.45	20.03	24.73	20.10	21.49	24.40	24.21	25.61	22.87
EOM	21.12	21.19	22.26	20.84	19.94	21.82	23.04	21.18	24.71	25.18	23.25	22.43

WTR YR 2001 HIGHEST 19.44 FEB 25 LOWEST 25.87 AUG 15



GROUND-WATER LEVELS

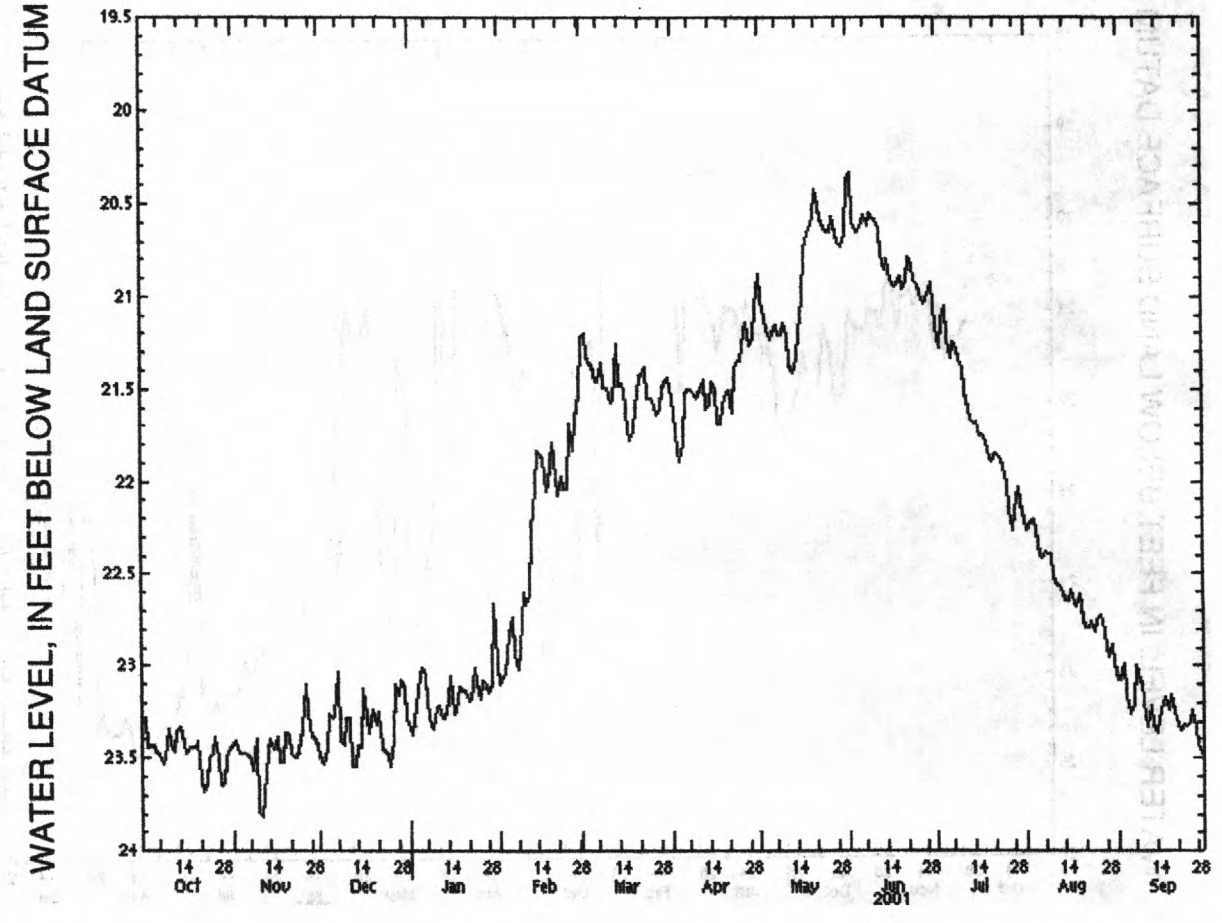
INGHAM COUNTY

423805084311801. Local number, 3N 2W 23BCBD.
LOCATION.--Lat 42°38'05", long 84°31'18", Hydrologic Unit 04050004, at Holt High School, at Sycamore Street, Delhi Township in Holt. Owner: Holt High School.
AQUIFER.--Saginaw Formation.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 8 in, depth 188 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 895 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--March 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 18.3 ft below land-surface datum, May 1983; lowest recorded, 26.34 ft below land-surface datum, June 5, 1991.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	23.43	23.48	23.28	23.01	22.73	21.37	21.79	21.23	20.65	21.23	22.40	23.26
10	23.34	23.79	23.28	23.22	22.67	21.49	21.55	21.14	20.58	21.38	22.52	23.27
15	23.42	23.45	23.44	23.05	21.86	21.47	21.46	21.18	20.80	21.67	22.64	23.28
20	23.41	23.37	23.31	23.13	21.88	21.59	21.51	20.57	20.95	21.89	22.74	23.25
25	23.47	23.34	23.54	23.18	21.68	21.55	21.34	20.65	20.93	22.00	22.75	23.30
EOM	23.44	23.43	23.28	22.98	21.53	21.43	21.05	20.66	20.92	22.21	22.98	23.44

WTR YR 2001 HIGHEST 20.18 JUN 1, 2 LOWEST 23.82 NOV 11



GROUND-WATER LEVELS

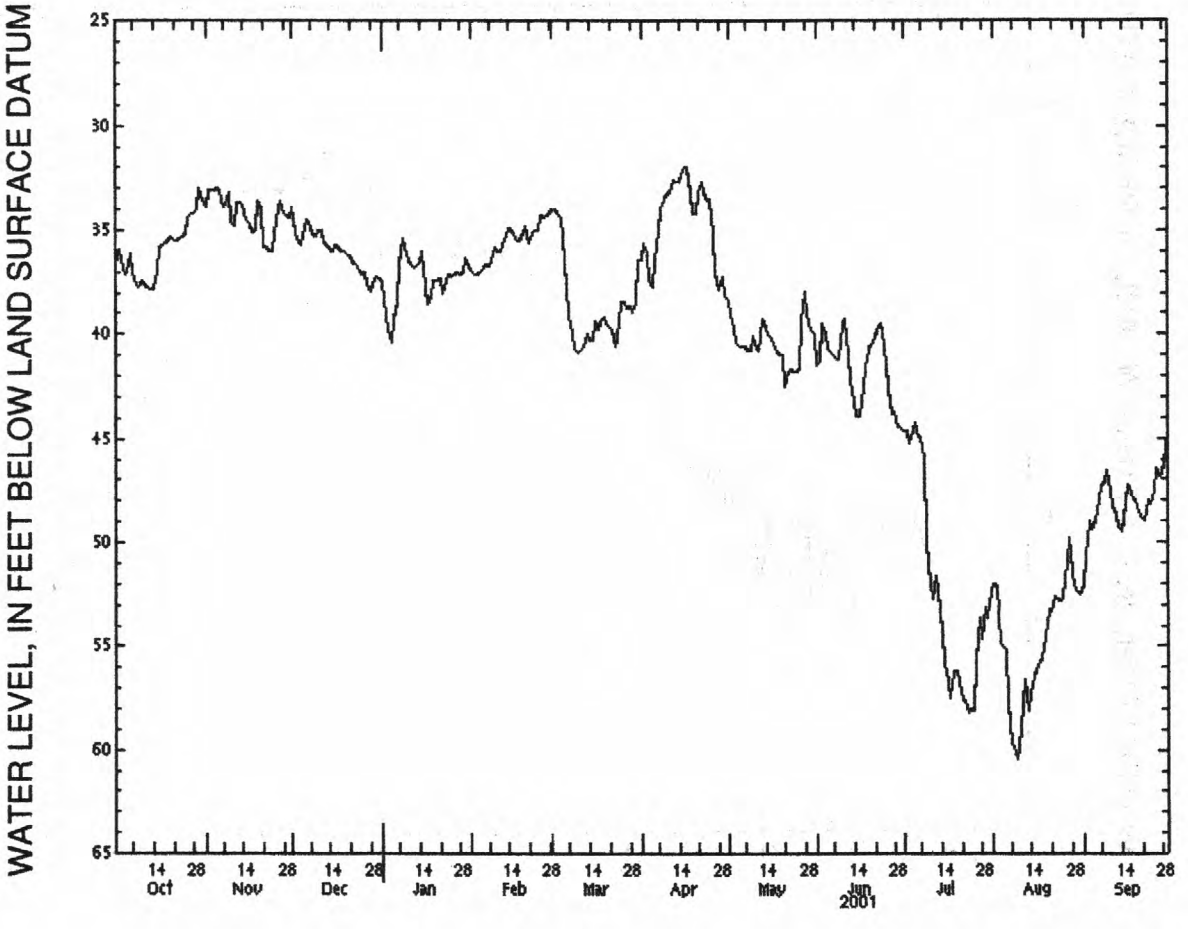
INGHAM COUNTY

424235084311201. Local number, 4N 2W 27BB.
LOCATION.--Lat 42°42'35", long 84°31'12", Hydrologic Unit 04050004, at Fenner Arboretum in Lansing. Owner: U.S. Geological Survey.
AQUIFER.--Saginaw Formation.
WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in, depth 215 ft, cased to 51 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 835 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 3.7 ft above land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--July 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 20.24 ft below land-surface datum, Dec. 29, 1993; lowest recorded, 89.5 ft below land-surface datum, October 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	37.00	32.93	34.83	39.22	36.86	35.27	37.76	40.53	40.65	44.25	55.20	48.96
10	37.40	34.58	35.05	36.44	36.05	40.83	33.26	40.02	39.47	52.00	59.89	47.57
15	36.88	34.50	35.97	36.05	35.03	40.28	32.31	39.97	43.93	55.77	56.44	48.88
20	35.34	34.00	36.18	37.46	34.77	39.45	34.21	40.93	40.47	56.66	53.25	48.53
25	35.21	35.11	37.09	37.23	34.26	38.43	33.44	41.81	41.36	58.09	52.71	47.61
EOM	33.61	34.36	37.33	36.69	34.23	36.40	38.11	39.96	44.42	52.34	52.57	44.67

WTR YR 2001 HIGHEST 31.81 APR 17 LOWEST 60.45 AUG 9



GROUND-WATER LEVELS

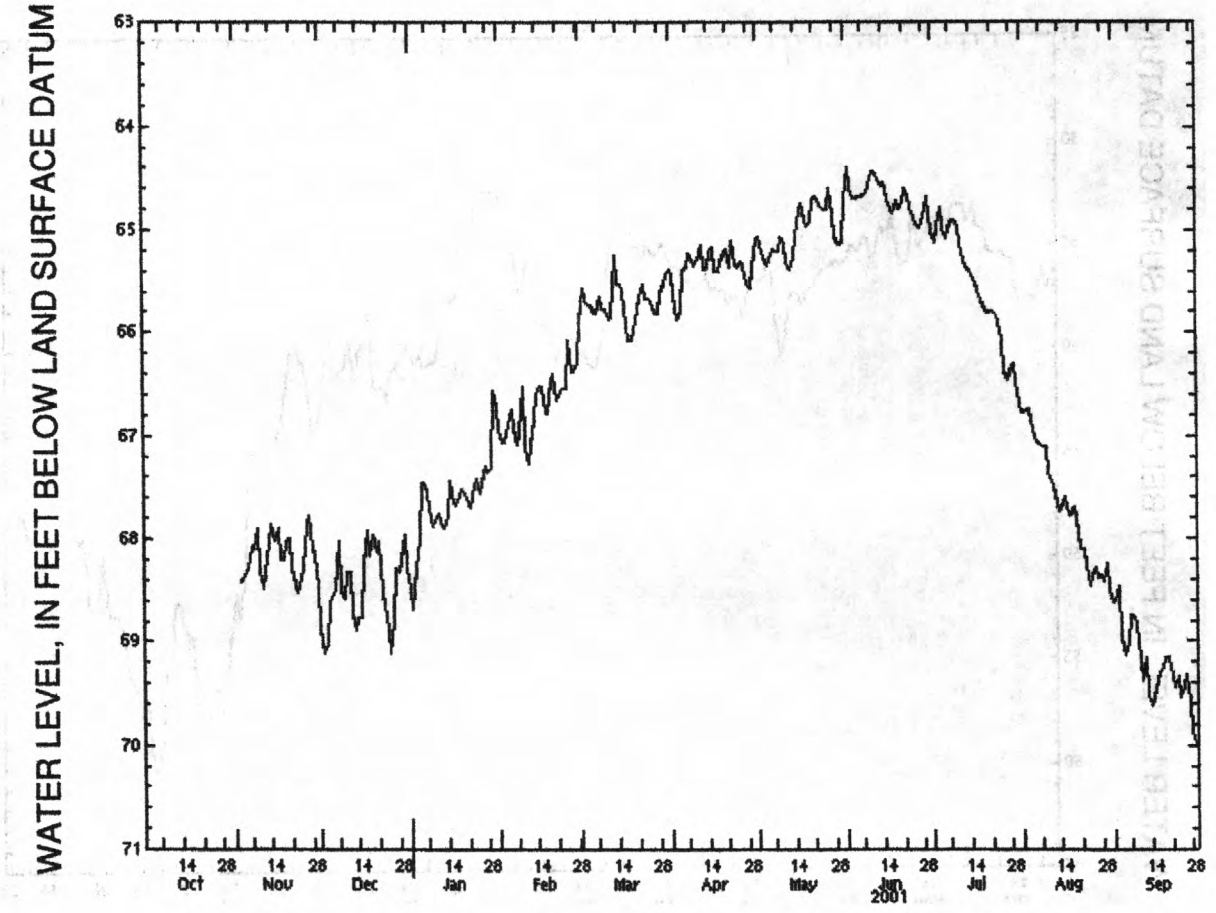
INGHAM COUNTY

424424084340301. Local number, 4N 2W 17ABAA.
LOCATION.--Lat 42°44'24", long 84°34'03", Hydrologic Unit 04050004, at Kirby and Logan Streets in Lansing. Owner: City of Lansing.
AQUIFER.--Saginaw Formation of Pennsylvanian age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 20 in, depth 424 ft.
INSTRUMENTATION.--Water-level recorder. Monthly measurements prior to August 1960.
DATUM.--Elevation of land-surface datum is 858.72 ft above sea level. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--December 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.3 ft below land-surface datum, December 1929; lowest recorded, 168.3 ft below land-surface datum, May 7, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	--	68.32	68.53	67.45	66.74	65.73	65.80	65.34	64.69	64.98	67.00	69.13
10	--	68.30	68.33	67.77	67.13	65.78	65.34	65.06	64.50	64.96	67.38	69.18
15	--	68.01	68.77	67.43	66.53	65.53	65.20	65.04	64.54	65.44	67.65	69.53
20	--	67.99	68.13	67.55	66.40	65.98	65.22	64.91	64.79	65.81	67.93	69.16
25	--	68.28	69.12	67.56	66.08	65.66	65.36	64.79	64.87	66.08	68.37	69.44
EOM	--	68.46	68.28	66.72	66.28	65.42	65.37	65.12	64.68	66.68	68.51	69.97

WTR YR 2001 HIGHEST 64.20 JUN 2 LOWEST 69.99 SEP 29



GROUND-WATER LEVELS

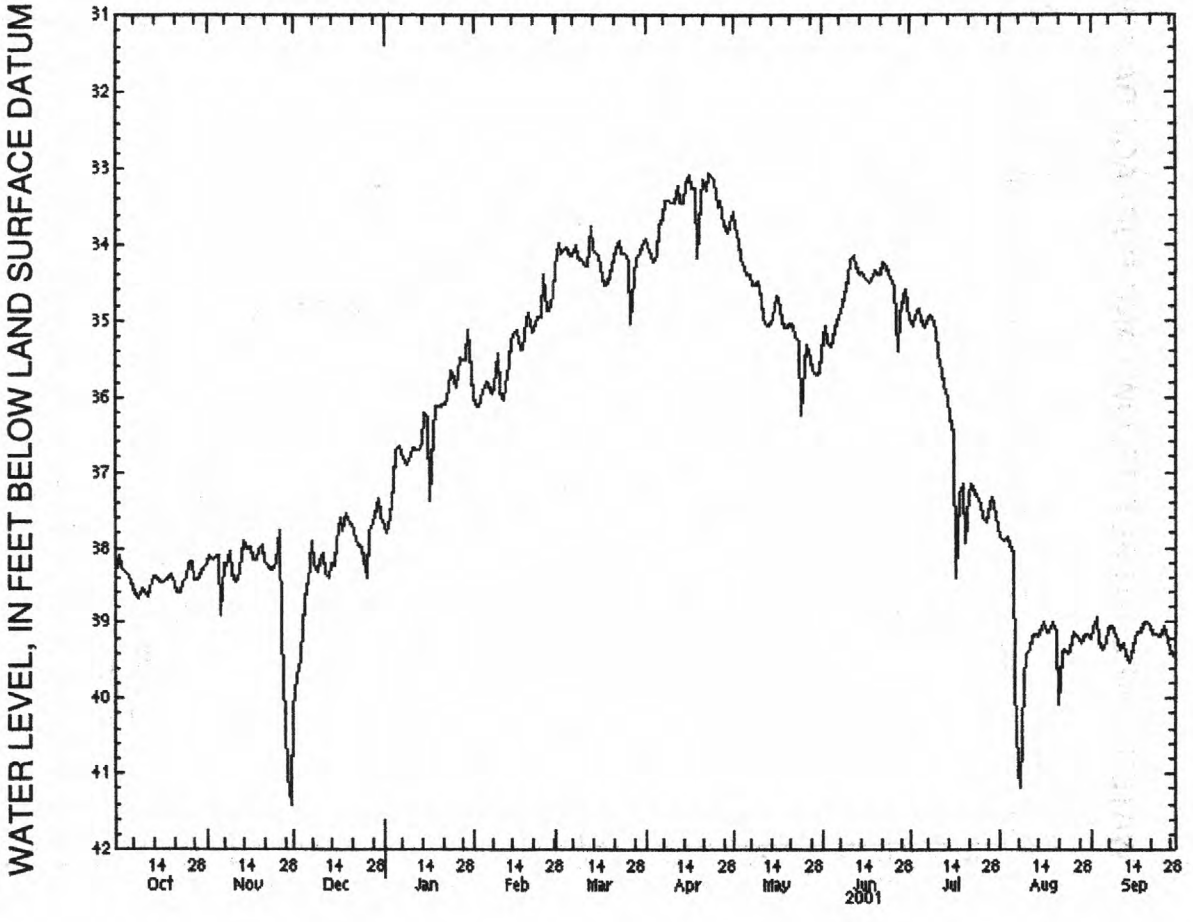
INGHAM COUNTY

424502084331301. Local number, 4N 2W 9BDAD.
LOCATION.--Lat 42°45'02", 84°33'13", Hydrologic Unit 04050004, at North Grand River Avenue, Lansing Township in Lansing. Owner: City of Lansing.
AQUIFER.--Saginaw Formation.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 14 in, depth 401 ft, cased to 49 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 828.81 ft above sea level. Measuring point: Plywood instrument shelf, 4.0 ft above land-surface datum.
REMARKS.--Water levels affected by regional pumping.
PERIOD OF RECORD.--1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 15.6 ft below land-surface datum, March 1931; lowest recorded, 179.4 ft below land-surface datum, April 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	38.34	38.11	38.49	36.69	35.78	34.03	34.15	34.30	35.22	34.99	38.08	39.34
10	38.53	38.34	38.15	36.77	35.93	34.19	33.45	34.48	34.45	35.12	39.41	39.25
15	38.41	38.01	38.23	36.21	35.14	34.11	33.20	34.95	34.36	36.25	39.08	39.43
20	38.35	37.95	37.67	36.11	34.89	34.39	33.38	35.08	34.40	37.93	39.14	38.98
25	38.39	38.17	38.15	35.77	34.40	34.12	33.14	36.24	34.47	37.39	39.35	39.16
EOM	38.27	41.41	37.56	35.68	34.68	33.99	33.71	35.68	34.58	37.70	39.15	39.38

WTR YR 2001 HIGHEST 32.62 APR 23 LOWEST 41.41 NOV 30



GROUND-WATER LEVELS

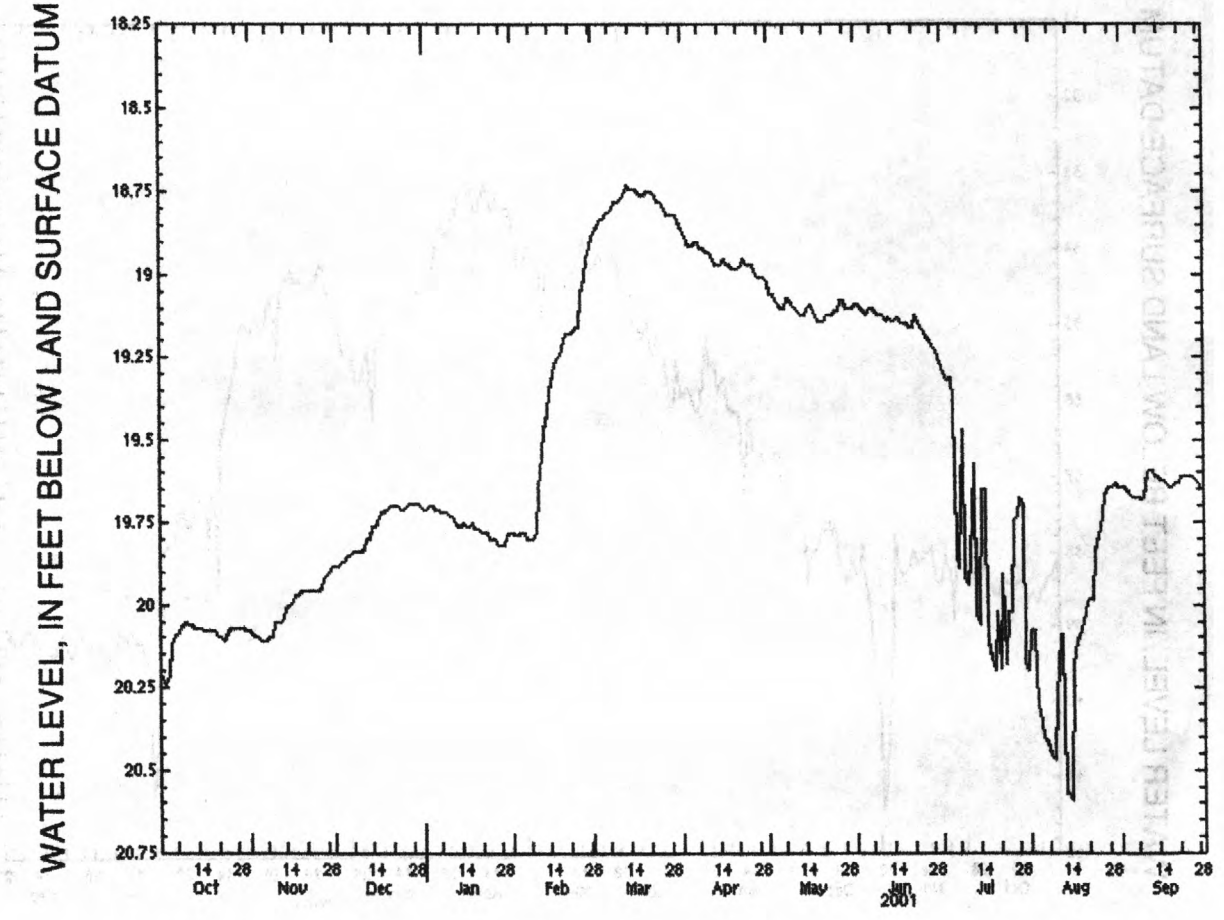
KALAMAZOO COUNTY

420838085344501. Local number, 4S 11W 3CDDA.
LOCATION.--Lat 42°08'38", long 85°34'45", Hydrologic Unit 04050003, in Prairie View Park, 300 ft north of U Avenue, and 3.0 mi south of Portage.
Owner: Kalamazoo County.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 190 ft, screened 180 ft to 190 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 870 ft above sea level, from topographic map. Measuring point: Top of shelter base, 2.5 ft above land-surface datum.
PERIOD OF RECORD.--October 1969 to September 1992, June to September 2001.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 18.03 ft below land-surface datum, Apr. 17, 1985; lowest recorded, 20.72 ft below land-surface datum, Aug. 22, 23, 2000.
EXTREMES OUTSIDE PERIOD OF RECORD.--Lowest water level measured, 20.85 ft below land-surface datum, Nov. 17, 1999.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	20.12	20.11	19.85	19.71	19.78	18.83	18.91	19.09	19.12	19.38	20.40	19.67
10	20.05	20.05	19.84	19.73	19.65	18.78	18.93	19.09	19.12	19.94	20.28	19.60
15	20.07	20.00	19.76	19.75	19.30	18.74	18.97	19.10	19.14	19.65	20.59	19.62
20	20.08	19.96	19.70	19.77	19.18	18.75	18.98	19.14	19.16	20.02	19.99	19.63
25	20.07	19.96	19.71	19.80	19.06	18.78	18.97	19.11	19.17	20.02	19.77	19.61
EOM	20.08	19.88	19.70	19.78	18.91	18.84	19.01	19.10	19.25	20.20	19.64	19.65

