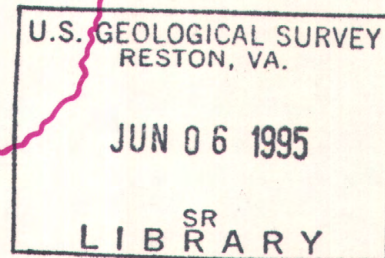
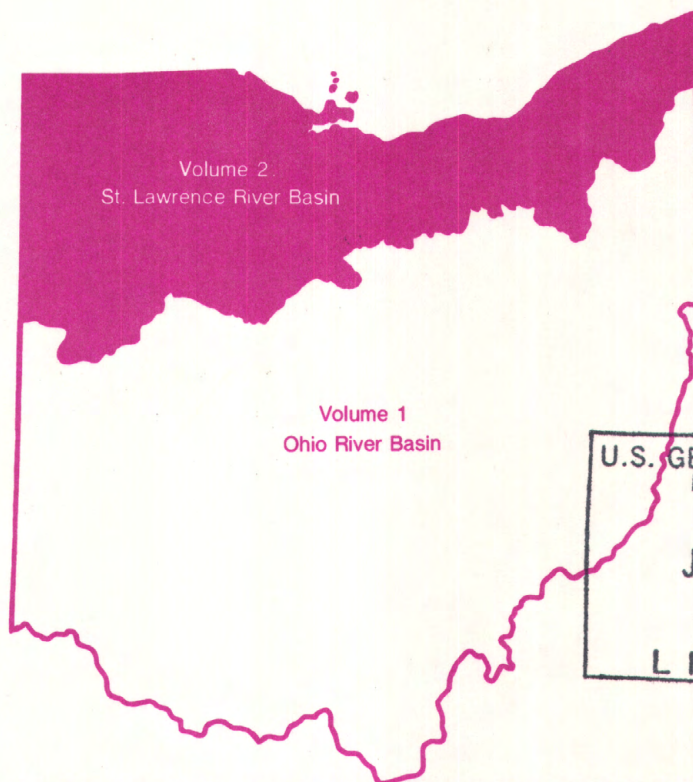


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# Water Resources Data Ohio Water Year 1994

Volume 2. St. Lawrence River Basin and  
Statewide Project Data



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OH-94-2  
Prepared in cooperation with the State of Ohio  
and with other agencies



# CALENDAR FOR WATER YEAR 1994

1993

## OCTOBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

## NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

## DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1994

## JANUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

## FEBRUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

## MARCH

S	M	T	W	T	F	S
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27	28	29	30	31		

## APRIL

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## MAY

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29	30	31				

## JUNE

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26	27	28	29	30		

## JULY

S	M	T	W	T	F	S
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24	25	26	27	28	29	30
31						

## AUGUST

S	M	T	W	T	F	S
	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

## SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	





# Water Resources Data Ohio Water Year 1994

## Volume 2. St. Lawrence River Basin and Statewide Project Data

by H.L. Shindel, J.P. Mangus, and L.E. Trimble



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OH-94-2  
Prepared in cooperation with the State of Ohio  
and with other agencies



UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U. S. GEOLOGICAL SURVEY

Gordon Eaton, Director

Prepared in cooperation with the  
State of Ohio  
and with other agencies as listed  
under cooperation

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975 West Third Avenue  
Columbus, OH 43212  
1995



## PREFACE

This volume of the annual hydrologic data report of Ohio 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 Trust Territories. These records of streamflow, ground-water levels, and quality of water provides 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. Hydrologic data for Ohio are contained in two volumes:

Volume 1. Ohio River Basin

Volume 2. St. Lawrence River Basin - Statewide Project Data

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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This report was prepared in cooperation with the State of Ohio and with other agencies under the general supervision of S.M. Hindall District Chief, Ohio.



REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE March 1995		3. REPORT TYPE AND DATES COVERED Annual--Oct.1, 1993-Sept. 30, 1994
4. TITLE AND SUBTITLE Water Resources Data Ohio, Water Year 1994, Volume 2. St. Lawrence River Basin and Statewide Project Data.			5. FUNDING NUMBERS	
6. AUTHOR(S) H.L. Shindel, J.P. Mangus, and L.E. Trimble				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Geological Survey, Water Resources Division Ohio District 975 West Third Avenue Columbus, Ohio 43212-3194			8. PERFORMING ORGANIZATION REPORT NUMBER USGS-WDR-OHIO-94-2	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Geological Survey, Water Resources Division Ohio District 975 West Third Avenue Columbus, Ohio 43212-3194			10. SPONSORING / MONITORING AGENCY REPORT NUMBER USGS/WRD/HD-95/249	
11. SUPPLEMENTARY NOTES Prepared in cooperation with Federal, State, and local agencies.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT No restriction on distribution. This report may be purchased from National Technical Information Service, Springfield, Virginia 22161.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Water-resources data for the 1994 water year for Ohio consist of records of stage, discharge, and water quality of streams; stage and contents of lakes and reservoirs; and water levels and water quality of ground-water wells. This report, in two volumes, contains records for water discharge at 123 gaging stations, 8 partial-record sites; water levels at 251 observation wells; 21 crest stage gages; water quality at 25 gaging stations, 302 observation wells, and 8 partial record sites. Also included are data from miscellaneous and synoptic sites. Additional water data were collected at various sites not involved in the systematic data-collection program and are published as miscellaneous measurements and analyses. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Ohio.				
14. SUBJECT TERMS *Ohio, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rates, Gaging stations, Lakes, reservoirs, Chemical analyses, Sediments, Water temperature, Sampling sites, Water levels, Water analyses, Streamflow, Water wells.			15. NUMBER OF PAGES 480	
			16. PRICE CODE A21	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	



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(Letter after station name designates type of data: (c) miscellaneous chemical measurements, (C) daily chemical data, (d) discharge, (e) contents and (or) elevation, (HBM) hydrologic bench mark, (M) water-quality monitor, (m) microbiological, (NASQAN) National stream-quality accounting network, (r) radio-chemical, (s) miscellaneous sediment measurements, (S) daily suspended-sediment data, (t) temperature.)

## ST. LAWRENCE RIVER BASIN

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## VIII

## DISCONTINUED SURFACE-WATER STATIONS - ST. LAWRENCE RIVER BASIN

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

[Letters after station name designate type of data collected: (d) discharge]

Station Name	Station Number	Drainage Area (mi <sup>2</sup> )	Period of Record
ST JOSEPH R NR BLAKESLEE (d)	04177500	394	1926-32
ST MARYS R NR WILLSHIRE (d)	04181000	354	1925-32
MAUMEE R AT ANTWERP (d)	04183500	2,129	1939-82
MAUMEE R NR SHERWOOD (d)	04184000	2,275	1903-06
BEAN C AT POWERS (d)	04184500	206	1940-81
TIFFIN R NR BRUNERSBURG (d)	04185500	736	1928-35
MIAMI & ERIE CA AT DELPHOS (d)	04186000	—	1928-33
OTTAWA R AT ALLENTOWN (d)	04187500	160	1923-35 1943-82
OTTAWA R AT KALIDA (d)	04188000	309	1930-35
EAGLE CR NR FINDLAY (d)	4188500	55.0	1947-57
BLANCHARD R AT GLANDORF (d)	04189500	644	1921-28 1947-51
BLANCHARD R AT DUPONT (d)	04190000	756	1928-35
ROLLER CR AT OHIO CITY (d)	04190500	5.14	1946-48
TOWN CR NR VAN WERT (d)	04191000	21.2	1945-53
MIAMI & ERIE CA NR DEFIANCE (d)	04192000	—	1924-29 1952-69
MIAMI & ERIE CA AT WATERVILLE (d)	04193000	—	1921-29
SWAN C AT TOLEDO (d)	04194000	199	1940-48 1985-91
PORTAGE R NR PEMBERVILLE (d)	04194500	337	1930-35
N B PORTAGE R NR BOWLING GREEN (d)	04195000	45.1	1923-32
LACARPE CR NR OAK HARBOR (d)	04195825	2.95	1987-92
BAYOU DITCH NR OAK HARBOR (d)	04195830	2.82	1987-92
SANDUSKY R NR BUCYRUS (d)	04196000	88.8	1925-35 1938-51 1964-81
BROKEN SWORD C AT NEVADA (d)	04196200	83.8	1976-81
SANDUSKY R NR UPPER SANDUSKY (d)	04196500	298	1921-35 1938-81
SANDUSKY RIVER NR MEXICO (d)	04197000	774	1928-35 1938-82
WOLF C AT BETTSVILLE (d)	04197300	66.2	1976-81
E B WOLF C NR BETTSVILLE (d)	04197450	82.4	1976-81
HAVENS C AT HAVENS (d)	04197500	4.28	1946-49
VERMILION R NR FITCHVILLE	04199287	112	1978-89 1990-93
VERMILION R NR VERMILION	04199500	262	1950-81
E B BLACK R AT ELYRIA (d)	04200000	217	1922-35
W B BLACK R AB LAKE ST AT ELYRIA (d)	04200430	174	1980-84
CUYAHOGA RIVER NR KENT (d)	04202500	210	1933-35
BREAKNECK C NR KENT (d)	04203000	77.6	1927-35
L CUYAHOGA R AT MOGADORE (d)	04204000	14.3	1945-78
CUYAHOGA R AT MASSILLON RD AKRON (d)	04204500	31.6	1945-74
SPRINGFIELD LAKE OUTLET AT AKRON (d)	04205000	9.72	1945-74
L CUYAHOGA R AT AKRON (d)	04205500	44.4	1920 1927-34
L CUYAHOGA R BL OHIO CA AT AKRON (d)	04205700	59.2	1973-79
CUYAHOGA R AT IRA (d)	04206250	478	1973-79
OHIO CANAL FEEDER AT BRECKSVILLE (d)	04207000	—	1923-24
OHIO CA AT INDEPENDENCE (d)	04207500	—	1921-23 1927-35 1940-41 1948-81
BIG C AT CLEVELAND (d)	04208502	35.3	1972-86
EUCLID C NR EUCLID (d)	04208690	22.6	1977-80 1984-85
GRAND R NR NORTH BRISTOL (d)	04209500	85.4	1942-47
PHELPS C NR WINDSOR (d)	04210000	25.6	1942-59
GRAND RIVER NR ROME (d)	04210500	251	1942-47
ROCK C NR ROCK CREEK (d)	04211000	69.2	1948-66
MILL C NR JEFFERSON (d)	04211500	82.0	1942-74
GRAND R NR MADISON (d)	04212000	581	1922-35 1938-74
ASHTABULA R NR ASHTABULA (d)	04212500	111	1924-35 1950-80

-- not determined for canals.

## DISCONTINUED SURFACE-WATER-QUALITY STATIONS - ST. LAWRENCE RIVER BASIN

IX

The following stations were discontinued as continuous-record surface-water-quality stations prior to the 1993 water year. Daily records of temperature, specific conductance, pH, dissolved oxygen or sediment were collected and published for the record shown for each station.

Station Name	Station Number	Drainage Area (mi <sup>2</sup> )	Type of Record	Period of Record
MAUMEE R AT ANTWERP	04183500	2,129	Temp.	1939-82
MAUMEE R AT DEFIANCE	04184100	2,316	Temp., S.C., D.O.	1966-70
			pH	1973-78
TIFFIN R AT EVANSPOET	04185300	541	Temp., S.C., D.O., pH	1968-78
AUGLAIZE R NR FT. JENNINGS	04186500	332	Temp., S.C., D.O., pH	1969-78
OTTAWA R AT ALLENTOWN	04187500	160	Temp., S.C.	1969-82
			D.O., pH.	1977-82
AUGLAIZE R AT CLOVERDALE	04188200	713	Temp., S.C., D.O., pH	1967-78
BLANCHARD R NR FINDLAY	04189000	346	Temp., S.C., D.O., pH	1968-80
AUGLAIZE R NR DEFIANCE	04191500	2,318	Temp., S.C., D.O., pH	1966-76
			Sed.	1936
KEITZ RUN AT WATERVILLE	04192900	1.06	Precip.	1981-86
MAUMEE R NR WATERVILLE	04193490	6,313	Temp., S.C., D.O., pH	1977-91
MIAMI RIVER AT WATERVILLE	04193500	6,329	Temp., S.C., D.O., PH	1963-77
MAUMEE R AT MOUTH AT TOLEDO	04194023	6,608	Temp., S.C., D.O., pH.	1967-75
M B PORTAGE R NR PORTAGE	04194310	217	Temp., S.C.	1969-75
PORTAGE R AT RR BRIDGE AT WOODVILLE	04195600	428	Temp., S.C., D.O., pH.	1968-80
PORTAGE R AT ELMORE	04195800	432	Temp	1950-52
			D.O.	1970-80
			Sed.	1950-53
SANDUSKY R NR UPPER SANDUSKY	04196500	298	Temp., S.C., D.O.,	1969-79
			pH	1977-79
TYMOCHTEE C AT CRAWFORD	04196800	229	Temp., S.C., D.O., pH.	1968-75
SANDUSKY R AT ST JOHNS BRIDGE NR MEXICO	04196990	711	Temp., S.C., D.O.	1969-76
HONEY CR AT MELMORE	04197100	141	Sed.	1988-89
SANDUKY RIVER BELOW FREMONT	04198005	1,264	Temp., S.C., D.O., pH.	1966-80
W B HURON R NR WILLARD	04198018	86.0	Temp., S.C.	1968-75
SANDHILL C NR MONROEVILLE	04198019	1.76	Precip	1981-86
HURON RIVER AT MILAN	04199000	371	Sed.	1970-74
				1988-91
HURON RIVER BL MILAN	04199100	385	Temp., S.C., D.O., pH	1968-78
VERMILION R NR FITCHVILLE	04199287	112	Sed.	1987-89
VERMILION R NR VERMILION	04199500	262	Temp., S.C.,	1969-76
			D.O., pH	1976-80
E B BLACK R AT GRAFTON	04199900	170	Temp., S.C.	1969-75
W B BLACK R NR ELYRIA	04200400	170	Temp., S.C.	1969-75
W B BLACK R AB LAKE ST AT ELYRIA	04200430	174	Sed.	1980-81
BLACK R AT ELYRIA	04200500	396	Temp.	1962-70
			S.C.	1964-70
			Sed.	1980-81
BLACK R BL ELYRIA	04200550	412	Temp., S.C., D.O.	1966-82
			pH	1976-82
CUYAHOGA R AT OLD PORTAGE	04205700	59.2	Temp., S.C., D.O., pH	1970-84
			Sed.	1972-81
CUYAHOGA R AT BATZUM	04206200	443	Temp.	1947-49
TINKERS C AT BEDFORD	04207200	83.9	Sed.	1972-79
CUYAHOGA R AT INDEPENDENCE	04208000		Temp., S.C., D.O.	1965-72
			Temp., S.C., D.O., pH	1972-91
BIG C AT CLEVELAND	04208502	35.3	Sed.	1978
CUYAHOGA R AT DUPONT INTAKE IN CLEVELAND	04208505	794	S.C.	1964-75
CUYAHOGA R AT WEST THIRD STREED BRIDGE	04208506	798	Temp., S.C., D.O., pH	1966-87
CUYAHOGA R AT SUPR ST BRIDGE IN CLEVELAND	04208510	808	Temp., S.C., D.O., pH	1964-66
CHAGRIN R AT WILLOUGHBY	04209000	246	Temp	1950
			Sed.	1969-74
GRAND RIVER AT PAINESVILLE	04212200	701	Temp., S.C., D.O., pH	1966-82
FIELDS BROOK AT ASHTABULA	04212680	3.63	Temp., S.C., D.O., pH	1983-91
ASHTABULA R AT ASHTABULA	04212700	136	Temp., S.C., D.O., pH	1968-79



**X GROUND-WATER STATIONS FOR WHICH RECORDS ARE PUBLISHED - ST. LAWRENCE RIVER BASIN**

<u>Well Number</u>	<u>Local Number</u>	<u>Location</u>	<u>Page</u>
<b>CRAWFORD COUNTY</b>			
404838082563100	CR-1	Bucyrus .....	113
<b>HANCOCK COUNTY</b>			
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**VOLUME 2: ST. LAWRENCE RIVER BASIN****STATEWIDE PROJECT DATA****INTRODUCTION**

The Water Resources Division of the U.S. Geological Survey (USGS), in cooperation with State agencies, obtains a large amount of data each water year (a water year is the 12-month period from October 1 through September 30 and is identified by the calendar year in which it ends) pertaining to the water resources of Ohio. These data, accumulated during many 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 USGS, they are published annually in this report series entitled "Water Resources Data--Ohio."

This report (in two volumes) includes records on surface water and ground water in the State. Specifically, it contains: (1) Discharge records for streamflow-gaging stations, miscellaneous sites, and crest-stage stations; (2) stage and content records for streams, lakes, and reservoirs; (3) water-quality data for streamflow-gaging stations, wells, synoptic sites, and partial-record sites; and (4) water-level data for observation wells. Locations of lake- and streamflow-gaging stations, water-quality stations, and observation wells for which data are presented in this volume are shown in figures 8a through 8b. The data in this report represent that part of the National Water Data System collected by the USGS and cooperating State and Federal agencies in Ohio.

This series of annual reports for Ohio 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 was changed to present (in two to three volumes) data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to the introduction of this series, and for several years concurrent with it, water-resources data for Ohio were published in a series of USGS Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage through September 1960 were published annually under the title "Surface-Water Supply of the United States, Parts 3 and 4." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on the chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and ground-water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above-mentioned Water-Supply Papers can be found in libraries of the principal cities of the United States, and can be purchased from the U.S. Geological Survey, Open-File Reports Section, Box 25286, Mail Stop 517, Denver, CO 80225.

Publications similar to this report are published annually by the USGS for all States. These official USGS reports are identified by means of a 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 OH-94-2". For archiving and general distribution, the reports for 1971-74 water years are also identified as water-data reports. These water-data reports can be purchased in paper copy or in microfiche from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

Additional information for ordering specific reports, including current prices, may be obtained by writing the District Chief at the address given on the back of title page or by telephoning (614) 469-5553. A limited number of CD-ROM discs will be available for sale by the U.S. Geological Survey, Map Distribution Section, Box 25286, Building 810, Federal Center, Denver, Colorado 80225 and (or) U.S. Geological Survey, Open-File Reports Section, Box 25286, Mail Stop 517, Denver, Colorado 80225.

**COOPERATION**

The USGS and agencies of the State of Ohio have had cooperative agreements for the collection of water-resource data since 1898. The following organizations assisted in collecting data in this report:

Ohio Department of Natural Resources, Frances Buchholzer, Director;  
Ohio Department of Natural Resources; Natural Areas and Preserves, Ralph Ramey, Chief;  
U.S. Air Force, Air Force Materiel Command, Air Force Guidance and Metrology Center,  
Office of Environmental Management, Vincent A. Power, Chief;  
Ohio Department of Transportation, Jerry H. Wray, Director;  
Miami Conservancy District, J. L. Rozelle, General Manager and Chief Engineer;  
City of Columbus Department of Public Service, J. R. Douthett, Administrator;  
City of Canton Water Department, J. D. Williams, Superintendent;  
Ross County, James Kennard, Administrative Assistant;  
Summit County, Jeffrey Lintern, Director, Environmental Services;

Seneca Soil and Water Conservation District, Norman Daniel, Board Chairman;  
 Cuyahoga River Community Planning Organization, John Beeker;  
 Northeast Regional Sewer District, E. J. Deal, Executive Director;  
 City of Fremont, Warren Curtis, City Engineer;  
 City of Akron, Linda Sowa, Administrator;  
 Northeast Regional Sewer District, E. J. Deal, Executive Director;  
 City of Lima, A. Godsey, City Sanitary Engineer;  
 Eastgate Development and Transportation Agency, J. Wells, Environment Project Manager;  
 U.S. Air Force, Air Force Materiel Command, 645 Air Base Wing, Office of Environmental Management, A. F. Sculimbrene, Director;  
 Ohio State University, Ohio Agricultural Research and Development Center (OARDC), Professor Warren Dick;  
 Ohio State University Research Foundation, Sharon Coulter, Associate Director;  
 Washington County Board of Commissioners, Sandra Matthews, Commissioner;  
 Geauga County, Board of Commissioners, Tony Gall, Neil C. Hofstetter and William M. Repke;  
 U. S. Air Force, Air Force Materiel Command, Aeronautical Systems Center, Environmental Management Directorate, Restoration Branch, Susan A. Schmidt, Chief.

## SUMMARY OF HYDROLOGIC CONDITIONS

Ohio is part of three physiographic provinces. Each province has its own distinctive hydrologic characteristics. The topography of the Till Plains section of the Central Lowlands physiographic province (fig. 1) consists of gently rolling ground moraine, bands of terminal moraine, and outwash-filled valleys. Glaciation altered the courses of most streams in this area. The Eastern Lake Plains section (fig. 1) consists of wide expanses of level or nearly level land interrupted only by the sporadic sandy ridges that are the last visible remnants of glacial-lake beaches. Much of the area was swamp prior to development, and marshes are still present along Lake Erie near Toledo. The Lexington Plains section of the Interior Low Plateau province (fig. 1) is characterized by rolling terrain and a few isolated large hills and ridges. The "barbed" drainage pattern formed when small streams were captured as their headwaters cut back into the hills over time. Streams have carved the Kanawha section of the Appalachian Plateaus province (fig. 1) into an intricate series of hollows and steep-sided ridges. Only the large streams in the section have any appreciable flood plain. In the southern New York section (fig. 1), successive waves of glaciation have subdued the relief, buried many precocial valleys, and rerouted many streams.

## PRECIPITATION

The average annual precipitation in Ohio is about 38 inches. The annual precipitation decreases from around 42 inches on the southern border to about 32 inches in the northwest. An anomalous area of high precipitation (as much as 44 inches) in northeastern Ohio results from air masses that pick up moisture and heat from Lake Erie and subsequently release precipitation over a range of hills stretching northeastward from Cleveland.

Monthly precipitation typically is greatest from May through July and least in October, December, and February. Of the approximate 38 inches of average annual precipitation, about 10 inches runs off immediately, 2 inches is retained at or near the surface and evaporates and transpires, and 26 inches enters the ground. Of the 26 inches that enters the ground, 20 inches is retained in the unsaturated zone and is later lost by evapotranspiration. The remaining 6 inches reaches the water table. Of this 6 inches, 2 inches eventually discharges to streams, and the rest is lost by evapotranspiration and consumptive use. Average runoff ranges from about 15 to 18 inches along the southern border to about 8 to 12 inches along most of the northern border, except in the northeast, where runoff is as much as 20 inches. The pattern of streamflow differs from the pattern of precipitation because of the contributions of snowmelt to streamflow in the early spring and the reduction in flows by evapotranspiration from June through September.



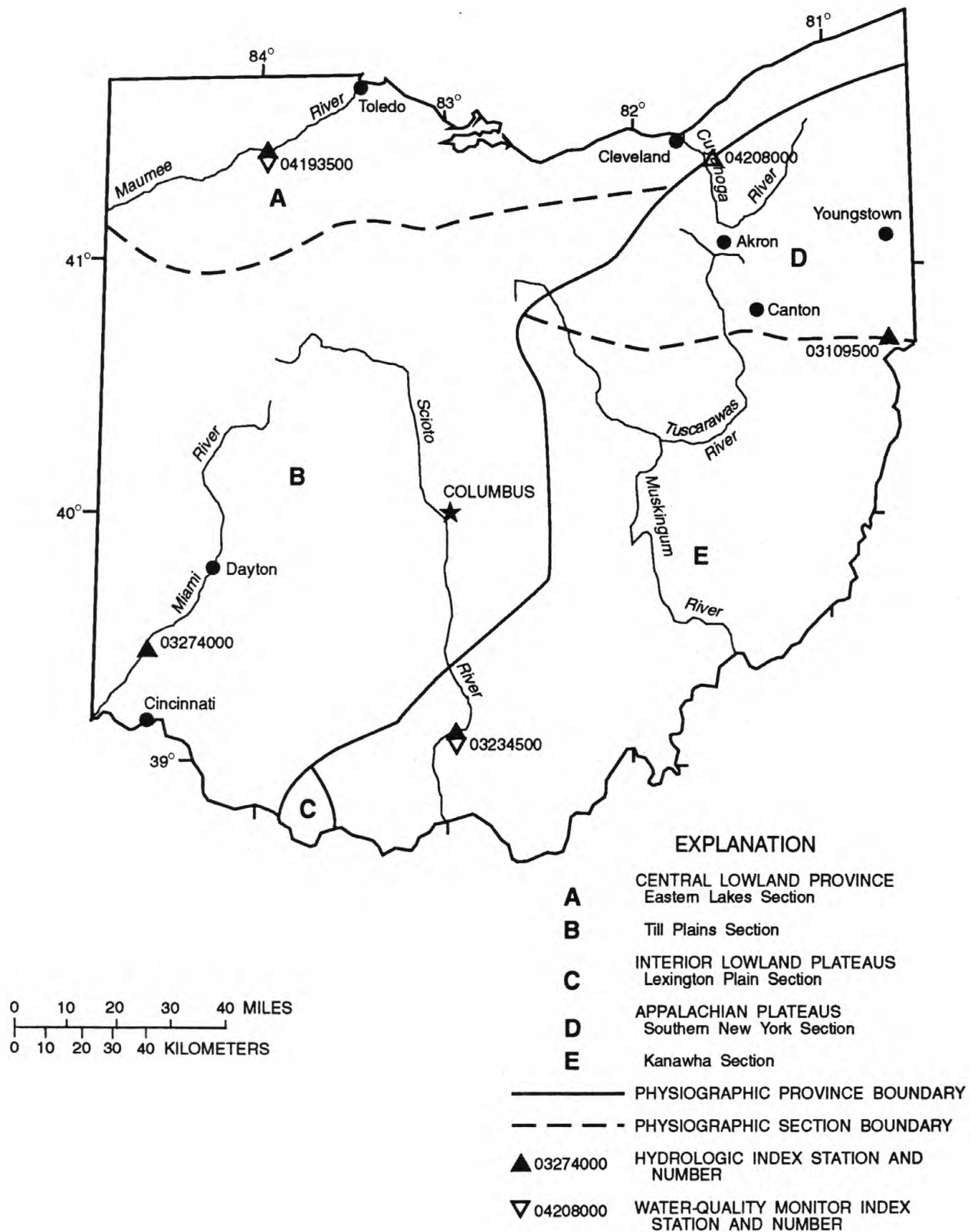


Figure 1. Physiographic divisions and location of Hydrologic Index Stations.

## SURFACE WATER

### Streamflow

Streamflow-data-collection stations are distributed irregularly throughout the State, and tend to be concentrated on the main river systems. The stations are used to sample a wide variety of conditions. The drainage areas range from 12 to 7,420 square miles and represent a wide diversity of topography and other physical characteristics. Streamflow ranges from unregulated to highly regulated.

#### Statewide Streamflow, Water Year 1994

At the beginning of the water year 1994, streamflow was deficient in parts of northeastern and south-central Ohio and in the normal<sup>1</sup> range in the remainder of the State. Above-normal precipitation during October and November brought flows to near normal statewide in October and caused excessive flows in southern Ohio in November. Near-record monthly flows were recorded at some gages in southwestern Ohio in November.

A decline in precipitation in December brought streamflow back to normal range statewide. In January, above-normal precipitation throughout Ohio caused excessive flows statewide except for northwestern Ohio, where streamflow remained in the normal range. Excessive flows prevailed in south-central Ohio during February, but below-normal precipitation caused a return to normal flows elsewhere.

Below-normal precipitation continued into March, causing a decline in streamflow into the deficient range in western Ohio; elsewhere, flows were normal. A return to normal precipitation in April resulted in near-normal flows statewide, a condition that prevailed throughout May and June except for northwestern Ohio, where flows declined into the deficient range in response to below-normal precipitation.

In July, streamflow remained normal for most of the State except for south-central Ohio, where above-normal precipitation caused streamflow to rise into the excessive range.

In August, streamflow was normal statewide and remained so until the end of the water year; the exception was northwestern Ohio, where below-normal precipitation caused streamflow to fall into the deficient range.

### Water Quality

The USGS collects long-term water-quality data in Ohio at six fixed stations (fig. 1). Five National Stream Quality Accounting Network (NASQAN) stations are in major river basins in Ohio, and one Hydrologic Benchmark station is in a small, relatively pristine basin in southern Ohio. Samples are collected quarterly at four stations, every two months at one station, and every two months at the Benchmark station. Because of the fixed schedule, samples are collected at various streamflows (fig. 2). Samples are analyzed for major anions and cations, nutrients, trace elements, suspended sediment, selected physical properties, and fecal coliform and fecal streptococci.

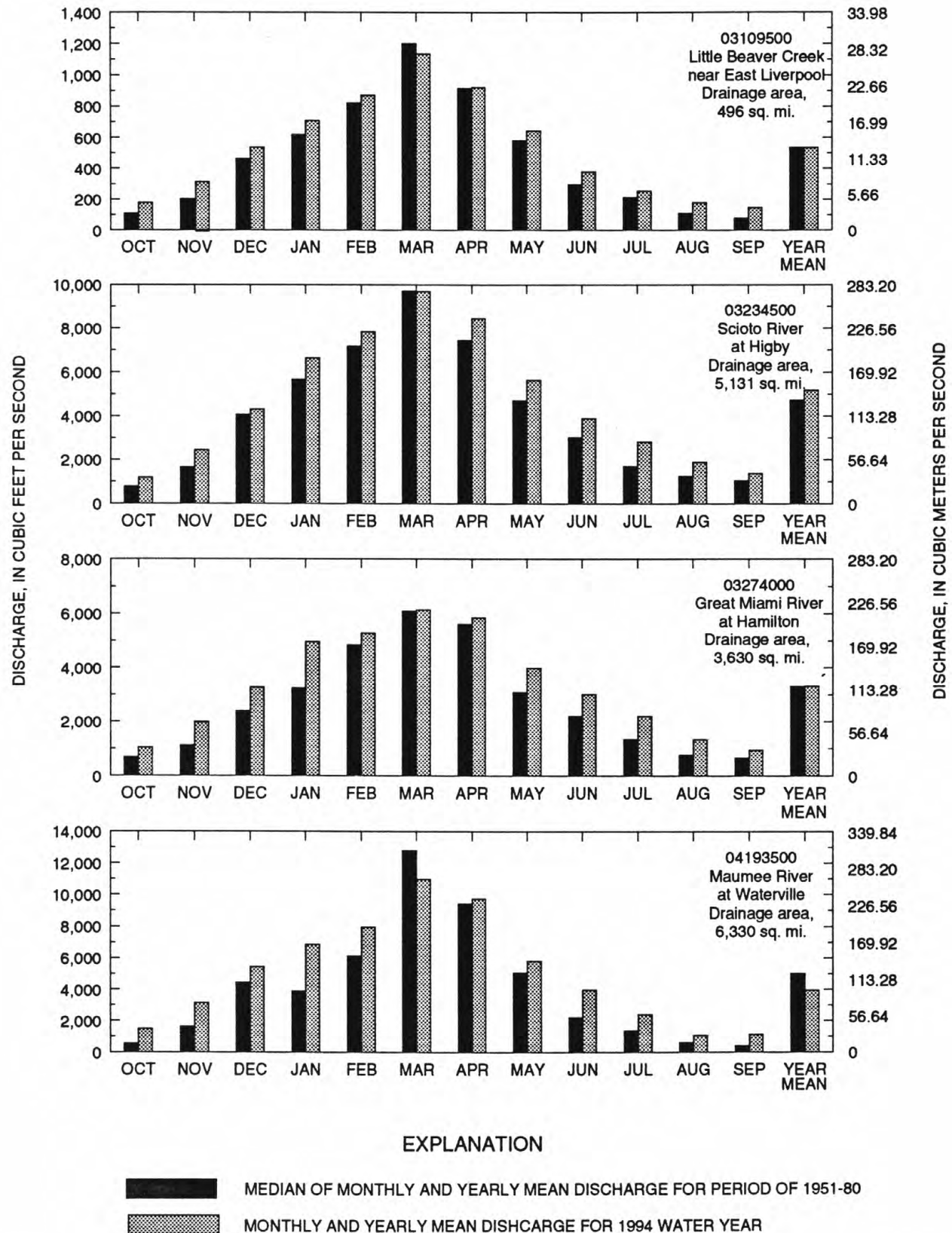
Box plots of selected constituents measured from 1984 through 1993 are shown in figures 3a and 3b. Results of analysis of samples collected in water year 1994 are superimposed on the box plots and are represented by solid circles.

For the Little Miami River at Milford, streamflows were above the 75th percentile for two samplings and below the 25th percentile for one sampling. Chloride concentrations at this station reflect these extreme streamflows and follow the typical pattern found in most streams in Ohio: the two higher streamflows resulted in low chloride concentrations, whereas the low streamflow resulted in a high chloride concentration. In the lower Grand River Basin, chloride concentrations were lower than the extremely high concentrations found in the previous 10-year period. In this area, salt mining and processing and runoff from abandoned chemical industries may have contributed to high chloride concentrations in the past.

None of the streams sampled had nitrate concentrations above the maximum contaminant level for finished drinking water, 10 milligrams per liter (as N). In Ohio streams, runoff from agriculture is a major source of nitrate.

Agricultural runoff and municipal and industrial point discharges are the principal sources of phosphorus in Ohio. Increased phosphorus concentrations may lead to a high rate of production of plant materials in the water and eutrophication of the stream. Total phosphorus concentrations were greatest and most variable in the Little Miami, Maumee, and Sandusky Rivers. The basins drained by these rivers contain agricultural and urban lands that contribute runoff of agricultural chemicals and discharges from municipal and industrial point sources.

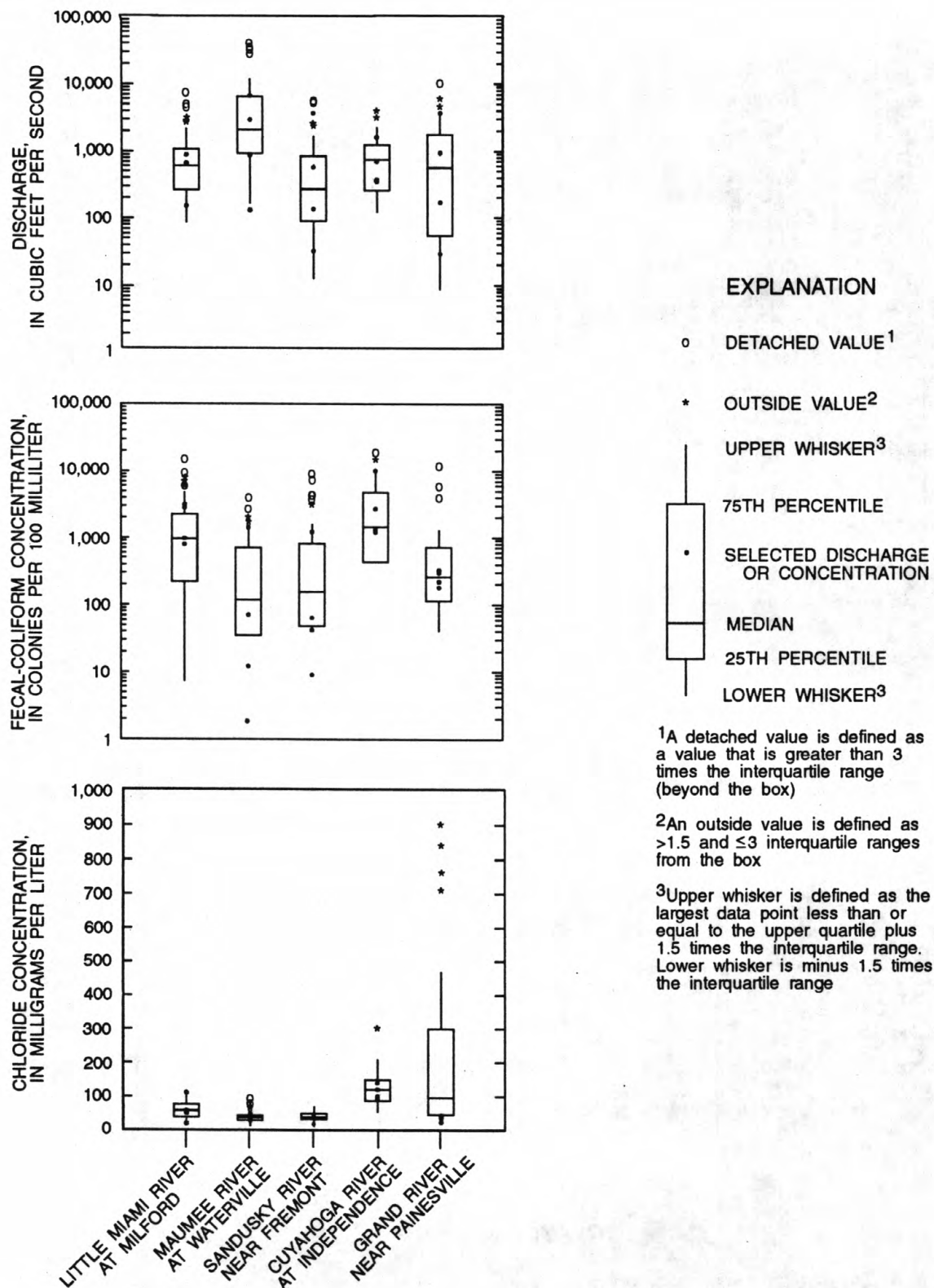
<sup>1</sup>For streamflow, "normal" is defined as being between the 25th and 75th percentiles as measured during the base period water years 1961-90.



**Figure 2.** Discharge during 1994 water-year compared with median discharge for period 1951-80 for four representative gaging stations.



## WATER RESOURCES DATA FOR OHIO, 1994



**Figure 3a.** Discharge, fecal-coliform, and chloride concentrations measured in water year 1994 and the distribution of those constituents from measurements made during water years 1984-1993 at NASQAN stations.

For the Little Miami and Cuyahoga Rivers, fecal coliform concentrations for water year 1994 were near or above the 10-year median concentrations. For the Grand River, fecal coliform concentrations for water year 1994 were similar to concentrations found in the previous 10-year period. Lower fecal coliform concentrations, however, were found in water year 1994 for the Maumee and Sandusky Rivers.

At the Grand River near Painesville dissolved solids concentrations were less than the median and the extremely high concentrations found in previous years. For all other sites, however, dissolved solids for water year 1994 were similar to concentrations found from 1984 through 1993.

## GROUND WATER

Ground water serves the needs of 45 percent of Ohio's population. An estimated 658 million gallons of ground water per day is withdrawn for public supply, domestic, industrial, and agricultural purposes. Many people in Ohio depend on ground water as the only practical source of supply.

Ohio's unconsolidated aquifers are composed of either coarse- or fine-grained sediments. Both types are composed mainly of materials of glacial origin. The coarse-grained unconsolidated aquifers generally consist of highly permeable sand and gravel. Much of the sand and gravel is alluvium derived from glaciofluvial outwash along the courses of some modern streams; thus, these aquifers sometimes are referred to as "watercourse" aquifers. Coarse-grained unconsolidated aquifers in the northwestern corner of the State (fig. 4) underlie glacial till, are locally confined under artesian pressure, and are highly productive. Extensive kame-terrace deposits of water-bearing gravel and sand are widely used ground-water sources in northeastern Ohio. The fine-grained unconsolidated aquifers are similar to the coarse-grained unconsolidated aquifers in form and origin but are less permeable because of higher percentages of mixed fine sand, silt, and clay. Included in the fine-grained unconsolidated aquifers are tills that contain thin or localized stratified lenses of sand and gravel.

Ground-water supply for much of the unglaciated upland area of southeastern Ohio is from bedrock aquifers composed of shaly sandstone and thin limestone. These strata, which range from Mississippian to Permian in age, are dominated by low-yielding shales and shaly sandstones that include numerous coal-bearing strata. In some places, small water supplies are available from fractured coal beds. Several sandstone aquifers in northeastern Ohio are of regional extent and are major ground-water sources for individual and small public supplies. These include the Berea and Black Hand Sandstones of Mississippian age and several sandstone members of the Pottsville and Allegheny Formations of Pennsylvanian age. The Lake Erie coastline of northeastern Ohio is underlain by shale of Devonian and Mississippian age (fig. 4) that yields only small amounts of water to wells. Silurian-age limestone and dolomite and Devonian limestone comprise the carbonate aquifer system (fig. 4) of much of western Ohio. Glacial cover is uneven and consists of valley fill and terminal moraine in some places. The northeastern part of western Ohio contains an area of high-yielding wells that tap a preferentially weathered zone, which developed when carbonate section was periodically exposed as land mass during the Paleozoic Era. The southwestern corner of Ohio near Cincinnati is underlain by shale and a thin limestone aquifer of Ordovician age. Away from the watercourse (coarse unconsolidated) aquifers that traverse the area, the rocks that form the uplands yield only very small amounts of ground water.

### Ground-Water Levels

Most ground-water observation wells in Ohio tap unconsolidated sand and gravel aquifers associated with the State's principal streams. Sample 1-year and 5-year hydrographs of a well completed in an unconfined unconsolidated sand-and-gravel aquifer are shown in figure 5. The observation-well network also includes some bedrock wells in areas where consolidated aquifers are heavily used for water supply, such as in the carbonate-rock region of northwestern Ohio. Sample 1-year and 5-year hydrographs of a well completed in a confined carbonate-rock aquifer are shown in figure 6. The yearly low for most wells occurs during the winter months, especially in cold, dry years or near the end of the growing season. Highs for the year usually occur from March through June, which is the peak of the recharge season. The yearly water-level fluctuation due to climatic conditions in water-table and confined-aquifer wells is commonly 3 to 5 feet, but can be as much as 10 feet.

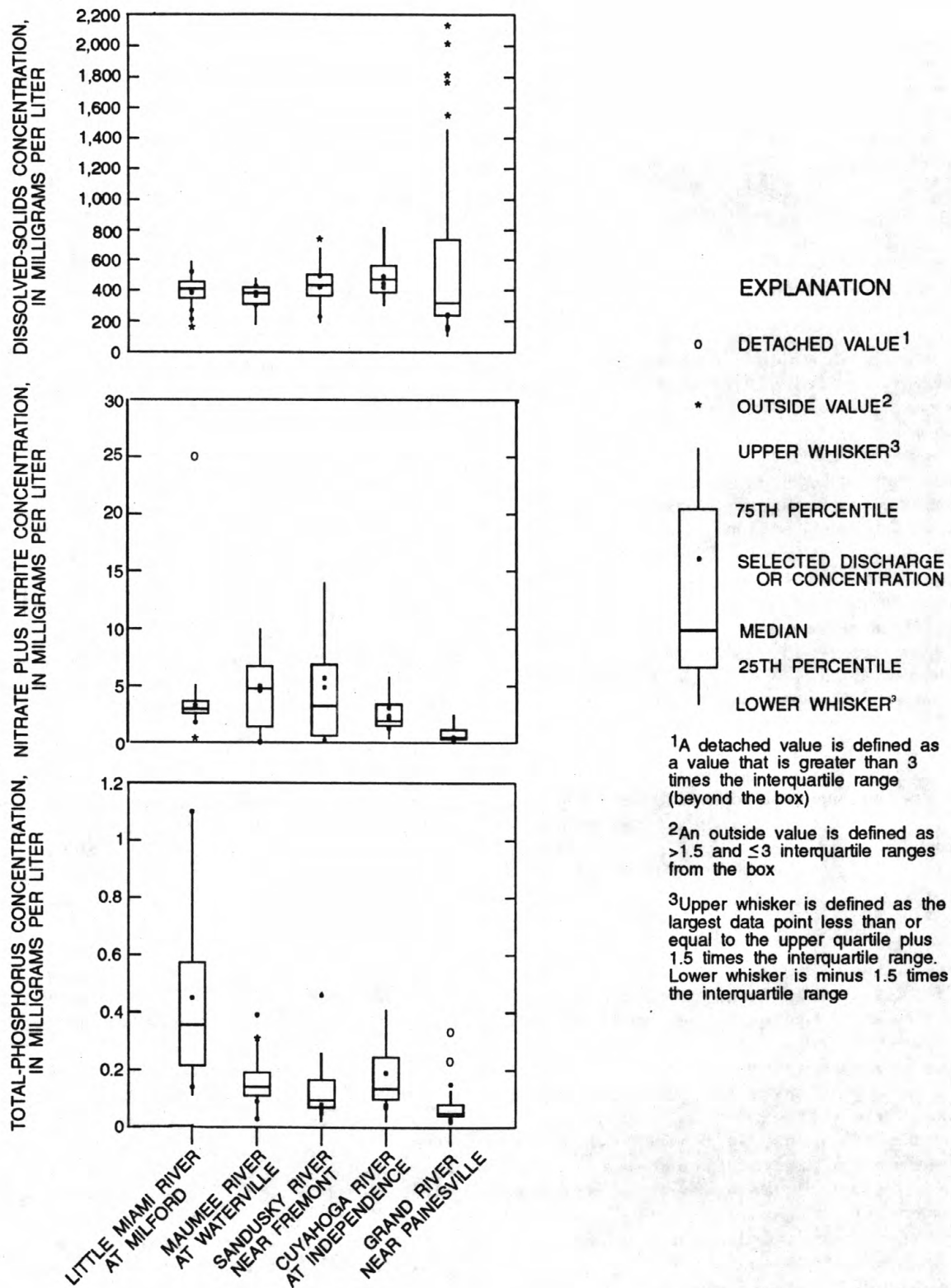
At the beginning of water year 1994 below-normal<sup>2</sup> ground-water levels prevailed throughout much of Ohio. Seasonal declines continued through November despite above-normal precipitation in October and November. Record lows were established at some wells in eastern Ohio.

There were net rises in ground-water levels throughout Ohio during December in response to precipitation in November, although levels remained below normal in eastern Ohio and near-normal elsewhere. In January and February, ground-water levels were generally stable but remained below normal in eastern Ohio and near to above normal in the western part of the State.

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<sup>2</sup>For ground-water levels, "normal" is defined as being between the 25th and 75th percentiles of the range of values recorded during the reference period 1960-75.

## WATER RESOURCES DATA FOR OHIO, 1994



**Figure 3b.** Dissolved-solids, nitrate plus nitrite, and total-phosphorus concentrations measured in water year 1994 and the distribution of those constituents from measurements made during waters years 1984-1993 at NASQAN stations.



Ground-water levels showed some net rises in March but generally were below normal in response to below-normal precipitation. A return to above-normal precipitation in April caused rises throughout Ohio, although ground-water levels remained in the normal to below-normal range.

Water levels generally declined throughout the State during May through September; normal or below-normal water levels prevailed throughout much of the State. Near-record lows were established in eastern Ohio during September.

## SPECIAL NETWORKS AND PROGRAM

Hydrologic Bench-Mark Network is a network of 53 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology (including water quality), related factors in representative undeveloped watersheds nationwide, and to describe conditions in basins more obviously affected by human activities.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the USGS to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the USGS Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) to describe the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) to detect changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) to provide a nationally consistent data base useful for water-quality assessment and hydrologic research.

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

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

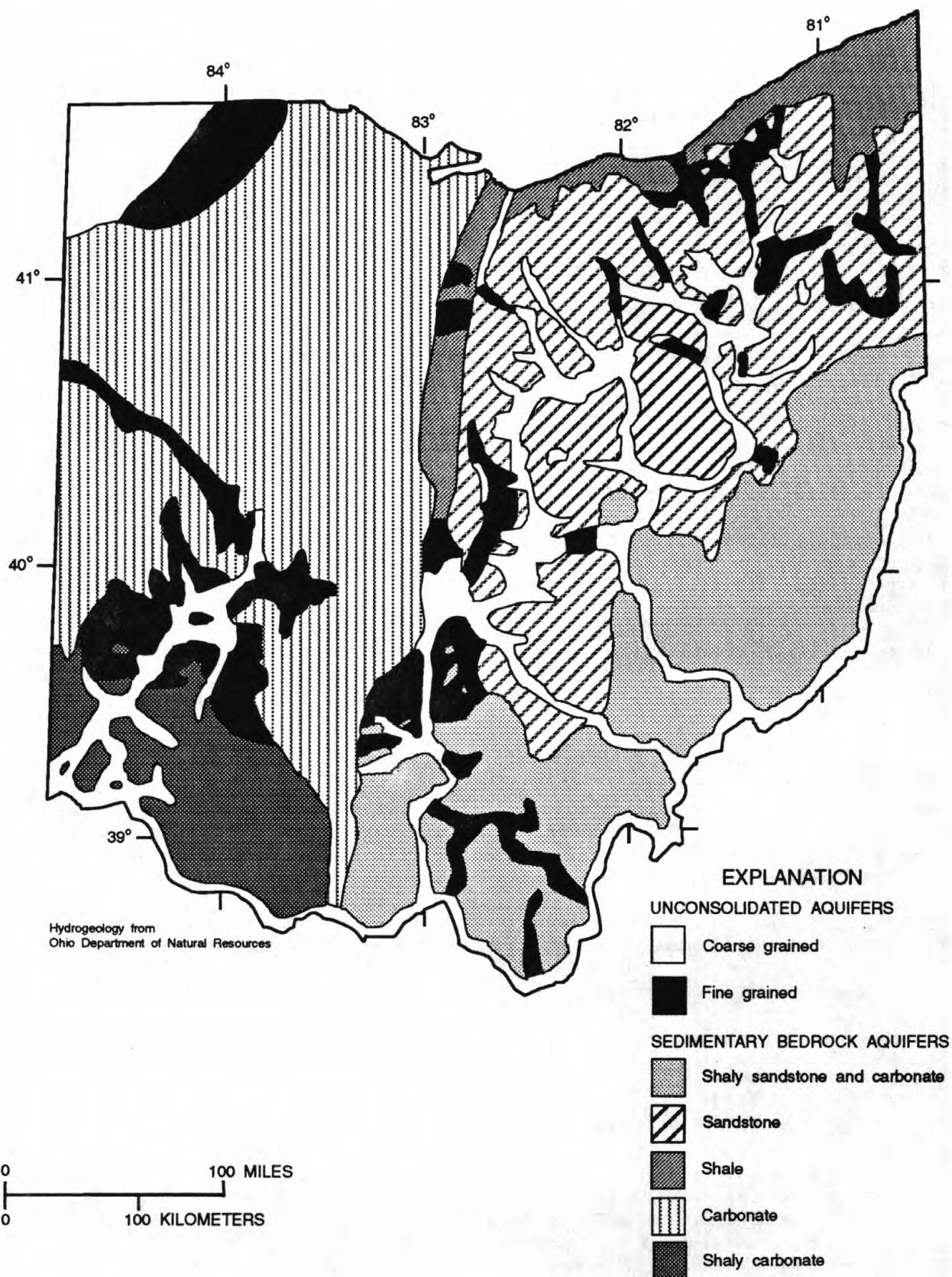
Assessment activities have begun in more than two-thirds of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide 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 the aggregation and comparison of findings to address water-quality issues of regional and national interest.

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

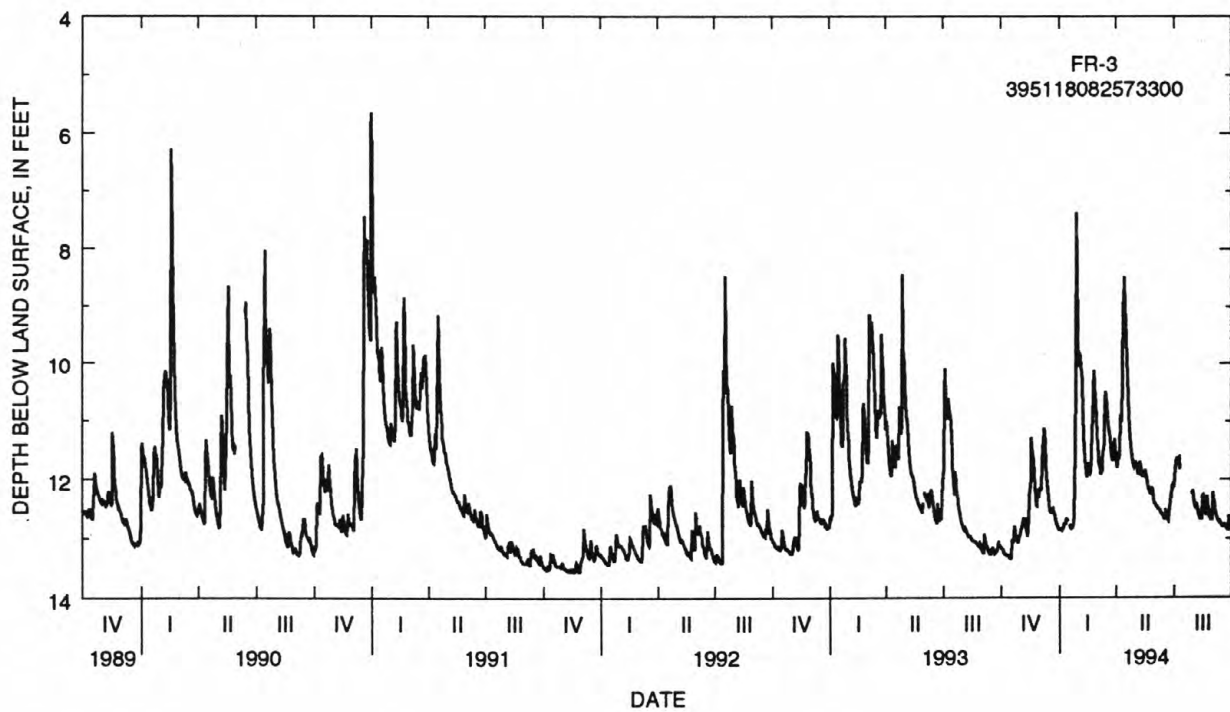
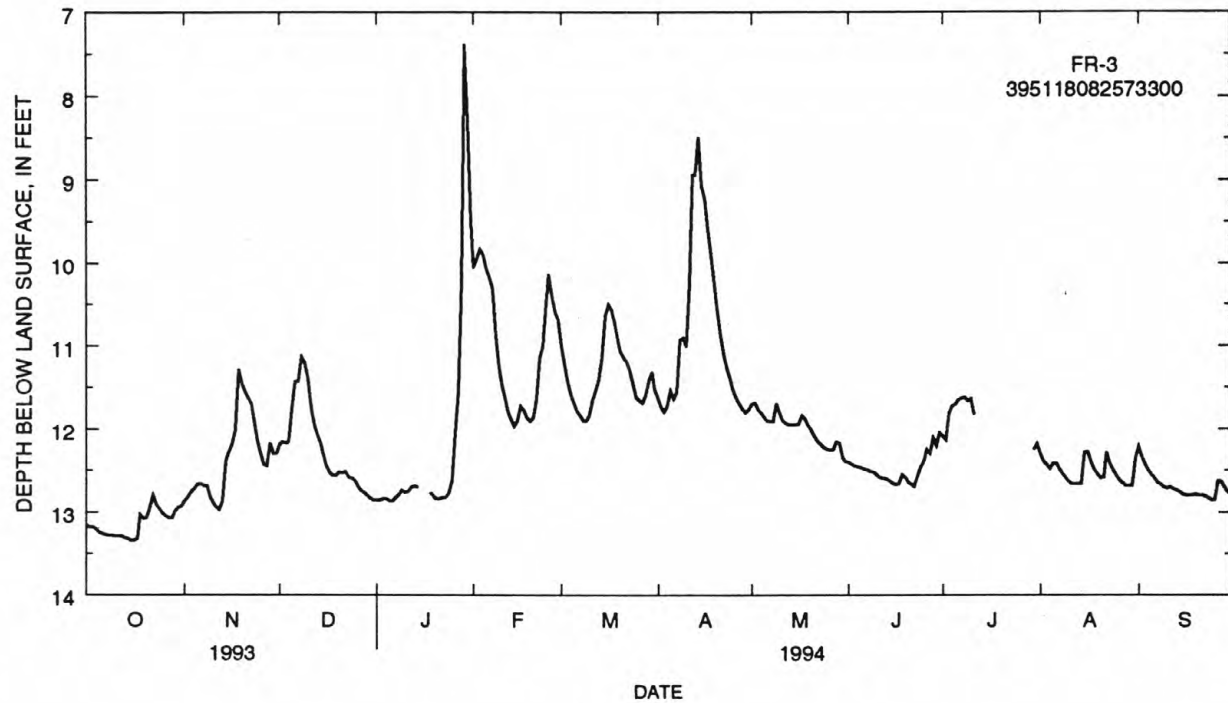
Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose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

## EXPLANATION OF THE RECORDS

The records in this report are for the 1994 water year that began October 1, 1993, and ended September 30, 1994. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The 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.



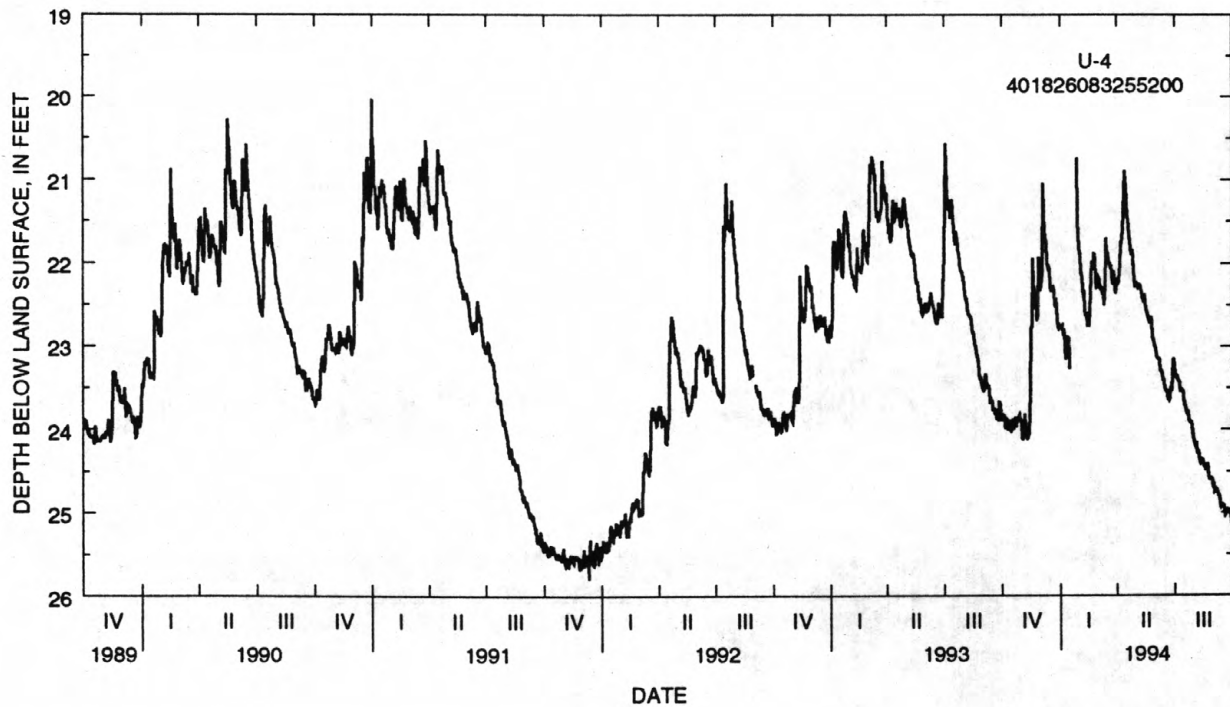
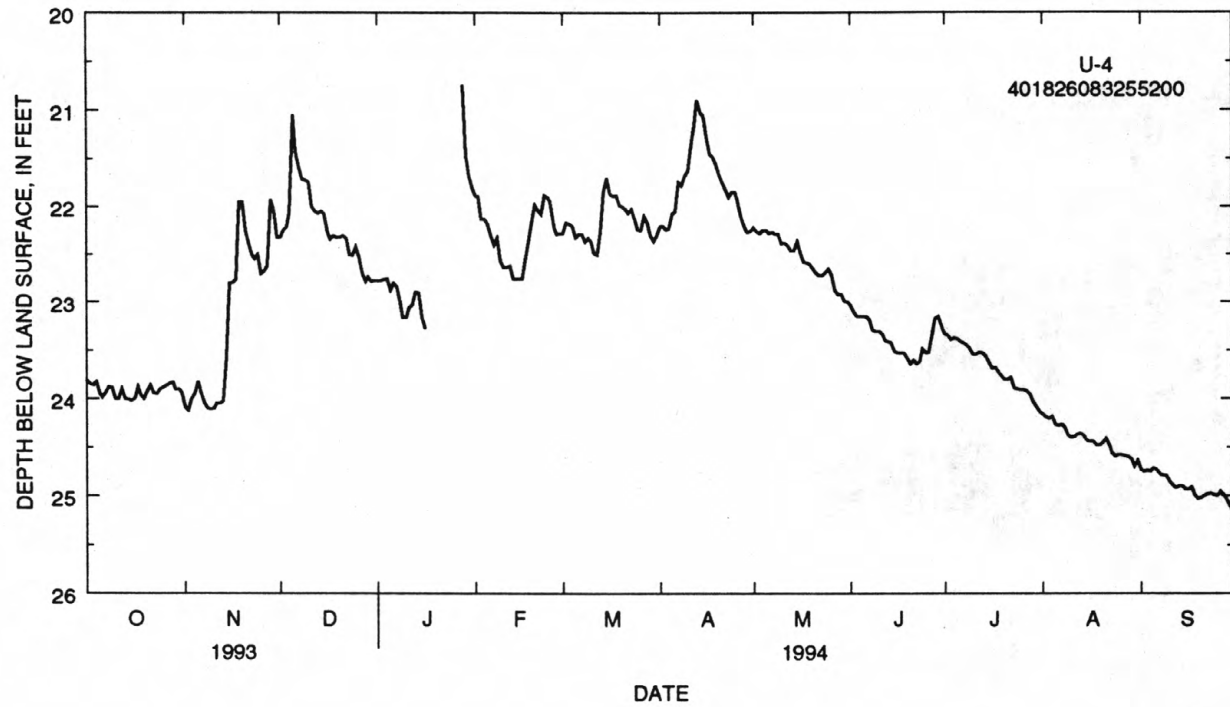
**Figure 4.** Geographic distribution of principal aquifers in Ohio.



**Figure 5.** Sample 1-year and 5-year hydrographs of a well completed in an unconfined unconsolidated aquifer.



## WATER RESOURCES DATA FOR OHIO, 1994



**Figure 6.** Sample 1-year and 5-year hydrographs of a well completed in a confined carbonate-rock aquifer.

### STATION IDENTIFICATION NUMBERS

Each data station, whether onstream or at a well, is assigned a unique identification number. The number is generally assigned when a station is first established and is retained for that station indefinitely. The systems used by the USGS to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic locations. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Ohio, for surface-water stations where only infrequent measurements are made.

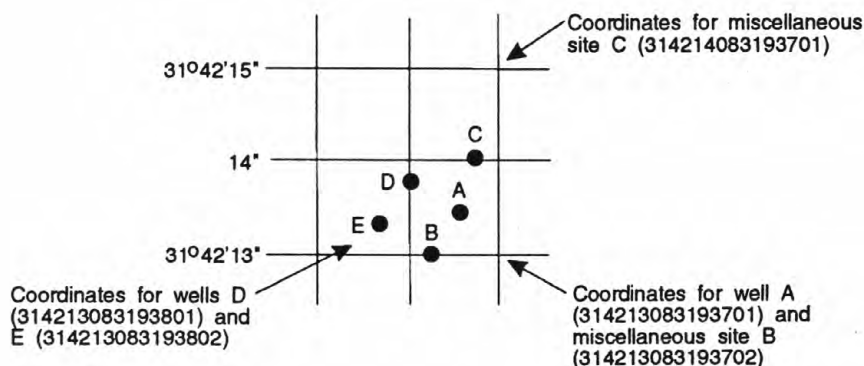
#### Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in USGS reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary that enters between two main-stream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indentation in a "List of Stations" in the front of the report. Each indentation represents one rank. This downstream order and system of indentation show 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 the above-mentioned 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 04041000, which appears just to the left of the station name, includes the two-digit part number "04" plus the six-digit downstream order number "041000". The part number designates the major river basin; for example, part "03" is the Ohio River Basin, and part "04" is the St. Lawrence River Basin.

#### Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. 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 7.)



**Figure 7.** System for numbering wells and miscellaneous sites (latitude and longitude).

## 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 discharge may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir contents, 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 mean daily discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements often without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of a 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 and crest-stage stations for which data are given in this volume are shown in figures 8a through 8d.

### 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, or with digital recorders that punch stage values on paper tapes or store stage data on solid state storage media at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the USGS as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in USGS Techniques of Water-Resources Investigations, Book 3, Chapter A6.

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

Daily mean discharges are computed by applying stages (gage heights) to the stage discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curve 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 relation that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

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

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

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



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.

### Data Presentation

The records published for each gaging station consist of two parts--the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; 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.

#### Station Manuscript

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

**LOCATION.**--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileage, 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 the drainage areas likewise varies. Drainage areas are updated as better maps become available.

**PERIOD OF RECORD.**--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

**REVISED RECORDS.**--Published records, because of new information, 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 the 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 Mean Sea Level (MSL) (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 record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a REMARKS statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station, in addition, 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 USGS by a cooperating organization are identified here.

**EXTREMES FOR PERIOD OF RECORD.**--Extremes for period of record is presented as a separate paragraph where outside summary statistical period. Extremes may include maximum and minimum stages and maximum and minimum discharges or contents. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

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

**PEAK DISCHARGES ABOVE BASE FOR CURRENT YEAR**--Presented as a separate table. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. All peaks greater than the base discharge are listed with the maximum for the year footnoted by an asterisk (\*). Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial regulation or at locations where the instantaneous peak discharge does not exceed the mean daily discharge by 10 percent. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330.

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

Although rare, occasionally the records of a discontinued station 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 data from previously published data reports may wish to contact the District office to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published retrieval of data is always accompanied by revisions of the corresponding data in computer storage.

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

### **Data Table of Daily Mean Values**

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

The date or water year as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in the footnotes. When the maximum or minimum statistic occurred outside the designated period, that statistic is listed in the EXTREMES FOR PERIOD OF RECORD paragraph in the manuscript. Selected streamflow duration curve statistics and runoff data are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

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

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

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

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

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

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

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

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

**INSTANTANEOUS PEAK FLOW.**--The maximum instantaneous stage occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are given in table "PEAK DISCHARGES AND STAGES AT CONTINUOUS-RECORD SURFACE DISCHARGE STATIONS."

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

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

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

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

Inches (INCHES) indicates the depth to which the drainage area would be covered if all 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 usually presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second, when collected, 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 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.

### Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

### Accuracy of the Records

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

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "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 hundredths of a cubic foot per second for values less than 1 ft<sup>3</sup>/s; to the nearest tenth between 1.0 and 10 ft<sup>3</sup>/s; to whole numbers between 10 and 1,000 ft<sup>3</sup>/s; and to three significant figures for more than 1,000 ft<sup>3</sup>/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or 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

Records of discharge, ground water, reservoir contents, and water quality not published by the USGS are collected in Ohio at several sites by State and other Federal agencies. The National Water Data Exchange (NAWDEX), U.S. Geological Survey, Reston, VA 22092, maintains an index of these sites as well as an index of records of discharge collected by other agencies but not published by the USGS. Information on records at specific sites can be obtained from that office upon request.

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

### 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 or recorded electronically. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recording; however, because of cost, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this volume are shown in figures 8a and 8b.

### 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 a nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of "DISCHARGE MEASUREMENTS."

### On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern is 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 sample 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" (TWRI), Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A4, and USGS Open-File Report 93-125 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments." The TWRI references are listed in this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the USGS District office.

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

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

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

### Water Temperatures

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are frequently taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small daily temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

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

### Sediment

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

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

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

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

### Laboratory Measurements

Sediment samples, samples for biochemical oxygen demand (BOD), and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the USGS laboratories in Arvada, CO. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the USGS laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A4, and USGS Open-File Report 93-125 "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments."

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.

Historical and current (1994) dissolved trace-element concentrations are reported herein for water that was collected, processed, and analyzed by using either ultraclean or other than ultraclean techniques. If ultraclean techniques were used, then those concentrations are reported in nanograms per liter. If other than ultraclean techniques were used, then those concentrations are reported in micrograms per liter and could reflect contamination introduced during some phase of the procedure.

### Data Presentation

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

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

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

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

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

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

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

**COOPERATION.**--Records provided by a cooperating organization or obtained for the USGS 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 and minimums may not have been sampled. Extremes, when given, are for both the period of record and for the current water year.

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

### Remark Codes

The following remarks 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
K	Results based on colony count outside the acceptable range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted)
M	Presence of material verified but not quantified
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

### Dissolved Trace-Element Concentrations

**NOTE.**--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (ug/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 ug/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 USGS began using new trace-element protocols at some stations in water year 1994. Full implementation of the protocols will take place during the 1995 water year.

### 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/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

### RECORDS OF GROUND-WATER LEVELS

Water-level data from a network of observation wells (as well as project wells) are given in this report. The network well 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 Ohio are shown in figures 8c and 8d. Water-level data for specific projects are reported under those projects.



### 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 a 15-digit number that is based on latitude and longitude. The secondary identification number is the local well number, which is provided for local needs. Water-level measurements in this report are given in feet with reference to land-surface datum. Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above sea level is given in each well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description.

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 larger units.

### Data Presentation

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

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

**AQUIFER.**--This entry describes the aquifer by age and composition.

**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.

**DATUM.**--This entry describes both the measuring point and the land-surface altitude at the well. The measuring point is described physically (such as top of collar, notch in top of casing, plug in pump base, and so on), and in relation to land surface (such as 1.3 ft above land-surface datum). The altitude of the land-surface datum is described in feet above (or below) Mean Sea Level (MSL); 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 are also water-quality observation wells, and may be used to acknowledge the assistance of local (non-USGS) observers.

**PERIOD OF PUBLISHED 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 USGS or cooperating agency, and the words "to current year" if the records are to be continued to the following year. Periods for which water-level records are available, but not published by the USGS, may be noted.

**EXTREMES FOR PERIOD OF PUBLISHED 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 (or above) land-surface datum. All periodic measurements of water levels for wells are listed. For wells equipped with recorders, daily water-level lows are published. The highest and lowest daily lows of the water year are shown on a line below the table. Because only daily lows are published for wells with recorders, the extreme instantaneous high may be a value that is not listed in the table. Missing records are indicated by dashes in place of the water level.



## RECORDS OF GROUND-WATER QUALITY

Records of ground-water quality in this report differ from other types of records in that, for most sampling sites, they consist of only one set of measurements. The quality of ground water ordinarily changes slowly, so that frequent measuring of the same parameter is not necessary unless one is concerned with a particular problem such as monitoring for trends of a particular constituent.

### Data Collection and Computation

The records of ground-water quality in this report were obtained mostly as part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some counties, but none are presented for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality statewide. Such a view can be attained only by considering records for this year in context with similar records obtained for these and other counties in earlier years.

Most methods for collecting and analyzing water samples are described in the TWRI manuals listed in this report. The data presented in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and the material comprising the casings.

### Data Presentation

The records of ground-water quality are published intermixed with the ground-water-level data for network wells and with the specific project for project wells.

## ACCESS TO WATSTORE DATA

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

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

In 1976, the USGS opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the USGS is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requestor will be expected to pay all computer costs incurred. Direct access may be obtained by contacting:

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

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or 5-1/4 inch floppy disk; and, as noted in the introduction, on CD-ROM discs. Beginning with the 1990 water year, all water-data reports will also be available on CD-ROM. All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division's District offices. (See address on the back of the title page.) A limited number of CD-ROM discs will be available for sale by the U.S. Geological Survey, Map Distribution Section, Box 25286, Building 810, Federal Center, Denver, Colorado 80225 and (or) U.S. Geological Survey, Open-File Reports Section, Box 25286, Mail Stop 517, Denver, Colorado 80225.

### DEFINITION OF TERMS

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

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

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

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

Algal growth potential (AGP) is the maximum 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.

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

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

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

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

Fecal coliform bacteria are bacteria that are present in the intestine or feces of 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°C + 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. 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 + 1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 ml of sample.

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

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

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

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

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

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

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

Bottom material: See Bed material.

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

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,447 cubic meters.

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

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

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

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

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

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

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

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

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

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



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

Dissolved: That material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totalling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

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

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

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.

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ( $\text{CaCO}_3$ ).

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

Hydrologic Index Stations, in this report, refers to four continuous record gaging stations that have been selected as representative of streamflow patterns for their respective regions of Ohio. Station locations are shown in figure 1.

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

Mean Sea Level (MSL) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

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

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.

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



Micrograms per gram (UG/G,  $\mu\text{g/g}$ ) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Microgram per kilogram (UG/KG,  $\mu\text{g/kg}$ ) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (kilogram) of bottom material.

Micrograms per liter (UG/L,  $\mu\text{g/L}$ ) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

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

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

Organism is any living entity.

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

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

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

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

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

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

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology.

The classifications are 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 or sieve
Gravel	2.0 - 64.0	Sieve

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

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

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

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

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

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

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

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

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

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

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

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movement 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.

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 by the plants (carbon method).

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

Milligrams of oxygen per area or volume per unit time [ $\text{mg O}_2/(\text{m}^2 \text{ or } \text{m}^3/\text{time})$ ] for periphyton, macrophytes, and phytoplankton are units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

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

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



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

Substrate is the physical surface upon which an organism lives.

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

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

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

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

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

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45-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 would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

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

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

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



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

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

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

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

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

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

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

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

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, 1980, is called the "1980 water year."

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

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

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

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

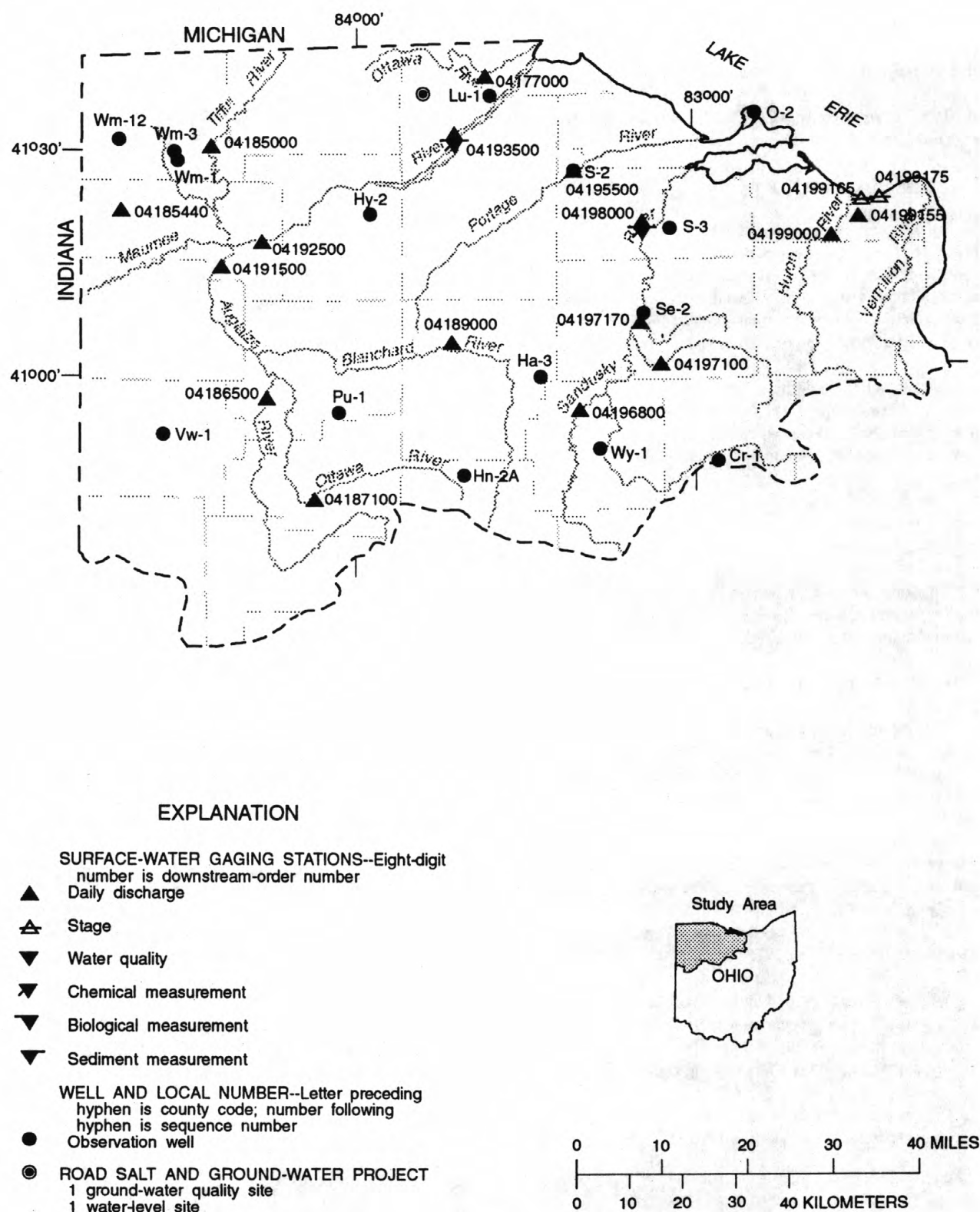
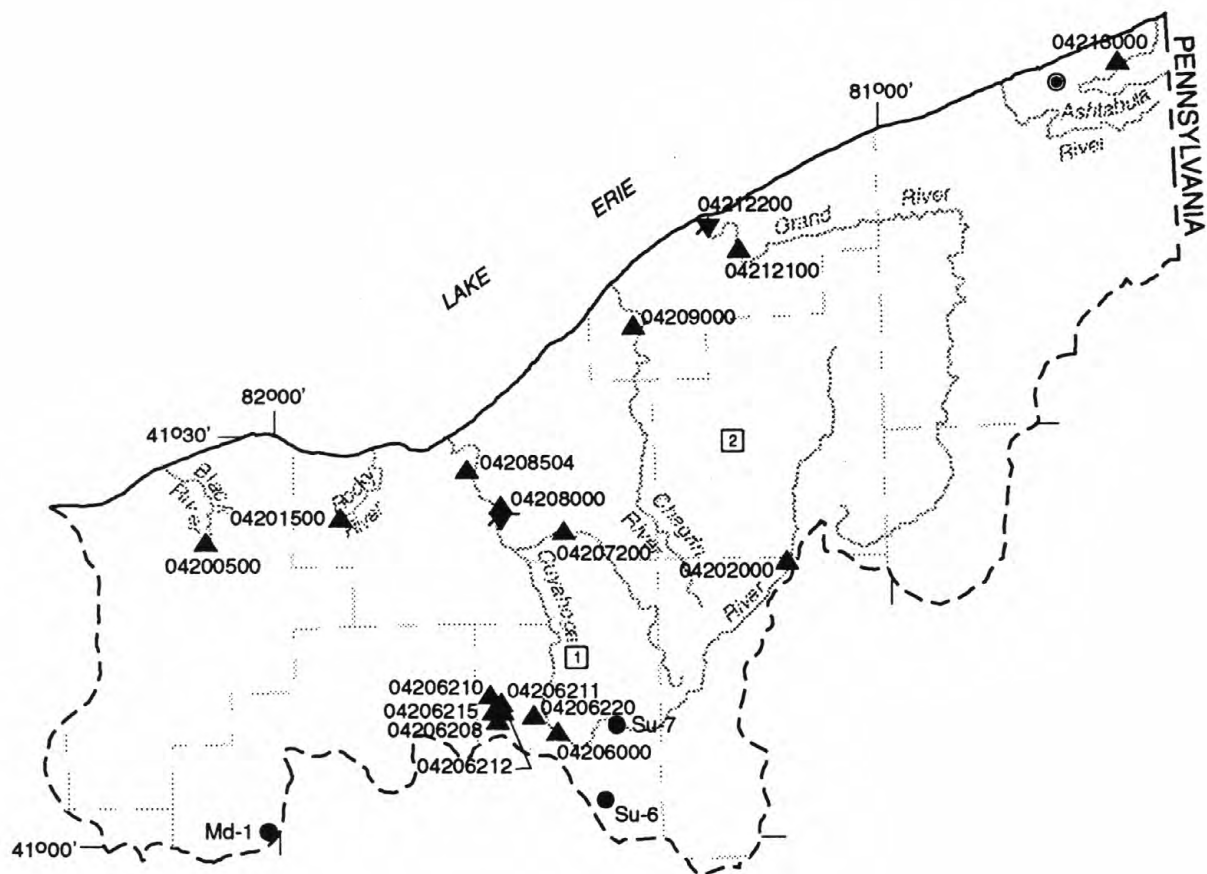


Figure 8a. Location of data-collection stations.



## EXPLANATION

- SURFACE-WATER GAGING STATIONS**--Eight-digit number is downstream-order number
- ▲ Daily discharge
  - ▼ Water quality
  - ▼ Chemical measurement
  - ▼ Sediment measurement
- WELL AND LOCAL NUMBER**--Letter preceding hyphen is county code; number following hyphen is sequence number
- Observation well
  - ◎ ROAD SALT AND GROUND-WATER PROJECT
    - 1 ground-water quality site
    - 1 water-level site
  - [1] CUYAHOGA RIVER BACTERIA PROJECT
    - 3 surface-water quality sites
  - [2] GEauga COUNTY GROUND-WATER PROJECT
    - 220 observation wells

Study Area

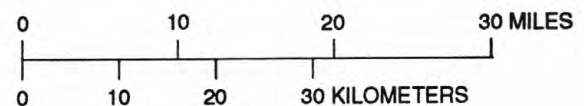


Figure 8b. Location of data-collection stations.

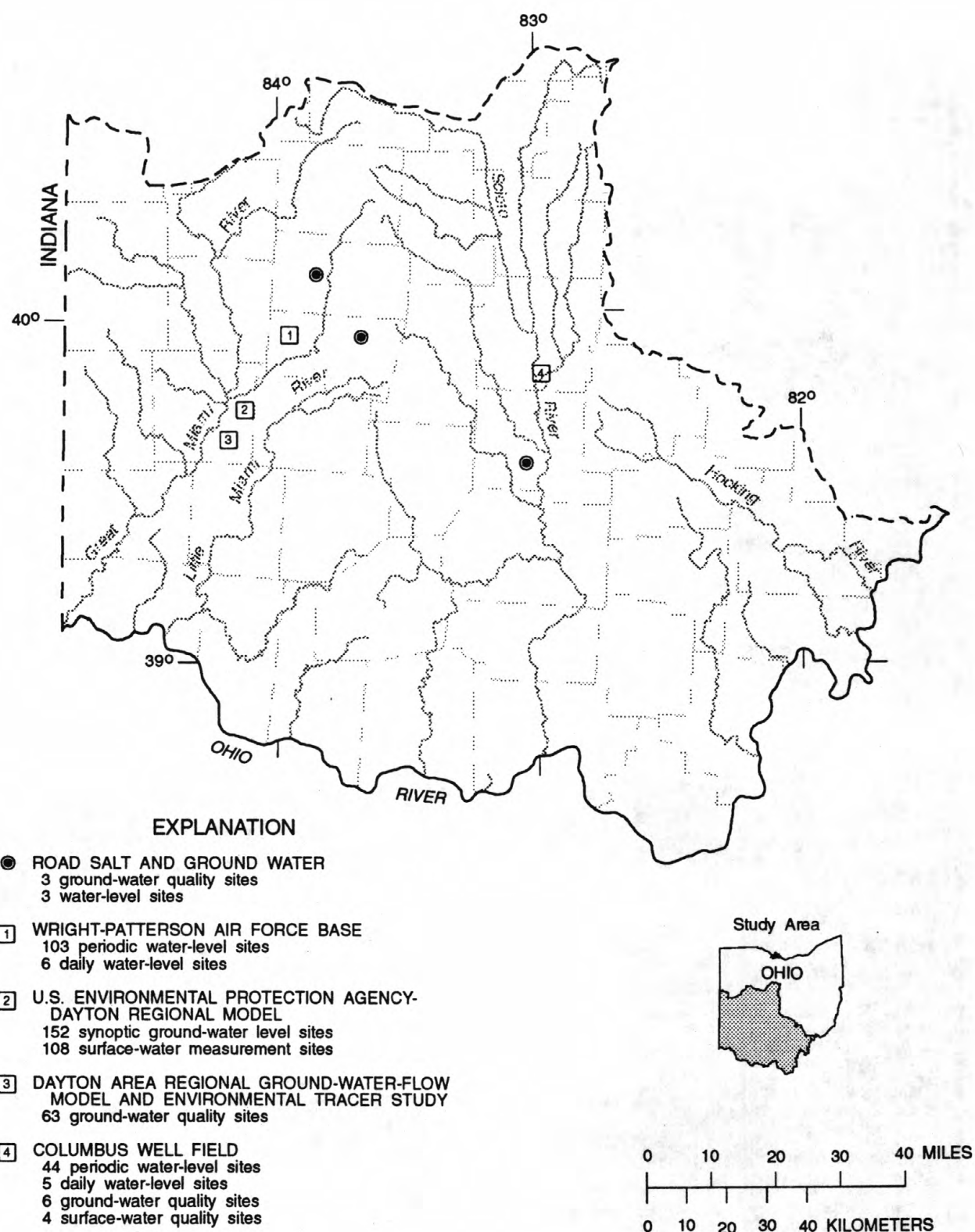
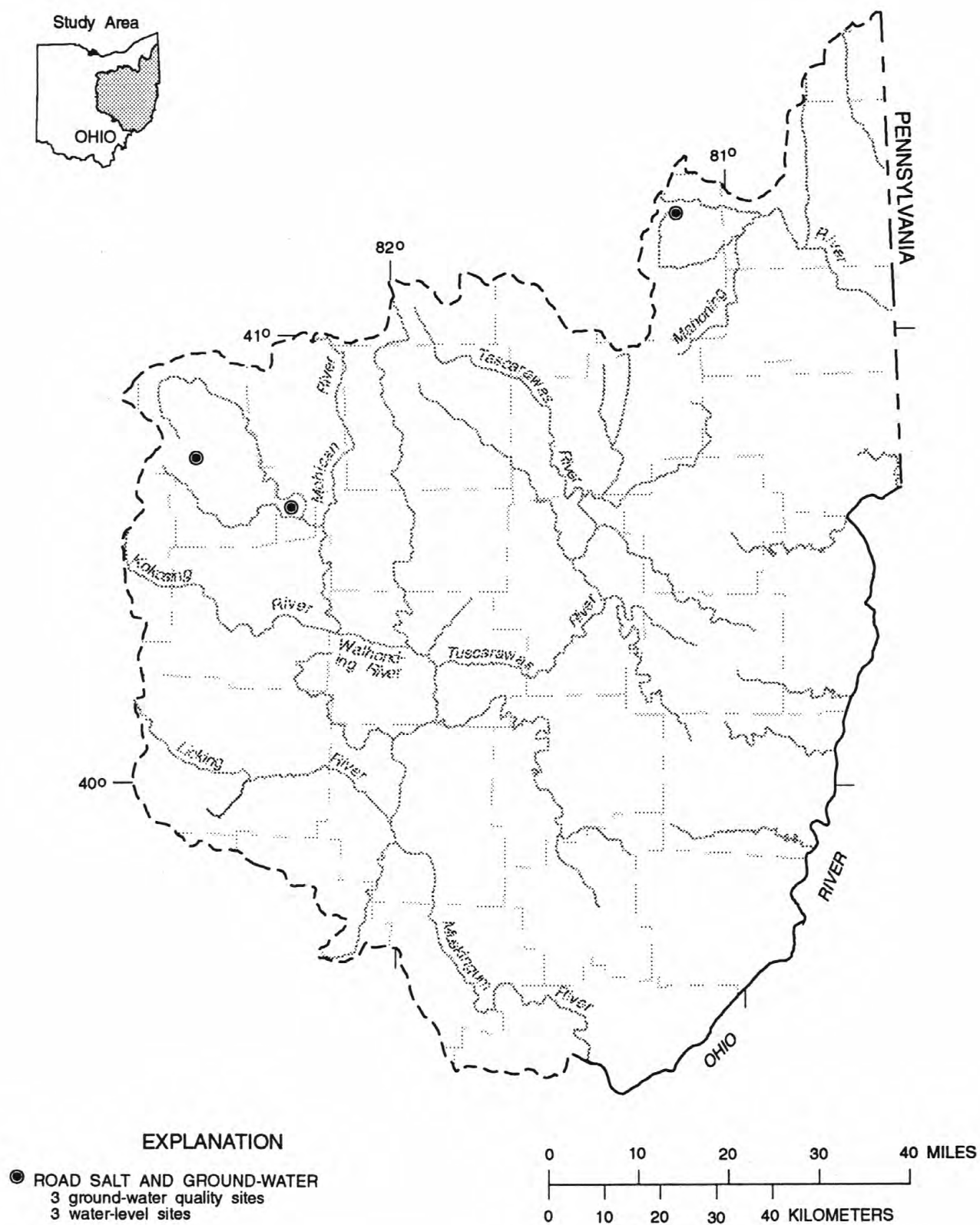


Figure 8c. Location of data-collection stations for projects, Ohio River basin.





**Figure 8d.** Location of data-collections stations for projects, Ohio River basin.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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

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

- 1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficken, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L.M. McCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 2-E2. *Borehole geophysics applied to ground-water investigations*, by W. S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.
- 2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W. E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.
- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. *Measurement of time of travel in streams by dye tracing*, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.
- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A12. *Fluorometric procedures for dye tracing*, Revised, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

- 3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-A16. *Measurement of discharge using tracers*, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
- 3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
- 3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F. A. Kilpatrick, R. E. Rathburn, Nobuhiro Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.
- 3-A19. *Levels of streamflow gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 31 pages.
- 3-A20. *Simulation of soluble waste transport and buildup in surface waters using tracers*, by F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 pages.
- 3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 3-B2. *Introduction to ground-water hydraulics, a programmed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.
- 3-B4. *Regression modeling of ground-water flow*, by R. L. Cooley and R. L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.
- 3-B4. *Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems*, by R. L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.
- 3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.
- 3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.
- 3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow*, by E. J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 190 pages.
- 3-C1. *Fluvial sediment concepts*, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 3-C2. *Field methods for measurement of fluvial sediment*, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 4-D1. *Computation of rate and volume of stream depletion by wells*, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
- 5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M.J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. *Methods for the determination of organic substances in water and fluvial sediments*, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.
- 5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.
- 5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L.L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

- 5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.
- 6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S. A. Leake and D. E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.
- 6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L. J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.
- 6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R. L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.
- 6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water problems, Part 3: Design philosophy and programming details*, by L. J. Torak: USGS--TWRI Book 6, Chapter A5, 1993. 243 pages.
- 7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
- 7-C3. *A model for simulation of flow in singular and interconnected channels*, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.



## 04177000 OTTAWA RIVER AT TOLEDO UNIVERSITY, TOLEDO, OH

LOCATION.--Lat 41°39'36", long 83°36'44", in NE 1/4 sec. 32, T.9 S., R.7 E., Lucas County, Hydrologic Unit 04100001, on left bank at auto bridge at Toledo University, Toledo, Ohio, 0.4 mi downstream from Deline Ditch, 5.6 mi upstream from Sibley Creek, and 10.9 mi upstream from mouth.

DRAINAGE AREA.--150 mi<sup>2</sup>. Area at site used prior to Sept. 30, 1948, 150 mi<sup>2</sup>, revised.

PERIOD OF RECORD.--March 1945 to September 1948 (published as "Tenmile Creek at Toledo"), August 1976 to current year.

REVISED RECORDS.--WSP 1307: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 576.28 ft above sea level. (From Aug. 1976 to July, 1979 at site 500 ft downstream. Prior to Sept. 30, 1948 water-stage recorder at site 2,500 ft upstream at datum 3.72 ft higher.

REMARKS.--Estimated daily discharges: Dec. 22 to Jan. 24, Feb. 1-17, 23 to Mar. 31, Apr. 12-26, Jul. 25-30. Records fair, except for periods of estimated record, which are poor. Water-quality data collected at this site 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1943 reached a stage of 15.1 ft present datum, from floodmark, Lucas County Sanitary Engineers, discharge, 3,400 ft<sup>3</sup>/s. Flood of Apr. 25, 1950 reached a stage of 15.0 ft present datum, from floodmark, discharge, 3,300 ft<sup>3</sup>/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	10	54	13	320	140	90	418	35	36	9.7	8.0
2	13	10	48	13	260	130	78	344	21	33	12	5.6
3	9.4	11	47	13	210	120	133	185	20	27	19	5.3
4	9.1	10	111	12	170	110	130	128	21	24	9.4	6.3
5	7.3	11	304	12	140	120	155	100	17	55	9.5	6.6
6	5.8	9.8	192	11	120	200	249	84	17	38	7.6	9.3
7	5.8	9.3	111	11	100	300	355	81	14	35	6.9	18
8	6.2	7.9	71	11	85	1150	559	78	13	65	6.9	6.0
9	113	8.3	58	11	75	1000	417	67	12	44	6.9	9.4
10	17	8.5	52	10	64	550	281	56	11	42	6.9	4.0
11	17	8.3	48	10	55	320	184	44	12	31	33	4.2
12	14	7.6	36	10	51	210	1400	42	29	22	19	4.4
13	12	11	31	10	46	170	1000	42	32	20	131	4.4
14	8.8	77	31	10	44	190	560	39	24	19	39	5.0
15	7.8	32	30	10	42	230	330	38	13	18	22	7.3
16	14	18	28	9.8	40	170	250	37	12	17	14	8.8
17	41	112	26	9.8	38	130	190	34	8.5	16	11	20
18	16	144	25	9.7	342	110	140	31	8.5	14	9.4	28
19	18	87	28	9.6	539	100	110	28	8.5	13	8.5	25
20	16	46	29	9.6	910	96	96	26	42	14	19	27
21	36	34	41	9.6	936	140	86	24	54	21	24	26
22	15	26	30	9.6	746	250	76	24	24	165	11	26
23	14	20	26	9.6	500	400	70	24	38	66	8.9	26
24	28	31	23	11	360	500	64	17	206	41	8.0	27
25	22	25	21	25	260	250	60	16	107	27	7.6	34
26	15	29	18	21	220	170	80	52	119	20	6.9	7.4
27	11	245	17	75	190	140	113	30	94	16	6.9	38
28	9.7	433	15	625	160	130	127	28	56	13	7.4	9.5
29	9.1	183	14	986	---	190	166	27	60	10	9.0	7.4
30	7.0	87	14	816	---	150	209	27	42	13	8.9	5.7
31	11	---	14	550	---	100	---	28	---	10	14	---
TOTAL	544.0	1751.7	1593	3353.3	7023	7966	7758	2199	1170.5	985	513.3	419.6
MEAN	17.5	58.4	51.4	108	251	257	259	70.9	39.0	31.8	16.6	14.0
MAX	113	433	304	986	936	1150	1400	418	206	165	131	38
MIN	5.8	7.6	14	9.6	38	96	60	16	8.5	10	6.9	4.0
CFSM	.12	.39	.34	.72	1.67	1.71	1.72	.47	.26	.21	.11	.09
IN.	.13	.43	.40	.83	1.74	1.98	1.92	.55	.29	.24	.13	.10

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1994, BY WATER YEAR (WY)

	MEAN	69.8	113	148	115	162	299	250	134	124	55.6	30.1	44.0
MAX	407	449	380	561	467	729	438	358	437	264	143	406	
(WY)	1987	1993	1978	1993	1990	1978	1977	1945	1989	1992	1980	1981	
MIN	.85	3.04	6.14	4.92	30.4	56.0	20.4	21.4	7.36	8.46	.82	.13	
(WY)	1947	1947	1947	1977	1978	1989	1946	1988	1988	1984	1946	1946	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1945 - 1994

ANNUAL TOTAL	60861.3	35276.4	
ANNUAL MEAN	167	96.6	129
HIGHEST ANNUAL MEAN			215
LOWEST ANNUAL MEAN			78.8
HIGHEST DAILY MEAN	2190	Jan 5	3500
LOWEST DAILY MEAN	2.7	Sep 18	.00
ANNUAL SEVEN-DAY MINIMUM	6.1	Sep 17	.00
INSTANTANEOUS PEAK FLOW			2390
INSTANTANEOUS PEAK STAGE			12.18
INSTANTANEOUS LOW FLOW			4.0
ANNUAL RUNOFF (CFSM)	1.11		.64
ANNUAL RUNOFF (INCHES)	15.09		8.75
10 PERCENT EXCEEDS	484		249
50 PERCENT EXCEEDS	32		28
90 PERCENT EXCEEDS	8.3		8.5
			7.2

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

LOCATION.--Lat 41°30'16", long 84°25'47", in SE 1/4 sec. 5, T.6 N., R.4 E., Williams County, Hydrologic Unit 04100006, on left bank 0.5 mi downstream from bridge on State Highway 191 at west edge of Stryker, 0.6 mi upstream from Penn Central bridge, and 1.6 mi downstream from Leatherwood Creek.

PERIOD OF RECORD.--September 1921 to September 1928 (published as "near Stryker"), October 1940 to current year.

REVISED RECORDS.--WSP 1144: 1922-28. WSP 1387: 1925. WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 685.1 ft above sea level. Prior to Sept. 30, 1928, nonrecording gage at site 3.5 mi downstream at different datum. Oct. 13, 1940 to Jan. 17, 1941, nonrecording gage and Jan. 18, 1941 to Sept. 30, 1953, water-stage recorder, at site 0.5 mi downstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 25 to Jan. 28, 31 to Feb. 22, 24-27, Mar. 2-6. Records fair, except for periods of estimated record, which are poor. Small diversion 12.5 mi upstream from gage for municipal supply of Archbold. Diversion averaged 3.09 ft<sup>3</sup>/s is returned as sewage to Brush Creek which flows into Tiffin River about 15 mi downstream from station. Water-quality data collected at this site 1965 to 1977. Sediment data collected 1969 to 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 16.0 ft. from floodmarks, discharge, 7,600 ft<sup>3</sup>/s. Flood in 1937 reached a stage of 15.0 ft. from information by local resident, discharge, 6,000 ft<sup>3</sup>/s.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108	88	309	63	920	445	326	731	71	102	22	20
2	91	100	270	58	720	380	295	823	66	85	22	18
3	78	136	267	55	560	350	280	690	61	76	20	16
4	68	138	322	51	470	350	303	476	57	64	20	15
5	59	125	473	48	380	440	311	357	54	57	23	16
6	57	92	453	47	320	700	342	300	50	58	22	17
7	53	84	391	44	280	1950	489	261	49	55	20	21
8	49	85	343	42	245	2320	780	247	47	55	19	17
9	56	82	308	41	215	2110	947	245	43	60	19	17
10	183	75	287	39	190	1720	872	238	42	58	18	15
11	223	70	264	38	170	1130	703	212	40	54	22	14
12	144	68	235	37	150	617	1280	206	38	45	31	14
13	109	69	215	36	140	503	2180	202	38	37	37	14
14	90	83	187	36	130	553	2460	181	41	34	56	15
15	79	140	166	35	130	535	2400	167	47	31	74	15
16	75	169	159	34	175	466	2050	157	113	29	84	16
17	99	271	152	34	220	376	1660	146	107	29	79	17
18	309	492	148	33	290	326	1130	138	78	27	57	16
19	364	371	150	33	400	293	649	130	58	27	42	16
20	266	271	149	33	640	267	427	123	47	26	34	15
21	205	222	156	33	1000	438	338	115	61	26	31	13
22	201	192	163	33	1800	846	297	107	65	29	29	13
23	189	160	160	33	2610	973	269	101	60	36	28	13
24	161	131	138	40	1500	844	251	94	101	33	25	13
25	141	161	125	50	1100	581	235	89	311	29	23	15
26	124	240	110	68	760	410	223	97	345	26	21	17
27	113	625	97	100	620	375	288	103	301	25	21	17
28	104	809	87	220	497	452	358	95	227	24	21	20
29	96	711	80	1610	---	478	454	91	165	22	20	19
30	94	440	73	1550	---	421	522	83	129	22	20	21
31	91	---	67	1200	---	366	---	77	---	24	20	---
TOTAL	4079	6700	6504	5774	16632	22015	23119	7082	2912	1305	980	487
MEAN	132	223	210	186	594	710	771	228	97.1	42.1	31.6	16.2
MAX	364	809	473	1610	2610	2320	2460	823	345	102	84	21
MIN	49	68	67	33	130	267	223	77	38	22	18	11

MEAN	111	230	374	388	539	799	660	376	235	156	62.8	65.9
MAX	887	1339	1785	1687	1569	2563	1990	2112	1422	761	389	460
(WY)	1987	1993	1928	1993	1976	1982	1950	1943	1989	1943	1980	1981
MIN	10.2	14.6	18.4	20.2	21.9	135	106	74.4	24.1	13.7	9.76	7.40
(WY)	1964	1954	1964	1963	1963	1964	1946	1925	1988	1988	1941	1953

## WATER YEARS 1922 - 1994

ANNUAL TOTAL	169891		97589			
ANNUAL MEAN	465		267		332	
HIGHEST ANNUAL MEAN					671	1950
LOWEST ANNUAL MEAN					59.6	1964
HIGHEST DAILY MEAN	4790	Jan 6	2610	Feb 23	7640	Mar 15 1982
LOWEST DAILY MEAN	24	Aug 29	13	Sep 21	2.5	Jul 18 1988
ANNUAL SEVEN-DAY MINIMUM	28	Aug 24	14	Sep 19	3.6	Jul 7 1988
INSTANTANEOUS PEAK FLOW			2800	Feb 22 a	7800	Mar 15 1982
INSTANTANEOUS PEAK STAGE			13.32	Feb 22	18.36	Mar 15 1982
INSTANTANEOUS LOW FLOW			13	Sep 21		
10 PERCENT EXCEEDS	1290		665		920	
50 PERCENT EXCEEDS	156		107		122	
90 PERCENT EXCEEDS	39		20		23	

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

# STREAMS TRIBUTARY TO LAKE ERIE

41

## 04185440 UNNAMED TRIBUTARY TO LOST CREEK NR FARMER, OH

LOCATION.--Lat 41°21'42", long 84°41'28", Defiance County, Hydrologic Unit 04100006, on right bank 400 ft above bridge on Rosedale Rd., 0.5 mi above mouth and 2.0 mi from Farmer.

DRAINAGE AREA.--4.23 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Elevation of gage is 760 ft above sea level from topographic map.

REMARKS.--Estimated discharges: Dec. 25 to Jan. 27, Feb. 1-16, Apr. 12-13. Records poor.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.15	.10	2.0	.48	2.0	.77	1.0	13	.23	.11	.05	.03
2	.11	.10	2.1	.45	1.1	.71	.89	4.1	.20	.10	.08	.02
3	.10	.10	3.2	.42	.75	1.3	1.8	2.6	.18	.10	.07	.02
4	.09	.10	13	.40	.60	21	2.0	1.9	.16	.09	.06	.02
5	.09	.10	8.0	.36	.52	22	1.5	1.5	.16	.09	.06	.01
6	.08	.10	4.4	.34	.46	17	5.6	1.2	.14	4.6	.05	.01
7	.08	.10	3.2	.33	.43	49	12	1.2	.13	2.3	.05	.01
8	.08	.10	2.6	.32	.40	13	15	1.3	.13	.25	.05	.01
9	.21	.10	2.2	.31	.37	4.9	8.0	1.1	.13	.56	.05	.00
10	.42	.10	2.1	.30	.35	3.6	30	.88	.12	.11	.05	.00
11	.12	.10	1.7	.29	.32	3.4	8.4	.81	.12	.10	.08	.00
12	.11	.10	1.4	.29	.31	3.3	138	.81	.12	.09	.07	.00
13	.10	.11	1.3	.29	.30	5.6	24	.68	.14	.08	.35	.00
14	.10	3.8	1.3	.28	.29	4.7	12	.63	.13	.08	.11	.00
15	.09	4.7	1.3	.28	.28	3.8	7.6	.61	.12	.07	.07	.00
16	.10	1.6	1.2	.28	.50	2.4	4.6	.55	.11	.07	.06	.00
17	1.4	22	1.3	.27	17	1.6	2.8	.48	.11	.07	.05	.00
18	.85	9.4	1.4	.27	31	1.5	2.2	.44	.11	.07	.05	.00
19	.22	4.7	1.5	.27	40	1.1	1.9	.38	.10	.06	.05	.00
20	.12	3.1	1.5	.26	27	1.1	1.6	.36	.11	.06	.06	.00
21	.11	2.1	2.6	.26	14	5.1	1.4	.33	.10	.06	.06	.00
22	.11	1.7	1.8	.26	4.8	3.8	1.3	.31	.09	.07	.05	.00
23	.11	1.5	1.4	.25	2.6	2.4	1.2	.28	.29	.07	.05	.00
24	.11	3.8	1.3	.25	2.4	1.8	1.1	.27	6.2	.06	.04	.00
25	.11	4.4	.92	.25	1.6	1.3	.93	.27	2.5	.06	.04	.00
26	.11	7.7	.80	.40	1.3	1.1	.79	1.4	.83	.07	.04	.00
27	.10	18	.73	.60	1.2	2.7	17	.63	.46	.06	.04	.02
28	.10	5.7	.66	99	.90	2.4	7.1	.43	.21	.06	.03	.03
29	.10	3.2	.61	19	---	1.8	8.4	.32	.90	.06	.03	.02
30	.10	2.5	.56	8.2	---	1.3	13	.28	.16	.05	.02	.01
31	.10	---	.52	4.2	---	1.1	---	.25	---	.05	.04	---
TOTAL	5.78	101.21	68.60	139.16	152.78	186.58	333.11	39.30	14.49	9.73	1.96	0.21
MEAN	.19	3.37	2.21	4.49	5.46	6.02	11.1	1.27	.48	.31	.063	.007
MAX	1.4	22	13	99	40	49	138	13	6.2	4.6	.35	.03
MIN	.08	.10	.52	.25	.28	.71	.79	.25	.09	.05	.02	.00
CFSM	.04	.80	.52	1.06	1.29	1.42	2.62	.30	.11	.07	.01	.00
IN.	.05	.89	.60	1.22	1.34	1.64	2.93	.35	.13	.09	.02	.00

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1994, BY WATER YEAR (WY)

	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	4.08	6.22	7.92	5.69	7.50	7.49	7.49	3.00	1.93
MAX	12.6	15.6	23.9	13.9	21.2	13.9	14.1	10.9	4.83
(WY)	1987	1993	1991	1993	1990	1986	1991	1990	1988
MIN	.14	1.53	.11	1.68	.57	3.59	1.92	.26	.046
(WY)	1990	1990	1990	1988	1993	1989	1987	1988	1988

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1986 - 1994
ANNUAL TOTAL	1482.77	1052.91	
ANNUAL MEAN	4.06	2.88	4.57
HIGHEST ANNUAL MEAN			5.87
LOWEST ANNUAL MEAN			2.88
HIGHEST DAILY MEAN	176 Jan 4	138 Apr 12	244 Feb 22 1990
LOWEST DAILY MEAN	.05 Aug 27	.00 Sep 9	.00 Aug 3 1987
ANNUAL SEVEN-DAY MINIMUM	.05 Aug 24	.00 Sep 9	.00 Aug 3 1987
INSTANTANEOUS PEAK FLOW		332 Apr 12	757 Oct 3 1987
INSTANTANEOUS PEAK STAGE		4.54 Apr 12	5.74 Oct 3 1987
INSTANTANEOUS LOW FLOW		.00 Sep 9	
ANNUAL RUNOFF (CFSM)	.96	.68	1.08
ANNUAL RUNOFF (INCHES)	13.04	9.26	14.69
10 PERCENT EXCEEDS	9.1	5.6	10
50 PERCENT EXCEEDS	1.2	.32	.74
90 PERCENT EXCEEDS	.09	.04	.05

## STREAMS TRIBUTARY TO LAKE ERIE

## 04186500 AUGLAIZE RIVER NEAR FORT JENNINGS, OH

LOCATION.--Lat 40°56'55", long 84°15'58", in SE 1/4 sec. 15, T.1 S., R.5. E., Putnam County, Hydrologic Unit 04100007, on left bank 200 ft upstream from bridge on U. S. Highway 224, 3.5 mi northeast of Fort Jennings, 6 mi upstream from Ottawa River, and 7.3 mi downstream from Jennings Creek.

DRAINAGE AREA.--332 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1921 to December 1935. October 1940 to current year.

REVISED RECORDS.--WSP 744: 1932. WSP 974: 1930(M). WSP 1307: 1922-24(M), 1926-27(M), 1929(M). WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 713.6 ft above sea level. Prior to Oct. 6, 1930, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 25 to Jan. 24, 26-28, 30 to Feb. 18, 26 to Mar. 4. Records good, except for periods of estimated record, which are fair. Beginning Jan. 4, 1971, water was diverted at a point 24.3 mi upstream from station into Lake Bresler. Storage in Lake Bresler is available for low-flow augmentation and water supply of city of Lima, in Ottawa River basin. Net withdrawal totaled 5,088 mil gal, equivalent to a mean withdrawal of 21.6 ft<sup>3</sup>/s. No releases have been made for low-flow augmentation. Some diversion from Grand Lake to Auglaize River basin through Miami and Erie Canal into Jennings Creek at a point 9.2 mi upstream from station. Annual figures of runoff are considered to be within 10 percent of natural yield. Sediment data collected at this site 1970 to 1974. Water-quality data collected at this site 1968 to 1978. National Weather Service gage height Handar telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	8.6	121	27	720	155	57	77	24	402	51	37
2	21	8.0	103	28	450	125	70	79	17	160	44	33
3	21	7.7	98	27	290	110	76	65	13	315	37	33
4	17	7.4	183	26	210	95	77	50	13	418	37	24
5	14	8.6	1560	25	150	105	79	44	32	168	38	22
6	13	12	1960	25	110	143	93	40	30	85	36	20
7	12	14	848	27	86	230	353	41	28	62	36	17
8	9.7	12	405	30	72	356	872	46	27	59	35	14
9	8.7	12	254	34	60	303	759	51	27	64	31	13
10	8.3	17	192	40	50	222	923	49	26	77	31	13
11	8.4	13	144	45	43	189	1840	44	26	49	28	14
12	7.6	16	117	48	37	171	2630	41	24	52	30	14
13	8.6	14	102	52	35	264	3820	54	26	47	29	15
14	8.9	31	88	39	34	565	2440	40	26	46	33	14
15	7.2	1060	83	32	74	616	870	35	25	44	46	11
16	6.1	1230	79	26	150	436	523	53	23	40	57	9.0
17	7.6	694	73	22	330	255	344	53	22	38	48	6.6
18	7.7	2280	67	19	680	202	246	49	21	36	33	5.9
19	13	2570	64	17	1440	175	211	39	19	35	25	6.9
20	26	853	68	15	1600	132	182	43	16	33	33	9.5
21	22	372	85	14	942	110	148	42	15	32	40	8.5
22	15	221	157	13	585	105	124	42	18	49	53	6.6
23	11	152	140	12	319	106	109	40	15	45	54	6.9
24	8.3	111	110	38	432	105	77	40	96	44	41	6.7
25	6.6	88	88	125	524	118	68	43	316	58	36	6.5
26	5.9	86	70	310	340	104	65	73	534	96	31	13
27	4.7	135	57	860	250	89	61	54	268	62	27	17
28	4.0	446	47	2000	190	71	71	72	280	48	26	23
29	3.3	312	40	4960	---	69	76	51	348	41	30	23
30	2.9	187	34	2700	---	65	71	40	467	51	27	18
31	3.9	---	30	1500	---	62	---	30	---	58	44	---
TOTAL	334.4	10978.3	7467	13136	10203	5853	17335	1520	2822	2814	1147	461.1
MEAN	10.8	366	241	424	364	189	578	49.0	94.1	90.8	37.0	15.4
MAX	26	2570	1960	4960	1600	616	3820	79	534	418	57	37
MIN	2.9	7.4	30	12	34	62	57	30	13	32	25	5.9
CFSM	.03	1.10	.73	1.28	1.10	.57	1.74	.15	.28	.27	.11	.05
IN.	.04	1.23	.84	1.47	1.14	.66	1.94	.17	.32	.32	.13	.05

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1994, BY WATER YEAR (WY)

	MEAN	77.1	180	309	432	474	607	510	283	241	173	73.0	89.1
MAX	782	1286	1283	2184	1555	2112	1874	1237	1142	1652	477	1090	
(WY)	1927	1973	1991	1950	1950	1978	1957	1943	1981	1992	1979	1926	
MIN	5.44	13.4	11.9	8.23	23.6	81.3	51.3	28.7	13.6	20.4	8.10	5.78	
(WY)	1989	1957	1977	1977	1964	1981	1971	1934	1988	1965	1991	1991	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1921 - 1994

ANNUAL TOTAL	132099.6	74070.8	287
ANNUAL MEAN	362	203	537
HIGHEST ANNUAL MEAN			65.3
LOWEST ANNUAL MEAN			1973
HIGHEST DAILY MEAN	6770	4960	12000
LOWEST DAILY MEAN	2.9	2.9	.71
ANNUAL SEVEN-DAY MINIMUM	4.5	4.5	1.2
INSTANTANEOUS PEAK FLOW		5190	12800
INSTANTANEOUS PEAK STAGE		14.52	20.30
INSTANTANEOUS LOW FLOW		2.9	
ANNUAL RUNOFF (CFSM)	1.09	.61	.86
ANNUAL RUNOFF (INCHES)	14.80	8.30	11.74
10 PERCENT EXCEEDS	1180	440	687
50 PERCENT EXCEEDS	98	47	74
90 PERCENT EXCEEDS	13	12	18

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.



# STREAMS TRIBUTARY TO LAKE ERIE

43

## 04187100 OTTAWA RIVER AT LIMA, OH

LOCATION.--Lat 40°43'29", long 84°07'35", Allen County, Hydrologic Unit 04100007, on right bank, 70 ft downstream of Erie Lackawanna RR bridge, 300 ft upstream of bridge to Lima STP, 0.7 mi downstream from Collett Street at Lima, Ohio.

DRAINAGE AREA.--128 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1988 to current year.

GAGE.--Water-stage recorder. Datum of gage is 820.00 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 14-18, 21, 26 to Jan. 26, Feb. 1-18, 26 to Mar. 4. Records good, except for periods of estimated record, which are fair. Water diverted upstream of gage for City of Lima and Sohio Chemical Co. Water is returned to stream below gage.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	.62	34	10	56	26	31	23	12	393	14	16
2	6.9	.20	40	12	38	23	30	17	14	169	14	13
3	6.4	.50	47	13	29	28	33	6.9	16	318	13	10
4	4.9	.88	373	11	24	35	35	16	12	144	23	8.6
5	4.7	.54	979	10	20	46	40	13	6.5	32	19	7.4
6	4.9	.70	653	9.8	17	66	131	12	8.0	16	25	6.5
7	3.0	.70	193	9.6	15	100	426	23	12	20	22	6.7
8	2.5	.50	116	9.4	13	116	526	20	20	18	14	5.9
9	2.9	.44	90	9.3	12	79	275	18	19	33	12	5.4
10	3.7	1.0	67	9.2	12	58	757	14	17	28	12	5.1
11	4.5	1.2	52	11	12	56	775	11	11	24	13	5.2
12	2.9	.79	38	12	12	52	1690	14	6.1	21	13	4.4
13	3.6	2.9	32	13	12	223	1540	9.6	6.9	19	67	4.4
14	3.7	265	29	13	12	595	707	8.9	9.3	18	118	3.9
15	4.2	82	26	12	15	376	268	7.4	7.1	18	145	1.4
16	11	45	24	10	22	199	130	13	3.7	13	38	.62
17	16	696	23	9.6	40	91	77	18	4.9	12	24	.30
18	1.5	749	21	8.6	100	44	55	18	.98	11	13	.20
19	.96	291	28	7.7	493	34	54	18	1.2	10	15	.20
20	.94	87	33	7.0	577	30	43	14	11	9.7	31	.15
21	6.1	68	44	6.5	401	46	36	7.1	8.7	10	19	.10
22	.27	44	50	6.0	181	92	31	7.8	9.4	17	20	.08
23	.28	46	45	8.8	157	70	16	17	17	56	17	.02
24	.63	35	36	14	377	33	14	21	65	84	13	4.1
25	.62	38	29	28	109	23	24	25	125	35	12	10
26	.56	38	23	80	56	29	23	40	59	44	11	7.0
27	.40	85	19	380	41	28	22	27	57	23	9.8	4.1
28	.26	130	17	1810	32	31	21	19	25	99	22	1.6
29	.01	67	14	1320	---	27	18	3.5	621	46	15	1.2
30	.00	36	13	443	---	35	24	8.4	697	16	46	1.1
31	.32	---	11	117	---	32	---	11	---	12	26	---
TOTAL	105.25	2812.97	3199	4420.5	2885	2723	7852	481.6	1882.78	1768.7	855.8	134.67
MEAN	3.40	93.8	103	143	103	87.8	262	15.5	62.8	57.1	27.6	4.49
MAX	16	749	979	1810	577	595	1690	40	697	393	145	16
MIN	.00	.20	11	6.0	12	23	14	3.5	.98	9.7	9.8	.02

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1994, BY WATER YEAR (WY)

MEAN	46.8	106	135	139	142	123	193	80.5	60.1	131	39.2	69.1
MAX	192	434	586	327	425	422	262	208	195	444	134	346
(WY)	1991	1993	1991	1993	1990	1993	1994	1990	1990	1992	1990	1992
MIN	3.40	5.56	5.01	12.2	18.9	42.5	98.3	15.5	7.44	7.85	6.58	4.49
(WY)	1994	1992	1992	1992	1989	1992	1991	1994	1988	1991	1993	1994

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR

#### FOR 1994 WATER YEAR

#### WATER YEARS 1988 - 1994

ANNUAL TOTAL	45813.32	29121.27	109
ANNUAL MEAN	126	79.8	156
HIGHEST ANNUAL MEAN			56.5
LOWEST ANNUAL MEAN			1993
HIGHEST DAILY MEAN	2050	1810	3860
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.26	.15	.15
INSTANTANEOUS PEAK FLOW		2200	4590
INSTANTANEOUS PEAK STAGE		14.38	18.63
INSTANTANEOUS LOW FLOW		.00	
10 PERCENT EXCEEDS	384	150	216
50 PERCENT EXCEEDS	33	18	26
90 PERCENT EXCEEDS	3.0	1.3	4.7

## STREAMS TRIBUTARY TO LAKE ERIE

## 04189000 BLANCHARD RIVER NEAR FINDLAY, OH

LOCATION.--Lat 41°03'21", long 83°41'17", on east line of sec. 10, T.1 N., R.10 E., Hancock County, Hydrologic Unit 04100008, on left bank at upstream side of county road bridge, 2 mi west of Findlay, 3 mi downstream from Eagle Creek, and 3 mi upstream from Aurand Run.

DRAINAGE AREA.--346 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1923 to December 1935, October 1940 to current year. Monthly discharge only for October 1923, published in WSP 1307.

REVISED RECORDS.--WSP 974: 1942. WSP 1054: 1927-30, 1933(M), 1945. WSP 1387: 1926, 1928(M), 1930(M), 1952. WSP 1912: Drainage area. WRD-OH-81-2: 1959, 1975 (M).

GAGE.--Water-stage recorder. Datum of gage is 754.55 ft above sea level. Prior to July 24, 1930, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1, Dec. 24 to Jan. 27, 30 to Feb. 18, 27 to Mar. 4, Jul. 22. Records fair, except for periods of estimated record, which are poor. Water is diverted upstream from station into Findlay Reservoir. Storage in Findlay Reservoir used for water supply of city of Findlay, and is available for low-flow augmentation. All water returns to stream upstream from station. No releases have been made for low-flow augmentation. Sediment data collected at this site 1970-74. Water-quality data collected at this site 1968 to 1980.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	22	158	44	1000	80	99	124	76	780	29	42
2	22	20	141	42	700	70	93	106	62	277	30	31
3	18	21	145	40	500	76	130	100	61	178	28	25
4	17	21	524	38	350	88	115	83	52	220	46	21
5	17	25	2070	37	250	127	142	73	36	155	42	19
6	17	24	1740	35	200	187	368	82	43	94	30	27
7	17	28	1080	34	150	329	922	98	40	69	29	30
8	17	25	435	33	130	356	1260	99	35	79	32	20
9	27	22	301	32	110	273	800	82	31	76	26	19
10	21	20	240	31	92	197	1340	75	26	213	23	17
11	18	19	197	30	82	149	1530	70	25	134	36	16
12	17	18	156	29	72	151	3510	89	24	69	27	17
13	17	22	130	28	64	542	3890	59	25	54	186	18
14	16	187	115	27	56	1100	2830	53	25	48	270	19
15	17	281	120	27	50	932	922	53	26	57	100	20
16	19	335	111	27	86	592	516	52	30	40	117	20
17	76	693	97	27	220	378	383	48	46	35	62	16
18	28	1480	98	26	500	296	304	46	31	41	42	13
19	23	1110	100	26	1220	228	245	44	26	36	29	16
20	23	576	109	25	1690	198	181	42	21	32	44	17
21	39	269	148	24	1360	250	165	39	27	31	44	23
22	25	180	159	24	733	375	148	36	27	40	39	20
23	24	137	150	24	452	331	140	37	33	44	62	17
24	20	110	100	24	690	283	131	37	106	170	44	15
25	20	90	74	24	436	230	126	88	411	113	35	20
26	20	76	64	60	201	186	135	164	215	114	29	20
27	20	255	60	150	140	178	140	263	310	94	26	22
28	21	536	56	2820	100	158	103	140	249	53	31	20
29	20	386	52	4190	---	134	93	109	792	40	29	18
30	19	217	50	3000	---	114	115	116	1230	28	59	18
31	23	---	46	2000	---	105	---	83	---	30	68	---
TOTAL	703	7205	9026	12978	11634	8693	20876	2590	4141	3444	1694	616
MEAN	22.7	240	291	419	415	280	696	83.5	138	111	54.6	20.5
MAX	76	1480	2070	4190	1690	1100	3890	263	1230	780	270	42
MIN	16	18	46	24	50	70	93	36	21	28	23	13
CFSM	.07	.69	.84	1.21	1.20	.81	2.01	.24	.40	.32	.16	.06
IN.	.08	.77	.97	1.40	1.25	.93	2.24	.28	.45	.37	.18	.07

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1994, BY WATER YEAR (WY)

	MEAN	64.8	163	287	369	421	560	459	261	215	130	56.2	90.8
MAX	623	1435	1482	1800	1402	1814	1588	865	1612	1075	474	944	
(WY)	1927	1973	1991	1930	1959	1978	1957	1969	1981	1992	1979	1926	
MIN	2.43	3.67	4.28	6.54	9.86	60.1	33.3	22.1	18.3	4.27	1.24	1.62	
(WY)	1935	1935	1935	1945	1964	1941	1925	1925	1988	1934	1934	1934	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1924 - 1994

ANNUAL TOTAL	120020	83600	
ANNUAL MEAN	329	229	
HIGHEST ANNUAL MEAN			256
LOWEST ANNUAL MEAN			571
HIGHEST DAILY MEAN	3570	Jan 5	57.5
LOWEST DAILY MEAN	16	Oct 14	1931
ANNUAL SEVEN-DAY MINIMUM	18	Oct 2	12000
INSTANTANEOUS PEAK FLOW			.40
INSTANTANEOUS PEAK STAGE			.56
INSTANTANEOUS LOW FLOW			13000
ANNUAL RUNOFF (CFSM)	.95	.66	.74
ANNUAL RUNOFF (INCHES)	12.90	8.99	10.05
10 PERCENT EXCEEDS	894	519	617
50 PERCENT EXCEEDS	115	64	57
90 PERCENT EXCEEDS	22	20	9.0

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

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LOCATION.--Lat 41°14'14", long 84°23'59", in NE 1/4 sec. 9, T.3 N. R.4 E., Defiance County, Hydrologic Unit 04100007, on right bank 125 ft downstream from hydroelectric dam of Hydro-Corporation, 0.2 mi upstream from Jackson ditch, and 3 mi south of Defiance.

PERIOD OF RECORD.--May to August 1903 (gage heights only), April 1915 to current year. Monthly discharges only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 954: 1941. WSP 1912: Drainage area. WRD OH-72-1: 1966 (M).

GAGE.--Water-stage recorder. Datum of gage is 659.70 ft above sea level. May 20 to Aug. 8, 1903, non-recording gage at site 1.8 mi downstream at different datum. April 13, 1915, to Dec. 6, 1933, nonrecording gage near right bank on downstream side of dam at datum 6.00 ft higher, and auxiliary tailwater staff gage near right bank on downstream side of dam at present datum. Oct. 1982 to Nov. 1984 at dam 125 ft upstream, at present datum.

REMARKS.--Estimated daily discharges: Dec. 19-21, 27 to Jan. 7, 15-18, Feb. 3-13, 16-17, 22 to Mar. 6, Jul. 11-14. Records good, except for periods of estimated record, which are fair. Flow regulated by dam at powerplant at station; reservoir capacity, 9,800 acre-ft. Plant shut down except for occasional gate operation, Jan. 10, 1963 to Sept. 7, 1985. Some diversion by Miami and Erie Canal from Grand Lake into Jennings Creek, tributary to Auglaize River 70 mi upstream from station. Water-quality data collected at this site 1966 to 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of March 1913 reached a stage of 38.8 ft. from reading on powerplant tailwater gage at present datum; discharge, 120,000 ft<sup>3</sup>/s, from rating curve extended above 51,000 ft<sup>3</sup>/s.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	627	60	1030	150	9440	760	444	895	117	4140	360	276
2	207	64	534	135	5990	690	387	844	130	3200	139	58
3	108	64	596	120	3600	620	421	630	135	1900	264	84
4	83	71	651	110	2100	580	437	645	124	1450	113	226
5	64	70	3900	100	1400	780	498	424	61	1160	218	57
6	66	65	7630	95	940	1400	572	384	182	460	349	64
7	72	63	6610	88	700	3600	1760	382	47	893	169	214
8	71	58	4230	82	540	5030	4680	384	52	1100	324	54
9	74	57	2580	80	420	3800	7130	468	114	1110	203	53
10	90	58	1650	76	350	2660	9500	578	66	1190	57	55
11	90	59	1260	254	300	1980	12200	526	167	700	61	55
12	73	53	725	68	255	1620	20400	407	66	760	79	55
13	79	56	437	303	225	1850	28700	175	136	810	342	60
14	71	400	421	379	192	3380	26700	418	65	450	198	55
15	72	962	642	310	183	4880	18300	279	141	294	586	57
16	67	2340	591	200	230	4410	9330	201	57	259	626	52
17	79	2230	367	140	470	3170	5960	327	67	354	443	47
18	95	4630	182	95	2670	2100	2900	163	179	373	340	47
19	77	7300	210	58	6220	1570	1780	315	62	211	153	46
20	82	5410	260	50	9740	1180	1430	180	305	77	66	47
21	88	2860	340	47	10500	1130	1170	80	294	80	294	46
22	92	1770	511	45	6000	1280	826	214	159	94	444	46
23	95	839	680	81	3400	1290	764	287	169	221	329	47
24	85	493	981	129	2300	1290	753	78	328	158	155	45
25	87	585	658	267	1700	1070	622	277	2370	308	344	43
26	90	466	438	578	1350	954	494	293	2630	467	57	44
27	87	487	370	1240	1100	742	548	250	2000	403	60	48
28	66	1370	300	7440	920	599	544	551	1440	411	84	83
29	66	1560	240	15900	---	582	616	329	2770	420	274	56
30	62	1480	200	18400	---	575	573	347	4920	591	56	59
31	61	---	175	14600	---	524	---	204	---	573	63	---
TOTAL	3126	35980	39399	61620	73235	56096	160439	11535	19353	24617	7250	2179
MEAN	101	1199	1271	1988	2616	1810	5348	372	645	794	234	72.6
MAX	627	7300	7630	18400	10500	5030	28700	895	4920	4140	626	276
MIN	61	53	175	45	183	524	387	78	47	77	56	43

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 1994, BY WATER YEAR (WY)

MEAN	495	1045	1825	2518	2987	4155	3465	1888	1365	821	309	433
MAX	3445	7856	8510	13350	10170	13090	11210	10490	6733	5762	1988	5571
(WY)	1955	1973	1967	1950	1976	1982	1957	1943	1947	1992	1979	1992
MIN	23.6	7.28	9.34	48.5	111	382	242	69.8	101	42.0	27.1	28.9
(WY)	1953	1953	1977	1977	1964	1941	1946	1934	1988	1930	1932	1963

## SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

## WATER YEARS 1916 - 1994

ANNUAL TOTAL	934155		494829				
ANNUAL MEAN	2559		1356			1760	
HIGHEST ANNUAL MEAN						3337	1973
LOWEST ANNUAL MEAN						342	1931
HIGHEST DAILY MEAN	25400	Jan 6	28700	Apr 13		52300	Mar 14 1982
LOWEST DAILY MEAN	53	Nov 12	43	Sep 25		.50	Oct 13 1952
ANNUAL SEVEN-DAY MINIMUM	58	Nov 7	45	Sep 20		1.1	Oct 12 1952
INSTANTANEOUS PEAK FLOW			29600	Apr 13		52500	Feb 16 1950
INSTANTANEOUS PEAK STAGE			20.27	Apr 13		27.65	Feb 13 1959
INSTANTANEOUS LOW FLOW			43	Sep 25			
10 PERCENT EXCEEDS	8430		3390			4880	
50 PERCENT EXCEEDS	627		340			435	
90 PERCENT EXCEEDS	71		58			38	

## STREAMS TRIBUTARY TO LAKE ERIE

## 04192500 MAUMEE RIVER NEAR DEFIANCE, OH

LOCATION.--Lat 41°17'30", long 84°16'52", in NW 1/4 sec. 22, T.4 N., R.5 E., Defiance County, Hydrologic Unit 04100009, on left bank 40 ft. upstream from Independence Dam, 4 mi downstream from mouth of Auglaize River, and 4.5 mi east of Defiance.

DRAINAGE AREA.--5,545 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1924 to December 1935, March 1939 to September 1974, October 1978 to current year.

REVISED RECORDS.--WSP 974: 1926-27, 1930. WSP 1387: 1925-28, 1946. WRD Ohio, 1970: Drainage Area.

GAGE.--Water-stage recorder. Datum of gage is 658.56 ft above sea level. Prior to Nov. 13, 1924, nonrecording gage at same site and datum.

REMARKS.--Estimated discharges Dec. 28-Jan. 26, Feb. 8-16. Records good, except for estimated discharges, which are fair. Flow affected by regulation of Auglaize River at hydroelectric plant of the Hydro-Corporation, 7 mi upstream. Operation of hydroelectric plant there was discontinued Jan. 10, 1963 to Sept. 7, 1985. Low flow slightly regulated by powerplant at Ft. Wayne, Indiana. Slight diversion 275 ft upstream into Miami and Erie Canal through a 24 inch conduit which bypasses station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1610	690	3550	640	18000	4060	2060	5070	773	6400	674	400
2	1080	718	2640	610	12600	3520	1850	5070	701	4790	495	324
3	834	779	2570	580	10000	3540	1740	4470	664	3210	462	278
4	736	582	3120	550	7590	3160	1750	3720	619	2410	435	394
5	624	540	6980	530	5600	4960	1900	3180	615	2090	438	296
6	560	555	10800	500	4140	9010	2080	2440	611	1440	581	266
7	546	498	10000	480	3150	13700	3570	2270	441	1890	532	344
8	523	478	7300	460	2400	18800	7830	2110	404	3370	512	278
9	516	461	5490	440	1900	14400	11800	2030	509	4120	480	223
10	473	455	4550	420	1600	10500	16400	2130	481	3240	275	217
11	578	454	3970	410	1400	8490	22000	2050	554	2560	287	211
12	895	433	3130	400	1200	6990	35400	1810	416	1560	277	219
13	814	456	2260	390	1050	6360	50800	1580	440	1180	444	257
14	786	798	1840	380	910	7280	50300	1650	381	916	486	244
15	774	2130	1870	370	820	8270	39400	1640	493	848	855	226
16	658	4290	1770	360	1050	7710	26300	1410	377	571	1040	221
17	570	5500	1410	350	1900	6160	19100	1440	462	640	861	207
18	694	9270	1160	340	4950	4710	12400	1320	721	662	657	198
19	1040	12300	1150	340	10800	3850	8510	1260	549	551	647	196
20	1320	10500	1280	330	16700	3210	6340	1210	671	369	469	193
21	1240	7990	1370	320	19400	2990	4660	966	833	368	541	189
22	1240	6510	1530	310	18700	3380	3380	1030	614	361	773	198
23	1150	5050	1790	310	14200	3870	2780	1030	487	489	681	193
24	1120	3430	2040	310	10200	3880	2540	895	1660	411	504	197
25	1040	2790	1760	420	8980	3680	2250	914	4320	575	499	193
26	928	2450	1330	680	7080	3110	1860	1040	5520	744	385	196
27	819	3940	924	1650	5410	2720	2040	990	4940	897	276	218
28	776	5260	830	10900	4650	2440	2630	1840	3730	855	303	231
29	705	5120	770	22400	---	2510	3750	1620	4950	773	442	212
30	642	4470	720	26500	---	2470	3870	1220	6730	919	337	230
31	695	---	680	23800	---	2320	---	996	---	965	295	---
TOTAL	25986	98897	90584	96480	196380	182050	351290	60401	44666	50174	15943	7249
MEAN	838	3297	2922	3112	7014	5873	11710	1948	1489	1619	514	242
MAX	1610	12300	10800	26500	19400	18800	50800	5070	6730	6400	1040	400
MIN	473	433	680	310	820	2320	1740	895	377	361	275	189

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	MEAN	1368	2806	4581	5967	6944	9509	8572	4998	3381	1999	902	1076
MAX	8314	16410	18040	30150	22460	33940	23210	27270	20370	10700	4739	11470	
(WY)	1955	1973	1967	1950	1959	1982	1957	1943	1981	1992	1958	1926	
MIN	63.9	110	158	219	363	1455	789	359	214	211	111	88.1	
(WY)	1929	1954	1964	1945	1964	1941	1925	1925	1988	1930	1932	1955	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1925 - 1994

ANNUAL TOTAL	2146228												
ANNUAL MEAN	5880												
HIGHEST ANNUAL MEAN										4324			
LOWEST ANNUAL MEAN										8286			1950
HIGHEST DAILY MEAN	53000	Jan 6								849			1931
LOWEST DAILY MEAN	201	Aug 25								98800			Mar 15 1982
ANNUAL SEVEN-DAY MINIMUM	221	Aug 25								3.0			Sep 4 1925
INSTANTANEOUS PEAK FLOW										27			Aug 31 1925
INSTANTANEOUS PEAK STAGE										104000			Mar 15 1982
INSTANTANEOUS LOW FLOW										15.87			Mar 15 1982
10 PERCENT EXCEEDS	17200									189			
50 PERCENT EXCEEDS	2420									8360			
90 PERCENT EXCEEDS	444									1050			
										322			
										12400			
										1370			
										218			



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OH National Stream Quality Accounting Network Station

LOCATION.--Lat 41°30'00", long 83°42'46", Lucas County, Hydrologic Unit 04100009, on downstream side of first pier from left end of bridge on State Highway 64 at Waterville, 3 mi downstream from Tontogany Creek, and 20.7 mi upstream from mouth.  
DRAINAGE AREA.--6,330 mi<sup>2</sup>.

### WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1898 to December 1901, August 1921 to December 1935, March 1939 to current year. Miami and Erie Canal flow included at Waterville prior to 1930 when the canal was abandoned.  
REVISED RECORDS.--WSP 894: 1930(M). WSP 1084: 1946. WSP 1387: 1900(M), 1922-23, 1933. WDR OH-68-1: 1967. WDR OH-70-1: Drainage area. WRD-OH-82-2: 1981.  
GAGE.--Water-stage recorder with auxiliary crest-stage gage. Datum of gage is 595.71 ft above sea level. Nov. 19, 1898 to Dec. 31, 1901, Aug. 26, 1921 to July 31, 1930, nonrecording gage Aug. 1, 1930 to Dec. 31, 1935, water-stage recorder, Mar. 14, 1939 to Mar. 12, 1940, nonrecording gage at same site and datum.  
REMARKS.--Estimated daily discharges: Dec. 27 to Jan. 26, Feb. 9-16, Sep. 22. Records fair except for estimated daily discharges which are poor. Satellite telemeter at station.  
EXTREMES FOR PERIOD OF RECORD.--Practically no flow at times prior to June 30, 1929, when entire river flow was being diverted by canal.  
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 19.9 ft, from information by local resident, estimated discharge, 180,000 ft<sup>3</sup>/s, from rating curve extended above 94,000 ft<sup>3</sup>/s.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1600	706	4330	780	22600	4780	2560	6210	1030	7510	807	234
2	1350	640	3240	720	16800	4060	2310	6550	824	6000	634	321
3	910	771	2650	680	11900	3950	2120	5630	813	4270	483	278
4	722	632	2970	640	9640	3600	2180	4730	827	3000	522	211
5	587	687	6450	620	7100	4120	2260	4110	838	2460	394	316
6	558	412	11200	580	5300	8950	2680	3090	846	1970	475	326
7	504	556	12100	560	4000	17500	3760	2580	613	1550	612	240
8	456	404	9170	520	3070	26600	8310	2590	420	2900	512	298
9	501	427	6590	500	2500	19300	14900	2350	542	4690	525	234
10	506	444	5360	490	2100	13300	19200	2110	669	3710	433	152
11	423	491	4360	470	1900	10200	27900	2390	736	3100	334	134
12	653	329	3790	460	1600	8490	40100	2090	753	2090	356	162
13	716	503	2640	450	1300	8000	63900	1840	620	1340	404	229
14	746	536	1980	440	1200	8990	63700	1680	555	1020	610	237
15	723	1280	1820	420	1100	9950	49000	2140	541	1020	586	179
16	720	3160	1870	410	960	9500	34200	1670	631	658	894	176
17	715	5350	1610	400	1610	7700	24200	1430	655	573	932	176
18	494	8120	1340	390	3280	6100	17000	1690	765	668	784	141
19	716	13200	1100	385	9920	4800	11500	1390	887	605	692	122
20	1070	12600	1190	380	19400	3860	8210	1590	837	466	618	131
21	1510	9550	1500	370	23100	3930	6020	1390	1110	351	531	119
22	941	7350	1320	365	22300	4370	4460	1250	955	417	703	88
23	1060	6100	1700	360	18300	4890	3460	1330	798	337	787	81
24	1060	4170	1940	355	13100	4890	3000	1340	1190	449	682	68
25	969	3140	2260	350	10500	4330	2640	1080	5150	420	490	169
26	925	2810	1420	1200	7780	3760	2180	1350	6880	575	499	170
27	859	3750	1300	3390	7020	3630	2320	1230	6420	729	343	214
28	741	5830	1100	10800	5570	3040	2440	1560	4960	776	303	254
29	775	6040	1000	23500	---	3030	4430	2020	4400	730	211	158
30	534	5050	900	27700	---	2890	4590	1610	7430	764	350	94
31	673	---	820	28600	---	2860	---	1400	---	884	377	---
TOTAL	24717	105038	101020	107285	234950	225370	435530	73420	53695	56032	16883	5712
MEAN	797	3501	3259	3461	8391	7270	14520	2368	1790	1807	545	190
MAX	1600	13200	12100	28600	23100	26600	63900	6550	7430	7510	932	326
MIN	423	329	820	350	960	2860	2120	1080	420	337	211	68
CFSM	.13	.55	.51	.55	1.33	1.15	2.29	.37	.28	.29	.09	.03
IN.	.15	.62	.59	.63	1.38	1.32	2.56	.43	.32	.33	.10	.03

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

	MEAN	1486	3132	5427	6859	7961	10990	9729	5819	3987	2369	1036	1102
MAX	9041	19010	23830	34010	30000	38210	25890	29540	24030	11200	6185	10320	
(WY)	1955	1993	1967	1950	1976	1982	1957	1943	1981	1992	1958	1992	
MIN	95.5	196	177	235	424	1759	914	587	231	207	146	127	
(WY)	1964	1965	1964	1945	1934	1941	1946	1934	1988	1930	1941	1963	

### SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1930 - 1994
ANNUAL TOTAL	2547132	1439652	
ANNUAL MEAN	6978	3944	4972
HIGHEST ANNUAL MEAN			9370
LOWEST ANNUAL MEAN			938
HIGHEST DAILY MEAN	65000	Jan 6	113000
LOWEST DAILY MEAN	312	Aug 21	17
ANNUAL SEVEN-DAY MINIMUM	343	Aug 21	47
INSTANTANEOUS PEAK FLOW			68300
INSTANTANEOUS PEAK STAGE			12.59
INSTANTANEOUS LOW FLOW			68
ANNUAL RUNOFF (CFSM)	1.10	.62	.79
ANNUAL RUNOFF (INCHES)	14.97	8.46	10.67
10 PERCENT EXCEEDS	20000	9590	13800
50 PERCENT EXCEEDS	2800	1250	1610
90 PERCENT EXCEEDS	493	347	254

## STREAMS TRIBUTARY TO LAKE ERIE

## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1950 to current year.

PERIOD OF DAILY RECORD.--

CHLORIDE: October 1987 to current year.

NITROGEN, NITRITE + NITRATE: October 1987 to current year.

NITROGEN, AMMONIA + ORGANIC: October 1987 to current year.

PHOSPHORUS: October 1987 to current year.

SUSPENDED SEDIMENT DISCHARGE: April 1950 to September 1984. October 1987 to current year.

INSTRUMENTATION.--Refrigerated water-quality pumping sampler since 1987. Sampler located at station 04193490.

REMARKS.--Water-quality samples were collected by pumping sampler three times daily. Heidelberg College Water Quality Laboratory operates the pumping sampler and analyzes the water-quality samples for chemical concentration.

Sediment samples were collected by a local observer on an approximate once daily basis. Chemical loads were calculated using the mean-interval method (Porterfield, George, 1972, Computation of Fluvial-Sediment Discharge: U.S. Geological Survey, Techniques of Water Resources Investigations, Book 3, Chap. C3, 66 p.). For days with unsteady concentration, discharge, or both, the day was sub-divided into hourly intervals and the daily load was calculated by summation of hourly loads. This required interpolation between measured and estimated concentrations. Concentrations reported as below the limit of detection (for example, <.100) were assumed to have a value of half of the detection limit for the purpose of load calculation.

EXTREMES FOR PERIOD OF DAILY RECORD.--

DISSOLVED CHLORIDE CONCENTRATIONS: Maximum daily mean, 110 mg/L, Jul. 31-Aug. 6, 1988; minimum daily mean, <10 mg/L, Jul. 24-26, 1990, Aug. 26, 1992, on several days during 1993.

DISSOLVED CHLORIDE LOADS: Maximum daily, 3,590 tons, Jan. 29, 1994; minimum daily, 10.5 tons, Jun. 28, 1988.

DISSOLVED NITROGEN, NITRITE + NITRATE CONCENTRATIONS: Maximum daily mean, 24.1 mg/L, May 13, 1990; minimum daily mean, <.100 mg/L, on many days during 1988, 1991, 1993, and 1994 water years, and on several days during 1992.

DISSOLVED NITROGEN, NITRITE + NITRATE LOADS: Maximum daily, 1,300 tons, Apr. 5, 1989; minimum daily, .01 ton, on many days during 1988 water year and Sep. 22-24, 30, 1994.

TOTAL NITROGEN, AMMONIA + ORGANIC CONCENTRATIONS: Maximum daily mean, 6.6 mg/L, Feb. 23, 1990; minimum daily mean, .24 mg/L, Feb. 9, 13, 1993.

TOTAL NITROGEN, AMMONIA + ORGANIC LOADS: Maximum daily, 1,030 tons, Feb. 23, 1990; minimum daily, .13 ton, Sep. 24, 1994.

TOTAL PHOSPHORUS CONCENTRATIONS: Maximum daily mean, 1.95 mg/L, Feb. 4, 1990; minimum daily mean, .067 mg/L, Jul. 24, 1994.

TOTAL PHOSPHORUS LOADS: Maximum daily, 362 tons, Jan. 1, 1991; minimum daily, .024 ton, Sep. 24, 1994.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,240 mg/L, Mar. 26, 1954; minimum daily mean, 1 mg/L, on many days during 1953, 1955, 1963.

SEDIMENT LOADS: Maximum daily, 300,000 tons, Feb. 24, 1990; minimum daily, 0.26 ton, Sep. 18, 1955.

EXTREMES FOR CURRENT YEAR.--

DISSOLVED CHLORIDE CONCENTRATIONS: Maximum daily mean, 74 mg/L, Sep. 26; minimum daily mean, 14 mg/L, Apr. 14.

DISSOLVED CHLORIDE LOADS: Maximum daily, 3,590 tons, Jan. 29; minimum daily, 13.4 tons, Sep. 24.

DISSOLVED NITROGEN, NITRITE + NITRATE CONCENTRATIONS: Maximum daily mean, 13.3 mg/L, Jul. 1; minimum daily mean, <.100 mg/L, on many days during the year.

DISSOLVED NITROGEN, NITRITE + NITRATE LOADS: Maximum daily, 1,200 tons, Apr. 13; minimum daily, .01 ton, Sep. 22-24, 30.

TOTAL NITROGEN, AMMONIA + ORGANIC CONCENTRATIONS: Maximum daily mean, 3.5 mg/L, Jun. 26; minimum daily mean, .32 mg/L, Oct. 30.

TOTAL NITROGEN, AMMONIA + ORGANIC LOADS: Maximum daily, 513 tons, Apr. 13; minimum daily, .13 ton, Sep. 24.

TOTAL PHOSPHORUS CONCENTRATIONS: Maximum daily mean, 1.21 mg/L, Mar. 5; minimum daily mean, .067 mg/L, Jul. 24.

TOTAL PHOSPHORUS LOADS: Maximum daily, 145 tons, Apr. 13; minimum daily, .024 ton, Sep. 24.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 925 mg/L, Apr. 13; minimum daily mean, 3 mg/L, May 23.