WTR YR 2001 HIGHEST 18.72 MAR 12, 13 LOWEST 20.59 AUG 15



GROUND-WATER LEVELS

KALAMAZOO COUNTY

421127085321701. Local number, 3S 11W 24DBCA.
LOCATION.--Lat 42°11'27", long 85°32'17", Hydrologic Unit 04050003, in Ramona Park in Portage. Owner: City of Portage.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 183 ft, screened 178 ft to 183 ft.
INSTRUMENTATION.--Periodic measurements.
DATUM.--Elevation of land-surface datum is 861.77 ft above sea level (levels by City of Portage). Measuring point: Top of casing, 0.3 ft below land-surface datum.
REMARKS.--Water level measurements provided by City of Portage.
PERIOD OF RECORD.--March 1999 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.35 ft below land-surface datum, May 14, 1999; lowest measured, 15.87 ft below land-surface datum, May 8, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	15.18	DEC 15	14.90	FEB 23	13.72	MAY 3	13.00	JUL 20	13.60
OCT 6	15.04	DEC 22	14.75	MAR 2	13.10	MAY 10	13.08	JUL 26	13.40
OCT 13	15.04	DEC 26	14.47	MAR 8	13.20	MAY 17	12.92	AUG 1	13.59
OCT 19	15.20	JAN 5	14.27	MAR 12	13.06	MAY 24	12.99	AUG 7	13.83
OCT 25	14.78	JAN 11	14.80	MAR 15	12.90	JUN 1	12.78	AUG 8	13.82
NOV 3	15.10	JAN 15	14.69	MAR 22	13.00	JUN 7	12.80	AUG 16	13.97
NOV 9	14.97	JAN 22	14.75	MAR 29	12.80	JUN 14	12.75	AUG 23	13.40
NOV 19	14.95	JAN 26	14.70	APR 5	12.99	JUN 22	12.75	AUG 30	13.14
NOV 21	15.20	FEB 1	14.50	APR 10	12.95	JUN 29	13.11	SEP 7	13.25
DEC 1	14.99	FEB 8	14.60	APR 19	13.15	JUL 3	12.93	SEP 13	13.26
DEC 8	15.00	FEB 14	13.84	APR 27	13.04	JUL 7	13.36	SEP 20	13.30
						JUL 13	13.55	SEP 25	13.11

WTR YR 2001 HIGHEST 12.75 JUN 14, 22 LOWEST 15.20 OCT 19, NOV 21

GROUND-WATER LEVELS

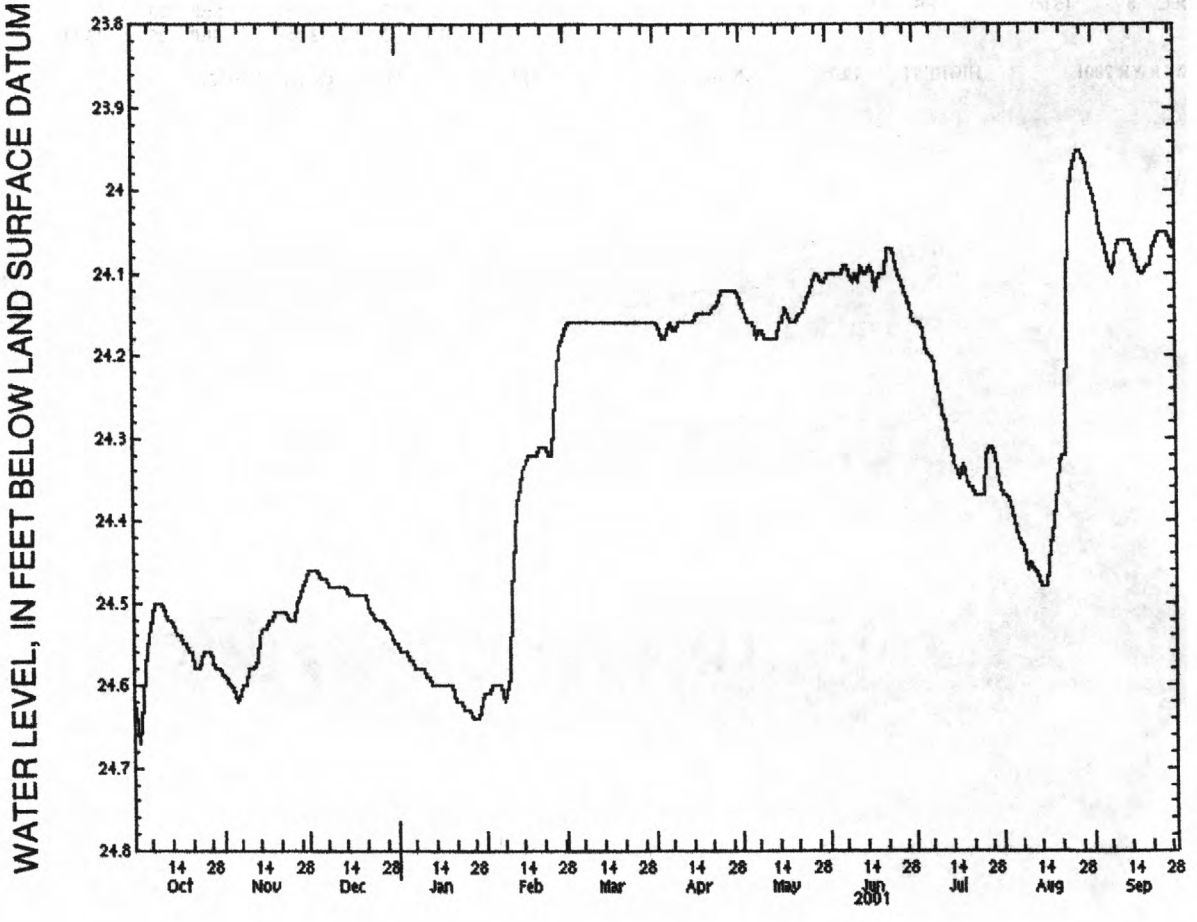
KALAMAZOO COUNTY

421150085383901. Local number, 3S 11W 19BBDD1.
LOCATION.--Lat 42°11'50", long 85°38'39", Hydrologic Unit 04050003, in Gourdneck State Game Area, near intersection of Angling Road and Centre Avenue, 1.5 mi southwest of Portage. Owner: Pharmacia & Upjohn.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in, depth 65 ft, screened 63 ft to 65 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 890.18 ft above sea level. Measuring point: Plywood shelter base, 2.8 ft above land-surface datum.
PERIOD OF RECORD.--November 1998 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 23.76 ft below land-surface datum, Apr. 28, 29, 1999; lowest recorded, 24.81 ft below land-surface datum, Sept. 8-10, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	24.58	24.61	24.47	24.57	24.60	24.16	24.18	24.16	24.10	24.19	24.41	24.06
10	24.50	24.58	24.48	24.58	24.49	24.16	24.16	24.18	24.11	24.25	24.45	24.06
15	24.53	24.53	24.49	24.60	24.33	24.16	24.16	24.16	24.10	24.33	24.48	24.07
20	24.56	24.51	24.49	24.60	24.31	24.16	24.15	24.16	24.10	24.36	24.33	24.09
25	24.56	24.52	24.52	24.63	24.28	24.16	24.12	24.13	24.09	24.37	23.98	24.05
EOM	24.58	24.47	24.55	24.61	24.18	24.16	24.12	24.11	24.14	24.36	23.99	24.07

WTR YR 2001 HIGHEST 23.94 AUG 27 LOWEST 24.67 OCT 3



GROUND-WATER LEVELS

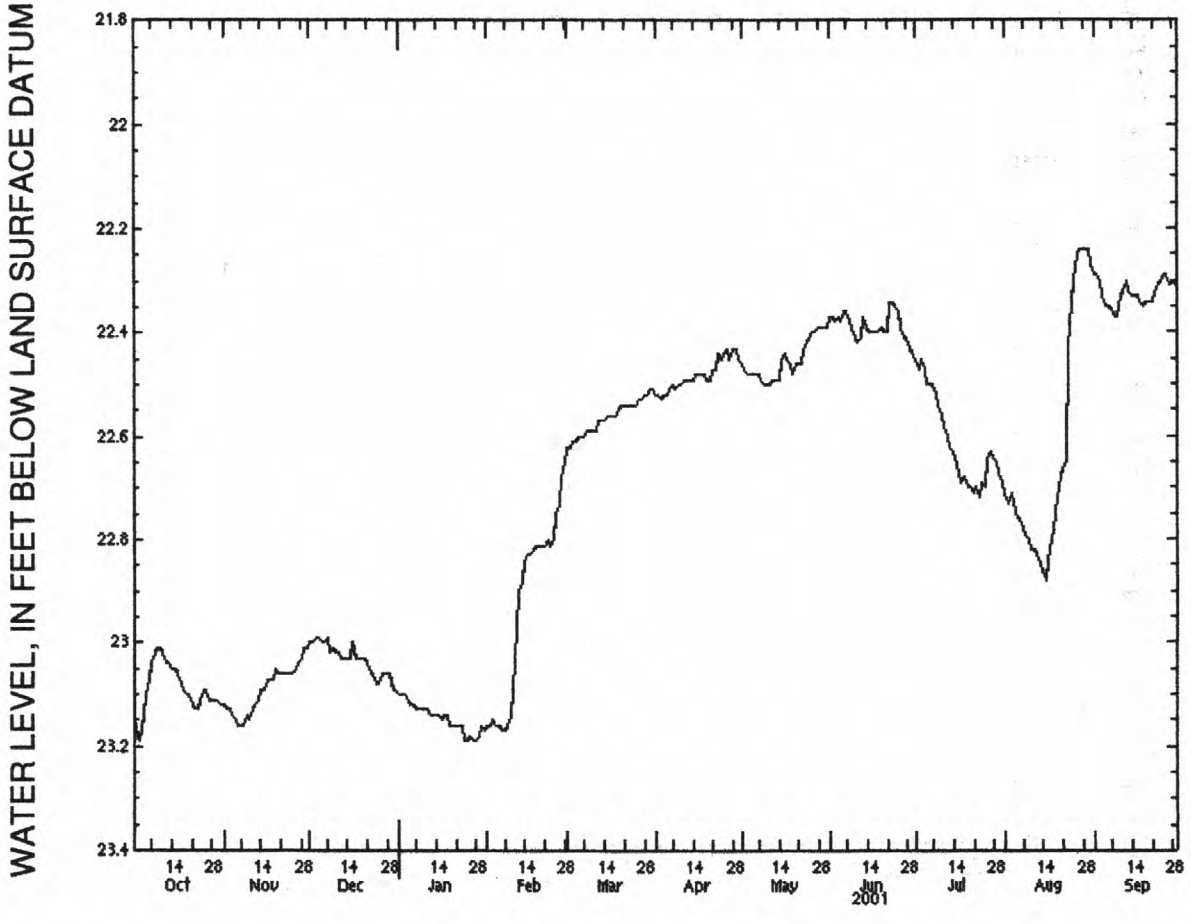
KALAMAZOO COUNTY

421150085383902. Local number, 3S 11W 19BBDD2.
LOCATION.--Lat 42°11'50", long 85°38'39", Hydrologic Unit 04050003, in Gourdneck State Game Area, near intersection of Angling Road and Centre Avenue, 1.5 mi southwest of Portage. Owner: Pharmacia & Upjohn.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in, depth 177 ft, screened 175 ft to 177 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 889.90 ft above sea level. Measuring point: Plywood shelter base, 3.0 ft above land-surface datum.
PERIOD OF RECORD.--November 1998 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 22.00 ft below land-surface datum, Apr. 30 - May 3, 1999; lowest recorded, 23.34 ft below land-surface datum, Sept. 8-10, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	23.10	23.15	23.00	23.12	23.16	22.60	22.52	22.48	22.38	22.50	22.76	22.35
10	23.01	23.15	23.02	23.13	23.09	22.59	22.50	22.50	22.41	22.56	22.82	22.33
15	23.05	23.09	23.03	23.14	22.83	22.56	22.48	22.45	22.40	22.64	22.88	22.33
20	23.10	23.06	23.03	23.16	22.81	22.54	22.49	22.46	22.40	22.70	22.68	22.34
25	23.09	23.06	23.08	23.19	22.75	22.54	22.44	22.41	22.36	22.70	22.30	22.29
EOM	23.12	23.01	23.09	23.17	22.65	22.51	22.45	22.39	22.44	22.69	22.27	22.31

WTR YR 2001 HIGHEST 22.22 AUG 27-30 LOWEST 23.19 OCT 3, JAN 24, 27, 28



GROUND-WATER LEVELS

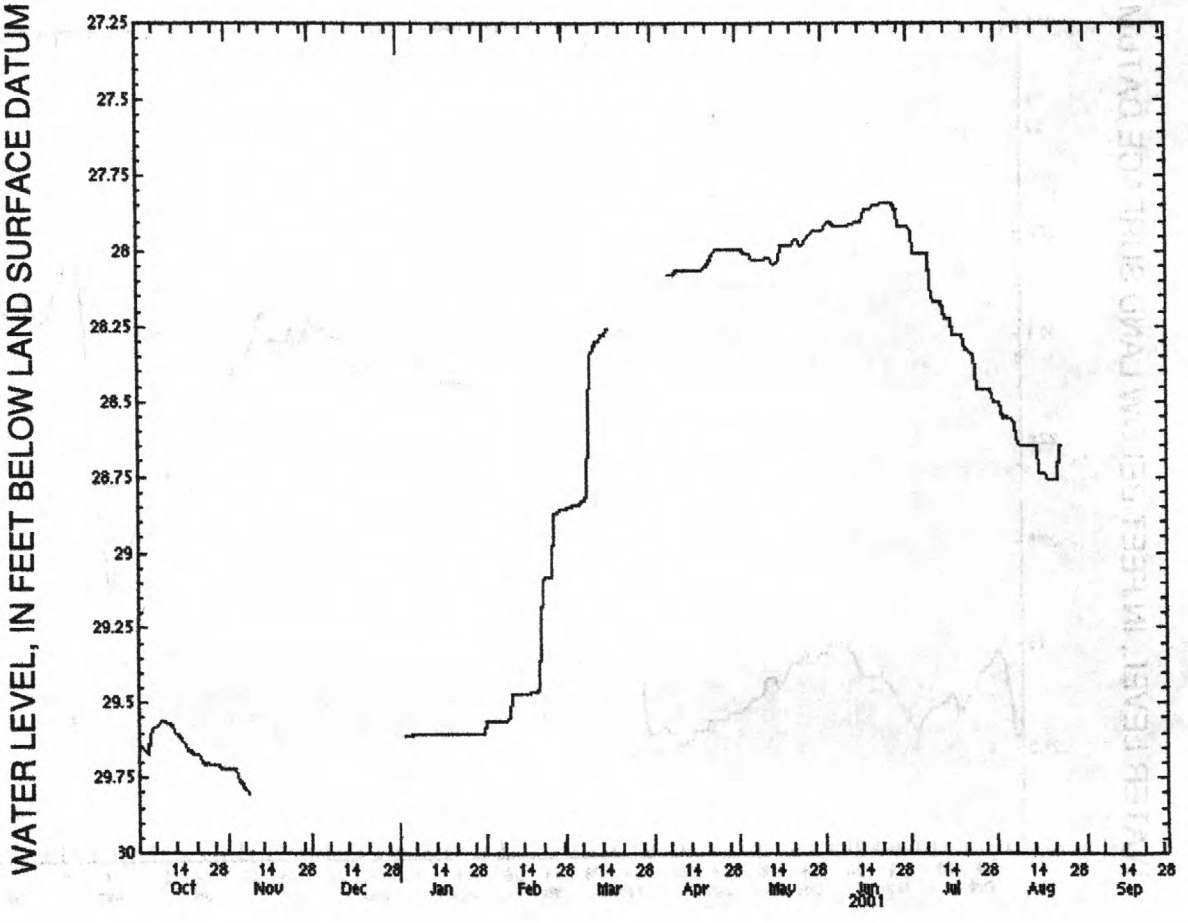
KALAMAZOO COUNTY

421151085351601. Local number, 3S 11W 22BBCD.
LOCATION.--Lat 42°11'51", long 85°35'16", Hydrologic Unit 04050003, at Portage Central High School, Kalamazoo Township in Portage. Owner: Portage Public Schools.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 12 in, depth 102 ft, screened 87 ft to 102 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 877 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 2.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--June 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 24.8 ft below land-surface datum, April 1985; lowest recorded, 30.58 ft below land-surface datum, Feb. 21, 22, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	29.60	29.76	---	29.61	29.56	28.84	---	28.01	27.92	28.01	28.56	---
10	29.56	---	---	29.60	29.47	28.34	28.06	28.03	27.92	28.17	28.65	---
15	29.61	---	---	29.60	29.47	28.28	28.06	28.04	27.90	28.22	28.65	---
20	29.67	---	---	29.60	29.45	---	28.05	27.98	27.85	28.28	28.76	---
25	29.70	---	---	29.60	28.87	---	27.99	27.98	27.84	28.46	---	---
EOM	29.72	---	---	29.60	28.86	---	27.99	27.93	27.92	28.50	---	28.53

WTR YR 2001 HIGHEST 27.84 JUN 19-27 LOWEST 29.81 NOV 9



GROUND-WATER LEVELS

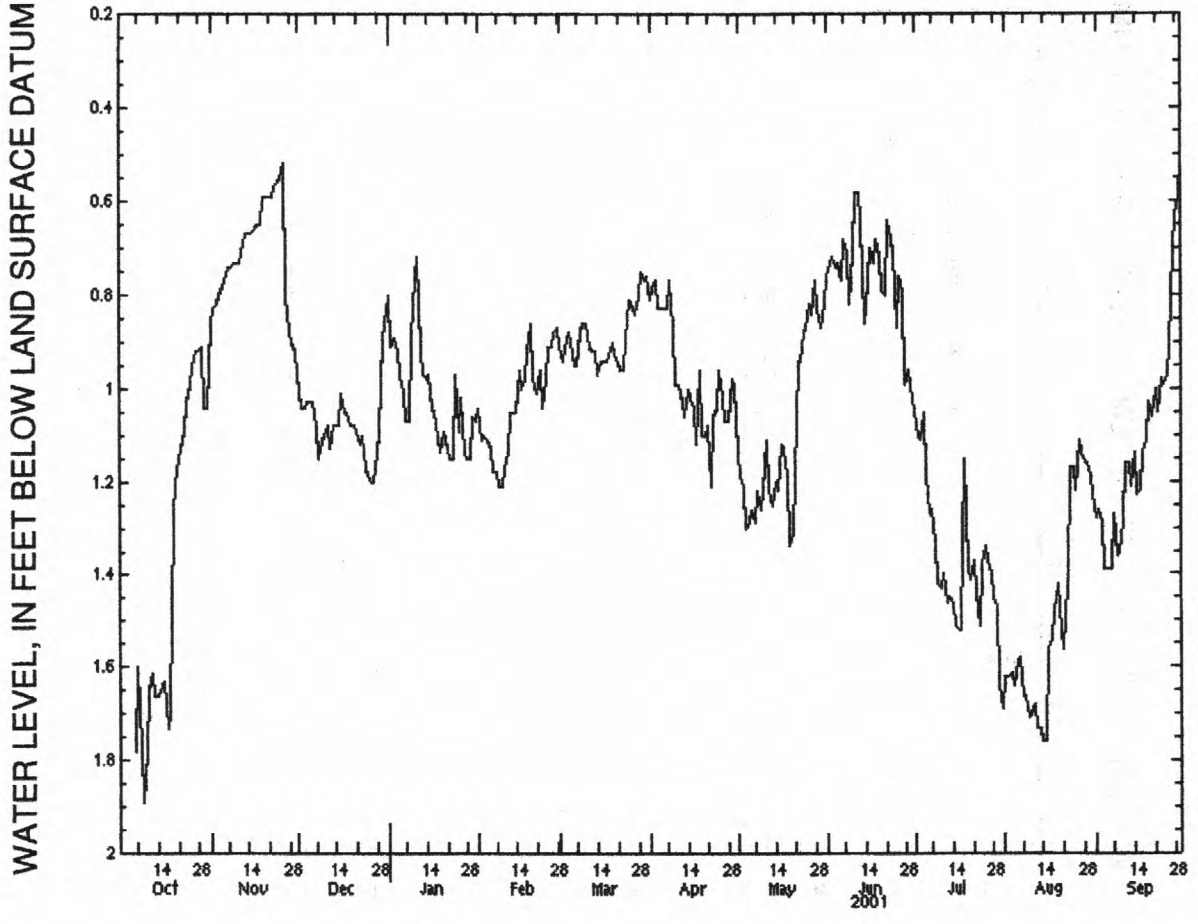
KALAMAZOO COUNTY

421325085404801. Local number, 3S 12W 11BDAD.
LOCATION.--Lat 42°13'25", long 85°40'48", Hydrologic Unit 04050003, at Kalamazoo Valley Community College. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 3 in, depth 248 ft, screened 245 ft to 248 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 880 ft above sea level, from topographic map. Measuring point: Top of shelter base, 3.5 ft above land-surface datum.
PERIOD OF RECORD.--March 1961 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, +2.98 ft above land-surface datum, Sept 4, 1969; lowest recorded, 2.16 ft below land-surface datum, Sept. 10, 18, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	—	.78	1.03	.97	1.13	.90	.83	1.29	.73	1.19	1.59	1.39
10	1.78	.73	1.10	.76	1.17	.86	.99	1.22	.71	1.43	1.70	1.29
15	1.64	.67	1.08	.97	.96	.94	1.02	1.22	.83	1.51	1.76	1.23
20	1.20	.59	1.08	1.09	.98	.93	1.10	1.31	.79	1.41	1.52	1.06
25	.99	.55	1.19	1.09	.91	.81	.96	.87	.87	1.34	1.22	.97
EOM	1.04	.92	.86	1.07	.87	.76	.99	.82	.99	1.69	1.23	.52