SEDIMENT LOADS: Maximum daily, 159,000 tons, Apr. 13; minimum daily, 2.9 tons, Sep. 22, 23.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALACHLOR TOT RECV (UG/L)	DATE	TIME	ALACHLOR TOT RECV (UG/L)	DATE	TIME	ALACHLOR TOT RECV (UG/L)
Oct 11	1100	<1	May 09	1200	.6	Jul 04	1200	.6
Oct 25	1120	<1	May 13	1200	<1	Jul 05	1210	.7
Nov 08	1135	<1	May 16	1215	.2	Jul 06	1200	.4
Nov 22	1330	.3	May 20	1200	<1	Jul 08	1200	.4
Dec 06	1105	<1	May 23	1010	<1	Jul 10	1200	.3
Dec 20	1020	<1	May 31	1148	.2	Jul 11	1210	.3
Jan 03	1125	<1	Jun 04	1200	<1	Jul 15	1200	.1
Jan 31	1115	<1	Jun 06	1220	<1	Jul 18	1200	.1
Feb 14	1010	.2	Jun 13	1220	<1	Jul 22	1200	.2
Feb 28	1130	.2	Jun 17	1200	<1	Jul 25	1220	.2
Mar 14	1145	.2	Jun 20	1200	.9	Jul 29	1200	<1
Mar 28	1130	<1	Jun 20	1225	<1	Aug 01	1135	<1
Apr 04	1050	<1	Jun 21	1200	<1	Aug 05	1200	<1
Apr 11	1120	.3	Jun 22	1200	<1	Aug 12	1200	<1
Apr 15	1200	<1	Jun 23	1200	<1	Aug 14	1210	<1
Apr 18	1110	<1	Jun 24	1200	<1	Aug 15	1110	<1
Apr 21	1200	<1	Jun 25	1200	<1	Aug 19	1200	<1
Apr 25	1120	<1	Jun 26	1200	.6	Sep 05	1145	<1
Apr 29	1200	<1	Jun 28	1200	.6	Sep 19	1220	<1
May 02	1120	.6	Jun 30	1200	.4			
May 06	1200	.5	Jul 02	1200	.6			

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

### WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD) (UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCOCI, KF AGAR (COLS. PER 100 ML) (31673)
DEC 09...	1100	6630	493	8.1	5.0	5.0	110	13.5	107	1350	2200
MAR 30...	1000	2920	602	8.6	6.0	7.5	2.7	14.2	120	K2	K23
JUN 03...	0830	860	615	8.7	21.0	21.0	3.0	11.3	128	K12	K8
SEP 21...	0915	130	706	8.4	27.5	20.5	4.7	9.1	101	71	690
DATE	HARD-NESS TOTAL (MG/L AS CaCO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS Ca) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg) (00925)	SODIUM, DIS-SOLVED (MG/L AS Na) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	ALKA-LINITY WAT WH TOT FET FIELD (MG/L AS CaCO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
DEC 09...	210	59	16	12	4.4	160	0	129	58	29	0.2
MAR 30...	290	81	20	18	2.8	197	17	189	73	41	0.2
JUN 03...	240	57	24	29	4.6	173	5	151	86	50	0.4
SEP 21...	210	50	21	44	5.5	175	0	145	98	74	0.6
DATE	SILICA, DIS-SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)
DEC 09...	7.0	302	4.6	0.11	1.3	0.39	0.14	0.12	50	31	<3
MAR 30...	2.8	386	5.0	0.02	1.0	0.09	<0.01	<0.01	<10	37	<3
JUN 03...	0.19	363	0.13	0.01	1.3	0.09	<0.01	<0.01	20	44	<3
SEP 21...	0.58	428	<0.05	0.02	0.8	0.03	0.03	0.01	30	47	<3
DATE	IRON, DIS-SOLVED (UG/L AS Fe) (01046)	LITHIUM DIS-SOLVED (UG/L AS Li) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS Mn) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS Mo) (01060)	NICKEL, DIS-SOLVED (UG/L AS Ni) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS Se) (01145)	SILVER, DIS-SOLVED (UG/L AS Ag) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS Sr) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	
DEC 09...	120	<4	3	<10	1	<1	<1.0	620	<6	116	
MAR 30...	5	5	1	<10	<1	<1	<1.0	690	<6	--	
JUN 03...	12	5	2	10	2	<1	<1.0	860	<6	63.7	
SEP 21...	18	7	1	20	7	<1	<1.0	1200	<6	31.8	

K Non-idea colony count

## STREAMS TRIBUTARY TO LAKE ERIE

## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

CHLORIDE DISSOLVED (MG/L AS CL), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	1600	50	217	706	50	95.9	4330	33	381
2	1350	50	183	640	49	85.5	3240	36	311
3	910	49	120	771	49	103	2650	37	265
4	722	50	97.8	632	49	84.3	2970	39	309
5	587	52	82.6	687	49	90.1	6450	39	671
6	558	54	82.0	412	47	52.7	11200	36	1100
7	504	58	79.3	556	47	69.8	12100	38	1250
8	456	59	72.9	404	47	51.0	9170	35	867
9	501	60	80.7	427	47	53.7	6590	30	540
10	506	61	83.3	444	46	55.0	5360	31	446
11	423	64	72.9	491	46	61.4	4360	29	343
12	653	65	115	329	46	41.2	3790	29	298
13	716	67	129	503	47	63.7	2640	30	212
14	746	67	135	536	46	66.8	1980	30	161
15	723	70	137	1280	50	172	1820	30	149
16	720	71	138	3160	53	457	1870	30	152
17	715	72	138	5350	58	841	1610	30	132
18	494	68	91.2	8120	73	1610	1340	31	111
19	716	66	127	13200	61	2170	1100	31	91.6
20	1070	61	176	12600	39	1320	1190	33	106
21	1510	60	243	9550	29	754	1500	35	140
22	941	60	153	7350	27	530	1320	37	132
23	1060	62	176	6100	27	450	1700	39	178
24	1060	60	171	4170	27	309	1940	41	214
25	969	60	157	3140	28	233	2260	41	253
26	925	58	146	2810	27	208	1420	43	163
27	859	57	132	3750	30	307	1300	44	155
28	741	56	113	5830	32	497	1100	46	136
29	775	56	116	6040	31	509	1000	47	127
30	534	54	77.6	5050	31	423	900	48	116
31	673	52	95.2	---	---	---	820	49	109
TOTAL	24717	---	3937.5	105038	---	11764.1	101020	---	9618.6
JANUARY			FEBRUARY			MARCH			
1	780	50	105	22600	23	1400	4780	34	444
2	720	52	100	16800	22	1020	4060	37	407
3	680	56	103	11900	22	705	3950	39	414
4	640	60	103	9640	22	561	3600	40	384
5	620	59	99.5	7100	22	412	4120	38	419
6	580	60	94.5	5300	23	323	8950	32	757
7	560	62	94.2	4000	24	256	17500	25	1150
8	520	62	86.7	3070	25	210	26600	23	1670
9	500	62	83.2	2500	26	177	19300	22	1150
10	490	62	81.9	2100	27	154	13300	27	958
11	470	62	78.9	1900	28	141	10200	28	781
12	460	62	77.5	1600	25	108	8490	29	676
13	450	62	75.2	1300	29	102	8000	29	626
14	440	61	72.6	1200	32	103	8990	28	690
15	420	61	68.8	1100	33	98.1	9950	31	838
16	410	62	68.1	960	35	90.9	9500	35	886
17	400	62	66.8	1610	37	162	7700	38	792
18	390	62	65.4	3280	37	325	6100	38	623
19	385	62	64.8	9920	31	811	4800	36	464
20	380	63	64.2	19400	26	1360	3860	35	361
21	370	63	62.9	23100	22	1350	3930	35	367
22	365	69	67.6	22300	20	1190	4370	35	415
23	360	72	69.8	18300	21	1050	4890	34	448
24	355	70	67.4	13100	24	856	4890	34	455
25	350	68	64.0	10500	25	718	4330	36	427
26	1200	68	221	7780	25	522	3760	38	389
27	3390	72	660	7020	26	492	3630	38	377
28	10800	62	1660	5570	30	448	3040	38	310
29	23500	57	3590	---	---	---	3030	38	314
30	27700	31	2310	---	---	---	2890	38	300
31	28600	29	2210	---	---	---	2860	39	300
TOTAL	107285	---	12636.0	234950	---	15145.0	225370	---	18592



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

CHLORIDE DISSOLVED (MG/L AS CL), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	2560	39	270	6210	34	567	1030	47	130
2	2310	41	256	6550	33	590	824	48	107
3	2120	42	242	5630	33	498	813	49	107
4	2180	44	261	4730	31	391	827	50	111
5	2260	44	270	4110	31	342	838	50	114
6	2680	44	315	3090	32	269	846	51	117
7	3760	44	445	2580	32	224	613	53	86.8
8	8310	40	905	2590	32	227	420	53	60.4
9	14900	41	1630	2350	34	215	542	53	77.8
10	19200	40	2090	2110	35	197	669	54	98.0
11	27900	32	2380	2390	34	218	736	55	109
12	40100	25	2600	2090	33	188	753	56	113
13	63900	15	2550	1840	34	168	620	57	95.3
14	63700	14	2360	1680	34	155	555	57	85.9
15	49000	15	1980	2140	35	204	541	58	84.6
16	34200	16	1500	1670	37	165	631	59	101
17	24200	18	1200	1430	38	148	655	59	105
18	17000	20	924	1690	41	187	765	59	122
19	11500	22	675	1390	41	154	887	58	138
20	8210	23	500	1590	41	178	837	58	132
21	6020	23	379	1390	42	157	1110	58	175
22	4460	24	295	1250	42	141	955	59	152
23	3460	26	239	1330	42	152	798	59	128
24	3000	26	213	1340	43	155	1190	56	176
25	2640	27	192	1080	43	124	5150	45	625
26	2180	29	169	1350	42	153	6880	43	794
27	2320	29	185	1230	43	142	6420	46	795
28	2440	30	197	1560	45	189	4960	53	711
29	4430	32	381	2020	45	244	4400	47	557
30	4590	33	411	1610	46	197	7430	36	715
31	---	---	---	1400	46	175	---	---	---
TOTAL	435530	---	26014	73420	---	7114	53695	---	6922.8
JULY			AUGUST			SEPTEMBER			
1	7510	33	670	807	32	69.1	234	67	42.2
2	6000	31	511	634	33	56.6	321	67	58.2
3	4270	25	289	483	34	44.9	278	66	49.9
4	3000	28	229	522	36	50.6	211	66	37.7
5	2460	30	199	394	37	39.7	316	68	58.2
6	1970	29	155	475	39	50.0	326	67	59.0
7	1550	30	124	612	41	67.0	240	67	43.2
8	2900	31	240	512	42	58.3	298	67	54.0
9	4690	32	399	525	44	62.4	234	67	42.3
10	3710	32	317	433	46	53.4	152	66	27.2
11	3100	34	286	334	48	43.1	134	66	24.1
12	2090	32	181	356	49	47.5	162	65	28.2
13	1340	29	104	404	49	53.0	229	66	41.2
14	1020	27	73.5	610	48	78.4	237	68	43.2
15	1020	26	70.6	586	52	82.8	179	67	32.5
16	658	25	44.3	894	55	134	176	67	32.0
17	573	25	39.3	932	61	153	176	69	32.6
18	668	26	47.4	784	60	128	141	69	26.5
19	605	27	43.5	692	62	116	122	72	23.6
20	466	26	33.4	618	63	105	131	73	25.8
21	351	26	24.9	531	65	92.8	119	73	23.4
22	417	26	29.3	703	65	123	88	72	17.2
23	337	26	23.2	787	65	138	81	72	15.8
24	449	26	31.9	682	65	120	68	73	13.4
25	420	27	31.0	490	65	86.6	169	73	33.3
26	575	28	43.3	499	65	87.0	170	74	34.1
27	729	28	55.5	343	65	60.3	214	73	42.0
28	776	29	60.2	303	66	53.8	254	72	49.2
29	730	29	56.7	211	67	38.2	158	71	30.3
30	764	30	61.4	350	67	63.5	94	71	18.1
31	884	31	73.5	377	68	68.8	---	---	---
TOTAL	56032	---	4546.9	16883	---	2424.8	5712	---	1058.4
YEAR	1439652		119774.1						

## STREAMS TRIBUTARY TO LAKE ERIE

## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

NITROGEN NITRITE PLUS NITRATE DISSOLVED (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	1600	1.08	4.7	706	1.14	2.2	4330	4.96	58
2	1350	.972	3.6	640	1.17	2.0	3240	4.89	43
3	910	.803	2.0	771	1.23	2.6	2650	4.61	33
4	722	.789	1.5	632	1.25	2.1	2970	4.54	36
5	587	.807	1.3	687	1.34	2.5	6450	5.84	100
6	558	.735	1.1	412	1.37	1.5	11200	6.15	190
7	504	.645	.88	556	1.35	2.0	12100	6.36	210
8	456	.466	.57	404	1.36	1.5	9170	6.16	150
9	501	.414	.56	427	1.34	1.5	6590	5.87	100
10	506	.486	.66	444	1.24	1.5	5360	5.91	85
11	423	.615	.70	491	1.14	1.5	4360	5.97	70
12	653	.654	1.2	329	1.02	.91	3790	5.57	57
13	716	.660	1.3	503	1.00	1.4	2640	5.14	37
14	746	.619	1.2	536	.976	1.4	1980	4.87	26
15	723	.556	1.1	1280	1.09	3.8	1820	4.70	23
16	720	.450	.88	3160	1.22	10	1870	4.58	23
17	715	.358	.69	5350	1.25	18	1610	4.55	20
18	494	.342	.46	8120	2.12	48	1340	4.40	16
19	716	.314	.61	13200	3.35	120	1100	4.12	12
20	1070	.438	1.3	12600	4.79	160	1190	4.23	14
21	1510	.706	2.9	9550	4.16	110	1500	4.25	17
22	941	.785	2.0	7350	4.45	88	1320	4.39	16
23	1060	.806	2.3	6100	4.58	75	1700	4.49	21
24	1060	.624	1.8	4170	4.56	51	1940	4.38	23
25	969	.620	1.6	3140	4.45	38	2260	4.21	26
26	925	.735	1.8	2810	4.31	33	1420	4.11	16
27	859	.709	1.6	3750	4.12	42	1300	4.06	14
28	741	.666	1.3	5830	4.78	75	1100	3.98	12
29	775	.780	1.6	6040	4.83	79	1000	3.92	11
30	534	.881	1.3	5050	4.96	68	900	3.97	9.6
31	673	1.02	1.9	---	---	---	820	4.13	9.1
TOTAL	24717	---	46.41	105038	---	1043.41	101020	---	1477.7
JANUARY			FEBRUARY			MARCH			
1	780	4.09	8.6	22600	2.30	140	4780	4.30	56
2	720	4.14	8.0	16800	2.52	110	4060	4.12	45
3	680	4.29	7.9	11900	2.76	88	3950	3.96	42
4	640	4.32	7.5	9640	3.02	78	3600	3.77	37
5	620	4.03	6.7	7100	3.11	60	4120	3.86	43
6	580	3.89	6.1	5300	3.13	45	8950	4.42	110
7	560	3.91	5.9	4000	3.32	36	17500	5.16	240
8	520	3.83	5.4	3070	3.38	28	26600	5.11	370
9	500	3.91	5.3	2500	3.33	22	19300	5.31	280
10	490	4.03	5.3	2100	3.30	19	13300	5.22	190
11	470	4.15	5.3	1900	3.30	17	10200	5.44	150
12	460	4.27	5.3	1600	3.24	14	8490	5.76	130
13	450	4.41	5.4	1300	3.25	11	8000	6.46	140
14	440	4.53	5.4	1200	3.11	10	8990	7.75	190
15	420	3.97	4.5	1100	2.99	8.9	9950	7.67	210
16	410	4.02	4.5	960	2.96	7.7	9500	7.37	190
17	400	4.23	4.6	1610	2.93	13	7700	7.45	150
18	390	4.44	4.7	3280	2.89	26	6100	7.72	130
19	385	4.66	4.8	9920	2.80	75	4800	7.49	97
20	380	4.90	5.0	19400	2.88	150	3860	7.25	76
21	370	5.12	5.1	23100	3.54	220	3930	7.23	77
22	365	4.54	4.5	22300	3.74	230	4370	7.72	91
23	360	4.13	4.0	18300	3.64	180	4890	7.84	100
24	355	3.89	3.7	13100	3.98	140	4890	7.30	96
25	350	3.57	3.4	10500	4.14	120	4330	6.59	77
26	1200	3.56	12	7780	3.97	83	3760	6.29	64
27	3390	3.78	35	7020	4.01	76	3630	6.12	60
28	10800	3.65	100	5570	4.28	64	3040	5.80	48
29	23500	3.15	200	---	---	---	3030	5.38	44
30	27700	2.15	160	---	---	---	2890	4.73	37
31	28600	2.10	160	---	---	---	2860	4.42	34
TOTAL	107285	---	803.9	234950	---	2071.6	225370	---	3604

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

NITROGEN NITRITE PLUS NITRATE DISSOLVED (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	2560	3.75	26	6210	4.21	71	1030	.398	1.1
2	2310	3.46	22	6550	4.87	86	824	.318	.71
3	2120	3.33	19	5630	4.94	75	813	.189	.42
4	2180	3.53	21	4730	4.76	61	827	<.100	.13
5	2260	3.46	21	4110	4.80	53	838	<.100	.11
6	2680	3.45	25	3090	4.56	38	846	<.100	.11
7	3760	4.02	41	2580	4.26	30	613	<.100	.08
8	8310	5.58	130	2590	4.08	29	420	<.100	.05
9	14900	7.13	290	2350	4.13	26	542	<.100	.07
10	19200	8.65	450	2110	3.68	21	669	<.100	.08
11	27900	9.72	730	2390	3.56	23	736	<.100	.09
12	40100	9.28	990	2090	3.33	19	753	<.100	.10
13	63900	6.90	1200	1840	3.06	15	620	<.100	.08
14	63700	6.48	1100	1680	2.88	13	555	<.100	.07
15	49000	6.31	840	2140	2.79	16	541	<.100	.07
16	34200	6.37	590	1670	2.52	11	631	<.100	.08
17	24200	6.31	410	1430	2.24	8.6	655	<.100	.08
18	17000	6.41	290	1690	1.94	8.9	765	<.100	.10
19	11500	6.27	190	1390	1.81	6.8	887	<.100	.11
20	8210	5.81	130	1590	1.67	7.2	837	<.100	.11
21	6020	5.49	89	1390	1.27	4.8	1110	<.100	.14
22	4460	5.18	63	1250	1.03	3.5	955	<.100	.12
23	3460	4.95	46	1330	.910	3.3	798	<.100	.10
24	3000	4.72	38	1340	.890	3.2	1190	.148	.68
25	2640	4.50	32	1080	.962	2.8	5150	4.25	64
26	2180	4.36	26	1350	.982	3.6	6880	5.06	94
27	2320	4.00	25	1230	1.11	3.7	6420	6.56	110
28	2440	3.76	25	1560	1.08	4.5	4960	6.78	91
29	4430	3.95	47	2020	.979	5.4	4400	9.13	110
30	4590	4.09	51	1610	.624	2.7	7430	11.9	240
31	---	---	---	1400	.536	2.0	---	---	---
TOTAL	435530	---	7957	73420	---	658.0	53695	---	713.79
JULY			AUGUST			SEPTEMBER			
1	7510	13.3	270	807	2.54	5.5	234	<.100	.03
2	6000	11.7	190	634	2.27	3.9	321	<.100	.04
3	4270	12.2	140	483	2.03	2.7	278	<.100	.04
4	3000	12.6	100	522	1.82	2.6	211	<.100	.03
5	2460	12.4	82	394	1.63	1.7	316	<.100	.04
6	1970	12.5	67	475	1.46	1.9	326	<.100	.04
7	1550	12.4	52	612	1.31	2.2	240	<.100	.03
8	2900	11.8	92	512	1.17	1.6	298	<.100	.04
9	4690	11.3	140	525	1.05	1.5	234	<.100	.03
10	3710	10.6	110	433	.939	1.1	152	<.100	.02
11	3100	8.99	75	334	.840	.76	134	<.100	.02
12	2090	8.48	48	356	.765	.74	162	.215	.10
13	1340	7.77	28	404	.784	.86	229	<.100	.04
14	1020	6.99	19	610	.880	1.5	237	<.100	.03
15	1020	6.51	18	586	.700	1.1	179	<.100	.02
16	658	6.18	11	894	.411	.98	176	<.100	.02
17	573	5.97	9.2	932	.184	.47	176	<.100	.02
18	668	5.86	11	784	<.100	.12	141	<.100	.02
19	605	5.65	9.2	692	<.100	.09	122	<.100	.02
20	466	5.29	6.7	618	<.100	.08	131	<.100	.02
21	351	4.94	4.7	531	<.100	.07	119	<.100	.02
22	417	4.68	5.3	703	<.100	.09	88	<.100	.01
23	337	4.34	3.9	787	<.100	.10	81	<.100	.01
24	449	4.20	5.1	682	<.100	.09	68	<.100	.01
25	420	4.17	4.7	490	<.100	.06	169	<.100	.02
26	575	4.17	6.5	499	<.100	.06	170	<.100	.02
27	729	4.18	8.2	343	<.100	.04	214	<.100	.03
28	776	4.09	8.6	303	<.100	.04	254	<.100	.03
29	730	3.79	7.5	211	<.100	.05	158	<.100	.02
30	764	3.60	7.4	350	<.100	.09	94	<.100	.01
31	884	3.03	7.2	377	<.100	.05	---	---	---
TOTAL	56032	---	1547.2	16883	---	32.14	5712	---	0.83
YEAR	1439652		19955.98						

## STREAMS TRIBUTARY TO LAKE ERIE

## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

NITROGEN AMMONIA PLUS ORGANIC TOTAL (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	1600	1.0	4.37	706	.38	.73	4330	.91	10.7
2	1350	1.0	3.68	640	.83	1.45	3240	.67	5.92
3	910	1.0	2.57	771	.91	1.90	2650	.57	4.06
4	722	1.1	2.25	632	.81	1.39	2970	.53	4.27
5	587	1.3	2.04	687	.84	1.57	6450	.73	12.9
6	558	1.3	1.93	412	.85	.95	11200	1.1	35.0
7	504	1.3	1.74	556	.82	1.23	12100	1.5	48.3
8	456	.99	1.21	404	.93	1.02	9170	1.4	34.1
9	501	.84	1.14	427	.88	1.01	6590	1.5	26.3
10	506	.88	1.20	444	.83	1.00	5360	1.6	22.9
11	423	1.2	1.35	491	.86	1.14	4360	1.6	18.9
12	653	1.2	2.19	329	.72	.64	3790	1.5	15.1
13	716	1.2	2.39	503	.74	1.01	2640	1.2	8.64
14	746	1.3	2.54	536	.78	1.14	1980	1.3	6.76
15	723	1.1	2.20	1280	.86	2.96	1820	1.1	5.40
16	720	1.0	2.03	3160	.84	7.18	1870	1.0	5.27
17	715	1.1	2.17	5350	.88	12.7	1610	.96	4.19
18	494	1.2	1.55	8120	.98	21.7	1340	.99	3.58
19	716	1.1	2.19	13200	1.3	45.0	1100	.97	2.89
20	1070	1.1	3.18	12600	1.7	57.8	1190	1.1	3.44
21	1510	1.0	4.26	9550	1.6	42.4	1500	.96	3.89
22	941	1.0	2.53	7350	1.7	33.1	1320	.85	3.04
23	1060	.93	2.65	6100	1.7	27.6	1700	.82	3.75
24	1060	1.0	2.96	4170	1.5	17.3	1940	.73	3.81
25	969	.69	1.79	3140	1.4	11.6	2260	.60	3.67
26	925	.41	1.03	2810	1.3	9.93	1420	.60	2.29
27	859	.39	.90	3750	1.3	12.8	1300	.60	2.09
28	741	.47	.94	5830	1.2	18.6	1100	.64	1.90
29	775	.48	.998	6040	1.3	20.3	1000	.61	1.64
30	534	.32	.46	5050	1.3	17.7	900	.60	1.46
31	673	.33	.60	---	---	---	820	.61	1.34
TOTAL	24717	---	63.038	105038	---	374.85	101020	---	307.50
JANUARY			FEBRUARY			MARCH			
1	780	.54	1.13	22600	1.4	87.7	4780	1.1	14.6
2	720	.51	.999	16800	1.3	60.2	4060	1.2	12.7
3	680	.58	1.07	11900	1.2	39.3	3950	1.1	11.3
4	640	.67	1.15	9640	1.1	29.4	3600	1.1	10.4
5	620	.69	1.15	7100	1.0	19.7	4120	1.1	12.0
6	580	.66	1.04	5300	1.0	15.0	8950	1.4	34.6
7	560	.61	.92	4000	1.1	11.9	17500	2.6	128
8	520	.61	.86	3070	1.1	9.04	26600	2.4	177
9	500	.66	.89	2500	1.0	7.04	19300	1.9	101
10	490	.71	.94	2100	.96	5.46	13300	1.9	67.4
11	470	.76	.97	1900	.91	4.65	10200	1.6	45.4
12	460	.81	1.01	1600	.89	3.86	8490	1.3	30.2
13	450	.70	.85	1300	.86	3.01	8000	1.2	26.1
14	440	.75	.89	1200	.98	3.18	8990	1.1	27.6
15	420	.67	.76	1100	1.1	3.16	9950	1.0	28.1
16	410	.65	.72	960	1.1	2.81	9500	.99	25.4
17	400	.65	.71	1610	1.2	5.10	7700	.78	16.3
18	390	.66	.69	3280	1.2	10.8	6100	.79	13.0
19	385	.66	.69	9920	1.4	38.7	4800	.89	11.5
20	380	.67	.68	19400	1.8	93.6	3860	.96	9.97
21	370	.67	.67	23100	1.7	104	3930	.79	8.36
22	365	.74	.73	22300	1.8	107	4370	.86	10.2
23	360	.76	.73	18300	1.7	84.0	4890	.92	12.1
24	355	.53	.51	13100	1.5	52.2	4890	.92	12.1
25	350	.52	.49	10500	1.3	36.3	4330	.84	9.88
26	1200	.57	1.84	7780	1.2	24.7	3760	.87	8.79
27	3390	.50	4.58	7020	1.1	21.6	3630	.95	9.31
28	10800	.76	25.1	5570	1.1	16.2	3040	.87	7.16
29	23500	1.1	72.8	---	---	---	3030	1.1	8.79
30	27700	1.6	119	---	---	---	2890	1.3	10.3
31	28600	1.7	129	---	---	---	2860	1.6	12.5
TOTAL	107285	---	373.569	234950	---	899.61	225370	---	912.06



## STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

## NITROGEN AMMONIA PLUS ORGANIC TOTAL (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	2560	1.3	9.13	6210	.75	12.6	1030	1.3	3.56
2	2310	1.4	8.56	6550	1.0	18.3	824	1.3	2.90
3	2120	1.3	7.68	5630	1.0	15.9	813	1.2	2.54
4	2180	1.3	7.92	4730	1.1	14.1	827	1.2	2.59
5	2260	1.3	8.17	4110	1.1	11.7	838	1.4	3.14
6	2680	1.4	9.93	3090	.98	8.16	846	1.4	3.28
7	3760	1.1	11.7	2580	.93	6.51	613	1.2	1.99
8	8310	1.3	28.8	2590	.88	6.19	420	1.2	1.34
9	14900	1.3	52.8	2350	1.0	6.46	542	1.2	1.69
10	19200	1.5	75.9	2110	1.1	6.31	669	1.1	2.03
11	27900	1.8	134	2390	1.2	7.44	736	1.1	2.20
12	40100	2.4	269	2090	1.1	6.09	753	1.1	2.25
13	63900	3.0	513	1840	1.0	5.09	620	1.1	1.84
14	63700	2.2	380	1680	1.1	4.79	555	1.1	1.63
15	49000	1.9	256	2140	1.1	6.36	541	1.0	1.53
16	34200	1.4	132	1670	1.2	5.60	631	1.1	1.79
17	24200	1.6	105	1430	1.2	4.43	655	1.0	1.81
18	17000	1.3	59.4	1690	1.2	5.53	765	1.0	2.16
19	11500	1.1	34.6	1390	1.2	4.42	887	1.2	2.76
20	8210	1.1	23.9	1590	1.0	4.38	837	1.2	2.76
21	6020	1.1	17.8	1390	.95	3.55	1110	1.3	3.82
22	4460	1.0	12.6	1250	.87	2.94	955	1.4	3.58
23	3460	.88	8.27	1330	.92	3.31	798	1.4	2.98
24	3000	.84	6.81	1340	.95	3.43	1190	1.6	5.47
25	2640	.78	5.56	1080	.85	2.49	5150	2.9	42.0
26	2180	.87	5.11	1350	.82	2.97	6880	3.5	64.7
27	2320	.88	5.49	1230	.83	2.77	6420	3.1	53.5
28	2440	.81	5.31	1560	.85	3.59	4960	1.6	21.1
29	4430	.82	9.77	2020	1.1	5.75	4400	1.5	18.0
30	4590	.78	9.68	1610	1.3	5.73	7430	1.6	31.1
31	---	---	---	1400	1.3	4.81	---	---	---
TOTAL	435530	---	2213.89	73420	---	201.70	53695	---	292.04
JULY			AUGUST			SEPTEMBER			
1	7510	1.2	25.1	807	1.2	2.54	234	1.0	.66
2	6000	1.3	21.7	634	1.2	2.02	321	.95	.82
3	4270	1.4	16.4	483	1.2	1.56	278	.87	.66
4	3000	1.3	10.9	522	1.2	1.71	211	.88	.50
5	2460	1.2	7.96	394	1.2	1.31	316	.96	.81
6	1970	1.2	6.54	475	1.3	1.60	326	.89	.79
7	1550	1.4	5.84	612	1.3	2.09	240	.77	.50
8	2900	1.4	10.7	512	1.3	1.78	298	.78	.63
9	4690	1.3	15.9	525	1.3	1.85	234	.71	.45
10	3710	1.2	11.5	433	1.3	1.54	152	.66	.27
11	3100	1.1	9.17	334	1.3	1.21	134	.71	.26
12	2090	1.2	6.77	356	1.3	1.28	162	.73	.32
13	1340	1.3	4.66	404	1.2	1.30	229	.75	.47
14	1020	1.3	3.58	610	1.2	1.92	237	.76	.49
15	1020	1.3	3.68	586	1.3	2.03	179	.76	.37
16	658	1.3	2.28	894	1.4	3.44	176	.79	.37
17	573	1.6	2.42	932	1.3	3.29	176	.76	.36
18	668	1.3	2.40	784	1.2	2.52	141	.79	.30
19	605	1.3	2.10	692	1.0	1.90	122	.88	.29
20	466	1.4	1.70	618	.89	1.49	131	.87	.31
21	351	1.6	1.49	531	1.0	1.47	119	.81	.26
22	417	1.4	1.62	703	1.1	2.02	88	.78	.19
23	337	1.3	1.23	787	1.2	2.50	81	.71	.16
24	449	1.4	1.65	682	1.2	2.21	68	.70	.13
25	420	1.6	1.78	490	1.1	1.47	169	.76	.35
26	575	1.5	2.31	499	1.1	1.48	170	1.3	.60
27	729	1.4	2.71	343	.95	.88	214	.98	.55
28	776	1.3	2.73	303	1.1	.90	254	.82	.56
29	730	1.3	2.50	211	1.1	.65	158	.82	.35
30	764	1.3	2.69	350	1.1	1.02	94	.78	.20
31	884	1.2	2.91	377	1.0	1.04	---	---	---
TOTAL	56032	---	194.92	16883	---	54.02	5712	---	12.98
YEAR	1439652		5900.180						

## STREAMS TRIBUTARY TO LAKE ERIE

## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

## PHOSPHORUS TOTAL (MG/L AS P), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	1600	.191	.83	706	.105	.20	4330	.258	3.02
2	1350	.197	.72	640	.110	.19	3240	.228	2.00
3	910	.191	.47	771	.103	.22	2650	.199	1.43
4	722	.177	.34	632	.105	.18	2970	.206	1.66
5	587	.163	.26	687	.118	.22	6450	.246	4.31
6	558	.156	.24	412	.123	.14	11200	.286	8.74
7	504	.154	.21	556	.109	.16	12100	.369	12.0
8	456	.155	.19	404	.102	.11	9170	.395	9.80
9	501	.166	.22	427	.092	.11	6590	.384	6.83
10	506	.162	.22	444	.086	.10	5360	.392	5.68
11	423	.161	.18	491	.098	.13	4360	.382	4.50
12	653	.139	.24	329	.082	.073	3790	.326	3.35
13	716	.131	.25	503	.089	.12	2640	.274	1.96
14	746	.138	.28	536	.093	.13	1980	.265	1.41
15	723	.137	.27	1280	.095	.33	1820	.274	1.35
16	720	.133	.26	3160	.114	.98	1870	.266	1.34
17	715	.133	.26	5350	.135	1.96	1610	.255	1.11
18	494	.128	.17	8120	.177	3.95	1340	.251	.91
19	716	.130	.25	13200	.325	11.8	1100	.245	.73
20	1070	.137	.40	12600	.435	14.9	1190	.235	.76
21	1510	.144	.59	9550	.452	11.6	1500	.220	.89
22	941	.138	.35	7350	.457	9.07	1320	.201	.72
23	1060	.124	.36	6100	.425	7.01	1700	.179	.82
24	1060	.123	.35	4170	.413	4.65	1940	.168	.88
25	969	.145	.38	3140	.389	3.30	2260	.152	.93
26	925	.151	.38	2810	.375	2.85	1420	.149	.57
27	859	.145	.34	3750	.361	3.65	1300	.140	.49
28	741	.160	.32	5830	.336	5.28	1100	.134	.40
29	775	.132	.27	6040	.283	4.61	1000	.134	.36
30	534	.119	.17	5050	.285	3.89	900	.132	.32
31	673	.112	.20	---	---	---	820	.123	.27
TOTAL	24717	---	9.97	105038	---	91.913	101020	---	79.54
JANUARY			FEBRUARY			MARCH			
1	780	.116	.24	22600	.428	26.2	4780	.152	1.96
2	720	.113	.22	16800	.394	17.9	4060	.149	1.64
3	680	.112	.21	11900	.363	11.7	3950	.146	1.56
4	640	.121	.21	9640	.334	8.71	3600	.141	1.37
5	620	.131	.22	7100	.314	6.03	4120	1.21	14.2
6	580	.136	.21	5300	.299	4.28	8950	.294	7.10
7	560	.135	.20	4000	.287	3.10	17500	.578	29.1
8	520	.129	.18	3070	.276	2.29	26600	.571	41.4
9	500	.140	.19	2500	.274	1.85	19300	.397	20.8
10	490	.156	.21	2100	.270	1.53	13300	.369	13.1
11	470	.173	.22	1900	.262	1.34	10200	.289	8.02
12	460	.192	.24	1600	.246	1.06	8490	.217	4.99
13	450	.187	.23	1300	.229	.80	8000	.192	4.14
14	440	.202	.24	1200	.212	.69	8990	.176	4.26
15	420	.123	.14	1100	.205	.61	9950	.155	4.16
16	410	.115	.13	960	.199	.51	9500	.143	3.68
17	400	.128	.14	1610	.214	.93	7700	.125	2.61
18	390	.143	.15	3280	.218	1.95	6100	.115	1.90
19	385	.159	.17	9920	.277	7.60	4800	.116	1.51
20	380	.178	.18	19400	.373	19.7	3860	.122	1.26
21	370	.196	.20	23100	.380	23.8	3930	.128	1.35
22	365	.154	.15	22300	.348	21.0	4370	.134	1.58
23	360	.128	.12	18300	.326	16.1	4890	.131	1.73
24	355	.121	.12	13100	.266	9.50	4890	.135	1.78
25	350	.117	.11	10500	.235	6.68	4330	.121	1.41
26	1200	.114	.37	7780	.222	4.66	3760	.124	1.25
27	3390	.115	1.06	7020	.200	3.80	3630	.145	1.43
28	10800	.317	10.8	5570	.172	2.60	3040	.118	.97
29	23500	.372	23.9	---	---	---	3030	.119	.97
30	27700	.611	45.8	---	---	---	2890	.122	.95
31	28600	.521	40.4	---	---	---	2860	.192	1.49
TOTAL	107285	---	126.96	234950	---	206.92	225370	---	183.67

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

### PHOSPHORUS TOTAL (MG/L AS P), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	2560	.122	.84	6210	.144	2.42	1030	.155	.43
2	2310	.124	.77	6550	.142	2.52	824	.145	.32
3	2120	.103	.59	5630	.135	2.05	813	.135	.30
4	2180	.085	.50	4730	.135	1.72	827	.145	.32
5	2260	.084	.51	4110	.134	1.49	838	.168	.38
6	2680	.079	.57	3090	.134	1.12	846	.178	.41
7	3760	.077	.79	2580	.130	.91	613	.156	.26
8	8310	.111	2.56	2590	.119	.83	420	.196	.22
9	14900	.170	6.88	2350	.117	.74	542	.195	.29
10	19200	.269	14.2	2110	.122	.70	669	.180	.32
11	27900	.386	29.1	2390	.155	.998	736	.189	.38
12	40100	.618	70.0	2090	.122	.69	753	.188	.38
13	63900	.842	145	1840	.108	.54	620	.170	.28
14	63700	.655	113	1680	.106	.48	555	.154	.23
15	49000	.522	69.3	2140	.099	.57	541	.154	.22
16	34200	.446	41.3	1670	.084	.38	631	.160	.27
17	24200	.384	25.2	1430	.080	.31	655	.173	.31
18	17000	.324	14.9	1690	.087	.40	765	.161	.33
19	11500	.269	8.40	1390	.084	.32	887	.164	.39
20	8210	.214	4.75	1590	.087	.37	837	.170	.39
21	6020	.181	2.96	1390	.086	.32	1110	.168	.50
22	4460	.162	1.96	1250	.080	.27	955	.165	.43
23	3460	.146	1.37	1330	.086	.31	798	.158	.34
24	3000	.137	1.11	1340	.095	.34	1190	.174	.58
25	2640	.125	.89	1080	.087	.25	5150	.241	3.39
26	2180	.126	.74	1350	.091	.33	6880	.261	4.86
27	2320	.120	.75	1230	.109	.36	6420	.228	3.97
28	2440	.126	.83	1560	.096	.41	4960	.193	2.59
29	4430	.149	1.78	2020	.117	.64	4400	.182	2.17
30	4590	.135	1.68	1610	.136	.59	7430	.223	4.48
31	---	---	---	1400	.148	.56	---	---	---
TOTAL	435530	---	563.23	73420	---	23.938	53695	---	29.74
JULY			AUGUST			SEPTEMBER			
1	7510	.189	3.84	807	.107	.23	234	.120	.076
2	6000	.179	2.89	634	.109	.19	321	.114	.098
3	4270	.198	2.28	483	.111	.15	278	.105	.079
4	3000	.185	1.50	522	.114	.16	211	.115	.065
5	2460	.181	1.20	394	.117	.12	316	.105	.090
6	1970	.173	.92	475	.119	.15	326	.123	.11
7	1550	.173	.73	612	.122	.20	240	.103	.067
8	2900	.163	1.27	512	.125	.17	298	.111	.089
9	4690	.182	2.31	525	.128	.18	234	.098	.062
10	3710	.188	1.89	433	.131	.15	152	.103	.042
11	3100	.176	1.47	334	.134	.12	134	.107	.039
12	2090	.190	1.07	356	.137	.13	162	.107	.047
13	1340	.197	.71	404	.134	.15	229	.105	.066
14	1020	.202	.56	610	.114	.19	237	.114	.073
15	1020	.199	.55	586	.128	.20	179	.112	.054
16	658	.182	.32	894	.151	.36	176	.121	.057
17	573	.182	.28	932	.144	.36	176	.105	.050
18	668	.140	.25	784	.132	.28	141	.099	.038
19	605	.128	.21	692	.128	.24	122	.108	.035
20	466	.118	.15	618	.143	.24	131	.110	.039
21	351	.122	.12	531	.141	.20	119	.114	.037
22	417	.123	.14	703	.123	.23	88	.119	.028
23	337	.097	.088	787	.125	.27	81	.117	.026
24	449	.067	.081	682	.124	.23	68	.132	.024
25	420	.104	.12	490	.114	.15	169	.137	.063
26	575	.091	.14	499	.117	.16	170	.205	.095
27	729	.089	.17	343	.108	.10	214	.152	.086
28	776	.094	.20	303	.122	.099	254	.128	.088
29	730	.109	.21	211	.114	.065	158	.115	.049
30	764	.126	.26	350	.121	.11	94	.112	.028
31	884	.120	.29	377	.121	.12	---	---	---
TOTAL	56032	---	26.219	16883	---	5.704	5712	---	1.800
YEAR	1439652		1349.606						

## STREAMS TRIBUTARY TO LAKE ERIE

## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

## SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	1600	55	240	706	16	30	4330	65	760
2	1350	48	174	640	14	23	3240	46	402
3	910	45	112	771	14	29	2650	34	242
4	722	51	100	632	33	56	2970	33	266
5	587	53	83	687	22	40	6450	45	818
6	558	52	78	412	18	20	11200	135	4230
7	504	53	72	556	18	26	12100	178	5810
8	456	49	60	404	12	13	9170	162	4030
9	501	49	66	427	9	9.9	6590	131	2340
10	506	44	60	444	7	8.7	5360	127	1840
11	423	43	49	491	9	13	4360	99	1160
12	653	40	70	329	12	11	3790	87	888
13	716	38	74	503	12	17	2640	60	432
14	746	39	79	536	35	51	1980	56	298
15	723	37	72	1280	94	337	1820	53	262
16	720	35	68	3160	49	389	1870	42	211
17	715	36	69	5350	39	560	1610	40	175
18	494	40	53	8120	61	1390	1340	31	113
19	716	42	81	13200	160	5770	1100	26	77
20	1070	45	129	12600	183	6240	1190	28	90
21	1510	45	183	9550	179	4620	1500	27	109
22	941	36	91	7350	158	3140	1320	18	65
23	1060	35	100	6100	130	2140	1700	17	80
24	1060	38	108	4170	109	1240	1940	23	121
25	969	35	91	3140	105	888	2260	22	132
26	925	36	91	2810	109	826	1420	18	70
27	859	37	86	3750	99	994	1300	16	55
28	741	31	62	5830	82	1290	1100	13	40
29	775	28	58	6040	87	1410	1000	11	31
30	534	18	26	5050	84	1140	900	10	23
31	673	15	28	---	---	---	820	8	18
TOTAL	24717	---	2713	105038	---	32721.6	101020	---	25188
JANUARY			FEBRUARY			MARCH			
1	780	7	15	22600	163	10000	4780	15	191
2	720	6	12	16800	125	5710	4060	12	134
3	680	5	9.8	11900	96	3110	3950	12	129
4	640	7	12	9640	75	1960	3600	13	124
5	620	8	13	7100	59	1140	4120	13	141
6	580	8	12	5300	45	647	8950	30	785
7	560	7	11	4000	39	422	17500	232	13300
8	520	7	9.9	3070	35	289	26600	641	46500
9	500	7	9.2	2500	31	212	19300	381	20200
10	490	7	8.8	2100	28	160	13300	208	7580
11	470	6	8.1	1900	25	130	10200	122	3380
12	460	6	7.7	1600	23	98	8490	76	1750
13	450	6	7.3	1300	20	70	8000	53	1150
14	440	6	6.9	1200	13	42	8990	76	1840
15	420	6	6.4	1100	12	37	9950	73	1960
16	410	5	6.0	960	14	35	9500	57	1470
17	400	5	5.7	1610	14	59	7700	73	1510
18	390	5	5.4	3280	23	207	6100	39	656
19	385	5	5.1	9920	28	784	4800	30	393
20	380	5	4.9	19400	64	3430	3860	31	327
21	370	5	4.6	23100	147	9180	3930	31	327
22	365	4	4.4	22300	149	8960	4370	36	423
23	360	4	4.2	18300	109	5430	4890	36	472
24	355	4	4.0	13100	80	2870	4890	33	434
25	350	4	3.8	10500	59	1680	4330	33	386
26	1200	9	28	7780	43	909	3760	37	378
27	3390	27	253	7020	32	605	3630	36	351
28	10800	90	3090	5570	23	348	3040	31	258
29	23500	272	17600	---	---	---	3030	34	278
30	27700	279	20900	---	---	---	2890	52	408
31	28600	213	16500	---	---	---	2860	47	362
TOTAL	107285	---	58568.2	234950	---	58524	225370	---	107597



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04193500 MAUMEE RIVER AT WATERVILLE, OHIO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	2560	44	304	6210	65	1090	1030	36	99
2	2310	44	276	6550	66	1160	824	25	55
3	2120	35	203	5630	62	938	813	16	36
4	2180	33	192	4730	55	707	827	16	35
5	2260	22	136	4110	50	550	838	23	53
6	2680	20	144	3090	42	353	846	22	51
7	3760	23	241	2580	34	237	613	19	32
8	8310	60	1440	2590	33	234	420	23	26
9	14900	101	4050	2350	34	214	542	24	35
10	19200	130	7250	2110	34	191	669	26	47
11	27900	392	29700	2390	33	215	736	44	90
12	40100	496	59200	2090	33	185	753	48	98
13	63900	925	159000	1840	28	138	620	46	77
14	63700	594	103000	1680	20	90	555	46	69
15	49000	401	53600	2140	9	51	541	51	74
16	34200	238	22400	1670	8	36	631	49	84
17	24200	199	13000	1430	7	28	655	41	72
18	17000	150	6980	1690	7	32	765	50	102
19	11500	122	3790	1390	6	24	887	51	124
20	8210	89	1980	1590	5	20	837	45	102
21	6020	64	1050	1390	5	20	1110	40	119
22	4460	49	589	1250	5	16	955	35	91
23	3460	41	386	1330	3	12	798	31	67
24	3000	39	317	1340	5	19	1190	48	171
25	2640	36	258	1080	7	20	5150	52	706
26	2180	34	203	1350	14	52	6880	61	1140
27	2320	36	226	1230	20	66	6420	78	1340
28	2440	37	244	1560	32	148	4960	84	1120
29	4430	40	489	2020	51	276	4400	82	973
30	4590	57	703	1610	50	219	7430	120	2420
31	---	---	---	1400	45	171	---	---	---
TOTAL	435530	---	471351	73420	---	7512	53695	---	9508
JULY			AUGUST			SEPTEMBER			
1	7510	121	2440	807	40	86	234	22	15
2	6000	113	1840	634	37	63	321	25	22
3	4270	115	1330	483	34	44	278	24	18
4	3000	92	753	522	43	61	211	21	12
5	2460	84	559	394	43	46	316	23	20
6	1970	77	410	475	45	57	326	22	20
7	1550	68	284	612	37	60	240	21	13
8	2900	73	575	512	31	43	298	26	22
9	4690	81	1030	525	36	51	234	29	18
10	3710	76	765	433	37	44	152	22	9.0
11	3100	77	642	334	33	30	134	18	6.4
12	2090	82	461	356	28	27	162	18	7.8
13	1340	81	294	404	29	32	229	20	13
14	1020	78	215	610	36	59	237	24	15
15	1020	78	215	586	41	65	179	25	12
16	658	55	100	894	39	94	176	23	11
17	573	39	60	932	39	99	176	25	12
18	668	36	65	784	39	83	141	20	8.0
19	605	30	49	692	39	74	122	15	5.0
20	466	24	31	618	39	66	131	15	5.2
21	351	24	23	531	40	57	119	14	4.5
22	417	27	30	703	40	75	88	12	2.9
23	337	21	19	787	40	85	81	14	2.9
24	449	21	25	682	40	74	68	16	3.0
25	420	30	35	490	39	52	169	14	6.2
26	575	43	66	499	34	45	170	16	7.3
27	729	48	94	343	29	27	214	20	12
28	776	45	95	303	25	20	254	29	20
29	730	45	88	211	21	12	158	29	13
30	764	44	91	350	23	22	94	21	5.5
31	884	38	90	377	29	30	---	---	---
TOTAL	56032	---	12774	16883	---	1683	5712	---	341.7
YEAR	1439652		788481.5						

## STREAMS TRIBUTARY TO LAKE ERIE

## 04195500 PORTAGE RIVER AT WOODVILLE, OH

LOCATION.--Lat 41°26'58", long 83°21'41", in sec. 28, T.6 N., R.13 E., Sandusky County, Hydrologic Unit 04100010, on left bank at upstream side of bridge on U. S. Highway 20 in Woodville, 600 ft downstream from unnamed right bank tributary, and 10.3 mi upstream from Sugar Creek.

DRAINAGE AREA.--428 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1928 to December 1935, October 1939 to current year.

REVISED RECORDS.--WSP 894: 1929-30. WSP 1207: 1933. WSP 1387: 1931, 1933. WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 614.75 ft above sea level. Prior to Oct. 8, 1933, nonrecording gage, Oct. 9, 1933 to Dec. 30, 1935 water-stage recorder, Oct. 17 to Nov. 29, 1939, nonrecording gage, all at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 24 to Jan. 29, Feb. 2-20, 26 to Mar. 4. Records good, except estimated discharges, which are poor. Flow supplemented by water imported from Maumee River basin for municipal supply for city of Bowling Green 16 mi upstream. The importation of this water began Sept. 1, 1951. Sediment data collected at this site 1950 to 1956. Water-quality data collected at this site 800 ft downstream 1968 to 1980. National Weather Service gage height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 17 ft, from information by local residents, discharge, 17,000 ft<sup>3</sup>/s, from rating curve extended above 11,500 ft<sup>3</sup>/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	19	70	32	925	120	107	174	22	342	14	12
2	18	20	54	30	560	110	105	203	19	187	13	11
3	17	23	52	29	370	120	106	157	19	116	12	11
4	14	24	83	28	290	140	117	131	18	77	14	11
5	12	23	593	27	220	231	121	117	17	58	19	11
6	11	20	602	26	185	479	166	108	15	50	24	8.3
7	10	21	276	25	160	1260	721	103	14	44	25	7.4
8	9.2	23	168	24	140	1680	1320	107	12	54	16	7.0
9	11	21	123	23	120	993	1520	115	10	71	13	7.1
10	13	17	104	22	100	536	1670	101	12	67	11	8.5
11	25	16	90	21	92	381	2420	91	12	48	12	9.1
12	25	16	69	21	80	367	3560	87	10	37	14	9.4
13	19	18	57	20	72	797	7340	89	13	30	18	9.2
14	15	26	54	20	64	1460	6240	91	12	26	19	8.1
15	12	64	51	20	58	1090	2100	80	9.7	23	176	7.5
16	14	111	50	20	66	825	1020	69	9.1	20	122	7.5
17	24	100	50	20	90	500	584	64	9.4	23	59	7.7
18	43	236	45	19	250	368	387	57	8.9	19	36	7.8
19	69	236	42	19	600	311	311	52	7.6	16	24	8.2
20	48	118	41	18	1600	243	243	49	8.8	15	22	8.0
21	30	77	51	18	1990	299	188	44	8.6	14	45	7.2
22	21	55	77	18	1090	580	156	40	8.8	20	131	7.0
23	21	44	103	18	489	495	135	37	11	40	78	6.6
24	22	38	75	17	584	370	124	32	112	79	48	8.4
25	21	33	60	17	447	272	117	29	1350	48	32	11
26	19	31	50	45	230	204	110	36	988	41	24	10
27	16	53	44	90	180	181	111	96	614	34	19	10
28	14	158	42	600	150	184	120	80	444	27	16	12
29	13	161	39	1800	---	157	115	48	232	20	16	13
30	11	102	36	3210	---	134	125	34	389	19	16	13
31	16	---	33	1920	---	115	---	27	---	15	13	---
TOTAL	633.2	1904	3284	8217	11202	15002	31459	2548	4415.9	1680	1101	275
MEAN	20.4	63.5	106	265	400	484	1049	82.2	147	54.2	35.5	9.17
MAX	69	236	602	3210	1990	1680	7340	203	1350	342	176	13
MIN	9.2	16	33	17	58	110	105	27	7.6	14	11	6.6
CFSM	.05	.15	.25	.62	.93	1.13	2.45	.19	.34	.13	.08	.02
IN.	.06	.17	.29	.71	.97	1.30	2.73	.22	.38	.15	.10	.02
(+)	5.5	5.2	5.3	5.4	5.9	5.6	5.6	5.7	6.7	5.9	6	6.7
MEAN*	14.9	58.3	101	260	394	478	1043	76.5	140	48.3	29.5	2.47
CFSM*	.03	.14	.24	.61	.92	1.12	2.44	.18	.33	.11	.07	.01
IN.*	.04	.15	.27	.70	.96	1.29	2.72	.21	.36	.13	.08	.01

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1994, BY WATER YEAR (WY)

	MEAN	207	358	453	511	763	641	390	274	157	59.7	90.7
MAX	722	1595	1722	2129	1793	2542	1965	1685	1875	821	635	1088
(WY)	1951	1973	1991	1952	1976	1982	1957	1943	1981	1958	1979	1981
MIN	2.96	3.61	4.37	2.24	2.00	1.18	41.7	25.4	9.29	2.81	3.09	3.67
(WY)	1935	1935	1935	1945	1934	1941	1946	1934	1988	1930	1933	1944

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1928 - 1994

ANNUAL TOTAL	166387.6	81721.1	
ANNUAL MEAN	456	224 (#218)	#330
HIGHEST ANNUAL MEAN			628
LOWEST ANNUAL MEAN			81.4
HIGHEST DAILY MEAN	7120	Jan 5	11000
LOWEST DAILY MEAN	6.1	Aug 27	.40
ANNUAL SEVEN-DAY MINIMUM	6.9	Aug 22	.93
INSTANTANEOUS PEAK FLOW			8360
INSTANTANEOUS PEAK STAGE			12.35
INSTANTANEOUS LOW FLOW			6.6
ANNUAL RUNOFF (CFSM)	1.07		.52
ANNUAL RUNOFF (INCHES)	14.46		7.10 (#6.92)
10 PERCENT EXCEEDS	1390		514
50 PERCENT EXCEEDS	75		44
90 PERCENT EXCEEDS	10		11

(+) Diversion in cubic ft per second, from Maumee R basin for municipal supply; furnished by city of Bowling Green.  
\* Adjusted for diversion.

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

## 04196800 TYMOCHTEE CREEK AT CRAWFORD, OH

LOCATION.--Lat 40°55'22", long 83°20'56", in SE 1/4 sec. 27, T.1 S., R.13 E., Wyandot County, Hydrologic Unit 04100011, on right bank at downstream side of bridge on State Highway 199 (formerly U.S. Highway 23), 0.4 mi northwest of Crawford, 1.5 mi downstream from Lick Run, 2.7 mi upstream from Little Tymochtee Creek, and 3 mi southeast of Carey.

DRAINAGE AREA.--229 mi<sup>2</sup>.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961-63, and annual maximum, water years 1961-64, June 1964 to current year.

REVISED RECORDS.--WRD Ohio 1969: 1964(P), 1966(M), 1967(P).

GAGE.--Water-stage recorder. Datum of gage is 785.86 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 23, Feb. 1-19. Records fair. Beginning Mar. 9, 1972 water is diverted at a point 29.4 mi upstream from station into Killdeer Reservoir. Storage is available for low-flow augmentation. During the year, releases totaled 418.5 mil gal, equivalent to a mean annual release of 1.77 ft<sup>3</sup>/s. There were no withdrawals. Water-quality data collected at this site 1968 to 1977. Sediment data collected 1970 to 1974.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.7	190	22	940	128	70	24	9.9	1470	14	13
2	2.1	2.4	129	20	520	145	69	33	8.3	807	6.9	16
3	1.9	2.4	123	18	320	106	71	53	7.5	613	5.2	11
4	1.7	2.8	393	17	210	94	64	43	8.1	879	7.6	7.6
5	1.6	3.3	1280	16	150	95	70	43	7.7	407	9.5	5.7
6	1.5	3.4	1800	15	115	116	199	37	6.6	187	10	4.9
7	1.7	3.8	1750	14	90	168	786	36	6.4	118	8.3	5.6
8	1.7	4.4	675	13	76	229	1130	33	6.2	92	5.7	5.2
9	1.6	4.6	290	13	62	235	864	37	4.7	149	5.3	5.2
10	1.1	4.9	187	12	53	193	734	38	4.2	96	4.0	4.0
11	.82	4.7	137	12	47	134	1090	41	4.6	64	3.4	3.1
12	.74	3.1	106	11	41	121	2130	40	5.7	43	3.0	2.2
13	.74	2.9	77	11	37	312	2760	33	5.7	34	4.1	1.7
14	.74	12	63	11	33	839	2610	27	5.7	30	6.1	1.7
15	.74	293	56	11	31	963	1340	40	4.5	30	7.5	1.5
16	.68	638	55	11	28	699	539	37	4.2	25	14	1.1
17	1.2	529	54	11	68	398	324	22	3.8	22	8.5	.84
18	1.3	1050	49	12	200	240	212	19	3.5	22	5.4	.58
19	.99	1510	47	13	500	181	155	19	4.2	20	4.0	.56
20	1.0	1600	56	15	1300	162	124	20	5.1	18	4.0	.57
21	1.3	523	66	18	1730	193	98	17	5.2	19	6.9	.56
22	1.1	220	77	23	1210	283	78	15	8.3	22	6.0	.45
23	.98	131	79	29	577	243	67	13	29	23	5.2	.39
24	1.6	87	66	51	620	195	65	14	56	24	6.0	.38
25	2.4	66	55	93	666	156	58	12	609	20	14	.37
26	2.7	50	45	409	294	118	53	9.1	1000	18	13	.32
27	2.5	113	39	1110	236	103	44	40	997	16	8.8	.34
28	1.9	645	34	2150	209	91	32	49	722	15	6.1	.36
29	1.7	787	30	3410	---	90	27	29	919	15	5.5	.33
30	1.8	347	26	3590	---	89	24	20	1220	9.8	4.5	.33
31	2.5	---	24	2130	---	80	---	14	---	12	6.6	---
TOTAL	46.13	8646.4	8058	13291	10363	7199	15887	907.1	5682.1	5319.8	219.1	95.88
MEAN	1.49	288	260	429	370	232	530	29.3	189	172	7.07	3.20
MAX	2.7	1600	1800	3590	1730	963	2760	53	1220	1470	14	16
MIN	.68	2.4	24	11	28	80	24	9.1	3.5	9.8	3.0	.32

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

MEAN	34.5	157	239	220	311	415	328	195	128	119	31.1	35.8
MAX	278	844	1104	777	823	1392	946	645	780	741	201	370
(WY)	1987	1993	1991	1974	1975	1978	1972	1969	1981	1992	1992	1981
MIN	.084	.86	1.78	1.65	37.2	35.1	32.8	11.7	1.78	1.04	.48	.27
(WY)	1965	1992	1992	1977	1972	1983	1971	1988	1988	1965	1965	1964

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1964 - 1994

ANNUAL TOTAL	88292.41	75714.51	
ANNUAL MEAN	242	207	184
HIGHEST ANNUAL MEAN			330
LOWEST ANNUAL MEAN			72.2
HIGHEST DAILY MEAN	3150	3590	6280
LOWEST DAILY MEAN	.32	.32	.00
ANNUAL SEVEN-DAY MINIMUM	.44	.35	.00
INSTANTANEOUS PEAK FLOW		4460	6700
INSTANTANEOUS PEAK STAGE		8.31	11.21
INSTANTANEOUS LOW FLOW		.32	
10 PERCENT EXCEEDS	772	685	500
50 PERCENT EXCEEDS	50	27	33
90 PERCENT EXCEEDS	.74	1.7	1.3

## STREAMS TRIBUTARY TO LAKE ERIE

## 04197100 HONEY CREEK AT MELMORE, OH

LOCATION.--Lat 41°01'20", long 83°06'35", Seneca County, Hydrologic Unit 04100011, at bridge on State Highways 67 and 100 at Melmore, 1.5 mi upstream from Buckeye Creek.

DRAINAGE AREA.--149 mi<sup>2</sup>.

PERIOD OF RECORD.--Annual maximum, water years 1961-75, February 1976 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 818 ft above sea level from topographic map.

REMARKS.--Estimated daily discharges: Dec. 27 to Feb. 21, 28 to Mar. 4. Records good except those for estimated daily discharges which are poor. Water-quality data collected at this site 1976 to 1977, 1988 to 1989.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	3.7	101	19	450	64	50	28	6.3	153	48	3.1
2	1.1	4.0	95	17	330	56	46	30	5.8	76	25	2.6
3	1.1	9.5	201	15	230	52	49	29	5.7	46	17	2.0
4	1.1	6.4	534	14	170	56	61	26	5.4	32	15	1.6
5	1.0	4.6	1290	13	130	64	60	23	5.0	24	29	1.4
6	.98	3.4	1050	12	100	87	214	21	4.6	19	141	1.2
7	1.1	2.9	472	11	80	148	611	20	4.1	16	78	.95
8	1.0	2.7	233	10	60	179	728	21	3.6	20	39	.74
9	1.2	2.4	152	9.0	50	144	407	20	3.6	17	25	.76
10	1.2	1.9	115	8.6	45	103	596	19	3.2	14	17	.77
11	1.3	1.2	94	8.0	40	82	736	18	3.0	15	13	.63
12	1.1	1.1	74	7.6	35	76	2060	17	2.8	13	11	.60
13	1.1	1.3	59	7.2	30	203	2270	15	2.7	9.9	13	.51
14	1.1	17	51	7.0	28	516	1230	15	2.4	8.5	76	.44
15	1.0	99	46	6.4	24	482	594	14	2.2	10	134	.53
16	1.1	95	43	6.0	26	358	336	14	21	29	72	.52
17	1.6	344	42	5.8	54	197	218	13	43	19	33	.69
18	1.7	766	39	5.6	120	129	149	12	25	12	21	.70
19	1.8	592	38	5.4	300	104	110	12	16	8.7	15	.68
20	1.8	225	47	5.2	660	88	81	11	12	6.0	13	.62
21	2.4	118	53	4.9	700	143	63	10	9.6	4.2	18	.58
22	2.0	76	59	4.7	510	299	52	9.9	73	3.5	73	.49
23	2.0	51	58	4.5	282	219	45	9.5	51	3.3	47	.45
24	3.3	39	49	4.4	421	146	40	8.8	31	12	25	.45
25	3.8	32	42	4.3	332	105	36	9.3	64	20	17	.70
26	2.7	27	37	4.1	172	82	37	8.5	203	13	12	.69
27	2.2	237	32	30	112	72	34	7.9	237	8.6	9.8	.87
28	1.8	504	29	1000	80	67	29	8.0	288	6.1	7.5	1.0
29	1.8	316	26	1700	---	65	26	8.1	174	17	5.6	.85
30	1.6	153	23	1200	---	62	25	7.4	147	50	4.1	.86
31	2.8	---	21	720	---	56	---	6.5	---	63	3.5	---
TOTAL	50.78	3736.1	5205	4869.7	5571	4504	10993	471.9	1455.0	748.8	1057.5	27.98
MEAN	1.64	125	168	157	199	145	366	15.2	48.5	24.2	34.1	.93
MAX	3.8	766	1290	1700	700	516	2270	30	288	153	141	3.1
MIN	.98	1.1	21	4.1	24	52	25	6.5	2.2	3.3	3.5	.44
CFSM	.01	.84	1.13	1.05	1.34	.98	2.46	.10	.33	.16	.23	.01
IN.	.01	.93	1.30	1.22	1.39	1.12	2.74	.12	.36	.19	.26	.01

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1994, BY WATER YEAR (WY)

	MEAN	35.9	126	175	129	228	283	248	100	104	75.0	32.5	40.6
MAX	186	550	518	465	528	765	540	314	740	373	125	242	
(WY)	1991	1993	1978	1993	1990	1978	1979	1983	1981	1992	1990	1981	
MIN	.71	2.60	1.98	1.31	65.6	40.4	77.5	8.69	1.05	.46	1.52	.93	
(WY)	1989	1992	1977	1977	1978	1981	1991	1988	1988	1988	1993	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1977 - 1994

ANNUAL TOTAL	54897.06	38690.76	
ANNUAL MEAN	150	106	131
HIGHEST ANNUAL MEAN			189
LOWEST ANNUAL MEAN			48.1
HIGHEST DAILY MEAN	2300	2270	4000
LOWEST DAILY MEAN	.86	.44	.07
ANNUAL SEVEN-DAY MINIMUM	.91	.56	.09
INSTANTANEOUS PEAK FLOW		2720	4440
INSTANTANEOUS PEAK STAGE		9.00	11.00
INSTANTANEOUS LOW FLOW		.44	
ANNUAL RUNOFF (CFSM)	1.01	.71	.88
ANNUAL RUNOFF (INCHES)	13.71	9.66	11.92
10 PERCENT EXCEEDS	499	284	350
50 PERCENT EXCEEDS	31	21	31
90 PERCENT EXCEEDS	1.1	1.1	1.9



# STREAMS TRIBUTARY TO LAKE ERIE

63

## 04197170 ROCK CREEK AT TIFFIN, OH

LOCATION.--Lat 41°06'49", long 83°10'06", Seneca County, Hydrologic Unit 04100011, on left bank 0.05 mi downstream from bridge on Rebecca Street, at Heidelberg College, Tiffin, Ohio.

DRAINAGE AREA.--34.6 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Elevation of gage is 740 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 29 to Jan. 28, 30 to Feb. 17, 26 to Mar. 3. Records fair except those for estimated record and Feb. 18-20, which are poor.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	8.6	8.5	4.0	52	2.9	8.3	7.1	1.7	9.0	1.8	1.8
2	1.4	7.1	8.7	3.8	38	2.8	7.7	6.6	1.6	5.9	1.8	1.7
3	1.3	8.5	31	3.7	27	3.1	9.6	6.2	1.6	4.7	1.8	1.7
4	1.3	7.3	185	3.5	21	4.6	28	5.8	1.6	3.8	3.0	1.7
5	1.3	5.6	438	3.4	15	6.1	17	5.6	1.5	3.4	2.5	1.7
6	1.3	4.5	84	3.2	12	9.7	114	5.6	1.4	3.1	1.9	1.5
7	1.3	4.3	31	3.1	10	24	200	5.6	1.3	2.8	1.8	1.6
8	1.3	4.4	18	3.0	7.4	25	182	5.3	1.2	3.1	1.8	1.3
9	2.1	5.0	13	2.8	6.0	15	57	5.0	1.3	3.9	1.7	1.5
10	1.5	4.8	11	2.7	5.0	10	279	4.8	1.2	3.6	1.8	1.4
11	1.5	5.0	9.4	2.7	3.7	8.8	152	4.7	1.2	3.0	1.9	1.5
12	1.5	5.7	8.4	2.6	3.2	11	1000	4.8	1.2	2.6	2.1	1.4
13	1.5	6.5	7.7	2.5	2.7	64	417	4.5	1.3	2.4	10	1.2
14	1.5	13	7.4	2.4	2.5	107	98	4.2	1.5	2.6	34	1.2
15	2.0	24	7.2	2.4	4.5	58	48	4.0	1.5	2.6	12	1.4
16	2.3	9.7	6.8	2.3	7.8	38	29	3.9	1.5	2.6	6.7	1.3
17	3.5	146	6.6	2.2	15	16	19	3.8	1.4	2.4	4.2	1.5
18	3.0	155	6.4	2.1	29	12	15	3.6	1.2	2.4	3.3	1.5
19	2.9	35	6.2	2.1	94	10	13	3.4	1.3	2.2	2.7	1.9
20	3.5	13	6.7	2.0	161	10	11	3.3	1.1	2.1	3.4	1.6
21	5.0	8.0	7.4	1.9	132	26	9.4	3.3	1.7	2.0	3.6	1.5
22	4.5	6.0	7.9	1.9	53	61	8.8	3.1	1.4	2.2	2.9	1.5
23	4.6	5.1	7.8	1.8	29	28	8.1	2.9	1.6	2.4	2.3	1.5
24	5.0	4.6	6.9	1.8	78	18	7.5	2.8	5.6	1.9	2.0	1.9
25	6.1	4.4	6.4	1.8	31	13	7.5	2.7	13	1.9	2.2	1.8
26	6.5	4.3	6.1	1.7	12	10	7.0	2.8	30	1.8	2.1	1.3
27	6.9	67	5.5	15	4.5	10	7.0	2.5	112	1.8	2.0	1.4
28	6.7	99	4.9	700	3.2	10	6.4	2.3	63	5.8	2.2	1.3
29	7.9	24	4.6	502	---	10	6.3	2.0	41	2.3	1.9	1.6
30	8.8	11	4.3	110	---	10	6.9	1.8	21	2.1	1.8	1.3
31	10	---	4.2	76	---	8.9	---	1.9	---	1.8	1.8	---
TOTAL	109.6	706.4	967.0	1470.4	859.5	642.9	2779.5	125.9	317.9	94.2	125.0	45.5
MEAN	3.54	23.5	31.2	47.4	30.7	20.7	92.6	4.06	10.6	3.04	4.03	1.52
MAX	10	155	438	700	161	107	1000	7.1	112	9.0	34	1.9
MIN	1.3	4.3	4.2	1.7	2.5	2.8	6.3	1.8	1.1	1.8	1.7	1.2
CFSM	.10	.68	.90	1.37	.89	.60	2.68	.12	.31	.09	.12	.04
IN.	.12	.76	1.04	1.58	.92	.69	2.99	.14	.34	.10	.13	.05

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

MEAN	13.3	42.0	44.3	32.9	59.1	48.6	52.8	22.0	13.5	16.2	6.66	14.7
MAX	50.3	145	172	98.5	122	138	92.6	82.3	36.8	82.0	28.1	99.5
(WY)	1991	1993	1991	1993	1990	1984	1994	1989	1993	1992	1990	1992
MIN	1.28	2.24	2.09	10.2	13.0	13.6	17.9	2.29	1.12	.55	1.37	1.01
(WY)	1989	1992	1992	1992	1993	1989	1988	1988	1988	1988	1991	1991

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR

#### FOR 1994 WATER YEAR

#### WATER YEARS 1984 - 1994

ANNUAL TOTAL	12595.96	8243.8	
ANNUAL MEAN	34.5	22.6	
HIGHEST ANNUAL MEAN			30.3
LOWEST ANNUAL MEAN			48.2
HIGHEST DAILY MEAN	663	Jan 5	11.6
LOWEST DAILY MEAN	.98	Aug 29	1440
ANNUAL SEVEN-DAY MINIMUM	1.0	Aug 26	.32
INSTANTANEOUS PEAK FLOW			.38
INSTANTANEOUS PEAK STAGE			1850
INSTANTANEOUS LOW FLOW			8.05
ANNUAL RUNOFF (CFSM)	1.00		.88
ANNUAL RUNOFF (INCHES)	13.54		11.90
10 PERCENT EXCEEDS	97		61
50 PERCENT EXCEEDS	6.9		6.6
90 PERCENT EXCEEDS	1.4		1.5

## STREAMS TRIBUTARY TO LAKE ERIE

04198000 SANDUSKY RIVER NEAR FREMONT, OH  
National Stream Quality Accounting Network Station

LOCATION.--Lat 41°18'28", long 83°09'32", in sec. 17, T.4 N., R.15 E., Sandusky County, Hydrologic Unit 04100011, on left bank at downstream side of county road bridge, 2.3 mi upstream from Ballville diversion dam, 2.5 mi downstream from Wolf Creek, and 3.5 mi southwest of Fremont.  
DRAINAGE AREA.--1,251 mi<sup>2</sup>.

## WATER DISCHARGE RECORDS

PERIOD OF RECORD.--November 1898 to March 1901 (gage height and discharge measurements only, published as "at Fremont"), October 1923 to December 1935, July 1938 to current year. Monthly discharge only for October 1923, published in WSP 1307.  
REVISED RECORDS.--WSP 744: 1931-32. WSP 874: 1938. WSP 1144: 1924-30. WSP 1387: 1925, 1928-29, 1931-35. WSP 1912: Drainage area.  
GAGE.--Water-stage recorder. Datum of gage is 626.3 ft above sea level. Nov. 18, 1898, to Mar. 10, 1901, nonrecording gage at site 4 mi downstream at different datum. Nov. 8, 1923, to Sept. 5, 1930, nonrecording gage at present site and datum.  
REMARKS.--Estimated daily discharges: Dec. 26-Feb. 19, Jun. 8-21, and Sep. 13-23. Records good prior to May 23, fair there after except for periods of estimated daily discharge which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	65	1070	180	7000	644	468	348	143	3120	307	68
2	67	60	722	170	5000	549	438	354	135	2250	305	65
3	55	59	690	160	3500	483	425	360	127	1380	210	59
4	50	70	1220	150	2500	503	467	358	118	1210	150	55
5	47	99	6620	140	2000	514	492	353	111	1250	161	53
6	47	97	6660	135	1500	559	702	331	103	746	218	56
7	43	88	5470	130	1100	811	2990	316	97	452	447	57
8	42	87	3540	125	840	1050	5400	323	88	352	350	51
9	40	74	1780	120	640	1050	4260	322	84	408	225	49
10	41	64	1070	115	520	953	3940	318	78	536	158	46
11	43	58	803	110	450	776	5760	317	74	385	149	44
12	38	55	652	107	400	649	10800	323	70	296	149	35
13	35	54	531	104	350	1070	15700	306	66	227	160	32
14	34	95	444	100	310	2850	11500	288	62	190	587	30
15	34	391	394	98	290	3600	8700	266	60	221	490	36
16	34	1130	365	94	280	3310	4600	247	170	233	374	36
17	40	1740	344	92	400	2220	2100	243	400	238	330	41
18	53	4470	329	88	814	1410	1450	240	270	206	227	37
19	48	4390	314	86	2200	990	1080	229	190	158	143	34
20	42	3350	308	84	6930	791	842	226	160	139	116	32
21	46	2340	343	82	7230	891	687	220	140	139	109	28
22	65	1160	388	82	6160	1600	583	213	749	139	142	28
23	70	665	432	80	3800	1710	508	202	441	131	509	34
24	60	483	418	78	2800	1370	458	183	477	131	379	32
25	57	382	376	76	3060	1020	426	178	1590	151	233	36
26	55	321	320	74	2150	855	398	185	2500	142	143	57
27	55	359	270	70	1190	722	381	182	3990	133	107	46
28	49	2090	240	200	984	624	360	190	3090	134	95	42
29	45	2770	220	600	---	573	336	213	2960	135	101	39
30	43	1920	200	2500	---	543	319	210	3710	129	105	36
31	50	---	190	10000	---	507	---	164	---	138	77	---
TOTAL	1505	28986	36723	16230	64398	35197	86570	8208	22253	15499	7256	1294
MEAN	48.5	966	1185	524	2300	1135	2886	265	742	500	234	43.1
MAX	77	4470	6660	10000	7230	3600	15700	360	3990	3120	587	68
MIN	34	54	190	70	280	483	319	164	60	129	77	28
CFSM	.04	.77	.95	.42	1.84	.91	2.31	.21	.59	.40	.19	.03
IN.	.04	.86	1.09	.48	1.91	1.05	2.57	.24	.66	.46	.22	.04

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1994, BY WATER YEAR (WY)

	MEAN	231	600	1095	1536	1940	2331	1816	1013	766	453	207	264
MAX	2521	4413	5495	7659	7504	8261	5524	3654	6091	3479	1660	3713	
(WY)	1927	1993	1991	1930	1984	1978	1957	1969	1981	1992	1958	1981	
MIN	9.94	25.4	32.6	53.5	60.3	319	144	100	43.4	30.9	22.4	13.5	
(WY)	1964	1954	1964	1961	1964	1941	1946	1941	1988	1934	1952	1953	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1924 - 1994

ANNUAL TOTAL	478181												
ANNUAL MEAN	1310												
HIGHEST ANNUAL MEAN										1016			
LOWEST ANNUAL MEAN										2167			1984
HIGHEST DAILY MEAN	13500	Jan 5								275			1934
LOWEST DAILY MEAN	25	Aug 30								36000			Mar 15 1978
ANNUAL SEVEN-DAY MINIMUM	27	Aug 26								5.0			Oct 20 1963
INSTANTANEOUS PEAK FLOW										6.3			Jul 9 1988
INSTANTANEOUS PEAK STAGE										36500			Mar 16 1978
INSTANTANEOUS LOW FLOW										16.14			Feb 24 1979
ANNUAL RUNOFF (CFSM)	1.05									.81			
ANNUAL RUNOFF (INCHES)	14.22									11.03			
10 PERCENT EXCEEDS	4230									2720			
50 PERCENT EXCEEDS	365									269			
90 PERCENT EXCEEDS	36									38			
INSTANTANEOUS PEAK FLOW													
										18200	Nov 13		
										36500		Mar 16 1978	

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.  
\* Ice jam

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

### WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-56, 1978 to current year.

PERIOD OF DAILY RECORD.--

CHLORIDE: February 1988 to current year.

NITROGEN, NITRITE + NITRATE: February 1988 to current year.

NITROGEN, AMMONIA + ORGANIC: February 1988 to current year.

PHOSPHORUS: February 1988 to current year.

SUSPENDED SEDIMENT DISCHARGE: Water years 1951-1956, 1978 to current year.

INSTRUMENTATION.--Refrigerated water-quality pumping sampler since February 1988.

REMARKS.--Water-quality samples were collected by pumping sampler three times daily. Heidelberg College Water Quality Laboratory operates the pumping sampler and analyzes the water-quality samples for chemical concentration.

Sediment samples were collected by a local observer on an approximate once daily basis. Chemical loads were calculated using the mean-interval method (Porterfield, George, 1972, Computation of Fluvial-Sediment Discharge: U.S. Geological Survey, Techniques of Water Resources Investigations, Book 3, Chap. C3, 66 p.). For days with unsteady concentration, discharge, or both, the day was sub-divided into half-hour intervals and the daily load was calculated by summing the loads for these half-hour intervals. This required interpolation between measured and estimated concentrations. Concentrations reported as below the limit of detection (for example, <.100) were assumed to have a value of half of the detection limit for the purpose of load calculation.

EXTREMES FOR PERIOD OF DAILY RECORD.--

DISSOLVED CHLORIDE CONCENTRATIONS: Maximum daily mean, 120 mg/L, Oct. 8-10, 1991; minimum daily mean, <10 mg/L, Dec. 30, 31, 1990, Jan. 1-3, 1991, on several days during 1992.

DISSOLVED CHLORIDE LOADS: Maximum daily, 1,280 tons, Jan. 1, 2, 1990; minimum daily, 1.11 tons, Jul. 9, 15-18, 1988.

DISSOLVED NITROGEN, NITRITE + NITRATE CONCENTRATIONS: Maximum daily mean, 23.8 mg/L, Jun. 28, 1994; minimum daily mean, <.100 mg/L, on many days during 1988-1991, 1993, and 1994 water years, Oct. 6, 22-24, 1991.

DISSOLVED NITROGEN, NITRITE + NITRATE LOADS: Maximum daily, 330 tons, Jul. 15, 1990; minimum daily, .00 ton, on many days during 1988, 1989, 1991, and 1993 water years, on several days during the 1994 water year.

TOTAL NITROGEN, AMMONIA + ORGANIC CONCENTRATIONS: Maximum daily mean, 7.6 mg/L, Jun. 1, 1991; minimum daily mean, <.20 mg/L, Feb. 20, 1993, Oct. 30, 31, 1993.

TOTAL NITROGEN, AMMONIA + ORGANIC LOADS: Maximum daily, 184 tons, May 27, 1989; minimum daily, .011 ton, Oct. 10-11, 1988.

TOTAL PHOSPHORUS CONCENTRATIONS: Maximum daily mean, 2.19 mg/L, Jun. 1, 1991; minimum daily mean, <.010 mg/L, May 17-22, 1988, on several days during 1992.

TOTAL PHOSPHORUS LOADS: Maximum daily 66.0 tons, Dec. 31, 1990; minimum daily, .001 ton, Oct. 9-12, 1988, on several days during 1992.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,420 mg/L, Jun. 9, 1981; minimum daily mean, 1 mg/L, on many days during 1951-56, 1980, 1981, 1988, 1992.

SEDIMENT LOADS: Maximum daily, 124,000 tons, Jun. 14, 1981; minimum daily, less than 0.05 ton, on several days during 1952, 1954, 1989.

EXTREMES FOR CURRENT YEAR.--

DISSOLVED CHLORIDE CONCENTRATIONS: Maximum daily mean, 92 mg/L, Oct. 23; minimum daily mean, 11 mg/L, Apr. 13.

DISSOLVED CHLORIDE LOADS: Maximum daily, 486 tons, Apr. 12; minimum daily, 3.41 tons, Sep. 21.

DISSOLVED NITROGEN, NITRITE + NITRATE CONCENTRATIONS: Maximum daily mean, 23.8 mg/L, Jun. 28; minimum daily mean, <.100 mg/L, on many days during the year.

DISSOLVED NITROGEN, NITRITE + NITRATE LOADS: Maximum daily, 240 tons, Apr. 13; minimum daily, .00 ton, on several days during the year.

TOTAL NITROGEN, AMMONIA + ORGANIC CONCENTRATIONS: Maximum daily mean, 3.2 mg/L, Nov. 30; minimum daily mean, <.20 mg/L, Oct. 30, 31.

TOTAL NITROGEN, AMMONIA + ORGANIC LOADS: Maximum daily, 133 tons, Apr. 13; minimum daily, .016 ton, Oct. 31.

TOTAL PHOSPHORUS CONCENTRATIONS: Maximum daily mean, .902 mg/L, Nov. 19; minimum daily mean, .030 mg/L, May 19, 22.

TOTAL PHOSPHORUS LOADS: Maximum daily, 36.0 tons, Apr. 13; minimum daily, .005 ton, Oct. 7-10, Sep. 30.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 637 mg/L, Jun. 27; minimum daily mean, 3 mg/L, on several days during the year.

SEDIMENT LOADS: Maximum daily, 26,000 tons, Apr. 13; minimum daily, .51 ton, Oct. 14, 15.

### WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALACHLOR TOT RECV (UG/L)	DATE	TIME	ALACHLOR TOT RECV (UG/L)	DATE	TIME	ALACHLOR TOT RECV (UG/L)
Oct 11	1000	<.1	May 13	1200	<.1	Jul 01	1200	1.3
Oct 25	1025	<.1	May 16	1020	<.1	Jul 05	1020	.8
Nov 22	1125	<.1	May 20	1200	<.1	Jul 06	1200	.3
Dec 06	1000	<.1	May 23	1110	.4	Jul 08	1200	.2
Dec 20	0910	<.1	May 27	1200	<.1	Jul 10	1200	.1
Jan 03	1030	<.1	May 31	1000	<.1	Jul 11	1030	3.9
Jan 17	1450	<.1	Jun 04	1200	<.1	Jul 15	1200	.1
Feb 28	1015	.2	Jun 06	1040	<.1	Jul 18	1005	<.1
Mar 14	1025	6.0	Jun 13	1025	<.1	Jul 22	1200	<.1
Mar 28	1030	<.1	Jun 20	1040	3.7	Jul 25	1040	<.1
Apr 04	1320	<.1	Jun 20	1200	<.1	Jul 29	1200	<.1
Apr 08	0400	<.1	Jun 21	1200	<.1	Aug 01	1015	2.1
Apr 11	1225	<.1	Jun 22	1200	.5	Aug 05	1200	<.1
Apr 15	2000	<.1	Jun 23	1200	.1	Aug 08	0925	<.1
Apr 18	1240	<.1	Jun 24	1035	1.9	Aug 12	1200	<.1
Apr 21	1200	<.1	Jun 24	1200	.9	Aug 15	0945	4.0
Apr 25	1015	3.9	Jun 25	1200	2.1	Aug 18	1200	.4
Apr 29	1200	<.1	Jun 26	1200	.8	Aug 22	1025	.1
May 02	1020	.3	Jun 27	1225	.4	Sep 05	1005	<.1
May 06	1200	.1	Jun 28	1200	1.0	Sep 19	1050	<.1
May 09	1010	.2	Jun 30	1200	.6			

## STREAMS TRIBUTARY TO LAKE ERIE

## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC 08...	1050	3630	336	7.5	3.5	4.5	190	13.0	102	1200	5300
MAR 29...	1245	568	602	8.5	8.5	7.5	4.8	12.7	107	K9	K15
JUN 02...	1300	134	787	8.4	22.0	22.5	4.1	9.9	116	K64	<25
SEP 20...	1450	--	676	8.6	28.5	24.5	4.7	9.1	111	K42	K500
DATE	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3 (00452)	ALKA- LITY WAT WH TOT FET FIELD (MG/L AS CACO3 (00410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)
DEC 08...	150	42	11	5.6	4.3	92	0	74	45	19	0.2
MAR 29...	290	79	22	15	2.4	179	7	156	100	38	0.3
JUN 02...	360	85	34	25	4.2	187	12	170	170	44	0.7
SEP 20...	270	62	27	25	5.8	164	3	136	140	43	0.4
DATE	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L AS N) (70300)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
DEC 08...	7.2	230	4.9	0.04	1.6	0.46	0.10	0.09	30	24	<3
MAR 29...	3.9	418	5.7	0.02	0.5	0.05	0.02	0.03	10	38	<3
JUN 02...	0.44	497	<0.05	0.02	0.8	0.06	<0.01	<0.01	<10	58	<3
SEP 20...	0.32	429	<0.05	0.03	1.0	0.08	<0.01	<0.01	30	52	<3
DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	
DEC 08...	83	<4	7	<10	<1	<1	<1.0	500	<6	184	
MAR 29...	19	5	11	<10	<1	<1	<1.0	1600	<6	--	
JUN 02...	10	8	12	<10	2	<1	<1.0	3400	<6	--	
SEP 20...	30	10	8	10	7	<1	<1.0	3400	<6	24.9	

K Non-idea colony count



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

CHLORIDE DISSOLVED (MG/L AS CL), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	77	59	12.3	65	64	11.3	1070	29	82.3
2	67	58	10.4	60	63	10.3	722	30	59.3
3	55	60	9.00	59	63	9.97	690	32	59.9
4	50	57	7.67	70	63	12.1	1220	35	113
5	47	57	7.28	99	65	17.2	6620	27	462
6	47	57	7.28	97	63	16.4	6660	20	352
7	43	57	6.62	88	65	15.5	5470	19	279
8	42	59	6.58	87	67	15.7	3540	19	180
9	40	59	6.41	74	67	13.5	1780	21	100
10	41	60	6.69	64	67	11.6	1070	22	64.6
11	43	63	7.26	58	65	10.2	803	24	51.5
12	38	65	6.62	55	65	9.61	652	25	44.5
13	35	64	5.96	54	69	10.1	531	27	38.5
14	34	65	5.87	95	68	17.6	444	29	34.2
15	34	66	6.01	391	79	82.1	394	30	32.3
16	34	69	6.27	1130	58	172	365	32	31.7
17	40	77	8.27	1740	44	205	344	34	31.8
18	53	71	10.3	4470	31	363	329	37	32.5
19	48	71	9.30	4390	21	247	314	38	32.5
20	42	73	8.29	3350	20	180	308	39	32.9
21	46	72	9.02	2340	19	117	343	42	38.5
22	65	79	14.0	1160	21	65.5	388	43	45.2
23	70	92	17.4	665	26	46.0	432	45	52.9
24	60	81	13.1	483	29	37.8	418	46	51.9
25	57	76	11.8	382	33	33.9	376	47	47.8
26	55	76	11.4	321	37	31.9	320	48	41.6
27	55	69	10.1	359	40	39.0	270	49	35.4
28	49	66	8.75	2090	35	194	240	52	33.4
29	45	69	8.31	2770	29	219	220	52	31.1
30	43	71	8.31	1920	28	143	200	53	28.9
31	50	72	9.66	---	---	---	190	54	27.5
TOTAL	1505	---	276.23	28986	---	2357.28	36723	---	2548.7
JANUARY			FEBRUARY			MARCH			
1	180	55	26.6	7000	12	219	644	30	52.7
2	170	54	25.0	5000	14	189	549	34	50.5
3	160	57	24.5	3500	16	148	483	38	49.7
4	150	59	24.0	2500	17	115	503	39	53.3
5	140	61	23.1	2000	18	99.0	514	41	56.5
6	135	62	22.5	1500	20	80.3	559	42	63.9
7	130	62	21.8	1100	21	63.7	811	41	89.2
8	125	60	20.4	840	23	52.6	1050	37	104
9	120	61	19.7	640	25	43.3	1050	35	99.9
10	115	65	20.1	520	27	38.1	953	36	93.8
11	110	60	17.9	450	29	35.6	776	39	80.7
12	107	56	16.2	400	32	34.2	649	42	74.1
13	104	58	16.2	350	34	32.4	1070	46	130
14	100	63	17.0	310	37	31.0	2850	35	267
15	98	69	18.1	290	40	31.4	3600	32	308
16	94	67	17.0	280	43	32.7	3310	29	263
17	92	67	16.6	400	41	43.8	2220	27	163
18	88	70	16.5	814	33	71.5	1410	29	112
19	86	71	16.5	2200	26	155	990	31	82.1
20	84	71	16.1	6930	21	389	791	33	70.3
21	82	74	16.5	7230	17	334	891	39	94.0
22	82	78	17.2	6160	16	273	1600	37	160
23	80	78	16.8	3800	17	175	1710	35	161
24	78	80	16.8	2800	17	131	1370	36	132
25	76	83	16.9	3060	19	157	1020	36	100
26	74	83	16.6	2150	21	124	855	36	84.1
27	70	82	15.4	1190	24	76.2	722	37	72.5
28	200	47	25.2	984	27	71.5	624	37	62.5
29	600	28	45.6	---	---	---	573	36	55.7
30	2500	17	114	---	---	---	543	36	52.8
31	10000	12	326	---	---	---	507	37	50.9
TOTAL	16230	---	1022.8	64398	---	3246.3	35197	---	3289.2

## STREAMS TRIBUTARY TO LAKE ERIE

## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

CHLORIDE DISSOLVED (MG/L AS CL), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	468	37	47.2	348	38	35.4	143	43	16.6
2	438	40	47.4	354	38	36.7	135	44	16.0
3	425	44	50.6	360	38	36.9	127	46	15.7
4	467	43	53.7	358	38	36.4	118	47	14.9
5	492	46	61.3	353	38	36.3	111	47	14.0
6	702	48	90.7	331	39	34.5	103	48	13.5
7	2990	40	316	316	41	34.7	97	50	13.1
8	5400	31	447	323	42	36.9	88	53	12.6
9	4260	27	316	322	35	30.7	84	57	12.9
10	3940	26	269	318	36	31.2	78	60	12.6
11	5760	22	348	317	33	27.8	74	57	11.5
12	10800	18	486	323	35	30.5	70	57	10.8
13	15700	11	476	306	39	32.4	66	58	10.3
14	11500	12	385	288	33	25.6	62	60	10.1
15	8700	13	306	266	32	23.3	60	63	10.2
16	4600	17	203	247	41	27.2	170	62	28.5
17	2100	20	114	243	47	30.8	400	64	68.7
18	1450	23	87.9	240	47	30.4	270	65	47.6
19	1080	25	73.4	229	47	29.0	190	67	34.4
20	842	27	61.2	226	46	27.9	160	65	28.0
21	687	28	51.3	220	46	27.5	140	56	21.2
22	583	29	45.3	213	48	27.6	749	44	87.8
23	508	30	41.4	202	49	27.0	441	48	57.2
24	458	32	39.3	183	51	25.3	477	39	50.3
25	426	33	37.8	178	53	25.3	1590	34	144
26	398	33	36.0	185	51	25.7	2500	29	193
27	381	35	35.8	182	52	25.3	3990	25	272
28	360	34	33.3	190	50	25.9	3090	26	215
29	336	35	32.0	213	46	26.4	2960	26	208
30	319	38	32.3	210	44	25.1	3710	24	240
31	---	---	---	164	44	19.3	---	---	---
TOTAL	86570	---	4623.9	8208	---	915.0	22253	---	1890.5
JULY			AUGUST			SEPTEMBER			
1	3120	21	177	307	39	32.5	68	37	6.88
2	2250	23	137	305	33	26.9	65	36	6.36
3	1380	25	93.6	210	36	20.1	59	34	5.45
4	1210	25	81.4	150	37	14.8	55	35	5.23
5	1250	24	79.7	161	39	17.1	53	37	5.32
6	746	21	43.1	218	41	23.8	56	38	5.69
7	452	20	24.3	447	32	38.7	57	39	5.92
8	352	23	21.5	350	28	26.9	51	40	5.42
9	408	25	27.6	225	27	16.3	49	40	5.26
10	536	27	38.6	158	28	12.0	46	40	4.95
11	385	28	29.3	149	31	12.4	44	40	4.78
12	296	29	23.1	149	32	12.9	35	40	3.81
13	227	30	18.1	160	35	15.1	32	41	3.57
14	190	30	15.6	587	31	46.9	30	43	3.45
15	221	31	18.6	490	30	40.2	36	43	4.18
16	233	32	20.0	374	31	31.4	36	43	4.20
17	238	33	20.9	330	28	24.7	41	43	4.80
18	206	33	18.2	227	29	17.4	37	43	4.34
19	158	33	14.1	143	31	11.8	34	44	4.01
20	139	35	13.3	116	33	10.2	32	45	3.85
21	139	38	14.2	109	34	10.0	28	45	3.41
22	139	41	15.3	142	36	13.8	28	47	3.53
23	131	43	15.3	509	38	51.6	34	49	4.50
24	131	45	15.7	379	36	36.9	32	51	4.40
25	151	43	17.5	233	36	22.6	36	49	4.71
26	142	41	15.9	143	38	14.5	57	50	7.81
27	133	39	13.9	107	38	10.9	46	54	6.64
28	134	40	14.4	95	38	9.66	42	55	6.16
29	135	40	14.7	101	40	10.9	39	58	6.10
30	129	40	13.9	105	41	11.7	36	64	6.14
31	138	41	15.4	77	40	8.26	---	---	---
TOTAL	15499	---	1081.2	7256	---	652.92	1294	---	150.87
YEAR	324119		22054.90						

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

NITROGEN NITRITE PLUS NITRATE DISSOLVED (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	77	.338	.07	65	<.100	.01	1070	6.71	19
2	67	.181	.03	60	<.100	.01	722	6.76	13
3	55	<.100	.01	59	<.100	.01	690	6.68	12
4	50	<.100	.01	70	<.100	.01	1220	6.71	22
5	47	<.100	.01	99	.100	.03	6620	6.62	120
6	47	<.100	.01	97	.164	.04	6660	6.25	110
7	43	<.100	.01	88	.217	.05	5470	6.17	91
8	42	<.100	.01	87	.201	.05	3540	5.77	55
9	40	<.100	.01	74	<.100	.01	1780	5.80	28
10	41	<.100	.01	64	<.100	.01	1070	5.67	16
11	43	<.100	.01	58	<.100	.01	803	5.53	12
12	38	<.100	.01	55	<.100	.01	652	5.40	9.5
13	35	<.100	.00	54	<.100	.01	531	5.28	7.6
14	34	<.100	.00	95	.112	.03	444	5.15	6.2
15	34	<.100	.00	391	.267	.30	394	5.03	5.4
16	34	<.100	.01	1130	.645	2.1	365	4.91	4.8
17	40	.179	.02	1740	2.90	14	344	4.80	4.5
18	53	<.100	.01	4470	5.08	62	329	4.75	4.2
19	48	<.100	.01	4390	5.83	69	314	4.60	3.9
20	42	<.100	.01	3350	5.94	54	308	4.67	3.9
21	46	<.100	.01	2340	5.45	35	343	4.53	4.2
22	65	.103	.02	1160	5.56	17	388	4.37	4.6
23	70	.162	.03	665	5.75	10	432	4.30	5.0
24	60	<.100	.01	483	5.98	7.8	418	4.31	4.9
25	57	<.100	.01	382	5.86	6.0	376	4.51	4.6
26	55	<.100	.01	321	5.59	4.9	320	4.65	4.0
27	55	<.100	.01	359	5.38	5.2	270	4.70	3.4
28	49	<.100	.01	2090	5.19	29	240	4.93	3.2
29	45	<.100	.01	2770	6.11	46	220	5.01	3.0
30	43	<.100	.01	1920	6.58	34	200	5.14	2.8
31	50	<.100	.01	---	---	---	190	5.23	2.7
TOTAL	1505	---	0.40	28986	---	396.59	36723	---	590.4
JANUARY			FEBRUARY			MARCH			
1	180	5.19	2.5	7000	2.96	56	644	5.07	8.8
2	170	5.01	2.3	5000	3.45	47	549	5.18	7.7
3	160	5.10	2.2	3500	3.57	34	483	5.30	6.9
4	150	4.95	2.0	2500	3.61	24	503	5.29	7.2
5	140	4.84	1.8	2000	3.66	20	514	5.17	7.2
6	135	4.70	1.7	1500	3.71	15	559	5.29	8.0
7	130	4.64	1.6	1100	3.75	11	811	6.49	14
8	125	4.53	1.5	840	3.80	8.6	1050	7.06	20
9	120	4.39	1.4	640	3.85	6.7	1050	6.39	18
10	115	4.10	1.3	520	3.88	5.4	953	6.07	16
11	110	4.01	1.2	450	3.80	4.6	776	6.10	13
12	107	3.89	1.1	400	3.70	4.0	649	5.93	10
13	104	3.74	1.0	350	3.60	3.4	1070	7.55	22
14	100	3.58	.97	310	3.51	2.9	2850	8.33	64
15	98	3.53	.93	290	3.42	2.7	3600	8.66	84
16	94	3.44	.87	280	3.33	2.5	3310	8.78	78
17	92	3.35	.83	400	3.24	3.5	2220	9.12	55
18	88	3.38	.80	814	3.15	6.9	1410	8.85	34
19	86	3.40	.79	2200	3.07	18	990	8.42	23
20	84	3.33	.76	6930	3.16	59	791	7.92	17
21	82	3.29	.73	7230	3.85	75	891	7.97	19
22	82	3.33	.74	6160	4.28	71	1600	8.63	37
23	80	3.32	.72	3800	4.54	47	1710	8.41	39
24	78	3.14	.66	2800	4.56	35	1370	8.20	30
25	76	3.07	.63	3060	4.64	38	1020	7.92	22
26	74	2.91	.58	2150	4.75	28	855	7.38	17
27	70	2.60	.49	1190	4.85	15	722	6.93	14
28	200	2.41	1.3	984	4.96	13	624	6.36	11
29	600	2.24	3.6	---	---	---	573	5.73	8.9
30	2500	2.08	14	---	---	---	543	5.10	7.5
31	10000	2.47	67	---	---	---	507	4.78	6.5
TOTAL	16230	---	118.00	64398	---	657.2	35197	---	725.7

## STREAMS TRIBUTARY TO LAKE ERIE

## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

## NITROGEN NITRITE PLUS NITRATE DISSOLVED (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	468	4.36	5.5	348	2.00	1.9	143	<.100	.02
2	438	4.04	4.8	354	2.04	2.0	135	<.100	.02
3	425	3.68	4.2	360	1.85	1.8	127	<.100	.02
4	467	3.47	4.4	358	1.65	1.6	118	<.100	.02
5	492	3.32	4.4	353	1.46	1.4	111	<.100	.02
6	702	3.65	7.3	331	1.32	1.2	103	<.100	.01
7	2990	6.27	52	316	1.26	1.1	97	<.100	.01
8	5400	8.99	130	323	1.32	1.1	88	<.100	.01
9	4260	9.25	110	322	.940	.82	84	.132	.03
10	3940	8.97	95	318	.737	.63	78	.110	.02
11	5760	8.95	140	317	.716	.61	74	<.100	.02
12	10800	6.76	180	323	.676	.59	70	<.100	.01
13	15700	5.62	240	306	.611	.51	66	<.100	.01
14	11500	5.93	180	288	.525	.41	62	<.100	.01
15	8700	5.77	140	266	.391	.28	60	<.100	.01
16	4600	6.03	75	247	.750	.50	170	<.100	.02
17	2100	6.09	35	243	.847	.56	400	<.100	.06
18	1450	6.14	24	240	.803	.52	270	<.100	.04
19	1080	6.17	18	229	.757	.47	190	<.100	.03
20	842	5.87	13	226	.650	.40	160	<.100	.04
21	687	5.37	10	220	.564	.33	140	.442	.17
22	583	5.05	8.0	213	.465	.27	749	1.80	3.9
23	508	4.71	6.5	202	.385	.21	441	.984	1.2
24	458	4.38	5.4	183	.325	.16	477	5.58	7.3
25	426	3.88	4.5	178	.388	.19	1590	13.4	61
26	398	3.30	3.6	185	.486	.24	2500	15.9	110
27	381	2.91	3.0	182	.525	.26	3990	20.9	230
28	360	2.48	2.4	190	.500	.26	3090	23.8	200
29	336	2.21	2.0	213	.192	.11	2960	21.4	170
30	319	2.03	1.7	210	.125	.07	3710	20.2	200
31	---	---	---	164	.132	.06	---	---	---
TOTAL	86570	---	1509.7	8208	---	20.56	22253	---	984.00
JULY			AUGUST			SEPTEMBER			
1	3120	17.9	150	307	.121	.10	68	.896	.17
2	2250	15.2	92	305	.125	.10	65	.960	.17
3	1380	12.7	48	210	.196	.11	59	.729	.12
4	1210	13.1	43	150	.238	.10	55	.427	.06
5	1250	12.6	43	161	.323	.14	53	.158	.02
6	746	9.25	19	218	.439	.27	56	<.100	.01
7	452	7.91	9.7	447	1.15	1.4	57	.174	.03
8	352	7.80	7.4	350	1.91	1.8	51	.439	.06
9	408	7.53	8.3	225	1.86	1.1	49	.467	.06
10	536	7.11	10	158	1.87	.80	46	.370	.05
11	385	6.18	6.4	149	1.79	.72	44	.280	.03
12	296	5.65	4.5	149	1.65	.66	35	.263	.02
13	227	5.16	3.2	160	1.51	.65	32	.166	.01
14	190	4.71	2.4	587	1.55	2.6	30	<.100	.01
15	221	4.31	2.6	490	2.62	3.4	36	<.100	.01
16	233	3.94	2.5	374	2.28	2.3	36	<.100	.01
17	238	3.60	2.3	330	1.81	1.6	41	<.100	.01
18	206	3.21	1.8	227	1.82	1.1	37	<.100	.01
19	158	2.56	1.1	143	1.43	.56	34	<.100	.00
20	139	2.01	.75	116	.412	.13	32	<.100	.00
21	139	1.53	.57	109	<.100	.03	28	<.100	.00
22	139	1.25	.47	142	<.100	.03	28	<.100	.00
23	131	1.14	.40	509	.123	.16	34	<.100	.00
24	131	.963	.34	379	.304	.31	32	<.100	.00
25	151	1.23	.50	233	<.100	.05	36	<.100	.01
26	142	1.40	.54	143	<.100	.02	57	<.100	.01
27	133	1.01	.36	107	<.100	.02	46	.127	.02
28	134	.580	.21	95	<.100	.02	42	.188	.02
29	135	.220	.08	101	.364	.10	39	.246	.03
30	129	.182	.06	105	.611	.17	36	.229	.02
31	138	.178	.07	77	.817	.17	---	---	---
TOTAL	15499	---	461.55	7256	---	20.72	1294	---	0.97
YEAR	324119		5485.79						



## STREAMS TRIBUTARY TO LAKE ERIE

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## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

NITROGEN AMMONIA PLUS ORGANIC TOTAL (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	77	.46	.095	65	.43	.077	1070	2.7	7.89
2	67	.44	.079	60	.55	.090	722	1.9	3.68
3	55	.38	.057	59	.59	.094	690	1.2	2.19
4	50	.41	.055	70	.61	.12	1220	1.0	3.53
5	47	.42	.053	99	.57	.15	6620	2.3	43.0
6	47	.43	.054	97	.58	.15	6660	2.6	47.4
7	43	.39	.045	88	.58	.14	5470	2.3	33.8
8	42	.41	.046	87	.51	.12	3540	1.8	17.0
9	40	.39	.042	74	.44	.088	1780	1.5	7.39
10	41	.35	.039	64	.38	.066	1070	1.4	4.04
11	43	.43	.050	58	.41	.065	803	1.3	2.77
12	38	.43	.044	55	.57	.084	652	1.2	2.05
13	35	.41	.038	54	.54	.078	531	1.1	1.53
14	34	.43	.039	95	.64	.15	444	.97	1.17
15	34	.38	.035	391	.71	.78	394	.89	.95
16	34	.42	.038	1130	.89	2.78	365	.82	.80
17	40	.46	.049	1740	1.4	6.65	344	.75	.69
18	53	.56	.081	4470	2.3	28.2	329	.74	.65
19	48	.52	.069	4390	2.4	28.0	314	.57	.49
20	42	.46	.052	3350	1.9	17.8	308	.46	.38
21	46	.40	.050	2340	1.6	10.1	343	.43	.40
22	65	.40	.070	1160	1.5	4.54	388	.44	.46
23	70	.44	.083	665	1.2	2.23	432	.40	.46
24	60	.47	.076	483	1.1	1.39	418	.37	.42
25	57	.48	.075	382	1.1	1.11	376	.39	.40
26	55	.25	.037	321	1.1	.96	320	.40	.35
27	55	.28	.040	359	1.0	1.02	270	.35	.25
28	49	.26	.035	2090	1.3	7.67	240	.33	.22
29	45	.28	.034	2770	2.7	20.1	220	.35	.21
30	43	<.20	.022	1920	3.2	16.8	200	.40	.21
31	50	<.20	.016	---	---	---	190	.39	.20
TOTAL	1505	---	1.598	28986	---	151.602	36723	---	184.98
JANUARY			FEBRUARY			MARCH			
1	180	.34	.17	7000	1.1	21.3	644	.99	1.72
2	170	.32	.15	5000	1.0	13.5	549	.92	1.37
3	160	.40	.17	3500	.86	8.17	483	.86	1.12
4	150	.45	.18	2500	.80	5.43	503	.83	1.12
5	140	.46	.17	2000	.75	4.04	514	.75	1.04
6	135	.51	.19	1500	.70	2.82	559	.63	.95
7	130	.50	.18	1100	.65	1.92	811	.83	1.83
8	125	.50	.17	840	.60	1.36	1050	.96	2.74
9	120	.43	.14	640	.56	.97	1050	.87	2.47
10	115	.48	.15	520	.52	.73	953	.89	2.28
11	110	.53	.16	450	.48	.59	776	.75	1.58
12	107	.50	.15	400	.45	.49	649	.62	1.09
13	104	.51	.14	350	.42	.40	1070	.80	2.45
14	100	.50	.14	310	.39	.33	2850	1.3	10.5
15	98	.48	.13	290	.36	.28	3600	1.7	16.2
16	94	.54	.14	280	.34	.25	3310	1.4	12.6
17	92	.47	.12	400	.43	.47	2220	1.4	8.20
18	88	.52	.12	814	.72	1.59	1410	1.1	4.34
19	86	.55	.13	2200	1.2	7.19	990	.96	2.57
20	84	.58	.13	6930	1.8	33.0	791	.76	1.63
21	82	.63	.14	7230	1.8	34.5	891	.71	1.72
22	82	.57	.13	6160	1.7	28.4	1600	.90	3.92
23	80	.54	.12	3800	1.5	15.7	1710	1.1	5.08
24	78	.58	.12	2800	1.4	10.7	1370	.97	3.58
25	76	.57	.12	3060	1.3	10.7	1020	.97	2.69
26	74	.55	.11	2150	1.2	7.04	855	.85	1.96
27	70	.67	.13	1190	1.1	3.64	722	.73	1.43
28	200	.82	.44	984	1.1	2.81	624	.69	1.16
29	600	1.1	1.80	---	---	---	573	.66	1.03
30	2500	1.5	10.1	---	---	---	543	.66	.96
31	10000	1.5	39.5	---	---	---	507	.59	.81
TOTAL	16230	---	55.74	64398	---	218.32	35197	---	102.14

## STREAMS TRIBUTARY TO LAKE ERIE

## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

## NITROGEN AMMONIA PLUS ORGANIC TOTAL (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	468	.61	.77	348	.89	.83	143	.99	.38
2	438	.61	.72	354	.85	.82	135	.91	.33
3	425	.63	.72	360	.92	.90	127	.92	.31
4	467	.73	.93	358	.92	.89	118	1.0	.32
5	492	.76	1.01	353	.84	.80	111	1.0	.30
6	702	.81	1.65	331	.84	.75	103	1.0	.29
7	2990	1.5	12.0	316	.87	.74	97	1.0	.26
8	5400	1.7	25.2	323	.90	.79	88	1.0	.25
9	4260	1.6	18.2	322	.99	.86	84	.91	.21
10	3940	1.7	18.1	318	.94	.81	78	.93	.20
11	5760	2.0	30.4	317	.82	.71	74	.95	.19
12	10800	3.1	98.2	323	.83	.73	70	1.0	.19
13	15700	3.1	133	306	.77	.63	66	1.0	.18
14	11500	2.4	75.5	288	.78	.60	62	1.1	.18
15	8700	2.2	53.2	266	.60	.43	60	1.0	.16
16	4600	1.6	20.5	247	.72	.48	170	.91	.42
17	2100	1.2	6.66	243	.78	.51	400	.92	.99
18	1450	.97	3.81	240	.64	.41	270	1.0	.73
19	1080	.95	2.77	229	.66	.41	190	1.1	.57
20	842	.90	2.05	226	.52	.32	160	1.2	.52
21	687	.88	1.64	220	.51	.30	140	1.4	.54
22	583	.71	1.12	213	.43	.25	749	1.8	3.75
23	508	.64	.88	202	.57	.31	441	1.4	1.71
24	458	.68	.84	183	.70	.34	477	2.2	2.84
25	426	.76	.87	178	.68	.33	1590	2.6	11.3
26	398	.86	.93	185	.59	.29	2500	2.8	18.7
27	381	.86	.89	182	.54	.26	3990	2.3	24.6
28	360	.87	.85	190	.64	.33	3090	2.3	19.3
29	336	.90	.81	213	1.0	.58	2960	2.2	17.2
30	319	.96	.83	210	1.0	.57	3710	1.8	18.5
31	---	---	---	164	1.3	.57	---	---	---
TOTAL	86570	---	515.05	8208	---	17.55	22253	---	125.42
JULY			AUGUST			SEPTEMBER			
1	3120	2.3	19.9	307	1.4	1.18	68	1.0	.19
2	2250	1.9	11.8	305	1.5	1.21	65	1.0	.18
3	1380	1.8	6.63	210	1.3	.73	59	1.0	.16
4	1210	1.8	6.08	150	1.2	.48	55	1.1	.16
5	1250	1.9	6.40	161	1.1	.49	53	1.2	.17
6	746	1.4	2.81	218	1.2	.72	56	1.3	.20
7	452	1.3	1.54	447	1.2	1.42	57	1.2	.18
8	352	1.4	1.32	350	1.1	1.04	51	1.1	.15
9	408	1.2	1.28	225	1.0	.63	49	1.1	.14
10	536	1.2	1.74	158	.95	.41	46	1.1	.13
11	385	1.1	1.18	149	.93	.37	44	.93	.11
12	296	1.1	.90	149	.87	.35	35	.93	.088
13	227	1.1	.68	160	.89	.39	32	1.0	.089
14	190	1.1	.57	587	1.4	2.28	30	1.1	.090
15	221	1.1	.66	490	1.2	1.66	36	1.1	.11
16	233	1.1	.69	374	1.4	1.42	36	1.0	.10
17	238	1.1	.70	330	1.5	1.37	41	.99	.11
18	206	1.2	.64	227	1.6	.96	37	.94	.094
19	158	1.1	.47	143	1.4	.52	34	.89	.082
20	139	1.0	.39	116	1.4	.43	32	.79	.068
21	139	.82	.31	109	1.6	.46	28	.63	.048
22	139	.71	.26	142	1.7	.69	28	.61	.046
23	131	.70	.25	509	1.8	2.43	34	.57	.052
24	131	.80	.28	379	1.5	1.56	32	.60	.052
25	151	.80	.33	233	1.7	1.05	36	.66	.064
26	142	.74	.28	143	1.7	.66	57	.61	.093
27	133	.85	.30	107	1.8	.51	46	.56	.069
28	134	.98	.35	95	1.6	.41	42	.50	.057
29	135	1.2	.44	101	1.5	.40	39	.43	.045
30	129	1.1	.40	105	1.2	.36	36	.42	.040
31	138	.98	.36	77	1.1	.23	---	---	---
TOTAL	15499	---	69.94	7256	---	26.82	1294	---	3.167
YEAR	324119		1472.327						

## STREAMS TRIBUTARY TO LAKE ERIE

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## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

## PHOSPHORUS TOTAL (MG/L AS P), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	77	.059	.012	65	.074	.013	1070	.421	1.22
2	67	.053	.010	60	.075	.012	722	.343	.67
3	55	.045	.007	59	.073	.012	690	.275	.51
4	50	.047	.006	70	.070	.013	1220	.241	.82
5	47	.044	.006	99	.067	.018	6620	.593	11.1
6	47	.046	.006	97	.062	.016	6660	.678	12.2
7	43	.046	.005	88	.055	.013	5470	.596	8.85
8	42	.047	.005	87	.053	.012	3540	.507	4.88
9	40	.049	.005	74	.051	.010	1780	.430	2.08
10	41	.048	.005	64	.046	.008	1070	.368	1.07
11	43	.057	.006	58	.042	.007	803	.316	.69
12	38	.058	.006	55	.045	.007	652	.271	.48
13	35	.059	.006	54	.049	.007	531	.232	.33
14	34	.062	.006	95	.112	.026	444	.199	.24
15	34	.062	.006	391	.115	.13	394	.171	.18
16	34	.075	.007	1130	.176	.56	365	.146	.14
17	40	.097	.010	1740	.337	1.64	344	.125	.12
18	53	.076	.011	4470	.774	9.53	329	.107	.095
19	48	.069	.009	4390	.902	10.7	314	.094	.080
20	42	.067	.008	3350	.715	6.51	308	.089	.074
21	46	.063	.008	2340	.596	3.79	343	.081	.075
22	65	.065	.011	1160	.469	1.49	388	.080	.084
23	70	.070	.013	665	.379	.68	432	.078	.091
24	60	.075	.012	483	.303	.40	418	.080	.091
25	57	.082	.013	382	.253	.26	376	.078	.079
26	55	.086	.013	321	.222	.19	320	.081	.070
27	55	.089	.013	359	.205	.20	270	.072	.053
28	49	.080	.011	2090	.339	2.00	240	.069	.045
29	45	.076	.009	2770	.529	3.95	220	.071	.042
30	43	.076	.009	1920	.493	2.59	200	.077	.041
31	50	.074	.010	---	---	---	190	.074	.038
TOTAL	1505	---	0.264	28986	---	44.794	36723	---	46.538
JANUARY			FEBRUARY			MARCH			
1	180	.071	.035	7000	.273	5.15	644	.143	.25
2	170	.065	.030	5000	.246	3.32	549	.131	.19
3	160	.066	.029	3500	.221	2.09	483	.119	.16
4	150	.068	.028	2500	.200	1.35	503	.102	.14
5	140	.065	.025	2000	.181	.98	514	.093	.13
6	135	.068	.025	1500	.164	.66	559	.091	.14
7	130	.064	.022	1100	.148	.44	811	.104	.23
8	125	.056	.019	840	.134	.30	1050	.107	.30
9	120	.050	.016	640	.121	.21	1050	.097	.28
10	115	.049	.015	520	.110	.15	953	.093	.24
11	110	.047	.014	450	.099	.12	776	.086	.18
12	107	.047	.014	400	.090	.097	649	.079	.14
13	104	.046	.013	350	.081	.077	1070	.117	.36
14	100	.047	.013	310	.073	.061	2850	.216	1.68
15	98	.048	.013	290	.066	.052	3600	.275	2.68
16	94	.045	.011	280	.060	.045	3310	.234	2.10
17	92	.044	.011	400	.080	.086	2220	.189	1.14
18	88	.052	.012	814	.145	.32	1410	.127	.49
19	86	.054	.013	2200	.261	1.55	990	.136	.36
20	84	.051	.012	6930	.400	7.50	791	.103	.22
21	82	.052	.012	7230	.400	7.81	891	.092	.22
22	82	.053	.012	6160	.388	6.49	1600	.118	.51
23	80	.053	.011	3800	.284	2.97	1710	.141	.65
24	78	.053	.011	2800	.231	1.74	1370	.138	.51
25	76	.057	.012	3060	.206	1.70	1020	.125	.35
26	74	.059	.012	2150	.188	1.10	855	.108	.25
27	70	.087	.016	1190	.172	.55	722	.095	.19
28	200	.224	.12	984	.157	.42	624	.082	.14
29	600	.286	.46	---	---	---	573	.076	.12
30	2500	.359	2.43	---	---	---	543	.066	.097
31	10000	.344	9.28	---	---	---	507	.060	.082
TOTAL	16230	---	12.746	64398	---	47.338	35197	---	14.529

## STREAMS TRIBUTARY TO LAKE ERIE

## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

## PHOSPHORUS TOTAL (MG/L AS P), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	468	.058	.074	348	.072	.067	143	.079	.030
2	438	.058	.069	354	.060	.057	135	.072	.026
3	425	.057	.065	360	.060	.058	127	.072	.025
4	467	.054	.068	358	.069	.067	118	.076	.024
5	492	.060	.080	353	.073	.070	111	.082	.024
6	702	.080	.16	331	.067	.060	103	.084	.024
7	2990	.174	1.48	316	.071	.060	97	.090	.024
8	5400	.320	4.68	323	.069	.060	88	.094	.022
9	4260	.271	3.15	322	.068	.059	84	.077	.017
10	3940	.283	3.21	318	.072	.061	78	.070	.015
11	5760	.426	6.66	317	.070	.060	74	.079	.016
12	10800	.812	26.2	323	.079	.069	70	.092	.017
13	15700	.845	36.0	306	.064	.053	66	.090	.016
14	11500	.643	20.0	288	.084	.066	62	.091	.015
15	8700	.525	12.4	266	.055	.040	60	.085	.014
16	4600	.408	5.17	247	.039	.026	170	.080	.037
17	2100	.312	1.79	243	.032	.021	400	.085	.092
18	1450	.240	.94	240	.031	.020	270	.099	.072
19	1080	.202	.59	229	.030	.019	190	.135	.069
20	842	.164	.37	226	.033	.020	160	.166	.072
21	687	.134	.25	220	.034	.020	140	.220	.083
22	583	.105	.17	213	.030	.017	749	.288	.60
23	508	.083	.11	202	.034	.019	441	.226	.27
24	458	.074	.091	183	.049	.024	477	.316	.41
25	426	.065	.074	178	.045	.022	1590	.438	1.93
26	398	.063	.068	185	.044	.022	2500	.427	2.91
27	381	.070	.072	182	.040	.019	3990	.485	5.22
28	360	.073	.071	190	.053	.027	3090	.415	3.48
29	336	.073	.066	213	.073	.042	2960	.435	3.48
30	319	.071	.061	210	.082	.046	3710	.499	5.01
31	---	---	---	164	.088	.039	---	---	---
TOTAL	86570	---	124.189	8208	---	1.310	22253	---	24.044
JULY			AUGUST			SEPTEMBER			
1	3120	.604	5.14	307	.260	.22	68	.129	.024
2	2250	.470	2.86	305	.218	.18	65	.121	.021
3	1380	.382	1.44	210	.168	.095	59	.115	.018
4	1210	.389	1.28	150	.157	.064	55	.118	.018
5	1250	.392	1.34	161	.151	.066	53	.130	.019
6	746	.302	.61	218	.180	.11	56	.129	.019
7	452	.276	.34	447	.224	.27	57	.116	.018
8	352	.238	.23	350	.324	.30	51	.101	.014
9	408	.233	.26	225	.182	.11	49	.094	.012
10	536	.222	.32	158	.155	.066	46	.090	.011
11	385	.180	.19	149	.134	.054	44	.085	.010
12	296	.170	.14	149	.121	.049	35	.084	.008
13	227	.160	.098	160	.145	.064	32	.086	.007
14	190	.152	.078	587	.328	.53	30	.092	.007
15	221	.143	.086	490	.289	.39	36	.093	.009
16	233	.135	.085	374	.241	.24	36	.091	.009
17	238	.128	.082	330	.223	.20	41	.089	.010
18	206	.100	.057	227	.204	.13	37	.086	.009
19	158	.092	.039	143	.170	.066	34	.083	.008
20	139	.070	.026	116	.147	.046	32	.078	.007
21	139	.061	.023	109	.162	.048	28	.074	.006
22	139	.059	.022	142	.216	.091	28	.075	.006
23	131	.060	.021	509	.301	.41	34	.077	.007
24	131	.075	.027	379	.237	.25	32	.077	.007
25	151	.104	.043	233	.209	.13	36	.085	.008
26	142	.096	.037	143	.174	.068	57	.101	.015
27	133	.103	.037	107	.155	.045	46	.074	.009
28	134	.117	.043	95	.151	.039	42	.061	.007
29	135	.160	.058	101	.156	.042	39	.057	.006
30	129	.145	.050	105	.140	.040	36	.055	.005
31	138	.149	.056	77	.134	.028	---	---	---
TOTAL	15499	---	15.118	7256	---	4.441	1294	---	0.334
YEAR	324119		335.645						



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	77	10	2.0	65	8	1.4	1070	144	420
2	67	9	1.6	60	7	1.1	722	109	213
3	55	8	1.2	59	5	.87	690	87	162
4	50	8	1.1	70	9	1.7	1220	106	378
5	47	8	1.1	99	14	3.7	6620	347	6540
6	47	9	1.1	97	15	3.8	6660	367	6630
7	43	9	1.0	88	22	5.2	5470	267	3980
8	42	8	.86	87	25	5.9	3540	201	1950
9	40	6	.69	74	12	2.5	1780	151	736
10	41	8	.83	64	13	2.2	1070	118	345
11	43	8	.92	58	15	2.3	803	90	196
12	38	8	.80	55	17	2.5	652	67	118
13	35	6	.59	54	24	3.5	531	48	69
14	34	6	.51	95	38	12	444	41	49
15	34	6	.51	391	74	84	394	34	36
16	34	19	1.7	1130	208	678	365	26	26
17	40	12	1.3	1740	261	1270	344	19	18
18	53	9	1.3	4470	594	7280	329	17	15
19	48	9	1.2	4390	497	5910	314	14	12
20	42	9	1.1	3350	362	3310	308	12	9.6
21	46	12	1.5	2340	260	1660	343	11	10
22	65	9	1.6	1160	198	628	388	10	11
23	70	9	1.8	665	152	275	432	8	9.3
24	60	9	1.5	483	115	151	418	6	7.0
25	57	8	1.3	382	88	91	376	6	6.0
26	55	8	1.3	321	74	64	320	6	5.0
27	55	9	1.3	359	66	64	270	6	4.1
28	49	9	1.2	2090	133	810	240	6	3.6
29	45	8	1.0	2770	254	1900	220	5	3.2
30	43	9	1.0	1920	192	1010	200	5	2.9
31	50	10	1.3	---	---	---	190	5	2.7
TOTAL	1505	---	36.21	28986	---	25233.67	36723	---	21967.4
JANUARY			FEBRUARY			MARCH			
1	180	5	2.5	7000	109	2060	644	48	83
2	170	5	2.3	5000	84	1130	549	45	66
3	160	5	2.1	3500	64	606	483	43	57
4	150	5	1.9	2500	49	332	503	42	57
5	140	5	1.8	2000	38	204	514	41	56
6	135	5	1.7	1500	29	117	559	40	60
7	130	5	1.6	1100	21	62	811	50	111
8	125	4	1.5	840	18	40	1050	55	157
9	120	4	1.4	640	16	27	1050	45	128
10	115	4	1.3	520	14	20	953	37	94
11	110	4	1.2	450	13	15	776	30	62
12	107	4	1.2	400	11	12	649	23	40
13	104	4	1.1	350	10	9.7	1070	43	135
14	100	4	1.1	310	9	7.7	2850	100	799
15	98	4	1.0	290	8	6.5	3600	167	1630
16	94	4	.96	280	7	5.6	3310	129	1160
17	92	4	.92	400	13	14	2220	83	509
18	88	4	.86	814	34	75	1410	56	217
19	86	4	.83	2200	87	519	990	40	108
20	84	3	.79	6930	186	3500	791	34	72
21	82	3	.76	7230	162	3170	891	42	102
22	82	3	.74	6160	125	2090	1600	25	105
23	80	3	.71	3800	96	1010	1710	21	97
24	78	3	.68	2800	90	687	1370	48	174
25	76	3	.65	3060	110	914	1020	53	146
26	74	3	.62	2150	85	499	855	45	104
27	70	3	.57	1190	63	207	722	37	72
28	200	6	3.4	984	61	171	624	30	50
29	600	20	32	---	---	---	573	29	44
30	2500	64	431	---	---	---	543	27	40
31	10000	131	3540	---	---	---	507	25	34
TOTAL	16230	---	4039.19	64398	---	17510.5	35197	---	6569

## STREAMS TRIBUTARY TO LAKE ERIE

## 04198000 SANDUSKY RIVER NEAR FREMONT, OH--Continued

## SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	468	25	32	348	64	60	143	49	19
2	438	26	31	354	71	68	135	75	27
3	425	21	24	360	80	78	127	84	29
4	467	18	23	358	93	90	118	84	27
5	492	21	27	353	90	86	111	84	25
6	702	27	56	331	79	71	103	79	22
7	2990	81	700	316	73	63	97	72	19
8	5400	205	3030	323	71	62	88	76	18
9	4260	170	1980	322	69	60	84	84	19
10	3940	197	2280	318	72	61	78	92	19
11	5760	371	5870	317	74	64	74	82	16
12	10800	569	18900	323	76	67	70	64	12
13	15700	610	26000	306	78	64	66	52	9.3
14	11500	432	13500	288	78	61	62	52	8.7
15	8700	338	8000	266	79	57	60	39	6.4
16	4600	237	3040	247	75	50	170	41	19
17	2100	159	917	243	71	46	400	47	51
18	1450	116	456	240	70	45	270	50	36
19	1080	90	263	229	71	44	190	67	35
20	842	74	168	226	66	40	160	74	32
21	687	57	105	220	74	44	140	106	40
22	583	42	66	213	63	36	749	207	429
23	508	31	43	202	57	31	441	155	184
24	458	24	29	183	62	31	477	140	182
25	426	53	61	178	66	32	1590	276	1240
26	398	74	79	185	69	35	2500	453	3100
27	381	66	68	182	72	35	3990	637	6900
28	360	60	58	190	72	37	3090	517	4360
29	336	57	51	213	70	40	2960	438	3500
30	319	59	51	210	59	34	3710	461	4620
31	---	---	---	164	45	20	---	---	---
TOTAL	86570	---	85908	8208	---	1612	22253	---	25004.4
JULY			AUGUST			SEPTEMBER			
1	3120	350	2980	307	126	106	68	49	9.0
2	2250	258	1570	305	97	81	65	43	7.5
3	1380	189	719	210	65	37	59	36	5.6
4	1210	152	494	150	48	19	55	31	4.6
5	1250	186	623	161	43	19	53	28	4.0
6	746	193	392	218	65	39	56	25	3.8
7	452	165	202	447	112	136	57	22	3.4
8	352	140	134	350	89	85	51	19	2.7
9	408	120	131	225	65	40	49	17	2.2
10	536	102	148	158	49	21	46	14	1.8
11	385	93	96	149	38	15	44	13	1.5
12	296	79	64	149	30	12	35	15	1.4
13	227	64	39	160	30	13	32	18	1.6
14	190	62	32	587	135	234	30	18	1.4
15	221	68	40	490	134	180	36	16	1.6
16	233	70	44	374	107	108	36	15	1.5
17	238	61	39	330	89	80	41	15	1.6
18	206	51	29	227	74	46	37	14	1.4
19	158	36	15	143	62	24	34	14	1.3
20	139	27	10	116	52	16	32	13	1.1
21	139	21	8.0	109	48	14	28	13	.96
22	139	21	8.0	142	57	24	28	12	.92
23	131	24	8.4	509	145	201	34	12	1.1
24	131	26	9.2	379	128	132	32	11	.98
25	151	28	11	233	91	58	36	10	.98
26	142	29	11	143	67	26	57	8	1.3
27	133	31	11	107	53	15	46	6	.81
28	134	70	26	95	51	13	42	6	.67
29	135	99	36	101	52	14	39	6	.63
30	129	93	33	105	59	17	36	6	.58
31	138	89	33	77	56	12	---	---	---
TOTAL	15499	---	7995.6	7256	---	1837	1294	---	67.93
YEAR	324119		197780.90						

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04199000 HURON RIVER AT MILAN, OH

LOCATION.--Lat 41°18'04", long 82°36'36, in SW 1/4 sec. 4, T.5 N., R.22 W., Erie County, Hydrologic Unit 04100012, on right bank on upstream side of bridge on U.S. Highway 250, 0.2 mi northwest of Milan and 2.0 mi downstream from confluence of East and West Branches.

DRAINAGE AREA.--371 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1950 to September 1980, October 1987 to current year.

REVISED RECORDS.--WSP 1912: Drainage area. WDR OH-89-2: 1988.

GAGE.--Water-stage recorder. Datum of gage is 573.26 ft above sea level. July 29, 1953 to Oct. 5, 1979, water-stage recorder at site of former highway bridge 500 ft downstream at same datum. July 29, 1953, nonrecording gage at site of former highway 450 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 25 to Feb. 19, 26 to Mar. 4, Apr. 11, 12, May 5, 6, Jul. 20, Aug. 13-18, 21 to Sep. 13. Records fair, except for periods of estimated record, which are poor. Water-quality data collected at this site 1969 to 1974, 1978 to 1980, 1988 to 1991. Sediment data collected 1970 to 1974, 1988 to 1991.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	67	126	37	800	160	120	134	45	268	47	19
2	21	84	100	36	580	140	110	140	38	142	44	17
3	22	59	222	35	450	130	140	109	36	90	110	16
4	22	37	1100	34	350	120	200	96	34	69	51	15
5	19	32	2670	33	250	170	195	88	32	62	49	14
6	17	30	1010	31	200	295	645	83	32	54	156	13
7	17	28	474	31	150	444	1660	86	31	45	63	12
8	16	28	293	30	120	418	1620	93	28	70	41	22
9	19	25	216	29	100	287	681	88	26	57	34	35
10	18	23	180	28	90	213	1520	82	25	78	28	27
11	21	24	139	27	84	178	3000	71	24	61	28	22
12	19	23	94	27	76	193	6000	73	23	43	24	22
13	17	22	74	26	70	784	2430	68	25	37	700	21
14	17	61	64	25	66	1270	1520	63	22	39	450	20
15	15	521	63	24	70	755	831	62	20	60	220	19
16	17	293	61	24	80	503	537	63	20	63	180	18
17	22	1560	60	23	100	308	391	62	20	47	90	20
18	20	2210	58	23	400	255	299	60	18	36	60	21
19	22	727	60	22	1200	227	238	56	17	30	51	20
20	55	393	64	22	2400	218	203	52	95	27	55	21
21	120	247	77	21	1770	346	174	50	247	24	120	19
22	143	165	85	21	804	727	154	48	69	22	48	15
23	136	86	82	21	455	416	141	48	43	23	36	14
24	98	56	64	21	1120	298	128	44	132	25	45	13
25	31	41	58	20	501	222	118	118	675	40	35	31
26	21	35	54	20	300	168	111	244	322	27	28	25
27	17	578	50	200	220	157	109	87	1360	22	27	24
28	15	1020	46	2240	190	153	93	62	750	40	28	23
29	24	363	43	7000	---	145	93	53	1180	53	26	21
30	31	194	40	5000	---	137	101	46	537	50	20	19
31	51	---	38	1700	---	128	---	44	---	38	21	---
TOTAL	1104	9032	7765	16831	12996	9965	23562	2473	5926	1742	2915	598
MEAN	35.6	301	250	543	464	321	785	79.8	198	56.2	94.0	19.9
MAX	143	2210	2670	7000	2400	1270	6000	244	1360	268	700	35
MIN	15	22	38	20	66	120	93	44	17	22	20	12
CFSM	.10	.81	.68	1.46	1.25	.87	2.12	.22	.53	.15	.25	.05
IN.	.11	.91	.78	1.69	1.30	1.00	2.36	.25	.59	.17	.29	.06

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY)

	MEAN	55.9	178	348	456	538	700	557	298	205	182	84.8	76.1
MAX	402	1259	1909	1302	1422	1697	1536	929	980	1821	514	573	
(WY)	1991	1973	1991	1952	1959	1978	1957	1967	1981	1969	1958	1972	
MIN	7.86	14.0	9.23	26.8	24.0	117	86.0	46.5	14.9	11.8	11.3	5.76	
(WY)	1964	1964	1964	1977	1964	1981	1971	1962	1988	1963	1952	1955	

### SUMMARY STATISTICS FOR 1993 CALENDAR YEAR FOR 1994 WATER YEAR WATER YEARS 1951 - 1994

ANNUAL TOTAL	148679.9	94909	
ANNUAL MEAN	407	260	305
HIGHEST ANNUAL MEAN			528
LOWEST ANNUAL MEAN			145
HIGHEST DAILY MEAN	6400	Jan 5	31400
LOWEST DAILY MEAN	9.6	Aug 19	3.0
ANNUAL SEVEN-DAY MINIMUM	11	Aug 26	3.4
INSTANTANEOUS PEAK FLOW			9200e
INSTANTANEOUS PEAK STAGE			19.19c
INSTANTANEOUS LOW FLOW			12e
ANNUAL RUNOFF (CFSM)	1.10	.70	.82
ANNUAL RUNOFF (INCHES)	14.91	9.52	11.18
10 PERCENT EXCEEDS	1130	606	694
50 PERCENT EXCEEDS	71	61	84
90 PERCENT EXCEEDS	14	20	15

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

c Observed

e Estimated

## STREAMS TRIBUTARY TO LAKE ERIE

## 04199155 OLD WOMAN'S CREEK AT BERLIN ROAD NR HURON, OH

LOCATION.--Lat 41°20'54", long 82°30'50", Erie County, Hydrologic Unit 04100012, on left downstream side of Berlin Road Bridge, 3.8 mi southeast of Huron.

DRAINAGE AREA.--22.1 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1987 to current year (Discontinued).

GAGE.--Water-stage recorder. Datum of gage is 570 ft above sea level, Erie county benchmark.

REMARKS.--Estimated daily discharges: Dec. 22 to Jan. 27, 30 to Feb. 19, 26 to Mar. 4, 8-12. Records good except for periods of estimated record which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.35	2.6	5.7	1.7	14	9.0	8.0	11	2.4	8.0	.00	.08
2	.21	1.5	5.4	1.6	11	8.0	7.3	6.6	1.7	4.6	.00	.01
3	.22	1.1	11	1.5	9.0	7.5	17	5.3	1.3	3.1	.00	.00
4	.10	.97	113	1.4	7.0	7.0	26	4.8	1.0	2.2	.10	.00
5	.04	.98	183	1.3	6.2	20	18	4.5	.94	1.7	.48	.00
6	.01	.78	34	1.2	5.6	38	89	4.0	.81	1.7	.09	.00
7	.00	.66	18	1.2	5.2	44	143	3.8	.89	2.0	.00	.00
8	.00	.56	12	1.1	4.8	25	115	5.9	.85	2.2	.00	.00
9	.00	.48	8.6	1.1	4.5	15	52	4.7	.81	1.7	.00	.00
10	.00	.45	8.0	1.0	4.1	13	134	3.7	.67	.93	.00	.00
11	.00	.35	6.5	.96	3.9	12	63	3.2	.46	.56	.00	.00
12	.00	.21	4.7	.92	3.7	15	476	4.9	.40	.40	.00	.00
13	.00	.24	4.3	.88	3.5	100	123	3.8	.48	.23	108	.00
14	.00	3.7	4.2	.86	3.4	66	61	3.0	.53	.24	53	.00
15	.00	8.5	4.6	.82	4.0	45	37	2.9	.38	.33	8.9	.00
16	.00	3.9	4.6	.80	6.0	26	26	2.6	.22	.24	3.0	.00
17	.02	84	4.1	.78	10	16	18	2.3	.14	.13	1.4	.00
18	.36	52	4.2	.76	30	15	14	2.2	.05	.08	.99	.00
19	.13	13	4.7	.74	100	13	13	2.1	.01	.03	.66	.00
20	.06	7.0	4.6	.72	124	13	9.8	2.0	.79	.00	.69	.00
21	1.5	4.3	5.9	.72	74	33	8.3	1.7	24	.00	4.4	.00
22	.49	3.0	5.5	.70	38	41	7.3	1.5	4.3	.00	3.0	.00
23	.20	2.4	4.8	.68	45	23	6.8	1.3	1.4	.00	1.2	.00
24	.10	2.2	4.0	.68	74	18	6.2	1.3	11	.00	.67	.00
25	.05	1.9	3.5	1.0	30	13	5.6	9.5	28	.26	.44	.00
26	.04	1.8	3.0	3.5	15	10	5.1	9.5	13	.02	.32	.00
27	.03	46	2.7	20	12	12	5.1	3.8	99	.00	.20	.00
28	.03	34	2.4	728	10	11	4.2	2.3	24	.00	.15	.00
29	.02	13	2.1	344	---	10	4.8	1.7	26	.00	.19	.00
30	.09	7.8	1.9	40	---	9.3	6.4	1.2	21	.00	.09	.00
31	2.8	---	1.8	21	---	8.5	---	1.1	---	.00	.09	---
TOTAL	6.85	299.38	482.8	1181.62	657.9	696.3	1509.9	118.2	266.53	30.65	188.06	0.09
MEAN	.22	9.98	15.6	38.1	23.5	22.5	50.3	3.81	8.88	.99	6.07	.003
MAX	2.8	84	183	728	124	100	476	11	99	8.0	108	.08
MIN	.00	.21	1.8	.68	3.4	7.0	4.2	1.1	.01	.00	.00	.00
CFSM	.01	.45	.70	1.72	1.06	1.02	2.28	.17	.40	.04	.27	.00
IN.	.01	.50	.81	1.99	1.11	1.17	2.54	.20	.45	.05	.32	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1994, BY WATER YEAR (WY)

	1988	1989	1990	1991	1992	1993	1994
MEAN	3.30	15.1	25.4	30.2	34.6	30.2	39.4
MAX	14.8	68.4	98.2	74.8	78.6	86.3	58.9
(WY)	1991	1993	1991	1993	1990	1993	1989
MIN	.16	.31	.70	8.03	10.3	12.4	18.4
(WY)	1989	1992	1992	1988	1989	1990	1988

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1988 - 1994

ANNUAL TOTAL	8311.94	5438.28	
ANNUAL MEAN	22.8	14.9	17.9
HIGHEST ANNUAL MEAN			29.7
LOWEST ANNUAL MEAN			8.77
HIGHEST DAILY MEAN	477	728	728
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		972	1130
INSTANTANEOUS PEAK STAGE		10.83	11.66
INSTANTANEOUS LOW FLOW		.00	
ANNUAL RUNOFF (CFSM)	1.03	.67	.81
ANNUAL RUNOFF (INCHES)	13.99	9.15	11.00
10 PERCENT EXCEEDS	57	31	38
50 PERCENT EXCEEDS	3.0	2.2	4.0
90 PERCENT EXCEEDS	.00	.00	.00



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04199165 OLD WOMAN'S CREEK AT U.S. 6 AT HURON, OH

LOCATION.--Lat 41°22'51", long 82°30'53", Erie County, Hydrologic Unit 04100012, on left bank at U.S. Highway 6 and State Highway 2 bridge, 0.75 mi east of Huron.

DRAINAGE AREA.--26.5 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1980 to current year (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 560.00 ft above sea level. Oct. 1982 to Sept. 1985 at same site at datum 0.10 ft lower.

REMARKS.--Interruptions in record are due to malfunctions of the instruments.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 22.20 ft Feb. 5, 1988 due to ice jam;

minimum recorded gage height, 9.95 ft Dec. 16, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 16.12 ft Jun. 27; minimum recorded gage height, 11.78 ft Dec. 29, 31, Jan. 21.

### GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	12.61	12.06	---	---	---	13.55	14.47	13.62	13.82	13.75
2	---	---	12.38	12.50	---	---	---	13.45	14.46	13.66	13.80	13.75
3	---	13.55	12.50	12.77	---	---	---	13.63	14.46	13.90	13.79	13.73
4	---	13.57	13.15	13.16	---	---	---	13.58	14.46	13.97	13.83	13.72
5	---	13.60	13.21	12.73	---	---	---	13.49	14.45	13.99	13.96	13.72
6	---	13.59	12.30	12.76	---	---	---	13.50	14.44	13.99	13.99	13.72
7	---	13.60	12.55	13.18	---	---	---	13.76	14.42	14.02	13.99	13.70
8	---	13.60	12.58	12.33	---	---	---	13.82	14.41	14.06	13.97	13.68
9	---	13.59	12.48	12.18	---	---	---	13.31	14.41	14.07	13.95	13.69
10	---	13.59	12.51	12.51	---	---	---	13.45	14.39	14.05	13.95	13.67
11	---	13.60	13.24	12.25	---	---	---	13.38	14.38	14.04	13.94	13.65
12	---	13.57	12.69	12.49	---	---	---	13.38	14.36	14.04	13.94	13.64
13	---	13.60	12.68	12.34	---	---	---	13.51	14.35	14.02	14.18	13.63
14	---	13.67	13.24	12.32	---	---	13.30	13.57	14.34	14.00	14.11	13.62
15	---	13.82	13.65	12.02	---	---	13.33	13.63	14.32	14.00	13.61	13.62
16	---	13.88	13.74	12.11	---	---	12.97	13.65	14.31	13.99	13.49	13.61
17	---	14.13	13.81	12.02	---	---	13.32	13.86	14.29	13.98	13.55	13.58
18	---	15.26	13.87	11.85	---	---	13.44	13.91	14.27	13.96	13.63	13.57
19	---	15.54	13.93	11.93	---	---	13.32	13.93	14.24	13.95	13.62	13.57
20	---	15.63	14.00	12.21	---	---	13.50	13.94	14.25	13.93	13.63	13.56
21	---	15.69	14.05	12.04	---	---	13.47	13.95	14.42	13.91	13.69	13.55
22	---	15.72	12.80	12.05	---	---	13.59	13.97	14.54	13.91	13.80	13.53
23	---	15.72	12.87	12.08	---	---	13.40	13.97	14.56	13.92	13.83	13.51
24	---	15.73	12.09	12.15	---	---	13.21	13.98	14.65	13.92	13.83	13.50
25	---	15.74	12.43	12.65	---	---	13.35	14.03	14.95	13.92	13.83	13.52
26	---	15.75	12.26	13.18	---	---	13.41	14.27	15.12	13.90	13.83	13.52
27	---	15.68	12.56	13.14	---	---	13.35	14.43	15.55	13.89	13.82	13.51
28	---	12.54	12.59	---	---	---	14.05	14.47	13.62	13.87	13.81	13.50
29	---	12.29	12.20	---	---	---	13.73	14.49	13.52	13.87	13.80	13.47
30	---	12.64	12.16	---	---	---	13.90	14.49	13.62	13.86	13.78	13.46
31	---	---	11.93	---	---	---	---	14.49	---	13.84	13.77	---
MEAN	---	---	12.87	---	---	---	---	13.83	14.40	13.94	13.82	13.61
MAX	---	---	14.05	---	---	---	---	14.49	15.55	14.07	14.18	13.75
MIN	---	---	11.93	---	---	---	---	13.31	13.52	13.62	13.49	13.46

## STREAMS TRIBUTARY TO LAKE ERIE

## 04199175 LAKE ERIE AT RUGGLES BEACH, OH

LOCATION.--Lat 41°22'59", long 82°28'22", Erie County, Hydrologic Unit 04100012, on left bank, at mouth of Cranberry Creek, at Ruggles Beach, 4.5 mi east of Huron.

PERIOD OF RECORD.--Oct. 29, 1986 to current year (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 560.00 ft above sea level. Gage height of orifice is 10.98 ft. minimum water surface can be lower.

REMARKS.--Interruptions in record are due to malfunctions of the instruments.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded gage height, 17.98 ft Jan. 19, 1987; minimum recorded gage height, 10.98 ft several days in 1990, 1991, 1992 and 1993.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 14.88 ft Aug. 5, minimum recorded gage height, 11.11 ft Jan. 8.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	12.96	13.07	12.61	---	12.96	13.33	13.73	---	---	13.78	13.67
2	---	12.82	12.85	13.10	---	13.19	13.30	---	---	---	13.80	13.70
3	---	12.35	12.97	13.48	---	12.83	13.42	---	---	---	13.84	13.73
4	---	12.59	13.40	13.55	---	12.79	13.34	---	---	---	13.52	13.77
5	---	12.41	13.27	12.72	---	12.82	13.51	---	---	---	14.06	13.71
6	---	12.99	12.63	13.33	---	12.88	14.00	---	---	---	13.94	13.51
7	---	12.46	12.98	13.58	---	12.85	13.55	---	---	---	13.81	13.45
8	---	12.45	13.04	11.95	---	12.77	13.66	---	---	---	13.74	13.29
9	---	12.65	12.94	12.65	---	13.34	13.41	---	---	---	13.76	13.38
10	---	12.83	12.97	12.98	---	12.96	13.58	---	---	---	13.80	13.58
11	---	12.54	13.44	12.69	---	13.01	13.74	---	---	---	13.76	13.50
12	---	12.99	13.06	12.94	---	12.91	13.92	---	---	---	13.77	13.35
13	---	12.67	13.15	12.83	---	13.01	13.67	---	---	---	13.50	13.26
14	---	12.94	13.51	12.75	---	12.94	13.77	---	---	14.12	13.78	13.34
15	---	12.76	13.51	12.37	---	12.99	13.82	---	---	13.96	13.82	13.44
16	---	12.94	13.34	12.59	12.66	13.12	13.36	---	---	14.01	13.87	13.32
17	---	13.19	13.13	12.39	12.61	13.10	13.77	---	---	14.03	13.91	13.38
18	---	13.05	13.03	12.07	12.66	13.22	13.93	---	---	13.95	13.84	13.35
19	---	12.54	12.89	12.40	12.63	13.00	13.83	---	---	13.97	13.82	13.37
20	13.31	12.46	12.93	12.68	12.59	13.16	13.95	---	---	13.93	13.71	13.29
21	12.27	12.34	12.72	12.46	12.75	13.17	13.86	---	---	13.89	13.83	13.32
22	12.83	12.59	12.73	12.52	13.20	13.13	13.93	---	---	13.76	13.95	13.33
23	13.09	12.99	13.20	12.50	13.63	13.17	13.91	---	---	13.79	13.80	13.43
24	12.78	13.23	12.40	---	12.17	13.16	13.72	---	---	13.81	13.77	13.43
25	13.14	13.48	12.73	---	12.96	13.27	13.86	---	---	13.84	13.66	13.37
26	13.16	13.02	12.70	---	13.07	13.41	13.92	---	---	13.80	13.72	13.26
27	12.96	12.99	13.02	---	12.88	13.35	13.84	---	---	13.95	13.75	12.91
28	12.51	12.92	13.07	---	12.88	13.41	14.16	---	---	13.91	13.40	12.58
29	12.37	12.73	12.58	---	---	13.29	13.95	---	---	13.95	13.71	12.98
30	13.24	13.08	12.67	---	---	13.32	14.18	---	---	13.82	13.75	13.22
31	13.63	---	12.43	---	---	13.37	---	---	---	13.81	13.61	---
MEAN	---	12.80	12.98	---	---	13.09	13.74	---	---	---	13.77	13.37
MAX	---	13.48	13.51	---	---	13.41	14.18	---	---	---	14.06	13.77
MIN	---	12.34	12.40	---	---	12.77	13.30	---	---	---	13.40	12.58

# STREAMS TRIBUTARY TO LAKE ERIE

81

## 04200500 BLACK RIVER AT ELYRIA, OH

LOCATION.--Lat 41°22'49", long 82°06'17", in T.6 N., R.17 W., Lorain County, Hydrologic Unit 04110001, on left bank in Cascade Park at Elyria, 0.8 mi downstream from confluence of East and West Branches.

DRAINAGE AREA.--396 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1944 to current year. Records for May 1903 to July 1906 (published as "near Elyria")

published in WSP 97, 129, and 205, are unreliable and should not be used.

REVISED RECORDS.--WSP 1912: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 620.83 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 1 to Jan. 28, 30 to Mar. 8. Records fair, except for periods of estimated record and for discharges greater than 1,000 ft<sup>3</sup>/s, which are poor. Some regulation at low flow for industrial use. Water-quality data collected at this site 1969 to 1974. Sediment data collected 1970 to 1974.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	250	260	68	500	140	137	69	32	425	17	11
2	150	900	200	60	380	120	113	71	23	189	16	10
3	50	400	300	54	280	100	133	74	20	107	14	8.9
4	25	150	800	48	220	100	178	64	17	71	46	8.1
5	20	80	2600	44	180	170	205	53	16	103	38	7.5
6	17	45	1000	41	140	300	505	48	15	64	23	7.2
7	14	36	620	38	110	500	2190	45	15	52	23	6.6
8	12	32	480	35	90	520	1960	58	12	70	22	6.8
9	15	29	200	33	74	407	768	53	12	57	19	9.5
10	30	27	180	31	64	274	1500	58	10	39	16	7.6
11	25	25	170	30	56	221	2350	56	9.5	42	17	7.3
12	20	25	170	28	50	251	4730	62	9.2	41	13	6.9
13	17	30	160	27	45	748	9900	45	13	29	834	6.2
14	15	500	150	25	42	1740	4620	37	15	29	560	6.2
15	13	1600	180	24	40	1200	1200	40	46	27	245	7.2
16	12	400	250	23	48	759	609	36	15	21	198	17
17	25	2500	200	22	60	408	408	35	11	23	86	19
18	19	3000	160	21	110	262	278	51	9.9	21	49	17
19	16	1000	210	21	400	220	215	44	9.8	16	34	15
20	14	500	190	20	1500	201	176	37	34	15	35	10
21	15	350	219	20	2200	335	143	33	233	18	39	12
22	25	200	259	19	1300	979	119	32	147	16	27	9.7
23	20	150	251	19	660	703	103	30	63	23	20	9.4
24	17	120	210	22	1510	386	91	27	194	274	26	9.2
25	16	110	170	70	500	284	83	72	187	118	21	29
26	15	100	140	150	300	217	74	141	106	54	17	31
27	16	1000	120	300	230	184	69	98	645	33	15	19
28	17	1900	100	1500	180	176	62	56	1020	45	16	20
29	20	700	90	8740	---	176	57	38	1790	23	15	20
30	35	540	80	3000	---	174	61	29	1350	25	12	14
31	100	---	72	800	---	161	---	28	---	18	13	---
TOTAL	905	16699	10191	15333	11269	12416	33037	1620	6079.4	2088	2526	368.3
MEAN	29.2	557	329	495	402	401	1101	52.3	203	67.4	81.5	12.3
MAX	150	3000	2600	8740	2200	1740	9900	141	1790	425	834	31
MIN	12	25	72	19	40	100	57	27	9.2	15	12	6.2
CFSM	.07	1.41	.83	1.25	1.02	1.01	2.78	.13	.51	.17	.21	.03
IN.	.09	1.57	.96	1.44	1.06	1.17	3.10	.15	.57	.20	.24	.03

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1994, BY WATER YEAR (WY)

	MEAN	57.9	229	398	468	613	807	625	353	202	145	70.3	70.1
MAX	431	1238	1885	1825	1505	1866	1728	1122	1245	1472	529	701	
(WY)	1991	1986	1991	1952	1959	1978	1957	1969	1947	1969	1958	1972	
MIN	2.34	5.78	5.82	8.48	16.6	135	22.0	50.0	10.6	7.42	4.72	2.84	
(WY)	1945	1945	1945	1945	1964	1953	1946	1963	1988	1991	1952	1946	

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1945 - 1994	
ANNUAL TOTAL	155058.5		112531.7			
ANNUAL MEAN	425		308		335	
HIGHEST ANNUAL MEAN					534	
LOWEST ANNUAL MEAN					130	
HIGHEST DAILY MEAN	5990		9900		24900	
LOWEST DAILY MEAN	3.2		6.2		.60	
ANNUAL SEVEN-DAY MINIMUM	3.9		7.2		1.4	
INSTANTANEOUS PEAK FLOW			11200		51700	
INSTANTANEOUS PEAK STAGE			15.53		26.40	
INSTANTANEOUS LOW FLOW			6.2			
ANNUAL RUNOFF (CFSM)	1.07		.78		.85	
ANNUAL RUNOFF (INCHES)	14.57		10.57		11.49	
10 PERCENT EXCEEDS	1370		721		820	
50 PERCENT EXCEEDS	87		57		72	
90 PERCENT EXCEEDS	7.1		14		10	

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

## STREAMS TRIBUTARY TO LAKE ERIE

## 04201500 ROCKY RIVER NEAR BERE, OH

LOCATION.--Lat 41°24'24", long 81°53'14", in T.6 N., R.15 W., Cuyahoga County, Hydrologic Unit 04110001, on right bank at downstream side of Cedar Point Road Bridge in Rocky River Reservation, just downstream from confluence of East and West Branches, and 3.0 mi northwest of Berea.

DRAINAGE AREA.--267 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1923 to September 1935, September 1943 to current year. Monthly discharge only for October 1923, published in WSP 1307.

REVISED RECORDS.--WSP 1437: 1924, 1925(M), 1926, 1927(M), 1928-29, 1930-35(M), 1945. WSP 1912: Drainage area.

WDR-OH-2-1983: 1978-1982(M).

GAGE.--Water-stage recorder. Datum of gage is 649.90 ft above sea level (Cuyahoga County bench mark). Prior to Sept. 30, 1935, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 23 to Jan. 28, 31 to Feb. 21, 25 to Mar. 13. Records good except for periods of estimated record which are poor. Some regulation at low flow by small reservoirs on East Branch. Some interbasin transfer of water from Lake Erie for municipal water supply by Cleveland Metro Water District. Water-quality data collected at this site 1964 to 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 20.9 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	166	878	289	70	190	100	192	177	98	180	24	29
2	296	375	255	60	140	96	165	157	74	94	19	25
3	124	230	527	54	110	92	217	111	52	63	18	24
4	79	239	1250	50	90	110	372	93	41	48	104	26
5	53	182	2690	46	74	170	264	85	38	44	232	21
6	44	122	768	43	62	280	1130	81	35	44	101	19
7	41	98	563	40	54	400	2690	80	31	68	49	17
8	37	80	366	37	49	422	997	163	30	225	31	15
9	108	68	268	35	45	250	468	147	29	154	23	19
10	108	59	227	33	41	190	2400	95	28	93	20	21
11	85	55	225	31	39	180	1430	72	35	55	30	21
12	56	53	228	29	37	180	6450	130	34	39	32	20
13	46	56	222	28	35	400	5140	84	42	33	1320	16
14	42	861	214	27	34	1450	1920	71	45	66	1330	23
15	38	1670	257	26	33	828	793	89	34	68	398	30
16	35	471	450	25	32	522	598	224	32	54	122	26
17	211	2730	275	24	35	305	408	194	30	38	67	41
18	249	2880	212	23	60	250	301	119	30	30	52	44
19	122	657	275	22	270	240	241	87	26	20	40	32
20	85	417	265	21	1600	233	194	71	35	16	37	29
21	102	283	296	20	1100	769	158	62	233	66	154	21
22	81	206	337	20	490	1280	132	57	81	79	145	16
23	56	166	250	20	324	487	118	48	49	77	63	15
24	47	142	200	35	772	354	106	47	140	72	42	14
25	40	130	180	160	250	317	101	113	216	72	35	26
26	39	114	150	320	190	220	99	537	122	39	28	146
27	36	1250	130	760	150	222	124	209	294	31	65	95
28	40	1890	120	4600	110	253	124	98	245	36	88	58
29	37	706	100	7330	---	245	148	69	1500	38	55	62
30	44	410	90	1350	---	284	149	55	542	48	43	45
31	350	---	80	280	---	238	---	52	---	34	34	---
TOTAL	2897	17478	11759	15619	6416	11367	27629	3677	4221	2024	4801	996
MEAN	93.5	583	379	504	229	367	921	119	141	65.3	155	33.2
MAX	350	2880	2690	7330	1600	1450	6450	537	1500	225	1330	146
MIN	35	53	80	20	32	92	99	47	26	16	18	14
CFSM	.35	2.18	1.42	1.89	.86	1.37	3.45	.44	.53	.24	.58	.12
IN.	.40	2.44	1.64	2.18	.89	1.58	3.85	.51	.59	.28	.67	.14

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1994, BY WATER YEAR (WY)

	MEAN	88.5	218	345	394	474	602	500	289	168	116	73.7	97.1
MAX	935	1080	1534	1398	1245	1253	1374	845	911	887	553	820	
(WY)	1927	1986	1991	1930	1959	1984	1961	1984	1947	1992	1935	1924	
MIN	1.25	9.14	8.15	32.4	17.0	141	40.9	17.6	10.1	4.25	.90	.94	
(WY)	1934	1964	1964	1945	1934	1969	1946	1934	1933	1954	1933	1933	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1924 - 1994

ANNUAL TOTAL	144747	108884	
ANNUAL MEAN	397	298	
HIGHEST ANNUAL MEAN			279
LOWEST ANNUAL MEAN			462
HIGHEST DAILY MEAN	6400	Jan 5	79.5
LOWEST DAILY MEAN	17	Aug 26	1993
ANNUAL SEVEN-DAY MINIMUM	18	Aug 23	1934
INSTANTANEOUS PEAK FLOW			14300
INSTANTANEOUS PEAK STAGE			.20
INSTANTANEOUS LOW FLOW			.27
ANNUAL RUNOFF (CFSM)	1.49	1.12	1.05
ANNUAL RUNOFF (INCHES)	20.17	15.17	14.22
10 PERCENT EXCEEDS	1090	577	652
50 PERCENT EXCEEDS	143	93	81
90 PERCENT EXCEEDS	30	27	10

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04202000 CUYAHOGA RIVER AT HIRAM RAPIDS, OH

LOCATION.--Lat 41°20'26", long 81°10'01", in T.5 N., R.7 W., Portage County, Hydrologic Unit 04110002, on left bank at downstream side of bridge on Winchell Road at Hiram Rapids, 0.6 mi downstream from Black Brook.

DRAINAGE AREA.--151 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1927 to December 1935 (published as "near Hiram"), October 1944 to current year.

REVISED RECORDS.--WSP 1054: 1945. WSP 1437: 1931. WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,087.46 ft above sea level. Prior to Aug. 26, 1927, nonrecording gage and Aug. 26, 1927, to Dec. 31, 1935, water-stage recorder, at site 2.8 mi downstream at different datum. Oct. 20, 1944, to Oct. 22, 1946, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Dec. 27-31, Jan. 6-28, and Feb. 4-15. Records good except for estimated daily discharges, which are poor. Flow regulated by East Branch Reservoir, usable capacity, 4,140 acre-ft, 14.6 mi upstream since 1939 and by LaDue Reservoir, usable capacity, 18,110 acre-ft, 9.8 mi upstream since 1961. Water-quality data collected at this site 1965 to 1977.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3670 ft<sup>3</sup>/s Jan. 23, 1959, gage height 8.11 ft; minimum daily, 6.6 ft<sup>3</sup>/s Sept. 10, 1933.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	97	414	123	1500	292	245	85	53	193	59	70
2	122	131	342	120	1430	235	212	84	78	172	57	72
3	111	141	272	123	1300	186	209	76	68	143	56	87
4	96	149	245	122	1100	167	211	69	55	111	56	91
5	80	155	314	125	900	173	212	65	45	88	77	91
6	62	158	387	120	740	185	223	64	40	77	94	89
7	51	147	468	120	660	247	310	63	38	117	81	99
8	45	124	456	120	580	344	393	72	37	140	68	127
9	44	94	399	115	500	408	435	75	36	153	62	135
10	45	71	329	115	430	394	514	74	33	136	60	137
11	45	58	273	115	370	430	555	69	31	110	59	137
12	42	50	220	110	320	329	784	79	37	89	60	134
13	41	45	186	105	270	282	1120	80	44	76	297	134
14	40	67	188	105	250	326	1450	69	51	70	969	133
15	39	151	177	100	240	445	1350	68	65	71	1380	138
16	39	188	179	100	238	554	1080	146	66	70	1240	169
17	50	282	193	98	242	619	851	158	62	65	955	192
18	89	447	215	96	258	604	659	154	75	62	727	204
19	101	572	245	92	297	538	528	138	78	60	568	209
20	92	625	265	90	483	463	431	113	77	60	460	210
21	88	551	288	90	771	487	345	88	76	60	369	208
22	86	451	302	88	1020	688	280	71	77	70	284	207
23	74	350	305	86	965	915	214	61	80	72	212	206
24	64	251	295	86	815	901	139	54	85	69	147	203
25	57	179	276	84	653	784	99	62	107	74	110	201
26	51	128	255	82	541	661	80	73	119	73	87	202
27	44	127	220	80	558	552	69	67	130	73	75	201
28	37	224	200	300	464	468	64	61	142	66	71	200
29	37	327	180	1040	---	401	67	53	161	69	79	214
30	37	424	150	1240	---	340	82	47	189	66	76	219
31	46	---	130	1500	---	289	---	42	---	62	71	---
TOTAL	1980	6764	8368	6890	17895	13707	13211	2480	2235	2817	8966	4719
MEAN	63.9	225	270	222	639	442	440	80.0	74.5	90.9	289	157
MAX	125	625	468	1500	1500	915	1450	158	189	193	1380	219
MIN	37	45	130	80	238	167	64	42	31	60	56	70
CFSM	.42	1.49	1.79	1.47	4.23	2.93	2.92	.53	.49	.60	1.92	1.04
IN.	.49	1.67	2.06	1.70	4.41	3.38	3.25	.61	.55	.69	2.21	1.16

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1994, BY WATER YEAR (WY)

	MEAN	108	205	281	267	367	455	356	199	129	102	94.8	110
	MAX	315	616	816	707	883	835	649	569	542	325	307	374
	(WY)	1991	1986	1978	1993	1976	1963	1961	1984	1989	1969	1992	1975
	MIN	39.0	33.5	45.2	43.5	56.6	174	134	59.8	35.2	48.4	37.1	36.6
	(WY)	1984	1992	1961	1961	1963	1989	1986	1987	1991	1991	1961	1967

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR

#### FOR 1994 WATER YEAR

#### WATER YEARS 1961 - 1994

ANNUAL TOTAL	94874	90032	
ANNUAL MEAN	260	247	222
HIGHEST ANNUAL MEAN			301
LOWEST ANNUAL MEAN			131
HIGHEST DAILY MEAN	1610	1500	3250
LOWEST DAILY MEAN	20	31	12
ANNUAL SEVEN-DAY MINIMUM	35	36	13
INSTANTANEOUS PEAK FLOW		1560	3320
INSTANTANEOUS PEAK STAGE		5.31	7.67
INSTANTANEOUS LOW FLOW		31	
ANNUAL RUNOFF (CFSM)	1.72	1.63	1.47
ANNUAL RUNOFF (INCHES)	23.37	22.18	19.99
10 PERCENT EXCEEDS	584	575	520
50 PERCENT EXCEEDS	164	133	127
90 PERCENT EXCEEDS	47	56	43

LOCATION.--Lat 41°08'08", long 81°32'50", Summit County, Hydrologic Unit 04110002, on right bank 230 ft upstream from North Portage Path bridge at Old Portage, 1.2 mi downstream from Little Cuyahoga River, and 4 mi northwest of Akron City Hall.

PERIOD OF RECORD.--September 1921 to December 1935, March 1939 to current year.

REVISED RECORDS.--WSP 1307: 1924(M). WSP 1912: Drainage area. WDR OH-79-2: 1974 (M), 1976 (M).

GAGE.--Water-stage recorder. Datum of gage is 740.11 ft above sea level, unadjusted. Prior to Dec. 21, 1923, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Jan. 15-26, 30 to Feb. 1, 9-15, Mar. 1-5. Records good, except those for estimated daily discharges, which are fair. Natural flow of stream affected by diversions, storage reservoirs and power plants. At Lake Rockwell, 17.7 mi upstream from gage, an average of 74 ft<sup>3</sup>/s was diverted for municipal supply of city of Akron. Sewage from city enters river 2.9 mi downstream from station. Some diversion from the Tuscarawas River basin drainage into this basin at Portage Lakes (see REMARKS for station 03117000 in volume 1 of this report). Sediment data collected at this site 1972-1981. Satellite telemeter at gage.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	139	379	781	312	1640	600	626	358	189	301	116	174
2	125	273	750	299	1530	470	523	321	148	457	167	153
3	112	231	660	308	1270	430	575	286	142	426	146	139
4	95	219	823	318	1070	400	606	263	137	346	170	132
5	78	200	1100	298	873	380	541	248	140	301	194	132
6	76	191	943	296	737	444	716	235	148	215	145	130
7	74	183	854	312	650	501	1040	232	143	1360	129	110
8	76	171	872	295	605	684	950	256	132	1960	128	120
9	129	161	837	314	470	641	838	238	170	1000	126	213
10	109	168	743	321	410	704	1750	221	182	618	111	137
11	89	151	679	323	350	674	1760	216	129	497	114	128
12	80	144	569	300	290	710	3560	212	110	365	114	118
13	79	162	489	294	250	797	4070	203	112	295	477	114
14	77	1320	460	230	240	978	3730	194	111	301	1240	121
15	78	887	420	220	230	1070	3490	295	103	272	1360	212
16	80	656	402	210	303	1080	3010	321	123	252	1490	181
17	353	1290	372	210	360	1040	2260	326	118	231	1510	293
18	187	1460	380	200	398	1050	1670	336	104	207	1350	227
19	215	1270	412	200	497	1010	1310	334	100	183	1070	218
20	259	1130	447	190	814	901	1060	295	109	161	886	213
21	385	1140	510	190	1360	1080	891	244	138	244	790	205
22	216	982	500	190	1410	1390	722	207	121	239	594	204
23	213	787	474	180	1680	1360	605	181	100	185	478	207
24	218	606	455	180	1860	1540	526	188	200	182	383	219
25	187	456	440	180	1540	1560	468	295	261	158	305	232
26	152	369	401	180	1220	1350	333	313	157	136	194	289
27	157	934	408	503	972	1200	316	271	148	137	186	276
28	153	1010	399	2190	818	1040	286	244	120	167	181	257
29	141	843	409	1830	---	939	350	207	316	161	189	246
30	154	763	348	1640	---	823	316	170	229	217	187	247
31	245	---	334	1440	---	739	---	157	---	123	182	---
TOTAL	4731	18536	17671	14153	23847	27585	38898	7867	4440	11697	14712	5647
MEAN	153	618	570	457	852	890	1297	254	148	377	475	188
MAX	385	1460	1100	2190	1860	1560	4070	358	316	1960	1510	293
MIN	74	144	334	180	230	380	286	157	100	123	111	111

MEAN	212	324	470	563	670	878	741	463	305	233	183	209
MAX	1205	1307	1516	1807	1592	1416	1520	1225	1371	676	772	1150
(WY)	1927	1986	1928	1952	1976	1927	1940	1984	1989	1976	1992	1926
MIN	50.8	56.5	48.3	83.3	86.1	282	166	77.0	72.4	50.4	56.9	47.1
(WY)	1934	1964	1964	1961	1963	1931	1935	1934	1988	1954	1962	1964

ANNUAL TOTAL	213206		189784			
ANNUAL MEAN	584		520		437	
HIGHEST ANNUAL MEAN					669	1927
LOWEST ANNUAL MEAN					181	1934
HIGHEST DAILY MEAN	3290	Jan 5	4070	Apr 13	6040	Jan 22 1959
LOWEST DAILY MEAN	70	Aug 27	74	Oct 7	24	Sep 24 1964
ANNUAL SEVEN-DAY MINIMUM	78	Aug 23	85	Oct 10	40	Oct 30 1944
INSTANTANEOUS PEAK FLOW			4550	Apr 12	6500	Jan 21 1959
INSTANTANEOUS PEAK STAGE			10.73	Apr 12	13.29	Sep 14 1979
INSTANTANEOUS LOW FLOW			74	Oct 7		
10 PERCENT EXCEEDS	1430		1270		1030	
50 PERCENT EXCEEDS	378		298		264	
90 PERCENT EXCEEDS	94		126		76	

## 04206208 YELLOW CREEK AT GHENT, OH

LOCATION.--Lat 41°09'29", long 81°38'32", Summit County, Hydrologic Unit 04110002, on left downstream bank at driveway bridge of Creekside Farm at 3680 Granger Road, 150 ft south of Granger Road, 0.25 mi west of Cleveland-Massillon Road, 2.9 mi northwest of Akron corporate boundary.

DRAINAGE AREA.--12.7 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 908 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 12-16, 18, 22-30, Nov. 6, 12, Dec. 26 to Jan. 21, 26, 27, 30 to Feb. 3, 10-12, 26, 27, Mar. 1, 2. Records fair, except for periods of estimated record and discharges less than 3.0 ft<sup>3</sup>/s, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	22	12	8.5	19	12	12	17	8.1	7.3	2.3	3.4
2	4.5	13	12	8.0	16	11	11	14	5.7	6.8	2.3	3.1
3	4.1	13	16	7.7	14	12	14	12	5.0	6.6	2.0	3.0
4	3.5	12	34	7.7	15	13	14	11	4.7	5.2	3.2	3.0
5	3.3	8.6	52	7.3	16	15	13	12	4.6	4.8	4.5	2.8
6	3.3	7.3	24	7.3	15	16	32	11	4.6	4.3	3.0	2.6
7	3.2	6.8	18	7.3	12	16	47	11	4.4	4.5	2.5	2.7
8	3.0	5.9	14	7.3	13	16	23	14	4.0	5.0	2.3	2.5
9	5.4	5.7	13	7.3	13	13	16	12	3.9	4.1	2.4	4.0
10	6.0	5.5	11	7.3	8.0	13	69	10	3.8	3.4	2.5	2.7
11	4.1	5.4	12	7.0	7.7	12	36	9.3	3.5	3.2	2.8	2.1
12	3.2	4.6	12	7.0	14	13	162	9.6	3.5	3.0	3.5	2.0
13	3.0	5.0	14	7.0	13	28	94	10	3.5	2.9	19	1.9
14	2.6	46	11	7.0	11	38	51	8.1	3.7	4.3	25	1.7
15	2.4	31	13	7.0	11	33	39	13	3.4	3.4	8.1	2.5
16	2.8	13	13	7.0	12	21	36	14	3.5	2.8	4.8	2.0
17	12	60	13	7.0	12	15	24	11	3.5	2.6	4.0	3.3
18	7.3	38	14	6.5	16	15	20	12	3.9	2.5	3.6	3.2
19	5.7	17	14	6.5	33	15	18	8.8	3.3	2.4	3.4	2.3
20	6.8	13	11	6.5	58	14	17	7.3	3.3	2.3	3.8	2.0
21	5.8	10	12	6.5	45	31	16	6.5	4.2	3.4	13	1.8
22	4.0	8.8	12	7.8	24	29	15	6.2	3.3	4.9	6.2	1.6
23	3.7	8.1	11	7.8	24	18	15	7.6	3.1	7.0	4.5	1.7
24	3.5	7.7	9.9	9.2	34	19	15	7.2	4.9	3.6	3.8	2.0
25	3.2	7.3	10	12	20	15	14	11	6.4	2.9	3.6	2.4
26	3.0	8.2	9.9	12	15	13	14	11	4.6	3.5	3.4	4.4
27	2.8	48	9.9	23	12	16	14	8.5	8.4	2.7	3.7	4.1
28	2.8	40	9.0	175	14	15	12	6.5	5.6	2.7	4.5	4.0
29	2.8	20	9.0	105	---	15	15	5.9	27	2.9	4.2	3.4
30	3.5	14	8.5	36	---	15	14	5.4	13	2.9	3.4	3.2
31	11	---	8.5	22	---	12	---	5.4	---	2.5	3.4	---
TOTAL	137.6	504.9	442.7	560.5	516.7	539	892	308.3	164.4	120.4	158.7	81.4
MEAN	4.44	16.8	14.3	18.1	18.5	17.4	29.7	9.95	5.48	3.88	5.12	2.71
MAX	12	60	52	175	58	38	162	17	27	7.3	25	4.4
MIN	2.4	4.6	8.5	6.5	7.7	11	11	5.4	3.1	2.3	2.0	1.6
CFSM	.35	1.33	1.12	1.42	1.45	1.37	2.34	.78	.43	.31	.40	.21
IN.	.40	1.48	1.30	1.64	1.51	1.58	2.61	.90	.48	.35	.46	.24

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	MEAN	5.73	15.6	13.4	20.0	14.4	23.9	26.6	10.5	8.54	10.6	7.39	8.98
MAX	9.44	25.3	19.3	33.9	18.5	37.5	29.7	11.7	12.0	24.3	15.0	20.0	
(WY)	1993	1993	1993	1993	1994	1993	1994	1993	1993	1992	1992	1992	
MIN	3.31	4.63	6.68	7.89	11.8	16.9	21.6	9.93	5.48	3.62	2.04	2.71	
(WY)	1992	1992	1992	1992	1992	1992	1992	1992	1994	1993	1993	1994	

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1992 - 1994

ANNUAL TOTAL	5539.3	4426.6	
ANNUAL MEAN	15.2	12.1	13.8
HIGHEST ANNUAL MEAN			16.7
LOWEST ANNUAL MEAN			12.1
HIGHEST DAILY MEAN	145	Jan 5	175
LOWEST DAILY MEAN	1.1	Aug 31	1.6
ANNUAL SEVEN-DAY MINIMUM	1.3	Aug 26	2.0
INSTANTANEOUS PEAK FLOW			243
INSTANTANEOUS PEAK STAGE			12.94
INSTANTANEOUS LOW FLOW			1.6
ANNUAL RUNOFF (CFSM)	1.19		.95
ANNUAL RUNOFF (INCHES)	16.23		12.97
10 PERCENT EXCEEDS	34		23
50 PERCENT EXCEEDS	10		7.8
90 PERCENT EXCEEDS	2.5		2.8
			2.8

## STREAMS TRIBUTARY TO LAKE ERIE

## 04206210 NORTH FORK AT BATH, OH

LOCATION.--Lat 41°11'20", long 81°39'12", Summit County, Hydrologic Unit 04110002, on right upstream bank at triple barrel culvert under Ira Road, 0.9 mi west of Cleveland-Massillon Road, 4.7 mi northwest of Akron corporate boundary.

DRAINAGE AREA.--2.81 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 996 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 24 to Jan. 25, Feb. 10-18. Records fair, except for periods of estimated record, discharges less than 6.0 ft<sup>3</sup>/s, and Feb. 20 to Apr. 28, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.60	8.8	3.0	1.1	4.0	1.8	1.2	8.4	3.9	.96	.29	.24
2	.96	4.0	3.7	1.1	4.8	1.5	1.0	5.2	.64	.54	.26	.20
3	.54	7.4	6.6	1.0	2.5	1.6	5.7	3.6	.45	.46	.26	.20
4	.40	4.8	20	.94	2.1	2.3	4.0	2.9	.39	.42	1.2	.20
5	.37	2.1	15	.90	1.2	4.6	2.0	2.4	.34	.35	1.1	.18
6	.35	1.3	8.0	.86	1.0	6.1	18	2.3	.33	.33	.48	.16
7	.34	.89	6.4	.82	.88	6.7	13	2.4	.29	18	.34	.23
8	.41	.72	3.8	.79	.89	4.8	5.3	5.3	.24	9.1	.29	.25
9	2.3	.63	2.5	.76	1.1	2.0	3.2	3.0	.21	3.2	.26	.42
10	1.6	.55	2.2	.71	1.6	2.4	28	1.7	.19	1.3	.26	.41
11	.74	.54	2.9	.68	.60	2.5	7.6	1.3	.13	.81	.30	.29
12	.69	.49	2.7	.65	.60	3.2	73	3.1	.10	.66	.33	.22
13	.44	.54	2.2	.62	.69	12	30	1.5	.13	.58	6.1	.18
14	.42	39	2.0	.58	.60	13	16	1.1	.14	1.1	7.6	.25
15	.47	20	4.1	.56	.79	11	14	8.8	.10	.76	1.2	.56
16	.53	7.5	3.2	.54	.95	6.7	13	10	.10	.58	.59	.30
17	6.1	49	1.6	.53	1.1	3.7	11	6.6	.09	.44	.46	.46
18	1.3	12	1.8	.51	8.9	3.3	9.2	3.3	.06	.40	.40	.41
19	.96	7.0	3.0	.50	24	3.6	8.5	1.9	.03	.31	.40	.18
20	1.4	6.1	1.8	.49	34	3.5	7.1	1.6	.06	.26	.45	.15
21	2.4	3.5	2.7	.49	17	22	6.5	.97	.13	.34	1.6	.37
22	1.1	2.2	2.6	.49	8.7	10	5.5	.76	.06	.48	.49	.40
23	.77	1.7	2.4	.50	11	5.5	4.3	.60	.05	.48	.38	.39
24	.69	1.4	2.6	.62	11	5.1	3.7	.64	.16	.41	.37	.29
25	.73	1.3	2.1	.84	6.2	3.0	3.3	12	.30	.35	.40	.35
26	.63	1.2	1.9	1.5	4.6	1.8	2.8	9.4	.22	.30	.34	.76
27	.60	28	1.8	11	4.2	4.2	4.1	3.9	1.6	.30	.26	.52
28	.62	12	1.6	156	2.4	3.3	3.0	1.3	.52	.47	.27	.47
29	.60	7.0	1.4	21	---	4.5	5.5	.74	21	.58	.27	.48
30	.70	4.3	1.3	8.5	---	3.6	5.6	.52	3.1	.39	.21	.39
31	6.4	---	1.2	5.9	---	1.7	---	.49	---	.33	.24	---
TOTAL	36.16	235.96	118.1	221.48	157.40	161.0	315.1	107.72	35.06	44.99	27.40	9.91
MEAN	1.17	7.87	3.81	7.14	5.62	5.19	10.5	3.47	1.17	1.45	.88	.33
MAX	6.4	49	20	156	34	22	73	12	21	18	7.6	.76
MIN	.34	.49	1.2	.49	.60	1.5	1.0	.49	.03	.26	.21	.15
CFSM	.42	2.80	1.36	2.54	2.00	1.85	3.74	1.24	.42	.52	.31	.12
IN.	.48	3.12	1.56	2.93	2.08	2.13	4.17	1.43	.46	.60	.36	.13

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1992	1993	1994	1992	1993	1994	1992	1993	1994
MEAN	1.02	5.26	3.61	7.32	4.50	7.42	7.61	2.03	1.73	3.82	1.66	1.56
MAX	1.25	7.87	5.77	12.5	5.62	13.0	10.5	3.47	3.63	9.23	3.84	3.47
(WY)	1993	1994	1993	1993	1994	1993	1994	1994	1993	1992	1992	1992
MIN	.65	1.07	1.24	2.31	3.63	4.07	4.33	1.01	.38	.77	.25	.33
(WY)	1992	1992	1992	1992	1992	1992	1992	1992	1992	1993	1993	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1992 - 1994
ANNUAL TOTAL	1757.07	1470.28	
ANNUAL MEAN	4.81	4.03	3.96
HIGHEST ANNUAL MEAN			4.90
LOWEST ANNUAL MEAN			2.94
HIGHEST DAILY MEAN	75 Jan 13	156 Jan 28	156 Jan 28 1994
LOWEST DAILY MEAN	.12 Aug 27	.03 Jun 19	.01 Jul 4 1992
ANNUAL SEVEN-DAY MINIMUM	.13 Aug 23	.07 Jun 17	.01 Jul 3 1992
INSTANTANEOUS PEAK FLOW		386 Apr 12	635 Apr 12 a
INSTANTANEOUS PEAK STAGE		13.89 Apr 12	15.21 Jul 30 1992
INSTANTANEOUS LOW FLOW			.01 Jul 4 1992
ANNUAL RUNOFF (CFSM)	1.71	1.43	1.41
ANNUAL RUNOFF (INCHES)	23.26	19.46	19.13
10 PERCENT EXCEEDS	12	9.1	9.4
50 PERCENT EXCEEDS	1.9	1.1	1.1
90 PERCENT EXCEEDS	.27	.26	.27

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04206211 PARK CREEK AT BATH CENTER, OH

LOCATION.--Lat 41°10'44", long 81°38'09", Summit County, Hydrologic Unit 04110002, on upstream left bank at culvert under the entrance of the Bath Community Center, 200 ft east of Cleveland-Massillon Road, 0.7 mi north of Bath Road, 3.7 mi northwest of Akron corporate boundary.