WTR YR 2001 HIGHEST 0.38 JUN 13 LOWEST 1.89 OCT 9



GROUND-WATER LEVELS

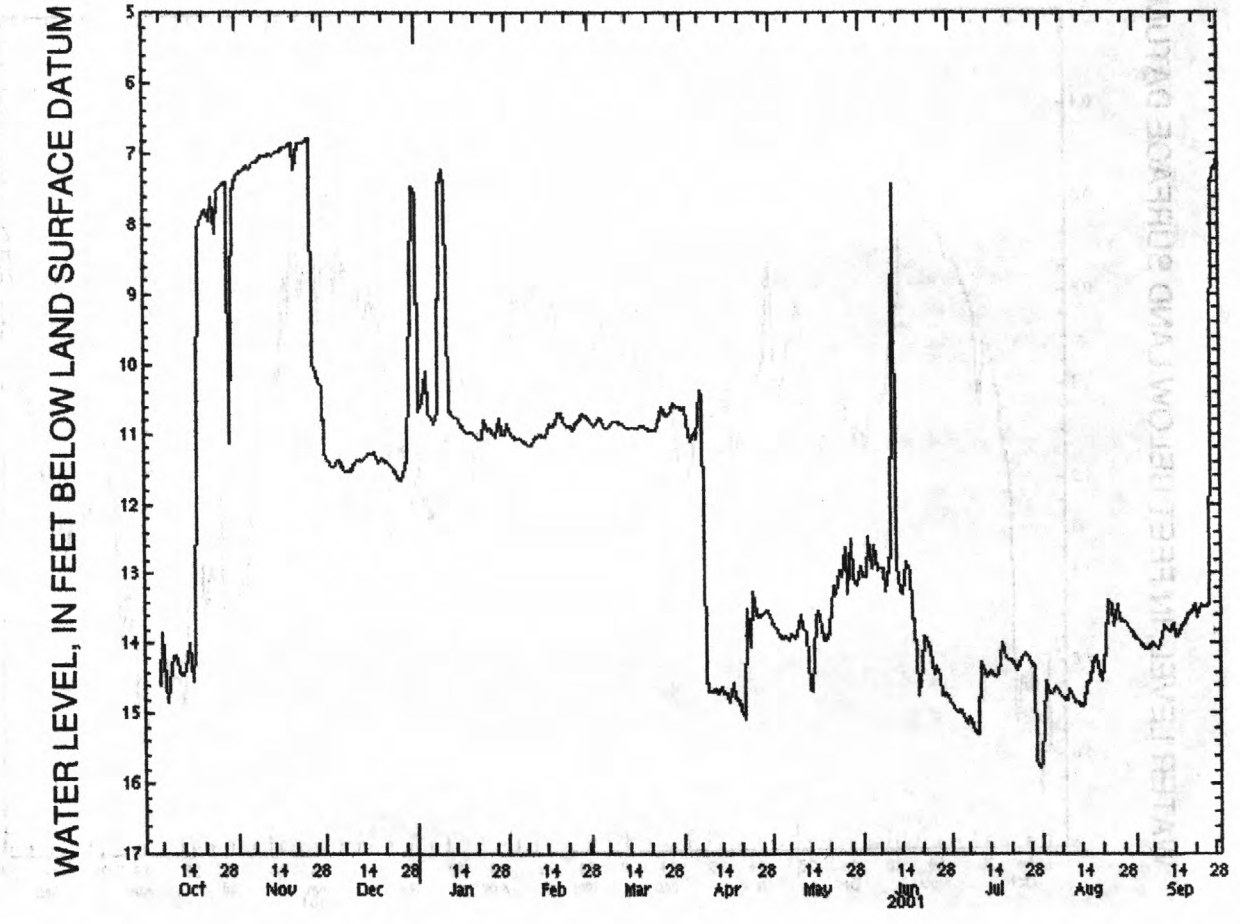
KALAMAZOO COUNTY

421332085401901. Local number, 3S 12W 11AD1.
LOCATION.--Lat 42°13'32", long 85°40'19", Hydrologic Unit 04050003, at Al Sabo Land Preserve, Texas Township, 3.0 mi west of Portage. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 300 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 877 ft above sea level. Measuring point: Plywood instrument shelf, 2.5 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--December 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 4.5 ft below land-surface datum, July 1973; lowest recorded, 17.09 ft below land-surface datum, July 20, 1994.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	--	7.19	11.37	10.70	11.08	10.83	10.97	13.92	12.58	15.04	14.62	14.08
10	14.33	7.03	11.54	7.20	11.08	10.84	14.69	13.87	12.88	15.30	14.66	13.89
15	14.24	6.96	11.32	10.78	10.87	10.93	14.71	14.70	13.29	14.44	14.88	13.89
20	7.95	6.86	11.34	10.99	10.84	10.93	14.80	13.94	14.76	14.24	14.45	13.56
25	8.12	6.82	11.57	10.94	10.83	10.61	13.25	13.05	14.44	14.18	13.74	13.46
EOM	7.53	10.32	7.45	11.00	10.77	10.62	13.53	12.88	14.78	15.78	13.82	7.03

WTR YR 2001 HIGHEST 6.77 NOV 27 LOWEST 15.78 JUL 31



GROUND-WATER LEVELS

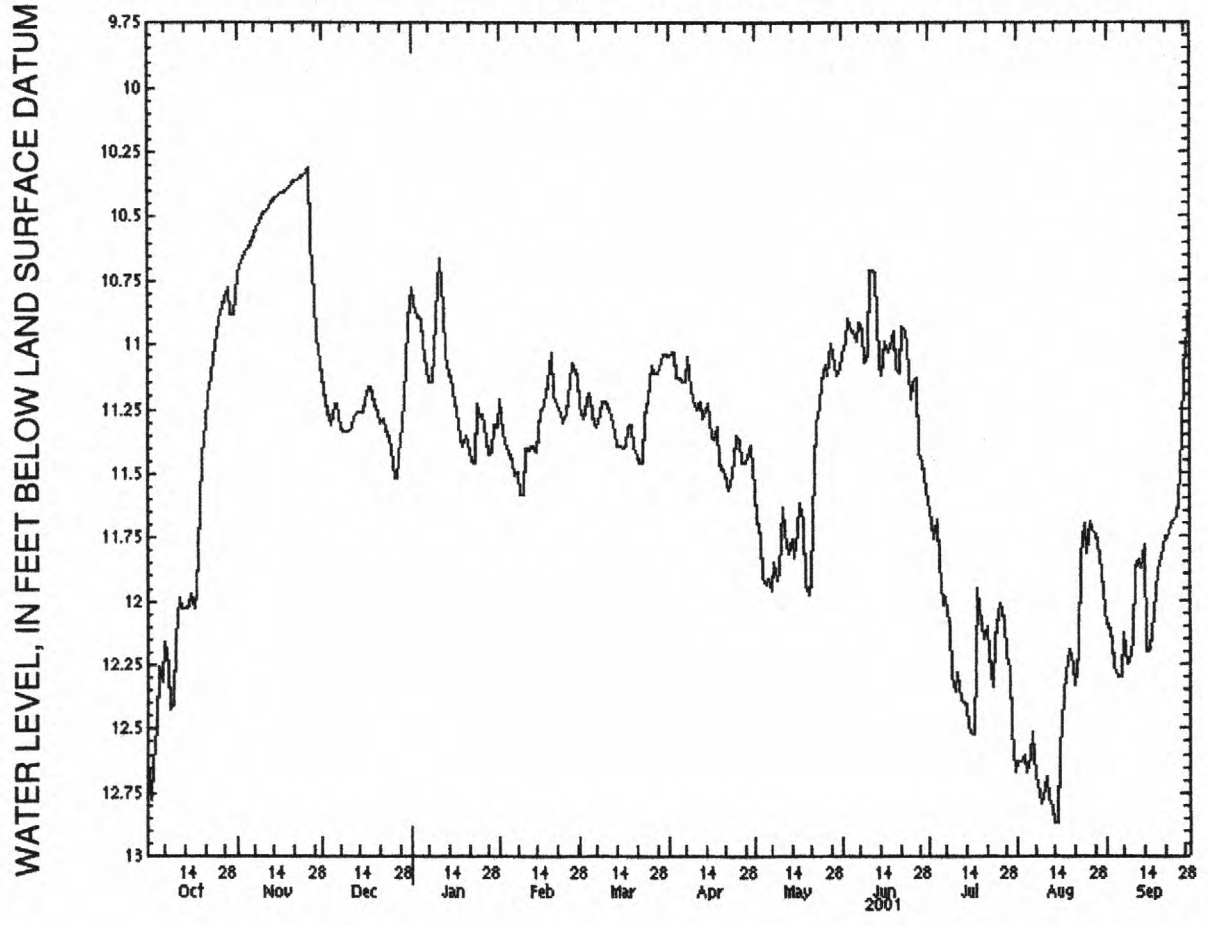
KALAMAZOO COUNTY

421332085401902. Local number, 3S 12W 22AD2.
LOCATION.--Lat 42°13'32", long 85°40'19", Hydrologic Unit 04050003, at Al Sabo Land Preserve, Texas Township, 3.0 mi west of Portage. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in, depth 38 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 877 ft above sea level. Measuring point: Plywood instrument shelf, 2.5 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--January 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 9.1 ft below land-surface datum, August 1975; lowest recorded, 13.42 ft below land-surface datum, Sept. 10, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.26	10.62	11.23	11.00	11.45	11.21	11.13	11.94	10.95	11.85	12.61	12.30
10	12.41	10.49	11.34	10.77	11.40	11.22	11.21	11.88	11.04	12.36	12.77	12.16
15	12.02	10.42	11.26	11.13	11.25	11.39	11.23	11.83	11.12	12.50	12.87	12.20
20	11.43	10.37	11.26	11.35	11.20	11.40	11.49	11.98	11.10	12.15	12.25	11.83
25	10.96	10.33	11.40	11.28	11.21	11.21	11.35	11.15	11.21	12.05	11.81	11.67
EOM	10.88	11.07	10.91	11.32	11.12	11.04	11.39	11.10	11.52	12.67	11.97	10.80

WTR YR 2001 HIGHEST 10.28 NOV 27 LOWEST 12.87 AUG 14



GROUND-WATER LEVELS

KALAMAZOO COUNTY

421358085322401. Local number, 3S 11W 1DCBB.
LOCATION.--Lat 42°13'58", long 85°32'24", Hydrologic Unit 04050003, near intersection of Sprinkle Road and Winthrop Avenue in Portage. Owner: City of Portage.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 179 ft, screened 134 ft to 179 ft.
INSTRUMENTATION.--Periodic measurements.
DATUM.--Elevation of land-surface datum is 856.64 ft above sea level (levels by City of Portage). Measuring point: Top of casing, 2.0 ft above land-surface datum.
REMARKS.--Water level measurements provided by City of Portage.
PERIOD OF RECORD.--March 1999 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.27 ft below land-surface datum, June 1, 2001; lowest measured, 18.73 ft below land-surface datum, Feb. 23, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	17.25	DEC 19	16.74	FEB 16	16.06	MAY 3	14.80	JUL 20	14.77
OCT 6	17.35	DEC 22	16.85	FEB 23	15.31	MAY 10	14.80	JUL 27	15.00
OCT 13	17.28	DEC 26	16.70	MAR 1	14.57	MAY 18	14.54	AUG 1	14.92
OCT 19	17.40	JAN 5	16.40	MAR 9	14.40	MAY 24	14.40	AUG 8	15.00
OCT 25	17.36	JAN 11	17.00	MAR 15	14.31	JUN 1	14.27	AUG 10	15.20
NOV 1	17.41	JAN 17	16.72	MAR 22	14.41	JUN 7	14.50	AUG 19	15.26
NOV 9	17.41	JAN 22	16.85	MAR 29	14.70	JUN 16	14.30	AUG 23	15.20
NOV 19	17.35	JAN 26	16.78	APR 6	14.50	JUN 22	14.40	AUG 30	14.62
NOV 22	17.28	FEB 1	16.73	APR 12	14.59	JUN 29	14.30	SEP 7	14.78
DEC 9	17.10	FEB 8	16.85	APR 18	14.65	JUL 3	14.35	SEP 13	14.82
DEC 15	17.10	FEB 15	15.64	APR 20	14.68	JUL 7	14.46	SEP 20	15.20
				APR 27	14.60	JUL 14	14.71	SEP 25	14.84

WTR YR 2001 HIGHEST 14.27 JUN 1 LOWEST 17.41 NOV 1, 9

GROUND-WATER LEVELS

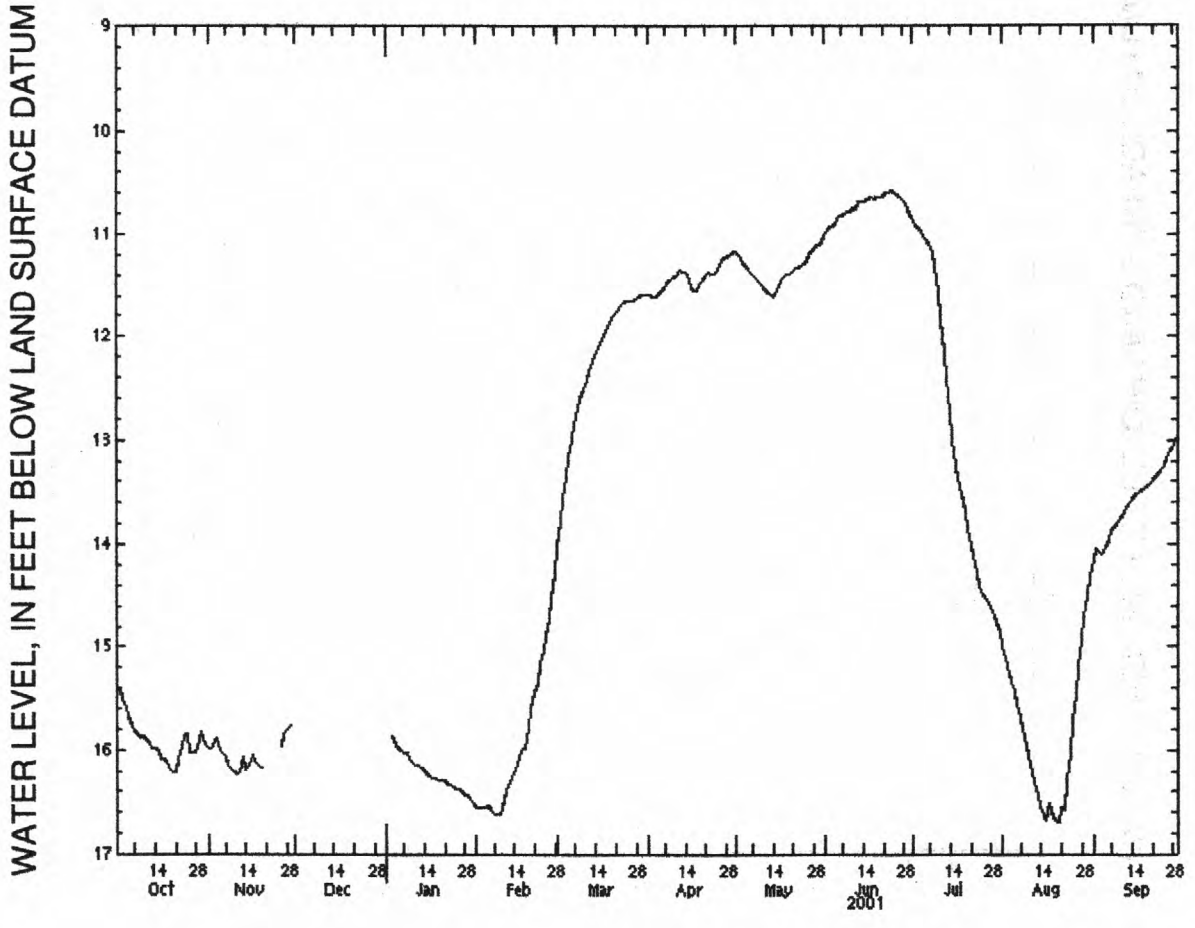
KALAMAZOO COUNTY

421435085353701. Local number, 3S 11W 4ABAD1.
LOCATION.--Lat 42°14'35", long 85°35'37", Hydrologic Unit 04050003, at Kilgore Road pump station No. 9 in Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 36 ft, screened 33 ft to 36 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 860 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--September 1987 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 9.17 ft below land-surface datum, Apr. 27, 1993; lowest recorded, 17.27 ft below land-surface datum, Sept. 27, 1996.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.68	16.00	---	15.99	16.53	13.17	11.59	11.30	10.87	11.03	15.43	14.04
10	15.86	16.21	---	16.13	16.55	12.53	11.42	11.47	10.77	11.54	16.07	13.75
15	16.01	16.14	---	16.22	16.14	12.11	11.39	11.56	10.67	12.99	16.64	13.54
20	16.20	16.16	---	16.29	15.60	11.81	11.45	11.38	10.63	13.85	16.69	13.43
25	15.84	---	---	16.36	14.90	11.65	11.36	11.29	10.59	14.48	15.72	13.24
EOM	15.95	15.75	---	16.51	14.29	11.58	11.18	11.08	10.75	14.85	14.31	12.97

WTR YR 2001 HIGHEST 10.58 JUN 23-25 LOWEST 16.69 AUG 20



GROUND-WATER LEVELS

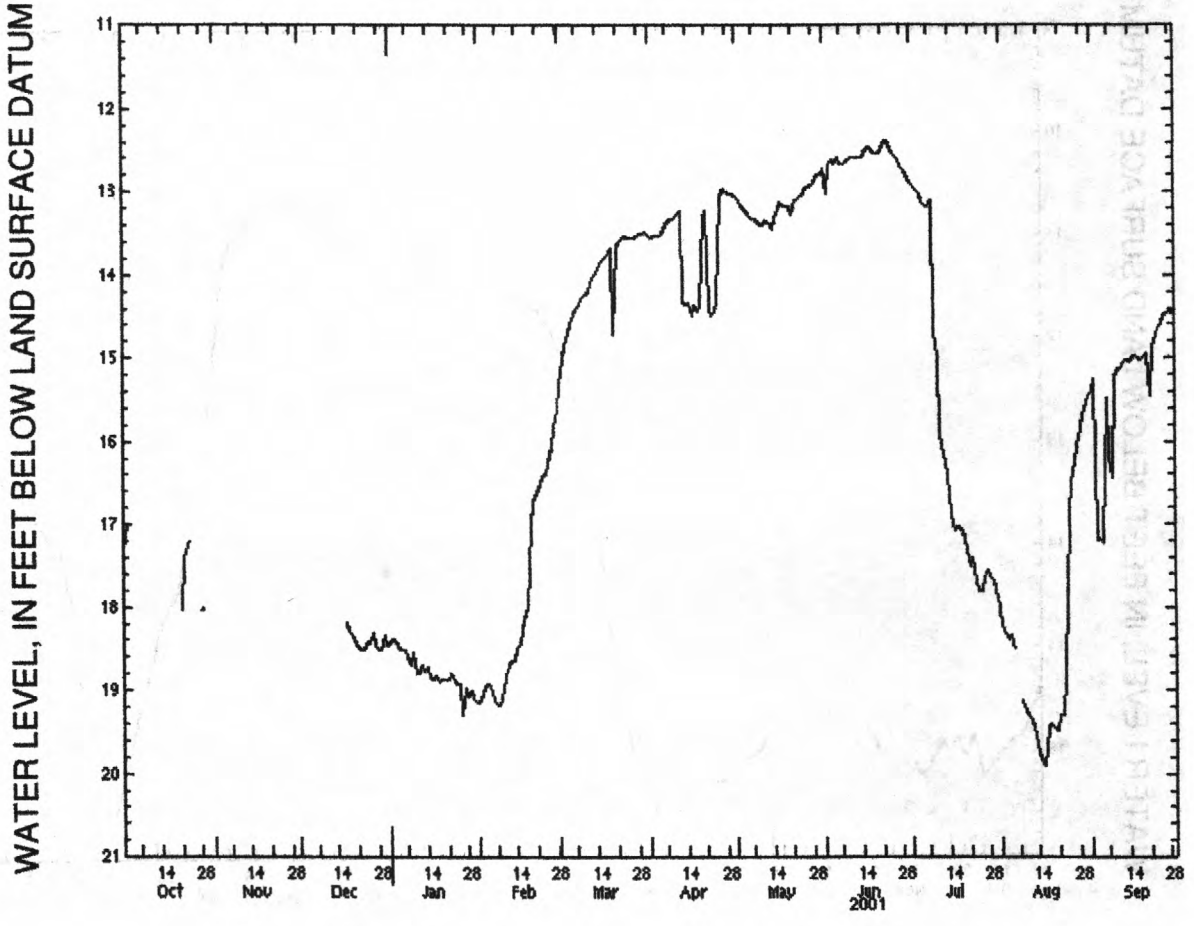
KALAMAZOO COUNTY

421435085353702. Local number, 3S 11W 4ABAD2.
LOCATION.--Lat 42°14'35", long 85°35'37", Hydrologic Unit 04050003, at Kilgore Road pump station No. 9 in Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 148 ft, screened 145 ft to 148 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 860 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--September 1987 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 10.73 ft below land-surface datum, May 4, 5, 1993; lowest recorded, 20.08 ft below land-surface datum, Sept. 20, 1996.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	—	—	—	18.51	19.00	14.58	13.52	13.23	12.67	13.12	18.52	17.22
10	—	—	—	18.80	18.82	14.23	13.32	13.39	12.62	15.00	19.29	15.13
15	—	—	—	18.84	18.45	13.86	14.34	13.29	12.60	16.89	19.87	14.99
20	—	—	18.44	18.88	16.72	14.71	13.29	13.16	12.53	17.32	19.47	14.94
25	—	—	18.43	18.93	16.26	13.54	14.31	13.04	12.54	17.81	16.48	14.58
EOM	—	—	18.47	19.15	15.61	13.47	13.02	12.78	12.80	18.01	15.44	14.44