DRAINAGE AREA.--0.826 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 980 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1 to Feb. 14, 24 to Mar. 3, 9-12, 16-19, Apr. 14 to May 24, Jun. 3-18, Jul. 26 to Aug. 4. Records poor.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.74	.02	.34	.58	.11	.75	1.2	.23	.92	.00	.34
2	.19	.50	.27	.39	.68	.09	.72	.80	.03	.54	.00	.33
3	.13	.56	.36	.30	.37	.20	1.1	.52	.00	.45	.00	.03
4	.13	.35	2.6	.28	.30	.48	.98	.43	.00	.44	.90	.02
5	.11	.24	1.7	.25	.18	.72	.90	.35	.00	.44	1.1	.00
6	.08	.12	1.2	.26	.14	.83	2.7	.33	.00	.41	.57	.00
7	.05	.08	.96	.28	.13	.97	1.5	.34	.00	8.9	.47	.00
8	.04	.08	.38	.28	.13	.73	.83	.75	.00	2.1	.45	.00
9	.51	.08	.02	.31	.15	.34	.67	.43	.00	1.1	.37	.45
10	.32	.08	.02	.51	.23	.22	8.0	.25	.00	.84	.34	.45
11	.13	.08	.02	.45	.05	.58	1.2	.19	.00	.51	.34	.37
12	.13	.08	.02	.29	.12	.65	20	.44	.00	.31	.34	.34
13	.12	.08	.02	.30	.16	1.6	2.7	.22	.00	.03	5.7	.34
14	.08	6.4	.02	.34	.08	1.5	2.3	.16	.00	.55	3.0	.18
15	.08	.49	.35	.48	.15	1.3	2.0	1.2	.00	.30	1.2	.63
16	.05	.13	.08	.61	.13	.81	1.8	1.4	.00	.03	1.1	.48
17	.92	9.2	.02	.82	.26	.65	1.6	1.0	.00	.03	.98	.80
18	.26	2.1	.13	.55	.94	.42	1.3	.48	.00	.03	.80	.61
19	.22	.56	.10	.29	2.7	.65	1.2	.27	.03	.03	.68	.46
20	.30	.15	.02	.48	2.6	.89	1.0	.23	.11	.02	.81	.45
21	.25	.02	.03	.31	1.9	2.1	.93	.14	.03	.26	1.6	.45
22	.13	.02	.05	.54	1.1	1.3	.80	.11	.03	.22	1.0	.35
23	.13	.02	.05	.13	1.5	1.0	.62	.09	.03	.03	.80	.34
24	.13	.01	.38	.14	1.5	1.1	.55	.09	.03	.03	.69	.34
25	.13	.01	.36	.86	.81	.88	.48	.46	.06	.03	.59	.46
26	.13	.01	.34	.23	.38	.81	.41	.45	.11	.00	.55	.81
27	.08	3.7	.31	11	.20	1.0	.58	.47	.22	.00	.50	.82
28	.04	1.6	.28	36	.12	.89	.44	.23	.05	.00	.45	.64
29	.04	1.1	.28	1.9	---	1.0	.78	.08	16	.00	.45	.68
30	.05	.11	.30	1.5	---	.95	.80	.03	1.2	.00	.39	.56
31	.96	---	.33	.93	---	.83	---	.08	---	.00	.34	---
TOTAL	6.12	28.70	11.02	61.35	17.59	25.60	59.64	13.22	18.16	18.55	26.51	11.73
MEAN	.20	.96	.36	1.98	.63	.83	1.99	.43	.61	.60	.86	.39
MAX	.96	9.2	2.6	36	2.7	2.1	20	1.4	16	8.9	5.7	.82
MIN	.04	.01	.02	.13	.05	.09	.41	.03	.00	.00	.00	.00
CFSM	.24	1.17	.43	2.41	.77	1.01	2.42	.52	.74	.73	1.04	.48
IN.	.28	1.30	.50	2.78	.80	1.16	2.71	.60	.82	.84	1.20	.53

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MEAN	.18	1.49	1.50	2.21	.79	1.76	1.80	.36	.45	1.17	.55	.50
MAX	.27	3.46	3.95	3.45	1.30	3.06	2.10	.43	.63	2.84	.86	1.09
(WY)	1993	1993	1993	1993	1992	1993	1993	1994	1993	1992	1994	1992
MIN	.071	.052	.21	1.20	.43	.83	1.32	.31	.12	.078	.000	.030
(WY)	1992	1992	1992	1992	1993	1994	1992	1993	1992	1993	1993	1993

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1992 - 1994
ANNUAL TOTAL	354.93	298.19	
ANNUAL MEAN	.97	.82	1.07
HIGHEST ANNUAL MEAN			1.49
LOWEST ANNUAL MEAN			.82
HIGHEST DAILY MEAN	17 Apr 25	36 Jan 28	36 Jan 28 1994
LOWEST DAILY MEAN	.00 Jul 17	.00 Jun 3	.00 Jul 17 1993
ANNUAL SEVEN-DAY MINIMUM	.00 Jul 17	.00 Jun 3	.00 Jul 17 1993
INSTANTANEOUS PEAK FLOW		124 Apr 12	162 Dec 30 1992
INSTANTANEOUS PEAK STAGE		14.30 Apr 12	15.18 Dec 30 1992
INSTANTANEOUS LOW FLOW		.00 Aug 4	.00 Aug 21 1993
ANNUAL RUNOFF (CFSM)	1.19	1.00	1.30
ANNUAL RUNOFF (INCHES)	16.10	13.53	17.68
10 PERCENT EXCEEDS	3.2	1.3	2.7
50 PERCENT EXCEEDS	.17	.34	.31
90 PERCENT EXCEEDS	.00	.02	.01

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

## STREAMS TRIBUTARY TO LAKE ERIE

## 04206212 NORTH FORK AT BATH CENTER, OH

LOCATION.--Lat 41°10'08", long 81°38'04", Summit County, Hydrologic Unit 04110002, on left upstream side of bridge on Bath Road, 750 ft east of Cleveland-Massillon Road at Bath Center, 3.1 mi northwest of Akron corporate boundary.  
 DRAINAGE AREA.--5.58 mi<sup>2</sup>.  
 PERIOD OF RECORD.--October 1, 1991 to current year.  
 GAGE.--Water-stage recorder. Elevation of gage is 936 ft above sea level, from topographic map.  
 REMARKS.--Estimated daily discharges: Oct. 23-27, Dec. 26 to Jan. 27, Feb. 6 to Mar. 30, May 15-24. Records fair, except for periods of estimated record and discharges of less than 5 ft<sup>3</sup>/s, which are poor.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	17	7.6	3.4	6.4	3.6	3.8	7.3	4.8	3.7	.55	.48
2	3.8	8.7	8.5	3.3	6.8	3.0	4.1	4.8	1.8	2.8	.68	.64
3	1.8	14	12	3.2	4.3	3.2	10	4.1	1.4	1.9	.55	.48
4	1.2	9.9	42	3.1	3.3	4.4	8.3	4.0	1.3	1.6	5.1	.33
5	1.4	6.3	34	3.0	2.1	9.0	6.6	4.0	1.2	1.4	4.8	.25
6	1.4	4.4	16	2.9	2.0	12	35	4.0	1.0	1.0	1.7	.48
7	1.5	3.5	13	2.8	1.7	13	26	4.2	.87	38	1.1	.80
8	1.7	2.6	9.4	2.7	1.8	10	12	5.7	1.0	18	.71	1.8
9	5.7	2.0	7.7	2.6	2.2	4.0	9.0	4.1	1.0	6.8	.60	3.3
10	3.8	2.0	7.4	2.5	3.2	4.7	57	3.4	1.0	3.7	.60	2.1
11	1.7	2.3	7.9	2.4	1.2	5.0	11	3.5	1.0	2.6	1.0	2.0
12	2.2	3.0	7.8	2.3	1.2	6.3	134	4.1	1.0	1.7	.83	2.0
13	1.4	3.6	6.9	2.3	1.4	24	60	3.5	1.0	1.4	22	1.8
14	1.6	53	6.5	2.2	1.2	26	24	3.0	1.1	4.6	21	1.6
15	2.0	22	9.3	2.2	1.6	22	19	17	1.2	2.2	4.2	3.0
16	2.8	9.8	8.0	2.1	1.9	14	15	20	.51	1.4	2.3	2.0
17	13	74	5.9	2.1	2.2	7.4	11	14	.43	1.2	1.4	4.0
18	3.5	23	6.1	2.1	18	6.5	8.7	6.6	.45	.80	1.4	3.0
19	3.1	12	7.9	2.0	46	7.1	8.1	3.7	.42	.66	1.1	2.1
20	4.4	10	6.4	2.0	66	7.0	7.0	3.2	.81	.55	1.6	1.1
21	4.7	6.9	8.0	2.0	39	43	6.4	2.0	.99	1.5	7.5	1.3
22	2.9	5.4	7.2	2.0	17	25	6.0	1.6	.39	2.2	2.5	2.0
23	2.0	5.0	7.2	1.9	22	11	5.7	1.2	.51	1.4	1.3	2.4
24	2.0	4.6	6.5	1.9	22	10	4.6	1.3	.83	1.2	1.2	1.7
25	2.0	4.0	6.4	2.0	12	6.6	4.0	11	1.7	.68	.99	1.9
26	1.4	3.9	5.2	3.5	9.0	3.6	4.4	7.9	1.1	.31	.94	4.7
27	1.4	61	4.6	23	8.3	8.2	4.8	3.8	4.6	.25	.64	4.1
28	1.9	26	4.3	190	5.0	6.7	4.1	2.3	1.6	.50	.68	3.0
29	3.0	13	4.0	37	---	8.9	6.0	2.6	54	1.5	.80	3.6
30	3.8	9.2	3.8	15	---	7.7	5.6	1.4	6.2	1.3	.59	2.3
31	15	---	3.6	9.5	---	4.0	---	1.8	---	.73	.60	---
TOTAL	100.4	422.1	291.1	339.0	308.8	326.9	521.2	161.1	95.21	107.58	90.96	60.26
MEAN	3.24	14.1	9.39	10.9	11.0	10.5	17.4	5.20	3.17	3.47	2.93	2.01
MAX	15	74	42	190	66	43	134	20	54	38	22	4.7
MIN	1.2	2.0	3.6	1.9	1.2	3.0	3.8	1.2	.39	.25	.55	.25
CFSM	.58	2.52	1.68	1.96	1.98	1.89	3.11	.93	.57	.62	.53	.36
IN.	.67	2.81	1.94	2.26	2.06	2.18	3.47	1.07	.63	.72	.61	.40

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1992	1993	1994	1992	1993	1994	1992	1993	1994
MEAN	4.10	10.9	8.24	10.7	7.48	14.3	14.5	4.03	4.30	7.26	3.38	3.86
MAX	4.56	15.3	13.4	17.4	11.0	22.3	17.4	5.20	8.14	16.9	6.94	7.21
(WY)	1992	1993	1993	1993	1994	1993	1994	1994	1993	1992	1992	1992
MIN	3.24	3.30	1.97	3.76	4.16	10.1	11.2	3.05	1.57	1.45	.27	2.01
(WY)	1994	1992	1992	1992	1993	1992	1992	1993	1992	1993	1993	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1992 - 1994

ANNUAL TOTAL	3074.90	2824.61	
ANNUAL MEAN	8.42	7.74	7.75
HIGHEST ANNUAL MEAN			8.97
LOWEST ANNUAL MEAN			6.55
HIGHEST DAILY MEAN	94	190	190
LOWEST DAILY MEAN	.08	.25	.07
ANNUAL SEVEN-DAY MINIMUM	.10	.47	.10
INSTANTANEOUS PEAK FLOW		546	885
INSTANTANEOUS PEAK STAGE		12.41	12.93
INSTANTANEOUS LOW FLOW		.06	.02
ANNUAL RUNOFF (CFSM)	1.51	1.39	1.39
ANNUAL RUNOFF (INCHES)	20.50	18.83	18.88
10 PERCENT EXCEEDS	19	17	17
50 PERCENT EXCEEDS	4.0	3.5	3.7
90 PERCENT EXCEEDS	.25	.91	.60

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04206215 BATH CREEK AT BATH CENTER, OH

LOCATION.--Lat 41°10'09", long 81°38'56", Summit County, Hydrologic Unit 04110002, on upstream left bank at bridge on Bath Road, 0.2 mi downstream from Sterner Pond, 0.6 mi west of Cleveland-Massillon Road, and 3.6 mi northwest of Akron corporate boundary.

DRAINAGE AREA.--3.52 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 961 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 28, Feb. 1 to Mar. 11. Records fair, except for periods of estimated record and discharges less than 3.0 ft<sup>3</sup>/s, which are poor.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	6.7	3.7	1.7	5.4	3.4	2.4	2.8	1.7	1.6	.32	.60
2	.87	3.6	3.7	1.7	4.5	3.1	2.2	2.0	.69	.90	.43	.60
3	.56	5.3	5.6	1.7	3.9	3.4	4.3	1.6	.55	.80	.48	.60
4	.50	4.5	16	1.6	4.2	3.6	4.2	1.6	.50	.71	.99	.59
5	.50	2.5	26	1.6	4.4	4.1	3.4	1.6	.50	.61	1.5	.60
6	.50	1.9	10	1.6	4.2	4.5	16	1.5	.50	.60	.63	.60
7	.57	1.6	8.3	1.6	3.4	4.5	18	1.4	.45	4.6	.44	.56
8	.53	1.3	5.2	1.5	3.6	4.5	6.9	1.9	.42	12	.40	.50
9	1.1	1.1	4.0	1.5	3.6	3.7	4.8	1.5	.47	2.3	.40	.68
10	.94	.82	3.7	1.5	2.3	3.7	31	1.2	.46	1.1	.54	.56
11	.52	1.2	3.7	1.5	2.2	3.4	11	1.1	.42	.71	.57	.50
12	.50	1.1	3.5	1.5	3.8	3.7	77	1.4	.40	.57	.60	.46
13	.50	1.1	3.1	1.5	3.6	7.7	37	1.1	.44	.50	4.2	.40
14	.50	22	2.9	1.5	3.1	15	16	.82	.48	1.1	6.8	.41
15	.50	15	4.5	1.5	3.1	13	9.9	2.6	.46	.71	2.0	.68
16	.50	5.0	4.4	1.4	3.3	7.6	7.9	2.6	.50	.56	.97	.69
17	2.9	40	3.2	1.4	3.4	5.6	4.7	1.9	.46	.51	.63	.74
18	1.5	20	3.1	1.4	4.5	4.3	3.5	1.5	.40	.48	.60	.71
19	.91	7.0	4.0	1.4	9.1	4.2	2.9	1.3	.37	.46	.60	.50
20	1.4	5.1	3.2	1.4	16	4.0	2.4	1.1	.38	.40	.76	.46
21	1.4	3.5	4.0	1.4	13	17	2.1	.79	.50	.49	2.2	.40
22	1.2	2.7	3.6	1.4	6.8	11	2.0	.71	.33	.55	.98	.39
23	.71	2.3	2.9	1.4	6.8	5.8	1.8	.66	.32	.46	.61	.38
24	.70	2.2	2.7	1.4	9.3	5.7	1.7	.61	.45	.37	.56	.39
25	.62	2.0	2.5	1.4	5.6	4.2	1.6	2.9	.64	.36	.60	.65
26	.60	1.8	2.3	1.4	4.3	3.5	1.4	4.3	.50	.33	.52	.74
27	.54	25	2.2	6.0	3.4	4.4	1.5	1.6	1.1	.39	.55	.66
28	.50	18	2.1	89	3.8	4.0	1.2	.95	.67	.35	.60	.60
29	.50	7.6	2.0	35	---	4.2	1.8	.67	17	.44	.60	.60
30	.52	4.8	1.9	15	---	3.6	2.0	.55	2.9	.49	.55	.53
31	2.5	---	1.8	8.0	---	2.8	---	.95	---	.37	.60	---
TOTAL	26.21	216.72	149.8	191.9	144.6	173.2	282.6	47.21	34.96	35.82	32.23	16.78
MEAN	.85	7.22	4.83	6.19	5.16	5.59	9.42	1.52	1.17	1.16	1.04	.56
MAX	2.9	40	26	89	16	17	77	4.3	17	12	6.8	.74
MIN	.50	.82	1.8	1.4	2.2	2.8	1.2	.55	.32	.33	.32	.38
CFSM	.24	2.05	1.37	1.76	1.47	1.59	2.68	.43	.33	.33	.30	.16
IN.	.28	2.29	1.58	2.03	1.53	1.83	2.99	.50	.37	.38	.34	.18

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MEAN	.86	5.48	4.45	6.40	4.19	6.81	8.51	1.68	1.96	3.70	1.60	1.67
MAX	1.34	8.75	7.80	11.2	5.16	8.45	9.42	1.83	3.91	9.25	3.33	3.80
(WY)	1993	1993	1993	1993	1994	1993	1994	1992	1993	1992	1992	1992
MIN	.41	.45	.72	1.80	2.44	5.59	7.53	1.52	.81	.70	.42	.56
(WY)	1992	1992	1992	1992	1993	1994	1992	1994	1992	1993	1993	1994

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR

#### FOR 1994 WATER YEAR

#### WATER YEARS 1992 - 1994

ANNUAL TOTAL	1552.79	1352.03	
ANNUAL MEAN	4.25	3.70	3.94
HIGHEST ANNUAL MEAN			4.67
LOWEST ANNUAL MEAN			3.43
HIGHEST DAILY MEAN	61	Jan 5	105
LOWEST DAILY MEAN	.00	Sep 14	.00
ANNUAL SEVEN-DAY MINIMUM	.15	Aug 25	.15
INSTANTANEOUS PEAK FLOW			204
INSTANTANEOUS PEAK STAGE			14.49
INSTANTANEOUS LOW FLOW			.00
ANNUAL RUNOFF (CFSM)	1.21	1.05	1.12
ANNUAL RUNOFF (INCHES)	16.41	14.29	15.19
10 PERCENT EXCEEDS	9.6	7.2	8.4
50 PERCENT EXCEEDS	2.0	1.5	1.6
90 PERCENT EXCEEDS	.42	.46	.41

## STREAMS TRIBUTARY TO LAKE ERIE

## 04206220 YELLOW CREEK AT BOTZUM, OH

LOCATION.--Lat 41°09'47", long 81°35'03", Summit County, Hydrologic Unit 04110002, on right downstream bank near Bath Road truss bridge over Yellow Creek, 0.5 mi upstream from confluence with Cuyahoga River, 0.7 mi west of Akron sewage treatment plant.

DRAINAGE AREA.--30.7 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 743 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 28, Feb. 2-17. Records fair, except for periods of estimated record, which are poor. (Formerly named Yellow Creek at Bath Road near Botzum, Ohio)

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	59	27	20	41	41	27	39	24	17	4.1	5.3
2	12	28	27	19	37	35	26	28	13	16	5.1	4.4
3	9.9	34	37	18	34	27	44	24	10	15	4.2	4.3
4	8.0	29	133	18	36	30	40	22	9.7	11	9.3	4.2
5	6.9	20	180	17	38	36	32	23	8.7	10	15	3.8
6	6.9	17	74	17	37	42	142	22	8.2	8.0	7.4	3.8
7	7.1	14	56	17	30	46	167	22	8.0	101	4.9	3.9
8	6.8	13	37	17	32	42	67	28	7.2	60	4.1	4.2
9	16	11	31	17	32	30	44	24	7.0	19	3.9	12
10	15	11	27	17	29	32	308	20	6.7	12	3.9	8.8
11	9.7	11	29	16	28	30	121	18	6.1	9.2	4.7	6.7
12	8.6	10	28	16	31	33	659	20	5.8	7.6	5.6	5.8
13	8.2	11	28	16	34	99	349	19	6.2	6.5	78	4.0
14	7.2	224	25	16	28	122	153	17	6.5	12	89	3.6
15	8.5	104	29	16	27	100	113	33	6.2	9.3	21	5.9
16	7.8	38	30	16	29	59	96	37	5.9	6.6	12	4.8
17	46	290	25	16	30	40	63	25	5.9	5.6	8.9	10
18	21	125	26	15	51	37	50	24	6.0	5.1	7.6	8.6
19	16	47	29	15	121	35	44	19	5.1	4.8	6.4	5.2
20	18	34	24	15	217	33	37	17	7.4	4.2	7.7	3.9
21	18	25	28	15	143	132	33	15	11	7.7	31	3.5
22	12	21	26	15	70	90	29	13	5.8	14	14	3.4
23	12	18	24	18	77	49	28	15	5.0	15	9.0	3.4
24	9.9	17	23	18	96	53	27	14	19	8.0	7.1	3.5
25	9.4	16	23	20	51	40	25	33	19	6.1	6.2	3.8
26	9.3	15	23	25	39	32	26	36	11	9.4	5.8	10
27	9.9	225	21	57	39	44	26	20	22	5.7	5.7	9.1
28	9.3	127	21	765	55	39	23	15	14	5.3	6.7	8.6
29	9.3	53	21	289	---	42	34	14	180	6.3	6.5	7.6
30	10	35	20	99	---	39	29	11	34	6.0	5.3	6.1
31	32	---	20	56	---	30	---	12	---	4.9	5.5	---
TOTAL	392.7	1682	1152	1711	1512	1539	2862	679	484.4	428.3	405.6	172.2
MEAN	12.7	56.1	37.2	55.2	54.0	49.6	95.4	21.9	16.1	13.8	13.1	5.74
MAX	46	290	180	765	217	132	659	39	180	101	89	12
MIN	6.8	10	20	15	27	27	23	11	5.0	4.2	3.9	3.4
CFSM	.41	1.83	1.21	1.80	1.76	1.62	3.11	.71	.53	.45	.43	.19
IN.	.48	2.04	1.40	2.07	1.83	1.86	3.47	.82	.59	.52	.49	.21

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MEAN	13.2	47.2	36.9	57.1	39.0	67.2	75.1	22.0	21.9	32.9	20.0	21.9
MAX	19.3	76.2	61.5	98.2	54.0	108	95.4	23.6	34.0	74.8	41.1	48.3
(WY)	1993	1993	1993	1993	1994	1993	1994	1993	1993	1992	1992	1992
MIN	7.53	9.23	12.1	17.8	31.6	43.8	50.9	20.5	15.7	10.1	5.68	5.74
(WY)	1992	1992	1992	1992	1992	1992	1992	1992	1992	1993	1993	1994

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1992 - 1994

ANNUAL TOTAL	15472.7	13020.2	37.8
ANNUAL MEAN	42.4	35.7	46.7
HIGHEST ANNUAL MEAN			1993
LOWEST ANNUAL MEAN			1992
HIGHEST DAILY MEAN	462	765	765
LOWEST DAILY MEAN	4.0	3.4	3.4
ANNUAL SEVEN-DAY MINIMUM	4.2	3.8	3.8
INSTANTANEOUS PEAK FLOW		1190	1470
INSTANTANEOUS PEAK STAGE		14.84	15.60
INSTANTANEOUS LOW FLOW		2.9	2.9
ANNUAL RUNOFF (CFSM)	1.38	1.16	1.23
ANNUAL RUNOFF (INCHES)	18.75	15.78	16.74
10 PERCENT EXCEEDS	103	.68	.77
50 PERCENT EXCEEDS	22	19	20
90 PERCENT EXCEEDS	6.2	5.6	6.2

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04207200 TINKERS CREEK AT BEDFORD, OH

LOCATION.--Lat 41°23'04", long 81°31'39", in T.6 N., R.11 W., Cuyahoga County, Hydrologic Unit 04110002, on left bank at downstream side of bridge on State Highway 14 in Bedford, 5.5 mi upstream from mouth.

DRAINAGE AREA.--83.9 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1962 to current year.

REVISED RECORDS.--WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 876.18 ft above sea level.

REMARKS.--Estimated daily discharges: Dec. 25 to Jan. 27, 31 to Feb. 18, 27 to Mar. 5. Records good except for estimated daily discharges, which are poor. Water-quality data collected at this site 1965 to 1977. Sediment data collected at this site 1974 to 1979.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	294	147	60	250	80	70	63	95	74	28	28
2	114	169	137	60	170	72	61	55	42	47	28	27
3	57	202	160	58	140	66	125	45	33	35	29	25
4	57	138	512	56	120	62	130	42	30	36	140	23
5	48	95	550	56	110	60	101	41	26	32	300	22
6	43	69	371	55	100	185	506	42	28	30	60	27
7	40	65	242	54	96	192	564	45	28	513	35	34
8	35	55	168	54	92	169	361	60	27	507	29	29
9	93	53	128	52	88	121	172	51	27	602	29	44
10	66	47	110	52	84	104	693	53	26	235	28	28
11	42	43	133	50	82	101	595	42	55	69	35	25
12	36	43	125	50	80	122	1410	76	32	49	36	24
13	34	44	110	50	78	282	1520	49	69	38	2610	26
14	31	514	103	48	76	365	1070	40	65	93	768	32
15	30	396	118	48	74	349	566	177	86	43	583	31
16	27	289	113	48	72	294	333	202	40	35	228	29
17	237	1200	94	47	72	199	208	105	35	30	71	54
18	122	710	95	46	120	166	126	67	33	30	51	38
19	69	477	143	46	488	174	88	52	26	29	42	29
20	65	227	111	45	741	174	72	45	47	28	41	26
21	66	161	135	45	632	647	62	39	66	94	145	26
22	67	126	128	44	359	549	55	35	34	61	72	25
23	46	105	113	44	243	308	50	35	28	43	42	24
24	38	91	95	44	287	171	46	34	66	75	35	24
25	36	83	80	44	215	133	45	82	104	44	33	88
26	34	72	74	43	159	103	46	80	67	34	31	67
27	33	956	70	43	110	119	57	57	66	28	30	47
28	38	679	68	1830	94	115	43	42	42	47	42	57
29	32	488	64	1150	---	122	69	34	331	40	35	133
30	34	220	62	858	---	106	56	32	180	69	30	52
31	193	---	62	450	---	85	---	43	---	30	30	---
TOTAL	1928	8111	4621	5630	5232	5795	9300	1865	1834	3120	5696	1144
MEAN	62.2	270	149	182	187	187	310	60.2	61.1	101	184	38.1
MAX	237	1200	550	1830	741	647	1520	202	331	602	2610	133
MIN	27	43	62	43	72	60	43	32	26	28	28	22
CFSM	.01	.03	.02	.02	.02	.02	.04	.01	.01	.01	.02	.00
IN.	.01	.04	.02	.03	.02	.03	.04	.01	.01	.01	.03	.01

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY)

	MEAN	68.4	139	178	146	203	252	189	120	83.3	81.1	64.3	74.0
MAX	261	402	506	396	463	457	314	339	257	329	255	289	
(WY)	1991	1986	1991	1993	1976	1963	1964	1989	1975	1969	1992	1990	
MIN	8.55	13.4	16.9	33.1	39.0	81.2	54.1	33.4	16.5	13.1	11.3	8.73	
(WY)	1964	1965	1964	1977	1963	1990	1971	1965	1964	1967	1963	1964	

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR

#### FOR 1994 WATER YEAR

#### WATER YEARS 1963 - 1994

ANNUAL TOTAL	59415	54276	
ANNUAL MEAN	163	149	
HIGHEST ANNUAL MEAN			134
LOWEST ANNUAL MEAN			185
HIGHEST DAILY MEAN	1480	Jan 5	2610
LOWEST DAILY MEAN	19	Aug 22	22
ANNUAL SEVEN-DAY MINIMUM	21	Jul 21	26
INSTANTANEOUS PEAK FLOW			6750
INSTANTANEOUS PEAK STAGE			9.81
INSTANTANEOUS LOW FLOW			22
ANNUAL RUNOFF (CFSM)	.020		.018
ANNUAL RUNOFF (INCHES)	.27		.24
10 PERCENT EXCEEDS	461		360
50 PERCENT EXCEEDS	69		65
90 PERCENT EXCEEDS	25		30

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

LOCATION.--Lat 41°23'43", long 81°37'48, in T.6 N., R.12 W., Cuyahoga County, Hydrologic Unit 04110002, on left bank 240 ft downstream from bridge on Old Rockside Road, 0.8 mi northeast of Independence, and 3.0 mi downstream from Tinkers Creek.

DRAINAGE AREA.--707 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1903 to December 1905 (fragmentary), January to July 1906 (gage heights and discharge measurements only), September 1921 to May 1923, September 1927 to December 1935, March 1940 to current year.  
REVISED RECORDS.--WSP 1307: 1922-23(M), 1928-30(M), 1933(M), 1940(M), 1947(M), 1950(M). WSP 1912: Drainage area.  
GAGE.--Water-stage recorder. Datum of gage is 583.57 ft above sea level. Sept. 21, 1903 to July 21, 1906, nonrecording gage at bridge 240 ft upstream at present datum. Sept. 28, 1921 to May 30, 1923, nonrecording gage at bridge 240 ft upstream at datum 2.42 ft higher. Sept., to Oct. 8, 1927, nonrecording gage, and Oct. 9, 1927, to Dec. 31, 1935, Mar. 5, 1940, to June 19, 1969, water-stage recorder, at site 100 ft upstream at present datum.  
REMARKS.--Estimated daily discharges: Jan. 17-27, 31 to Mar. 5, 25-30, Apr. 8-9, 17 to Jun. 13, 29 to Jul. 11. Records good except for periods of estimated daily discharge and record between Jan. 28-Aug. 10, which are poor. Natural flow of stream affected by diversion, storage reservoirs and power plants. Some diversion from the Tuscarawas River basin drainage into this basin at Portage Lakes (see REMARKS for station 03117000). Water diverted into Ohio Canal at Brecksville, 6 mi upstream from station, bypasses station. These records do not include flow in canal except above about 15,000 ft<sup>3</sup>/s, when channels merge. Satellite telemeter at gage.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	409	1350	1230	482	1900	1200	848	840	450	500	202	298
2	460	833	1160	567	2200	1000	743	780	380	980	245	281
3	305	774	1260	547	1900	880	923	720	360	860	247	259
4	264	697	2070	562	1700	760	1140	680	350	720	371	238
5	227	518	3030	524	1500	700	984	640	330	580	602	224
6	206	432	1970	494	1300	854	1600	600	320	520	410	240
7	195	403	1620	535	1100	937	2620	560	310	1400	276	267
8	194	366	1370	508	960	1070	1500	540	300	3800	248	258
9	334	348	1270	467	820	946	1100	660	290	2000	255	381
10	382	335	1130	473	700	885	2630	600	380	1500	236	304
11	259	319	1120	531	600	964	2060	540	430	960	246	260
12	216	304	997	531	540	997	5480	500	320	618	265	244
13	200	313	882	545	480	1460	7220	480	240	439	6670	240
14	190	2210	816	505	450	2000	6040	450	273	587	3860	260
15	187	2620	834	376	410	1870	4400	800	378	486	2350	339
16	183	1450	828	356	640	1580	3930	900	325	378	1980	343
17	776	3190	734	340	760	1350	3000	1000	181	349	1780	402
18	686	3380	666	330	960	1320	2200	940	179	365	1630	505
19	406	2320	815	320	1500	1370	1700	860	163	355	1350	352
20	499	1760	730	310	2000	1260	1400	760	219	329	1070	345
21	612	1560	871	310	1900	2610	1100	640	407	384	1440	332
22	506	1380	874	300	1700	2690	980	560	255	483	934	326
23	376	1140	799	300	2200	2190	880	450	209	309	705	324
24	364	941	734	300	2700	2040	780	500	329	297	576	329
25	354	774	696	290	3500	1800	700	800	606	308	492	500
26	306	663	621	290	2800	1700	660	860	427	229	359	607
27	286	2580	603	290	1900	1500	620	700	488	191	314	457
28	301	2890	575	4120	1500	1300	580	600	324	232	315	483
29	273	2040	569	4350	---	1200	780	500	700	310	324	637
30	275	1430	531	3130	---	980	680	410	600	377	309	443
31	639	---	514	2300	---	847	---	340	---	234	313	---
TOTAL	10870	39320	31919	25283	40620	42260	59278	20210	10523	21080	30374	10478
MEAN	351	1311	1030	816	1451	1363	1976	652	351	680	980	349
MAX	776	3380	3030	4350	3500	2690	7220	1000	700	3800	6670	637
MIN	183	304	514	290	410	700	580	340	163	191	202	222

MEAN	364	636	936	1100	1315	1675	1456	926	606	457	355	364
MAX	1747	2713	2889	3585	3217	3008	3175	2396	2450	1543	1363	1866
(WY)	1955	1986	1978	1952	1959	1963	1957	1984	1989	1992	1992	1979
MIN	65.8	74.9	115	191	194	584	243	120	111	82.9	62.3	61.0
(WY)	1934	1931	1964	1945	1934	1931	1946	1934	1934	1954	1933	1933

## WATER YEARS 1922 - 1994

ANNUAL TOTAL	400724		342215			
ANNUAL MEAN	1098		938		850	
HIGHEST ANNUAL MEAN					1393	1975
LOWEST ANNUAL MEAN					278	1934
HIGHEST DAILY MEAN	7610	Jan 5	7220	Apr 13	16700	Jan 22 1959
LOWEST DAILY MEAN	144	Aug 29	163	Jun 19	21	Aug 28 1933
ANNUAL SEVEN-DAY MINIMUM	159	Aug 24	230	Jun 17	37	Aug 26 1933
INSTANTANEOUS PEAK FLOW			12900	Aug 13	16700	Jan 22 1959
INSTANTANEOUS PEAK STAGE			20.64	Aug 13	22.41	Jan 22 1959
INSTANTANEOUS LOW FLOW			183	Oct 16		
10 PERCENT EXCEEDS	2690		2040		2010	
50 PERCENT EXCEEDS	696		600		476	
90 PERCENT EXCEEDS	202		260		126	

## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1948 to September 1949, October 1950 to current year.

## PERIOD OF DAILY RECORD.--

CHLORIDE: October 1987 to current year.

NITROGEN, NITRITE + NITRATE: October 1987 to current year.

NITROGEN, AMMONIA + ORGANIC: October 1987 to current year.

PHOSPHORUS: October 1987 to current year.

SUSPENDED SEDIMENT DISCHARGE: Water years 1950-74, December 1976 to September 1984, October 1987 to current year.

INSTRUMENTATION.--Alcohol-actuated thermograph October 1956 to June 1965, water-quality monitor from July 1965 to September 1991 and a refrigerated water-quality pumping sampler since October 1987.

REMARKS.--Water-quality samples were collected by pumping sampler three times daily. Heidelberg College Water Quality Laboratory operates the pumping sampler and analyzes the water-quality samples for chemical concentrations. The submersible pump that is located in the stream was buried with sediment from about January 29 to April 29. Chemical concentrations for this time period are estimated. Sediment samples were collected by a local observer on an approximate once daily basis. Chemical loads were calculated using the mean-interval method (Porterfield, George, 1972, Computation of Fluvial-Sediment Discharge: U.S. Geological Survey, Techniques of Water Resources Investigations, Book 3, Chap. C3, 66 p.). For days with unsteady concentration, discharge, or both, the day was sub-divided into half-hour intervals and the daily load was calculated by summing the loads for these half-hour intervals. This required interpolation between measured and estimated concentrations. Concentrations reported as below the limit of detection (for example, <.20) were assumed to have a value of half of the detection limit for the purpose of load calculation.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

DISSOLVED CHLORIDE CONCENTRATIONS: Maximum daily mean, 580 mg/L, Jan. 27, 1994; minimum daily mean, 21 mg/L, Aug. 25, 1989.

DISSOLVED CHLORIDE LOADS: Maximum daily, 3,000 tons, Jan. 28, 1994; minimum daily, 10.2 tons, Aug. 27, 1989.

DISSOLVED NITROGEN, NITRITE + NITRATE CONCENTRATIONS: Maximum daily mean, 9.81 mg/L, July 11, 1988; minimum daily mean, .169 mg/L, July 30, 1992.

DISSOLVED NITROGEN, NITRITE + NITRATE LOADS: Maximum daily, 30 tons, June 9, 1993; minimum daily, .21 ton, Aug. 27, 1989.

TOTAL NITROGEN, AMMONIA + ORGANIC CONCENTRATIONS: Maximum daily mean, 4.7 mg/L, Sept. 7, 1990; minimum daily mean, <.20 mg/L, Feb. 23, 24, 1989, May 2, 3, 1990, June 29, 30, 1992, Oct. 25, 26, 30, 1993.

TOTAL NITROGEN, AMMONIA + ORGANIC LOADS: Maximum daily 130 tons, Sept. 7, 1990; minimum daily, .060 ton, June 29, 1992.

TOTAL PHOSPHORUS CONCENTRATIONS: Maximum daily mean 2.27 mg/L, July 11, 1988; minimum daily mean .026 mg/L, Aug. 27, 1989.

TOTAL PHOSPHORUS LOADS: Maximum daily 54.4 tons, Sept. 7, 1990; minimum daily, .012 ton, Aug. 27, 1989.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,400 mg/L, Dec. 31, 1992; minimum daily mean, 1 mg/L, Feb. 12, 13, 1989.

SEDIMENT LOADS: Maximum daily, 82,900 tons, Dec. 31, 1992; minimum daily, 1.2 tons, Feb. 13, 1989.

## EXTREMES FOR CURRENT YEAR.--

DISSOLVED CHLORIDE CONCENTRATIONS: Maximum daily mean, 580 mg/L, Jan. 27; minimum daily mean, 46 mg/L, Nov. 18.

DISSOLVED CHLORIDE LOADS: Maximum daily, 3,000 tons, Jan. 28; minimum daily, 55.6 tons, Jul. 27.

DISSOLVED NITROGEN, NITRITE + NITRATE CONCENTRATIONS: Maximum daily mean, 5.41 mg/L, Oct. 16; minimum daily mean, .602 mg/L, Apr. 13.

DISSOLVED NITROGEN, NITRITE + NITRATE LOADS: Maximum daily, 22 tons, Aug. 13; minimum daily, 1.3 ton, Jun. 19.

TOTAL NITROGEN, AMMONIA + ORGANIC CONCENTRATIONS: Maximum daily mean, 3.7 mg/L, Jun. 29; minimum daily mean, <.20 mg/L, Oct. 25, 26, 30.

TOTAL NITROGEN, AMMONIA + ORGANIC LOADS: Maximum daily, 67.2 tons, Aug. 13; minimum daily, .084 ton, Oct. 26.

TOTAL PHOSPHORUS CONCENTRATIONS: Maximum daily mean, 1.13 mg/L, Jul. 8; minimum daily mean, .051 mg/L, May 7.

TOTAL PHOSPHORUS LOADS: Maximum daily, 19.7 tons, Aug. 13; minimum daily, .044 ton, Oct. 16.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,380 mg/L, Aug. 13; minimum daily mean, 5 mg/L, Oct. 30, Nov. 9.

SEDIMENT LOADS: Maximum daily, 39,400 tons, Aug. 13; minimum daily, 3.0 tons, Oct. 16.

## STREAMS TRIBUTARY TO LAKE ERIE

04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

		DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCOCCI, KF AGAR (COLS. PER 100 ML) (31673)	
DEC 20...	1400	694	726	8.0	4.0	5.0	2.7	12.9	103	2700	380	
MAR 16...	0845	1600	745	7.6	-2.5	3.5	27	12.8	97	>10000	4200	
JUN 02...	0845	366	849	7.9	18.5	18.0	3.6	7.5	81	K1200	K300	
SEP 20...	0910	351	734	8.1	28.0	18.5	7.2	8.1	93	1300	K150	
DATE		HARD-NESS TOTAL (MG/L AS CaCO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS Ca) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg) (00925)	SODIUM, DIS-SOLVED (MG/L AS Na) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	ALKA-LINITY WAT WH TOT FET FIELD (MG/L AS CaCO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
DEC 20...	210	61	13	64	3.7	132	0	110	80	100	0.2	
MAR 16...	170	50	10	81	3.0	107	0	89	58	140	0.2	
JUN 02...	240	70	15	73	6.2	174	0	140	88	120	0.4	
SEP 20...	200	60	13	61	5.1	152	0	125	74	95	0.3	
DATE		SILICA, DIS-SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L AS N) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)
DEC 20...	7.2	423	2.2	0.10	0.5	0.08	0.08	0.07	20	36	<3	
MAR 16...	6.1	419	1.3	0.21	0.5	0.07	0.04	0.03	40	33	<3	
JUN 02...	3.8	493	2.4	0.38	1.3	0.19	0.10	0.10	10	42	<3	
SEP 20...	6.5	447	3.1	0.04	0.6	0.19	0.11	0.11	10	36	<3	
DATE		IRON, DIS-SOLVED (UG/L AS FE) (01046)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	SEDI-MENT, SUB-PENDED (MG/L) (80154)	
DEC 20...	110	5	66	<10	1	<1	<1.0	160	<6	14.8		
MAR 16...	110	<4	54	<10	1	<1	<1.0	150	<6	--		
JUN 02...	49	7	78	<10	2	<1	<1.0	200	<6	65.7		
SEP 20...	26	7	24	<10	2	<1	<1.0	160	<6	54.8		

K Non-idea colony count



## STREAMS TRIBUTARY TO LAKE ERIE

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## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

## CHLORIDE DISSOLVED (MG/L AS CL), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	409	92	102	1350	110	380	1230	68	225
2	460	92	114	833	160	358	1160	71	223
3	305	110	87.5	774	130	276	1260	77	260
4	264	120	82.4	697	110	213	2070	71	374
5	227	120	73.3	518	110	156	3030	53	428
6	206	120	68.8	432	110	128	1970	56	297
7	195	130	67.3	403	110	117	1620	56	247
8	194	130	66.3	366	110	112	1370	58	214
9	334	110	99.8	348	110	102	1270	110	374
10	382	110	108	335	110	99.4	1130	83	256
11	259	120	80.7	319	110	96.1	1120	84	255
12	216	130	72.8	304	110	91.9	997	190	519
13	200	130	71.2	313	110	95.0	882	130	321
14	190	130	66.6	2210	84	356	816	110	235
15	187	130	64.6	2620	50	343	834	110	258
16	183	130	64.0	1450	58	228	828	110	248
17	776	110	222	3190	50	386	734	100	198
18	686	96	174	3380	46	414	666	93	168
19	406	110	123	2320	52	326	815	100	221
20	499	120	160	1760	59	279	730	100	203
21	612	110	181	1560	63	265	871	150	353
22	506	110	144	1380	66	247	874	260	610
23	376	110	107	1140	70	216	799	250	535
24	364	100	102	941	74	187	734	200	398
25	354	110	105	774	78	162	696	170	329
26	306	110	93.7	663	82	147	621	160	276
27	286	110	85.8	2580	57	330	603	180	286
28	301	110	87.3	2890	47	368	575	160	250
29	273	110	80.1	2040	57	312	569	150	231
30	275	100	75.1	1430	64	249	531	140	202
31	639	92	150	---	---	---	514	140	199
TOTAL	10870	---	3179.3	39320	---	7039.4	31919	---	9193
JANUARY			FEBRUARY			MARCH			
1	482	160	206	1900	160	798	1200	150	496
2	567	250	383	2200	150	910	1000	170	452
3	547	300	439	1900	160	812	880	170	399
4	562	270	417	1700	160	740	760	170	341
5	524	300	426	1500	160	665	700	160	311
6	494	310	415	1300	170	588	854	160	373
7	535	360	514	1100	170	507	937	160	406
8	508	440	597	960	170	450	1070	160	458
9	467	410	512	820	180	392	946	160	401
10	473	290	376	700	180	341	885	160	371
11	531	260	371	600	180	298	964	150	400
12	531	280	403	540	190	273	997	150	408
13	545	350	518	480	190	247	1460	140	543
14	505	400	551	450	190	236	2000	120	632
15	376	410	416	410	200	219	1870	120	620
16	356	380	366	640	190	335	1580	130	537
17	340	310	283	760	180	373	1350	130	468
18	330	260	229	960	170	442	1320	130	470
19	320	240	205	1500	160	648	1370	130	498
20	310	220	181	2000	150	820	1260	140	470
21	310	190	163	1900	150	795	2610	110	690
22	300	180	149	1700	160	718	2690	96	695
23	300	180	145	2200	140	815	2190	100	595
24	300	230	189	2700	120	855	2040	100	560
25	290	410	323	3500	100	977	1800	100	498
26	290	550	428	2800	110	842	1700	100	474
27	290	580	451	1900	120	635	1500	100	421
28	4120	270	3000	1500	140	558	1300	100	368
29	4350	160	1870	---	---	---	1200	110	343
30	3130	160	1320	---	---	---	980	110	282
31	2300	170	1030	---	---	---	847	110	246
TOTAL	25283	---	16876	40620	---	16289	42260	---	14226

## STREAMS TRIBUTARY TO LAKE ERIE

## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

CHLORIDE DISSOLVED (MG/L AS CL), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	848	110	248	840	110	244	450	110	138
2	743	110	219	780	100	216	380	120	119
3	923	100	250	720	100	197	360	120	114
4	1140	95	292	680	100	191	350	120	113
5	984	98	260	640	110	183	330	120	108
6	1600	88	357	600	110	172	320	120	106
7	2620	73	510	560	110	164	310	120	101
8	1500	87	351	540	110	164	300	120	98.6
9	1100	100	300	660	100	184	290	120	96.9
10	2630	77	502	600	100	170	380	120	126
11	2060	79	438	540	110	155	430	120	142
12	5480	64	878	500	110	146	320	130	112
13	7220	48	940	480	110	136	240	130	81.6
14	6040	54	881	450	100	125	273	120	87.5
15	4400	60	717	800	110	239	378	110	98.9
16	3930	65	692	900	100	246	325	120	107
17	3000	70	570	1000	100	282	181	160	77.7
18	2200	76	451	940	120	304	179	160	77.5
19	1700	82	376	860	120	284	163	150	64.1
20	1400	88	333	760	110	234	219	150	83.5
21	1100	94	280	640	110	185	407	120	130
22	980	96	255	560	110	159	255	130	86.3
23	880	98	232	450	110	133	209	130	74.4
24	780	99	209	500	110	152	329	130	119
25	700	100	190	800	120	251	606	120	199
26	660	100	182	860	100	242	427	120	137
27	620	100	173	700	100	193	488	320	421
28	580	100	164	600	110	173	324	560	488
29	780	110	224	500	110	149	700	180	348
30	680	110	197	410	110	123	600	91	147
31	---	---	---	340	110	103	---	---	---
TOTAL	59278	---	11671	20210	---	5899	10523	---	4202.0
JULY			AUGUST			SEPTEMBER			
1	500	100	139	202	110	57.9	298	100	81.6
2	980	110	294	245	120	76.8	281	100	78.0
3	860	92	214	247	110	74.0	259	100	72.5
4	720	89	173	371	100	97.5	238	110	69.0
5	580	97	152	602	97	157	224	120	70.4
6	520	100	141	410	110	125	240	120	77.2
7	1400	85	320	276	120	89.7	267	120	84.0
8	3800	49	499	248	120	79.4	258	110	79.3
9	2000	54	292	255	120	81.5	381	120	120
10	1500	61	245	236	120	77.8	304	110	87.5
11	960	67	175	246	130	83.2	260	110	74.8
12	618	74	123	265	120	88.9	244	120	77.2
13	439	81	96.0	6670	64	660	240	120	78.5
14	587	89	141	3860	50	515	260	120	85.2
15	486	94	123	2350	53	338	339	120	108
16	378	99	101	1980	56	298	343	110	103
17	349	100	97.0	1780	59	283	402	110	119
18	365	100	102	1630	61	270	505	92	128
19	355	110	100	1350	56	206	352	87	82.8
20	329	110	93.7	1070	56	161	345	95	88.6
21	384	110	109	1440	60	232	332	98	88.1
22	483	100	137	934	64	161	326	97	85.2
23	309	100	83.7	705	70	132	324	95	83.3
24	297	110	88.6	576	74	115	329	94	83.9
25	308	120	95.6	492	78	103	500	90	116
26	229	110	69.2	359	82	79.5	607	87	143
27	191	110	55.6	314	86	72.7	457	88	109
28	232	110	71.4	315	91	77.1	483	92	119
29	310	110	94.4	324	96	84.1	637	82	140
30	377	110	112	309	99	82.5	443	88	105
31	234	100	64.1	313	100	84.5	---	---	---
TOTAL	21080	---	4601.3	30374	---	5043.1	10478	---	2837.1
YEAR	342215		101056.2						

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

NITROGEN NITRITE PLUS NITRATE DISSOLVED (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	409	2.52	2.9	1350	1.65	6.0	1230	1.48	4.9
2	460	2.37	2.9	833	1.76	4.0	1160	1.63	5.1
3	305	3.13	2.6	774	1.90	4.0	1260	1.59	5.4
4	264	3.42	2.4	697	2.03	3.8	2070	1.37	7.0
5	227	4.02	2.4	518	2.39	3.3	3030	.846	6.8
6	206	4.53	2.5	432	2.85	3.3	1970	1.10	5.8
7	195	4.86	2.6	403	3.14	3.4	1620	1.25	5.5
8	194	4.97	2.6	366	3.05	3.0	1370	1.31	4.8
9	334	4.19	3.6	348	3.45	3.2	1270	1.38	4.8
10	382	4.14	4.2	335	3.50	3.2	1130	1.48	4.5
11	259	3.87	2.7	319	3.41	2.9	1120	1.54	4.7
12	216	4.58	2.7	304	3.37	2.8	997	1.79	4.8
13	200	5.31	2.9	313	3.69	3.1	882	2.18	5.2
14	190	5.17	2.7	2210	2.71	10	816	2.28	4.9
15	187	5.07	2.6	2620	1.44	9.9	834	2.20	5.0
16	183	5.41	2.7	1450	1.67	6.5	828	2.11	4.7
17	776	4.58	8.4	3190	1.13	7.7	734	2.28	4.5
18	686	2.19	4.1	3380	.835	7.6	666	2.45	4.4
19	406	2.72	3.0	2320	.994	6.2	815	2.27	5.0
20	499	3.22	4.3	1760	1.17	5.6	730	2.42	4.8
21	612	3.00	4.9	1560	1.29	5.4	871	2.42	5.7
22	506	2.81	3.8	1380	1.39	5.2	874	2.08	4.9
23	376	3.14	3.2	1140	1.50	4.6	799	1.96	4.2
24	364	3.42	3.3	941	1.62	4.1	734	2.08	4.1
25	354	3.55	3.4	774	1.75	3.7	696	2.18	4.1
26	306	3.68	3.0	663	1.89	3.4	621	2.19	3.7
27	286	3.91	3.0	2580	1.22	6.6	603	2.58	4.2
28	301	4.08	3.3	2890	.910	7.1	575	2.76	4.3
29	273	3.74	2.8	2040	1.12	6.2	569	2.62	4.0
30	275	3.71	2.7	1430	1.43	5.5	531	2.47	3.5
31	639	3.25	4.9	---	---	---	514	2.28	3.2
TOTAL	10870	---	103.1	39320	---	151.3	31919	---	148.5
JANUARY			FEBRUARY			MARCH			
1	482	2.46	3.2	1900	.903	4.6	1200	1.41	4.6
2	567	2.47	3.8	2200	.978	5.8	1000	1.57	4.2
3	547	2.92	4.3	1900	1.03	5.3	880	1.58	3.7
4	562	2.89	4.4	1700	1.12	5.1	760	1.55	3.2
5	524	2.75	3.9	1500	1.21	4.9	700	1.53	2.9
6	494	2.74	3.7	1300	1.31	4.6	854	1.50	3.5
7	535	2.76	4.0	1100	1.42	4.2	937	1.48	3.7
8	508	2.67	3.7	960	1.54	4.0	1070	1.46	4.2
9	467	2.49	3.1	820	1.67	3.7	946	1.44	3.7
10	473	2.59	3.3	700	1.81	3.4	885	1.41	3.4
11	531	2.56	3.7	600	1.96	3.2	964	1.39	3.6
12	531	2.44	3.5	540	2.12	3.1	997	1.37	3.7
13	545	2.49	3.7	480	2.30	3.0	1460	1.26	4.8
14	505	2.33	3.2	450	2.49	3.0	2000	1.06	5.7
15	376	2.48	2.5	410	2.69	3.0	1870	1.14	5.8
16	356	2.71	2.6	640	2.51	4.3	1580	1.18	5.0
17	340	2.59	2.4	760	2.00	4.1	1350	1.22	4.5
18	330	2.73	2.4	960	1.59	4.1	1320	1.27	4.5
19	320	2.94	2.5	1500	1.27	5.1	1370	1.32	4.9
20	310	2.96	2.5	2000	1.04	5.6	1260	1.36	4.7
21	310	2.89	2.4	1900	1.10	5.6	2610	1.08	6.9
22	300	2.80	2.3	1700	1.17	5.4	2690	.927	6.7
23	300	2.77	2.2	2200	1.07	6.4	2190	1.01	6.0
24	300	2.26	1.8	2700	.955	7.0	2040	1.07	5.9
25	290	2.42	1.9	3500	.876	8.3	1800	1.14	5.6
26	290	2.40	1.9	2800	.967	7.3	1700	1.22	5.6
27	290	2.01	1.6	1900	1.10	5.6	1500	1.30	5.3
28	4120	1.12	12	1500	1.24	5.0	1300	1.38	4.8
29	4350	.914	11	---	---	---	1200	1.47	4.8
30	3130	.811	6.9	---	---	---	980	1.57	4.1
31	2300	.790	4.9	---	---	---	847	1.67	3.8
TOTAL	25283	---	115.3	40620	---	134.7	42260	---	143.8

## STREAMS TRIBUTARY TO LAKE ERIE

## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

NITROGEN NITRITE PLUS NITRATE DISSOLVED (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	848	1.77	4.1	840	2.17	4.9	450	3.02	3.7
2	743	1.89	3.8	780	2.37	5.0	380	3.13	3.2
3	923	1.72	4.1	720	2.47	4.8	360	3.23	3.1
4	1140	1.44	4.4	680	2.38	4.4	350	3.34	3.2
5	984	1.64	4.3	640	2.40	4.1	330	3.44	3.1
6	1600	1.46	5.8	600	2.32	3.8	320	3.21	2.8
7	2620	.987	6.9	560	2.48	3.7	310	3.50	2.9
8	1500	1.19	4.8	540	2.67	3.9	300	3.45	2.8
9	1100	1.44	4.3	660	2.65	4.7	290	3.48	2.7
10	2630	.982	6.1	600	2.66	4.3	380	3.57	3.7
11	2060	.849	4.7	540	2.57	3.7	430	3.26	3.8
12	5480	.735	10	500	2.35	3.2	320	3.12	2.7
13	7220	.602	12	480	2.24	2.9	240	3.78	2.4
14	6040	.701	11	450	2.12	2.6	273	3.58	2.7
15	4400	.816	9.7	800	2.33	5.0	378	3.41	3.0
16	3930	.948	10	900	1.96	4.8	325	2.95	2.6
17	3000	1.10	8.9	1000	2.21	6.0	181	2.98	1.5
18	2200	1.28	7.6	940	2.36	6.0	179	3.10	1.5
19	1700	1.49	6.8	860	2.24	5.2	163	3.06	1.3
20	1400	1.73	6.5	760	2.06	4.2	219	3.04	1.7
21	1100	1.97	5.8	640	2.01	3.5	407	2.75	3.0
22	980	2.04	5.4	560	2.10	3.2	255	2.59	1.8
23	880	2.08	4.9	450	2.08	2.5	209	2.71	1.5
24	780	2.12	4.5	500	2.36	3.2	329	3.01	2.7
25	700	2.16	4.1	800	2.52	5.4	606	2.42	4.0
26	660	2.20	3.9	860	2.11	4.9	427	1.94	2.2
27	620	2.24	3.7	700	2.04	3.9	488	2.35	3.1
28	580	2.28	3.6	600	2.13	3.5	324	2.48	2.2
29	780	2.32	4.9	500	2.64	3.6	700	2.01	3.8
30	680	2.18	4.0	410	2.85	3.2	600	1.81	2.9
31	---	---	---	340	2.93	2.7	---	---	---
TOTAL	59278	---	180.6	20210	---	126.8	10523	---	81.6
JULY			AUGUST			SEPTEMBER			
1	500	2.24	3.0	202	3.10	1.7	298	3.86	3.1
2	980	2.69	7.1	245	3.65	2.4	281	3.79	2.9
3	860	2.47	5.7	247	3.41	2.3	259	3.75	2.6
4	720	2.19	4.3	371	3.01	3.0	238	4.15	2.7
5	580	2.39	3.7	602	2.04	3.3	224	4.37	2.6
6	520	2.37	3.3	410	2.35	2.6	240	4.49	2.9
7	1400	2.22	8.4	276	3.14	2.3	267	4.60	3.3
8	3800	1.20	12	248	3.47	2.3	258	4.79	3.3
9	2000	.961	5.2	255	3.93	2.7	381	4.60	4.7
10	1500	1.09	4.4	236	4.09	2.6	304	3.83	3.2
11	960	1.34	3.5	246	4.41	2.9	260	3.64	2.6
12	618	1.62	2.7	265	4.45	3.2	244	3.84	2.5
13	439	1.95	2.3	6670	2.19	22	240	4.29	2.8
14	587	2.33	3.7	3860	1.27	13	260	4.59	3.2
15	486	2.57	3.4	2350	1.22	7.8	339	4.67	4.3
16	378	2.79	2.8	1980	1.16	6.2	343	4.02	3.7
17	349	2.93	2.8	1780	1.10	5.3	402	3.87	4.0
18	365	2.92	2.9	1630	1.05	4.6	505	2.73	3.7
19	355	3.06	2.9	1350	1.09	4.0	352	3.10	2.9
20	329	3.00	2.7	1070	1.40	4.0	345	3.63	3.4
21	384	2.85	2.8	1440	1.32	5.1	332	3.90	3.5
22	483	2.45	3.2	934	1.83	4.6	326	3.78	3.3
23	309	2.54	2.1	705	2.16	4.1	324	3.71	3.2
24	297	2.72	2.2	576	2.12	3.3	329	3.68	3.3
25	308	2.75	2.3	492	2.16	2.9	500	3.30	4.3
26	229	2.88	1.8	359	2.47	2.4	607	2.86	4.7
27	191	3.10	1.6	314	3.09	2.6	457	2.73	3.4
28	232	3.33	2.1	315	3.30	2.8	483	2.62	3.4
29	310	2.58	2.1	324	3.23	2.8	637	2.05	3.5
30	377	2.93	3.0	309	3.48	2.9	443	2.69	3.2
31	234	2.82	1.8	313	3.83	3.2	---	---	---
TOTAL	21080	---	111.8	30374	---	134.9	10478	---	100.2
YEAR	342215		1532.6						



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

NITROGEN AMMONIA PLUS ORGANIC TOTAL (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	409	.86	.99	1350	.90	3.39	1230	.60	1.99
2	460	.75	.96	833	.63	1.44	1160	.63	1.96
3	305	.31	.25	774	.57	1.18	1260	.74	2.50
4	264	.63	.45	697	.54	1.02	2070	.77	4.40
5	227	.60	.37	518	.90	1.25	3030	.94	7.64
6	206	.54	.30	432	.78	.91	1970	.96	5.10
7	195	.54	.29	403	.57	.62	1620	.91	3.98
8	194	.58	.30	366	.55	.55	1370	1.0	3.71
9	334	.67	.63	348	.52	.49	1270	.95	3.26
10	382	.64	.68	335	.53	.48	1130	.92	2.81
11	259	.48	.33	319	.55	.47	1120	.98	2.98
12	216	.44	.26	304	.53	.44	997	.89	2.42
13	200	.40	.21	313	.55	.46	882	.61	1.45
14	190	.46	.23	2210	1.5	13.6	816	.60	1.29
15	187	.44	.22	2620	1.9	14.5	834	.63	1.42
16	183	.37	.18	1450	1.2	4.84	828	.63	1.41
17	776	.89	2.25	3190	1.5	14.9	734	.67	1.33
18	686	.81	1.56	3380	1.6	14.5	666	.65	1.16
19	406	.51	.56	2320	1.2	7.65	815	.55	1.22
20	499	.53	.72	1760	.95	4.50	730	.40	.80
21	612	.61	1.04	1560	.85	3.56	871	.47	1.10
22	506	.63	.87	1380	.78	2.91	874	.41	.97
23	376	.52	.53	1140	.72	2.23	799	.37	.80
24	364	.35	.35	941	.66	1.69	734	.37	.73
25	354	<.20	.096	774	.61	1.28	696	.37	.69
26	306	<.20	.084	663	.57	1.02	621	.43	.71
27	286	.22	.17	2580	.93	7.57	603	.47	.77
28	301	.33	.27	2890	.94	7.41	575	.47	.73
29	273	.32	.24	2040	.67	3.72	569	.59	.90
30	275	<.20	.12	1430	.56	2.18	531	.62	.89
31	639	.48	1.21	---	---	---	514	.60	.83
TOTAL	10870	---	16.720	39320	---	120.76	31919	---	61.95
JANUARY			FEBRUARY			MARCH			
1	482	.54	.71	1900	1.1	5.70	1200	.81	2.63
2	567	.56	.85	2200	1.0	6.23	1000	.71	1.92
3	547	.45	.66	1900	.99	5.08	880	.70	1.65
4	562	.42	.63	1700	.93	4.29	760	.70	1.43
5	524	.44	.62	1500	.88	3.57	700	.70	1.32
6	494	.46	.61	1300	.83	2.92	854	.70	1.60
7	535	.50	.72	1100	.79	2.34	937	.70	1.76
8	508	.54	.75	960	.74	1.92	1070	.70	2.01
9	467	.71	.89	820	.70	1.55	946	.70	1.78
10	473	1.1	1.35	700	.66	1.25	885	.70	1.67
11	531	.98	1.41	600	.62	1.01	964	.70	1.82
12	531	.95	1.36	540	.59	.86	997	.70	1.88
13	545	1.1	1.55	480	.56	.72	1460	.78	3.17
14	505	.89	1.22	450	.53	.64	2000	.95	5.17
15	376	1.0	1.01	410	.50	.55	1870	.87	4.39
16	356	1.1	1.02	640	.53	.91	1580	.84	3.58
17	340	.93	.85	760	.63	1.29	1350	.81	2.93
18	330	.86	.76	960	.75	1.95	1320	.78	2.77
19	320	.93	.80	1500	.90	3.64	1370	.75	2.76
20	310	.95	.79	2000	1.0	5.60	1260	.72	2.45
21	310	.91	.76	1900	.99	5.06	2610	1.1	8.49
22	300	.89	.72	1700	.94	4.31	2690	1.2	8.49
23	300	.89	.72	2200	1.1	6.40	2190	1.0	6.11
24	300	1.1	.93	2700	1.3	9.28	2040	.97	5.33
25	290	1.3	1.02	3500	1.4	13.6	1800	.90	4.40
26	290	1.2	.94	2800	1.3	9.74	1700	.85	3.88
27	290	.98	.77	1900	1.1	5.67	1500	.79	3.21
28	4120	1.5	16.6	1500	.95	3.84	1300	.74	2.60
29	4350	1.7	19.5	---	---	---	1200	.69	2.25
30	3130	1.5	12.3	---	---	---	980	.65	1.72
31	2300	1.2	7.46	---	---	---	847	.61	1.39
TOTAL	25283	---	80.28	40620	---	109.92	42260	---	96.56

## STREAMS TRIBUTARY TO LAKE ERIE

## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

## NITROGEN AMMONIA PLUS ORGANIC TOTAL (MG/L AS N), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
APRIL			MAY			JUNE			
1	848	.57	1.30	840	.57	1.29	450	.77	.94
2	743	.53	1.07	780	.61	1.29	380	.80	.82
3	923	.58	1.50	720	.57	1.11	360	.84	.81
4	1140	.66	2.02	680	.57	1.05	350	.87	.82
5	984	.61	1.61	640	.56	.97	330	.91	.81
6	1600	.79	3.80	600	.51	.83	320	.97	.84
7	2620	1.2	8.40	560	.51	.77	310	1.0	.88
8	1500	.86	3.49	540	.62	.90	300	1.1	.92
9	1100	.65	1.94	660	.58	1.03	290	1.2	.93
10	2630	.99	7.77	600	.58	.94	380	1.1	1.13
11	2060	1.0	5.62	540	.62	.91	430	1.1	1.31
12	5480	1.6	25.7	500	.64	.87	320	1.1	.94
13	7220	2.2	42.6	480	.68	.88	240	1.1	.69
14	6040	1.7	28.3	450	.83	1.01	273	1.3	.95
15	4400	1.4	16.6	800	1.0	2.24	378	1.8	2.46
16	3930	1.2	13.1	900	.83	2.02	325	1.1	1.02
17	3000	1.1	8.93	1000	.70	1.89	181	.99	.48
18	2200	.98	5.85	940	.58	1.47	179	1.0	.51
19	1700	.88	4.04	860	.47	1.10	163	1.0	.45
20	1400	.79	2.97	760	.46	.95	219	1.1	.72
21	1100	.71	2.10	640	.57	.98	407	1.3	1.58
22	980	.68	1.81	560	.68	1.03	255	1.1	.74
23	880	.67	1.59	450	.87	1.06	209	1.1	.63
24	780	.65	1.38	500	.94	1.28	329	1.2	1.04
25	700	.64	1.21	800	1.1	2.42	606	1.4	2.23
26	660	.63	1.11	860	1.2	2.84	427	.95	1.14
27	620	.61	1.02	700	.92	1.73	488	.89	1.18
28	580	.60	.94	600	.84	1.36	324	.73	.64
29	780	.58	1.23	500	.83	1.12	700	3.7	7.07
30	680	.57	1.05	410	.74	.82	600	1.5	2.37
31	---	---	---	340	.74	.68	---	---	---
TOTAL	59278	---	200.05	20210	---	38.84	10523	---	37.05
JULY			AUGUST			SEPTEMBER			
1	500	1.0	1.40	202	.76	.42	298	.46	.37
2	980	.90	2.39	245	.77	.52	281	.44	.33
3	860	.93	2.17	247	.75	.50	259	.42	.29
4	720	.84	1.63	371	1.2	1.66	238	.51	.32
5	580	.75	1.17	602	1.5	2.51	224	.59	.36
6	520	.74	1.04	410	.69	.78	240	.50	.32
7	1400	2.1	7.82	276	.65	.49	267	.51	.37
8	3800	3.0	30.8	248	.66	.44	258	.54	.38
9	2000	1.4	7.74	255	.62	.43	381	.85	.90
10	1500	1.4	5.66	236	.60	.38	304	.81	.67
11	960	1.4	3.67	246	.61	.41	260	.54	.38
12	618	1.3	2.16	265	.59	.43	244	.49	.32
13	439	1.2	1.40	6670	2.6	67.2	240	.50	.32
14	587	1.3	2.13	3860	1.4	14.7	260	.62	.44
15	486	1.2	1.64	2350	1.1	7.28	339	.66	.61
16	378	.98	1.00	1980	1.0	5.51	343	.62	.57
17	349	.89	.84	1780	.93	4.48	402	.76	1.01
18	365	.94	.93	1630	.84	3.70	505	1.2	1.86
19	355	.83	.79	1350	.92	3.33	352	.59	.56
20	329	.80	.71	1070	.94	2.71	345	.52	.49
21	384	1.3	1.45	1440	.80	3.11	332	.57	.51
22	483	1.5	1.98	934	.66	1.68	326	.56	.49
23	309	1.2	.97	705	.59	1.12	324	.54	.47
24	297	1.0	.84	576	.57	.89	329	.50	.45
25	308	1.0	.86	492	.63	.83	500	1.0	1.91
26	229	.90	.55	359	.69	.67	607	1.0	1.68
27	191	.94	.48	314	.66	.56	457	.64	.79
28	232	.99	.62	315	.61	.52	483	.58	.75
29	310	1.0	.84	324	.59	.51	637	.57	.98
30	377	1.3	1.31	309	.53	.44	443	.53	.63
31	234	1.1	.71	313	.53	.45	---	---	---
TOTAL	21080	---	87.70	30374	---	128.66	10478	---	19.53
YEAR	342215		998.020						

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

PHOSPHORUS TOTAL (MG/L AS P), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	409	.150	.17	1350	.283	1.07	1230	.129	.43
2	460	.146	.19	833	.166	.38	1160	.121	.38
3	305	.107	.089	774	.145	.30	1260	.128	.43
4	264	.109	.078	697	.153	.29	2070	.175	1.12
5	227	.122	.075	518	.144	.20	3030	.243	2.06
6	206	.129	.072	432	.133	.16	1970	.143	.76
7	195	.125	.066	403	.114	.12	1620	.123	.54
8	194	.107	.056	366	.150	.15	1370	.114	.42
9	334	.151	.15	348	.203	.19	1270	.122	.42
10	382	.185	.20	335	.204	.18	1130	.124	.38
11	259	.135	.095	319	.134	.12	1120	.124	.38
12	216	.137	.080	304	.111	.091	997	.122	.33
13	200	.165	.089	313	.156	.13	882	.136	.32
14	190	.134	.069	2210	.562	5.55	816	.157	.34
15	187	.097	.049	2620	.706	5.39	834	.154	.35
16	183	.090	.044	1450	.419	1.67	828	.133	.30
17	776	.264	.69	3190	.662	6.85	734	.131	.26
18	686	.237	.46	3380	.643	5.97	666	.135	.24
19	406	.149	.16	2320	.410	2.61	815	.143	.32
20	499	.152	.21	1760	.268	1.28	730	.133	.26
21	612	.153	.26	1560	.220	.93	871	.185	.44
22	506	.142	.19	1380	.192	.72	874	.172	.41
23	376	.115	.12	1140	.167	.52	799	.137	.29
24	364	.121	.12	941	.146	.37	734	.145	.29
25	354	.137	.13	774	.127	.27	696	.141	.26
26	306	.136	.11	663	.110	.20	621	.143	.24
27	286	.122	.095	2580	.255	2.21	603	.165	.27
28	301	.111	.091	2890	.269	2.13	575	.188	.29
29	273	.093	.069	2040	.173	.97	569	.201	.31
30	275	.080	.059	1430	.133	.52	531	.162	.23
31	639	.181	.42	---	---	---	514	.140	.19
TOTAL	10870	---	4.756	39320	---	41.541	31919	---	13.26
JANUARY			FEBRUARY			MARCH			
1	482	.144	.19	1900	.255	1.31	1200	.154	.50
2	567	.135	.21	2200	.232	1.38	1000	.124	.33
3	547	.136	.20	1900	.211	1.08	880	.121	.29
4	562	.160	.24	1700	.192	.88	760	.122	.25
5	524	.160	.23	1500	.175	.71	700	.123	.23
6	494	.159	.21	1300	.159	.56	854	.124	.28
7	535	.133	.19	1100	.145	.43	937	.124	.31
8	508	.120	.16	960	.132	.34	1070	.125	.36
9	467	.121	.15	820	.120	.27	946	.126	.32
10	473	.123	.16	700	.109	.21	885	.127	.30
11	531	.114	.16	600	.099	.16	964	.128	.33
12	531	.118	.17	540	.090	.13	997	.129	.35
13	545	.113	.17	480	.082	.11	1460	.154	.64
14	505	.082	.11	450	.075	.091	2000	.215	1.17
15	376	.078	.079	410	.068	.076	1870	.190	.96
16	356	.076	.073	640	.076	.13	1580	.180	.77
17	340	.073	.067	760	.100	.21	1350	.171	.62
18	330	.069	.061	960	.132	.34	1320	.162	.58
19	320	.081	.070	1500	.175	.71	1370	.153	.57
20	310	.093	.078	2000	.219	1.18	1260	.145	.50
21	310	.102	.085	1900	.204	1.05	2610	.297	2.50
22	300	.127	.10	1700	.189	.87	2690	.312	2.30
23	300	.150	.12	2200	.237	1.41	2190	.258	1.52
24	300	.197	.16	2700	.309	2.25	2040	.236	1.30
25	290	.166	.13	3500	.376	3.56	1800	.217	1.05
26	290	.150	.12	2800	.317	2.39	1700	.199	.91
27	290	.158	.12	1900	.249	1.28	1500	.182	.74
28	4120	.565	6.33	1500	.196	.79	1300	.167	.59
29	4350	.653	7.70	---	---	---	1200	.153	.50
30	3130	.462	3.94	---	---	---	980	.141	.37
31	2300	.296	1.84	---	---	---	847	.129	.29
TOTAL	25283	---	23.623	40620	---	23.907	42260	---	21.73

## STREAMS TRIBUTARY TO LAKE ERIE

04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

PHOSPHORUS TOTAL (MG/L AS P), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/ DAY)
APRIL				MAY			JUNE		
1	848	.118	.27	840	.081	.18	450	.090	.11
2	743	.108	.22	780	.081	.17	380	.096	.098
3	923	.122	.32	720	.077	.15	360	.102	.099
4	1140	.138	.43	680	.068	.12	350	.108	.10
5	984	.127	.34	640	.059	.10	330	.114	.10
6	1600	.184	.91	600	.054	.087	320	.112	.097
7	2620	.284	2.06	560	.051	.077	310	.157	.13
8	1500	.193	.78	540	.079	.12	300	.182	.15
9	1100	.144	.43	660	.080	.14	290	.146	.11
10	2630	.285	2.30	600	.078	.13	380	.129	.13
11	2060	.248	1.40	540	.073	.11	430	.141	.16
12	5480	.561	9.89	500	.073	.099	320	.152	.13
13	7220	.905	17.7	480	.070	.090	240	.210	.14
14	6040	.548	9.06	450	.063	.077	273	.303	.23
15	4400	.352	4.21	800	.135	.29	378	.542	.79
16	3930	.292	3.11	900	.188	.46	325	.305	.29
17	3000	.249	2.02	1000	.154	.41	181	.244	.12
18	2200	.212	1.26	940	.102	.26	179	.218	.11
19	1700	.180	.83	860	.077	.18	163	.209	.092
20	1400	.153	.58	760	.075	.15	219	.254	.19
21	1100	.132	.39	640	.068	.12	407	.325	.40
22	980	.124	.33	560	.066	.10	255	.210	.14
23	880	.119	.28	450	.069	.084	209	.189	.11
24	780	.113	.24	500	.097	.13	329	.199	.19
25	700	.108	.20	800	.134	.29	606	.286	.47
26	660	.104	.18	860	.157	.36	427	.204	.24
27	620	.099	.17	700	.130	.25	488	.212	.28
28	580	.095	.15	600	.100	.16	324	.199	.17
29	780	.090	.19	500	.085	.11	700	1.09	2.05
30	680	.078	.14	410	.081	.090	600	.436	.71
31	---	---	---	340	.085	.078	---	---	---
TOTAL	59278	---	60.39	20210	---	5.172	10523	---	8.136
JULY				AUGUST			SEPTEMBER		
1	500	.232	.31	202	.166	.091	298	.147	.12
2	980	.180	.47	245	.171	.12	281	.115	.087
3	860	.195	.45	247	.151	.10	259	.113	.079
4	720	.202	.39	371	.356	.55	238	.121	.078
5	580	.214	.33	602	.526	.87	224	.122	.074
6	520	.216	.30	410	.165	.19	240	.143	.093
7	1400	.949	3.59	276	.141	.11	267	.153	.11
8	3800	1.13	11.6	248	.164	.11	258	.177	.12
9	2000	.456	2.46	255	.210	.14	381	.246	.26
10	1500	.330	1.33	236	.198	.13	304	.159	.13
11	960	.279	.72	246	.152	.10	260	.107	.075
12	618	.248	.41	265	.129	.092	244	.096	.063
13	439	.220	.26	6670	.742	19.7	240	.107	.069
14	587	.267	.44	3860	.433	4.72	260	.188	.13
15	486	.239	.32	2350	.355	2.26	339	.160	.14
16	378	.163	.17	1980	.309	1.65	343	.121	.11
17	349	.137	.13	1780	.270	1.30	402	.150	.19
18	365	.153	.15	1630	.236	1.04	505	.208	.31
19	355	.136	.13	1350	.206	.75	352	.155	.15
20	329	.115	.10	1070	.180	.52	345	.176	.16
21	384	.271	.34	1440	.274	1.10	332	.161	.14
22	483	.333	.45	934	.224	.57	326	.140	.12
23	309	.181	.15	705	.187	.36	324	.156	.14
24	297	.179	.15	576	.145	.23	329	.170	.15
25	308	.220	.19	492	.126	.17	500	.313	.60
26	229	.196	.12	359	.119	.12	607	.296	.49
27	191	.196	.10	314	.109	.093	457	.221	.27
28	232	.205	.13	315	.122	.10	483	.186	.24
29	310	.303	.26	324	.152	.13	637	.185	.32
30	377	.370	.38	309	.184	.15	443	.190	.23
31	234	.275	.18	313	.197	.17	---	---	---
TOTAL	21080	---	26.51	30374	---	37.736	10478	---	5.248
YEAR	342215		272.009						



## STREAMS TRIBUTARY TO LAKE ERIE

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## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	409	63	72	1350	100	375	1230	64	213
2	460	66	87	833	41	98	1160	38	119
3	305	20	17	774	27	56	1260	50	170
4	264	14	10	697	21	39	2070	195	1560
5	227	14	8.8	518	19	27	3030	283	2440
6	206	12	6.6	432	13	16	1970	118	635
7	195	13	6.9	403	9	9.4	1620	79	351
8	194	16	8.1	366	8	7.6	1370	50	184
9	334	36	38	348	5	4.9	1270	47	161
10	382	49	55	335	6	5.5	1130	38	117
11	259	11	8.0	319	8	6.6	1120	38	114
12	216	9	5.1	304	7	6.0	997	39	105
13	200	12	6.6	313	8	7.0	882	35	84
14	190	8	4.1	2210	805	8980	816	33	71
15	187	7	3.5	2620	503	4140	834	39	89
16	183	6	3.0	1450	172	692	828	37	83
17	776	227	746	3190	708	8140	734	40	80
18	686	104	229	3380	337	3200	666	29	52
19	406	22	24	2320	169	1080	815	45	98
20	499	33	45	1760	98	469	730	32	62
21	612	42	73	1560	73	306	871	31	73
22	506	28	39	1380	57	214	874	32	76
23	376	12	12	1140	45	140	799	23	51
24	364	12	12	941	38	96	734	16	32
25	354	15	14	774	35	73	696	19	36
26	306	15	12	663	29	51	621	24	41
27	286	11	8.6	2580	517	5110	603	24	38
28	301	8	6.6	2890	263	2140	575	15	24
29	273	7	5.2	2040	117	656	569	12	19
30	275	5	3.7	1430	69	268	531	12	18
31	639	33	90	---	---	---	514	19	26
TOTAL	10870	---	1659.8	39320	---	36413.0	31919	---	7222
JANUARY			FEBRUARY			MARCH			
1	482	17	23	1900	115	590	1200	63	203
2	567	24	36	2200	170	1010	1000	63	170
3	547	23	34	1900	118	605	880	48	115
4	562	20	30	1700	63	288	760	39	80
5	524	17	24	1500	59	240	700	34	63
6	494	15	20	1300	48	167	854	57	131
7	535	25	36	1100	44	131	937	74	186
8	508	31	43	960	47	121	1070	86	247
9	467	29	36	820	50	110	946	57	145
10	473	25	32	700	53	100	885	53	127
11	531	26	37	600	56	91	964	41	106
12	531	25	37	540	53	78	997	45	122
13	545	25	37	480	45	59	1460	100	449
14	505	31	42	450	36	44	2000	161	876
15	376	40	40	410	27	30	1870	147	744
16	356	49	47	640	34	58	1580	102	442
17	340	47	44	760	35	72	1350	67	244
18	330	44	39	960	67	175	1320	45	161
19	320	39	33	1500	141	571	1370	41	152
20	310	24	21	2000	304	1640	1260	40	135
21	310	14	12	1900	272	1390	2610	826	7630
22	300	10	7.9	1700	193	886	2690	448	3390
23	300	14	11	2200	150	892	2190	190	1130
24	300	14	11	2700	227	1660	2040	157	866
25	290	16	12	3500	316	2980	1800	134	651
26	290	25	20	2800	130	984	1700	89	408
27	290	281	220	1900	87	448	1500	72	290
28	4120	1200	13600	1500	73	294	1300	61	216
29	4350	437	5150	---	---	---	1200	54	175
30	3130	327	2780	---	---	---	980	45	120
31	2300	195	1210	---	---	---	847	36	82
TOTAL	25283	---	23724.9	40620	---	15714	42260	---	19856

## STREAMS TRIBUTARY TO LAKE ERIE

## 04208000 CUYAHOGA RIVER AT INDEPENDENCE, OH--Continued

## SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	848	32	74	840	32	73	450	39	47
2	743	25	50	780	18	37	380	30	31
3	923	28	73	720	12	23	360	27	26
4	1140	30	91	680	15	28	350	28	26
5	984	21	57	640	13	22	330	19	17
6	1600	301	1860	600	12	19	320	19	16
7	2620	401	3000	560	9	14	310	21	18
8	1500	141	571	540	12	18	300	30	24
9	1100	121	360	660	14	25	290	35	28
10	2630	620	4950	600	12	19	380	33	34
11	2060	383	2200	540	10	15	430	36	42
12	5480	957	16700	500	23	31	320	46	40
13	7220	1310	25600	480	13	17	240	93	60
14	6040	862	14300	450	24	29	273	135	109
15	4400	565	6740	800	59	128	378	666	1220
16	3930	419	4480	900	200	485	325	363	399
17	3000	349	2820	1000	47	128	181	82	40
18	2200	265	1570	940	22	55	179	74	36
19	1700	184	846	860	20	46	163	72	32
20	1400	134	506	760	22	46	219	116	103
21	1100	99	295	640	17	29	407	238	288
22	980	76	200	560	14	22	255	109	76
23	880	60	143	450	19	23	209	62	35
24	780	46	98	500	43	58	329	189	221
25	700	33	62	800	78	169	606	500	825
26	660	28	50	860	69	160	427	286	370
27	620	25	42	700	52	99	488	221	299
28	580	22	35	600	32	52	324	82	75
29	780	42	89	500	27	37	700	1090	2070
30	680	74	136	410	23	26	600	691	1120
31	---	---	---	340	22	20	---	---	---
TOTAL	59278	---	87998	20210	---	1953	10523	---	7727
JULY			AUGUST			SEPTEMBER			
1	500	180	243	202	17	9.3	298	14	11
2	980	133	351	245	24	16	281	8	6.3
3	860	140	325	247	21	14	259	8	5.9
4	720	104	203	371	168	293	238	7	4.7
5	580	82	129	602	307	504	224	7	4.2
6	520	64	90	410	63	75	240	6	4.0
7	1400	924	3490	276	33	25	267	6	4.6
8	3800	838	8600	248	27	18	258	7	4.8
9	2000	331	1790	255	23	16	381	29	32
10	1500	177	717	236	16	10	304	16	14
11	960	109	281	246	23	15	260	10	6.9
12	618	68	114	265	27	20	244	9	5.7
13	439	44	52	6670	1380	39400	240	7	4.8
14	587	122	221	3860	840	9610	260	9	6.6
15	486	66	93	2350	315	2020	339	19	17
16	378	35	36	1980	204	1090	343	16	15
17	349	29	27	1780	177	855	402	32	49
18	365	22	22	1630	153	674	505	53	82
19	355	17	17	1350	130	475	352	23	22
20	329	16	14	1070	103	300	345	22	20
21	384	91	116	1440	289	1210	332	19	17
22	483	130	178	934	113	294	326	23	20
23	309	50	42	705	67	128	324	22	19
24	297	43	40	576	52	81	329	17	15
25	308	46	41	492	44	59	500	53	111
26	229	25	15	359	31	31	607	74	123
27	191	27	14	314	30	26	457	39	48
28	232	36	23	315	28	24	483	40	52
29	310	125	108	324	26	23	637	109	195
30	377	55	58	309	19	16	443	37	45
31	234	27	17	313	24	20	---	---	---
TOTAL	21080	---	17467	30374	---	57351.3	10478	---	965.5
YEAR	342215		278051.5						

# STREAMS TRIBUTARY TO LAKE ERIE

105

## 04208504 CUYAHOGA RIVER AT LTV STEEL AT CLEVELAND, OH

LOCATION.--Lat 41°27'54", long 82°22'50", Cuyahoga County, Hydrologic Unit 04110002, on left bank, at LTV Steel Company footbridge, 1.2 mi downstream from Big Creek, 5.5 mi upstream from mouth at Cleveland.

DRAINAGE AREA.--788 mi².

PERIOD OF RECORD.--October 1, 1991 to current year.

GAGE.--Water-stage and acoustic velocity meter recorder. Elevation of gage is 583.57 ft above sea level, from topographic map.

REMARKS.--Estimated daily discharges are marked in table. Records fair, except for periods of estimated record, which are poor..

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,500 ft³/s Aug. 13, 1994; minimum daily discharge, 310 ft³/s Aug. 29, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,500 ft³/s Aug. 13; minimum daily discharge, 325 ft³/s Jun. 23.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	749	e2660	e1480	e760	2880	1330	e1270	964	767	826	461	e450
2	1290	e1310	e1510	e900	2520	1290	1170	839	562	733	518	e430
3	626	1290	1700	e830	e1470	e1190	1480	762	499	804	524	e390
4	521	1120	3120	916	e1300	e960	e1600	712	473	725	1030	e360
5	464	e787	e4790	849	1300	1160	e1340	680	440	691	2000	e340
6	425	e632	e3000	e800	1540	1380	2860	683	442	609	691	e370
7	403	698	e2600	e920	e1600	e1410	4240	e700	495	1940	601	e400
8	388	629	e2200	e860	e1650	e1590	e2750	893	482	4900	543	e450
9	812	e671	e2000	e760	1500	1550	e1950	709	e500	2660	486	e560
10	703	e890	e1800	e780	1680	2160	4710	e800	545	1520	651	e480
11	489	571	e1700	e890	e2210	e2720	3900	e886	583	993	1070	e400
12	410	549	e1600	e900	e1190	e3040	e7800	928	462	814	e4600	e380
13	433	e711	e1400	936	1330	2890	e9000	663	e550	684	e10000	e370
14	395	e4090	e1300	e910	1040	2950	e7300	e540	636	1030	e5600	e400
15	387	3550	e1200	e800	e1470	e2730	5250	e1060	768	737	e3600	e540
16	377	1890	e1300	e660	e1100	e2290	4510	1450	617	626	e3000	580
17	1500	e4910	e950	e580	973	2070	3450	968	476	559	e2700	684
18	1160	e3790	e1100	e560	1310	1980	2630	e900	474	558	e2500	778
19	683	2910	1220	e540	e1790	e2020	2140	e930	441	519	e2000	552
20	759	2190	1100	e520	e3450	e1960	1800	692	604	483	e1600	554
21	937	e1810	e1320	e500	3570	3640	1560	641	621	926	e2100	533
22	772	e1740	e1320	e490	2680	3600	1360	590	483	998	e1400	511
23	620	1490	1230	e490	e2220	e2760	1140	562	325	670	e1100	524
24	e539	1280	1130	e480	e3180	e2530	1020	523	1010	815	e950	539
25	e527	e1180	e1180	e480	2570	2430	933	806	1200	708	e750	790
26	511	e1180	e1100	e470	2020	2160	896	877	748	538	e600	957
27	490	4350	e1000	e470	e1610	e2050	916	735	1240	485	e470	706
28	e1020	4300	e960	e3500	e1310	e1830	808	622	591	602	e480	815
29	e545	2600	e900	e6600	---	1870	906	563	2160	674	e490	e1000
30	529	1840	e850	e6000	---	1670	920	499	1510	800	e480	687
31	1630	---	e820	3220	---	e1610	---	605	---	515	e470	---
TOTAL	21094	57618	48880	38371	52463	64820	81609	23782	20704	30142	53465	16530
MEAN	680	1921	1577	1238	1874	2091	2720	767	690	972	1725	551
MAX	1630	4910	4790	6600	3570	3640	9000	1450	2160	4900	10000	1000
MIN	377	549	820	470	973	960	808	499	325	483	461	340

CAL YR 1993 TOTAL 539770 MEAN 1479 MAX 8810 MIN 310  
WTR YR 1994 TOTAL 509478 MEAN 1396 MAX 10000 MIN 325

e Estimated

LOCATION.--Lat 41°37'51", long 81°24'13", in T.9 N., R.10 W., Lake County, Hydrologic Unit 04110003, on left bank, 150 ft downstream from city waterworks dam, 800 ft downstream from East Branch, 1.0 mi southeast of Willoughby, and 5.0 mi upstream from mouth.

PERIOD OF RECORD.--July 1925 to November 1935, October 1939 to 1984, March 25, 1988 to current year. [July 1925 to September 1932 monthly run-off in inches, adjusted for diversion, published in WSP 1307; previously published run-off was unadjusted and should not be used].

REVISED RECORDS.--WSP 1084: 1929(M), 1931(M). WSP 1307: 1926-28(M), 1930(M), 1932-35(M), 1942(M). WSP 1912: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 594.57 ft above sea level. Prior to Dec. 20, 1939, nonrecording gage at site 150 ft upstream at datum 7 ft higher.

REMARKS.--Estimated daily discharges: Dec. 26 to Jan. 27, Feb. 3-17, 28 to Mar. 5, Aug. 14 to Sep. 20. Records good except for periods of estimated record, which are poor. Water diverted 200 ft upstream from station for municipal supply of city of Willoughby until 1988 when water treatment plant was relocated downstream of gaging station. Water-quality data collected at this site 1965 to 1977. Sediment data collected at this site 1969 to 1981.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	1120	338	270	458	290	382	295	356	214	54	72
2	406	501	296	270	309	260	357	258	157	134	51	70
3	233	578	460	270	290	230	387	240	115	110	50	66
4	134	567	1240	260	270	210	439	233	88	88	110	62
5	107	376	1930	260	250	200	389	229	79	78	842	60
6	81	300	645	260	240	643	1050	234	77	71	216	80
7	72	248	533	250	220	947	1710	227	71	843	115	110
8	69	208	395	250	210	783	864	267	69	1680	88	84
9	133	177	313	240	200	495	530	245	66	418	67	140
10	166	155	273	240	190	411	1760	265	64	224	58	90
11	102	145	312	240	180	388	967	237	62	148	67	74
12	77	138	317	230	170	408	3120	259	109	115	114	66
13	71	129	288	230	170	678	3190	254	122	91	7450	62
14	66	786	263	230	160	951	1530	219	252	282	2800	76
15	65	1070	310	230	150	1090	741	536	478	171	1000	72
16	65	443	392	230	150	939	643	793	355	93	350	80
17	292	2600	281	220	500	534	500	413	128	69	160	150
18	383	2200	241	220	1860	483	421	316	86	61	130	130
19	179	770	399	220	3160	456	389	266	72	57	100	110
20	137	550	374	220	4020	492	344	238	69	55	90	90
21	141	368	370	220	2840	2020	304	212	123	117	330	74
22	146	284	373	220	1270	1830	280	188	79	175	180	66
23	107	236	331	210	764	886	256	164	67	80	110	63
24	88	214	298	210	932	667	247	153	224	71	90	58
25	80	196	315	210	539	524	243	161	368	110	82	78
26	79	175	300	210	418	455	263	182	343	84	76	187
27	80	1950	290	500	373	458	312	170	294	56	70	89
28	117	1900	290	5340	320	466	268	134	182	113	120	192
29	114	688	290	3600	---	447	260	115	522	143	96	902
30	102	442	280	1480	---	432	285	102	407	110	80	282
31	482	---	280	674	---	400	---	101	---	68	76	---
TOTAL	4632	19514	13017	17714	20613	19473	22431	7706	5484	6129	15222	3735
MEAN	149	650	420	571	736	628	748	249	183	198	491	124
MAX	482	2600	1930	5340	4020	2020	3190	793	522	1680	7450	902
MIN	65	129	241	210	150	200	243	101	62	55	50	58
CFSM	.61	2.64	1.71	2.32	2.99	2.55	3.04	1.01	.74	.80	2.00	.51
IN.	.70	2.95	1.97	2.68	3.12	2.94	3.39	1.17	.83	.93	2.30	.56

MEAN	155	305	419	466	550	692	546	357	210	131	123	125
MAX	976	850	1284	1312	1242	1234	1409	1088	781	698	602	641
(WY)	1927	1984	1991	1952	1982	1963	1957	1989	1947	1969	1992	1926
MIN	21.9	44.3	60.4	115	48.1	179	120	53.4	23.1	20.3	16.8	17.6
(WY)	1954	1965	1964	1977	1934	1990	1946	1934	1934	1934	1930	1933

ANNUAL TOTAL	147697		155670			
ANNUAL MEAN	405		426		339	
HIGHEST ANNUAL MEAN					465	1975
LOWEST ANNUAL MEAN					148	1934
HIGHEST DAILY MEAN	4880	Jan 5	7450	Aug 13	12300	Mar 22 1948
LOWEST DAILY MEAN	35	Aug 22	50	Aug 3	3.0	Jul 25 1934
ANNUAL SEVEN-DAY MINIMUM	39	Aug 22	69	Aug 30	7.0	Aug 25 1933
INSTANTANEOUS PEAK FLOW			15200	Aug 13 a	28000	Mar 22 1948
INSTANTANEOUS PEAK STAGE			14.41	Aug 13	17.95	Mar 22 1948
INSTANTANEOUS LOW FLOW			50	Aug 3		
ANNUAL RUNOFF (CFSM)	1.64		1.73		1.38	
ANNUAL RUNOFF (INCHES)	22.33		23.54		18.75	
10 PERCENT EXCEEDS	937		873		765	
50 PERCENT EXCEEDS	214		238		149	
90 PERCENT EXCEEDS	53		72		36	

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.



# STREAMS TRIBUTARY TO LAKE ERIE

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## 04212100 GRAND RIVER NEAR PAINESVILLE, OH National Stream Quality Accounting Network Station

LOCATION.--Lat 41°43'08", long 81°13'41", Lake County, Hydrologic Unit 04110004, on downstream left abutment of bridge on State Highway 84 (Walnut Avenue), 0.9 mi downstream from Big Creek in Painesville.  
DRAINAGE AREA.--685 mi<sup>2</sup>.

### WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 596.37 ft above sea level. Previously published, in error, as 620.37 ft above sea level.

REMARKS.--Estimated daily discharges: Oct. 1-6, Dec. 26 to Jan. 27, Feb. 2-15, 26 to Mar. 6. Records good except periods of estimated record, which are poor.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	460	2450	1660	520	3640	1300	685	213	157	1190	41	119
2	520	2210	1310	500	2600	940	532	233	118	727	34	89
3	410	1680	1220	490	2000	740	474	249	121	395	30	70
4	270	1580	2220	480	1200	600	547	267	129	226	36	59
5	200	1280	4820	470	960	500	716	247	103	156	156	51
6	150	924	3370	470	800	700	1560	213	80	119	84	43
7	99	697	2360	460	700	2830	3330	189	65	248	78	42
8	77	486	2120	450	640	3840	3610	189	55	866	62	39
9	94	371	1680	450	560	2680	2060	181	50	1660	55	36
10	98	281	1280	440	520	1830	2710	174	38	757	47	32
11	65	236	1090	440	470	1410	3420	165	34	337	37	29
12	57	209	1010	430	430	1110	4550	160	32	183	56	25
13	48	183	803	430	400	1300	7900	148	41	126	1810	25
14	47	585	654	430	380	1840	7780	135	161	125	3070	25
15	43	1920	653	420	360	3730	5440	156	134	119	3760	26
16	39	1820	931	420	423	5060	4150	238	223	92	3540	42
17	143	3230	787	420	522	3420	2780	418	142	71	3420	44
18	807	6340	603	420	815	2420	1680	807	91	58	2480	41
19	871	4610	685	410	2010	1810	1020	734	84	51	1380	29
20	463	2510	852	410	6550	1490	668	509	63	43	490	25
21	335	1830	937	410	8720	3050	492	362	55	36	282	23
22	491	1470	996	400	7150	6340	373	269	49	55	243	20
23	482	981	946	400	4480	5130	292	216	37	49	206	18
24	322	595	771	400	4030	3740	262	182	56	38	164	17
25	245	445	660	400	3720	2860	236	163	165	39	129	18
26	180	384	630	400	3000	1870	264	143	328	61	103	41
27	136	1420	600	1000	2100	1300	388	143	496	46	85	29
28	120	4590	570	5110	1700	1070	297	165	857	70	73	46
29	111	3930	560	7320	---	1060	244	173	847	82	92	115
30	111	2180	540	6590	---	1010	207	173	1100	73	108	110
31	414	---	520	5030	---	877	---	142	---	56	142	---
TOTAL	7908	51427	37838	36420	60880	67857	58667	7756	5911	8154	22293	1328
MEAN	255	1714	1221	1175	2174	2189	1956	250	197	263	719	44.3
MAX	871	6340	4820	7320	8720	6340	7900	807	1100	1660	3760	119
MIN	39	183	520	400	360	500	207	135	32	36	30	17
CFSM	.37	2.50	1.78	1.72	3.17	3.20	2.85	.37	.29	.38	1.05	.06
IN.	.43	2.79	2.05	1.98	3.31	3.69	3.19	.42	.32	.44	1.21	.07

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
MEAN	517	1269	1630	1335	1902	2074	1456	762	620	305	313	453								
MAX	1880	4026	3816	3327	4044	3753	2598	3214	2851	1106	1106	1854								
(WY)	1991	1986	1978	1993	1981	1993	1987	1989	1986	1987	1980	1990								
MIN	42.1	67.1	363	109	322	577	450	106	39.8	30.5	17.0	18.6								
(WY)	1992	1979	1992	1977	1987	1990	1975	1987	1988	1991	1991	1991								

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR

#### FOR 1994 WATER YEAR

#### WATER YEARS 1975 - 1994

ANNUAL TOTAL	411802.3	366439	
ANNUAL MEAN	1128	1004	1048
HIGHEST ANNUAL MEAN			1375
LOWEST ANNUAL MEAN			668
HIGHEST DAILY MEAN	10900	Mar 26	15300
LOWEST DAILY MEAN	9.3	Aug 31	5.1
ANNUAL SEVEN-DAY MINIMUM	13	Aug 27	5.3
INSTANTANEOUS PEAK FLOW			18700
INSTANTANEOUS PEAK STAGE			13.16
INSTANTANEOUS LOW FLOW			17
ANNUAL RUNOFF (CFSM)	1.65	1.47	1.53
ANNUAL RUNOFF (INCHES)	22.36	19.90	20.78
10 PERCENT EXCEEDS	3420	3130	2840
50 PERCENT EXCEEDS	371	418	420
90 PERCENT EXCEEDS	29	43	41

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

## STREAMS TRIBUTARY TO LAKE ERIE

## 04212100 GRAND RIVER NEAR PAINESVILLE, OH--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

		DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC 21...	1130	939	267	8.0	1.0	2.5	6.0	13.8	102	180	190
MAR 15...	1345	3700	243	7.5	10.0	2.0	97	13.6	101	300	490
JUN 01...	1330	169	420	8.1	15.0	20.5	2.0	8.4	95	220	320
SEP 19...	1400	29	389	8.1	23.5	21.5	1.2	8.8	103	K330	K39
DATE	HARD-NESS TOTAL (MG/L AS CaCO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS Ca) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg) (00925)	SODIUM, DIS-SOLVED (MG/L AS Na) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	BICAR-BONATE WATER DIS IT FIELD HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD CO3 (00452)	ALKA-LINITY WAT WH TOT FET FIELD CACO3 (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
DEC 21...	93	26	6.8	15	2.1	64	0	53	38	24	0.10
MAR 15...	68	19	5.0	20	1.9	38	0	31	24	36	0.10
JUN 01...	140	38	10	28	3.0	--	--	91	42	43	0.30
SEP 19...	130	36	9.6	22	4.0	106	0	84	45	36	0.20
DATE	SILICA, DIS-SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)
DEC 21...	5.7	164	0.53	0.03	0.3	0.02	<0.01	0.01	50	20	<3
MAR 15...	4.9	150	0.53	0.04	0.8	0.15	0.03	0.02	80	17	<3
JUN 01...	0.8	244	0.16	0.01	0.6	0.03	<0.01	<0.01	20	28	<3
SEP 19...	1.1	236	0.12	0.02	0.4	0.03	0.04	0.02	10	28	<3
DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	
DEC 21...	220	<4	28	<10	<1	<1	<1.0	79	<6	17.4	
MAR 15...	180	<4	31	<10	1	<1	<1.0	60	<6	--	
JUL 01...	60	<4	16	<10	2	<1	<1.0	110	<6	16.1	
SEP 19...	44	<4	20	<10	2	<1	<1.0	110	<6	11.4	

K Non-idea colony count

# STREAMS TRIBUTARY TO LAKE ERIE

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## 04213000 CONNEAUT CREEK AT CONNEAUT, OH

LOCATION.--Lat 41°55'37", long 80°36'15", Ashtabula County, Hydrologic Unit 04120101, on right bank at downstream side of Keefus Road bridge at Conneaut, and 6.4 mi upstream from mouth.

DRAINAGE AREA.--175 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1922 to December 1935, March 1950 to September 1961 (published as "at Amboy"), October 1961 to current year.

REVISED RECORDS.--WSP 714: 1926. WSP 784: 1933. WSP 1437: 1923-25(M), 1926-30, 1931-32(M), 1933, 1935(M). WSP 1912: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 610.30 ft above sea level. Prior to Aug. 17, 1924, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 7-17, Dec. 26 to Jan. 30, Feb. 2-14, 21, 26 to Mar. 6, Jun. 6 to Sep. 27. Records fair, except for periods of estimated record and discharges below 45 cfs, which are poor. Water-quality data collected at this site 1965 to 1977. Sediment data collected 1970 to 1974.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	768	319	190	821	160	186	101	36	420	22	70
2	125	762	252	190	450	150	153	109	38	210	17	60
3	144	606	403	180	320	130	144	97	43	140	14	50
4	98	935	732	180	260	120	214	80	33	100	12	40
5	68	640	1920	180	220	110	293	73	32	74	80	35
6	49	362	1210	180	170	120	347	74	31	50	45	30
7	39	251	609	180	150	486	1390	78	30	120	20	25
8	37	206	633	175	130	1440	1520	83	30	200	16	22
9	35	169	362	175	110	1160	562	84	28	560	14	20
10	33	136	252	175	100	448	622	80	27	350	12	17
11	31	109	336	175	94	260	1300	71	26	200	11	15
12	29	96	379	175	86	244	941	67	25	100	11	13
13	28	87	227	170	80	242	2640	64	80	60	100	12
14	27	211	179	170	90	359	2910	64	1340	47	2400	12
15	26	1020	172	170	108	1230	837	64	302	40	2600	13
16	25	738	188	170	114	2440	455	88	61	32	540	26
17	45	756	174	170	151	1190	480	341	29	27	310	35
18	457	2330	139	170	144	517	309	362	27	20	230	30
19	352	1490	154	180	258	334	219	190	27	16	180	23
20	155	483	279	180	1220	294	178	121	23	14	130	18
21	164	368	296	180	2000	703	145	89	22	13	100	14
22	481	243	264	180	3810	2900	120	70	20	21	80	12
23	237	186	244	190	1270	3380	105	56	19	17	60	11
24	125	152	206	190	765	2080	96	47	19	14	50	10
25	87	137	204	190	939	1540	90	43	40	13	45	13
26	69	126	200	200	350	581	88	47	33	22	40	70
27	61	201	200	500	250	364	129	90	49	20	35	130
28	98	1330	200	1000	200	504	153	68	69	17	32	123
29	168	1410	190	2000	---	434	112	53	127	35	45	255
30	124	499	190	2900	---	306	100	39	490	30	60	249
31	164	---	190	1610	---	236	---	34	---	28	80	---
TOTAL	3731	16807	11303	12675	14660	24462	16838	2927	3156	3010	7391	1453
MEAN	120	560	365	409	524	789	561	94.4	105	97.1	238	48.4
MAX	481	2330	1920	2900	3810	3380	2910	362	1340	560	2600	255
MIN	25	87	139	170	80	110	88	34	19	13	11	10
CFSM	.69	3.20	2.08	2.34	2.99	4.51	3.21	.54	.60	.55	1.36	.28
IN.	.79	3.57	2.40	2.69	3.12	5.20	3.58	.62	.67	.64	1.57	.31

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 1994, BY WATER YEAR (WY)

	MEAN	139	315	423	412	464	546	388	228	125	78.5	68.8	105
MAX	804	1373	1049	929	1115	987	839	670	1013	415	493	709	
(WY)	1927	1986	1928	1990	1981	1972	1957	1953	1986	1969	1980	1990	
MIN	4.95	17.1	35.1	81.0	39.6	235	69.9	20.2	5.46	2.79	3.19	3.56	
(WY)	1924	1954	1961	1977	1934	1969	1935	1934	1934	1934	1923	1932	

### SUMMARY STATISTICS

#### FOR 1993 CALENDAR YEAR \*

#### FOR 1994 WATER YEAR

#### WATER YEARS 1922 - 1994

ANNUAL TOTAL	106274.3	118413	
ANNUAL MEAN	291	324	274
HIGHEST ANNUAL MEAN			401
LOWEST ANNUAL MEAN			140
HIGHEST DAILY MEAN	3330	Mar 25	11000
LOWEST DAILY MEAN	4.0	Aug 31	.30
ANNUAL SEVEN-DAY MINIMUM	4.9	Aug 26	.64
INSTANTANEOUS PEAK FLOW			4910
INSTANTANEOUS PEAK STAGE			8.99
INSTANTANEOUS LOW FLOW			10
ANNUAL RUNOFF (CFSM)	1.66	1.85	1.56
ANNUAL RUNOFF (INCHES)	22.59	25.17	21.25
10 PERCENT EXCEEDS	755	827	680
50 PERCENT EXCEEDS	98	144	96
90 PERCENT EXCEEDS	10	22	10

a Peaks above base shown in Table of peak discharges and stages at continuous-record surface-water-discharge stations.

\* Ice jam

## 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 flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at crest-stage partial-record stations are presented in the following table. Discharge measurements made at low-flow partial-record sites and at miscellaneous sites and for special studies are given in separate tables.

## CREST-STAGE PARTIAL-RECORD STATIONS

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device that will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but 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 1994 maximum		Period of record maximum			
			Date	Gage height Dis-charge (ft) (ft <sup>3</sup> /s)	Date	Gage height Dis-charge (ft) (ft <sup>3</sup> /s)		
LAKE ERIE BASIN								
Astabula River nr Astabula, Oh. (04212500)	Lat 41°51'20", long 80°45'44", Astabula County, Hydrologic Unit 04110003, on left bank at downstream side of State Road bridge, 1.1 miles upstream from Hubbard Run, 1.3 miles southeast of Astabula, and 5.5 miles upstream from mouth. Drainage area is 121 mi <sup>2</sup> .	1924-35 * 1950-80 * 1994	2-21-94	4.61	3,590	1-22-59	11.03	11,600

\* Operated as a continuous-record station



# PEAK DISCHARGES AND STAGES AT CONTINUOUS-RECORD SURFACE DISCHARGE STATIONS 111

For continuous-record surface-water-discharge stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented in this table. The peaks greater than the base discharge, excluding the highest one are referred to as secondary peaks. The peaks are listed in chronological order. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030 and 1:30 p.m. is 1330. The maximum peak discharge and gage height for the water year are flagged with an asterisk (\*). Note - a = From Highwater Mark, b = Ice Jam, c = Observed, E = Estimated.

Peak discharges equal to or greater than base discharges, water year October 1993 to September 1994

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
STREAMS TRIBUTARY TO LAKE ERIE							
04177000 OTTAWA RIVER AT TOLEDO UNIVERSITY, TOLEDO, OH (Base discharge: 1,150 ft <sup>3</sup> /s)							
Mar. 8	Unknown	1,300e	Unknown	Apr. 12	1300	*2,390	*12.18
04185000 TIFFIN RIVER AT STRYKER, OH (Base discharge: 1,850 ft <sup>3</sup> /s)							
Feb. 22	2400	*2,800	*13.32	Apr. 14	1700	2,550	12.99
Mar. 8	1000	2,360	12.72				
04185440 UNNAMED TRIBUTARY TO LOST CREEK NR FARMER, OH (Base discharge: 120 ft <sup>3</sup> /s)							
Jan. 28	1045	241	4.14	Apr. 12	1200	*332	*4.54
04186500 AUGLAIZE RIVER NEAR FORT JENNINGS, OH (Base discharge: 2,700 ft <sup>3</sup> /s)							
Nov. 19	0430	2,850	11.27	Apr. 13	1000	3,990	13.11
Jan. 29	1800	*5,190	*14.52				
04187100 OTTAWA RIVER AT LIMA, OH (Base discharge: 1,300 ft <sup>3</sup> /s)							
Jan. 28	2030	*2,200	*14.38	Apr. 12	1230	2,050	14.15
04189000 BLANCHARD RIVER NEAR FINDLAY, OH (Base discharge: 2,800 ft <sup>3</sup> /s)							
Jan. 29	0300	*4,420	*11.23	Apr. 12	2230	4,180	10.90
4192500 MAUMEE RIVER NEAR DEFIANCE, OH (Base discharge: 23,000 ft <sup>3</sup> /s)							
Jan. 30	1500	27,000	6.35	Apr. 13	2300	*53,300	*9.32
04195500 PORTAGE RIVER AT WOODVILLE, OH (Base discharge: 3,500 ft <sup>3</sup> /s)							
Jan. 30	0800	3,510	8.33	Apr. 13	2000	*8,360	*12.35
04196800 TYMOCHTEE CREEK AT CRAWFORD, OH (Base discharge: 1,800 ft <sup>3</sup> /s)							
Nov. 20	0030	1,910	6.05	Feb. 21	1830	1,970	6.12
Dec. 7	0230	2,050	6.21	Apr. 14	0030	3,020	7.16
Jan. 29	2230	*4,460	*8.31				
04197100 HONEY CREEK AT MELMORE, OH (Base discharge: 1,500 ft <sup>3</sup> /s)							
Jan. 29	Unknown	1,900	Ice Jam	Apr. 12	2030	*2,720	*9.00
04198000 SANDUSKY RIVER NEAR FREMONT, OH (Base discharge: 10,000 ft <sup>3</sup> /s)							
Jan. 31	Unknown	10,700e	8.55b	Apr. 13	0630	*16,800	8.23
04199000 HURON RIVER AT MILAN, OH (Base discharge: 4,700 ft <sup>3</sup> /s)							
Jan. 28	1725	*9,200e	*19.19c	Apr. 12	Unknown	8,580	18.66a
04199155 OLD WOMAN'S CREEK AT BERLIN ROAD NR HURON, OH (Base discharge: 400 ft <sup>3</sup> /s)							
Dec. 5	0100	442	7.44	Apr. 12	0945	757	9.60
Jan. 28	1400	*972	*10.83				
04200500 BLACK RIVER AT ELYRIA, OH (Base discharge: 3,200 ft <sup>3</sup> /s)							
Nov. 18	Unknown	3,400e	Unknown	Apr. 13	1400	*11,200	*15.53
Jan. 29	1700	10,000e	15.53b				
04201500 ROCKY RIVER NEAR BEREA, OH (Base discharge: 4,000 ft <sup>3</sup> /s)							
Nov. 17	2030	5,580	5.35	Apr. 12	1900	9,770	7.06
Jan. 29	0130	*11,200	*7.60				

## 112 PEAK DISCHARGES AND STAGES AT CONTINUOUS-RECORD SURFACE DISCHARGE STATIONS

Peak discharges equal to or greater than base discharges, water year October 1993 to September 1994 (Continued)

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
<b>04206208 YELLOW CREEK AT GHENT, OH (Base discharge: 120 ft<sup>3</sup>/s)</b>							
Jan. 28	1925	223	12.84	Apr. 12	1350	*243	*12.94
<b>04206210 NORTH FORK AT BATH, OH (Base discharge: 80.0 ft<sup>3</sup>/s)</b>							
Nov. 14	1210	128	12.04	Apr. 12	0450	*386	*13.89
Nov. 17	1025	166	12.73	Jun. 29	0250	95	11.74
Jan. 28	0810	317	13.60	Jul. 7	2015	172	12.38
<b>04206211 PARK CREEK AT BATH CENTER, OH (Base discharge: 30 ft<sup>3</sup>/s)</b>							
Nov. 14	1110	39	11.70	Apr. 12	0355	*124	*14.30
Nov. 17	0920	49	12.07	Jun. 29	0035	112	13.85
Jan. 28	0915	60	12.43	Jul. 7	1930	72	12.70
Apr. 10	0430	32	11.47				
<b>04206212 NORTH FORK AT BATH CENTER, OH (Base discharge: 140 ft<sup>3</sup>/s)</b>							
Nov. 14	1120	170	11.36	Apr. 12	0510	*546	*12.41
Nov. 17	1330	190	11.44	Jun. 29	0315	226	11.58
Jan. 28	0855	276	11.75	Jul. 7	2030	286	11.78
<b>04206215 BATH CREEK AT BATH CENTER, OH (Base discharge: 60.0 ft<sup>3</sup>/s)</b>							
Nov. 17	1550	83	13.36	Apr. 12	0915	*151	*14.03
Jan. 28	1500	125	13.79				
<b>04206220 YELLOW CREEK AT BOTZUM, OH (Base discharge: 555 ft<sup>3</sup>/s)</b>							
Nov. 14	1150	594	13.33	Apr. 12	0515	*1,190	*14.84
Nov. 17	1155	661	13.49	Jun. 29	0310	708	13.60
Jan. 28	1040	973	14.22				
<b>04207200 TINKERS CREEK AT BEDFORD, OH (Base discharge: 1,500 ft<sup>3</sup>/s)</b>							
Nov. 17	1330	2,770	7.13	Apr. 12	0800	2,300	6.76
Nov. 27	1130	1,640	6.19	Aug. 13	1330	*6,750	*9.81
Jan. 28	1200	2,340	6.79				
<b>04209000 CHAGRIN RIVER AT WILLOUGHBY, OH (Base discharge: 4,000 ft<sup>3</sup>/s)</b>							
Nov. 17	1600	6,060	8.52	Mar. 21	1800	4,170	6.90
Nov. 27	2030	4,450	7.14	Apr. 12	0930	4,610	7.27
Jan. 28	1330	8,240	10.25	Aug. 13	2230	*15,200	*14.41
Feb. 20	1800	5,220	7.79				
<b>04212100 GRAND RIVER NEAR PAINESVILLE, OH (Base discharge: 6,500 ft<sup>3</sup>/s)</b>							
Nov. 18	1900	6,610	7.17	Mar. 22	2100	6,760	7.27
Jan. 29	1200	8,350	8.24	Apr. 13	1730	9,550	8.85
Feb. 20	2130	*9,810	*8.98				
<b>04213000 CONNEAUT CREEK AT CONNEAUT, OH (Base discharge: 2,900 ft<sup>3</sup>/s)</b>							
Jan. 30	1400	3,300e	*8.99b	Apr. 14	1000	3,340	6.18
Feb. 22	0200	*4,910	7.42	Aug. 14	0800	3,250	6.09
Mar. 23	0200	4,580	7.20				

## GROUND-WATER RECORDS

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## CRAWFORD COUNTY

404838082563100. Local number, CR-1.

LOCATION.--Lat 40°48'38", long 82°56'31", Hydrologic Unit 04100011, Timken Roller Bearing Co., U.S. 30 in Bucyrus.

Owner: Timken Roller Bearing Co.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled test water-table well, diameter 6 in., depth 54 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 1039.13 ft above sea level.

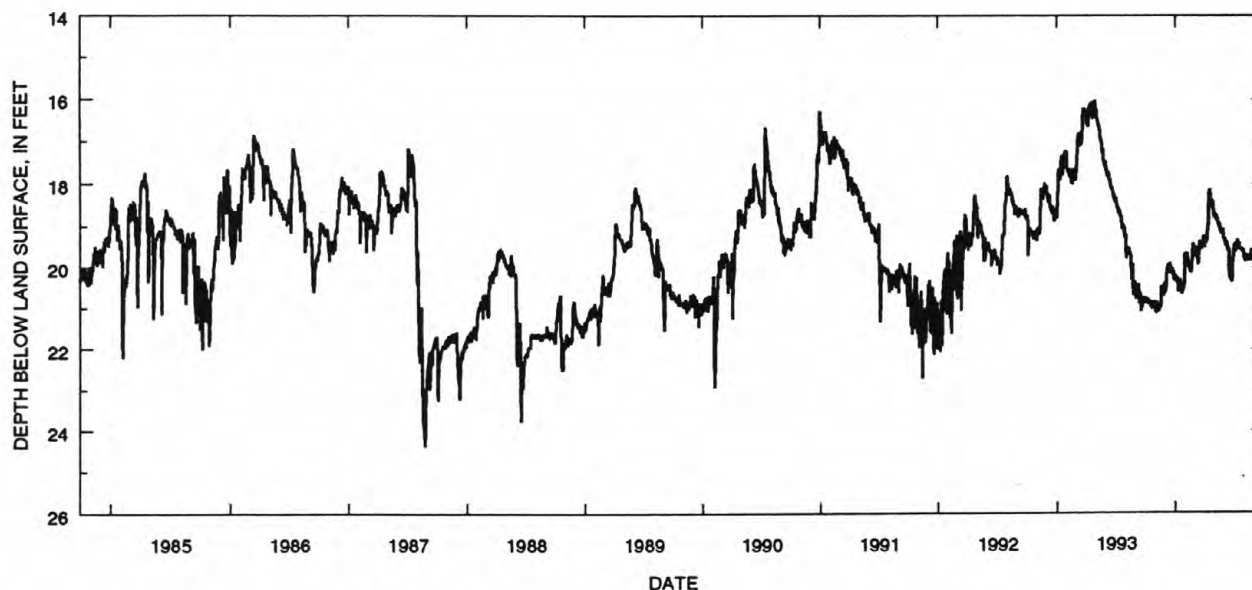
Measuring point: Floor of instrument shelter 3.50 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of water.

PERIOD OF RECORD.--April 1962 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 37.64 ft below land-surface datum, Dec. 11, 1962;  
minimum daily low, 16.04 ft below land-surface datum, Apr. 29, 1993.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.73	21.06	20.55	20.22	19.68	19.62	19.35	18.76	19.37	19.46	19.72	19.83
2	20.78	21.08	20.41	20.27	19.65	19.52	19.33	18.80	19.44	19.51	19.84	19.85
3	20.78	20.92	20.42	20.23	19.75	19.50	19.39	18.81	19.46	19.59	19.79	19.84
4	20.79	20.87	20.24	20.25	19.73	19.57	19.41	18.75	19.43	19.58	19.74	19.85
5	20.89	20.85	20.05	20.37	19.71	19.69	19.28	18.76	19.42	19.57	19.75	19.80
6	20.89	20.97	20.00	20.26	19.77	19.70	19.28	18.82	19.39	19.56	19.75	19.78
7	20.81	21.05	20.04	20.28	19.90	19.72	19.35	18.81	19.48	19.56	19.70	19.83
8	20.77	21.07	19.97	20.42	19.79	19.80	19.25	18.83	19.56	19.48	19.72	19.84
9	20.84	21.08	19.93	20.53	19.97	19.78	19.01	18.86	19.56	19.34	19.82	19.85
10	20.91	21.04	19.91	20.52	20.01	19.78	18.98	18.93	19.55	19.39	19.83	19.92
11	20.87	20.99	20.05	20.42	19.94	19.89	18.98	18.93	19.56	19.48	19.80	19.95
12	20.81	21.06	20.05	20.37	19.92	19.87	18.72	18.96	19.60	19.41	19.78	19.96
13	20.91	20.97	20.02	20.35	20.00	19.67	18.21	18.99	19.61	19.42	19.78	19.93
14	20.90	20.97	19.90	20.33	20.01	19.54	18.19	18.97	19.92	19.42	19.70	19.92
15	20.94	20.96	20.01	20.57	20.08	19.37	18.18	18.94	20.27	19.50	19.73	19.95
16	20.83	20.97	20.13	20.59	20.12	19.45	18.28	19.06	20.05	19.54	19.73	19.96
17	20.86	20.82	20.13	20.41	20.03	19.46	18.36	19.11	19.90	19.50	19.72	19.98
18	20.93	20.75	20.04	20.60	20.03	19.45	18.36	19.11	19.87	19.53	19.83	20.01
19	20.91	20.45	20.08	20.64	19.94	19.49	18.39	19.12	19.87	19.55	19.78	20.05
20	20.89	20.61	20.04	20.64	19.77	19.50	18.47	19.15	20.14	19.58	19.72	20.05
21	20.96	20.64	20.03	20.63	19.71	19.48	18.49	19.17	20.26	19.55	19.57	20.04
22	20.98	20.67	20.06	20.54	19.70	19.49	18.52	19.17	20.34	19.53	19.62	19.99
23	20.97	20.66	20.18	20.44	19.43	19.38	18.54	19.16	20.16	19.57	19.68	20.01
24	20.89	20.68	20.14	20.53	19.55	19.39	18.42	19.15	19.88	19.58	19.66	20.04
25	20.90	20.71	20.09	20.51	19.55	19.41	18.47	19.07	19.82	19.58	19.64	20.02
26	20.85	20.60	20.24	20.49	19.68	19.38	18.51	19.22	19.84	19.59	19.64	19.98
27	20.88	20.60	20.30	20.34	19.72	19.25	18.71	19.29	19.65	19.61	19.65	20.04
28	20.83	20.40	20.31	19.96	19.66	19.31	18.76	19.30	19.60	19.70	19.60	20.07
29	20.96	20.53	20.17	19.71	---	19.46	18.76	19.31	19.51	19.74	19.69	20.14
30	20.95	20.63	20.32	19.71	---	19.50	18.77	19.32	19.47	19.74	19.72	20.18
31	20.93	---	20.25	19.65	---	19.42	---	19.32	---	19.75	19.74	---
MAX	20.98	21.08	20.55	20.64	20.12	19.89	19.41	19.32	20.34	19.75	19.84	20.18

CAL YR 1993 LOW 21.08  
WTR YR 1994 LOW 21.08

## GROUND-WATER RECORDS

## HANCOCK COUNTY

405940083275500. Local number, HA-3.

LOCATION.--Lat 40°59'40", long 83°27'55", Hydrologic Unit 0410008, 2 miles south of Vanlue.

Owner: City of Findlay.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled artesian well, diameter 10 in., diameter 6 in. below 55 ft., depth 240 ft., cased to 55 ft.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 815 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 1.40 ft above land-surface datum.

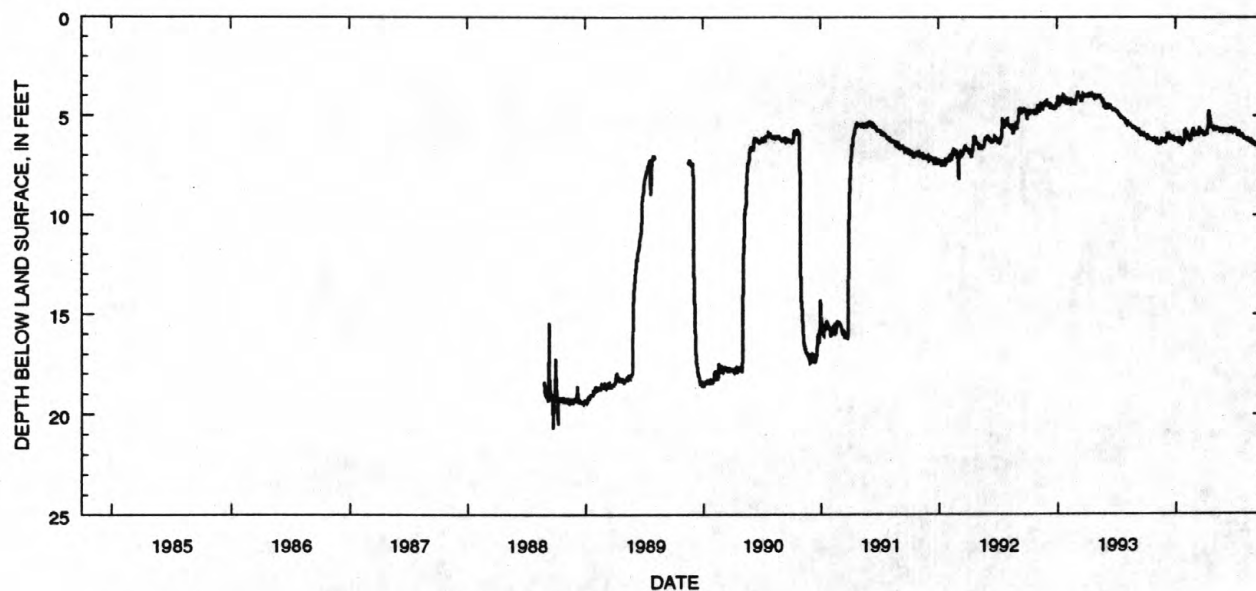
REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

PERIOD OF RECORD.--May 1947 to October 1972 and August 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 20.67 ft below land-surface datum, Sept. 22, 1988; minimum daily low, 3.82 ft below land-surface datum, Mar. 7, 1993.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.97	6.40	6.32	6.10	5.83	5.85	5.85	5.66	5.71	5.67	6.11	6.47
2	6.04	6.40	6.21	6.16	5.85	5.76	5.85	5.68	5.75	5.73	6.11	6.48
3	6.04	6.27	6.23	6.12	5.93	5.80	5.90	5.68	5.76	5.75	6.13	6.47
4	6.06	6.23	6.16	6.12	5.90	5.87	5.90	5.61	5.69	5.74	6.12	6.45
5	6.11	6.24	5.97	6.22	5.94	5.90	5.86	5.61	5.67	5.75	6.20	6.40
6	6.11	6.35	5.95	6.12	6.03	5.87	5.88	5.64	5.65	5.75	6.20	6.40
7	6.04	6.42	5.99	6.15	6.09	5.88	5.92	5.61	5.71	5.78	6.16	6.45
8	6.02	6.42	5.96	6.24	5.97	5.91	5.80	5.64	5.77	5.80	6.18	6.45
9	6.10	6.42	5.93	6.32	6.17	5.85	5.58	5.65	5.76	5.84	6.23	6.46
10	6.14	6.37	5.99	6.32	6.19	5.90	5.54	5.69	5.73	5.89	6.23	6.52
11	6.12	6.32	6.07	6.17	6.08	5.99	5.50	5.68	5.69	5.88	6.21	6.55
12	6.09	6.40	6.06	6.17	6.05	5.94	5.03	5.68	5.72	5.85	6.20	6.54
13	6.16	6.32	6.04	6.07	6.12	5.72	4.74	5.70	5.71	5.87	6.21	6.50
14	6.13	6.32	5.98	6.14	6.11	5.58	4.92	5.67	5.76	5.88	6.22	6.49
15	6.15	6.45	6.08	6.36	6.13	5.59	5.05	5.61	5.80	5.93	6.25	6.51
16	6.08	6.45	6.15	6.36	6.15	5.66	5.21	5.69	5.80	5.96	6.24	6.53
17	6.15	6.30	6.15	6.20	6.01	5.66	5.35	5.73	5.77	5.93	6.23	6.58
18	6.19	6.28	6.06	6.38	5.96	5.75	5.37	5.71	5.77	5.96	6.25	6.62
19	6.18	6.10	6.08	6.41	5.87	5.76	5.45	5.69	5.78	5.99	6.23	6.66
20	6.17	6.22	6.06	6.38	5.76	5.77	5.51	5.68	5.78	6.00	6.21	6.64
21	6.23	6.22	6.06	6.35	5.78	5.81	5.53	5.69	5.77	5.98	6.25	6.62
22	6.23	6.26	6.06	6.25	5.78	5.82	5.57	5.67	5.80	5.97	6.31	6.58
23	6.22	6.24	6.15	6.20	5.60	5.74	5.58	5.67	5.77	6.01	6.36	6.60
24	6.17	6.28	6.11	6.26	5.79	5.85	5.49	5.64	5.66	6.01	6.33	6.60
25	6.19	6.30	6.08	6.23	5.83	5.87	5.53	5.59	5.71	6.01	6.30	6.60
26	6.17	6.22	6.19	6.31	5.93	5.86	5.55	5.73	5.69	6.03	6.29	6.59
27	6.19	6.25	6.22	6.22	5.93	5.81	5.70	5.76	5.64	6.04	6.30	6.66
28	6.16	6.21	6.22	5.78	5.87	5.86	5.73	5.73	5.63	6.09	6.28	6.69
29	6.26	6.31	6.10	5.74	---	5.95	5.67	5.72	5.59	6.11	6.35	6.75
30	6.25	6.38	6.18	5.79	---	5.97	5.69	5.71	5.67	6.12	6.38	6.78
31	6.27	---	6.12	5.79	---	5.88	---	5.70	---	6.13	6.39	---
MAX	6.27	6.45	6.32	6.41	6.19	5.99	5.92	5.76	5.80	6.13	6.39	6.78
CAL YR 1993	LOW 6.45											
WTR YR 1994	LOW 6.78											





## GROUND-WATER RECORDS

115

## HARDIN COUNTY

404648083412600. Local number, HN-2A.

LOCATION.--Lat 40°46'48", long 83°41'26", Hydrologic Unit 04100007, at southeast edge of Dola.

Owner: Kevin Eikenbary.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in., depth 51 ft cased.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 945 ft above sea level, from topographic map.

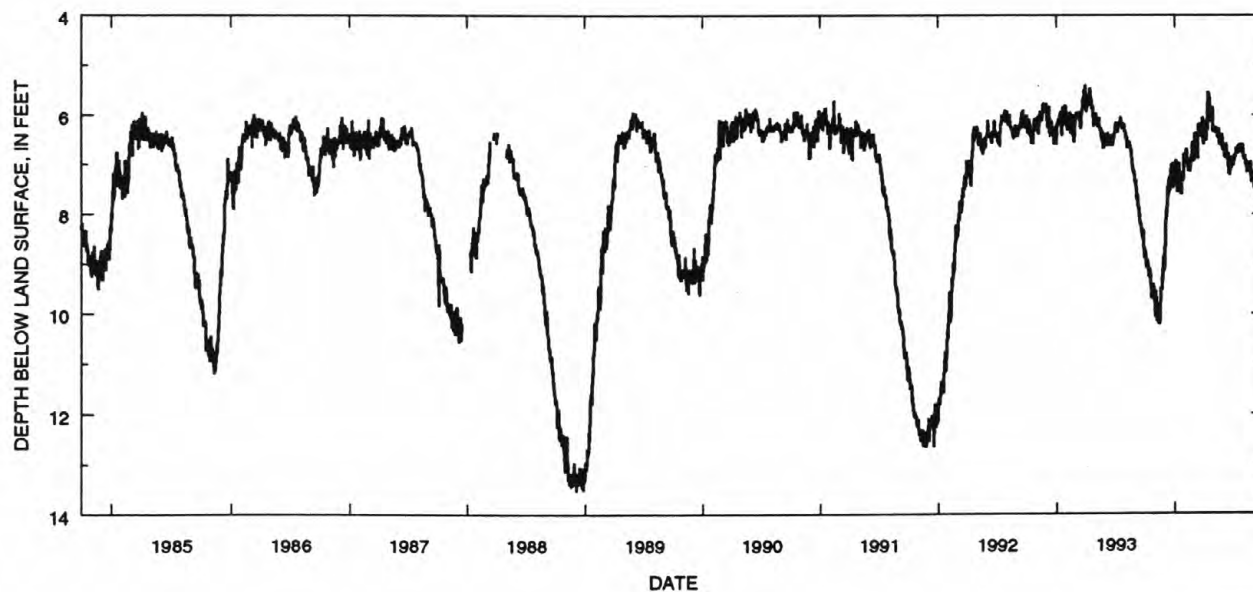
Measuring point: Floor of instrument shelter 2.88 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 15.86 ft below land-surface datum, Jan. 20, 21, 1965;  
minimum daily low, 5.40 ft below land-surface datum, Apr. 1, 1993.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.70	9.98	9.08	7.12	6.86	6.74	6.33	6.31	6.70	6.88	6.87	7.45
2	8.75	10.07	8.76	7.11	6.84	6.53	6.24	6.35	6.83	6.84	6.83	7.48
3	8.77	9.87	8.57	7.10	6.78	6.36	6.34	6.36	6.87	6.86	6.86	7.48
4	8.77	9.73	8.33	6.92	6.78	6.40	6.35	6.29	6.81	6.83	6.82	7.47
5	9.03	9.55	7.96	7.16	6.69	6.55	6.13	6.23	6.73	6.81	6.99	7.41
6	9.08	9.81	7.95	7.00	6.75	6.55	6.30	6.28	6.58	6.77	7.01	7.28
7	8.98	10.03	8.05	6.98	6.97	6.58	6.51	6.28	6.67	6.73	6.97	7.36
8	8.91	10.12	7.90	7.33	6.87	6.75	6.51	6.25	6.85	6.68	6.96	7.38
9	8.95	10.14	7.83	7.55	6.99	6.72	6.10	6.28	6.86	6.68	7.14	7.38
10	9.12	10.14	7.45	7.55	7.13	6.67	6.27	6.40	6.85	6.77	7.16	7.50
11	9.12	10.05	7.68	7.35	7.00	6.86	6.31	6.40	6.81	6.77	7.12	7.61
12	8.98	10.07	7.68	7.32	6.93	6.86	6.00	6.38	6.83	6.66	7.08	7.65
13	9.18	10.00	7.56	6.97	6.94	6.55	5.54	6.45	6.81	6.64	7.07	7.62
14	9.22	9.87	7.35	6.98	6.96	6.34	5.58	6.45	6.97	6.63	7.02	7.53
15	9.28	10.14	7.27	7.49	7.03	6.17	5.58	6.27	7.10	6.72	7.07	7.53
16	9.21	10.21	7.49	7.50	7.15	6.35	5.74	6.45	7.16	6.76	7.09	7.53
17	9.11	10.05	7.50	7.16	7.10	6.36	5.89	6.58	7.17	6.74	7.08	7.49
18	9.30	9.95	7.39	7.51	7.00	6.20	5.90	6.58	7.12	6.70	7.08	7.70
19	9.31	9.63	7.28	7.57	6.94	6.29	5.95	6.58	7.11	6.73	7.04	7.79
20	9.31	9.48	7.24	7.59	6.81	6.29	6.05	6.58	7.08	6.76	6.94	7.82
21	9.55	9.50	7.01	7.59	6.85	6.27	6.06	6.60	7.05	6.74	6.98	7.80
22	9.67	9.52	7.03	7.36	6.90	6.35	6.10	6.61	7.07	6.60	7.15	7.73
23	9.70	9.51	7.26	7.26	6.59	6.22	6.09	6.57	7.02	6.66	7.31	7.72
24	9.64	9.26	7.26	7.22	6.55	6.35	5.88	6.55	6.85	6.69	7.32	7.75
25	9.53	9.35	6.98	7.22	6.59	6.43	5.84	6.38	6.95	6.66	7.31	7.75
26	9.48	9.20	7.22	7.35	6.88	6.44	5.90	6.55	6.95	6.60	7.26	7.66
27	9.43	8.98	7.45	7.27	6.94	6.05	6.28	6.69	7.00	6.62	7.25	7.76
28	9.40	8.83	7.49	6.78	6.92	6.24	6.33	6.70	7.02	6.74	7.15	7.84
29	9.49	8.86	7.35	6.86	---	6.52	6.23	6.69	6.88	6.84	7.20	8.05
30	9.49	9.15	7.32	6.96	---	6.60	6.34	6.70	6.89	6.87	7.28	8.11
31	9.57	---	7.16	6.95	---	6.53	---	6.70	---	6.89	7.27	---
MAX	9.70	10.21	9.08	7.59	7.15	6.86	6.51	6.70	7.17	6.89	7.32	8.11

CAL YR 1993 LOW 10.21  
WTR YR 1994 LOW 10.21

## GROUND-WATER RECORDS

## HENRY COUNTY

412123083574000. Local number, HY-2.

LOCATION.--Lat 41°21'23", long 83°57'40", Hydrologic Unit 04100009, 1.4 Mi southwest of McClure.

Owner: State of Ohio.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in., depth drilled 300 ft, cased to 43 ft.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

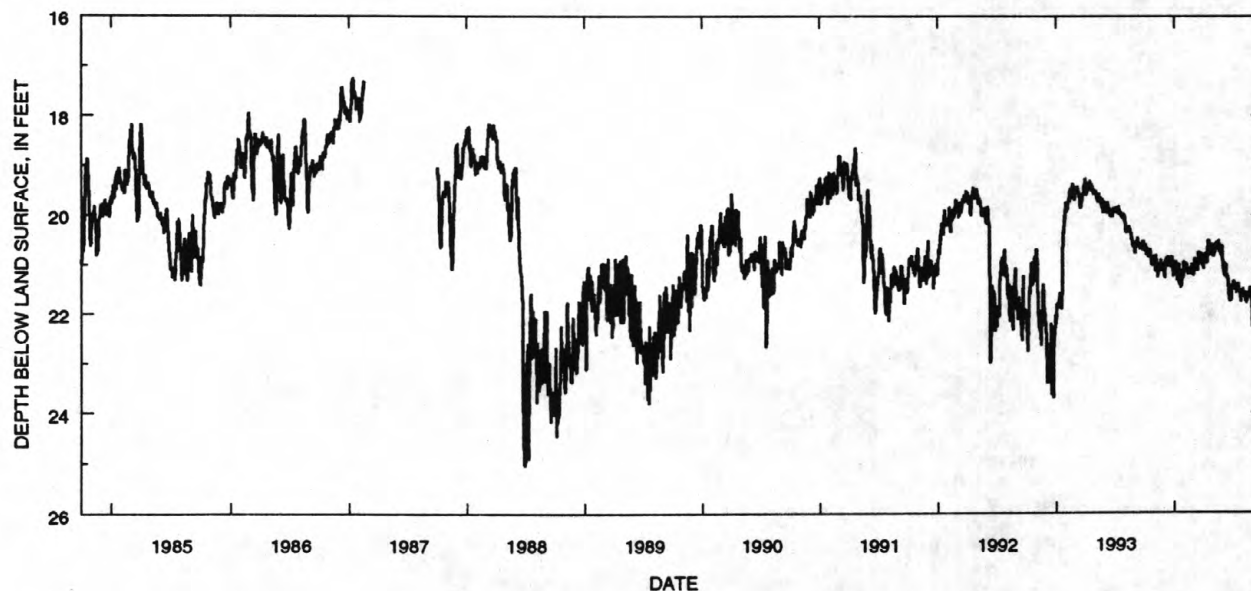
DATUM.--Elevation of land-surface datum is 680 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 3.00 ft above land-surface datum.

PERIOD OF RECORD.--June 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 25.04 ft below land-surface datum, June 28, 1988;  
minimum daily low, 14.55 ft below land-surface datum, Mar. 22, 1978.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.64	21.09	21.23	21.05	21.07	21.16	20.91	20.73	21.15	21.41	21.61	22.10
2	20.64	21.13	21.09	21.05	21.03	21.05	20.89	20.76	21.20	21.44	21.59	22.16
3	20.66	21.02	21.09	21.05	21.02	20.90	20.93	20.77	21.23	21.51	21.61	22.17
4	20.59	20.95	20.94	20.94	20.99	20.88	20.94	20.72	21.21	21.49	21.56	22.16
5	20.77	20.81	20.87	21.06	20.96	20.99	20.77	20.64	21.14	21.43	21.65	22.15
6	20.81	20.95	20.88	21.01	21.03	20.96	20.78	20.65	21.01	21.41	21.70	22.10
7	20.74	21.05	20.99	20.97	21.14	20.95	20.95	20.60	21.02	21.41	21.69	22.14
8	20.68	21.13	20.97	21.13	21.10	21.05	20.97	20.63	21.16	21.43	21.67	22.11
9	20.69	21.15	20.94	21.30	21.16	21.06	20.80	20.59	21.22	21.45	21.74	22.12
10	20.85	21.25	20.83	21.30	21.20	20.99	20.86	20.68	21.25	21.55	21.74	22.12
11	20.82	21.11	21.04	21.16	21.15	21.10	20.95	20.65	21.25	21.53	21.72	22.12
12	20.71	21.07	21.03	21.18	21.12	21.10	20.77	20.63	21.27	21.43	21.66	22.12
13	20.86	21.06	20.99	20.98	21.12	21.01	20.53	20.67	21.29	21.39	21.60	22.04
14	20.86	20.98	20.91	21.03	21.14	20.92	20.61	20.63	21.37	21.39	21.56	21.99
15	20.85	21.10	20.90	21.33	21.10	20.75	20.51	20.51	21.52	21.46	21.63	21.97
16	20.81	21.15	21.03	21.40	21.16	20.93	20.57	20.65	21.59	21.55	21.68	21.94
17	20.69	21.07	21.05	21.11	21.14	20.97	20.64	20.73	21.64	21.56	21.61	21.98
18	20.80	21.07	20.96	21.28	21.10	20.74	20.67	20.75	21.66	21.52	21.57	22.06
19	20.83	20.90	20.96	21.34	21.04	20.82	20.62	20.74	21.75	21.55	21.54	22.13
20	20.84	20.98	20.94	21.43	21.07	20.83	20.70	20.75	21.74	21.64	21.49	22.14
21	20.91	21.02	20.83	21.42	21.18	20.79	20.76	20.77	21.67	21.67	21.46	22.17
22	20.98	21.09	20.86	21.27	21.18	20.82	20.77	20.80	21.68	21.66	21.52	22.11
23	21.02	21.09	20.99	21.21	21.01	20.78	20.76	20.80	21.59	21.76	21.56	22.09
24	20.93	21.11	20.97	21.23	21.00	20.90	20.65	20.74	21.41	21.68	21.60	22.10
25	20.91	21.15	20.85	21.24	21.03	20.99	20.61	20.61	21.47	21.59	21.54	22.11
26	20.88	21.08	21.05	21.26	21.17	21.00	20.59	20.67	21.46	21.51	21.51	22.02
27	20.85	20.97	21.22	21.24	21.22	20.80	20.69	20.85	21.44	21.53	21.58	22.01
28	20.82	20.96	21.23	20.94	21.19	20.87	20.83	20.97	21.43	21.52	21.64	22.08
29	20.85	21.11	21.16	21.05	---	20.98	20.79	21.04	21.33	21.55	21.80	22.23
30	20.86	21.22	21.11	21.13	---	21.08	20.84	21.12	21.38	21.61	21.89	22.29
31	20.92	---	21.07	21.12	---	21.01	---	21.14	---	21.65	21.93	---
MAX	21.02	21.25	21.23	21.43	21.22	21.16	20.97	21.14	21.75	21.76	21.93	22.29

CAL YR 1993 LOW 22.19  
WTR YR 1994 LOW 22.29

## GROUND-WATER RECORDS

117

## LUCAS COUNTY

413704083362200. Local number, LU-1.

LOCATION.--Lat 41°37'04", long 83°36'22", Hydrologic Unit 04100001, at Toledo State Hospital.

Owner: State of Ohio.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in., depth drilled 525 ft, present depth 523.0 ft, cased to 93 ft.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 624 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 2.98 ft above land-surface datum (Revised from 1978 and 1979).

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water. Prior to Aug. 23, 1978,

measuring point was 3.10 ft above land-surface datum. Reported in 1979 as 3.00 ft above land-surface datum.

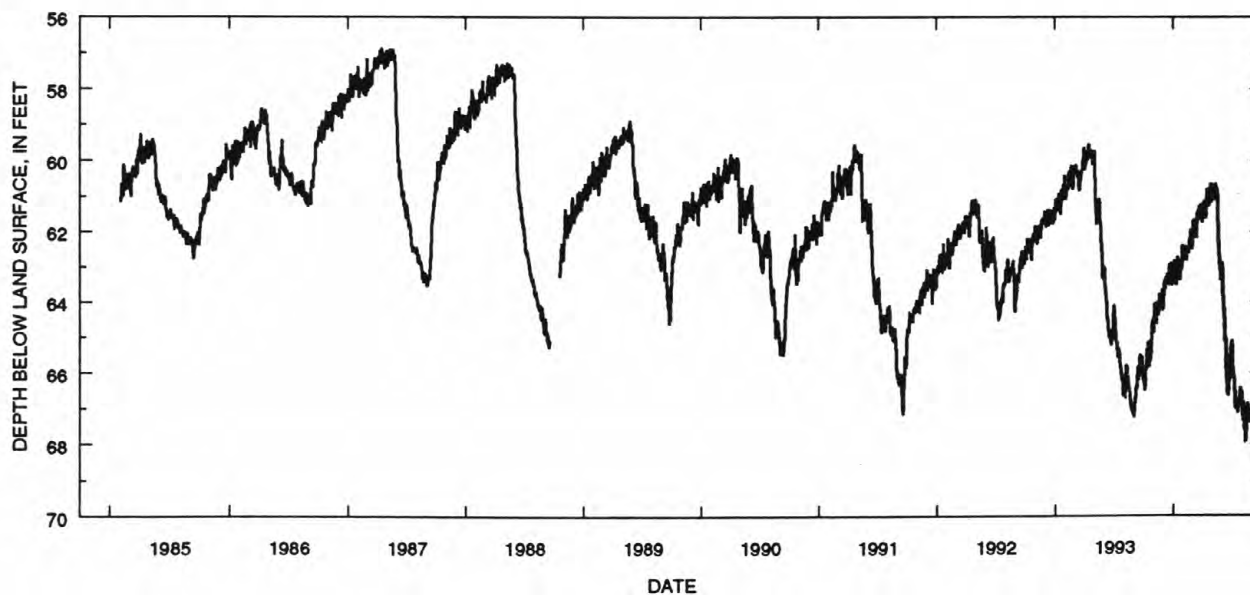
PERIOD OF RECORD.--March 1946 to September 1982 continuous, October 1983 to January 1985 periodic, continuous thereafter.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 117.25 ft below land-surface datum, Sept. 18, 1957;

minimum daily low, 56.87 ft below land-surface datum, Apr. 16, 1987.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65.95	64.81	64.17	63.06	62.70	62.23	61.40	60.96	63.28	65.41	67.34	67.26
2	66.23	64.87	63.83	63.12	62.63	62.06	61.29	61.04	63.71	65.78	67.10	67.24
3	66.28	64.56	63.81	63.07	62.59	61.76	61.36	61.07	63.95	65.92	66.97	67.38
4	66.28	64.35	63.56	62.82	62.56	61.66	61.36	60.93	64.10	65.98	66.81	67.57
5	66.44	64.04	63.39	63.08	62.40	61.85	61.14	60.82	64.24	66.12	67.23	67.55
6	66.49	64.28	63.48	62.93	62.46	61.82	61.24	60.83	64.29	66.21	67.53	67.70
7	66.29	64.47	63.65	62.86	62.66	61.83	61.61	60.79	64.61	66.33	67.52	67.80
8	66.03	64.54	63.53	63.17	62.58	62.05	61.63	60.70	65.06	66.40	67.49	67.83
9	65.82	64.57	63.49	63.49	62.67	62.03	61.22	60.65	65.04	66.63	67.78	67.64
10	65.90	64.51	63.27	63.50	62.80	61.92	61.48	60.82	65.03	66.95	67.90	67.62
11	65.78	64.34	63.51	63.18	62.55	62.16	61.61	60.79	65.05	67.02	67.89	67.62
12	65.33	64.33	63.48	63.14	62.55	62.15	61.29	60.75	65.81	66.83	67.81	67.50
13	65.50	64.12	63.44	62.72	62.44	61.83	60.81	61.07	66.04	66.82	67.50	67.28
14	65.41	64.00	63.22	62.71	62.48	61.69	60.85	61.11	66.05	66.79	67.15	67.35
15	65.31	64.31	63.22	63.24	62.49	61.45	60.83	60.83	66.35	66.94	67.14	67.58
16	65.13	64.38	63.46	63.32	62.60	61.64	60.92	61.08	66.58	67.10	67.04	67.72
17	65.49	64.17	63.47	62.81	62.44	61.66	61.10	61.53	66.59	67.12	66.85	68.00
18	65.83	64.25	63.25	63.21	62.40	61.37	61.09	61.89	66.51	66.91	66.85	68.22
19	65.84	63.79	63.20	63.29	62.25	61.48	61.04	62.16	66.47	66.86	66.97	68.42
20	65.73	63.90	63.11	63.37	62.22	61.51	61.19	62.40	66.35	66.95	67.03	68.51
21	65.61	63.92	62.94	63.33	62.41	61.38	61.22	62.64	66.15	66.90	67.17	68.57
22	65.68	64.07	63.02	63.03	62.50	61.43	61.23	62.77	66.15	66.82	67.32	68.54
23	65.62	64.07	63.23	62.82	62.01	61.27	61.14	62.93	66.03	66.82	67.41	68.66
24	65.33	64.06	63.15	62.86	62.03	61.45	60.82	62.94	65.54	66.69	67.34	68.67
25	65.14	64.12	62.89	62.92	62.06	61.59	60.69	62.87	65.46	66.42	67.08	68.65
26	64.98	63.92	63.28	63.08	62.40	61.59	60.64	63.36	65.39	66.57	67.08	68.52
27	64.83	63.80	63.50	62.92	62.49	61.20	61.05	63.35	65.21	66.57	67.16	68.43
28	64.65	63.64	63.53	62.39	62.37	61.30	61.17	63.22	65.17	66.49	67.05	68.30
29	64.60	63.96	63.25	62.70	---	61.62	61.09	63.07	65.10	66.56	67.20	68.33
30	64.61	64.19	63.30	62.85	---	61.73	61.11	62.95	65.33	66.60	67.25	68.39
31	64.49	---	63.13	62.79	---	61.63	---	62.87	---	67.05	67.08	---
MAX	66.49	64.87	64.17	63.50	62.80	62.23	61.63	63.36	66.59	67.12	67.90	68.67

CAL YR 1993 LOW 67.24  
WTR YR 1994 LOW 68.67

## GROUND-WATER RECORDS

## MEDINA COUNTY

410142082005900. Local number, MD-1.

LOCATION.--Lat 41°01'42", long 82°00'59", Hydrologic Unit 04110001. Waterworks plant at Lodi.

Owner: Lodi Water Dept.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in., depth 65 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 910 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 1.90 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

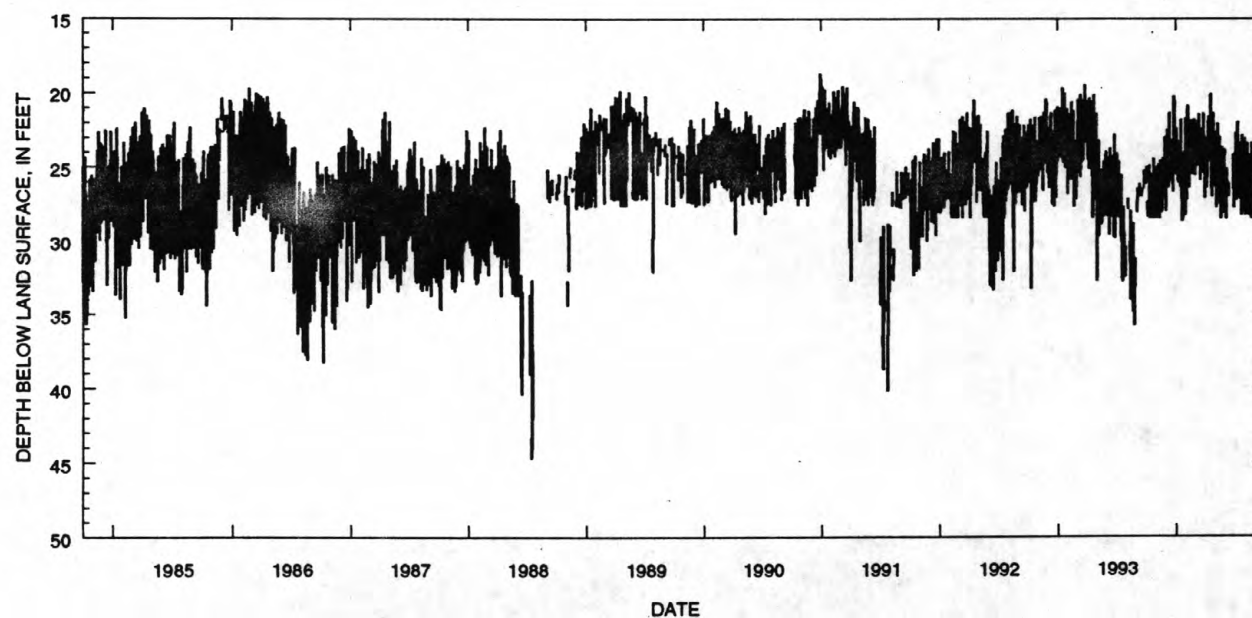
PERIOD OF RECORD.--September 1946 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 45.21 ft below land-surface datum, July 8, 1988;  
minimum daily low, 7.60 ft below land-surface datum, July 6, 1969.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	28.00	25.10	23.82	25.12	25.50	25.14	24.20	27.38	26.78	28.18	27.64
2	26.12	27.60	27.92	22.72	27.16	23.76	23.10	26.02	27.72	25.32	---	---
3	24.96	28.12	23.76	22.40	23.72	24.90	25.12	---	28.40	22.72	---	25.36
4	---	26.86	23.66	25.42	24.90	24.52	24.46	27.66	28.34	25.04	25.78	23.94
5	---	28.40	22.50	24.28	21.36	22.98	25.10	27.58	25.06	25.90	26.92	24.54
6	27.28	26.32	26.32	25.88	20.90	22.18	26.32	27.14	---	27.20	24.88	---
7	28.32	24.82	22.72	24.42	25.38	24.88	24.90	23.16	---	26.32	23.36	---
8	---	27.82	24.36	26.02	25.10	24.50	25.72	22.08	---	27.14	---	---
9	24.88	27.24	22.58	23.68	23.84	24.76	22.18	26.96	27.56	23.66	27.90	26.78
10	24.88	27.86	26.38	23.28	22.86	24.12	21.64	24.36	---	21.98	---	25.16
11	27.84	27.02	24.84	25.76	26.34	22.34	23.10	27.12	26.96	26.62	28.20	23.96
12	---	28.40	21.38	24.96	21.90	21.44	24.50	25.44	25.96	25.48	27.24	28.20
13	27.94	27.40	25.84	24.24	24.36	24.16	22.02	26.80	---	26.54	25.10	27.58
14	28.40	24.56	23.94	24.60	23.98	23.16	23.26	24.50	---	26.36	24.18	27.72
15	28.32	26.94	24.84	26.30	24.92	22.48	24.58	22.96	---	25.96	---	27.94
16	25.70	27.64	25.40	25.84	25.22	23.72	22.12	27.46	---	25.16	28.02	27.60
17	25.42	28.04	24.72	21.80	25.10	25.78	20.12	25.18	---	23.32	27.74	25.90
18	27.76	25.56	25.12	26.56	24.40	23.38	23.86	28.40	---	27.12	27.98	23.28
19	28.40	27.94	23.18	27.74	21.86	22.64	22.78	25.42	25.92	26.54	28.38	---
20	28.26	25.84	24.02	28.58	25.46	23.94	26.38	27.24	---	26.82	24.80	---
21	26.64	24.38	26.04	28.20	24.42	22.62	23.98	26.00	---	28.22	23.36	---
22	28.40	25.78	25.58	25.28	22.62	22.40	26.96	23.62	---	26.60	27.56	---
23	26.94	25.24	26.64	23.98	23.64	25.34	22.32	26.98	---	24.98	27.86	---
24	24.42	27.04	24.52	28.20	23.80	23.98	21.38	26.08	---	22.86	28.40	---
25	28.40	24.60	22.20	26.00	22.38	25.04	24.64	---	26.48	26.46	27.98	---
26	27.92	25.10	20.24	26.44	21.78	21.40	24.12	25.80	24.12	25.06	27.70	---
27	28.12	24.08	20.90	26.26	23.80	24.26	24.10	28.04	27.68	27.88	24.82	---
28	26.60	22.98	24.74	24.92	24.50	22.84	25.34	27.04	25.74	27.72	24.14	---
29	28.40	24.90	23.48	22.92	---	24.36	26.22	24.52	26.42	26.92	---	---
30	26.54	23.94	23.88	21.72	---	26.38	22.70	23.82	25.60	26.32	28.06	---
31	25.00	---	25.44	28.22	---	27.04	---	---	---	23.06	---	---
MAX	28.40	28.40	27.92	28.58	27.16	27.04	26.96	28.40	28.40	28.22	28.40	28.20

CAL YR 1993 LOW 35.68

WTR YR 1994 LOW 28.58





## GROUND-WATER RECORDS

119

## OTTAWA COUNTY

413434082494000. Local number, O-2.

LOCATION.--Lat 41°34'34", long 82°49'40", Hydrologic Unit 04100010. Catawba Island near Port Clinton.

Owner: William Williams.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled water table well, diameter 6 in., depth 62 ft, cased to 26 ft.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 591 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 1.60 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

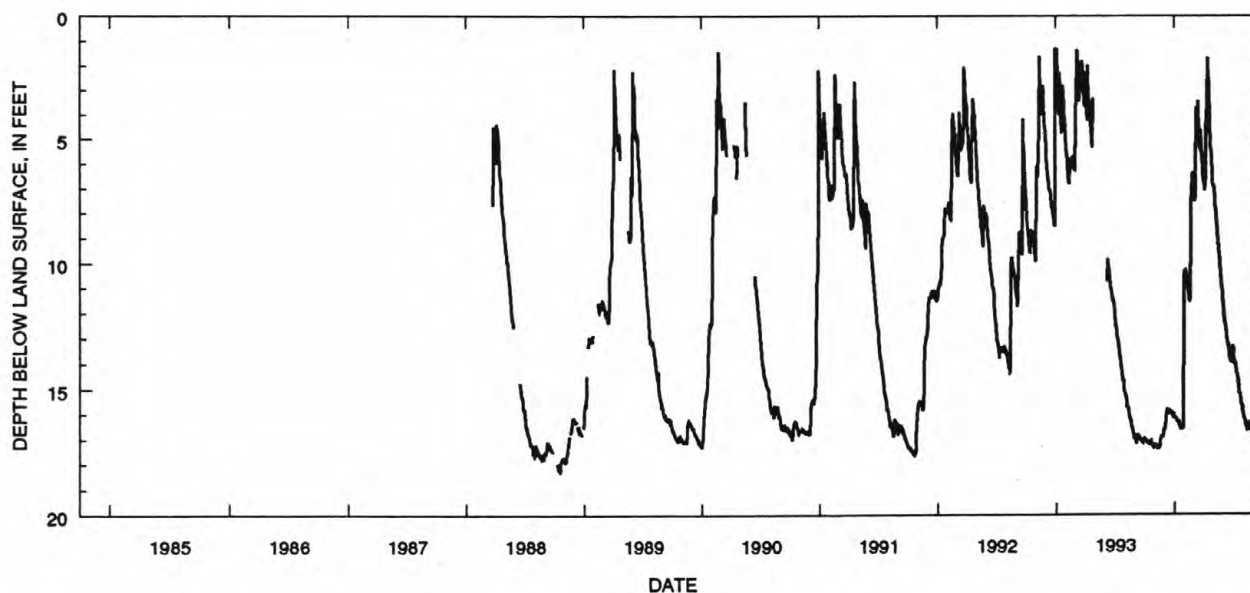
PERIOD OF RECORD.--March 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 18.27 ft below land-surface datum, Sept. 17, 1989;

minimum daily low, 1.29 ft below land-surface datum, Dec. 31, 1992.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.94	17.28	16.61	16.13	10.33	7.13	6.79	6.85	11.90	13.52	16.13	16.91
2	17.06	17.26	16.61	16.15	10.30	7.18	6.89	6.99	12.08	13.74	16.17	17.00
3	17.05	17.24	16.51	16.16	10.35	7.29	7.05	7.09	12.25	13.91	16.23	---
4	17.02	17.23	16.47	16.15	10.31	7.42	6.93	7.25	12.31	14.02	16.24	---
5	17.06	17.24	16.25	16.19	10.39	7.52	6.90	7.37	12.43	13.98	16.27	---
6	17.07	17.32	16.10	16.20	10.50	7.28	6.90	7.68	12.44	14.01	16.37	---
7	17.14	17.32	16.03	16.21	10.64	6.56	6.30	7.79	12.50	14.06	16.42	---
8	17.13	17.32	15.97	16.25	10.61	3.71	4.72	7.93	12.64	14.10	16.49	---
9	17.14	17.32	15.93	16.31	10.87	3.85	3.90	8.14	12.73	14.23	16.51	---
10	17.15	17.34	15.87	16.31	10.94	4.38	3.93	8.36	12.92	14.35	16.54	---
11	17.12	17.32	15.89	16.31	11.01	4.62	3.59	8.40	13.07	14.39	16.56	---
12	17.11	17.35	15.89	16.31	11.04	4.48	3.45	8.65	13.17	14.44	16.61	---
13	17.11	17.38	15.88	16.30	11.22	3.96	1.68	8.86	13.13	14.50	16.58	---
14	17.11	17.37	15.85	16.35	11.29	3.43	2.11	9.00	13.22	14.61	16.40	---
15	17.17	17.30	15.87	16.44	11.42	3.90	2.31	9.19	13.25	14.71	16.37	---
16	17.17	17.27	15.93	16.47	11.53	4.40	2.99	9.33	13.35	14.92	16.40	---
17	17.17	17.24	15.92	16.40	11.51	4.59	3.50	9.46	13.50	14.99	16.41	---
18	17.14	17.08	15.90	16.54	11.37	4.97	3.73	9.61	13.64	15.15	16.47	---
19	17.11	16.96	15.93	16.53	10.88	5.25	4.26	9.74	13.80	15.13	16.50	---
20	17.10	16.95	15.92	16.58	9.24	5.44	4.65	9.84	13.82	15.22	16.56	---
21	17.08	16.91	15.93	16.58	7.42	5.44	4.92	10.12	13.86	15.29	16.56	---
22	17.11	16.89	15.93	16.60	7.30	4.61	5.27	10.32	13.92	15.36	16.55	---
23	17.23	16.89	15.95	16.58	7.12	4.74	5.49	10.48	13.94	15.47	16.62	---
24	17.24	16.89	15.95	16.59	6.49	5.17	5.62	10.66	13.84	15.58	16.63	---
25	17.29	16.89	15.97	16.57	6.37	5.51	5.97	10.78	13.75	15.61	16.70	---
26	17.31	16.88	16.04	16.54	6.72	5.65	6.22	10.98	13.69	15.68	16.73	---
27	17.24	16.86	16.05	16.54	6.91	5.86	6.55	10.98	13.42	15.78	16.87	---
28	17.21	16.73	16.06	16.15	7.01	6.10	6.74	11.21	13.28	15.77	16.88	---
29	17.22	16.59	16.04	11.96	---	6.39	6.87	11.40	13.30	15.89	16.84	---
30	17.24	16.57	16.07	10.84	---	6.54	6.93	11.58	13.45	16.00	16.85	---
31	17.23	---	16.10	10.51	---	6.62	---	11.73	---	16.09	16.85	---
MAX	17.31	17.38	16.61	16.60	11.53	7.52	7.05	11.73	13.94	16.09	16.88	17.00

CAL YR 1993 LOW 17.38  
WTR YR 1994 LOW 17.38

## GROUND-WATER RECORDS

## PUTNAM COUNTY

405505084032900. Local number, PU-1.

LOCATION.--Lat 40°55'05", long 84°03'29", Hydrologic Unit 04100007, Center and Broadway Streets, Columbus Grove.