WTR YR 2001 HIGHEST 12.35 JUN 24 LOWEST 19.92 AUG 16



GROUND-WATER LEVELS

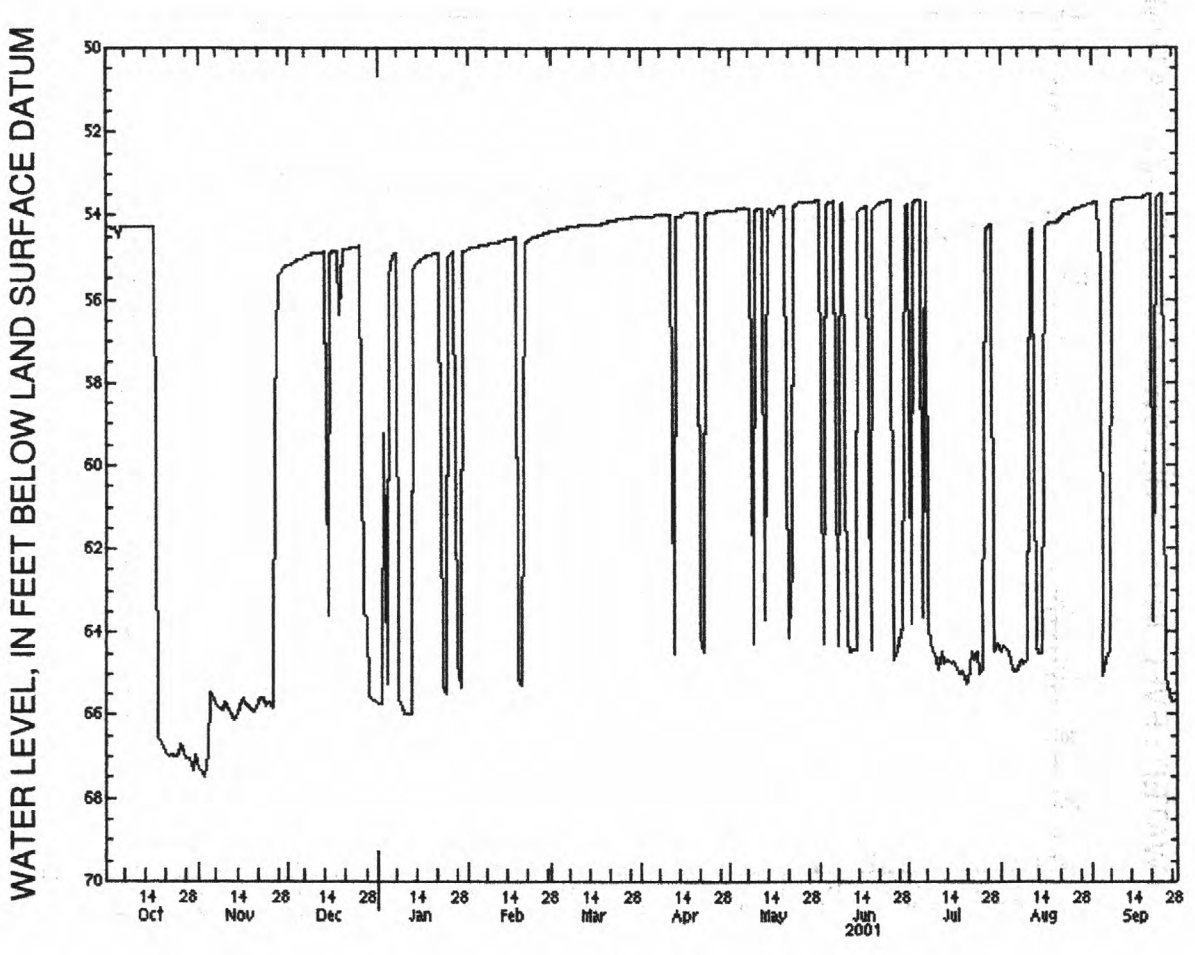
KALAMAZOO COUNTY

421448085383601. Local number, 2S 11W 31CD.
LOCATION.--Lat 42°14'48", long 85°38'36", Hydrologic Unit 04050003, at city well field, 1,000 ft from U.S. Highway 131 in Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 226 ft, screened 216 ft to 226 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 910 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 3.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 41.39 ft below land-surface datum, Sept. 12, 1982; lowest recorded, 71.75 ft below land-surface datum, May 22, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	54.50	65.46	55.04	55.45	54.72	54.33	54.03	53.84	53.67	53.63	64.92	65.07
10	54.27	65.71	54.92	66.00	54.68	54.26	53.97	53.90	64.23	64.62	64.65	53.63
15	54.27	65.76	63.58	55.09	54.55	54.21	53.97	53.82	53.85	64.78	64.50	53.60
20	66.74	65.93	54.81	54.92	54.69	54.16	53.92	53.79	53.78	65.25	54.15	53.51
25	66.93	65.70	54.74	54.99	54.47	54.10	53.92	53.71	53.65	65.03	53.92	53.47
EOM	66.93	55.26	65.62	54.83	54.42	54.04	53.88	53.66	53.78	64.26	53.73	65.58

WTR YR 2001 HIGHEST 53.47 SEP 23-26 LOWEST 67.46 NOV 3



GROUND-WATER LEVELS

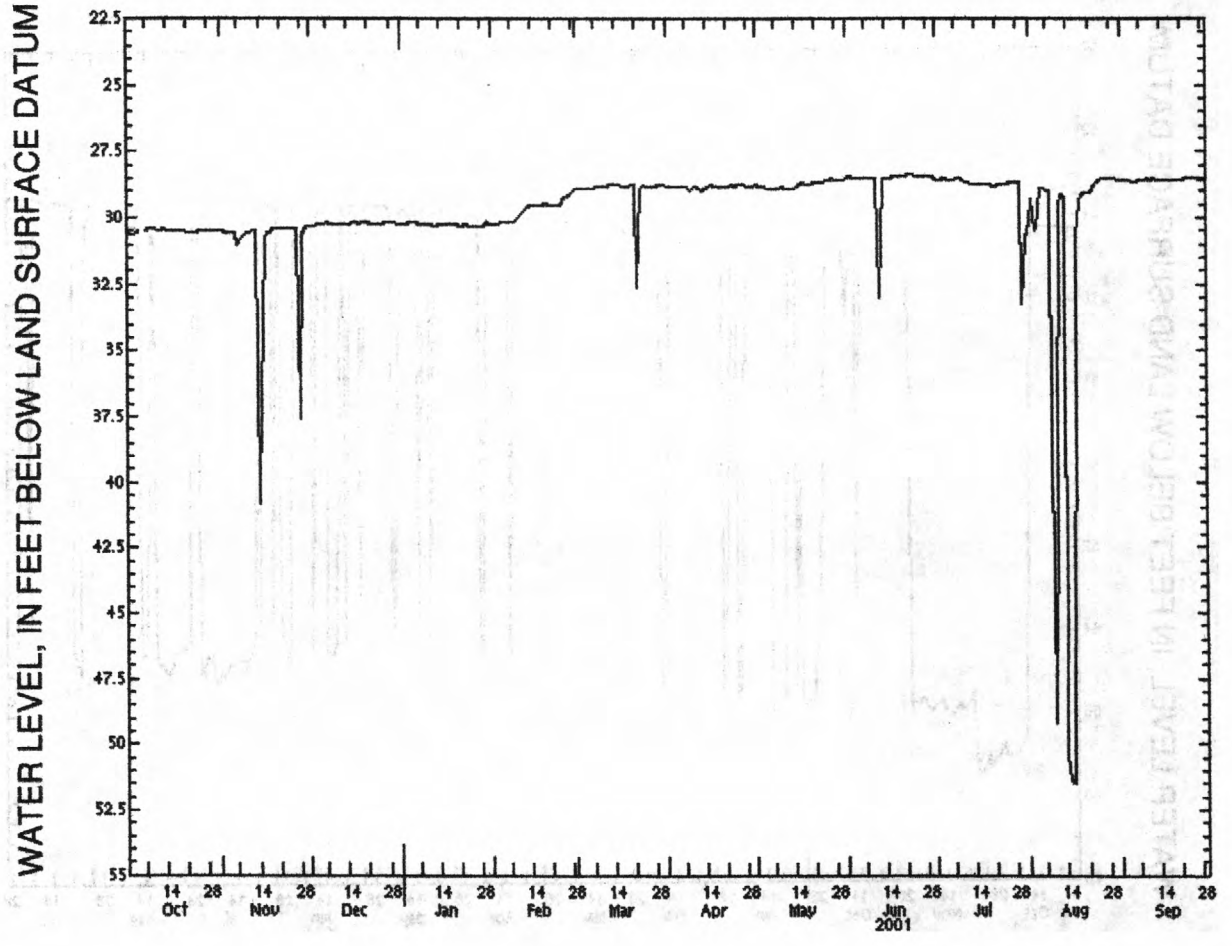
KALAMAZOO COUNTY

421457085325801. Local number, 2S 11W 36CB.
LOCATION.--Lat 42°14'57", long 85°32'58", Hydrologic Unit 04050003, in city well field, 500 ft from Emerald Street in Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 226 ft, screened 216 ft to 226 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 860 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 3.5 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 25.35 ft below land-surface datum, April 1985; lowest recorded, 51.48 ft below land-surface datum, Aug. 16, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	30.46	30.52	30.23	30.18	30.13	28.87	28.84	28.86	28.51	28.55	28.89	28.64
10	30.40	30.53	30.21	30.21	29.91	28.84	28.80	28.84	28.49	28.59	49.14	28.53
15	30.44	36.96	30.22	30.21	29.52	28.75	28.78	28.77	28.49	28.71	51.42	28.56
20	30.47	30.42	30.17	30.23	29.48	28.75	28.80	28.69	28.44	28.78	29.07	28.60
25	30.50	30.42	30.22	30.28	29.22	28.77	28.74	28.60	28.40	28.72	28.61	28.47
EOM	30.50	30.32	30.19	30.21	29.01	28.73	28.78	28.54	28.43	30.82	28.55	28.58

WTR YR 2001 HIGHEST 28.31 JUN 22 LOWEST 51.48 AUG 16



GROUND-WATER LEVELS

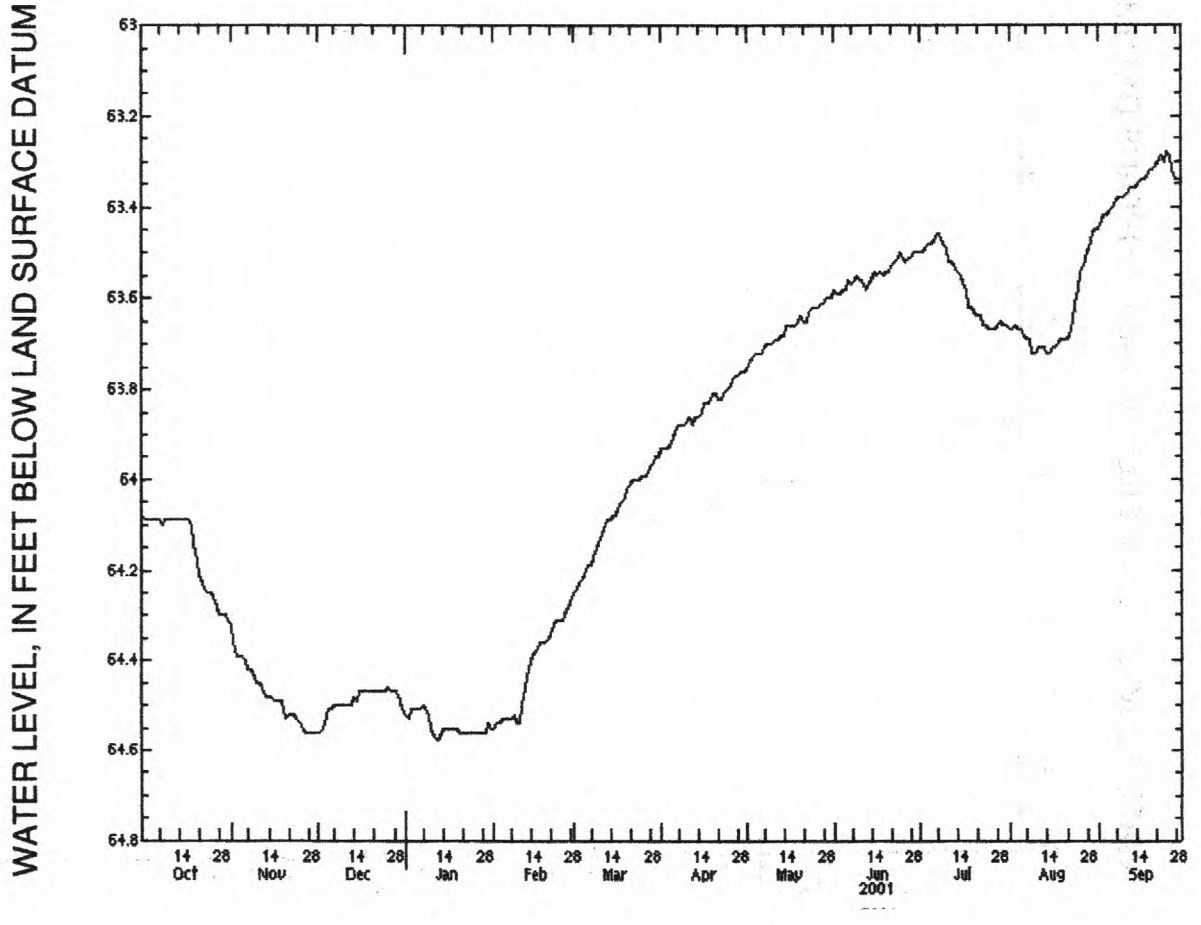
KALAMAZOO COUNTY

421552085384001. Local number, 2S 11W 30CBDC1.
LOCATION.--Lat 42°15'52", long 85°38'40", Hydrologic Unit 04050003, at Western Michigan University Baker Farm in Kalamazoo. Owner: Western Michigan University.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 5 in, depth 240 ft, screened 215 ft to 240 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 936.01 ft above sea level (levels by City of Kalamazoo). Measuring point: Plywood shelter base, 1.6 ft above land-surface datum.
PERIOD OF RECORD.--October 1998 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 62.72 ft below land-surface datum, Oct. 1, 1998; lowest recorded, 64.58 ft below land-surface datum, Jan. 12, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	64.09	64.39	64.51	64.51	64.53	64.21	63.91	63.72	63.58	63.48	63.67	63.41
10	64.09	64.45	64.50	64.55	64.54	64.14	63.87	63.70	63.56	63.49	63.72	63.38
15	64.09	64.48	64.49	64.55	64.38	64.08	63.85	63.66	63.54	63.55	63.72	63.35
20	64.18	64.53	64.47	64.56	64.35	64.02	63.81	63.64	63.54	63.64	63.69	63.32
25	64.25	64.54	64.47	64.56	64.31	63.99	63.79	63.62	63.51	63.67	63.58	63.28
EOM	64.31	64.56	64.51	64.55	64.27	63.95	63.76	63.60	63.50	63.66	63.45	63.34

WTR YR 2001 HIGHEST 63.26 SEP 25, 26 LOWEST 64.58 JAN 12



GROUND-WATER LEVELS

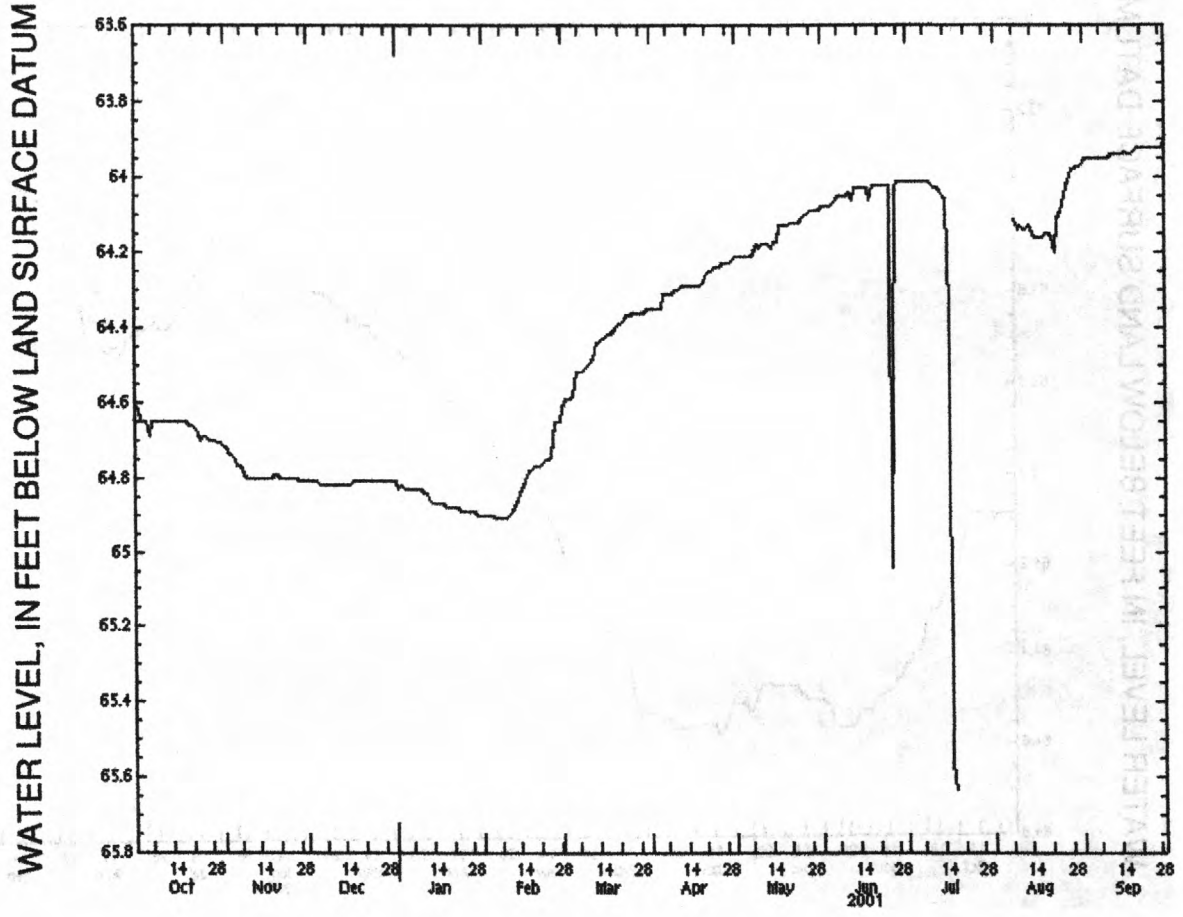
KALAMAZOO COUNTY

421552085384002. Local number, 2S 11W 30CBDC2.
LOCATION.--Lat 42°15'52", long 85°38'40", Hydrologic Unit 04050003, at Western Michigan University Baker Farm in Kalamazoo. Owner: Western Michigan University.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in, depth 89 ft, screened 74 ft to 89 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 936.34 ft above sea level (levels by City of Kalamazoo). Measuring point: Plywood shelter base, 3.0 ft above land-surface datum.
PERIOD OF RECORD.--October 1998 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 63.52 ft below land-surface datum, Oct. 1, 1998; lowest recorded, 65.69 ft below land-surface datum, Aug. 3, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	64.65	64.75	64.82	64.83	64.91	64.58	64.35	64.21	64.07	64.01	---	63.95
10	64.65	64.80	64.82	64.83	64.90	64.50	64.30	64.19	64.05	64.02	64.13	63.95
15	64.65	64.80	64.82	64.87	64.82	64.43	64.29	64.17	64.03	64.06	64.16	63.94
20	64.66	64.79	64.81	64.88	64.77	64.40	64.28	64.13	64.02	---	64.15	63.92
25	64.69	64.80	64.81	64.89	64.74	64.37	64.24	64.11	64.02	---	64.07	63.92
EOM	64.71	64.81	64.81	64.90	64.65	64.35	64.22	64.09	64.01	---	63.97	63.90