Owner: Columbus Grove Water Department.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in., depth 110 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 770 ft above sea level, from topographic map.

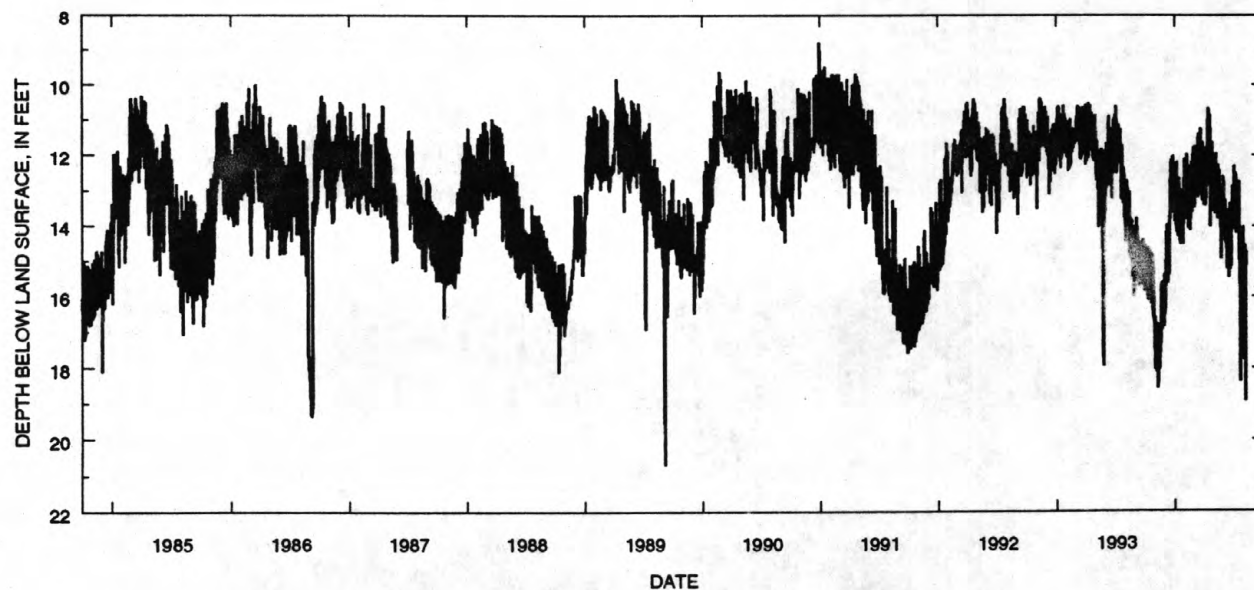
Measuring point: Floor of instrument shelter 3.00 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resource, Division of Water.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 24.30 ft below land-surface datum, Aug. 24, 1962;  
minimum daily low, 8.80 ft below land-surface datum, Dec. 30, 1990.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.71	17.40	16.16	12.25	13.67	12.86	11.80	11.97	14.27	12.90	15.08	---
2	14.56	16.57	15.66	13.39	12.64	11.75	13.31	13.65	13.76	12.30	17.76	---
3	15.63	18.04	16.33	12.63	12.21	13.49	12.01	12.49	13.27	13.25	17.02	---
4	14.67	17.50	15.76	13.78	13.48	12.10	12.16	12.30	14.37	12.51	14.56	---
5	14.84	16.86	14.18	14.17	12.34	11.81	13.43	13.63	14.51	12.53	18.92	---
6	15.77	18.06	15.72	12.84	11.98	12.90	12.39	12.53	13.71	14.20	15.56	---
7	15.31	18.04	15.50	12.19	13.81	12.33	12.25	11.95	13.65	13.63	14.73	---
8	14.78	16.77	13.97	13.38	12.59	12.03	13.20	13.23	14.64	12.58	---	---
9	15.98	18.56	15.54	13.52	12.36	13.01	12.07	12.61	14.06	13.90	---	---
10	14.62	17.61	15.56	12.73	14.06	12.75	11.38	12.32	15.21	12.74	---	---
11	14.92	17.19	14.41	14.30	12.80	11.72	12.85	13.80	13.92	12.95	---	---
12	16.11	18.42	15.62	13.19	12.32	13.20	11.30	12.83	13.55	13.29	---	---
13	15.36	17.61	14.49	12.64	13.50	11.60	10.67	12.29	14.83	13.74	---	---
14	15.64	16.86	14.09	13.61	12.76	11.39	11.93	13.46	13.54	13.38	---	---
15	15.14	18.04	15.39	12.99	12.55	13.11	10.88	12.56	13.77	13.93	---	---
16	15.84	17.26	14.77	14.07	14.11	12.00	10.85	12.41	15.45	13.68	---	---
17	14.72	16.84	12.70	14.36	13.02	11.41	11.76	13.80	14.96	12.71	---	---
18	14.96	17.59	13.81	14.51	12.30	12.41	11.23	13.19	13.36	14.30	---	---
19	16.09	17.07	13.36	14.16	13.80	11.67	11.49	12.86	13.65	15.64	---	---
20	14.82	15.67	12.19	13.99	12.58	11.24	14.00	14.05	15.24	15.58	---	---
21	15.13	16.73	13.12	12.99	12.17	13.03	13.17	13.37	13.71	18.38	---	---
22	16.21	15.61	12.13	13.28	13.61	12.11	12.01	13.32	15.14	15.11	---	---
23	15.00	15.75	12.15	14.09	12.49	11.68	12.93	14.93	13.46	14.86	---	---
24	14.80	16.93	13.62	13.28	11.97	13.28	11.64	13.49	14.70	15.96	---	---
25	16.39	15.94	13.05	12.99	13.02	11.72	11.96	12.86	12.86	15.90	---	---
26	15.31	15.56	12.02	14.52	12.25	11.62	13.57	13.77	13.79	14.69	---	---
27	15.05	16.61	13.49	13.38	11.78	12.63	12.32	13.46	12.99	16.96	---	---
28	16.59	15.89	13.25	12.62	12.92	12.35	12.02	12.59	14.10	16.91	---	---
29	16.27	15.38	12.36	13.49	---	11.81	13.18	13.59	12.93	14.02	---	---
30	15.95	16.84	13.22	12.57	---	13.41	12.36	12.91	13.73	16.04	---	---
31	17.49	---	13.87	12.10	---	12.32	---	12.75	---	15.69	---	---
MAX	17.49	18.56	16.33	14.52	14.11	13.49	14.00	14.93	15.45	18.38	18.92	---
CAL YR 1993	LOW 18.56											
WTR YR 1994	LOW 18.92											



## GROUND-WATER RECORDS

121

## RICHLAND COUNTY

405753082360800. Local number, R-3.

LOCATION.--Lat 40°57'53", long 82°36'08", Hydrologic Unit 04100012, Voisard plant in Shiloh.

Owner: Voisard Corp.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in., depth 150 ft, cased.

INSTRUMENTATION.--Digital recorder --60-minute punch.

DATUM.--Elevation of land-surface datum is 1080 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 3.17 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

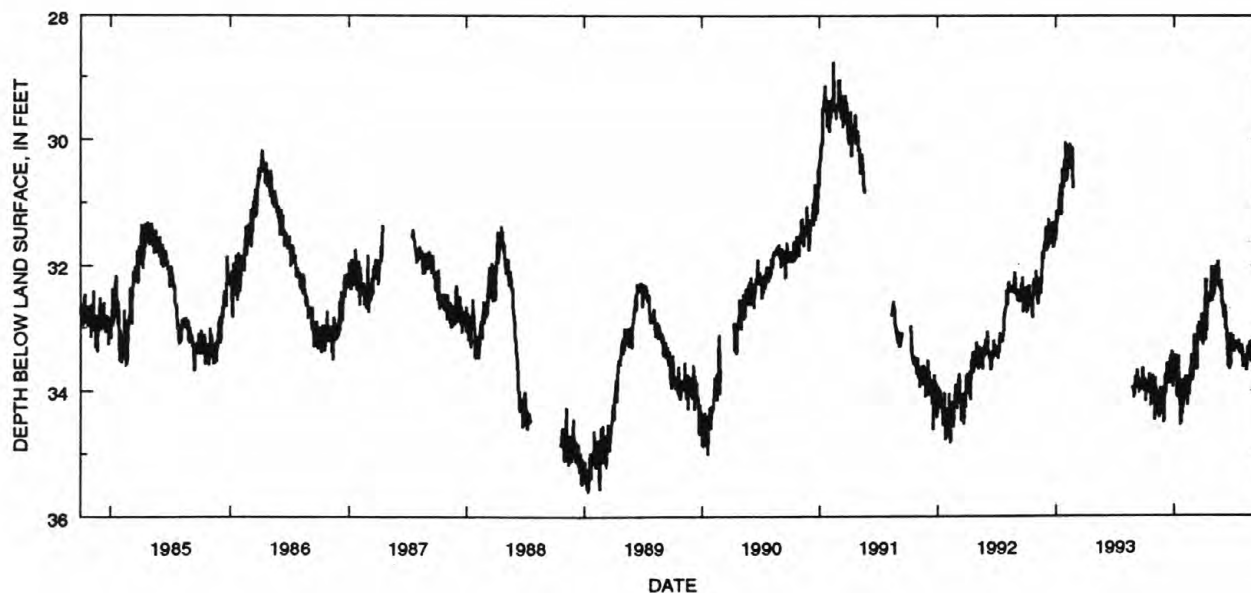
PERIOD OF RECORD.--April 1946 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 35.90 ft below land-surface datum, Feb. 12, 1981;

minimum daily low, 23.68 ft below land-surface datum, June 15, 23, 1947.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33.80	34.36	34.44	33.57	34.07	33.62	33.00	32.33	32.69	33.33	33.49	33.62
2	33.85	34.47	34.13	33.59	34.06	33.40	32.87	32.39	32.81	33.29	33.51	33.68
3	33.85	34.16	34.10	33.52	34.08	33.13	32.96	32.46	32.83	33.38	33.55	33.59
4	33.85	34.09	33.83	33.43	34.05	33.11	32.91	32.32	32.74	33.28	33.45	33.58
5	34.17	33.80	33.74	33.70	33.78	33.37	32.72	32.17	32.74	33.31	33.60	33.47
6	34.17	34.08	33.87	33.58	33.78	33.37	32.77	32.17	32.65	33.29	33.59	33.38
7	33.96	34.24	34.04	33.52	34.06	33.31	32.22	32.14	32.86	33.27	33.48	33.53
8	33.87	34.34	33.92	33.80	34.02	33.54	33.20	32.00	33.01	33.26	33.45	33.55
9	33.88	34.39	33.86	34.08	34.07	33.54	32.81	32.04	33.01	33.21	33.63	33.54
10	33.99	34.34	33.56	34.09	34.23	33.40	33.00	32.23	33.00	33.33	33.67	33.64
11	33.96	34.16	33.84	33.85	34.05	33.66	33.04	32.24	33.05	33.29	33.53	33.72
12	33.85	34.24	33.83	33.83	33.95	33.64	32.89	32.18	33.18	33.23	33.46	33.66
13	34.01	34.08	33.77	33.45	33.88	33.34	32.47	32.27	33.19	33.28	33.36	33.65
14	34.01	34.02	33.60	33.52	33.89	33.07	32.49	32.20	33.37	33.24	33.29	33.60
15	34.04	34.37	33.59	34.05	33.92	32.96	32.50	31.93	33.53	33.30	33.37	33.58
16	33.85	34.44	33.88	34.14	34.07	33.14	32.45	32.17	33.60	33.34	33.45	33.60
17	33.73	34.21	33.90	33.71	33.90	33.15	32.55	32.32	33.54	33.28	33.39	33.48
18	33.97	34.31	33.67	34.15	33.87	32.90	32.55	32.33	33.57	33.19	33.36	33.62
19	34.02	33.95	33.63	34.29	33.71	33.00	32.44	32.27	33.65	33.33	33.38	33.64
20	33.99	34.24	33.55	34.52	33.61	33.00	32.58	32.34	33.65	33.41	33.25	33.74
21	34.12	34.24	33.44	34.51	33.75	32.99	32.53	32.31	33.56	33.36	33.24	33.68
22	34.22	34.35	33.49	34.39	33.85	33.08	32.51	32.31	33.58	33.31	33.36	33.59
23	34.21	34.38	33.71	34.21	33.42	33.01	32.41	32.38	33.44	33.32	33.51	33.58
24	34.05	34.27	33.67	34.24	33.52	33.08	32.12	32.43	33.09	33.32	33.54	33.52
25	33.94	34.35	33.37	34.27	33.52	33.20	32.01	32.24	33.23	33.27	33.43	33.48
26	33.95	34.21	33.68	34.38	33.78	33.17	32.18	32.49	33.27	33.30	33.44	33.33
27	33.89	34.08	33.89	34.17	33.84	32.77	32.52	32.61	33.25	33.31	33.37	33.47
28	33.76	33.94	33.95	33.83	33.71	32.84	32.56	32.55	33.28	33.40	33.26	33.54
29	34.05	34.30	33.73	34.08	---	33.17	32.44	32.57	33.12	33.51	33.32	33.70
30	34.03	34.51	33.78	34.14	---	33.27	32.45	32.65	33.35	33.56	33.46	33.83
31	33.94	---	33.66	34.06	---	33.14	---	32.68	---	33.62	33.44	---
MAX	34.22	34.51	34.44	34.52	34.23	33.66	33.20	32.68	33.65	33.62	33.67	33.83

CAL YR 1993 LOW 34.51  
WTR YR 1994 LOW 34.52

## GROUND-WATER RECORDS

## SANDUSKY COUNTY

411914083045300. Local number, S-3.

LOCATION.--Lat 41°19'14", long 83°04'53", Hydrologic Unit 04100011, 2.6 mi southeast of Fremont Post Office.

Owner: State of Ohio.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled test artesian well, diameter 12 in., depth 121 ft, cased to 93 ft.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 627 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 3.00 ft above land-surface datum.

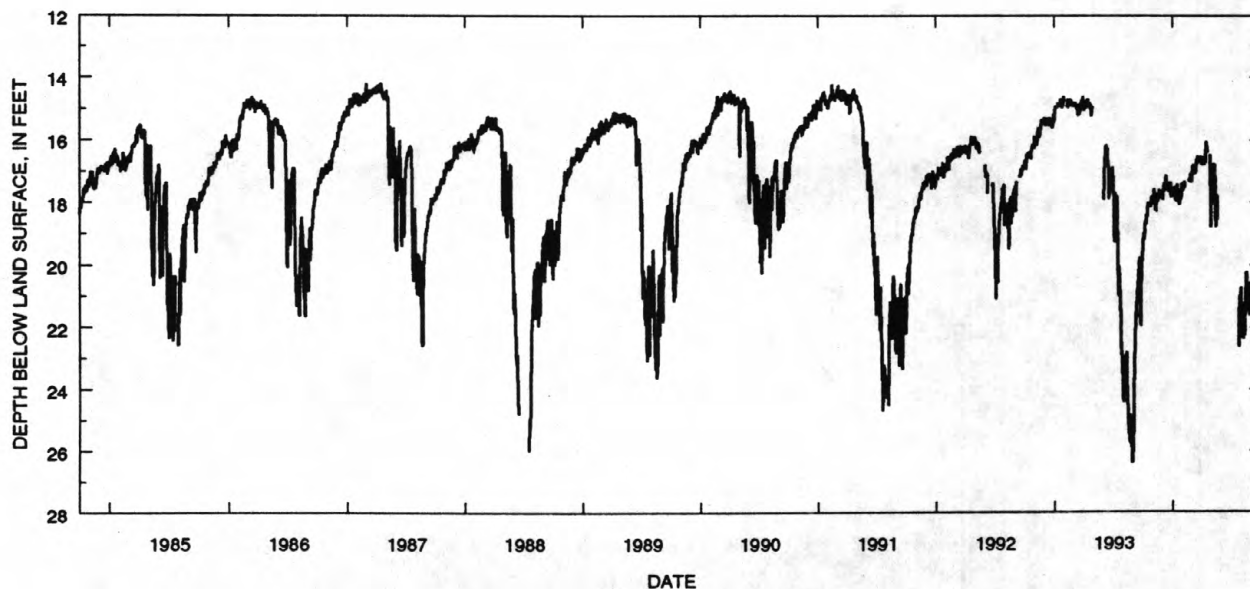
PERIOD OF RECORD.--December 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 26.38 ft below land-surface datum, Aug. 30, 1993;

minimum daily low, 14.02 ft below land-surface datum, Mar. 24, 1975.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.44	18.00	17.90	17.60	17.57	17.18	16.62	17.28	---	---	22.30	20.56
2	19.17	18.04	17.69	17.68	17.50	17.04	16.60	17.25	---	---	21.64	20.94
3	19.18	17.87	17.65	17.66	17.48	16.87	16.72	17.19	---	---	22.11	21.60
4	18.96	17.78	17.49	17.58	17.42	16.81	16.72	17.01	---	---	22.32	20.98
5	19.16	17.58	17.39	17.66	17.32	17.00	16.61	16.91	---	---	22.32	21.55
6	19.09	17.83	17.46	17.57	17.39	16.97	16.58	16.91	---	---	21.87	21.66
7	18.87	18.09	17.57	17.50	17.52	16.98	16.78	16.82	---	---	21.26	22.04
8	18.73	18.19	17.53	17.68	17.45	17.08	16.79	16.84	---	---	21.43	22.38
9	18.57	18.22	17.49	17.89	---	17.04	16.57	16.80	---	---	22.25	22.70
10	18.67	18.12	17.29	17.91	---	16.93	16.62	17.58	---	---	21.91	23.03
11	18.60	18.00	17.14	17.68	---	17.06	16.73	18.37	---	---	21.29	---
12	18.38	17.98	17.61	17.68	---	17.03	16.54	18.76	---	---	20.90	22.23
13	18.48	17.90	17.61	17.44	---	16.84	16.07	---	---	---	20.59	22.86
14	18.44	17.79	17.55	17.41	---	16.75	16.20	18.54	---	---	20.23	22.58
15	18.36	17.81	17.47	17.72	---	16.60	16.21	17.89	---	---	20.33	23.28
16	18.21	17.98	17.59	17.80	---	16.70	16.39	17.78	---	---	20.79	23.54
17	18.02	17.84	17.62	17.57	---	16.73	---	18.51	---	---	21.28	22.89
18	18.11	17.85	17.47	17.84	---	16.53	---	---	---	19.94	21.00	23.05
19	18.14	17.61	17.48	17.95	17.32	16.65	16.36	---	---	---	21.06	22.97
20	18.07	17.68	17.45	18.06	17.22	16.66	---	---	---	---	21.45	---
21	18.05	17.73	17.38	18.02	---	16.60	---	---	---	---	20.77	---
22	18.12	17.82	17.38	17.83	---	16.63	---	---	---	22.25	20.75	---
23	18.12	17.79	17.39	17.73	17.17	16.58	---	---	---	22.59	21.63	22.62
24	17.98	17.77	17.39	17.79	17.13	16.66	16.46	---	---	21.74	21.24	22.03
25	18.14	17.85	17.38	17.78	17.13	16.72	17.20	---	---	21.01	20.89	21.67
26	18.02	17.74	17.68	17.85	17.29	16.71	17.75	---	---	21.62	21.58	21.24
27	18.00	17.63	17.80	17.80	17.36	16.52	18.76	---	---	21.87	21.04	21.01
28	17.88	17.60	17.82	17.40	17.27	16.60	18.39	---	---	21.12	20.54	20.85
29	17.85	17.80	17.74	17.51	---	16.71	17.71	---	---	20.74	20.88	20.76
30	17.85	17.89	17.69	17.64	---	16.80	17.52	---	---	21.72	20.62	21.40
31	17.82	---	17.62	17.63	---	16.70	---	---	---	22.13	20.84	---
MAX	19.44	18.22	17.90	18.06	17.57	17.18	18.76	18.76	---	22.59	22.32	23.54

CAL YR 1993 LOW 26.38  
WTR YR 1994 LOW 23.54



## GROUND-WATER RECORDS

123

## SANDUSKY COUNTY--Continued

412703083213600. Local number, S-2.

LOCATION.--Lat 41°27'03", long 83°21'36", Hydrologic Unit 04100010, at water works in Woodville.

Owner: Woodville Water department.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in., depth 198 ft cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 635 ft above sea level from topographic map.

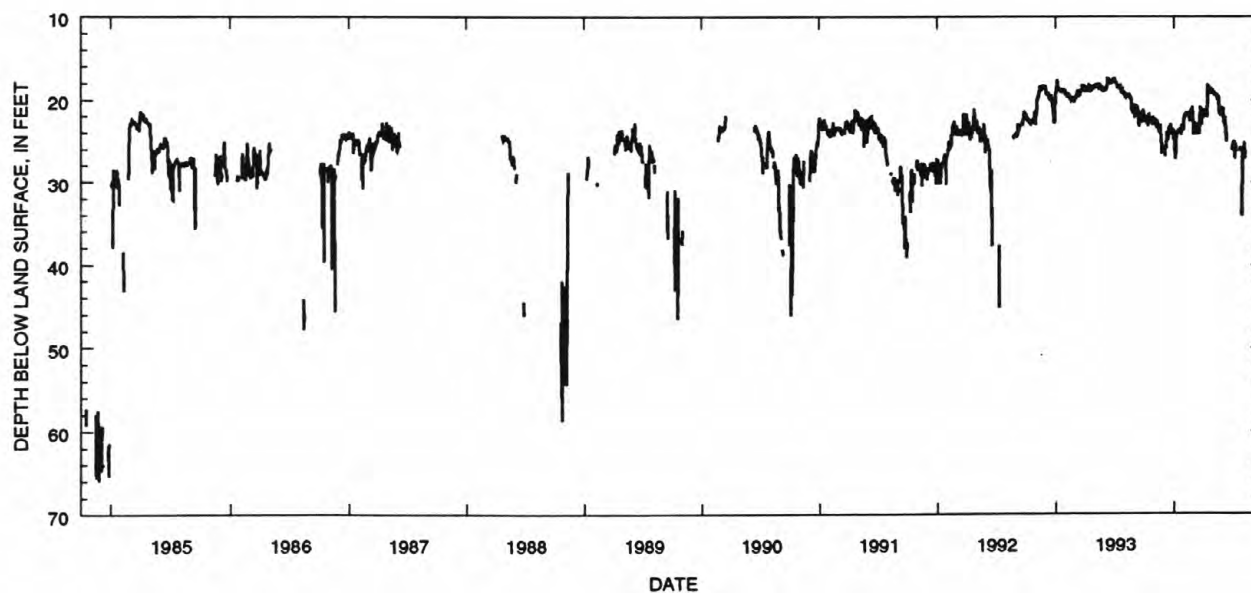
Measuring point: Top of casing at land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

PERIOD OF RECORD.--June 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 100.97 ft below land-surface datum, Jan. 29, 1982;  
minimum daily low, 17.58 ft below land-surface datum, June 11, 1993.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.31	22.62	---	24.02	22.00	24.13	21.59	19.13	22.55	25.48	---	---
2	22.71	22.54	---	25.27	21.77	23.72	21.23	19.21	22.70	25.25	26.05	---
3	21.90	23.08	26.78	25.42	21.84	23.65	21.32	19.26	22.87	25.01	25.20	---
4	22.67	22.31	25.83	27.11	21.74	24.17	21.38	19.26	22.27	---	25.31	---
5	22.09	22.34	25.62	26.08	21.96	23.83	21.60	19.25	22.06	27.11	27.11	---
6	22.82	23.23	---	25.81	21.76	22.86	21.85	19.39	22.42	25.31	---	---
7	22.24	23.44	25.88	24.74	21.91	22.98	21.86	19.37	23.85	---	---	---
8	22.04	22.55	25.13	24.39	21.64	22.86	21.86	19.36	24.00	---	---	---
9	23.00	22.56	24.95	24.39	21.78	23.15	21.79	19.41	24.07	---	26.88	---
10	22.42	23.25	23.98	24.18	21.77	23.22	21.87	19.54	25.00	---	---	---
11	22.11	22.84	23.97	24.09	21.75	22.92	21.59	19.49	---	---	26.26	---
12	22.88	23.34	24.57	23.86	21.61	23.76	21.24	19.60	---	---	---	---
13	23.22	23.27	24.61	23.68	21.73	23.89	20.33	19.68	---	---	---	---
14	22.27	23.38	24.22	23.67	21.65	23.82	18.43	19.63	---	---	---	---
15	22.51	24.01	23.99	23.88	21.78	23.76	18.47	19.55	---	---	---	---
16	21.70	23.63	23.45	23.72	22.60	23.67	18.80	19.72	---	---	---	---
17	22.61	23.75	23.33	23.55	22.04	23.78	18.87	19.88	---	26.08	---	---
18	22.15	23.38	23.75	23.71	22.18	23.35	18.82	21.27	---	26.20	---	---
19	22.07	23.27	23.98	23.64	22.14	24.07	18.82	21.64	---	---	---	---
20	22.85	23.95	23.81	23.86	22.11	22.47	18.91	21.11	---	25.71	---	---
21	22.28	24.48	23.00	23.57	21.95	21.78	18.94	21.46	---	26.05	---	---
22	22.35	25.20	23.62	23.45	21.63	21.65	18.99	20.97	---	---	---	---
23	22.38	25.38	23.80	24.20	21.24	21.04	18.94	21.92	---	26.23	---	---
24	23.17	26.57	24.24	23.46	21.16	21.13	18.79	21.16	---	---	---	---
25	22.37	---	23.44	23.30	21.08	21.92	18.83	21.19	---	---	---	---
26	22.31	---	23.98	23.36	21.66	22.98	18.85	20.89	---	---	---	---
27	23.16	---	24.19	23.06	21.93	22.00	19.18	21.02	26.14	34.00	---	---
28	22.19	---	23.94	23.61	23.47	21.71	19.22	21.03	25.66	26.35	---	---
29	22.87	---	23.65	23.52	---	21.77	19.18	21.29	25.30	26.06	---	---
30	23.13	---	24.63	23.50	---	21.86	19.20	21.19	---	25.85	---	---
31	22.42	---	24.53	22.50	---	21.92	---	21.56	---	---	---	---
MAX	23.22	26.57	26.78	27.11	23.47	24.17	21.87	21.92	26.14	34.00	27.11	---

CAL YR 1993 LOW 26.78  
WTR YR 1994 LOW 34.00

## GROUND-WATER RECORDS

## SENECA COUNTY

410802083093900. Local number, SE-2.

LOCATION.--Lat 41°08'02", long 83°09'39", Hydrologic Unit 04100011, Tiffin State Hospital, Tiffin.

Owner: State of Ohio.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in., depth 250 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 740 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 0.50 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

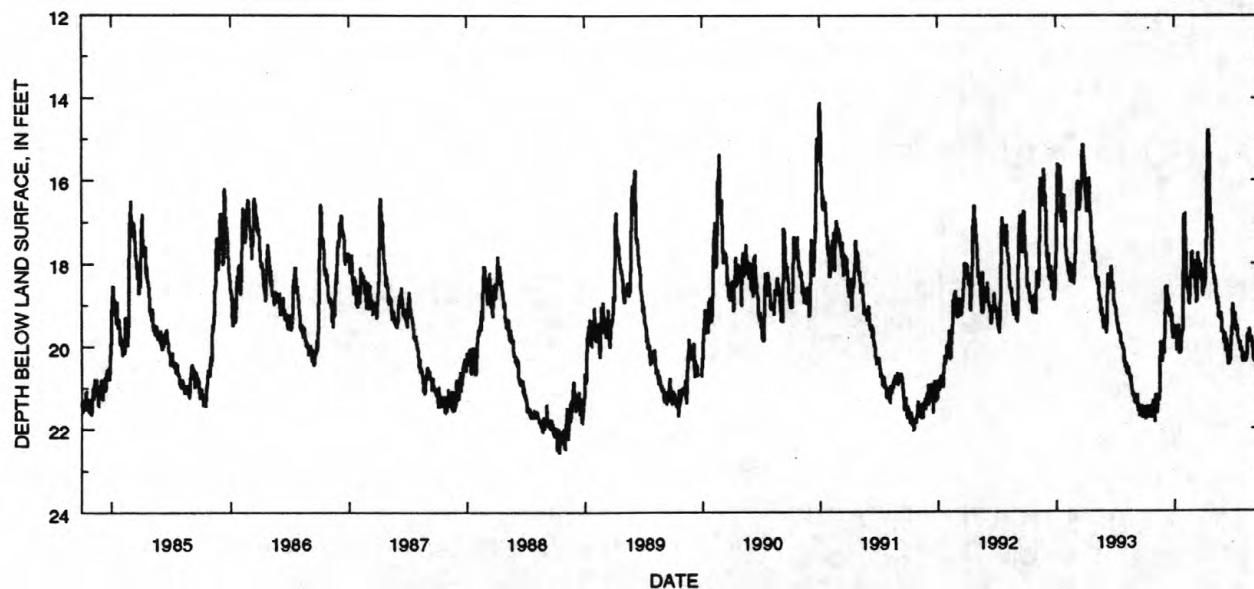
PERIOD OF RECORD.--July 1962 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 23.76 ft below land-surface datum, Nov. 22, 1964;  
minimum daily low, 14.11 ft below land-surface datum, Jan. 2, 1991.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.51	21.81	20.17	19.55	16.85	18.19	18.43	18.18	19.71	19.00	20.29	20.26
2	21.57	21.85	19.85	19.63	16.83	18.02	18.40	18.31	19.85	19.09	20.25	20.33
3	21.60	21.55	19.78	19.60	17.34	17.92	18.61	18.39	19.93	19.24	20.32	20.32
4	21.53	21.38	19.55	19.51	17.40	18.11	18.61	18.29	19.83	19.25	20.22	20.29
5	21.75	21.17	18.78	19.78	17.55	18.41	18.49	18.30	19.78	19.26	20.34	20.20
6	21.78	21.42	18.54	19.67	17.89	18.43	18.43	18.45	19.68	19.25	20.38	20.11
7	21.59	21.60	18.65	19.67	18.20	18.52	18.42	18.44	19.89	19.29	20.21	20.25
8	21.46	21.63	18.61	19.96	18.11	18.73	18.23	18.55	20.14	19.36	20.17	20.27
9	21.58	21.63	18.57	20.09	18.54	18.70	17.54	18.63	20.10	19.45	20.35	20.28
10	21.76	21.54	18.54	20.09	18.64	18.65	17.30	18.85	20.01	19.63	20.36	20.43
11	21.70	21.40	18.94	19.88	18.54	18.91	17.20	18.83	19.84	19.59	20.29	20.54
12	21.52	21.45	18.94	19.88	18.54	18.90	16.50	18.91	20.06	19.49	20.26	20.55
13	21.71	21.34	18.93	19.48	18.71	18.51	15.08	18.99	20.07	19.56	20.22	20.48
14	21.71	21.28	18.82	19.56	18.73	18.17	14.87	18.93	20.23	19.59	19.71	20.45
15	21.69	21.27	18.94	20.07	18.90	17.74	14.79	18.81	20.36	19.71	19.74	20.49
16	21.56	21.33	19.25	20.18	18.99	17.98	15.00	19.10	20.44	19.85	19.74	20.49
17	21.46	20.98	19.30	19.69	18.83	18.00	15.28	19.24	20.42	19.79	19.68	20.55
18	21.62	20.60	19.12	20.07	18.73	17.93	15.37	19.23	20.40	19.82	19.74	20.68
19	21.66	19.91	19.13	20.16	18.54	18.11	15.79	19.24	20.43	19.90	19.69	20.76
20	21.59	20.11	19.12	20.11	18.17	18.19	16.29	19.28	20.44	19.97	19.58	20.75
21	21.66	20.14	19.06	20.11	18.26	18.13	16.56	19.31	20.34	19.91	19.66	20.71
22	21.75	20.31	19.16	19.79	18.25	18.19	16.86	19.33	20.34	19.91	19.80	20.65
23	21.73	20.28	19.43	19.69	17.77	18.00	16.98	19.33	20.24	20.04	19.90	20.65
24	21.49	20.33	19.39	19.77	17.75	18.26	16.86	19.26	19.94	20.06	19.88	20.69
25	21.46	20.39	19.22	19.72	17.77	18.41	17.06	19.18	20.01	20.04	19.82	20.68
26	21.37	20.22	19.59	19.67	18.22	18.41	17.25	19.45	19.94	20.06	19.83	20.56
27	21.37	20.11	19.80	19.58	18.34	18.15	17.81	19.67	19.58	20.08	19.88	20.63
28	21.31	19.89	19.83	18.66	18.26	18.32	18.02	19.63	19.50	20.20	19.77	20.70
29	21.51	20.02	19.67	17.71	---	18.65	18.06	19.64	19.14	20.29	19.95	20.87
30	21.53	20.20	19.49	17.23	---	18.78	18.10	19.65	18.98	20.33	20.06	20.97
31	21.51	---	19.56	16.95	---	18.63	---	19.66	---	20.38	20.03	---
MAX	21.78	21.85	20.17	20.18	18.99	18.91	18.61	19.67	20.44	20.38	20.38	20.97

CAL YR 1993 LOW 21.85

WTR YR 1994 LOW 21.85



## GROUND-WATER RECORDS

125

## SUMMIT COUNTY

410330081282000. Local number, SU-6.

LOCATION.--Lat 41°03'30", long 81°28'20", Hydrologic Unit 04110002, Seiberling St, Akron.

Owner: Goodyear Tire and Rubber Co.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 24 in., depth 89 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 1000 ft above sea level from topographic map.

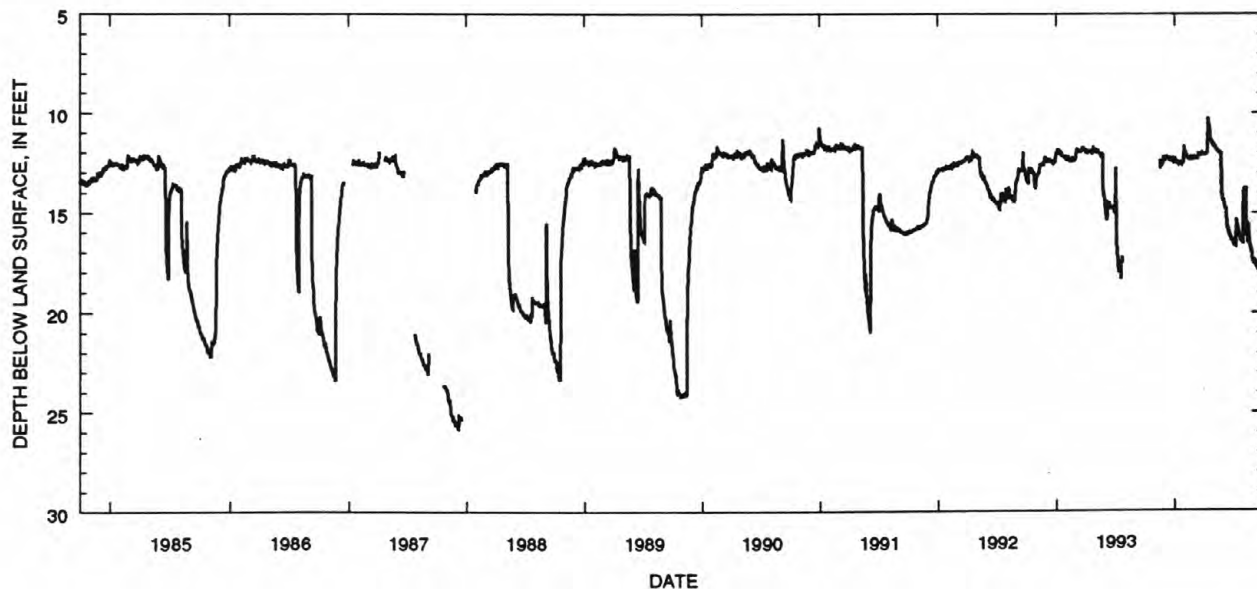
Measuring point: Floor of instrument shelter 2.63 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

PERIOD OF RECORD.--March 1944 to current year. Records for May 14-Sept. 30, 1980, published in USGS-WDR-OH-80-1, are unreliable and should not be used.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 59.47 ft below land-surface datum, Oct. 18, 1947;  
minimum daily low, 10.26 ft below land-surface datum, Apr. 13, 1994.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	12.38	12.42	11.98	12.26	12.11	11.62	14.51	16.59	13.90	17.38
2	---	---	12.39	12.35	12.01	12.24	12.13	11.64	14.63	16.63	13.83	17.40
3	---	---	12.40	12.35	12.11	12.24	12.12	11.69	14.72	16.63	13.82	17.44
4	---	---	12.38	12.45	12.12	12.27	12.10	11.72	14.77	16.60	13.80	17.45
5	---	---	12.21	12.51	12.15	12.31	12.09	11.74	14.78	16.63	13.78	17.47
6	---	---	12.22	12.50	12.15	12.31	12.09	11.80	14.75	16.66	13.78	17.52
7	---	---	12.24	12.48	12.19	12.27	12.06	11.81	14.81	16.67	13.77	17.59
8	---	---	12.28	12.54	12.18	12.32	12.06	11.81	15.20	16.51	15.11	17.65
9	---	---	12.28	12.55	12.25	12.32	12.05	11.82	15.43	15.33	15.83	17.67
10	---	---	12.26	12.54	12.26	12.32	11.99	11.87	15.58	15.48	16.15	17.72
11	---	---	12.30	12.51	12.31	12.33	11.79	11.87	15.66	15.63	16.23	17.74
12	---	---	12.27	12.50	12.32	12.32	11.79	11.93	15.74	15.75	16.43	17.79
13	---	---	12.26	12.49	12.31	12.25	10.26	11.97	15.80	15.85	16.54	17.83
14	17.34	---	12.29	12.54	12.33	12.15	10.42	11.98	15.87	15.93	16.35	17.85
15	---	---	12.37	12.57	12.34	12.10	10.63	11.97	15.98	15.99	15.57	17.87
16	---	12.77	12.42	12.56	12.35	12.13	10.73	11.96	16.03	16.06	16.10	17.89
17	---	12.76	12.42	12.47	12.35	12.14	10.82	11.98	16.09	16.11	16.35	17.90
18	---	12.50	12.40	12.52	12.35	12.14	10.98	12.01	16.13	16.14	16.46	17.89
19	---	12.52	12.37	12.54	12.34	12.17	11.16	12.04	16.16	16.20	16.57	17.94
20	---	12.59	12.36	12.56	12.31	12.17	11.24	12.05	16.19	16.26	16.71	17.98
21	---	12.58	12.42	12.57	12.25	12.13	11.36	12.05	16.23	16.33	16.76	17.99
22	---	12.58	12.43	12.57	12.28	12.03	11.41	12.05	16.31	16.34	16.82	18.01
23	---	12.60	12.42	12.56	12.26	12.03	11.44	12.04	16.35	16.38	16.83	18.04
24	---	12.62	12.38	12.50	12.20	12.03	11.44	13.66	16.37	16.39	16.89	18.08
25	---	12.59	12.31	12.48	12.22	12.07	11.52	13.98	16.37	16.42	17.05	18.09
26	---	12.50	12.33	12.51	12.25	12.07	11.56	14.15	16.38	16.44	17.24	18.09
27	---	12.43	12.41	12.50	12.25	12.05	11.62	14.30	16.39	16.47	17.36	18.12
28	---	12.21	12.44	12.32	12.25	12.06	11.64	14.35	16.44	16.50	17.32	18.15
29	---	12.27	12.45	11.67	---	12.07	11.64	14.36	16.47	14.80	17.36	18.18
30	---	12.36	12.49	11.80	---	12.09	11.65	14.38	16.52	14.28	17.44	18.23
31	---	---	12.47	11.89	---	12.09	---	14.43	---	13.99	17.57	---
MAX	17.34	12.77	12.49	12.57	12.35	12.33	12.13	14.43	16.52	16.67	17.57	18.23

CAL YR 1993 LOW 18.32  
WTR YR 1994 LOW 18.23

## GROUND-WATER RECORDS

## SUMMIT COUNTY--Continued

410846081271600. Local number, SU-7.

LOCATION.--Lat 41°08'46", long 81°27'16", Hydrologic Unit 04110002, Monroe Falls Road, Cuyahoga Falls.

Owner: Cuyahoga Falls Water Department.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused water-table, diameter 6 in., depth 100 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 994 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 5.00 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

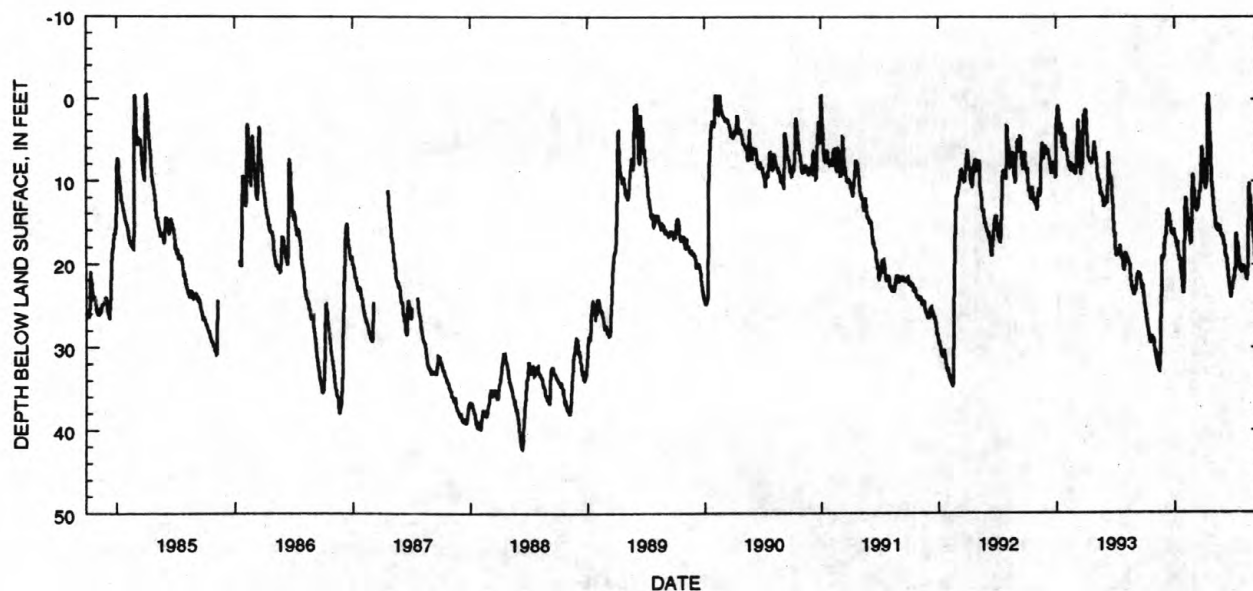
PERIOD OF RECORD.--August 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 44.19 ft below land-surface datum, Sept. 7, 1971;

minimum daily low, 0.67 ft above land-surface datum, Apr. 15, 1994.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.92	30.54	17.87	16.56	16.11	11.01	9.03	12.67	17.57	22.13	20.24	16.52
2	25.17	30.81	17.23	16.75	14.04	11.28	9.59	13.45	17.67	21.86	20.32	17.06
3	25.40	30.95	16.91	16.87	12.12	11.29	10.08	13.68	17.65	21.58	20.77	17.71
4	25.75	30.42	16.67	17.08	11.93	11.85	10.23	14.06	17.76	21.59	20.59	18.00
5	26.09	31.24	16.42	17.34	12.46	12.60	10.71	14.56	18.24	20.76	20.54	18.90
6	26.39	31.56	15.89	17.46	13.06	13.06	10.93	14.94	18.54	20.73	20.45	18.99
7	26.65	31.75	15.20	17.74	13.45	13.24	10.89	15.20	18.92	20.79	21.23	19.51
8	27.06	31.92	14.95	17.75	13.74	13.32	10.34	15.48	19.13	20.04	21.25	19.93
9	27.26	32.09	14.16	17.91	14.11	13.49	10.17	15.63	19.13	16.29	21.48	20.06
10	27.53	32.29	13.70	17.19	14.41	13.64	10.05	15.77	19.46	16.58	21.67	19.39
11	27.80	32.41	13.69	18.45	14.58	13.24	8.32	15.86	19.77	17.05	21.70	20.23
12	28.07	32.59	13.58	18.58	14.76	13.30	6.16	15.69	20.14	17.48	21.09	20.40
13	28.31	32.73	14.00	18.90	15.09	13.25	1.89	15.47	20.55	17.95	21.18	20.60
14	28.57	32.76	14.16	19.22	15.72	13.10	- .57	15.38	20.88	18.08	20.94	20.88
15	28.79	32.75	14.29	19.39	16.22	12.91	- .67	15.40	21.42	17.40	19.90	21.08
16	29.10	32.17	13.98	19.44	16.51	12.41	- .11	15.43	21.90	18.51	16.64	21.25
17	29.36	31.24	15.17	19.45	17.04	11.81	.65	15.43	22.29	18.83	12.88	21.28
18	29.51	30.27	14.85	19.24	17.16	11.31	1.47	15.41	22.56	19.14	11.12	21.31
19	28.73	27.97	15.16	20.52	17.33	11.25	3.39	15.42	22.98	19.38	10.21	21.36
20	28.68	24.98	15.97	20.85	17.40	11.04	4.78	15.49	23.26	19.77	11.55	20.60
21	28.69	22.64	16.07	21.06	17.33	11.20	5.85	15.71	23.31	20.46	11.76	20.60
22	28.70	20.19	16.08	21.43	16.15	11.11	6.74	15.88	23.97	20.50	11.83	21.07
23	28.74	19.15	16.23	21.63	14.30	9.60	7.71	16.29	24.01	20.73	12.00	20.76
24	28.79	18.94	16.16	22.05	12.20	8.54	8.58	16.44	23.51	20.82	12.57	20.84
25	28.90	19.18	16.29	22.53	9.71	7.22	9.79	16.43	23.01	20.90	13.17	20.92
26	29.02	19.29	16.31	23.02	9.10	5.77	10.58	16.58	22.79	21.02	13.89	20.93
27	29.06	19.34	15.94	23.34	9.69	6.32	11.21	16.66	22.61	20.23	14.31	20.98
28	29.13	19.26	15.73	23.40	10.60	6.86	11.70	16.69	23.07	20.33	14.61	20.95
29	29.21	18.76	15.93	23.19	---	7.63	12.18	16.76	22.38	20.14	15.12	20.93
30	29.96	18.25	16.21	21.47	---	8.22	12.31	16.92	22.30	20.15	15.50	20.95
31	30.22	---	16.41	18.09	---	8.70	---	17.28	---	20.18	16.46	---
MAX	30.22	32.76	17.87	23.40	17.40	13.64	12.31	17.28	24.01	22.13	21.70	21.36
CAL YR 1993	LOW 32.76											
WTR YR 1994	LOW 32.76											





## GROUND-WATER RECORDS

127

## VAN WERT COUNTY

405215084335400. Local number, VW-1.

LOCATION.--Lat 40°52'15", long 84°33'54", Hydrologic Unit 04100007, Ridge Road near Van Wert.

Owner: Marsh Foundation.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in., depth 340 ft, cased.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 790.37 ft above sea level.

Measuring point: Floor of instrument shelter 6.15 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

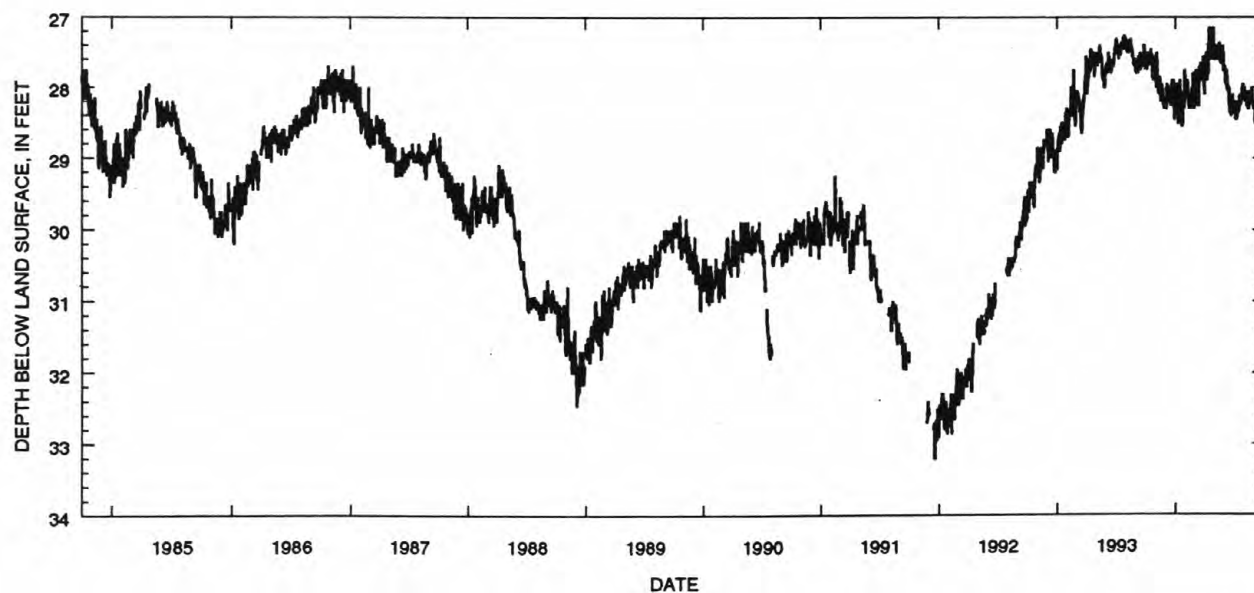
PERIOD OF RECORD.--August 1957 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low 33.20 ft below land-surface datum, Dec. 20-21, 1991;  
minimum daily low, 18.85 ft below land-surface datum, Mar. 6, 1959.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27.50	27.95	---	28.10	28.00	28.20	27.75	27.55	27.80	28.35	28.15	28.50
2	27.55	28.00	28.30	28.10	28.00	28.00	27.65	27.60	27.90	28.30	28.15	28.50
3	27.55	27.85	28.30	28.10	28.00	27.80	27.70	27.60	27.95	28.45	28.15	28.45
4	27.50	27.70	28.05	27.95	28.00	27.75	27.70	27.50	27.90	28.40	28.05	28.35
5	27.70	27.50	27.95	28.10	27.90	27.90	27.50	27.45	27.85	28.45	28.20	28.20
6	27.75	27.75	28.10	27.95	27.95	27.90	27.60	27.50	27.75	28.40	28.25	28.15
7	27.60	27.95	28.20	28.00	28.15	27.95	27.90	27.40	27.95	28.35	28.25	28.20
8	27.50	28.05	28.20	28.30	28.00	28.10	27.90	27.45	28.00	28.30	28.10	28.15
9	27.55	28.10	28.10	28.50	28.20	28.05	27.60	27.45	28.05	28.20	28.10	28.20
10	27.70	28.10	28.00	28.50	28.30	28.05	27.70	27.60	28.00	28.25	28.30	28.30
11	27.65	28.00	28.20	28.30	28.20	28.25	27.80	27.55	28.00	28.35	28.30	28.30
12	27.50	28.00	28.20	28.20	28.20	28.25	27.55	27.55	28.00	28.30	28.20	28.30
13	27.65	27.95	28.15	27.90	28.20	28.00	27.20	27.60	28.05	28.25	28.15	28.25
14	27.65	27.85	28.00	27.95	28.20	27.85	27.20	27.50	28.20	28.20	28.10	28.20
15	27.65	28.10	28.00	28.35	28.25	27.70	27.15	27.35	28.30	28.15	28.05	28.20
16	27.55	28.20	28.25	28.40	28.30	27.85	27.30	27.55	28.35	28.10	28.15	28.20
17	27.45	28.10	28.25	28.05	28.20	27.85	27.40	27.60	28.35	28.20	28.20	28.25
18	27.60	28.15	28.10	28.40	28.15	27.65	27.40	27.65	28.35	28.25	28.15	28.40
19	27.60	27.95	28.05	28.45	28.05	27.75	27.40	27.65	28.35	28.20	28.15	28.50
20	27.60	28.00	28.00	28.55	28.00	27.75	27.55	27.65	28.40	28.15	28.10	28.50
21	27.75	28.05	27.90	28.50	28.15	27.70	27.55	27.65	28.35	28.15	28.00	28.40
22	27.85	28.20	27.95	28.30	28.20	27.75	27.60	27.60	28.35	28.15	28.00	28.35
23	27.90	28.20	28.15	28.10	27.80	27.65	27.50	27.60	28.35	28.10	28.10	28.30
24	27.75	28.20	28.15	28.15	27.90	27.80	27.25	27.50	28.10	28.05	28.20	28.30
25	27.70	28.30	27.90	28.20	27.90	27.90	27.20	27.40	28.30	27.95	28.30	28.25
26	27.60	28.20	28.20	28.30	28.20	27.90	27.15	27.60	28.25	28.05	28.30	28.15
27	27.65	28.15	28.35	28.20	28.30	27.55	27.45	27.75	28.35	28.00	28.25	28.20
28	27.55	---	28.45	27.75	28.20	27.65	27.55	27.75	28.35	28.00	28.20	28.25
29	27.60	---	28.30	27.90	---	27.90	27.60	27.70	28.20	28.10	28.25	28.40
30	27.60	---	28.35	28.00	---	28.10	27.60	27.75	28.35	28.15	28.30	28.45
31	27.65	---	28.20	28.00	---	27.90	---	27.70	---	28.20	28.30	---
MAX	27.90	28.30	28.45	28.55	28.30	28.25	27.90	27.75	28.40	28.45	28.30	28.50

CAL YR 1993 LOW 29.15

WTR YR 1994 LOW 28.55



## GROUND-WATER RECORDS

## WILLIAMS COUNTY

412821084313600. Local number, WM-1.

LOCATION.--Lat 41°28'21", long 84°31'36", Hydrologic Unit 04100006, Bryan Water Treatment Plant, Bryan.

Owner: City of Bryan.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused production well, diameter 8 in., depth 118 ft, cased.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 747 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 3.30 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

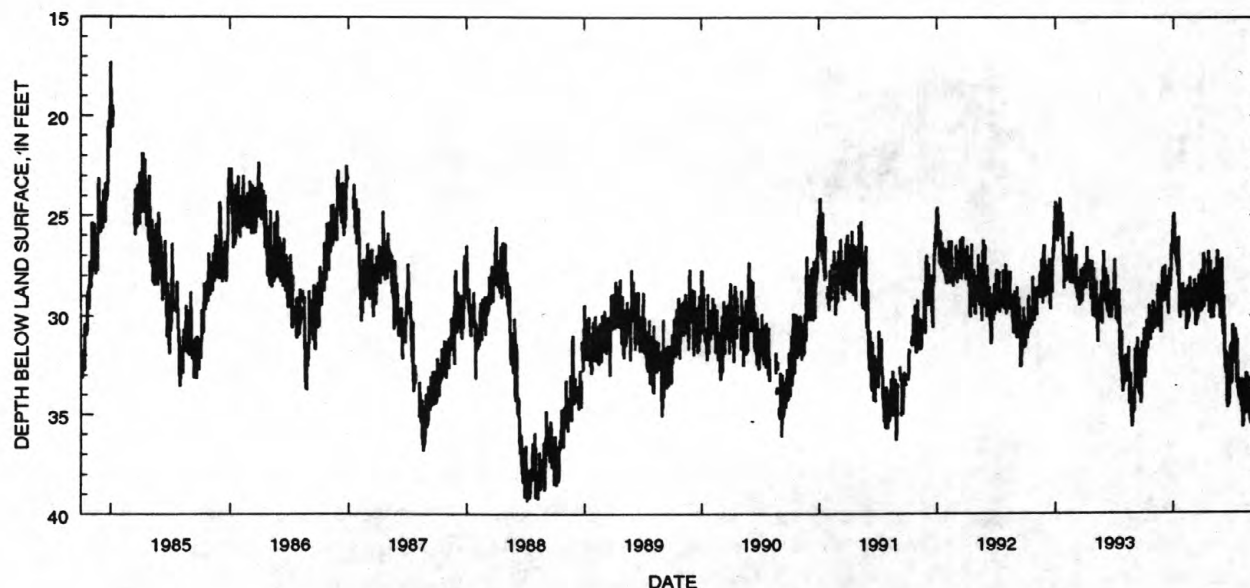
PERIOD OF RECORD.--May 1951 to May 1957, discontinued June 1957 to September 1984, reactivated October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 39.35 ft below land-surface datum, July 7, 1988;  
minimum daily low, 1.45 ft below land-surface datum, Jan. 27, 1952.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31.80	29.40	28.75	25.10	29.00	29.05	29.05	27.80	29.40	33.45	33.20	35.35
2	31.50	30.60	29.10	25.00	29.20	29.00	28.45	28.00	30.15	32.55	34.70	35.80
3	31.35	30.55	29.30	24.90	29.50	29.20	27.50	29.40	30.95	31.45	35.10	34.70
4	30.65	30.70	29.20	25.85	29.75	29.50	26.90	30.10	30.40	30.45	35.65	33.75
5	32.80	30.40	27.80	26.70	29.75	29.75	27.30	30.05	29.80	30.95	35.20	32.40
6	33.10	30.65	27.50	26.90	29.10	29.00	28.90	29.95	29.00	31.30	34.20	32.15
7	32.70	29.95	28.55	26.90	28.65	28.20	29.50	29.25	31.05	31.65	33.30	34.00
8	32.30	30.00	28.90	27.10	29.10	28.90	29.60	28.25	31.75	32.00	33.25	35.00
9	32.00	30.60	29.20	26.80	29.50	29.55	29.05	27.65	31.90	31.55	34.95	34.95
10	31.15	30.30	29.20	26.25	29.80	30.00	28.05	28.60	32.40	30.95	34.85	34.40
11	30.20	30.35	29.20	27.25	30.70	30.40	28.10	29.00	32.90	30.70	35.00	33.75
12	30.70	30.40	28.70	27.50	30.15	30.50	---	28.80	32.35	31.20	34.60	33.30
13	30.85	30.25	28.05	27.50	28.75	29.40	28.20	29.40	31.85	31.85	34.45	35.15
14	31.50	29.05	28.55	28.00	28.50	28.45	28.75	28.70	32.60	33.10	32.90	35.95
15	31.50	28.45	29.20	27.80	28.90	29.20	29.25	27.45	33.15	33.40	33.00	36.40
16	31.70	29.90	29.40	27.00	29.50	29.55	28.25	26.75	34.20	32.90	33.70	36.55
17	30.80	30.60	29.90	26.10	30.30	30.20	27.60	28.45	34.65	32.20	34.10	35.45
18	29.45	30.60	29.25	28.30	29.90	30.00	26.80	28.85	34.45	31.20	34.60	34.80
19	30.00	30.45	28.25	29.00	29.95	29.50	28.20	29.30	33.85	33.35	34.90	34.10
20	30.15	29.95	27.85	29.65	29.00	29.00	28.85	29.45	33.00	34.05	33.90	35.60
21	30.20	28.75	27.65	30.10	28.10	27.95	29.60	29.10	34.50	33.90	33.10	35.95
22	30.50	30.30	28.35	29.65	29.20	28.85	29.85	27.25	33.95	34.05	33.40	36.20
23	31.25	30.75	28.50	28.70	29.10	29.50	29.50	28.05	34.05	34.20	34.20	36.75
24	30.15	30.85	28.35	28.55	28.95	29.80	28.50	29.85	33.65	33.30	34.70	35.50
25	29.75	30.65	27.20	29.55	29.20	29.60	27.30	30.15	33.45	33.30	35.35	34.70
26	30.40	28.70	26.50	29.60	29.60	29.80	29.00	29.70	31.80	33.65	35.15	33.80
27	30.20	28.40	26.45	29.75	29.15	28.45	29.90	29.40	31.50	34.20	35.50	35.30
28	29.85	27.95	26.85	29.20	28.65	27.75	30.15	29.30	31.40	34.45	33.90	35.60
29	30.90	27.60	26.35	29.65	---	29.35	29.80	28.50	33.20	34.55	33.80	36.90
30	30.40	28.55	25.85	28.75	---	29.55	29.45	27.25	33.30	34.60	34.80	36.90
31	29.35	---	25.65	28.40	---	29.75	---	27.15	---	33.95	35.05	---
MAX	33.10	30.85	29.90	30.10	30.70	30.50	30.15	30.15	34.65	34.60	35.65	36.90

CAL YR 1993 LOW 35.60

WTR YR 1994 LOW 36.90



## GROUND-WATER RECORDS

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## WILLIAMS COUNTY--Continued

412930084320900. Local number, WM-3.

LOCATION.--Lat 41°29'30", long 84°32'09", Hydrologic Unit 04100006, Union Street, Bryan.

Owner: City of Bryan.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled unused test well, diameter 8 in., depth 174 ft, cased.

INSTRUMENTATION.--Type F continuous recorder.

DATUM.--Elevation of land-surface datum is 760 ft above sea level, from topographic map.

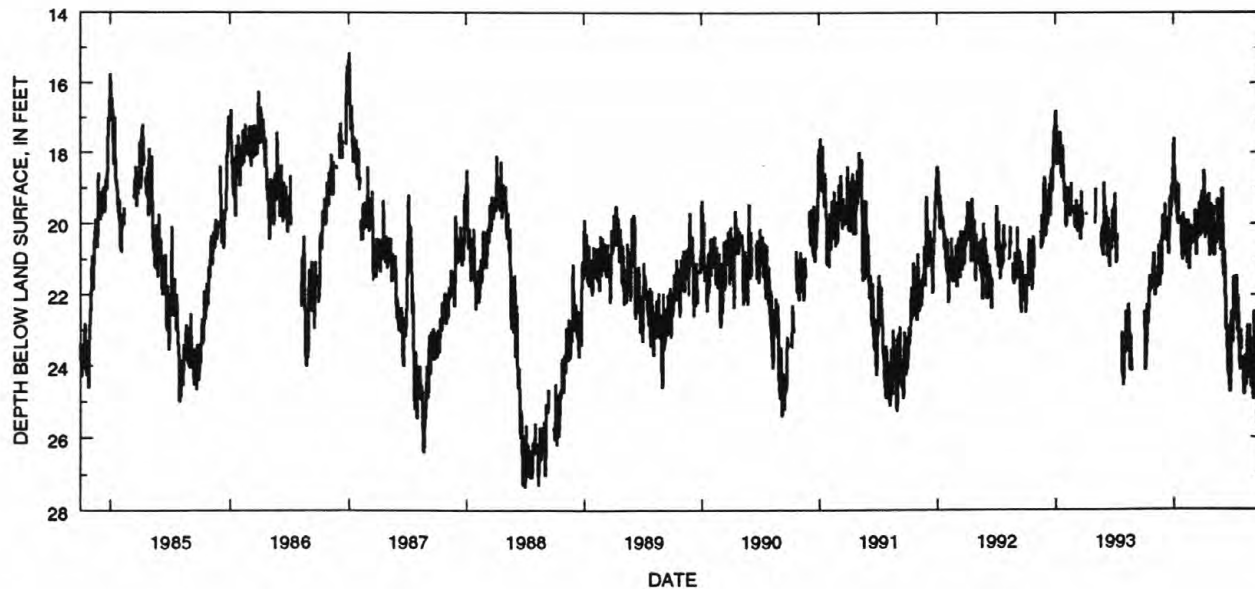
Measuring point: Floor of instrument shelter 2.00 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 27.35 ft below land-surface datum, June 30 - July 1, 1988;  
minimum daily low, 15.15 ft below land-surface datum, Jan. 4, 1987.DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	20.85	20.40	17.90	20.00	20.50	20.10	19.60	20.25	23.35	23.75	24.85
2	---	21.50	20.45	17.60	20.30	20.45	19.45	19.50	20.85	23.10	24.25	24.95
3	---	21.70	20.45	18.10	20.70	20.50	18.70	20.20	21.45	22.45	24.60	24.35
4	22.45	21.80	20.30	18.75	20.90	20.50	18.50	20.60	21.40	21.70	24.80	23.35
5	23.50	22.00	19.45	19.30	20.75	20.50	18.85	20.80	20.95	21.50	24.75	22.45
6	24.10	22.00	19.75	19.45	20.25	19.75	19.80	20.90	20.75	21.85	24.45	23.10
7	24.00	21.60	20.10	19.45	19.90	19.60	20.40	20.85	21.55	22.10	23.70	---
8	23.85	21.50	20.40	19.40	20.00	20.00	20.40	20.15	21.90	22.10	---	---
9	23.60	21.80	20.40	19.00	20.50	20.20	20.20	20.05	22.20	21.80	---	24.10
10	23.15	21.80	20.50	18.85	21.00	20.65	19.45	20.00	22.90	---	24.30	---
11	22.25	21.75	20.40	19.50	21.10	20.85	19.50	20.15	23.00	21.45	24.55	---
12	22.30	21.75	19.85	19.90	21.05	20.85	19.70	20.45	22.85	21.65	24.40	23.75
13	22.40	21.55	19.95	20.00	20.10	19.90	19.90	20.55	22.90	21.95	24.25	24.50
14	22.60	21.75	20.20	19.95	19.90	19.75	20.20	20.35	23.20	22.65	23.30	25.00
15	22.75	20.60	20.50	19.90	20.45	19.65	20.25	19.40	23.80	23.05	22.85	25.40
16	22.80	21.25	20.80	18.90	20.90	20.10	20.00	19.30	24.05	23.00	23.45	25.65
17	22.10	21.50	20.85	19.65	21.25	20.40	19.30	19.80	24.25	22.65	23.85	---
18	21.50	21.65	20.70	---	21.25	20.30	19.15	20.05	24.20	22.05	24.10	---
19	21.55	21.75	20.00	---	21.15	20.20	19.85	20.35	23.90	23.00	24.20	---
20	21.50	21.50	19.35	---	20.30	19.60	20.40	20.25	24.30	23.70	23.90	24.70
21	21.45	20.50	19.25	---	20.10	19.40	20.80	20.25	24.70	23.90	23.25	24.85
22	21.90	21.10	19.60	---	20.10	19.85	20.90	19.85	24.70	24.00	22.85	---
23	21.90	21.25	19.80	---	20.05	20.25	20.75	20.20	24.70	24.10	23.60	---
24	21.45	21.45	19.75	19.80	20.20	20.35	20.00	20.70	24.45	23.45	24.10	---
25	21.60	21.40	19.35	20.40	20.55	20.35	19.45	20.75	24.00	23.00	24.60	---
26	21.70	20.55	18.90	20.80	20.55	20.25	20.15	20.70	23.00	23.35	---	---
27	21.70	20.15	19.00	21.00	20.20	19.40	20.60	20.55	22.50	23.55	---	24.55
28	21.45	19.75	19.05	20.75	20.30	19.10	20.70	20.30	22.45	---	---	25.35
29	21.50	20.10	18.90	20.75	---	19.65	20.75	19.60	22.75	---	23.80	25.75
30	21.40	20.30	18.60	20.15	---	20.05	20.70	19.00	23.20	---	24.05	25.75
31	20.85	---	18.30	19.70	---	20.25	---	19.80	---	---	24.40	---
MAX	24.10	22.00	20.85	21.00	21.25	20.85	20.90	20.90	24.70	24.10	24.80	25.75
CAL YR 1993	LOW 24.55											
WTR YR 1994	LOW 25.75											



## GROUND-WATER RECORDS

## WILLIAMS COUNTY--Continued

413108084415300. Local number, WM-12.

LOCATION.--Lat 41°31'08", long 84°41'53", Hydrologic Unit 04100003, 1.7 mi east of Blakeslee.

Owner: State of Ohio.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Drilled test artesian well, diameter 10 in., depth 115 ft, cased to 115 ft, screened 85 ft to 115 ft.

INSTRUMENTATION.--Periodic measurement with chalked tape by ODNR personnel.

DATUM.--Elevation of land-surface datum is 830 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 1.50 ft above land-surface datum.

REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

PERIOD OF RECORD.--1974 to September 1982 continuous, periodic October 1983 to December 1984, continuous January 1985 to November 1986, periodic thereafter.

EXTREMES FOR PERIOD OF RECORD.--Maximum measured low, 10.59 ft below land-surface datum, Oct. 25, 1989; minimum daily low, 3.83 ft below land-surface datum, Mar. 17, 1982.

Date	Water Level	Date	Water Level
Oct. 28, 1993	9.03	May 2, 1994	7.62



## GROUND-WATER RECORDS

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## WYANDOT COUNTY

405009083172600. Local number, WY-1.

LOCATION.--Lat 40°50'09", long 83°17'26", Hydrologic Unit 04100011, State Rt 199, Upper Sandusky.

Owner: Karg Supply Co.

AQUIFER.--Limestone of Silurian Age.

WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in, depth 90 ft, cased.

INSTRUMENTATION.--Digital recorder -- 60-minute punch.

DATUM.--Elevation of land-surface datum is 850 ft above sea level, from topographic map.

Measuring point: Floor of instrument shelter 3.00 ft above land-surface datum.

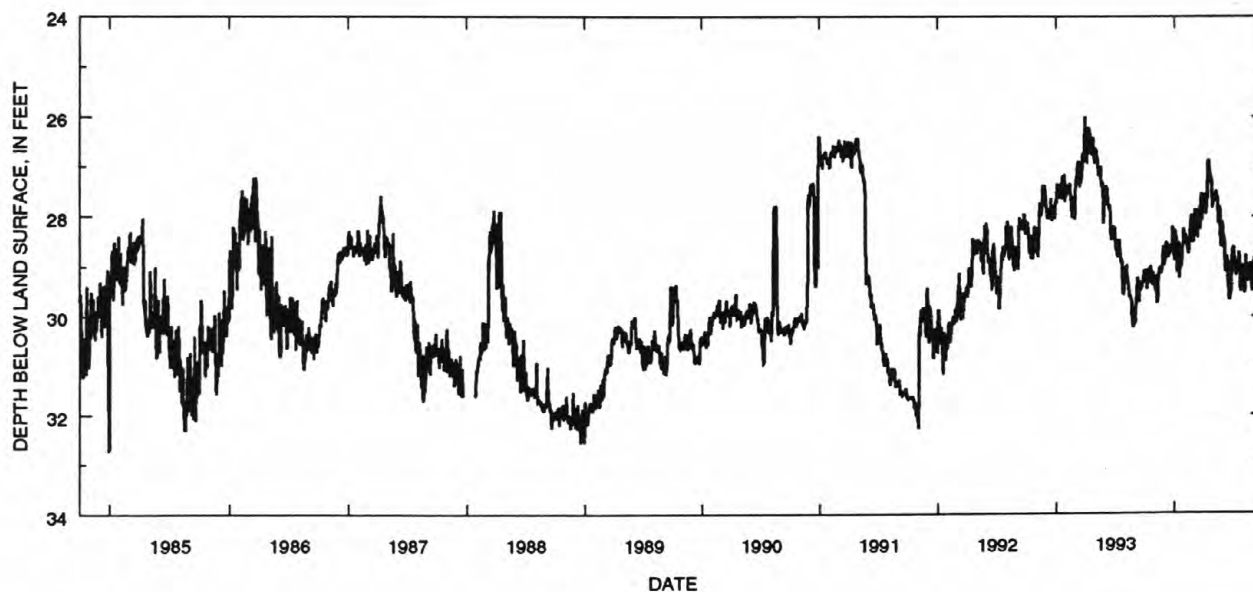
REMARKS.--Station operated by Ohio Department of Natural Resources, Division of Water.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 40.90 ft below land-surface datum, July 12, 15, 17, 21, Aug. 26, 1961; minimum daily low, 25.75 ft below land-surface datum, Apr. 16, 1980.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29.23	29.40	28.95	28.88	28.50	28.30	27.75	27.59	28.60	28.62	29.24	28.96
2	29.18	29.47	28.93	28.42	28.45	28.17	27.70	27.68	28.42	28.70	29.32	28.82
3	29.11	29.45	28.86	28.30	28.36	28.09	27.60	27.68	28.56	28.91	29.49	28.92
4	29.08	29.33	28.84	28.32	28.42	27.86	27.59	27.68	28.78	28.93	29.53	28.99
5	29.08	29.18	28.60	28.50	28.45	27.99	27.58	27.58	28.91	28.96	29.48	29.00
6	29.08	29.46	28.57	28.56	28.56	28.04	27.86	27.59	29.06	28.99	29.24	28.93
7	29.09	29.65	28.51	28.67	28.52	28.01	27.91	27.57	29.11	29.08	28.77	28.74
8	29.45	29.72	28.55	28.92	28.47	27.88	27.94	27.49	28.99	29.15	28.78	28.75
9	29.45	29.72	28.58	29.09	28.58	27.87	27.75	27.62	28.86	29.18	29.14	29.12
10	29.26	29.72	28.58	29.10	28.67	28.22	27.55	27.62	28.80	29.18	29.01	29.46
11	29.19	29.55	28.66	28.98	28.69	28.37	27.57	27.61	28.91	29.01	29.14	29.48
12	29.06	29.49	28.82	28.79	28.73	28.38	27.49	27.64	28.91	28.89	29.13	29.33
13	29.10	29.41	28.80	28.51	28.69	28.10	27.11	27.82	28.92	29.01	29.27	29.34
14	29.12	29.16	28.72	28.60	28.67	28.06	26.93	27.92	29.21	29.00	29.30	29.45
15	29.23	29.04	28.58	29.00	28.47	27.86	26.88	28.12	29.39	29.01	29.25	29.77
16	29.26	29.12	28.57	29.23	28.44	27.90	27.11	28.12	29.41	29.01	29.09	29.81
17	29.20	29.08	28.77	29.23	28.29	27.96	27.16	27.90	29.48	28.70	28.98	29.70
18	29.10	29.03	28.77	28.85	28.23	28.00	27.17	27.80	29.63	28.76	29.09	29.65
19	29.08	29.03	28.59	28.98	28.09	28.19	27.13	27.82	29.67	28.84	29.14	29.43
20	28.99	29.08	28.60	28.97	28.06	28.26	27.21	27.85	29.67	29.15	29.16	29.41
21	29.08	29.15	28.69	28.98	27.97	27.83	27.22	28.23	29.50	29.37	29.08	29.48
22	29.35	29.14	28.71	29.00	28.00	27.74	27.28	28.56	29.49	29.50	28.96	29.50
23	29.36	29.04	28.66	28.99	27.97	27.69	27.31	28.55	29.42	29.50	28.98	29.42
24	29.27	29.00	28.62	28.79	28.03	27.54	27.25	28.60	29.22	29.48	28.94	29.33
25	29.17	28.94	28.54	28.60	28.31	28.00	27.45	28.41	29.13	29.30	29.17	29.34
26	29.16	28.81	28.20	28.58	28.48	28.08	27.77	28.28	28.88	29.13	29.37	29.24
27	29.11	28.61	28.30	28.55	28.49	27.73	27.81	28.11	28.70	28.96	29.50	28.98
28	29.17	28.69	28.56	28.24	28.48	27.57	27.82	28.22	28.73	29.06	29.50	28.81
29	29.28	28.93	28.58	28.33	---	27.69	27.67	28.25	28.66	29.27	29.35	28.76
30	29.29	28.99	28.71	28.48	---	27.80	27.66	28.46	28.60	29.28	29.20	28.90
31	29.26	---	28.87	28.49	---	27.81	---	28.60	---	29.25	28.99	---
MAX	29.45	29.72	28.95	29.23	28.73	28.38	27.94	28.60	29.67	29.50	29.53	29.81
CAL YR 1993	LOW 30.21											
WTR YR 1994	LOW 29.81											



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

The following tables list the results of chemical analysis of ground-water samples collected from eight sites throughout Ohio, established to monitor the ground-water quality in areas near state highways where road deicing is practiced. Some wells, with station ID's ending in "01" through "06" represent the multiports within the same well ending in "00". Level "01" is the deepest port and level "06" is the shallowest port. These ports were sampled using dialysis tubing filled with distilled water, set at each level and allowed to come to equilibrium in thirty to forty-five days. Wells at the sites in Pickaway and Clark counties were not sampled this water year due to lack of salt application in those areas. Sampling will resume at those sites as soon as salt is applied. Ground-water level measurements are listed in the third table.

This study began in 1988 and will continue through 1997. Water-quality sampling will be done 1991-1996. These data are presented to the Ohio Department of Transportation for their use in reviewing deicing practices and to accumulate base-line data. Dashes (--) indicate sample was not analyzed for that constituent.

## **WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>393541083000801 PK-50 NR CIRCLEVILLE OH-L1 (LAT 39 35 41N LONG 083 00 08W)</b>					
FEB 1994					
14...	736	96	2.4	15	0.030
MAR					
28...	838	120	4.5	16	0.040
MAY					
09...	667	100	8.8	8.0	0.020
JUN					
20...	796	110	8.1	41	0.040
AUG					
02...	771	110	9.3	34	--
SEP					
19...	728	110	4.1	22	0.030
<b>393541083000802 PK-50 NR CIRCLEVILLE OH-L2 (LAT 39 35 41N LONG 083 00 08W)</b>					
FEB 1994					
14...	711	90	2.4	19	0.030
MAR					
28...	780	100	10	14	0.030
MAY					
09...	589	110	6.9	8.9	0.020
JUN					
20...	828	110	12	59	0.040
AUG					
02...	877	110	17	83	--
SEP					
19...	714	95	11	31	0.030
<b>393541083000803 PK-50 NR CIRCLEVILLE OH-L3 (LAT 39 35 41N LONG 083 00 08W)</b>					
FEB 1994					
14...	928	140	7.1	18	0.030
MAR					
28...	699	96	12	14	0.040
MAY					
09...	731	100	6.9	19	0.020
JUN					
20...	859	120	21	76	0.040
AUG					
02...	896	120	26	92	--
SEP					
19...	781	100	15	35	0.030
<b>393541083000804 PK-50 NR CIRCLEVILLE OH-L4 (LAT 39 35 41N LONG 083 00 08W)</b>					
FEB 1994					
14...	971	130	6.3	18	0.030
MAR					
28...	746	100	12	15	0.030
MAY					
09...	656	110	8.4	15	0.020
JUN					
20...	872	--	22	70	0.040
AUG					
02...	894	110	22	83	--
SEP					
19...	742	94	13	33	0.030

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
393541083000805 PK-50 NR CIRCLEVILLE OH-L5 (LAT 39 35 41N LONG 083 00 08W)					
FEB 1994					
14...	924	130	5.1	18	0.040
MAR					
28...	762	88	12	15	0.030
MAY					
09...	644	110	8.6	10	0.020
JUN					
20...	871	120	18	73	0.040
AUG					
02...	938	120	24	95	--
SEP					
19...	649	97	13	28	0.030
393541083000806 PK-50 NR CIRCLEVILLE OH-L6 (LAT 39 35 41N LONG 083 00 08W)					
MAR 1994					
28...	705	87	17	25	0.040
MAY					
09...	800	120	9.1	25	0.020
393541083000901 PK-49 NR CIRCLEVILLE OH-L1 (LAT 39 35 41N LONG 083 00 09W)					
FEB 1994					
14...	763	100	10	17	0.050
393541083000902 PK-49 NR CIRCLEVILLE OH-L2 (LAT 39 35 41N LONG 083 00 09W)					
FEB 1994					
14...	632	--	--	16	0.040
393541083000903 PK-49 NR CIRCLEVILLE OH-L3 (LAT 39 35 41N LONG 083 00 09W)					
FEB 1994					
14...	710	--	--	15	0.040
393541083000904 PK-49 NR CIRCLEVILLE OH-L4 (LAT 39 35 41N LONG 083 00 09W)					
MAR 1994					
28...	690	98	14	31	0.030
MAY					
09...	644	96	8.1	23	--
JUN					
20...	666	--	--	53	--
AUG					
02...	551	97	22	39	--
SEP					
19...	540	89	4.3	--	--
393541083000905 PK-49 NR CIRCLEVILLE OH-L5 (LAT 39 35 41N LONG 083 00 09W)					
MAR 1994					
28...	722	96	19	38	0.030
MAY					
09...	663	98	9.3	26	--
JUN					
20...	697	100	17	56	--
AUG					
02...	706	95	28	52	--
SEP					
19...	596	92	4.1	17	--
393541083000906 PK-49 NR CIRCLEVILLE OH-L6 (LAT 39 35 41N LONG 083 00 09W)					
MAR 1994					
28...	552	87	13	15	0.030
MAY					
09...	626	91	15	29	--
JUN					
20...	643	90	11	28	--
AUG					
02...	590	92	13	51	--
SEP					
19...	560	91	9.6	22	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>393541083001001 PK-47 NR CIRCLEVILLE OH-L1 (LAT 39 35 41N LONG 083 00 10W)</b>					
MAR 1994					
28...	603	85	8.9	25	0.040
MAY					
09...	639	93	9.9	27	--
JUN					
20...	602	99	10	29	--
AUG					
02...	590	91	8.0	18	--
SEP					
19...	580	92	3.3	13	--
<b>393541083001002 PK-47 NR CIRCLEVILLE OH-L2 (LAT 39 35 41N LONG 083 00 10W)</b>					
MAR 1994					
28...	666	--	--	27	0.040
MAY					
09...	639	--	--	25	--
JUN					
20...	612	94	10	27	--
AUG					
02...	523	88	7.8	18	--
SEP					
19...	630	94	3.1	13	--
<b>393541083001003 PK-47 NR CIRCLEVILLE OH-L3 (LAT 39 35 41N LONG 083 00 10W)</b>					
MAR 1994					
28...	587	93	8.8	27	0.030
MAY					
09...	559	91	9.4	24	--
JUN					
20...	584	97	11	27	--
AUG					
02...	577	92	7.9	18	--
SEP					
19...	634	93	3.2	14	--
<b>393541083001004 PK-47 NR CIRCLEVILLE OH-L4 (LAT 39 35 41N LONG 083 00 10W)</b>					
MAR 1994					
28...	649	91	8.0	25	0.020
MAY					
09...	579	94	8.3	23	--
JUN					
20...	635	97	11	27	--
AUG					
02...	506	89	7.9	18	--
SEP					
19...	576	95	3.1	14	--
<b>393541083001005 PK-47 NR CIRCLEVILLE OH-L5 (LAT 39 35 41N LONG 083 00 10W)</b>					
MAR 1994					
28...	644	88	5.7	23	0.030
MAY					
09...	579	99	9.9	26	--
JUN					
20...	563	100	10	28	--
AUG					
02...	442	88	8.3	18	--
SEP					
19...	586	93	3.0	13	--
<b>393541083001006 PK-47 NR CIRCLEVILLE OH-L6 (LAT 39 35 41N LONG 083 00 10W)</b>					
MAR 1994					
28...	--	91	7.4	24	0.020
MAY					
09...	552	95	4.7	20	--
AUG					
02...	567	64	32	22	--
SEP					
19...	472	52	11	18	--



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
393541083001201 PK-53 NR CIRCLEVILLE OH-L1 (LAT 39 35 41N LONG 083 00 12W)					
FEB 1994					
14...	539	86	2.6	15	0.010
MAR					
28...	607	92	2.2	16	0.020
MAY					
09...	480	85	2.4	16	--
AUG					
02...	489	89	2.4	14	--
SEP					
19...	608	82	2.3	11	--
393541083001202 PK-53 NR CIRCLEVILLE OH-L2 (LAT 39 35 41N LONG 083 00 12W)					
FEB 1994					
14...	602	--	--	16	0.020
MAR					
28...	628	91	2.0	17	0.010
MAY					
09...	511	84	2.3	15	--
AUG					
02...	482	89	3.2	14	--
SEP					
19...	518	80	2.3	11	--
393541083001203 PK-53 NR CIRCLEVILLE OH-L3 (LAT 39 35 41N LONG 083 00 12W)					
FEB 1994					
14...	597	--	--	15	0.020
MAR					
28...	595	91	2.2	17	0.030
MAY					
09...	514	90	2.3	15	--
JUN					
20...	575	99	2.0	16	--
AUG					
02...	489	92	3.1	14	--
SEP					
19...	587	83	2.3	11	--
393541083001204 PK-53 NR CIRCLEVILLE OH-L4 (LAT 39 35 41N LONG 083 00 12W)					
FEB 1994					
14...	516	--	--	15	0.020
MAR					
28...	574	89	2.1	16	0.030
MAY					
09...	--	50	2.4	14	--
JUN					
20...	542	98	1.9	15	--
AUG					
02...	524	89	3.3	13	--
SEP					
19...	569	81	2.3	11	--
393541083001205 PK-53 NR CIRCLEVILLE OH-L5 (LAT 39 35 41N LONG 083 00 12W)					
FEB 1994					
14...	530	81	2.3	14	0.010
MAR					
28...	--	95	1.9	16	0.020
MAY					
09...	530	82	1.9	12	--
JUN					
20...	541	89	1.8	15	--
AUG					
02...	483	82	2.2	9.8	--
SEP					
19...	503	75	1.9	7.1	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, RIDE, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>393541083001206 PK-53 NR CIRCLEVILLE OH-L6 (LAT 39 35 41N LONG 083 00 12W)</b>					
FEB 1994					
14...	573	--	--	12	0.020
MAR					
28...	588	84	1.7	14	0.010
MAY					
09...	451	81	2.3	11	--
AUG					
02...	453	77	2.0	8.2	--
SEP					
19...	508	72	1.8	4.8	--
<b>393542083000501 PK-52 NR CIRCLEVILLE OH-L1 (LAT 39 35 42N LONG 083 00 05W)</b>					
FEB 1994					
14...	706	--	--	19	0.040
MAR					
28...	773	--	--	20	0.020
MAY					
09...	671	120	20	62	--
<b>393542083000502 PK-52 NR CIRCLEVILLE OH-L2 (LAT 39 35 42N LONG 083 00 05W)</b>					
FEB 1994					
14...	748	--	--	19	0.040
MAR					
28...	793	100	21	31	0.030
MAY					
09...	741	100	21	77	--
<b>393542083000503 PK-52 NR CIRCLEVILLE OH-L3 (LAT 39 35 42N LONG 083 00 05W)</b>					
FEB 1994					
14...	729	94	15	19	0.020
MAR					
28...	751	100	21	29	0.020
MAY					
09...	748	110	22	81	--
<b>393542083000504 PK-52 NR CIRCLEVILLE OH-L4 (LAT 39 35 42N LONG 083 00 05W)</b>					
FEB 1994					
14...	653	--	--	20	0.030
MAR					
28...	792	--	--	31	0.020
MAY					
09...	804	--	--	83	--
JUN					
20...	822	96	51	93	--
AUG					
02...	663	110	44	58	--
SEP					
19...	632	96	7.8	20	--
<b>393542083000505 PK-52 NR CIRCLEVILLE OH-L5 (LAT 39 35 42N LONG 083 00 05W)</b>					
FEB 1994					
14...	741	--	--	23	0.030
MAR					
28...	764	100	21	36	0.020
MAY					
09...	840	110	23	87	--
JUN					
20...	838	110	52	98	--
AUG					
02...	749	--	--	54	--
SEP					
19...	651	93	7.3	21	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, RIDE, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>393542083000506 PK-52 NR CIRCLEVILLE OH-L6 (LAT 39 35 42N LONG 083 00 05W)</b>					
MAR 1994					
28...	751	100	21	33	0.020
MAY					
09...	765	110	24	92	--
JUN					
20...	822	120	50	95	--
AUG					
02...	743	100	43	59	--
SEP					
19...	714	100	16	25	--
<b>393542083000701 PK-51 NR CIRCLEVILLE OH-L1 (LAT 39 35 42N LONG 083 00 07W)</b>					
FEB 1994					
14...	706	--	--	22	0.040
MAR					
28...	629	93	12	19	0.030
MAY					
09...	719	--	--	61	--
JUN					
20...	658	110	15	39	--
AUG					
02...	660	92	12	24	--
SEP					
19...	651	93	11	20	--
<b>393542083000702 PK-51 NR CIRCLEVILLE OH-L2 (LAT 39 35 42N LONG 083 00 07W)</b>					
MAR 1994					
28...	--	93	8.8	24	0.020
MAY					
09...	686	110	16	66	--
JUN					
20...	684	110	15	35	--
AUG					
02...	507	98	11	20	--
SEP					
19...	665	94	11	18	--
<b>393542083000703 PK-51 NR CIRCLEVILLE OH-L3 (LAT 39 35 42N LONG 083 00 07W)</b>					
MAR 1994					
28...	687	99	7.6	25	0.040
MAY					
09...	709	110	17	62	--
AUG					
02...	564	98	12	21	--
SEP					
19...	706	93	10	16	--
<b>393542083000704 PK-51 NR CIRCLEVILLE OH-L4 (LAT 39 35 42N LONG 083 00 07W)</b>					
MAR 1994					
28...	687	98	8.0	25	0.020
MAY					
09...	735	110	17	62	--
AUG					
02...	562	92	9.9	19	--
SEP					
19...	699	100	10	17	--
<b>393542083000705 PK-51 NR CIRCLEVILLE OH-L5 (LAT 39 35 42N LONG 083 00 07W)</b>					
MAR 1994					
28...	700	--	--	23	0.030
MAY					
09...	787	110	17	61	--
JUN					
20...	649	110	15	35	--
AUG					
02...	564	95	13	21	--
SEP					
19...	706	99	9.9	16	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>393542083000706 PK-51 NR CIRCLEVILLE OH-L6 (LAT 39 35 42N LONG 083 00 07W)</b>					
MAR 1994					
28...	543	--	--	22	0.040
MAY					
09...	489	99	15	52	--
JUN					
20...	679	100	11	32	--
AUG					
02...	630	94	14	22	--
SEP					
19...	641	100	9.4	17	--
<b>395859083440201 CL-141 NR SPRINGFIELD OH-L1 (LAT 39 58 59N LONG 083 44 02W)</b>					
FEB 1994					
18...	806	--	--	27	0.030
MAR					
30...	876	110	12	26	0.030
MAY					
12...	742	110	9.3	20	--
<b>395859083440202 CL-141 NR SPRINGFIELD OH-L2 (LAT 39 58 59N LONG 083 44 02W)</b>					
MAR 1994					
30...	864	110	12	23	0.040
MAY					
12...	751	110	8.5	18	--
<b>395859083440203 CL-141 NR SPRINGFIELD OH-L3 (LAT 39 58 59N LONG 083 44 02W)</b>					
MAR 1994					
30...	879	110	13	26	0.040
MAY					
12...	637	110	9.5	21	--
<b>395859083440204 CL-141 NR SPRINGFIELD OH-L4 (LAT 39 58 59N LONG 083 44 02W)</b>					
FEB 1994					
18...	809	--	--	30	0.040
MAR					
30...	884	110	14	32	0.040
MAY					
12...	760	110	11	21	--
<b>395859083440205 CL-141 NR SPRINGFIELD OH-L5 (LAT 39 58 59N LONG 083 44 02W)</b>					
MAY 1994					
12...	699	99	16	20	--
<b>395859083440301 CL-143 NR SPRINGFIELD OH-L1 (LAT 39 58 59N LONG 083 44 03W)</b>					
MAR 1994					
30...	839	100	11	20	0.030
MAY					
12...	767	17	13	31	--
<b>395859083440302 CL-143 NR SPRINGFIELD OH-L2 (LAT 39 58 59N LONG 083 44 03W)</b>					
MAR 1994					
30...	737	90	10	17	0.030
MAY					
12...	660	98	9.8	18	--
<b>395859083440303 CL-143 NR SPRINGFIELD OH-L3 (LAT 39 58 59N LONG 083 44 03W)</b>					
MAR 1994					
30...	733	91	9.3	16	0.030
MAY					
12...	656	90	9.8	17	--



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
395859083440304 CL-143 NR SPRINGFIELD OH-L4 (LAT 39 58 59N LONG 083 44 03W)					
MAR 1994					
30...	624	84	6.3	6.6	<0.010
MAY					
12...	595	85	5.0	6.6	--
395859083440305 CL-143 NR SPRINGFIELD OH-L5 (LAT 39 58 59N LONG 083 44 03W)					
MAR 1994					
30...	490	--	--	4.2	<0.010
MAY					
12...	517	81	4.6	4.3	--
395859083440401 CL-142 NR SPRINGFIELD OH-L1 (LAT 39 58 59N LONG 083 44 04W)					
MAR 1994					
30...	884	110	20	37	0.040
MAY					
12...	845	110	23	41	--
395859083440402 CL-142 NR SPRINGFIELD OH-L2 (LAT 39 58 59N LONG 083 44 04W)					
MAR 1994					
30...	865	--	--	35	0.040
MAY					
12...	824	100	23	43	--
395859083440403 CL-142 NR SPRINGFIELD OH-L3 (LAT 39 58 59N LONG 083 44 04W)					
MAR 1994					
30...	851	100	18	34	0.050
MAY					
12...	--	100	25	44	--
395859083440404 CL-142 NR SPRINGFIELD OH-L4 (LAT 39 58 59N LONG 083 44 04W)					
MAR 1994					
30...	--	100	18	28	0.040
MAY					
12...	700	100	19	32	--
395859083440501 CL-140 NR SPRINGFIELD OH-L1 (LAT 39 58 59N LONG 083 44 05W)					
JAN 1994					
07...	884	--	--	--	--
FEB					
18...	853	110	13	23	0.040
MAR					
30...	866	120	12	25	0.030
MAY					
12...	837	110	6.9	15	0.040
395859083440502 CL-140 NR SPRINGFIELD OH-L2 (LAT 39 58 59N LONG 083 44 05W)					
JAN 1994					
07...	895	--	--	--	--
FEB					
18...	870	110	12	23	0.050
MAR					
30...	867	110	11	19	0.040
MAY					
12...	821	100	5.8	17	0.050
395859083440503 CL-140 NR SPRINGFIELD OH-L3 (LAT 39 58 59N LONG 083 44 05W)					
FEB 1994					
18...	880	110	14	26	0.040
MAR					
30...	865	120	13	20	0.040
MAY					
12...	844	110	7.1	21	0.050
JUN					
23...	808	--	--	--	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
395859083440504 CL-140 NR SPRINGFIELD OH-L4 (LAT 39 58 59N LONG 083 44 05W)					
FEB 1994					
18...	912	120	11	39	0.060
MAR					
30...	908	120	14	37	0.050
MAY					
12...	880	110	13	27	0.050
395859083440505 CL-140 NR SPRINGFIELD OH-L5 (LAT 39 58 59N LONG 083 44 05W)					
FEB 1994					
18...	862	110	18	32	0.040
MAR					
30...	850	110	15	31	0.030
MAY					
12...	821	99	14	19	0.050
395859083440601 CL-137 NR SPRINGFIELD OH-L1 (LAT 39 58 59N LONG 083 44 06W)					
MAR 1994					
30...	775	120	8.3	19	0.020
MAY					
12...	747	110	8.2	17	--
395859083440602 CL-137 NR SPRINGFIELD OH-L2 (LAT 39 58 59N LONG 083 44 06W)					
MAR 1994					
30...	804	120	6.3	14	0.030
MAY					
12...	864	110	25	50	--
395859083440603 CL-137 NR SPRINGFIELD OH-L3 (LAT 39 58 59N LONG 083 44 06W)					
MAR 1994					
30...	--	110	6.6	14	0.030
MAY					
12...	749	110	26	50	--
395859083440604 CL-137 NR SPRINGFIELD OH-L4 (LAT 39 58 59N LONG 083 44 06W)					
MAR 1994					
30...	764	110	9.3	17	0.040
MAY					
12...	763	110	23	46	--
395901083440701 CL-136 NR SPRINGFIELD OH-LV-1 (LAT 39 59 01N LONG 083 44 07W)					
MAR 1994					
30...	704	--	--	25	0.030
MAY					
12...	731	--	--	21	--
395901083440702 CL-136 NR SPRINGFIELD OH-LV-2 (LAT 39 59 01N LONG 083 44 07W)					
MAR 1994					
30...	618	52	25	26	0.040
MAY					
12...	725	--	--	18	--
395901083440703 CL-136 NR SPRINGFIELD OH-LV-3 (LAT 39 59 01N LONG 083 44 07W)					
MAR 1994					
30...	413	--	--	15	0.020
MAY					
12...	772	--	--	19	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400947083480001 CH-44 NR URBANA OH-LV1 (LAT 40 09 47N LONG 083 48 00W)</b>					
OCT 1993					
07...	853	120	12	34	0.030
NOV					
19...	804	110	13	31	0.030
JAN 1994					
05...	1010	110	48	43	0.030
FEB					
22...	1010	110	59	39	0.050
MAR					
29...	1030	110	68	40	0.030
MAY					
10...	944	100	72	40	0.030
JUN					
21...	850	100	19	25	0.030
AUG					
05...	737	110	14	24	--
<b>400947083480002 CH-44 NR URBANA OH-LV2 (LAT 40 09 47N LONG 083 48 00W)</b>					
OCT 1993					
07...	905	120	20	43	0.030
NOV					
19...	877	120	18	35	0.030
JAN 1994					
05...	984	110	37	41	0.030
FEB					
22...	992	110	46	37	0.040
MAR					
29...	1010	110	53	40	0.050
MAY					
10...	967	110	70	38	0.030
JUN					
21...	925	100	49	34	0.040
AUG					
05...	708	110	24	26	--
<b>400947083480003 CH-44 NR URBANA OH-LV3 (LAT 40 09 47N LONG 083 48 00W)</b>					
OCT 1993					
07...	941	130	27	49	0.030
NOV					
19...	888	120	25	42	0.030
JAN 1994					
05...	961	110	30	40	0.030
FEB					
22...	981	120	33	38	0.030
MAR					
29...	997	120	40	40	0.040
MAY					
10...	950	120	53	40	0.040
JUN					
21...	986	120	51	37	0.040
AUG					
05...	809	110	28	29	--
<b>400947083480004 CH-44 NR URBANA OH-LV4 (LAT 40 09 47N LONG 083 48 00W)</b>					
OCT 1993					
07...	1230	130	42	57	0.040
NOV					
19...	1170	120	45	52	0.020
JAN 1994					
05...	1100	110	51	49	0.030
FEB					
22...	1180	130	46	48	0.030
MAR					
29...	1190	130	53	47	0.040
MAY					
10...	1200	130	56	45	0.040
JUN					
21...	1200	120	58	42	0.040
AUG					
05...	1180	120	63	38	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400948083475801 CH-46 NR URBANA OH-LV1 (LAT 40 09 48N LONG 083 47 58W)</b>					
OCT 1993					
07...	982	--	--	71	0.030
NOV					
19...	850	120	45	63	0.030
JAN 1994					
05...	804	120	27	45	0.030
FEB					
22...	850	110	27	39	0.040
MAR					
29...	896	110	28	36	0.040
MAY					
10...	742	110	27	32	--
JUN					
21...	781	110	20	35	--
AUG					
05...	691	120	29	58	--
<b>400948083475802 CH-46 NR URBANA OH-LV2 (LAT 40 09 48N LONG 083 47 58W)</b>					
OCT 1993					
07...	943	--	--	70	0.040
NOV					
19...	793	110	44	61	0.020
JAN 1994					
05...	--	110	27	--	0.020
FEB					
22...	882	110	27	38	0.020
MAR					
29...	905	--	--	33	0.020
MAY					
10...	764	110	28	34	--
JUN					
21...	758	110	20	35	--
AUG					
05...	670	120	28	59	--
<b>400948083475803 CH-46 NR URBANA OH-LV3 (LAT 40 09 48N LONG 083 47 58W)</b>					
OCT 1993					
07...	946	--	--	49	0.030
NOV					
19...	818	110	44	61	0.030
JAN 1994					
05...	703	110	30	37	0.020
FEB					
22...	--	--	--	--	--
MAR					
29...	721	110	28	36	0.020
MAY					
10...	639	110	26	33	--
JUN					
21...	745	74	21	33	--
AUG					
05...	711	120	28	57	--
<b>400948083475804 CH-46 NR URBANA OH-LV4 (LAT 40 09 48N LONG 083 47 58W)</b>					
OCT 1993					
07...	918	--	--	39	0.030
NOV					
19...	837	120	44	62	0.030
JAN 1994					
05...	747	110	27	45	0.030
FEB					
22...	878	110	22	37	0.040
MAR					
29...	864	110	33	37	0.030
MAY					
10...	771	100	39	35	--
JUN					
21...	658	110	24	29	--
AUG					
05...	687	110	23	39	--



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400948083475805 CH-46 NR URBANA OH-LV5 (LAT 40 09 48N LONG 083 47 58W)</b>					
NOV 1993					
19...	761	110	43	58	0.020
JAN 1994					
05...	811	110	27	43	0.020
FEB					
22...	839	100	38	42	0.030
MAR					
29...	834	100	43	37	0.030
MAY					
10...	738	97	44	36	--
JUN					
21...	761	100	33	26	--
AUG					
05...	540	100	24	22	--
<b>400948083475806 CH-46 NR URBANA OH-LV6 (LAT 40 09 48N LONG 083 47 58W)</b>					
NOV 1993					
19...	802	--	--	22	0.010
JAN 1994					
05...	713	110	30	35	0.020
FEB					
22...	839	100	35	76	0.030
MAR					
29...	736	87	33	33	0.020
MAY					
10...	649	85	35	24	--
JUN					
21...	602	75	35	29	--
AUG					
05...	562	--	--	18	--
<b>400948083480001 CH-45 NR URBANA OH-LV1 (LAT 40 09 48N LONG 083 48 00W)</b>					
JAN 1994					
05...	776	110	36	40	0.020
<b>400948083480002 CH-45 NR URBANA OH-LV2 (LAT 40 09 48N LONG 083 48 00W)</b>					
OCT 1993					
07...	716	120	12	31	0.030
NOV					
19...	834	110	13	32	0.020
JAN 1994					
05...	766	110	31	40	0.020
FEB					
22...	705	110	18	33	0.030
MAR					
29...	933	110	34	35	0.040
MAY					
10...	771	110	38	31	--
JUN					
21...	776	100	15	24	--
AUG					
05...	562	110	17	26	--
<b>400948083480003 CH-45 NR URBANA OH-LV3 (LAT 40 09 48N LONG 083 48 00W)</b>					
OCT 1993					
07...	775	--	--	33	0.030
NOV					
19...	754	120	19	39	0.030
JAN 1994					
05...	832	110	40	43	0.020
FEB					
22...	846	110	41	39	0.020
MAR					
29...	793	110	31	34	0.030
MAY					
10...	852	110	48	35	--
JUN					
21...	708	110	14	24	--
AUG					
05...	560	110	15	26	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400948083480004 CH-45 NR URBANA OH-LV4 (LAT 40 09 48N LONG 083 48 00W)</b>					
OCT 1993					
07...	772	130	19	36	0.020
NOV					
19...	1020	--	--	59	0.040
JAN 1994					
05...	742	100	33	35	0.020
FEB					
22...	628	120	48	40	0.030
MAR					
29...	957	110	42	35	0.030
MAY					
10...	837	110	55	37	--
JUN					
21...	797	110	20	28	--
AUG					
05...	636	110	20	36	--
<b>400948083480005 CH-45 NR URBANA OH-LV5 (LAT 40 09 48N LONG 083 48 00W)</b>					
OCT 1993					
07...	753	130	24	37	0.020
NOV					
19...	855	130	37	66	0.030
JAN 1994					
05...	671	110	17	22	0.010
FEB					
22...	886	100	44	41	0.040
MAR					
29...	944	110	54	37	0.030
MAY					
10...	872	98	71	43	--
JUN					
21...	765	96	37	28	--
AUG					
05...	707	110	22	33	--
<b>400948083480006 CH-45 NR URBANA OH-LV6 (LAT 40 09 48N LONG 083 48 00W)</b>					
OCT 1993					
07...	--	110	21	30	0.010
NOV					
19...	821	120	34	57	0.030
FEB 1994					
22...	820	100	23	27	0.010
MAR					
29...	699	95	21	24	0.020
MAY					
10...	548	95	18	17	--
JUN					
21...	601	86	21	18	--
<b>400948083480101 CH-43 NR URBANA OH-LV1 (LAT 40 09 48N LONG 083 48 01W)</b>					
OCT 1993					
07...	809	--	--	28	0.030
NOV					
19...	720	120	13	33	0.010
JAN 1994					
05...	862	110	58	45	0.020
FEB					
22...	1020	--	--	42	0.050
MAR					
29...	1050	110	78	43	0.030
MAY					
10...	877	100	77	44	--
JUN					
21...	542	110	34	28	--
AUG					
05...	605	110	21	25	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400948083480102 CH-43 NR URBANA OH-LV2 (LAT 40 09 48N LONG 083 48 01W)</b>					
OCT 1993					
07...	871	--	--	47	0.030
NOV					
19...	823	120	16	40	0.020
JAN 1994					
05...	835	110	51	44	0.020
FEB					
22...	923	110	51	40	0.030
MAR					
29...	1060	110	79	41	0.040
MAY					
10...	885	110	71	41	--
JUN					
21...	735	110	19	25	--
AUG					
05...	699	110	15	25	--
<b>400948083480103 CH-43 NR URBANA OH-LV3 (LAT 40 09 48N LONG 083 48 01W)</b>					
OCT 1993					
07...	794	120	19	45	0.020
NOV					
19...	710	120	15	36	0.020
JAN 1994					
05...	862	110	58	47	0.020
FEB					
22...	951	100	55	41	0.040
MAR					
29...	1050	91	79	41	0.060
MAY					
10...	832	100	80	43	--
JUN					
21...	749	110	25	27	--
AUG					
05...	609	110	17	26	--
<b>400948083480104 CH-43 NR URBANA OH-LV4 (LAT 40 09 48N LONG 083 48 01W)</b>					
OCT 1993					
07...	883	110	35	51	0.030
NOV					
19...	820	110	12	38	0.020
JAN 1994					
05...	782	110	60	44	0.020
FEB					
22...	918	110	66	44	0.020
MAR					
29...	1010	92	75	39	0.050
MAY					
10...	850	100	75	45	--
JUN					
21...	770	110	30	29	--
AUG					
05...	578	110	20	27	--
<b>400948083480105 CH-43 NR URBANA OH-LV5 (LAT 40 09 48N LONG 083 48 01W)</b>					
OCT 1993					
07...	860	110	60	56	0.020
NOV					
19...	725	110	42	37	0.020
JAN 1994					
05...	668	100	17	41	<0.010
FEB					
22...	778	99	31	28	0.020
MAR					
29...	792	82	23	21	0.040
MAY					
10...	764	110	41	31	--
JUN					
21...	862	100	75	35	--
AUG					
05...	661	97	55	29	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400948083480106 CH-43 NR URBANA OH-LV6 (LAT 40 09 48N LONG 083 48 01W)</b>					
NOV 1993					
19...	746	--	--	34	0.020
JAN 1994					
05...	686	110	46	41	0.010
FEB					
22...	757	95	24	25	0.030
MAR					
29...	657	--	--	18	<0.010
MAY					
10...	591	93	15	17	--
<b>400948083480201 CH-41 NR URBANA OH-LV1 (LAT 40 09 48N LONG 083 48 02W)</b>					
OCT 1993					
07...	797	--	--	21	0.030
NOV					
19...	809	--	--	22	0.020
JAN 1994					
05...	817	110	13	29	0.020
FEB					
22...	767	100	10	24	0.030
MAR					
29...	785	97	11	21	0.050
MAY					
10...	738	110	8.4	19	--
JUN					
21...	544	120	8.2	43	--
AUG					
05...	626	100	7.9	21	--
<b>400948083480202 CH-41 NR URBANA OH-LV2 (LAT 40 09 48N LONG 083 48 02W)</b>					
OCT 1993					
07...	764	110	7.0	19	0.030
NOV					
19...	651	100	9.7	24	0.020
JAN 1994					
05...	817	110	13	29	0.020
FEB					
22...	782	110	10	23	0.040
MAR					
29...	808	97	9.0	19	0.050
MAY					
10...	644	110	7.1	19	--
JUN					
21...	668	110	7.4	18	--
AUG					
05...	720	110	7.5	23	--
<b>400948083480203 CH-41 NR URBANA OH-LV3 (LAT 40 09 48N LONG 083 48 02W)</b>					
OCT 1993					
07...	764	110	7.2	21	0.020
NOV					
19...	689	100	10	24	0.020
JAN 1994					
05...	687	110	11	26	0.020
FEB					
22...	824	110	10	22	0.020
MAR					
29...	792	98	9.0	19	0.050
MAY					
10...	713	100	7.2	18	--
JUN					
21...	731	110	7.8	17	--
AUG					
05...	605	110	8.3	23	--



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400948083480204 CH-41 NR URBANA OH-LV4 (LAT 40 09 48N LONG 083 48 02W)</b>					
OCT 1993					
07...	662	110	7.8	21	0.020
NOV					
19...	626	100	20	29	0.010
JAN 1994					
05...	802	120	16	33	0.030
FEB					
22...	739	110	10	24	0.030
MAR					
29...	802	97	13	23	0.050
MAY					
10...	741	100	14	25	--
JUN					
21...	674	110	12	21	--
AUG					
05...	639	110	9.4	22	--
<b>400948083480205 CH-41 NR URBANA OH-LV5 (LAT 40 09 48N LONG 083 48 02W)</b>					
OCT 1993					
07...	753	110	29	42	0.030
NOV					
19...	957	97	81	36	0.030
JAN 1994					
05...	874	110	43	58	0.030
FEB					
22...	813	110	28	43	0.030
MAR					
29...	889	97	32	43	0.060
MAY					
10...	732	110	34	50	--
JUN					
21...	702	110	23	29	--
AUG					
05...	725	110	39	32	--
<b>400948083480206 CH-41 NR URBANA OH-LV6 (LAT 40 09 48N LONG 083 48 02W)</b>					
OCT 1993					
07...	--	110	27	38	0.030
NOV					
19...	948	96	69	36	0.030
JAN 1994					
05...	908	110	46	63	0.030
FEB					
22...	827	110	35	49	0.020
MAR					
29...	888	97	43	53	0.060
MAY					
10...	841	110	33	49	--
JUN					
21...	677	110	28	35	--
AUG					
05...	606	110	36	34	--
<b>400952083480801 CH-40 NR URBANA OH-LV1 (LAT 40 09 52N LONG 083 48 08W)</b>					
OCT 1993					
07...	--	120	7.0	20	0.020
NOV					
19...	707	99	8.0	19	0.030
JAN 1994					
05...	695	110	7.0	21	0.030
FEB					
22...	690	110	6.5	22	0.030
MAR					
29...	690	110	6.3	21	0.040
MAY					
10...	650	110	6.6	21	--
JUN					
21...	745	110	7.0	22	--
AUG					
05...	652	120	7.0	21	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400952083480802 CH-40 NR URBANA OH-LV2 (LAT 40 09 52N LONG 083 48 08W)</b>					
OCT 1993					
07...	--	120	7.2	21	0.030
NOV					
19...	634	100	7.1	20	0.030
JAN 1994					
05...	734	110	6.6	21	0.020
FEB					
22...	726	110	7.1	21	0.020
MAR					
29...	790	120	6.4	21	0.040
MAY					
10...	650	110	7.1	22	--
JUN					
21...	742	110	6.9	22	--
AUG					
05...	586	110	7.2	22	--
<b>400952083480803 CH-40 NR URBANA OH-LV3 (LAT 40 09 52N LONG 083 48 08W)</b>					
OCT 1993					
07...	650	120	7.0	21	0.030
NOV					
19...	786	100	7.3	20	0.030
JAN 1994					
05...	730	110	6.6	22	0.020
FEB					
22...	873	110	--	39	0.040
MAR					
29...	771	97	6.4	22	0.060
MAY					
10...	611	110	6.7	22	--
JUN					
21...	771	110	7.0	23	--
AUG					
05...	618	110	7.1	22	--
<b>400952083480804 CH-40 NR URBANA OH-LV4 (LAT 40 09 52N LONG 083 48 08W)</b>					
OCT 1993					
07...	--	110	7.3	20	0.030
NOV					
19...	686	100	7.9	19	0.030
JAN 1994					
05...	685	110	6.7	22	0.020
FEB					
22...	806	100	6.4	22	0.050
MAR					
29...	798	110	6.4	21	0.040
MAY					
10...	722	110	6.9	22	--
JUN					
21...	731	110	7.0	21	--
<b>400952083480805 CH-40 NR URBANA OH-LV5 (LAT 40 09 52N LONG 083 48 08W)</b>					
OCT 1993					
07...	642	110	7.3	21	0.020
NOV					
19...	699	100	6.5	20	0.020
JAN 1994					
05...	653	110	7.0	20	0.030
FEB					
22...	793	110	6.7	22	0.030
MAR					
29...	794	100	6.1	21	0.040
MAY					
10...	626	110	6.7	22	--
JUN					
21...	748	120	7.0	22	--
AUG					
05...	579	110	6.9	22	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>400952083480806 CH-40 NR URBANA OH-LV6 (LAT 40 09 52N LONG 083 48 08W)</b>					
OCT 1993					
07...	--	64	7.3	20	--
NOV					
19...	724	100	7.0	21	0.030
JAN 1994					
05...	656	120	6.9	21	0.020
FEB					
22...	751	110	7.4	22	0.020
MAR					
29...	796	100	6.4	22	0.060
MAY					
10...	666	110	6.8	23	--
JUN					
21...	758	110	7.2	22	--
AUG					
05...	573	110	6.8	22	--
<b>403635082152101 AS-48 NR LOUDONVILLE OH-L1 (LAT 40 36 35N LONG 082 15 21W)</b>					
FEB 1994					
24...	569	72	19	24	0.040
APR					
04...	475	--	--	25	0.030
MAY					
16...	555	70	22	30	--
JUN					
27...	493	62	15	13	--
AUG					
03...	435	55	14	12	--
SEP					
22...	366	65	12	8.6	--
<b>403635082152102 AS-48 NR LOUDONVILLE OH-L2 (LAT 40 36 35N LONG 082 15 21W)</b>					
FEB 1994					
24...	535	72	19	24	0.020
APR					
04...	482	70	18	26	0.020
MAY					
16...	519	67	18	20	--
JUN					
27...	466	60	13	9.0	--
AUG					
03...	432	58	13	10	--
SEP					
22...	480	62	11	7.9	--
<b>403635082152103 AS-48 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 21W)</b>					
FEB 1994					
24...	559	72	21	26	0.030
APR					
04...	500	68	19	27	0.030
MAY					
16...	460	67	17	17	--
JUN					
27...	478	61	12	8.9	--
AUG					
03...	497	62	13	11	--
SEP					
22...	480	61	11	8.0	--
<b>403635082152104 AS-48 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 21W)</b>					
FEB 1994					
24...	559	76	25	38	0.040
APR					
04...	460	69	18	25	0.020
MAY					
16...	530	69	19	19	--
JUN					
27...	470	63	13	8.8	--
AUG					
03...	432	58	13	10	--
SEP					
22...	487	64	11	8.3	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
403635082152105 AS-48 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 21W)					
APR 1994					
04...	403	68	15	18	<0.010
MAY					
16...	517	67	18	19	--
JUN					
27...	450	62	13	8.7	--
AUG					
03...	469	60	13	10	--
SEP					
22...	485	61	11	8.2	--
403635082152106 AS-48 NR LOUDONVILLE OH-L6 (LAT 40 36 35N LONG 082 15 21W)					
MAY 1994					
16...	398	58	8.8	12	--
JUN					
27...	336	68	11	14	--
403635082152201 AS-47 NR LOUDONVILLE OH-L1 (LAT 40 36 35N LONG 082 15 22W)					
FEB 1994					
24...	826	88	53	86	0.070
APR					
04...	820	87	51	100	0.050
MAY					
16...	915	100	70	140	--
JUN					
27...	908	95	60	110	--
AUG					
03...	827	100	61	100	--
SEP					
22...	888	96	58	92	--
403635082152202 AS-47 NR LOUDONVILLE OH-L2 (LAT 40 36 35N LONG 082 15 22W)					
FEB 1994					
24...	739	--	--	81	0.050
APR					
04...	760	86	52	110	0.050
MAY					
16...	957	99	72	140	--
JUN					
27...	680	98	62	120	--
AUG					
03...	804	96	65	110	--
SEP					
22...	630	96	61	98	--
403635082152203 AS-47 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 22W)					
APR 1994					
04...	762	88	51	100	0.050
MAY					
16...	956	100	73	140	--
JUN					
27...	764	96	63	120	--
AUG					
03...	886	95	67	100	--
SEP					
22...	528	--	--	35	--
403635082152204 AS-47 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 22W)					
APR 1994					
04...	737	84	48	95	0.040
MAY					
16...	811	--	--	97	--
AUG					
03...	714	--	--	78	--



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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403635082152205 AS-47 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 22W)</b>					
APR 1994					
04...	577	--	--	61	0.020
MAY					
16...	635	--	--	57	--
<b>403635082152401 AS-46 NR LOUDONVILLE OH-L1 (LAT 40 36 35N LONG 082 15 24W)</b>					
FEB 1994					
24...	--	140	49	55	0.050
APR					
04...	896	110	42	50	0.070
MAY					
16...	802	--	--	59	--
JUN					
27...	892	100	53	93	--
AUG					
03...	737	100	55	85	--
SEP					
22...	589	91	52	75	--
<b>403635082152402 AS-46 NR LOUDONVILLE OH-L2 (LAT 40 36 35N LONG 082 15 24W)</b>					
FEB 1994					
24...	1040	130	49	53	0.070
APR					
04...	619	74	29	55	0.030
MAY					
16...	869	100	51	100	--
JUN					
27...	827	100	55	96	--
AUG					
03...	917	110	55	89	--
SEP					
22...	706	100	54	76	--
<b>403635082152403 AS-46 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 24W)</b>					
FEB 1994					
24...	891	--	--	45	0.050
APR					
04...	639	76	31	59	0.030
MAY					
16...	835	100	54	120	--
JUN					
27...	918	110	55	100	--
AUG					
03...	908	100	60	84	--
SEP					
22...	903	84	56	75	--
<b>403635082152404 AS-46 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 24W)</b>					
APR 1994					
04...	665	82	35	64	0.040
MAY					
16...	876	110	56	130	--
JUN					
27...	750	97	48	86	--
SEP					
22...	498	--	--	20	--
<b>403635082152405 AS-46 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 24W)</b>					
APR 1994					
04...	794	110	41	53	0.050
MAY					
16...	670	--	--	59	--
AUG					
03...	322	--	--	26	--
<b>403635082152406 AS-46 NR LOUDONVILLE OH-L6 (LAT 40 36 35N LONG 082 15 24W)</b>					
MAY 1994					
16...	563	--	--	45	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403635082152502 AS-44 NR LOUDONVILLE OH-L2 (LAT 40 36 35N LONG 082 15 25W)</b>					
FEB 1994					
24...	686	76	41	56	0.040
APR					
04...	760	86	46	83	0.030
MAY					
16...	897	89	69	140	--
JUN					
27...	836	93	72	110	--
AUG					
03...	849	91	62	96	--
SEP					
22...	805	85	58	80	--
<b>403635082152503 AS-44 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 25W)</b>					
FEB 1994					
24...	637	73	39	51	0.050
APR					
04...	736	82	43	72	0.040
MAY					
16...	895	89	67	140	--
JUN					
27...	887	91	70	110	--
AUG					
03...	858	90	65	100	--
SEP					
22...	663	92	69	86	--
<b>403635082152504 AS-44 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 25W)</b>					
FEB 1994					
24...	613	69	36	44	0.010
APR					
04...	688	84	46	87	0.030
MAY					
16...	904	89	64	140	--
JUN					
27...	560	92	73	100	--
AUG					
03...	782	84	65	95	--
SEP					
22...	860	92	65	85	--
<b>403635082152505 AS-44 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 25W)</b>					
APR 1994					
04...	499	71	27	37	<0.010
MAY					
16...	656	76	35	65	--
JUN					
27...	863	88	74	110	--
AUG					
03...	802	82	64	88	--
SEP					
22...	823	84	65	80	--
<b>403635082152506 AS-44 NR LOUDONVILLE OH-L6 (LAT 40 36 35N LONG 082 15 25W)</b>					
APR 1994					
04...	527	66	20	23	0.010
MAY					
16...	462	66	20	22	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
403635082152603 AS-49 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 26W)					
JAN 1994					
12...	803	--	--	--	--
FEB					
24...	753	91	40	51	0.060
APR					
04...	775	89	40	53	0.050
MAY					
16...	777	87	42	63	0.050
JUN					
27...	825	91	41	68	0.060
AUG					
03...	817	93	44	69	--
SEP					
22...	855	95	44	60	0.050
403635082152604 AS-49 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 26W)					
JAN 1994					
12...	799	--	--	--	--
FEB					
24...	726	81	43	68	0.060
APR					
04...	742	86	40	74	0.050
MAY					
16...	911	86	58	110	0.090
JUN					
27...	909	100	52	97	0.070
AUG					
03...	892	96	57	74	--
403635082152605 AS-49 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 26W)					
FEB 1994					
24...	720	79	42	76	0.050
APR					
04...	675	79	34	58	0.040
403635082152606 AS-49 NR LOUDONVILLE OH-L6 (LAT 40 36 35N LONG 082 15 26W)					
FEB 1994					
24...	716	68	63	36	0.040
403635082152702 AS-43 NR LOUDONVILLE OH-L2 (LAT 40 36 35N LONG 082 15 27W)					
FEB 1994					
24...	515	--	--	20	<0.010
APR					
04...	640	110	27	82	0.060
MAY					
16...	722	110	26	81	--
JUN					
27...	865	88	30	120	--
AUG					
03...	564	97	19	48	--
SEP					
22...	710	110	20	28	--
403635082152703 AS-43 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 27W)					
FEB 1994					
24...	664	91	26	73	0.020
APR					
04...	694	130	30	110	0.070
MAY					
16...	1050	120	38	130	--
JUN					
27...	515	89	14	13	--
AUG					
03...	535	100	25	50	--
SEP					
22...	699	110	19	42	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403635082152704 AS-43 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 27W)</b>					
FEB 1994					
24...	797	--	--	100	0.020
APR					
04...	749	110	23	79	0.040
MAY					
16...	833	100	24	79	--
AUG					
03...	544	110	20	26	--
SEP					
22...	699	120	20	26	--
<b>403635082152705 AS-43 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 27W)</b>					
APR 1994					
04...	502	91	21	34	0.030
MAY					
16...	709	110	20	40	--
AUG					
03...	469	100	15	11	--
<b>403635082152706 AS-43 NR LOUDONVILLE OH-L6 (LAT 40 36 35N LONG 082 15 27W)</b>					
APR 1994					
04...	341	--	--	24	0.020
MAY					
16...	483	--	--	44	--
<b>403922082325901 R-19 NR LEXINGTON OH-LV1 (LAT 40 39 22N LONG 082 32 59W)</b>					
OCT 1993					
04...	606	84	11	45	0.030
NOV					
16...	580	87	9.3	42	0.030
JAN 1994					
11...	604	82	9.0	49	0.030
FEB					
28...	617	84	8.5	42	0.020
APR					
05...	617	85	8.4	42	0.040
MAY					
19...	577	89	9.7	36	--
JUN					
30...	529	81	9.1	37	--
AUG					
08...	562	77	8.7	45	--
SEP					
20...	583	71	9.2	44	--
<b>403922082325902 R-19 NR LEXINGTON OH-LV2 (LAT 40 39 22N LONG 082 32 59W)</b>					
OCT 1993					
04...	590	82	9.5	44	0.030
NOV					
16...	599	86	9.1	43	0.030
JAN 1994					
11...	601	83	8.0	47	0.020
FEB					
28...	611	82	8.1	45	0.020
APR					
05...	529	82	8.9	41	0.030
MAY					
19...	564	90	9.7	37	--
JUN					
30...	538	80	8.7	38	--
AUG					
08...	500	76	8.4	45	--
SEP					
20...	577	74	9.2	44	--



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403922082325903 R-19 NR LEXINGTON OH-LV3 (LAT 40 39 22N LONG 082 32 59W)</b>					
OCT 1993					
04...	506	73	9.0	47	0.040
NOV					
16...	532	74	8.1	44	0.030
JAN 1994					
11...	588	86	8.3	48	0.020
FEB					
28...	610	84	8.0	45	0.040
APR					
05...	543	83	8.5	41	0.030
MAY					
19...	--	86	9.8	33	--
JUN					
30...	480	72	8.4	--	--
AUG					
08...	496	76	8.4	45	--
SEP					
20...	585	--	--	43	--
<b>403922082325904 R-19 NR LEXINGTON OH-LV4 (LAT 40 39 22N LONG 082 32 59W)</b>					
OCT 1993					
04...	601	--	--	44	0.030
NOV					
16...	593	73	8.2	44	0.030
JAN 1994					
11...	609	100	8.1	48	0.040
FEB					
28...	614	85	8.8	42	0.040
APR					
05...	475	83	9.1	40	0.030
MAY					
19...	528	85	11	31	--
JUN					
30...	568	76	9.9	36	--
AUG					
08...	513	78	10	38	--
SEP					
20...	593	86	9.1	42	--
<b>403922082325905 R-19 NR LEXINGTON OH-LV5 (LAT 40 39 22N LONG 082 32 59W)</b>					
OCT 1993					
04...	--	83	9.7	44	0.030
JAN 1994					
11...	608	84	8.9	48	0.040
FEB					
28...	561	81	9.3	23	0.020
APR					
05...	505	85	9.5	35	0.030
MAY					
19...	452	75	12	31	--
JUN					
30...	522	81	11	33	--
<b>403922082330001 R-20 NR LEXINGTON OH-LV1 (LAT 40 39 22N LONG 082 33 00W)</b>					
OCT 1993					
04...	534	77	8.0	27	0.010
NOV					
16...	521	76	7.9	31	0.030
JAN 1994					
11...	579	--	--	35	0.030
FEB					
28...	609	86	9.1	35	0.020
APR					
05...	595	--	--	33	0.030
MAY					
19...	512	80	12	20	--
JUN					
30...	502	74	13	18	--
AUG					
08...	450	72	13	22	--
SEP					
20...	553	77	12	24	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403922082330002 R-20 NR LEXINGTON OH-LV2 (LAT 40 39 22N LONG 082 33 00W)</b>					
OCT 1993					
04...	502	76	8.0	25	0.030
NOV					
16...	488	77	7.4	32	0.030
JAN 1994					
11...	575	87	9.2	35	0.050
FEB					
28...	627	87	9.5	35	0.020
APR					
05...	580	--	--	33	0.030
MAY					
19...	534	85	13	19	--
JUN					
30...	517	74	14	17	--
AUG					
08...	502	71	13	22	--
<b>403922082330003 R-20 NR LEXINGTON OH-LV3 (LAT 40 39 22N LONG 082 33 00W)</b>					
OCT 1993					
04...	542	88	8.5	27	0.020
NOV					
16...	480	81	8.5	30	0.030
JAN 1994					
11...	575	92	9.5	36	0.040
FEB					
28...	644	--	--	36	0.030
APR					
05...	579	--	--	31	0.030
MAY					
19...	515	75	14	16	--
JUN					
30...	529	75	14	18	--
AUG					
08...	503	72	13	21	--
SEP					
20...	552	78	12	26	--
<b>403922082330004 R-20 NR LEXINGTON OH-LV4 (LAT 40 39 22N LONG 082 33 00W)</b>					
OCT 1993					
04...	528	85	8.2	27	0.030
NOV					
16...	453	82	9.0	31	0.030
JAN 1994					
11...	607	89	10	37	0.040
FEB					
28...	630	90	10	34	0.030
APR					
05...	540	83	9.9	29	0.030
MAY					
19...	489	81	14	16	--
JUN					
30...	525	74	14	18	--
AUG					
08...	415	74	13	22	--
SEP					
20...	563	78	12	27	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403922082330005 R-20 NR LEXINGTON OH-LV5 (LAT 40 39 22N LONG 082 33 00W)</b>					
OCT 1993					
04...	547	--	--	26	0.010
NOV					
16...	502	82	8.9	31	0.030
JAN 1994					
11...	607	90	9.1	36	0.030
FEB					
28...	649	94	11	33	0.030
APR					
05...	572	84	11	31	0.020
MAY					
19...	494	75	14	15	--
JUN					
30...	540	76	14	18	--
AUG					
08...	491	72	12	23	--
SEP					
20...	559	--	--	29	--
<b>403922082330006 R-20 NR LEXINGTON OH-LV6 (LAT 40 39 22N LONG 082 33 00W)</b>					
OCT 1993					
04...	--	74	8.8	22	0.010
NOV					
16...	512	81	9.0	29	0.030
JAN 1994					
11...	537	81	8.5	32	0.060
FEB					
28...	649	93	11	33	0.040
APR					
05...	605	--	--	30	0.030
MAY					
19...	515	77	14	15	--
JUN					
30...	512	75	14	18	--
AUG					
08...	480	72	14	18	--
SEP					
20...	553	78	12	26	--
<b>403923082325401 R-21 NR LEXINGTON OH-LV1 (LAT 40 39 23N LONG 082 32 54W)</b>					
OCT 1993					
04...	192	22	2.4	2.3	0.020
NOV					
16...	199	22	5.9	7.6	0.010
JAN 1994					
11...	198	--	--	4.6	0.020
FEB					
28...	226	28	2.5	3.1	0.090
APR					
05...	283	45	2.8	3.3	0.020
MAY					
19...	292	47	2.3	2.8	--
JUN					
30...	242	--	--	2.2	--
AUG					
08...	205	27	3.3	3.3	--
SEP					
20...	185	24	2.6	2.4	--
<b>403923082325402 R-21 NR LEXINGTON OH-LV2 (LAT 40 39 23N LONG 082 32 54W)</b>					
OCT 1993					
04...	162	21	1.9	2.2	0.020
NOV					
16...	206	25	4.1	5.8	<0.010
JAN 1994					
11...	188	25	2.6	2.6	0.030
FEB					
28...	217	29	2.3	2.7	<0.010
APR					
05...	283	45	2.6	3.3	0.010
MAY					
19...	290	44	2.6	2.9	--
JUN					
30...	246	33	2.1	2.5	--
AUG					
08...	182	24	3.1	2.9	--
SEP					
20...	170	20	2.9	2.6	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403923082325403 R-21 NR LEXINGTON OH-LV3 (LAT 40 39 23N LONG 082 32 54W)</b>					
NOV 1993					
16...	178	--	--	5.1	<0.010
JAN 1994					
11...	194	25	2.7	3.5	0.020
FEB					
28...	213	28	2.2	2.6	<0.010
APR					
05...	298	45	2.7	3.2	<0.010
MAY					
19...	290	44	2.5	3.0	--
JUN					
30...	271	38	1.8	--	--
AUG					
08...	198	25	2.8	2.9	--
SEP					
20...	200	--	--	2.3	--
<b>403923082325404 R-21 NR LEXINGTON OH-LV4 (LAT 40 39 23N LONG 082 32 54W)</b>					
JAN 1994					
11...	--	--	--	4.5	<0.010
FEB					
28...	209	26	1.8	2.7	<0.010
APR					
05...	289	43	2.7	3.2	0.010
MAY					
19...	268	40	2.0	3.0	--
JUN					
30...	214	--	--	3.9	--
AUG					
08...	169	--	--	3.0	--
<b>403923082325405 R-21 NR LEXINGTON OH-LV5 (LAT 40 39 23N LONG 082 32 54W)</b>					
APR 1994					
05...	278	--	--	3.5	<0.010
MAY					
19...	253	--	--	2.3	--
AUG					
08...	142	--	--	3.1	--
<b>403923082325601 R-15 NR LEXINGTON OH-LV1 (LAT 40 39 23N LONG 082 32 56W)</b>					
OCT 1993					
04...	559	50	38	46	<0.010
NOV					
16...	489	--	--	23	<0.010
JAN 1994					
11...	441	--	--	43	0.020
FEB					
28...	381	26	30	48	0.020
APR					
05...	315	23	24	35	<0.010
MAY					
19...	229	21	14	18	--
JUN					
30...	301	27	16	21	--
AUG					
08...	420	--	--	33	--
SEP					
20...	437	--	--	30	--
<b>403923082325602 R-15 NR LEXINGTON OH-LV2 (LAT 40 39 23N LONG 082 32 56W)</b>					
OCT 1993					
04...	533	50	32	37	0.010
NOV					
16...	493	50	25	23	0.010
JAN 1994					
11...	421	33	29	42	0.020
FEB					
28...	362	25	30	47	0.030
APR					
05...	307	23	24	34	0.020
MAY					
19...	229	19	13	18	--
JUN					
30...	336	27	17	23	--
AUG					
08...	421	41	23	31	--
SEP					
20...	448	44	24	28	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
403923082325603 R-15 NR LEXINGTON OH-LV3 (LAT 40 39 23N LONG 082 32 56W)					
NOV 1993					
16...	176	--	--	30	<0.010
JAN 1994					
11...	410	36	90	40	0.020
FEB					
28...	362	25	30	45	0.020
APR					
05...	310	23	24	35	0.010
MAY					
19...	242	23	14	20	--
JUN					
30...	319	28	17	24	--
AUG					
08...	402	--	--	39	--
SEP					
20...	293	--	--	19	--
403923082325604 R-15 NR LEXINGTON OH-LV4 (LAT 40 39 23N LONG 082 32 56W)					
FEB 1994					
28...	355	24	30	47	0.020
APR					
05...	300	22	23	34	0.010
MAY					
19...	232	21	14	18	--
JUN					
30...	322	--	--	37	--
AUG					
08...	356	--	--	45	--
403923082325605 R-15 NR LEXINGTON OH-LV5 (LAT 40 39 23N LONG 082 32 56W)					
APR 1994					
05...	303	23	24	34	0.020
MAY					
19...	264	21	17	23	--
JUN					
30...	288	--	--	33	--
403923082325701 R-18 NR LEXINGTON OH-LV1 (LAT 40 39 23N LONG 082 32 57W)					
NOV 1993					
16...	467	56	5.1	48	0.030
JAN 1994					
11...	469	59	5.4	50	0.030
FEB					
28...	526	63	8.6	65	0.040
APR					
05...	474	58	15	53	0.040
MAY					
19...	416	40	17	37	0.040
JUN					
30...	410	49	9.6	45	0.040
AUG					
08...	459	55	6.8	51	--
SEP					
20...	484	62	5.4	54	0.040
403923082325702 R-18 NR LEXINGTON OH-LV2 (LAT 40 39 23N LONG 082 32 57W)					
NOV 1993					
16...	461	56	5.2	49	0.030
JAN 1994					
11...	455	59	5.3	49	0.040
FEB					
28...	516	58	9.3	67	0.030
APR					
05...	462	49	16	52	0.030
MAY					
19...	407	40	18	37	0.040
JUN					
30...	421	37	43	11	<0.010
AUG					
08...	437	54	6.4	48	--
SEP					
20...	466	55	5.0	54	0.040



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>403923082325703 R-18 NR LEXINGTON OH-LV3 (LAT 40 39 23N LONG 082 32 57W)</b>					
NOV 1993					
16...	543	71	12	49	0.030
JAN 1994					
11...	531	72	8.0	49	0.030
FEB					
28...	413	76	7.7	59	0.040
APR					
05...	553	73	11	58	0.040
MAY					
19...	522	59	15	46	0.030
JUN					
30...	492	58	12	44	0.040
AUG					
08...	481	65	10	45	--
SEP					
20...	526	69	8.2	52	0.040
<b>403923082325704 R-18 NR LEXINGTON OH-LV4 (LAT 40 39 23N LONG 082 32 57W)</b>					
NOV 1993					
16...	711	99	45	48	0.030
JAN 1994					
11...	669	90	15	48	0.040
FEB					
28...	606	79	12	58	0.030
APR					
05...	623	75	17	58	0.040
MAY					
19...	554	71	17	49	0.040
JUN					
30...	538	68	15	45	0.040
AUG					
08...	546	70	14	49	--
SEP					
20...	528	68	12	47	0.030
<b>403923082325705 R-18 NR LEXINGTON OH-LV5 (LAT 40 39 23N LONG 082 32 57W)</b>					
FEB 1994					
28...	644	87	16	63	0.030
APR					
05...	548	67	29	51	0.030
MAY					
19...	560	65	28	47	0.040
JUN					
30...	566	60	16	47	0.040
AUG					
08...	579	71	16	46	--
<b>403923082325706 R-18 NR LEXINGTON OH-LV6 (LAT 40 39 23N LONG 082 32 57W)</b>					
FEB 1994					
28...	690	91	27	32	0.020
<b>403923082325901 R-17 NR LEXINGTON OH-LV1 (LAT 40 39 23N LONG 082 32 59W)</b>					
OCT 1993					
04...	581	72	15	65	0.010
NOV					
16...	530	66	7.2	45	0.040
JAN 1994					
11...	527	71	6.7	49	0.030
FEB					
28...	562	75	6.9	54	0.030
APR					
05...	547	70	13	59	0.030
MAY					
19...	502	57	19	46	--
JUN					
30...	478	60	14	40	--
AUG					
08...	463	70	8.6	51	--
SEP					
20...	533	70	7.1	52	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
403923082325902 R-17 NR LEXINGTON OH-LV2 (LAT 40 39 23N LONG 082 32 59W)					
OCT 1993					
04...	572	69	14	65	0.050
NOV					
16...	490	66	5.4	45	0.030
JAN 1994					
11...	509	70	5.9	49	0.020
FEB					
28...	549	70	8.0	63	0.040
APR					
05...	458	58	16	55	0.040
MAY					
19...	457	48	20	42	--
JUN					
30...	466	56	13	43	--
AUG					
08...	417	65	7.2	52	--
SEP					
20...	515	65	6.0	55	--
403923082325903 R-17 NR LEXINGTON OH-LV3 (LAT 40 39 23N LONG 082 32 59W)					
OCT 1993					
04...	550	80	15	66	0.030
NOV					
16...	502	63	4.9	47	0.040
JAN 1994					
11...	491	64	5.5	51	0.040
FEB					
28...	575	62	17	73	0.030
APR					
05...	489	52	19	51	0.030
MAY					
19...	432	48	21	37	--
JUN					
30...	455	53	13	43	--
AUG					
08...	424	58	6.4	53	--
SEP					
20...	497	66	5.4	56	--
403923082325904 R-17 NR LEXINGTON OH-LV4 (LAT 40 39 23N LONG 082 32 59W)					
FEB 1994					
28...	551	63	12	69	0.030
APR					
05...	475	52	20	53	0.030
MAY					
19...	443	45	21	42	--
403923082325905 R-17 NR LEXINGTON OH-LV5 (LAT 40 39 23N LONG 082 32 59W)					
MAY 1994					
19...	321	--	--	28	--
411136081172501 PO-119 NR RAVENNA OH-LV1 (LAT 41 11 36N LONG 081 17 25W)					
NOV 1993					
22...	651	--	18	43	--
JAN 1994					
14...	660	100	19	37	0.010
FEB					
16...	571	85	18	31	0.070
APR					
07...	506	79	19	23	<0.010
MAY					
18...	456	31	63	11	--
JUN					
29...	472	43	46	18	--
AUG					
10...	515	64	35	19	--
SEP					
15...	514	70	31	29	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411136081172502 PO-119 NR RAVENNA OH-LV2 (LAT 41 11 36N LONG 081 17 25W)</b>					
NOV 1993					
22...	433	62	15	9.1	<0.010
JAN 1994					
14...	511	80	14	17	<0.010
FEB					
16...	481	64	20	20	0.020
APR					
07...	427	--	--	11	<0.010
MAY					
18...	408	26	63	6.5	--
JUN					
29...	429	45	9.5	47	--
AUG					
10...	468	63	27	10	--
SEP					
15...	416	66	22	14	--
<b>411136081172503 PO-119 NR RAVENNA OH-LV3 (LAT 41 11 36N LONG 081 17 25W)</b>					
NOV 1993					
22...	666	110	18	41	0.010
JAN 1994					
14...	396	64	11	9.0	<0.010
FEB					
16...	381	45	25	10	<0.010
APR					
07...	283	--	--	6.3	<0.010
MAY					
18...	428	30	54	7.1	--
JUN					
29...	361	38	31	7.3	--
AUG					
10...	428	61	19	8.8	--
SEP					
15...	364	59	12	13	--
<b>411136081172504 PO-119 NR RAVENNA OH-LV4 (LAT 41 11 36N LONG 081 17 25W)</b>					
NOV 1993					
22...	443	--	--	10	<0.010
JAN 1994					
14...	266	39	5.6	6.5	<0.010
FEB					
16...	322	38	18	6.7	<0.010
APR					
07...	255	37	8.6	6.0	<0.010
MAY					
18...	373	33	43	5.6	--
JUN					
29...	355	39	30	7.5	--
AUG					
10...	384	56	14	9.4	--
SEP					
15...	373	60	11	12	--
<b>411136081172505 PO-119 NR RAVENNA OH-LV5 (LAT 41 11 36N LONG 081 17 25W)</b>					
JAN 1994					
14...	--	--	--	--	--
FEB					
16...	310	38	14	9.9	<0.010
APR					
07...	229	33	7.2	5.7	<0.010
MAY					
18...	346	37	27	6.5	--
AUG					
10...	436	--	--	10	--
<b>411136081172506 PO-119 NR RAVENNA OH-LV6 (LAT 41 11 36N LONG 081 17 25W)</b>					
JAN 1994					
14...	287	--	--	7.8	<0.010

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411136081172601 PO-120 NR RAVENNA OH-LV1 (LAT 41 11 36N LONG 081 17 26W)</b>					
NOV 1993					
22...	217	19	23	2.5	<0.010
JAN 1994					
14...	201	30	7.0	1.8	0.030
FEB					
16...	232	27	15	2.8	<0.010
APR					
07...	209	26	11	2.7	<0.010
MAY					
18...	270	--	--	3.4	--
JUN					
29...	290	34	18	3.6	--
AUG					
10...	338	47	20	4.5	--
SEP					
15...	360	51	18	4.5	--
<b>411136081172602 PO-120 NR RAVENNA OH-LV2 (LAT 41 11 36N LONG 081 17 26W)</b>					
NOV 1993					
22...	181	--	--	1.8	<0.010
JAN 1994					
14...	197	30	4.7	2.0	0.020
FEB					
16...	221	26	12	2.7	<0.010
APR					
07...	206	26	14	2.9	<0.010
MAY					
18...	255	31	18	3.4	--
JUN					
29...	288	38	15	3.9	--
AUG					
10...	360	45	21	3.6	--
SEP					
15...	367	56	18	4.6	--
<b>411136081172603 PO-120 NR RAVENNA OH-LV3 (LAT 41 11 36N LONG 081 17 26W)</b>					
NOV 1993					
22...	180	19	12	1.6	<0.010
JAN 1994					
14...	197	27	5.2	2.0	0.010
FEB					
16...	180	19	9.5	3.4	<0.010
APR					
07...	201	24	13	3.2	<0.010
MAY					
18...	263	29	18	3.2	--
JUN					
29...	305	42	14	4.1	--
AUG					
10...	377	51	18	2.4	--
SEP					
15...	318	60	15	3.1	--
<b>411136081172604 PO-120 NR RAVENNA OH-LV4 (LAT 41 11 36N LONG 081 17 26W)</b>					
NOV 1993					
22...	182	--	--	2.0	<0.010
JAN 1994					
14...	188	28	5.2	2.4	0.030
FEB					
16...	190	18	12	4.0	<0.010
APR					
07...	199	24	11	3.3	<0.010
MAY					
18...	260	30	18	3.7	--
JUN					
29...	311	45	12	3.5	--
AUG					
10...	416	60	14	1.7	--
SEP					
15...	347	66	11	1.9	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411136081172605 PO-120 NR RAVENNA OH-LV5 (LAT 41 11 36N LONG 081 17 26W)</b>					
JAN 1994					
14...	236	28	15	1.8	0.010
FEB					
16...	170	--	--	2.4	<0.010
APR					
07...	197	23	12	3.3	<0.010
MAY					
18...	257	32	19	3.6	--
JUN					
29...	355	--	--	3.8	--
AUG					
10...	445	--	--	2.3	--
SEP					
15...	351	--	--	2.3	--
<b>411136081172606 PO-120 NR RAVENNA OH-LV6 (LAT 41 11 36N LONG 081 17 26W)</b>					
APR 1994					
07...	129	--	--	4.3	<0.010
MAY					
18...	199	--	--	3.8	--
<b>411137081172101 PO-114 NR RAVENNA OH-LV1 (LAT 41 11 37N LONG 081 17 21W)</b>					
NOV 1993					
22...	359	--	--	2.8	<0.010
JAN 1994					
14...	317	46	11	3.1	<0.010
FEB					
16...	385	59	9.1	5.4	<0.010
APR					
07...	311	49	15	7.5	<0.010
MAY					
18...	408	65	9.3	8.2	0.010
JUN					
29...	396	77	7.9	8.6	--
AUG					
10...	475	85	9.7	6.0	--
SEP					
15...	469	--	--	5.1	--
<b>411137081172102 PO-114 NR RAVENNA OH-LV2 (LAT 41 11 37N LONG 081 17 21W)</b>					
NOV 1993					
22...	320	43	11	3.2	<0.010
JAN 1994					
14...	309	50	10	6.2	<0.010
FEB					
16...	387	60	7.3	5.4	0.020
APR					
07...	312	48	14	7.0	<0.010
MAY					
18...	400	65	10	8.2	--
JUN					
29...	469	82	7.7	8.3	--
AUG					
10...	474	76	9.3	6.1	--
SEP					
15...	470	81	15	4.9	--
<b>411137081172103 PO-114 NR RAVENNA OH-LV3 (LAT 41 11 37N LONG 081 17 21W)</b>					
NOV 1993					
22...	392	--	--	3.4	<0.010
JAN 1994					
14...	266	49	10	2.4	<0.010
FEB					
16...	383	60	8.4	6.5	0.020
APR					
07...	300	46	14	7.0	<0.010
MAY					
18...	347	62	12	7.2	--
JUN					
29...	480	94	8.0	8.0	--
AUG					
10...	465	77	8.5	5.4	--
SEP					
15...	480	79	14	4.3	--



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
411137081172104 PO-114 NR RAVENNA OH-LV4 (LAT 41 11 37N LONG 081 17 21W)					
NOV 1993					
22...	442	60	10	3.5	<0.010
JAN 1994					
14...	302	49	8.9	2.7	<0.010
FEB					
16...	370	58	9.2	5.5	0.020
APR					
07...	308	50	12	6.9	<0.010
MAY					
18...	355	60	12	8.5	--
JUN					
29...	514	93	8.4	8.1	--
AUG					
10...	465	85	7.6	5.3	--
SEP					
15...	479	82	13	4.3	--
411137081172105 PO-114 NR RAVENNA OH-LV5 (LAT 41 11 37N LONG 081 17 21W)					
NOV 1993					
22...	476	48	9.5	3.7	<0.010
JAN 1994					
14...	295	46	9.2	2.3	<0.010
FEB					
16...	367	--	--	5.7	0.010
APR					
07...	297	46	12	7.1	<0.010
MAY					
18...	379	60	12	7.2	--
JUN					
29...	479	95	8.0	7.7	--
AUG					
10...	407	79	7.5	5.4	--
SEP					
15...	485	82	12	4.3	--
411137081172106 PO-114 NR RAVENNA OH-LV6 (LAT 41 11 37N LONG 081 17 21W)					
JAN 1994					
14...	291	44	9.3	2.3	<0.010
FEB					
16...	348	56	7.8	6.8	0.010
APR					
07...	296	44	11	7.4	<0.010
MAY					
18...	392	58	12	7.4	--
JUN					
29...	427	87	7.3	7.8	--
AUG					
10...	471	87	7.8	5.2	--
SEP					
15...	481	--	--	5.2	--
411137081172301 PO-118 NR RAVENNA OH-LV1 (LAT 41 11 37N LONG 081 17 23W)					
NOV 1993					
22...	1390	--	--	330	0.050
JAN 1994					
14...	1270	65	180	270	0.050
FEB					
16...	728	30	100	140	0.040
APR					
07...	1440	--	--	370	0.050
MAY					
18...	2190	93	310	600	--
JUN					
29...	4880	230	710	1400	--
AUG					
10...	3770	130	650	1100	--
SEP					
15...	3050	88	540	800	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411137081172302 PO-118 NR RAVENNA OH-LV2 (LAT 41 11 37N LONG 081 17 23W)</b>					
NOV 1993					
22...	1230	51	200	300	0.060
JAN 1994					
14...	1140	41	190	230	0.040
FEB					
16...	623	19	79	120	0.030
APR					
07...	1030	45	180	250	0.040
MAY					
18...	2140	94	300	580	--
JUN					
29...	4620	210	690	1300	--
AUG					
10...	3700	130	650	1000	--
SEP					
15...	3070	87	550	850	--
<b>411137081172303 PO-118 NR RAVENNA OH-LV3 (LAT 41 11 37N LONG 081 17 23W)</b>					
NOV 1993					
22...	1330	50	190	320	0.070
JAN 1994					
14...	1060	31	180	210	0.030
FEB					
16...	751	--	--	160	0.040
APR					
07...	1440	53	220	330	0.050
MAY					
18...	2160	94	300	580	--
JUN					
29...	4570	210	670	1300	--
AUG					
10...	3730	140	630	1000	--
SEP					
15...	3060	87	550	840	--
<b>411137081172304 PO-118 NR RAVENNA OH-LV4 (LAT 41 11 37N LONG 081 17 23W)</b>					
NOV 1993					
22...	1210	39	140	290	0.060
JAN 1994					
14...	1020	32	170	190	0.030
FEB					
16...	628	24	72	120	0.030
APR					
07...	1270	--	--	340	0.040
MAY					
18...	1900	91	250	490	--
JUN					
29...	4550	210	670	1300	--
AUG					
10...	3660	110	610	990	--
SEP					
15...	3020	82	540	760	--
<b>411137081172305 PO-118 NR RAVENNA OH-LV5 (LAT 41 11 37N LONG 081 17 23W)</b>					
NOV 1993					
22...	1050	53	170	240	0.050
JAN 1994					
14...	966	35	150	190	0.040
FEB					
16...	544	21	50	95	0.030
APR					
07...	1020	39	180	250	0.040
MAY					
18...	1780	89	250	480	--
JUN					
29...	4410	210	650	1300	--
SEP					
15...	2920	85	530	770	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
411137081172306 PO-118 NR RAVENNA OH-LV6 (LAT 41 11 37N LONG 081 17 23W)					
JAN 1994					
14...	691	36	95	120	0.020
FEB					
16...	377	17	58	62	0.020
APR					
07...	986	34	150	240	0.030
MAY					
18...	1280	69	170	320	--
JUN					
29...	3980	170	570	1100	--
AUG					
10...	1970	110	250	510	--
411137081172401 PO-117 NR RAVENNA OH-LV1 (LAT 41 11 37N LONG 081 17 24W)					
OCT 1993					
06...	1090	100	98	210	0.040
NOV					
22...	1210	100	120	230	0.050
JAN 1994					
14...	1040	90	99	190	0.040
FEB					
16...	1180	97	120	230	0.070
APR					
07...	1170	96	120	230	0.050
MAY					
18...	1360	84	100	210	0.060
JUN					
29...	1120	86	120	200	0.040
AUG					
10...	1180	91	130	230	--
SEP					
15...	1250	96	130	260	0.050
411137081172402 PO-117 NR RAVENNA OH-LV2 (LAT 41 11 37N LONG 081 17 24W)					
OCT 1993					
06...	1230	93	130	260	0.040
NOV					
22...	1340	110	140	290	0.050
JAN 1994					
14...	--	110	160	300	0.050
FEB					
16...	1230	81	150	230	0.050
APR					
07...	1020	65	120	180	0.040
MAY					
18...	918	61	110	170	0.040
JUN					
29...	1170	74	140	220	0.050
AUG					
10...	1280	87	150	280	--
SEP					
15...	1490	95	160	340	0.060
411137081172403 PO-117 NR RAVENNA OH-LV3 (LAT 41 11 37N LONG 081 17 24W)					
OCT 1993					
06...	1470	110	140	330	0.050
NOV					
22...	1570	120	170	380	0.060
JAN 1994					
14...	1220	89	140	220	0.030
FEB					
16...	945	71	110	160	0.040
APR					
07...	774	64	91	120	0.020
MAY					
18...	669	56	70	90	0.030
JUN					
29...	948	81	110	180	0.050
AUG					
10...	1330	100	140	300	--
SEP					
15...	1710	120	180	410	0.060

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411137081172404 PO-117 NR RAVENNA OH-LV4 (LAT 41 11 37N LONG 081 17 24W)</b>					
OCT 1993					
06...	1870	130	180	450	0.070
NOV					
22...	1930	160	220	450	0.070
JAN 1994					
14...	1160	89	130	200	0.030
FEB					
16...	925	71	100	150	0.030
APR					
07...	701	59	75	110	0.020
MAY					
18...	670	58	48	71	0.020
JUN					
29...	977	78	98	180	0.040
AUG					
10...	1670	120	180	390	--
SEP					
15...	1890	130	230	460	0.070
<b>411137081172405 PO-117 NR RAVENNA OH-LV5 (LAT 41 11 37N LONG 081 17 24W)</b>					
OCT 1993					
06...	2050	140	230	480	0.070
NOV					
22...	1780	130	220	350	0.060
JAN 1994					
14...	985	88	100	160	0.030
FEB					
16...	757	65	73	110	0.030
APR					
07...	644	58	64	88	0.020
MAY					
18...	607	60	54	63	0.020
JUN					
29...	1070	81	110	210	0.040
AUG					
10...	1850	120	200	470	--
SEP					
15...	1710	120	210	410	0.070
<b>411137081172406 PO-117 NR RAVENNA OH-LV6 (LAT 41 11 37N LONG 081 17 24W)</b>					
NOV 1993					
22...	1140	120	110	130	0.030
JAN 1994					
14...	659	72	46	76	0.020
FEB					
16...	604	60	49	80	0.020
APR					
07...	457	49	41	54	0.010
MAY					
18...	465	50	35	34	0.010
JUN					
29...	1120	98	92	230	0.050
AUG					
10...	1470	110	130	330	--
SEP					
15...	1320	92	170	300	0.050
<b>411138081172401 PO-115 NR RAVENNA OH-LV1 (LAT 41 11 38N LONG 081 17 24W)</b>					
NOV 1993					
22...	1020	--	--	170	0.020
JAN 1994					
14...	755	32	120	120	0.030
FEB					
16...	1110	50	160	240	0.050
APR					
07...	1920	83	260	520	0.050
MAY					
18...	2070	110	270	550	--
JUN					
29...	4410	180	690	1300	--
AUG					
10...	2410	120	360	650	--
SEP					
15...	1470	38	260	300	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411138081172402 PO-115 NR RAVENNA OH-LV2 (LAT 41 11 38N LONG 081 17 24W)</b>					
NOV 1993					
22...	1040	--	--	170	0.030
JAN 1994					
14...	717	33	110	110	0.010
FEB					
16...	--	54	140	220	0.040
APR					
07...	1860	86	260	490	0.040
MAY					
18...	1950	120	270	500	--
JUN					
29...	4560	190	720	1300	--
AUG					
10...	1640	59	300	350	--
SEP					
15...	1480	38	260	300	--
<b>411138081172403 PO-115 NR RAVENNA OH-LV3 (LAT 41 11 38N LONG 081 17 24W)</b>					
NOV 1993					
22...	982	38	150	170	0.030
JAN 1994					
14...	696	--	--	100	0.010
FEB					
16...	864	52	110	170	0.050
APR					
07...	1570	--	--	400	0.030
MAY					
18...	2070	120	260	540	--
JUN					
29...	4290	180	670	1300	--
AUG					
10...	1670	53	280	380	--
SEP					
15...	1490	38	260	320	--
<b>411138081172404 PO-115 NR RAVENNA OH-LV4 (LAT 41 11 38N LONG 081 17 24W)</b>					
NOV 1993					
22...	869	--	--	130	0.020
JAN 1994					
14...	662	35	91	99	0.010
FEB					
16...	835	51	100	160	0.030
APR					
07...	1400	78	180	350	0.030
MAY					
18...	1910	100	220	490	--
JUN					
29...	4520	190	690	1300	--
AUG					
10...	1550	64	230	330	--
SEP					
15...	1280	37	230	270	--
<b>411138081172405 PO-115 NR RAVENNA OH-LV5 (LAT 41 11 38N LONG 081 17 24W)</b>					
NOV 1993					
22...	730	--	--	100	0.020
JAN 1994					
14...	664	36	85	97	0.020
FEB					
16...	623	53	61	91	0.020
APR					
07...	812	67	78	160	0.020
MAY					
18...	1580	96	150	390	--
JUN					
29...	4080	180	630	1200	--
AUG					
10...	1440	60	230	320	--
SEP					
15...	1220	33	220	250	--



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>411138081172406 PO-115 NR RAVENNA OH-LV6 (LAT 41 11 38N LONG 081 17 24W)</b>					
NOV 1993					
22...	748	--	--	110	0.010
JAN 1994					
14...	597	35	76	80	0.010
FEB					
16...	438	35	53	54	0.020
APR					
07...	446	50	29	58	<0.010
MAY					
18...	881	86	85	190	--
JUN					
29...	2350	130	320	650	--
AUG					
10...	1970	61	150	480	--
<b>413546083480901 LU-28 NR HOLLAND OH-LV1 (LAT 41 35 46N LONG 083 48 09W)</b>					
OCT 1993					
08...	598	--	--	61	0.020
NOV					
18...	459	78	11	12	<0.010
JAN 1994					
06...	453	77	11	16	0.020
FEB					
17...	500	80	17	29	0.020
MAR					
31...	498	--	--	27	0.020
MAY					
11...	482	100	11	21	--
JUN					
22...	488	81	12	26	--
AUG					
11...	472	78	12	17	--
SEP					
13...	359	88	13	19	--
<b>413546083480902 LU-28 NR HOLLAND OH-LV2 (LAT 41 35 46N LONG 083 48 09W)</b>					
OCT 1993					
08...	--	110	50	79	0.020
NOV					
18...	574	83	28	53	0.010
JAN 1994					
06...	611	90	26	72	0.030
FEB					
17...	655	98	19	87	0.040
MAR					
31...	686	110	13	96	<0.010
MAY					
11...	714	120	15	110	--
JUN					
22...	812	120	24	140	--
AUG					
11...	809	110	36	150	--
SEP					
13...	781	100	38	130	--
<b>413546083480903 LU-28 NR HOLLAND OH-LV3 (LAT 41 35 46N LONG 083 48 09W)</b>					
OCT 1993					
08...	--	33	73	35	<0.010
NOV					
18...	579	57	43	62	0.010
JAN 1994					
06...	946	100	62	200	0.030
FEB					
17...	1320	160	41	320	0.030
MAR					
31...	1400	180	26	--	0.050
MAY					
11...	1390	170	49	330	--
JUN					
22...	1300	130	78	310	--
AUG					
11...	891	100	53	170	--
SEP					
13...	775	93	50	130	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413546083480904 LU-28 NR HOLLAND OH-LV4 (LAT 41 35 46N LONG 083 48 09W)</b>					
OCT 1993					
08...	--	35	73	50	0.020
NOV					
18...	646	53	67	90	0.010
JAN 1994					
06...	967	96	73	210	0.030
FEB					
17...	1330	140	64	340	0.060
MAR					
31...	1350	170	35	340	0.050
MAY					
11...	1350	120	56	310	--
JUN					
22...	1360	120	110	330	--
AUG					
11...	942	51	120	180	--
SEP					
13...	688	48	92	95	--
<b>413546083480905 LU-28 NR HOLLAND OH-LV5 (LAT 41 35 46N LONG 083 48 09W)</b>					
OCT 1993					
08...	--	40	59	47	<0.010
NOV					
18...	635	57	54	58	0.020
JAN 1994					
06...	685	68	48	130	0.020
FEB					
17...	774	83	40	160	0.070
MAR					
31...	244	79	16	78	0.010
MAY					
11...	504	90	16	66	--
JUN					
22...	460	53	18	51	--
AUG					
11...	520	59	22	61	--
SEP					
13...	547	58	34	70	--
<b>413547083481001 LU-26 NR HOLLAND OH-LV1 (LAT 41 35 47N LONG 083 48 10W)</b>					
OCT 1993					
08...	558	95	7.2	55	0.020
NOV					
18...	584	93	7.7	67	0.030
JAN 1994					
06...	733	100	10	110	0.030
FEB					
17...	598	96	9.3	66	0.060
MAR					
31...	581	97	7.0	59	0.12
MAY					
11...	544	91	7.3	53	0.040
JUN					
22...	574	94	6.8	55	0.020
AUG					
11...	597	98	7.7	65	--
SEP					
13...	636	100	8.7	96	0.020
<b>413547083481002 LU-26 NR HOLLAND OH-LV2 (LAT 41 35 47N LONG 083 48 10W)</b>					
OCT 1993					
08...	801	130	5.9	150	0.040
NOV					
18...	699	150	6.1	120	0.040
JAN 1994					
06...	644	100	5.7	87	0.030
FEB					
17...	585	88	5.6	67	0.040
MAR					
31...	565	86	5.0	59	0.040
MAY					
11...	540	80	4.8	54	0.050
JUN					
22...	588	85	6.0	75	0.030
AUG					
11...	767	110	10	140	--
SEP					
13...	850	100	14	180	0.030

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413547083481003 LU-26 NR HOLLAND OH-LV3 (LAT 41 35 47N LONG 083 48 10W)</b>					
OCT 1993					
08...	434	28	57	33	<0.010
NOV					
18...	369	30	38	14	<0.010
FEB 1994					
17...	908	56	95	210	0.040
MAR					
31...	1070	120	50	270	0.040
MAY					
11...	658	53	48	130	0.030
JUN					
22...	612	60	38	100	0.020
AUG					
11...	656	76	21	130	--
SEP					
13...	804	86	20	180	0.030
<b>413547083481004 LU-26 NR HOLLAND OH-LV4 (LAT 41 35 47N LONG 083 48 10W)</b>					
OCT 1993					
08...	395	5.4	77	27	0.010
NOV					
18...	777	18	130	180	0.030
JAN 1994					
06...	2120	110	260	610	0.080
FEB					
17...	1860	49	300	480	0.080
MAR					
31...	804	16	140	150	0.040
MAY					
11...	517	11	90	83	0.020
JUN					
22...	577	14	95	99	0.030
AUG					
11...	468	10	80	80	--
SEP					
13...	716	29	120	170	0.030
<b>413547083481005 LU-26 NR HOLLAND OH-LV5 (LAT 41 35 47N LONG 083 48 10W)</b>					
OCT 1993					
08...	944	23	170	130	0.060
NOV					
18...	1010	27	180	180	0.070
JAN 1994					
06...	1030	31	180	240	0.030
FEB					
17...	1280	33	200	300	0.060
MAR					
31...	1920	46	290	490	0.080
MAY					
11...	1220	25	230	240	0.050
JUN					
22...	502	7.9	100	52	0.020
AUG					
11...	530	11	96	74	--
SEP					
13...	622	23	120	100	0.030
<b>413547083481006 LU-26 NR HOLLAND OH-LV6 (LAT 41 35 47N LONG 083 48 10W)</b>					
JAN 1994					
06...	170	17	8.3	12	0.040
FEB					
17...	177	16	8.8	14	0.050
MAR					
31...	567	21	9.9	20	0.040
MAY					
11...	269	23	11	15	0.040
JUN					
22...	326	29	13	17	0.040
AUG					
11...	213	20	8.5	12	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413547083481105 LU-27 NR HOLLAND OH-LV5 (LAT 41 35 47N LONG 083 48 11W)</b>					
OCT 1993					
08...	--	93	3.2	6.3	<0.010
NOV					
18...	986	90	5.4	7.8	0.020
JAN 1994					
06...	625	110	4.1	4.3	<0.010
FEB					
17...	346	22	6.2	8.8	<0.010
MAR					
31...	643	91	17	5.6	<0.010
MAY					
11...	893	91	22	22	--
JUN					
22...	766	120	6.8	19	--
AUG					
11...	1080	170	8.4	7.9	--
SEP					
13...	1370	210	10	6.9	--
<b>413547083481201 LU-25 NR HOLLAND OH-LV1 (LAT 41 35 47N LONG 083 48 12W)</b>					
OCT 1993					
08...	--	--	--	39	0.020
NOV					
18...	518	81	8.7	42	0.020
JAN 1994					
06...	533	92	11	39	<0.010
FEB					
17...	646	88	5.3	83	0.030
MAR					
31...	551	87	11	48	0.010
MAY					
11...	529	12	11	42	--
JUN					
22...	691	110	8.6	19	--
AUG					
11...	564	99	7.1	52	--
SEP					
13...	515	83	7.0	41	--
<b>413547083481202 LU-25 NR HOLLAND OH-LV2 (LAT 41 35 47N LONG 083 48 12W)</b>					
OCT 1993					
08...	--	110	6.7	69	0.020
NOV					
18...	550	85	8.0	58	0.020
JAN 1994					
06...	579	89	7.4	58	0.020
FEB					
17...	719	85	36	110	0.050
MAR					
31...	615	92	11	71	0.040
MAY					
11...	621	92	11	68	--
JUN					
22...	601	100	6.6	62	--
AUG					
11...	611	100	5.7	74	--
SEP					
13...	617	120	5.8	77	--
<b>413547083481203 LU-25 NR HOLLAND OH-LV3 (LAT 41 35 47N LONG 083 48 12W)</b>					
OCT 1993					
08...	--	61	32	80	<0.010
NOV					
18...	695	--	--	120	0.020
JAN 1994					
06...	809	83	52	150	0.030
FEB					
17...	748	56	68	140	0.030
MAR					
31...	593	68	24	89	0.010
MAY					
11...	512	100	14	52	--
JUN					
22...	551	54	30	73	--
AUG					
11...	507	58	26	59	--
SEP					
13...	742	120	8.9	140	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413547083481204 LU-25 NR HOLLAND OH-LV4 (LAT 41 35 47N LONG 083 48 12W)</b>					
OCT 1993					
08...	--	17	100	56	0.020
NOV					
18...	--	35	64	81	0.010
JAN 1994					
06...	1050	--	--	230	0.030
FEB					
17...	1150	62	130	280	0.040
MAR					
31...	1690	55	250	430	0.050
MAY					
11...	752	100	86	140	--
JUN					
22...	728	42	92	130	--
AUG					
11...	493	49	44	55	--
SEP					
13...	702	90	28	140	--
<b>413547083481205 LU-25 NR HOLLAND OH-LV5 (LAT 41 35 47N LONG 083 48 12W)</b>					
OCT 1993					
08...	710	--	--	92	0.040
NOV					
18...	--	--	--	90	0.020
JAN 1994					
06...	1020	41	150	230	0.040
FEB					
17...	1450	63	200	360	0.060
MAR					
31...	850	42	96	150	0.040
MAY					
11...	1050	44	150	220	--
JUN					
22...	888	26	140	170	--
AUG					
11...	513	36	57	62	--
SEP					
13...	655	24	97	120	--
<b>413547083481206 LU-25 NR HOLLAND OH-LV6 (LAT 41 35 47N LONG 083 48 12W)</b>					
FEB 1994					
17...	58	--	--	2.5	0.010
<b>413547083481301 LU-22 NR HOLLAND OH-LV1 (LAT 41 35 47N LONG 083 48 13W)</b>					
OCT 1993					
08...	--	160	11	140	0.030
NOV					
18...	912	110	15	170	0.070
JAN 1994					
06...	852	140	16	150	0.020
FEB					
17...	677	100	18	92	0.030
MAR					
31...	571	96	15	68	0.010
MAY					
11...	582	92	10	57	--
JUN					
22...	577	98	9.3	57	--
AUG					
11...	591	93	10	61	--
SEP					
13...	568	92	11	59	--



**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413547083481302 LU-22 NR HOLLAND OH-LV2 (LAT 41 35 47N LONG 083 48 13W)</b>					
OCT 1993					
08...	--	140	8.1	110	0.030
NOV					
18...	978	150	12	200	0.070
JAN 1994					
06...	1060	170	13	220	0.030
FEB					
17...	915	140	24	170	0.050
MAR					
31...	643	97	17	72	0.030
MAY					
11...	608	94	18	62	--
JUN					
22...	594	97	13	59	--
AUG					
11...	577	87	14	63	--
SEP					
13...	630	91	16	88	--
<b>413547083481303 LU-22 NR HOLLAND OH-LV3 (LAT 41 35 47N LONG 083 48 13W)</b>					
OCT 1993					
08...	--	70	17	100	0.020
NOV					
18...	885	110	29	180	0.050
JAN 1994					
06...	864	130	18	170	0.030
FEB					
17...	827	120	15	150	0.030
MAR					
31...	615	88	14	66	0.040
MAY					
11...	547	82	13	54	--
JUN					
22...	524	79	13	48	--
AUG					
11...	1140	130	42	270	--
SEP					
13...	1740	130	180	470	--
<b>413547083481304 LU-22 NR HOLLAND OH-LV4 (LAT 41 35 47N LONG 083 48 13W)</b>					
OCT 1993					
08...	--	100	66	200	0.030
NOV					
18...	1410	90	140	310	0.050
JAN 1994					
06...	708	27	100	120	0.030
FEB					
17...	804	120	14	150	0.030
MAR					
31...	574	82	13	61	0.030
MAY					
11...	703	67	48	130	--
JUN					
22...	529	72	19	57	--
AUG					
11...	1000	80	80	240	--
SEP					
13...	2060	140	220	590	--
<b>413547083481305 LU-22 NR HOLLAND OH-LV5 (LAT 41 35 47N LONG 083 48 13W)</b>					
OCT 1993					
08...	--	61	170	290	0.040
NOV					
18...	1530	64	220	370	0.070
JAN 1994					
06...	822	26	130	150	0.030
FEB					
17...	424	17	65	44	0.020
MAR					
31...	552	71	27	66	0.020
MAY					
11...	804	30	120	170	--
JUN					
22...	832	55	89	170	--
AUG					
11...	1370	80	140	350	--
SEP					
13...	1900	80	290	450	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413549083481501 LU-21 NR HOLLAND OH-LV1 (LAT 41 35 49N LONG 083 48 15W)</b>					
OCT 1993					
08...	884	160	6.7	130	0.16
NOV					
18...	738	120	8.4	97	0.060
JAN 1994					
06...	754	130	8.5	99	0.040
FEB					
17...	780	130	6.7	110	0.13
MAR					
31...	784	130	7.8	98	0.050
MAY					
11...	808	130	7.3	110	--
JUN					
22...	807	130	8.0	110	--
AUG					
11...	799	130	8.9	110	--
SEP					
13...	759	130	8.1	110	--
<b>413549083481502 LU-21 NR HOLLAND OH-LV2 (LAT 41 35 49N LONG 083 48 15W)</b>					
OCT 1993					
08...	--	46	2.8	15	<0.010
NOV					
18...	494	77	4.3	52	0.030
JAN 1994					
06...	426	66	3.8	32	0.010
FEB					
17...	489	77	3.8	47	0.040
MAR					
31...	399	60	2.8	27	0.010
MAY					
11...	344	47	3.2	20	--
JUN					
22...	359	55	3.7	23	--
AUG					
11...	390	59	4.0	27	--
SEP					
13...	452	70	4.1	44	--
<b>413549083481503 LU-21 NR HOLLAND OH-LV3 (LAT 41 35 49N LONG 083 48 15W)</b>					
OCT 1993					
08...	550	33	2.5	5.5	<0.010
NOV					
18...	317	44	3.7	19	<0.010
JAN 1994					
06...	277	41	2.9	11	<0.010
FEB					
17...	296	43	2.6	14	0.020
MAR					
31...	274	40	2.1	10	<0.010
MAY					
11...	170	18	4.0	7.6	--
JUN					
22...	265	37	2.5	8.3	--
AUG					
11...	275	40	3.2	10	--
SEP					
13...	282	50	2.6	12	--
<b>413549083481504 LU-21 NR HOLLAND OH-LV4 (LAT 41 35 49N LONG 083 48 15W)</b>					
OCT 1993					
08...	--	23	2.7	3.5	<0.010
NOV					
18...	267	35	3.3	9.5	<0.010
JAN 1994					
06...	153	18	3.3	3.2	<0.010
FEB					
17...	232	33	1.9	7.0	<0.010
MAR					
31...	157	19	2.5	3.2	0.010
MAY					
11...	148	16	4.0	5.8	--
JUN					
22...	158	19	3.2	5.2	--
AUG					
11...	199	26	2.7	5.3	--
SEP					
13...	211	31	2.1	5.4	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>413549083481505 LU-21 NR HOLLAND OH-LV5 (LAT 41 35 49N LONG 083 48 15W)</b>					
OCT 1993					
08...	--	15	3.8	3.0	<0.010
NOV					
18...	142	16	3.8	3.8	<0.010
JAN 1994					
06...	133	15	3.8	3.0	<0.010
FEB					
17...	143	18	2.3	3.7	<0.010
MAR					
31...	158	20	2.9	3.5	<0.010
MAY					
11...	143	11	--	5.1	--
JUN					
22...	149	17	3.4	5.6	--
AUG					
11...	159	19	3.5	6.4	--
SEP					
13...	149	17	3.6	6.7	--
<b>415305080414201 AB-139 NR KINGSVILLE OH-L1 (LAT 41 53 05N LONG 080 41 42W)</b>					
OCT 1993					
05...	426	59	10	9.0	<0.010
NOV					
23...	395	--	--	4.2	<0.010
JAN 1994					
13...	538	93	6.3	4.1	<0.010
FEB					
15...	396	58	7.3	4.2	0.020
APR					
06...	322	43	8.2	5.2	<0.010
MAY					
17...	421	66	5.9	3.9	--
JUN					
28...	468	73	8.7	31	--
AUG					
09...	526	70	12	35	--
SEP					
21...	533	89	5.8	7.5	--
<b>415305080414202 AB-139 NR KINGSVILLE OH-L2 (LAT 41 53 05N LONG 080 41 42W)</b>					
OCT 1993					
05...	436	61	11	9.7	<0.010
NOV					
23...	391	55	5.5	6.7	0.020
JAN 1994					
13...	540	94	6.0	3.2	0.010
FEB					
15...	410	59	7.1	4.2	<0.010
APR					
06...	313	43	8.2	5.5	<0.010
MAY					
17...	385	65	5.8	3.6	--
JUN					
28...	390	14	7.6	25	--
AUG					
09...	555	87	9.6	30	--
SEP					
21...	513	86	6.0	6.9	--
<b>415305080414203 AB-139 NR KINGSVILLE OH-L3 (LAT 41 53 05N LONG 080 41 42W)</b>					
OCT 1993					
05...	--	--	--	9.2	<0.010
NOV					
23...	368	53	6.9	5.1	0.010
JAN 1994					
13...	482	90	5.9	3.4	<0.010
FEB					
15...	391	57	6.0	3.8	0.040
APR					
06...	321	44	6.5	4.7	<0.010
MAY					
17...	414	63	5.6	3.8	--
JUN					
28...	454	70	7.4	23	--
AUG					
09...	557	84	9.5	31	--
SEP					
21...	491	82	6.3	6.9	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415305080414204 AB-139 NR KINGSVILLE OH-L4 (LAT 41 53 05N LONG 080 41 42W)</b>					
NOV 1993					
23...	309	--	--	5.4	<0.010
JAN 1994					
13...	513	84	5.2	3.6	<0.010
FEB					
15...	392	57	5.4	4.0	<0.010
APR					
06...	341	--	--	5.4	<0.010
MAY					
17...	413	64	6.5	4.2	--
JUN					
28...	481	--	--	15	--
AUG					
09...	560	86	9.8	31	--
SEP					
21...	507	82	6.7	6.3	--
<b>415305080414205 AB-139 NR KINGSVILLE OH-L5 (LAT 41 53 05N LONG 080 41 42W)</b>					
APR 1994					
06...	267	35	6.2	5.2	<0.010
MAY					
17...	321	--	--	6.4	--
SEP					
21...	399	57	6.4	9.0	--
<b>415307080414201 AB-133 NR KINGSVILLE OH-L1 (LAT 41 53 07N LONG 080 41 42W)</b>					
OCT 1993					
05...	3980	190	610	1000	0.22
NOV					
23...	3960	210	640	1100	0.21
JAN 1994					
13...	1620	85	270	390	0.060
FEB					
15...	2040	160	190	490	0.12
APR					
06...	2450	97	350	670	0.080
MAY					
17...	2330	80	360	640	--
JUN					
28...	2720	130	420	740	--
AUG					
09...	2470	84	400	620	--
SEP					
21...	1690	58	260	410	--
<b>415307080414202 AB-133 NR KINGSVILLE OH-L2 (LAT 41 53 07N LONG 080 41 42W)</b>					
OCT 1993					
05...	4040	180	690	960	0.22
NOV					
23...	2000	80	300	480	0.090
JAN 1994					
13...	1360	44	220	300	0.040
FEB					
15...	1610	59	240	400	0.060
APR					
06...	2510	95	370	700	0.090
MAY					
17...	2310	79	360	640	--
JUN					
28...	2880	130	440	800	--
AUG					
09...	2490	90	390	650	--
SEP					
21...	1620	47	270	400	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415307080414203 AB-133 NR KINGSVILLE OH-L3 (LAT 41 53 07N LONG 080 41 42W)</b>					
OCT 1993					
05...	4000	180	610	1000	0.22
NOV					
23...	1940	110	290	460	0.080
JAN 1994					
13...	1340	42	220	310	0.050
FEB					
15...	1590	58	250	390	0.060
APR					
06...	2500	97	370	700	0.080
MAY					
17...	2290	89	370	620	--
JUN					
28...	2490	120	420	780	--
AUG					
09...	2500	89	390	650	--
SEP					
21...	1640	48	270	400	--
<b>415307080414204 AB-133 NR KINGSVILLE OH-L4 (LAT 41 53 07N LONG 080 41 42W)</b>					
OCT 1993					
05...	3760	180	610	940	0.20
NOV					
23...	2000	75	290	480	0.090
JAN 1994					
13...	1280	38	210	290	0.040
FEB					
15...	1580	51	240	400	0.060
APR					
06...	2490	93	380	650	0.090
MAY					
17...	2130	--	--	570	--
JUN					
28...	2770	130	420	760	--
AUG					
09...	2450	86	400	630	--
SEP					
21...	1580	46	260	370	--
<b>415307080414205 AB-133 NR KINGSVILLE OH-L5 (LAT 41 53 07N LONG 080 41 42W)</b>					
OCT 1993					
05...	3850	180	600	910	0.20
NOV					
23...	1610	--	--	480	0.060
JAN 1994					
13...	1240	36	200	280	0.040
FEB					
15...	1540	51	240	380	0.060
APR					
06...	2460	97	370	690	0.080
MAY					
17...	1960	65	310	520	--
JUN					
28...	2750	130	420	730	--
AUG					
09...	2350	81	380	590	--
SEP					
21...	1260	28	210	290	--
<b>415307080414206 AB-133 NR KINGSVILLE OH-L6 (LAT 41 53 07N LONG 080 41 42W)</b>					
FEB 1994					
15...	1480	48	230	370	0.010
APR					
06...	2470	92	370	680	0.090
MAY					
17...	1780	44	260	450	--
JUN					
28...	2770	--	--	710	--
AUG					
09...	2160	--	--	560	--
SEP					
21...	1040	23	180	220	--



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415308080414301 AB-135 NR KINGSVILLE OH-L1 (LAT 41 53 08N LONG 080 41 43W)</b>					
OCT 1993					
05...	1280	120	110	250	0.040
NOV					
23...	2010	--	--	520	0.11
JAN 1994					
13...	1510	110	150	340	0.060
FEB					
15...	1220	98	100	250	0.060
APR					
06...	1440	110	140	310	0.080
MAY					
17...	1070	100	100	280	--
JUN					
28...	1160	97	100	230	--
AUG					
09...	1260	--	--	270	--
SEP					
21...	1240	100	110	260	--
<b>415308080414302 AB-135 NR KINGSVILLE OH-L2 (LAT 41 53 08N LONG 080 41 43W)</b>					
OCT 1993					
05...	--	120	120	260	0.070
NOV					
23...	2010	140	210	510	0.11
JAN 1994					
13...	1280	100	120	270	0.050
FEB					
15...	1180	95	99	240	0.070
APR					
06...	1460	110	140	310	0.080
MAY					
17...	693	98	110	260	--
JUN					
28...	1100	110	99	240	--
AUG					
09...	1240	100	120	260	--
SEP					
21...	1140	98	100	240	--
<b>415308080414303 AB-135 NR KINGSVILLE OH-L3 (LAT 41 53 08N LONG 080 41 43W)</b>					
OCT 1993					
05...	1420	120	130	290	0.070
NOV					
23...	1980	180	200	490	0.11
JAN 1994					
13...	1210	99	120	250	0.050
FEB					
15...	1180	96	98	240	0.060
APR					
06...	1410	110	130	320	0.080
MAY					
17...	643	97	100	250	--
JUN					
28...	1160	96	100	240	--
AUG					
09...	1230	100	120	260	--
SEP					
21...	1160	99	100	240	--
<b>415308080414304 AB-135 NR KINGSVILLE OH-L4 (LAT 41 53 08N LONG 080 41 43W)</b>					
OCT 1993					
05...	1380	120	130	290	0.070
NOV					
23...	1930	160	200	480	0.11
JAN 1994					
13...	1180	94	110	240	0.050
FEB					
15...	1160	96	100	230	0.070
APR					
06...	1410	110	130	300	0.070
MAY					
17...	1150	95	100	250	--
JUN					
28...	1100	98	97	240	--
AUG					
09...	1220	--	--	270	--
SEP					
21...	1140	95	110	230	--

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415308080414305 AB-135 NR KINGSVILLE OH-L5 (LAT 41 53 08N LONG 080 41 43W)</b>					
OCT 1993					
05...	1170	120	90	220	0.060
NOV					
23...	1580	130	130	330	0.090
JAN 1994					
13...	1470	110	140	320	0.070
FEB					
15...	1180	89	100	240	0.060
APR					
06...	1200	97	100	240	0.060
MAY					
17...	1220	110	110	270	--
JUN					
28...	1090	94	95	230	--
AUG					
09...	1130	100	100	220	--
SEP					
21...	1210	110	100	250	--
<b>415308080414306 AB-135 NR KINGSVILLE OH-L6 (LAT 41 53 08N LONG 080 41 43W)</b>					
OCT 1993					
05...	1080	110	82	190	0.060
JAN 1994					
13...	1630	120	160	380	0.070
FEB					
15...	1190	95	100	240	0.060
APR					
06...	1200	100	100	240	0.060
MAY					
17...	1270	110	110	280	--
JUN					
28...	1050	99	100	230	--
AUG					
09...	1110	94	100	230	--
SEP					
21...	1210	110	100	250	--
<b>415309080414301 AB-136 NR KINGSVILLE OH-L1 (LAT 41 53 09N LONG 080 41 43W)</b>					
OCT 1993					
05...	1590	56	210	350	0.070
NOV					
23...	1650	87	210	400	0.080
JAN 1994					
13...	1510	76	200	340	0.080
FEB					
15...	1550	77	200	370	0.080
APR					
06...	1560	71	210	370	0.070
MAY					
17...	1520	85	200	360	--
JUN					
28...	1640	84	220	360	--
AUG					
09...	1690	84	260	380	--
SEP					
21...	1700	79	250	430	--
<b>415309080414302 AB-136 NR KINGSVILLE OH-L2 (LAT 41 53 09N LONG 080 41 43W)</b>					
OCT 1993					
05...	1610	82	210	350	0.070
NOV					
23...	1640	87	210	400	0.080
JAN 1994					
13...	1530	76	200	340	0.080
FEB					
15...	1540	76	200	360	0.080
APR					
06...	1560	75	210	380	0.070
MAY					
17...	1550	93	210	350	--
JUN					
28...	1630	82	220	370	--
AUG					
09...	1720	82	250	400	--
SEP					
21...	1730	83	250	430	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued**

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415309080414303 AB-136 NR KINGSVILLE OH-L3 (LAT 41 53 09N LONG 080 41 43W)</b>					
OCT 1993					
05...	1600	83	220	350	0.070
NOV					
23...	1620	85	210	380	0.070
JAN 1994					
13...	1500	78	200	340	0.060
FEB					
15...	1550	75	200	360	0.070
APR					
06...	1540	72	210	360	0.070
MAY					
17...	1540	86	200	340	--
JUN					
28...	1610	84	220	370	--
AUG					
09...	1730	78	250	390	--
SEP					
21...	1710	82	250	420	--
<b>415309080414304 AB-136 NR KINGSVILLE OH-L4 (LAT 41 53 09N LONG 080 41 43W)</b>					
OCT 1993					
05...	1620	84	220	360	0.070
NOV					
23...	1600	--	--	390	0.070
JAN 1994					
13...	1490	74	200	330	0.080
FEB					
15...	1530	75	200	360	0.070
APR					
06...	1530	73	210	360	0.070
MAY					
17...	--	82	200	350	--
JUN					
28...	1490	85	210	350	--
AUG					
09...	1700	83	250	390	--
SEP					
21...	1700	--	--	400	--
<b>415309080414305 AB-136 NR KINGSVILLE OH-L5 (LAT 41 53 09N LONG 080 41 43W)</b>					
OCT 1993					
05...	1600	85	220	350	0.070
NOV					
23...	1600	--	--	390	0.070
JAN 1994					
13...	1460	75	190	330	0.060
FEB					
15...	1500	73	200	350	0.080
APR					
06...	1520	75	210	370	0.070
MAY					
17...	1520	82	200	370	--
JUN					
28...	1600	83	220	360	--
AUG					
09...	1690	81	250	380	--
SEP					
21...	1680	--	--	410	--
<b>415309080414306 AB-136 NR KINGSVILLE OH-L6 (LAT 41 53 09N LONG 080 41 43W)</b>					
OCT 1993					
05...	1370	78	190	290	0.060
JAN 1994					
13...	1450	80	180	320	0.040
FEB					
15...	1460	79	180	320	0.11
APR					
06...	1440	79	190	330	0.11
MAY					
17...	1050	82	160	300	--
JUN					
28...	1410	85	180	310	--
AUG					
09...	1380	78	180	310	--
SEP					
21...	1360	82	200	330	--

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415309080414401 AB-138 NR KINGSVILLE OH-L1 (LAT 41 53 09N LONG 080 41 44W)</b>					
OCT 1993					
05...	765	100	32	110	0.040
NOV					
23...	884	85	55	150	0.050
JAN 1994					
13...	677	65	52	110	0.020
FEB					
15...	675	62	53	100	0.040
APR					
06...	643	60	46	97	0.030
MAY					
17...	593	49	42	88	--
JUN					
28...	569	65	30	70	0.030
AUG					
09...	581	66	34	73	--
SEP					
21...	617	59	45	89	0.030
<b>415309080414402 AB-138 NR KINGSVILLE OH-L2 (LAT 41 53 09N LONG 080 41 44W)</b>					
OCT 1993					
05...	814	99	33	120	0.050
NOV					
23...	835	86	49	140	0.050
JAN 1994					
13...	677	70	40	99	0.030
FEB					
15...	647	65	40	92	0.040
APR					
06...	588	60	38	78	0.020
MAY					
17...	541	57	33	68	0.030
JUN					
28...	570	68	25	65	0.030
AUG					
09...	585	65	27	68	--
SEP					
21...	579	64	31	73	0.030
<b>415309080414403 AB-138 NR KINGSVILLE OH-L3 (LAT 41 53 09N LONG 080 41 44W)</b>					
OCT 1993					
05...	843	130	36	130	0.050
NOV					
23...	790	85	41	120	0.040
JAN 1994					
13...	631	69	34	85	0.030
FEB					
15...	638	63	38	90	0.070
APR					
06...	607	62	41	83	0.030
MAY					
17...	531	57	28	58	0.030
JUN					
28...	563	64	23	70	0.030
AUG					
09...	553	67	21	56	--
SEP					
21...	551	63	24	63	0.020
<b>415309080414404 AB-138 NR KINGSVILLE OH-L4 (LAT 41 53 09N LONG 080 41 44W)</b>					
OCT 1993					
05...	801	110	28	120	0.050
NOV					
23...	744	89	52	130	0.040
JAN 1994					
13...	710	66	55	110	0.040
FEB					
15...	748	64	65	130	0.030
APR					
06...	757	64	64	130	0.030
MAY					
17...	516	48	31	64	0.030
JUN					
28...	477	55	18	46	0.020
AUG					
09...	507	59	25	56	--
SEP					
21...	587	58	39	87	0.020

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415309080414405 AB-138 NR KINGSVILLE OH-L5 (LAT 41 53 09N LONG 080 41 44W)</b>					
OCT 1993					
05...	525	55	32	62	0.020
JAN 1994					
13...	589	55	42	79	0.040
FEB					
15...	560	55	35	79	0.030
MAY					
17...	319	50	40	43	0.020
<b>415309080414406 AB-138 NR KINGSVILLE OH-L6 (LAT 41 53 09N LONG 080 41 44W)</b>					
OCT 1993					
05...	627	60	49	85	0.030
NOV					
23...	959	78	92	180	0.040
JAN 1994					
13...	806	67	76	140	0.040
FEB					
15...	805	62	69	150	0.030
APR					
06...	757	61	73	130	0.030
MAY					
17...	693	49	56	120	0.040
JUN					
28...	617	51	54	97	0.030
AUG					
09...	674	61	54	110	--
SEP					
21...	656	55	56	31	0.030
<b>415310080414401 AB-137 NR KINGSVILLE OH-L1 (LAT 41 53 10N LONG 080 41 44W)</b>					
NOV 1993					
23...	890	94	59	110	0.040
JAN 1994					
13...	666	87	49	95	0.030
FEB					
15...	810	83	51	98	0.040
APR					
06...	760	77	50	95	0.030
MAY					
17...	755	84	49	89	--
JUN					
28...	721	85	47	110	--
AUG					
09...	810	94	45	93	--
SEP					
21...	792	94	46	91	--
<b>415310080414402 AB-137 NR KINGSVILLE OH-L2 (LAT 41 53 10N LONG 080 41 44W)</b>					
OCT 1993					
05...	792	88	49	110	0.040
NOV					
23...	869	--	--	99	0.030
JAN 1994					
13...	792	86	47	100	0.040
FEB					
15...	791	82	50	100	0.050
APR					
06...	746	74	49	95	0.080
MAY					
17...	749	85	47	91	--
JUN					
28...	764	85	47	100	--
AUG					
09...	800	87	47	110	--
SEP					
21...	760	94	45	89	--



**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 THROUGH SEPTEMBER 1994--Continued

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	CALCIUM DIS- SOLVED (MG/L AS CA)	SODIUM, DIS- SOLVED (MG/L AS NA)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	BROMIDE DIS- SOLVED (MG/L AS BR)
<b>415310080414403 AB-137 NR KINGSVILLE OH-L3 (LAT 41 53 10N LONG 080 41 44W)</b>					
OCT 1993					
05...	--	90	50	110	0.050
NOV					
23...	843	92	54	110	0.040
JAN 1994					
13...	785	86	47	100	0.040
FEB					
15...	787	80	50	98	0.040
APR					
06...	--	--	--	--	--
MAY					
17...	729	85	47	92	--
JUN					
28...	747	19	45	110	--
AUG					
09...	749	80	47	110	--
SEP					
21...	764	93	45	90	--
<b>415310080414404 AB-137 NR KINGSVILLE OH-L4 (LAT 41 53 10N LONG 080 41 44W)</b>					
OCT 1993					
05...	784	91	49	110	0.040
NOV					
23...	936	100	63	100	0.040
JAN 1994					
13...	721	86	49	97	0.040
FEB					
15...	782	81	51	100	0.040
APR					
06...	764	76	50	93	0.030
MAY					
17...	739	90	47	93	--
JUN					
28...	716	85	45	100	--
AUG					
09...	798	85	48	100	--
SEP					
21...	811	88	45	95	--
<b>415310080414405 AB-137 NR KINGSVILLE OH-L5 (LAT 41 53 10N LONG 080 41 44W)</b>					
OCT 1993					
05...	768	91	48	110	0.040
NOV					
23...	934	110	63	110	0.040
JAN 1994					
13...	733	90	47	100	0.030
FEB					
15...	792	83	50	99	0.040
APR					
06...	759	74	48	95	0.030
MAY					
17...	710	86	47	89	--
JUN					
28...	716	91	44	98	--
AUG					
09...	761	88	47	110	--
SEP					
21...	789	88	45	91	--
<b>415310080414406 AB-137 NR KINGSVILLE OH-L6 (LAT 41 53 10N LONG 080 41 44W)</b>					
OCT 1993					
05...	--	90	47	110	0.040
NOV					
23...	939	100	66	100	0.040
JAN 1994					
13...	783	87	48	100	0.040
FEB					
15...	789	82	50	100	0.030
APR					
06...	797	83	53	92	0.050
MAY					
17...	812	120	48	80	--
JUN					
28...	768	100	44	--	--
AUG					
09...	811	88	47	100	--
SEP					
21...	823	92	46	91	--

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

SAMPLE ANALYSES FROM ONE WELL AT EACH SITE  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE LAB (STAND- ARDS UNITS)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	CYANIDE DIS- SOLVED (MG/L AS CN)
<b>PICKAWAY COUNTY SITE # 6 (SR 104)</b>				
<b>393541083000801 PK-50 NR CIRCLEVILLE OH-L1 (LAT 39 35 41N LONG 083 00 08W)</b>				
JAN 1994				
03...	736	7.4	454	<0.01
MAR				
28...	838	7.3	544	<0.01
<b>393541083000802 PK-50 NR CIRCLEVILLE OH-L2 (LAT 39 35 41N LONG 083 00 08W)</b>				
JAN 1994				
03...	714	7.4	434	<0.01
<b>393541083000803 PK-50 NR CIRCLEVILLE OH-L3 (LAT 39 35 41N LONG 083 00 08W)</b>				
MAR 1994				
28...	699	7.4	428	<0.01
<b>393541083000804 PK-50 NR CIRCLEVILLE OH-L4 (LAT 39 35 41N LONG 083 00 08W)</b>				
JUN 1994				
20...	872	7.5	517	<0.01
<b>393541083000805 PK-50 NR CIRCLEVILLE OH-L5 (LAT 39 35 41N LONG 083 00 08W)</b>				
MAR 1994				
28...	762	7.6	477	<0.01
<b>CLARK COUNTY SITE # 8 (SR 4)</b>				
<b>395859083440501 CL-140 NR SPRINGFIELD OH-L1 (LAT 39 58 59N LONG 083 44 05W)</b>				
JAN 1994				
07...	884	7.2	508	<0.01
MAR				
30...	866	7.1	497	<0.01
<b>395859083440502 CL-140 NR SPRINGFIELD OH-L2 (LAT 39 58 59N LONG 083 44 05W)</b>				
JAN 1994				
07...	895	7.2	517	<0.01
<b>395859083440503 CL-140 NR SPRINGFIELD OH-L3 (LAT 39 58 59N LONG 083 44 05W)</b>				
MAR 1994				
30...	865	7.2	497	<0.01
JUN				
23...	808	7.1	477	<0.01
<b>395859083440505 CL-140 NR SPRINGFIELD OH-L5 (LAT 39 58 59N LONG 083 44 05W)</b>				
MAR 1994				
30...	850	7.1	479	<0.01
<b>CHAMPAIGN COUNTY SITE #7 (SR 29)</b>				
<b>400947083480001 CH-44 NR URBANA OH-LV1 (LAT 40 09 47N LONG 083 48 00W)</b>				
MAR 1994				
29...	1030	7.1	596	<0.01
<b>400947083480003 CH-44 NR URBANA OH-LV3 (LAT 40 09 47N LONG 083 48 00W)</b>				
JAN 1994				
05...	950	7.4	574	<0.01
MAR				
29...	997	7.3	599	<0.01
JUN				
21...	986	7.2	513	<0.01

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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SAMPLE ANALYSES FROM ONE WELL AT EACH SITE--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE LAB (STAND- ARD UNITS)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	CYANIDE DIS- SOLVED (MG/L AS CN)
------	--	---	--	--

## CHAMPAIGN COUNTY SITE #7 (SR 29)--Continued

400947083480004 CH-44 NR URBANA OH-LV4 (LAT 40 09 47N LONG 083 48 00W)

JAN 1994				
05...	1120	7.4	716	<0.01
MAR				
29...	1190	7.3	756	<0.01

## ASHLAND COUNTY SITE # 3 (SR 3)

403635082152603 AS-49 NR LOUDONVILLE OH-L3 (LAT 40 36 35N LONG 082 15 26W)

JAN 1994				
12...	803	7.5	471	<0.01
APR				
04...	775	7.2	443	<0.01
JUN				
27...	825	7.3	449	<0.01

403635082152604 AS-49 NR LOUDONVILLE OH-L4 (LAT 40 36 35N LONG 082 15 26W)

JAN 1994				
12...	799	7.3	469	<0.01
APR				
04...	742	7.4	412	<0.01

403635082152605 AS-49 NR LOUDONVILLE OH-L5 (LAT 40 36 35N LONG 082 15 26W)

APR 1994				
04...	675	7.4	371	<0.01

## RICHLAND COUNTY SITE # 4 (SR 97)

403923082325701 R-18 NR LEXINGTON OH-LV1 (LAT 40 39 23N LONG 082 32 57W)

JAN 1994				
11...	459	7.2	252	<0.01
APR				
05...	474	7.4	256	<0.01

403923082325702 R-18 NR LEXINGTON OH-LV2 (LAT 40 39 23N LONG 082 32 57W)

JAN 1994				
11...	460	7.2	247	<0.01

403923082325703 R-18 NR LEXINGTON OH-LV3 (LAT 40 39 23N LONG 082 32 57W)

APR 1994				
05...	553	7.5	313	<0.01

403923082325704 R-18 NR LEXINGTON OH-LV4 (LAT 40 39 23N LONG 082 32 57W)

JUN 1994				
30...	538	7.4	308	<0.01

403923082325705 R-18 NR LEXINGTON OH-LV5 (LAT 40 39 23N LONG 082 32 57W)

APR 1994				
05...	548	7.3	323	<0.01

## PORTAGE COUNTY SITE # 5 (SR 14)

411137081172401 PO-117 NR RAVENNA OH-LV1 (LAT 41 11 37N LONG 081 17 24W)

APR 1994				
07...	1170	7.4	650	<0.01

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

SAMPLE ANALYSES FROM ONE WELL AT EACH SITE--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE LAB (STAND- ARD UNITS)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	CYANIDE DIS- SOLVED (MG/L AS CN)
PORTAGE COUNTY SITE # 5 (SR 14)--Continued				
411137081172403 PO-117 NR RAVENNA OH-LV3 (LAT 41 11 37N LONG 081 17 24W)				
APR 1994				
07...	774	7.7	428	<0.01
JUN				
29...	948	7.4	526	<0.01
411137081172405 PO-117 NR RAVENNA OH-LV5 (LAT 41 11 37N LONG 081 17 24W)				
JAN 1994				
14...	983	7.6	558	<0.01
APR				
07...	644	7.9	348	<0.01
411137081172406 PO-117 NR RAVENNA OH-LV6 (LAT 41 11 37N LONG 081 17 24W)				
JAN 1994				
14...	680	7.6	389	<0.01
LUCAS COUNTY SITE # 2 (SR 2)				
413547083481001 LU-26 NR HOLLAND OH-LV1 (LAT 41 35 47N LONG 083 48 10W)				
MAR 1994				
31...	581	7.4	378	<0.01
413547083481003 LU-26 NR HOLLAND OH-LV3 (LAT 41 35 47N LONG 083 48 10W)				
JAN 1994				
06...	619	7.9	341	<0.01
MAR				
31...	1070	7.6	612	<0.01
JUN				
22...	612	7.7	364	<0.01
413547083481004 LU-26 NR HOLLAND OH-LV4 (LAT 41 35 47N LONG 083 48 10W)				
JAN 1994				
06...	2170	7.2	1180	<0.01
413547083481005 LU-26 NR HOLLAND OH-LV5 (LAT 41 35 47N LONG 083 48 10W)				
MAR 1994				
31...	1920	7.8	1010	<0.01
ASHTABULA COUNTY SITE # 1 (SR 84)				
415309080414401 AB-138 NR KINGSVILLE OH-L1 (LAT 41 53 09N LONG 080 41 44W)				
APR 1994				
06...	643	7.7	358	<0.01
415309080414403 AB-138 NR KINGSVILLE OH-L3 (LAT 41 53 09N LONG 080 41 44W)				
JAN 1994				
13...	631	7.6	335	<0.01
APR				
06...	607	7.7	333	<0.01
JUN				
28...	563	7.5	320	<0.01
415309080414404 AB-138 NR KINGSVILLE OH-L4 (LAT 41 53 09N LONG 080 41 44W)				
JAN 1994				
13...	710	7.5	385	<0.01
415309080414406 AB-138 NR KINGSVILLE OH-L6 (LAT 41 53 09N LONG 080 41 44W)				
APR 1994				
06...	757	7.5	404	<0.01

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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## ADDITIONAL SAMPLE ANALYSES WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

PICKAWAY COUNTY SITE #6 (SR 104)  
393541083001000 - PK-47 NR CIRCLEVILLE OH

### COMPREHENSIVE SAMPLE ANALYSIS FROM ONE WELL AT THIS SITE

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JAN 03...	--	630	695	7.4	7.2	--	0.1	350	90	30	3.7	2
JUN 20...	9.71	698	724	7.1	7.2	13.5	0.1	380	99	31	6.2	3
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JAN 03...	0.1	2.0	--	285	64	17	0.10	0.030	7.5	410	398	0.030
JUN 20...	0.1	1.9	291	296	67	20	0.10	0.040	7.9	421	419	0.020
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JAN 03...	2.70	0.040	<0.20	<0.050	<0.010	<1	75	<0.5	30	<1.0	<1	<3
JUN 20...	1.90	0.040	<0.20	<0.010	<0.010	<1	78	<0.5	40	<1.0	<1	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JAN 03...	<10	10	10	<4	16	<0.1	<10	140	<6	13	0.6	<0.01
JUN 20...	<10	5	<10	5	27	0.1	<10	140	<6	14	0.6	<0.01



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

CLARK COUNTY SITE #8 (SR 4)  
395859083440800 - CL-139 NR SPRINGFIELD OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM TWO NEIGHBORING WELLS

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	
JAN 07...	24.29	750	848	6.7	7.0	0.7	430	110	38	7.0	3	
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JAN 07...	2.1	384	34	18	0.20	0.030	11	485	489	<0.010	8.70	0.030
DATE	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	
JAN 07...	<0.20	<0.010	<0.010	<1	130	<0.5	20	<1.0	<1	<3	<10	
DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)	
JAN 07...	<3	<10	<4	1	<0.1	<10	170	<6	5	0.6	<0.01	

395859083440600 CL-137 NR SPRINGFIELD OH

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JUN 23...	21.47	830	853	7.0	7.0	12.0	0.3	410	100	38	10	5
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JUN 23...	0.2	1.9	361	324	33	19	0.30	0.050	10	490	444	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JUN 23...	8.30	0.010	<0.20	<0.010	<0.010	<1	120	<0.5	20	<1.0	<1	<3

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

395859083440600 CL-137 NR SPRINGFIELD OH--Continued

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JUN 23...	<10	6	<10	<4	1	<0.1	<10	200	<6	27	0.6	<0.01

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

CHAMPAIGN COUNTY SITE #7 (SR 29)  
400948083480200 - CH-41 NR URBANA OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM ONE WELL AT THIS SITE

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JAN 05...	--	830	891	7.3	7.1	--	0.5	400	100	36	21	10
JUN 21...	12.03	775	827	7.1	7.1	14.5	0.3	400	100	36	11	6
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JAN 05...	0.5	3.8	--	339	97	38	0.30	0.040	7.9	538	512	0.020
JUN 21...	0.2	3.3	388	279	100	21	0.30	0.040	7.7	506	450	0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JAN 05...	0.930	0.040	<0.20	0.040	<0.010	<1	78	<0.5	30	2.0	<1	<3
JUN 21...	0.570	0.020	0.20	<0.010	<0.010	<1	71	<0.5	30	<1.0	<1	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JAN 05...	<10	68	<10	<4	120	<0.1	20	390	<6	8	1.1	<0.01
JUN 21...	<10	84	<10	5	140	<0.1	<10	400	<6	11	0.9	<0.01

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

ASHLAND COUNTY SITE #3 (SR 3)  
403635082152500 - AS-44 NR LOUDONVILLE OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM ONE WELL AT THIS SITE

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JAN 12...	5.05	572	606	7.1	6.9	--	0.3	250	66	21	26	18
JUN 27...	5.44	660	677	6.9	6.7	13.5	0.2	260	68	21	35	23
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, CARBON- ATE IT-FLD - (MG/L - CACO3)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JAN 12...	0.7	1.2	--	217	51	32	0.10	0.040	11	341	340	<0.010
JUN 27...	1	1.4	221	218	51	54	0.20	0.060	11	392	374	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JAN 12...	0.064	0.080	<0.20	0.010	<0.010	<1	55	<0.5	50	<1.0	<1	<3
JUN 27...	0.063	0.070	0.20	<0.010	<0.010	<1	61	<0.5	50	<1.0	<1	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JAN 12...	<10	<3	<10	<4	1200	<0.1	<10	160	<6	7	1.3	<0.01
JUN 27...	<10	<3	<10	<4	1400	<0.1	<10	160	<6	4	0.8	<0.01

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

RICHLAND COUNTY SITE #4 (SR 97)  
403923082325600 - R-15 NR LEXINGTON OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM TWO NEIGHBORING WELLS

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
JAN 11...	16.33	370	391	7.1	7.1	0.1	120	32	9.9	24	30	1
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JAN 11...	1.3	100	27	38	<0.10	0.020	8.8	214	208	<0.010	1.60	0.020
DATE	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	
JAN 11...	<0.20	0.010	0.010	<1	22	<0.5	20	<1.0	<1	<3	<10	
DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)	
JAN 11...	41	<10	<4	7	<0.1	<10	60	<6	7	0.9	<0.01	

403923082325900 - R-17 NR LEXINGTON OH

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JUN 30...	13.92	417	411	7.1	7.0	12.5	<0.1	160	44	13	9.9	12
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JUN 30...	0.3	1.1	116	111	20	44	0.10	0.040	10	235	215	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JUN 30...	1.30	0.010	<0.20	<0.010	<0.010	<1	16	<0.5	20	<1.0	<1	<3



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

403923082325900 - R-17 NR LEXINGTON OH--Continued

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JUN 30...	<10	10	<10	<4	10	<0.1	<10	170	<6	13	0.2	<0.01

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

PORTAGE COUNTY SITE #5 (SR 14)  
411138081172400 - PO-115 NR RAVENNA OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM ONE WELL AT THIS SITE

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JAN 12...	7.29	1020	1030	7.3	7.4	--	<0.1	130	46	4.6	160	72
JUN 29...	--	3500	3740	7.0	6.9	13.0	0.2	390	130	16	600	77
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JAN 12...	6	2.4	--	159	40	190	0.20	0.040	5.0	578	548	<0.010
JUN 29...	13	5.1	150	153	84	1100	0.10	0.17	5.4	2300	2040	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JAN 12...	0.840	0.020	<0.20	0.030	0.040	<1	23	0.5	60	<1.0	<1	<3
JUN 29...	0.960	0.020	<0.20	0.010	0.010	<1	120	<2	50	4.0	<1	<9
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JAN 12...	<10	8	<10	<4	2	<0.1	<10	130	<6	5	2.9	0.01
JUN 29...	<30	10	<30	<12	7	<0.1	<30	540	<18	<9	1.7	<0.01

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

LUCAS COUNTY SITE #2 (SR 2)  
413547083481300 - LJ-22 NR HOLLAND OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM ONE WELL AT THIS SITE

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JAN 06...	7.67	685	718	7.5	7.7	--	0.1	170	57	7.1	69	46
JUN 22...	6.30	818	879	7.6	7.5	14.5	<0.1	210	67	10	72	42
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JAN 06...	2	2.3	--	107	42	130	0.20	0.020	7.8	396	384	<0.010
JUN 22...	2	3.2	79	84	45	170	<0.10	0.050	6.7	504	430	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JAN 06...	0.720	0.080	<0.20	<0.010	0.030	1	53	<0.5	20	<1.0	<1	4
JUN 22...	1.00	0.070	0.30	<0.010	<0.010	1	59	<0.5	20	<1.0	<1	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JAN 06...	<10	340	<10	<4	120	<0.1	<10	180	<6	3	1.5	<0.01
JUN 22...	<10	360	<10	<4	82	<0.1	10	410	<6	9	1.5	<0.01

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

ADDITIONAL SAMPLE ANALYSES--Continued  
WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

ASHTABULA COUNTY SITE #1 (SR 84)  
415307080414200 - AB-133 NR KINGSVILLE OH

## COMPREHENSIVE SAMPLE ANALYSIS FROM ONE WELL AT THIS SITE

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	ACIDITY (MG/L AS H)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
JAN 13...	6.69	1960	2050	7.2	7.2	--	0.2	260	79	15	290	71
JUN 28...	7.16	2730	2780	7.3	7.2	13.0	0.3	360	110	20	400	71
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CACO3)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
JAN 13...	8	1.7	--	198	59	480	<0.10	0.090	8.1	1090	1050	<0.010
JUN 28...	9	1.7	225	219	60	740	0.10	0.13	8.4	1580	1470	<0.010
DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
JAN 13...	0.440	0.020	<0.20	<0.010	<0.010	<1	75	<0.5	30	<1.0	<1	<3
JUN 28...	0.410	<0.010	<0.20	<0.010	<0.010	<1	110	<2	40	<3.0	<1	<9
DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CYANIDE DIS- SOLVED (MG/L AS CN)
JAN 13...	<10	12	<10	5	.9	--	<10	160	<6	9	1.7	<0.01
JUN 28...	<30	13	40	<12	<3	<0.1	<30	240	<18	12	1.4	<0.01

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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The following table lists ground-water level measurements from wells located throughout the eight sites in the "Effects of Highway Deicing Chemicals" study area. The water level in these wells is measured periodically, however, they are not part of the routine water-quality network.

## GROUND-WATER LEVELS

SITE-ID	LOCAL WELL NUMBER	DEPTH OF WELL (FEET)	AQUIFER CODE	WATER- LEVEL DATE	WATER LEVEL (FEET)	ALTITUDE OF LAND SURFACE (FEET)
393540083001200	PK-46 NR CIRCLEVILLE OH	34.6	112OTSH	10-01-93	11.74	679.16
				11-15-93	11.94	
				02-14-94	10.08	
				03-28-94	9.37	
				05-09-94	8.18	
				06-20-94	9.44	
				08-02-94	10.17	
				09-19-94	11.01	
393541083000700	PK-44 NR CIRCLEVILLE OH	38	112OTSH	10-01-93	13.27	679.54
				11-15-93	13.40	
				02-14-94	11.54	
				03-28-94	10.91	
				05-09-94	9.91	
				09-19-94	12.52	
393541083000800	PK-50 NR CIRCLEVILLE OH	34.3	112OTSH	10-01-93	12.99	679.62
				11-15-93	13.15	
				02-14-94	11.27	
				03-28-94	10.45	
				05-09-94	9.34	
				06-20-94	10.56	
				08-02-94	11.43	
393541083000900	PK-49 NR CIRCLEVILLE OH	35.6	112OTSH	10-01-93	12.64	679.51
				11-15-93	12.74	
				02-14-94	10.92	
				03-28-94	10.23	
				05-09-94	9.16	
				06-20-94	10.37	
				08-02-94	11.07	
393541083001000	PK-47 NR CIRCLEVILLE OH	36.1	112OTSH	10-01-93	11.44	678.37
				11-15-93	11.77	
				02-14-94	9.87	
				03-28-94	9.27	
				05-09-94	8.02	
				06-20-94	9.25	
				08-02-94	10.08	
393541083001100	PK-48 NR CIRCLEVILLE OH	28.0	112OTSH	10-01-93	11.85	678.50
				11-15-93	12.02	
				02-14-94	10.19	
				03-28-94	9.53	
				05-09-94	8.45	
				06-20-94	9.64	
				08-02-94	10.32	
393541083001200	PK-53 NR CIRCLEVILLE OH	35.6	112OTSH	10-01-93	11.10	678.50
				11-15-93	11.23	
				02-14-94	9.44	
				03-28-94	8.67	
				05-09-94	7.51	
				06-20-94	8.80	
				08-02-94	9.50	
				09-19-94	10.31	



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

## **GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
393542083000500	PK-52 NR CIRCLEVILLE OH	36.2	112OTSH	10-01-93	12.94	679.58
				11-15-93	13.06	
				02-14-94	11.22	
				03-28-94	10.57	
				05-09-94	9.54	
				06-20-94	10.73	
				08-02-94	11.42	
				09-19-94	12.24	
393542083000700	PK-51 NR CIRCLEVILLE OH	35.5	112OTSH	10-01-93	12.85	679.63
				11-15-93	12.95	
				02-14-94	11.14	
				03-28-94	10.47	
				05-09-94	9.41	
				06-20-94	10.62	
				08-02-94	11.31	
				09-19-94	12.11	
395854083440500	CL-132 NR SPRINGFIELD OH	27.3	112OTSH	11-11-93	12.97	1022.59
				02-18-94	13.11	
				03-30-94	13.00	
				05-12-94	10.68	
				06-23-94	10.80	
				08-01-94	10.77	
395858083440100	CL-133 NR SPRINGFIELD OH	22.3	112OTSH	10-01-93	12.84	1024.24
				11-15-93	14.48	
				02-18-94	14.63	
				03-30-94	14.54	
				05-12-94	12.24	
				06-23-94	12.38	
				08-01-94	12.32	
395859083440200	CL-141 NR SPRINGFIELD OH	37.5	112OTSH	10-01-93	19.30	1030.70
				11-15-93	20.96	
				01-07-94	21.21	
				02-18-94	21.07	
				03-30-94	20.99	
				05-12-94	18.70	
				06-23-94	18.85	
				08-01-94	18.79	
395859083440300	CL-143 NR SPRINGFIELD OH	40.0	112OTSH	10-01-93	18.07	1029.45
				11-15-93	19.73	
				01-07-94	20.23	
				02-18-94	19.85	
				03-30-94	19.77	
				05-12-94	17.48	
				06-23-94	17.61	
				08-01-94	17.54	
395859083440400	CL-142 NR SPRINGFIELD OH	35.9	112OTSH	10-01-93	18.60	1030.00
				11-15-93	20.27	
				01-07-94	20.75	
				02-18-94	20.37	
				03-30-94	20.30	
				05-12-94	18.00	
				06-23-94	18.13	
				08-01-94	18.10	

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
395859083440500	CL-140 NR SPRINGFIELD OH	36.7	112OTSH	10-01-93	19.11	1030.49
				11-15-93	20.80	
				01-07-94	21.14	
				02-18-94	20.90	
				03-30-94	20.86	
				05-12-94	18.55	
				06-23-94	18.67	
				08-01-94	18.67	
395859083440600	CL-137 NR SPRINGFIELD OH	38.0	112OTSH	10-01-93	19.92	1031.34
				11-15-93	21.59	
				01-07-94	21.80	
				02-18-94	21.72	
				03-30-94	21.62	
				05-12-94	19.33	
				06-23-94	19.48	
				08-01-94	19.43	
395859083440700	CL-138 NR SPRINGFIELD OH	28.5	112OTSH	10-01-93	20.16	1031.61
				11-15-93	21.85	
				01-07-94	22.34	
				02-18-94	21.98	
				03-30-94	21.90	
				05-12-94	19.58	
				06-23-94	19.72	
				08-01-94	19.68	
395859083440800	CL-139 NR SPRINGFIELD OH	36.9	112OTSH	10-01-93	19.50	1031.33
				11-15-93	21.14	
				01-07-94	21.68	
				02-18-94	20.32	
				03-30-94	21.22	
				05-12-94	18.94	
				06-23-94	19.07	
				08-01-94	19.01	
395901083440600	CL-135 NR SPRINGFIELD OH	37.2	112OTSH	10-01-93	18.54	1031.89
				11-15-93	19.37	
				01-07-94	19.62	
				02-18-94	19.08	
				03-30-94	18.95	
				05-12-94	18.16	
				06-23-94	18.33	
				08-01-94	18.41	
395901083440700	CL-136 NR SPRINGFIELD OH	37.5	112OTSH	10-01-93	20.93	1032.08
				11-15-93	19.75	
				01-07-94	19.78	
				02-18-94	19.32	
				03-30-94	19.33	
				05-12-94	18.42	
				06-23-94	18.75	
				08-01-94	18.81	
400947083480000	CH-44 NR URBANA OH	31.0	112OTSH	10-07-93	9.78	1029.71
				11-19-93	8.00	
				01-05-94	8.95	
				02-22-94	8.73	
				03-29-94	9.01	
				05-10-94	8.97	
				06-21-94	9.64	
				08-05-94	9.72	

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER LEVELS--Continued

SITE-ID	LOCAL WELL NUMBER	DEPTH OF WELL (FEET)	AQUIFER CODE	WATER- LEVEL DATE	WATER LEVEL (FEET)	ALTITUDE OF LAND SURFACE (FEET)
400948083475800	CH-46 NR URBANA OH	34.8	112OTSH	10-07-93	8.80	1028.56
				11-19-93	6.89	
				01-05-94	8.18	
				02-22-94	7.59	
				03-29-94	8.09	
				05-10-94	7.98	
				06-21-94	8.65	
				08-05-94	8.74	
400948083480000	CH-45 NR URBANA OH	34.4	112OTSH	10-07-93	9.43	1029.26
				11-19-93	7.52	
				01-05-94	8.83	
				02-22-94	8.23	
				03-29-94	8.72	
				05-10-94	8.61	
				06-21-94	9.29	
				08-05-94	9.39	
400948083480100	CH-43 NR URBANA OH	32.2	112OTSH	10-07-93	9.69	1029.48
				11-19-93	7.77	
				01-05-94	9.08	
				02-22-94	8.49	
				03-29-94	8.97	
				05-10-94	8.87	
				06-21-94	9.54	
				08-05-94	9.66	
400948083480200	CH-41 NR URBANA OH	34.3	112OTSH	10-07-93	10.14	1029.98
				11-19-93	8.22	
				01-05-94	9.49	
				02-22-94	8.91	
				03-29-94	9.38	
				05-10-94	9.30	
				06-21-94	9.97	
				08-05-94	10.10	
400949083480100	CH-42 NR URBANA OH	28.7	112OTSH	10-07-93	10.08	1029.89
				11-19-93	8.16	
				01-05-94	9.45	
				02-22-94	8.86	
				03-29-94	9.34	
				05-10-94	9.26	
				06-21-94	9.91	
				08-05-94	10.05	
400950083480600	CH-38 NR URBANA OH	19.2	112OTSH	10-07-93	7.45	1027.30
				11-19-93	5.50	
				01-05-94	6.73	
				02-22-94	6.15	
				03-29-94	6.68	
				05-10-94	6.53	
				06-21-94	7.25	
				08-05-94	7.38	
400952083475400	CH-37 NR URBANA OH	24.0	112OTSH	11-19-93	6.63	1028.40
				02-22-94	7.34	
				03-29-94	7.83	
				05-10-94	7.75	

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
400952083480800	CH-40 NR URBANA OH	34.7	112OTSH	10-07-93	8.12	1028.95
				11-19-93	6.38	
				01-05-94	7.40	
				02-22-94	6.78	
				03-29-94	7.32	
				05-10-94	7.23	
				06-21-94	7.93	
				08-05-94	8.08	
403631082152100	AS-9 NR LOUDONVILLE OH	12.3	111ALVM	10-12-93	7.38	928.36
				11-16-93	6.99	
				01-12-94	5.77	
				02-24-94	2.37	
				04-04-94	4.07	
				05-16-94	5.10	
				06-27-94	6.46	
				08-03-94	5.95	
403631082152200	AS-6 NR LOUDONVILLE OH	19.9	111ALVM	10-12-93	7.00	928.27
				11-16-93	6.21	
				01-12-94	5.40	
				02-24-94	2.26	
				04-04-94	3.81	
				05-16-94	4.79	
				06-27-94	5.87	
				08-03-94	5.54	
403633082152400	AS-10 NR LOUDONVILLE OH	12.7	111ALVM	10-12-93	7.46	931.00
				11-16-93	6.88	
				01-12-94	5.74	
				02-24-94	2.20	
				04-04-94	3.97	
				05-16-94	5.09	
				06-27-94	6.40	
				08-03-94	5.96	
403634082152300	AS-7 NR LOUDONVILLE OH	23.1	111ALVM	10-12-93	7.31	930.97
				11-16-93	6.65	
				01-12-94	5.64	
				02-24-94	2.24	
				04-04-94	3.92	
				05-16-94	4.99	
				06-27-94	6.21	
				08-03-94	5.84	
403635082152100	AS-48 NR LOUDONVILLE OH	16.0	111ALVM	02-24-94	2.10	931.00
				04-04-94	3.88	
				05-16-94	5.06	
				06-27-94	6.41	
				08-03-94	5.99	
				09-22-94	6.82	
403635082152200	AS-47 NR LOUDONVILLE OH	11.2	111ALVM	02-24-94	1.90	930.99
				04-04-94	3.61	
				05-16-94	4.87	
				06-27-94	6.33	
				08-03-94	5.91	
				09-22-94	7.66	

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

## **GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
403635082152300	AS-45 NR LOUDONVILLE OH	15.7	111ALVM	10-12-93	7.13	931.74
				11-16-93	6.54	
				01-12-94	5.20	
				02-24-94	1.96	
				04-04-94	3.32	
				05-16-94	4.49	
				06-27-94	5.64	
				08-03-94	5.36	
				09-22-94	6.42	
403635082152400	AS-46 NR LOUDONVILLE OH	11.6	111ALVM	02-24-94	1.66	931.19
				04-04-94	3.21	
				05-16-94	4.45	
				06-27-94	5.66	
				08-03-94	5.32	
403635082152500	AS-44 NR LOUDONVILLE OH	18.0	111ALVM	02-24-94	1.72	931.50
				04-04-94	3.09	
				05-16-94	4.30	
				06-27-94	5.44	
				08-03-94	5.16	
403635082152600	AS-49 NR LOUDONVILLE OH	11.0	111ALVM	09-22-94	6.26	931.23
				10-12-93	7.35	
				11-16-93	6.85	
				01-12-94	5.53	
				02-24-94	2.07	
403635082152700	AS-43 NR LOUDONVILLE OH	16.2	111ALVM	04-04-94	3.72	933.40
				05-16-94	4.99	
				06-27-94	6.20	
				08-03-94	5.80	
				09-22-94	6.76	
403635082152800	AS-8 NR LOUDONVILLE OH	16.2	111ALVM	02-24-94	2.47	933.24
				04-04-94	2.76	
				05-16-94	3.16	
				06-27-94	3.05	
				08-03-94	4.30	
403636082152200	AS-42 NR LOUDONVILLE OH	16.5	111ALVM	09-22-94	5.93	930.86
				10-12-93	6.13	
				11-16-93	3.80	
				01-12-94	4.52	
				02-24-94	2.32	
403636082152300	AS-41 NR LOUDONVILLE OH	11.8	111ALVM	04-04-94	2.59	930.73
				05-16-94	2.98	
				06-27-94	3.09	
				08-03-94	4.05	
				09-22-94	5.71	
403636082152200	AS-42 NR LOUDONVILLE OH	16.5	111ALVM	11-16-93	6.71	930.86
				02-24-94	1.45	
				04-04-94	3.71	
				05-16-94	4.88	
				06-14-94	6.05	
403636082152300	AS-41 NR LOUDONVILLE OH	11.8	111ALVM	10-12-93	7.20	930.73
				01-12-94	5.48	
				02-24-94	1.85	
				04-04-94	3.60	
				05-16-94	4.78	
403636082152300	AS-41 NR LOUDONVILLE OH	11.8	111ALVM	06-14-94	5.98	930.73
				10-12-93	7.20	
				01-12-94	5.48	
				02-24-94	1.85	
				04-04-94	3.60	



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**GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
403636082152600	AS-5 NR LOUDONVILLE OH	12.7	111ALVM	10-12-93	5.39	931.60
				11-16-93	3.83	
				01-12-94	3.40	
				02-24-94	.74	
				04-04-94	1.23	
				05-16-94	2.09	
				06-27-94	3.15	
				08-03-94	3.55	
				09-22-94	4.95	
403922082325700	R-11 NR LEXINGTON OH	22.5	112OTSH	10-04-93	17.21	1167.73
				11-16-93	16.77	
				01-11-94	16.52	
				02-28-94	14.63	
				04-05-94	14.89	
				05-19-94	15.59	
				06-30-94	15.72	
				08-08-94	16.46	
403922082325900	R-19 NR LEXINGTON OH	30.0	112OTSH	10-04-93	13.89	1164.90
				11-16-93	13.42	
				01-11-94	13.18	
				02-28-94	11.15	
				04-05-94	11.41	
				05-19-94	12.13	
				06-30-94	12.36	
				08-08-94	13.03	
403922082330000	R-20 NR LEXINGTON OH	34.2	112OTSH	10-04-93	10.63	1161.26
				11-16-93	10.10	
				01-11-94	9.90	
				02-28-94	8.00	
				04-05-94	8.15	
				05-19-94	8.92	
				06-30-94	9.00	
				08-08-94	9.75	
403923082325400	R-21 NR LEXINGTON OH	25.0	112OTSH	11-16-93	17.95	1185.19
				01-11-94	17.32	
				02-28-94	10.28	
				04-05-94	13.04	
				05-19-94	15.91	
				06-30-94	15.82	
				08-08-94	17.36	
				09-20-94	19.03	
403923082325500	R-16 NR LEXINGTON OH	18.9	112OTSH	10-04-93	17.21	1168.37
				11-16-93	16.92	
				01-11-94	16.47	
				02-28-94	12.23	
				04-05-94	12.75	
				05-19-94	14.38	
				06-30-94	15.80	
				08-08-94	16.49	
				09-20-94	17.07	

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

## **GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
403923082325600	R-15 NR LEXINGTON OH	23.0	112OTSH	10-04-93	17.12	1168.39
				11-16-93	16.89	
				01-11-94	16.33	
				02-28-94	10.72	
				04-05-94	10.86	
				05-19-94	11.43	
				06-30-94	11.24	
				08-08-94	16.56	
				09-20-94	17.01	
403923082325700	R-18 NR LEXINGTON OH	23.0	112OTSH	10-04-93	15.73	1167.10
				11-16-93	15.34	
				01-11-94	15.07	
				02-28-94	12.84	
				04-05-94	13.13	
				05-19-94	13.96	
				06-30-94	14.31	
				08-08-94	14.96	
				09-20-94	15.55	
403923082325800	R-12 NR LEXINGTON OH	22.0	112OTSH	10-04-93	15.93	1167.02
				01-11-94	15.24	
				02-28-94	12.99	
				04-05-94	13.28	
				06-30-94	14.41	
				08-08-94	15.11	
				09-20-94	15.69	
403923082325900	R-17 NR LEXINGTON OH	23.2	112OTSH	10-04-93	15.39	1166.89
				11-16-93	14.96	
				01-11-94	14.24	
				04-05-94	12.75	
				05-19-94	13.59	
				06-30-94	13.92	
				08-08-94	14.59	
				09-20-94	15.14	
403923082330000	R-13 NR LEXINGTON OH	30	112OTSH	10-04-93	11.66	1162.27
				11-16-93	11.18	
				01-11-94	11.01	
				02-28-94	9.21	
				04-05-94	9.42	
				05-19-94	10.05	
				06-30-94	10.11	
				08-08-94	10.87	
403925082325600	R-14 NR LEXINGTON OH	30	112OTSH	10-04-93	27.19	1185.01
				11-16-93	25.83	
				01-11-94	20.18	
				02-28-94	14.12	
				04-05-94	15.83	
				05-19-94	18.70	
				06-30-94	18.61	
				08-08-94	20.20	
				09-20-94	26.33	

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
411135081172600	PO-113 NR RAVENNA OH	9.2	112OTSH	10-06-93	2.11	1061.12
				11-22-93	0.54	
				01-14-94	0.63	
				02-16-94	0.57	
				04-07-94	0.20	
				05-18-94	0.45	
				06-29-94	0.43	
				08-10-94	1.46	
				09-15-94	1.71	
411136081172500	PO-119 NR RAVENNA OH	11.0	112OTSH	10-06-93	6.31	1064.91
				11-22-93	3.11	
				01-14-94	3.76	
				02-16-94	3.21	
				04-07-94	2.38	
				05-18-94	3.24	
				06-29-94	4.47	
				08-10-94	4.67	
				09-15-94	5.70	
411136081172600	PO-120 NR RAVENNA OH	10.4	112OTSH	10-06-93	4.75	1063.89
				11-22-93	2.77	
				01-14-94	3.07	
				02-16-94	2.81	
				04-07-94	1.67	
				05-18-94	2.55	
				06-29-94	3.21	
				08-10-94	3.69	
				09-15-94	4.27	
411137081172100	PO-114 NR RAVENNA OH	12.3	112OTSH	10-06-93	5.04	1064.40
				11-22-93	2.73	
				01-14-94	2.12	
				02-16-94	1.75	
				04-07-94	0.78	
				05-18-94	1.46	
				06-29-94	2.79	
				08-10-94	3.22	
				09-15-94	3.93	
411137081172300	PO-118 NR RAVENNA OH	19.0	112OTSH	10-06-93	7.54	1067.14
				11-22-93	5.31	
				01-14-94	5.86	
				02-16-94	5.42	
				04-07-94	4.67	
				05-18-94	5.47	
				06-29-94	6.27	
				08-10-94	6.54	
				09-15-94	7.02	
411137081172400	PO-117 NR RAVENNA OH	18.5	112OTSH	10-06-93	7.28	1066.86
				11-22-93	5.04	
				01-14-94	5.56	
				02-16-94	5.11	
				04-07-94	4.40	
				05-18-94	5.16	
				06-29-94	5.99	
				08-10-94	6.22	

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER LEVELS--Continued

SITE-ID	LOCAL WELL NUMBER	DEPTH OF WELL (FEET)	AQUIFER CODE	WATER- LEVEL DATE	WATER LEVEL (FEET)	ALTITUDE OF LAND SURFACE (FEET)
411137081172500	PO-112 NR RAVENNA OH	8.5	112OTSH	10-06-93	4.88	1064.50
				11-22-93	2.69	
				01-14-94	3.12	
				02-16-94	2.70	
				04-07-94	1.95	
				05-18-94	2.75	
				06-29-94	3.51	
				08-10-94	3.86	
				09-15-94	4.33	
411138081172100	PO-111 NR RAVENNA OH	10.0	112OTSH	10-06-93	4.06	1063.92
				11-22-93	1.80	
				01-14-94	1.65	
				02-16-94	1.22	
				04-07-94	0.39	
				05-18-94	1.01	
				06-29-94	2.23	
				08-10-94	2.54	
				09-15-94	2.94	
411138081172400	PO-115 NR RAVENNA OH	17.5	112OTSH	10-06-93	8.98	1068.59
				11-22-93	6.71	
				01-14-94	7.29	
				02-16-94	6.82	
				04-07-94	6.10	
				05-18-94	6.90	
				06-29-94	7.70	
				08-10-94	7.96	
				09-15-94	8.31	
411138081172500	PO-116 NR RAVENNA OH	17.5	112OTSH	10-06-93	8.74	1068.39
				11-22-93	6.52	
				01-14-94	7.11	
				02-16-94	6.69	
				04-07-94	5.94	
				05-18-94	6.73	
				06-29-94	7.56	
				08-10-94	7.82	
411138081172600	PO-121 NR RAVENNA OH	18.4	112OTSH	10-06-93	8.68	1068.24
				11-22-93	6.42	
				04-07-94	5.82	
				05-18-94	6.62	
				06-29-94	7.40	
				08-10-94	7.66	
413546083480900	LU-28 NR HOLLAND OH	28.2	112LAKE	10-08-93	7.27	676.61
				11-18-93	7.46	
				01-07-94	7.15	
				02-17-94	6.88	
				03-31-94	5.99	
				05-11-94	5.61	
				06-22-94	6.56	
				08-11-94	6.99	
				09-13-94	7.43	
413547083481000	LU-26 NR HOLLAND OH	29.6	112LAKE	10-08-93	6.73	676.75
				11-18-93	6.95	
				01-06-94	7.05	
				02-17-94	6.40	
				03-31-94	5.47	
				05-11-94	5.07	
				06-22-94	6.01	
				08-11-94	6.47	
				09-13-94	6.90	

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
413547083481100	LU-27 NR HOLLAND OH	28.4	112LAKE	10-08-93	6.55	676.39
				11-18-93	6.74	
				01-07-94	6.44	
				02-17-94	6.17	
				03-31-94	5.27	
				05-11-94	4.88	
				06-22-94	5.81	
				08-11-94	6.27	
				09-13-94	6.72	
413547083481200	LU-25 NR HOLLAND OH	29.4	112LAKE	10-08-93	6.69	676.68
				11-18-93	6.91	
				01-06-94	6.54	
				02-17-94	6.33	
				03-31-94	5.41	
				05-11-94	5.02	
				06-22-94	5.96	
				08-11-94	6.41	
				09-13-94	6.85	
413547083481300	LU-22 NR HOLLAND OH	28.3	112LAKE	10-08-93	7.00	677.08
				11-18-93	7.22	
				01-06-94	6.89	
				02-17-94	6.57	
				03-31-94	5.74	
				05-11-94	5.22	
				06-22-94	6.30	
				08-11-94	6.74	
				09-13-94	7.06	
413547083481400	LU-23 NR HOLLAND OH	29.4	112LAKE	10-08-93	6.91	676.97
				11-18-93	7.13	
				01-06-94	6.77	
				02-17-94	6.60	
				03-31-94	5.64	
				05-11-94	5.25	
				06-22-94	6.19	
				08-11-94	6.63	
				09-13-94	7.07	
413547083481500	LU-24 NR HOLLAND OH	18.7	112LAKE	10-08-93	7.15	677.21
				11-18-93	7.38	
				01-06-94	7.02	
				02-17-94	6.84	
				03-31-94	5.89	
				05-11-94	5.48	
				06-22-94	6.43	
				08-11-94	6.88	
				09-13-94	7.32	
413548083480400	LU-17 NR HOLLAND OH	29.2	112LAKE	10-08-93	7.21	676.23
				11-18-93	7.30	
				01-07-94	7.03	
				02-17-94	6.76	
				03-31-94	5.89	
				05-11-94	5.51	
				06-22-94	6.56	
				08-11-94	6.97	
				09-13-94	7.40	



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

## **GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
413549083481500	LU-21 NR HOLLAND OH	29.1	112LAKE	10-08-93	6.47	677.07
				11-18-93	7.19	
				01-06-94	7.20	
				02-17-94	7.26	
				03-31-94	5.27	
				05-11-94	7.19	
				06-22-94	5.84	
				08-11-94	6.24	
				09-13-94	6.63	
413551083481200	LU-20 NR HOLLAND OH	31.0	112LAKE	10-08-93	5.65	676.13
				11-18-93	6.27	
				01-06-94	5.52	
				02-17-94	5.27	
				03-31-94	4.39	
				05-11-94	4.08	
				06-22-94	5.15	
				08-11-94	5.52	
				09-13-94	5.91	
413553083480600	LU-18 NR HOLLAND OH	29.0	112LAKE	10-08-93	5.65	675.75
				11-18-93	5.67	
				01-06-94	5.47	
				02-17-94	5.19	
				03-31-94	4.40	
				05-11-94	4.18	
				06-22-94	5.40	
				08-11-94	5.72	
				09-13-94	6.09	
413553083480900	LU-19 NR HOLLAND OH	31.3	112LAKE	10-08-93	5.14	675.75
				11-18-93	5.30	
				01-06-94	4.95	
				02-17-94	4.73	
				03-31-94	3.90	
				05-11-94	3.67	
				06-22-94	4.84	
				08-11-94	5.15	
				09-13-94	5.49	
415305080414200	AB-139 NR KINGSVILLE OH	20.2	111TRRC	10-05-93	11.54	777.51
				11-23-93	9.41	
				01-13-94	9.91	
				02-15-94	9.93	
				04-06-94	8.62	
				05-17-94	10.69	
				06-28-94	10.34	
				08-09-94	11.24	
				09-21-94	11.31	
415305080414300	AB-132 NR KINGSVILLE OH	14.5	111TRRC	10-05-93	12.45	778.47
				11-23-93	10.22	
				01-13-94	10.79	
				02-15-94	10.81	
				04-06-94	9.48	
				05-17-94	11.61	
				06-28-94	11.34	
				08-09-94	12.14	
				09-21-94	12.22	

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
415307080414200	AB-133 NR KINGSVILLE OH	20.0	111TRRC	10-05-93	8.66	772.10
				11-23-93	5.84	
				01-13-94	6.69	
				02-15-94	6.19	
				04-06-94	5.90	
				05-17-94	7.41	
				06-28-94	7.16	
				08-09-94	8.01	
				09-21-94	7.90	
415307080414300	AB-129 NR KINGSVILLE OH	18.0	111TRRC	10-05-93	9.04	772.50
				11-23-93	6.22	
				01-13-94	6.88	
				02-15-94	6.41	
				04-06-94	6.20	
				05-17-94	7.81	
				06-28-94	7.46	
				08-09-94	8.44	
				09-21-94	8.27	
415307080414400	AB-130 NR KINGSVILLE OH	10.0	111TRRC	10-05-93	8.91	770.95
				11-23-93	5.46	
				01-13-94	6.22	
				02-15-94	5.69	
				04-06-94	5.53	
				05-17-94	6.81	
				06-28-94	7.42	
				08-09-94	7.60	
				09-21-94	7.21	
415307080414500	AB-134 NR KINGSVILLE OH	17.4	111TRRC	10-05-93	8.67	772.10
				11-23-93	5.86	
				01-13-94	6.70	
				02-15-94	6.21	
				04-06-94	5.91	
				05-17-94	7.41	
				06-28-94	7.13	
				08-09-94	8.03	
				09-21-94	7.88	
415307080414600	AB-140 NR KINGSVILLE OH	20.8	111TRRC	10-05-93	8.81	772.22
				11-23-93	5.98	
				01-13-94	6.85	
				02-15-94	6.34	
				04-06-94	7.60	
				05-17-94	7.57	
				06-28-94	7.31	
				08-09-94	8.20	
				09-21-94	7.95	
415308080414300	AB-135 NR KINGSVILLE OH	19.5	111TRRC	10-05-93	9.21	771.36
				11-23-93	5.99	
				01-13-94	6.84	
				02-15-94	6.29	
				04-06-94	6.01	
				05-17-94	7.37	
				06-28-94	7.65	
				08-09-94	8.18	
				09-21-94	7.85	

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

## **GROUND-WATER LEVELS--Continued**

<b>SITE-ID</b>	<b>LOCAL WELL NUMBER</b>	<b>DEPTH OF WELL (FEET)</b>	<b>AQUIFER CODE</b>	<b>WATER- LEVEL DATE</b>	<b>WATER LEVEL (FEET)</b>	<b>ALTITUDE OF LAND SURFACE (FEET)</b>
415308080414400	AB-131 NR KINGSVILLE OH	21	111TRRC	10-05-93	7.19	765.00
				11-23-93	4.89	
				01-13-94	5.33	
				02-15-94	5.19	
				04-06-94	5.10	
				05-17-94	5.49	
				06-28-94	5.41	
				08-09-94	6.50	
				09-21-94	5.94	
415309080414300	AB-136 NR KINGSVILLE OH	20.1	111TRRC	10-05-93	7.80	767.66
				11-23-93	5.27	
				01-13-94	5.69	
				02-15-94	5.21	
				04-06-94	4.85	
				05-17-94	6.01	
				06-28-94	6.28	
				08-09-94	6.89	
				09-21-94	6.41	
415309080414400	AB-138 NR KINGSVILLE OH	19.5	111TRRC	10-05-93	8.04	767.87
				11-23-93	5.52	
				01-13-94	5.92	
				02-15-94	5.46	
				04-06-94	5.08	
				05-17-94	6.26	
				06-28-94	7.12	
				08-09-94	7.04	
				09-21-94	6.67	
415310080414400	AB-137 NR KINGSVILLE OH	19.5	111TRRC	10-05-93	5.97	763.76
				11-23-93	3.66	
				01-13-94	4.03	
				02-15-94	3.80	
				04-06-94	2.82	
				05-17-94	4.23	
				06-28-94	4.16	
				08-09-94	5.28	
				09-21-94	4.71	

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**AQUIFER CODE (Geologic Unit)**

112OTSH - Outwash, Pleistocene Epoch  
 111TRCC - Terrace Deposits, Holocene Epoch  
 112LAKE - Lake Deposits, Pleistocene Epoch  
 111ALVM - Alluvium, Holocene Epoch

EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO

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GROUND-WATER RECORDS

415307080414500. Local number, AB-134.

LOCATION.--Lat 41°53'07" Long 80°41'45", Hydrologic Unit 04120101, along State Route 84 near Kingsville, OH.  
Owner.--USGS-Ohio State University (OARDC).

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 17.4 ft. Cased with Sch 40 PVC to 7.5 ft; .010 in. screen from 7.5 to 17.4 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: water level, air temperature, soil temperature, water temperature, and specific conductance. Conductivity/water temperature probe was set at 10.0 feet below land surface; probe removed July, 1992.

DATUM.--Elevation of land-surface datum is 772.10 feet above sea level.  
Measuring point: shelter shelf 3.93 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

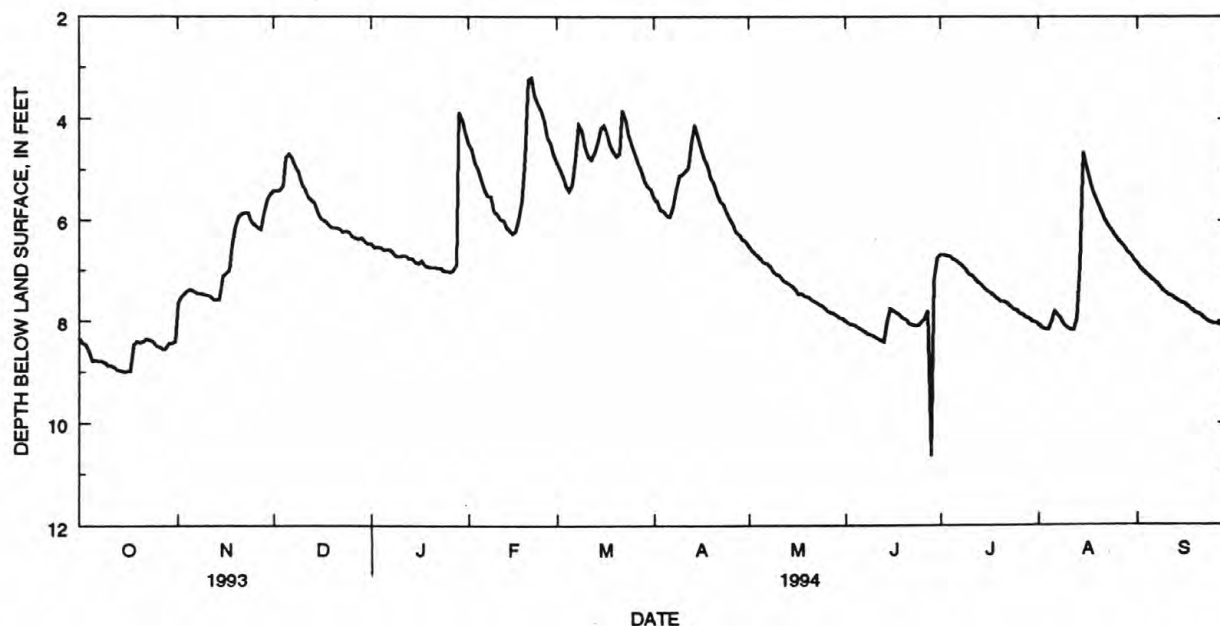
WATER LEVEL: February 1991 to current year  
SPECIFIC CONDUCTANCE: February 1991 to July 1992  
AIR TEMPERATURE: February 1991 to current year  
WATER TEMPERATURE: February 1991 to July 1992  
SOIL TEMPERATURE: July 1992 to current year  
PRECIPITATION: February 1991 to current year

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER LEVEL: Maximum daily low, 10.64 ft. below land-surface datum, June 28, 1994 (this represents an artificial low due to pumping of well AB-133, 4 ft. away); maximum daily high, 2.11 ft. below land-surface datum, March 23, 1993.  
SPECIFIC CONDUCTANCE: Maximum, 2560 microsiemens March 27, 1991; minimum, 948 microsiemens August 8, 1991.  
AIR TEMPERATURE: Maximum, 33.0°C September 16, 1991; minimum, -29.6°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 15.5°C many days in 1991; minimum, 6.6°C March 26-28, April 1-7 1992.  
SOIL TEMPERATURE: Maximum, 31.8°C July 11, 1993; minimum, -0.7°C February 2, 1993.

EXTREMES FOR CURRENT YEAR.--

WATER LEVEL: Maximum daily low, 10.64 ft. below land-surface datum, June 28, 1994 (this represents an artificial low due to pumping of well AB-133, 4 ft. away); maximum daily high, 2.38 ft. below land-surface datum, February 20, 1994.  
AIR TEMPERATURE: Maximum, 31.8°C July 20, 1994; minimum, -29.6°C January 19, 1994.  
SOIL TEMPERATURE: Maximum, undetermined due to probe malfunction during summer months; minimum, 1.7°C February 10-13, 1994.



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

415307080414500 AB-134 NR KINGSVILLE OH--Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	8.34	8.27	7.66	7.52	5.42	5.38	6.46	6.40	4.48	4.27	4.87	4.73
2	8.43	8.34	7.53	7.46	5.42	5.36	6.54	6.47	4.60	4.48	4.98	4.88
3	8.47	8.44	7.46	7.42	5.42	5.34	6.53	6.47	4.86	4.60	5.14	4.99
4	8.59	8.47	7.40	7.34	5.32	4.79	6.54	6.44	4.99	4.86	5.32	5.12
5	8.79	8.59	7.38	7.32	4.77	4.58	6.59	6.52	5.19	5.00	5.42	5.30
6	8.77	8.74	7.41	7.38	4.70	4.57	6.57	6.51	5.39	5.21	5.29	4.82
7	8.78	8.74	7.46	7.41	4.79	4.70	6.57	6.53	5.52	5.39	4.80	4.12
8	8.78	8.78	7.46	7.45	4.95	4.80	6.66	6.57	5.52	5.47	4.12	4.08
9	8.83	8.77	7.48	7.46	5.05	4.95	6.72	6.66	5.83	5.54	4.23	4.10
10	8.88	8.83	7.49	7.48	5.28	5.04	6.72	6.64	5.88	5.83	4.55	4.24
11	8.88	8.83	7.50	7.46	5.39	5.28	6.71	6.65	5.98	5.86	4.74	4.56
12	8.91	8.83	7.58	7.50	5.53	5.39	6.71	6.65	6.00	5.96	4.80	4.68
13	8.96	8.91	7.58	7.52	5.60	5.53	6.75	6.66	6.15	5.98	4.67	4.50
14	8.98	8.96	7.58	7.10	5.67	5.60	6.75	6.69	6.21	6.16	4.48	4.22
15	9.00	8.98	7.10	7.06	5.84	5.67	6.83	6.75	6.27	6.19	4.19	4.02
16	8.99	8.98	7.08	6.99	5.97	5.85	6.86	6.74	6.22	5.99	4.13	4.01
17	8.99	8.50	6.98	6.52	6.01	5.97	6.80	6.72	5.97	5.64	4.29	4.14
18	8.48	8.37	6.51	6.14	6.06	6.01	6.90	6.80	5.62	4.76	4.52	4.24
19	8.41	8.37	6.13	5.94	6.13	6.06	6.92	6.90	4.76	3.28	4.65	4.52
20	8.43	8.38	5.94	5.88	6.14	6.11	6.93	6.90	3.24	2.38	4.74	4.66
21	8.40	8.34	5.88	5.82	6.14	6.11	6.93	6.88	3.20	2.70	4.67	3.86
22	8.35	8.34	5.86	5.82	6.17	6.14	6.94	6.89	3.56	3.23	3.84	3.73
23	8.38	8.36	5.86	5.82	6.23	6.17	6.95	6.88	3.71	3.56	4.04	3.76
24	8.40	8.38	6.03	5.85	6.21	6.17	7.01	6.95	3.84	3.54	4.32	4.04
25	8.49	8.40	6.10	6.04	6.23	6.13	7.01	6.97	4.03	3.85	4.54	4.33
26	8.51	8.49	6.15	6.07	6.32	6.23	7.02	7.00	4.37	4.07	4.69	4.54
27	8.56	8.51	6.18	5.89	6.35	6.32	6.99	6.89	4.48	4.37	4.88	4.64
28	8.56	8.26	5.86	5.61	6.37	6.35	6.88	3.95	4.72	4.48	5.02	4.87
29	8.44	8.34	5.60	5.49	6.35	6.25	3.88	3.60	---	---	5.22	5.03
30	8.45	8.42	5.48	5.43	6.43	6.36	4.04	3.75	---	---	5.33	5.22
31	8.41	7.70	---	---	6.47	6.40	4.27	4.04	---	---	5.38	5.33
MONTH	9.00	7.70	7.66	5.43	6.47	4.57	7.02	3.60	6.27	2.38	5.42	3.73

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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415307080414500 AB-134 NR KINGSVILLE OH--Continued

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	18.5	15.8	17.2	3.0	-7	2.0	7.0	-6.9	.9	3.7	-4.0	-.2
2	14.0	6.6	11.6	6.4	-1.1	3.1	9.9	1.8	5.4	1.5	-6.6	-2.8
3	16.8	3.9	10.0	5.2	2.5	3.5	6.3	1.2	4.1	-2.2	-8.2	-4.7
4	18.0	2.2	11.6	11.4	3.5	7.2	5.4	4.1	4.8	-2.0	-6.4	-4.2
5	13.0	1.7	6.5	16.0	4.7	11.1	3.8	2.0	2.9	-4.4	-10.4	-8.2
6	19.9	2.9	11.0	3.7	-.4	1.4	5.4	2.1	3.5	-2.9	-10.4	-6.4
7	25.9	11.0	17.9	1.9	-2.7	-.1	3.9	-.5	2.0	-3.6	-6.7	-5.6
8	23.5	13.0	17.6	9.0	-3.6	2.0	6.5	-1.5	1.5	-5.9	-13.6	-11.4
9	16.5	3.6	10.0	11.5	-1.1	3.5	8.5	-2.9	3.8	-7.7	-12.7	-9.8
10	7.6	-1.7	3.5	11.6	-2.4	4.9	10.2	-.8	7.1	-3.1	-16.3	-9.1
11	12.9	-.4	6.2	13.9	3.2	8.5	-1.3	-6.0	-4.4	1.5	-3.9	-.7
12	13.8	5.6	9.5	8.6	1.5	5.7	.7	-4.5	-2.5	4.5	-3.4	-.3
13	8.0	.1	4.4	16.0	8.6	11.5	4.4	-7.0	-.7	.9	-5.0	-1.3
14	14.8	-1.5	5.3	16.2	9.1	12.7	5.4	-1.3	.2	-5.8	-13.8	-10.5
15	20.2	5.4	12.0	16.8	5.6	10.0	4.4	2.3	3.4	-13.9	-18.1	-16.6
16	18.5	11.1	14.5	7.5	.7	5.3	3.0	-3.4	1.9	-11.6	-23.9	-17.4
17	17.1	11.0	14.3	7.2	3.8	5.7	.3	-7.1	-2.5	-4.7	-13.9	-8.5
18	11.9	2.4	8.9	7.6	-3.0	3.5	5.5	.2	2.7	-14.4	-24.4	-19.7
19	13.5	4.2	8.3	7.6	3.5	5.9	3.2	.9	2.1	-19.6	-29.6	-23.9
20	17.8	7.7	12.0	2.8	-1.5	.1	3.1	.4	1.2	-12.0	-22.8	-17.8
21	19.4	9.2	12.6	10.0	-1.7	4.2	.7	-1.2	.0	-8.1	-19.9	-13.6
22	9.4	.4	7.7	11.8	-.3	5.2	-2.4	-4.5	-3.4	-4.5	-8.5	-6.3
23	12.9	-.5	5.8	10.7	-1.0	5.0	-3.4	-13.3	-6.7	3.3	-6.6	-.9
24	20.8	6.0	11.9	6.4	1.2	4.7	-4.4	-8.4	-5.9	1.8	.1	1.2
25	17.0	3.8	10.3	3.6	-4.9	-.4	-5.4	-10.8	-7.1	-.2	-9.6	-3.7
26	20.8	4.2	13.5	10.2	1.7	5.0	-10.8	-13.0	-11.9	-10.0	-12.8	-11.4
27	12.6	4.4	9.3	7.5	.1	4.3	-8.4	-14.5	-11.0	2.1	-11.3	-2.7
28	8.8	2.8	6.1	3.4	-1.1	.6	-7.4	-20.5	-10.8	7.4	-1.5	3.5
29	9.8	3.8	7.4	.4	-1.7	-1.1	-5.5	-21.6	-10.6	-1.7	-7.7	-3.6
30	4.2	.2	2.4	2.1	-5.2	-.4	-8.2	-11.5	-10.0	-8.2	-13.3	-10.3
31	3.2	.8	1.9	---	---	---	-1.8	-10.8	-5.3	-8.1	-17.1	-12.1
MONTH	25.9	-1.7	9.7	16.8	-5.2	4.5	10.2	-21.6	-1.4	7.4	-29.6	-7.7

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	-10.6	-17.0	-12.9	-1.7	-11.5	-6.4	11.1	.2	5.1	12.4	1.7	6.2
2	-3.7	-16.9	-10.0	1.2	-10.9	-4.9	19.8	2.7	13.1	11.1	.1	6.3
3	-3.3	-10.9	-8.0	-1.1	-4.1	-2.7	10.9	-4.0	1.0	13.1	-1.8	6.4
4	-1.9	-11.1	-6.2	1.6	-.8	.3	10.8	-4.1	2.7	12.1	5.2	9.3
5	-.9	-10.8	-5.2	1.8	-4.4	.0	13.4	3.3	7.4	17.3	8.1	11.6
6	3.2	-16.2	-4.8	9.2	-2.4	2.0	4.3	-1.2	.2	11.2	1.7	6.6
7	-6.2	-12.5	-8.9	6.0	2.5	4.4	1.3	-1.9	-.6	11.5	.9	6.0
8	-10.2	-13.3	-11.9	2.4	-5.8	-.6	10.8	-5.9	2.4	14.8	6.6	9.7
9	-11.4	-20.9	-13.4	-1.3	-5.5	-3.5	18.1	7.6	12.1	18.7	4.9	12.9
10	-10.6	-25.6	-17.3	-2.3	-14.1	-4.4	10.9	1.0	7.8	15.4	2.8	9.8
11	-7.0	-14.6	-10.5	-1.5	-17.5	-7.8	9.2	-.7	4.8	20.6	5.3	13.2
12	4.0	-11.1	-3.6	5.3	-10.7	-.7	16.8	5.5	10.3	14.5	1.1	8.8
13	1.5	-6.2	-3.5	4.5	-1.2	1.6	16.3	7.0	11.3	13.0	-1.9	6.3
14	.4	-11.0	-5.4	5.7	-2.1	1.8	17.6	7.1	11.3	20.3	.4	11.4
15	5.5	-.4	1.7	6.5	-3.3	3.5	26.2	10.4	17.7	21.6	14.2	17.7
16	-.1	-5.2	-2.2	-4.6	-8.4	-6.8	11.5	6.8	9.2	14.2	4.4	7.6
17	8.6	-2.5	2.8	-4.3	-8.9	-6.5	11.5	4.8	8.4	8.6	4.8	6.5
18	12.5	1.3	6.2	-.6	-5.1	-3.2	18.5	4.0	12.0	9.5	6.1	7.5
19	15.6	6.1	10.1	1.4	-5.3	-2.3	20.4	5.6	14.0	14.4	3.9	10.0
20	14.4	4.5	10.9	2.9	-4.2	-.5	10.8	-1.9	6.1	18.6	.7	10.6
21	3.9	-1.8	.9	9.7	2.2	4.9	8.2	.5	4.7	22.0	4.0	13.9
22	-1.9	-6.0	-4.5	15.2	.1	8.0	8.6	-2.6	3.5	26.6	8.8	18.0
23	3.9	-4.8	.4	20.9	6.9	13.6	13.6	-3.2	6.9	21.3	9.7	16.6
24	1.6	-7.4	-3.7	17.8	.0	11.1	24.2	7.1	16.5	21.5	5.3	13.9
25	-4.2	-9.1	-7.0	1.0	-3.6	-1.6	26.2	16.3	20.9	21.6	14.4	17.0
26	-8.0	-16.2	-11.7	6.8	-7.2	-.6	28.2	16.6	21.2	18.8	5.1	12.3
27	-9.8	-21.9	-14.7	8.0	1.0	4.1	24.5	6.0	17.4	13.7	.6	8.0
28	-3.8	-22.7	-12.0	6.1	-.2	2.7	6.0	3.2	4.5	18.9	3.0	12.2
29	---	---	---	3.5	.0	1.9	16.5	5.1	12.5	24.0	9.2	16.6
30	---	---	---	3.7	-1.9	.7	8.7	2.8	5.5	27.0	13.8	20.9
31	---	---	---	6.5	-3.2	2.1	---	---	---	28.5	14.1	21.5
MONTH	15.6	-25.6	-5.2	20.9	-17.5	.3	28.2	-5.9	9.0	28.5	-1.9	11.5

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

415307080414500 AB-134 NR KINGSVILLE OH--Continued

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	16.9	3.4	12.4	27.6	13.6	20.9	27.7	17.2	22.2	18.0	10.7	16.1
2	15.1	3.3	10.6	25.9	16.5	20.8	26.2	18.7	22.3	17.5	7.0	12.8
3	18.8	3.2	12.0	22.8	16.0	18.9	26.5	17.7	22.0	20.2	6.0	13.1
4	21.0	4.6	13.9	28.9	14.0	22.1	27.5	17.6	21.3	20.3	6.9	14.2
5	26.4	6.7	18.2	29.8	20.7	24.8	18.7	10.5	15.6	20.3	8.0	14.2
6	28.6	15.0	21.4	30.8	20.8	25.7	20.6	9.4	15.1	20.7	8.2	14.2
7	22.3	12.5	16.8	28.5	20.0	23.3	24.8	10.5	17.5	20.0	13.6	16.5
8	17.5	7.3	12.8	30.1	20.9	25.4	24.6	13.6	19.1	23.6	11.2	17.8
9	20.2	3.6	12.6	25.3	21.0	23.6	19.6	15.5	17.5	22.1	10.1	17.5
10	24.4	4.4	16.6	21.0	13.4	17.5	21.0	13.5	16.8	18.1	7.1	12.4
11	26.9	16.5	20.5	22.1	12.5	17.6	18.6	13.6	15.8	17.6	5.4	11.8
12	28.7	14.5	20.7	29.2	12.5	22.3	27.7	16.9	20.9	22.8	7.1	14.8
13	28.2	17.1	19.4	25.4	17.0	22.4	23.6	18.9	20.9	26.9	15.0	20.5
14	27.2	17.9	21.9	22.5	16.6	18.9	22.2	15.6	18.3	23.2	18.5	20.4
15	31.0	21.3	25.8	25.6	17.5	22.1	19.4	11.8	16.6	25.2	18.5	21.6
16	30.8	21.3	26.0	23.7	14.4	19.7	24.5	10.6	17.2	27.2	18.4	22.5
17	30.0	20.0	25.1	26.7	13.8	20.3	23.7	16.0	19.6	22.1	15.9	19.6
18	31.0	19.0	25.6	26.0	17.3	21.8	23.5	15.1	19.9	19.3	11.0	16.1
19	28.4	17.7	23.7	28.0	16.6	22.4	27.7	15.1	21.2	21.3	8.5	14.5
20	28.2	13.8	21.5	31.8	19.5	25.6	27.6	18.2	21.6	24.2	9.7	15.9
21	26.6	18.1	22.7	30.8	20.2	24.8	22.1	17.9	19.6	25.0	12.7	17.6
22	24.8	11.8	19.8	26.2	20.1	22.8	21.6	11.8	18.7	22.6	12.4	16.5
23	26.3	13.7	19.6	25.3	18.5	22.1	23.1	11.0	17.1	18.3	9.4	14.9
24	27.5	16.7	21.2	26.7	18.4	22.3	25.4	13.7	19.6	22.6	13.0	17.0
25	20.2	15.2	17.6	26.4	17.2	21.5	25.9	16.9	21.8	25.2	13.9	17.5
26	24.1	15.1	19.2	22.7	13.4	19.2	27.3	16.4	21.9	20.1	11.1	15.9
27	17.6	15.5	16.2	25.1	13.1	18.4	25.9	17.3	21.8	16.3	10.3	12.9
28	25.0	14.9	20.0	24.9	15.5	18.9	25.8	18.6	21.7	15.7	10.2	12.1
29	24.9	16.4	19.6	23.9	13.0	19.8	21.4	11.4	17.3	14.9	11.3	12.7
30	20.7	13.9	17.7	25.3	15.8	20.0	22.0	10.0	16.5	18.5	10.7	13.8
31	---	---	---	27.0	16.3	21.1	21.6	15.8	18.7	---	---	---
MONTH	31.0	3.2	19.0	31.8	12.5	21.5	27.7	9.4	19.2	27.2	5.4	15.9
YEAR	31.8	-29.6	8.1									

TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	15.4	13.7	14.2	8.2	7.2	7.6	5.8	5.2	5.5	3.5	3.5	3.5
2	16.3	15.4	15.8	8.3	6.8	7.5	6.7	4.7	5.4	3.5	3.3	3.4
3	15.5	13.7	14.7	8.0	7.6	7.8	7.4	6.5	6.9	3.3	3.2	3.3
4	16.3	14.2	15.1	9.4	7.7	8.3	7.5	7.0	7.2	3.3	3.2	3.3
5	15.3	13.4	14.4	12.0	9.6	10.9	7.4	6.8	7.2	3.3	3.2	3.3
6	15.4	12.7	14.0	10.8	7.9	9.3	7.0	6.5	6.8	3.3	3.2	3.3
7	18.4	14.7	16.2	7.8	6.5	7.1	6.8	6.0	6.5	3.3	3.2	3.3
8	19.6	17.1	18.2	7.1	5.4	6.3	6.4	5.1	5.8	3.3	3.2	3.3
9	18.8	15.4	17.6	7.7	5.7	6.7	6.3	5.0	5.6	3.2	3.2	3.2
10	15.2	13.1	14.1	8.0	5.9	6.9	8.2	6.4	7.4	3.2	3.2	3.2
11	13.4	11.4	12.4	9.0	7.1	8.0	7.2	4.1	5.4	3.2	3.2	3.2
12	14.1	12.8	13.4	9.9	8.9	9.3	4.1	3.5	3.7	3.2	3.2	3.2
13	13.6	12.4	13.0	11.5	8.9	9.9	3.5	3.2	3.3	3.2	3.1	3.1
14	13.3	10.6	11.9	13.6	11.6	12.9	3.5	3.2	3.3	3.1	3.1	3.1
15	14.6	12.0	13.1	13.6	12.3	13.1	5.1	3.6	4.3	3.1	3.1	3.1
16	16.0	14.0	14.9	12.2	10.8	11.6	5.2	4.8	5.0	3.1	3.1	3.1
17	17.3	16.0	16.6	10.6	10.1	10.3	4.7	3.7	3.9	3.1	3.0	3.0
18	16.5	15.1	15.9	10.1	8.7	9.6	5.2	3.7	4.4	3.0	2.9	3.0
19	15.0	13.9	14.5	9.1	8.3	8.7	5.5	5.1	5.2	2.9	2.8	2.9
20	16.0	14.4	15.0	8.9	6.0	7.1	5.1	4.7	4.9	2.8	2.6	2.7
21	17.2	14.5	16.2	7.0	5.4	6.2	4.8	4.0	4.5	2.6	2.5	2.6
22	14.4	13.0	13.6	8.1	6.2	7.0	4.1	3.8	3.9	2.5	2.5	2.5
23	13.5	11.3	12.4	8.0	6.7	7.3	4.3	4.1	4.2	2.5	2.5	2.5
24	14.2	11.7	12.8	8.0	7.3	7.6	4.3	4.2	4.3	2.6	2.5	2.5
25	14.8	12.4	13.5	7.5	5.9	6.5	4.3	4.2	4.3	2.6	2.6	2.6
26	14.9	12.8	13.8	7.3	5.7	6.4	4.2	3.5	3.9	2.7	2.6	2.6
27	14.5	12.9	14.0	7.9	7.1	7.5	3.5	3.4	3.4	2.7	2.7	2.7
28	12.8	11.5	12.0	7.2	6.5	6.8	3.6	3.5	3.5	2.7	2.4	2.5
29	11.8	11.0	11.3	6.6	6.0	6.2	3.6	3.4	3.5	2.5	2.4	2.5
30	11.0	10.0	10.6	6.0	5.8	5.9	3.5	3.3	3.4	2.6	2.5	2.5
31	9.9	8.3	9.2	---	---	---	3.5	3.3	3.4	2.6	2.5	2.5
MONTH	19.6	8.3	14.0	13.6	5.4	8.2	8.2	3.2	4.8	3.5	2.4	3.0



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

415307080414500 AB-134 NR KINGSVILLE OH--Continued

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.09	.00	.14	.10	.08	.00	.01	.00	.00	.00	.00
2	.27	.00	.20	.01	.10	.09	.00	.00	.00	.00	.00	.00
3	.00	.17	.00	.00	.03	.09	.11	.00	.00	.00	.00	.00
4	.13	.00	.73	.00	.03	.09	.08	.00	.00	.00	1.39	.00
5	.03	.00	.00	.00	.00	.04	.14	.17	.00	.00	.16	.00
6	.00	.16	.10	.00	.00	.18	.46	.00	.23	.00	.00	.06
7	.00	.00	.00	.00	.00	.52	.16	.11	.00	.26	.00	.15
8	.00	.00	.00	.00	.00	.00	.00	.03	.02	.01	.00	.00
9	.44	.00	.00	.00	.00	.00	.04	.01	.00	.02	.00	.02
10	.00	.00	.15	.00	.05	.06	.42	.00	.00	.13	.00	.00
11	.00	.02	.00	.05	.00	.08	.01	.03	.00	.00	.05	.00
12	.00	.02	.00	.01	.02	.00	.85	.01	.00	.00	.74	.00
13	.00	.01	.00	.04	.03	.12	.58	.00	2.52	.00	2.57	.00
14	.00	1.06	.00	.05	.02	.08	.00	.00	.00	.31	1.25	.42
15	.00	.05	.00	.00	.01	.12	.06	.30	.00	.00	.00	.02
16	.06	.00	.00	.01	.00	.00	.07	.25	.00	.00	.00	.00
17	.94	1.04	.00	.26	.00	.00	.00	.01	.00	.00	.00	.07
18	.00	.00	.08	.00	.00	.02	.01	.00	.00	.00	.00	.00
19	.08	.12	.26	.00	.00	.03	.00	.00	.00	.00	.00	.00
20	.18	.00	.04	.08	.00	.00	.00	.00	.05	.00	.40	.00
21	.15	.00	.16	.10	.00	.59	.00	.00	.00	.79	.09	.00
22	.00	.00	.00	.14	.00	.00	.00	.00	.00	.00	.01	.00
23	.00	.08	.03	.08	.18	.00	.00	.00	.01	.00	.00	.00
24	.00	.09	.00	.09	.05	.03	.00	.03	1.31	.06	.00	.00
25	.00	.00	.00	.09	.14	.00	.00	.01	.18	.05	.02	.53
26	.00	.00	.00	.08	.07	.02	.27	.25	.59	.01	.00	.18
27	.55	1.01	.00	.42	.07	.15	.06	.00	.82	.20	.00	.06
28	.02	.13	.00	.48	.08	.01	.15	.00	.01	.00	.36	.08
29	.00	.05	.00	.07	---	.08	.02	.00	.92	.05	.00	.01
30	.30	.00	.00	.13	---	.01	.21	.00	.00	.16	.01	.00
31	1.01	---	.00	.10	---	.00	---	.32	---	.00	.05	---
TOTAL	4.17	4.10	1.75	2.43	0.98	2.49	3.70	1.54	6.66	2.05	7.10	1.60

WTR YR 1994 TOTAL 38.57

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER RECORDS**

415307080414600. Local number, AB-140.

LOCATION.--Lat 41°53'07" Long 80°41'46", Hydrologic Unit 04120101, along State Route 84 near Kingsville, OH.  
Owner.--USGS-Ohio State University (OARDC).

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 20.8 ft. Cased with Sch 40 PVC to 5.8 ft; .020 in. screen from 5.8 to 20.8 ft.

INSTRUMENTATION - Data logger--60 minute record. At this well there are 4 conductivity/water temperature probes at increasing depths within the well to better document vertical movement of high conductivity water on an hourly basis. Conductance/water temperature probes are set at 8.3 (level 4), 12.3 (level 3), 16.3 (level 2), and 20.3 (level 1) feet below land surface.

DATUM.--Elevation of land-surface datum is 772.22 feet above sea level.  
Measuring point: top of PVC casing 1.70 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: (FOUR LEVELS): July 1992 to current year  
WATER TEMPERATURE: (FOUR LEVELS): July 1992 to current year

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE:

LEVEL 1-Maximum, 3460 microsiemens October 28, 1993; minimum, 1040 microsiemens February 6, 1994.  
LEVEL 2- Maximum, 3190 microsiemens November 5-6, 1993; minimum, 387 microsiemens January 6, 1993.  
LEVEL 3- Maximum, 2790 microsiemens November 5, 1993; minimum, 362 microsiemens January 24, 1993.  
LEVEL 4- Maximum, 2740 microsiemens November 17-18, 1993; minimum, 308 microsiemens January 23, 1993.  
WATER TEMPERATURE: LEVEL 1- Maximum, 12.3°C October 29-December 13, 1993; minimum, 7.2°C March 31, April 2-3, 1993.  
LEVEL 2- Maximum, 13.0 °C many days October, November, 1992; minimum, 6.7°C March 23, 1993, and 1994.  
LEVEL 3- Maximum, 14.0°C October 1-26, 1992, October 5, 1993, and many days in September, 1994; minimum, 5.7°C March 22, 1994.  
LEVEL 4- Maximum, 17.8°C August 12, 1994; minimum, 3.8°C March 23-24, 1993.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE:

LEVEL 1-Maximum, 3460 microsiemens October 28, 1993; minimum, 1040 microsiemens February 26, 1994.  
LEVEL 2-Maximum, 3190 microsiemens November 5-6, 1993; minimum, 512 microsiemens January 29, 1994.  
LEVEL 3-Maximum, 2790 microsiemens November 5, 1993; minimum, 495 microsiemens August 18, 1994.  
LEVEL 4-Maximum, 2740 microsiemens November 17-18, 1993; minimum, 461 microsiemens August 18-19, 1994.  
WATER TEMPERATURE:  
LEVEL 1-Maximum, 12.1°C many days in November and December, 1993; minimum, 7.7°C March 25-27, 1994.  
LEVEL 2-Maximum, 12.8°C October 27, November 5, 1993; minimum, 6.7°C March 23, 1994.  
LEVEL 3-Maximum, 14.0°C October 5, 1993, and many days in September, 1994; minimum, 5.7°C March 22, 1994.  
LEVEL 4-Maximum, 17.8°C August 12, 1994; minimum, 4.7°C February 20, 1994.



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

415307080414600 AB-140,NR KINGSVILLE OH--Continued

#1 (22.0' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	3030	3010	3010	3340	3320	3340	3260	3260	3260	2780	2770	2770
2	3050	3030	3040	3350	3340	3350	3260	3260	3260	2770	2750	2760
3	3090	3040	3070	3350	3350	3350	3260	3250	3250	2750	2730	2740
4	3120	3070	3100	3360	3350	3350	3250	3240	3250	2750	2730	2740
5	3140	3100	3120	3360	3350	3360	3240	3230	3230	2730	2700	2720
6	3170	3130	3150	3360	3350	3360	3230	3210	3220	2710	2690	2700
7	3200	3150	3170	3360	3360	3360	3210	3180	3200	2690	2660	2680
8	3200	3160	3180	3360	3360	3360	3180	3160	3170	2660	2630	2650
9	3170	3160	3170	3360	3360	3360	3160	3130	3150	2630	2610	2620
10	3170	3160	3160	3360	3360	3360	3150	3110	3130	2610	2580	2590
11	3170	3160	3170	3370	3360	3360	3110	3080	3100	2580	2550	2560
12	3180	3170	3170	3360	3350	3360	3090	3060	3080	2550	2520	2540
13	3170	3170	3170	3360	3350	3360	3070	3040	3060	2530	2440	2500
14	3180	3160	3170	3360	3360	3360	3060	3030	3050	2440	2320	2380
15	3190	3170	3180	3370	3360	3360	3040	3010	3020	2330	2300	2310
16	3190	3180	3190	3360	3360	3360	3010	2980	3000	2300	2300	2300
17	3200	3180	3190	3360	3350	3360	2980	2950	2960	2310	2300	2300
18	3220	3180	3200	3360	3350	3360	2950	2920	2940	2320	2310	2310
19	3230	3210	3210	3350	3350	3350	2920	2900	2910	2320	2320	2320
20	3240	3220	3220	3350	3340	3340	2900	2880	2890	2320	2310	2320
21	3250	3230	3230	3340	3340	3340	2880	2860	2870	2320	2310	2310
22	3230	3230	3230	3340	3330	3340	2870	2850	2860	2320	2310	2320
23	3230	3230	3230	3340	3300	3330	2850	2850	2850	2320	2320	2320
24	3260	3230	3240	3300	3270	3280	2850	2840	2840	2320	2320	2320
25	3240	3230	3240	3270	3260	3260	2840	2830	2840	2320	2320	2320
26	3250	3220	3240	3270	3260	3260	2840	2820	2830	2330	2320	2320
27	3240	3220	3240	3270	3270	3270	2840	2810	2830	2330	2320	2330
28	3460	3240	3250	3280	3270	3270	2830	2810	2820	2410	2330	2360
29	3260	3220	3240	3280	3270	3270	2820	2800	2810	2410	2400	2400
30	3290	3250	3270	3270	3260	3270	2810	2790	2800	2410	2390	2400
31	3320	3290	3310	---	---	---	2790	2780	2780	2410	2390	2400
MONTH	3460	3010	3190	3370	3260	3330	3260	2780	3010	2780	2300	2470

#1 (22.0' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	2400	2340	2380	1130	1130	1130	1300	1260	1280	2040	2010	2030
2	2340	2100	2240	1130	1130	1130	1450	1300	1370	2050	2040	2050
3	2100	1760	1920	1130	1120	1130	1580	1450	1510	2060	2050	2060
4	1760	1560	1650	1120	1100	1110	1680	1580	1630	2070	2060	2070
5	1560	1430	1490	1100	1060	1080	1740	1680	1710	2070	2070	2070
6	1430	1360	1390	1170	1060	1080	1810	1750	1780	2090	2070	2080
7	1360	1330	1350	1380	1170	1280	1860	1810	1840	2090	2080	2090
8	1350	1330	1330	1470	1380	1430	1880	1860	1870	2100	2090	2100
9	1410	1350	1370	1480	1470	1480	1890	1880	1890	2100	2090	2100
10	1580	1410	1500	1480	1470	1480	1900	1890	1900	2110	2100	2100
11	1700	1580	1640	1470	1450	1470	1920	1900	1910	2100	2090	2100
12	1880	1700	1780	1460	1400	1430	1920	1910	1910	2100	2090	2100
13	1990	1880	1930	1400	1310	1350	1920	1910	1920	2100	2090	2100
14	2140	1990	2070	1420	1310	1340	1920	1910	1910	2100	2090	2090
15	2210	1430	1830	1610	1420	1530	1920	1910	1910	2090	2080	2090
16	1590	1480	1540	1640	1610	1630	1910	1910	1910	2090	2080	2080
17	1640	1590	1610	1640	1630	1630	1910	1900	1910	2090	2070	2080
18	1690	1640	1660	1640	1620	1630	1910	1880	1900	2080	2070	2080
19	1750	1690	1720	1630	1590	1620	1890	1850	1870	2090	2080	2090
20	1760	1750	1750	1590	1500	1560	1850	1810	1830	2110	2090	2100
21	1760	1740	1750	1500	1440	1460	1810	1760	1780	2120	2100	2110
22	1740	1590	1690	1460	1440	1450	1760	1720	1730	2130	2110	2130
23	1590	1250	1400	1450	1440	1440	1720	1700	1710	2150	2130	2140
24	1250	1100	1160	1440	1420	1430	1710	1700	1700	2160	2140	2150
25	1100	1060	1080	1420	1370	1400	1730	1700	1720	2170	2150	2160
26	1060	1040	1050	1380	1330	1350	1760	1720	1740	2170	2160	2170
27	1110	1050	1080	1340	1320	1330	1820	1750	1780	2170	2170	2170
28	1130	1110	1120	1320	1310	1320	1910	1820	1870	2190	2170	2180
29	---	---	---	1310	1290	1300	1970	1910	1940	2190	2180	2180
30	---	---	---	1290	1280	1280	2010	1970	1990	2190	2180	2180
31	---	---	---	1280	1270	1270	---	---	---	2190	2180	2190
MONTH	2400	1040	1590	1640	1060	1370	2010	1260	1790	2190	2010	2110

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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415307080414600 AB-140 NR KINGSVILLE OH--Continued

#1 (22.0' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	2190	2190	2190	2060	2050	2060	2210	2210	2210	2270	2250	2260
2	2190	2180	2190	2070	2060	2060	2210	2200	2210	2250	2230	2240
3	2190	2180	2190	2070	2060	2070	2210	2200	2210	2230	2220	2220
4	2190	2180	2180	2080	2060	2070	2220	2210	2210	2220	2200	2210
5	2190	2180	2180	2100	2080	2090	2210	2210	2210	2200	2190	2200
6	2180	2170	2180	2110	2090	2100	2220	2210	2220	2190	2180	2190
7	2180	2170	2180	2120	2110	2120	2220	2210	2220	2180	2170	2180
8	2180	2170	2170	2140	2120	2130	2220	2210	2220	2170	2160	2170
9	2170	2160	2170	2150	2140	2140	2350	2210	2270	2160	2140	2150
10	2170	2160	2160	2160	2150	2160	2340	2330	2330	2150	2130	2140
11	2170	2160	2160	2170	2160	2170	2340	2340	2340	2130	2120	2130
12	2160	2160	2160	2180	2170	2180	2340	2340	2340	2120	2110	2120
13	2160	2150	2150	2180	2180	2180	2340	2340	2340	2110	2100	2110
14	2150	2150	2150	2190	2180	2190	2370	2340	2350	2100	2100	2100
15	2150	2140	2140	2190	2190	2190	2370	2370	2370	2100	2090	2090
16	2140	2130	2140	2190	2190	2190	2370	2360	2370	2090	2080	2090
17	2140	2120	2130	2200	2190	2190	2370	2360	2370	2080	2070	2080
18	2130	2120	2130	2200	2190	2190	2370	2350	2370	2080	2060	2070
19	2120	2120	2120	2200	2190	2190	2370	2350	2360	2060	2050	2060
20	2120	2110	2120	2200	2190	2200	2370	2350	2360	2060	2050	2050
21	2110	2110	2110	2200	2190	2200	2360	2360	2360	2050	2040	2050
22	2110	2100	2110	2200	2200	2200	2360	2360	2360	2040	2040	2040
23	2110	2100	2110	2200	2200	2200	2360	2350	2360	2040	2030	2040
24	2100	2100	2100	2210	2200	2200	2360	2350	2360	2040	2030	2030
25	2100	2100	2100	2210	2200	2210	2360	2350	2350	2030	2030	2030
26	2100	2090	2100	2210	2200	2210	2350	2330	2340	2030	2030	2030
27	2090	2090	2090	2210	2200	2210	2340	2320	2330	2030	2030	2030
28	2090	2050	2070	2210	2200	2210	2320	2310	2320	2030	2030	2030
29	2060	2050	2060	2210	2210	2210	2310	2300	2310	2030	2020	2030
30	2060	2060	2060	2210	2210	2210	2300	2270	2290	2030	2010	2020
31	---	---	---	2210	2210	2210	2290	2260	2280	---	---	---
MONTH	2190	2050	2140	2210	2050	2170	2370	2200	2310	2270	2010	2110
YEAR	3460	1040	2300									

#2 (18.0' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	2890	2880	2880	3180	3160	3180	2590	2510	2560	2310	2280	2300
2	2920	2890	2900	3160	3130	3140	2510	2410	2460	2310	2300	2300
3	2950	2920	2930	3140	3130	3130	2420	2400	2410	2310	2290	2300
4	2980	2950	2970	3170	3140	3150	2460	2400	2420	2320	2300	2310
5	3010	2980	3000	3190	3170	3180	2480	2420	2470	2320	2310	2320
6	3030	3000	3020	3190	3140	3170	2420	908	2050	2320	2320	2320
7	3030	3020	3030	3140	3080	3110	952	904	928	2330	2320	2320
8	3020	3000	3010	3080	3030	3060	961	952	958	2330	2330	2330
9	3010	2970	2990	3030	2990	3020	954	917	938	2330	2320	2320
10	2980	2960	2970	2990	2970	2980	917	871	897	2320	2300	2310
11	3000	2970	2980	2970	2950	2960	876	859	866	2310	2300	2310
12	3010	2990	3000	2950	2900	2930	935	876	900	2320	2300	2310
13	3000	2990	2990	2920	2900	2910	1260	931	1050	2330	2230	2300
14	3020	3000	3000	2900	2870	2890	1630	1260	1470	2230	2180	2200
15	3030	3010	3010	2930	2900	2920	1790	1630	1720	2200	2190	2190
16	3020	3020	3020	2960	2930	2950	1870	1790	1830	2210	2190	2200
17	3050	3020	3030	3000	2960	2980	1940	1870	1900	2230	2200	2220
18	3070	3050	3060	3040	3000	3020	2000	1930	1970	2240	2220	2230
19	3070	3030	3060	3050	3030	3040	2050	2000	2020	2230	2220	2230
20	3050	3020	3040	3060	3010	3050	2110	2050	2080	2220	2210	2220
21	3040	3010	3030	3010	2860	2940	2160	2110	2130	2230	2220	2220
22	3050	3020	3040	2870	2680	2780	2220	2160	2200	2230	2210	2220
23	3050	3030	3040	2700	2640	2670	2250	2220	2240	2230	2210	2220
24	3060	3030	3050	2650	2570	2620	2280	2250	2270	2230	2220	2220
25	3050	3030	3050	2580	2550	2560	2310	2280	2300	2230	2220	2220
26	3060	3040	3050	2550	2520	2530	2320	2310	2310	2220	2200	2210
27	3070	3050	3060	2540	2510	2520	2320	2320	2320	2230	2210	2220
28	3080	2980	3030	2660	2540	2610	2320	2290	2300	2340	2230	2280
29	3100	3030	3080	2690	2660	2680	2320	2310	2310	2340	512	1110
30	3140	3100	3120	2670	2590	2630	2320	2310	2320	899	658	793
31	3170	3130	3140	---	---	---	2320	2290	2300	1060	916	987
MONTH	3170	2880	3020	3190	2510	2910	2590	859	1900	2340	512	2140



**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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415307080414600 AB-140 NR KINGSVILLE OH--Continued

#3 (14.0' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	2120	2100	2110	2410	2340	2400	1750	1110	1420	1090	1070	1080
2	2100	2090	2100	2450	2400	2420	1110	799	854	1120	1090	1100
3	2090	2080	2090	2540	2450	2500	817	809	812	1140	1120	1130
4	2090	2080	2080	2700	2540	2610	817	801	809	1160	1140	1150
5	2460	2010	2220	2790	2700	2770	816	790	798	1180	1160	1170
6	2290	2170	2210	2780	2750	2770	915	816	868	1200	1180	1190
7	2170	2150	2160	2780	2720	2750	968	915	942	1210	1200	1210
8	2160	2150	2150	2730	2700	2720	976	962	970	1230	1210	1220
9	2150	2130	2140	2700	2670	2690	966	927	950	1250	1230	1240
10	2140	2120	2130	2680	2660	2670	931	882	908	1270	1250	1260
11	2150	2130	2130	2660	2630	2650	882	865	873	1290	1270	1280
12	2150	2140	2150	2630	2590	2600	934	879	903	1300	1290	1290
13	2150	2140	2150	2630	2590	2620	995	932	968	2340	1300	1790
14	2150	2140	2140	2700	2520	2620	968	920	942	2250	2210	2220
15	2150	2140	2150	2710	2700	2700	921	876	900	2230	2210	2220
16	2150	2140	2150	2720	2700	2710	876	853	868	2240	2220	2230
17	2230	2150	2170	2720	2690	2710	856	837	847	2260	2230	2250
18	2250	2230	2240	2690	2660	2680	848	833	840	2260	2250	2260
19	2230	2200	2220	2660	2650	2650	843	830	837	2270	2260	2260
20	2200	2190	2190	2660	2640	2660	846	837	841	2260	2230	2250
21	2190	2190	2190	2650	2630	2640	846	840	842	2250	2250	2250
22	2190	2190	2190	2630	2620	2620	854	842	845	2250	2230	2240
23	2190	2190	2190	2620	2340	2460	863	850	857	2250	2230	2240
24	2210	2190	2200	2340	2230	2300	885	863	876	2250	2240	2250
25	2190	2180	2180	2270	2210	2240	913	885	901	2250	2240	2250
26	2190	2170	2180	2210	1650	1890	932	913	923	2250	2230	2240
27	2190	2170	2180	1890	1520	1610	978	932	952	2260	2230	2250
28	2430	2170	2270	2530	1890	2400	997	977	987	2370	2250	2300
29	2320	2270	2300	2540	2500	2530	1020	997	1010	2370	513	756
30	2280	2250	2270	2500	1750	2130	1040	1020	1030	924	676	814
31	2340	2250	2270	---	---	---	1070	1040	1060	1080	924	1010
MONTH	2460	2010	2180	2790	1520	2520	1750	790	917	2370	513	1690

#3 (14.0' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1180	1080	1130	1210	1200	1210	1540	1370	1480	1570	1550	1560
2	1220	1180	1200	1200	1180	1190	1430	1370	1400	1590	1570	1580
3	1220	1210	1220	1180	1150	1170	1460	1430	1440	1590	1580	1590
4	1220	1200	1210	1150	1120	1140	1460	1350	1390	1610	1590	1600
5	1200	1180	1190	1140	1100	1120	1390	1350	1370	1620	1600	1610
6	1190	1170	1180	1300	1140	1200	1420	1400	1410	1620	1610	1620
7	1240	1170	1200	1520	1300	1420	1990	1420	1680	1630	1620	1620
8	1340	1240	1280	1560	969	1290	2000	1890	1990	1640	1630	1630
9	1440	1340	1380	1140	1020	1090	1890	1430	1640	1650	1640	1640
10	1580	1440	1520	1180	1140	1170	1430	1320	1380	1650	1640	1650
11	1660	1200	1520	1190	1170	1180	1420	1310	1360	1650	1630	1640
12	1240	1180	1210	1180	1150	1170	1450	1420	1440	1650	1620	1640
13	1260	1240	1250	1340	1170	1250	1660	1450	1590	1630	1600	1610
14	1270	1260	1270	1410	1070	1210	1620	1510	1550	1610	1590	1600
15	1270	702	1010	1120	1030	1070	1570	1530	1550	1590	1590	1590
16	711	703	708	1190	1050	1130	1540	1520	1530	1590	1570	1580
17	1000	709	775	1280	1190	1240	1580	1540	1560	1570	1540	1550
18	1750	1000	1230	1340	1280	1320	1590	1570	1580	1540	1530	1540
19	1800	736	1400	1390	1340	1360	1590	1570	1580	1540	1530	1540
20	868	705	764	1420	1390	1400	1570	1530	1550	1550	1540	1550
21	895	720	801	1610	1420	1500	1550	1540	1540	1550	1540	1550
22	1010	895	962	1620	1030	1360	1650	1550	1590	1560	1540	1550
23	1050	1010	1040	1100	1020	1050	1550	1490	1510	1570	1550	1560
24	1100	1050	1070	1310	1100	1210	1550	1530	1540	1590	1560	1580
25	1120	1100	1110	1480	1310	1400	1560	1540	1550	1620	1590	1610
26	1120	1090	1100	1560	1470	1520	1560	1500	1510	1630	1610	1620
27	1200	1120	1160	1570	1550	1570	1520	1480	1500	1640	1610	1630
28	1210	1190	1200	1570	1530	1550	1510	1480	1490	1660	1630	1650
29	---	---	---	1540	1500	1520	1520	1510	1510	1670	1650	1660
30	---	---	---	1500	1460	1480	1550	1520	1540	1680	1660	1670
31	---	---	---	1480	1460	1470	---	---	---	1690	1670	1680
MONTH	1800	702	1150	1620	969	1290	2000	1310	1520	1690	1530	1600



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

415307080414600 AB-140 NR KINGSVILLE OH--Continued

#3 (14.0' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	1690	1680	1690	2020	2010	2020	2030	2030	2030	1100	1080	1090
2	1700	1680	1690	2020	2020	2020	2030	2020	2030	1130	1100	1110
3	1700	1690	1700	2030	2020	2030	2030	2020	2030	1150	1120	1140
4	1710	1700	1700	2030	2020	2030	2030	2030	2030	1160	1140	1150
5	1720	1700	1710	2030	2020	2030	2030	2030	2030	1170	1160	1170
6	1720	1710	1720	2030	2020	2020	2040	2030	2040	1180	1170	1180
7	1720	1710	1720	2030	2020	2020	2040	2040	2040	1190	1180	1190
8	1720	1720	1720	2030	2030	2030	2040	2040	2040	1190	1180	1190
9	1730	1720	1720	2030	2020	2020	2170	2040	2090	1200	1190	1190
10	1730	1720	1730	2030	2020	2030	2170	2150	2160	1200	1200	1200
11	1740	1730	1730	2030	2020	2030	2150	2150	2150	1200	1200	1200
12	1740	1730	1730	2030	2020	2030	2150	2140	2150	1210	1200	1210
13	1740	1710	1740	2030	2020	2020	2240	2150	2180	1210	1210	1210
14	1790	1740	1770	2020	2020	2020	2340	2220	2300	1230	1210	1220
15	1790	1790	1790	2020	2020	2020	2330	1880	2190	1270	1230	1250
16	1800	1790	1800	2020	2010	2010	1880	516	1090	1290	1270	1280
17	1800	1800	1800	2010	2010	2010	518	507	515	1300	1290	1300
18	1800	1800	1800	2010	2000	2010	507	495	499	1320	1300	1310
19	1800	1800	1800	2010	2010	2010	529	501	516	1340	1320	1330
20	1800	1800	1800	2010	2010	2010	576	528	553	1360	1340	1350
21	1800	1800	1800	2010	2010	2010	616	576	600	1370	1360	1370
22	1800	1790	1800	2010	2010	2010	644	616	626	1380	1370	1370
23	1800	1790	1800	2020	2010	2010	680	644	660	1410	1380	1390
24	1800	1800	1800	2020	2010	2010	727	680	703	1420	1410	1410
25	1810	1800	1810	2020	2010	2020	785	727	757	1430	1420	1430
26	1830	1810	1820	2020	2020	2020	852	785	818	1450	1430	1440
27	1900	1820	1860	2020	2020	2020	914	852	882	1460	1450	1460
28	2090	1920	2010	2020	2020	2020	964	914	942	1470	1450	1460
29	2060	2010	2040	2030	2020	2020	1010	964	986	1510	1470	1500
30	2020	2010	2020	2030	2020	2020	1050	1010	1030	1520	1510	1520
31	---	---	---	2030	2020	2020	1080	1050	1070	---	---	---
MONTH	2090	1680	1790	2030	2000	2020	2340	495	1410	1520	1080	1290
YEAR	2790	495	1620									

#4 (10.0' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	2190	2060	2160	833	801	814	1120	1100	1110
2	---	---	---	2230	2180	2210	833	819	827	1150	1120	1140
3	---	---	---	2240	2230	2230	837	828	832	1170	1150	1160
4	---	---	---	2250	2230	2240	833	822	828	1190	1170	1180
5	---	---	---	2260	2250	2250	850	810	823	1210	1190	1200
6	---	---	---	2260	2250	2250	937	850	897	1230	1210	1220
7	---	---	---	2250	2250	2250	991	937	969	1250	1230	1240
8	---	---	---	2260	2250	2250	999	987	993	1270	1250	1260
9	---	---	---	2260	2250	2260	994	950	971	1280	1260	1270
10	---	---	---	2260	2250	2260	957	895	928	1300	1280	1290
11	---	---	---	2260	2250	2260	902	882	891	1320	1300	1310
12	---	---	---	2260	2250	2250	954	891	918	1340	1320	1330
13	---	---	---	2260	2250	2260	1010	950	985	1320	1340	1830
14	---	---	---	2270	2260	2260	989	945	964	1290	1250	1270
15	---	---	---	2270	2260	2270	948	899	925	1270	1920	2120
16	---	---	---	2320	2260	2290	902	876	892	1920	1840	1860
17	---	---	---	2740	2310	2420	879	861	871	1870	1840	1860
18	---	---	---	2740	2700	2720	873	858	864	1870	1850	1860
19	---	---	---	2700	2690	2700	867	851	863	1900	1870	1890
20	---	---	---	2710	2690	2700	868	862	865	1910	1890	1900
21	---	---	---	2700	2660	2690	867	861	864	1970	1890	1910
22	---	---	---	2670	2140	2380	876	863	871	1920	1850	1880
23	---	---	---	2140	880	1280	890	876	882	1930	1880	1910
24	---	---	---	885	846	866	912	890	903	1990	1930	1960
25	---	---	---	847	774	827	940	912	928	2070	1990	2030
26	---	---	---	784	767	778	961	940	949	2280	2070	2190
27	---	---	---	767	761	765	1000	961	979	2300	2280	2290
28	---	---	---	1430	762	1070	1030	1000	1020	2410	1910	2330
29	---	---	---	1460	1240	1400	1060	1030	1040	1910	522	657
30	---	---	---	1240	830	975	1070	1050	1060	961	711	850
31	---	---	---	---	---	---	1100	1070	1090	1100	961	1040
MONTH	---	---	---	2740	761	1980	1100	801	920	2410	522	1590





# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

415307080414600 AB-140 NR KINGSVILLE OH--Continued

#1 (22.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	12.0	12.0	12.0	12.1	12.0	12.0	11.6	11.6	11.6
2	11.4	11.4	11.4	12.1	12.0	12.0	12.1	12.0	12.0	11.6	11.6	11.6
3	11.6	11.4	11.4	12.0	12.0	12.0	12.0	12.0	12.0	11.6	11.4	11.5
4	11.6	11.4	11.5	12.1	12.0	12.0	12.0	12.0	12.0	11.6	11.3	11.4
5	11.6	11.4	11.6	12.1	12.0	12.1	12.0	12.0	12.0	11.6	11.3	11.4
6	11.6	11.4	11.6	12.0	12.0	12.0	12.0	12.0	12.0	11.5	11.3	11.4
7	11.7	11.4	11.6	12.0	12.0	12.0	12.0	12.0	12.0	11.4	11.3	11.3
8	11.7	11.4	11.6	12.1	12.0	12.0	12.1	12.0	12.0	11.3	11.3	11.3
9	11.6	11.6	11.6	12.1	12.0	12.0	12.1	12.0	12.0	11.4	11.3	11.3
10	11.6	11.6	11.6	12.1	12.0	12.0	12.1	11.8	12.0	11.4	11.3	11.3
11	11.6	11.6	11.6	12.1	12.0	12.1	12.0	12.0	12.0	11.4	11.4	11.4
12	11.6	11.6	11.6	12.1	12.0	12.1	12.0	11.8	12.0	11.4	11.2	11.4
13	11.6	11.6	11.6	12.1	12.0	12.1	12.0	11.8	11.9	11.4	10.7	11.1
14	11.8	11.6	11.6	12.1	12.1	12.1	12.0	11.8	11.8	10.9	10.7	10.7
15	11.6	11.6	11.6	12.1	12.0	12.1	12.0	11.8	11.8	10.9	10.7	10.9
16	11.6	11.6	11.6	12.0	12.0	12.0	11.8	11.8	11.8	10.9	10.9	10.9
17	11.9	11.6	11.6	12.0	12.0	12.0	12.0	11.8	11.8	10.9	10.7	10.9
18	11.9	11.6	11.8	12.1	12.0	12.0	11.8	11.8	11.8	10.9	10.9	10.9
19	11.9	11.6	11.8	12.0	12.0	12.0	11.8	11.8	11.8	10.9	10.8	10.9
20	11.9	11.6	11.8	12.0	12.0	12.0	11.8	11.8	11.8	10.9	10.7	10.8
21	11.9	11.6	11.8	12.1	12.0	12.0	11.8	11.8	11.8	10.9	10.6	10.7
22	11.8	11.8	11.8	12.1	12.0	12.1	11.8	11.8	11.8	10.7	10.5	10.6
23	11.9	11.8	11.8	12.1	12.0	12.0	11.8	11.8	11.8	10.5	10.5	10.5
24	11.9	11.6	11.8	12.0	12.0	12.0	11.8	11.8	11.8	10.5	10.5	10.5
25	11.9	11.8	11.8	12.0	12.0	12.0	11.8	11.8	11.8	10.5	10.5	10.5
26	12.0	11.8	11.9	12.1	12.0	12.0	11.8	11.8	11.8	10.5	10.3	10.5
27	12.0	11.8	11.9	12.0	12.0	12.0	11.8	11.5	11.7	10.5	10.2	10.3
28	11.8	8.1	11.7	12.0	12.0	12.0	11.8	11.5	11.7	10.3	10.1	10.3
29	12.0	11.8	11.9	12.0	12.0	12.0	11.7	11.5	11.6	11.1	10.3	10.8
30	12.0	12.0	12.0	12.0	12.0	12.0	11.6	11.5	11.6	11.1	10.5	10.9
31	12.0	12.0	12.0	---	---	---	11.6	11.5	11.6	10.5	10.0	10.2
MONTH	12.0	8.1	11.7	12.1	12.0	12.0	12.1	11.5	11.9	11.6	10.0	11.0

#1 (22.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	10.0	9.6	9.9	8.3	8.3	8.3	8.5	8.1	8.2	8.7	8.7	8.7
2	9.6	9.5	9.5	8.5	8.3	8.3	8.9	8.5	8.6	8.7	8.7	8.7
3	9.5	9.4	9.4	8.5	8.3	8.3	---	---	---	8.7	8.7	8.7
4	9.5	9.2	9.4	8.5	8.3	8.4	8.9	8.9	8.9	8.7	8.7	8.7
5	9.5	9.2	9.4	8.5	8.5	8.5	8.9	8.9	8.9	8.7	8.7	8.7
6	9.5	9.2	9.4	8.7	8.5	8.7	8.9	8.9	8.9	8.7	8.7	8.7
7	9.5	9.4	9.4	8.9	8.7	8.7	8.9	8.5	8.7	8.9	8.7	8.7
8	9.4	9.4	9.4	9.5	8.9	9.0	8.5	8.3	8.4	8.7	8.7	8.7
9	9.6	9.4	9.5	9.9	9.5	9.6	8.9	8.5	8.7	8.9	8.7	8.7
10	9.8	9.6	9.6	9.9	9.4	9.7	8.9	8.9	8.9	8.9	8.7	8.8
11	9.9	9.6	9.8	9.4	9.0	9.3	9.1	8.9	8.9	8.9	8.7	8.8
12	10.1	9.8	9.9	9.1	8.7	8.9	9.3	8.7	9.1	8.9	8.7	8.7
13	10.3	10.1	10.2	8.7	8.3	8.5	8.7	8.5	8.5	8.9	8.7	8.8
14	10.3	10.1	10.2	9.1	8.7	8.9	8.9	8.5	8.8	8.9	8.7	8.8
15	10.3	10.1	10.3	9.3	9.1	9.2	9.4	8.9	9.2	8.9	8.7	8.8
16	10.3	10.1	10.1	9.6	9.2	9.4	9.3	9.3	9.3	8.9	8.7	8.8
17	10.1	9.9	10.1	9.9	9.6	9.7	9.3	9.3	9.3	8.9	8.9	8.9
18	10.1	9.9	10.0	9.6	9.3	9.4	9.3	8.7	9.0	8.9	8.9	8.9
19	9.9	9.7	9.9	9.2	8.9	9.0	8.7	8.5	8.7	8.9	8.7	8.8
20	10.5	9.9	10.3	8.9	8.1	8.5	8.7	8.3	8.5	8.9	8.7	8.8
21	10.1	9.3	9.6	8.1	7.9	8.1	8.5	8.3	8.3	8.9	8.7	8.8
22	9.1	8.3	8.7	9.1	8.1	8.5	8.7	8.3	8.5	8.9	8.7	8.8
23	8.3	8.1	8.2	9.5	9.3	9.4	8.9	8.7	8.9	8.9	8.7	8.8
24	8.3	7.9	8.1	9.5	8.9	9.1	9.0	8.7	8.9	8.9	8.7	8.8
25	8.1	7.9	7.9	8.9	7.7	8.3	9.0	8.7	8.9	8.9	8.7	8.8
26	8.2	7.9	8.0	7.9	7.7	7.8	8.9	8.7	8.8	8.9	8.7	8.9
27	8.3	8.2	8.3	7.9	7.7	7.8	8.9	8.7	8.8	8.9	8.9	8.9
28	8.3	8.2	8.3	7.9	7.9	7.9	8.9	8.7	8.7	8.9	8.7	8.9
29	---	---	---	8.1	7.9	7.9	8.9	8.7	8.7	9.0	8.9	8.9
30	---	---	---	7.9	7.9	7.9	8.7	8.7	8.7	9.0	8.9	8.9
31	---	---	---	8.1	7.9	8.1	---	---	---	9.0	8.9	8.9
MONTH	10.5	7.9	9.4	9.9	7.7	8.7	9.4	8.1	8.8	9.0	8.7	8.8

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

227

415307080414600 AB-140 NR KINGSVILLE OH--Continued

#1 (22.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.9	8.9	8.9	9.5	9.3	9.4	10.0	9.9	9.9	11.0	10.8	10.9
2	9.1	8.9	8.9	9.5	9.3	9.4	10.1	9.9	10.0	11.0	11.0	11.0
3	9.1	8.9	8.9	9.5	9.3	9.4	10.2	9.9	10.0	11.0	10.9	11.0
4	9.1	8.9	9.0	9.5	9.3	9.4	10.2	10.0	10.1	11.0	11.0	11.0
5	9.0	8.9	8.9	9.5	9.3	9.4	10.1	10.1	10.1	11.0	11.0	11.0
6	9.1	8.9	8.9	9.6	9.4	9.5	10.2	10.1	10.1	11.0	11.0	11.0
7	9.1	8.9	9.0	9.6	9.5	9.5	10.2	10.1	10.1	11.0	11.0	11.0
8	9.1	8.9	9.1	9.6	9.5	9.5	10.4	10.1	10.2	11.0	11.0	11.0
9	9.1	8.9	9.1	9.6	9.5	9.5	---	---	---	11.2	11.0	11.1
10	9.3	9.1	9.2	9.5	9.5	9.5	10.4	10.3	10.3	11.2	11.0	11.2
11	9.2	8.9	9.1	9.5	9.5	9.5	10.4	10.3	10.3	11.2	11.2	11.2
12	9.1	8.9	9.0	9.6	9.5	9.5	10.4	10.3	10.4	11.2	11.2	11.2
13	9.1	8.9	9.1	9.6	9.5	9.5	10.4	10.3	10.4	11.2	11.2	11.2
14	9.1	8.9	9.0	9.5	9.5	9.5	10.4	10.3	10.3	11.2	11.2	11.2
15	9.2	8.9	9.1	9.6	9.5	9.5	10.4	10.3	10.3	11.2	11.2	11.2
16	9.2	9.1	9.2	9.6	9.5	9.5	10.4	10.3	10.3	11.2	11.2	11.2
17	9.4	9.1	9.2	9.7	9.5	9.6	10.4	10.3	10.3	11.4	11.2	11.2
18	9.4	9.2	9.3	9.7	9.5	9.6	10.5	10.3	10.4	11.4	11.2	11.3
19	9.4	9.2	9.3	9.8	9.5	9.7	10.6	10.3	10.4	11.5	11.4	11.4
20	9.4	9.3	9.3	9.8	9.6	9.7	10.6	10.4	10.5	11.5	11.4	11.4
21	9.4	9.3	9.3	9.8	9.7	9.7	10.6	10.5	10.6	11.5	11.4	11.4
22	9.4	9.3	9.3	9.8	9.7	9.7	10.6	10.5	10.6	11.4	11.4	11.4
23	9.4	9.3	9.3	9.8	9.7	9.7	10.6	10.5	10.6	11.4	11.4	11.4
24	9.4	9.3	9.3	9.8	9.7	9.7	10.6	10.5	10.6	11.4	11.4	11.4
25	9.3	9.3	9.3	9.9	9.7	9.8	10.6	10.5	10.6	11.5	11.4	11.4
26	9.4	9.3	9.3	10.0	9.7	9.8	10.8	10.5	10.6	11.4	11.4	11.4
27	9.3	9.3	9.3	10.0	9.7	9.9	10.8	10.5	10.7	11.4	11.4	11.4
28	9.4	9.3	9.3	10.0	9.7	9.9	10.8	10.8	10.8	11.4	11.4	11.4
29	9.4	9.3	9.3	10.0	9.9	9.9	10.8	10.7	10.8	11.6	11.4	11.5
30	9.3	9.3	9.3	10.0	9.9	9.9	11.0	10.7	10.8	11.6	11.4	11.5
31	---	---	---	10.0	9.9	9.9	11.0	10.8	10.8	---	---	---
MONTH	9.4	8.9	9.1	10.0	9.3	9.6	11.0	9.9	10.4	11.6	10.8	11.2
YEAR	12.1	7.7	10.2									

#2 (18.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	12.7	12.7	12.7	12.3	12.2	12.3	11.6	11.4	11.4
2	12.3	12.3	12.3	12.7	12.5	12.7	12.3	12.3	12.3	11.6	11.3	11.4
3	12.3	12.3	12.3	12.7	12.7	12.7	12.3	12.3	12.3	11.6	11.3	11.4
4	12.3	12.3	12.3	12.7	12.5	12.6	12.3	12.3	12.3	11.4	11.3	11.3
5	12.5	12.3	12.3	12.8	12.5	12.5	12.3	12.3	12.3	11.4	11.3	11.3
6	12.5	12.3	12.3	12.7	12.7	12.7	12.3	11.4	11.9	11.4	11.3	11.3
7	12.4	12.3	12.3	12.7	12.5	12.7	11.4	11.4	11.4	11.4	11.3	11.3
8	12.5	12.3	12.3	12.7	12.5	12.6	11.4	11.4	11.4	11.3	11.3	11.3
9	12.5	12.3	12.4	12.7	12.5	12.6	11.4	11.4	11.4	11.4	11.3	11.3
10	12.5	12.3	12.5	12.7	12.5	12.6	11.4	11.4	11.4	11.4	11.3	11.3
11	12.5	12.3	12.5	12.7	12.5	12.5	11.4	11.4	11.4	11.4	11.4	11.4
12	12.5	12.3	12.5	12.7	12.5	12.5	11.4	11.4	11.4	11.4	11.1	11.3
13	12.5	12.5	12.5	12.5	12.5	12.5	11.6	11.3	11.4	11.4	10.5	11.0
14	12.5	12.3	12.5	12.5	12.5	12.5	11.6	11.6	11.6	10.7	10.5	10.6
15	12.6	12.3	12.5	12.5	12.5	12.5	11.8	11.6	11.7	10.9	10.7	10.7
16	12.5	12.5	12.5	12.5	12.5	12.5	11.8	11.6	11.8	10.9	10.6	10.8
17	12.5	12.5	12.5	12.5	12.5	12.5	11.8	11.6	11.8	10.9	10.7	10.7
18	12.5	12.5	12.5	12.5	12.3	12.5	11.8	11.6	11.7	10.9	10.6	10.8
19	12.7	12.5	12.5	12.5	12.5	12.5	11.8	11.6	11.6	10.9	10.8	10.9
20	12.7	12.5	12.6	12.5	12.5	12.5	11.6	11.6	11.6	10.9	10.5	10.7
21	12.7	12.5	12.5	12.5	12.3	12.4	11.6	11.6	11.6	10.7	10.5	10.7
22	12.7	12.5	12.6	12.5	12.3	12.3	11.6	11.6	11.6	10.7	10.5	10.5
23	12.7	12.5	12.6	12.5	12.3	12.4	11.8	11.5	11.6	10.5	10.3	10.5
24	12.7	12.5	12.6	12.5	12.3	12.3	11.6	11.5	11.6	10.5	10.3	10.5
25	12.7	12.5	12.6	12.5	12.2	12.3	11.6	11.5	11.6	10.5	10.3	10.5
26	12.7	12.5	12.6	12.5	12.3	12.3	11.5	11.5	11.5	10.5	10.2	10.4
27	12.8	12.5	12.6	12.3	12.3	12.3	11.6	11.5	11.5	10.3	10.2	10.3
28	12.7	10.1	12.5	12.3	12.3	12.3	11.6	11.5	11.6	10.3	10.1	10.2
29	12.7	12.5	12.5	12.3	12.3	12.3	11.6	11.5	11.5	10.5	8.1	8.9
30	12.7	12.5	12.6	12.3	12.2	12.3	11.6	11.5	11.6	8.9	8.6	8.7
31	12.7	12.5	12.7	---	---	---	11.6	11.3	11.4	9.3	8.8	9.1
MONTH	12.8	10.1	12.5	12.8	12.2	12.5	12.3	11.3	11.7	11.6	8.1	10.7





# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

229

415307080414600 AB-140 NR KINGSVILLE OH--Continued

#3 (14.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	---	---	---	13.2	13.2	13.2	12.3	11.8	12.2	10.3	10.1	10.1
2	13.7	13.7	13.7	13.2	13.2	13.2	11.6	11.4	11.4	10.3	10.1	10.1
3	13.7	13.7	13.7	13.2	13.2	13.2	11.4	11.4	11.4	10.1	9.9	10.0
4	13.7	13.7	13.7	13.2	13.2	13.2	11.4	11.4	11.4	10.1	9.9	10.0
5	14.0	13.5	13.7	13.2	13.0	13.0	11.4	11.4	11.4	10.1	9.8	9.9
6	13.7	13.5	13.7	13.2	13.2	13.2	11.4	11.1	11.2	10.0	9.8	9.9
7	13.8	13.5	13.7	13.2	13.0	13.1	11.4	11.1	11.2	9.9	9.9	9.9
8	13.8	13.5	13.7	13.2	13.0	13.0	11.4	11.1	11.3	9.9	9.8	9.8
9	13.7	13.7	13.7	13.0	13.0	13.0	11.4	11.1	11.2	9.9	9.6	9.8
10	13.7	13.7	13.7	13.0	13.0	13.0	11.2	11.1	11.2	9.9	9.6	9.7
11	13.7	13.5	13.7	13.0	13.0	13.0	11.4	11.1	11.1	9.7	9.7	9.7
12	13.7	13.7	13.7	13.0	13.0	13.0	11.2	10.9	11.1	9.7	9.5	9.6
13	13.7	13.5	13.7	13.0	13.0	13.0	11.3	10.9	11.1	10.7	9.5	10.0
14	13.7	13.5	13.6	13.0	12.8	12.9	11.1	10.9	11.0	10.3	10.2	10.3
15	13.7	13.5	13.6	13.0	12.8	13.0	10.9	10.9	10.9	10.5	10.2	10.3
16	13.7	13.5	13.5	13.0	12.7	12.9	10.9	10.7	10.9	10.5	10.4	10.4
17	13.5	13.5	13.5	13.0	12.7	12.8	10.9	10.7	10.9	10.5	10.3	10.4
18	13.5	13.5	13.5	12.7	12.5	12.6	10.9	10.7	10.8	10.5	10.4	10.4
19	13.5	13.5	13.5	12.5	12.3	12.4	10.9	10.7	10.8	10.6	10.4	10.4
20	13.5	13.5	13.5	12.5	12.3	12.3	10.7	10.5	10.7	10.4	10.2	10.3
21	13.5	13.5	13.5	12.3	12.2	12.3	10.5	10.5	10.5	10.3	10.2	10.2
22	13.5	13.5	13.5	12.5	12.3	12.4	10.5	10.3	10.5	10.3	10.1	10.2
23	13.5	13.4	13.5	12.5	12.5	12.5	10.5	10.3	10.4	10.3	9.9	10.1
24	13.5	13.3	13.4	12.5	12.5	12.5	10.5	10.3	10.3	10.3	10.1	10.1
25	13.5	13.3	13.4	12.5	12.3	12.4	10.3	10.3	10.3	10.3	9.9	10.1
26	13.5	13.2	13.4	12.3	12.3	12.3	10.3	10.2	10.3	10.0	9.8	10.0
27	13.5	13.2	13.4	12.3	12.3	12.3	10.3	10.2	10.3	10.0	9.8	9.9
28	13.5	9.7	13.1	12.3	12.3	12.3	10.3	10.2	10.3	9.9	9.5	9.8
29	13.5	13.2	13.2	12.3	12.3	12.3	10.3	10.2	10.3	9.7	7.4	8.0
30	13.5	13.2	13.2	12.3	12.2	12.3	10.3	10.2	10.3	8.2	7.9	7.9
31	13.2	13.2	13.2	---	---	---	10.3	10.0	10.2	8.6	8.2	8.4
MONTH	14.0	9.7	13.5	13.2	12.2	12.8	12.3	10.0	10.9	10.7	7.4	9.9

#3 (14.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	8.6	8.4	8.6	7.8	7.4	7.6	8.0	6.6	7.5	7.4	7.2	7.4
2	8.7	8.3	8.5	7.9	7.5	7.7	7.2	6.8	7.0	7.6	7.4	7.4
3	8.7	8.5	8.5	7.7	7.5	7.7	---	---	---	7.6	7.4	7.5
4	8.7	8.4	8.6	7.9	7.5	7.7	7.4	6.6	6.8	7.6	7.4	7.5
5	8.7	8.3	8.6	7.9	7.5	7.7	7.2	6.6	6.9	7.6	7.4	7.5
6	8.7	8.4	8.5	8.1	7.7	7.9	7.2	6.8	7.2	7.7	7.6	7.6
7	8.7	8.5	8.6	8.3	8.1	8.2	8.3	6.8	7.4	7.8	7.6	7.7
8	8.8	8.4	8.7	8.7	6.3	7.6	8.3	7.4	8.1	7.8	7.7	7.8
9	9.0	8.6	8.8	7.2	6.8	7.0	7.4	6.9	7.0	7.8	7.7	7.8
10	9.3	8.8	9.1	7.5	7.2	7.3	7.0	6.3	6.9	7.9	7.7	7.8
11	9.5	8.1	9.0	7.7	7.2	7.3	6.7	6.3	6.5	8.0	7.7	7.8
12	8.5	8.1	8.3	7.6	7.1	7.4	6.7	6.3	6.6	7.9	7.7	7.9
13	8.7	8.3	8.5	8.1	7.4	7.8	7.1	6.3	6.8	7.9	7.7	7.8
14	8.7	8.3	8.5	8.5	6.8	7.5	6.8	6.3	6.6	7.9	7.7	7.8
15	8.7	7.9	8.4	6.8	6.0	6.4	7.2	6.7	6.9	7.8	7.8	7.8
16	7.9	7.7	7.8	7.1	6.3	6.6	7.2	6.8	7.1	7.9	7.8	7.9
17	8.3	7.2	7.6	7.2	6.8	7.1	7.2	7.0	7.2	7.9	7.9	7.9
18	9.7	8.3	8.8	7.2	7.0	7.2	7.4	7.2	7.2	7.9	7.9	7.9
19	9.7	6.7	8.8	7.4	7.0	7.2	7.6	7.2	7.4	8.0	7.9	7.9
20	7.0	6.5	6.8	7.4	7.2	7.2	7.8	7.4	7.5	8.1	7.9	8.0
21	7.2	6.6	6.8	7.6	7.2	7.2	7.8	7.4	7.6	8.1	7.9	8.0
22	7.0	6.6	6.8	7.7	5.7	6.8	8.0	7.0	7.8	8.1	7.9	8.0
23	7.2	6.6	6.9	6.7	6.0	6.4	7.2	7.0	7.1	8.2	8.0	8.1
24	7.4	6.8	7.1	7.0	6.7	6.8	7.4	7.2	7.2	8.2	8.1	8.1
25	7.1	6.8	6.9	7.0	6.8	6.9	7.4	7.2	7.4	8.2	8.1	8.2
26	7.4	6.6	7.0	7.2	6.8	7.0	7.3	7.2	7.2	8.3	8.1	8.2
27	7.7	7.3	7.5	7.2	7.0	7.1	7.3	7.1	7.2	8.3	8.1	8.2
28	7.7	7.4	7.6	7.4	7.0	7.2	7.2	7.2	7.2	8.4	8.1	8.3
29	---	---	---	7.6	7.2	7.3	7.2	7.2	7.2	8.4	8.2	8.3
30	---	---	---	7.4	7.0	7.3	7.4	7.2	7.3	8.4	8.2	8.3
31	---	---	---	7.6	7.2	7.4	---	---	---	8.4	8.3	8.4
MONTH	9.7	6.5	8.1	8.7	5.7	7.3	8.3	6.3	7.2	8.4	7.2	7.9



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

415307080414600 AB-140 NR KINGSVILLE OH--Continued

#3 (14.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.5	8.3	8.3	9.9	9.7	9.7	12.1	12.1	12.1	13.5	13.5	13.5
2	8.5	8.3	8.5	10.0	9.7	9.9	12.3	12.1	12.1	13.7	13.5	13.6
3	8.6	8.4	8.5	10.0	9.9	9.9	12.4	12.1	12.3	13.7	13.5	13.7
4	8.7	8.5	8.5	10.2	9.9	10.1	12.4	12.3	12.3	13.7	13.7	13.7
5	8.7	8.5	8.6	10.2	10.1	10.2	12.3	12.3	12.3	13.7	13.7	13.7
6	8.7	8.5	8.6	10.4	10.1	10.3	12.3	12.3	12.3	13.7	13.7	13.7
7	8.8	8.7	8.7	10.4	10.4	10.4	12.4	12.3	12.3	14.0	13.7	13.8
8	8.7	8.7	8.7	10.4	10.4	10.4	12.4	12.3	12.3	14.0	13.7	13.8
9	8.9	8.7	8.8	10.6	10.4	10.5	---	---	---	14.0	13.7	13.9
10	8.9	8.7	8.8	10.8	10.5	10.6	12.6	12.3	12.4	14.0	13.7	14.0
11	9.0	8.8	8.9	10.8	10.6	10.7	12.5	12.5	12.5	14.0	13.9	14.0
12	9.0	8.9	8.9	10.8	10.7	10.8	12.8	12.5	12.6	14.0	13.9	14.0
13	9.0	8.9	8.9	11.0	10.8	11.0	12.5	12.3	12.4	14.0	14.0	14.0
14	9.0	8.9	8.9	11.0	11.0	11.0	12.5	11.6	12.0	14.0	14.0	14.0
15	9.0	8.9	9.0	11.0	11.0	11.0	13.0	12.5	12.9	14.0	14.0	14.0
16	9.1	8.9	9.0	11.2	11.0	11.2	13.0	13.0	13.0	14.0	14.0	14.0
17	9.2	8.9	9.1	11.2	11.2	11.2	13.3	13.0	13.2	14.0	14.0	14.0
18	9.2	9.1	9.2	11.4	11.2	11.2	13.3	13.2	13.3	14.0	14.0	14.0
19	9.4	9.1	9.2	11.5	11.4	11.4	13.3	13.0	13.2	14.0	14.0	14.0
20	9.4	9.3	9.3	11.5	11.4	11.4	13.3	13.0	13.2	14.0	13.9	14.0
21	9.4	9.3	9.3	11.5	11.4	11.4	13.3	13.2	13.3	14.0	14.0	14.0
22	9.5	9.3	9.3	11.5	11.4	11.4	13.3	13.2	13.3	14.0	14.0	14.0
23	9.5	9.3	9.5	11.7	11.4	11.5	13.3	13.2	13.2	14.0	14.0	14.0
24	9.6	9.5	9.5	11.7	11.4	11.6	13.3	13.2	13.3	14.0	14.0	14.0
25	9.5	9.5	9.5	11.7	11.6	11.7	13.3	13.2	13.3	14.0	14.0	14.0
26	9.5	9.5	9.5	11.7	11.6	11.6	13.3	13.2	13.3	14.0	14.0	14.0
27	9.5	9.5	9.5	11.9	11.6	11.8	13.5	13.2	13.3	14.0	14.0	14.0
28	10.4	9.5	9.6	11.9	11.9	11.9	13.5	13.2	13.5	14.0	14.0	14.0
29	9.7	9.5	9.6	12.1	11.8	11.9	13.5	13.5	13.5	14.0	14.0	14.0
30	9.7	9.7	9.7	12.1	11.9	12.0	13.5	13.5	13.5	14.0	14.0	14.0
31	---	---	---	12.1	12.1	12.1	13.5	13.5	13.5	---	---	---
MONTH	10.4	8.3	9.0	12.1	9.7	11.0	13.5	11.6	12.9	14.0	13.5	13.9
YEAR	14.0	5.7	10.4									

#4 (10.0' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	13.2	13.2	13.2	11.2	11.1	11.1	9.7	9.7	9.7
2	---	---	---	13.2	13.2	13.2	11.2	10.9	11.1	9.7	9.6	9.7
3	---	---	---	13.2	13.2	13.2	11.2	10.9	11.1	9.7	9.6	9.7
4	---	---	---	13.2	13.0	13.1	11.2	10.9	11.1	9.7	9.5	9.5
5	---	---	---	13.0	13.0	13.0	10.9	10.7	10.9	9.6	9.4	9.5
6	---	---	---	13.0	13.0	13.0	10.7	10.5	10.7	9.6	9.4	9.5
7	---	---	---	13.0	13.0	13.0	10.7	10.5	10.6	9.5	9.5	9.5
8	---	---	---	13.0	12.7	12.9	10.7	10.5	10.7	9.5	9.4	9.4
9	---	---	---	13.0	12.7	12.8	10.7	10.5	10.6	9.5	9.4	9.4
10	---	---	---	13.0	12.7	12.8	10.7	10.5	10.6	9.5	9.2	9.4
11	---	---	---	12.8	12.7	12.7	10.7	10.5	10.7	9.5	9.3	9.3
12	---	---	---	12.8	12.7	12.7	10.7	10.5	10.7	9.3	9.3	9.3
13	---	---	---	12.8	12.5	12.6	10.7	10.5	10.7	9.9	8.9	9.4
14	---	---	---	12.5	12.3	12.5	10.7	10.5	10.6	9.8	9.6	9.7
15	---	---	---	12.3	12.3	12.3	10.5	10.5	10.5	9.8	8.8	9.3
16	---	---	---	12.3	12.0	12.2	10.5	10.5	10.5	8.8	8.6	8.8
17	---	---	---	12.3	12.0	12.1	10.5	10.3	10.5	8.7	8.6	8.7
18	---	---	---	12.3	12.3	12.3	10.5	10.3	10.4	8.6	8.6	8.6
19	---	---	---	12.3	12.0	12.3	10.5	10.3	10.3	8.6	8.2	8.5
20	---	---	---	12.3	12.0	12.1	10.3	10.3	10.3	8.5	8.2	8.3
21	---	---	---	12.3	12.0	12.1	10.3	10.3	10.3	8.3	8.2	8.3
22	---	---	---	12.3	11.6	11.9	10.3	10.1	10.1	8.3	8.1	8.2
23	---	---	---	11.8	11.4	11.5	10.1	10.0	10.1	8.3	7.9	8.3
24	---	---	---	11.6	11.4	11.6	10.1	9.9	10.0	8.7	8.3	8.5
25	---	---	---	11.8	11.6	11.6	9.9	9.8	9.9	8.7	8.6	8.7
26	---	---	---	11.6	11.4	11.6	10.0	9.8	9.9	9.4	8.6	9.1
27	---	---	---	11.6	11.4	11.4	10.0	9.8	9.8	9.5	9.2	9.4
28	---	---	---	11.4	11.1	11.4	9.9	9.8	9.8	9.5	7.7	9.1
29	---	---	---	11.4	11.4	11.4	9.9	9.6	9.8	7.5	6.6	7.1
30	---	---	---	11.4	10.9	11.1	9.9	9.8	9.8	7.3	6.8	6.9
31	---	---	---	---	---	---	9.9	9.6	9.7	7.7	7.1	7.4
MONTH	---	---	---	13.2	10.9	12.3	11.2	9.6	10.4	9.9	6.6	8.9



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER RECORDS

413551083481200. Local number, LU-20.

LOCATION.--Lat 41°35'51" Long 83°48'12", Hydrologic Unit 04100009, along State Route 2 near Holland, OH.  
Owner.--USGS-Toledo Express Airport.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 31 ft. Cased with Sch 40 PVC to 6.0 ft; .010 in. screen from 6.0 to 31 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: air temperature, soil temperature, water temperature, and specific conductance. At this well there are 4 conductivity/water temperature probes at various depths within the well to better document vertical movement of high conductivity water on an hourly basis. Conductivity/water temperature probes set at 8.6 (level 4), 13.6 (level 3), 21.6 (level 2), and 26.6 (level 1) feet below land surface.

DATUM.--Elevation of land-surface datum is 676.13 feet above sea level.  
Measuring point: shelter shelf 2.38 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (FOUR LEVELS): February 1991 to current year.

AIR TEMPERATURE: February 1991 to current year.

WATER TEMPERATURE (FOUR LEVELS): February 1991 to current year.

SOIL TEMPERATURE: February 1991 to current year.

PRECIPITATION: February 1991 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE:

LEVEL 1- Maximum, 1260 microsiemens August 13, 1991; minimum, 330 microsiemens April 1, 1993.

LEVEL 2- Maximum, 953 microsiemens July 1, 1991; minimum, 293 microsiemens April 1-2, 1993.

LEVEL 3- Maximum, 785 microsiemens April 25, 1991; minimum, 99 microsiemens June 9-10, 1993.