WTR YR 2001 HIGHEST 63.90 SEP 29, 30 LOWEST 65.64 JUL 18



GROUND-WATER LEVELS

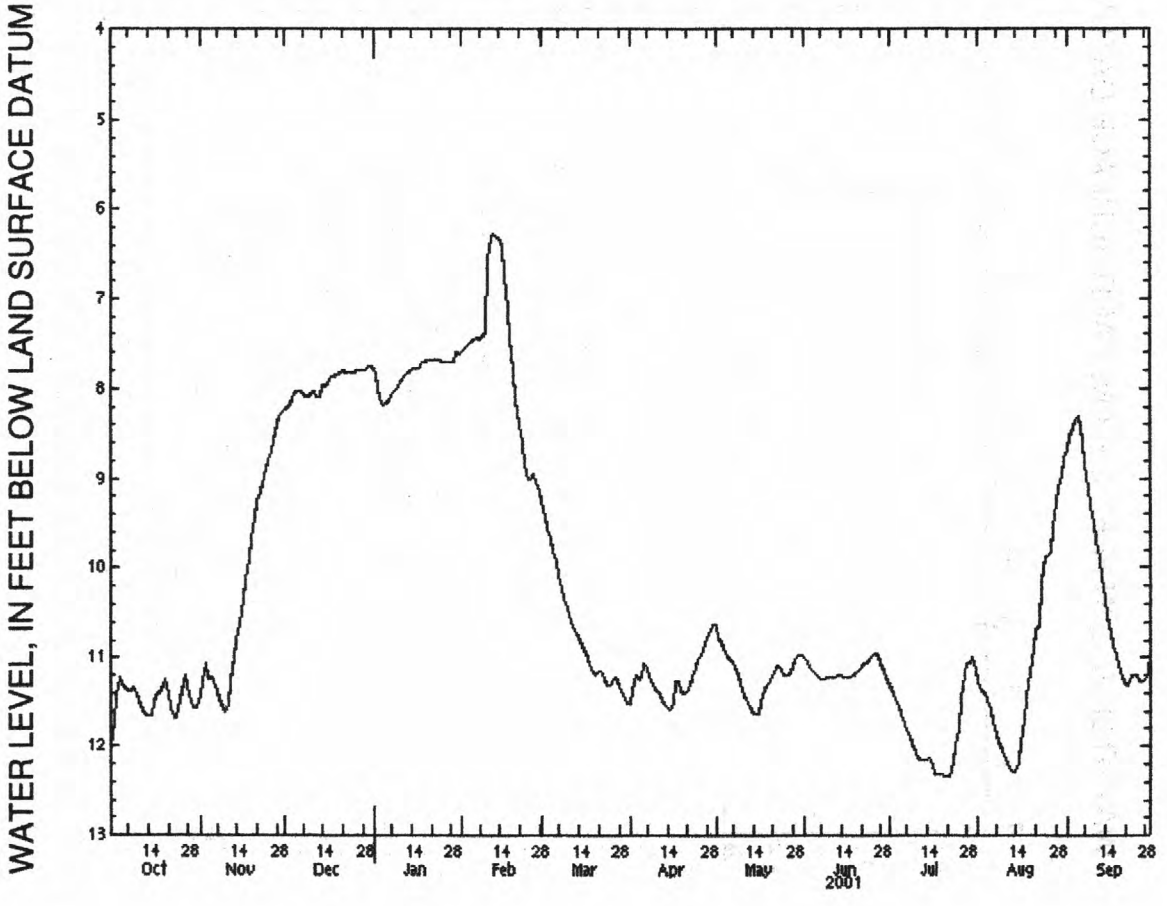
KALAMAZOO COUNTY

421614085270801. Local number, 2S 10W 26BBCC.
LOCATION.--Lat 42°16'14", long 85°27'08", Hydrologic Unit 04050003, at end of Miller Road by Morrow Lake, Comstock Township, 4 mi east of Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 27 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 790 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 2.5 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--February 1987 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 5.88 ft below land-surface datum, Apr. 7-11, 1988; lowest recorded, 13.14 ft below land-surface datum, Sept. 13-15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.31	11.23	8.02	8.17	7.45	9.81	11.23	10.97	11.18	11.64	11.59	8.31
10	11.40	11.60	8.05	7.93	6.54	10.45	11.35	11.29	11.23	12.07	12.11	9.50
15	11.65	10.61	7.98	7.77	6.40	10.85	11.58	11.62	11.21	12.13	12.18	10.53
20	11.24	9.44	7.83	7.69	8.13	11.19	11.40	11.27	11.15	12.33	10.89	11.22
25	11.48	8.81	7.82	7.71	9.01	11.31	11.01	11.19	10.97	11.79	9.88	11.20
EOM	11.56	8.26	7.76	7.61	9.13	11.51	10.62	10.96	11.22	11.13	8.79	10.95

WTR YR 2001 HIGHEST 6.25 FEB 12 LOWEST 12.33 JUL 20, 21, 22



GROUND-WATER LEVELS

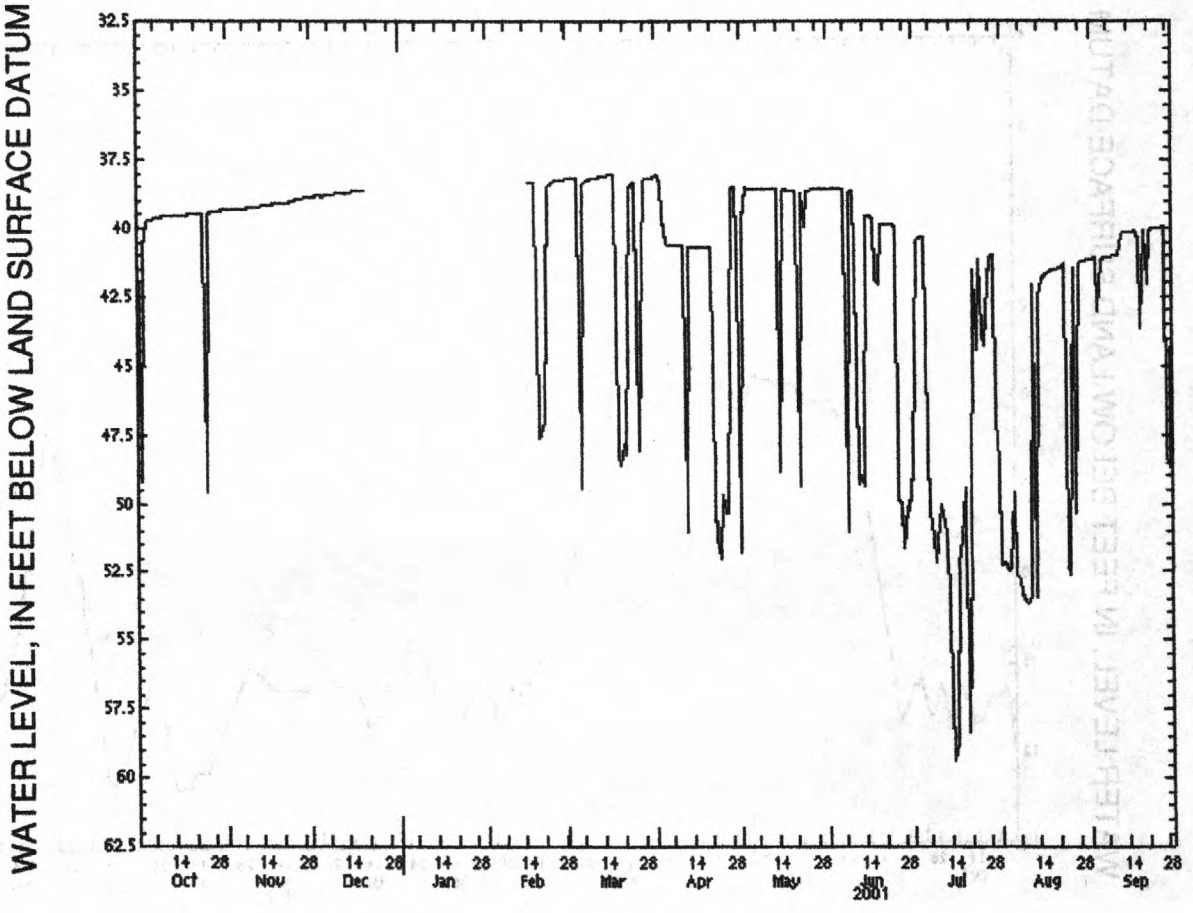
KALAMAZOO COUNTY

421614085354001. Local number, 2S 11W 28AA.
LOCATION.--Lat 42°16'14", long 85°35'40", Hydrologic Unit 04050003, near intersection of Peeler Street and Crosstown Parkway in Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 245 ft, screened 235 ft to 245 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 820 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 4.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 29.0 ft below land-surface datum, May 1988; lowest recorded, 64.63 ft below land-surface datum, July 15, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	39.70	39.31	38.83	—	—	38.15	40.53	38.57	38.56	40.30	49.56	41.11
10	39.58	39.24	38.73	—	—	38.21	40.63	38.56	38.65	50.69	53.71	41.00
15	39.52	39.16	38.68	—	—	38.08	40.68	48.81	39.57	59.36	41.93	40.15
20	39.48	39.10	38.60	—	47.41	48.62	40.66	38.62	39.87	58.29	41.49	40.10
25	49.56	39.00	—	—	38.29	38.33	49.66	38.64	39.90	43.80	52.59	39.98
EOM	39.35	38.87	—	—	38.22	38.14	40.62	38.57	50.25	48.46	41.16	40.02

WTR YR 2001 HIGHEST 38.00 MAR 19 LOWEST 59.36 JUL 15



GROUND-WATER LEVELS

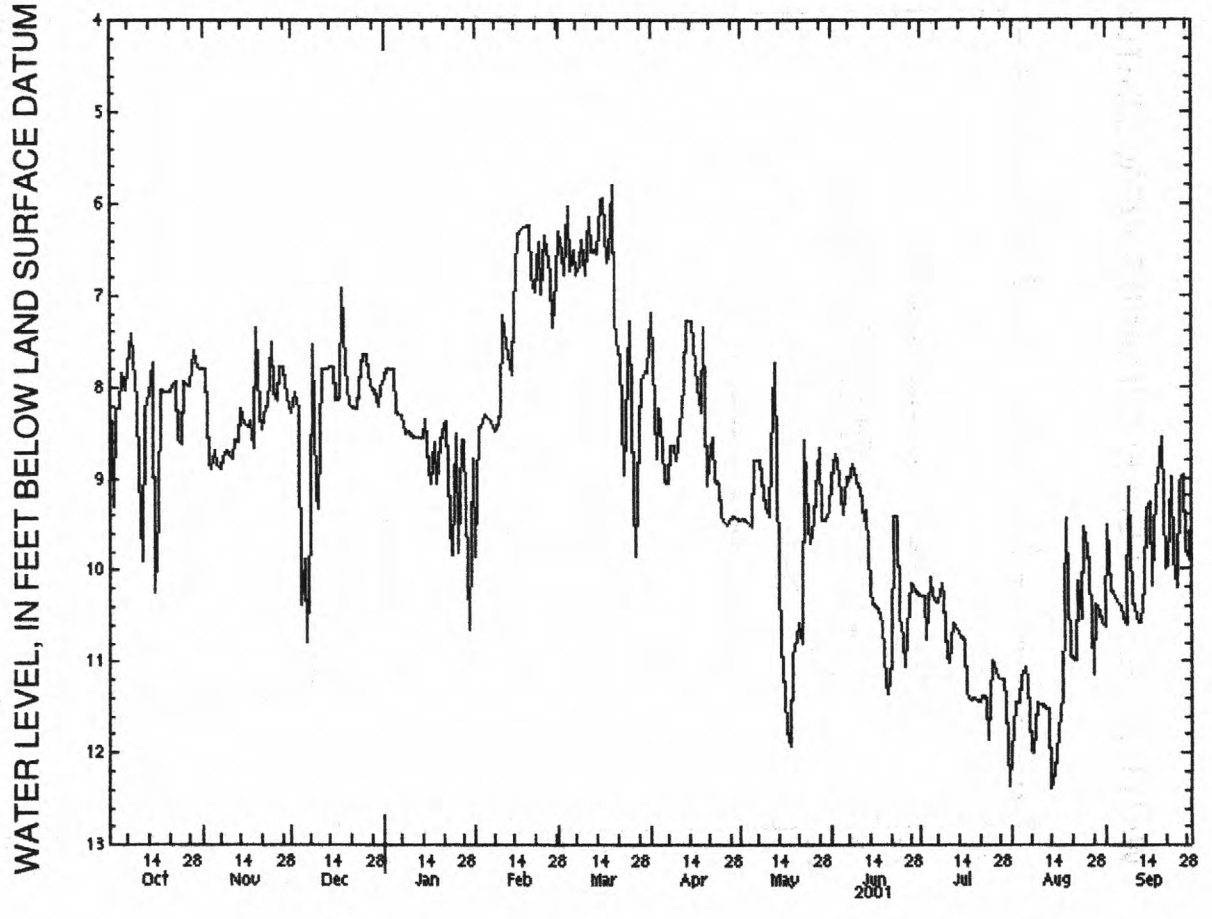
KALAMAZOO COUNTY

421641085350601. Local number, 2S 11W 22CD.
LOCATION.--Lat 42°16'41", long 85°35'06", Hydrologic Unit 04050003, at intersection of Crosstown Parkway and Stockbridge Avenue in Kalamazoo.
Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 137 ft, screened 134 ft to 137 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 764.7 ft above sea level. Measuring point: Plywood instrument shelf, 2.6 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--August 1960 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 3.54 ft below land-surface datum, Mar. 6, 2001; lowest recorded, 31.1 ft below land surface datum, August 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	7.85	8.69	9.87	8.28	8.34	6.72	8.65	9.53	9.40	10.29	11.07	10.36
10	8.17	8.73	9.33	8.51	7.21	6.77	8.80	9.30	9.10	10.94	11.46	10.32
15	7.73	8.40	7.78	8.35	6.34	5.98	7.27	10.81	10.37	10.74	12.21	9.34
20	8.06	8.27	8.18	8.59	6.80	7.25	9.07	10.76	11.36	11.43	10.92	8.56
25	8.62	8.05	7.65	8.51	6.51	7.28	9.43	9.72	10.74	11.00	9.54	10.20
EOM	7.81	8.20	8.01	8.77	6.81	7.84	9.44	9.36	10.26	12.36	10.58	9.26

WTR YR 2001 HIGHEST 3.54 MAR 6 LOWEST 12.38 AUG 14



GROUND-WATER LEVELS

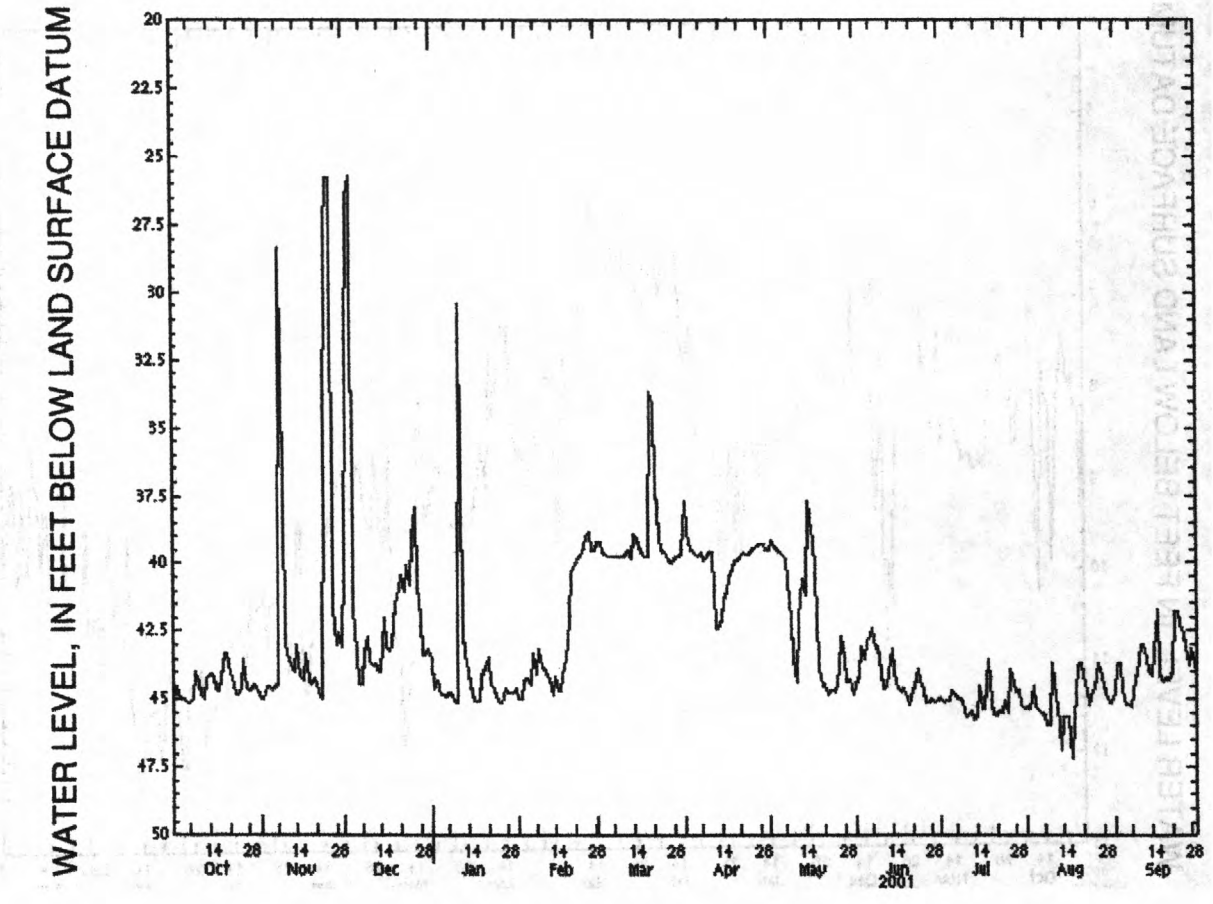
KALAMAZOO COUNTY

421716085373702. Local number, 2S 11W 20BB2.
LOCATION.--Lat 42°17'16", long 85°37'37", Hydrologic Unit 04050003, at intersection of Howard Street and Kendall Street in Kalamazoo Township, in Kalamazoo. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 106 ft, screened 103 ft to 106 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 880 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 2.3 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--May 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 12.5 ft below land-surface datum, February 1976; lowest recorded, 48.4 ft below land-surface datum, June 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	44.97	44.67	43.34	44.81	44.43	39.73	39.67	39.61	42.88	44.67	45.41	45.17
10	44.40	42.97	43.64	45.14	43.81	39.72	39.62	43.42	44.01	45.65	43.65	43.00
15	44.16	44.17	41.99	44.45	44.69	39.08	41.35	37.69	44.03	44.53	45.67	43.33
20	43.31	44.18	40.97	43.80	40.24	33.62	39.87	44.50	45.22	45.61	43.66	44.27
25	44.60	25.75	38.97	45.10	38.96	39.56	39.47	44.78	44.68	45.49	44.62	42.63
EOM	44.64	43.09	43.12	44.60	39.51	39.57	39.51	44.83	45.07	45.32	45.11	44.11

WTR YR 2001 HIGHEST 22.00 MAR 22 LOWEST 47.17 AUG 17



GROUND-WATER LEVELS

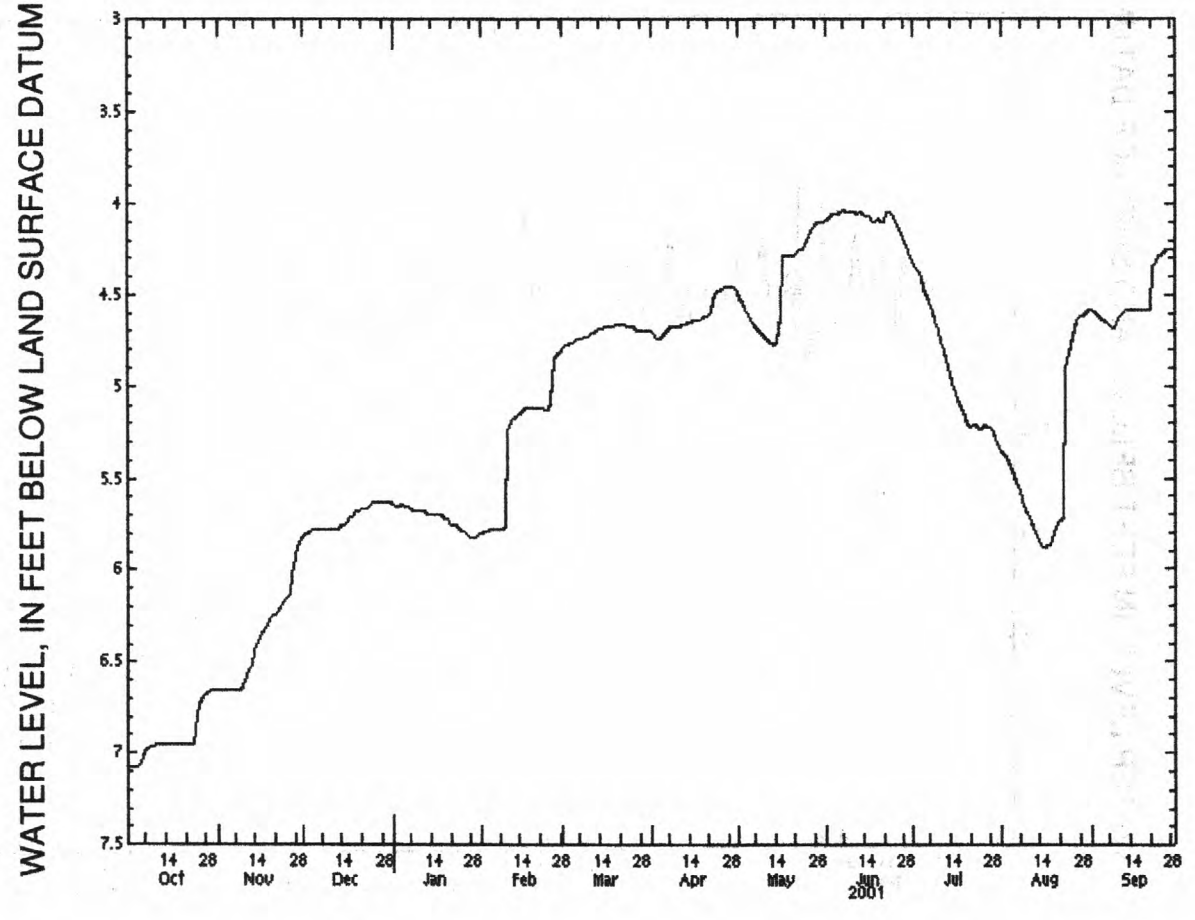
KALAMAZOO COUNTY

421918085283801. Local number, 2S 10W 4D.
LOCATION.--Lat 42°19'18", long 85°28'38", Hydrologic Unit 04050003, at Campbell well field near Campbell Lake, 2 mi east of Eastwood. Owner: City of Kalamazoo.
AQUIFER.--Glacial deposits of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 13 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 836.50 ft above sea level. Measuring point: Plywood instrument shelf, 1.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--March 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.9 ft below land-surface datum, April 1974; lowest recorded, 7.51 ft below land-surface datum, Sept. 27 to Oct. 9, 1999.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	7.06	6.65	5.78	5.65	5.78	4.76	4.73	4.60	4.06	4.47	5.48	4.64
10	6.96	6.63	5.78	5.68	5.24	4.73	4.67	4.72	4.04	4.69	5.70	4.63
15	6.95	6.38	5.76	5.70	5.14	4.68	4.65	4.75	4.07	4.98	5.88	4.58
20	6.95	6.25	5.68	5.72	5.12	4.66	4.62	4.28	4.10	5.21	5.74	4.58
25	6.79	6.15	5.63	5.79	5.08	4.67	4.48	4.22	4.09	5.23	4.77	4.28
EOM	6.65	5.83	5.63	5.80	4.82	4.69	4.46	4.10	4.26	5.32	4.58	4.25