LEVEL 4- Maximum, 634 microsiemens January 29, 1994; minimum, 82 microsiemens May 22-23, 26, 1994.

AIR TEMPERATURE: Maximum, 37.7°C June 16, 1994; minimum, -28.1°C January 19, 1994.

WATER TEMPERATURE:

LEVEL 1- Maximum, 12.7°C several days in November, December 1991; minimum, 9.6°C April 8, 1993.

LEVEL 2- Maximum, 13.6°C several days in November, 1991; minimum, 9.2°C April 8, 1993.

LEVEL 3- Maximum, 15.2°C many days in October 1991; minimum, 7.6°C March 26, 28, 1993.

LEVEL 4- Maximum, 17.5°C many days in 1991; minimum, 6.0°C March 24-26, 1993.

SOIL TEMPERATURE: Maximum, 31.3°C June 19, 1994; minimum, -4.7°C February 6, 1994.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE:

LEVEL 1- Maximum, 920 microsiemens October 1, 1993; minimum, 407 microsiemens April 4, 13, 1994.

LEVEL 2- Maximum, 843 microsiemens October 1, 7, 1993; minimum, 359 microsiemens April 14, 1994.

LEVEL 3- Maximum, 706 microsiemens January 28, 1994; minimum, 155 microsiemens December 11, 1993.

LEVEL 4- Maximum, 634 microsiemens January 29, 1994; minimum, 82 microsiemens May 22-23, 26, 1994.

AIR TEMPERATURE: Maximum, 37.7°C June 16, 1994; minimum, -28.1°C January 19, 1994.

WATER TEMPERATURE:

LEVEL 1- Maximum, 12.4°C many days in December, 1993, January, 1994; minimum, 10.2°C many days in April, May, and June, 1994.

LEVEL 2- Maximum, 12.8°C November 18, 20, 28, 1993; minimum, 9.4°C many days in April, 1994.

LEVEL 3- Maximum, 14.6°C October 3-6, 1993; minimum, 8.2°C March 22-26, 28, April 1-2, 1994.

LEVEL 4- Maximum, 16.5°C September 27-30, 1994; minimum, 7.0°C March 17, 1994.

SOIL TEMPERATURE: Maximum, 31.3°C June 19, 1994; minimum, -4.7°C February 6, 1994.

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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413551083481200 LU-20 NR HOLLAND OH--Continued

#1 (26.6' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	920	905	909	912	874	890	890	885	887	892	885	890
2	913	906	908	878	872	875	888	885	887	892	889	890
3	911	905	907	879	874	876	888	885	887	892	885	890
4	911	905	907	879	876	878	886	883	885	891	886	891
5	911	904	907	881	878	879	887	882	885	891	889	890
6	909	902	906	883	881	882	886	883	884	891	886	889
7	909	905	907	883	879	881	888	881	886	890	884	889
8	---	---	---	884	879	882	890	883	888	891	885	888
9	---	---	---	884	881	883	890	883	887	890	884	888
10	---	---	---	885	880	883	888	885	886	891	885	889
11	---	---	---	885	881	883	891	884	888	889	887	888
12	---	---	---	887	881	884	892	886	889	890	887	889
13	---	---	---	885	881	883	893	884	890	888	887	887
14	---	---	---	886	881	884	890	883	888	889	887	888
15	---	---	---	887	883	884	890	884	888	889	883	888
16	---	---	---	888	879	884	892	886	890	890	883	888
17	---	---	---	885	880	883	891	885	890	887	885	886
18	---	---	---	886	880	883	892	885	890	887	881	886
19	---	---	---	889	880	884	892	886	891	887	881	885
20	904	901	902	888	881	883	892	886	891	889	882	884
21	905	902	903	887	880	883	891	886	890	884	880	882
22	905	902	903	887	880	883	892	886	889	884	878	881
23	904	901	903	887	880	883	891	885	888	883	877	880
24	904	902	903	888	881	883	892	885	887	877	874	876
25	905	901	904	883	881	882	891	886	888	877	867	873
26	905	901	903	888	880	882	892	886	887	867	862	865
27	905	902	903	886	880	882	892	886	888	873	858	863
28	904	902	903	888	880	884	892	886	888	896	863	883
29	906	900	904	888	881	884	891	886	889	863	817	837
30	905	898	901	890	884	888	892	886	888	817	781	799
31	903	898	900	---	---	---	891	886	890	781	761	770
MONTH	920	898	904	912	872	883	893	881	888	896	761	877

#1 (26.6' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	771	751	760	499	491	495	440	425	434	513	505	511
2	751	729	739	498	486	493	440	431	436	513	506	509
3	729	708	719	492	485	489	---	---	---	524	510	517
4	708	685	698	502	480	489	443	407	428	539	524	533
5	685	545	639	531	501	514	442	431	439	552	539	545
6	545	506	518	532	526	529	443	430	439	568	552	557
7	506	493	499	549	527	537	443	425	436	572	566	568
8	493	482	487	550	526	541	463	419	437	609	570	583
9	495	479	486	528	506	518	464	455	461	625	587	603
10	495	481	489	506	484	493	462	451	455	634	593	611
11	489	477	484	486	478	481	454	441	449	625	597	611
12	484	473	479	480	474	477	471	440	450	624	615	618
13	477	459	468	475	469	473	441	407	426	623	614	617
14	461	453	456	478	470	474	444	431	438	616	611	613
15	454	449	451	473	465	469	456	443	450	615	609	612
16	498	452	459	465	455	462	460	448	456	609	602	606
17	616	498	586	459	450	455	461	455	458	602	599	600
18	619	505	577	456	446	451	473	449	459	599	596	598
19	506	471	487	453	447	450	460	443	453	599	596	597
20	471	452	460	454	445	449	445	436	440	608	595	598
21	465	449	455	455	446	449	440	435	437	606	599	602
22	474	450	466	464	454	459	442	433	437	608	592	602
23	478	467	473	463	456	459	450	435	442	599	587	594
24	486	473	479	459	448	454	488	446	460	587	579	581
25	496	482	490	449	440	444	490	461	475	579	578	579
26	500	492	496	440	422	435	489	472	481	581	579	580
27	501	495	498	435	428	432	493	472	484	592	581	587
28	500	495	497	441	431	437	491	483	485	602	585	594
29	---	---	---	441	432	436	501	486	495	591	585	588
30	---	---	---	440	430	435	505	497	501	587	585	586
31	---	---	---	439	419	434	---	---	---	589	587	588
MONTH	771	449	528	550	419	471	505	407	453	634	505	583



EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO

413551083481200 LU-20 NR HOLLAND OH--Continued

#1 (26.6' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	591	589	590	---	---	---	718	712	714	791	788	789
2	594	591	592	---	---	---	718	715	716	792	790	791
3	595	592	594	---	---	---	722	718	720	794	792	793
4	597	595	595	---	---	---	724	722	723	796	794	795
5	597	596	596	---	---	---	726	723	724	797	793	796
6	599	596	597	---	---	---	729	724	727	799	797	798
7	600	598	599	---	---	---	731	728	730	801	795	798
8	602	600	601	---	---	---	733	729	732	803	797	800
9	603	601	602	---	---	---	738	733	735	804	798	801
10	604	602	603	---	---	---	740	733	738	805	800	802
11	606	604	605	---	---	---	758	736	742	806	801	803
12	608	606	606	---	---	---	747	740	744	808	803	805
13	609	608	608	---	---	---	752	744	749	810	804	805
14	611	609	610	---	---	---	754	749	753	811	806	807
15	612	610	611	---	---	---	756	751	754	811	808	809
16	615	612	614	---	---	---	759	753	756	813	811	812
17	618	615	616	---	---	---	762	755	759	815	813	814
18	619	616	617	---	---	---	765	758	761	818	811	815
19	621	617	618	---	---	---	767	761	764	819	813	816
20	625	621	622	---	---	---	765	763	764	820	815	817
21	627	624	625	---	---	---	767	765	766	822	816	818
22	---	---	---	---	---	---	772	767	768	823	818	819
23	---	---	---	---	---	---	772	769	770	823	819	820
24	---	---	---	---	---	---	774	772	773	822	820	821
25	---	---	---	---	---	---	775	774	774	823	821	822
26	---	---	---	---	---	---	777	775	776	825	822	824
27	---	---	---	---	---	---	780	777	778	826	824	825
28	---	---	---	---	---	---	782	779	781	827	825	826
29	---	---	---	---	---	---	784	781	783	829	826	827
30	---	---	---	---	---	---	786	784	785	829	824	827
31	---	---	---	715	710	712	788	786	787	---	---	---
MONTH	627	589	606	715	710	712	788	712	753	829	788	810
YEAR	920	407	703									

#2 (21.6' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	843	838	842	840	782	811	840	838	839	834	833	834
2	842	837	841	796	787	790	839	838	838	834	833	833
3	842	837	839	803	797	800	838	837	838	834	833	833
4	842	837	840	808	803	805	838	837	838	833	832	833
5	841	836	838	812	808	810	838	837	837	834	832	833
6	842	837	839	814	812	813	838	837	838	833	832	832
7	843	838	840	816	814	814	838	837	837	832	831	832
8	---	---	---	818	815	816	838	836	837	833	832	832
9	---	---	---	823	818	820	837	835	836	835	831	832
10	---	---	---	827	823	825	836	835	836	835	831	833
11	---	---	---	830	827	828	836	834	835	836	835	835
12	---	---	---	831	830	830	835	833	834	836	831	834
13	---	---	---	832	831	831	834	833	834	834	832	833
14	---	---	---	835	832	833	833	832	833	833	829	832
15	---	---	---	836	835	835	833	832	832	832	830	831
16	---	---	---	837	836	837	833	832	832	830	824	828
17	---	---	---	839	837	838	832	832	832	825	822	823
18	---	---	---	840	834	839	832	831	832	822	818	820
19	---	---	---	840	838	839	832	831	832	820	811	816
20	839	838	838	838	832	836	832	831	832	815	807	811
21	840	838	839	836	835	835	832	831	832	807	798	803
22	840	838	839	836	835	835	832	831	831	798	789	795
23	840	838	839	837	836	836	832	831	831	792	775	783
24	840	839	840	837	837	837	832	831	831	774	763	769
25	841	839	840	838	836	837	832	831	831	763	737	753
26	841	839	840	838	837	838	832	830	831	735	698	719
27	841	840	841	840	838	839	836	830	832	799	657	681
28	841	839	840	840	835	839	835	830	831	820	690	796
29	841	840	841	840	839	839	835	830	832	687	624	652
30	840	839	839	840	838	839	835	830	834	623	590	607
31	840	839	839	---	---	---	835	830	834	589	559	575
MONTH	843	836	840	840	782	827	840	830	834	836	559	791



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#2 (21.6' BLS)  
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413551083481200 LU-20 NR HOLLAND OH--Continued

#3 (13.6' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	372	351	359	326	280	304	356	350	353	173	170	171
2	351	340	345	301	281	291	357	323	351	172	168	170
3	340	337	339	318	301	315	323	293	309	171	168	170
4	338	329	336	324	318	319	306	272	291	172	170	171
5	333	328	331	325	320	323	272	161	211	172	170	171
6	337	332	335	320	318	319	315	188	291	173	170	171
7	338	336	337	322	318	320	281	166	232	172	169	170
8	---	---	---	326	322	324	269	212	241	172	170	171
9	---	---	---	329	326	328	280	162	245	171	168	170
10	---	---	---	334	329	332	162	157	159	171	168	170
11	---	---	---	337	334	335	173	155	157	173	169	170
12	---	---	---	335	329	331	165	160	162	174	170	172
13	---	---	---	341	333	338	161	158	159	175	170	172
14	---	---	---	350	336	341	170	158	164	174	169	172
15	---	---	---	351	350	350	167	163	165	172	168	170
16	---	---	---	355	350	352	165	162	163	172	167	170
17	---	---	---	363	355	359	170	162	165	172	169	171
18	---	---	---	371	363	367	169	167	168	171	167	169
19	---	---	---	372	357	368	169	165	167	169	167	168
20	347	341	342	357	343	348	172	166	168	170	167	169
21	347	341	343	345	342	344	171	168	170	171	168	169
22	343	340	341	342	337	340	170	169	169	171	168	170
23	346	342	344	340	334	338	171	169	170	174	169	172
24	346	344	345	340	332	337	171	169	170	173	170	172
25	345	343	345	342	332	336	170	168	169	177	171	173
26	345	344	345	341	334	338	170	167	169	188	175	181
27	344	343	343	355	335	345	170	167	169	206	187	196
28	344	342	343	398	355	377	170	168	169	706	206	619
29	343	325	333	404	386	398	171	167	169	688	634	658
30	329	325	327	386	353	366	171	167	168	636	601	617
31	330	326	329	---	---	---	171	168	169	601	568	584
MONTH	372	325	340	404	280	339	357	155	199	706	167	230

#3 (13.6' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	572	539	554	449	444	447	381	373	377	476	469	473
2	543	513	529	449	441	446	378	370	375	479	474	477
3	513	492	502	445	438	443	---	---	---	486	479	483
4	495	476	485	445	438	441	384	375	379	495	486	490
5	497	473	481	467	442	454	384	380	383	501	495	497
6	500	486	494	480	467	475	388	380	384	507	501	504
7	487	472	480	487	475	480	396	386	391	512	507	510
8	477	464	470	488	477	483	406	392	398	518	512	515
9	467	455	459	477	451	465	407	398	403	522	518	520
10	456	447	452	452	427	439	402	391	397	528	521	525
11	452	440	446	430	414	421	399	389	395	532	528	530
12	444	437	441	419	412	417	397	385	390	536	532	533
13	440	431	435	417	409	413	393	359	371	539	534	537
14	435	426	431	414	406	411	366	359	363	543	538	541
15	431	422	427	413	401	408	372	359	366	546	543	544
16	441	426	432	405	395	401	376	369	372	548	543	546
17	455	438	446	399	389	395	377	371	374	549	547	548
18	477	452	463	395	385	390	377	372	375	552	548	550
19	479	445	464	391	385	389	376	371	373	555	550	552
20	448	423	435	391	384	388	376	370	374	556	552	554
21	429	419	423	391	383	388	377	371	374	559	554	556
22	431	419	426	399	385	394	383	374	378	560	555	557
23	435	427	432	401	391	396	391	381	386	561	557	559
24	440	430	436	396	387	391	401	390	395	562	557	558
25	445	438	442	390	381	386	412	401	407	562	557	559
26	449	441	445	384	374	381	425	412	418	559	552	555
27	450	446	448	380	371	375	437	425	430	564	554	560
28	450	445	448	380	373	377	449	436	443	565	558	563
29	---	---	---	382	376	379	460	449	454	560	545	555
30	---	---	---	383	377	380	469	460	465	545	512	525
31	---	---	---	382	376	380	---	---	---	512	425	484
MONTH	572	419	458	488	371	414	469	359	393	565	425	531

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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413551083481200 LU-20 NR HOLLAND OH--Continued

<div> #3 (13.6' BLS)  SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 </div>												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	425	321	360	---	---	---	285	283	284	321	317	319
2	323	300	315	---	---	---	290	284	285	323	318	321
3	301	289	297	---	---	---	296	290	294	325	322	323
4	289	268	280	---	---	---	295	294	295	327	324	325
5	268	259	263	---	---	---	295	294	294	328	326	327
6	260	240	251	---	---	---	295	294	294	328	328	328
7	240	228	237	---	---	---	296	295	295	328	326	327
8	231	225	228	---	---	---	296	295	295	328	327	327
9	235	228	231	---	---	---	295	291	293	329	328	328
10	233	230	231	---	---	---	294	291	293	328	327	328
11	234	229	231	---	---	---	305	273	297	329	327	328
12	229	227	228	---	---	---	304	300	302	330	329	329
13	233	227	229	---	---	---	321	300	309	332	324	330
14	228	226	227	---	---	---	322	316	319	324	312	317
15	230	226	228	---	---	---	316	313	314	312	306	308
16	235	228	231	---	---	---	313	311	312	306	302	304
17	239	233	236	---	---	---	315	312	314	305	298	303
18	242	237	239	---	---	---	320	315	318	300	297	298
19	243	239	241	---	---	---	321	319	320	303	299	300
20	255	242	247	---	---	---	319	311	315	307	303	305
21	266	255	262	---	---	---	311	309	310	308	305	307
22	---	---	---	---	---	---	309	307	308	310	308	309
23	---	---	---	---	---	---	310	307	308	310	308	310
24	---	---	---	---	---	---	315	310	313	311	308	310
25	---	---	---	---	---	---	316	313	315	315	310	312
26	---	---	---	---	---	---	317	314	315	313	312	312
27	---	---	---	---	---	---	318	314	316	321	312	318
28	---	---	---	---	---	---	321	318	320	321	317	320
29	---	---	---	---	---	---	319	317	318	317	314	315
30	---	---	---	---	---	---	323	317	319	318	314	316
31	---	---	---	284	282	283	324	321	323	---	---	---
MONTH	425	225	252	284	282	283	324	273	307	332	297	317
YEAR	706	155	345									

<div> #4 (8.6' BLS)  SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994 </div>												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	95	93	94	260	91	126	163	155	159	161	159	160
2	93	89	91	140	125	132	155	150	152	160	159	159
3	89	89	89	124	114	119	152	144	148	160	159	160
4	89	88	88	113	107	110	144	140	142	161	160	160
5	88	87	87	107	103	105	150	140	145	162	161	162
6	87	87	87	103	100	102	148	144	146	162	161	162
7	87	86	87	101	100	100	153	144	148	161	160	161
8	---	---	---	100	99	100	150	144	147	161	160	160
9	---	---	---	100	99	100	151	142	144	160	159	160
10	---	---	---	100	99	100	151	148	150	162	160	160
11	---	---	---	101	100	100	153	146	147	162	161	161
12	---	---	---	101	100	100	154	151	152	163	161	162
13	---	---	---	102	101	101	151	149	150	163	162	162
14	---	---	---	103	101	102	157	149	153	163	161	162
15	---	---	---	104	103	103	156	153	155	162	159	161
16	---	---	---	106	104	105	154	152	153	162	159	160
17	---	---	---	109	106	107	159	152	155	163	161	162
18	---	---	---	112	109	110	158	156	157	161	159	160
19	---	---	---	113	111	112	157	155	156	160	159	159
20	89	88	89	113	112	112	160	155	157	161	159	160
21	89	89	89	112	111	111	160	158	159	161	159	161
22	89	89	89	111	110	110	159	158	159	161	160	160
23	89	89	89	111	110	111	160	158	159	163	161	162
24	90	89	89	111	111	111	160	159	159	163	161	162
25	90	89	90	113	111	112	160	158	159	166	162	164
26	90	89	90	116	113	115	159	157	158	176	166	170
27	90	90	90	124	116	120	158	157	158	195	177	185
28	90	90	90	161	123	130	159	157	158	633	196	507
29	90	90	90	156	155	156	159	157	158	634	590	610
30	91	90	90	173	156	166	159	157	158	589	561	575
31	91	90	91	---	---	---	160	158	159	560	533	547
MONTH	95	86	89	260	91	113	163	140	154	634	159	213





# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	21.5	7.2	13.9	4.3	-3.5	.7	6.4	-5.1	1.0	3.5	-4.3	.4
2	15.9	.8	11.3	7.2	-2.9	2.7	8.6	3.2	5.8	.4	-5.2	-2.9
3	19.0	1.0	10.1	9.9	4.0	6.4	5.2	2.8	3.9	-3.1	-5.9	-4.8
4	22.0	5.5	13.3	12.6	5.3	8.7	6.1	4.1	5.1	-1.9	-6.4	-4.5
5	16.5	-.4	7.7	13.4	3.1	9.0	7.3	3.1	3.9	-3.6	-12.2	-8.0
6	23.5	2.0	12.9	2.7	-.1	1.4	5.7	2.2	3.8	-2.3	-8.9	-5.4
7	27.2	10.9	19.1	-.3	-3.5	-1.9	2.4	-1.2	.8	-6.5	-10.3	-8.0
8	---	---	---	9.8	-2.7	2.9	5.8	-.9	1.6	-12.5	-19.9	-16.4
9	---	---	---	12.0	-1.2	4.1	9.9	-2.2	4.7	-7.3	-18.6	-14.2
10	---	---	---	13.5	-4.0	4.0	11.2	-3.2	6.6	-2.3	-20.0	-10.3
11	---	---	---	14.8	.0	7.9	-1.8	-8.6	-4.8	1.8	-7.6	-.5
12	---	---	---	8.8	.3	5.5	2.7	-9.9	-3.7	1.2	-9.5	-3.0
13	---	---	---	16.6	7.2	12.6	4.8	-4.0	.6	.6	-7.4	-2.0
14	---	---	---	15.3	7.9	9.4	6.0	2.8	4.2	-8.0	-19.8	-13.6
15	---	---	---	12.7	4.7	8.3	7.7	2.0	4.8	-16.8	-22.6	-19.7
16	---	---	---	6.0	1.9	4.5	4.8	-1.0	2.0	-12.2	-25.1	-19.0
17	---	---	---	6.1	-.9	4.3	3.4	.3	1.5	-9.2	-20.1	-12.1
18	---	---	---	9.1	-3.3	1.8	5.1	1.3	3.4	-20.8	-27.0	-23.9
19	---	---	---	7.2	-1.0	4.6	2.9	.0	1.5	-18.8	-28.1	-23.9
20	18.3	10.4	12.9	2.3	-2.6	.1	2.0	-.1	1.1	-11.2	-21.1	-16.8
21	14.9	5.0	10.1	9.9	1.4	5.3	-.8	-4.6	-1.9	-9.4	-19.7	-13.8
22	13.0	1.5	6.7	12.1	2.1	6.0	-.9	-4.3	-2.6	-.9	-8.8	-6.1
23	16.5	-1.6	7.7	12.0	-.2	5.6	-4.0	-9.3	-5.9	2.3	-5.3	.3
24	20.4	6.3	13.0	6.3	2.5	4.9	-5.1	-8.3	-6.6	2.2	.9	1.7
25	21.1	5.2	12.5	5.1	1.6	3.4	-6.9	-11.3	-9.2	.8	-7.7	-2.2
26	20.3	6.5	13.4	14.2	2.8	7.6	-12.0	-17.0	-13.3	-8.2	-11.4	-10.2
27	9.4	2.7	7.1	2.3	-5.7	-1.4	-6.8	-17.1	-11.2	4.5	-10.0	-2.1
28	9.6	.8	5.3	1.1	-7.9	-2.6	-9.0	-17.6	-12.9	5.4	-2.5	2.1
29	7.7	1.8	5.3	1.2	-3.3	-1.0	-5.5	-18.6	-9.9	-1.4	-4.9	-2.7
30	3.4	.3	1.6	3.4	-6.9	-2.0	-8.0	-14.4	-11.1	-5.7	-13.4	-9.2
31	3.6	.3	1.6	---	---	---	-.9	-7.3	-3.3	-7.4	-13.9	-10.7
MONTH	27.2	-1.6	9.8	16.6	-7.9	4.1	11.2	-18.6	-1.3	5.4	-28.1	-8.4

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	-10.9	-19.0	-14.5	-.6	-5.9	-3.8	17.9	1.8	8.9	9.8	2.4	5.5
2	-1.9	-17.5	-7.7	1.4	-7.4	-3.0	21.7	7.4	14.5	15.4	-.6	8.1
3	-4.4	-11.8	-8.9	3.7	-9.3	-1.9	---	---	---	14.9	1.9	9.2
4	-2.7	-9.8	-5.8	5.7	1.2	2.6	13.0	-2.3	5.5	15.8	8.1	11.9
5	-1.1	-12.0	-6.9	7.5	-.4	2.9	13.7	.3	7.2	19.8	6.2	13.8
6	4.3	-12.4	-3.7	14.7	2.4	7.5	.5	-3.3	-1.3	16.1	2.6	10.1
7	-5.6	-11.6	-8.5	7.9	1.3	5.1	4.3	-6.4	-1.1	9.7	6.6	8.2
8	-11.8	-14.1	-12.7	2.1	-3.5	-.3	12.2	-4.6	3.7	18.8	3.7	12.0
9	-10.2	-17.2	-12.7	-1.1	-4.4	-3.1	18.0	6.4	12.5	21.1	7.1	14.5
10	-10.1	-22.3	-14.9	2.8	-5.0	-1.4	15.5	6.2	10.2	19.2	5.9	13.1
11	-4.4	-13.6	-9.7	2.8	-5.3	-1.2	7.8	3.1	5.3	22.4	5.6	14.2
12	-.2	-12.7	-6.5	10.1	-4.0	3.5	14.2	5.4	8.6	16.7	8.1	11.9
13	-.7	-6.1	-3.4	6.7	.1	3.0	15.7	7.3	9.6	19.0	3.0	11.8
14	4.5	-9.4	-1.8	7.1	-1.4	3.0	20.2	6.5	13.0	25.5	3.2	15.1
15	3.4	-1.5	2.1	9.0	-3.3	4.3	22.9	9.9	16.7	23.0	13.3	19.1
16	3.8	-5.6	-.7	.1	-6.3	-3.5	13.5	7.0	10.1	17.1	9.6	13.0
17	8.8	-1.0	3.2	2.0	-9.5	-3.6	15.5	4.8	10.3	19.0	6.3	12.1
18	14.2	.4	6.5	2.8	-1.9	.1	26.8	2.9	13.9	17.8	3.8	11.1
19	17.3	5.6	11.4	7.5	-4.5	1.4	20.2	10.5	16.0	20.6	3.7	12.8
20	14.2	3.7	10.5	12.7	-3.5	3.8	16.3	.7	9.8	24.3	5.0	15.2
21	3.7	-3.5	1.7	12.1	.7	5.9	13.7	3.2	8.6	28.9	7.4	19.1
22	-2.4	-5.8	-4.0	17.3	1.2	9.5	14.4	1.2	7.6	31.5	11.2	22.5
23	1.7	-5.2	-1.7	22.6	7.3	14.9	18.9	-.3	10.7	28.7	14.4	21.9
24	-2.0	-8.3	-5.3	16.3	1.5	10.5	26.9	9.6	18.6	27.9	15.4	20.5
25	-4.6	-11.7	-7.3	4.1	-2.3	.6	29.5	17.5	23.6	25.5	16.2	20.6
26	-7.6	-18.6	-11.4	8.6	-2.3	2.4	29.6	20.4	24.6	16.7	6.5	12.5
27	-7.5	-21.3	-14.5	6.4	2.5	4.2	24.1	9.3	18.1	18.7	1.3	10.9
28	-.8	-19.1	-7.8	10.8	.5	4.9	9.4	4.9	6.0	23.0	5.4	15.1
29	---	---	---	5.9	-.9	1.9	17.6	5.6	11.4	27.2	13.3	20.2
30	---	---	---	7.4	-2.7	1.3	7.0	3.0	5.1	29.8	13.8	22.5
31	---	---	---	9.9	-4.6	3.4	---	---	---	28.7	13.8	22.2
MONTH	17.3	-22.3	-4.8	22.6	-9.5	2.4	29.6	-6.4	10.6	31.5	-.6	14.5



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413551083481200 LU-20 NR HOLLAND OH--Continued

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	21.3	11.8	16.8	---	---	---	30.7	17.1	23.4	18.8	8.1	13.3
2	21.6	3.5	13.7	---	---	---	27.2	17.5	22.0	20.2	6.4	12.9
3	24.1	5.9	15.5	---	---	---	29.3	17.1	23.1	20.3	7.4	13.7
4	26.4	7.6	17.9	---	---	---	24.4	19.0	22.2	22.4	8.0	15.5
5	31.2	8.9	21.6	---	---	---	21.0	10.3	16.4	25.4	8.8	17.6
6	30.6	17.3	25.0	---	---	---	24.4	6.6	15.7	23.5	14.4	18.3
7	31.8	13.3	21.2	---	---	---	25.8	10.2	18.4	24.9	11.1	17.0
8	19.8	8.2	13.8	---	---	---	29.0	12.2	20.9	28.2	10.2	19.0
9	24.2	3.8	14.7	---	---	---	22.7	12.0	15.6	28.9	15.4	21.3
10	27.3	7.1	18.7	---	---	---	22.3	8.8	15.7	24.0	11.5	17.7
11	28.7	11.0	20.8	---	---	---	19.2	15.6	17.4	25.5	8.4	16.1
12	30.0	17.5	22.6	---	---	---	23.3	17.9	20.2	29.3	8.1	19.0
13	32.6	19.7	24.0	---	---	---	26.4	19.5	22.4	30.5	17.0	23.3
14	34.3	17.9	26.4	---	---	---	23.8	12.2	18.9	32.2	20.0	25.0
15	36.6	23.5	29.2	---	---	---	23.3	9.3	16.5	31.5	19.9	24.5
16	37.7	21.2	28.1	---	---	---	25.2	10.7	18.1	31.5	18.6	24.9
17	36.0	20.7	27.5	---	---	---	26.2	12.0	19.2	25.5	13.2	20.9
18	35.5	20.7	28.6	---	---	---	27.2	13.0	20.3	24.0	8.8	16.5
19	33.8	22.3	27.3	---	---	---	28.7	16.4	22.0	27.0	9.0	17.5
20	33.8	19.6	25.2	---	---	---	24.2	18.5	21.2	28.9	10.6	19.4
21	33.1	20.2	26.3	---	---	---	21.5	16.7	18.8	27.8	12.0	19.5
22	---	---	---	---	---	---	26.0	12.5	19.2	27.9	11.7	19.6
23	---	---	---	---	---	---	26.4	12.6	19.7	24.7	12.0	18.3
24	---	---	---	---	---	---	28.1	14.8	21.4	24.3	14.5	19.5
25	---	---	---	---	---	---	31.3	20.0	24.8	23.2	13.9	18.4
26	---	---	---	---	---	---	27.2	18.1	22.6	17.2	10.5	13.6
27	---	---	---	---	---	---	29.9	17.1	23.5	14.6	12.6	13.2
28	---	---	---	---	---	---	26.9	15.3	23.2	15.9	10.3	12.5
29	---	---	---	---	---	---	24.4	9.5	17.1	19.2	7.6	12.7
30	---	---	---	---	---	---	23.1	7.0	15.7	21.6	3.8	12.6
31	---	---	---	28.8	15.5	22.4	22.6	14.8	19.1	---	---	---
MONTH	37.7	3.5	22.1	28.8	15.5	22.4	31.3	6.6	19.8	32.2	3.8	17.8
YEAR	37.7	-28.1	7.5									

#1 (26.6' BLS)

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	11.5	11.3	11.4	11.9	11.2	11.9	12.2	12.1	12.1	12.4	12.1	12.2
2	11.5	11.3	11.4	11.9	11.9	11.9	12.2	12.1	12.2	12.1	12.1	12.1
3	11.5	11.3	11.4	12.0	11.9	11.9	12.2	12.1	12.2	12.4	12.1	12.1
4	11.5	11.3	11.5	12.0	11.9	11.9	12.2	12.1	12.2	12.4	12.1	12.1
5	11.5	11.3	11.5	12.0	11.9	11.9	12.2	12.1	12.2	12.1	12.1	12.1
6	11.7	11.3	11.5	11.9	11.9	11.9	12.2	12.1	12.2	12.3	12.1	12.1
7	11.6	11.5	11.5	11.9	11.9	11.9	12.4	12.1	12.2	12.4	12.1	12.2
8	---	---	---	12.0	11.9	11.9	12.4	12.1	12.2	12.3	12.1	12.2
9	---	---	---	12.0	11.9	11.9	12.4	12.1	12.2	12.3	12.1	12.2
10	---	---	---	12.0	11.9	11.9	12.2	12.1	12.2	12.3	12.1	12.2
11	---	---	---	12.0	11.9	11.9	12.4	12.1	12.2	12.1	12.1	12.1
12	---	---	---	12.0	11.9	11.9	12.4	12.1	12.2	12.1	12.1	12.1
13	---	---	---	12.0	11.9	11.9	12.4	12.1	12.2	12.1	12.1	12.1
14	---	---	---	12.0	11.9	11.9	12.4	12.1	12.2	12.1	12.1	12.1
15	---	---	---	11.9	11.9	11.9	12.4	12.1	12.2	12.3	12.1	12.1
16	---	---	---	12.1	11.9	12.0	12.4	12.1	12.2	12.3	12.1	12.1
17	---	---	---	12.2	11.9	12.0	12.4	12.1	12.2	12.1	12.1	12.1
18	---	---	---	12.1	11.9	12.0	12.4	12.1	12.2	12.3	12.1	12.1
19	---	---	---	12.2	11.9	12.0	12.4	12.1	12.2	12.3	12.1	12.1
20	11.7	11.7	11.7	12.1	11.9	12.1	12.4	12.1	12.2	12.1	11.9	12.1
21	11.7	11.7	11.7	12.2	11.9	12.0	12.4	12.1	12.1	12.1	12.1	12.1
22	11.7	11.7	11.7	12.2	11.9	12.1	12.4	12.1	12.2	12.1	11.9	12.0
23	11.7	11.7	11.7	12.2	11.9	12.1	12.4	12.1	12.2	12.1	11.9	12.0
24	11.8	11.7	11.7	12.2	11.9	12.1	12.4	12.1	12.3	11.9	11.9	11.9
25	11.8	11.7	11.7	12.2	12.1	12.2	12.4	12.1	12.3	11.9	11.9	11.9
26	11.8	11.7	11.7	12.2	11.9	12.1	12.4	12.1	12.3	11.9	11.9	11.9
27	11.7	11.7	11.7	12.2	11.9	12.1	12.4	12.1	12.3	11.9	11.9	11.9
28	11.7	11.7	11.7	12.1	12.1	12.1	12.4	12.1	12.3	11.9	11.9	11.9
29	11.9	11.7	11.7	12.1	12.1	12.1	12.4	12.1	12.2	11.9	11.7	11.8
30	11.9	11.7	11.8	12.2	12.1	12.1	12.4	12.1	12.3	11.9	11.7	11.8
31	11.9	11.7	11.9	---	---	---	12.3	12.1	12.2	11.9	11.6	11.7
MONTH	11.9	11.3	11.6	12.2	11.2	12.0	12.4	12.1	12.2	12.4	11.6	12.0



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413551083481200 LU-20 NR HOLLAND OH--Continued

#2 (21.6' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	12.4	12.2	12.2	12.6	11.2	12.6	12.6	12.6	12.6	12.4	12.4	12.4
2	12.4	12.2	12.2	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.4	12.4
3	12.4	12.2	12.3	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.4	12.4
4	12.4	12.2	12.3	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.4	12.4
5	12.4	12.2	12.3	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.3	12.4
6	12.4	12.2	12.3	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.3	12.4
7	12.5	12.2	12.4	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.3	12.4
8	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.3	12.3
9	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.1	12.3
10	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.1	12.2
11	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.1	12.1	12.1
12	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.4	12.1	12.1
13	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.1	12.1	12.1
14	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.1	12.1
15	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.1	12.1	12.1
16	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.1	12.1
17	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.1	12.1	12.1
18	---	---	---	12.8	12.6	12.6	12.6	12.6	12.6	12.1	12.1	12.1
19	---	---	---	12.6	12.6	12.6	12.6	12.6	12.6	12.1	11.8	12.0
20	12.6	12.6	12.6	12.8	12.6	12.6	12.6	12.6	12.6	12.1	11.8	11.9
21	12.7	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	11.9	11.9	11.9
22	12.7	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	11.9	11.7	11.8
23	12.7	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	11.9	11.7	11.7
24	12.7	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	11.7	11.7	11.7
25	12.7	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	11.7	11.7	11.7
26	12.7	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	11.7	11.4	11.6
27	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.5	11.7	11.2	11.4
28	12.6	12.6	12.6	12.8	12.6	12.6	12.6	12.4	12.5	11.7	11.0	11.6
29	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.5	10.8	10.8	10.8
30	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.3	12.4	10.8	10.8	10.8
31	12.6	12.6	12.6	---	---	---	12.6	12.3	12.4	10.8	10.8	10.8
MONTH	12.7	12.2	12.5	12.8	11.2	12.6	12.6	12.3	12.6	12.4	10.8	11.9

#2 (21.6' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	10.8	10.7	10.8	10.4	10.1	10.2	9.8	9.6	9.6	9.8	9.6	9.6
2	10.8	10.7	10.8	10.4	10.1	10.2	9.8	9.4	9.6	9.8	9.6	9.7
3	10.8	10.6	10.8	10.4	10.1	10.2	---	---	---	9.8	9.6	9.7
4	10.8	10.6	10.6	10.4	10.2	10.2	9.8	9.5	9.6	9.8	9.6	9.7
5	10.8	10.5	10.6	10.2	10.2	10.2	9.8	9.6	9.6	9.8	9.6	9.7
6	10.8	10.8	10.8	10.2	10.0	10.1	9.8	9.5	9.6	9.8	9.6	9.7
7	10.8	10.8	10.8	10.2	10.0	10.2	9.8	9.5	9.6	9.8	9.6	9.8
8	10.8	10.8	10.8	10.2	10.2	10.2	9.8	9.5	9.6	9.8	9.6	9.7
9	10.8	10.8	10.8	10.2	10.0	10.1	9.6	9.4	9.6	9.8	9.6	9.7
10	10.8	10.7	10.8	10.2	10.0	10.1	9.6	9.4	9.6	9.8	9.6	9.7
11	10.8	10.6	10.8	10.2	10.0	10.0	9.6	9.6	9.6	9.8	9.6	9.7
12	10.8	10.6	10.7	10.2	10.0	10.0	9.6	9.4	9.6	9.8	9.6	9.7
13	10.8	10.6	10.6	10.2	10.0	10.0	9.6	9.4	9.5	10.0	9.6	9.7
14	10.8	10.6	10.6	10.2	10.0	10.0	9.6	9.4	9.5	10.0	9.6	9.7
15	10.6	10.6	10.6	10.0	9.8	9.9	9.6	9.4	9.4	9.8	9.6	9.7
16	10.6	10.4	10.6	10.0	9.8	9.9	9.6	9.4	9.5	9.8	9.6	9.7
17	10.6	10.4	10.5	10.0	9.9	10.0	9.6	9.4	9.5	10.0	9.6	9.7
18	10.6	10.2	10.4	10.0	9.8	9.9	9.6	9.4	9.5	9.8	9.6	9.7
19	10.6	10.2	10.5	10.0	9.6	9.9	9.6	9.4	9.4	9.8	9.6	9.7
20	10.6	10.2	10.4	10.0	9.6	9.8	9.6	9.4	9.5	9.8	9.6	9.7
21	10.6	10.4	10.4	10.0	9.8	9.8	9.6	9.4	9.5	9.8	9.6	9.7
22	10.6	10.4	10.5	10.0	9.6	9.8	9.6	9.4	9.5	9.8	9.6	9.7
23	10.6	10.4	10.4	9.8	9.6	9.7	9.6	9.4	9.5	9.8	9.6	9.7
24	10.6	10.2	10.4	10.0	9.6	9.7	9.6	9.4	9.5	9.9	9.6	9.7
25	10.6	10.2	10.4	10.0	9.6	9.8	9.6	9.4	9.5	9.9	9.6	9.8
26	10.4	10.1	10.3	10.0	9.6	9.7	9.6	9.4	9.5	9.8	9.6	9.8
27	10.5	10.1	10.3	9.8	9.6	9.7	9.6	9.4	9.6	10.0	9.6	9.8
28	10.4	10.1	10.3	10.0	9.6	9.7	9.8	9.6	9.7	10.0	9.6	9.8
29	---	---	---	10.0	9.6	9.7	9.8	9.6	9.6	9.9	9.6	9.8
30	---	---	---	9.8	9.5	9.7	9.8	9.6	9.7	9.9	9.8	9.8
31	---	---	---	10.0	9.5	9.7	---	---	---	9.9	9.8	9.8
MONTH	10.8	10.1	10.6	10.4	9.5	9.9	9.8	9.4	9.6	10.0	9.6	9.7

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

243

413551083481200 LU-20 NR HOLLAND OH--Continued

#2 (21.6' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	10.0	9.8	9.8	---	---	---	10.9	10.6	10.7	11.5	11.5	11.5
2	10.0	9.8	9.9	---	---	---	10.9	10.6	10.7	11.5	11.5	11.5
3	10.0	9.8	9.9	---	---	---	10.9	10.6	10.7	11.7	11.5	11.5
4	10.0	9.8	9.9	---	---	---	10.9	10.7	10.9	11.7	11.5	11.6
5	10.0	9.8	9.9	---	---	---	10.9	10.9	10.9	11.8	11.5	11.7
6	10.1	9.8	9.9	---	---	---	10.9	10.8	10.9	11.8	11.5	11.7
7	10.1	9.8	9.9	---	---	---	10.9	10.8	10.9	11.8	11.7	11.7
8	10.0	10.0	10.0	---	---	---	10.9	10.8	10.9	11.8	11.7	11.7
9	10.0	9.8	10.0	---	---	---	10.9	10.9	10.9	11.8	11.7	11.8
10	10.1	9.9	10.0	---	---	---	10.9	10.8	10.9	11.8	11.7	11.8
11	10.1	9.9	10.0	---	---	---	11.1	10.9	10.9	11.8	11.7	11.7
12	10.1	9.9	10.0	---	---	---	10.9	10.9	10.9	11.8	11.7	11.7
13	10.1	10.0	10.0	---	---	---	10.9	10.9	10.9	11.8	11.7	11.8
14	10.1	10.0	10.0	---	---	---	11.1	10.9	10.9	11.8	11.7	11.8
15	10.1	9.9	10.1	---	---	---	11.1	10.9	11.0	11.8	11.7	11.8
16	10.1	10.0	10.1	---	---	---	11.1	10.9	11.0	11.8	11.7	11.8
17	10.1	10.0	10.1	---	---	---	11.1	10.9	11.0	12.0	11.7	11.8
18	10.1	10.0	10.1	---	---	---	11.1	10.9	11.1	12.0	11.8	11.9
19	10.1	10.0	10.1	---	---	---	11.1	11.1	11.1	12.0	11.8	11.9
20	10.2	10.0	10.1	---	---	---	11.1	11.1	11.1	12.0	11.8	11.9
21	10.2	10.0	10.1	---	---	---	11.3	11.1	11.1	12.0	11.8	12.0
22	---	---	---	---	---	---	11.3	11.1	11.2	12.0	11.9	12.0
23	---	---	---	---	---	---	11.3	11.1	11.3	12.0	12.0	12.0
24	---	---	---	---	---	---	11.3	11.1	11.3	12.0	12.0	12.0
25	---	---	---	---	---	---	11.4	11.3	11.3	12.0	12.0	12.0
26	---	---	---	---	---	---	11.3	11.3	11.3	12.2	11.9	12.0
27	---	---	---	---	---	---	11.4	11.3	11.3	12.2	12.0	12.1
28	---	---	---	---	---	---	11.3	11.3	11.3	12.2	12.0	12.2
29	---	---	---	---	---	---	11.5	11.3	11.4	12.2	12.0	12.2
30	---	---	---	---	---	---	11.5	11.3	11.5	12.4	12.0	12.2
31	---	---	---	10.7	10.6	10.7	11.5	11.3	11.5	---	---	---
MONTH	10.2	9.8	10.0	10.7	10.6	10.7	11.5	10.6	11.1	12.4	11.5	11.8
YEAR	12.8	9.4	11.1									

#3 (13.6' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.4	14.3	14.4	14.1	11.2	13.9	12.6	12.6	12.6	10.8	10.8	10.8
2	14.4	14.3	14.4	14.1	13.8	14.0	12.6	12.4	12.6	10.8	10.8	10.8
3	14.6	14.3	14.4	14.1	13.8	13.9	12.4	12.1	12.3	10.8	10.8	10.8
4	14.6	14.3	14.4	13.9	13.8	13.8	12.6	12.4	12.4	10.8	10.6	10.7
5	14.6	14.3	14.4	13.9	13.8	13.8	12.4	11.9	12.1	10.8	10.6	10.7
6	14.6	14.3	14.4	13.8	13.8	13.8	12.4	11.9	12.3	10.8	10.6	10.6
7	14.4	14.3	14.4	13.8	13.8	13.8	12.4	11.7	12.0	10.6	10.4	10.6
8	---	---	---	13.9	13.8	13.8	11.9	11.7	11.7	10.6	10.5	10.6
9	---	---	---	13.9	13.8	13.8	11.9	11.7	11.8	10.6	10.3	10.5
10	---	---	---	13.9	13.8	13.8	11.7	11.7	11.7	10.6	10.3	10.4
11	---	---	---	13.9	13.8	13.8	11.7	11.7	11.7	10.4	10.2	10.3
12	---	---	---	13.8	13.8	13.8	11.7	11.6	11.7	10.4	10.1	10.3
13	---	---	---	13.8	13.6	13.7	11.7	11.7	11.7	10.2	10.2	10.2
14	---	---	---	13.8	13.6	13.6	11.7	11.7	11.7	10.1	10.1	10.1
15	---	---	---	13.6	13.6	13.6	11.7	11.7	11.7	10.1	10.1	10.1
16	---	---	---	13.6	13.6	13.6	11.7	11.5	11.7	10.1	10.1	10.1
17	---	---	---	13.6	13.6	13.6	11.7	11.5	11.6	10.1	9.9	10.1
18	---	---	---	13.6	13.5	13.6	11.5	11.5	11.5	10.1	10.1	10.1
19	---	---	---	13.6	13.6	13.6	11.5	11.2	11.5	10.1	9.9	10.0
20	14.4	14.1	14.3	13.6	13.3	13.5	11.5	11.2	11.3	10.1	9.7	9.9
21	14.4	14.3	14.3	13.6	13.3	13.3	11.5	11.2	11.3	9.9	9.7	9.9
22	14.4	14.1	14.3	13.4	13.1	13.3	11.5	11.2	11.3	10.0	9.7	9.8
23	14.4	14.1	14.2	13.3	13.1	13.2	11.2	11.2	11.2	9.8	9.6	9.7
24	14.3	14.1	14.2	13.1	13.1	13.1	11.2	11.2	11.2	9.8	9.6	9.7
25	14.3	14.1	14.1	13.1	13.1	13.1	11.2	11.0	11.2	9.7	9.5	9.6
26	14.3	14.1	14.1	13.1	13.1	13.1	11.2	11.0	11.1	9.7	9.5	9.5
27	14.1	14.1	14.1	13.1	13.1	13.1	11.2	11.0	11.0	9.6	9.4	9.5
28	14.1	14.1	14.1	13.1	13.0	13.1	11.0	10.8	11.0	10.8	9.4	10.4
29	14.1	14.1	14.1	13.1	12.8	12.9	11.0	10.8	10.9	10.2	9.7	9.9
30	14.1	14.1	14.1	12.8	12.6	12.7	11.0	10.8	10.9	10.0	9.7	9.9
31	14.1	14.1	14.1	---	---	---	11.0	10.8	10.8	10.0	9.5	9.8
MONTH	14.6	14.1	14.3	14.1	11.2	13.5	12.6	10.8	11.6	10.8	9.4	10.2







# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

245

413551083481200 LU-20 NR HOLLAND OH--Continued

#4 (8.6' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	16.0	15.9	15.9	14.1	11.2	13.9	11.9	11.7	11.8	10.2	10.2	10.2
2	16.0	15.9	15.9	14.1	13.8	13.9	11.9	11.7	11.7	10.2	10.2	10.2
3	16.0	15.9	15.9	13.8	13.8	13.8	11.7	11.7	11.7	10.2	10.1	10.2
4	15.9	15.6	15.8	13.9	13.8	13.8	11.7	11.5	11.7	10.2	9.9	10.1
5	15.9	15.6	15.7	13.9	13.8	13.8	11.7	11.5	11.6	10.1	9.9	10.0
6	15.7	15.6	15.7	13.8	13.6	13.7	11.7	11.2	11.5	10.0	9.9	9.9
7	15.7	15.4	15.7	13.6	13.5	13.6	11.5	11.2	11.4	10.0	9.9	9.9
8	---	---	---	13.6	13.5	13.6	11.5	11.2	11.3	9.9	9.7	9.9
9	---	---	---	13.6	13.3	13.4	11.3	11.0	11.2	10.0	9.7	9.8
10	---	---	---	13.5	13.3	13.4	11.3	11.2	11.3	9.7	9.5	9.7
11	---	---	---	13.3	13.1	13.2	11.2	11.0	11.2	9.8	9.5	9.6
12	---	---	---	13.1	13.1	13.1	11.2	11.0	11.2	9.6	9.5	9.5
13	---	---	---	13.1	12.9	13.1	11.2	11.0	11.1	9.6	9.5	9.6
14	---	---	---	13.1	12.9	13.0	11.0	11.0	11.0	9.5	9.3	9.5
15	---	---	---	12.9	12.9	12.9	11.0	10.8	11.0	9.5	9.3	9.4
16	---	---	---	12.9	12.8	12.9	11.0	10.8	11.0	9.5	9.3	9.4
17	---	---	---	12.9	12.6	12.7	11.0	10.8	10.8	9.3	9.3	9.3
18	---	---	---	12.6	12.6	12.6	10.8	10.8	10.8	9.3	9.3	9.3
19	---	---	---	12.6	12.6	12.6	10.8	10.8	10.8	9.3	9.3	9.3
20	14.9	14.6	14.7	12.6	12.6	12.6	10.8	10.8	10.8	9.3	9.1	9.2
21	14.6	14.6	14.6	12.6	12.6	12.6	10.8	10.8	10.8	9.3	9.1	9.2
22	14.6	14.6	14.6	12.6	12.4	12.6	10.8	10.8	10.8	9.2	9.1	9.1
23	14.6	14.6	14.6	12.6	12.4	12.4	10.8	10.6	10.8	9.1	9.0	9.1
24	14.6	14.4	14.5	12.4	12.4	12.4	10.8	10.6	10.7	9.0	9.0	9.0
25	14.6	14.3	14.5	12.4	12.1	12.3	10.6	10.6	10.6	9.0	8.9	8.9
26	14.6	14.3	14.4	12.4	11.9	12.2	10.8	10.5	10.6	8.9	8.9	8.9
27	14.4	14.3	14.3	12.2	11.9	12.1	10.6	10.4	10.5	9.0	8.7	8.8
28	14.3	14.3	14.3	12.1	11.9	11.9	10.6	10.3	10.4	10.0	8.4	9.4
29	14.3	14.3	14.3	11.9	11.9	11.9	10.5	10.3	10.4	9.1	8.7	9.0
30	14.3	14.1	14.3	11.9	11.9	11.9	10.4	10.1	10.3	8.9	8.7	8.8
31	14.3	14.1	14.1	---	---	---	10.4	10.1	10.2	8.8	8.5	8.7
MONTH	16.0	14.1	14.9	14.1	11.2	12.9	11.9	10.1	11.0	10.2	8.4	9.4

#4 (8.6' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	8.9	8.5	8.6	7.8	7.6	7.6	7.6	7.4	7.5	8.0	7.8	8.0
2	8.7	8.5	8.6	7.6	7.6	7.6	7.6	7.4	7.5	8.0	8.0	8.0
3	8.7	8.5	8.6	7.6	7.6	7.6	---	---	---	8.2	8.0	8.1
4	8.6	8.4	8.5	7.6	7.6	7.6	7.7	7.4	7.6	8.2	8.2	8.2
5	8.6	8.3	8.5	7.7	7.6	7.6	7.7	7.4	7.6	8.4	8.2	8.3
6	8.6	8.3	8.4	7.7	7.5	7.6	7.6	7.6	7.6	8.4	8.2	8.4
7	8.5	8.3	8.4	7.6	7.4	7.6	7.6	7.6	7.6	8.4	8.4	8.4
8	8.5	8.3	8.3	7.6	7.4	7.5	7.6	7.6	7.6	8.4	8.4	8.4
9	8.5	8.3	8.3	7.6	7.2	7.4	7.7	7.5	7.6	8.4	8.4	8.4
10	8.5	8.3	8.3	7.6	7.1	7.4	7.7	7.4	7.6	8.6	8.4	8.4
11	8.4	8.3	8.3	7.6	7.1	7.3	7.6	7.6	7.6	8.6	8.4	8.6
12	8.4	8.3	8.3	7.5	7.1	7.3	7.7	7.6	7.6	8.6	8.6	8.6
13	8.4	8.2	8.4	7.4	7.1	7.3	7.6	7.6	7.6	8.6	8.6	8.6
14	8.4	8.2	8.3	7.3	7.1	7.2	7.7	7.5	7.6	8.8	8.6	8.7
15	8.2	8.2	8.2	7.4	7.1	7.2	7.7	7.6	7.7	8.8	8.6	8.8
16	8.2	8.0	8.2	7.3	7.1	7.1	7.7	7.6	7.6	9.0	8.8	8.8
17	8.2	8.0	8.1	7.4	7.0	7.1	7.9	7.6	7.7	9.0	8.8	9.0
18	8.2	7.9	8.0	7.2	7.1	7.1	7.9	7.6	7.7	9.0	9.0	9.0
19	8.0	7.8	7.9	7.3	7.1	7.1	7.9	7.7	7.8	9.2	9.0	9.1
20	8.0	7.8	7.8	7.3	7.1	7.1	8.0	7.8	7.9	9.2	9.0	9.1
21	8.0	7.8	7.8	7.4	7.1	7.2	8.0	8.0	8.0	9.3	9.2	9.2
22	8.0	7.8	7.8	7.4	7.1	7.2	8.2	8.0	8.2	9.4	9.2	9.3
23	8.0	7.8	7.8	7.4	7.1	7.2	8.4	8.2	8.4	9.5	9.4	9.4
24	7.8	7.6	7.8	7.3	7.1	7.2	8.2	7.7	7.8	9.5	9.4	9.4
25	8.0	7.6	7.8	7.3	7.1	7.2	7.7	7.5	7.6	9.6	9.4	9.4
26	7.8	7.6	7.8	7.5	7.2	7.3	7.7	7.5	7.7	9.6	9.6	9.6
27	7.8	7.6	7.7	7.4	7.2	7.3	7.7	7.6	7.7	9.8	9.6	9.7
28	7.7	7.6	7.6	7.5	7.3	7.4	7.6	7.6	7.6	10.0	9.8	9.8
29	---	---	---	7.4	7.4	7.4	7.8	7.6	7.7	10.1	9.8	10.0
30	---	---	---	7.4	7.4	7.4	8.0	7.8	7.8	10.1	10.0	10.0
31	---	---	---	7.6	7.4	7.5	---	---	---	10.3	10.0	10.1
MONTH	8.9	7.6	8.1	7.8	7.0	7.3	8.4	7.4	7.7	10.3	7.8	8.9

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413551083481200 LU-20 NR HOLLAND OH--Continued

#4 (8.6' BLS)												
WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	10.2	10.2	10.2	---	---	---	15.7	15.4	15.5	16.2	15.9	16.1
2	10.4	10.2	10.2	---	---	---	15.7	15.4	15.5	16.2	16.0	16.1
3	10.5	10.2	10.4	---	---	---	15.7	15.4	15.6	16.2	16.0	16.2
4	10.7	10.4	10.5	---	---	---	15.7	15.7	15.7	16.3	16.0	16.2
5	10.7	10.5	10.6	---	---	---	15.7	15.7	15.7	16.3	16.0	16.2
6	10.7	10.6	10.7	---	---	---	15.7	15.6	15.7	16.2	16.2	16.2
7	10.9	10.7	10.8	---	---	---	15.7	15.6	15.7	16.3	16.0	16.2
8	10.9	10.8	10.9	---	---	---	15.7	15.6	15.7	16.3	16.0	16.1
9	10.9	10.8	10.9	---	---	---	15.9	15.7	15.7	16.2	16.0	16.1
10	11.1	10.8	10.9	---	---	---	16.0	15.7	15.8	16.2	16.0	16.1
11	11.1	10.9	11.1	---	---	---	16.0	15.7	15.8	16.2	16.0	16.1
12	11.3	11.1	11.1	---	---	---	16.0	15.7	15.8	16.2	16.0	16.1
13	11.4	11.1	11.3	---	---	---	16.0	15.7	15.8	16.2	16.0	16.0
14	11.4	11.3	11.3	---	---	---	16.0	15.7	15.8	16.2	16.0	16.0
15	11.6	11.3	11.4	---	---	---	16.0	15.7	15.8	16.2	16.0	16.0
16	11.6	11.4	11.5	---	---	---	16.0	15.7	15.8	16.2	16.0	16.0
17	11.8	11.5	11.6	---	---	---	16.0	15.7	15.8	16.2	16.0	16.0
18	11.8	11.7	11.8	---	---	---	16.0	15.7	15.9	16.2	16.0	16.1
19	11.8	11.7	11.8	---	---	---	16.0	15.7	15.9	16.2	16.0	16.1
20	12.0	11.7	11.8	---	---	---	16.0	15.7	15.9	16.2	16.0	16.1
21	12.0	12.0	12.0	---	---	---	16.0	16.0	16.0	16.3	16.0	16.2
22	---	---	---	---	---	---	16.0	15.7	15.9	16.3	16.0	16.2
23	---	---	---	---	---	---	16.0	15.9	16.0	16.3	16.2	16.2
24	---	---	---	---	---	---	16.0	15.9	16.0	16.2	16.2	16.2
25	---	---	---	---	---	---	16.0	16.0	16.0	16.2	16.2	16.2
26	---	---	---	---	---	---	16.0	16.0	16.0	16.2	16.2	16.2
27	---	---	---	---	---	---	16.0	16.0	16.0	16.5	16.2	16.2
28	---	---	---	---	---	---	16.0	16.0	16.0	16.5	16.2	16.2
29	---	---	---	---	---	---	16.0	15.9	16.0	16.5	16.2	16.3
30	---	---	---	---	---	---	16.2	15.9	16.0	16.5	16.2	16.3
31	---	---	---	15.5	15.2	15.4	16.0	15.9	16.0	---	---	---
MONTH	12.0	10.2	11.1	15.5	15.2	15.4	16.2	15.4	15.8	16.5	15.9	16.1
YEAR	16.5	7.0	11.1									

(6 IN. BLS)												
TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.0	11.1	12.4	6.8	5.4	6.1	2.7	1.8	2.2	1.0	1.0	1.0
2	15.2	12.9	13.9	6.1	4.3	5.3	4.7	2.3	3.5	1.0	1.0	1.0
3	14.1	10.7	12.4	7.8	6.1	6.8	5.1	4.2	4.6	1.1	1.0	1.1
4	15.9	12.5	13.9	9.0	7.1	7.8	5.7	4.9	5.3	1.1	1.0	1.0
5	15.4	11.3	13.3	10.1	8.7	9.5	6.6	4.9	5.6	1.0	.7	.9
6	15.2	11.4	13.2	8.6	6.9	7.8	5.6	5.0	5.4	.7	.7	.7
7	17.2	13.4	15.1	6.8	4.5	5.7	4.9	3.8	4.3	.8	.7	.7
8	---	---	---	6.4	3.7	4.9	5.0	3.0	3.9	.7	.6	.7
9	---	---	---	7.4	4.3	5.7	5.7	3.0	4.1	.6	.4	.5
10	---	---	---	7.1	4.2	5.6	7.6	5.5	6.6	.4	.1	.2
11	---	---	---	8.0	5.0	6.4	5.1	2.6	3.5	.3	.2	.2
12	---	---	---	8.0	6.4	7.5	2.5	1.7	2.0	.3	.3	.3
13	---	---	---	10.7	7.6	8.8	1.8	1.6	1.7	.4	.3	.3
14	---	---	---	10.8	9.7	10.2	3.4	1.7	2.5	.4	.3	.4
15	---	---	---	10.0	8.8	9.6	4.4	3.0	3.6	.3	.0	.2
16	---	---	---	8.7	7.4	8.1	4.3	2.9	3.7	.0	-.4	-.2
17	---	---	---	7.6	6.6	7.2	3.9	3.6	3.8	-.4	-.4	-.4
18	---	---	---	7.0	4.4	5.7	4.9	3.9	4.4	-.4	-.9	-.6
19	---	---	---	6.4	4.7	5.6	4.1	3.4	3.8	-1.0	-1.8	-1.4
20	13.9	12.8	13.2	5.6	3.8	4.5	3.6	3.2	3.4	-1.8	-2.2	-2.1
21	14.2	11.5	13.2	5.4	3.7	4.5	3.1	2.7	3.0	-2.2	-2.5	-2.4
22	12.4	9.3	10.8	6.8	4.3	5.4	2.6	2.1	2.3	-1.7	-2.4	-2.2
23	11.7	8.2	10.0	6.3	4.6	5.4	2.3	1.9	2.1	-.5	-1.7	-1.3
24	12.8	9.5	11.0	6.4	5.8	6.1	1.9	1.6	1.7	.1	-.4	-.1
25	13.7	10.1	11.8	6.3	4.9	5.6	1.6	1.5	1.6	.2	.1	.2
26	13.7	10.8	12.2	7.8	5.6	6.6	1.5	1.5	1.5	.3	.2	.2
27	12.8	10.8	11.8	7.1	4.0	5.6	1.4	1.3	1.4	.3	.3	.3
28	10.6	9.1	9.8	3.8	2.8	3.1	1.3	1.2	1.3	.3	.3	.3
29	10.7	9.0	9.7	3.4	2.4	2.9	1.2	1.0	1.1	.3	.2	.3
30	9.2	7.7	8.5	2.8	2.1	2.4	1.1	1.0	1.0	.3	.2	.2
31	7.6	6.6	7.1	---	---	---	1.0	1.0	1.0	.2	-.7	-.3
MONTH	17.2	6.6	11.8	10.8	2.1	6.2	7.6	1.0	3.1	1.1	-2.5	.0



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

413551083481200 LU-20 NR HOLLAND OH--Continued

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.00	.00	.02	.00	.00	.00	.02	.00	---	.00	.00
2	.00	.00	.05	.00	.00	.00	.00	.00	.00	---	.01	.00
3	.00	.03	.00	.00	.00	.00	---	.00	.00	---	.00	.00
4	.00	.01	.16	.00	.00	.00	.01	.00	.00	---	.00	.00
5	.00	.00	.00	.00	.00	.00	.09	.00	.00	---	.00	.00
6	.00	.00	.01	.10	.00	.03	.07	.00	.06	---	.00	.03
7	.00	.00	.00	.01	.00	.21	.12	.08	.00	---	.00	.00
8	---	.00	.00	.06	.00	.00	.00	.00	.00	---	.00	.00
9	---	.00	.00	.02	.00	.00	.06	.00	.00	---	.00	.00
10	---	.00	.00	.04	.00	.05	.06	.00	.00	---	.00	.00
11	---	.00	.01	.01	.04	.00	.11	.21	.00	---	.06	.00
12	---	.00	.00	.00	.01	.00	.39	.00	.03	---	.00	.00
13	---	.07	.00	.00	.01	.04	.21	.00	.06	---	.39	.00
14	---	.26	.00	.02	.00	.00	.00	.00	.00	---	.02	.00
15	---	.03	.00	.06	.00	.00	.07	.00	.00	---	.00	.21
16	---	.00	.00	.07	.00	.00	.00	.00	.00	---	.00	.00
17	---	.23	.00	.02	.00	.00	.00	.00	.00	---	.00	.00
18	---	.02	.07	.00	.00	.01	.02	.00	.00	---	.00	.00
19	---	.00	.00	.01	.00	.00	.00	.00	.00	---	.00	.00
20	.16	.00	.05	.05	.00	.10	.00	.00	.39	---	.21	.00
21	.04	.00	.01	.04	.00	.13	.00	.00	.07	---	.00	.00
22	.00	.00	.00	.02	.00	.00	.00	.00	---	---	.00	.00
23	.00	.00	.00	.00	.08	.00	.00	.00	---	---	.00	.00
24	.00	.09	.02	.00	.00	.03	.00	.00	---	---	.00	.20
25	.00	.00	.02	.00	.00	.00	.00	.00	---	---	.00	.02
26	.00	.15	.01	.00	.00	.02	.06	.32	---	---	.00	.07
27	.00	.10	.03	.24	.03	.08	.44	.00	---	---	.00	.01
28	.00	.00	.00	.16	.00	.05	.21	.00	---	---	.01	.00
29	.00	.00	.00	.00	---	.03	.00	.00	---	---	.00	.00
30	.03	.00	.00	.00	---	.00	.25	.00	---	---	.05	.00
31	.03	---	.00	.00	---	.02	---	.19	---	.00	.00	---
TOTAL	0.27	0.99	0.44	0.95	0.17	0.80	2.17	0.82	0.61	0.00	0.75	0.54

WTR YR 1994 TOTAL 8.51

**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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**GROUND-WATER RECORDS**

413547083481400. Local number, LU-23.

LOCATION.--Lat 41°35'47" Long 83°48'14", Hydrologic Unit 04100009, along State Route 2 near Holland, OH.  
Owner.--USGS-Toledo Express Airport.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 29.4 ft. Cased with Sch 40 PVC to 4.4 ft; .010 in. screen from 4.4 to 29.4 ft.

INSTRUMENTATION - Data logger--60 minute record. At this well there are 4 conductivity/water temperature probes at increasing depths within the well to better document vertical movement of high conductivity water on an hourly basis. Conductivity/water temperature probes are set at 6.9 (level 4), 10.4 (level 3), 16.9 (level 2), and 25.4 (level 1) feet below land surface.

DATUM.--Elevation of land-surface datum is 676.97 feet above sea level.  
Measuring point: top of PVC casing 0.58 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (FOUR LEVELS): February 1991 to current year.

WATER TEMPERATURE (FOUR LEVELS): February 1991 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE:

LEVEL 1- Maximum, 1630 microsiemens July 16 and 17, 1991; minimum, 441 microsiemens March 2-3, 1992.

LEVEL 2- Maximum, 1790 microsiemens July 15, 1991; minimum, 462 microsiemens September 11, 1991.

LEVEL 3- Maximum, 1530 microsiemens July 22 and 23, 1991; minimum, 413 microsiemens October 8, 1991.

LEVEL 4- Maximum, 1180 microsiemens August 17-18, 1994; minimum, 107 microsiemens August 31, 1991.

WATER TEMPERATURE:

LEVEL 1- Maximum, 13.9°C many days in 1991; minimum, 11.1°C many days April, May, June, 1993, and May, 1994.

LEVEL 2- Maximum, 15.4°C October 30, November 11, 16, 1991; minimum, 9.6°C April 2, 7, 13, 18, 1993.

LEVEL 3- Maximum, 17.5°C many days in 1991; minimum, 7.9°C March 29-30, 1993.

LEVEL 4- Maximum, 19.0°C many days in 1991; minimum, 7.4°C March 25-29, 1993.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE:

LEVEL 1- Maximum, 1270 microsiemens August 13, 1994; minimum, 516 microsiemens June 19-20, 1994.

LEVEL 2- Maximum, 1280 microsiemens August 13, 1994; minimum, 523 microsiemens May 19-20, 1994.

LEVEL 3- Maximum, 1250 microsiemens August 14-16, 1994; minimum, 528 microsiemens May 18, 1994.

LEVEL 4- Maximum, 1180 microsiemens August 17-18, 1994; minimum, 521 microsiemens May 21-22, 1994.

WATER TEMPERATURE:

LEVEL 1- Maximum, 13.4°C November 28, 30, December 1, 7-17, 1993; minimum, 11.1°C several days in May, 1994.

LEVEL 2- Maximum, 14.4°C many days in October, November, 1993, and September 30, 1994; minimum, 9.9°C April 14-17, 19, 1994.

LEVEL 3- Maximum, 16.5°C October 2, 1993; minimum, 8.9°C March 26, and many days in April, 1994.

LEVEL 4- Maximum, 17.1°C September 25, 1994; minimum, 8.9°C many days in March and April, 1994.



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413547083481400 LU-23 NR HOLLAND OH--Continued

#1 (25.4' BLS)

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	942	933	937	1050	1030	1040	1070	1050	1060	1190	1180	1180
2	950	941	945	1030	1020	1030	1060	1060	1060	1190	1180	1190
3	957	948	952	1040	1030	1030	1060	1060	1060	1190	1190	1190
4	963	954	958	1040	1030	1040	1060	1050	1060	1200	1190	1200
5	970	962	965	1040	1040	1040	1050	1050	1050	1200	1190	1200
6	976	967	971	1040	1040	1040	1050	1050	1050	1210	1200	1210
7	981	972	975	1050	1040	1040	1050	1040	1050	1210	1210	1210
8	984	977	981	1050	1040	1050	1050	1040	1050	1210	1210	1210
9	988	981	985	1050	1040	1050	1050	1040	1040	1210	1210	1210
10	992	982	987	1050	1050	1050	1050	1040	1040	1210	1210	1210
11	997	987	992	1060	1050	1050	1040	1040	1040	1210	1210	1210
12	1000	993	998	1060	1050	1050	1040	1030	1040	1210	1210	1210
13	1000	996	1000	1060	1050	1060	1040	1030	1040	1210	1200	1210
14	1010	1000	1000	1060	1050	1060	1040	1030	1040	1210	1200	1200
15	1010	1000	1010	1060	1050	1060	1040	1030	1030	1200	1200	1200
16	1020	1010	1010	1060	1060	1060	1030	1030	1030	1200	1190	1190
17	1020	1010	1010	1060	1060	1060	1050	1030	1040	1190	1180	1180
18	1020	1010	1020	1070	1060	1060	1070	1050	1060	1180	1180	1180
19	1020	1020	1020	1060	1060	1060	1080	1070	1070	1180	1170	1170
20	1020	1020	1020	1060	1060	1060	1080	1070	1080	1170	1160	1170
21	1030	1020	1020	1060	1060	1060	1080	1080	1080	1170	1160	1160
22	1030	1020	1020	1060	1060	1060	1080	1080	1080	1160	1160	1160
23	1030	1020	1030	1060	1060	1060	1090	1080	1090	1160	1150	1160
24	1030	1020	1030	1070	1060	1060	1110	1090	1100	1150	1150	1150
25	1030	1020	1030	1070	1060	1060	1120	1110	1110	1150	1140	1150
26	1040	1030	1030	1060	1060	1060	1130	1120	1120	1140	1140	1140
27	1030	1030	1030	1070	1060	1060	1140	1130	1140	1150	1140	1140
28	1030	1030	1030	1070	1060	1060	1150	1140	1150	1140	1060	1100
29	1040	1030	1030	1070	1060	1070	1160	1150	1160	1060	1030	1050
30	1040	1030	1030	1070	1050	1060	1170	1160	1170	1030	1020	1030
31	1040	1030	1040	---	---	---	1180	1170	1170	1020	1010	1020
MONTH	1040	933	1000	1070	1020	1050	1180	1030	1080	1210	1010	1170

#1 (25.4' BLS)

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1020	1010	1010	818	808	812	---	---	---	585	581	583
2	1010	1010	1010	809	798	804	---	---	---	581	574	579
3	1020	1010	1020	800	791	796	---	---	---	578	572	576
4	1020	1020	1020	791	783	788	635	628	632	575	570	573
5	1020	1020	1020	783	774	779	632	625	627	572	569	570
6	1020	1020	1020	776	768	772	625	620	623	570	563	568
7	1020	1020	1020	771	758	765	621	615	619	567	563	565
8	1020	1010	1020	761	749	754	615	612	614	564	561	562
9	1010	1010	1010	751	742	746	613	606	610	562	558	560
10	1010	1000	1000	747	739	741	609	601	605	560	556	557
11	1000	992	996	740	733	736	605	601	604	557	553	555
12	992	982	987	736	726	730	604	597	602	553	543	549
13	987	972	978	729	720	724	601	596	598	547	541	544
14	976	967	970	724	716	720	596	591	593	543	535	540
15	967	956	962	720	710	714	599	592	595	541	533	536
16	957	946	951	715	705	711	599	596	599	535	531	533
17	946	933	940	711	703	706	599	595	598	533	526	530
18	933	917	925	708	695	702	599	594	597	530	525	527
19	918	901	911	701	692	697	600	595	597	528	525	526
20	905	891	898	697	692	694	601	598	600	528	523	525
21	891	878	885	696	688	692	603	599	601	526	524	524
22	878	866	872	691	680	685	603	599	602	527	523	524
23	866	854	859	684	676	681	603	597	601	527	523	524
24	854	842	848	681	672	676	601	597	600	528	524	525
25	842	832	837	676	671	672	600	596	599	529	525	526
26	832	820	827	672	667	669	599	595	597	529	525	526
27	831	817	823	668	663	666	597	592	595	529	526	527
28	824	817	820	663	659	661	595	592	594	529	526	527
29	---	---	---	660	656	658	592	586	589	529	525	526
30	---	---	---	658	653	656	588	584	587	529	525	526
31	---	---	---	---	---	---	---	---	---	530	525	527
MONTH	1020	817	944	818	653	720	635	584	603	585	523	543

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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413547083481400 LU-23 NR HOLLAND OH--Continued

#1 (25.4' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	529	525	526	585	579	582	737	725	731	891	879	885
2	528	525	526	595	584	589	750	736	743	902	889	894
3	527	524	525	602	594	596	799	748	774	910	897	902
4	527	523	524	610	602	606	856	799	830	912	904	907
5	527	523	524	621	610	616	899	856	873	911	902	906
6	527	522	524	645	621	631	954	899	927	909	893	899
7	527	522	523	661	645	652	1010	953	982	893	879	886
8	526	520	524	673	661	665	1060	1010	1040	879	864	871
9	525	521	523	680	673	675	1110	1060	1090	864	846	854
10	529	524	526	683	676	679	1150	1110	1130	846	829	838
11	528	525	526	683	675	679	1220	1150	1180	830	812	822
12	527	524	526	683	672	678	1260	1220	1240	816	800	810
13	528	524	525	681	671	676	1270	1210	1250	838	796	810
14	525	522	523	678	668	673	1220	1210	1210	845	835	840
15	524	520	522	675	666	671	1220	1200	1210	839	825	834
16	523	519	521	671	663	667	1210	1180	1200	829	812	821
17	522	518	520	668	662	665	1190	1150	1170	818	805	812
18	522	519	520	668	661	664	1160	1120	1140	809	797	802
19	520	516	519	666	658	661	1130	1090	1110	799	792	795
20	521	516	519	663	653	658	1090	1060	1070	797	785	790
21	521	517	520	663	655	658	1060	1010	1030	797	788	791
22	536	518	526	668	654	660	1010	964	984	789	781	785
23	539	533	535	677	665	671	967	935	949	783	773	778
24	544	536	541	688	677	684	938	908	923	773	761	768
25	548	539	544	693	688	690	914	890	900	765	753	760
26	554	546	549	696	691	693	895	875	884	758	750	754
27	559	552	554	698	691	695	881	870	874	750	743	747
28	565	558	560	701	689	696	875	865	868	747	730	736
29	576	564	567	707	698	703	869	864	866	733	720	726
30	582	573	576	716	703	710	874	865	869	723	714	719
31	---	---	---	728	712	721	882	871	876	---	---	---
MONTH	582	516	531	728	579	663	1270	725	998	912	714	818
YEAR	1270	516	846									

#2 (16.9' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	748	662	666	806	725	748	881	873	878	1190	1180	1180
2	674	669	671	758	751	755	894	881	886	1190	1180	1190
3	680	670	673	759	751	755	905	891	898	1200	1190	1190
4	683	676	679	769	756	763	910	905	908	1200	1190	1200
5	686	681	683	774	769	772	913	907	910	1200	1200	1200
6	687	682	686	776	770	772	923	913	917	1210	1200	1210
7	694	686	689	779	773	775	933	921	928	1210	1210	1210
8	703	691	696	783	776	779	948	933	941	1210	1210	1210
9	696	686	691	787	779	783	967	948	958	1220	1210	1210
10	688	675	682	789	782	786	984	967	976	1220	1210	1210
11	683	677	680	794	787	792	1000	984	994	1220	1210	1220
12	687	682	685	796	794	794	1020	1000	1010	1220	1210	1220
13	690	684	687	802	796	799	1030	1020	1030	1220	1210	1210
14	694	688	692	813	801	805	1040	1030	1040	1210	1200	1210
15	697	691	694	819	812	816	1050	1040	1050	1210	1200	1200
16	699	693	697	820	819	819	1060	1050	1060	1200	1190	1200
17	706	698	701	828	820	823	1060	1060	1060	1190	1190	1190
18	707	701	704	841	828	832	1070	1060	1070	1190	1180	1180
19	708	705	706	829	824	826	1070	1060	1070	1180	1170	1180
20	708	706	707	825	825	825	1070	1070	1070	1180	1170	1180
21	715	707	712	834	823	828	1080	1070	1080	1180	1160	1170
22	715	709	714	834	826	831	1080	1070	1080	1170	1160	1170
23	716	709	713	837	829	835	1090	1080	1090	1170	1160	1160
24	717	710	714	841	837	840	1100	1090	1100	1160	1160	1160
25	717	712	716	846	841	844	1120	1100	1110	1160	1150	1160
26	720	714	717	857	846	852	1130	1120	1120	1150	1150	1150
27	721	718	719	862	852	858	1150	1130	1140	1150	1150	1150
28	725	717	721	864	857	861	1150	1140	1150	1150	1070	1110
29	725	721	725	868	864	867	1170	1150	1160	1070	1040	1050
30	727	721	724	875	868	871	1170	1160	1170	1040	1030	1030
31	729	723	726	---	---	---	1180	1170	1170	1030	1020	1020
MONTH	748	662	699	875	725	810	1180	873	1030	1220	1020	1170



**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO**

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413547083481400 LU-23 NR HOLLAND OH--Continued

#3 (10.4' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	661	652	656	771	712	738	868	861	864	1180	1170	1170
2	664	655	659	761	756	759	883	868	874	1180	1180	1180
3	670	664	666	756	751	753	895	878	887	1190	1180	1180
4	674	666	669	755	750	752	897	894	896	1190	1190	1190
5	679	671	674	755	754	754	899	894	896	1200	1190	1190
6	683	676	679	755	754	755	913	899	906	1210	1190	1200
7	686	681	685	755	754	755	928	909	920	1210	1200	1210
8	696	682	688	761	755	758	942	927	934	1210	1200	1210
9	698	691	692	762	756	760	962	942	951	1210	1210	1210
10	692	685	688	764	762	763	982	959	971	1210	1210	1210
11	690	685	687	771	764	767	997	977	987	1220	1210	1210
12	690	684	687	773	766	770	1010	997	1010	1220	1210	1210
13	690	685	689	776	773	774	1030	1010	1020	1210	1200	1210
14	690	684	688	778	776	777	1040	1030	1030	1210	1200	1200
15	690	685	689	784	778	780	1050	1040	1050	1200	1200	1200
16	694	686	691	788	784	786	1050	1050	1050	1200	1180	1190
17	698	691	694	793	788	790	1060	1050	1060	1190	1180	1180
18	701	694	696	817	793	804	1060	1050	1060	1180	1170	1180
19	702	701	701	818	812	816	1060	1060	1060	1180	1170	1170
20	705	701	703	816	811	815	1060	1060	1060	1170	1160	1170
21	707	705	706	820	814	816	1070	1060	1060	1170	1160	1160
22	709	706	707	823	815	820	1080	1070	1070	1160	1160	1160
23	709	703	707	827	818	824	1090	1080	1080	1160	1150	1150
24	711	705	710	831	827	829	1100	1090	1090	1150	1150	1150
25	715	710	711	836	831	833	1110	1100	1110	1150	1140	1150
26	715	710	712	844	836	839	1130	1110	1120	1150	1140	1140
27	716	713	715	848	839	843	1140	1120	1130	1150	1140	1150
28	715	709	712	852	844	849	1150	1140	1140	1140	1060	1100
29	710	708	709	856	850	853	1160	1140	1150	1060	1030	1050
30	711	709	710	861	856	858	1160	1150	1160	1030	1020	1030
31	715	710	711	---	---	---	1180	1160	1170	1020	1010	1010
MONTH	716	652	693	861	712	793	1180	861	1020	1220	1010	1170

#3 (10.4' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1010	1010	1010	812	800	806	---	---	---	584	581	583
2	1010	1010	1010	800	791	797	---	---	---	581	575	579
3	1020	1010	1010	794	783	788	---	---	---	578	573	576
4	1020	1020	1020	787	774	780	633	628	630	576	570	573
5	1020	1020	1020	776	767	772	632	623	628	573	568	571
6	1020	1020	1020	772	757	765	626	617	621	571	565	568
7	1020	1010	1020	765	751	757	618	613	616	569	567	568
8	1020	1010	1010	756	743	748	614	607	611	567	561	564
9	1010	1000	1010	744	738	741	612	603	606	564	559	562
10	1010	999	1000	740	732	736	605	598	602	560	557	558
11	999	989	996	733	727	729	602	596	599	559	553	556
12	994	985	988	729	717	724	601	595	596	554	543	549
13	988	974	981	723	715	720	599	593	595	546	537	541
14	976	965	970	719	710	714	597	592	594	540	533	535
15	965	954	960	714	707	710	600	596	598	535	531	533
16	954	941	949	708	701	705	602	597	599	535	529	532
17	945	930	937	705	698	702	602	594	598	533	529	532
18	931	917	923	700	692	697	600	596	598	533	528	531
19	917	901	910	696	687	693	601	595	598	533	529	531
20	905	888	896	692	684	688	602	596	599	533	529	530
21	888	873	881	687	682	685	603	598	600	533	529	530
22	875	858	868	684	675	680	604	598	601	533	530	531
23	862	848	855	680	671	676	604	599	601	533	530	532
24	850	838	844	676	668	673	604	600	601	534	531	533
25	840	826	833	673	667	669	604	597	600	536	532	534
26	828	817	822	669	665	667	600	595	598	537	533	535
27	825	810	818	666	660	662	599	594	596	536	535	535
28	822	810	816	661	654	658	594	592	593	537	533	536
29	---	---	---	659	653	656	593	587	590	538	534	536
30	---	---	---	655	651	653	590	584	586	538	535	537
31	---	---	---	---	---	---	---	---	---	539	535	536
MONTH	1020	810	942	812	651	715	633	584	602	584	528	547



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413547083481400 LU-23 NR HOLLAND OH--Continued

#3 (10.4' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	539	535	537	574	570	572	707	698	702	886	880	884
2	539	536	537	582	574	577	716	705	710	886	879	884
3	539	536	537	587	578	583	724	716	720	887	880	884
4	538	534	537	588	584	587	739	721	733	888	881	885
5	538	535	537	593	587	590	753	739	749	893	884	888
6	539	535	537	594	589	592	805	753	779	903	892	895
7	540	536	537	596	591	594	845	802	822	912	899	904
8	538	535	538	595	590	592	869	842	857	916	909	911
9	538	535	536	594	591	592	913	868	893	915	899	907
10	538	534	536	592	588	590	959	913	934	904	891	897
11	540	536	538	599	588	592	1070	959	999	891	875	882
12	541	537	539	608	595	600	1130	1070	1100	875	860	868
13	541	536	539	617	603	612	1230	1130	1180	878	858	868
14	539	536	538	624	616	620	1250	1230	1240	879	871	875
15	539	535	537	635	623	630	1250	1240	1250	878	869	873
16	539	535	537	637	632	635	1250	1230	1240	874	866	868
17	540	536	537	644	635	640	1230	1210	1230	871	859	864
18	540	536	537	649	643	646	1220	1180	1200	861	855	858
19	537	534	536	655	649	651	1190	1150	1170	855	846	852
20	538	534	536	659	652	654	1150	1120	1140	847	841	843
21	538	534	535	659	653	656	1120	1070	1100	842	835	840
22	601	533	554	660	654	658	1080	1040	1060	841	823	832
23	557	552	556	658	648	653	1040	1000	1020	828	821	826
24	554	546	549	652	646	650	1000	968	984	826	816	823
25	550	546	548	651	646	649	971	937	955	821	808	814
26	555	548	551	679	651	663	941	916	926	812	805	809
27	559	554	555	686	677	680	923	901	909	805	795	800
28	566	558	560	687	683	685	906	893	897	797	782	789
29	571	564	568	690	684	688	894	887	891	783	772	779
30	573	569	571	695	688	691	889	880	886	774	763	769
31	---	---	---	700	693	695	886	881	885	---	---	---
MONTH	601	533	543	700	570	630	1250	698	973	916	763	856
YEAR	1250	528	792									

#4 (6.9' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	671	614	620	759	676	700	828	820	823	1120	1120	1120
2	625	621	624	722	717	719	840	825	834	1130	1120	1120
3	629	623	626	717	710	713	853	840	846	1130	1130	1130
4	634	626	630	715	709	711	854	849	852	1140	1130	1140
5	635	631	634	715	714	714	862	849	856	1140	1130	1140
6	645	635	638	715	714	715	871	858	865	1160	1140	1150
7	647	641	642	716	714	715	881	871	875	1150	1150	1150
8	656	645	650	721	715	718	897	881	888	1150	1150	1150
9	657	655	656	723	717	720	917	897	907	1150	1150	1150
10	658	654	657	725	723	724	935	917	926	1160	1150	1150
11	660	655	656	731	724	727	952	935	944	1160	1150	1160
12	658	654	656	734	727	730	971	952	961	1160	1150	1150
13	658	654	656	736	730	734	983	966	975	1150	1150	1150
14	660	654	656	739	736	737	992	983	988	1150	1140	1150
15	660	654	656	744	739	741	999	992	996	1140	1140	1140
16	658	653	657	749	744	746	1000	999	1000	1140	1130	1140
17	657	652	656	753	748	750	1010	1000	1010	1140	1120	1130
18	659	654	655	775	753	763	1010	1010	1010	1130	1120	1130
19	659	655	658	777	772	775	1010	1010	1010	1130	1120	1120
20	661	659	660	776	771	774	1020	1010	1020	1120	1110	1120
21	661	659	660	778	773	775	1020	1020	1020	1120	1110	1110
22	661	656	660	782	775	779	1030	1020	1020	1110	1100	1110
23	662	657	661	786	779	783	1040	1030	1030	1110	1100	1110
24	666	662	663	789	786	788	1050	1040	1040	1100	1100	1100
25	668	663	664	795	789	792	1060	1050	1060	1100	1090	1100
26	669	665	666	804	793	799	1080	1060	1070	1100	1090	1090
27	671	669	670	808	799	805	1090	1080	1080	1110	1090	1100
28	672	671	672	811	808	809	1100	1090	1090	1090	1010	1050
29	674	672	673	814	810	812	1110	1100	1100	1020	988	1000
30	675	674	675	820	814	816	1110	1100	1110	990	977	983
31	680	675	676	---	---	---	1120	1110	1120	979	967	972
MONTH	680	614	654	820	676	753	1120	820	978	1160	967	1110





# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413547083481400 LU-23 NR HOLLAND OH--Continued

#1 (25.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	12.7	12.5	12.6	12.9	12.9	12.9	13.4	13.1	13.2	13.1	12.9	13.0
2	12.7	12.5	12.5	13.1	12.9	12.9	13.2	13.1	13.2	13.1	12.9	12.9
3	12.7	12.5	12.5	12.9	12.9	12.9	13.2	13.1	13.2	13.1	12.9	12.9
4	12.7	12.5	12.6	12.9	12.9	12.9	13.2	13.1	13.2	13.1	12.9	12.9
5	12.7	12.4	12.5	13.0	12.9	12.9	13.2	13.1	13.2	13.1	12.9	12.9
6	12.8	12.5	12.6	13.1	12.9	13.0	13.2	13.1	13.2	13.1	12.9	12.9
7	12.8	12.5	12.6	13.1	12.9	13.1	13.4	13.1	13.3	12.9	12.9	12.9
8	12.8	12.5	12.6	13.1	12.9	13.0	13.4	13.1	13.3	12.9	12.9	12.9
9	12.7	12.5	12.5	13.2	12.9	13.1	13.4	13.1	13.3	12.9	12.9	12.9
10	12.7	12.5	12.6	13.2	12.9	13.1	13.4	13.1	13.2	12.9	12.8	12.9
11	12.7	12.5	12.6	13.2	12.9	13.1	13.4	13.1	13.4	12.9	12.9	12.9
12	12.7	12.5	12.6	13.2	12.9	13.1	13.4	13.2	13.3	12.9	12.9	12.9
13	12.7	12.5	12.6	13.2	12.9	13.0	13.4	13.2	13.4	12.9	12.9	12.9
14	12.7	12.5	12.7	13.2	12.9	13.1	13.4	13.1	13.2	12.9	12.9	12.9
15	12.8	12.5	12.7	13.2	12.9	13.2	13.4	13.1	13.2	12.9	12.8	12.9
16	12.7	12.5	12.7	13.2	13.1	13.2	13.4	13.1	13.3	12.9	12.8	12.8
17	13.0	12.5	12.7	13.2	13.1	13.2	13.4	13.1	13.2	12.9	12.9	12.9
18	13.0	12.7	12.7	13.2	13.1	13.1	13.2	13.1	13.2	12.9	12.8	12.8
19	12.7	12.7	12.7	13.2	13.1	13.2	13.1	13.1	13.1	12.9	12.8	12.8
20	12.7	12.7	12.7	13.2	13.1	13.1	13.1	13.1	13.1	12.9	12.6	12.8
21	12.7	12.7	12.7	13.2	13.1	13.2	13.1	13.1	13.1	12.9	12.6	12.8
22	13.0	12.7	12.8	13.2	13.1	13.2	13.1	13.1	13.1	12.7	12.6	12.7
23	13.0	12.7	12.9	13.2	13.1	13.2	13.2	13.1	13.1	12.7	12.6	12.7
24	13.0	12.7	12.9	13.2	13.1	13.2	13.1	13.1	13.1	12.7	12.7	12.7
25	13.0	12.7	12.9	13.2	13.1	13.2	13.1	13.1	13.1	12.7	12.7	12.7
26	13.0	12.7	12.9	13.2	13.1	13.2	13.1	13.1	13.1	12.7	12.6	12.6
27	12.9	12.9	12.9	13.2	13.1	13.1	13.1	13.1	13.1	12.7	12.5	12.6
28	12.9	12.9	12.9	13.4	13.1	13.2	13.1	13.1	13.1	12.7	12.5	12.6
29	13.0	12.9	12.9	13.2	13.1	13.1	13.1	13.1	13.1	12.7	12.7	12.7
30	12.9	12.9	12.9	13.4	13.1	13.2	13.1	13.1	13.1	12.7	12.4	12.6
31	12.9	12.9	12.9	---	---	---	13.1	13.1	13.1	12.6	12.4	12.5
MONTH	13.0	12.4	12.7	13.4	12.9	13.1	13.4	13.1	13.2	13.1	12.4	12.8

#1 (25.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	12.6	12.4	12.5	12.2	12.0	12.0	---	---	---	11.4	11.3	11.3
2	12.6	12.4	12.4	12.0	12.0	12.0	---	---	---	11.6	11.3	11.4
3	12.4	12.4	12.4	12.0	11.8	11.9	---	---	---	11.6	11.3	11.4
4	12.5	12.4	12.4	12.0	11.8	12.0	---	---	---	11.6	11.4	11.4
5	12.5	12.4	12.4	12.0	11.8	11.9	11.6	11.3	11.5	11.4	11.3	11.4
6	12.5	12.4	12.4	12.0	11.8	11.9	11.5	11.5	11.5	11.6	11.3	11.4
7	12.4	12.4	12.4	12.0	11.8	11.8	11.6	11.4	11.5	11.4	11.3	11.3
8	12.4	12.4	12.4	12.0	11.8	12.0	11.6	11.3	11.5	11.4	11.3	11.4
9	12.4	12.4	12.4	12.0	11.7	11.9	11.6	11.3	11.4	11.4	11.2	11.3
10	12.4	12.4	12.4	12.0	11.7	11.8	11.6	11.3	11.4	11.4	11.2	11.4
11	12.5	12.2	12.4	11.8	11.7	11.8	11.5	11.3	11.4	11.4	11.3	11.4
12	12.5	12.2	12.4	11.8	11.7	11.8	11.6	11.3	11.4	11.6	11.2	11.4
13	12.5	12.2	12.4	11.8	11.8	11.8	11.4	11.3	11.4	11.4	11.2	11.4
14	12.4	12.2	12.3	11.8	11.8	11.8	11.6	11.3	11.5	11.6	11.2	11.4
15	12.2	12.2	12.2	11.8	11.8	11.8	11.6	11.4	11.5	11.6	11.2	11.4
16	12.4	12.2	12.2	11.8	11.7	11.8	11.6	11.3	11.4	11.4	11.1	11.3
17	12.2	12.2	12.2	11.8	11.6	11.7	11.6	11.3	11.4	11.6	11.2	11.4
18	12.5	12.2	12.3	11.8	11.5	11.7	11.6	11.3	11.4	11.4	11.1	11.4
19	12.5	12.2	12.3	11.8	11.5	11.6	11.6	11.4	11.5	11.4	11.2	11.4
20	12.2	12.0	12.2	11.8	11.5	11.7	11.6	11.3	11.4	11.4	11.1	11.4
21	12.2	12.2	12.2	11.8	11.5	11.6	11.6	11.3	11.4	11.4	11.1	11.4
22	12.2	12.2	12.2	11.8	11.5	11.6	11.6	11.3	11.4	11.5	11.1	11.4
23	12.2	12.2	12.2	11.8	11.6	11.6	11.6	11.3	11.4	11.4	11.2	11.4
24	12.2	12.2	12.2	11.8	11.4	11.6	11.6	11.4	11.4	11.4	11.2	11.4
25	12.2	12.2	12.2	11.6	11.5	11.6	11.6	11.4	11.5	11.4	11.2	11.4
26	12.2	12.0	12.1	11.6	11.4	11.5	11.6	11.4	11.5	11.4	11.1	11.3
27	12.2	12.0	12.1	11.6	11.5	11.6	11.6	11.4	11.5	11.4	11.1	11.4
28	12.2	12.0	12.1	11.6	11.4	11.6	11.4	11.3	11.3	11.4	11.1	11.3
29	---	---	---	11.6	11.4	11.5	11.6	11.3	11.4	11.4	11.2	11.4
30	---	---	---	11.6	11.4	11.5	11.4	11.3	11.3	11.4	11.2	11.4
31	---	---	---	---	---	---	---	---	---	11.4	11.2	11.3
MONTH	12.6	12.0	12.3	12.2	11.4	11.7	11.6	11.3	11.4	11.6	11.1	11.4

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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413547083481400 LU-23 NR HOLLAND OH--Continued

<div style="text-align: center;">#1 (25.4' BLS)</div> <div style="text-align: center;">WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994</div>												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	11.4	11.2	11.4	11.6	11.4	11.5	11.9	11.6	11.7	12.3	12.0	12.1
2	11.4	11.2	11.4	11.6	11.4	11.5	11.9	11.6	11.7	12.3	12.0	12.2
3	11.4	11.2	11.4	11.6	11.4	11.5	11.9	11.6	11.7	12.3	12.0	12.2
4	11.4	11.2	11.4	11.7	11.4	11.5	11.8	11.6	11.7	12.3	12.0	12.2
5	11.4	11.2	11.4	11.6	11.4	11.6	11.8	11.6	11.8	12.3	12.0	12.2
6	11.4	11.2	11.4	11.7	11.4	11.6	11.9	11.6	11.8	12.3	12.0	12.2
7	11.4	11.2	11.4	11.6	11.4	11.5	11.9	11.6	11.8	12.3	12.1	12.3
8	11.6	11.2	11.4	11.6	11.4	11.5	11.9	11.6	11.8	12.3	12.2	12.3
9	11.6	11.3	11.4	11.6	11.4	11.5	12.0	11.6	11.8	12.3	12.3	12.3
10	11.4	11.2	11.4	11.6	11.4	11.5	12.0	11.8	11.8	12.3	12.2	12.3
11	11.4	11.4	11.4	11.6	11.4	11.6	12.0	11.8	11.8	12.5	12.2	12.3
12	11.6	11.4	11.4	11.7	11.4	11.5	12.1	11.8	11.9	12.5	12.2	12.3
13	11.4	11.2	11.4	11.7	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.3
14	11.5	11.4	11.4	11.6	11.4	11.5	12.1	11.8	12.0	12.5	12.3	12.4
15	11.6	11.4	11.5	11.6	11.4	11.5	12.1	11.8	11.9	12.5	12.3	12.3
16	11.6	11.2	11.4	11.7	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.4
17	11.6	11.4	11.4	11.6	11.4	11.5	12.1	11.8	11.9	12.5	12.3	12.4
18	11.5	11.2	11.4	11.7	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.5
19	11.6	11.4	11.4	11.6	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.5
20	11.6	11.4	11.5	11.7	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.5
21	11.6	11.4	11.4	11.6	11.4	11.5	12.1	11.8	11.9	12.5	12.3	12.5
22	11.6	11.4	11.4	11.6	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.5
23	11.6	11.4	11.4	11.6	11.4	11.6	12.1	11.8	11.9	12.5	12.3	12.5
24	11.6	11.4	11.5	11.8	11.6	11.6	12.1	11.8	11.9	12.7	12.5	12.5
25	11.6	11.4	11.4	11.8	11.6	11.6	12.1	11.8	12.0	12.7	12.5	12.6
26	11.6	11.4	11.5	11.8	11.6	11.6	12.1	11.8	12.0	12.5	12.5	12.5
27	11.6	11.4	11.5	11.8	11.6	11.6	12.1	11.8	12.0	12.5	12.5	12.5
28	11.6	11.4	11.5	11.9	11.6	11.6	12.1	11.8	12.0	12.5	12.5	12.5
29	11.6	11.4	11.5	11.9	11.6	11.6	12.1	12.0	12.0	12.7	12.5	12.5
30	11.6	11.4	11.5	11.9	11.6	11.7	12.3	12.0	12.1	12.7	12.5	12.5
31	---	---	---	11.9	11.6	11.7	12.3	12.0	12.1	---	---	---
MONTH	11.6	11.2	11.4	11.9	11.4	11.6	12.3	11.6	11.9	12.7	12.0	12.4
YEAR	13.4	11.1	12.2									

<div style="text-align: center;">#2 (16.9' BLS)</div> <div style="text-align: center;">WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994</div>												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.2	13.9	14.1	14.4	14.1	14.3	13.6	13.6	13.6	12.7	12.4	12.5
2	14.2	13.9	14.0	14.4	14.1	14.3	13.6	13.4	13.6	12.7	12.4	12.5
3	14.2	13.9	14.1	14.4	14.1	14.3	13.6	13.4	13.5	12.7	12.4	12.4
4	14.2	13.9	14.1	14.4	14.1	14.2	13.4	13.4	13.4	12.7	12.4	12.4
5	14.2	13.9	14.1	14.4	14.1	14.2	13.4	13.4	13.4	12.4	12.4	12.4
6	14.4	14.1	14.2	14.4	14.1	14.3	13.4	13.4	13.4	12.4	12.4	12.4
7	14.4	14.1	14.2	14.4	14.1	14.3	13.4	13.4	13.4	12.4	12.4	12.4
8	14.4	14.1	14.2	14.4	14.1	14.2	13.4	13.4	13.4	12.4	12.4	12.4
9	14.2	14.1	14.1	14.4	14.1	14.3	13.4	13.4	13.4	12.5	12.2	12.4
10	14.4	14.1	14.2	14.4	14.1	14.2	13.4	13.2	13.4	12.4	12.2	12.4
11	14.4	14.1	14.2	14.4	14.1	14.2	13.4	13.4	13.4	12.4	12.2	12.3
12	14.1	14.1	14.1	14.1	14.1	14.1	13.4	13.1	13.3	12.2	12.2	12.2
13	14.4	14.1	14.2	14.2	14.1	14.1	13.4	13.1	13.2	12.2	12.2	12.2
14	14.4	14.1	14.2	14.2	14.1	14.1	13.2	13.1	13.2	12.2	12.2	12.2
15	14.4	14.1	14.2	14.1	14.1	14.1	13.2	13.1	13.2	12.2	12.1	12.2
16	14.4	14.1	14.2	14.1	14.1	14.1	13.2	13.1	13.2	12.2	12.1	12.2
17	14.4	14.1	14.2	14.1	14.1	14.1	13.1	13.1	13.1	12.2	12.2	12.2
18	14.4	14.1	14.2	14.1	14.1	14.1	13.2	12.9	13.0	12.2	12.1	12.2
19	14.2	14.1	14.1	14.1	14.1	14.1	12.9	12.9	12.9	12.2	11.9	12.1
20	14.2	14.1	14.1	14.1	14.1	14.1	12.9	12.9	12.9	12.2	11.9	12.0
21	14.2	14.1	14.1	14.1	13.9	14.0	12.9	12.9	12.9	12.2	11.9	12.0
22	14.4	14.1	14.1	14.2	13.9	13.9	12.9	12.9	12.9	12.2	11.7	11.9
23	14.4	14.1	14.2	14.1	13.9	13.9	12.9	12.9	12.9	12.0	11.7	11.8
24	14.4	14.1	14.2	13.9	13.9	13.9	12.9	12.9	12.9	11.8	11.8	11.8
25	14.4	14.1	14.2	13.9	13.9	13.9	12.9	12.9	12.9	11.8	11.7	11.8
26	14.4	14.1	14.2	13.9	13.6	13.8	12.9	12.7	12.9	11.7	11.7	11.7
27	14.1	14.1	14.1	13.9	13.6	13.7	12.9	12.6	12.8	11.8	11.7	11.8
28	14.4	14.1	14.2	13.9	13.6	13.7	12.9	12.6	12.8	11.8	11.8	11.8
29	14.4	14.1	14.2	13.6	13.6	13.6	12.9	12.6	12.7	11.8	11.7	11.8
30	14.4	14.1	14.3	13.6	13.6	13.6	12.9	12.6	12.7	11.8	11.7	11.7
31	14.4	14.1	14.3	---	---	---	12.7	12.4	12.6	11.7	11.5	11.6
MONTH	14.4	13.9	14.2	14.4	13.6	14.1	13.6	12.4	13.1	12.7	11.5	12.1





# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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413547083481400 LU-23 NR HOLLAND OH--Continued

#3 (10.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	16.3	16.0	16.2	15.1	14.6	14.9	13.4	13.4	13.4	12.0	11.7	11.8
2	16.5	16.2	16.3	15.1	14.9	14.9	13.4	13.2	13.3	11.8	11.7	11.8
3	16.3	16.0	16.2	14.9	14.9	14.9	13.4	13.1	13.2	11.8	11.7	11.8
4	16.3	16.0	16.2	14.9	14.6	14.8	13.2	13.1	13.2	11.8	11.7	11.8
5	16.3	16.0	16.2	14.7	14.6	14.6	13.2	13.1	13.2	11.8	11.5	11.7
6	16.3	16.0	16.2	14.6	14.6	14.6	13.2	12.9	13.1	11.8	11.5	11.6
7	16.3	16.0	16.0	14.6	14.6	14.6	13.1	12.9	12.9	11.7	11.5	11.6
8	16.3	15.7	16.0	14.6	14.4	14.5	12.9	12.9	12.9	11.7	11.5	11.6
9	16.0	15.7	15.9	14.7	14.4	14.4	12.9	12.7	12.9	11.5	11.5	11.5
10	16.0	15.7	15.9	14.4	14.4	14.4	12.9	12.7	12.8	11.5	11.5	11.5
11	16.0	15.7	15.9	14.4	14.1	14.3	12.9	12.7	12.9	11.5	11.3	11.4
12	15.9	15.7	15.8	14.4	14.1	14.2	12.9	12.6	12.7	11.5	11.3	11.4
13	16.0	15.7	15.7	14.2	14.1	14.1	12.7	12.5	12.7	11.3	11.3	11.3
14	16.0	15.6	15.7	14.2	14.1	14.1	12.7	12.5	12.6	11.3	11.3	11.3
15	16.0	15.7	15.7	14.1	14.1	14.1	12.7	12.5	12.5	11.3	11.3	11.3
16	16.0	15.4	15.7	14.1	14.1	14.1	12.5	12.4	12.5	11.3	11.2	11.3
17	15.7	15.4	15.6	14.1	14.1	14.1	12.5	12.5	12.4	11.3	11.3	11.3
18	15.7	15.4	15.6	14.1	13.9	14.0	12.5	12.5	12.5	11.3	11.2	11.3
19	15.4	15.4	15.4	14.1	13.9	14.0	12.5	12.5	12.4	11.3	11.2	11.3
20	15.4	15.4	15.4	14.1	13.9	13.9	12.5	12.4	12.4	11.3	11.1	11.2
21	15.4	15.4	15.4	13.9	13.6	13.8	12.5	12.2	12.4	11.3	11.0	11.1
22	15.5	15.4	15.4	13.9	13.6	13.7	12.5	12.2	12.3	11.1	10.9	11.1
23	15.7	15.4	15.5	13.9	13.6	13.7	12.2	12.2	12.2	11.1	10.9	11.1
24	15.7	15.4	15.4	13.6	13.6	13.6	12.2	12.2	12.2	11.1	10.9	11.0
25	15.5	15.2	15.4	13.6	13.6	13.6	12.2	12.2	12.2	11.1	10.9	11.0
26	15.5	15.2	15.4	13.7	13.4	13.6	12.2	12.2	12.2	11.1	10.9	10.9
27	15.2	15.1	15.2	13.6	13.4	13.5	12.2	12.0	12.2	10.9	10.7	10.9
28	15.2	15.1	15.1	13.6	13.4	13.4	12.2	12.0	12.1	11.1	10.9	11.0
29	15.2	15.1	15.2	13.4	13.4	13.4	12.2	11.9	12.0	11.1	10.7	10.8
30	15.1	15.1	15.1	13.4	13.4	13.4	12.2	11.9	12.0	10.9	10.6	10.7
31	15.1	14.9	15.1	---	---	---	12.0	11.7	11.9	10.7	10.4	10.6
MONTH	16.5	14.9	15.7	15.1	13.4	14.1	13.4	11.7	12.6	12.0	10.4	11.3

#3 (10.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	10.6	10.4	10.6	9.7	9.6	9.6	---	---	---	9.7	9.7	9.7
2	10.5	10.4	10.4	9.7	9.6	9.6	---	---	---	9.9	9.6	9.7
3	10.5	10.4	10.5	9.7	9.5	9.6	---	---	---	9.9	9.7	9.7
4	10.5	10.4	10.5	9.7	9.5	9.6	---	---	---	9.9	9.7	9.8
5	10.5	10.2	10.4	9.9	9.5	9.6	9.3	8.9	9.0	9.9	9.7	9.8
6	10.5	10.2	10.4	9.7	9.5	9.6	9.1	8.9	9.0	9.9	9.7	9.8
7	10.5	10.2	10.4	9.7	9.5	9.5	9.1	8.9	9.0	9.7	9.7	9.7
8	10.4	10.2	10.4	9.7	9.6	9.6	9.1	8.9	9.0	9.9	9.7	9.8
9	10.4	10.2	10.3	9.6	9.4	9.6	9.3	8.9	9.1	9.9	9.7	9.8
10	10.4	10.0	10.2	9.5	9.4	9.5	9.3	8.9	9.1	9.9	9.7	9.9
11	10.3	10.0	10.2	9.5	9.2	9.4	9.1	8.9	9.1	10.1	9.7	9.9
12	10.2	10.0	10.1	9.5	9.1	9.3	9.1	9.1	9.1	10.1	9.9	9.9
13	10.3	10.0	10.1	9.5	9.1	9.3	9.1	8.9	9.1	10.1	9.9	10.0
14	10.2	10.0	10.1	9.3	9.1	9.2	9.3	8.9	9.0	10.1	9.9	10.1
15	10.1	10.0	10.1	9.3	9.1	9.2	9.1	8.9	9.0	10.1	9.9	10.0
16	10.1	9.9	10.0	9.3	9.0	9.2	9.1	8.9	9.0	10.3	9.9	10.1
17	10.1	9.9	10.0	9.2	9.0	9.1	9.3	8.9	9.0	10.3	10.1	10.1
18	10.1	9.8	10.0	9.2	9.0	9.1	9.3	9.1	9.1	10.3	10.1	10.2
19	9.9	9.7	9.9	9.3	9.0	9.1	9.3	8.9	9.2	10.3	10.1	10.2
20	9.9	9.7	9.8	9.3	9.0	9.1	9.3	9.1	9.2	10.4	10.1	10.2
21	9.9	9.6	9.8	9.1	9.1	9.1	9.3	9.1	9.2	10.4	10.1	10.3
22	9.9	9.6	9.8	9.3	9.0	9.1	9.3	9.1	9.2	10.4	10.1	10.3
23	9.8	9.6	9.7	9.3	9.1	9.1	9.3	9.1	9.2	10.5	10.3	10.3
24	9.8	9.6	9.7	9.3	9.1	9.1	9.4	9.1	9.3	10.5	10.3	10.3
25	9.8	9.6	9.6	9.1	9.0	9.1	9.5	9.1	9.3	10.6	10.3	10.4
26	9.8	9.6	9.6	9.1	8.9	9.1	9.5	9.3	9.4	10.5	10.3	10.4
27	9.7	9.6	9.6	9.1	9.1	9.1	9.5	9.3	9.5	10.5	10.5	10.5
28	9.7	9.6	9.6	9.3	9.1	9.1	9.5	9.5	9.5	10.8	10.5	10.6
29	---	---	---	9.1	9.0	9.1	9.7	9.5	9.5	10.8	10.5	10.6
30	---	---	---	9.1	9.0	9.1	9.7	9.5	9.6	10.8	10.5	10.6
31	---	---	---	---	---	---	---	---	---	10.8	10.5	10.7
MONTH	10.6	9.6	10.1	9.9	8.9	9.3	9.7	8.9	9.2	10.8	9.6	10.1



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

413547083481400 LU-23 NR HOLLAND OH--Continued

#3 (10.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	10.8	10.5	10.6	12.8	12.5	12.7	15.0	14.4	14.7	16.0	15.7	15.8
2	10.8	10.5	10.7	12.8	12.5	12.6	15.0	14.7	14.8	16.0	15.7	15.8
3	10.8	10.5	10.7	12.8	12.5	12.7	15.2	14.7	14.9	16.0	15.7	15.8
4	11.0	10.7	10.8	13.0	12.7	12.8	15.2	14.9	15.1	16.0	15.7	15.8
5	11.0	10.7	10.8	13.0	12.7	13.0	15.2	14.9	15.0	16.0	15.7	15.8
6	11.0	10.7	10.9	13.2	13.0	13.0	15.2	14.9	15.1	16.0	15.7	15.8
7	11.0	10.7	10.9	13.2	13.0	13.1	15.2	14.9	15.2	16.0	15.7	15.9
8	11.2	10.9	11.0	13.2	13.0	13.1	15.5	15.2	15.2	16.0	15.7	15.9
9	11.2	11.0	11.1	13.2	13.0	13.1	15.5	15.2	15.2	16.0	15.7	15.9
10	11.4	11.1	11.2	13.5	13.2	13.3	15.5	15.1	15.3	16.0	15.7	15.9
11	11.4	11.1	11.2	13.5	13.2	13.3	15.4	15.2	15.2	16.0	15.7	16.0
12	11.4	11.2	11.3	13.5	13.2	13.4	15.5	15.2	15.3	16.0	15.7	16.0
13	11.6	11.2	11.4	13.7	13.4	13.5	15.5	15.2	15.3	16.0	15.7	15.9
14	11.6	11.4	11.4	13.7	13.4	13.6	15.7	15.2	15.4	16.0	15.7	15.9
15	11.6	11.4	11.5	13.7	13.4	13.6	15.7	15.4	15.5	16.0	15.7	15.9
16	11.7	11.4	11.5	13.7	13.4	13.6	15.7	15.4	15.5	16.0	15.7	16.0
17	11.7	11.4	11.5	14.0	13.7	13.7	15.7	15.4	15.5	16.3	15.7	16.0
18	11.7	11.4	11.6	14.0	13.7	13.8	15.8	15.4	15.6	16.0	15.7	16.0
19	11.9	11.6	11.7	14.0	13.7	13.8	15.8	15.4	15.6	16.0	16.0	16.0
20	11.9	11.6	11.7	14.0	13.7	13.9	15.7	15.5	15.5	16.0	16.0	16.0
21	11.9	11.6	11.8	14.2	13.7	14.0	15.7	15.4	15.5	16.3	16.0	16.0
22	12.5	11.8	11.9	14.2	13.7	13.9	15.8	15.4	15.6	16.3	16.0	16.0
23	12.1	11.8	11.9	14.4	13.9	14.2	15.8	15.4	15.6	16.3	16.0	16.0
24	12.1	11.8	11.9	14.5	14.2	14.3	15.8	15.4	15.6	16.3	16.0	16.1
25	12.3	11.8	12.1	14.5	14.2	14.3	15.8	15.5	15.6	16.3	16.0	16.1
26	12.3	12.0	12.2	14.5	14.2	14.3	15.7	15.4	15.6	16.2	16.0	16.0
27	12.5	12.3	12.4	14.5	14.1	14.3	15.8	15.4	15.7	16.2	16.0	16.0
28	12.5	12.2	12.4	14.5	14.2	14.4	15.7	15.5	15.7	16.2	16.0	16.1
29	12.5	12.3	12.4	14.7	14.4	14.5	15.7	15.7	15.7	16.3	16.0	16.2
30	12.8	12.5	12.6	14.7	14.4	14.5	16.0	15.7	15.7	16.3	16.0	16.2
31	---	---	---	14.7	14.4	14.6	16.0	15.7	15.7	---	---	---
MONTH	12.8	10.5	11.5	14.7	12.5	13.6	16.0	14.4	15.4	16.3	15.7	16.0
YEAR	16.5	8.9	12.5									

#4 (6.9' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	16.8	16.5	16.7	15.1	14.6	15.0	13.4	13.1	13.3	11.8	11.7	11.8
2	16.8	16.5	16.5	14.9	14.9	14.9	13.4	13.1	13.2	11.8	11.7	11.8
3	16.8	16.5	16.6	14.9	14.9	14.9	13.2	13.1	13.2	11.8	11.5	11.7
4	16.8	16.5	16.6	14.9	14.6	14.8	13.2	13.1	13.2	11.7	11.5	11.6
5	16.8	16.5	16.6	14.7	14.6	14.6	13.1	12.9	13.0	11.7	11.5	11.5
6	16.8	16.2	16.5	14.6	14.6	14.6	13.1	12.9	12.9	11.5	11.3	11.5
7	16.6	16.2	16.5	14.6	14.6	14.6	12.9	12.9	12.9	11.5	11.5	11.5
8	16.6	16.2	16.3	14.6	14.4	14.5	12.9	12.9	12.9	11.5	11.5	11.5
9	16.2	16.2	16.2	14.7	14.4	14.5	12.9	12.7	12.8	11.5	11.3	11.4
10	16.5	16.2	16.2	14.4	14.4	14.4	12.7	12.7	12.7	11.5	11.3	11.4
11	16.3	16.0	16.2	14.4	14.1	14.3	12.7	12.6	12.7	11.3	11.3	11.3
12	16.2	15.9	16.1	14.4	14.1	14.2	12.7	12.4	12.6	11.3	11.3	11.3
13	16.2	15.9	16.0	14.4	14.1	14.2	12.7	12.4	12.6	11.3	11.3	11.3
14	16.0	15.7	15.9	14.2	14.1	14.1	12.5	12.5	12.5	11.3	11.3	11.3
15	16.0	15.7	15.9	14.1	14.1	14.1	12.5	12.5	12.5	11.3	11.3	11.3
16	16.0	15.7	15.8	14.1	14.1	14.1	12.5	12.4	12.5	11.3	11.1	11.2
17	16.0	15.7	15.7	14.1	14.1	14.1	12.5	12.5	12.4	11.3	11.1	11.1
18	15.7	15.4	15.7	14.1	13.9	14.1	12.5	12.2	12.4	11.3	11.0	11.2
19	15.7	15.4	15.5	14.1	13.9	14.0	12.5	12.2	12.3	11.2	11.0	11.1
20	15.4	15.4	15.4	14.1	13.9	13.9	12.2	12.2	12.2	11.1	11.0	11.1
21	15.4	15.4	15.4	13.9	13.6	13.9	12.2	12.2	12.2	11.1	10.9	11.1
22	15.7	15.4	15.5	13.9	13.6	13.7	12.2	12.2	12.2	11.1	10.9	11.0
23	15.7	15.4	15.4	13.9	13.6	13.7	12.2	12.2	12.2	11.1	10.9	10.9
24	15.5	15.2	15.4	13.6	13.6	13.6	12.2	12.2	12.2	10.9	10.9	10.9
25	15.5	15.2	15.4	13.6	13.6	13.6	12.2	12.0	12.2	10.9	10.7	10.9
26	15.5	15.2	15.4	13.6	13.4	13.5	12.2	11.9	12.1	10.9	10.6	10.8
27	15.2	15.1	15.2	13.6	13.4	13.4	12.2	11.9	12.0	10.9	10.7	10.7
28	15.2	15.1	15.1	13.4	13.4	13.4	12.0	11.8	11.9	10.9	10.7	10.8
29	15.2	15.1	15.2	13.4	13.4	13.4	12.0	11.7	11.9	10.7	10.5	10.7
30	15.1	15.1	15.1	13.4	13.4	13.4	12.0	11.7	11.8	10.7	10.4	10.5
31	15.1	14.9	15.1	---	---	---	11.8	11.7	11.8	10.5	10.4	10.4
MONTH	16.8	14.9	15.8	15.1	13.4	14.1	13.4	11.7	12.5	11.8	10.4	11.2



**EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO****GROUND-WATER RECORDS**

413547083481500. Local number, LU-24.

LOCATION.--Lat 41°35'47" Long 83°48'15", Hydrologic Unit 04100009, along State Route 2 near Holland, OH.  
Owner.--USGS-Toledo Express Airport.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 18.7 ft. Cased with Sch 40 PVC to 8.7 ft; .010 in. screen from 8.7 to 18.7 ft.

INSTRUMENTATION - Data logger--60 minute record. Water-level data only was collected at this well.

DATUM.--Elevation of land-surface datum is 677.21 feet above sea level.  
Measuring point: shelter floor 2.12 ft above land-surface datum.

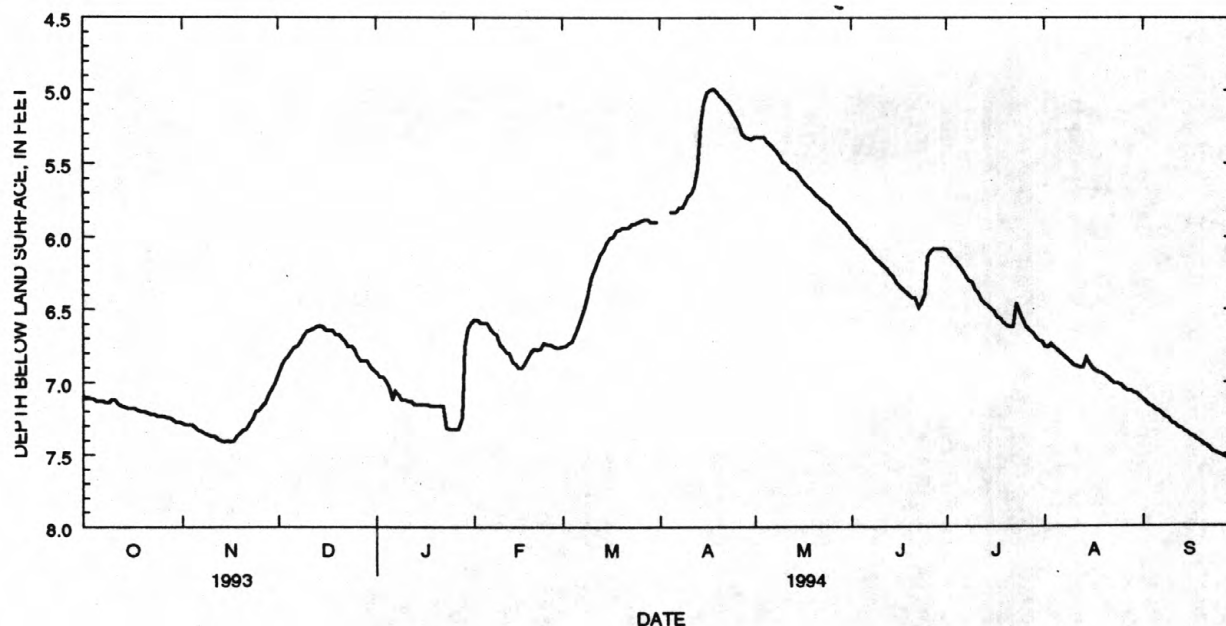
REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in adjacent tables.

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

PERIOD OF DAILY RECORD.--  
WATER LEVEL: February 1991 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
WATER LEVEL: Maximum daily low, 8.10 ft. below land-surface datum, October 24, 1991; maximum daily high, 3.70 ft. below land-surface data, April 2, 1993.

EXTREMES FOR CURRENT YEAR.--  
WATER LEVEL: Maximum daily low, 7.56 ft. below land-surface datum, September 30, 1994; maximum daily high, 4.97 ft. below land-surface data, April 18, 1994.



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DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	7.10	7.07	7.28	7.27	6.94	6.89	6.93	6.90	6.57	6.57	6.75	6.75
2	7.11	7.10	7.29	7.28	6.88	6.85	6.96	6.93	6.57	6.56	6.75	6.73
3	7.11	7.11	7.29	7.29	6.85	6.82	6.96	6.96	6.59	6.56	6.73	6.72
4	7.11	7.11	7.29	7.29	6.82	6.79	6.99	6.96	6.59	6.58	6.72	6.67
5	7.13	7.11	7.31	7.29	6.79	6.76	7.03	6.99	6.59	6.58	6.67	6.62
6	7.13	7.12	7.33	7.31	6.76	6.75	7.12	7.03	6.63	6.59	6.62	6.55
7	7.13	7.12	7.34	7.33	6.75	6.72	7.06	7.04	6.66	6.63	6.55	6.49
8	7.14	7.13	7.35	7.34	6.72	6.68	7.09	7.06	6.67	6.65	6.49	6.40
9	7.14	7.11	7.36	7.35	6.68	6.65	7.12	7.09	6.74	6.67	6.40	6.29
10	7.12	7.11	7.37	7.36	6.65	6.64	7.12	7.12	6.76	6.74	6.29	6.23
11	7.12	7.12	7.37	7.37	6.64	6.63	7.13	7.12	6.79	6.76	6.23	6.18
12	7.15	7.12	7.39	7.38	6.63	6.62	7.13	7.13	6.80	6.79	6.18	6.12
13	7.16	7.15	7.40	7.39	6.62	6.61	7.15	7.13	6.86	6.80	6.12	6.09
14	7.17	7.16	7.41	7.37	6.61	6.60	7.15	7.15	6.87	6.86	6.09	6.04
15	7.18	7.17	7.40	7.37	6.62	6.60	7.15	7.15	6.90	6.87	6.04	6.01
16	7.18	7.18	7.41	7.40	6.64	6.62	7.15	7.15	6.90	6.87	6.01	6.00
17	7.18	7.18	7.40	7.37	6.64	6.64	7.15	7.15	6.87	6.83	6.00	5.96
18	7.19	7.18	7.37	7.35	6.64	6.64	7.16	7.15	6.83	6.79	5.96	5.95
19	7.20	7.19	7.35	7.33	6.67	6.64	7.16	7.16	6.79	6.76	5.95	5.94
20	7.20	7.19	7.33	7.32	6.67	6.67	7.16	7.16	6.77	6.75	5.94	5.93
21	7.21	7.19	7.32	7.28	6.69	6.67	7.16	7.16	6.78	6.77	5.94	5.91
22	7.22	7.21	7.28	7.25	6.72	6.69	7.16	7.16	6.77	6.73	5.94	5.91
23	7.22	7.22	7.25	7.20	6.75	6.72	7.31	7.16	6.73	6.70	5.91	5.90
24	7.23	7.22	7.20	7.19	6.75	6.75	7.32	7.31	6.74	6.71	5.91	5.90
25	7.23	7.23	7.19	7.16	6.77	6.75	7.32	7.32	6.74	6.70	5.90	5.89
26	7.23	7.23	7.16	7.14	6.82	6.77	7.32	7.32	6.75	6.72	5.89	5.88
27	7.24	7.23	7.14	7.08	6.85	6.82	7.32	7.24	6.76	6.75	5.88	5.87
28	7.24	7.23	7.08	7.04	6.85	6.85	7.24	6.75	6.76	6.75	5.88	5.87
29	7.26	7.24	7.04	7.00	6.85	6.85	6.75	6.63	---	---	5.90	5.88
30	7.27	7.26	7.00	6.95	6.89	6.85	6.63	6.59	---	---	5.90	5.90
31	7.27	7.27	---	---	6.91	6.89	6.59	6.57	---	---	5.90	5.90
MONTH	7.27	7.07	7.41	6.95	6.94	6.60	7.32	6.57	6.90	6.56	6.75	5.87
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	5.32	5.28	5.97	5.94	6.09	6.08	6.75	6.72	7.12	7.10
2	---	---	5.32	5.32	6.00	5.97	6.12	6.09	6.76	6.74	7.14	7.12
3	---	---	5.32	5.32	6.02	6.00	6.15	6.12	6.74	6.72	7.16	7.14
4	5.83	5.81	5.32	5.32	6.04	6.02	6.17	6.15	6.76	6.73	7.17	7.16
5	5.83	5.81	5.35	5.32	6.06	6.04	6.20	6.17	6.78	6.76	7.19	7.17
6	5.83	5.80	5.37	5.35	6.08	6.06	6.23	6.20	6.80	6.78	7.20	7.19
7	5.80	5.80	5.39	5.36	6.11	6.08	6.27	6.23	6.82	6.80	7.22	7.20
8	5.80	5.76	5.42	5.39	6.14	6.11	6.30	6.27	6.84	6.82	7.24	7.22
9	5.76	5.72	5.45	5.42	6.16	6.14	6.31	6.30	6.86	6.84	7.25	7.24
10	5.72	5.70	5.49	5.45	6.18	6.16	6.36	6.31	6.88	6.86	7.28	7.25
11	5.70	5.65	5.50	5.47	6.20	6.18	6.39	6.36	6.89	6.86	7.29	7.28
12	5.65	5.53	5.53	5.50	6.22	6.20	6.43	6.39	6.90	6.88	7.31	7.29
13	5.53	5.24	5.54	5.53	6.25	6.22	6.46	6.43	6.90	6.79	7.32	7.31
14	5.24	5.09	5.55	5.54	6.27	6.25	6.47	6.46	6.83	6.78	7.34	7.32
15	5.09	5.02	5.58	5.54	6.31	6.27	6.50	6.47	6.87	6.83	7.35	7.34
16	5.02	5.00	5.61	5.58	6.34	6.31	6.51	6.50	6.90	6.87	7.37	7.35
17	5.00	4.98	5.63	5.61	6.36	6.34	6.55	6.51	6.92	6.90	7.38	7.37
18	4.99	4.97	5.66	5.63	6.38	6.36	6.56	6.55	6.93	6.92	7.40	7.38
19	5.01	4.98	5.67	5.66	6.40	6.38	6.59	6.56	6.94	6.93	7.41	7.40
20	5.04	5.01	5.70	5.67	6.42	6.39	6.61	6.59	6.95	6.94	7.43	7.41
21	5.06	5.04	5.72	5.70	6.42	6.39	6.62	6.61	6.97	6.95	7.44	7.43
22	5.09	5.06	5.74	5.72	6.49	6.42	6.62	6.40	6.99	6.97	7.46	7.44
23	5.11	5.09	5.76	5.74	6.46	6.39	6.46	6.40	7.01	6.99	7.48	7.46
24	5.15	5.10	5.78	5.76	6.39	6.14	6.52	6.46	7.01	7.01	7.49	7.48
25	5.19	5.15	5.79	5.78	6.14	6.10	6.57	6.52	7.02	7.01	7.50	7.49
26	5.23	5.19	5.83	5.79	6.10	6.08	6.62	6.57	7.04	7.02	7.51	7.50
27	5.30	5.23	5.85	5.83	6.08	6.08	6.64	6.62	7.06	7.04	7.52	7.50
28	5.32	5.30	5.87	5.85	6.08	6.08	6.66	6.64	7.06	7.06	7.53	7.50
29	5.33	5.29	5.89	5.87	6.08	6.06	6.69	6.66	7.07	7.06	7.54	7.53
30	5.34	5.28	5.91	5.89	6.08	6.06	6.71	6.69	7.08	7.07	7.56	7.54
31	---	---	5.94	5.91	---	---	6.72	6.71	7.10	7.08	---	---
MONTH	5.83	4.97	5.94	5.28	6.49	5.94	6.72	6.08	7.10	6.72	7.56	7.10
YEAR	7.56	4.97										



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER RECORDS

403635082152300. Local number, AS-45.

LOCATION.--Lat 40°36'35" Long 82°15'23", Hydrologic Unit 05040002, along State Route 3 near Loudonville, OH.  
Owner.--USGS-State of Ohio (Mohican State Park).

AQUIFER.--Sand and Gravel of Quaternary age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 15.7 ft. Cased with Sch 40 PVC to 5.7 ft; .010 in. screen from 5.7 to 15.7 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: water level, air temperature, soil temperature, water temperature and specific conductance. Conductivity/water temperature probe set at 11.8 feet below land surface.

DATUM.--Elevation of land-surface datum is 931.74 feet above sea level.  
Measuring point: shelter shelf 3.08 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

### PERIOD OF DAILY RECORD.--

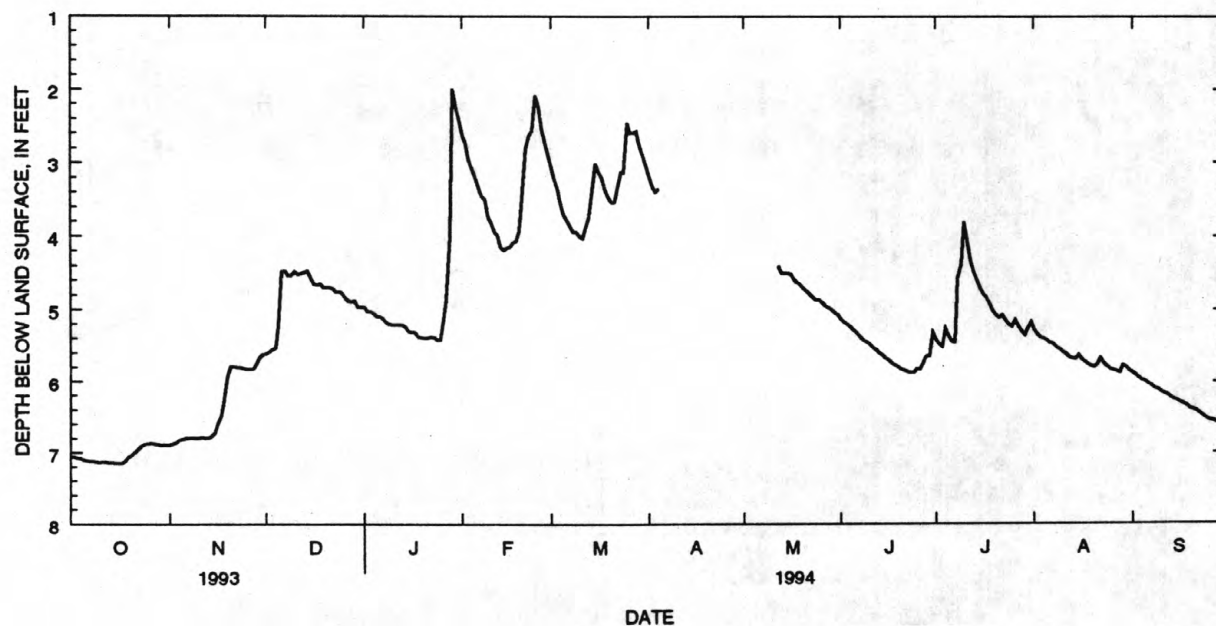
WATER LEVEL: February 1991 to current year.  
SPECIFIC CONDUCTANCE: February 1991 to current year.  
AIR TEMPERATURE: February 1991 to current year.  
WATER TEMPERATURE: February 1991 to current year.  
SOIL TEMPERATURE: February 1991 to current year.  
PRECIPITATION: February 1991 to current year.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER LEVEL: Maximum daily low, 7.18 ft. below land-surface datum, October 7-11, 1991; maximum daily high, 0.87 ft. below land-surface datum, April 26, 1993.  
SPECIFIC CONDUCTANCE: Maximum, 907 microsiemens March 26, 1993; minimum, 722 microsiemens March 26, 1992.  
AIR TEMPERATURE: Maximum, 35.5°C July 3, 1991; minimum, -35.6°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 16.0°C September 27, 1991; minimum, 7.2°C March 25-26, 1993.  
SOIL TEMPERATURE: Maximum, 35.5°C July 3, 1991; minimum, 1.5°C February 11-12, 19, 1994.

### EXTREMES FOR CURRENT YEAR.--

WATER LEVEL: Maximum daily low, 7.15 ft. below land-surface datum, October 15-17, 1993; maximum daily high, 1.60 ft. below land-surface datum, January 28, 1994.  
SPECIFIC CONDUCTANCE: Maximum, 829 microsiemens October 1, 1993; minimum, 727 microsiemens several days in January and February, 1994.  
AIR TEMPERATURE: Maximum, 34.9°C June 17, 1994; minimum, -35.6°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 15.6°C October 1-4, 1993; minimum, 7.7°C March 20, 23-24, 1994.  
SOIL TEMPERATURE: Maximum, 31.2°C June 22, 1994; minimum, 1.5°C February 11-12, 19, 1994.





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DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	7.06	7.06	6.89	6.87	5.61	5.58	4.96	4.93	2.62	2.42	3.07	2.90
2	7.06	7.06	6.87	6.85	5.58	5.56	5.02	4.96	2.74	2.62	3.21	3.07
3	7.08	7.06	6.85	6.82	5.56	5.53	5.02	4.97	2.97	2.74	3.37	3.21
4	7.08	7.08	6.82	6.81	5.53	5.23	5.05	4.95	3.08	2.97	3.55	3.37
5	7.10	7.08	6.81	6.79	5.23	4.48	5.09	5.05	3.20	3.08	3.71	3.55
6	7.11	7.10	6.79	6.79	4.48	4.39	5.09	5.05	3.33	3.20	3.78	3.71
7	7.12	7.11	6.79	6.79	4.47	4.44	5.12	5.07	3.46	3.33	3.86	3.78
8	7.12	7.12	6.79	6.79	4.53	4.45	5.18	5.12	3.49	3.46	3.94	3.86
9	7.13	7.12	6.79	6.79	4.53	4.48	5.20	5.18	3.74	3.49	3.94	3.88
10	7.14	7.13	6.79	6.78	4.48	4.43	5.21	5.17	3.82	3.74	4.00	3.88
11	7.13	7.13	6.78	6.78	4.52	4.47	5.21	5.17	3.94	3.82	4.03	3.87
12	7.13	7.13	6.79	6.78	4.51	4.48	5.21	5.19	3.99	3.94	3.88	3.73
13	7.14	7.13	6.79	6.77	4.49	4.47	5.21	5.20	4.15	3.99	3.73	3.37
14	7.14	7.14	6.77	6.72	4.47	4.46	5.24	5.20	4.19	4.08	3.37	3.01
15	7.15	7.14	6.72	6.60	4.56	4.47	5.30	5.24	4.16	4.03	3.01	2.97
16	7.15	7.15	6.60	6.47	4.65	4.56	5.31	5.24	4.14	4.06	3.13	3.01
17	7.15	7.12	6.47	6.25	4.66	4.65	5.31	5.23	4.09	4.06	3.21	3.13
18	7.12	7.06	6.25	5.94	4.65	4.64	5.37	5.31	4.06	3.93	3.37	3.17
19	7.06	7.03	5.94	5.79	4.69	4.65	5.38	5.36	3.93	3.38	3.47	3.37
20	7.03	7.00	5.79	5.77	4.69	4.66	5.39	5.36	3.38	2.81	3.54	3.47
21	7.00	6.95	5.79	5.78	4.69	4.65	5.39	5.35	2.81	2.64	3.54	3.37
22	6.95	6.91	5.80	5.79	4.71	4.69	5.37	5.35	2.64	2.57	3.37	3.12
23	6.91	6.88	5.80	5.80	4.76	4.71	5.38	5.36	2.57	1.96	3.13	3.11
24	6.88	6.87	5.81	5.80	4.76	4.71	5.41	5.38	2.09	1.92	3.14	2.26
25	6.87	6.86	5.82	5.80	4.77	4.69	5.41	5.13	2.23	2.09	2.46	2.29
26	6.86	6.86	5.82	5.82	4.84	4.77	5.13	4.86	2.54	2.23	2.60	2.46
27	6.87	6.86	5.82	5.75	4.88	4.84	4.86	3.99	2.73	2.54	2.60	2.53
28	6.88	6.87	5.75	5.66	4.89	4.87	3.99	1.60	2.90	2.73	2.58	2.56
29	6.89	6.88	5.66	5.62	4.88	4.82	2.00	1.63	---	---	2.77	2.58
30	6.89	6.88	5.62	5.61	4.96	4.88	2.23	2.00	---	---	2.90	2.77
31	6.89	6.89	---	---	4.96	4.93	2.42	2.23	---	---	3.03	2.90
MONTH	7.15	6.86	6.89	5.61	5.61	4.39	5.41	1.60	4.19	1.92	4.03	2.26

[illegible]

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

403635082152300 AS-45 NR LOUDONVILLE OH--Continued

**SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	829	824	827	793	788	791	777	772	774	753	748	751
2	828	823	827	792	788	790	779	773	775	753	748	751
3	827	821	825	791	788	790	779	773	775	752	749	750
4	827	822	824	788	786	787	778	773	776	750	748	749
5	828	822	824	788	785	786	773	764	768	750	746	748
6	827	821	824	785	784	785	766	762	764	749	745	748
7	826	820	823	788	783	785	767	762	765	748	747	748
8	824	819	822	787	783	785	766	762	764	748	744	747
9	823	818	822	786	782	784	766	761	764	748	743	746
10	823	817	821	786	781	784	763	758	761	748	741	744
11	823	817	819	786	781	782	762	759	761	746	740	743
12	820	816	818	785	780	782	763	758	761	747	740	743
13	820	815	817	786	781	784	763	759	761	745	741	743
14	818	813	816	783	779	781	764	760	762	746	740	743
15	817	811	815	784	779	780	762	758	760	744	739	742
16	817	811	814	785	779	782	763	758	760	747	738	743
17	814	812	813	785	780	783	763	758	761	744	738	741
18	815	810	812	784	780	782	762	760	761	748	739	742
19	811	809	810	781	777	779	765	759	761	746	738	742
20	812	808	810	780	777	778	764	758	761	744	737	740
21	810	805	809	779	775	777	763	761	761	745	736	740
22	812	806	808	779	775	777	762	760	761	739	733	736
23	810	806	808	780	775	777	761	758	760	737	732	734
24	808	803	806	779	774	777	761	757	759	737	732	735
25	806	803	804	779	775	777	761	755	758	736	733	734
26	806	800	803	779	774	777	760	755	757	734	730	732
27	803	800	802	778	776	777	760	754	757	735	730	733
28	801	797	799	779	774	777	760	754	757	732	727	730
29	798	792	795	777	775	776	757	753	755	732	727	731
30	792	790	791	777	773	775	757	752	755	734	728	730
31	794	789	790	---	---	---	754	749	752	733	727	731
MONTH	829	789	813	793	773	782	779	749	762	753	727	741

**SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	733	728	731	748	743	745	755	749	752	---	---	---
2	737	728	732	748	743	746	755	749	751	---	---	---
3	733	728	731	748	741	745	755	750	752	---	---	---
4	733	728	731	748	742	745	754	750	752	---	---	---
5	733	728	731	748	741	744	---	---	---	---	---	---
6	733	727	730	748	741	744	---	---	---	---	---	---
7	734	729	731	747	741	744	---	---	---	---	---	---
8	735	728	732	747	740	744	---	---	---	---	---	---
9	735	727	732	746	741	743	---	---	---	---	---	---
10	734	729	731	747	740	744	---	---	---	---	---	---
11	735	730	732	746	739	743	---	---	---	---	---	---
12	734	729	731	747	741	744	---	---	---	763	761	762
13	733	731	732	747	743	745	---	---	---	765	761	763
14	734	728	731	750	745	747	---	---	---	764	760	763
15	733	728	730	752	745	748	---	---	---	765	763	764
16	733	728	731	751	746	748	---	---	---	767	763	764
17	733	727	730	750	746	748	---	---	---	768	764	764
18	732	727	730	751	746	748	---	---	---	766	764	765
19	735	728	733	748	746	747	---	---	---	768	765	766
20	740	732	736	751	743	747	---	---	---	768	765	767
21	741	735	739	748	743	746	---	---	---	769	766	767
22	743	739	741	751	744	748	---	---	---	769	766	768
23	745	740	742	753	746	748	---	---	---	769	768	769
24	748	743	746	754	746	750	---	---	---	771	769	770
25	748	743	746	755	749	752	---	---	---	772	768	771
26	748	743	746	755	750	752	---	---	---	773	768	771
27	748	742	746	756	750	753	---	---	---	774	768	770
28	749	742	746	756	750	753	---	---	---	774	768	771
29	---	---	---	756	750	752	---	---	---	773	769	771
30	---	---	---	755	750	752	---	---	---	773	769	771
31	---	---	---	755	749	752	---	---	---	772	767	771
MONTH	749	727	735	756	739	747	755	749	752	774	760	767

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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403635082152300 AS-45 NR LOUDONVILLE OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	773	768	771	782	780	781	785	778	781	797	795	796
2	774	770	771	783	780	782	781	778	780	798	793	796
3	775	770	772	783	777	781	796	775	786	798	793	796
4	773	769	772	785	777	781	794	789	791	798	792	795
5	773	768	771	787	779	781	791	789	790	798	793	795
6	773	768	771	782	779	780	792	790	791	798	792	795
7	775	769	771	781	776	779	792	788	792	798	792	795
8	772	768	771	785	777	780	793	788	791	798	792	795
9	773	768	771	784	779	783	795	789	791	798	792	795
10	773	767	770	787	779	781	796	789	792	798	792	794
11	773	768	770	783	780	782	792	790	791	798	789	793
12	771	770	771	783	778	782	793	791	792	798	789	792
13	772	771	771	784	777	781	794	789	794	798	789	792
14	773	771	772	784	778	780	795	789	794	794	789	793
15	773	768	771	781	779	780	797	791	794	793	788	792
16	775	769	771	781	779	780	799	792	795	793	788	792
17	776	770	771	782	776	780	794	793	794	793	788	792
18	773	771	772	782	775	779	795	794	795	792	787	790
19	775	769	773	783	776	779	796	794	795	792	787	790
20	775	769	771	779	773	777	796	795	796	792	786	789
21	773	770	771	779	772	775	797	796	797	791	786	789
22	774	768	771	776	773	775	798	796	798	791	785	788
23	771	769	770	777	775	776	799	797	798	791	786	788
24	773	770	771	778	772	775	799	794	798	794	785	788
25	775	770	774	779	772	775	799	797	798	790	784	789
26	772	770	771	775	772	774	799	793	797	789	784	787
27	775	772	773	776	774	775	799	793	796	789	784	786
28	778	775	777	778	776	777	799	793	795	789	783	786
29	780	773	777	779	776	778	799	794	796	788	782	785
30	781	777	780	781	778	780	800	795	796	787	782	784
31	---	---	---	784	777	781	796	795	796	---	---	---
MONTH	781	767	772	787	772	779	800	775	793	798	782	791
YEAR	829	727	771									

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	21.6	- .8	12.4	2.6	-5.7	.0	9.8	-9.0	-1.7	3.5	-12.6	-2.0
2	17.2	2.9	11.6	8.1	-6.9	.9	11.3	-5.4	4.0	1.5	-3.0	-.3
3	16.7	-1.9	6.6	6.2	2.6	4.1	7.6	-.3	3.5	-1.2	-4.3	-2.6
4	23.8	2.5	12.2	12.2	4.4	8.0	11.9	4.8	7.2	-1.8	-9.4	-3.8
5	16.9	-.5	6.8	17.5	4.0	10.9	4.6	2.9	3.7	-4.0	-10.7	-7.2
6	22.3	-1.6	8.4	3.9	-.6	2.1	5.8	1.9	3.3	.8	-8.3	-2.8
7	27.1	3.3	13.0	-.1	-4.9	-1.1	4.5	-3.0	.5	.2	-6.5	-2.1
8	26.1	5.0	13.8	10.3	-6.9	-.8	8.7	-4.5	1.2	-6.7	-17.0	-12.8
9	15.7	4.1	9.0	12.9	-8.0	-.2	12.6	-5.5	3.4	-4.6	-19.6	-11.8
10	10.0	-2.5	3.9	14.0	-7.6	.3	14.9	.0	8.3	-2.7	-22.3	-12.2
11	14.6	-5.4	4.9	14.9	-4.8	5.5	-.9	-9.0	-4.5	3.3	-3.7	.1
12	---	---	---	12.4	6.3	9.5	4.8	-11.3	-5.5	3.7	-.1	1.3
13	13.0	-2.8	5.9	16.4	8.0	11.3	4.3	-9.1	-2.9	1.1	-3.4	-.2
14	18.1	-4.0	5.2	18.7	14.8	16.4	7.2	-3.9	.7	-3.7	-19.0	-10.8
15	24.0	-.3	9.3	16.6	6.2	11.4	6.5	-1.9	3.0	-16.3	-22.2	-19.1
16	16.3	3.5	11.6	9.9	.4	5.4	4.4	1.3	3.0	-11.7	-28.0	-18.9
17	17.5	5.1	13.9	11.4	1.6	6.4	2.5	.3	1.6	-3.6	-17.2	-8.8
18	18.3	4.0	9.6	9.4	-2.3	2.5	4.1	.0	2.7	-19.1	-28.1	-23.5
19	11.0	2.4	8.2	9.2	-.9	5.5	2.6	.7	1.5	-19.0	-35.6	-26.0
20	18.9	10.8	13.7	3.1	-5.5	-.5	2.0	.1	.9	-8.0	-28.9	-18.8
21	18.9	-1.6	10.9	9.9	-5.2	2.7	.2	-3.8	-1.7	-7.1	-30.8	-18.0
22	14.6	-3.5	3.8	15.0	-3.5	3.4	.0	-4.1	-2.1	-3.2	-13.8	-8.2
23	18.1	-4.1	4.5	14.6	-4.0	3.7	-2.0	-12.5	-4.8	2.9	-6.2	.2
24	21.9	-2.6	6.5	11.1	2.7	6.3	-3.9	-8.5	-5.4	3.7	.6	2.5
25	22.9	-2.0	7.4	10.8	1.3	4.9	-3.1	-12.1	-6.3	2.6	-4.9	.7
26	22.8	-.5	10.2	14.5	4.3	8.9	-8.8	-14.0	-11.9	-4.3	-9.1	-6.9
27	11.6	2.4	7.1	10.3	-2.5	2.9	-6.7	-11.4	-9.3	5.2	-3.9	1.7
28	8.3	-4.0	4.5	.9	-6.7	-2.2	-6.5	-19.3	-10.6	7.6	-1.5	4.1
29	10.3	-.8	6.4	-.3	-2.5	-1.3	-3.4	-20.8	-11.4	-.8	-8.9	-3.2
30	1.4	.0	.9	2.7	-7.0	-1.8	-8.3	-16.7	-11.1	-2.2	-13.4	-6.3
31	2.9	.5	1.4	---	---	---	-1.3	-10.1	-5.3	-2.6	-15.6	-8.9
MONTH	27.1	-5.4	8.1	18.7	-8.0	4.2	14.9	-20.8	-1.5	7.6	-35.6	-7.2





# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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403635082152300 AS-45 NR LOUDONVILLE OH--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	15.6	15.4	15.5	14.3	14.0	14.2	12.9	12.6	12.8	11.5	11.3	11.4
2	15.6	15.4	15.4	14.3	14.0	14.2	12.8	12.4	12.6	11.5	11.3	11.3
3	15.6	15.4	15.5	14.1	14.1	14.1	12.6	12.4	12.6	11.3	11.2	11.3
4	15.6	15.3	15.4	14.1	14.1	14.1	12.6	12.4	12.4	11.3	11.2	11.3
5	15.4	15.1	15.4	14.1	13.9	14.0	12.4	12.4	12.4	11.3	11.0	11.2
6	15.4	15.1	15.3	14.1	14.1	14.1	12.4	12.2	12.3	11.2	11.0	11.1
7	15.4	15.1	15.3	14.1	13.8	13.9	12.4	12.1	12.2	11.0	11.0	11.0
8	15.4	15.1	15.2	14.0	13.6	13.9	12.4	12.1	12.3	11.2	11.0	11.1
9	15.4	15.1	15.1	13.8	13.6	13.7	12.4	12.4	12.4	11.2	11.0	11.0
10	15.4	15.1	15.1	13.8	13.6	13.7	12.4	12.2	12.4	11.2	10.8	11.0
11	15.3	15.1	15.2	13.8	13.5	13.6	12.4	12.4	12.4	11.0	10.6	10.9
12	---	---	---	13.6	13.4	13.5	12.4	12.2	12.3	10.9	10.6	10.8
13	15.1	14.9	15.1	13.6	13.3	13.4	12.4	12.1	12.3	10.8	10.6	10.8
14	15.1	14.9	15.0	13.4	13.4	13.4	12.2	12.1	12.2	10.8	10.6	10.8
15	15.1	14.8	15.0	13.4	13.1	13.3	12.2	12.0	12.2	11.0	10.6	10.8
16	15.1	14.8	14.9	13.4	13.1	13.3	12.2	11.9	12.1	10.8	10.5	10.7
17	14.9	14.8	14.9	13.3	13.1	13.2	12.2	11.9	12.0	10.6	10.4	10.6
18	14.9	14.6	14.8	13.1	13.1	13.1	12.0	11.9	11.9	10.8	10.3	10.6
19	14.9	14.8	14.8	13.1	13.1	13.1	11.9	11.7	11.9	10.7	10.5	10.6
20	14.9	14.6	14.7	13.1	13.1	13.1	11.9	11.7	11.8	10.6	10.4	10.5
21	14.8	14.6	14.6	13.1	13.1	13.1	11.7	11.7	11.7	10.5	10.3	10.4
22	14.8	14.4	14.6	13.1	12.9	13.1	11.7	11.7	11.7	10.4	10.2	10.4
23	14.6	14.4	14.5	13.1	12.9	13.0	11.7	11.7	11.7	10.4	10.2	10.4
24	14.6	14.3	14.5	13.1	12.9	13.0	11.7	11.7	11.7	10.4	10.2	10.3
25	14.6	14.3	14.4	13.1	12.9	12.9	11.7	11.5	11.6	10.2	10.2	10.2
26	14.6	14.3	14.4	13.1	12.9	12.9	11.7	11.5	11.6	10.2	10.0	10.2
27	14.3	14.3	14.3	12.9	12.9	12.9	11.7	11.5	11.6	10.2	9.8	10.0
28	14.3	14.3	14.3	13.1	12.8	12.9	11.7	11.5	11.5	9.8	9.4	9.6
29	14.3	14.1	14.3	12.9	12.8	12.8	11.7	11.4	11.5	9.6	9.4	9.4
30	14.3	14.3	14.3	12.9	12.6	12.8	11.5	11.5	11.5	9.6	9.4	9.4
31	14.3	14.1	14.3	---	---	---	11.5	11.3	11.5	9.4	9.2	9.4
MONTH	15.6	14.1	14.9	14.3	12.6	13.4	12.9	11.3	12.0	11.5	9.2	10.6

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	9.5	9.3	9.4	8.2	8.0	8.2	8.1	7.9	8.0	---	---	---
2	9.5	9.1	9.3	8.2	8.0	8.2	8.1	7.9	8.1	---	---	---
3	9.4	9.2	9.3	8.2	8.0	8.2	---	---	---	---	---	---
4	9.4	9.2	9.3	8.2	8.0	8.1	---	---	---	---	---	---
5	9.4	9.0	9.2	8.2	8.0	8.1	---	---	---	---	---	---
6	9.4	9.0	9.2	8.2	8.0	8.1	---	---	---	---	---	---
7	9.4	9.0	9.2	8.2	8.0	8.2	---	---	---	---	---	---
8	9.4	9.0	9.2	8.2	8.0	8.1	---	---	---	---	---	---
9	9.4	9.0	9.2	8.2	8.0	8.2	---	---	---	---	---	---
10	9.4	9.0	9.2	8.2	8.0	8.1	---	---	---	---	---	---
11	9.2	9.0	9.1	8.2	8.0	8.1	---	---	---	---	---	---
12	9.2	9.0	9.1	8.2	8.0	8.1	---	---	---	9.4	9.4	9.4
13	9.0	9.0	9.0	8.1	8.0	8.0	---	---	---	9.6	9.4	9.4
14	9.0	9.0	9.0	8.1	7.9	8.0	---	---	---	9.6	9.4	9.5
15	9.0	8.8	9.0	8.1	7.9	7.9	---	---	---	9.5	9.4	9.4
16	9.0	8.8	8.9	8.1	7.9	8.0	---	---	---	9.6	9.4	9.6
17	9.0	8.8	8.9	8.0	7.9	8.0	---	---	---	9.6	9.4	9.6
18	9.0	8.7	8.9	8.0	7.9	8.0	---	---	---	9.6	9.6	9.6
19	9.0	8.6	8.7	8.0	7.9	8.0	---	---	---	9.6	9.6	9.6
20	8.8	8.4	8.6	8.1	7.7	7.9	---	---	---	9.7	9.6	9.6
21	8.6	8.4	8.4	8.1	7.9	7.9	---	---	---	9.7	9.6	9.6
22	8.4	8.4	8.4	8.0	7.8	7.9	---	---	---	9.7	9.6	9.7
23	8.4	8.2	8.3	8.0	7.7	7.9	---	---	---	9.7	9.6	9.7
24	8.4	8.2	8.2	7.9	7.7	7.9	---	---	---	9.7	9.6	9.6
25	8.4	8.0	8.2	8.0	7.9	7.9	---	---	---	9.8	9.6	9.7
26	8.4	8.0	8.2	8.0	7.9	7.9	---	---	---	9.8	9.6	9.7
27	8.4	8.0	8.2	8.1	7.9	7.9	---	---	---	9.9	9.7	9.8
28	8.4	8.0	8.2	8.1	7.9	8.0	---	---	---	10.0	9.7	9.8
29	---	---	---	8.1	7.9	8.0	---	---	---	10.0	9.8	9.9
30	---	---	---	8.1	7.9	8.0	---	---	---	10.0	9.8	9.9
31	---	---	---	8.1	7.9	8.0	---	---	---	10.0	9.8	9.9
MONTH	9.5	8.0	8.8	8.2	7.7	8.0	8.1	7.9	8.0	10.0	9.4	9.6



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

403635082152300 AS-45 NR LOUDONVILLE OH--Continued

**WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	10.1	9.8	9.9	11.6	11.5	11.6	13.4	13.2	13.3	14.4	14.3	14.4
2	10.1	9.9	10.0	11.6	11.5	11.5	13.4	13.4	13.4	14.6	14.3	14.4
3	10.1	9.9	10.0	11.8	11.5	11.6	---	---	---	14.6	14.3	14.4
4	10.2	10.0	10.1	11.8	11.5	11.7	13.6	13.4	13.5	14.6	14.3	14.4
5	10.2	10.0	10.1	11.8	11.6	11.8	13.6	13.6	13.6	14.6	14.3	14.5
6	10.3	10.0	10.1	11.8	11.8	11.8	13.7	13.6	13.6	14.6	14.4	14.5
7	10.3	10.1	10.2	12.0	11.8	11.9	13.8	13.6	13.6	14.6	14.4	14.5
8	10.5	10.2	10.3	12.0	11.8	11.9	13.8	13.6	13.7	14.6	14.4	14.5
9	10.5	10.2	10.4	12.2	12.0	12.0	13.9	13.6	13.8	14.6	14.4	14.5
10	10.5	10.3	10.4	12.2	12.0	12.2	13.9	13.6	13.8	14.6	14.4	14.6
11	10.5	10.3	10.5	12.3	12.2	12.2	13.9	13.9	13.9	14.8	14.4	14.6
12	10.5	10.4	10.5	12.4	12.2	12.3	13.9	13.9	13.9	14.8	14.4	14.7
13	10.5	10.5	10.5	12.5	12.2	12.3	14.1	13.9	13.9	14.8	14.4	14.7
14	10.5	10.5	10.5	12.5	12.2	12.4	14.1	13.9	13.9	14.9	14.6	14.6
15	10.7	10.5	10.6	12.5	12.4	12.5	14.1	13.9	14.0	14.9	14.6	14.6
16	10.7	10.5	10.7	12.5	12.4	12.5	14.1	13.9	14.0	14.9	14.6	14.6
17	10.7	10.5	10.7	12.7	12.4	12.5	14.1	14.1	14.1	14.9	14.6	14.6
18	10.7	10.7	10.7	12.7	12.4	12.6	14.2	14.1	14.1	14.9	14.6	14.7
19	10.9	10.7	10.8	12.7	12.5	12.6	14.2	14.1	14.1	14.9	14.6	14.7
20	10.9	10.7	10.8	12.9	12.7	12.7	14.1	14.1	14.1	14.9	14.6	14.7
21	11.0	10.9	10.9	12.9	12.7	12.8	14.1	14.1	14.1	14.9	14.6	14.7
22	11.1	10.9	11.0	12.9	12.9	12.9	14.1	14.1	14.1	14.9	14.6	14.7
23	11.1	11.1	11.1	13.0	12.9	12.9	14.1	14.1	14.1	14.8	14.6	14.7
24	11.1	11.1	11.1	13.1	12.9	13.0	14.3	14.1	14.2	14.9	14.4	14.7
25	11.3	11.1	11.1	13.2	12.9	13.1	14.2	14.1	14.1	14.9	14.6	14.6
26	11.3	11.3	11.3	13.2	13.1	13.1	14.4	14.1	14.2	14.9	14.6	14.7
27	11.3	11.3	11.3	13.2	13.1	13.1	14.4	14.1	14.2	14.9	14.6	14.8
28	11.4	11.3	11.3	13.2	13.1	13.1	14.4	14.1	14.3	14.9	14.6	14.7
29	11.6	11.3	11.4	13.2	13.1	13.1	14.4	14.1	14.3	14.9	14.6	14.8
30	11.6	11.5	11.5	13.2	13.1	13.2	14.4	14.1	14.3	14.9	14.6	14.7
31	---	---	---	13.4	13.1	13.3	14.4	14.4	14.4	---	---	---
MONTH	11.6	9.8	10.7	13.4	11.5	12.5	14.4	13.2	14.0	14.9	14.3	14.6
YEAR	15.6	7.7	11.8									

**TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	16.5	12.6	14.3	8.3	6.9	7.6	4.5	3.8	4.0	3.0	2.9	2.9
2	17.1	15.7	16.3	8.0	5.6	6.8	6.5	3.7	4.6	3.0	2.9	2.9
3	15.3	12.3	14.0	8.4	7.3	7.7	7.5	5.4	6.5	3.1	3.0	3.0
4	16.6	12.1	14.1	10.2	7.9	8.8	9.3	7.2	8.1	3.3	3.1	3.2
5	15.8	12.6	14.4	13.0	10.3	11.4	8.7	7.6	8.1	3.5	3.3	3.4
6	15.5	11.4	13.4	10.4	8.4	9.5	7.6	7.0	7.4	3.5	3.4	3.5
7	17.3	12.3	14.5	8.3	6.6	7.7	7.1	5.8	6.5	3.5	3.4	3.4
8	18.0	13.7	15.8	6.9	5.2	6.0	6.5	4.7	5.6	3.4	3.1	3.3
9	16.4	14.1	15.4	7.2	4.7	5.7	6.6	4.4	5.4	3.0	2.8	2.9
10	14.4	12.3	13.3	6.6	4.5	5.4	9.6	6.7	8.2	2.9	2.7	2.8
11	13.3	9.5	11.5	7.5	4.6	5.9	7.8	5.0	6.4	2.7	2.7	2.7
12	---	---	---	9.9	7.3	8.5	4.9	3.9	4.2	2.7	2.7	2.7
13	14.3	11.7	13.0	11.5	9.3	10.0	3.8	3.4	3.6	2.7	2.7	2.7
14	14.0	9.6	11.7	14.7	11.6	13.4	3.4	3.4	3.4	2.8	2.7	2.7
15	15.0	10.4	12.5	14.5	12.4	13.8	5.4	3.4	4.0	2.7	2.6	2.7
16	15.0	11.9	13.4	12.4	10.2	11.7	6.5	5.0	5.7	2.6	2.3	2.4
17	16.9	15.1	15.8	10.9	9.7	10.3	6.1	5.5	5.8	2.4	2.3	2.3
18	16.2	13.3	14.6	10.2	8.0	9.2	6.7	5.9	6.2	2.3	2.3	2.3
19	14.1	12.7	13.4	9.4	7.7	8.5	6.2	5.7	5.9	2.3	2.3	2.3
20	15.9	13.9	14.6	8.9	5.5	6.9	5.6	5.0	5.4	2.3	2.3	2.3
21	16.8	13.2	15.8	6.6	4.8	5.6	4.9	4.7	4.8	2.3	2.2	2.3
22	13.1	10.0	11.7	7.2	4.6	5.7	4.8	4.5	4.7	2.3	2.2	2.2
23	12.6	8.8	10.7	7.6	4.8	6.0	4.5	4.1	4.3	2.3	2.2	2.2
24	12.6	8.6	10.6	8.4	6.8	7.6	4.1	3.8	3.9	2.3	2.2	2.2
25	13.1	8.7	10.8	9.0	7.3	8.1	4.2	4.1	4.1	2.3	2.2	2.2
26	13.9	9.5	11.7	10.3	7.5	8.7	4.1	3.7	3.9	2.3	2.2	2.3
27	13.1	11.0	12.0	10.1	7.4	9.1	3.7	3.5	3.6	2.3	2.2	2.3
28	11.4	9.2	10.6	7.2	5.2	5.9	3.5	3.3	3.4	2.3	2.2	2.2
29	11.8	9.8	10.5	5.7	5.0	5.4	3.3	3.1	3.1	2.3	2.2	2.3
30	9.6	7.9	8.7	5.9	4.6	5.1	3.1	3.0	3.0	2.3	2.3	2.3
31	8.3	7.6	7.9	---	---	---	3.0	3.0	3.0	2.3	2.3	2.3
MONTH	18.0	7.6	12.9	14.7	4.5	8.1	9.6	3.0	5.1	3.5	2.2	2.6



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

403635082152300 AS-45 NR LOUDONVILLE OH--Continued

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.17	.46	.00	.11	.00	---	.05	.00	.28	.00
2	.00	.00	.43	.00	.01	.12	.00	---	.00	.08	.00	.00
3	.00	.17	.20	.01	.00	.07	---	---	.00	.96	---	.00
4	.00	.01	1.49	.00	.00	.08	---	---	.00	.00	.58	.00
5	.00	.05	.18	.02	.00	.08	---	---	.00	.00	.07	.00
6	.00	.03	.29	.00	.00	.07	---	---	.04	.00	.00	.01
7	.00	.00	.17	.01	.00	.18	---	---	.00	2.42	.00	.01
8	.00	.01	.16	.00	.00	.10	---	---	.05	.60	.00	.00
9	.00	.01	.14	.00	.00	.79	---	---	.00	.70	.00	.11
10	.00	.00	.27	.00	.00	.54	---	---	.00	.00	.00	.00
11	.00	.00	.05	.07	.02	.18	---	---	.00	.00	.09	.00
12	---	.00	.01	.58	.14	.15	---	.01	.07	.00	.00	.00
13	.00	.87	.00	.23	.15	.35	---	.00	.00	.00	.06	.00
14	.00	.93	.00	.21	.05	.17	---	.00	.00	.00	.80	.02
15	.00	.01	.06	.12	.00	.14	---	.45	.00	.00	.00	.01
16	.29	.00	.00	.26	.00	.18	---	.01	.01	.00	.00	.00
17	1.08	1.49	.01	.59	.00	.19	---	.00	.09	.00	.00	.38
18	.00	.00	.23	.00	.00	.15	---	.00	.00	.10	.00	.00
19	.42	.08	.01	.01	.00	.00	---	.00	.16	.00	.00	.00
20	.47	.00	.12	.21	.01	.08	---	.00	.91	.00	1.23	.00
21	.13	.00	.00	.09	.00	.43	---	.00	.01	.84	.09	.00
22	.01	.00	.00	.08	.00	.01	---	.00	.00	.00	.00	.01
23	.00	.00	.00	.18	.62	.00	---	.00	.75	.00	.00	.00
24	.00	.00	.00	.06	.00	.88	---	.47	.45	.04	.00	.37
25	.00	.00	.00	.70	.01	.00	---	.14	.03	.55	.00	.23
26	.00	.06	.00	.05	.01	.11	---	.12	.94	.00	.00	.01
27	.00	.80	.00	.84	.08	.41	---	.00	.20	.00	.00	.05
28	.00	.25	.00	.81	.10	.09	---	.00	.00	.07	.99	.00
29	.00	.20	.00	.02	---	.12	---	.00	1.34	1.19	.00	.02
30	.42	.18	.00	.00	---	.01	---	.00	.00	.01	.00	.00
31	.69	---	.00	.00	---	.00	---	.15	---	.00	.32	---
TOTAL	3.51	5.15	3.99	5.61	1.20	5.79	0.00	1.35	5.10	7.56	4.51	1.23

WTR YR 1994 TOTAL 45.00

EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO

273

GROUND-WATER RECORDS

403923082325500. Local number, R-16.

LOCATION.--Lat 40°39'23" Long 82°32'55", Hydrologic Unit 05040002, along State Route 97 near Lexington, OH.  
Owner.--USGS-Sam McBride.