WTR YR 2001 HIGHEST 4.02 JUN 12, 13 LOWEST 7.08 OCT 1-4



GROUND-WATER LEVELS

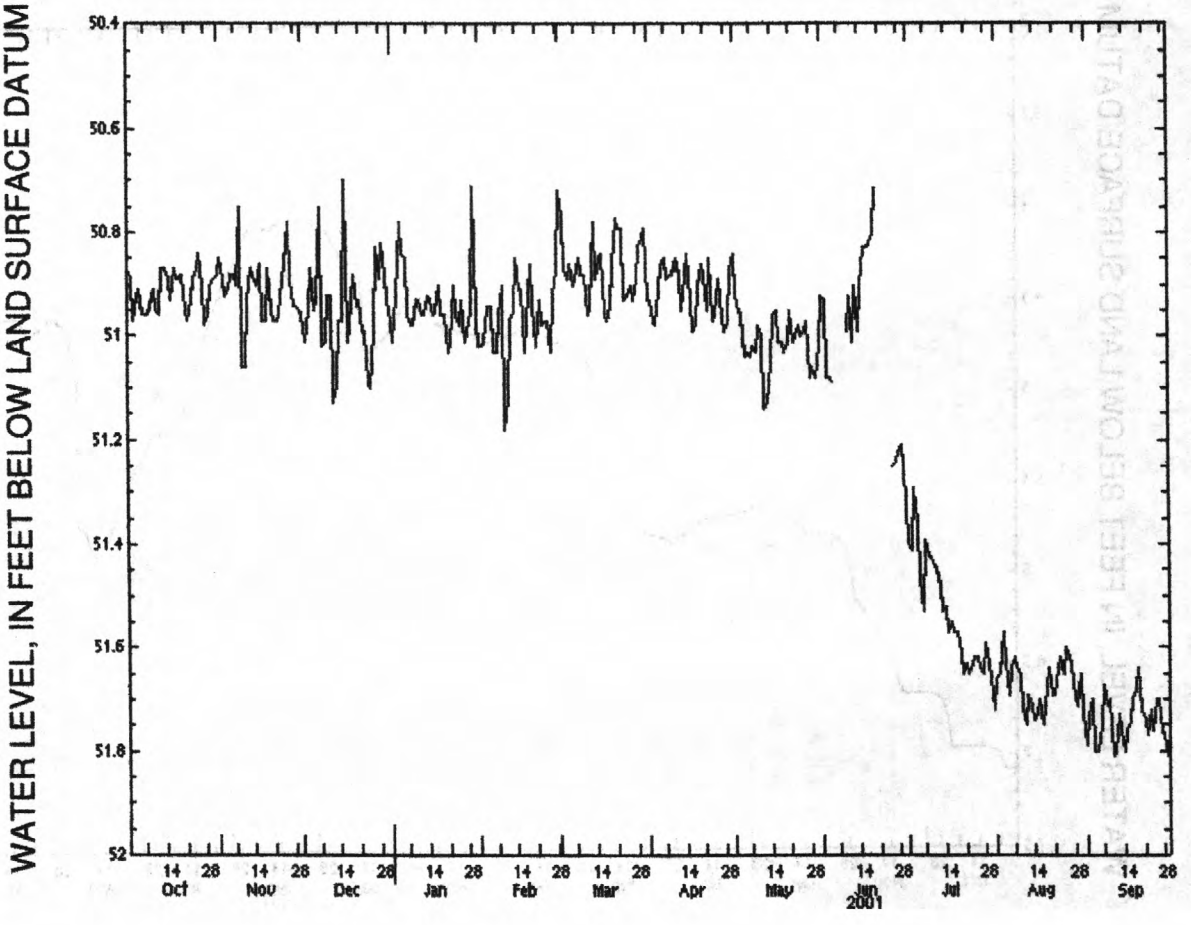
MONROE COUNTY

415206083414401. Local number, 7S 6E 15ACAA.
LOCATION.--Lat 41°52'06", long 83°41'44", Hydrologic Unit 04100002, at Teal Road, 2 mi southeast of Petersburg. Owner: U.S. Geological Survey.
AQUIFER.--Detroit River Group of Devonian age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in, depth 72 ft, cased to 53 ft, open bottom.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 680 ft above sea level, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.
PERIOD OF RECORD.--November 1978 to September 1988, December 1997 to September 1998 (monthly measurement), October 1988 to September 1991, October 1998 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 32.30 ft below land-surface datum, Mar. 26, 1982; lowest recorded, 51.81 ft below land-surface datum, Sept. 10, 29, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	50.91	50.91	50.95	50.84	50.94	50.86	50.91	51.04	51.09	51.47	51.69	51.80
10	50.91	51.06	50.92	50.93	51.18	50.88	50.88	50.98	50.99	51.44	51.72	51.81
15	50.89	50.90	50.97	50.93	50.91	50.85	50.84	50.96	50.90	51.57	51.73	51.76
20	50.88	50.95	50.94	50.96	50.94	50.86	50.86	51.01	50.71	51.65	51.69	51.72
25	50.87	50.86	51.10	50.98	50.97	50.92	50.96	51.00	---	51.62	51.60	51.70
EOM	50.89	50.95	50.93	50.97	50.87	50.79	50.87	51.02	51.25	51.72	51.73	51.75

WTR YR 2001 HIGHEST 50.70 DEC 16 LOWEST 51.81 SEP 10, 29



GROUND-WATER LEVELS

MONROE COUNTY

415235083413901. Local number, 7S 6E 15ADBB.
LOCATION.--Lat 41°52'35", long 83°41'40", Hydrologic Unit 04100002, at Teal Road, 1.5 mi southeast of Petersburg. Owner: Michigan Department of Natural Resources.
AQUIFER.--Sand of Pleistocene age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 1.25 in, depth 17 ft, screened 14 to 17 ft.
INSTRUMENTATION.--Periodic measurements.
DATUM.--Elevation of land-surface datum is 675 ft above sea level, from topographic map. Measuring point: Top of casing, 4.0 ft above land-surface datum.
PERIOD OF RECORD.--December 1965 to September 1991, February 1998 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.00 ft below land-surface datum, Feb. 14, 1966; lowest measured, 9.04 ft below land-surface datum, Sept. 14, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	7.71	JAN 04	7.70	MAR 20	7.10	JUN 07	7.87	AUG 28	8.92	SEP 24	9.01
NOV 14	7.78	FEB 13	7.55	APR 24	8.30	JUL 10	8.31	SEP 14	9.04		

GROUND-WATER LEVELS

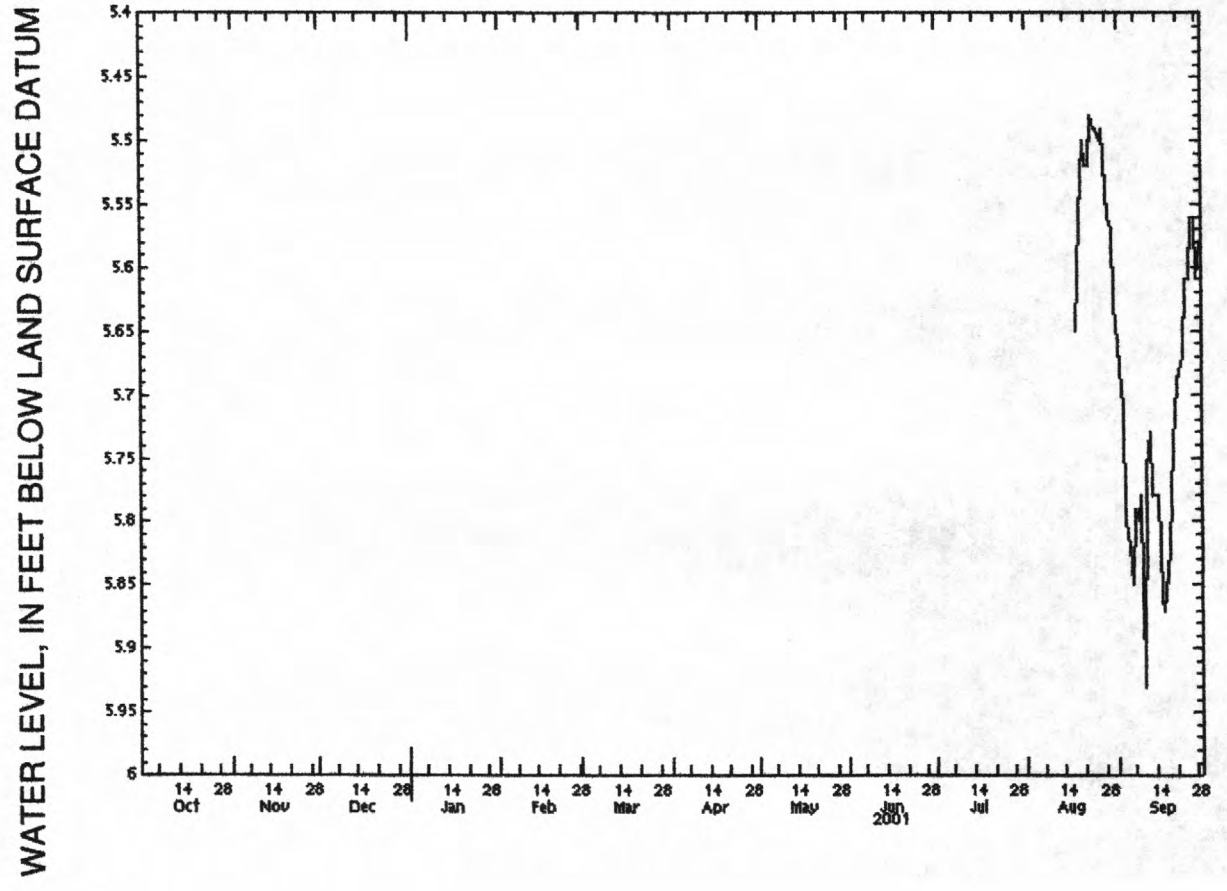
OAKLAND COUNTY

423423083324001. Local number, 2N 8E 18DBAD01.
LOCATION.--Lat 42°34'23", long 83°32'40", Hydrologic Unit 04090005, at Proud Lake State Park. Owner: Michigan Department of Natural Resources.
AQUIFER.--Sand and gravel of Peistocene age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 6 in, depth 45 ft, cased to 41 ft, screened 41 and 45 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 910 ft above sea level (from topographic map). Measuring point: Aluminum lip of transducer platform, 2.0 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--Static water levels from September 1969 to December 1991. Continuous record from October 1991 to December 1991, and from August 2001 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 3.74 ft below land-surface datum, July 4, 1969; lowest recorded, 6.21 ft below land-surface datum, Sept. 3, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	---	---	---	---	---	---	---	5.82
10	---	---	---	---	---	---	---	---	---	---	---	5.93
15	---	---	---	---	---	---	---	---	---	---	---	5.78
20	---	---	---	---	---	---	---	---	---	---	5.50	5.74
25	---	---	---	---	---	---	---	---	---	---	5.49	5.61
EOM	---	---	---	---	---	---	---	---	---	---	5.63	5.58

WTR YR 2001 HIGHEST 5.48 AUG 23 LOWEST 5.93 SEP 10



GROUND-WATER LEVELS

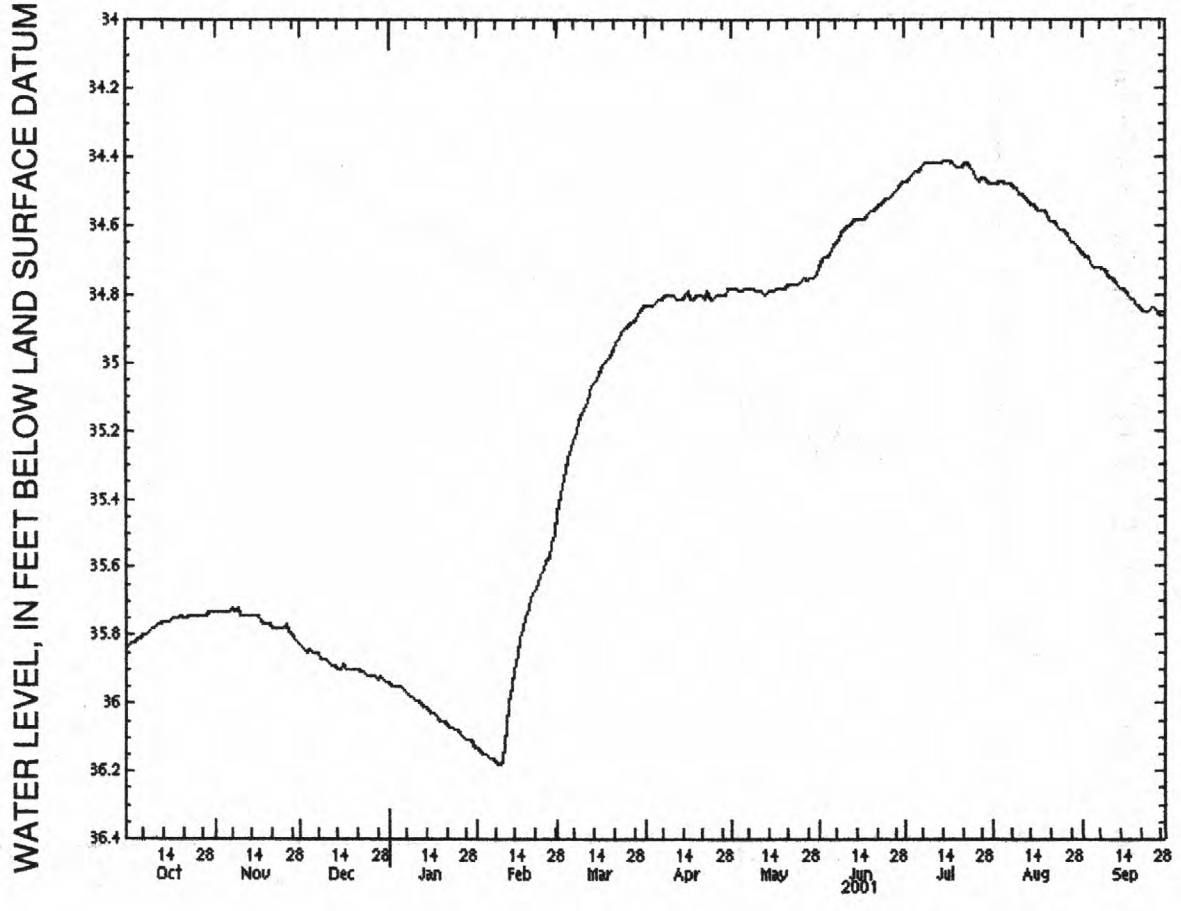
OAKLAND COUNTY

424109083384301. Local number, 3N 7E 5BA.
LOCATION.--Lat 42°41'09", long 83°38'43", Hydrologic Unit 04080203, 150 ft west of Fish Lake Road, 1.2 mi east of Clyde. Owner: American Aggregates Company.
AQUIFER.--Sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 49 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 1,055 ft above sea level, from topographic map. Measuring point: Top of flange, 3.0 ft above land-surface datum.
PERIOD OF RECORD.--April 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 29.5 ft below land-surface datum, June 1976; lowest recorded, 38.7 ft below land-surface datum, December 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	35.81	35.73	35.85	35.95	36.16	35.28	34.82	34.79	34.68	34.44	34.48	34.72
10	35.78	35.74	35.87	35.99	36.17	35.15	34.80	34.79	34.61	34.42	34.51	34.75
15	35.76	35.74	35.90	36.02	35.86	35.05	34.80	34.79	34.58	34.41	34.54	34.78
20	35.74	35.77	35.90	36.05	35.69	34.98	34.80	34.78	34.56	34.43	34.58	34.83
25	35.74	35.78	35.92	36.08	35.58	34.90	34.81	34.77	34.52	34.44	34.61	34.84
EOM	35.73	35.82	35.94	36.13	35.50	34.84	34.78	34.74	34.48	34.48	34.67	34.86

WTR YR 2001 HIGHEST 34.41 JUL 9-18, 21 LOWEST 36.18 FEB 8, 9



GROUND-WATER LEVELS

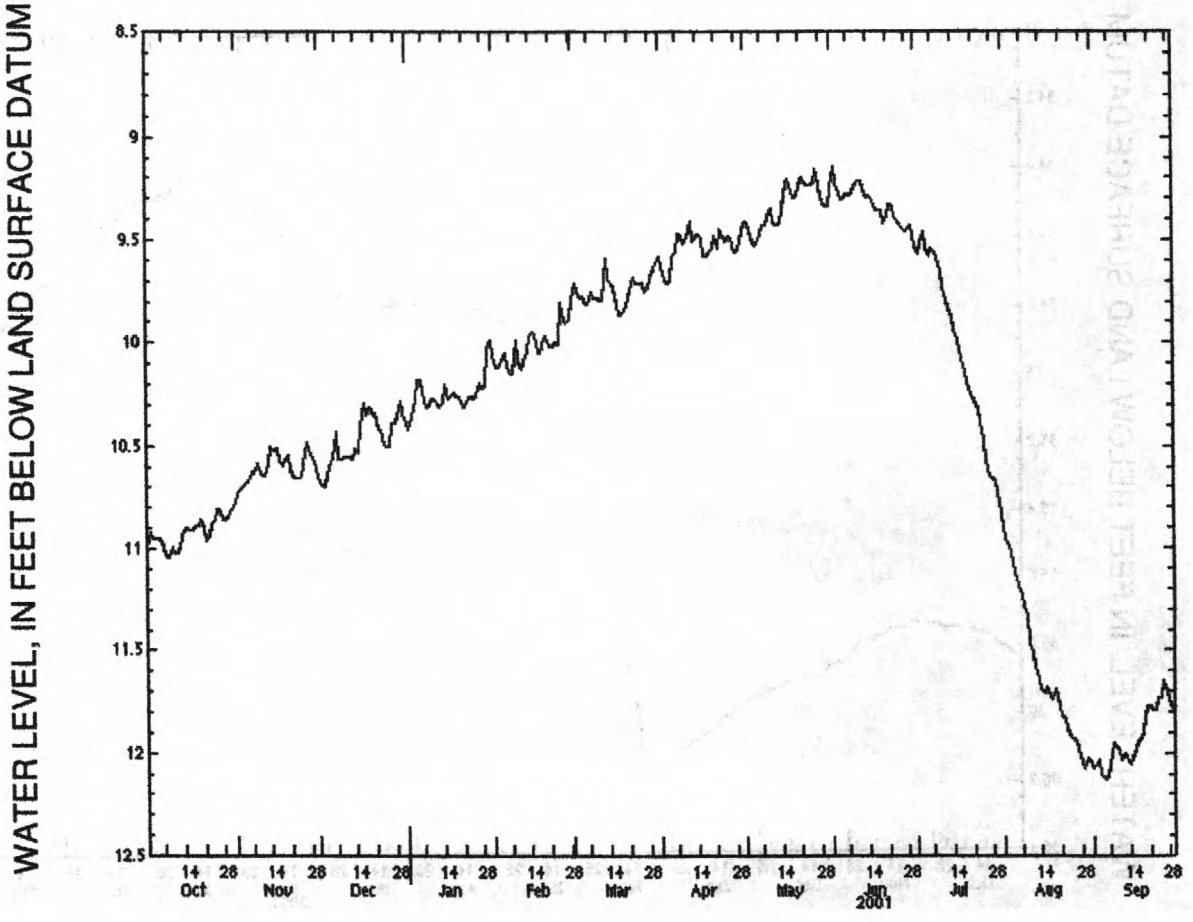
SAGINAW COUNTY

431457084194401. Local number, 10N 1E 22DADA1.
LOCATION.--Lat 43°14'57", long 84°19'44", Hydrologic Unit 04080203, at west side of Merrill Road, 0.35 mi north of Marion Springs. Owner: U.S. Geological Survey.
AQUIFER.--Saginaw Formation of Pennsylvanian age.
WELL CHARACTERISTICS.--Drilled artesian well, diameter 6 in, depth 210 ft, cased to 170 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 657 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 2.50 ft above land-surface datum.
PERIOD OF RECORD.--December 1977 to September 1991, September 2000 to September 2001.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.93 ft below land-surface datum, Feb. 10, 1981; lowest recorded, 12.12 ft below land-surface datum, Sept. 5, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	10.95	10.68	10.57	10.18	10.05	9.77	9.70	9.53	9.31	9.54	11.15	12.12
10	10.99	10.61	10.55	10.27	10.09	9.78	9.52	9.39	9.23	9.65	11.47	11.98
15	10.90	10.52	10.53	10.20	9.95	9.71	9.47	9.35	9.29	9.94	11.71	12.02
20	10.86	10.54	10.35	10.26	9.97	9.84	9.54	9.29	9.42	10.23	11.77	11.77
25	10.86	10.64	10.50	10.27	9.80	9.71	9.51	9.24	9.41	10.47	11.93	11.73
EOM	10.81	10.60	10.34	9.99	9.89	9.61	9.50	9.34	9.43	10.83	12.03	11.75

WTR YR 2001 HIGHEST 9.07 JUN 2 LOWEST 12.12 SEP 5



GROUND-WATER LEVELS

SAGINAW COUNTY

432206084194801. Local number, 11N 1E 11CBBB01.

LOCATION.--Lat 43°22'06", long 84°19'48", Hydrologic Unit 04080203, on S. Merrill Road, 2.5 mi south of Merrill. Owner: The Church of Jesus Christ of Latter Day Saints.

AQUIFER.--Saginaw formation.

WELL CHARACTERISTICS.--Drilled observation well, diameter 5 in, depth 250 ft, cased to 219 ft, open bottom.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 674 ft above sea level, from topographic map. Measuring point: Plywood instrument shelf, 2.8 ft above land-surface datum.

REMARKS.--Water levels affected by nearby pumping.