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 18.9 ft. Cased with Sch 40 PVC to 8.9 ft; .010 in. screen from 8.9 to 18.9 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: air temperature, soil temperature, water temperature, and specific conductance. Conductivity/water temperature probe set at 18.6 feet below land surface.

DATUM.--Elevation of land-surface datum is 1168.37 feet above sea level.  
Measuring point: shelter shelf 2.36 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

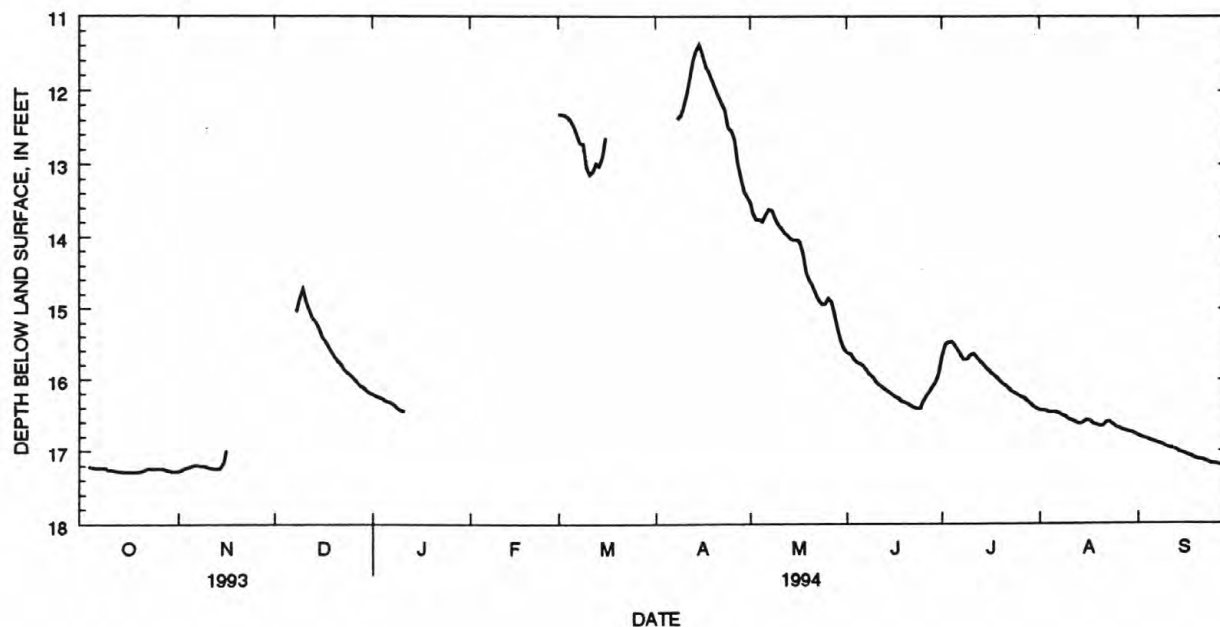
WATER LEVEL: February 1991 to current year.  
SPECIFIC CONDUCTANCE: February 1991 to current year.  
AIR TEMPERATURE: February 1991 to current year.  
WATER TEMPERATURE: February 1991 to current year.  
SOIL TEMPERATURE: February 1991 to current year.  
PRECIPITATION: February 1991 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER LEVEL: Maximum daily low, 17.62 ft. below land-surface datum, November 30-December 3, 1991; maximum daily high, 10.56 ft. below land-surface datum, March 27, 1993.  
SPECIFIC CONDUCTANCE: Maximum, 645 microsiemens January 7-8, 1993; minimum, 157 microsiemens March 6, 1991.  
AIR TEMPERATURE: Maximum, 36.0°C August 1, 1991; minimum, -26.1°C January 19, 1992.  
WATER TEMPERATURE: Maximum, 12.2°C November 22, 1992; minimum, 7.7°C April 16-17, 1994.  
SOIL TEMPERATURE: Maximum, 29.3°C August 29, 1993, and June 19, 1994; minimum, 1.0°C February 27 & 28, 1991.

EXTREMES FOR CURRENT YEAR.--

WATER LEVEL: Maximum daily low, 17.28 ft below land-surface datum, October 15-19, 1993; maximum daily high, 11.31 ft below land-surface datum, April 15, 1994.  
SPECIFIC CONDUCTANCE: Maximum, 540 microsiemens November 15-16, 1993; minimum, 221 microsiemens May 17-21, 1994.  
AIR TEMPERATURE: Maximum, 34.0°C June 19, 1994; minimum, -23.1°C January 10, 1994.  
WATER TEMPERATURE: Maximum, 12.0°C many days in October, November, and December, 1993; minimum, 7.7°C April 16-17, 1994.  
SOIL TEMPERATURE: Maximum, 29.3°C June 19, 1994; minimum, 1.7°C March 1-4, 1994.



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

403923082325500 R-16 NR LEXINGTON OH-Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	---	---	17.27	17.25	---	---	16.20	16.18	---	---	12.32	12.26
2	---	---	17.25	17.23	---	---	16.22	16.20	---	---	12.32	12.26
3	---	---	17.23	17.22	---	---	16.24	16.23	---	---	12.33	12.29
4	17.21	17.21	17.22	17.21	---	---	16.26	16.24	---	---	12.36	12.33
5	17.22	17.21	17.20	17.19	---	---	16.29	16.26	---	---	12.40	12.37
6	17.23	17.22	17.19	17.19	---	---	16.30	16.29	---	---	12.48	12.40
7	17.23	17.23	17.19	17.19	---	---	16.32	16.30	---	---	12.60	12.48
8	17.23	17.23	17.20	17.19	15.04	14.86	16.36	16.32	---	---	12.71	12.62
9	17.23	17.23	17.20	17.20	14.85	14.73	16.40	16.36	---	---	12.72	12.59
10	17.25	17.23	17.22	17.20	14.72	14.69	16.43	16.40	---	---	13.03	12.74
11	17.25	17.25	17.23	17.22	14.90	14.71	16.44	16.43	---	---	13.14	13.04
12	17.26	17.25	17.24	17.23	15.02	14.90	---	---	---	---	13.09	13.02
13	17.27	17.26	17.24	17.24	15.13	15.03	---	---	---	---	12.99	12.93
14	17.27	17.27	17.24	17.16	15.18	15.13	---	---	---	---	13.02	12.92
15	17.28	17.27	17.16	17.00	15.27	15.19	---	---	---	---	12.91	12.59
16	17.28	17.28	16.99	16.91	15.40	15.28	---	---	---	---	12.64	12.63
17	17.28	17.28	---	---	15.46	15.40	---	---	---	---	---	---
18	17.28	17.28	---	---	15.54	15.47	---	---	---	---	---	---
19	17.28	17.27	---	---	15.62	15.54	---	---	---	---	---	---
20	17.27	17.26	---	---	15.68	15.62	---	---	---	---	---	---
21	17.26	17.25	---	---	15.73	15.68	---	---	---	---	---	---
22	17.24	17.24	---	---	15.79	15.73	---	---	---	---	---	---
23	17.24	17.24	---	---	15.86	15.80	---	---	---	---	---	---
24	17.24	17.24	---	---	15.90	15.86	---	---	---	---	---	---
25	17.24	17.24	---	---	15.93	15.90	---	---	---	---	---	---
26	17.24	17.24	---	---	15.98	15.93	---	---	---	---	---	---
27	17.24	17.24	---	---	16.03	15.98	---	---	---	---	---	---
28	17.25	17.24	---	---	16.08	16.03	---	---	---	---	---	---
29	17.26	17.25	---	---	16.10	16.08	---	---	---	---	---	---
30	17.27	17.26	---	---	16.14	16.10	---	---	---	---	---	---
31	17.27	17.27	---	---	16.18	16.14	---	---	---	---	---	---
MONTH	17.28	17.21	17.27	16.91	16.18	14.69	16.44	16.18	---	---	13.14	12.26

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	13.51	13.31	15.62	15.57	15.67	15.52	16.43	16.41	16.78	16.76
2	---	---	13.66	13.51	15.64	15.62	15.52	15.48	16.43	16.43	16.80	16.78
3	---	---	13.75	13.66	15.70	15.64	15.48	15.47	16.44	16.43	16.82	16.80
4	---	---	13.75	13.73	15.75	15.70	15.47	15.47	16.45	16.44	16.83	16.82
5	---	---	13.78	13.69	15.77	15.75	15.52	15.47	16.45	16.45	16.85	16.83
6	---	---	13.69	13.59	15.80	15.77	15.58	15.52	16.45	16.45	16.86	16.85
7	---	---	13.61	13.52	15.86	15.80	15.66	15.58	16.47	16.45	16.88	16.86
8	12.37	12.33	13.63	13.55	15.92	15.86	15.72	15.66	16.50	16.47	16.90	16.88
9	12.33	12.23	13.73	13.61	15.96	15.92	15.72	15.66	16.52	16.50	16.92	16.90
10	12.23	12.01	13.82	13.73	16.02	15.96	15.66	15.62	16.55	16.52	16.94	16.92
11	12.02	11.84	13.88	13.82	16.07	16.02	15.64	15.62	16.57	16.55	16.95	16.94
12	11.84	11.60	13.94	13.88	16.10	16.07	15.68	15.64	16.59	16.57	16.97	16.95
13	11.60	11.46	13.97	13.93	16.13	16.10	15.73	15.68	16.61	16.59	16.98	16.97
14	11.46	11.37	14.03	13.97	16.16	16.13	15.78	15.73	16.61	16.59	17.01	16.98
15	11.38	11.31	14.04	14.02	16.20	16.16	15.83	15.78	16.59	16.57	17.02	17.01
16	11.51	11.37	14.04	14.02	16.23	16.20	15.88	15.83	16.57	16.57	17.04	17.02
17	11.67	11.51	14.07	14.02	16.25	16.23	15.92	15.88	16.58	16.57	17.06	17.04
18	11.75	11.67	14.23	14.07	16.29	16.25	15.96	15.92	16.62	16.58	17.08	17.06
19	11.86	11.75	14.49	14.23	16.31	16.29	16.00	15.96	16.63	16.62	17.10	17.08
20	11.97	11.86	14.60	14.49	16.33	16.31	16.05	16.00	16.65	16.63	17.11	17.10
21	12.07	11.97	14.68	14.60	16.36	16.33	16.08	16.05	16.65	16.60	17.12	17.11
22	12.17	12.07	14.79	14.68	16.38	16.36	16.12	16.08	16.60	16.58	17.13	17.12
23	12.26	12.17	14.88	14.79	16.40	16.38	16.16	16.12	16.59	16.58	17.15	17.13
24	12.50	12.26	14.93	14.88	16.40	16.31	16.19	16.16	16.62	16.59	17.17	17.15
25	12.53	12.48	14.93	14.85	16.31	16.23	16.21	16.19	16.66	16.62	17.17	17.17
26	12.65	12.50	14.85	14.80	16.23	16.17	16.24	16.21	16.68	16.66	17.18	17.17
27	12.97	12.65	14.91	14.81	16.17	16.10	16.26	16.24	16.70	16.68	17.19	17.18
28	13.17	12.97	15.09	14.91	16.10	16.04	16.30	16.26	16.71	16.70	17.20	17.19
29	13.36	13.17	15.31	15.09	16.04	15.91	16.34	16.30	16.73	16.71	17.21	17.20
30	13.42	13.32	15.48	15.31	15.91	15.67	16.37	16.34	16.74	16.73	17.22	17.21
31	---	---	15.57	15.48	---	---	16.41	16.37	16.76	16.74	---	---
MONTH	13.42	11.31	15.57	13.31	16.40	15.57	16.41	15.47	16.76	16.41	17.22	16.76
YEAR	17.28	11.31										



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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403923082325500 R-16 NR LEXINGTON OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	535	531	534	---	---	---	516	512	514
2	---	---	---	536	531	534	---	---	---	519	514	517
3	---	---	---	535	532	535	---	---	---	521	519	519
4	520	517	519	535	532	534	---	---	---	523	521	522
5	521	517	519	535	531	533	---	---	---	525	523	524
6	521	518	520	536	535	536	---	---	---	526	525	526
7	522	518	520	537	536	537	---	---	---	530	527	528
8	522	519	520	538	533	536	531	526	529	533	530	531
9	524	519	520	538	533	537	533	528	531	536	531	534
10	524	520	522	539	534	537	534	529	532	539	535	537
11	526	521	523	539	534	536	535	510	522	539	538	539
12	526	522	523	538	535	537	509	498	503	---	---	---
13	526	522	524	539	535	537	500	495	498	---	---	---
14	527	523	525	536	535	536	495	488	492	---	---	---
15	528	523	525	540	536	537	490	482	487	---	---	---
16	525	524	525	540	537	538	481	476	479	---	---	---
17	529	525	525	---	---	---	479	478	478	---	---	---
18	529	525	526	---	---	---	481	477	478	---	---	---
19	530	526	527	---	---	---	482	478	480	---	---	---
20	530	527	527	---	---	---	484	479	482	---	---	---
21	528	525	527	---	---	---	490	483	486	---	---	---
22	531	525	528	---	---	---	493	490	491	---	---	---
23	530	526	529	---	---	---	496	492	494	---	---	---
24	530	526	529	---	---	---	498	496	496	---	---	---
25	530	526	529	---	---	---	500	498	499	---	---	---
26	531	527	529	---	---	---	503	500	501	---	---	---
27	531	527	528	---	---	---	504	502	503	---	---	---
28	532	528	530	---	---	---	507	504	505	---	---	---
29	532	529	530	---	---	---	509	506	507	---	---	---
30	533	532	533	---	---	---	511	508	509	---	---	---
31	534	533	534	---	---	---	512	511	511	---	---	---
MONTH	534	517	526	540	531	536	535	476	500	539	512	526

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	355	347	351	---	---	---	264	260	262
2	---	---	---	349	343	346	---	---	---	261	258	259
3	---	---	---	343	335	339	---	---	---	259	258	258
4	---	---	---	335	324	330	---	---	---	258	254	256
5	---	---	---	326	313	318	---	---	---	255	252	254
6	---	---	---	312	301	306	---	---	---	253	245	249
7	---	---	---	300	293	297	---	---	---	245	239	242
8	---	---	---	294	288	290	299	294	295	239	235	237
9	---	---	---	288	281	284	312	299	306	235	232	234
10	---	---	---	283	280	281	331	311	318	234	230	232
11	---	---	---	282	277	279	348	331	340	232	228	230
12	---	---	---	280	276	278	353	347	351	229	227	228
13	---	---	---	285	279	281	353	349	351	229	224	226
14	---	---	---	288	284	286	349	344	346	226	222	224
15	---	---	---	290	287	288	344	341	342	223	222	222
16	---	---	---	289	287	289	343	337	339	223	222	222
17	---	---	---	---	---	---	338	335	336	223	221	222
18	---	---	---	---	---	---	336	332	335	223	221	222
19	---	---	---	---	---	---	333	330	332	223	221	222
20	---	---	---	---	---	---	331	327	329	224	221	222
21	---	---	---	---	---	---	328	325	327	224	221	223
22	---	---	---	---	---	---	327	321	324	224	222	223
23	---	---	---	---	---	---	323	315	319	226	222	225
24	---	---	---	---	---	---	315	307	312	228	224	227
25	---	---	---	---	---	---	307	297	303	229	226	227
26	---	---	---	---	---	---	297	289	293	230	228	230
27	---	---	---	---	---	---	289	283	286	234	230	232
28	---	---	---	---	---	---	284	276	280	235	232	234
29	---	---	---	---	---	---	276	270	274	238	235	237
30	---	---	---	---	---	---	270	264	268	243	238	241
31	---	---	---	---	---	---	---	---	---	247	242	245
MONTH	---	---	---	355	276	303	353	264	318	264	221	234

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

403923082325500 R-16 NR LEXINGTON OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	251	246	249	356	354	355	418	416	417	483	481	482
2	255	251	253	357	356	357	421	418	419	485	483	484
3	259	254	257	360	356	358	423	419	421	486	485	486
4	263	258	261	362	357	360	426	421	424	488	484	487
5	267	262	265	364	360	362	428	423	425	489	486	488
6	271	267	269	365	362	363	429	424	427	490	487	490
7	275	270	272	366	364	365	432	426	429	491	487	490
8	278	274	276	368	365	367	437	428	431	493	488	491
9	283	277	280	370	367	369	435	431	433	494	490	492
10	287	282	284	372	368	371	445	433	441	495	491	493
11	291	286	289	374	370	372	456	452	453	496	493	493
12	296	291	294	376	372	374	458	453	455	498	493	495
13	301	296	298	379	375	376	458	456	457	496	493	495
14	305	301	303	380	377	379	459	458	458	496	493	495
15	309	305	306	382	380	381	459	456	459	497	494	496
16	312	308	310	384	381	383	461	457	459	497	494	496
17	315	312	314	387	383	385	463	459	462	497	496	497
18	319	315	317	390	386	387	466	463	464	498	494	496
19	322	319	320	392	388	390	468	463	466	499	494	497
20	326	322	324	394	391	392	470	465	467	500	495	496
21	329	326	327	396	394	395	468	467	467	498	494	495
22	333	329	331	399	396	397	468	467	468	498	492	495
23	336	333	335	400	398	399	470	467	469	502	495	499
24	340	336	338	402	400	401	472	468	471	501	498	498
25	343	338	341	405	402	403	475	472	473	498	494	497
26	344	341	342	407	403	405	477	473	475	497	493	495
27	348	344	345	408	405	407	479	474	476	495	491	492
28	351	346	348	411	407	408	480	476	477	493	489	491
29	353	349	351	413	409	411	481	477	478	490	486	488
30	354	352	353	414	411	413	483	479	480	489	480	485
31	---	---	---	416	413	415	482	480	481	---	---	---
MONTH	354	246	305	416	354	384	483	416	454	502	480	492
YEAR	540	221	407									

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	1.5	-4.7	-.7	---	---	---	2.8	-4.6	-.3
2	---	---	---	6.3	-6.2	.9	---	---	---	.8	-3.4	-1.1
3	---	---	---	5.5	2.2	4.0	---	---	---	-1.3	-5.0	-3.0
4	---	---	---	12.2	4.1	7.4	---	---	---	-2.0	-7.6	-4.6
5	15.4	1.0	7.7	15.7	3.1	10.1	---	---	---	-4.5	-9.8	-8.1
6	22.0	-.4	10.3	3.1	-.6	1.4	---	---	---	1.0	-8.4	-2.9
7	26.0	6.6	15.4	-.9	-3.8	-1.9	---	---	---	.7	-8.0	-3.3
8	24.9	6.2	14.7	8.7	-4.0	1.4	---	---	---	-9.0	-18.2	-14.3
9	16.2	3.8	9.6	10.7	-6.3	.3	11.6	-3.3	4.3	-6.3	-20.4	-12.4
10	8.6	-1.2	3.5	12.4	-6.4	2.3	12.8	-.7	7.6	-3.1	-23.1	-11.6
11	13.4	-3.7	5.3	13.2	-2.7	7.1	-2.0	-8.5	-5.4	---	---	---
12	14.1	2.4	8.8	11.9	7.7	10.0	2.9	-11.6	-4.1	---	---	---
13	13.0	.6	6.6	16.3	8.0	11.3	5.0	-4.3	.0	---	---	---
14	17.8	-1.8	6.7	17.9	15.3	16.2	7.5	-.6	3.5	---	---	---
15	22.5	1.9	11.0	16.3	5.9	10.3	5.0	.8	3.2	---	---	---
16	15.3	9.4	13.8	---	---	---	4.3	.9	2.3	---	---	---
17	18.2	9.3	14.6	---	---	---	2.3	-.1	1.1	---	---	---
18	18.0	6.5	11.9	---	---	---	3.4	.6	2.4	---	---	---
19	12.0	5.9	9.8	---	---	---	1.8	.4	1.0	---	---	---
20	19.2	11.0	13.9	---	---	---	1.5	.1	.5	---	---	---
21	19.3	4.3	10.9	---	---	---	.1	-4.3	-2.6	---	---	---
22	12.9	-2.4	5.2	---	---	---	-.3	-4.6	-2.7	---	---	---
23	16.9	-3.6	5.5	---	---	---	-2.6	-13.5	-5.7	---	---	---
24	20.1	-1.3	8.0	---	---	---	-4.9	-7.8	-5.8	---	---	---
25	21.7	-.8	8.8	---	---	---	-5.0	-12.8	-7.3	---	---	---
26	21.1	1.9	11.3	---	---	---	-10.6	-14.7	-12.9	---	---	---
27	10.2	4.7	7.7	---	---	---	-7.6	-11.9	-10.1	---	---	---
28	8.3	-.1	4.7	---	---	---	-7.5	-20.3	-11.4	---	---	---
29	8.5	.3	6.3	---	---	---	-5.5	-21.3	-11.8	---	---	---
30	1.1	-.5	.6	---	---	---	-9.9	-16.0	-11.9	---	---	---
31	1.9	-.3	.8	---	---	---	-2.3	-9.9	-5.1	---	---	---
MONTH	26.0	-3.7	8.6	17.9	-6.4	5.3	12.8	-21.3	-3.1	2.8	-23.1	-6.2



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

403923082325500 R-16 NR LEXINGTON OH--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	12.0	11.7	11.8	---	---	---	11.5	11.3	11.4
2	---	---	---	12.0	11.7	11.8	---	---	---	11.5	11.3	11.3
3	---	---	---	12.0	11.7	11.8	---	---	---	11.3	11.3	11.3
4	---	---	---	12.0	11.7	11.8	---	---	---	11.3	11.3	11.3
5	11.8	11.5	11.6	12.0	11.7	11.9	---	---	---	11.3	11.3	11.3
6	11.8	11.5	11.6	11.7	11.7	11.7	---	---	---	11.3	11.3	11.3
7	11.8	11.5	11.7	11.7	11.7	11.7	---	---	---	11.3	11.1	11.3
8	11.8	11.5	11.7	12.0	11.7	11.8	---	---	---	11.3	11.2	11.3
9	11.8	11.5	11.8	12.0	11.7	11.8	12.0	11.7	11.8	11.3	11.0	11.2
10	11.8	11.5	11.7	12.0	11.7	11.8	12.0	11.7	11.8	11.3	11.0	11.1
11	11.8	11.5	11.6	12.0	11.7	11.9	12.0	11.7	11.7	---	---	---
12	11.8	11.5	11.7	12.0	11.7	11.9	12.0	11.7	11.8	---	---	---
13	11.8	11.5	11.7	12.0	11.7	11.9	11.7	11.7	11.7	---	---	---
14	11.8	11.5	11.7	12.0	12.0	12.0	12.0	11.7	11.7	---	---	---
15	11.8	11.5	11.7	12.0	11.7	11.9	12.0	11.7	11.8	---	---	---
16	11.8	11.8	11.8	---	---	---	12.0	11.7	11.8	---	---	---
17	11.8	11.5	11.8	---	---	---	11.7	11.7	11.7	---	---	---
18	11.8	11.5	11.8	---	---	---	11.7	11.5	11.7	---	---	---
19	11.8	11.5	11.7	---	---	---	11.7	11.5	11.6	---	---	---
20	11.8	11.5	11.8	---	---	---	11.7	11.5	11.6	---	---	---
21	12.0	11.8	11.8	---	---	---	11.7	11.5	11.5	---	---	---
22	12.0	11.5	11.8	---	---	---	11.5	11.5	11.5	---	---	---
23	12.0	11.7	11.8	---	---	---	11.7	11.5	11.5	---	---	---
24	12.0	11.7	11.8	---	---	---	11.5	11.5	11.5	---	---	---
25	12.0	11.7	11.8	---	---	---	11.5	11.5	11.5	---	---	---
26	12.0	11.7	11.8	---	---	---	11.5	11.5	11.5	---	---	---
27	12.0	11.7	11.9	---	---	---	11.5	11.5	11.5	---	---	---
28	12.0	11.7	11.9	---	---	---	11.5	11.5	11.5	---	---	---
29	12.0	11.7	11.9	---	---	---	11.5	11.4	11.5	---	---	---
30	11.7	11.7	11.7	---	---	---	11.5	11.5	11.5	---	---	---
31	11.7	11.7	11.7	---	---	---	11.5	11.5	11.5	---	---	---
MONTH	12.0	11.5	11.8	12.0	11.7	11.8	12.0	11.4	11.6	11.5	11.0	11.3

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	9.0	8.8	8.9	---	---	---	8.3	8.1	8.3
2	---	---	---	9.0	8.8	8.8	---	---	---	8.3	8.1	8.3
3	---	---	---	9.0	8.6	8.8	---	---	---	8.3	8.1	8.3
4	---	---	---	9.0	8.8	8.8	---	---	---	8.5	8.3	8.3
5	---	---	---	9.0	8.6	8.8	---	---	---	8.5	8.3	8.4
6	---	---	---	8.9	8.6	8.8	---	---	---	8.5	8.3	8.4
7	---	---	---	8.8	8.6	8.8	---	---	---	8.5	8.3	8.5
8	---	---	---	8.8	8.6	8.7	---	---	---	8.5	8.3	8.4
9	---	---	---	8.8	8.6	8.7	8.3	8.1	8.2	8.5	8.3	8.4
10	---	---	---	8.8	8.6	8.7	8.3	7.9	8.1	8.5	8.3	8.4
11	---	---	---	8.9	8.6	8.7	8.1	7.9	8.0	8.5	8.3	8.4
12	---	---	---	8.9	8.6	8.7	8.1	7.9	8.0	8.5	8.5	8.5
13	---	---	---	8.8	8.6	8.8	7.9	7.9	7.9	8.5	8.3	8.4
14	---	---	---	8.8	8.6	8.7	8.0	7.8	7.9	8.7	8.3	8.5
15	---	---	---	8.8	8.4	8.6	8.0	7.9	7.9	8.5	8.5	8.5
16	---	---	---	---	---	---	7.9	7.7	7.9	8.5	8.3	8.5
17	---	---	---	---	---	---	8.0	7.7	7.9	8.7	8.5	8.5
18	---	---	---	---	---	---	8.0	7.9	7.9	8.7	8.5	8.6
19	---	---	---	---	---	---	8.0	7.9	8.0	8.7	8.5	8.6
20	---	---	---	---	---	---	8.1	7.9	8.0	8.7	8.5	8.6
21	---	---	---	---	---	---	8.1	7.9	8.1	8.9	8.5	8.7
22	---	---	---	---	---	---	8.1	7.9	8.0	8.9	8.5	8.7
23	---	---	---	---	---	---	8.1	7.9	8.0	8.9	8.5	8.7
24	---	---	---	---	---	---	8.1	8.0	8.1	8.9	8.5	8.7
25	---	---	---	---	---	---	8.2	8.0	8.1	8.9	8.7	8.7
26	---	---	---	---	---	---	8.2	8.0	8.1	8.9	8.7	8.7
27	---	---	---	---	---	---	8.4	8.1	8.2	8.9	8.7	8.8
28	---	---	---	---	---	---	8.3	8.1	8.2	8.9	8.7	8.8
29	---	---	---	---	---	---	8.3	8.1	8.2	8.9	8.7	8.8
30	---	---	---	---	---	---	8.3	8.3	8.3	9.0	8.7	8.9
31	---	---	---	---	---	---	---	---	---	8.9	8.7	8.9
MONTH	---	---	---	9.0	8.4	8.8	8.4	7.7	8.0	9.0	8.1	8.6

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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403923082325500 R-16 NR LEXINGTON OH--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.9	8.9	8.9	9.5	9.3	9.3	10.4	10.1	10.1	11.0	10.9	11.0
2	9.1	8.9	8.9	9.5	9.3	9.3	10.4	10.1	10.2	11.0	10.9	10.9
3	9.1	8.9	9.0	9.5	9.3	9.3	10.4	10.1	10.2	11.0	10.9	10.9
4	9.1	8.9	9.0	9.5	9.3	9.4	10.3	10.1	10.2	11.2	10.9	11.0
5	9.2	8.9	9.0	9.6	9.3	9.5	10.3	10.1	10.3	11.2	10.9	11.0
6	9.2	8.9	9.0	9.6	9.3	9.5	10.5	10.1	10.3	11.1	10.9	11.0
7	9.2	8.9	9.0	9.7	9.5	9.5	10.5	10.1	10.3	11.2	10.9	11.0
8	9.1	8.9	9.0	9.7	9.5	9.5	10.6	10.1	10.4	11.2	11.0	11.1
9	9.1	8.9	9.0	9.7	9.5	9.5	10.5	10.3	10.4	11.2	11.0	11.1
10	9.2	8.9	9.1	9.7	9.5	9.5	---	---	---	11.2	11.0	11.1
11	9.1	8.9	9.1	9.7	9.5	9.6	10.5	10.3	10.5	11.2	11.0	11.2
12	9.1	8.9	9.1	9.8	9.5	9.7	10.8	10.4	10.5	11.2	11.0	11.2
13	9.1	8.9	9.1	9.8	9.5	9.7	10.6	10.5	10.5	11.4	11.1	11.2
14	9.3	9.1	9.1	9.7	9.7	9.7	10.6	10.5	10.5	11.4	11.2	11.2
15	9.3	9.1	9.1	9.9	9.7	9.7	10.7	10.5	10.6	11.4	11.2	11.2
16	9.4	9.1	9.1	10.0	9.7	9.8	10.8	10.5	10.6	11.4	11.2	11.2
17	9.4	9.1	9.2	10.0	9.7	9.9	10.8	10.5	10.6	11.2	11.2	11.2
18	9.4	9.1	9.2	10.0	9.7	9.9	10.8	10.5	10.6	11.4	11.2	11.3
19	9.4	9.1	9.2	10.1	9.7	9.9	10.8	10.5	10.7	11.4	11.2	11.3
20	9.4	9.1	9.2	10.2	9.9	9.9	10.8	10.5	10.7	11.4	11.2	11.3
21	9.3	9.1	9.2	10.0	9.9	9.9	10.8	10.7	10.7	11.4	11.2	11.3
22	9.4	9.1	9.2	9.9	9.9	9.9	10.8	10.7	10.8	11.6	11.2	11.4
23	9.1	9.1	9.1	10.2	9.9	10.0	11.0	10.7	10.8	11.4	11.2	11.4
24	9.1	9.1	9.1	10.2	9.9	9.9	11.0	10.7	10.8	11.4	11.2	11.4
25	9.3	9.1	9.2	10.2	9.9	10.0	11.0	10.7	10.8	11.6	11.4	11.4
26	9.3	9.1	9.3	10.2	9.9	10.0	11.0	10.7	10.8	11.6	11.4	11.5
27	9.3	9.1	9.3	10.1	9.9	10.0	11.0	10.7	10.9	11.6	11.4	11.6
28	9.3	9.1	9.2	10.1	9.9	10.1	11.0	10.8	10.9	11.6	11.4	11.6
29	9.3	9.1	9.3	10.2	9.9	10.1	11.0	10.8	10.9	11.6	11.4	11.6
30	9.3	9.3	9.3	10.4	10.1	10.1	11.0	10.8	10.9	11.6	11.3	11.5
31	---	---	---	10.4	10.1	10.2	11.0	11.0	11.0	---	---	---
MONTH	9.4	8.9	9.1	10.4	9.3	9.8	11.0	10.1	10.6	11.6	10.9	11.2
YEAR	12.0	7.7	10.1									

TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	6.8	6.4	6.6	---	---	---	2.6	2.6	2.6
2	---	---	---	6.9	5.5	6.2	---	---	---	2.9	2.7	2.8
3	---	---	---	7.3	6.8	7.0	---	---	---	2.9	2.7	2.8
4	---	---	---	8.8	7.3	7.8	---	---	---	2.9	2.8	2.9
5	16.5	13.6	15.0	10.8	8.9	9.9	---	---	---	2.8	2.6	2.7
6	16.4	13.1	14.7	9.8	8.1	8.9	---	---	---	2.6	2.5	2.6
7	18.2	14.3	16.0	8.0	6.4	7.2	---	---	---	2.8	2.6	2.7
8	18.4	15.5	17.0	6.8	5.4	6.1	---	---	---	2.8	2.5	2.6
9	17.5	14.3	16.2	6.9	5.2	6.0	6.4	4.9	5.6	2.5	2.4	2.4
10	14.0	12.2	13.2	6.9	5.0	5.9	8.4	6.5	7.5	2.4	2.3	2.3
11	13.2	11.0	12.3	7.6	5.6	6.6	7.2	4.3	5.5	---	---	---
12	13.8	12.1	13.0	8.9	7.6	8.2	4.2	3.5	3.8	---	---	---
13	14.3	12.3	13.3	10.4	8.9	9.3	3.5	3.3	3.3	---	---	---
14	14.0	11.4	12.6	13.6	10.5	12.6	4.2	3.3	3.7	---	---	---
15	14.9	11.9	13.3	13.6	11.8	13.0	5.2	4.1	4.5	---	---	---
16	14.8	13.7	14.1	---	---	---	5.6	4.9	5.2	---	---	---
17	15.9	14.8	15.3	---	---	---	5.3	5.0	5.1	---	---	---
18	15.9	14.2	15.0	---	---	---	5.5	5.1	5.3	---	---	---
19	15.0	14.1	14.3	---	---	---	5.2	4.9	5.1	---	---	---
20	15.3	14.2	14.5	---	---	---	4.9	4.5	4.7	---	---	---
21	15.9	13.8	15.2	---	---	---	4.5	4.4	4.4	---	---	---
22	13.6	11.7	12.6	---	---	---	4.4	4.2	4.3	---	---	---
23	12.7	10.5	11.7	---	---	---	4.2	4.0	4.1	---	---	---
24	12.8	10.4	11.6	---	---	---	3.9	3.7	3.7	---	---	---
25	13.1	10.5	11.8	---	---	---	3.8	3.7	3.7	---	---	---
26	13.5	11.2	12.3	---	---	---	3.8	3.3	3.4	---	---	---
27	13.2	11.8	12.4	---	---	---	3.3	3.1	3.2	---	---	---
28	11.7	10.3	10.8	---	---	---	3.2	3.0	3.1	---	---	---
29	10.9	10.0	10.3	---	---	---	2.9	2.7	2.8	---	---	---
30	10.0	8.3	9.1	---	---	---	2.7	2.6	2.7	---	---	---
31	8.3	6.9	7.6	---	---	---	2.6	2.6	2.6	---	---	---
MONTH	18.4	6.9	13.2	13.6	5.0	8.1	8.4	2.6	4.2	2.9	2.3	2.6





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RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

[illegible]

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER RECORDS

411138081172500. Local number, PO-116.

LOCATION.--Lat 41°11'38" Long 81°17'25", Hydrologic Unit 04110002, along State Route 14 near Ravenna, OH.  
Owner.--USGS-City of Akron, OH.

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 17.5 ft. Cased with Sch 40 PVC to 5.2 ft; .010 in. screen from 5.2 to 17.5 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: water level, air temperature, soil temperature, water temperature and specific conductance. Conductivity/water temperature probe set at 10.8 feet below land surface from February, 1991, through July, 1992, when removed; probe reinstalled August, 1994, through current year at depth of 13.4 feet below land surface.

DATUM.--Elevation of land-surface datum is 1068.39 feet above sea level.  
Measuring point: shelter shelf 2.20 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

### PERIOD OF DAILY RECORD.--

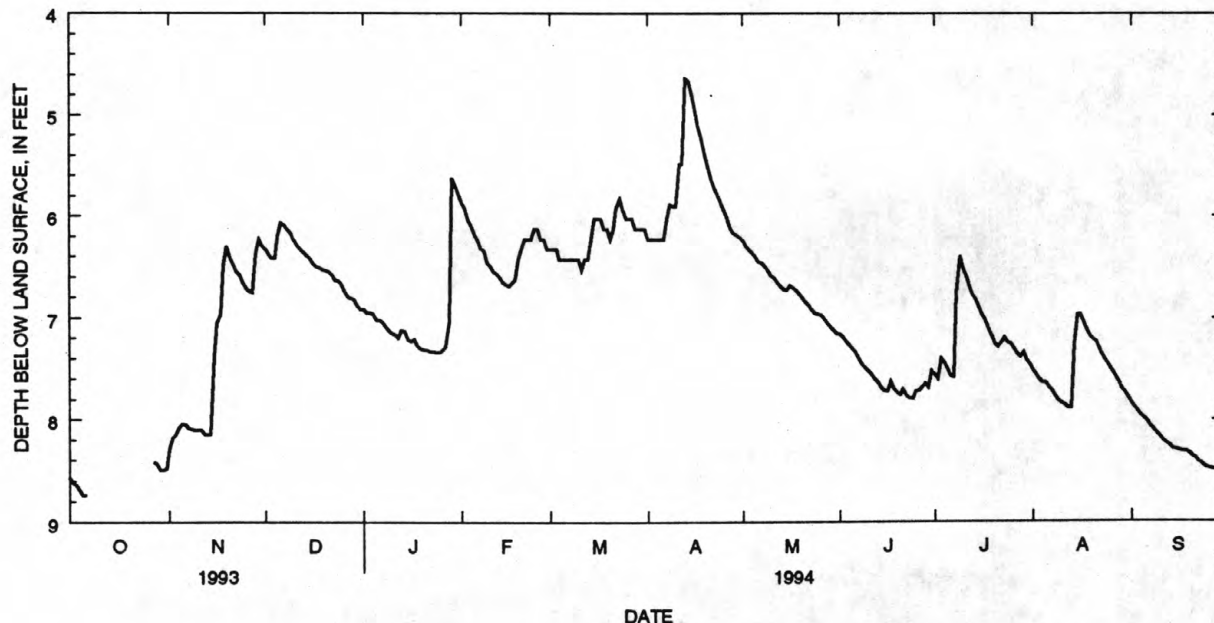
WATER LEVEL: February 1991 to current year.  
SPECIFIC CONDUCTANCE: February 1991 to July 1992; September, 1994 to current year.  
AIR TEMPERATURE: February 1991 to current year.  
SOIL TEMPERATURE: July 1992 to current year.  
PRECIPITATION: February 1991 to current year.  
WATER TEMPERATURE: February 1991 to July 1992; September, 1994, to current year.

### EXTREMES FOR PERIOD OF DAILY RECORD:

WATER LEVEL: Maximum daily low, 9.45 ft. below land-surface datum, October 9-10, 1991; maximum daily high, 4.35 ft. below land-surface datum, April 13, 1994.  
SPECIFIC CONDUCTANCE: Maximum, 2540 microsiemens December 19-20, 22-28, 1991; minimum, 242 microsiemens April 10, 1992.  
AIR TEMPERATURE: Maximum, 36.0°C August 2, 1991; minimum, -32.2°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 14.8°C October 1, 1991; minimum, 6.5°C many days in March, 1991.  
SOIL TEMPERATURE: Maximum, 28.5°C August 11, 1992; minimum, -0.4°C February 10-14, 1994.

### EXTREMES FOR CURRENT YEAR:

WATER LEVEL: Maximum daily low, 8.74 ft. below land-surface datum, October 5-6, 1993; maximum daily high, 4.35 ft. below land-surface datum, April 13, 1994.  
SPECIFIC CONDUCTANCE: Data not obtained from this well in 1994 except for several weeks in September, 1994.  
AIR TEMPERATURE: Maximum, 34.6°C June 18, 1994; minimum, -32.2°C January 19, 1994.  
WATER TEMPERATURE: Data not obtained from this well in 1994 except for several weeks in September, 1994.  
SOIL TEMPERATURE: Maximum, 27.1°C July 7, 1994; minimum, -0.4°C February 10-14, 1994



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DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

411138081172500 PO-116 NR RAVENNA OH--Continued

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	20.5	.9	11.6	2.5	-1.2	.5	8.9	-4.7	.9	4.1	-4.4	.0
2	18.2	3.4	11.8	5.2	-5.4	.8	10.3	-1.4	5.1	1.5	-4.9	-1.5
3	16.2	1.6	9.2	5.3	2.1	3.6	7.8	.5	4.6	-1.2	-6.6	-3.6
4	22.9	5.2	13.4	13.0	3.9	7.5	9.7	4.6	6.2	-2.2	-5.6	-3.9
5	15.5	.1	6.7	16.3	4.0	11.4	4.4	2.1	3.5	-5.3	-14.6	-8.8
6	---	---	---	3.9	-.6	1.6	5.4	2.5	3.3	-.3	-10.7	-5.5
7	---	---	---	.6	-2.5	-.9	2.6	-1.1	1.2	-.6	-6.0	-3.5
8	---	---	---	9.2	-4.6	1.2	7.1	-2.6	1.9	-5.9	-16.6	-13.2
9	---	---	---	10.9	-6.5	1.0	9.8	-2.8	3.6	-6.5	-20.7	-12.7
10	---	---	---	12.9	-6.6	2.3	12.0	-1.2	7.7	-3.5	-23.9	-13.0
11	---	---	---	14.3	-1.2	7.4	-1.8	-7.0	-5.0	2.3	-2.6	.1
12	---	---	---	12.4	4.8	9.1	1.3	-8.2	-3.7	5.5	-1.7	.8
13	---	---	---	16.3	8.4	11.1	3.9	-9.7	-2.6	1.3	-3.5	-.5
14	---	---	---	17.5	11.7	14.9	5.3	-.1	2.2	-3.7	-18.1	-11.5
15	---	---	---	16.2	6.3	11.0	7.8	.8	3.9	-17.1	-21.6	-19.2
16	---	---	---	10.2	.6	5.3	4.0	-.3	2.5	-12.2	-25.8	-18.3
17	---	---	---	9.2	1.4	6.0	2.9	-1.5	.2	-4.4	-16.2	-8.6
18	---	---	---	8.5	-.5	3.0	4.7	.5	2.8	-17.5	-28.3	-22.9
19	---	---	---	7.6	3.7	5.8	2.4	.6	1.6	-20.6	-32.2	-25.2
20	---	---	---	3.4	-2.1	-.3	1.4	.3	.7	-10.4	-28.4	-19.2
21	---	---	---	9.4	-1.8	4.1	.3	-3.6	-1.4	-9.4	-29.1	-17.0
22	---	---	---	14.2	-.4	6.2	-1.6	-5.0	-3.1	-4.4	-11.9	-7.6
23	---	---	---	13.0	-1.4	4.1	-3.0	-10.9	-5.2	3.2	-13.0	-1.0
24	---	---	---	9.1	1.2	4.8	-4.7	-10.4	-6.0	2.6	-.9	2.0
25	---	---	---	9.3	-2.9	2.4	-4.4	-11.8	-7.1	2.0	-6.7	-.3
26	---	---	---	11.6	1.8	6.1	-10.5	-15.9	-13.0	-5.4	-10.6	-7.7
27	---	---	---	8.1	-.4	4.0	-8.4	-16.8	-11.1	2.9	-6.0	-.4
28	9.2	.9	5.7	1.9	-2.5	-.3	-7.6	-18.6	-11.0	8.2	-1.4	4.1
29	10.6	2.6	7.6	-.6	-2.1	-1.2	-5.3	-20.5	-11.5	-2.1	-4.7	-2.8
30	3.2	.4	1.4	5.1	-4.6	-.3	-9.2	-13.6	-11.1	-4.1	-13.7	-7.7
31	1.5	.4	.8	---	---	---	-2.6	-10.0	-5.7	-5.2	-16.0	-10.7
MONTH	22.9	.1	7.6	17.5	-6.6	4.4	12.0	-20.5	-1.5	8.2	-32.2	-7.7

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	-10.5	-19.7	-14.1	3.0	-6.5	-2.5	16.2	-4.1	7.7	14.5	1.1	6.5
2	-2.7	-23.0	-11.2	-.2	-5.0	-2.0	---	---	---	13.0	-.2	6.2
3	-2.0	-11.0	-8.0	2.4	-3.5	.2	9.6	-6.1	.2	14.5	-2.7	7.5
4	-.2	-10.4	-5.4	2.8	.7	1.7	11.7	-6.3	3.4	11.4	7.3	9.4
5	.5	-9.6	-4.0	4.7	-4.3	.6	15.4	2.5	8.7	18.8	7.9	13.2
6	4.5	-13.2	-3.5	15.9	-.3	5.1	4.1	-1.1	1.2	14.6	3.2	9.1
7	-3.1	-11.0	-6.3	9.6	.0	4.5	4.0	-4.6	.1	12.9	.1	7.0
8	-7.8	-12.5	-9.8	2.6	-4.6	-1.0	13.1	-7.1	3.6	17.1	4.5	10.6
9	-9.5	-15.9	-12.1	-1.9	-3.5	-2.6	17.9	5.8	11.6	18.9	4.1	12.4
10	-7.1	-20.9	-13.4	.3	-14.5	-5.7	10.8	.8	8.2	17.2	.4	9.4
11	-2.3	-11.4	-7.5	2.2	-14.6	-5.3	11.5	-2.4	4.8	21.3	.4	12.3
12	3.8	-8.8	-1.8	6.4	-12.4	1.8	21.9	6.3	13.1	13.3	1.7	9.4
13	1.2	-4.8	-2.6	4.8	-1.5	1.9	18.2	8.3	12.4	16.5	-1.1	8.0
14	1.9	-7.2	-2.4	6.7	-2.0	3.8	21.4	6.8	12.9	23.7	-1.0	12.2
15	6.7	.2	3.2	10.9	-6.7	3.5	25.3	6.4	15.2	21.7	13.6	17.6
16	4.3	-5.4	-.6	-3.4	-11.8	-6.5	12.8	6.1	9.8	13.6	5.5	9.3
17	10.2	-7.9	.1	1.2	-12.0	-3.3	14.9	6.1	10.4	8.5	4.4	6.4
18	15.7	-6.1	4.4	1.4	-4.6	-1.9	19.7	-1.6	10.8	12.1	5.3	8.6
19	18.5	1.8	10.4	4.8	-4.4	.3	19.2	7.9	16.6	16.5	4.4	10.3
20	16.1	4.7	11.4	12.8	-5.8	4.2	14.1	-.3	7.9	21.8	1.4	12.0
21	5.4	-2.2	2.4	13.2	-1.7	6.5	11.6	-1.6	6.4	25.3	2.8	15.0
22	.1	-3.3	-2.1	15.9	-1.9	9.1	14.1	-3.5	4.6	29.7	6.8	18.1
23	6.8	-1.7	2.8	22.5	6.4	14.2	17.1	-4.5	7.0	24.8	9.7	17.3
24	-2.0	-8.1	-5.2	22.5	.0	11.7	26.0	2.3	16.5	24.3	6.1	15.3
25	-2.5	-10.0	-5.8	-.2	-6.9	-2.3	28.4	17.0	22.4	21.6	13.6	17.3
26	-9.4	-24.5	-13.7	8.7	-6.1	3.3	28.0	13.0	22.0	18.8	5.8	13.2
27	-6.7	-25.3	-14.9	8.7	1.3	5.2	26.6	9.4	19.7	15.6	1.7	8.6
28	-1.3	-21.2	-7.2	9.6	1.3	4.6	14.1	4.0	8.5	20.7	.4	11.1
29	---	---	---	5.9	-1.3	2.1	22.4	7.0	15.8	24.5	5.2	15.1
30	---	---	---	5.6	-4.7	.5	14.5	4.9	8.7	27.8	7.7	18.5
31	---	---	---	10.6	-5.6	2.5	---	---	---	28.4	13.1	20.8
MONTH	18.5	-25.3	-4.2	22.5	-14.6	1.7	28.4	-7.1	10.0	29.7	-2.7	11.9



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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411138081172500 PO-116 NR RAVENNA OH--Continued

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	20.5	4.9	14.3	27.4	10.1	19.3	28.8	13.7	21.2	19.1	7.9	14.7
2	17.6	3.1	10.4	28.0	15.7	20.7	30.1	15.9	22.5	17.4	4.8	11.0
3	23.0	2.4	12.7	25.3	15.2	19.3	29.5	15.8	22.4	19.6	4.9	12.5
4	25.0	4.5	15.3	30.4	13.7	22.3	27.1	18.7	21.6	22.6	7.0	14.2
5	27.8	7.2	18.2	31.6	18.2	24.8	18.9	8.6	15.5	23.8	5.8	14.2
6	29.6	11.8	21.6	32.9	18.7	26.3	22.2	6.8	14.2	21.1	7.9	14.7
7	27.5	11.5	19.5	32.1	18.8	23.0	25.7	7.1	16.5	21.2	8.5	15.0
8	18.1	6.1	13.6	30.1	18.9	24.8	27.2	9.5	18.3	24.8	5.6	15.3
9	25.6	3.9	14.5	27.8	19.3	24.2	19.6	14.1	16.9	24.6	10.4	17.8
10	28.1	5.7	18.0	21.1	15.7	18.5	---	---	---	23.0	6.8	14.0
11	26.8	14.6	20.4	24.8	9.7	17.3	22.5	14.9	17.8	22.6	3.6	12.2
12	27.3	9.9	19.1	29.5	11.1	20.8	29.5	16.3	22.4	25.1	2.6	13.4
13	30.6	13.3	21.7	29.3	15.7	23.1	25.2	18.2	21.0	27.5	9.1	18.2
14	32.0	16.7	24.2	26.2	18.3	21.1	22.3	12.1	19.0	28.9	17.1	21.9
15	32.7	17.6	23.8	29.4	17.5	22.7	22.3	9.2	15.2	---	---	---
16	34.0	17.4	23.6	26.9	14.7	20.2	25.3	7.7	16.6	28.3	14.4	21.1
17	33.7	17.4	25.1	28.3	13.6	20.8	24.3	13.2	18.8	22.2	14.6	19.7
18	34.6	18.5	25.9	28.4	16.5	21.6	26.2	13.9	19.4	21.1	8.7	14.4
19	34.0	17.1	24.4	29.5	13.5	21.7	29.5	13.0	20.6	22.2	6.6	13.5
20	33.5	16.0	22.8	33.1	16.7	25.0	28.6	16.8	22.1	25.7	5.8	15.1
21	29.9	17.4	23.4	30.5	18.9	23.1	22.3	18.0	19.8	26.0	8.2	16.0
22	28.1	12.3	20.0	26.0	18.8	22.3	24.6	11.3	19.2	22.8	8.1	14.6
23	28.2	10.0	19.5	28.0	17.7	22.4	25.6	9.0	16.8	21.1	7.2	14.4
24	28.2	18.5	22.4	28.2	15.9	20.6	26.6	10.5	18.8	25.9	12.4	18.2
25	20.1	15.3	17.3	28.1	15.1	21.4	29.7	17.0	22.5	24.7	11.6	17.4
26	22.9	16.0	19.2	25.2	14.9	19.5	28.3	14.7	21.4	19.3	10.1	15.3
27	19.9	16.1	17.9	23.3	12.8	18.6	28.5	15.8	21.5	14.9	8.9	12.3
28	26.9	14.3	20.5	24.2	12.7	17.8	28.8	16.7	22.5	17.0	10.2	12.4
29	25.9	15.9	20.0	26.6	14.0	19.9	22.8	11.0	17.8	16.1	4.5	10.7
30	21.9	12.8	17.5	26.6	16.4	20.6	24.3	8.3	16.4	21.2	2.3	11.0
31	---	---	---	27.3	13.3	20.2	23.2	14.9	18.6	---	---	---
MONTH	34.6	2.4	19.6	33.1	9.7	21.4	30.1	6.8	19.2	28.9	2.3	15.0
YEAR	34.6	-32.2	8.2									

TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	12.5	10.5	11.4	5.3	4.9	5.1	3.3	1.8	2.5	.4	.3	.3
2	13.2	12.2	12.7	5.1	4.2	4.7	4.0	2.0	2.9	.6	.3	.5
3	13.0	10.6	11.8	5.3	4.8	5.0	4.8	3.6	4.2	.6	.5	.6
4	13.9	11.0	12.3	6.5	5.0	5.6	5.2	4.4	4.8	.8	.6	.7
5	13.2	10.8	12.0	8.7	6.6	7.7	5.1	4.6	4.8	.7	.7	.7
6	---	---	---	7.5	5.9	6.7	4.5	4.2	4.4	.7	.6	.7
7	---	---	---	5.8	4.5	5.3	4.2	3.6	4.0	.8	.7	.8
8	---	---	---	5.2	3.4	4.3	4.2	2.8	3.5	.9	.6	.8
9	---	---	---	5.1	3.0	4.0	4.0	2.6	3.3	.6	.4	.5
10	---	---	---	5.1	2.8	3.9	5.5	4.1	4.8	.5	.4	.4
11	---	---	---	5.5	3.4	4.5	4.6	3.2	3.7	.5	.4	.5
12	---	---	---	6.9	5.4	6.1	3.2	3.0	3.1	.7	.5	.6
13	---	---	---	7.9	6.4	6.8	3.0	2.6	2.7	.7	.7	.7
14	---	---	---	11.3	8.0	9.8	2.6	2.5	2.6	.8	.7	.7
15	---	---	---	10.8	9.4	10.4	3.6	2.4	2.9	.7	.2	.4
16	---	---	---	9.3	7.6	8.7	3.7	3.1	3.4	.2	.1	.2
17	---	---	---	7.6	7.2	7.4	3.3	2.7	3.0	.1	.0	.1
18	---	---	---	7.3	6.0	6.7	3.7	3.0	3.3	.1	.0	.1
19	---	---	---	6.5	5.9	6.2	3.4	3.0	3.2	.0	.0	.0
20	---	---	---	6.3	4.1	5.3	2.9	2.5	2.7	.0	.0	.0
21	---	---	---	5.2	3.5	4.3	2.5	2.3	2.4	.0	-.1	-.1
22	---	---	---	6.0	4.0	4.9	2.3	2.1	2.2	.0	-.1	-.1
23	---	---	---	5.6	4.2	4.9	2.2	2.1	2.1	.0	-.1	-.1
24	---	---	---	5.5	4.7	5.1	2.1	1.8	1.9	.0	-.1	-.1
25	---	---	---	5.6	4.4	5.0	1.8	1.7	1.7	.0	-.1	-.1
26	---	---	---	5.8	4.4	5.0	1.7	.9	1.1	.0	-.1	.0
27	---	---	---	6.0	4.7	5.6	.9	.8	.8	.0	-.1	.0
28	9.6	8.4	9.0	4.9	4.1	4.4	.9	.8	.9	.0	-.1	-.1
29	9.2	8.2	8.5	4.1	3.2	3.6	.8	.5	.6	.0	-.1	.0
30	8.1	6.6	7.4	3.9	2.7	3.3	.5	.4	.4	.0	.0	.0
31	6.6	5.3	5.9	---	---	---	.4	.3	.3	.0	-.1	-.1
MONTH	13.9	5.3	10.1	11.3	2.7	5.7	5.5	.3	2.7	.9	-.1	.3



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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411138081172500 PO-116 NR RAVENNA OH--Continued

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.31	.02	.18	.00	.03	.00	.01	.01	.00	.00	.00
2	.13	.00	.13	.02	.00	.17	.01	.00	.00	.75	.15	.00
3	.00	.13	.01	.01	.00	.00	.48	.00	.00	.00	.00	.00
4	.01	.00	.87	.00	.01	.01	.06	.03	.00	.00	.25	.00
5	.00	.00	.01	.01	.00	.00	.10	.01	.00	.00	.29	.00
6	---	.01	.14	.00	.00	.00	.66	.06	.01	.04	.00	.02
7	---	.00	.00	.00	.00	.18	.11	.24	.00	3.17	.00	.00
8	---	.00	.01	.00	.00	.00	.00	.01	.00	.01	.00	.00
9	---	.00	.00	.00	.00	.00	.23	.01	.00	.01	.00	.23
10	---	.00	.08	.00	.01	.02	.95	.00	.00	.00	.00	.00
11	---	.00	.00	.00	.06	.37	.09	.15	.19	.00	.07	.00
12	---	.00	.07	.34	.13	.00	1.54	.05	.00	.00	.00	.00
13	---	.11	.00	.01	.02	.31	.69	.01	.04	.00	2.32	.00
14	---	1.87	.00	.05	.02	.00	.00	.00	.00	.26	.40	.52
15	---	.09	.00	.00	.00	.04	.24	.66	.27	.00	.00	.11
16	---	.00	.00	.00	.00	.01	.06	.05	.64	.00	.00	.00
17	---	1.24	.00	.00	.03	.00	.00	.00	.00	.00	.00	.41
18	---	.00	.16	.00	.39	.07	.01	.00	.00	.00	.00	.00
19	---	.12	.01	.00	.03	.02	.00	.00	.03	.00	.00	.00
20	---	.00	.02	.04	.00	.10	.00	.00	.55	.00	.41	.00
21	---	.00	.00	.00	.00	.62	.00	.00	.01	.71	.11	.00
22	---	.03	.00	.00	.17	.00	.00	.00	.00	.54	.08	.00
23	---	.10	.00	.15	.27	.05	.00	.00	.05	.00	.00	.00
24	---	.12	.00	.00	.08	.02	.00	.16	.72	.29	.00	.00
25	---	.14	.00	.05	.22	.00	.00	.13	.07	.10	.00	.27
26	---	.23	.00	.00	.20	.24	.00	.25	.38	.01	.00	.13
27	---	1.26	.00	.97	.18	.14	.02	.00	.03	.01	.00	.18
28	.00	.13	.00	.72	.07	.16	.00	.00	.01	.47	.03	.11
29	.00	.00	.00	.00	---	.04	.38	.00	.79	.07	.00	.38
30	.18	.02	.00	.00	---	.04	.31	.00	.06	.01	.00	.00
31	.73	---	.00	.00	---	.00	---	.45	---	.00	.25	---
TOTAL	1.05	5.91	1.53	2.55	1.89	2.64	5.94	2.28	3.86	6.45	4.36	2.36

WTR YR 1994 TOTAL 40.82

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER RECORDS

411138081172600. Local number, PO-121.

LOCATION.--Lat 41°11'38" Long 81°17'26", Hydrologic Unit 04110002, along State Route 14 near Ravenna, OH.  
Owner.--USGS-City of Akron, OH.

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 18.4 ft. Cased with Sch 40 PVC to 3.4 ft; .020 in. screen from 3.4 to 18.4 ft.

INSTRUMENTATION - Data logger--60 minute record. At this well there are 4 conductivity/water temperature probes at increasing depths within the well to better document vertical movement of high conductivity water on an hourly basis. Conductance/water temperature probes are set at 5.4 (level 4), 9.4 (level 3), 13.4 (level 2), and 17.4 (level 1) feet below land surface.

DATUM.--Elevation of land-surface datum is 1068.24 feet above sea level.  
Measuring point: Top of PVC casing, 1.80 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (FOUR LEVELS): July 1992 to current year.  
WATER TEMPERATURE (FOUR LEVELS): July 1992 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE:

LEVEL 1- Maximum, 2020 microsiemens January 27, 1994; minimum, 167 microsiemens January 6, 1993.  
LEVEL 2- Maximum, 1940 microsiemens January 27, 1994; minimum, 159 microsiemens January 6, 1993.  
LEVEL 3- Maximum, 1830 microsiemens June 8, 1993; minimum, 119 microsiemens April 14, 1994.  
LEVEL 4- Probe out of water.

WATER TEMPERATURE:

LEVEL 1- Maximum, 15.2°C many days in August, September 1992; minimum, 4.1°C March 25, 1993.  
LEVEL 2- Maximum, 16.0°C August 5, September 11-14, 1992; minimum, 3.8°C March 24-27, 1993.  
LEVEL 3- Maximum, 16.3°C August 1, 1992; minimum, 3.7°C March 25-26, 1993.  
LEVEL 4- Probe out of water.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE:

LEVEL 1- Maximum, 2020 microsiemens January 27, 1994; minimum, 177 microsiemens March 15, 1994.  
LEVEL 2- Maximum, 1940 microsiemens January 27, 1994; minimum, 173 microsiemens March 15, 1994.  
LEVEL 3- Maximum, 1810 microsiemens January 27, 1994; minimum, 119 microsiemens April 14, 1994.  
LEVEL 4- Probe out of water.

WATER TEMPERATURE:

LEVEL 1- Maximum, 12.3°C October 1,3-5, 1993; minimum, 5.7°C March 23-24, and April 13, 1994.  
LEVEL 2- Maximum, 13.2°C October 1-5, 1993; minimum, 5.2°C March 23-24, 1994.  
LEVEL 3- Maximum, 14.2°C October 1-5, 1992; minimum, 4.6°C March 22-24, 1994.  
LEVEL 4- Probe out of water.

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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411138081172600 PO-121 NR RAVENNA OH--Continued

#1 (17.4' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	1190	1190	1190	1370	1340	1360	367	362	364	324	314	320
2	1200	1190	1200	1390	1370	1370	371	362	366	328	321	324
3	1210	1200	1200	1420	1390	1400	374	364	369	423	328	354
4	1220	1210	1210	1460	1430	1450	697	359	395	454	338	375
5	1230	1220	1220	1460	1440	1450	1020	269	657	338	329	334
6	---	---	---	1440	1440	1440	266	257	261	472	336	396
7	---	---	---	1440	1440	1440	269	261	265	485	366	419
8	---	---	---	1440	1430	1430	282	262	269	481	368	423
9	---	---	---	1440	1430	1430	287	279	284	493	420	457
10	---	---	---	1440	1430	1430	295	284	287	934	464	677
11	---	---	---	1440	1430	1430	314	297	306	1050	950	1010
12	---	---	---	1430	1420	1420	322	311	315	1330	1060	1190
13	---	---	---	1420	1420	1420	323	308	316	1400	1340	1380
14	---	---	---	1560	1420	1480	323	308	316	1400	1360	1380
15	---	---	---	1560	1540	1550	324	309	318	1360	1180	1290
16	---	---	---	1550	1350	1470	326	312	319	1200	1080	1130
17	---	---	---	1570	1190	1410	322	312	318	1310	1210	1280
18	---	---	---	1570	846	1330	323	313	319	1290	1110	1220
19	---	---	---	768	553	638	324	312	318	1180	1080	1110
20	---	---	---	551	509	524	317	309	313	1290	1190	1240
21	---	---	---	508	493	499	317	307	312	1440	1290	1360
22	---	---	---	495	486	492	311	304	307	1490	1450	1480
23	---	---	---	486	470	477	307	301	304	1560	1480	1510
24	---	---	---	473	462	467	309	303	305	1690	1560	1590
25	---	---	---	470	464	467	308	299	305	1920	1710	1830
26	---	---	---	474	465	468	302	297	300	1990	1920	1960
27	---	---	---	1400	466	829	308	300	304	2020	1910	1990
28	1300	1280	1290	1470	678	1280	313	305	309	1890	969	1660
29	1290	1290	1290	564	368	428	315	310	313	906	444	611
30	1300	1290	1300	368	361	364	313	307	310	434	329	377
31	1330	1290	1310	---	---	---	316	311	314	327	276	299
MONTH	1330	1190	1250	1570	361	1090	1020	257	324	2020	276	999

#1 (17.4' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	275	257	264	221	215	218	275	267	270	497	463	480
2	258	252	256	221	218	219	281	274	278	496	465	481
3	259	250	254	227	219	224	287	270	280	514	496	507
4	261	257	259	229	225	227	271	266	268	518	511	516
5	267	260	262	235	229	231	272	264	267	520	514	517
6	275	266	270	235	231	233	711	269	359	518	513	516
7	291	276	284	235	232	233	698	224	342	533	517	525
8	291	286	288	235	233	234	248	238	244	542	518	534
9	293	284	288	235	232	233	256	247	251	518	510	511
10	295	291	293	234	231	233	1170	234	604	515	507	512
11	293	288	290	236	233	234	235	228	232	522	513	516
12	289	286	288	240	233	236	955	204	399	528	513	520
13	287	282	284	917	236	438	204	190	199	516	511	514
14	283	281	282	934	189	383	191	188	190	527	513	519
15	282	279	281	187	177	181	198	191	194	1110	524	583
16	283	275	279	189	181	186	212	196	204	1470	1110	1420
17	285	278	281	193	188	191	224	211	218	1450	1310	1380
18	579	277	367	200	191	193	239	224	231	1310	765	1080
19	318	255	267	208	200	205	258	239	248	765	543	619
20	259	224	239	218	208	214	282	258	270	567	543	555
21	225	214	219	538	216	341	306	282	294	596	567	581
22	219	212	214	245	195	203	331	306	318	621	595	609
23	547	207	267	208	199	202	354	331	341	645	621	633
24	551	192	282	216	205	210	379	352	365	681	645	663
25	192	188	191	225	214	219	397	378	386	809	681	744
26	202	191	196	232	225	228	418	397	406	1400	809	1190
27	210	202	206	236	230	232	438	416	425	1380	978	1260
28	216	210	212	245	236	240	465	438	456	978	767	857
29	---	---	---	255	245	249	493	464	480	798	762	775
30	---	---	---	264	255	260	476	452	464	841	797	817
31	---	---	---	268	261	265	---	---	---	883	841	858
MONTH	579	188	263	934	177	239	1170	188	316	1470	463	703



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

411138081172600 PO-121 NR RAVENNA OH--Continued

#1 (17.4' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	1420	883	1300	1760	1710	1730	---	---	---	---	---	---
2	1410	1100	1340	1740	1680	1710	---	---	---	---	---	---
3	1100	1030	1070	1760	1730	1740	---	---	---	---	---	---
4	1050	989	1030	1740	1660	1710	---	---	---	---	---	---
5	1020	983	1000	1700	1680	1690	---	---	---	---	---	---
6	1080	986	1040	1870	1700	1810	---	---	---	---	---	---
7	1040	1000	1020	---	---	---	---	---	---	---	---	---
8	1090	1010	1050	---	---	---	---	---	---	---	---	---
9	1210	1090	1170	---	---	---	---	---	---	---	---	---
10	1240	1190	1220	---	---	---	---	---	---	---	---	---
11	1380	1230	1320	---	---	---	---	---	---	---	---	---
12	1410	1380	1400	---	---	---	---	---	---	---	---	---
13	1460	1410	1430	---	---	---	---	---	---	---	---	---
14	1470	1440	1460	---	---	---	---	---	---	---	---	---
15	1470	1430	1440	---	---	---	---	---	---	---	---	---
16	1630	1470	1530	---	---	---	---	---	---	---	---	---
17	1740	1630	1710	---	---	---	---	---	---	---	---	---
18	1750	1680	1730	---	---	---	---	---	---	---	---	---
19	1680	1590	1640	---	---	---	---	---	---	---	---	---
20	1590	1550	1570	---	---	---	---	---	---	---	---	---
21	1690	1580	1650	---	---	---	---	---	---	---	---	---
22	1690	1630	1660	---	---	---	---	---	---	---	---	---
23	1640	1570	1590	---	---	---	---	---	---	---	---	---
24	1630	1570	1590	---	---	---	---	---	---	---	---	---
25	1740	1630	1710	---	---	---	---	---	---	---	---	---
26	1760	1740	1750	---	---	---	---	---	---	---	---	---
27	1800	1750	1790	---	---	---	---	---	---	---	---	---
28	1800	1770	1790	---	---	---	---	---	---	---	---	---
29	1780	1760	1770	---	---	---	---	---	---	---	---	---
30	1790	1760	1780	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	1800	883	1450	1870	1660	1730	---	---	---	---	---	---
YEAR	2020	177	719									

#2 (13.4' BLS)												
SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	1120	1090	1100	1270	1260	1270	358	354	356	316	309	313
2	1130	1110	1120	1270	1260	1270	362	353	357	322	313	317
3	1140	1130	1130	1270	1270	1270	365	355	360	341	321	331
4	1150	1130	1140	1290	1260	1270	388	353	370	347	326	341
5	1150	1140	1150	1300	1290	1290	567	264	401	331	321	326
6	---	---	---	1290	1270	1280	262	251	255	349	328	338
7	---	---	---	1280	1270	1270	263	256	259	356	343	351
8	---	---	---	1280	1270	1280	275	256	264	362	350	356
9	---	---	---	1290	1270	1280	281	273	277	367	351	359
10	---	---	---	1290	1280	1290	288	277	280	379	363	371
11	---	---	---	1290	1280	1290	306	292	300	383	370	378
12	---	---	---	1300	1290	1300	316	300	307	389	372	383
13	---	---	---	1310	1300	1300	317	301	309	404	384	393
14	---	---	---	1450	1310	1370	316	299	309	409	398	404
15	---	---	---	1460	1440	1450	318	298	310	414	396	405
16	---	---	---	1450	1140	1350	317	303	310	405	384	395
17	---	---	---	1470	1090	1280	316	302	310	414	396	405
18	---	---	---	1470	749	1200	316	304	311	415	400	408
19	---	---	---	735	537	612	317	301	311	414	391	403
20	---	---	---	534	491	507	310	301	306	418	400	409
21	---	---	---	493	477	483	311	299	305	427	405	415
22	---	---	---	482	474	478	304	295	300	433	421	428
23	---	---	---	474	458	465	300	292	297	456	434	445
24	---	---	---	462	451	456	302	293	298	455	450	453
25	---	---	---	458	453	455	300	291	297	1240	454	746
26	---	---	---	462	453	456	296	289	293	1320	1200	1260
27	---	---	---	1270	455	711	302	293	298	1940	1180	1460
28	1250	1240	1240	1330	582	1090	306	296	302	1820	917	1550
29	1260	1250	1250	563	358	419	308	304	306	842	425	581
30	1270	1260	1260	359	353	356	308	301	304	416	318	362
31	1270	1260	1270	---	---	---	309	304	307	315	268	289
MONTH	1270	1090	1180	1470	353	993	567	251	309	1940	268	496



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

411138081172600 PO-121 NR RAVENNA OH--Continued

#3 (9.4' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	1140	1090	1100	1230	1230	1230	344	324	337	309	301	305
2	1140	1120	1130	1230	1230	1230	349	322	341	313	306	309
3	1150	1130	1140	1240	1230	1230	355	329	344	335	312	323
4	1160	1140	1150	1240	1240	1240	380	313	356	340	316	332
5	1160	1150	1160	1240	1240	1240	411	233	346	323	313	318
6	---	---	---	1250	1240	1250	252	221	237	339	319	330
7	---	---	---	1250	1250	1250	256	229	246	346	334	341
8	---	---	---	1260	1250	1250	270	238	254	352	340	347
9	---	---	---	1260	1250	1250	275	266	270	357	339	349
10	---	---	---	1270	1260	1260	281	271	274	371	353	363
11	---	---	---	1270	1260	1270	299	283	292	374	359	370
12	---	---	---	1280	1270	1270	305	292	299	380	364	374
13	---	---	---	1280	1280	1280	307	293	301	394	376	383
14	---	---	---	1410	1280	1330	307	289	300	400	388	395
15	---	---	---	1430	1410	1420	308	291	302	406	388	396
16	---	---	---	1420	988	1230	310	294	302	395	371	386
17	---	---	---	1450	854	1160	307	293	302	406	387	396
18	---	---	---	1440	607	1080	307	293	303	407	387	399
19	---	---	---	612	439	511	308	293	302	404	381	393
20	---	---	---	456	410	431	303	292	298	408	388	400
21	---	---	---	448	395	419	303	292	297	416	395	405
22	---	---	---	435	382	411	296	287	293	424	411	419
23	---	---	---	439	377	406	293	285	290	446	424	436
24	---	---	---	426	389	411	294	286	291	447	439	443
25	---	---	---	439	375	415	294	284	290	458	444	452
26	---	---	---	440	366	419	288	282	286	470	458	464
27	---	---	---	1120	357	603	294	286	290	1810	470	666
28	1210	1210	1210	1160	435	941	299	289	295	1780	811	1500
29	1230	1210	1220	405	324	352	302	296	299	774	370	518
30	1230	1230	1230	340	328	335	300	292	296	368	278	321
31	1240	1230	1230	---	---	---	302	296	299	287	222	251
MONTH	1240	1090	1170	1450	324	937	411	221	298	1810	222	422

#3 (9.4' BLS) SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	230	206	219	210	203	207	225	207	215	313	286	300
2	214	203	210	210	205	208	259	213	222	343	311	325
3	217	197	209	216	209	213	256	209	232	351	342	346
4	220	197	211	218	215	216	248	216	233	356	351	353
5	237	214	226	224	218	220	240	212	226	357	352	354
6	258	230	243	224	219	222	280	217	244	368	356	363
7	273	252	264	224	220	222	284	170	205	382	365	373
8	274	268	271	224	221	222	199	180	191	378	351	359
9	276	266	271	224	221	222	206	196	201	362	352	356
10	279	273	277	224	220	222	706	172	350	374	360	363
11	278	273	275	225	221	223	190	160	177	374	362	367
12	275	271	273	228	221	225	496	140	247	371	360	365
13	273	269	270	246	224	231	163	122	143	371	363	367
14	270	267	268	253	173	213	124	119	122	384	367	371
15	270	266	268	175	148	159	154	122	135	523	380	408
16	269	263	267	166	148	158	158	128	150	540	523	533
17	273	264	268	173	152	160	159	125	145	528	408	475
18	301	264	278	169	159	164	160	122	145	408	376	386
19	259	218	246	194	168	184	169	153	162	404	379	388
20	247	212	227	200	185	193	188	162	177	438	403	416
21	214	203	208	246	149	218	205	185	197	469	436	449
22	207	202	204	176	148	159	223	199	212	487	467	474
23	223	197	204	159	151	155	243	217	231	520	476	490
24	232	183	209	171	160	166	260	239	250	542	508	521
25	183	174	180	174	163	170	274	259	267	597	524	578
26	191	175	185	183	165	176	290	272	280	693	561	649
27	200	191	196	202	180	192	311	290	297	661	553	568
28	205	198	201	214	192	204	320	311	317	620	555	577
29	---	---	---	232	208	223	321	299	306	662	620	640
30	---	---	---	226	210	218	314	303	312	699	662	685
31	---	---	---	221	205	214	---	---	---	775	699	723
MONTH	301	174	237	253	148	199	706	119	220	775	286	449

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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411138081172600 PO-121 NR RAVENNA OH--Continued

<div> <div>#3 (9.4' BLS)</div> <div>SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994</div> </div>												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	837	775	822	1470	1400	1440	---	---	---	---	---	---
2	787	738	752	1540	1400	1450	---	---	---	---	---	---
3	783	766	774	1570	1530	1550	---	---	---	---	---	---
4	796	781	789	1540	1510	1530	---	---	---	---	---	---
5	809	791	799	1560	1510	1540	---	---	---	---	---	---
6	828	794	815	1640	1560	1620	---	---	---	---	---	---
7	856	816	843	1770	1370	1540	---	---	---	---	---	---
8	903	850	879	---	---	---	---	---	---	---	---	---
9	922	887	908	---	---	---	---	---	---	---	---	---
10	951	912	937	---	---	---	---	---	---	---	---	---
11	1000	944	977	---	---	---	---	---	---	---	---	---
12	987	965	976	---	---	---	---	---	---	---	---	---
13	1020	973	994	---	---	---	---	---	---	---	---	---
14	1000	989	996	---	---	---	---	---	---	---	---	---
15	1080	994	1020	---	---	---	---	---	---	---	---	---
16	1150	1080	1110	---	---	---	---	---	---	---	---	---
17	1160	1140	1150	---	---	---	---	---	---	---	---	---
18	1150	1050	1120	---	---	---	---	---	---	---	---	---
19	1060	1040	1050	---	---	---	---	---	---	---	---	---
20	1140	1040	1080	---	---	---	---	---	---	---	---	---
21	1170	1120	1160	---	---	---	---	---	---	---	---	---
22	1120	1070	1100	---	---	---	---	---	---	---	---	---
23	1140	1070	1110	---	---	---	---	---	---	---	---	---
24	1240	1140	1180	---	---	---	---	---	---	---	---	---
25	1250	1240	1250	---	---	---	---	---	---	---	---	---
26	1260	1240	1250	---	---	---	---	---	---	---	---	---
27	1300	1260	1290	---	---	---	---	---	---	---	---	---
28	1290	1270	1290	---	---	---	---	---	---	---	---	---
29	1520	1280	1390	---	---	---	---	---	---	---	---	---
30	1540	1470	1510	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	1540	738	1040	1770	1370	1520	---	---	---	---	---	---
YEAR	1810	119	528									

<div> <div>#1 (17.4' BLS)</div> <div>WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994</div> </div>												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	12.3	12.0	12.1	12.2	12.0	12.0	10.9	10.6	10.8	10.2	10.0	10.1
2	12.2	12.0	12.1	12.2	12.0	12.1	10.9	10.6	10.7	10.2	10.0	10.0
3	12.3	12.0	12.2	12.0	12.0	12.0	10.9	10.6	10.7	10.2	10.0	10.0
4	12.3	12.0	12.2	12.0	12.0	12.0	11.3	10.9	11.0	10.2	10.0	10.0
5	12.3	12.0	12.2	12.0	12.0	12.0	11.5	10.4	11.0	10.0	10.0	10.0
6	---	---	---	12.0	12.0	12.0	10.2	10.0	10.2	10.2	10.0	10.0
7	---	---	---	12.0	12.0	12.0	10.2	10.2	10.2	10.2	9.8	10.0
8	---	---	---	12.2	12.0	12.0	10.3	10.0	10.2	10.2	9.8	10.0
9	---	---	---	12.2	12.0	12.0	10.4	10.2	10.3	10.2	9.8	10.0
10	---	---	---	12.2	12.0	12.0	10.3	10.2	10.2	10.6	9.7	10.3
11	---	---	---	12.0	12.0	12.0	10.4	10.2	10.4	10.6	10.4	10.6
12	---	---	---	12.0	12.0	12.0	10.5	10.2	10.4	10.7	10.5	10.6
13	---	---	---	12.0	12.0	12.0	10.5	10.4	10.4	10.6	10.6	10.6
14	---	---	---	12.0	12.0	12.0	10.5	10.4	10.4	10.6	10.6	10.6
15	---	---	---	12.0	12.0	12.0	10.5	10.4	10.4	10.6	10.4	10.5
16	---	---	---	12.0	12.0	12.0	10.5	10.4	10.4	10.6	10.4	10.5
17	---	---	---	12.0	12.0	12.0	10.5	10.4	10.4	10.6	10.4	10.5
18	---	---	---	12.0	11.5	11.8	10.5	10.4	10.4	10.6	10.4	10.4
19	---	---	---	11.3	11.3	11.3	10.4	10.4	10.4	10.6	10.2	10.4
20	---	---	---	11.3	11.3	11.3	10.4	10.4	10.4	10.6	10.4	10.4
21	---	---	---	11.3	11.3	11.3	10.4	10.4	10.4	10.4	10.4	10.4
22	---	---	---	11.4	11.3	11.3	10.4	10.2	10.3	10.4	10.4	10.4
23	---	---	---	11.3	11.3	11.3	10.2	10.2	10.2	10.4	10.2	10.4
24	---	---	---	11.3	11.3	11.3	10.4	10.2	10.2	10.4	10.2	10.3
25	---	---	---	11.3	11.3	11.3	10.2	10.2	10.2	10.2	10.0	10.2
26	---	---	---	11.3	11.3	11.3	10.2	10.2	10.2	10.2	10.0	10.2
27	---	---	---	11.8	11.3	11.5	10.2	10.2	10.2	10.2	10.0	10.2
28	12.2	12.0	12.1	12.0	11.1	11.6	10.2	10.2	10.2	10.2	7.9	9.9
29	12.0	12.0	12.0	10.9	10.6	10.8	10.4	10.0	10.2	7.5	6.7	6.9
30	12.2	12.0	12.1	10.9	10.6	10.8	10.2	10.0	10.2	6.8	6.6	6.7
31	12.2	12.0	12.0	---	---	---	10.2	10.0	10.1	6.7	6.6	6.6
MONTH	12.3	12.0	12.1	12.2	10.6	11.7	11.5	10.0	10.4	10.7	6.6	9.9







# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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411138081172600 PO-121 NR RAVENNA OH--Continued

#2 (13.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	13.2	12.9	13.1	12.6	12.4	12.6	10.9	10.6	10.8	9.8	9.6	9.6
2	13.2	12.9	13.2	12.6	12.4	12.5	10.9	10.6	10.7	9.8	9.6	9.6
3	13.2	13.0	13.1	12.4	12.4	12.4	10.9	10.6	10.7	9.8	9.6	9.6
4	13.2	13.0	13.2	12.5	12.4	12.4	11.1	10.6	10.9	9.6	9.4	9.6
5	13.2	12.9	13.1	12.5	12.4	12.5	11.3	10.4	10.7	9.6	9.4	9.6
6	---	---	---	12.4	12.4	12.4	10.4	10.0	10.2	9.6	9.4	9.5
7	---	---	---	12.4	12.2	12.4	10.2	10.2	10.2	9.6	9.4	9.4
8	---	---	---	12.4	12.2	12.3	10.2	9.8	10.1	9.6	9.4	9.4
9	---	---	---	12.4	12.0	12.2	10.0	10.0	10.0	9.6	9.4	9.4
10	---	---	---	12.2	12.0	12.1	10.0	9.8	10.0	9.4	9.1	9.4
11	---	---	---	12.2	12.0	12.1	10.2	10.0	10.0	9.4	9.2	9.3
12	---	---	---	12.0	12.0	12.0	10.2	10.0	10.1	9.2	9.0	9.1
13	---	---	---	12.0	12.0	12.0	10.2	10.0	10.1	9.0	9.0	9.0
14	---	---	---	12.0	12.0	12.0	10.2	10.0	10.0	9.2	9.0	9.1
15	---	---	---	12.0	11.8	12.0	10.2	10.0	10.1	9.4	8.9	9.1
16	---	---	---	12.0	11.7	11.9	10.2	10.0	10.2	9.2	8.9	9.1
17	---	---	---	12.0	11.7	11.9	10.2	10.0	10.1	9.2	9.0	9.0
18	---	---	---	11.7	11.3	11.5	10.0	10.0	10.0	9.2	8.7	9.0
19	---	---	---	11.3	11.1	11.3	10.2	10.0	10.0	9.1	8.7	8.9
20	---	---	---	11.3	11.3	11.3	10.0	10.0	10.0	9.0	8.7	8.8
21	---	---	---	11.3	11.3	11.3	10.0	10.0	10.0	8.8	8.7	8.8
22	---	---	---	11.3	11.1	11.3	10.0	9.8	10.0	9.0	8.8	8.8
23	---	---	---	11.3	11.3	11.3	10.0	9.8	9.8	8.8	8.6	8.8
24	---	---	---	11.3	11.3	11.3	10.0	9.8	9.9	8.8	8.6	8.7
25	---	---	---	11.3	11.3	11.3	10.0	9.8	9.8	9.4	8.4	8.9
26	---	---	---	11.3	11.3	11.3	10.0	9.6	9.8	9.4	9.4	9.4
27	---	---	---	11.7	11.3	11.5	9.8	9.6	9.8	10.0	9.2	9.5
28	12.7	12.6	12.7	11.7	10.6	11.3	9.8	9.6	9.8	10.0	7.3	9.4
29	12.7	12.5	12.6	10.9	10.6	10.8	10.0	9.6	9.8	7.1	6.4	6.6
30	12.7	12.6	12.7	10.9	10.6	10.8	9.8	9.6	9.7	6.6	6.4	6.4
31	12.6	12.4	12.6	---	---	---	9.8	9.6	9.7	6.5	6.4	6.4
MONTH	13.2	12.4	12.9	12.6	10.6	11.8	11.3	9.6	10.1	10.0	6.4	8.9

#2 (13.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	6.4	6.4	6.4	6.7	6.4	6.5	6.1	5.9	6.0	7.1	6.9	7.1
2	6.4	6.2	6.3	6.7	6.4	6.6	6.1	5.9	6.0	7.2	7.1	7.1
3	6.4	6.2	6.4	6.8	6.4	6.6	6.6	6.1	6.4	7.3	7.1	7.2
4	6.6	6.4	6.4	6.9	6.6	6.7	6.4	6.2	6.4	7.3	7.1	7.2
5	6.6	6.4	6.4	7.1	6.7	7.0	6.4	6.1	6.3	7.4	7.1	7.3
6	6.6	6.4	6.5	7.1	6.8	7.0	6.8	6.2	6.5	7.4	7.2	7.3
7	6.9	6.6	6.7	6.9	6.7	6.9	6.6	5.9	6.1	7.5	7.3	7.4
8	7.1	6.9	6.9	6.9	6.8	6.9	6.1	5.9	6.0	7.5	7.3	7.4
9	7.1	6.9	6.9	6.9	6.6	6.8	5.9	5.9	5.9	7.5	7.4	7.5
10	7.1	6.9	7.0	6.9	6.6	6.7	7.1	5.9	6.4	7.7	7.5	7.5
11	7.1	7.1	7.1	6.8	6.5	6.7	5.9	5.7	5.9	7.7	7.5	7.6
12	7.3	7.1	7.2	6.9	6.4	6.7	6.9	5.8	6.1	7.7	7.5	7.6
13	7.3	7.1	7.3	7.5	6.8	7.0	5.9	5.7	5.8	7.7	7.5	7.6
14	7.5	7.1	7.3	6.6	6.1	6.4	6.0	5.8	5.9	7.9	7.7	7.7
15	7.5	7.1	7.3	6.1	5.7	5.9	6.1	5.9	5.9	7.9	7.5	7.7
16	7.7	7.3	7.5	5.9	5.9	5.9	6.1	5.9	5.9	7.7	7.5	7.7
17	7.7	7.4	7.5	5.9	5.8	5.9	6.1	6.1	6.1	7.7	7.5	7.7
18	7.8	7.3	7.5	6.1	5.7	5.9	6.3	6.1	6.2	7.7	7.5	7.7
19	7.5	7.1	7.4	6.1	5.9	6.0	6.5	6.3	6.3	7.9	7.7	7.8
20	7.3	7.1	7.2	6.1	5.9	6.0	6.4	6.3	6.4	8.1	7.9	7.9
21	7.1	6.9	7.0	6.8	6.1	6.4	6.4	6.4	6.4	8.1	7.9	8.0
22	7.1	6.9	6.9	6.2	5.4	5.7	6.6	6.4	6.5	8.1	7.9	8.1
23	7.3	6.7	7.0	5.5	5.2	5.4	6.6	6.4	6.6	8.1	7.9	8.1
24	7.1	6.6	6.9	5.6	5.2	5.4	6.8	6.6	6.6	8.1	7.9	8.1
25	6.7	6.2	6.5	5.7	5.5	5.6	6.9	6.6	6.7	8.1	7.9	8.1
26	6.4	6.2	6.3	5.9	5.6	5.7	7.0	6.6	6.8	8.1	7.9	8.0
27	6.5	6.2	6.4	5.9	5.9	5.9	7.0	6.6	6.9	8.1	7.9	8.0
28	6.6	6.3	6.4	6.1	5.9	5.9	7.0	6.9	7.0	8.3	8.0	8.1
29	---	---	---	6.1	5.9	6.1	7.2	6.8	7.0	8.3	8.0	8.2
30	---	---	---	6.1	5.9	6.0	7.1	7.0	7.1	8.3	8.1	8.2
31	---	---	---	6.1	5.9	6.0	---	---	---	8.3	8.1	8.2
MONTH	7.8	6.2	6.9	7.5	5.2	6.3	7.2	5.7	6.3	8.3	6.9	7.7

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

411138081172600 PO-121 NR RAVENNA OH--Continued

#2 (13.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.3	8.1	8.1	9.7	9.4	9.6	---	---	---	---	---	---
2	8.3	8.1	8.2	9.7	9.3	9.5	---	---	---	---	---	---
3	8.3	8.1	8.2	9.7	9.5	9.6	---	---	---	---	---	---
4	8.5	8.2	8.3	9.9	9.5	9.7	---	---	---	---	---	---
5	8.5	8.2	8.3	9.9	9.7	9.8	---	---	---	---	---	---
6	8.5	8.3	8.4	10.1	9.7	9.8	---	---	---	---	---	---
7	8.7	8.3	8.5	---	9.9	---	---	---	---	---	---	---
8	8.7	8.5	8.5	---	---	---	---	---	---	---	---	---
9	8.7	8.4	8.5	---	---	---	---	---	---	---	---	---
10	8.7	8.4	8.6	---	---	---	---	---	---	---	---	---
11	8.7	8.5	8.6	---	---	---	---	---	---	---	---	---
12	8.7	8.5	8.6	---	---	---	---	---	---	---	---	---
13	8.7	8.6	8.7	---	---	---	---	---	---	---	---	---
14	8.9	8.7	8.7	---	---	---	---	---	---	---	---	---
15	8.9	8.7	8.8	---	---	---	---	---	---	---	---	---
16	8.9	8.7	8.8	---	---	---	---	---	---	---	---	---
17	8.9	8.7	8.8	---	---	---	---	---	---	---	---	---
18	8.9	8.7	8.8	---	---	---	---	---	---	---	---	---
19	8.9	8.7	8.8	---	---	---	---	---	---	---	---	---
20	9.1	8.9	8.9	---	---	---	---	---	---	---	---	---
21	9.1	8.7	8.9	---	---	---	---	---	---	---	---	---
22	9.1	8.8	9.0	---	---	---	---	---	---	---	---	---
23	9.3	9.0	9.1	---	---	---	---	---	---	---	---	---
24	9.3	8.9	9.1	---	---	---	---	---	---	---	---	---
25	9.1	8.9	9.0	---	---	---	---	---	---	---	---	---
26	9.3	9.0	9.1	---	---	---	---	---	---	---	---	---
27	9.2	9.0	9.1	---	---	---	---	---	---	---	---	---
28	9.5	9.2	9.3	---	---	---	---	---	---	---	---	---
29	9.5	9.0	9.3	---	---	---	---	---	---	---	---	---
30	9.7	9.2	9.4	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	9.7	8.1	8.7	10.1	9.3	9.7	---	---	---	---	---	---
YEAR	13.2	5.2	8.5									

#3 (9.4' BLS) WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.2	13.9	14.1	12.7	12.6	12.7	10.6	10.4	10.5	9.6	9.4	9.4
2	14.2	13.9	14.0	12.7	12.6	12.7	10.5	10.4	10.4	9.6	9.4	9.4
3	14.2	13.9	14.1	12.7	12.4	12.6	10.5	10.4	10.4	9.6	9.4	9.5
4	14.2	13.9	14.0	12.5	12.4	12.4	10.7	10.2	10.5	9.4	9.4	9.4
5	14.2	13.9	13.9	12.5	12.4	12.5	10.7	9.8	10.3	9.4	9.4	9.4
6	---	---	---	12.4	12.4	12.4	9.8	9.6	9.6	9.4	9.4	9.4
7	---	---	---	12.4	12.4	12.4	9.8	9.6	9.7	9.4	9.4	9.4
8	---	---	---	12.4	12.2	12.3	9.8	9.4	9.7	9.4	9.2	9.4
9	---	---	---	12.4	12.2	12.3	9.8	9.6	9.7	9.4	9.2	9.3
10	---	---	---	12.2	12.0	12.1	9.8	9.6	9.7	9.4	9.1	9.2
11	---	---	---	12.2	12.0	12.1	10.0	9.8	9.9	9.4	9.0	9.1
12	---	---	---	12.0	12.0	12.0	10.0	9.6	9.9	9.0	8.8	9.0
13	---	---	---	12.0	12.0	12.0	10.0	9.6	10.0	9.0	8.8	9.0
14	---	---	---	12.0	12.0	12.0	10.0	9.8	9.9	9.2	9.0	9.0
15	---	---	---	12.0	11.8	12.0	10.0	9.6	10.0	9.2	8.7	9.0
16	---	---	---	11.8	11.3	11.5	10.0	9.8	10.0	9.2	8.7	8.9
17	---	---	---	12.0	11.3	11.7	10.0	9.8	10.0	9.0	8.8	8.9
18	---	---	---	11.7	10.6	11.1	10.0	9.8	9.9	9.0	8.7	8.9
19	---	---	---	10.9	10.6	10.7	10.0	9.8	9.9	9.0	8.7	8.8
20	---	---	---	11.1	10.6	10.9	10.0	9.6	9.8	9.0	8.5	8.8
21	---	---	---	11.1	10.7	10.9	9.8	9.6	9.8	8.8	8.5	8.7
22	---	---	---	11.1	10.6	10.8	9.8	9.6	9.7	8.8	8.6	8.8
23	---	---	---	11.1	10.9	10.9	9.6	9.6	9.6	8.8	8.6	8.7
24	---	---	---	11.1	10.7	10.9	9.8	9.6	9.6	8.8	8.6	8.6
25	---	---	---	11.1	10.6	10.9	9.8	9.4	9.6	8.6	8.0	8.3
26	---	---	---	11.1	10.6	10.9	9.6	9.4	9.5	8.0	7.6	7.9
27	---	---	---	11.5	10.7	11.2	9.6	9.4	9.6	9.2	7.5	7.8
28	12.9	12.9	12.9	11.3	10.2	10.8	9.6	9.4	9.6	9.8	6.7	9.2
29	12.9	12.7	12.9	10.4	10.2	10.3	9.8	9.3	9.5	6.6	5.9	6.1
30	12.9	12.9	12.9	10.5	10.4	10.4	9.6	9.4	9.5	6.0	5.9	5.9
31	12.9	12.6	12.8	---	---	---	9.6	9.4	9.4	5.9	5.7	5.8
MONTH	14.2	12.6	13.5	12.7	10.2	11.6	10.7	9.3	9.8	9.8	5.7	8.7



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER RECORDS

393541083001100. Local number, PK-48.

LOCATION.--Lat 39°35'41" Long 83°00'11", Hydrologic Unit 05060002, along State Route 104 near Circleville, OH.  
Owner.--USGS-Stacy Thomas.

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 28 ft. Cased with Sch 40 PVC to 8 ft; .010 in. screen from 8 to 28 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: water level, air temperature, soil temperature, water temperature, and specific conductance. Conductivity/water temperature probe set at 16.0 feet below land surface.

DATUM.--Elevation of land-surface datum is 678.50 feet above sea level.  
Measuring point: shelter shelf 3.36 ft above land-surface datum.

REMARKS.--

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

PERIOD OF DAILY RECORD.--

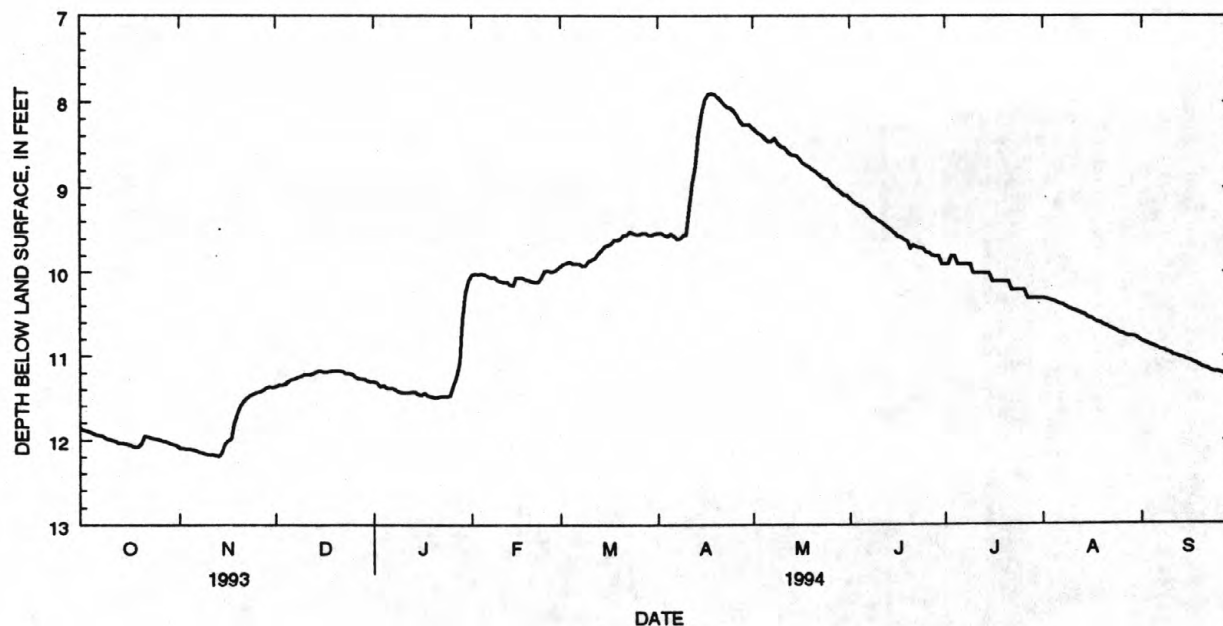
WATER LEVEL: February 1991 to current year.  
SPECIFIC CONDUCTANCE: February 1991 to current year.  
AIR TEMPERATURE: February 1991 to current year.  
WATER TEMPERATURE: February 1991 to current year.  
SOIL TEMPERATURE: February 1991 to current year.  
PRECIPITATION: February 1991 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER LEVEL: Maximum daily low, 13.11 ft. below land-surface datum, June 18, 1992; maximum daily high, 6.68 ft. below land-surface datum, March 27, 1991.  
SPECIFIC CONDUCTANCE: Maximum, 933 microsiemens April 15, 1994; minimum, 585 microsiemens October 23, 1992.  
AIR TEMPERATURE: Maximum, 37.0°C June 29 and August 1, 1991; minimum, -34.1°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 15.0°C October 20-21 1991; minimum, 10.6°C April 29, 1993.  
SOIL TEMPERATURE: Maximum, 32.5°C September 16, 1991; minimum, -2.2°C February 12, 1994.

EXTREMES FOR CURRENT YEAR.--

WATER LEVEL: Maximum daily low, 12.19 ft. below land-surface datum, November 13, 1993; maximum daily high, 7.87 ft. below land-surface datum, April 18-19, 1994.  
SPECIFIC CONDUCTANCE: Maximum, 933 microsiemens April 15, 1994; minimum, 621 microsiemens October 3, 1993.  
AIR TEMPERATURE: Maximum, 35.9°C June 19-20, 1994; minimum, -34.1°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 14.8°C many days October, November 1993; minimum, 11.0°C May 1-2, 4, 8, 1994.  
SOIL TEMPERATURE: Maximum, 25.3°C July 7, 1994; minimum, -2.2°C February 12, 1994.





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DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	11.86	11.85	12.09	12.06	11.36	11.34	11.30	11.29	10.04	10.02	9.93	9.91
2	11.88	11.86	12.09	12.09	11.34	11.33	11.32	11.30	10.02	10.00	9.91	9.88
3	11.89	11.88	12.10	12.09	11.34	11.33	11.36	11.31	10.03	10.00	9.89	9.87
4	11.90	11.89	12.10	12.09	11.33	11.30	11.35	11.31	10.02	10.01	9.88	9.86
5	11.92	11.90	12.11	12.09	11.30	11.28	11.38	11.35	10.03	10.01	9.90	9.88
6	11.93	11.92	12.12	12.11	11.28	11.27	11.38	11.37	10.05	10.03	9.90	9.88
7	11.94	11.93	12.14	12.12	11.27	11.25	11.38	11.38	10.07	10.05	9.90	9.89
8	11.95	11.94	12.15	12.14	11.25	11.24	11.41	11.38	10.06	10.03	9.92	9.90
9	11.98	11.95	12.16	12.15	11.24	11.22	11.42	11.41	10.10	10.03	9.92	9.86
10	11.99	11.98	12.17	12.16	11.22	11.21	11.43	11.42	10.11	10.10	9.87	9.85
11	12.00	11.99	12.17	12.17	11.22	11.21	11.43	11.42	10.12	10.09	9.85	9.83
12	12.01	12.00	12.18	12.17	11.22	11.20	11.43	11.42	10.12	10.11	9.83	9.78
13	12.03	12.01	12.19	12.17	11.20	11.18	11.42	11.40	10.15	10.12	9.78	9.74
14	12.03	12.03	12.17	12.05	11.18	11.17	11.42	11.40	10.16	10.07	9.74	9.69
15	12.04	12.03	12.05	12.01	11.17	11.17	11.45	11.42	10.07	10.05	9.69	9.67
16	12.05	12.04	12.01	11.98	11.19	11.17	11.46	11.42	10.07	10.05	9.68	9.66
17	12.06	12.05	11.98	11.81	11.19	11.18	11.44	11.41	10.07	10.05	9.66	9.60
18	12.08	12.06	11.81	11.69	11.18	11.16	11.47	11.44	10.09	10.07	9.62	9.56
19	12.08	12.04	11.69	11.59	11.17	11.16	11.48	11.47	10.10	10.09	9.62	9.59
20	12.04	11.95	11.59	11.54	11.17	11.15	11.49	11.48	10.11	10.10	9.60	9.56
21	11.95	11.94	11.54	11.50	11.17	11.15	11.49	11.48	10.12	10.11	9.56	9.54
22	11.96	11.95	11.50	11.47	11.18	11.17	11.48	11.48	10.12	10.07	9.56	9.52
23	11.97	11.96	11.47	11.45	11.20	11.18	11.48	11.48	10.07	9.98	9.52	9.51
24	11.98	11.97	11.45	11.43	11.20	11.19	11.48	11.47	9.99	9.97	9.53	9.50
25	11.99	11.98	11.43	11.42	11.21	11.18	11.47	11.35	9.98	9.94	9.55	9.53
26	12.00	11.99	11.42	11.41	11.24	11.21	11.35	11.27	10.00	9.97	9.55	9.51
27	12.01	12.00	11.41	11.38	11.26	11.24	11.27	11.07	9.99	9.96	9.53	9.49
28	12.02	12.01	11.38	11.36	11.27	11.26	11.07	10.57	9.96	9.93	9.53	9.52
29	12.04	12.02	11.36	11.35	11.27	11.24	10.57	10.24	---	---	9.56	9.52
30	12.05	12.04	11.37	11.36	11.29	11.27	10.24	10.10	---	---	9.56	

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	9.53	9.52	8.31	8.23	9.13	9.09	9.91	9.91	10.31	10.31	10.82	10.79
2	9.53	9.52	8.34	8.31	9.17	9.13	9.91	9.81	10.32	10.31	10.84	10.82
3	9.56	9.51	8.37	8.34	9.19	9.17	9.81	9.81	10.33	10.31	10.85	10.84
4	9.57	9.53	8.39	8.37	9.21	9.19	9.81	9.81	10.34	10.33	10.87	10.85
5	9.54	9.53	8.43	8.39	9.23	9.21	9.91	9.81	10.36	10.34	10.88	10.87
6	9.57	9.53	8.46	8.43	9.26	9.23	9.91	9.91	10.38	10.36	10.90	10.88
7	9.60	9.57	8.46	8.38	9.30	9.26	9.91	9.91	10.39	10.38	10.92	10.90
8	9.60	9.56	8.43	8.40	9.34	9.30	9.91	9.91	10.41	10.39	10.93	10.92
9	9.56	9.55	8.48	8.43	9.36	9.34	9.91	9.91	10.43	10.41	10.95	10.93
10	9.56	9.18	8.52	8.48	9.39	9.36	10.01	9.91	10.45	10.43	10.96	10.95
11	9.18	8.95	8.53	8.51	9.41	9.39	10.01	10.01	10.46	10.45	10.99	10.96
12	8.95	8.75	8.57	8.51	9.44	9.41	10.01	10.01	10.48	10.46	11.00	10.99
13	8.75	8.37	8.61	8.57	9.47	9.44	10.01	10.01	10.49	10.48	11.01	11.00
14	8.37	8.14	8.62	8.60	9.50	9.47	10.01	10.01	10.51	10.49	11.02	11.01
15	8.14	7.98	8.63	8.61	9.53	9.50	10.01	10.01	10.54	10.51	11.04	11.02
16	7.98	7.92	8.67	8.63	9.57	9.53	10.11	10.01	10.55	10.54	11.05	11.04
17	7.92	7.90	8.71	8.67	9.59	9.57	10.11	10.11	10.57	10.55	11.07	11.05
18	7.90	7.87	8.73	8.71	9.61	9.59	10.11	10.11	10.59	10.57	11.09	11.07
19	7.92	7.87	8.76	8.73	9.63	9.61	10.11	10.11	10.60	10.59	11.11	11.08
20	7.95	7.92	8.79	8.76	9.72	9.58	10.11	10.11	10.62	10.60	11.13	11.11
21	7.99	7.95	8.81	8.79	9.68	9.66	10.11	10.11	10.64	10.62	11.14	11.13
22	8.03	7.99	8.84	8.81	9.70	9.68	10.21	10.11	10.66	10.64	11.16	11.14
23	8.06	8.03	8.87	8.84	9.71	9.70	10.21	10.21	10.68	10.66	11.18	11.16
24	8.07	8.04	8.89	8.87	9.72	9.71	10.21	10.21	10.70	10.68	11.19	11.18
25	8.11	8.07	8.91	8.89	9.76	9.72	10.21	10.21	10.72	10.70	11.19	11.18
26	8.16	8.11	8.96	8.91	9.77	9.76	10.21	10.21	10.73	10.72	11.20	11.19
27	8.23	8.16	9.00	8.96	9.80	9.77	10.31	10.21	10.75	10.73	11.22	11.20
28	8.27	8.23	9.02	9.00	9.81	9.80	10.31	10.31	10.76	10.75	11.24	11.22
29	8.27	8.24	9.05	9.02	9.81	9.81	10.31	10.31	10.76	10.76	11.25	11.24
30	8.27	8.23	9.09	9.05	9.91	9.81	10.31	10.21	10.77	10.76	11.27	11.25
31	---	---	9.09	9.08	---	---	10.31	10.31	10.79	10.77	---	---
MONTH	9.60	7.87	9.09	8.23	9.91	9.09	10.31	9.81	10.79	10.31	11.27	10.79



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

393541083001100 PK-48 NR CIRCLEVILLE OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	628	623	624	649	645	648	692	682	688	708	701	705
2	625	623	624	650	646	648	692	687	690	708	699	704
3	626	621	625	649	645	648	693	691	692	706	699	703
4	627	622	626	649	645	647	694	691	693	705	701	704
5	629	627	628	648	647	647	700	694	697	705	700	703
6	630	627	629	649	648	648	705	694	699	705	698	702
7	630	628	629	650	646	649	708	698	703	705	701	701
8	631	629	630	650	646	648	710	703	707	705	697	700
9	633	630	631	650	645	647	711	706	709	705	698	701
10	634	632	633	650	645	647	713	710	712	702	697	700
11	635	631	633	649	645	647	717	710	714	701	696	699
12	635	632	633	648	647	648	718	713	715	700	695	699
13	636	633	635	648	648	648	718	714	716	699	695	698
14	637	633	635	648	647	648	719	714	717	700	695	698
15	638	634	636	650	647	648	723	715	718	699	697	699
16	637	635	636	656	650	651	725	719	723	700	696	699
17	636	635	636	656	652	652	725	720	723	701	695	699
18	638	636	638	663	652	658	724	721	724	701	697	698
19	639	638	638	667	659	664	724	719	723	701	698	700
20	639	638	638	672	664	669	724	718	722	702	696	699
21	640	637	639	677	669	673	724	719	722	703	695	698
22	643	637	641	681	674	678	723	717	721	698	692	696
23	646	641	644	682	677	680	722	716	720	697	693	694
24	646	642	645	683	681	682	720	715	718	697	692	694
25	647	642	645	684	682	683	719	713	716	697	693	696
26	646	642	645	685	682	684	719	713	715	699	694	698
27	646	645	646	686	682	685	718	710	713	700	699	699
28	648	646	647	688	683	686	717	709	712	721	700	707
29	648	646	647	689	684	688	713	708	711	771	721	745
30	648	644	648	690	683	687	711	705	708	806	771	790
31	648	644	647	---	---	---	710	703	707	824	806	816
MONTH	648	621	636	690	645	661	725	682	711	824	692	708

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	832	824	828	691	687	688	697	693	694	846	836	842
2	833	827	830	691	687	689	695	691	693	850	844	846
3	832	825	829	691	685	689	732	728	729	846	843	844
4	831	821	825	690	687	689	694	690	692	845	840	842
5	822	814	818	690	686	688	693	688	691	841	835	838
6	814	804	809	689	684	686	693	689	691	835	829	832
7	805	797	801	687	683	685	693	687	690	829	822	825
8	797	788	792	687	683	684	694	689	691	825	815	819
9	788	780	784	686	682	683	693	689	691	815	806	811
10	780	770	775	687	680	684	727	691	698	807	800	803
11	770	761	766	687	681	684	827	727	788	801	794	798
12	761	753	757	686	681	684	853	827	840	795	793	794
13	753	747	749	684	682	683	891	853	868	796	792	794
14	747	737	741	685	683	684	931	891	915	797	794	795
15	737	729	732	687	684	686	933	917	928	794	793	794
16	730	722	726	690	687	689	917	891	903	795	793	795
17	723	716	719	692	689	691	891	870	879	796	794	795
18	721	712	716	696	691	693	870	853	861	799	796	798
19	715	709	711	697	694	695	853	844	849	802	799	800
20	711	706	708	699	695	697	845	837	841	805	802	803
21	706	703	704	700	696	698	838	831	834	812	805	808
22	703	700	702	703	698	701	832	826	829	819	812	815
23	700	696	698	708	701	704	827	821	824	828	819	825
24	698	697	698	712	705	709	823	818	820	835	828	831
25	697	694	695	713	708	711	823	818	819	840	833	837
26	696	693	695	712	707	709	825	818	821	847	840	843
27	695	689	692	707	705	706	825	820	821	854	847	850
28	692	688	690	706	701	703	828	821	824	858	854	856
29	---	---	---	703	700	701	833	825	828	861	858	860
30	---	---	---	702	697	699	836	830	834	866	860	863
31	---	---	---	699	695	697	---	---	---	878	866	872
MONTH	833	688	750	713	680	693	933	687	796	878	792	823

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

301

393541083001100 PK-48 NR CIRCLEVILLE OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	887	876	881	751	745	750	691	689	690	682	680	681
2	897	887	892	749	743	747	692	689	690	682	681	682
3	906	897	901	746	742	744	695	691	693	683	682	682
4	908	906	907	743	737	742	694	692	693	684	682	683
5	910	908	909	741	737	740	695	693	694	684	682	683
6	911	907	909	740	733	738	697	693	694	684	683	684
7	913	911	912	737	730	733	695	691	694	685	684	684
8	913	907	910	734	728	730	695	692	694	685	684	685
9	907	899	903	731	724	727	696	692	693	689	685	686
10	899	890	896	724	721	723	695	692	693	687	685	686
11	890	883	887	722	719	721	694	692	693	687	686	687
12	883	876	879	719	716	718	695	693	694	688	686	687
13	876	866	871	716	713	715	695	693	694	688	687	687
14	866	852	861	713	710	712	695	693	694	689	684	688
15	855	837	848	711	708	709	696	693	694	689	684	689
16	842	825	834	709	707	708	695	692	694	690	685	688
17	828	812	821	708	706	707	696	689	694	690	686	687
18	812	801	807	707	704	705	695	689	693	690	686	686
19	801	792	798	705	702	704	694	687	691	687	685	686
20	793	785	789	702	700	701	691	686	687	687	685	686
21	787	780	783	703	700	701	693	687	690	687	685	686
22	781	776	779	700	698	699	692	688	690	687	686	686
23	776	772	774	701	697	698	691	689	690	687	686	687
24	773	768	771	698	696	697	691	688	689	687	686	687
25	769	765	767	697	696	696	690	687	689	687	687	687
26	766	763	765	698	693	697	688	687	688	689	687	688
27	763	760	762	697	693	696	688	686	687	689	688	688
28	760	757	759	696	690	694	687	684	686	689	688	689
29	757	750	755	696	692	693	687	681	684	690	688	689
30	753	750	752	696	690	692	687	680	682	691	689	690
31	---	---	---	693	691	692	681	680	681	---	---	---
MONTH	913	750	836	751	690	714	697	680	691	691	680	686
YEAR	933	621	725									

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	23.3	1.6	12.9	3.8	-5.4	.1	11.0	-6.0	1.2	2.1	-7.5	-1.7
2	17.9	5.7	12.1	7.8	-5.9	.8	11.8	-6	5.2	1.0	-.9	.1
3	17.3	-.8	8.2	5.3	.9	3.4	7.9	5.0	6.5	-.3	-1.9	-1.4
4	23.2	2.7	12.9	13.1	.1	7.5	12.0	5.8	9.6	-1.7	-8.9	-4.4
5	17.8	2.5	10.0	16.0	3.3	10.5	5.5	2.6	3.9	-4.2	-7.0	-5.4
6	24.5	-1.0	10.9	3.7	-.7	2.3	5.8	.9	3.5	.7	-3.9	-1.2
7	28.0	6.6	16.3	.2	-5.6	-2.0	5.4	-2.3	1.4	.3	-7.5	-2.2
8	26.3	6.3	14.7	9.7	-6.4	-.4	8.0	-4.1	1.0	-8.8	-14.9	-11.8
9	15.8	4.8	10.8	12.1	-6.8	.8	11.5	-4.8	3.9	-4.9	-16.9	-12.2
10	10.0	-1.4	3.8	13.9	-6.9	1.5	13.9	.8	8.2	-2.2	-17.0	-9.4
11	11.7	-3.1	4.4	14.5	-4.5	5.7	-.3	-8.2	-3.8	3.5	-3.7	.4
12	14.0	1.2	8.5	16.3	8.7	11.3	3.0	-10.6	-4.8	1.2	-.7	.0
13	14.3	3.3	8.1	14.4	7.5	10.6	8.3	-8.2	-1.3	.4	-2.4	-.4
14	19.5	2.5	8.8	19.6	14.1	15.5	8.5	-1.1	3.0	-3.8	-17.2	-10.2
15	23.9	1.3	11.5	16.0	6.4	11.7	5.0	.3	3.3	-15.5	-22.1	-18.6
16	15.6	9.1	13.1	11.1	3.7	6.9	4.7	-2.6	1.8	-9.5	-23.0	-16.8
17	20.5	9.6	14.8	15.0	5.1	9.2	3.1	.9	2.1	-2.3	-17.8	-8.3
18	15.8	8.3	11.4	9.9	-.1	4.3	4.3	-.2	2.5	-18.7	-30.2	-24.1
19	16.1	5.6	10.9	10.5	1.7	6.5	3.0	-.8	1.2	-19.0	-34.1	-25.0
20	21.0	12.0	16.1	4.2	-4.7	-.2	2.6	-.9	.6	-13.5	-26.2	-17.3
21	18.6	2.7	11.2	10.3	-3.5	2.5	.0	-4.1	-2.5	-9.2	-32.2	-20.1
22	14.9	-2.1	5.7	14.0	-1.3	4.1	.1	-4.0	-2.0	-2.0	-14.6	-9.0
23	17.2	-3.3	5.5	12.9	-3.4	4.3	-1.7	-3.8	-2.9	1.9	-2.6	.9
24	20.5	-1.6	7.8	14.5	3.8	8.7	-3.5	-5.2	-4.3	2.3	.9	1.6
25	21.4	-.8	8.8	12.9	2.3	6.7	-2.9	-12.8	-6.3	2.2	-.8	.7
26	21.6	2.7	10.5	17.1	6.4	10.5	-7.4	-13.4	-10.5	-.6	-5.6	-3.6
27	11.1	5.3	8.0	8.8	-3.4	1.2	-6.3	-12.9	-9.1	4.6	-2.4	1.8
28	8.8	-.5	5.1	1.4	-5.0	-1.6	-6.7	-17.5	-9.9	8.9	-1.3	3.9
29	13.1	2.5	8.3	-.2	-3.4	-1.5	-4.4	-20.4	-11.5	-.7	-4.9	-2.7
30	1.8	-1.0	.1	4.5	-2.6	.2	-8.5	-15.6	-11.8	.1	-6.7	-3.7
31	2.2	-.2	.9	---	---	---	1.0	-8.4	-4.3	-2.2	-11.3	-6.4
MONTH	28.0	-3.3	9.4	19.6	-6.9	4.7	13.9	-20.4	-.8	8.9	-34.1	-6.7



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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393541083001100 PK-48 NR CIRCLEVILLE OH--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.6	14.3	14.5	14.8	14.5	14.5	14.5	14.0	14.2	13.5	13.3	13.3
2	14.6	14.5	14.6	14.8	14.5	14.6	14.3	14.0	14.1	13.5	13.0	13.3
3	14.8	14.5	14.6	14.8	14.5	14.6	14.0	14.0	14.0	13.5	13.0	13.3
4	14.8	14.5	14.6	14.8	14.5	14.6	14.1	14.0	14.1	13.5	13.3	13.3
5	14.6	14.5	14.6	14.6	14.5	14.6	14.3	14.0	14.0	13.5	13.3	13.4
6	14.6	14.5	14.6	14.5	14.5	14.5	14.3	13.8	14.1	13.5	13.0	13.3
7	14.6	14.5	14.6	14.8	14.5	14.6	14.3	13.8	13.9	13.3	13.0	13.3
8	14.6	14.5	14.6	14.8	14.5	14.6	14.0	13.8	13.9	13.5	13.0	13.3
9	14.6	14.5	14.6	14.8	14.5	14.6	14.0	13.8	13.8	13.5	13.0	13.2
10	14.6	14.5	14.6	14.8	14.5	14.6	13.8	13.8	13.8	13.3	13.0	13.2
11	14.8	14.5	14.6	14.8	14.5	14.6	14.0	13.8	13.9	13.3	13.0	13.1
12	14.6	14.5	14.6	14.6	14.5	14.6	14.0	13.8	13.9	13.3	13.0	13.1
13	14.6	14.5	14.6	14.6	14.5	14.6	14.0	13.8	13.9	13.3	13.0	13.1
14	14.8	14.5	14.6	14.6	14.6	14.6	14.0	13.8	13.8	13.3	13.0	13.1
15	14.8	14.5	14.6	14.6	14.5	14.6	14.0	13.5	13.8	13.3	13.2	13.2
16	14.6	14.5	14.6	14.6	14.3	14.5	13.8	13.5	13.6	13.3	13.0	13.2
17	14.6	14.6	14.6	14.6	14.3	14.5	13.8	13.5	13.6	13.3	13.0	13.1
18	14.6	14.5	14.6	14.8	14.3	14.5	13.8	13.5	13.6	13.2	13.0	13.2
19	14.6	14.5	14.6	14.6	14.3	14.4	13.8	13.5	13.6	13.2	13.0	13.1
20	14.6	14.6	14.6	14.5	14.3	14.3	13.8	13.5	13.6	13.0	13.0	13.0
21	14.8	14.5	14.6	14.6	14.3	14.4	13.8	13.5	13.6	13.2	13.0	13.1
22	14.8	14.5	14.6	14.5	14.3	14.3	13.8	13.5	13.6	13.1	13.0	13.0
23	14.8	14.5	14.6	14.5	14.3	14.4	13.8	13.5	13.6	13.1	12.8	13.0
24	14.8	14.5	14.6	14.3	14.3	14.3	13.8	13.5	13.6	13.1	12.8	13.0
25	14.8	14.5	14.6	14.3	14.3	14.3	13.8	13.5	13.7	13.1	12.8	12.9
26	14.8	14.5	14.6	14.3	14.3	14.3	13.8	13.5	13.7	13.0	12.8	12.8
27	14.6	14.5	14.6	14.5	14.3	14.3	13.8	13.3	13.7	12.8	12.8	12.8
28	14.6	14.5	14.5	14.5	14.3	14.4	13.7	13.3	13.5	12.9	12.8	12.8
29	14.6	14.5	14.6	14.5	14.3	14.3	13.7	13.3	13.5	12.8	12.8	12.8
30	14.8	14.5	14.5	14.5	14.0	14.3	13.7	13.3	13.5	12.8	12.8	12.8
31	14.8	14.5	14.6	---	---	---	13.5	13.3	13.4	12.8	12.8	12.8
MONTH	14.8	14.3	14.6	14.8	14.0	14.5	14.5	13.3	13.8	13.5	12.8	13.1

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	12.8	12.8	12.8	12.4	12.1	12.3	11.7	11.7	11.7	11.3	11.0	11.2
2	12.8	12.6	12.8	12.4	12.1	12.3	11.7	11.5	11.7	11.3	11.0	11.2
3	12.8	12.5	12.7	12.4	12.1	12.2	---	---	---	11.3	11.2	11.3
4	12.8	12.5	12.6	12.2	12.1	12.1	11.7	11.5	11.7	11.3	11.0	11.3
5	12.6	12.6	12.6	12.2	12.1	12.1	11.7	11.5	11.7	11.3	11.3	11.3
6	12.6	12.5	12.6	12.2	12.0	12.1	11.7	11.5	11.6	11.3	11.1	11.3
7	12.6	12.6	12.6	12.2	11.9	12.1	11.7	11.5	11.6	11.3	11.3	11.3
8	12.6	12.6	12.6	12.1	11.9	12.1	11.7	11.4	11.6	11.3	11.0	11.3
9	12.6	12.5	12.6	12.1	11.9	12.1	11.7	11.5	11.5	11.3	11.1	11.3
10	12.6	12.5	12.6	12.2	11.9	12.0	11.5	11.5	11.5	11.3	11.2	11.3
11	12.6	12.6	12.6	12.1	11.9	11.9	11.5	11.2	11.3	11.3	11.2	11.3
12	12.6	12.6	12.6	12.0	11.9	11.9	11.3	11.3	11.3	11.3	11.3	11.3
13	12.6	12.6	12.6	11.9	11.9	11.9	11.3	11.3	11.3	11.3	11.2	11.3
14	12.6	12.6	12.6	11.9	11.9	11.9	11.3	11.2	11.3	11.3	11.2	11.3
15	12.6	12.6	12.6	12.0	11.9	11.9	11.3	11.3	11.3	11.3	11.3	11.3
16	12.6	12.6	12.6	11.9	11.9	11.9	11.3	11.3	11.3	11.3	11.3	11.3
17	12.6	12.4	12.6	11.9	11.9	11.9	11.3	11.2	11.3	11.3	11.3	11.3
18	12.6	12.3	12.5	11.9	11.9	11.9	11.3	11.2	11.3	11.3	11.2	11.3
19	12.6	12.4	12.5	12.0	11.9	11.9	11.3	11.3	11.3	11.3	11.2	11.3
20	12.4	12.4	12.4	12.0	11.9	11.9	11.3	11.2	11.3	11.3	11.2	11.3
21	12.4	12.4	12.4	12.0	11.7	11.9	11.3	11.3	11.3	11.3	11.2	11.3
22	12.4	12.3	12.4	12.0	11.7	11.9	11.3	11.2	11.3	11.4	11.2	11.3
23	12.4	12.4	12.4	12.0	11.7	11.8	11.3	11.2	11.3	11.3	11.3	11.3
24	12.4	12.3	12.3	12.0	11.7	11.8	11.3	11.2	11.3	11.3	11.1	11.3
25	12.4	12.3	12.4	11.9	11.7	11.7	11.3	11.1	11.3	11.3	11.3	11.3
26	12.4	12.3	12.3	11.7	11.7	11.7	11.3	11.1	11.3	11.3	11.3	11.3
27	12.4	12.3	12.3	11.7	11.7	11.7	11.3	11.1	11.3	11.3	11.3	11.3
28	12.4	12.3	12.3	11.7	11.7	11.7	11.3	11.1	11.3	11.3	11.2	11.3
29	---	---	---	11.7	11.7	11.7	11.3	11.1	11.3	11.3	11.2	11.3
30	---	---	---	11.7	11.7	11.7	11.3	11.3	11.3	11.4	11.3	11.3
31	---	---	---	11.7	11.5	11.7	---	---	---	11.3	11.1	11.3
MONTH	12.8	12.3	12.5	12.4	11.5	11.9	11.7	11.1	11.4	11.4	11.0	11.3



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

393541083001100 PK-48 NR CIRCLEVILLE OH--Continued

## **WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	11.3	11.3	11.3	11.7	11.5	11.5	12.0	12.0	12.0	12.4	12.4	12.4
2	11.3	11.3	11.3	11.8	11.5	11.5	12.0	12.0	12.0	12.4	12.4	12.4
3	11.3	11.2	11.3	11.6	11.5	11.5	12.0	12.0	12.0	12.4	12.4	12.4
4	11.3	11.3	11.3	11.8	11.5	11.6	12.0	12.0	12.0	12.4	12.4	12.4
5	11.4	11.3	11.3	11.7	11.5	11.6	12.0	11.9	12.0	12.4	12.4	12.4
6	11.4	11.3	11.3	11.8	11.5	11.6	12.0	11.9	12.0	12.4	12.4	12.4
7	11.4	11.3	11.3	11.8	11.5	11.7	12.0	11.9	12.0	12.5	12.4	12.4
8	11.3	11.3	11.3	11.8	11.5	11.7	12.0	11.9	12.0	12.5	12.4	12.4
9	11.3	11.3	11.3	11.8	11.5	11.7	12.0	12.0	12.0	12.5	12.2	12.4
10	11.3	11.3	11.3	11.8	11.7	11.7	12.0	11.9	12.0	12.5	12.4	12.4
11	11.5	11.3	11.3	11.8	11.7	11.7	12.0	11.9	12.0	12.5	12.4	12.4
12	11.6	11.3	11.3	11.8	11.7	11.8	12.0	12.0	12.0	12.5	12.4	12.4
13	11.5	11.3	11.3	11.8	11.7	11.8	12.0	12.0	12.0	12.5	12.4	12.4
14	11.5	11.3	11.4	11.8	11.7	11.8	12.0	11.9	12.0	12.6	12.4	12.4
15	11.5	11.3	11.4	11.8	11.7	11.7	12.0	11.9	12.0	12.6	12.4	12.4
16	11.5	11.3	11.4	11.8	11.7	11.8	12.0	11.9	12.0	12.7	12.4	12.5
17	11.5	11.3	11.4	11.8	11.7	11.8	12.2	12.0	12.0	12.7	12.4	12.6
18	11.6	11.3	11.5	11.8	11.7	11.8	12.2	11.9	12.0	12.7	12.4	12.6
19	11.6	11.4	11.5	11.8	11.7	11.8	12.2	11.9	12.1	12.7	12.6	12.6
20	11.6	11.4	11.5	11.8	11.7	11.8	12.2	12.0	12.2	12.7	12.6	12.6
21	11.6	11.3	11.5	11.8	11.7	11.7	12.2	12.2	12.2	12.7	12.6	12.6
22	11.6	11.5	11.5	11.8	11.7	11.7	12.2	12.2	12.2	12.7	12.6	12.6
23	11.6	11.5	11.5	11.8	11.6	11.7	12.2	12.2	12.2	12.7	12.6	12.6
24	11.5	11.5	11.5	11.8	11.7	11.8	12.2	12.1	12.2	12.7	12.6	12.6
25	11.5	11.5	11.5	11.8	11.7	11.7	12.2	12.2	12.2	12.7	12.6	12.6
26	11.5	11.5	11.5	11.9	11.7	11.7	12.2	12.2	12.2	12.7	12.6	12.6
27	11.5	11.5	11.5	11.9	11.7	11.7	12.2	12.2	12.2	12.6	12.6	12.6
28	11.6	11.5	11.5	12.0	11.7	11.8	12.2	12.2	12.2	12.7	12.6	12.6
29	11.8	11.5	11.5	12.0	11.7	11.9	12.5	12.2	12.3	12.7	12.6	12.6
30	11.5	11.5	11.5	12.0	11.8	12.0	12.5	12.2	12.4	12.7	12.6	12.6
31	---	---	---	12.0	11.9	12.0	12.4	12.4	12.4	---	---	---
MONTH	11.8	11.2	11.4	12.0	11.5	11.7	12.5	11.9	12.1	12.7	12.2	12.5
YEAR	14.8	11.0	12.6									

## **TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.6	12.4	13.2	8.0	7.4	7.8	5.4	4.6	5.0	.9	.7	.8
2	14.9	14.4	14.7	7.4	6.4	6.9	6.0	4.7	5.2	.9	.7	.8
3	14.4	12.9	13.5	7.9	7.4	7.7	7.0	6.1	6.6	1.0	.8	.9
4	14.1	12.5	13.2	8.7	7.3	7.8	8.2	7.0	7.5	1.1	.8	1.0
5	14.1	13.1	13.5	10.2	8.8	9.5	8.2	7.4	7.7	1.2	1.0	1.1
6	13.0	11.7	12.4	9.6	8.6	9.1	7.4	7.1	7.3	1.1	.9	1.0
7	14.4	12.5	13.2	8.5	7.3	7.8	7.0	6.5	6.8	1.1	.9	1.0
8	14.8	13.4	14.0	7.1	6.1	6.6	6.4	5.6	6.0	1.2	1.1	1.2
9	14.5	13.1	14.0	6.3	5.5	5.9	6.1	4.9	5.4	1.2	1.1	1.1
10	13.5	11.5	12.3	5.9	5.1	5.5	7.5	6.2	6.9	1.1	1.0	1.0
11	11.4	10.2	10.7	6.7	5.2	5.7	7.1	4.3	5.4	1.0	.9	.9
12	11.8	10.9	11.3	8.3	6.8	7.5	4.2	3.4	3.7	.9	.7	.8
13	12.0	11.5	11.7	9.0	6.9	8.3	3.3	3.0	3.1	.9	.7	.8
14	12.0	10.9	11.4	11.1	8.3	9.9	4.3	3.0	3.5	1.0	.9	1.0
15	12.2	10.7	11.4	12.1	10.8	11.6	5.1	4.3	4.6	1.0	.7	.9
16	13.1	11.7	12.3	11.2	10.2	10.7	5.1	4.7	5.0	.8	.5	.6
17	14.3	13.1	13.6	10.9	7.8	9.7	5.2	4.7	4.9	.5	.3	.5
18	14.0	13.6	13.8	10.6	9.1	9.8	5.4	5.2	5.3	.5	.4	.4
19	13.8	13.0	13.4	9.5	9.0	9.3	5.4	5.1	5.3	.5	.4	.4
20	15.1	13.4	14.3	9.4	7.4	8.3	5.3	5.0	5.2	.4	.4	.4
21	15.8	14.0	14.9	7.3	6.6	7.0	5.0	4.1	4.5	.4	.3	.4
22	13.9	12.1	12.7	7.2	6.2	6.7	4.0	3.8	3.9	.4	.2	.3
23	12.0	10.6	11.2	7.3	6.3	6.7	3.9	3.4	3.6	.2	-.2	.0
24	11.2	10.1	10.7	8.4	7.3	7.7	3.4	3.1	3.2	.1	-.1	.0
25	11.1	10.0	10.6	8.3	7.9	8.1	3.0	2.6	2.9	.3	.1	.2
26	11.7	10.5	11.0	9.1	8.0	8.5	2.5	2.1	2.3	.5	.2	.4
27	11.7	11.4	11.5	9.1	7.6	8.3	2.1	1.7	1.9	.5	.3	.4
28	11.4	10.6	10.9	7.5	6.4	6.8	1.7	1.4	1.6	.7	.5	.6
29	11.0	10.7	10.8	6.4	5.9	6.1	1.3	1.0	1.1	.6	.5	.6
30	10.6	8.2	9.4	5.9	5.5	5.7	1.1	.8	.9	.7	.6	.6
31	8.2	6.5	7.9	---	---	---	.9	.8	.8	.7	.6	.6
MONTH	15.8	6.5	12.2	12.1	5.1	7.9	8.2	.8	4.4	1.2	-.2	.7





# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

393541083001100 PK-48 NR CIRCLEVILLE OH--Continued

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.03	.12	.03	.00	.00	.00	.00	.00	.00
2	.11	.00	.06	.00	.02	.01	.00	.00	.00	1.17	.02	.00
3	.00	.09	.17	.00	.01	.01	.33	.11	.00	.12	.11	.00
4	.00	.00	.67	.00	.00	.00	.00	.00	.00	.00	.38	.00
5	.00	.06	.00	.03	.00	.00	.00	.00	.00	.00	.33	.00
6	.00	.03	.01	.23	.00	.00	.49	.28	.04	.00	.00	.00
7	.00	.00	.00	.08	.00	.01	.00	.71	.01	.00	.00	.00
8	.00	.00	.00	.00	.01	.01	.00	.00	.00	.16	.00	.00
9	.72	.00	.00	.00	.00	.43	.13	.00	.00	.00	.00	.00
10	.00	.00	.04	.04	.00	.65	2.00	.00	.00	.00	.00	.24
11	.00	.00	.00	.03	.00	.00	.44	.00	.00	.00	.00	.00
12	.00	.00	.00	.27	.17	.00	.11	.10	.00	.00	.08	.00
13	.00	.94	.00	.03	.14	.15	.89	.00	.00	.25	.00	.00
14	.00	1.26	.00	.00	.26	.00	.00	.14	.00	.06	.07	.00
15	.00	.06	.00	.00	.00	.00	.31	.51	.01	.08	.00	.00
16	.59	.00	.00	.10	.00	.00	.01	.00	.00	.00	.00	.00
17	.18	1.57	.00	.35	.00	.00	.00	.00	.00	.12	.00	.60
18	.00	.00	.17	.04	.00	.11	.00	.00	.02	.00	.00	.00
19	2.23	.01	.00	.06	.00	.00	.00	.00	.00	.00	.00	.00
20	.70	.00	.18	.01	.04	.06	.00	.00	.16	.00	.41	.00
21	.23	.00	.04	.00	.06	.58	.00	.00	.03	.35	.26	.00
22	.00	.00	.09	.07	.41	.00	.00	.00	.00	.09	.00	.00
23	.00	.00	.00	.00	.13	.00	.00	.00	.04	.00	.00	.02
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.50
25	.00	.02	.04	.57	.09	.00	.00	.20	.00	.56	.00	.76
26	.00	.10	.01	.00	.11	.10	.00	.09	.01	.01	.00	.01
27	.00	.83	.00	.68	.00	.53	.12	.00	.01	.05	.00	.07
28	.00	.01	.00	.33	.00	.13	.23	.00	.00	.00	.66	.00
29	.00	.00	.01	.00	---	.12	.52	.00	1.00	1.41	.84	.00
30	.25	.01	.00	.00	---	.00	.38	.00	.00	.00	.00	.00
31	.16	---	.00	.05	---	.00	---	.00	---	.00	.30	---
TOTAL	5.17	4.99	1.49	3.00	1.57	2.93	5.96	2.14	1.33	4.52	3.46	2.20

WTR YR 1994 TOTAL 38.76

EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW  
UNCONSOLIDATED AQUIFERS IN OHIO

307

GROUND-WATER RECORDS

400949083480100. Local number, CH-42.

LOCATION.--Lat 40°09'49" Long 83°48'01", Hydrologic Unit 05080001, along State Route 29 near Urbana, OH.  
Owner.--USGS-Jack Sommers.

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 28.7 ft. Cased with Sch 40 PVC to 13.7 ft; .020 in. screen from 13.7 to 28.7 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data was collected with a propane-heated, tipping-bucket rain gauge. Also collected: air temperature, soil temperature, water temperature, and specific conductance. Conductivity/water temperature probe set at 23.7 feet below land surface.

DATUM.--Elevation of land-surface datum is 1029.89 feet above sea level.  
Measuring point: shelter shelf 2.32 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

PERIOD OF DAILY RECORD.--

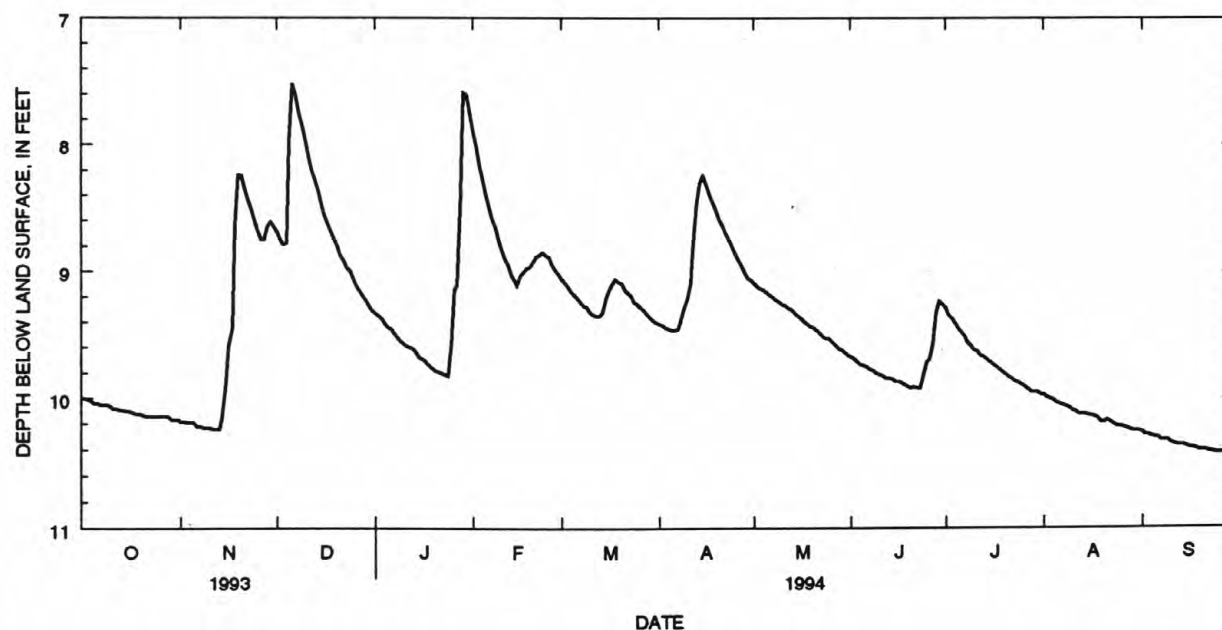
WATER LEVEL: February 1991 to current year.  
SPECIFIC CONDUCTANCE: February 1991 to current year.  
AIR TEMPERATURE: February 1991 to current year.  
WATER TEMPERATURE: February 1991 to current year.  
SOIL TEMPERATURE: February 1991 to current year.  
PRECIPITATION: February 1991 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER LEVEL: Maximum daily low, 10.62 ft. below land-surface datum, December 19, 1991; maximum daily high, 5.47 ft. below land-surface datum, July 18, 1992.  
SPECIFIC CONDUCTANCE: Maximum, 919 microsiemens December 11-12, 1993; minimum, 725 microsiemens July 31, 1991.  
AIR TEMPERATURE: Maximum, 37.6°C June 18, 1994; minimum, -33.6°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 13.2°C many days October, November 1992; minimum, 10.3°C May 23, 1994.  
SOIL TEMPERATURE: Maximum, 30.5°C August 2, 1991; minimum, -1.8°C February 10, 1994.

EXTREMES FOR CURRENT YEAR.--

WATER LEVEL: Maximum daily low, 10.45 ft. below land-surface datum, September 29-30, 1994; maximum daily high, 7.45 ft. below land-surface datum, December 6, 1993.  
SPECIFIC CONDUCTANCE: Maximum, 919 microsiemens December 11-12, 1993; minimum, 831 microsiemens August 5, 1994.  
AIR TEMPERATURE: Maximum, 37.6°C June 18, 1994; minimum, -33.6°C January 19, 1994.  
WATER TEMPERATURE: Maximum, 12.9°C many days in November 1993; minimum, 10.3°C May 23, 1994.  
SOIL TEMPERATURE: Maximum, 28.0°C June 19, 1994; minimum, -1.8°C February 10, 1994.



DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	9.41	9.40	9.09	9.06	9.67	9.66	9.29	9.26	9.97	9.97	10.26	10.25
2	9.42	9.41	9.11	9.09	9.69	9.67	9.35	9.29	9.99	9.97	10.28	10.26
3	9.44	9.42	9.13	9.11	9.71	9.69	9.37	9.35	10.00	9.99	10.28	10.28
4	9.45	9.44	9.14	9.13	9.73	9.71	9.41	9.37	10.01	10.00	10.29	10.28
5	9.46	9.45	9.16	9.14	9.74	9.73	9.45	9.41	10.03	10.01	10.30	10.29
6	9.46	9.45	9.18	9.16	9.75	9.74	9.48	9.45	10.04	10.03	10.30	10.30
7	9.45	9.37	9.20	9.18	9.77	9.75	9.51	9.48	10.05	10.04	10.32	10.30
8	9.37	9.28	9.22	9.20	9.78	9.77	9.56	9.51	10.06	10.05	10.32	10.32
9	9.28	9.23	9.24	9.22	9.80	9.78	9.59	9.56	10.07	10.06	10.32	10.32
10	9.23	9.09	9.26	9.24	9.81	9.80	9.62	9.59	10.09	10.07	10.34	10.32
11	9.09	8.77	9.27	9.26	9.82	9.81	9.63	9.62	10.10	10.09	10.35	10.34
12	8.77	8.48	9.29	9.27	9.84	9.82	9.66	9.63	10.12	10.10	10.36	10.34
13	8.48	8.31	9.30	9.29	9.84	9.84	9.67	9.66	10.12	10.12	10.36	10.36
14	8.31	8.25	9.33	9.30	9.85	9.84	9.69	9.67	10.12	10.08	10.36	10.36
15	8.25	8.23	9.35	9.33	9.87	9.85	9.71	9.69	10.13	10.10	10.37	10.36
16	8.31	8.25	9.37	9.35	9.87	9.87	9.73	9.71	10.13	10.13	10.38	10.37
17	8.39	8.31	9.39	9.37	9.88	9.87	9.75	9.73	10.14	10.13	10.38	10.38
18	8.45	8.39	9.41	9.39	9.89	9.88	9.77	9.75	10.15	10.14	10.39	10.38
19	8.51	8.45	9.43	9.41	9.91	9.89	9.79	9.77	10.18	10.15	10.40	10.39
20	8.58	8.51	9.44	9.43	9.92	9.91	9.81	9.79	10.18	10.16	10.40	10.40
21	8.63	8.58	9.46	9.44	9.91	9.91	9.83	9.81	10.17	10.16	10.40	10.40
22	8.69	8.63	9.48	9.46	9.92	9.91	9.85	9.83	10.18	10.17	10.41	10.40
23	8.74	8.69	9.51	9.48	9.92	9.80	9.87	9.85	10.20	10.18	10.41	10.41
24	8.79	8.74	9.53	9.51	9.80	9.72	9.88	9.87	10.21	10.20	10.42	10.41
25	8.85	8.79	9.53	9.53	9.72	9.69	9.89	9.88	10.21	10.21	10.42	10.42
26	8.90	8.85	9.56	9.53	9.69	9.57	9.91	9.89	10.22	10.21	10.42	10.42
27	8.95	8.90	9.58	9.56	9.57	9.33	9.93	9.91	10.23	10.22	10.42	10.42
28	9.00	8.95	9.61	9.58	9.33	9.24	9.95	9.93	10.24	10.23	10.44	10.42
29	9.05	9.00	9.62	9.61	9.24	9.23	9.95	9.92	10.25	10.24	10.45	10.44
30	9.06	9.05	9.64	9.62	9.26	9.23	9.95	9.92	10.25	10.25	10.45	10.45
31	---	---	9.66	9.64	---	---	9.97	9.95	10.25	10.25	---	---
MONTH	9.46	8.23	9.66	9.06	9.92	9.23	9.97	9.26	10.25	9.97	10.45	10.25
YEAR	10.45	7.45										

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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400949083480100 CH-42 NR URBANA OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	834	832	833	863	860	861	913	909	911	898	896	897
2	835	833	833	864	861	862	913	911	912	897	896	896
3	836	834	835	865	863	863	913	912	912	897	895	896
4	837	836	836	865	863	864	915	912	913	901	895	896
5	839	837	838	866	864	865	914	912	913	901	893	896
6	840	839	839	868	866	867	913	913	913	900	898	899
7	841	840	841	871	864	869	914	912	913	899	898	898
8	842	841	842	871	866	869	916	913	914	901	895	899
9	844	839	843	873	867	870	916	912	914	901	894	899
10	845	840	842	875	869	872	918	913	914	900	896	898
11	846	841	843	875	869	872	919	915	916	897	895	896
12	847	842	844	875	873	874	919	914	917	896	895	895
13	849	843	845	877	875	876	918	915	916	896	895	896
14	846	844	845	879	877	878	916	915	916	899	895	897
15	847	845	846	881	878	879	916	915	915	901	897	899
16	847	846	847	883	881	882	916	913	915	902	897	899
17	848	847	848	886	883	884	915	914	915	898	893	895
18	850	848	849	888	884	886	915	914	914	901	898	899
19	851	850	850	887	885	886	914	913	914	903	896	899
20	852	851	851	890	887	888	914	912	913	899	888	895
21	854	848	852	892	885	889	913	911	912	900	891	896
22	854	849	851	894	889	891	915	910	912	894	888	892
23	855	850	852	896	890	894	914	908	910	894	889	890
24	856	850	852	899	896	897	913	908	909	894	888	891
25	857	851	853	902	899	900	913	906	909	894	887	892
26	858	852	854	905	902	903	911	904	908	893	887	891
27	855	853	854	908	903	906	911	902	906	892	889	891
28	857	855	856	909	903	908	908	902	905	889	887	887
29	859	857	857	910	909	910	908	900	903	889	886	887
30	860	858	859	912	909	910	904	898	901	889	886	887
31	861	860	860	---	---	---	901	895	898	890	886	888
MONTH	861	832	847	912	860	882	919	895	911	903	886	895

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	893	888	890	912	906	910	910	903	906	893	887	889
2	894	887	891	912	906	910	909	903	906	893	886	890
3	895	889	891	911	906	909	908	903	905	891	886	888
4	897	892	894	911	907	909	909	902	905	891	885	889
5	899	893	897	911	906	908	906	901	905	890	884	888
6	901	895	898	911	906	908	907	900	905	889	882	887
7	902	899	900	909	906	908	907	902	904	889	883	886
8	904	901	903	912	907	909	906	899	902	888	883	885
9	906	903	904	910	908	909	902	899	900	886	882	885
10	907	902	905	912	907	910	901	896	899	885	881	884
11	909	903	905	914	906	910	899	896	898	885	880	883
12	910	904	907	911	907	910	897	891	894	883	878	882
13	911	904	908	912	906	910	895	891	893	884	879	881
14	912	906	908	912	907	910	894	891	893	882	876	880
15	911	907	909	911	906	908	893	891	892	880	878	879
16	913	907	910	912	905	908	893	891	892	880	877	879
17	912	907	910	911	905	908	894	890	892	880	875	878
18	911	906	909	911	905	908	894	890	892	878	875	877
19	908	905	907	911	906	908	895	890	891	878	873	876
20	907	906	906	912	904	908	895	890	892	877	873	876
21	908	906	906	910	905	908	892	890	891	876	873	875
22	908	906	907	911	906	908	895	890	892	876	872	874
23	907	903	905	909	906	908	894	890	892	877	871	873
24	908	906	907	909	906	907	896	890	892	874	871	872
25	909	905	907	910	906	908	896	889	892	872	869	871
26	909	904	907	910	906	908	895	889	892	872	870	871
27	911	904	908	908	906	907	895	888	893	872	868	870
28	911	905	908	910	905	907	894	888	891	871	866	869
29	---	---	---	908	905	906	894	888	891	870	867	868
30	---	---	---	910	904	907	893	888	890	869	866	867
31	---	---	---	908	902	906	---	---	---	868	865	867
MONTH	913	887	904	914	902	908	910	888	896	893	865	879



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

400949083480100 CH-42 NR URBANA OH--Continued

**SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	867	864	866	841	839	840	835	833	834	841	840	841
2	866	863	865	841	838	840	835	833	834	842	840	841
3	865	861	864	841	839	840	836	834	835	843	841	842
4	865	859	863	841	839	840	836	834	835	843	842	842
5	863	859	862	841	839	840	836	831	835	843	842	843
6	862	860	861	843	839	840	838	832	835	844	843	843
7	862	859	861	842	840	840	842	834	837	845	843	844
8	860	855	859	841	840	841	844	837	839	846	844	845
9	860	855	858	841	840	841	841	838	840	846	845	845
10	859	854	858	842	840	841	842	840	841	848	845	846
11	858	856	857	842	840	841	842	841	842	848	842	846
12	857	852	855	842	840	841	843	841	842	849	842	845
13	856	853	855	842	840	841	844	839	843	849	843	846
14	855	853	854	841	840	841	845	839	843	850	843	847
15	855	853	854	842	840	841	845	839	841	851	845	847
16	855	850	853	842	840	841	846	839	841	852	845	847
17	855	850	852	841	840	840	846	839	841	848	846	847
18	854	850	852	841	839	840	842	840	841	850	847	848
19	853	846	850	841	835	840	842	840	841	851	849	850
20	852	845	850	842	839	840	842	841	841	852	846	850
21	851	845	848	840	835	838	842	841	841	852	846	850
22	850	844	847	840	834	838	844	841	842	853	847	851
23	848	843	846	840	834	836	843	837	842	854	848	851
24	848	842	845	840	834	835	843	838	842	855	849	851
25	847	841	843	839	834	834	844	838	842	854	850	851
26	846	840	842	835	833	834	844	838	842	852	851	852
27	845	839	841	835	833	834	844	838	840	853	852	853
28	841	839	841	834	833	834	844	838	839	854	853	853
29	841	839	840	834	833	834	845	839	839	855	853	854
30	841	839	840	834	833	833	840	839	840	856	854	855
31	---	---	---	835	833	834	841	840	840	---	---	---
MONTH	867	839	853	843	833	838	846	831	840	856	840	848
YEAR	919	831	875									

**TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	24.1	6.2	15.0	4.4	-4.9	.2	9.4	-4.6	2.3	3.0	-4.3	.4
2	16.6	4.2	11.8	8.8	-4.6	1.8	9.9	1.5	5.7	.7	-2.0	-4
3	17.9	-5	8.7	7.9	2.6	4.5	7.9	3.3	5.7	-1	-2.9	-1.9
4	24.3	9.4	15.5	12.8	2.7	8.4	11.9	4.0	7.8	-3.2	-9.7	-5.1
5	19.3	2.5	9.8	14.0	3.2	9.5	4.4	2.3	3.4	-3.9	-7.0	-5.4
6	24.2	1.0	11.9	3.9	-.8	1.9	5.4	1.0	3.3	1.4	-4.8	-.5
7	26.6	6.3	16.6	-.9	-5.5	-2.9	5.6	-1.3	1.1	.8	-10.4	-4.0
8	26.3	6.6	15.6	10.8	-5.5	.7	6.9	-4.6	.5	-11.8	-16.6	-13.5
9	16.0	2.4	10.5	12.3	-6.4	1.1	11.3	-3.5	4.6	-2.5	-15.3	-9.4
10	12.5	-2.0	4.4	13.1	-7.4	2.2	12.3	-1.2	7.8	-2.2	-12.4	-6.4
11	15.3	-2.6	5.8	13.5	-1.5	6.6	-.3	-9.3	-4.0	2.6	-2.2	1.0
12	15.1	.8	8.6	14.1	8.2	11.0	3.9	-10.0	-4.1	2.4	.1	1.0
13	16.1	3.0	8.4	16.5	8.2	12.3	5.8	-4.2	.9	.9	-4.2	-1.1
14	20.0	.8	8.7	17.7	15.0	16.1	7.1	2.7	4.4	-4.4	-19.0	-11.6
15	23.9	4.2	13.8	16.6	6.0	10.1	4.1	1.4	3.1	-17.7	-23.6	-20.5
16	16.9	12.4	15.1	8.1	3.7	5.7	6.6	1.0	2.5	-9.9	-25.0	-18.0
17	17.9	10.9	15.3	12.4	4.5	7.8	3.7	1.6	2.3	-5.3	-21.3	-10.1
18	17.5	7.8	11.9	9.3	-1.1	3.1	4.0	1.0	2.7	-21.6	-29.0	-25.5
19	14.1	10.6	12.2	8.4	.6	5.5	2.4	.5	1.1	-19.6	-33.6	-25.5
20	19.5	12.2	15.6	2.9	-3.4	-.5	2.5	.0	1.0	-10.5	-29.0	-18.7
21	18.7	3.8	10.4	10.0	-2.1	3.4	-1.0	-4.6	-2.9	-9.2	-30.7	-18.5
22	16.7	-1.0	6.9	14.4	-.8	5.0	1.1	-3.9	-2.1	-2.5	-11.8	-7.6
23	18.0	-4.3	6.1	12.7	-1.1	5.7	-1.4	-4.6	-3.3	2.9	-1.4	1.2
24	21.4	-1.1	8.5	12.6	5.2	7.6	-4.3	-5.9	-5.1	3.0	.9	2.3
25	22.3	-1.4	9.0	10.4	2.6	6.1	-2.1	-13.2	-7.1	1.9	-3.4	.9
26	23.3	3.1	12.0	17.0	3.3	10.0	-7.5	-14.1	-11.2	-4.2	-7.2	-5.7
27	11.2	4.7	7.5	2.4	-6.0	-1.1	-5.7	-12.1	-8.6	5.2	-4.3	1.9
28	8.5	-.6	4.9	.2	-7.4	-1.9	-7.3	-18.3	-10.2	7.7	-2.9	2.6
29	9.0	1.1	6.4	-.7	-3.1	-1.7	-5.7	-18.7	-10.8	-1.8	-10.2	-4.0
30	1.3	-.8	.5	2.9	-2.7	-.5	-8.6	-15.2	-11.4	-2.2	-10.4	-6.5
31	2.4	.0	1.0	---	---	---	.3	-8.1	-4.1	-3.6	-15.1	-8.9
MONTH	26.6	-4.3	9.9	17.7	-7.4	4.6	12.3	-18.7	-.8	7.7	-33.6	-7.0



# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

400949083480100 CH-42 NR URBANA OH--Continued

## **WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	12.3	12.2	12.2	12.7	12.6	12.7	12.7	12.6	12.7	12.4	12.4	12.4
2	12.2	12.2	12.2	12.7	12.6	12.7	12.7	12.6	12.7	12.4	12.4	12.4
3	12.2	12.2	12.2	12.7	12.7	12.7	12.7	12.7	12.7	12.4	12.4	12.4
4	12.3	12.2	12.2	12.7	12.7	12.7	12.7	12.7	12.7	12.4	12.2	12.4
5	12.3	12.2	12.2	12.7	12.7	12.7	12.7	12.7	12.7	12.4	12.2	12.3
6	12.3	12.2	12.2	12.7	12.6	12.7	12.7	12.6	12.7	12.2	12.2	12.2
7	12.3	12.2	12.2	12.9	12.6	12.7	12.7	12.6	12.7	12.2	12.2	12.2
8	12.3	12.2	12.2	12.9	12.6	12.7	12.7	12.6	12.7	12.4	12.1	12.2
9	12.4	12.2	12.2	12.9	12.6	12.7	12.7	12.6	12.7	12.2	12.1	12.2
10	12.5	12.2	12.4	12.9	12.6	12.7	12.7	12.5	12.7	12.2	12.1	12.2
11	12.5	12.2	12.4	12.9	12.6	12.7	12.7	12.6	12.6	12.2	12.2	12.2
12	12.5	12.2	12.4	12.7	12.7	12.7	12.7	12.6	12.6	12.2	12.2	12.2
13	12.5	12.3	12.4	12.7	12.7	12.7	12.7	12.6	12.7	12.2	12.2	12.2
14	12.5	12.4	12.5	12.7	12.7	12.7	12.7	12.7	12.7	12.2	12.1	12.2
15	12.5	12.4	12.5	12.7	12.7	12.7	12.7	12.6	12.7	12.2	12.1	12.1
16	12.5	12.5	12.5	12.7	12.7	12.7	12.7	12.6	12.7	12.1	12.1	12.1
17	12.5	12.5	12.5	12.7	12.7	12.7	12.7	12.6	12.7	12.2	12.1	12.2
18	12.5	12.4	12.5	12.7	12.6	12.7	12.7	12.6	12.7	12.1	12.1	12.1
19	12.5	12.5	12.5	12.7	12.6	12.7	12.7	12.6	12.7	12.1	12.1	12.1
20	12.5	12.5	12.5	12.7	12.6	12.7	12.7	12.6	12.7	12.2	12.1	12.2
21	12.7	12.4	12.5	12.9	12.6	12.7	12.7	12.6	12.6	12.2	12.1	12.1
22	12.7	12.5	12.6	12.7	12.6	12.7	12.7	12.4	12.6	12.2	12.0	12.2
23	12.7	12.5	12.6	12.9	12.6	12.7	12.7	12.4	12.6	12.2	12.0	12.2
24	12.7	12.5	12.6	12.7	12.7	12.7	12.6	12.4	12.6	12.2	12.0	12.1
25	12.7	12.5	12.6	12.7	12.7	12.7	12.7	12.4	12.5	12.2	12.0	12.0
26	12.7	12.5	12.7	12.7	12.7	12.7	12.6	12.4	12.6	12.2	11.9	12.0
27	12.7	12.7	12.7	12.9	12.6	12.7	12.6	12.4	12.5	12.0	12.0	12.0
28	12.7	12.6	12.7	12.9	12.6	12.7	12.6	12.4	12.5	12.0	12.0	12.0
29	12.7	12.7	12.7	12.6	12.6	12.6	12.6	12.4	12.4	12.0	11.9	12.0
30	12.7	12.6	12.7	12.7	12.6	12.7	12.4	12.4	12.4	12.0	11.9	11.9
31	12.7	12.6	12.7	---	---	---	12.4	12.4	12.4	12.0	11.9	11.9
MONTH	12.7	12.2	12.5	12.9	12.6	12.7	12.7	12.4	12.6	12.4	11.9	12.2

## **WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	12.0	11.9	11.9	11.5	11.3	11.3	10.9	10.6	10.8	10.7	10.5	10.6
2	12.0	11.7	11.9	11.5	11.3	11.3	10.9	10.6	10.7	10.7	10.4	10.5
3	12.0	11.7	11.9	11.5	11.3	11.3	10.9	10.6	10.7	10.7	10.4	10.6
4	11.9	11.7	11.8	11.3	11.3	11.3	10.9	10.6	10.7	10.7	10.5	10.5
5	11.9	11.7	11.8	11.4	11.3	11.3	10.9	10.6	10.7	10.7	10.5	10.5
6	11.9	11.7	11.7	11.4	11.1	11.3	10.9	10.6	10.7	10.7	10.5	10.5
7	11.7	11.7	11.7	11.3	11.3	11.3	10.9	10.6	10.7	10.7	10.5	10.5
8	11.7	11.7	11.7	11.3	11.1	11.3	10.8	10.6	10.7	10.7	10.5	10.5
9	11.7	11.7	11.7	11.3	11.3	11.3	10.7	10.7	10.7	10.7	10.5	10.5
10	11.7	11.7	11.7	11.3	11.1	11.2	10.7	10.7	10.7	10.6	10.4	10.5
11	11.7	11.5	11.7	11.3	11.1	11.2	10.7	10.6	10.7	10.6	10.4	10.5
12	11.7	11.5	11.6	11.3	11.1	11.2	10.7	10.7	10.7	10.7	10.5	10.5
13	11.7	11.5	11.6	11.3	11.1	11.1	10.7	10.7	10.7	10.7	10.4	10.5
14	11.7	11.5	11.6	11.3	11.1	11.1	10.7	10.6	10.7	10.7	10.4	10.5
15	11.5	11.5	11.5	11.1	10.9	11.1	10.7	10.7	10.7	10.5	10.5	10.5
16	11.5	11.5	11.5	11.3	10.9	11.1	10.7	10.7	10.7	10.5	10.5	10.5
17	11.6	11.5	11.5	11.1	10.9	11.1	10.7	10.6	10.7	10.5	10.4	10.5
18	11.6	11.5	11.5	11.1	10.9	11.0	10.7	10.6	10.7	10.5	10.4	10.5
19	11.6	11.5	11.5	11.1	10.9	11.0	10.7	10.5	10.7	10.7	10.4	10.5
20	11.5	11.5	11.5	11.1	10.9	10.9	10.7	10.5	10.7	10.5	10.4	10.5
21	11.5	11.5	11.5	11.1	10.9	10.9	10.7	10.7	10.7	10.7	10.4	10.5
22	11.5	11.5	11.5	11.1	10.9	10.9	10.7	10.5	10.7	10.5	10.5	10.5
23	11.5	11.5	11.5	10.9	10.9	10.9	10.7	10.6	10.7	10.5	10.3	10.5
24	11.5	11.5	11.5	10.9	10.9	10.9	10.7	10.5	10.7	10.5	10.5	10.5
25	11.5	11.5	11.5	10.9	10.9	10.9	10.7	10.5	10.6	10.5	10.5	10.5
26	11.5	11.3	11.5	10.9	10.8	10.9	10.7	10.5	10.6	10.5	10.5	10.5
27	11.5	11.3	11.4	10.9	10.9	10.9	10.7	10.5	10.6	10.5	10.4	10.5
28	11.5	11.3	11.4	10.9	10.7	10.9	10.7	10.5	10.6	10.7	10.4	10.5
29	---	---	---	10.9	10.9	10.9	10.7	10.5	10.6	10.5	10.5	10.5
30	---	---	---	10.9	10.7	10.8	10.7	10.5	10.6	10.5	10.5	10.5
31	---	---	---	10.9	10.7	10.8	---	---	---	10.5	10.5	10.5
MONTH	12.0	11.3	11.6	11.5	10.7	11.1	10.9	10.5	10.7	10.7	10.3	10.5

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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400949083480100 CH-42 NR URBANA OH--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	10.5	10.5	10.5	10.7	10.7	10.7	11.0	10.9	10.9	11.6	11.5	11.6
2	10.5	10.5	10.5	10.7	10.7	10.7	11.0	10.9	10.9	11.6	11.5	11.6
3	10.7	10.4	10.5	10.7	10.7	10.7	11.0	10.9	10.9	11.6	11.5	11.6
4	10.7	10.5	10.5	10.7	10.7	10.7	10.9	10.9	10.9	11.6	11.5	11.6
5	10.7	10.5	10.5	10.8	10.7	10.7	11.1	10.9	10.9	11.6	11.5	11.6
6	10.5	10.5	10.5	10.8	10.7	10.7	11.1	10.9	11.0	11.6	11.5	11.6
7	10.5	10.5	10.5	10.7	10.7	10.7	11.1	10.9	11.1	11.6	11.5	11.6
8	10.7	10.5	10.5	10.7	10.7	10.7	11.2	10.9	11.1	11.6	11.5	11.6
9	10.7	10.5	10.5	10.7	10.7	10.7	11.1	11.1	11.1	11.6	11.5	11.6
10	10.7	10.5	10.5	10.7	10.7	10.7	11.2	11.1	11.1	11.6	11.5	11.6
11	10.5	10.5	10.5	10.7	10.7	10.7	11.1	11.1	11.1	11.8	11.5	11.6
12	10.7	10.5	10.5	10.7	10.7	10.7	11.2	11.1	11.1	11.8	11.5	11.7
13	10.5	10.5	10.5	10.7	10.7	10.7	11.4	11.1	11.1	11.8	11.5	11.7
14	10.5	10.5	10.5	10.7	10.7	10.7	11.4	11.1	11.2	11.8	11.6	11.7
15	10.5	10.5	10.5	10.7	10.7	10.7	11.4	11.1	11.3	11.8	11.6	11.7
16	10.5	10.5	10.5	10.7	10.7	10.7	11.4	11.1	11.3	11.8	11.6	11.8
17	10.5	10.5	10.5	10.7	10.7	10.7	11.4	11.2	11.3	11.8	11.8	11.8
18	10.6	10.5	10.5	10.7	10.7	10.7	11.4	11.3	11.4	11.8	11.8	11.8
19	10.7	10.5	10.5	10.9	10.7	10.7	11.4	11.3	11.4	11.8	11.7	11.8
20	10.7	10.5	10.5	10.7	10.7	10.7	11.4	11.3	11.4	12.0	11.7	11.8
21	10.7	10.5	10.5	10.9	10.7	10.8	11.4	11.3	11.3	12.0	11.8	11.8
22	10.7	10.5	10.6	10.9	10.7	10.8	11.4	11.3	11.4	12.0	11.8	11.9
23	10.7	10.5	10.6	11.0	10.7	10.9	11.5	11.3	11.4	12.0	11.8	11.9
24	10.7	10.5	10.6	10.9	10.7	10.9	11.5	11.3	11.4	12.0	11.8	11.9
25	10.7	10.5	10.6	11.0	10.7	10.9	11.6	11.3	11.4	12.0	11.8	12.0
26	10.7	10.5	10.7	10.9	10.9	10.9	11.6	11.3	11.4	12.0	12.0	12.0
27	10.7	10.5	10.7	11.0	10.9	10.9	11.6	11.4	11.5	12.0	12.0	12.0
28	10.7	10.7	10.7	11.0	10.9	10.9	11.6	11.4	11.6	12.0	12.0	12.0
29	10.7	10.7	10.7	11.0	10.9	10.9	11.6	11.4	11.6	12.0	12.0	12.0
30	10.7	10.7	10.7	11.0	10.9	10.9	11.6	11.5	11.6	12.0	12.0	12.0
31	---	---	---	11.0	10.9	10.9	11.6	11.6	11.6	---	---	---
MONTH	10.7	10.4	10.5	11.0	10.7	10.8	11.6	10.9	11.2	12.0	11.5	11.8
YEAR	12.9	10.3	11.5									

TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.3	12.2	13.1	7.6	6.6	7.1	4.5	3.2	3.8	.5	.3	.4
2	14.6	13.8	14.3	6.6	5.5	6.1	5.5	4.0	4.6	.6	.4	.5
3	13.7	11.9	13.0	7.0	6.5	6.7	6.3	5.4	5.8	.7	.4	.6
4	14.6	12.6	13.5	8.3	6.6	7.1	7.4	6.2	6.8	.8	.5	.6
5	14.3	12.6	13.6	9.6	8.4	9.0	7.1	6.1	6.5	.8	.6	.7
6	14.2	11.8	13.1	8.8	7.6	8.1	6.0	5.1	5.8	.8	.6	.7
7	15.4	12.9	14.0	7.5	5.3	6.5	5.2	4.6	4.9	.8	.6	.7
8	15.6	13.7	14.7	5.5	4.4	4.9	4.9	3.9	4.4	.7	.4	.6
9	15.1	13.7	14.7	5.7	4.0	4.8	5.6	3.5	4.3	.4	.2	.3
10	13.5	11.6	12.4	5.5	3.8	4.7	7.4	5.7	6.6	.3	-.1	.1
11	12.0	10.0	11.1	6.2	4.5	5.3	6.2	3.7	4.9	.2	-.1	.1
12	12.2	10.7	11.6	7.7	6.3	7.0	3.5	2.5	2.9	.2	.1	.2
13	12.4	11.1	11.7	9.6	7.7	8.3	3.1	2.2	2.6	.3	.1	.2
14	12.4	10.4	11.3	11.9	9.7	11.0	4.1	3.0	3.5	.4	.1	.3
15	13.3	10.9	12.0	12.0	10.5	11.4	4.5	3.9	4.1	.4	-.1	.1
16	13.5	12.7	13.1	10.4	9.3	9.9	4.9	4.1	4.5	.0	-.9	-.4
17	14.6	13.6	14.1	9.7	9.1	9.4	4.7	4.3	4.5	-.5	-.8	-.7
18	14.2	13.3	13.8	9.2	7.7	8.3	4.7	4.2	4.5	-.3	-.7	-.5
19	13.6	13.2	13.4	7.8	7.4	7.6	4.2	3.7	4.0	-.5	-.7	-.6
20	14.6	13.4	13.8	7.4	5.3	6.2	3.8	3.5	3.7	-.4	-.7	-.6
21	14.7	13.0	14.2	5.9	5.0	5.5	3.6	2.5	3.2	-.4	-.7	-.5
22	12.8	11.2	12.0	6.5	5.1	5.7	2.6	2.1	2.3	-.4	-.6	-.6
23	11.4	9.6	10.7	6.6	5.4	6.0	2.8	2.4	2.6	-.4	-.6	-.5
24	11.3	9.3	10.3	7.5	6.5	6.9	2.4	1.5	1.9	-.3	-.5	-.4
25	11.3	9.2	10.3	7.6	7.0	7.3	1.5	1.3	1.5	-.2	-.3	-.3
26	12.0	10.0	10.9	8.7	7.3	7.9	1.4	1.0	1.1	-.1	-.4	-.3
27	11.6	10.8	11.1	8.4	5.8	7.2	1.1	.9	1.0	-.1	-.4	-.3
28	10.8	9.4	9.8	5.7	4.4	4.8	1.1	.9	1.0	-.1	-.3	-.2
29	9.9	9.2	9.5	4.3	3.6	3.9	1.0	.7	.8	.0	-.4	-.2
30	9.2	7.5	8.3	4.3	3.8	4.1	.8	.5	.6	.0	-.3	-.1
31	7.6	7.2	7.4	---	---	---	.5	.3	.4	.0	-.3	-.2
MONTH	15.6	7.2	12.2	12.0	3.6	7.0	7.4	.3	3.5	.8	-.9	.0







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RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

[illegible]

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

## GROUND-WATER RECORDS

395859083440700. Local number, CL-138.

LOCATION.--Lat 39°58'59" Long 83°44'07", Hydrologic Unit 05080001, along State Route 4 near Springfield, OH.  
Owner.--USGS-U.S. Corps of Engineers.