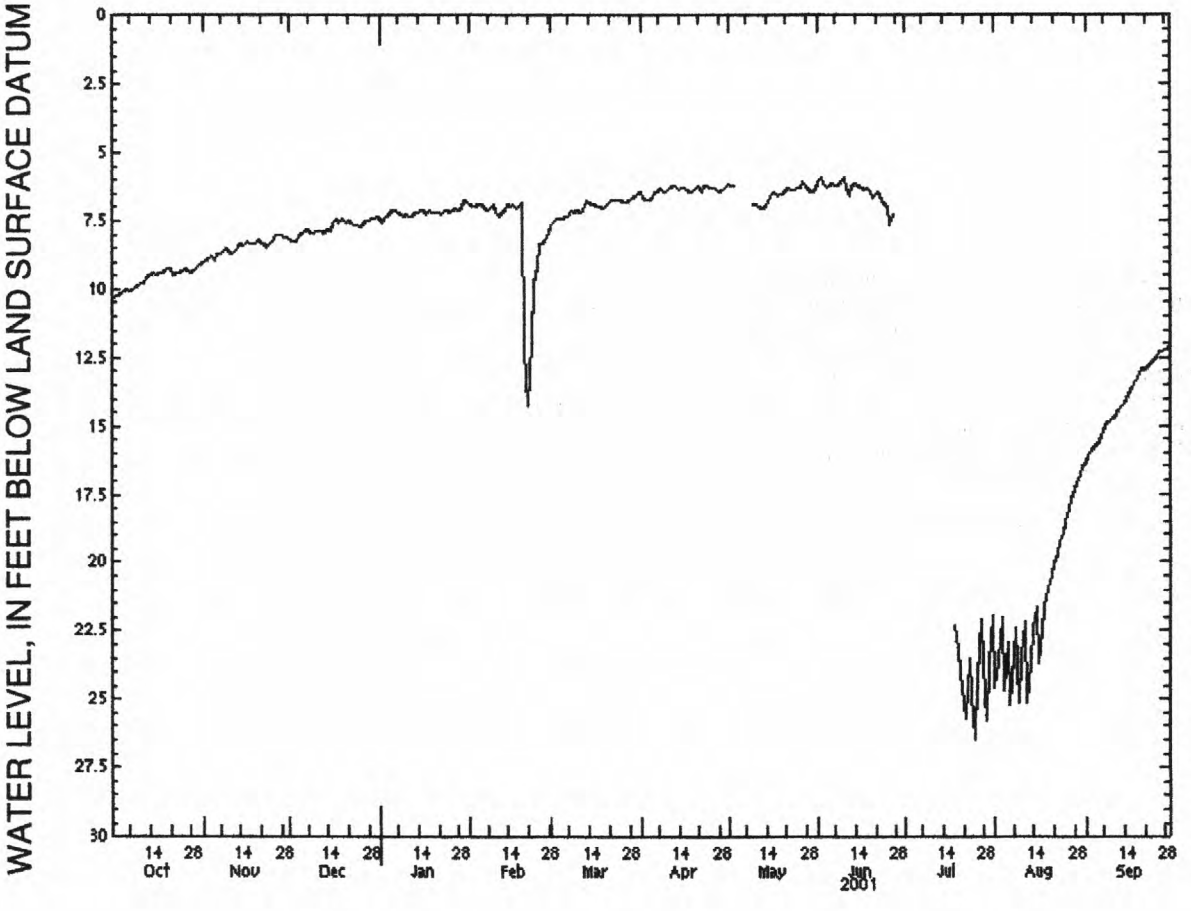
PERIOD OF RECORD.--September 2000 to September 2001.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 5.78 ft below land-surface datum, June 2, 2001; lowest recorded, 26.51 ft below land-surface datum, July 25, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	10.08	8.91	7.96	7.10	6.88	7.44	6.63	—	6.21	---	22.89	15.70
10	9.82	8.64	7.89	7.27	7.19	7.11	6.41	6.88	5.93	---	23.49	14.72
15	9.43	8.41	7.85	7.11	7.00	6.90	6.25	6.73	6.22	---	21.66	14.03
20	9.22	8.20	7.55	7.19	12.19	6.97	6.28	6.50	6.63	24.07	20.53	12.92
25	9.31	8.24	7.72	7.20	8.37	6.75	6.28	6.29	7.00	26.51	18.55	12.53
EOM	9.07	8.12	7.38	6.81	7.96	6.52	6.25	6.34	—	21.93	16.44	12.08

WTR YR 2001 HIGHEST 5.78 JUN 2 LOWEST 26.51 JUL 25



GROUND-WATER LEVELS

SCHOOLCRAFT COUNTY

462044086073601. Local number, 46N 15W 25CD.
LOCATION.--Lat 46°20'44", long 86°07'36", Hydrologic Unit 04060106, near State Highway 28 at Driggs River, 8.5 mi west of Seney. Owner: U.S. Geological Survey.
AQUIFER.--Glaciofluvial and fluvial deposits of Holocene age.
WELL CHARACTERISTICS.--Hand augered observation well, diameter 2 in, depth 10 ft, screened 8.5 ft to 10 ft.
INSTRUMENTATION.--Periodic measurements.
DATUM.--Elevation of land-surface datum is 758 ft above sea level, from topographic map. Measuring point: Top of flange, 3.1 ft above land-surface datum.
PERIOD OF RECORD.--September 2000 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.58 ft below land-surface datum, May 31, 2001; lowest measaured, 5.58 ft below land-surface datum, Mar. 28, 2001.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR SEPTEMBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP 18	5.40	NOV 8	5.29	FEB 16	4.91	MAR 28	5.58	MAY 31	4.58	JUL 11	5.05
OCT 4	5.45	DEC 28	5.24								

462114085574401. Local number, 46N 13W 29BD.
LOCATION.--Lat 46°21'14", long 85°57'44", Hydrologic Unit 04060106, in Seney Township Park, 0.9 mi northwest of Seney. Owner: U.S. Geological Survey.
AQUIFER.--Glaciofluvial and fluvial deposits of Holocene age.
WELL CHARACTERISTICS.--Hand augered observation well, diameter 2 in, depth 10 ft, screened 5 ft to 9 ft.
INSTRUMENTATION.--Periodic measurements.
DATUM.--Elevation of land-surface datum is 740 ft above sea level, from topographic map. Measuring point: Top of flange, 2.8 ft above land-surface datum.
PERIOD OF RECORD.--September 2000 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.71 ft below land-surface datum, May 31, 2001; lowest measaured, 5.96 ft below land-surface datum, Oct. 4, 2000.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR SEPTEMBER 2000 TO SEPTEMBER 2001

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP 18	5.94	NOV 8	5.84	FEB 16	5.78	MAR 28	5.73	MAY 31	4.71	JUL 11	5.51
OCT 4	5.96	DEC 28	4.87								

GROUND-WATER LEVELS

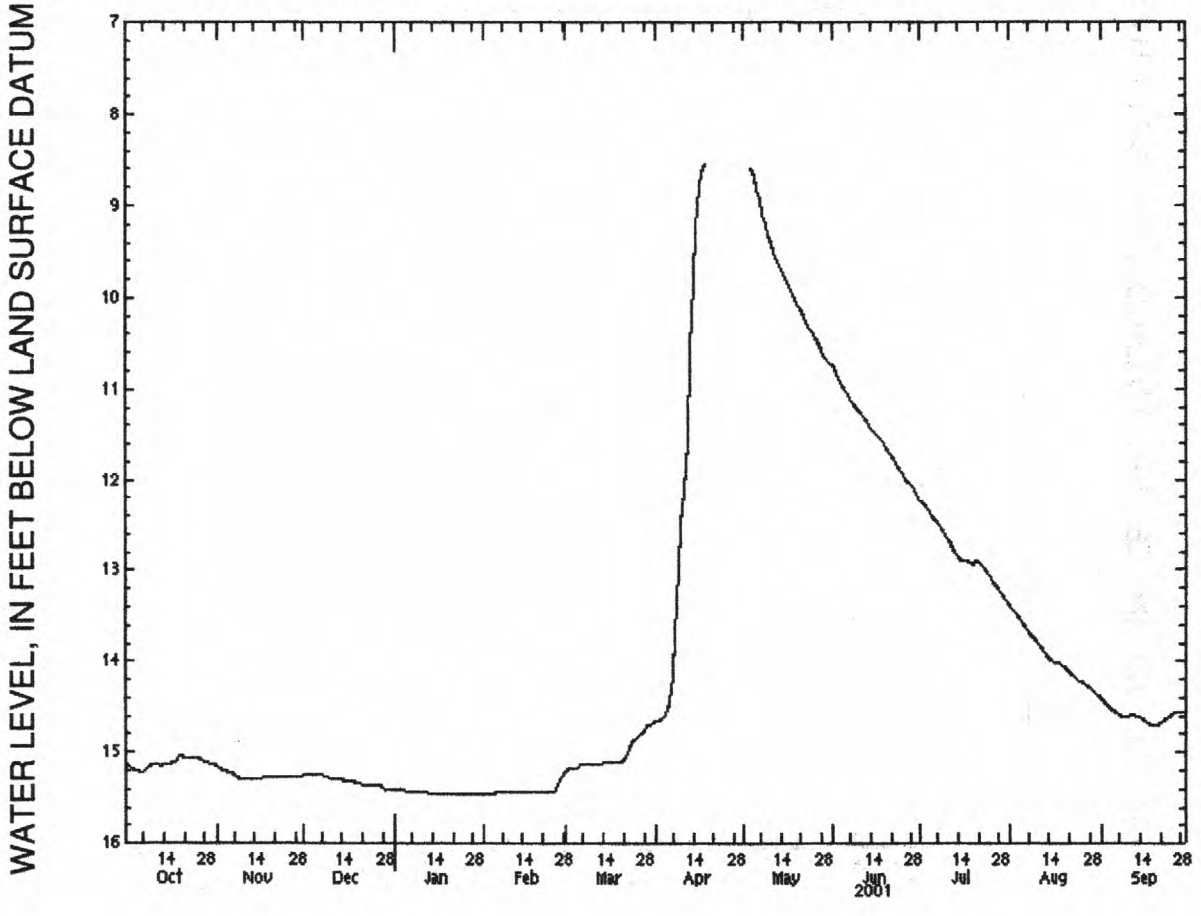
SCHOOLCRAFT COUNTY

462651086214601. Local number, 47N 16W 30BBBB01.
LOCATION.--Lat 46°26'51", long 86°21'46", Hydrologic Unit 04060106, at Cusino CCC site, 3.4 mi southeast of Melstrand.
AQUIFER.--Prairie du Chien Group.
WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in, depth 56.5 ft. Well was found filled with debris July 1957 and was cleaned out to about 22 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 900 ft above sea level, from topographic map. Measuring point: Top edge of metal flange, 2.8 ft above land surface datum.
PERIOD OF RECORD.--January 1957 to June 1992, October 2000 to September 2001.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 5.60 ft below land-surface datum, April 1985; lowest recorded, 16.40 ft below land-surface datum, Feb. 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.21	15.22	15.24	15.42	15.43	15.17	14.55	8.68	11.00	12.41	13.59	14.54
10	15.14	15.28	15.28	15.42	15.42	15.12	12.49	9.31	11.24	12.64	13.79	14.61
15	15.12	15.29	15.31	15.44	15.42	15.11	9.23	9.76	11.46	12.89	14.00	14.63
20	15.05	15.27	15.34	15.44	15.43	15.11	---	10.09	11.70	12.89	14.09	14.70
25	15.07	15.27	15.36	15.45	15.43	14.86	---	10.37	11.94	13.09	14.23	14.58
EOM	15.14	15.26	15.40	15.45	15.24	14.67	---	10.73	12.17	13.35	14.38	14.57

WTR YR 2001 HIGHEST 8.52 APR 19 LOWEST 15.45 JAN 24-31, FEB 1



GROUND-WATER LEVELS

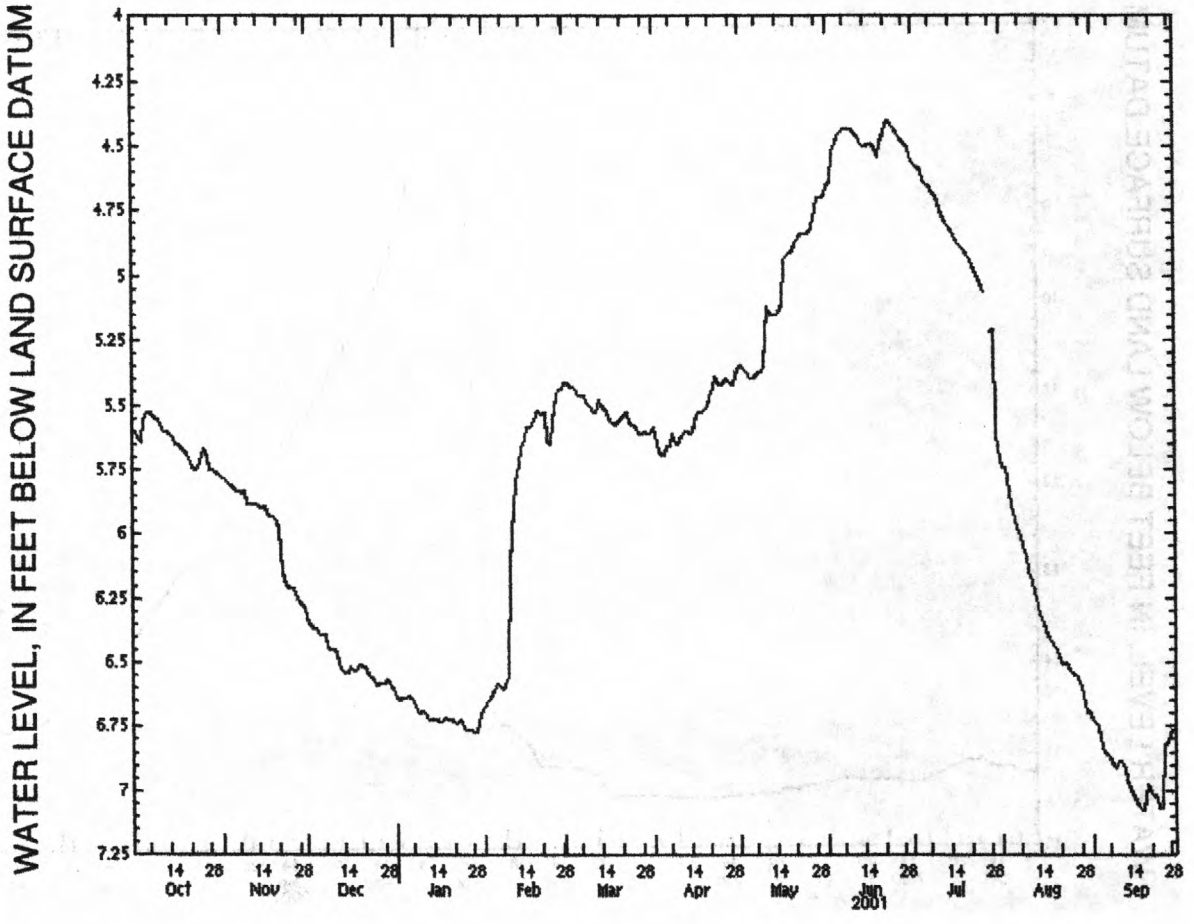
WASHTENAW COUNTY

421322083441301. Local number, 3S 6E 16BCCD.
LOCATION.--Lat 42°13'22", long 83°44'13", Hydrologic Unit 04090005, at Ann Arbor Municipal Airport. Owner: City of Ann Arbor.
AQUIFER.--Sand and gravel of Pleistocene age.
WELL CHARACTERISTICS.--Drilled water-table well, diameter 10 in, depth 55 ft, screened 35 ft to 55 ft.
INSTRUMENTATION.--Water-level recorder.
DATUM.--Elevation of land-surface datum is 821.50 ft above sea level. Measuring point: Plywood instrument shelf, 2.5 ft above land-surface datum.
REMARKS.--Water levels affected by pumping.
PERIOD OF RECORD.--September 1963 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.69 ft below land-surface datum, Mar. 10, 1974; lowest recorded, 15.86 ft below land-surface datum, Oct. 18, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	5.55	5.82	6.39	6.63	6.58	5.44	5.69	5.40	4.46	4.63	5.94	6.85
10	5.55	5.88	6.45	6.69	6.12	5.50	5.65	5.35	4.43	4.71	6.15	6.89
15	5.63	5.90	6.54	6.72	5.63	5.51	5.60	5.14	4.50	4.83	6.34	7.01
20	5.69	5.95	6.52	6.72	5.52	5.56	5.50	4.90	4.48	4.92	6.47	6.98
25	5.69	6.21	6.59	6.76	5.56	5.58	5.42	4.84	4.43	5.04	6.54	7.07
EOM	5.77	6.29	6.61	6.68	5.44	5.61	5.38	4.69	4.51	5.71	6.69	6.76

WTR YR 2001 HIGHEST 4.39 JUN 22, 23 LOWEST 7.08 SEP 18, 19



GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan

REMARKS.--Systems with (com) after their names are multiple well systems and the samples are considered composites. The other systems may be single or multiple well systems. For these multiple well systems, the samples can be attributed to a single well.

LOCAL WELL NUMBER	DATE	TURBIDITY (NTU) (00076)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)
LIVINGSTON COUNTY											
VIR093-1	01-17-01	13	742	.4	4	7.4	--	--	457	9.5	--
	06-26-01	16	744	.4	4	7.4	--	--	486	12.0	--
VIR093-3	02-28-01	.9	742	.1	0	7.2	--	--	706	10.4	--
	06-20-01	9.8	740	.1	0	6.9	--	--	745	10.8	--
VIR093-5	03-13-01	15	720	.1	0	7.4	--	--	574	7.8	--
	04-02-01	18	736	.4	4	7.5	--	--	558	8.7	--
	05-09-01	15	741	.2	2	7.3	--	--	588	10.7	--
	06-13-01	13	735	.1	0	7.2	7.7	593	594	11.3	--
	07-10-01	2.7	731	.1	0	7.0	--	--	604	12.9	--
MACOMB COUNTY											
VIR099-1	12-04-00	1.8	745	.2	2	6.8	--	--	1090	9.4	--
	03-07-01	4.1	738	.2	2	7.1	--	--	1150	9.2	--
OAKLAND COUNTY											
VIR125-1	10-25-00	--	742	.1	0	7.0	7.3	739	737	11.3	180
	03-20-01	1.2	741	.1	0	7.2	--	--	707	9.7	--
VIR125-2 (com)	02-13-01	25	745	3.0	28	7.2	--	--	741	11.0	--
VIR125-3	02-26-01	55	740	.1	0	7.2	--	--	689	10.7	--
VIR125-4	10-31-00	--	743	.1	0	7.1	7.0	1120	1100	12.1	140
	01-31-01	30	725	.1	0	7.1	--	--	1100	10.7	--
VIR125-5	11-06-00	.9	732	1.3	12	7.2	7.4	628	604	11.1	70
VIR125-6	01-22-01	16	740	.1	0	7.3	--	--	562	11.2	--
VIR125-7	02-20-01	15	733	1.1	10	7.0	--	--	999	10.1	--
	04-24-01	15	732	.4	4	7.0	--	--	1000	10.6	--
VIR125-8 (com)	11-28-00	2.1	733	1.1	11	7.2	--	--	500	11.7	--
	03-26-01	1.2	740	.4	3	7.1	--	--	566	5.3	--
VIR125-10(com)	10-23-00	--	745	2.9	27	7.2	7.5	546	536	11.3	16
	06-11-01	20	729	2.6	25	7.3	--	--	533	11.5	--
VIR125-11	11-15-00	5.4	734	.1	0	7.0	--	--	658	10.5	--
	03-28-01	20	741	.6	5	7.2	7.3	700	667	7.8	160
VIR125-12	11-01-00	--	741	2.1	20	7.1	7.3	593	573	11.4	9
	05-23-01	13	729	2.2	21	7.2	--	--	588	11.6	--
VIR125-13(com)	02-14-01	14	733	2.2	20	7.4	--	--	572	10.4	--
	04-09-01	12	734	2.3	21	7.3	--	--	579	10.2	--

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	TURBIDITY (NTU) (00076)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)
OAKLAND COUNTY											
VIR125-14(com)	11-29-00	7.5	732	1.1	10	7.2	--	--	496	10.4	--
	03-27-01	7.8	739	3.6	33	7.4	--	--	495	9.9	--
VIR125-15	12-06-00	26	735	.1	0	7.3	--	--	576	11.4	--
	03-12-01	20	734	.1	0	7.4	--	--	577	11.5	--
VIR125-16(com)	03-21-01	13	736	1.5	14	7.5	--	--	486	10.3	--
VIR125-17(com)	02-07-01	15	743	2.6	24	7.2	--	--	512	11.3	--
	06-05-01	24	739	2.2	21	7.3	--	--	519	11.5	--
VIR125-18(com)	02-27-01	9.5	738	.7	7	7.6	--	--	459	12.3	--
VIR125-19(com)	02-21-01	24	745	3.2	29	7.3	--	--	535	10.6	--
	04-10-01	17	736	2.8	26	7.4	--	--	520	10.6	--
VIR125-22(com)	03-06-01	2.0	732	7.5	70	7.4	--	--	560	10.6	--
	06-27-01	.2	743	8.6	81	7.1	7.5	596	589	11.7	11
VIR125-23	11-20-00	20	726	.1	0	7.1	7.7	702	714	10.5	140
	04-04-01	20	744	.1	0	7.4	--	--	688	10.4	--
VIR125-24(com)	11-27-00	3.9	729	3.9	37	7.3	--	--	708	11.2	--
	05-22-01	8.6	726	1.9	18	7.4	--	--	645	10.8	--
VIR125-26(com)	01-16-01	12	737	1.7	16	7.4	--	--	489	10.8	--
	06-04-01	13	736	.9	9	7.4	--	--	479	11.2	--
VIR125-27	01-23-01	.2	735	.1	0	7.2	--	--	737	10.8	--
	03-05-01	.8	728	.1	0	7.2	--	--	775	10.5	--
	04-25-01	.2	741	.1	0	7.0	--	--	849	10.7	--
	05-29-01	--	734	.1	0	7.2	7.4	799	805	10.6	77
	06-25-01	.1	742	.1	0	7.1	--	--	755	10.7	--
VIR125-28	02-06-01	28	730	.2	2	7.5	--	--	528	10.6	--
	03-19-01	26	744	.1	0	7.4	7.7	523	531	10.4	25
VIR125-30	03-14-01	22	728	.1	0	7.5	--	--	481	10.4	--
	04-03-01	24	736	.1	0	7.4	--	--	484	10.2	--
	05-07-01	26	738	.1	0	7.3	--	--	503	10.7	--
	06-12-01	22	730	.1	0	7.3	7.5	508	509	10.3	18
	07-09-01	17	731	.3	3	7.2	--	--	513	10.4	--
WASHTENAW COUNTY											
VIR161-1	01-03-01	--	736	3.5	32	6.9	--	--	647	10.4	--
	07-23-01	.7	734	3.7	37	6.7	--	--	564	13.6	--
VIR161-2	05-21-01	28	727	.1	0	7.1	--	--	862	12.3	--
	07-11-01	37	735	.1	0	6.7	--	--	891	12.1	--
VIR161-3	06-18-01	8.1	744	3.2	31	7.3	7.6	1430	1540	13.0	--

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM ADSORPTION RATIO (00931)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
LIVINGSTON COUNTY											
VIR093-1	01-17-01	--	--	--	--	--	--	--	--	--	--
	06-26-01	--	--	--	--	--	--	--	--	--	--
VIR093-3	02-28-01	--	--	--	--	--	--	--	--	--	--
	06-20-01	--	--	--	--	--	--	--	--	--	--
VIR093-5	03-13-01	--	--	--	--	--	--	--	--	--	--
	04-02-01	--	--	--	--	--	--	--	--	--	--
	05-09-01	--	--	--	--	--	--	--	--	--	--
	06-13-01	300	74.1	27.6	1.23	.3	13.4	9	328	400	0
	07-10-01	--	--	--	--	--	--	--	--	--	--
MACOMB COUNTY											
VIR099-1	12-04-00	--	--	--	--	--	--	--	--	--	--
	03-07-01	--	--	--	--	--	--	--	--	--	--
OAKLAND COUNTY											
VIR125-1	10-25-00	360	93.8	31.4	1.84	.2	8.3	5	186	227	0
	03-20-01	--	--	--	--	--	--	--	371	452	0
VIR125-2 (com)	02-13-01	--	--	--	--	--	--	--	--	--	--
VIR125-3	02-26-01	--	--	--	--	--	--	--	--	--	--
VIR125-4	10-31-00	470	128	36.6	2.48	.9	45.4	17	331	404	0
	01-31-01	--	--	--	--	--	--	--	--	--	--
VIR125-5	11-06-00	320	84.0	27.9	1.49	.2	8.3	6	255	311	0
VIR125-6	01-22-01	--	--	--	--	--	--	--	--	--	--
VIR125-7	02-20-01	--	--	--	--	--	--	--	--	--	--
	04-24-01	--	--	--	--	--	--	--	--	--	--
VIR125-8 (com)	11-28-00	--	--	--	--	--	--	--	--	--	--
	03-26-01	--	--	--	--	--	--	--	--	--	--
VIR125-10(com)	10-23-00	270	69.7	22.6	1.00	.3	9.7	7	251	306	0
	06-11-01	--	--	--	--	--	--	--	--	--	--
VIR125-11	11-15-00	--	--	--	--	--	--	--	--	--	--
	03-28-01	360	96.4	29.1	1.12	.1	5.7	3	205	250	0
VIR125-12	11-01-00	320	87.2	24.5	1.13	.1	6.1	4	310	378	0
	05-23-01	--	--	--	--	--	--	--	--	--	--
VIR125-13(com)	02-14-01	--	--	--	--	--	--	--	--	--	--
	04-09-01	--	--	--	--	--	--	--	--	--	--

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	HARDNESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM ADSORPTION RATIO (00931)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
OAKLAND COUNTY											
VIR125-14(com)	11-29-00	--	--	--	--	--	--	--	--	--	--
	03-27-01	--	--	--	--	--	--	--	--	--	--
VIR125-15	12-06-00	--	--	--	--	--	--	--	--	--	--
	03-12-01	--	--	--	--	--	--	--	--	--	--
VIR125-16(com)	03-21-01	--	--	--	--	--	--	--	--	--	--
VIR125-17(com)	02-07-01	--	--	--	--	--	--	--	--	--	--
	06-05-01	--	--	--	--	--	--	--	--	--	--
VIR125-18(com)	02-27-01	--	--	--	--	--	--	--	--	--	--
VIR125-19(com)	02-21-01	--	--	--	--	--	--	--	--	--	--
	04-10-01	--	--	--	--	--	--	--	--	--	--
VIR125-22(com)	03-06-01	--	--	--	--	--	--	--	--	--	--
	06-27-01	290	72.5	25.8	1.41	.4	14.2	10	276	337	0
VIR125-23	11-20-00	370	95.6	31.2	1.06	.1	5.1	3	223	272	0
	04-04-01	--	--	--	--	--	--	--	--	--	--
VIR125-24(com)	11-27-00	--	--	--	--	--	--	--	--	--	--
	05-22-01	--	--	--	--	--	--	--	--	--	--
VIR125-26(com)	01-16-01	--	--	--	--	--	--	--	--	--	--
	06-04-01	--	--	--	--	--	--	--	--	--	--
VIR125-27	01-23-01	--	--	--	--	--	--	--	--	--	--
	03-05-01	--	--	--	--	--	--	--	--	--	--
	04-25-01	--	--	--	--	--	--	--	--	--	--
	05-29-01	380	102	31.4	1.45	.4	18.1	10	308	375	0
	06-25-01	--	--	--	--	--	--	--	--	--	--
VIR125-28	02-06-01	--	--	--	--	--	--	--	--	--	--
	03-19-01	270	71.6	22.0	.84	.1	4.7	4	244	298	0
VIR125-30	03-14-01	--	--	--	--	--	--	--	--	--	--
	04-03-01	--	--	--	--	--	--	--	--	--	--
	05-07-01	--	--	--	--	--	--	--	--	--	--
	06-12-01	270	74.4	20.1	1.08	.1	3.5	3	250	305	0
	07-09-01	--	--	--	--	--	--	--	--	--	--
WASHTENAW COUNTY											
VIR161-1	01-03-01	--	--	--	--	--	--	--	--	--	--
	07-23-01	--	--	--	--	--	--	--	--	--	--
VIR161-2	05-21-01	--	--	--	--	--	--	--	--	--	--
	07-11-01	--	--	--	--	--	--	--	--	--	--
VIR161-3	06-18-01	250	67.6	20.1	3.64	5	198	63	258	315	0

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	BROMIDE DIS-SOLVED (MG/L AS BR) (71870)	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)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)
LIVINGSTON COUNTY											
VIR093-1	01-17-01	--	--	--	--	--	--	--	--	--	--
	06-26-01	--	--	--	--	--	--	--	--	--	--
VIR093-3	02-28-01	--	--	--	--	--	--	--	--	--	--
	06-20-01	--	--	--	--	--	--	--	--	--	--
VIR093-5	03-13-01	--	--	--	--	--	--	--	--	--	--
	04-02-01	--	--	--	--	--	--	--	--	--	--
	05-09-01	--	--	--	--	--	--	--	--	--	--
	06-13-01	.11	4.1	.6	19.6	14.8	.46	339	354	.185	.21
	07-10-01	--	--	--	--	--	--	--	--	--	--
MACOMB COUNTY											
VIR099-1	12-04-00	--	--	--	--	--	--	--	--	--	--
	03-07-01	--	--	--	--	--	--	--	--	--	--
OAKLAND COUNTY											
VIR125-1	10-25-00	.29	34.3	E.2	11.5	56.8	.57	422	350	<.041	<.10
	03-20-01	--	--	--	--	--	--	--	--	--	--
VIR125-2 (com)	02-13-01	--	--	--	--	--	--	--	--	--	--
VIR125-3	02-26-01	--	--	--	--	--	--	--	--	4.31	5.0
VIR125-4	10-31-00	.07	117	.3	16.0	78.5	.90	662	626	E.039	.17
	01-31-01	--	--	--	--	--	--	--	--	--	--
VIR125-5	11-06-00	.06	22.0	.3	15.5	37.4	.50	364	351	E.040	.11
VIR125-6	01-22-01	--	--	--	--	--	--	--	--	--	--
VIR125-7	02-20-01	--	--	--	--	--	--	--	--	--	--
	04-24-01	--	--	--	--	--	--	--	--	--	--
VIR125-8 (com)	11-28-00	--	--	--	--	--	--	--	--	--	--
	03-26-01	--	--	--	--	--	--	--	--	--	--
VIR125-10(com)	10-23-00	.06	8.6	.3	15.4	13.8	.42	310	292	.133	.16
	06-11-01	--	--	--	--	--	--	--	--	--	--
VIR125-11	11-15-00	--	--	--	--	--	--	--	--	--	--
	03-28-01	.11	11.3	.3	18.4	48.4	.59	431	336	.112	.16
VIR125-12	11-01-00	.03	4.5	.3	18.5	16.5	.47	348	346	<.041	E.06
	05-23-01	--	--	--	--	--	--	--	--	--	--
VIR125-13(com)	02-14-01	--	--	--	--	--	--	--	--	--	--
	04-09-01	--	--	--	--	--	--	--	--	--	--

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	BROMIDE DIS-SOLVED (MG/L AS BR) (71870)	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)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)
OAKLAND COUNTY											
VIR125-14(com)	11-29-00	--	--	--	--	--	--	--	--	--	--
	03-27-01	--	--	--	--	--	--	--	--	--	--
VIR125-15	12-06-00	--	--	--	--	--	--	--	--	--	--
	03-12-01	--	--	--	--	--	--	--	--	--	--
VIR125-16(com)	03-21-01	--	--	--	--	--	--	--	--	--	--
VIR125-17(com)	02-07-01	--	--	--	--	--	--	--	--	--	--
	06-05-01	--	--	--	--	--	--	--	--	--	--
VIR125-18(com)	02-27-01	--	--	--	--	--	--	--	--	--	--
VIR125-19(com)	02-21-01	--	--	--	--	--	--	--	--	--	--
	04-10-01	--	--	--	--	--	--	--	--	--	--
VIR125-22(com)	03-06-01	--	--	--	--	--	--	--	--	--	--
	06-27-01	.04	19.0	.5	17.6	21.7	.46	335	338	--	--
VIR125-23	11-20-00	.10	9.5	.3	15.2	144	.63	465	438	.064	E.07
	04-04-01	--	--	--	--	--	--	--	--	--	--
VIR125-24(com)	11-27-00	--	--	--	--	--	--	--	--	--	--
	05-22-01	--	--	--	--	--	--	--	--	--	--
VIR125-26(com)	01-16-01	--	--	--	--	--	--	--	--	--	--
	06-04-01	--	--	--	--	--	--	--	--	--	--
VIR125-27	01-23-01	--	--	--	--	--	--	--	--	--	--
	03-05-01	--	--	--	--	--	--	--	--	--	--
	04-25-01	--	--	--	--	--	--	--	--	--	--
	05-29-01	.06	41.8	E.1	12.4	43.5	.63	462	435	<.040	<.10
	06-25-01	--	--	--	--	--	--	--	--	--	--
VIR125-28	02-06-01	--	--	--	--	--	--	--	--	--	--
	03-19-01	.22	13.5	.2	13.8	35.9	.43	318	311	.080	E.09
VIR125-30	03-14-01	--	--	--	--	--	--	--	--	--	--
	04-03-01	--	--	--	--	--	--	--	--	--	--
	05-07-01	--	--	--	--	--	--	--	--	--	--
	06-12-01	.16	4.9	.2	16.1	18.6	.41	300	291	.085	.16
	07-09-01	--	--	--	--	--	--	--	--	--	--
WASHTENAW COUNTY											
VIR161-1	01-03-01	--	--	--	--	--	--	--	--	--	--
	07-23-01	--	--	--	--	--	--	--	--	--	--
VIR161-2	05-21-01	--	--	--	--	--	--	--	--	--	--
	07-11-01	--	--	--	--	--	--	--	--	--	--
VIR161-3	06-18-01	.24	217	.8	13.3	131	1.14	836	807	--	--

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	COLI-PHAGE, E. COLI C HOST, 1-AGAR, (PLAQUE 100 ML) (90905)	COLI-PHAGE, E. COLI F-AMP, 1-AGAR, (PLAQUE 100 ML) (90904)	COLIPGE F-SPEC FAMP 2-STEP, PRE/ABS PER 1 L 1=Y,2=N (99335)	COLIPGE F-SPEC FAMP 2-STEP, PRE/ABS /100ML 1=Y,2=N (99334)
LIVINGSTON COUNTY											
VIR093-1	01-17-01	--	--	--	--	--	--	<1	<1	2	2
	06-26-01	--	--	--	--	--	--	<1	<1	2	2
VIR093-3	02-28-01	--	--	--	--	--	--	<1	<1	2	2
	06-20-01	--	--	--	--	--	--	<1	<1	2	2
VIR093-5	03-13-01	--	--	--	--	--	--	<1	<1	2	2
	04-02-01	--	--	--	--	--	--	<1	<1	2	2
	05-09-01	--	--	--	--	--	--	<1	<1	1	2
	06-13-01	<.050	<.006	.03	<.006	<.020	.77	<1	<1	2	2
	07-10-01	--	--	--	--	--	--	<1	<1	2	2
MACOMB COUNTY											
VIR099-1	12-04-00	--	--	--	--	--	--	<1	<1	2	2
	03-07-01	--	--	--	--	--	--	<1	<1	2	2
OAKLAND COUNTY											
VIR125-1	10-25-00	E.033	E.003	--	<.006	<.018	.72	<1	<1	2	2
	03-20-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-2 (com)	02-13-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-3	02-26-01	<.047	<.006	.73	.029	.025	3.8	<1	<1	2	2
VIR125-4	10-31-00	E.029	E.003	--	<.006	<.018	1.7	<1	<1	2	2
	01-31-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-5	11-06-00	<.047	E.004	--	E.004	<.081	.53	<1	<1	2	2
VIR125-6	01-22-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-7	02-20-01	--	--	--	--	--	--	<1	<1	2	2
	04-24-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-8 (com)	11-28-00	--	--	--	--	--	--	<1	<1	2	2
	03-26-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-10(com)	10-23-00	<.047	<.006	.03	<.006	<.018	.86	<1	<1	2	2
	06-11-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-11	11-15-00	--	--	--	--	--	--	<1	<1	2	2
	03-28-01	<.047	<.006	.05	.010	E.011	.94	<1	<1	2	2
VIR125-12	11-01-00	.103	<.006	--	<.006	<.018	.67	<1	<1	2	2
	05-23-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-13(com)	02-14-01	--	--	--	--	--	--	<1	<1	2	2
	04-09-01	--	--	--	--	--	--	<1	<1	2	2

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N) (00607)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	COLI-PHAGE, E. COLI C HOST, 1-AGAR, (PLAQUE 100 ML) (90905)	COLI-PHAGE, E. COLI F-AMP, 1-AGAR, (PLAQUE 100 ML) (90904)	COLIPGE F-SPEC FAMP 2-STEP, PRE/ABS PER 1 L 1=Y,2=N (99335)	COLIPGE F-SPEC FAMP 2-STEP, PRE/ABS /100ML 1=Y,2=N (99334)
OAKLAND COUNTY											
VIR125-14(com)	11-29-00	--	--	--	--	--	--	<1	<1	2	2
	03-27-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-15	12-06-00	--	--	--	--	--	--	<1	<1	2	2
	03-12-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-16(com)	03-21-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-17(com)	02-07-01	--	--	--	--	--	--	<1	<1	2	2
	06-05-01	--	--	--	--	--	--	<1	<1	1	2
VIR125-18(com)	02-27-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-19(com)	02-21-01	--	--	--	--	--	--	<1	<1	2	2
	04-10-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-22(com)	03-06-01	--	--	--	--	--	--	<1	<1	2	2
	06-27-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-23	11-20-00	<.047	<.006	--	<.006	<.018	1.0	<1	<1	2	2
	04-04-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-24(com)	11-27-00	--	--	--	--	--	--	<1	<1	2	2
	05-22-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-26(com)	01-16-01	--	--	--	--	--	--	<1	<1	2	2
	06-04-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-27	01-23-01	--	--	--	--	--	--	<1	<1	2	2
	03-05-01	--	--	--	--	--	--	<1	<1	2	2
	04-25-01	--	--	--	--	--	--	<1	<1	2	2
	05-29-01	.057	E.003	--	<.006	<.020	.86	<1	<1	--	--
	06-25-01	--	--	--	--	--	--	<1	<1	2	2
VIR125-28	02-06-01	--	--	--	--	--	--	<1	<1	2	2
	03-19-01	<.047	<.006	--	.011	<.081	.62	<1	<1	2	2
VIR125-30	03-14-01	--	--	--	--	--	--	<1	<1	2	2
	04-03-01	--	--	--	--	--	--	<1	<1	2	2
	05-07-01	--	--	--	--	--	--	<1	<1	2	2
	06-12-01	E.033	<.006	.07	<.006	<.020	2.2	<1	<1	2	2
	07-09-01	--	--	--	--	--	--	<1	<1	2	2
WASHTENAW COUNTY											
VIR161-1	01-03-01	--	--	--	--	--	--	<1	<1	--	--
	07-23-01	--	--	--	--	--	--	<1	<1	2	2
VIR161-2	05-21-01	--	--	--	--	--	--	<1	<1	2	2
	07-11-01	--	--	--	--	--	--	<1	<1	2	2
VIR161-3	06-18-01	--	--	--	--	--	--	<1	<1	2	2

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	COLIPGE SOM,EC C-HOST, 2-STEP, PRE/ABS PER 1 L 1=Y,2=N (99329)	COLIPGE SOM,EC C-HOST, 2-STEP, PRE/ABS /100ML 1=Y,2=N (99328)	E COLI, MI MF, WATER (COL/ 100 ML) (90901)	ENTERIC VIRUS, TOTAL CULT., 1-MDS (MPN / 100 L) (90910)	ENTERO-COCCI, MEI MF, WATER (COL/ 100 ML) (90909)	TOTAL COLI-FORM, MI MF, WATER (COL/ 100 ML) (90900)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
LIVINGSTON COUNTY										
VIR093-1	01-17-01	2	2	<1	--	<1	<1	--	--	--
	06-26-01	2	2	<1	--	<1	<1	--	--	--
VIR093-3	02-28-01	2	2	<1	--	<1	<1	--	--	--
	06-20-01	2	2	<1	--	<1	<1	--	--	--
VIR093-5	03-13-01	2	2	<1	--	<1	<1	--	--	--
	04-02-01	2	2	<1	--	<1	<1	--	--	--
	05-09-01	2	2	<1	--	<1	<1	--	--	--
	06-13-01	2	2	<1	--	<1	<1	60	1300	19.2
	07-10-01	2	2	<1	--	<1	<1	--	--	--
MACOMB COUNTY										
VIR099-1	12-04-00	2	2	<1	<1.0	<1	<1	--	--	--
	03-07-01	2	2	<1	--	<1	<1	--	--	--
OAKLAND COUNTY										
VIR125-1	10-25-00	2	2	<1	<1.0	E1	<1	29	100	104
	03-20-01	2	2	<1	--	<1	<1	--	--	--
VIR125-2 (com)	02-13-01	2	2	<1	--	<1	<1	--	--	--
VIR125-3	02-26-01	2	2	<1	--	<1	<1	--	--	--
VIR125-4	10-31-00	2	2	<1	<1.0	<1	<1	29	2270	63.6
	01-31-01	2	2	<1	--	<1	<1	--	--	--
VIR125-5	11-06-00	2	2	<1	<1.0	<1	<1	19	1260	29.6
VIR125-6	01-22-01	2	2	<1	--	<1	<1	--	--	--
VIR125-7	02-20-01	2	2	<1	--	<1	<1	--	--	--
	04-24-01	2	2	<1	--	<1	<1	--	--	--
VIR125-8 (com)	11-28-00	2	2	<1	<1.0	<1	<1	--	--	--
	03-26-01	2	2	<1	--	<1	<1	--	--	--
VIR125-10 (com)	10-23-00	2	2	<1	<1.0	<1	<1	33	610	12.7
	06-11-01	2	2	<1	--	<1	<1	--	--	--
VIR125-11	11-15-00	2	2	<1	<1.0	<1	<1	--	--	--
	03-28-01	2	2	<1	--	<1	<1	27	1840	50.8
VIR125-12	11-01-00	2	2	<1	<1.0	E1	<1	23	900	27.0
	05-23-01	2	2	<1	--	<1	<1	--	--	--
VIR125-13 (com)	02-14-01	2	2	<1	--	<1	<1	--	--	--
	04-09-01	2	2	<1	--	<1	<1	--	--	--

GROUND-WATER DATA COLLECTED AT SPECIAL-STUDY SITES

USGS-USEPA study on the occurence of ground-water pathogens in small public ground-water supplies in southeast Michigan--Continued

LOCAL WELL NUMBER	DATE	COLIPGE SOM, EC C-HOST, 2-STEP, PRE/ABS PER 1 L 1=Y, 2=N (99329)	COLIPGE SOM, EC C-HOST, 2-STEP, PRE/ABS /100ML 1=Y, 2=N (99328)	E COLI, MI MF, WATER (COL/ 100 ML) (90901)	ENTERIC VIRUS, TOTAL CULT., 1-MDS (MPN / 100 L) (90910)	ENTERO-COCCI, MEI MF, WATER (COL/ 100 ML) (90909)	TOTAL COLI-FORM, MI MF, WATER (COL/ 100 ML) (90900)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)
OAKLAND COUNTY										
VIR125-14 (com)	11-29-00	2	2	<1	<1.0	<1	<1	--	--	--
	03-27-01	2	2	<1	--	<1	<1	--	--	--
VIR125-15	12-06-00	2	2	<1	<1.0	<1	<1	--	--	--
	03-12-01	2	2	<1	--	<1	<1	--	--	--
VIR125-16 (com)	03-21-01	2	2	<1	--	<1	<1	--	--	--
VIR125-17 (com)	02-07-01	2	2	<1	--	<1	<1	--	--	--
	06-05-01	2	2	<1	--	<1	<1	--	--	--
VIR125-18 (com)	02-27-01	2	2	<1	--	<1	<1	--	--	--
VIR125-19 (com)	02-21-01	2	2	<1	--	<1	<1	--	--	--
	04-10-01	2	2	<1	--	<1	<1	--	--	--
VIR125-22 (com)	03-06-01	2	2	<1	--	<1	<1	--	--	--
	06-27-01	2	2	<1	--	<1	<1	--	<10	12.9
VIR125-23	11-20-00	2	2	<1	<1.0	<1	<1	22	1510	24.3
	04-04-01	2	2	<1	--	<1	<1	--	--	--
VIR125-24 (com)	11-27-00	2	2	<1	<1.0	<1	<1	--	--	--
	05-22-01	2	2	<1	--	<1	<1	--	--	--
VIR125-26 (com)	01-16-01	2	2	<1	--	<1	<1	--	--	--
	06-04-01	2	2	<1	--	<1	<1	--	--	--
VIR125-27	01-23-01	2	2	<1	--	<1	<1	--	--	--
	03-05-01	2	2	<1	--	<1	<1	--	--	--
	04-25-01	2	2	<1	--	<1	<1	--	--	--
	05-29-01	--	--	<1	--	<1	<1	44	<10	17.4
	06-25-01	2	2	<1	--	<1	<1	--	--	--
VIR125-28	02-06-01	2	2	<1	--	<1	<1	--	--	--
	03-19-01	2	2	<1	--	<1	<1	27	1730	37.9
VIR125-30	03-14-01	2	2	<1	--	<1	<1	--	--	--
	04-03-01	2	2	E1	--	<1	<1	--	--	--
	05-07-01	2	2	<1	--	<1	<1	--	--	--
	06-12-01	2	2	<1	--	<1	<1	24	1890	41.1
	07-09-01	2	2	<1	--	<1	<1	--	--	--
WASHTENAW COUNTY										
VIR161-1	01-03-01	--	--	<1	--	<1	<1	--	--	--
	07-23-01	2	2	<1	--	<1	<1	--	--	--
VIR161-2	05-21-01	2	2	<1	--	--	<1	--	--	--
	07-11-01	2	2	<1	--	<1	<1	--	--	--
VIR161-3	06-18-01	2	2	<1	--	<1	<1	506	630	24.1

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^{0}	kilometer
	Area	
acre	4.047×10^{3}	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi^2)	2.590×10^{0}	square kilometer
	Volume	
gallon (gal)	3.785×10^{0}	liter
	3.785×10^{0}	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^{3}	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft^3)	2.832×10^{1}	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^{3}	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second
	2.832×10^{1}	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^{1}	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
	Mass	
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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