AQUIFER.--Sand and Gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger, diameter 4.0 in., depth 28.5 ft. Cased with Sch 40 PVC to 18.5 ft; .020 in. screen from 18.5 to 28.5 ft.

INSTRUMENTATION - Data logger--60 minute record. Precipitation data collected with a propane-heated, tipping-bucket rain gauge. Also collected: water level, air temperature and soil temperature, and also water temperature and specific conductance.

DATUM.--Elevation of land-surface datum is 1031.61 feet above sea level.  
Measuring point: shelter shelf 3.31 ft above land-surface datum.

REMARKS.--This station is part of an eight-site network to collect data for the Ohio Department of Transportation concerning road salt application and its effect(s) on shallow ground-water quality. Water-quality data for nearby wells is available in preceding tables.

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

### PERIOD OF DAILY RECORD.--

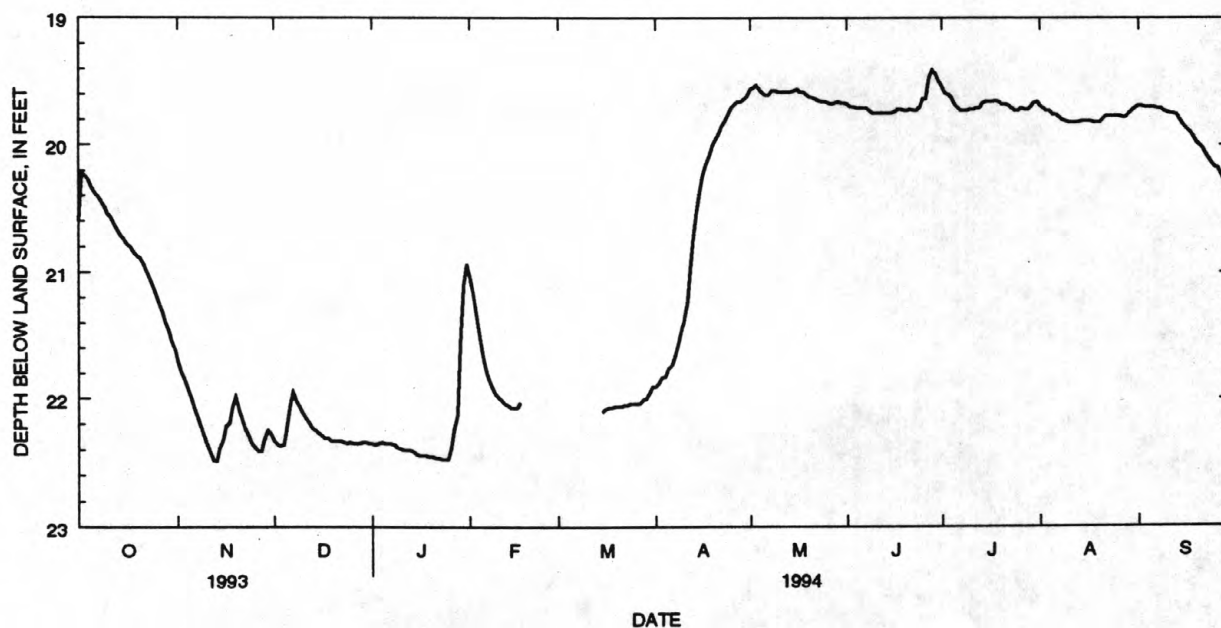
WATER LEVEL: February 1991 to current year.  
SPECIFIC CONDUCTANCE: July 1992 to current year.  
AIR TEMPERATURE: February 1991 to current year.  
WATER TEMPERATURE: July 1992 to current year.  
SOIL TEMPERATURE: February 1991 to current year.  
PRECIPITATION: February 1991 to current year.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER LEVEL: Maximum daily low, 22.54 ft. below land-surface datum, December 30-31, 1992; maximum daily high, 18.61 ft. below land-surface datum, July 20-21, 1993.  
WATER TEMPERATURE: Maximum, 13.9°C many days in November, December, 1993; minimum, 7.3°C July 13, 1993.  
AIR TEMPERATURE: Maximum, 37.5°C July 22, 1991; minimum, -30.7°C January 21, 1994.  
SOIL TEMPERATURE: Maximum, 39.5°C July 22 and August 2, 1991; minimum, -2.7°C Dec. 27, 1992.  
SPECIFIC CONDUCTANCE: Maximum, 922 microsiemens, March 18, 1993; minimum 751 microsiemens, March 15-16, 1994.

### EXTREMES FOR CURRENT YEAR.--

WATER LEVEL: Maximum daily low, 22.49 ft. below land-surface datum, November 13, 1993; maximum daily high, 19.40 ft. below land-surface datum, June 28-29, 1994.  
SPECIFIC CONDUCTANCE: Maximum, 853 microsiemens, February 6, 1994; minimum 751 microsiemens, March 15-16, 1994.  
AIR TEMPERATURE: Maximum, 37.1°C June 18, 1994; minimum, -30.7°C January 21, 1994.  
WATER TEMPERATURE: Maximum, 13.9°C many days in November, December, 1993; minimum, 8.9°C June 7, 9-22, 1994.  
SOIL TEMPERATURE: Maximum, 30.6°C June 19, 1994; minimum, 1.2°C March 17, 1994.



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DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	21.91	21.88	19.56	19.55	19.68	19.66	19.54	19.50	19.69	19.66	19.69	19.69
2	21.88	21.83	19.55	19.53	19.70	19.68	19.59	19.54	19.71	19.69	19.69	19.68
3	21.83	21.83	19.53	19.52	19.70	19.69	19.60	19.59	19.73	19.71	19.70	19.69
4	21.83	21.76	19.56	19.53	19.71	19.70	19.63	19.60	19.73	19.72	19.70	19.69
5	21.76	21.74	19.59	19.56	19.71	19.71	19.68	19.63	19.76	19.72	19.70	19.69
6	21.74	21.67	19.61	19.59	19.71	19.70	19.71	19.68	19.76	19.76	19.70	19.68
7	21.67	21.57	19.61	19.54	19.71	19.71	19.73	19.71	19.78	19.76	19.71	19.70
8	21.57	21.46	19.57	19.55	19.73	19.71	19.73	19.73	19.80	19.78	19.71	19.70
9	21.46	21.39	19.57	19.54	19.75	19.73	19.73	19.71	19.81	19.80	19.73	19.71
10	21.39	21.22	19.58	19.57	19.75	19.74	19.72	19.71	19.82	19.81	19.74	19.73
11	21.22	20.98	19.58	19.55	19.75	19.74	19.72	19.71	19.82	19.81	19.75	19.74
12	20.98	20.72	19.58	19.56	19.75	19.74	19.71	19.70	19.82	19.81	19.75	19.74
13	20.72	20.52	19.58	19.58	19.75	19.72	19.71	19.67	19.82	19.80	19.76	19.74
14	20.52	20.37	19.58	19.57	19.75	19.74	19.67	19.66	19.81	19.79	19.80	19.76
15	20.37	20.23	19.57	19.55	19.75	19.74	19.66	19.65	19.81	19.80	19.84	19.80
16	20.23	20.15	19.56	19.55	19.74	19.71	19.66	19.65	19.81	19.80	19.87	19.84
17	20.15	20.09	19.58	19.56	19.72	19.70	19.66	19.64	19.81	19.79	19.89	19.87
18	20.09	20.01	19.58	19.57	19.72	19.70	19.65	19.63	19.82	19.80	19.93	19.89
19	20.01	19.96	19.60	19.58	19.73	19.71	19.66	19.64	19.82	19.80	19.97	19.93
20	19.96	19.91	19.62	19.60	19.73	19.72	19.68	19.66	19.82	19.79	20.00	19.97
21	19.91	19.85	19.63	19.62	19.72	19.70	19.68	19.67	19.79	19.76	20.02	20.00
22	19.85	19.81	19.64	19.63	19.73	19.72	19.69	19.67	19.77	19.76	20.06	20.02
23	19.81	19.76	19.65	19.64	19.73	19.70	19.71	19.69	19.77	19.77	20.10	20.06
24	19.76	19.71	19.66	19.65	19.70	19.63	19.73	19.71	19.77	19.76	20.14	20.10
25	19.71	19.68	19.66	19.65	19.64	19.62	19.73	19.67	19.77	19.76	20.17	20.14
26	19.68	19.65	19.67	19.64	19.64	19.47	19.71	19.69	19.77	19.76	20.18	20.17
27	19.66	19.63	19.68	19.67	19.47	19.41	19.72	19.71	19.78	19.76	20.23	20.18
28	19.66	19.64	19.67	19.66	19.41	19.40	19.72	19.70	19.78	19.75	20.28	20.23
29	19.64	19.62	19.66	19.66	19.44	19.40	19.70	19.67	19.75	19.73	20.34	20.28
30	19.62	19.55	19.67	19.66	19.50	19.44	19.67	19.66	19.73	19.71	20.38	20.34
31	---	---	19.67	19.66	---	---	19.66	19.66	19.71	19.68	---	---
MONTH	21.91	19.55	19.68	19.52	19.75	19.40	19.73	19.50	19.82	19.66	20.38	19.68
YEAR	22.49	19.40										

# **EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO**

395859083440700 CL-138 NR SPRINGFIELD OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	798	781	786	769	768	769	775	774	774	777	776	777
2	788	782	784	770	768	769	775	774	775	777	776	776
3	784	782	782	770	769	769	775	775	775	776	776	776
4	785	784	784	769	768	769	776	775	775	776	775	776
5	789	782	784	770	768	769	776	774	775	779	775	775
6	789	784	786	770	765	770	776	775	775	775	774	775
7	787	786	787	771	766	768	776	775	776	776	774	775
8	788	783	787	771	766	768	778	776	776	776	775	776
9	790	784	788	770	765	768	779	777	778	778	773	775
10	792	789	790	770	765	767	778	777	777	779	774	776
11	792	787	791	770	765	767	780	778	778	780	774	778
12	793	787	792	770	765	769	780	778	779	780	775	779
13	794	787	790	770	765	768	781	780	780	780	775	779
14	793	785	788	769	764	769	782	780	781	780	775	779
15	790	784	788	770	765	769	782	782	782	780	775	777
16	792	789	790	770	765	768	783	782	783	780	775	778
17	792	774	785	770	765	769	783	782	783	780	778	779
18	774	770	772	769	764	767	783	782	782	779	774	777
19	770	767	768	769	764	766	782	781	781	778	773	776
20	772	767	768	770	765	766	781	780	780	778	773	776
21	771	767	768	769	765	766	780	779	780	777	773	775
22	769	767	768	770	765	766	783	777	779	781	775	777
23	770	766	768	767	765	766	782	777	779	784	781	782
24	770	766	768	767	766	767	781	776	777	788	783	784
25	771	768	770	768	767	768	781	775	777	787	782	783
26	771	768	769	769	767	768	781	775	777	783	780	782
27	772	771	771	769	768	769	780	775	777	785	780	782
28	773	772	772	770	769	769	780	774	778	784	780	782
29	773	768	772	772	770	771	779	774	777	780	777	778
30	774	769	770	774	772	773	779	774	778	779	777	778
31	774	768	769	---	---	---	779	776	777	784	779	781
MONTH	798	766	779	774	764	768	783	774	778	788	773	778

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	791	784	787	---	---	---	760	756	758	839	831	835
2	796	791	793	---	---	---	760	758	759	835	829	831
3	805	795	799	---	---	---	760	759	760	829	826	827
4	827	805	815	---	---	---	765	760	762	826	823	824
5	848	827	838	---	---	---	766	761	764	827	822	824
6	853	844	850	---	---	---	767	765	766	825	821	823
7	851	838	845	---	---	---	767	765	766	822	817	820
8	838	818	827	---	---	---	767	766	766	817	813	815
9	818	807	812	---	---	---	771	766	768	813	809	811
10	807	795	801	---	---	---	771	766	770	810	805	807
11	795	786	790	---	---	---	769	765	768	806	802	803
12	787	779	783	---	---	---	769	767	768	805	800	802
13	781	775	778	---	---	---	771	769	770	803	798	801
14	775	770	772	757	752	754	772	769	771	802	796	800
15	770	767	768	756	751	753	772	771	771	801	796	799
16	768	765	766	765	751	757	773	769	770	798	795	797
17	766	764	765	768	761	766	772	767	770	797	794	795
18	---	---	---	772	768	768	773	768	770	795	792	793
19	---	---	---	772	767	770	777	773	774	797	790	793
20	---	---	---	772	767	771	787	777	782	794	790	792
21	---	---	---	771	770	770	800	787	793	793	789	791
22	---	---	---	771	768	770	811	797	804	793	789	791
23	---	---	---	769	767	768	819	807	813	791	788	789
24	---	---	---	768	765	766	825	819	822	790	786	788
25	---	---	---	766	757	758	828	825	826	802	787	797
26	---	---	---	761	756	758	834	827	830	803	800	802
27	---	---	---	760	756	758	838	831	834	802	800	801
28	---	---	---	760	756	759	840	833	837	802	797	800
29	---	---	---	758	757	758	840	838	839	805	798	802
30	---	---	---	758	755	757	840	834	837	805	801	803
31	---	---	---	760	755	757	---	---	---	805	800	804
MONTH	853	764	799	772	751	762	840	756	786	839	786	805

# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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395859083440700 CL-138 NR SPRINGFIELD OH--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	805	803	804	783	777	779	802	783	795	787	785	786
2	804	800	803	782	777	778	792	786	789	788	786	787
3	804	799	802	783	778	779	791	786	787	789	786	787
4	803	800	801	781	779	780	790	785	786	789	784	787
5	802	799	800	782	777	780	788	786	786	789	784	787
6	802	798	800	782	778	781	788	786	787	790	784	788
7	804	799	801	784	778	781	788	786	787	791	786	788
8	801	800	801	786	780	783	788	785	787	791	786	788
9	803	798	799	789	783	785	788	783	787	792	787	788
10	802	797	800	794	788	790	788	786	787	791	787	788
11	801	797	799	798	793	795	787	782	786	792	788	789
12	801	797	799	805	798	801	787	781	786	791	788	790
13	801	795	798	809	805	807	787	782	784	792	789	790
14	800	795	798	813	809	811	786	781	782	793	790	791
15	798	793	796	818	813	815	784	781	783	795	791	793
16	798	792	794	820	818	819	784	781	783	795	793	794
17	796	792	794	822	820	821	784	782	783	795	794	795
18	796	791	794	823	819	822	784	782	783	797	795	796
19	796	791	794	822	817	820	785	782	784	798	796	797
20	795	790	792	821	816	818	785	780	784	799	797	798
21	793	788	791	817	815	816	784	779	781	800	794	798
22	793	788	790	816	815	815	784	780	782	801	795	799
23	791	788	789	816	813	814	782	780	781	802	796	800
24	790	787	788	815	812	813	782	780	781	803	801	802
25	789	788	788	814	810	812	783	781	782	803	798	801
26	789	787	788	812	810	811	784	781	782	800	798	799
27	787	784	785	811	806	809	784	781	783	806	800	803
28	787	782	785	810	803	806	785	782	784	807	801	802
29	782	780	781	807	802	803	786	782	783	808	803	806
30	782	778	781	805	800	802	786	783	784	808	804	807
31	---	---	---	805	800	801	785	783	785	---	---	---
MONTH	805	778	794	823	777	802	802	779	785	808	784	794
YEAR	853	751	786									

TEMPERATURE, AIR, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	23.4	6.9	15.2	4.7	-2.7	.8	10.0	-1.8	3.3	3.7	-3.9	.8
2	16.3	5.2	12.1	8.1	-1.9	3.4	10.7	3.3	6.6	1.1	-1.1	.2
3	17.4	.4	9.1	6.9	3.8	5.1	7.5	2.6	6.1	-.9	-2.4	-1.6
4	23.9	7.7	15.2	12.8	3.9	8.9	12.5	4.6	8.9	-2.5	-7.9	-4.4
5	17.4	3.4	10.1	14.4	3.2	10.0	4.6	2.8	3.8	-4.0	-6.1	-5.1
6	23.6	3.1	12.6	4.2	-.9	2.2	5.7	1.3	3.7	2.2	-3.7	-.2
7	26.5	10.3	17.3	.0	-4.0	-1.7	4.9	-.7	1.8	1.4	-10.0	-3.1
8	26.4	9.3	16.2	10.0	-3.7	1.4	7.7	-2.5	1.9	-10.7	-15.8	-12.9
9	16.8	3.2	11.2	12.1	-4.0	2.1	11.5	-1.4	5.5	-4.7	-14.7	-9.8
10	10.1	-.7	4.1	13.3	-4.4	3.6	13.6	-.2	8.3	-2.2	-11.5	-6.4
11	13.9	-.5	6.4	14.9	-.8	7.7	-.6	-8.3	-3.5	4.3	-.6	2.0
12	14.6	2.5	9.0	14.9	9.5	11.7	3.6	-9.1	-2.8	2.9	.5	1.4
13	14.1	4.4	8.7	16.6	8.4	12.5	5.7	-2.2	1.5	1.5	-3.8	-.5
14	19.1	3.3	9.3	18.4	14.3	15.9	7.6	2.4	4.6	-4.2	-18.4	-11.2
15	22.4	5.8	13.6	16.7	6.7	10.7	4.6	2.0	3.7	-17.2	-23.0	-20.0
16	16.2	13.5	15.3	8.6	5.3	6.6	6.8	-.6	2.8	-9.8	-23.4	-17.2
17	19.2	10.1	15.7	13.1	5.2	8.7	4.0	1.6	2.6	-3.9	-19.9	-9.2
18	16.6	10.3	12.6	9.4	-.1	3.8	4.0	1.2	2.9	-20.5	-29.4	-24.7
19	13.8	11.4	12.4	9.3	1.0	6.4	2.7	1.0	1.5	-19.5	-30.6	-24.2
20	19.8	12.7	15.9	3.2	-2.8	.1	2.7	.3	1.3	-11.7	-27.3	-17.9
21	18.9	5.5	11.1	10.5	-.5	4.6	-.4	-4.4	-2.5	-8.5	-30.7	-17.7
22	15.1	.3	6.9	13.7	1.8	6.1	1.9	-3.5	-1.2	-1.7	-10.9	-7.1
23	17.4	-1.3	6.7	12.4	.9	6.8	.1	-3.8	-2.7	3.5	-1.1	1.9
24	20.3	1.6	9.6	13.6	6.2	8.8	-3.7	-5.1	-4.5	3.6	1.4	2.9
25	21.3	1.4	9.9	10.8	2.7	6.7	-2.8	-13.2	-6.8	2.7	-2.2	1.5
26	21.9	6.2	12.8	15.6	4.8	10.2	-7.1	-13.9	-10.8	-3.2	-6.8	-4.9
27	10.1	5.2	8.1	3.6	-5.1	-.6	-6.2	-11.3	-8.5	5.3	-3.9	2.3
28	9.1	.4	5.5	.6	-5.7	-1.6	-7.5	-15.4	-9.4	8.8	-2.6	3.1
29	9.4	1.1	6.9	-.5	-2.7	-1.5	-4.6	-16.1	-9.8	-1.5	-10.7	-4.0
30	1.7	-.7	.6	3.7	-1.3	.3	-8.4	-15.1	-10.9	-.9	-9.3	-5.4
31	2.3	.3	1.2	---	---	---	1.0	-8.1	-3.4	-2.4	-14.5	-8.4
MONTH	26.5	-1.3	10.4	18.4	-5.7	5.3	13.6	-16.1	-.2	8.8	-30.7	-6.4





# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

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WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	13.1	12.9	13.0	13.6	13.6	13.6	13.9	13.8	13.9	13.6	13.6	13.6
2	13.2	12.9	13.1	13.6	13.6	13.6	13.9	13.9	13.9	13.6	13.6	13.6
3	13.2	13.1	13.2	13.6	13.6	13.6	13.9	13.9	13.9	13.6	13.6	13.6
4	13.2	13.1	13.2	13.6	13.6	13.6	13.9	13.9	13.9	13.6	13.6	13.6
5	13.2	13.0	13.2	13.7	13.6	13.6	13.9	13.9	13.9	13.6	13.4	13.6
6	13.2	13.0	13.2	13.9	13.6	13.6	13.9	13.9	13.9	13.6	13.6	13.6
7	13.2	13.2	13.2	13.9	13.6	13.7	13.9	13.9	13.9	13.6	13.6	13.6
8	13.4	13.2	13.2	13.9	13.6	13.7	13.9	13.9	13.9	13.6	13.6	13.6
9	13.4	13.1	13.2	13.9	13.6	13.8	13.9	13.8	13.9	13.6	13.4	13.6
10	13.2	13.1	13.2	13.9	13.6	13.8	13.9	13.9	13.9	13.6	13.4	13.5
11	13.4	13.1	13.2	13.9	13.6	13.8	13.9	13.8	13.9	13.6	13.4	13.4
12	13.4	13.1	13.2	13.9	13.6	13.7	13.9	13.8	13.9	13.6	13.4	13.4
13	13.4	13.2	13.3	13.9	13.6	13.7	13.9	13.8	13.9	13.6	13.4	13.4
14	13.4	13.1	13.3	13.9	13.7	13.7	13.9	13.9	13.9	13.6	13.3	13.4
15	13.4	13.1	13.3	13.9	13.6	13.7	13.9	13.9	13.9	13.6	13.3	13.5
16	13.2	13.2	13.2	13.9	13.6	13.7	13.9	13.9	13.9	13.6	13.3	13.4
17	13.4	13.2	13.3	13.9	13.6	13.7	13.9	13.9	13.9	13.4	13.3	13.3
18	13.4	13.4	13.4	13.9	13.6	13.7	13.9	13.9	13.9	13.5	13.3	13.4
19	13.4	13.4	13.4	13.9	13.6	13.8	13.9	13.9	13.9	13.5	13.3	13.4
20	13.4	13.2	13.4	13.9	13.6	13.8	13.9	13.9	13.9	13.5	13.3	13.3
21	13.4	13.2	13.4	13.9	13.6	13.8	13.9	13.8	13.9	13.5	13.3	13.4
22	13.4	13.4	13.4	13.9	13.7	13.8	13.9	13.6	13.8	13.4	13.3	13.4
23	13.4	13.4	13.4	13.9	13.9	13.9	13.9	13.6	13.8	13.4	13.4	13.4
24	13.5	13.4	13.4	13.9	13.9	13.9	13.9	13.6	13.8	13.4	13.1	13.4
25	13.5	13.4	13.4	13.9	13.9	13.9	13.9	13.6	13.8	13.4	13.1	13.4
26	13.5	13.4	13.4	13.9	13.9	13.9	13.9	13.6	13.8	13.4	13.4	13.4
27	13.4	13.4	13.4	13.9	13.8	13.9	13.9	13.6	13.7	13.4	13.1	13.3
28	13.4	13.4	13.4	13.9	13.8	13.9	13.8	13.6	13.7	13.1	13.1	13.1
29	13.6	13.4	13.4	13.9	13.9	13.9	13.9	13.6	13.7	13.1	13.1	13.1
30	13.6	13.4	13.5	13.9	13.9	13.9	13.8	13.6	13.6	13.1	13.1	13.1
31	13.6	13.4	13.6	---	---	---	13.6	13.6	13.6	13.1	13.1	13.1
MONTH	13.6	12.9	13.3	13.9	13.6	13.8	13.9	13.6	13.8	13.6	13.1	13.4

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	13.1	13.1	13.1	---	---	---	11.3	11.1	11.2	10.0	9.8	9.9
2	13.1	13.1	13.1	---	---	---	11.1	11.1	11.1	10.0	9.8	9.9
3	13.1	13.1	13.1	---	---	---	11.1	11.1	11.1	9.9	9.8	9.8
4	13.2	13.1	13.1	---	---	---	11.1	10.9	11.0	9.9	9.8	9.8
5	13.1	12.9	13.1	---	---	---	11.1	10.9	10.9	9.8	9.6	9.7
6	13.1	12.9	13.0	---	---	---	10.9	10.9	10.9	9.7	9.6	9.6
7	13.1	12.9	12.9	---	---	---	10.9	10.8	10.9	9.6	9.6	9.6
8	12.9	12.9	12.9	---	---	---	10.9	10.8	10.9	9.7	9.6	9.6
9	12.9	12.9	12.9	---	---	---	10.9	10.7	10.8	9.7	9.6	9.6
10	12.9	12.6	12.8	---	---	---	10.9	10.6	10.7	9.7	9.6	9.6
11	12.9	12.6	12.8	---	---	---	10.9	10.6	10.7	9.7	9.5	9.6
12	12.9	12.6	12.8	---	---	---	10.7	10.6	10.7	9.7	9.5	9.6
13	12.7	12.6	12.6	---	---	---	10.7	10.7	10.7	9.6	9.5	9.5
14	12.7	12.6	12.7	---	---	---	10.7	10.6	10.7	9.7	9.4	9.5
15	12.7	12.6	12.7	12.0	11.8	11.9	10.7	10.7	10.7	9.6	9.4	9.5
16	12.7	12.6	12.7	12.0	11.7	11.9	10.7	10.5	10.7	9.5	9.4	9.5
17	12.7	12.6	12.7	11.9	11.7	11.8	10.7	10.5	10.6	9.5	9.4	9.4
18	---	---	---	11.8	11.5	11.7	10.7	10.4	10.5	9.5	9.4	9.4
19	---	---	---	11.8	11.5	11.6	10.5	10.5	10.5	9.5	9.2	9.4
20	---	---	---	11.7	11.5	11.6	10.5	10.4	10.5	9.4	9.2	9.3
21	---	---	---	11.6	11.5	11.5	10.5	10.3	10.4	9.4	9.2	9.3
22	---	---	---	11.6	11.5	11.5	10.5	10.2	10.4	9.3	9.2	9.3
23	---	---	---	11.6	11.5	11.6	10.4	10.2	10.3	9.3	9.2	9.3
24	---	---	---	11.6	11.5	11.6	10.3	10.2	10.3	9.3	9.2	9.3
25	---	---	---	11.6	11.5	11.5	10.3	10.2	10.3	9.3	9.2	9.3
26	---	---	---	11.5	11.3	11.5	10.3	10.1	10.3	9.3	9.2	9.3
27	---	---	---	11.5	11.3	11.4	10.3	10.1	10.2	9.3	9.2	9.2
28	---	---	---	11.5	11.3	11.3	10.3	10.0	10.2	9.3	9.1	9.2
29	---	---	---	11.3	11.3	11.3	10.1	10.0	10.1	9.3	9.1	9.2
30	---	---	---	11.3	11.3	11.3	10.0	9.9	10.0	9.2	9.1	9.1
31	---	---	---	11.4	11.1	11.2	---	---	---	9.2	9.0	9.1
MONTH	13.2	12.6	12.9	12.0	11.1	11.5	11.3	9.9	10.6	10.0	9.0	9.5

**WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

TEMPERATURE, SOIL (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]



# EFFECTS OF HIGHWAY DEICING CHEMICALS ON SHALLOW UNCONSOLIDATED AQUIFERS IN OHIO

395859083440700 CL-138 NR SPRINGFIELD OH--Continued

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	---	.00	.00	.01	.00	.00	.01
2	.00	.00	.00	.00	.00	---	.01	.00	.00	.14	.00	.00
3	.00	.00	.00	.00	.00	---	.33	.03	.00	.14	.00	.00
4	.00	.00	.00	.00	.00	---	.01	.00	.00	.00	.25	.00
5	.00	.00	.00	.00	.00	---	.03	.00	.00	.00	.02	.00
6	.00	.00	.00	.00	.00	---	.31	.11	.04	.00	.00	.00
7	.00	.00	.00	.00	.00	---	.01	.44	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	---	.00	.00	.00	.29	.00	.00
9	.00	.00	.00	.00	.00	---	.06	.00	.00	.04	.00	.00
10	.00	.00	.00	.00	.00	---	.28	.00	.00	.00	.00	.03
11	.00	.00	.00	.00	.00	---	.20	.25	.00	.00	.22	.00
12	.00	.00	.00	.00	.00	---	.06	.01	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	---	.05	.00	.00	.24	.00	.00
14	.00	.00	.00	.00	.00	---	.00	.16	.00	.00	.21	.00
15	.00	.00	.00	.00	.00	.00	.07	.27	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.23	.00	.03
18	.00	.00	.00	.00	---	.06	.01	.00	.00	.00	.00	.01
19	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	---	.00	.00	.00	.21	.00	.48	.00
21	.00	.00	.00	.00	---	.08	.00	.00	.00	.00	.02	.00
22	.00	.00	.00	.00	---	.00	.00	.00	.00	.08	.00	.00
23	.00	.00	.00	.00	---	.00	.00	.01	.38	.00	.00	.00
24	.00	.00	.00	.00	---	.01	.00	.06	.93	.69	.00	.00
25	.00	.00	.00	.00	---	.00	.00	.02	.05	.00	.00	.01
26	.00	.00	.00	.00	---	.12	.00	.36	1.42	.00	.00	.00
27	.00	.00	.00	.00	---	.03	.07	.00	.00	.39	.00	.00
28	.00	.00	.00	.00	---	.08	.04	.00	.01	.22	.53	.00
29	.00	.00	.00	.00	---	.01	.37	.01	.01	.11	.01	.01
30	.00	.00	.00	.00	---	.00	.31	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.16	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.39	2.22	1.73	3.06	2.57	1.90	0.10

WTR YR 1994 TOTAL 11.97



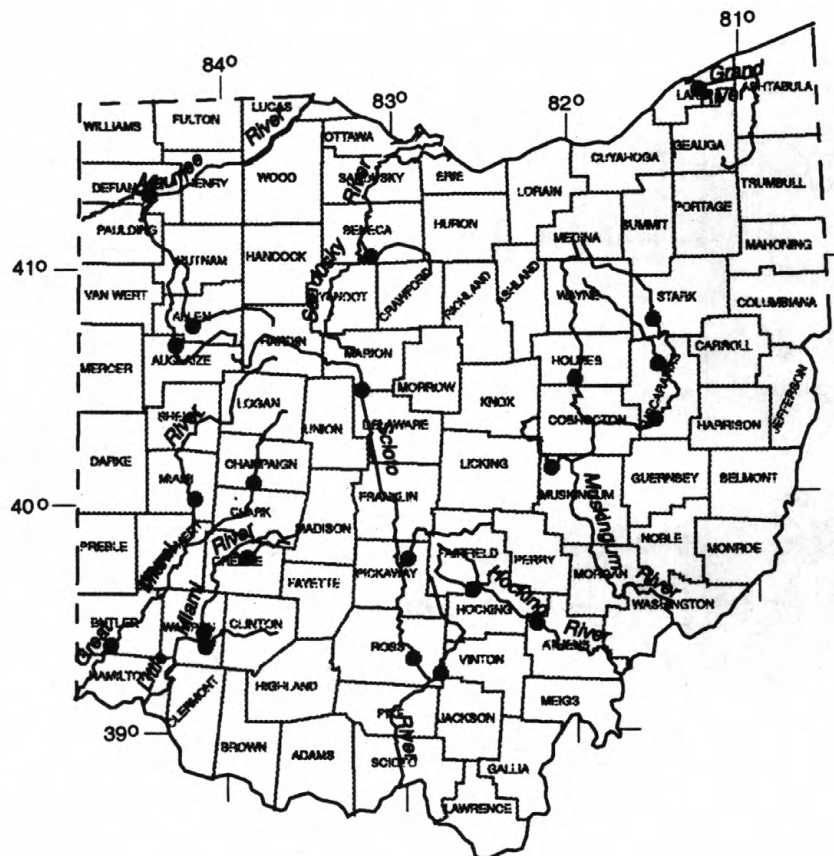
The following data list bridge-scour measurement sites and instantaneous discharge measurements collected at some of these sites. The data were collected as part of a cooperative study with the Ohio Department of Transportation. The objectives of this study are (1) to collect reliable and sufficient data during flood events to determine whether local scour, contraction scour, and general scour, are occurring at the sites; (2) to compare and evaluate published local scour-prediction equations with observed data; and (3) to compare local scour data collected using geophysical techniques with local scour data defined by physical measurements.

## BRIDGE-SCOUR MEASUREMENT SITES

Site Number	Site Name	Drainage Area (mi <sup>2</sup> )
404037084155200	Auglaize River near Wapakoneta, Ohio	200
393549082324700	Clear Creek near Rockbridge, Ohio	91.8
414308081134101	Grand River near Painesville, Ohio	685
392340084341700	Great Miami at Hamilton, Ohio	3,630
400150084111300	Great Miami River at Troy, Ohio	927
392731082142400	Hocking River at Nelsonville, Ohio	576
410120083063501	Honey Creek at Melmore, Ohio	149
402941081591200	Killbuck Creek at Killbuck, Ohio	462
392424084060400	Little Miami River at Ft. Ancient, Ohio	675
400627083475701	Mad River near Urbana, Ohio	162
394410083561000	Massies Creek at Oldtown, Ohio	84.4
411536084331400	Maumee River near Sherwood, Ohio	2,276
404257084081500	Ottawa River at Lima, Ohio	130
391520082461200	Salt Creek near Londonderry, Ohio	286
392031082582700	Scioto River at Chillicothe, Ohio	3,849
402902083112800	Scioto River near Prospect, Ohio	528
403515081312401	Sugar Creek at Strasburg, Ohio	311
392115084074600	Todd Fork at Morrow, Ohio	262
404715081312200	Tuscarawas River at Massillon, Ohio	513
401933081304100	Tuscarawas River at Port Washington, Ohio	2,400
400710082081001	Wakatomika Creek near Frazeyburg, Ohio	140
394609082544200	Walnut Creek near Ashville, Ohio	216

## BRIDGE-SCOUR DATA

## LOCATION OF BRIDGE-SCOUR MEASUREMENT SITES IN OHIO



## INSTANTANEOUS DISCHARGE MEASUREMENTS AT BRIDGE-SCOUR SITES

Site Number	Site Name	Date	Discharge (ft <sup>3</sup> /s)
393549082324700	Clear Creek near Rockbridge	1/28/94	3,510
392340084341700	Great Miami River at Hamilton	1/29/94	34,100
400150084111300	Great Miami River at Troy	1/29/94	9,960
392731082142400	Hocking River at Nelsonville	1/29/94	10,200
400627083475701	Mad River near Urbana	1/28/94	2,220
424410083561000	Massies Creek at Oldtown	1/28/94	1,760
391520082461200	Salt Creek near Londonderry	1/28/94	10,500
392031082582700	Scioto River at Chillicothe	1/29/94	26,600
403515081312401	Sugar Creek at Strausburg	12/6/93	1,830
392115084074600	Todd Fork at Morrow	1/28/94	7,050
401933081304100	Tuscarawas River at Port Washington	12/6/93	8,880

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

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The following tables contain ground water-level measurements and chemical analyses from a network of wells and two surface-water sites in southern Franklin County. The data were collected as part of a cooperative study with the City of Columbus. The objective of the study is to present estimates of ground-water travel times and flow paths under transient flow to determine the zone of contribution to the City of Columbus' South Well Field. The five digit parameter codes (in parentheses) in the water-quality reports are defined in WATSTORE.

394957083002900. SCIOTO RIVER AT ROUTE 665 AT SHADEVILLE.

LOCATION.--Lat 39°49'57", long 83°00'29", Hydrologic Unit 05060001, north side of Rt. 665 bridge over the Scioto River, 0.1 mi west of Shadeville.

PERIOD OF RECORD.--Aug. 1987 intermittently to current year.

REMARKS.--This site is used for chemical-quality sampling only as part of a cooperative study with the City of Columbus. A "K" associated with bacteriologic data indicates non-ideal colony counts.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)
MAR 22...	8.5	1490	607	11.3	7.7	133	0.110	0.040	0.60	5.50	0.220	0.210
AUG 15...	23.0	480	632	7.0	7.8	122	0.160	0.030	0.60	1.90	0.320	0.330
SEP 06...	21.0	256	878	7.9	7.9	114	0.030	0.020	0.50	4.90	1.10	1.00
DATE	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)
MAR 22...	5.6	69	20	24	3.5	47	87	0.30	5.5	37	<0.5	<1.0
AUG 15...	5.5	62	19	28	5.3	46	100	0.30	4.5	41	1	<1.0
SEP 06...	4.5	--	--	--	--	--	--	--	--	--	--	--
DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)
MAR 22...	<3	<10	25	<10	12	<10	1200	<6	4	6	--	--
AUG 15...	<3	<10	19	20	5	20	1300	<6	20	6	--	--
SEP 06...	--	--	--	--	--	--	--	--	--	--	<0.02	<0.01
DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	PCNOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)
MAR 22...	--	--	--	--	--	600	1300	--	--	--	--	--
AUG 15...	--	--	--	--	--	K6000	140	--	--	--	--	--
SEP 06...	0.09	0.07	0.06	0.14	<0.01	--	--	<0.01	<0.01	<0.00	<0.01	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

394957083002900 SCIOTO RIVER AT ROUTE 665 AT SHADEVILLE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)
MAR 22...	--	--	--	--	--	--	370	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	382	--	--	--	--	--
SEP 06...	0.31	<0.01	<0.02	0.02	0.85	<0.01	--	<0.01	<0.01	0.02	<0.02	<0.01
DATE	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PFB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)
MAR 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 06...	<0.01	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- FARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
MAR 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 06...	<0.01	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.04	<0.02

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

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395000082593400. BIG WALNUT CREEK AT ROUTE 317 NEAR SHADEVILLE

LOCATION.--Lat 39°50'00", long 82°59'34", Hydrologic Unit 05060001, north side of Rt. 317 bridge over Big Walnut Creek, 0.5 mi east-northeast of Shadeville.

PERIOD OF RECORD.--June 1984 intermittently to current year.

REMARKS.--This site is used for chemical-quality sampling only as part of a cooperative study with the City of Columbus. A "K" associated with bacteriological data indicates non-ideal colony counts.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINIT TOT FET FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)
MAR 22...	9.5	557	573	11.9	7.7	115	0.150	0.040	0.60	1.10	0.020	0.020
AUG 16...	21.0	169	342	5.4	7.5	73	0.090	0.030	0.40	1.50	0.050	0.040
SEP 06...	19.0	59	623	7.7	7.8	172	0.040	0.010	0.30	0.870	0.040	0.030
DATE	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)
MAR 22...	4.8	57	16	37	3.2	66	60	0.20	2.1	54	<0.5	<1.0
AUG 16...	5.8	34	8.7	15	4.2	24	33	0.10	5.1	42	1	<1.0
SEP 06...	4.0	71	19	28	3.1	50	66	0.30	6.7	82	<0.5	<1.0
DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)
MAR 22...	<3	<10	19	10	29	20	310	<6	<3	<4	--	--
AUG 16...	<3	<10	150	<10	6	<10	200	<6	5	<4	<0.02	<0.01
SEP 06...	<3	<10	18	<10	18	10	380	<6	5	<4	<0.02	<0.01
DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	MONOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)
MAR 22...	--	--	--	--	--	380	210	--	--	--	--	--
AUG 16...	0.18	0.09	0.09	0.06	0.01	670	1300	<0.01	<0.01	0.01	<0.01	<0.01
SEP 06...	0.04	0.08	0.03	0.04	<0.01	--	--	<0.01	<0.01	<0.00	<0.01	<0.01



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

330

395000082593400 BIG WALNUT CREEK AT ROUTE 317 NEAR SHADEVILLE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)
MAR 22...	--	--	--	--	--	--	333	--	--	--	--	--
AUG 16...	0.78	<0.01	<0.02	0.18	0.69	0.03	212	0.02	<0.01	<0.01	<0.02	<0.01
SEP 06...	0.13	0.02	<0.02	0.02	0.27	<0.01	371	<0.01	<0.01	<0.01	<0.02	<0.01
DATE	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUPOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)
MAR 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 16...	<0.01	<0.03	0.01	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
SEP 06...	<0.01	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
MAR 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 16...	<0.01	<0.06	<0.01	<0.02	0.09	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02
SEP 06...	<0.01	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.04	<0.02

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

331

395114083010401. SCIOTO RIVER AT CW-101 NR SHADEVILLE.

LOCATION.--Lat 39°51'14", long 83°01'04", Hydrologic Unit 05060001, adjacent to City of Columbus well CW-101, 1.5 mi north of Shadeville and 0.8 mi west of US 23.

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

REMARKS.--This site is used for chemical-quality sampling only as part of a cooperative study with the City of Columbus. A "K" associated with bacteriologic data indicates non-ideal colony counts.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LITY WAT WE TOT FET FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)
AUG 15...	22.5	536	634	6.7	7.6	125	0.200	0.030	0.80	2.00	0.330	0.330
SEP 01...	22.5	501	638	6.6	7.6	120	0.240	0.040	0.70	2.50	0.690	0.650
DATE	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)
AUG 15...	5.8	62	19	28	5.2	45	100	0.30	4.2	44	1	<1.0
SEP 01...	5.0	65	19	29	5.2	44	120	0.40	3.9	39	<0.5	<1.0
DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)
AUG 15...	<3	<10	10	<10	6	20	1300	<6	<3	6	<0.02	<0.01
SEP 01...	<3	<10	9	<10	10	10	1500	<6	6	8	<0.02	<0.01
DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, 0.7 UM-MF REC (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BEC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)
AUG 15...	0.17	0.14	0.30	0.37	<0.01	K6000	380	<0.01	<0.01	0.05	<0.01	<0.01
SEP 01...	0.10	0.18	0.08	0.16	<0.01	--	1400	<0.01	<0.01	<0.00	<0.01	<0.01
DATE	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENSOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)
AUG 15...	1.0	<0.01	<0.02	0.05	2.0	0.03	390	<0.01	<0.01	<0.01	<0.02	<0.01
SEP 01...	0.50	0.05	<0.02	0.05	1.2	<0.01	397	<0.01	<0.01	<0.01	<0.02	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

332

395114083010401 SCIOTO RIVER AT CW-101 NR SHADEVILLE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PFB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUPOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)
AUG 15...	<0.01	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
SEP 01...	<0.01	<0.03	<0.04	<0.03	<0.00	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	FENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
AUG 15...	<0.01	<0.06	<0.01	<0.02	0.01	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02
SEP 01...	<0.01	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.04	<0.02

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

333

395251083010700. SCIOTO RIVER AT I-270 S AT COLUMBUS.

LOCATION.--Lat 39°52'51", long 83°01'07", Hydrologic Unit 05060001, south side of I-270 S bridge over the Scioto River, 0.9 mi west of US 23.

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

REMARKS.--This site is used for chemical-quality sampling only as part of a cooperative study with the City of Columbus. A "K" associated with bacteriologic data indicates non-ideal colony counts.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LITY TOT WH TOT FET FIELD MG/L AS CAC03 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)
AUG 16...	22.5	344	700	6.6	7.6	105	0.080	0.030	0.70	4.60	0.790	0.800
SEP 01...	22.5	560	632	6.4	7.5	118	0.250	0.030	0.90	2.60	0.720	0.700
DATE	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)
AUG 16...	5.8	66	19	39	6.8	55	130	0.40	4.8	37	1	<1.0
SEP 01...	5.2	65	19	29	5.0	44	120	0.40	3.8	41	<0.5	<1.0
DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)
AUG 16...	<3	<10	11	<10	8	10	1300	<6	12	39	<0.02	<0.01
SEP 01...	<3	<10	10	<10	9	10	1500	<6	<3	8	<0.02	<0.01
DATE	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	PONOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KP AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRAIN DIS- SOLVED (UG/L) (39381)
AUG 16...	0.12	0.12	0.22	0.50	0.01	K35	180	<0.01	<0.01	0.08	<0.01	<0.01
SEP 01...	0.10	0.19	0.08	0.17	<0.01	--	1400	<0.01	<0.01	<0.00	<0.01	<0.01
DATE	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	DIMETH- OATE WATER FLT 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)
AUG 16...	5.3	0.02	<0.02	0.14	4.5	0.02	450	<0.01	<0.01	<0.01	<0.02	<0.01
SEP 01...	0.52	0.05	<0.02	0.05	1.2	<0.01	388	<0.01	<0.01	<0.01	<0.02	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

334

395251083010700 SCIOTO RIVER AT I-270 S AT COLUMBUS--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPIC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRED 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)
AUG 16...	<0.01	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
SEP 01...	<0.01	<0.03	<0.04	<0.03	<0.00	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHIRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
AUG 16...	<0.01	<0.06	<0.01	<0.02	0.01	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02
SEP 01...	<0.01	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.04	<0.02



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

335

395217083003800. OLEN QUARRY POND NR SHADEVILLE.

LOCATION.--Lat 39°52'17", long 83°00'38", Hydrologic Unit 05060001, at sand and gravel quarry, 1.9 mi north of Shadeville and 0.4 mi west of US 23.

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

REMARKS.--This site is used for chemical-quality sampling only as part of a cooperative study with the City of Columbus. A "K" associated with bacteriologic data indicates non-ideal colony counts.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
AUG 18...	24.5	1110	7.2	7.9	88	160	42	12	4.4
SEP 02...	22.5	1090	7.9	7.9	96	170	42	14	4.4

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
AUG 18...	33	450	0.30	5.7	57	<0.5	<1.0	<3	<10
SEP 02...	32	460	0.30	5.2	69	<0.5	2.0	<3	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
AUG 18...	<3	<10	7	40	660	<6	<3	4	840
SEP 02...	<3	<10	11	50	680	<6	<3	6	850

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

336

395134083010000. Local number FR-100

LOCATION.--Lat 39°51'34", long 83°01'00", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in., depth 56.8 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 688 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 2.47 ft above land-surface datum.

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

34.71 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	11.34
APR 1	15.50
JUN 30	18.50

395116083010400. Local number, FR-101 TH-42

LOCATION.--Lat 39°51'16", long 83°01'04", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in., depth 81 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 687.3 feet above National Geodetic Vertical Datum of 1929. Measuring

point: Top of casing 2.10 ft above land-surface datum

PERIOD OF RECORD.--Dec. 1989 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.13 ft below land-surface datum, Mar. 19, 1991; lowest measured, 35.33 ft below land-surface datum, June 11, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	25.18
APR 1	24.43
JUN 30	24.01

395114083010201. Local number, FR-101 TH-46

LOCATION.--Lat 39°51'14", long 83°01'02", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in., depth 80 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 687.5 feet above National Geodetic Vertical Datum of 1929. Measuring

point: Top of casing, 3.57 ft above land-surface datum.

PERIOD OF RECORD.--May 1981 to current year

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.19 ft below land-surface datum, May 19, 1981; lowest measured, 60.69 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	17.67
APR 1	22.35
JUN 30	25.48

395045083003100. Local number, FR-103, TH-11

LOCATION.--Lat 39°50'45", long 83°00'31", Hydrologic Unit 05060001, near Columbus.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 93 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 699 feet above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of sampler cap, 1.92 ft above land-surface datum.

PERIOD OF RECORD.--Aug. 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.00 ft below land-surface datum, May 9, 1983; lowest measured, 75.49 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	44.82
APR 1	47.03
JUN 30	56.75

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

337

395021083002900. Local number, FR-104 TH-18

LOCATION.--Lat 39°50'21", long 83°00'29", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in., depth 76 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 691 feet above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.00 ft above land-surface datum.

PERIOD OF RECORD.--Sept. 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.17 ft below land-surface datum, Mar. 26, 1984; lowest measured, 58.23 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	30.10
APR 1	31.91
JUN 30	44.04

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FBT FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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)
JUL 14...	15.0	1260	0.3	6.9	336	0.440	<0.010	0.50	<0.050	<0.010	<0.010	--
AUG 31...	13.5	1220	0.2	7.1	264	0.340	<0.010	0.30	<0.050	<0.010	<0.010	0.9
DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (MG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (MG/L AS BE) (01010)	CADMIUM DIS- SOLVED (MG/L AS CD) (01025)	COBALT, DIS- SOLVED (MG/L AS CO) (01035)
JUL 14...	89	26	100	2.4	66	250	0.40	11	54	<0.5	<1.0	<3
AUG 31...	95	50	35	2.2	63	200	0.10	5.3	48	<0.5	<1.0	40
DATE	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)
JUL 14...	<10	1400	<10	45	20	140	<6	<3	7	<0.02	<0.01	<0.01
AUG 31...	<10	14000	<10	480	10	510	<6	8	11	<0.02	<0.01	<0.01
DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEKETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BEC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)
JUL 14...	<0.01	<0.00	<0.01	<0.01	K2	K6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 31...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	0.00
DATE	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U GF, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
JUL 14...	<0.01	<0.02	<0.01	<0.02	<0.01	874	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
AUG 31...	<0.01	<0.02	<0.01	0.00	<0.01	667	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

338

395021083002900 Local number, FR-104 TH-18--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PFB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUPOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
JUL 14...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 31...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
JUL 14...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02
AUG 31...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02

395020083003400. Local number, FR-104 TH-72

LOCATION.--Lat 39°50'20", long 83°00'34", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 100 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 680 ft above National Geodetic Vertical Datum of 1929. Measuring point: top of casing, 6.17 ft above land-surface datum.

PERIOD OF RECORD.--Sept. 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.45 ft below land-surface datum, Mar. 26, 1984; lowest measured, 55.37 ft below land-surface datum, Dec. 20, 1990.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	23.29
APR 1	25.06
JUN 30	40.43

395019083003300. Local number, FR-104 TH-A

LOCATION.--Lat 39°50'19", long 83°00'33", Hydrologic Unit 05060001.

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in., depth 79.3 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 683 feet above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.89 ft above land-surface datum

PERIOD OF RECORD.--Dec. 1989 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.67 ft below land-surface datum, July 28, 1992; lowest measured, 53.59 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	23.44
APR 1	25.28
JUN 30	38.27

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

339

395157083003500. Local number, FR-109

LOCATION.--Lat 39°51'57", long 83°00'35", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 92 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 702.2 feet above National Geodetic Vertical Datum of 1929. Measuring point: Top of outer steel casing, 30.8 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.47 ft above land-surface datum, Sept. 05, 1990; lowest measured, 30.56 ft below land-surface datum, Aug. 05, 1988.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	3.33
APR 1	8.72
JUN 30	5.56

395039082585800. Local number, FR-115 TH-67

LOCATION.--Lat 39°50'39", long 82°58'58", Hydrologic Unit 05060001, near Hamilton Meadows.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation well, diameter 6 in., depth 116 ft.

INSTRUMENTATION - Data logger -- 60 minute record.

DATUM.--Elevation of land-surface datum is 721 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Floor of instrument shelter, 2.10 ft above land-surface datum.

PERIOD OF RECORD.--Aug. 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 48.15 ft below land-surface datum, Feb. 28 and 29, 1992; minimum daily low, 27.21 ft below land-surface datum, May 3, 1984.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 16	37.12
MAR 22	36.99
JUN 30	38.88



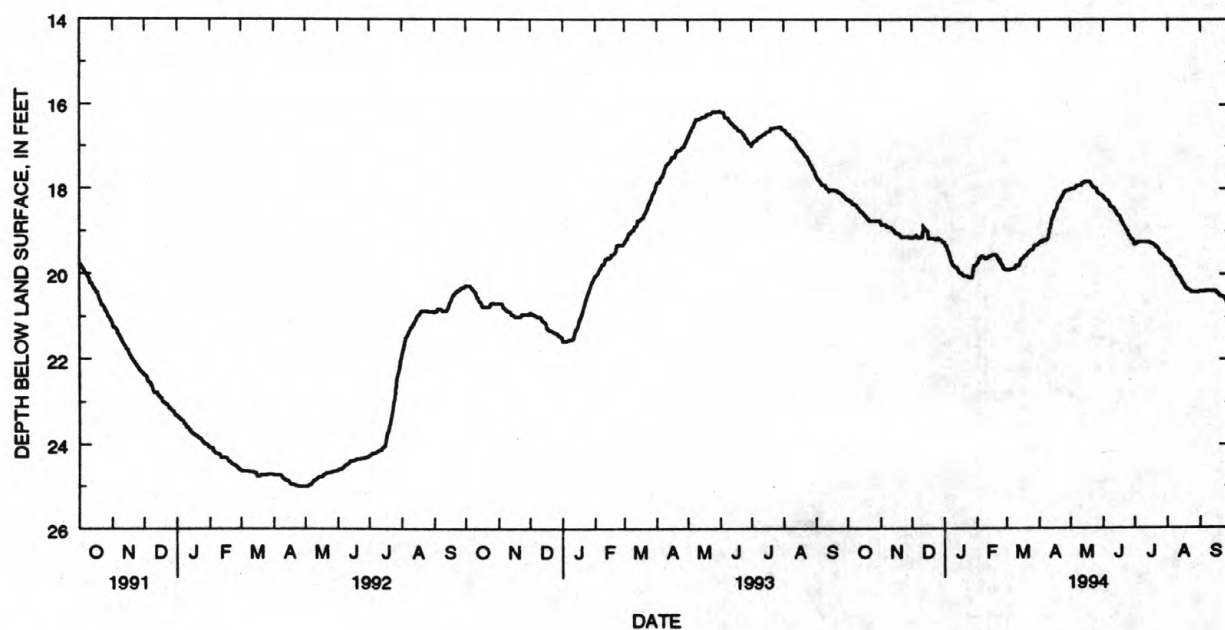
## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

340

395039082585800 Local number, FR-115 TH-67--Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38.62	37.16	36.97	39.67	38.20	39.78	37.73	36.09	38.32	38.63	40.71	39.14
2	38.62	37.54	37.29	40.09	38.89	39.26	37.93	36.00	39.03	38.32	41.29	39.08
3	36.39	38.47	37.25	40.37	39.39	38.95	37.40	35.90	39.14	38.10	41.56	39.04
4	36.64	37.59	37.09	40.73	39.70	38.76	37.27	36.20	38.23	38.83	41.77	39.03
5	36.82	35.84	37.09	40.91	40.01	38.65	37.07	36.15	39.08	39.50	41.94	39.02
6	36.90	36.14	37.01	41.13	40.22	38.57	36.06	36.04	39.36	39.90	42.06	39.02
7	36.98	36.84	37.01	41.18	40.32	38.54	36.15	36.00	39.58	39.96	42.13	39.05
8	37.02	37.20	36.84	40.27	39.53	38.33	36.08	36.05	39.04	39.11	41.66	39.05
9	37.16	37.83	36.80	39.66	38.83	38.26	36.25	35.98	38.27	38.48	41.58	39.06
10	38.60	38.44	36.83	39.30	38.45	38.21	36.33	35.29	38.42	38.12	41.80	39.50
11	38.88	37.99	36.90	39.01	37.97	38.17	36.27	35.71	39.36	39.06	42.14	39.41
12	38.23	37.72	36.89	38.85	37.81	38.09	35.97	35.99	39.83	39.67	42.34	39.27
13	37.88	37.64	36.90	38.73	37.68	36.78	35.86	35.68	39.90	40.04	42.48	40.46
14	37.75	37.62	36.93	38.66	37.59	36.97	35.79	35.40	39.72	40.31	42.68	40.95
15	37.68	38.73	37.07	38.66	38.71	37.20	35.65	35.25	40.17	40.55	42.74	40.74
16	37.63	39.45	37.13	38.64	39.50	37.23	35.55	35.25	40.33	40.57	42.31	40.12
17	37.62	39.45	37.13	38.57	40.04	37.21	34.25	36.93	40.23	39.56	41.94	39.80
18	37.62	38.51	37.15	38.57	40.43	37.22	34.62	37.79	40.50	39.95	42.11	39.64
19	37.55	37.80	37.20	38.57	40.72	37.22	34.96	38.31	40.67	40.48	41.54	39.54
20	37.54	37.82	37.17	38.67	40.97	37.06	35.07	38.71	40.78	40.80	40.82	40.23
21	37.59	37.18	37.25	39.88	41.16	37.11	34.97	38.83	40.90	41.01	40.40	41.12
22	37.55	35.96	37.27	40.28	41.20	37.11	34.91	37.88	40.96	41.19	40.10	41.69
23	37.50	36.68	37.30	39.94	41.33	36.90	34.96	37.22	40.98	41.33	39.86	42.07
24	36.41	36.88	36.06	39.72	41.37	36.88	34.95	37.82	40.60	41.38	39.68	42.31
25	35.85	36.85	35.44	40.73	41.41	36.26	35.01	38.24	40.88	40.70	39.54	42.33
26	36.36	36.85	36.08	41.21	41.46	36.38	36.48	37.71	40.98	39.89	39.43	41.58
27	36.59	36.93	37.73	41.22	41.48	36.59	37.47	37.94	40.64	39.36	39.37	42.07
28	36.71	36.95	38.59	40.13	40.67	36.64	37.56	38.72	40.13	40.45	39.33	42.46
29	36.91	37.00	38.87	39.29	---	36.71	36.59	38.79	39.26	40.90	39.29	42.58
30	36.97	37.02	38.49	38.41	---	36.71	36.26	37.91	39.08	40.74	39.23	42.10
31	37.10	---	38.98	37.69	---	36.66	---	37.45	---	40.08	39.14	---
MAX	38.88	39.45	38.98	41.22	41.48	39.78	37.93	38.83	40.98	41.38	42.74	42.58



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

341

395006083010300. Local number, FR-116, M-1

LOCATION.--Lat 39°50'06", long 83°01'36", Hydrologic Unit 05060001.

Owner.--Jackson Township.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 62 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 725 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of plastic pipe, 2.5 ft above land-surface datum.

PERIOD OF RECORD.--Apr. 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.48 ft below land-surface datum, Mar. 26, 1984; lowest measured, 28.29 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 17	24.99

395016083010300. Local number, FR-117, M-2

LOCATION.--Lat 39°50'16", long 83°01'03", Hydrologic Unit 05060001.

Owner.--Jackson Township.

AQUIFER.--Clay, sand, and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 45 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 700 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of 2-inch steel pipe, 3.08 ft above land-surface datum.

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.02 ft below land-surface datum, June 17, 1981; lowest measured, 24.15 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	18.44
MAR 29	17.42
JUN 30	18.11

395058083002400. Local number, FR-119, M-5

LOCATION.--Lat 39°51'11", long 83°00'26", Hydrologic Unit 05060001.

Owner.--Franklin County.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in., depth 85 ft.

INSTRUMENTATION - Data logger -- 60 minute record.

DATUM.--Elevation of land-surface datum is 700 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of plywood, 2.48 ft above land-surface datum.

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 52.34 ft below land-surface datum, Mar. 4-7, 1992; minimum daily low, 11.10 ft below land-surface datum, June 17, 1981.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

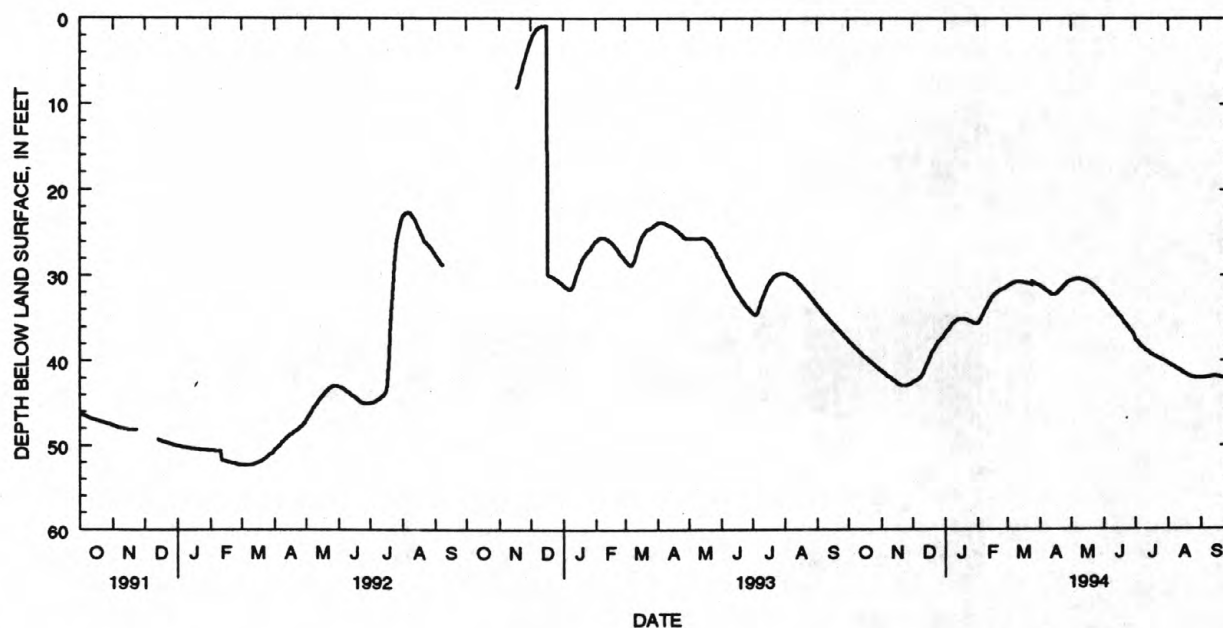
Date	Water Level
DEC 16	39.82
MAR 24	30.74
JUN 30	37.35

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395058083002400 Local number, FR-119, M-5--Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37.69	41.21	42.58	36.81	35.56	31.26	31.23	30.58	32.48	37.58	40.35	42.03
2	37.82	41.31	42.51	36.65	35.42	31.18	31.31	30.53	32.62	37.72	40.42	42.03
3	37.94	41.41	42.43	36.48	35.24	31.10	31.39	30.49	32.77	37.87	40.50	42.03
4	38.07	41.50	42.35	36.31	35.02	31.04	31.47	30.45	32.92	38.01	40.57	42.02
5	38.20	41.59	42.27	36.14	34.78	30.97	31.55	30.43	33.07	38.15	40.65	42.01
6	38.33	41.69	42.18	35.98	34.54	30.91	31.64	30.41	33.22	38.28	40.72	41.99
7	38.46	41.78	42.10	35.82	34.29	30.87	31.73	30.40	33.38	38.41	40.80	41.97
8	38.56	41.88	42.00	35.66	34.05	30.83	31.82	30.41	33.54	38.52	40.88	41.94
9	38.69	41.97	41.85	35.52	33.80	30.80	31.92	30.42	33.71	38.62	40.96	41.92
10	38.82	42.06	41.66	35.40	33.54	30.78	32.01	30.44	33.86	38.71	41.04	41.90
11	38.92	42.16	41.42	35.31	33.30	30.77	32.11	30.47	34.02	38.82	41.13	41.87
12	39.04	42.24	41.14	35.24	33.08	30.77	32.18	30.50	34.18	38.92	41.22	41.85
13	39.16	42.34	40.85	35.18	32.86	30.77	32.20	30.54	34.33	39.01	41.29	41.83
14	39.27	42.45	40.57	35.14	32.68	30.78	32.21	30.59	34.50	39.09	41.36	41.83
15	39.40	42.54	40.27	35.11	32.52	30.79	32.21	30.64	34.65	39.18	41.42	41.83
16	39.51	42.64	39.97	35.10	32.36	30.81	32.19	30.71	34.81	39.25	41.50	41.84
17	39.62	42.72	39.68	35.09	32.23	30.83	32.12	30.78	34.96	39.33	41.57	41.87
18	39.73	42.82	39.41	35.09	32.12	30.85	32.02	30.85	35.13	39.40	41.64	41.89
19	39.84	42.89	39.14	35.11	32.02	30.87	31.90	30.93	35.29	39.47	41.71	41.93
20	39.95	42.95	38.90	35.13	31.93	30.89	31.78	31.02	35.44	39.54	41.77	41.98
21	40.06	42.97	38.66	35.16	31.85	30.92	31.65	31.12	35.60	39.61	41.84	42.02
22	40.17	42.97	38.44	35.21	31.77	30.95	31.53	31.22	35.76	39.68	41.89	42.06
23	40.28	42.97	38.24	35.25	31.71	30.99	31.39	31.32	35.92	39.75	41.94	42.11
24	40.39	42.97	38.05	35.30	31.64	31.03	31.24	31.43	36.09	39.81	41.97	42.16
25	40.49	42.94	37.88	35.36	31.57	30.80	31.11	31.54	36.25	39.88	41.99	42.21
26	40.60	42.90	37.72	35.42	31.50	30.85	30.99	31.66	36.42	39.94	42.01	42.24
27	40.72	42.85	37.58	35.50	31.42	30.90	30.88	31.79	36.60	40.01	42.02	42.28
28	40.82	42.78	37.45	35.57	31.34	30.96	30.78	31.91	36.75	40.07	42.03	42.30
29	40.92	42.72	37.30	35.62	---	31.03	30.70	32.05	36.93	40.13	42.03	42.33
30	41.02	42.65	37.14	35.63	---	31.09	30.64	32.19	37.42	40.20	42.03	42.36
31	41.12	---	36.98	35.63	---	31.16	---	32.33	---	40.26	42.03	---
MAX	41.12	42.97	42.58	36.81	35.56	31.26	32.21	32.33	37.42	40.26	42.03	42.36



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

343

395117083011600. Local number, FR-120, M-6

LOCATION.--Lat 39°51'17", long 83°01'16", Hydrologic Unit 05060001, near Columbus.

Owner.--Franklin County.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 72 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 685 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Floor of instrument shelter, 7.14 ft above land-surface datum.

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.36 ft below land-surface datum, Mar. 21, 1984; lowest measured, 35.24 ft below land-surface datum, Mar. 16, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	9.28
MAR 29	12.68
JUN 30	16.44

395123083003301. Local number, FR-121A

LOCATION.--Lat 39°51'23", long 83°00'33", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 60 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 690.99 feet above National Geodetic Vertical Datum of 1929. Measuring

point: Top of outer steel casing, 3.16 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.53 ft below land-surface datum, Mar. 26, 1993; lowest measured, 26.98 ft below land-surface datum, June 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	24.10
MAR 24	20.66
JUN 30	26.98

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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)
MAR 24...	13.0	1380	0.6	6.6	416	0.130	0.020	0.20	0.280	<0.010	<0.010	1.4
JUL 07...	12.5	1470	0.1	6.4	432	0.120	<0.010	<0.20	<0.050	0.020	<0.010	1.3
AUG 30...	12.5	1490	0.2	6.6	413	0.160	<0.010	<0.20	<0.050	<0.010	<0.010	1.3

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
MAR 24...	210	60	19	2.3	58	320	0.30	13	21	<0.5	<1.0	10
JUL 07...	220	62	21	2.5	58	390	0.30	14	20	<0.5	2.0	5
AUG 30...	210	66	24	2.6	56	400	0.30	13	20	<0.5	<1.0	<3

DATE	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- YLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)
MAR 24...	<10	3200	<10	110	10	270	<6	4	13	--	--	--
JUL 07...	<10	4400	20	130	20	270	<6	10	10	<0.02	<0.01	<0.01
AUG 30...	<10	3900	40	150	20	270	<6	8	12	<0.02	<0.01	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395123083003301 Local number, FR-121A--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)
MAR 24...	--	--	--	--	<20	<20	--	--	--	--	--	--
JUL 07...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 30...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	0.00
DATE	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
MAR 24...	--	--	--	--	--	994	--	--	--	--	--	--
JUL 07...	<0.01	<0.02	<0.01	<0.02	<0.01	1130	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
AUG 30...	<0.01	<0.02	<0.01	0.01	<0.01	1110	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
MAR 24...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 30...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DATE	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	
MAR 24...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02	
AUG 30...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02	

395059083000900. Local number, FR-122, M-8

LOCATION.--Lat 39°50'59", long 83°00'09", Hydrologic Unit 05060002, near Shadeville.

Owner.--Franklin County.

AQUIFER.--Clay, sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 104 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 730 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of 3-inch aluminum casing, 2.90 ft above land-surface datum.

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.15 ft below land-surface datum, May 19, 1981; lowest measured, 94.64 ft below land-surface datum, Mar. 2, 1982.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 16	43.46
MAR 27	44.43
JUN 30	44.17



**GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY****345**

395131082592400. Local number, FR-123, M-9

LOCATION.--Lat 39°51'31", long 82°59'24", Hydrologic Unit 05060001, near Hamilton Meadows.

Owner.--Franklin County.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 36.5 ft.

INSTRUMENTATION - Data logger -- 60 minute record.

DATUM.--Elevation of land-surface datum is 710 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Floor of shelter, 2.25 ft above land-surface datum.

PERIOD OF RECORD.--Apr. 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 18.55 ft below land-surface datum, May 12, 1992; minimum daily low, 6.87 ft below land-surface datum, April 01, 1980.

**WATER LEVELS IN FEET BELOW LAND SURFACE DATUM**

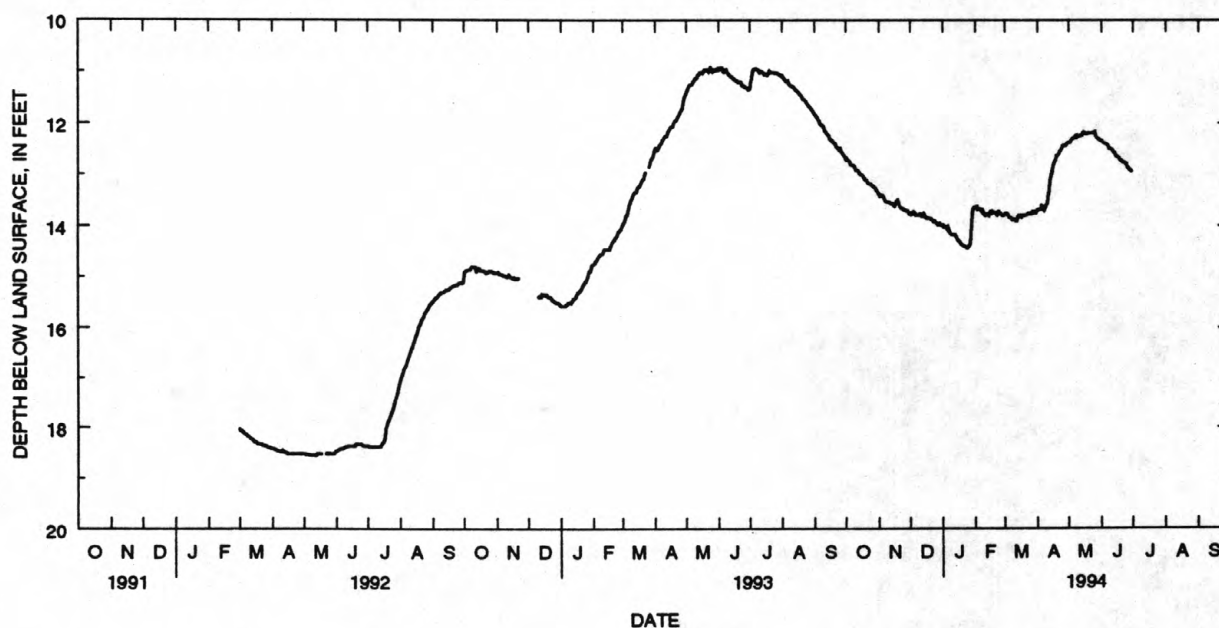
Date	Water Level
DEC 16	13.84
MAR 23	13.71
JUN 30	12.98

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395131082592400 Local number, FR-123, M-9--Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.66	13.40	13.78	13.99	13.64	13.78	13.69	12.38	12.35	---	---	---
2	12.72	13.42	13.76	14.02	13.63	13.75	13.68	12.37	12.39	---	---	---
3	12.73	13.40	13.78	14.01	13.68	13.75	13.68	12.35	12.39	---	---	---
4	12.76	13.40	13.73	14.04	13.67	13.79	13.68	12.31	12.40	---	---	---
5	12.81	13.43	13.75	14.07	13.67	13.83	13.62	12.29	12.41	---	---	---
6	12.82	13.47	13.79	14.04	13.69	13.84	13.64	12.28	12.41	---	---	---
7	12.83	13.51	13.79	14.09	13.73	13.85	13.69	12.26	12.44	---	---	---
8	12.83	13.53	13.79	14.13	13.70	13.88	13.67	12.28	12.49	---	---	---
9	12.88	13.54	13.78	14.17	13.77	13.87	13.60	12.24	12.50	---	---	---
10	12.91	13.54	13.77	14.17	13.79	13.88	13.57	12.26	12.51	---	---	---
11	12.91	13.55	13.81	14.17	13.77	13.90	13.46	12.25	12.54	---	---	---
12	12.93	13.57	13.82	14.17	13.77	13.90	13.29	12.24	12.56	---	---	---
13	12.97	13.56	13.81	14.18	13.80	13.84	13.13	12.24	12.58	---	---	---
14	13.00	13.56	13.77	14.22	13.81	13.81	13.02	12.21	12.62	---	---	---
15	13.01	13.60	13.82	14.28	13.73	13.79	12.92	12.18	12.65	---	---	---
16	13.01	13.61	13.86	14.30	13.75	13.82	12.83	12.21	12.66	---	---	---
17	13.04	13.57	13.86	14.30	13.72	13.83	12.77	12.22	12.68	---	---	---
18	13.08	13.53	13.84	14.35	13.74	13.80	12.73	12.22	12.71	---	---	---
19	13.10	13.50	13.86	14.37	13.74	13.81	12.64	12.20	12.73	---	---	---
20	13.11	13.58	13.86	14.39	13.74	13.80	12.64	12.20	12.74	---	---	---
21	13.15	13.61	13.88	14.40	13.78	13.79	12.60	12.20	12.76	---	---	---
22	13.17	13.65	13.89	14.40	13.79	13.79	12.56	12.20	12.77	---	---	---
23	13.19	13.65	13.92	14.41	13.70	13.75	12.54	12.19	12.78	---	---	---
24	13.19	13.67	13.91	14.44	13.75	13.76	12.48	12.18	12.79	---	---	---
25	13.21	13.69	13.93	14.44	13.75	13.77	12.45	12.17	12.85	---	---	---
26	13.22	13.69	13.95	14.40	13.80	13.77	12.43	12.24	12.87	---	---	---
27	13.24	13.70	13.98	14.35	13.81	13.72	12.44	12.28	12.91	---	---	---
28	13.25	13.70	13.98	14.19	13.79	13.72	12.44	12.30	12.92	---	---	---
29	13.29	13.74	13.96	13.76	---	13.76	12.40	12.31	12.95	---	---	---
30	13.31	13.77	14.00	13.68	---	13.76	12.39	12.33	---	---	---	---
31	13.35	---	14.00	13.64	---	13.72	---	12.33	---	---	---	---
MAX	13.35	13.77	14.00	14.44	13.81	13.90	13.69	12.38	---	---	---	---



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

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395008082593100. Local number, FR-126 M-13

LOCATION.--Lat 39°50'08", long 82°59'31", Hydrologic Unit 05060001, near Shadeville.

Owner.--Franklin County.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 122 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 703 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of PVC casing, 4.2 ft above land-surface datum.

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.96 ft below land-surface datum, June 17, 1981; lowest measured, 51.42 ft below land-surface datum, Nov. 09, 1977.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	15.08
MAR 29	14.80
JUN 30	16.45

395126083014000. Local number, FR-131 M-18.

LOCATION.--Lat 39°51'26", long 83°01'40", Hydrologic Unit 05060001, near Columbus.

Owner.--Franklin County.

AQUIFER.--Clay, sand, and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 53 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 728 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of plastic coupling, 2.4 ft above land-surface datum.

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 37.77 ft below land-surface datum, July 1, 1981; lowest measured, dry on Dec. 10, 1991; Mar. 16, June 12, and July 28, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	50.29
MAR 29	49.19
JUN 30	49.85

395218083023900. Local number, FR-133

LOCATION.--Lat 39°52'18", long 83°02'39", Hydrologic Unit 05060001, on White Road near Grove City, Ohio

Owner.--Franklin County.

AQUIFER.--Gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 82 ft, cased to 78 ft, finish: 4.0 ft of 0.80 in. well screen.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 765 feet above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.0 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 49.05 ft below land-surface datum, Apr. 1, 1981; lowest measured, 79.36 ft below land-surface datum, June 22, 1978.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	59.99
MAR 29	59.72
JUN 30	59.99

395020083014400. Local number, FR-141

LOCATION.--Lat 39°50'20", long 83°01'44", Hydrologic Unit 05060001.

Owner.--John Lako.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled domestic water well, diameter 4.25 in., depth 64 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 720 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 0.6 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.13 ft below land-surface datum, June 26, 1990; lowest measured, 31.72 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	28.90
MAR 29	27.09
JUN 30	28.33

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395108083010600. Local number FR-147

LOCATION.--Lat 39°51'08", long 83°01'06", Hydrologic Unit 05060001, near Columbus.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 75 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 685 feet above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.84 ft above land-surface datum.

PERIOD OF RECORD.--May 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.54 ft below land-surface datum, May 19, 1981; lowest measured, 45.66 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	14.88
APR 1	19.52
JUN 30	22.63

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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)
JUL 14...	14.0	960	0.1	6.9	282	0.330	<0.010	0.40	<0.050	<0.010	<0.010	--
AUG 30...	14.0	962	0.1	7.0	290	0.320	<0.010	0.30	<0.050	<0.010	<0.010	1.7

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (MG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (MG/L AS BE) (01010)	CADMIUM DIS- SOLVED (MG/L AS CD) (01025)	COBALT, DIS- SOLVED (MG/L AS CO) (01035)
JUL 14...	120	35	24	2.9	46	170	0.50	13	29	<0.5	1.0	<3
AUG 30...	120	37	24	2.9	45	170	0.50	14	29	<0.5	<1.0	<3

DATE	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, DISS, REC (UG/L AS CL) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L AS BU) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L AS SI) (04035)
JUL 14...	<10	1400	<10	94	10	1300	<6	12	12	<0.02	<0.01	<0.01
AUG 30...	<10	1600	10	100	20	1400	<6	<3	12	<0.02	<0.01	<0.01

DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)
JUL 14...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 30...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U (UG/L) (82664)
JUL 14...	<0.01	<0.02	<0.01	<0.02	<0.01	649	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
AUG 30...	<0.01	<0.02	<0.01	0.00	<0.01	636	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

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395108083010600 Local number FR-147--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PROM- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
JUL 14...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 30...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
JUL 14...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02
AUG 30...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02

395114083010200. Local number, FR-148

LOCATION.--Lat 39°51'14", long 83°01'02", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Devonian limestone.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in., depth 140 ft., 12 in. casing to 85 ft; 8 in. casing to 97.5.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 687 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 2.5 ft above land-surface datum.

PERIOD OF RECORD.--June 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.39 ft below land-surface datum, July 28, 1992; lowest measured, 54.34 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	17.21
APR 1	22.15
JUN 30	27.58

395024083003000. Local number, FR-149

LOCATION.--Lat 39°50'24", long 83°00'30", Hydrologic Unit 05060001, at Hartman Farms.

Owner.--City of Columbus.

AQUIFER.--Devonian limestone.

WELL CHARACTERISTICS.--Drilled observation water well, depth 144 ft.

INSTRUMENTATION - Continuous recording discontinued Aug. 13, 1991. Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 683 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 2.83 ft above land-surface datum.

PERIOD OF RECORD.--June 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.33 ft below land-surface datum, June 20, 1990; lowest measured, 30.99 ft below land-surface datum, Dec. 11, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	20.14
APR 1	17.67
JUN 30	22.25



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

394956083002700. Local number, FR-18

LOCATION.--Lat 39°49'56", long 83°00'27", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 74.75 ft, 6 in. casing.

INSTRUMENTATION - Continuous recorder operated by the Ohio Department of Natural Resources, Division of Water.

DATUM.--Elevation of land-surface datum is 695 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Floor of shelter, 4.05 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.81 ft below land-surface datum, March 25, 1993;

lowest measured, 32.04 ft below land-surface datum, Mar. 16, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	20.05
MAR 29	19.35
JUN 30	20.96

395314083021900. Local number, FR-202

LOCATION.--Lat 39°53'14", long 83°02'19", Hydrologic Unit 05060001.

Owner.--Mr. Daniel Himes

AQUIFER.--Devonian limestone

WELL CHARACTERISTICS.--Drilled domestic water well, diameter 4 in., depth 220 ft., cased to 175 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 752 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 17 ft above land-surface datum.

PERIOD OF RECORD.--June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 66.17 ft below land-surface datum, June 25, 1979; lowest measured, 96.50 ft below land-surface datum, July 19, 1984.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	89.79
MAR 29	89.79
JUN 30	89.89

395027082592500. Local number, FR-151

LOCATION.--Lat 39°50'27", long 82°59'25", Hydrologic Unit 05060001, near Shadeville.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 60 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 718 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of plastic pipe, 2.50 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.00 ft below land-surface datum, Mar. 26, 1986; lowest measured, 37.56 ft below land-surface datum, Mar. 16, 1992.

REMARKS.--A "K" associated with bacteriological data indicates non-ideal colony counts.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	30.63
MAR 23	30.78
JUN 30	32.42

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

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395027082592500 Local number, FR-151--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTH- DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
MAR 23...	14.0	1030	0.2	6.8	360	0.030	<0.010	<0.20	<0.050	<0.010	<0.010	0.8
JUL 07...	14.0	1020	0.1	6.6	368	0.030	<0.010	<0.20	<0.050	0.020	<0.010	0.7
AUG 31...	14.0	1000	0.2	6.8	361	0.030	<0.010	<0.20	<0.050	<0.010	<0.010	0.7
DATE	CALCIUM DIS- SOLVED (MG/L AS NA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS PB) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
MAR 23...	160	46	4.8	1.7	13	220	0.20	12	33	<0.5	<1.0	7
JUL 07...	160	43	5.4	1.5	14	200	0.20	13	34	<0.5	<1.0	5
AUG 31...	150	42	4.7	1.6	15	200	0.10	13	32	<0.5	<1.0	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)
MAR 23...	10	2400	<10	52	<10	240	<6	<3	8	--	--	--
JUL 07...	<10	2500	<10	52	<10	240	<6	12	6	<0.02	<0.01	<0.01
AUG 31...	<10	2600	<10	55	<10	230	<6	4	5	<0.02	<0.01	<0.01
DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	PONOFOS WATER, DISS, REC (UG/L) (04095)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P,P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIPOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)
MAR 23...	--	--	--	--	<20	<20	--	--	--	--	--	--
JUL 07...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 31...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DATE	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U (UG/L) (82664)
MAR 23...	--	--	--	--	--	714	--	--	--	--	--	--
JUL 07...	<0.01	<0.02	<0.01	<0.02	<0.01	742	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
AUG 31...	<0.01	<0.02	<0.01	<0.02	<0.01	688	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395027082592500 Local number, FR-151--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
MAR 23...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 31...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- FARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
MAR 23...	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02
AUG 31...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02

395315083020002. Local number, FR-213

LOCATION.--Lat 39°53'15", long 83°02'00", Hydrologic Unit 05060001.

Owner.--Tom Cannon Co.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled commercial water well, diameter 5 in., depth 97 ft., cased to 97 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 730 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 0.80 ft above land-surface datum

PERIOD OF RECORD.--June 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 71.38 ft below land-surface datum, June 08, 1982; lowest measured, 84.83 ft below land-surface datum, Mar. 16, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	82.36
MAR 29	82.18
JUN 30	82.31

395351083013700. Local number, FR-244

LOCATION.--Lat 39°53'35" long 83°01'37", Hydrologic Unit 05060001.

Owner.--Franklin County Waste to Energy Facility.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 75 ft., cased to 51.4 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 710 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 3.63 ft above land-surface datum

PERIOD OF RECORD.--Aug. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 41.89 ft below land-surface datum, Oct. 18, 1979; lowest measured, 73.83 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	69.29
MAR 29	69.01
JUN 30	69.35

395331083013900. Local number, FR-246

LOCATION.--Lat 39°53'31", long 83°01'39", Hydrologic Unit 05060001.

Owner.--Franklin County Waste to Energy Facility.

AQUIFER.--Devonian limestone.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 142 ft., cased to 89 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 722 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 0.63 ft above land-surface datum

PERIOD OF RECORD.--Oct. 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 104.40 ft below land-surface datum, Oct. 18, 1979; lowest measured, 127.99 ft below land-surface datum, Mar. 16, 1992.

#### WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	122.08
MAR 29	121.16
JUN 30	121.37

395206083014501. Local number, FR-209

LOCATION.--Lat 39°52'06", long 83°01'45", Hydrologic Unit 05060001.

Owner.--Mr. Martin Davis

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled domestic water well, diameter 4 in.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 704 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 0.72 ft above land-surface datum

PERIOD OF RECORD.--June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.51 ft below land-surface datum, May 23, 1984; lowest measured, 18.11 ft below land-surface datum, Mar. 16, 1992.

#### WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	15.81
MAR 29	14.81
JUN 30	15.60

395323083014000. Local number, FR-269

LOCATION.--Lat 39°53'23", long 83°01'40", Hydrologic Unit 05060001.

Owner.--Franklin County Waste to Energy Facility.

AQUIFER.--Devonian limestone.

WELL CHARACTERISTICS.--Drilled commercial water well, depth 90 ft.; 75 ft of 6 in casing.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 705 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 22 ft above land-surface datum.

PERIOD OF RECORD.--Aug. 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 67.04 ft below land-surface datum, Apr. 18, 1990; lowest measured, 71.79 ft below land-surface datum, Dec. 10, 1990.

#### WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	68.82
MAR 29	68.25
JUN 30	68.49

395224083000500. Local number, FR-273

LOCATION.--Lat 39°52'24", long 83°00'05", Hydrologic Unit 05060001, at County Water-Treatment Plant.

Owner.--Franklin County

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 91.5 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 710 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.15 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.5 ft below land-surface datum, June 27, 1990; lowest measured, 20.78 ft below land-surface datum, Mar. 16, 1992.

#### WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	16.64
MAR 29	15.83
JUN 30	16.89

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

394941083004400. Local number, FR-275

LOCATION.--Lat 39o49'41", long 83o00'44", Hydrologic Unit 05060001, near Shadeville.

Owner.--Franklin County

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 35 ft.; 2 in. casing.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 680 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of steel protective casing, 5.00 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.44 ft below land-surface datum, Mar. 26, 1993; lowest measured, 13.12 ft below land-surface datum, Apr. 18, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	9.09
MAR 29	8.98
JUN 30	6.85

395055082592400. Local number, FR-271

LOCATION.--Lat 39o50'55", long 82o59'24", Hydrologic Unit 05060001, at Parsons Avenue Water Plant

Owner.--Franklin County

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 91.8 ft.; 76 ft of 2 in casing.

INSTRUMENTATION - Data logger -- 60 minute record.

DATUM.--Elevation of land-surface datum is 710 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of PVC casing, 2.53 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily low, 25.00 ft below land-surface datum, Apr. 25 - May 2, 1992; minimum daily low, 13.92 ft below land-surface datum, Mar. 18, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 16	19.11
MAR 22	19.39
JUN 30	19.20



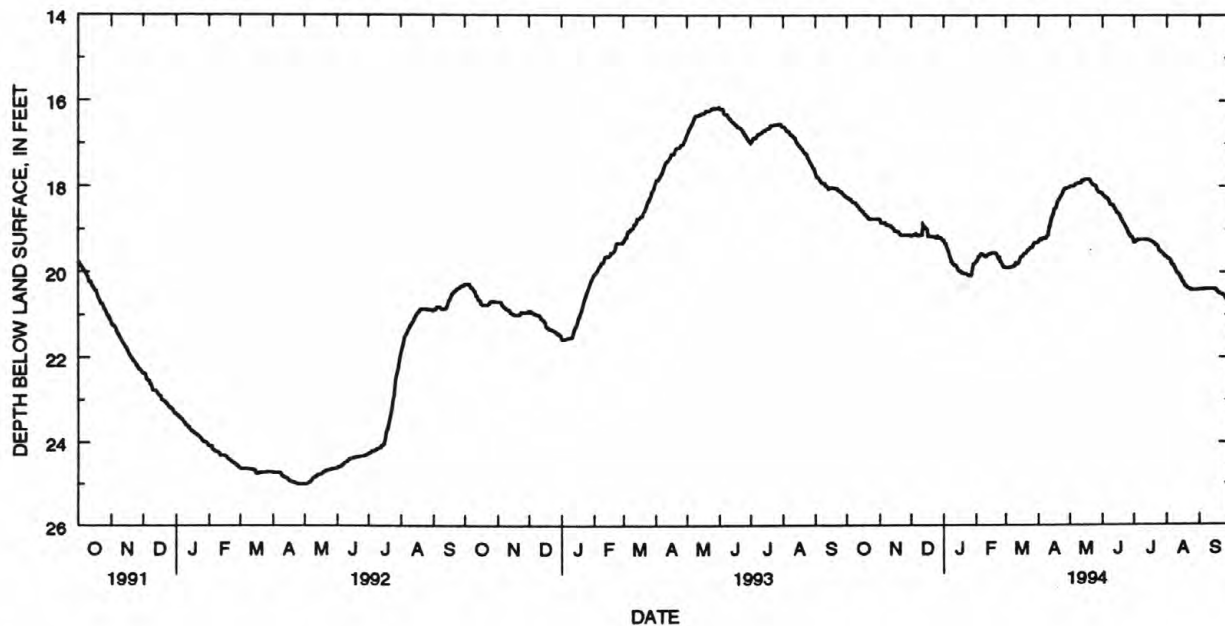
## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

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395055082592400 Local number, FR-271--Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.84	17.62	17.29	17.26	17.75	17.90	17.28	16.01	16.20	17.31	17.67	18.41
2	17.83	17.66	17.26	17.35	17.72	17.90	17.26	16.01	16.23	17.30	17.69	18.41
3	17.84	17.65	17.23	17.35	17.64	17.90	17.24	16.01	16.25	17.26	17.71	18.41
4	17.82	17.62	17.21	17.45	17.64	17.90	17.25	16.00	16.27	17.25	17.74	18.41
5	17.83	17.60	17.14	17.51	17.61	17.89	17.22	15.98	16.28	17.25	17.81	18.41
6	17.83	17.58	17.14	17.57	17.59	17.89	17.21	15.94	16.31	17.25	17.83	18.40
7	17.81	17.59	17.14	17.66	17.61	17.88	17.22	15.94	16.36	17.25	17.86	18.39
8	17.79	17.57	17.11	17.73	17.61	17.88	17.22	15.93	16.43	17.25	17.92	18.39
9	17.77	17.55	17.09	17.79	17.64	17.88	17.17	15.93	16.43	17.25	17.99	18.39
10	17.81	17.54	17.06	17.81	17.64	17.80	17.13	15.93	16.45	17.25	18.01	18.39
11	17.79	17.52	17.02	17.84	17.64	17.82	16.96	15.93	16.48	17.25	18.04	18.39
12	17.80	17.53	18.90	17.84	17.61	17.82	16.92	15.87	16.52	17.25	18.07	18.39
13	17.82	17.52	18.95	17.84	17.59	17.79	16.78	15.87	16.55	17.25	18.11	18.39
14	17.81	17.51	18.97	17.90	17.59	17.74	16.71	15.87	16.60	17.25	18.17	18.39
15	17.82	17.54	18.99	17.96	17.57	17.66	16.65	15.84	16.63	17.26	18.21	18.40
16	17.81	17.54	19.00	17.99	17.56	17.65	16.55	15.83	16.65	17.28	18.24	18.42
17	17.82	17.52	17.17	17.98	17.56	17.65	16.52	15.83	16.71	17.30	18.30	18.45
18	17.83	17.50	17.17	18.02	17.56	17.59	16.47	15.83	16.76	17.30	18.33	18.47
19	17.82	17.49	17.17	18.03	17.56	17.57	16.37	15.84	16.80	17.32	18.34	18.50
20	17.83	17.49	17.17	18.04	17.59	17.57	16.33	15.86	16.84	17.35	18.36	18.51
21	17.83	17.50	17.17	18.04	17.65	17.53	16.29	15.92	16.89	17.37	18.38	18.51
22	17.83	17.49	17.17	18.04	17.69	17.49	16.24	15.95	16.94	17.38	18.40	18.53
23	17.81	17.46	17.21	18.04	17.68	17.48	16.20	15.97	16.98	17.43	18.42	18.54
24	17.79	17.44	17.21	18.09	17.75	17.44	16.14	15.98	17.01	17.49	18.42	18.56
25	17.77	17.41	17.20	18.09	17.79	17.43	16.09	15.99	17.09	17.51	18.42	18.63
26	17.74	17.38	17.18	18.09	17.86	17.43	16.06	16.06	17.11	17.54	18.42	18.65
27	17.72	17.36	17.20	18.09	17.89	17.36	16.04	16.09	17.17	17.54	18.42	18.72
28	17.70	17.34	17.20	18.02	17.89	17.32	16.04	16.12	17.19	17.58	18.42	18.75
29	17.67	17.31	17.21	17.81	---	17.32	16.03	16.14	17.21	17.63	18.42	18.81
30	17.65	17.30	17.25	17.81	---	17.32	16.03	16.16	17.31	17.63	18.42	18.86
31	17.63	---	17.26	17.80	---	17.32	---	16.17	---	17.66	18.41	---
MAX	17.84	17.66	19.00	18.09	17.89	17.90	17.28	16.17	17.31	17.66	18.42	18.86



REMARKS.--A "K" associated with bacteriological data indicates non-ideal colony counts.

Date	Water Level
DEC 16	19.69
MAR 23	19.90
JUN 30	19.84

DATE	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD MG/L AS CAC03 UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD (00410)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN;AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	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)
MAR 23...	13.0	1210	0.3	6.8	371	0.040	0.010	<0.20	0.050	<0.010	<0.010	1.2
JUL 07...	13.0	1220	0.1	6.7	348	0.050	<0.010	<0.20	<0.050	<0.010	<0.010	1.2
AUG 30...	12.5	1220	0.3	6.8	368	0.050	<0.010	<0.20	<0.050	<0.010	<0.010	1.2

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
MAR 23...	180	54	14	2.2	44	270	0.20	13	31	<0.5	<1.0	10
JUL 07...	180	52	13	2.0	43	270	0.20	13	31	<0.5	<1.0	10
AUG 30...	180	52	13	2.2	41	270	0.20	14	29	<0.5	<1.0	<3

DATE	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)
MAR 23...	<10	3800	<10	83	<10	150	<6	8	8	--	--	--
JUL 07...	<10	3900	<10	85	10	150	<6	12	7	<0.02	<0.01	<0.01
AUG 30...	<10	3900	<10	84	10	140	<6	<3	11	<0.02	<0.01	<0.01

DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	PONOFOS WATER DISS REC (UG/L) (04095)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (39933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN SOLVED (UG/L) (39381)	METO- LACHOR WATER DISSOLV (UG/L) (39415)
MAR 23...	--	--	--	--	<20	--	--	--	--	--	--	--
JUL 07...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 30...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	0.00

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

357

395055082592401 Local number FR-272--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

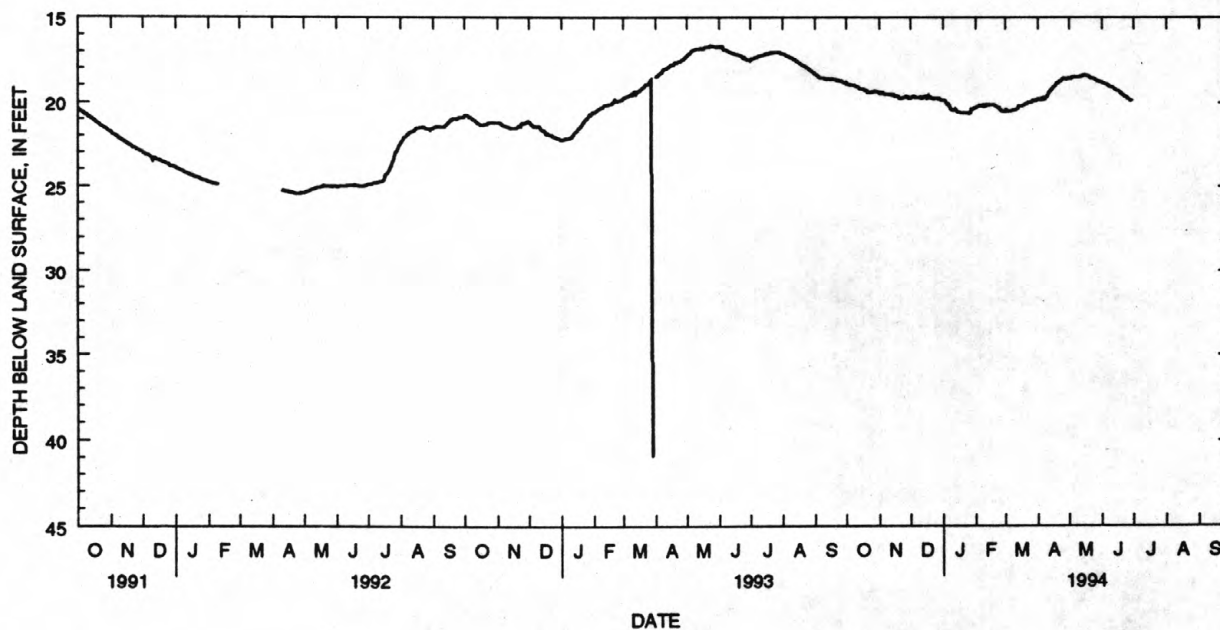
	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U (UG/L) (82664)
MAR 23...	--	--	--	--	--	844	--	--	--	--	--	--
JUL 07...	<0.01	<0.02	<0.01	<0.02	<0.01	864	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
AUG 30...	<0.01	<0.02	<0.01	0.00	<0.01	862	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
MAR 23...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 30...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	
MAR 23...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 07...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02	
AUG 30...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.05	<0.02	

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395055082592401 Local number FR-272--Continued

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.84	19.47	19.74	19.84	20.31	20.54	19.80	18.60	18.83	---	---	---
2	18.91	19.47	19.70	19.87	20.26	20.43	19.79	18.59	18.87	---	---	---
3	18.93	19.41	19.68	19.89	20.25	20.48	19.82	18.55	18.89	---	---	---
4	18.95	19.41	19.63	20.05	20.20	20.50	19.81	18.50	18.91	---	---	---
5	18.98	19.47	19.66	20.12	20.17	20.51	19.74	18.49	18.92	---	---	---
6	19.00	19.48	19.71	20.10	20.19	20.50	19.71	18.49	18.97	---	---	---
7	19.00	19.51	19.72	20.22	20.22	20.47	19.79	18.49	19.01	---	---	---
8	18.99	19.52	19.72	20.35	20.18	20.46	19.77	18.49	19.06	---	---	---
9	19.01	19.53	19.70	20.42	20.25	20.45	19.69	18.47	19.08	---	---	---
10	19.08	19.54	19.69	20.43	20.24	20.42	19.59	18.47	19.09	---	---	---
11	19.08	19.54	19.74	20.46	20.13	20.43	19.49	18.45	19.12	---	---	---
12	19.12	19.57	19.74	20.42	20.12	20.40	19.34	18.44	19.16	---	---	---
13	19.17	19.57	19.71	20.40	20.17	20.31	19.32	18.44	19.21	---	---	---
14	19.20	19.54	19.66	20.52	20.12	20.21	19.25	18.41	19.26	---	---	---
15	19.21	19.61	19.65	20.59	20.13	20.22	19.18	18.39	19.30	---	---	---
16	19.21	19.64	19.74	20.59	20.12	20.22	19.12	18.39	19.34	---	---	---
17	19.23	19.60	19.72	20.59	20.12	20.19	19.06	18.40	19.37	---	---	---
18	19.29	19.64	19.61	20.64	20.14	20.16	18.99	18.41	19.42	---	---	---
19	19.29	19.65	19.70	20.64	20.17	20.16	18.88	18.45	19.47	---	---	---
20	19.28	19.76	19.67	20.64	20.20	20.10	18.86	18.49	19.51	---	---	---
21	19.39	19.76	19.74	20.64	20.23	20.06	18.80	18.55	19.56	---	---	---
22	19.40	19.76	19.74	20.64	20.28	20.06	18.75	18.57	19.62	---	---	---
23	19.41	19.74	19.80	20.62	20.29	19.99	18.71	18.58	19.63	---	---	---
24	19.39	19.71	19.77	20.62	20.41	19.98	18.64	18.61	19.68	---	---	---
25	19.39	19.70	19.75	20.61	20.44	19.98	18.61	18.62	19.77	---	---	---
26	19.35	19.68	19.76	20.68	20.52	19.96	18.58	18.69	19.77	---	---	---
27	19.35	19.64	19.78	20.62	20.54	19.86	18.61	18.72	19.86	---	---	---
28	19.33	19.66	19.77	20.41	20.54	19.86	18.63	18.75	19.86	---	---	---
29	19.37	19.73	19.79	20.41	---	19.89	18.59	18.77	19.89	---	---	---
30	19.38	19.75	19.84	20.40	---	19.89	18.58	18.80	---	---	---	---
31	19.37	---	19.85	20.33	---	19.83	---	18.81	---	---	---	---
MAX	19.41	19.76	19.85	20.68	20.54	20.54	19.82	18.81	---	---	---	---



## 359

395224083000501. Local number, FR-274  
LOCATION.--Lat 39°52'24", long 83°00'05", Hydrologic Unit 05060001, at County Water-Treatment Plant.  
Owner.--Franklin County  
AQUIFER.--Sand and gravel of Quaternary Age.  
WELL CHARACTERISTICS.--Drilled observation water well, depth 25 ft.; 4 in. casing.  
INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.  
DATUM.--Elevation of land-surface datum is 710 feet above National Geodetic Vertical Datum of 1929. Measuring point:  
Top of PVC casing, 2.44 ft above land-surface datum.  
PERIOD OF RECORD.--May 1990 to current year.  
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.63 ft below land-surface datum, Mar. 18, 1991; lowest  
measured, 16.98 ft below land-surface datum, Mar. 16, 1992.  
REMARKS.--A "K" associated with bacteriological data indicates non-ideal colony counts.

Date	Water Level
DEC 15	14.59
MAR 25	14.18
JUN 30	14.30

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH	ALKA-	NITRO-	NITRO-	NITRO-	NITRO-	PHOS- PHORUS DIS- SOLVED (MG/L) (00666)	PHOS-	CARBON, ORGANIC DIS- SOLVED (MG/L) (00681)
				WATER WHOLE FIELD (STAND- ARD MG/L AS CACO3 (00400)	LINITY WAT WH TOT FET FIELD (MG/L AS CACO3 (00410)	GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)		PHOS- ORTHOR- DIS- SOLVED (MG/L) AS P) (00671)	
MAR 25...	12.5	1170	0.4	6.8	280	0.150	<0.010	0.20	0.230	<0.010	<0.010	2.1
JUL 14...	13.0	1130	0.3	6.9	392	0.130	<0.010	<0.20	0.250	<0.010	<0.010	--
AUG 31...	13.5	1150	0.4	7.0	316	0.170	<0.010	<0.20	0.091	<0.010	<0.010	1.9
DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)
MAR 25...	120	31	84	2.8	170	72	0.30	11	52	<0.5	<1.0	5
JUL 14...	150	47	32	2.1	150	78	0.40	13	95	<0.5	2.0	10
AUG 31...	98	29	110	2.5	180	81	0.40	12	55	<0.5	<1.0	<3
DATE	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)
MAR 25...	<10	2000	<10	43	<10	160	<6	4	11	--	--	--
JUL 14...	<10	9700	<10	260	<10	880	7	<3	9	<0.02	<0.01	<0.01
AUG 31...	<10	1800	<10	42	20	180	<6	<3	7	<0.02	<0.01	<0.01
DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	FONOFOS WATER DISS REC (UG/L) (04095)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	P, P' DDE DISSOLV (UG/L) (34653)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	LINDANE DIS- SOLVED (UG/L) (39341)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)
MAR 25...	--	--	--	--	<20	<20	--	--	--	--	--	--
JUL 14...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 31...	<0.01	<0.00	<0.01	<0.01	<20	<20	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395224083000501 Local number, FR-274--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

	MALA- THION, DIS- SOLVED (UG/L) (39532)	PARA- THION, DIS- SOLVED (UG/L) (39542)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	METRI- BUZIN SENCOR WATER (UG/L) (82630)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U (UG/L) (82660)	TRI- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82661)	DIMETH- OATE WATER FLTRD 0.7 U (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U (UG/L) (82664)
DATE												
MAR 25...	--	--	--	--	--	674	--	--	--	--	--	--
JUL 14...	<0.01	<0.02	<0.01	<0.02	<0.01	666	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
AUG 31...	<0.01	<0.02	<0.01	<0.02	<0.01	684	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)
DATE												
MAR 25...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 14...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AUG 31...	<0.03	<0.04	<0.03	<0.00	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	
DATE												
MAR 25...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 14...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.01	<0.05	<0.02
AUG 31...	<0.06	<0.01	<0.02	<0.05	<0.01	<0.00	<0.02	<0.01	<0.01	<0.01	<0.05	<0.02

395239083021400. Local number, FR-276

LOCATION.--Lat 39°52'39", long 83°02'14", Hydrologic Unit 05060001

Owner.--Stanley and Betty Wray.

AQUIFER.--Devonian limestone

WELL CHARACTERISTICS.--Drilled domestic water well, depth 155 ft.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel. 1.25 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 71.46 ft below land-surface datum, Mar. 18, 1991; lowest measured, 76.05 ft below land-surface datum, Mar. 16, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	72.95
MAR 29	72.92
JUN 30	73.39

394930083013100. Local number, FR-277

LOCATION.--Lat 39°49'30", long 83°01'31", Hydrologic unit 05060001

Owner.--Mr. and Mrs. Steve Doersam

AQUIFER.--Sand and gravel of Quaternary Age

WELL CHARACTERISTICS.--Drilled domestic water well, depth 52 ft.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 713 ft. above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.5 ft above land-surface datum.

PERIOD OF RECORD.--Dec. 1989 to current year.

EXTREMES FOR PERIOD OF RECORD.-- Highest water level measured, 16.30 ft below land-surface datum, March 25, 1993; lowest measured, 21.33 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	18.60
MAR 29	17.01
JUN 30	18.26

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

361

395115083022600. Local number, FR-278

LOCATION.--Lat 39°51'15", long 83°02'26", Hydrologic Unit 05060001

Owner.--Mr. Mark Boster

AQUIFER.--Quaternary sand and gravel-primary; Devonian limestone-secondary

WELL CHARACTERISTICS.--Drilled domestic water well, diameter 5 in, depth 114 ft, 10 ft screen.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 735 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 0.95 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.24 ft below land-surface datum, Mar. 18, 1991; lowest measured, 35.11 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	29.07
MAR 29	31.21
JUN 30	31.69

394932083022700. Local number, FR-279

LOCATION.--Lat 39°49'32", long 83°02'27", Hydrologic unit 05060001

Owner.--Mr. Gerald Boggs

AQUIFER.--Devonian limestone

WELL CHARACTERISTICS.--Drilled domestic water well, diameter 5 in, depth 145 ft, cased to 102 ft.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 735 ft. above National Geodetic Vertical datum of 1929. Measuring point:

Top of casing, 1.35 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.85 ft below land-surface datum, Mar. 18, 1991; lowest measured, 23.54 ft below land-surface datum, Sep. 12, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	11.78
MAR 29	9.74
JUN 30	13.06

395000082581700. Local number, FR-281

LOCATION.--Lat 39°50'00", long 82°58'17", Hydrologic Unit 05060001.

Owner.--Hamilton Township Trustees.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled domestic water-supply well, depth 83 ft., 4 in. steel.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 731 feet above National Geodetic Vertical Datum of 1929. Measuring point:

top of casing, .40 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.77 ft below land-surface datum, March 25, 1993; lowest measured, 42.42 ft below land-surface datum, March 16, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	38.54
MAR 29	37.56
JUN 30	37.91

394921083004700. Local number, FR-282

LOCATION.--Lat 39°49'21", long 83°00'47", Hydrologic Unit 05060001.

Owner.--City of Columbus.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 56 ft., 2 in. PVC.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 673 feet above National Geodetic Vertical Datum of 1929. Measuring point:

top of casing, 3.00 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.75 ft below land-surface datum, March 26, 1993; lowest measured, 10.90 ft below land-surface datum, Sept. 13, 1993.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	7.61
MAR 29	7.54
JUN 30	5.92

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395048083004500. Local number FR-310

LOCATION.--Lat 39°50'48", long 83°00'45", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 2-in. diameter PVC, 61 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 683.36 feet above National Geodetic Vertical Datum of 1929. Measuring point: top of outer steel protective casing, 4.25 ft above land-surface datum

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

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 8.91 ft below land-surface datum, Mar. 29, 1993; lowest measured, 23.66 ft below land-surface datum, Sep. 13, 1993.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	16.33
APR 1	19.37
JUN 30	22.83

395044083010500. Local number FR-311

LOCATION.--Lat 39°50'44", long 83°01'05", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 2-in. diameter PVC, 42 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 683.01 feet above National Geodetic Vertical Datum of 1929. Measuring point: top of outer steel protective casing, 4.10 ft above land-surface datum

PERIOD OF RECORD.--March 1993 to current year

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 7.00 ft below land-surface datum, Mar. 29, 1993; lowest measured, 16.13 ft below land-surface datum, Sep. 13, 1993.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	10.07
APR 1	13.83
JUN 30	14.38

395118082573300. Local number, FR-3

LOCATION.--Lat 39°51'18", long 82°57'33", Hydrologic Unit 05060001.

Owner.--R. Hann.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 60 ft.; 12 in. casing.

INSTRUMENTATION - Continuous recorder operated by the Ohio Department of Natural Resources, Division of Water.

DATUM.--Elevation of land-surface datum is 713.0 feet above National Geodetic Vertical Datum of 1929. Measuring point: Floor of shelter, 3.43 ft. above land-surface datum

PERIOD OF RECORD.--Oct. 1965 to current year

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.33 ft below land-surface datum, Mar. 30, 1984 and Nov 29, 1985; lowest measured, 16.48 feet below land-surface datum, Dec. 20, 1989.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	12.23
MAR 29	11.29
JUN 30	12.00

395037082581900. Local number, FR-36

LOCATION.--Lat 39°50'37", long 82°58'19", Hydrologic Unit 05060001.

Owner.--J.P. Sand and Gravel

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 31 ft.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 715 feet above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.3 ft above land-surface datum

PERIOD OF RECORD.--Oct. 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.03 ft below land-surface datum, Oct. 17, 1979; lowest measured, 21.69 ft below land-surface datum, Mar. 16, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	18.28
MAR 29	17.28
JUN 30	18.30

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

363

394927082595800. Local number, FR-70.

LOCATION.--Lat 39°49'27", long 82°59'58", Hydrologic Unit 05060001.

Owner.--St. Joseph Cemetery.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 59 ft.; 4 in. casing.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 705 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of concrete base, 0.35 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.24 ft below land-surface datum, Mar. 18, 1991; lowest measured, 27.60 ft below land-surface datum, June 12, 1992.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	21.72
MAR 29	20.34
JUN 30	20.06

395217083002300. Local number FR-72

LOCATION.--Lat 39°52'17", long 83°00'23", Hydrologic Unit 05060001.

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, depth 34.6 ft, 3 in. casing.

INSTRUMENTATION - Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 715 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing inside pit, 3.5 ft below land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.01 ft below land-surface datum, June 27, 1990; lowest measured, dry on Mar. 16, 1992 and all dates measured this water year.,

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	DRY
APR 1	DRY
JUN 30	DRY

395027082585600. Local number TH-83 M-15

LOCATION.--Lat 39°50'27", long 82°58'56", Hydrologic Unit 05060001

Owner.--J.P. Sand and Gravel

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 64 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 707 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.70 ft above land-surface datum

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

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 11.71 ft below land-surface datum, June 17, 1981; lowest measured, 38.08 ft below land-surface datum, Dec. 10, 1991.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	25.10
MAR 29	24.85
JUN 30	27.78

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395131083003801. Local number FR-301

LOCATION.--Lat 39°51'31", long 83°00'38", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 74 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 684 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.95 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 8.49 ft below land-surface datum, Dec 15, 1993; lowest measured, 18.33 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	8.49
APR 1	13.40
JUN 30	18.33

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)
JUL 05...	13.0	1060	0.1	6.6	160	46	9.0	1.6	25
SEP 07...	12.5	1010	0.1	6.9	160	43	8.6	1.2	25

DATE	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SiO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)	IRON, DIS- SOLVED (UG/L) AS FE (01046)
JUL 05...	220	0.30	14	51	<0.5	<1.0	<3	<10	2400
SEP 07...	200	0.30	14	48	<0.5	<1.0	8	<10	2200

DATE	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 05...	<10	77	30	460	<6	16	7	738
SEP 07...	<10	73	20	450	<6	<3	5	710



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

365

395140083003901. Local number FR-302

LOCATION.--Lat 39o51'40", long 83o00'39", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 56 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 684 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.40 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 9.67 ft below land-surface datum, Dec 15, 1993; lowest measured, 17.71 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	9.67
APR 1	13.24
JUN 30	17.71

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
JUL 05...	13.5	1030	<0.1	6.8	285	160	43	7.6	1.3
SEP 07...	13.0	1020	0.1	6.9	--	170	45	7.2	1.3

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SiO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
JUL 05...	22	260	0.40	14	52	0.7	<1.0	<3	<10
SEP 07...	20	240	0.40	15	49	<0.5	<1.0	6	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 05...	3900	<10	70	10	890	<6	<3	9	786
SEP 07...	3900	<10	72	10	830	<6	11	4	720

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395150083004001. Local number FR-303

LOCATION.--Lat 39°51'50", long 83°00'40", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 57 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 691 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.75 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 16.13 ft below land-surface datum, Dec 15, 1993; lowest measured, 22.18 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	16.13
APR 1	17.87
JUN 30	22.18

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
JUL 05...	14.0	1240	<0.1	6.7	314	200	56	5.6	1.3
SEP 07...	13.5	1210	0.1	6.9	--	200	56	5.6	1.3

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
JUL 05...	18	380	0.30	15	39	0.8	<1.0	<3	<10
SEP 07...	18	350	0.30	15	35	<0.5	<1.0	10	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 05...	5500	<10	100	20	760	<6	5	10	926
SEP 07...	5000	<10	96	10	680	<6	7	<4	906

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

367

395157083004101. Local number FR-304

LOCATION.--Lat 39o51'57", long 83o00'41", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 43 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 689 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 2.00 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 14.59 ft below land-surface datum, Dec 15, 1993; lowest measured, 18.95 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	14.59
APR 1	14.82
JUN 30	18.95

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
JUL 06...	16.5	1870	0.1	6.6	287	340	72	15	4.6
SEP 07...	17.5	1980	0.1	6.8	--	390	77	16	5.2

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
JUL 06...	32	920	0.20	11	34	0.9	<1.0	<3	<10
SEP 07...	33	1000	0.20	12	30	<0.5	<1.0	8	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 06...	2500	<10	390	<10	1700	<6	<3	9	1700
SEP 07...	3600	<10	450	20	1700	<6	<3	<4	1730

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395158083005401. Local number FR-305

LOCATION.--Lat 39°51'58", long 83°00'54", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 78.50 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 688 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.70 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 13.84 ft below land-surface datum, Dec 15, 1993; lowest measured, 19.06 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	13.84
APR 1	14.91
JUN 30	19.06

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
JUL 06...	13.5	768	<0.1	7.0	200	110	30	11	1.3
SEP 08...	11.5	950	0.1	7.3	--	140	37	13	1.2

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
JUL 06...	28	170	0.40	11	53	<0.5	1.0	4	<10
SEP 08...	30	310	0.30	9.6	58	<0.5	<1.0	6	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 06...	2700	<10	73	<10	760	<6	4	5	539
SEP 08...	3300	<10	91	<10	850	<6	7	7	704

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

369

395208083004501. Local number FR-307

LOCATION.--Lat 39o52'08", long 83o00'45", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 46 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 685 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.45 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 10.90 ft below land-surface datum, Apr 1, 1994; lowest measured, 15.15 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	11.94
APR 1	10.90
JUN 30	15.15

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
JUL 06...	14.5	1070	<0.1	6.9	199	170	41	12	2.7
SEP 08...	16.0	1180	0.1	7.0	--	190	47	13	2.7

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM, DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
JUL 06...	28	360	0.20	9.3	66	0.8	<1.0	<3	<10
SEP 08...	28	430	0.20	9.6	64	<0.5	<1.0	<3	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 06...	1000	<10	390	<10	1100	<6	6	9	800
SEP 08...	860	<10	470	<10	1100	<6	<3	9	898



## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

395217083004201. Local number FR-308

LOCATION.--Lat 39°52'17", long 83°00'42", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 38.20 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 685 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.40 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 9.49 ft below land-surface datum, Apr 1, 1994; lowest measured, 13.75 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	10.66
APR 1	9.49
JUN 30	13.75

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L) AS CA (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L) AS MG (00925)	SODIUM, DIS- SOLVED (MG/L) AS NA (00930)	POTAS- SIUM, DIS- SOLVED (MG/L) AS K (00935)
JUL 06...	15.0	1360	<0.1	7.0	163	220	56	13	2.7
SEP 08...	15.5	1250	0.1	7.1	--	200	50	13	2.6

DATE	CHLO- RIDE, DIS- SOLVED (MG/L) AS CL (00940)	SULFATE DIS- SOLVED (MG/L) AS SO4 (00945)	FLUO- RIDE, DIS- SOLVED (MG/L) AS F (00950)	SILICA, DIS- SOLVED (MG/L) AS SIO2 (00955)	BARIUM, DIS- SOLVED (UG/L) AS BA (01005)	BERYL- LIUM, DIS- SOLVED (UG/L) AS BE (01010)	CADMIUM DIS- SOLVED (UG/L) AS CD (01025)	COBALT, DIS- SOLVED (UG/L) AS CO (01035)	COPPER, DIS- SOLVED (UG/L) AS CU (01040)
JUL 06...	30	570	0.20	8.8	56	<0.5	<1.0	<3	<10
SEP 08...	28	490	0.20	9.1	55	<0.5	<1.0	5	<10

DATE	IRON, DIS- SOLVED (UG/L) AS FE (01046)	LEAD, DIS- SOLVED (UG/L) AS PB (01049)	MANGA- NESE, DIS- SOLVED (UG/L) AS MN (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L) AS MO (01060)	STRON- TIUM, DIS- SOLVED (UG/L) AS SR (01080)	VANA- DIUM, DIS- SOLVED (UG/L) AS V (01085)	ZINC, DIS- SOLVED (UG/L) AS ZN (01090)	LITHIUM DIS- SOLVED (UG/L) AS LI (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 06...	2700	<10	300	<10	880	<6	<3	9	1080
SEP 08...	2800	<10	370	<10	860	<6	10	10	978

## GROUND-WATER RECORDS--SOUTHERN FRANKLIN COUNTY

371

395227083004001. Local number FR-309

LOCATION.--Lat 39°52'27", long 83°00'40", Hydrologic Unit 05060001

Owner.--City of Columbus

AQUIFER.--Sand and gravel of Quaternary Age.

WELL CHARACTERISTICS.--Drilled observation water well, 8 in. diameter, 46 feet deep.

INSTRUMENTATION.--Periodic measurement with steel or electric tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 684 feet above National Geodetic Vertical Datum of 1929. Measuring point:

Top of casing, 1.60 ft above land-surface datum

PERIOD OF RECORD.--Dec.15, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--highest water level measured, 10.21 ft below land-surface datum, Apr 1, 1994; lowest measured, 13.84 ft below land-surface datum, Jun. 30, 1994.

## WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water Level
DEC 15	10.77
APR 1	10.21
JUN 30	13.84

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	ALKA- LILITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
JUL 07...	15.0	1420	<0.1	6.9	180	230	56	14	2.1
SEP 08...	14.5	1480	0.1	7.1	--	240	62	15	1.9

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM, DIS- SOLVED (UG/L AS CD) (01025)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)
JUL 07...	30	610	0.30	9.9	67	<0.5	<1.0	10	<10
SEP 08...	29	670	0.20	9.6	64	<0.5	<1.0	10	<10

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	LITHIUM, DIS- SOLVED (UG/L AS LI) (01130)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
JUL 07...	5100	20	300	10	1600	<6	<3	8	1140
SEP 08...	5100	<10	310	10	1700	<6	<3	9	1210

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

The following tables contain ground-water-level measurements from a network of water-supply and monitoring wells near Wright-Patterson Air Force Base, Ohio. The data was collected as part of a cooperative study with Air Force Materiel Command, 88th Air Base Wing/Environmental Management. The purpose of the study is to evaluate the affects of Wright-Patterson Air Force Base on regional ground-water and surface-water quality.

## DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394942084033500	GR-303	360ODVC	10-06-93	11.26	801.0
			11-11-93	11.24	
			12-02-93	10.16	
			01-06-94	10.89	
			02-03-94	9.49	
			03-03-94	10.49	
			03-31-94	10.81	
			05-03-94	10.40	
			06-06-94	11.01	
			07-18-94	11.10	
			08-22-94	11.33	
			09-30-94	11.49	
394855084033900	GR-304	360ODVC	10-06-93	4.50	798.1
			11-11-93	5.21	
			12-02-93	4.50	
			01-06-94	4.37	
			02-03-94	4.21	
			03-03-94	4.27	
			03-31-94	4.35	
			05-10-94	4.34	
			06-06-94	4.63	
			07-18-94	4.51	
			08-24-94	4.73	
394831084042700	GR-305	360ODVC	10-06-93	8.12	796.4
			11-11-93	8.10	
			12-02-93	7.60	
			01-06-94	8.05	
			02-03-94	7.14	
			03-03-94	7.79	
			03-31-94	8.00	
			05-10-94	7.94	
			06-06-94	8.37	
			07-18-94	8.30	
			08-22-94	8.55	
394815084020700	GR-306	360ODVC	10-06-93	133.17	839.2
			11-11-93	95.53	
			12-02-93	82.10	
			01-05-94	66.90	
			02-02-94	58.42	
			03-02-94	52.15	
			03-31-94	47.35	
			05-03-94	43.35	
			06-06-94	40.31	
			07-18-94	37.62	

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

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DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394815084020700	GR-306	360ODVC	08-22-94	36.02	839.2
			09-30-94	34.77	
394743084024300	GR-307	360ODVC	10-06-93	131.60	838.1
			11-11-93	99.56	
			12-01-93	86.81	
			01-05-94	70.45	
			02-02-94	61.35	
			03-02-94	54.67	
			03-31-94	49.36	
			05-03-94	45.03	
			06-06-94	41.90	
			07-18-94	39.21	
			08-22-94	37.80	
			09-30-94	36.75	
394750084043800	GR-308	360ODVC	11-08-93	8.94	799.9
			12-02-93	8.89	
			01-06-94	7.24	
			02-03-94	6.19	
			03-03-94	6.48	
			03-31-94	6.57	
			05-03-94	6.31	
			06-06-94	8.13	
394706084045800	GR-309	357BFLD	11-12-93	28.86	976.6
			12-01-93	27.89	
			01-05-94	28.10	
			02-02-94	27.50	
			03-02-94	27.51	
			03-31-94	27.53	
			05-03-94	27.77	
			06-06-94	27.83	
			07-18-94	28.57	
			08-23-94	29.01	
			09-29-94	29.81	
394633084045300	GR-310	357BFLD	11-06-93	28.60	974.0
			12-01-93	26.88	
			01-05-94	26.95	
			02-02-94	27.01	
			03-02-94	26.31	
			03-31-94	26.10	
			05-03-94	26.27	
			06-06-94	29.71	
			07-18-94	29.32	
			08-23-94	29.63	
			09-29-94	29.49	

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394852084023100	GR-311	360ODVC	10-06-93	178.24	815
			11-11-93	155.40	
			12-02-93	137.81	
			01-06-94	127.97	
			02-02-94	118.90	
			03-02-94	107.43	
			03-31-94	100.33	
			05-03-94	91.15	
			06-06-94	83.45	
			07-18-94	75.08	
			08-22-94	69.11	
			09-29-94	61.28	
394706084045801	GR-312	361WTTR	12-01-93	106.00	976.3
			01-05-94	105.57	
			02-02-94	105.27	
			03-02-94	104.99	
			03-31-94	105.10	
			05-03-94	105.00	
			06-06-94	100.00	
			07-18-94	103.35	
			08-23-94	102.85	
			09-29-94	102.58	
394645084055200	GR-313	360ODVC	10-06-93	36.24	806.5
			11-11-93	36.65	
			12-01-93	36.65	
			01-05-94	36.79	
			02-02-94	36.77	
			03-02-94	36.62	
			03-31-94	36.69	
			05-03-94	36.02	
			06-06-94	35.90	
			07-18-94	36.63	
			08-22-94	37.31	
			09-30-94	37.83	
394929084015000	GR-314	360ODVC	10-06-93	22.00	821.6
			11-11-93	22.08	
			12-02-93	22.31	
			01-06-94	21.97	
			02-03-94	21.84	
			03-02-94	21.76	
			03-31-94	21.72	
			05-03-94	21.55	
			06-06-94	21.68	
			07-18-94	21.70	
			08-22-94	21.85	
			09-29-94	22.11	



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

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DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
395032084023100	GR-315	360ODVC	10-06-93	181.82	812.2
			11-11-93	185.25	
			12-02-93	182.90	
			01-06-94	178.97	
			02-03-94	176.00	
			03-03-94	172.60	
			03-31-94	170.56	
			05-03-94	167.35	
			06-06-94	164.15	
			07-18-94	160.51	
			08-22-94	157.13	
			09-29-94	153.84	
395032084023101	GR-316	112OTSH	10-06-93	10.00	812.2
			11-11-93	10.05	
			12-02-93	9.13	
			01-06-94	9.05	
			02-03-94	7.71	
			03-03-94	8.45	
			03-31-94	9.33	
			05-03-94	8.80	
			06-06-94	9.58	
			07-18-94	9.56	
			08-22-94	9.99	
			09-29-94	10.41	
395032084023102	GR-317	112OTSH	10-06-93	7.93	812.2
			11-11-93	7.40	
			12-02-93	6.75	
			01-06-94	6.18	
			02-03-94	4.77	
			03-03-94	5.32	
			03-31-94	6.65	
			05-03-94	6.10	
			06-06-94	7.25	
			07-18-94	7.26	
			08-22-94	7.51	
			09-29-94	7.76	
394929084015001	GR-318	112OTSH	10-06-93	16.90	821.6
			11-11-93	19.42	
			12-02-93	18.82	
			01-06-94	18.83	
			02-03-94	18.31	
			03-02-94	18.28	
			03-31-94	18.35	
			05-03-94	17.45	
			06-06-94	17.83	
			07-18-94	16.12	
			08-22-94	18.91	
			09-29-94	19.51	

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394929084015002	GR-319	112OTSH	10-06-93	22.37	821.6
			11-11-93	22.62	
			12-02-93	21.91	
			01-06-94	22.00	
			02-03-94	21.27	
			03-02-94	21.59	
			03-31-94	21.85	
			05-03-94	21.23	
			06-06-94	21.72	
			07-18-94	21.85	
			08-22-94	22.40	
			09-29-94	22.74	
394942084033501	GR-320	112OTSH	10-06-93	11.46	801.0
			11-11-93	11.46	
			12-02-93	10.57	
			01-06-94	11.20	
			02-03-94	9.93	
			03-03-94	10.81	
			03-31-94	11.02	
			05-03-94	10.71	
			06-06-94	11.33	
			07-18-94	11.23	
			08-22-94	11.59	
			09-30-94	11.64	
394855084033901	GR-321	112OTSH	10-06-93	5.82	798.1
			11-11-93	5.81	
			12-02-93	5.22	
			01-06-94	5.55	
			02-03-94	4.80	
			03-03-94	5.39	
			03-31-94	5.45	
			05-10-94	5.28	
			06-06-94	5.80	
			07-18-94	5.74	
			08-24-94	5.96	
94855084033902	GR-322	112OTSH	10-06-93	4.80	798.1
			11-11-93	4.82	
			12-02-93	4.24	
			01-06-94	4.56	
			02-03-94	3.74	
			03-03-94	4.32	
			03-31-94	4.33	
			05-10-94	4.31	
			06-06-94	4.65	
			07-18-94	4.55	

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

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DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394831084042701	GR-323	112OTSH	10-06-93	9.12	796.4
			11-11-93	9.07	
			12-02-93	8.75	
			01-06-94	9.02	
			02-03-94	8.46	
			03-03-94	8.95	
			03-31-94	9.25	
			05-10-94	9.00	
			06-06-94	9.27	
			07-18-94	9.21	
			08-22-94	9.35	
394831084042702	GR-324	112OTSH	10-06-93	8.19	796.4
			11-11-93	8.17	
			12-02-93	7.80	
			01-06-94	8.20	
			02-03-94	7.29	
			03-03-94	7.91	
			03-31-94	8.01	
			05-10-94	8.03	
			06-06-94	8.35	
			07-18-94	8.31	
			08-22-94	8.47	
394743084024301	GR-326	112OTSH	10-06-93	32.09	838.1
			11-11-93	32.48	
			12-01-93	32.04	
			01-05-94	31.10	
			02-02-94	31.42	
			03-02-94	31.42	
			03-31-94	31.58	
			05-03-94	30.85	
			06-06-94	30.95	
			07-18-94	31.35	
			08-22-94	31.88	
			09-30-94	32.46	
394743084024302	GR-327	112OTSH	10-06-93	31.36	838.1
			11-11-93	31.80	
			12-01-93	31.58	
			01-05-94	31.55	
			02-02-94	31.05	
			03-02-94	30.99	
			03-31-94	31.11	
			05-03-94	30.26	
			06-06-94	30.44	
			07-18-94	30.78	
			08-22-94	31.27	
			09-30-94	31.81	

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394743084024303	GR-328	112OTSH	10-06-93	35.18	838.1
			11-11-93	35.43	
			12-01-93	34.97	
			01-05-94	35.05	
			02-02-94	34.63	
			03-02-94	34.79	
			03-31-94	34.83	
			05-03-94	34.30	
			06-06-94	34.13	
			07-18-94	34.79	
			08-22-94	35.15	
			09-30-94	35.61	
394645084055201	GR-329	112OTSH	10-06-93	32.04	806.5
			11-11-93	32.53	
			12-01-93	32.64	
			01-05-94	32.75	
			02-02-94	35.61	
			03-02-94	32.58	
			03-31-94	35.00	
			05-03-94	34.99	
			06-06-94	34.59	
			07-18-94	35.12	
			08-22-94	32.81	
			09-30-94	33.52	
394815084020701	GR-330	112OTSH	10-06-93	33.54	839.2
			11-11-93	34.00	
			12-02-93	33.87	
			01-05-94	33.85	
			02-02-94	33.80	
			03-02-94	33.62	
			03-31-94	33.62	
			05-03-94	32.95	
			06-06-94	32.92	
			07-18-94	33.10	
			08-22-94	30.75	
			09-30-94	31.16	
394815084020702	GR-331	112OTSH	10-06-93	32.85	839.2
			11-11-93	33.25	
			12-02-93	33.08	
			01-05-94	33.09	
			02-02-94	33.03	
			03-02-94	32.86	
			03-31-94	32.90	
			05-03-94	32.23	
			06-06-94	32.28	
			07-18-94	32.45	
			08-22-94	32.75	
			09-30-94	33.17	

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

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DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394815084020703	GR-332	112OTSH	10-06-93	34.23	839.2
			11-11-93	34.55	
			12-02-93	31.50	
			01-05-94	31.51	
			02-02-94	31.45	
			03-02-94	31.26	
			03-31-94	31.27	
			05-03-94	30.67	
			06-06-94	28.14	
			07-18-94	30.80	
			08-22-94	28.64	
			09-30-94	29.06	
394852084023101	GR-333	112OTSH	10-06-93	15.63	812.1
			11-11-93	15.00	
			12-02-93	15.09	
			01-06-94	15.35	
			02-02-94	14.75	
			03-02-94	15.18	
			03-31-94	15.33	
			05-03-94	14.90	
			06-06-94	15.02	
			07-18-94	15.32	
			08-22-94	14.53	
			09-29-94	16.08	
394852084023102	GR-334	112OTSH	10-06-93	15.00	812.1
			11-11-93	15.20	
			12-02-93	14.52	
			01-06-94	14.45	
			02-02-94	14.11	
			03-02-94	14.54	
			03-31-94	14.62	
			05-03-94	14.18	
			06-06-94	14.51	
			07-18-94	14.62	
			08-22-94	15.00	
			09-29-94	15.23	
394852084023103	GR-335	112OTSH	10-06-93	15.48	812.1
			11-11-93	15.72	
			12-02-93	14.97	
			01-06-94	15.12	
			02-02-94	14.57	
			03-02-94	15.00	
			03-31-94	15.02	
			05-03-94	14.68	
			06-06-94	15.01	
			07-18-94	15.10	
			08-22-94	15.46	
			09-29-94	15.10	



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

DEPTH BELOW LAND SURFACE DATUM (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994--Continued

Site	Local well number	Aquifer code	Water level date	Water level (feet)	Altitude of land surface (feet)
394623084064400	MT-133	360ODVC	10-06-93	31.46	791.4
			11-11-93	31.56	
			12-01-93	30.40	
			01-05-94	30.18	
			02-02-94	30.10	
			03-02-94	29.96	
			03-31-94	29.86	
			05-03-94	29.70	
			06-06-94	29.96	
			07-18-94	30.27	
			08-23-94	30.57	
			09-30-94	30.75	
394623084064401	MT-152	112OTSH	10-06-93	25.20	791.4
			11-10-93	25.50	
			12-01-93	25.17	
			01-05-94	25.70	
			02-02-94	25.63	
			03-02-94	25.22	
			03-31-94	25.22	
			05-03-94	23.98	
			06-06-94	24.86	
			07-18-94	26.35	
			08-23-94	27.18	
			09-30-94	27.49	
394623084064402	MT-153	112OTSH	10-06-93	24.76	791.4
			11-10-93	24.89	
			12-01-93	24.94	
			01-05-94	25.40	
			02-02-94	25.51	
			03-02-94	24.86	
			03-31-94	24.92	
			05-03-94	23.68	
			06-06-94	24.72	
			07-18-94	26.06	
			08-23-94	26.88	
			09-30-94	27.18	

## Aquifer Codes

112OTSH - Outwash, Pleistocene Epoch  
 112TILL - Glacial Till  
 357BFLD - Brassfield Limestone, Lower Silurian  
 361RCMD - Richmond Group, Upper Ordovician  
 111ALVM - Holocene Alluvium  
 360ODVC - Ordovician System  
 361WTTR - Whitewater Formation

394853084042200. Local number, GR-208.

LOCATION.--Lat 39 48'53" Long 84 04'22" Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

AQUIFER.--Sand of Pleistocene Age.

WELL CHARACTERISTICS.--Observation well installed by hollow stem auger, diameter 4.0 in. depth 19.5 ft. Cased with stainless steel to 4.50 ft;.010 in screen from 4.5 to 19.5 ft, bentonite seal.

INSTRUMENTATION.--Electronic data logger -- 60-minute record. Data collected: Water level and water temperature.

Precipitation data from NOAA.

DATUM.--Elevation of land-surface datum is 796.29 feet above sea level.

Measuring point: Floor of shelter 3.01 ft above land-surface datum.

PERIOD OF DAILY RECORD.--

Water level: August 1989 to current year.

Water temperature: November 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Water level: Maximum daily low, 6.54 ft below land-surface datum,

August 27, 28, 1994; minimum daily low, 1.68 ft below land-surface datum, December 31, 1990.

Water temperature: Maximum, 14.0°C, many days in 1991, 1992, 1993, and 1994; minimum, 10.3°C, many days in 1994.

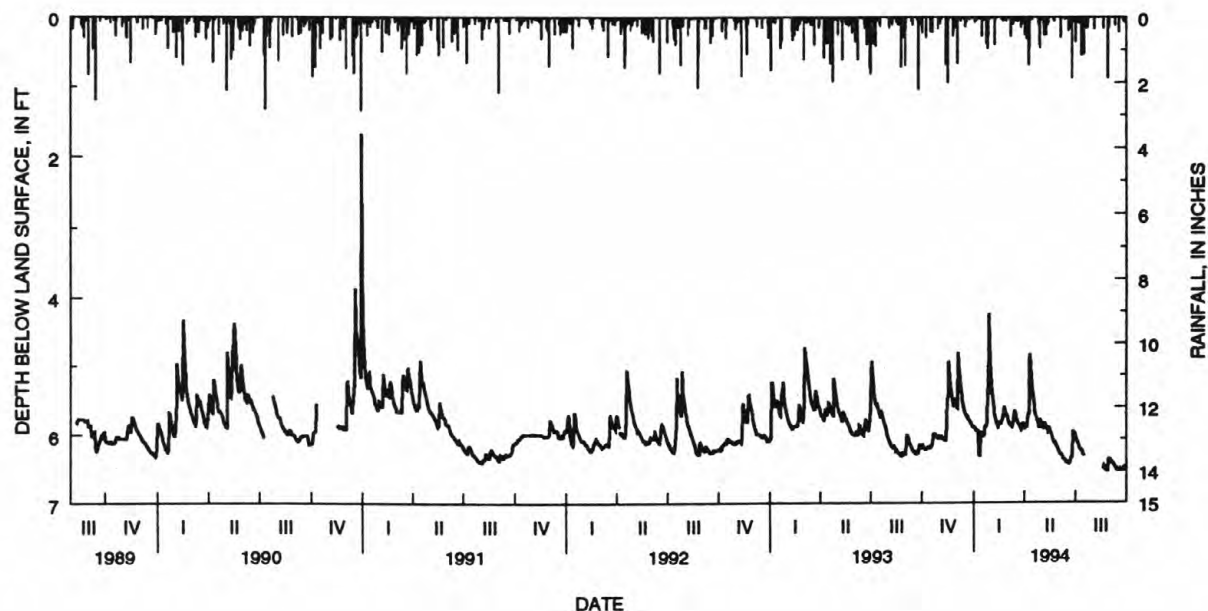
## WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

## MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.19	6.05	5.58	5.90	5.12	5.73	5.89	5.82	6.22	6.03	6.36	6.37
2	6.19	6.05	5.61	5.90	5.26	5.75	5.91	5.84	6.24	6.06	6.37	6.38
3	6.17	6.05	5.62	5.90	5.39	5.78	5.91	5.86	6.27	6.06	6.39	6.40
4	6.19	6.05	5.61	5.92	5.48	5.80	5.89	5.88	6.28	6.08	6.39	6.42
5	6.19	6.04	4.81	5.93	5.55	5.83	5.89	5.90	6.29	6.12	6.37	6.41
6	6.21	6.05	4.98	5.94	5.62	5.85	5.89	5.92	6.30	6.14	6.38	6.43
7	6.21	6.06	5.09	5.94	5.68	5.86	5.79	5.92	6.31	6.16	6.39	6.44
8	6.21	6.06	5.19	5.94	5.72	5.87	5.70	5.83	6.31	6.18	6.41	6.46
9	6.21	6.06	5.27	5.95	5.78	5.87	5.70	5.86	6.33	6.19	6.41	6.48
10	6.19	6.07	5.36	6.30	5.80	5.89	5.70	5.90	6.35	6.21	6.42	6.48
11	6.19	6.07	5.44	6.31	5.84	5.89	4.93	5.92	6.36	6.22	6.42	6.49
12	6.17	6.08	5.49	6.31	5.86	5.86	4.83	5.93	6.36	6.22	6.43	6.50
13	6.18	6.08	5.54	5.96	5.89	5.80	5.01	5.95	6.38	6.24	6.45	6.51
14	6.19	5.80	5.58	5.98	5.91	5.71	5.15	5.97	6.40	6.26	6.46	6.52
15	6.20	5.49	5.63	6.01	5.84	5.65	5.26	5.96	6.41	6.28	6.47	6.53
16	6.19	5.45	5.67	6.01	5.83	5.69	5.37	5.90	6.41	6.27	6.48	6.53
17	6.18	5.45	5.70	6.01	5.84	5.71	5.45	5.93	6.42	6.32	6.49	6.52
18	6.16	4.94	5.72	6.03	5.84	5.75	5.52	5.96	6.42	6.28	6.50	6.50
19	6.16	5.06	5.74	6.03	5.83	5.79	5.58	5.98	6.42	6.30	6.51	6.50
20	6.12	5.18	5.73	5.98	5.80	5.81	5.64	6.01	6.43	6.32	6.51	6.51
21	6.01	5.28	5.75	5.92	5.78	5.83	5.69	6.03	6.42	6.33	6.48	6.53
22	5.99	5.36	5.77	5.88	5.76	5.85	5.73	6.06	6.39	6.33	6.50	6.53
23	5.99	5.43	5.78	5.88	5.75	5.86	5.76	6.08	6.38	6.25	6.51	6.53
24	6.00	5.50	5.79	5.88	5.65	5.89	5.79	6.10	6.35	6.27	6.52	6.52
25	6.00	5.56	5.81	5.80	5.60	5.91	5.82	6.12	6.34	6.30	6.52	6.51
26	6.02	5.60	5.82	5.36	5.65	5.93	5.85	6.11	6.34	6.32	6.53	6.49
27	6.02	5.60	5.84	5.38	5.68	5.92	5.88	6.13	6.34	6.33	6.54	6.48
28	6.03	5.48	5.86	4.60	5.72	5.88	5.90	6.14	6.34	6.33	6.54	6.48
29	6.05	5.52	5.87	4.24	---	5.86	5.90	6.16	6.00	6.33	6.37	6.50
30	6.05	5.55	5.88	4.67	---	5.85	5.90	6.18	5.99	6.34	6.36	6.51
31	6.04	---	5.89	4.92	---	5.86	---	6.20	---	6.35	6.36	---
MAX	6.21	6.08	5.89	6.31	5.91	5.93	5.91	6.20	6.43	6.35	6.54	6.53

CAL YR 1993 LOW 6.32

WTR YR 1994 LOW 6.54



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-208 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.8	13.3	13.7	13.7	13.0	12.3	11.5	10.6	10.3	10.6	11.1	11.6
2	12.8	13.3	13.7	13.7	13.0	12.3	11.3	10.6	10.3	10.6	11.1	11.8
3	12.8	13.3	13.7	13.7	13.0	12.3	11.3	10.6	10.3	10.6	11.1	11.8
4	12.8	13.3	13.7	13.6	13.0	12.3	11.3	10.6	10.3	10.6	11.1	11.8
5	12.8	13.3	13.7	13.5	13.0	12.2	11.3	10.6	10.3	10.6	11.1	11.8
6	12.8	13.4	13.7	13.5	13.0	12.0	11.3	10.6	10.3	10.6	11.1	11.8
7	12.8	13.5	14.0	13.5	13.0	12.0	11.3	10.6	10.3	10.6	11.1	11.8
8	12.8	13.5	14.0	13.5	13.0	12.0	11.3	10.6	10.3	10.6	11.1	11.8
9	12.8	13.5	14.0	13.5	12.8	12.0	11.3	10.6	10.3	10.6	11.1	11.8
10	12.8	13.5	14.0	13.5	12.8	12.0	11.3	10.6	10.3	10.6	11.1	11.8
11	13.0	13.5	14.0	13.5	12.8	12.0	11.1	10.6	10.3	10.6	11.2	12.0
12	13.0	13.5	14.0	13.5	12.8	12.0	11.1	10.6	10.3	10.6	11.3	12.0
13	13.0	13.5	13.8	13.5	12.8	12.0	11.1	10.6	10.3	10.6	11.3	12.0
14	13.0	13.5	13.7	13.5	12.8	12.0	11.0	10.6	10.3	10.6	11.3	12.0
15	13.0	13.5	13.7	13.5	12.8	11.8	10.8	10.6	10.3	10.6	11.3	12.0
16	13.0	13.5	13.7	13.5	12.8	11.8	10.8	10.6	10.3	10.6	11.3	12.0
17	13.0	13.5	13.7	13.5	12.5	11.8	10.8	10.6	10.3	10.6	11.3	12.0
18	13.0	13.6	13.7	13.5	12.5	11.8	10.8	10.6	10.3	10.6	11.3	12.0
19	13.0	13.7	13.7	13.5	12.5	11.8	10.8	10.6	10.3	10.8	11.3	12.0
20	13.0	13.7	13.7	13.5	12.5	11.8	10.8	10.6	10.3	10.8	11.3	12.0
21	13.0	13.7	13.7	13.4	12.5	11.8	10.8	10.6	10.3	10.8	11.3	12.2
22	13.0	13.7	13.7	13.3	12.5	11.8	10.8	10.6	10.3	10.8	11.5	12.3
23	13.0	13.7	13.7	13.3	12.5	11.6	10.8	10.6	10.3	10.8	11.5	12.3
24	13.3	13.7	13.7	13.3	12.5	11.5	10.8	10.6	10.4	10.8	11.5	12.3
25	13.3	13.7	13.7	13.3	12.4	11.5	10.7	10.4	10.6	10.8	11.5	12.3
26	13.3	13.7	13.7	13.3	12.3	11.5	10.6	10.3	10.6	10.8	11.5	12.3
27	13.3	13.7	13.7	13.3	12.3	11.5	10.6	10.3	10.6	10.8	11.5	12.3
28	13.3	13.7	13.7	13.3	12.3	11.5	10.6	10.3	10.6	10.8	11.5	12.3
29	13.3	13.7	13.7	13.2	---	11.5	10.6	10.3	10.6	10.8	11.5	12.3
30	13.3	13.7	13.7	13.3	---	11.5	10.6	10.3	10.6	10.8	11.5	12.3
31	13.3	---	13.7	13.2	---	11.5	---	10.3	---	11.0	11.5	---

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

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394851084042300. Local number, GR-210.

LOCATION.--Lat 39 48'51" Long 84 04'23" Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

AQUIFER.--Sand of Pleistocene Age.

WELL CHARACTERISTICS.--Observation well installed by hollow stem auger, diameter 4.0 in. depth 38.0 ft. Cased with stainless steel to 33.0 ft;.010 in screen from 33.0 to 38.0 ft, bentonite seal.

INSTRUMENTATION.--Electronic data logger -- 60-minute record. Data collected: Water level and water temperature.

Precipitation data from NOAA.

DATUM.--Elevation of land-surface datum is 796.07 feet above sea level.

Measuring point: Floor of shelter 2.97 ft above land-surface datum.

PERIOD OF DAILY RECORD.--

Water level: August 1989 to current year.

Water temperature: November 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Water level: Maximum daily low, 5.46 ft below land-surface datum,

August 28, 1994; minimum daily low, 1.23 ft below land-surface datum, December 31, 1990.

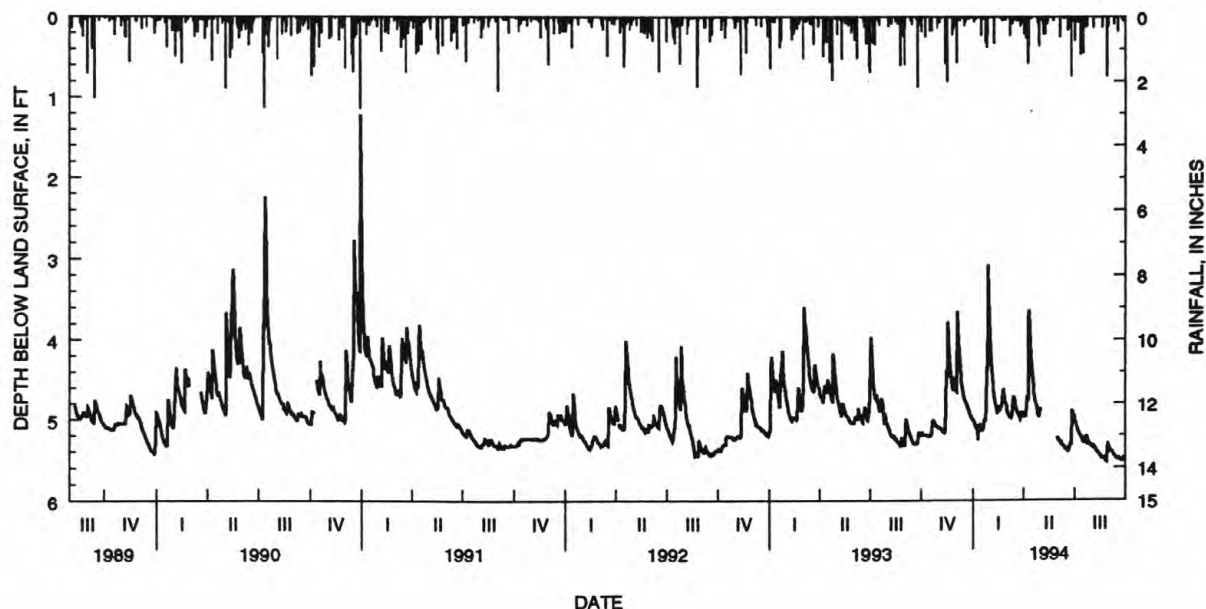
Water temperature: Maximum, 14.5°C, many days in December 1993 and 1994; minimum, 11.7°C, many days in 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.20	5.11	4.62	5.01	3.95	4.82	4.95	4.87	5.23	4.99	5.34	5.36
2	5.20	5.12	4.65	5.02	4.12	4.85	4.96	4.89	5.25	5.03	5.35	5.37
3	5.16	5.11	4.66	5.03	4.28	4.88	4.98	4.91	5.26	5.03	5.36	5.38
4	5.19	5.11	4.64	5.05	4.39	4.91	4.96	4.94	5.27	5.05	5.36	5.40
5	5.20	5.12	3.65	5.06	4.48	4.94	4.96	4.95	5.28	5.09	5.35	5.40
6	5.20	5.13	3.88	5.10	4.57	4.95	4.96	4.97	5.29	5.11	5.36	5.41
7	5.20	5.14	4.02	5.10	4.64	4.96	4.83	4.97	5.29	5.14	5.37	5.42
8	5.20	5.15	4.16	5.11	4.69	4.98	4.73	4.88	5.31	5.15	5.38	5.44
9	5.20	5.15	4.25	5.11	4.76	4.98	4.74	4.91	5.32	5.16	5.39	5.45
10	5.20	5.16	4.36	5.26	4.80	4.99	4.75	4.95	5.32	5.18	5.40	5.45
11	5.20	5.16	4.45	5.08	4.84	4.99	3.76	4.96	5.34	5.20	5.40	5.47
12	5.20	5.17	4.52	5.08	4.87	4.95	3.64	4.98	5.34	5.21	5.42	5.47
13	5.22	5.15	4.57	5.07	4.91	4.87	3.88	5.00	5.35	5.23	5.43	5.48
14	5.22	4.82	4.61	5.09	4.93	4.76	4.05	5.00	5.36	5.24	5.44	5.49
15	5.22	4.39	4.68	5.13	4.89	4.71	4.20	5.00	5.38	5.25	5.45	5.49
16	5.22	4.43	4.72	5.13	4.87	4.75	4.33	4.94	5.38	5.27	5.46	5.50
17	5.21	4.44	4.75	5.13	4.88	4.77	4.44	4.98	5.38	5.28	5.47	5.50
18	5.20	3.78	4.77	5.14	4.89	4.82	4.51	5.00	5.38	5.23	5.48	5.49
19	5.20	3.97	4.79	5.13	4.88	4.86	4.59	5.03	5.40	5.26	5.49	5.49
20	5.17	4.14	4.80	5.08	4.86	4.87	4.66	5.05	5.40	5.28	5.49	5.50
21	5.03	4.26	4.82	5.05	4.83	4.91	4.71	5.07	5.39	5.29	5.48	5.51
22	5.02	4.37	4.84	5.02	4.82	4.91	4.76	5.08	5.36	5.30	5.48	5.51
23	5.02	4.44	4.86	5.02	4.79	4.93	4.80	5.10	5.36	5.21	5.49	5.52
24	5.03	4.53	4.87	5.02	4.65	4.96	4.83	5.12	5.32	5.25	5.50	5.52
25	5.05	4.58	4.90	4.84	4.64	4.98	4.86	5.13	5.31	5.26	5.51	5.51
26	5.06	4.64	4.93	4.35	4.71	5.00	4.89	5.14	5.31	5.29	5.52	5.51
27	5.07	4.63	4.95	4.37	4.76	4.98	4.93	5.16	4.89	5.29	5.52	5.49
28	5.08	4.48	4.96	3.68	4.80	4.93	4.95	5.16	4.92	5.31	5.53	5.50
29	5.09	4.54	4.97	3.08	---	4.91	4.96	5.18	4.95	5.32	5.36	5.51
30	5.10	4.59	4.99	3.44	---	4.91	4.95	5.19	4.95	5.32	5.32	5.51
31	5.10	---	5.00	3.72	---	4.93	---	5.21	---	5.33	5.34	---
MAX	5.22	5.17	5.00	5.26	4.93	5.00	4.98	5.21	5.40	5.33	5.53	5.52

CAL YR 1993 LOW 5.34

WTR YR 1994 LOW 5.53



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-210 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.3	13.8	14.2	14.2	13.8	13.1	12.6	12.0	11.9	11.9	12.1	12.6
2	13.3	13.8	14.2	14.2	13.8	13.1	12.6	12.0	11.9	11.9	12.1	12.6
3	13.3	14.0	14.2	14.2	13.8	13.1	12.6	11.9	11.9	11.9	12.1	12.6
4	13.3	14.0	14.2	14.2	13.8	13.1	12.6	11.9	11.9	11.9	12.1	12.6
5	13.3	14.0	14.2	14.2	13.8	13.1	12.6	11.9	11.9	11.9	12.1	12.6
6	13.3	14.0	14.2	14.2	13.8	13.1	12.6	11.9	11.9	11.9	12.1	12.6
7	13.3	14.0	14.2	14.2	13.8	13.1	12.5	11.9	11.9	11.9	12.3	12.7
8	13.3	14.0	14.4	14.1	13.8	13.1	12.5	11.9	11.9	11.9	12.4	12.8
9	13.4	14.0	14.5	14.0	13.8	13.1	12.4	11.9	11.9	11.9	12.4	12.8
10	13.5	14.0	14.5	14.0	13.7	13.1	12.4	11.9	11.9	11.9	12.4	12.8
11	13.5	14.0	14.5	14.0	13.6	13.0	12.4	11.9	11.9	11.9	12.4	12.8
12	13.5	14.0	14.5	14.0	13.5	12.9	12.4	11.9	11.9	11.9	12.4	12.8
13	13.5	14.0	14.5	14.0	13.5	12.9	12.4	11.9	11.9	11.9	12.4	12.8
14	13.5	14.0	14.5	14.0	13.5	12.8	12.4	11.9	11.9	11.9	12.4	12.8
15	13.5	14.0	14.5	14.0	13.5	12.8	12.4	11.9	11.9	11.9	12.4	12.8
16	13.5	14.0	14.5	14.0	13.5	12.8	12.3	11.9	11.9	11.9	12.4	12.8
17	13.5	14.0	14.5	14.0	13.5	12.8	12.3	11.9	11.9	11.9	12.4	12.8
18	13.5	14.0	14.5	14.0	13.5	12.8	12.1	11.9	11.9	11.9	12.4	12.9
19	13.5	14.0	14.5	14.0	13.4	12.8	12.1	11.9	11.9	11.9	12.4	13.1
20	13.5	14.2	14.5	14.0	13.3	12.8	12.1	11.9	11.9	12.0	12.4	13.1
21	13.7	14.2	14.5	14.0	13.3	12.8	12.1	11.9	11.9	12.1	12.4	13.1
22	13.8	14.2	14.3	14.0	13.3	12.8	12.1	11.9	11.9	12.1	12.4	13.1
23	13.8	14.2	14.2	13.9	13.3	12.8	12.1	11.9	11.9	12.1	12.4	13.1
24	13.8	14.2	14.2	13.8	13.3	12.7	12.1	11.9	11.9	12.1	12.6	13.1
25	13.8	14.2	14.2	13.8	13.3	12.7	12.1	11.9	11.9	12.1	12.6	13.1
26	13.8	14.2	14.2	13.8	13.3	12.6	12.1	11.9	11.9	12.1	12.6	13.1
27	13.8	14.2	14.2	13.8	13.3	12.6	12.1	11.9	11.9	12.1	12.6	13.1
28	13.8	14.2	14.2	13.8	13.2	12.6	12.1	11.9	11.9	12.1	12.6	13.1
29	13.8	14.2	14.2	13.8	---	12.6	12.0	11.9	11.9	12.1	12.6	13.1
30	13.8	14.2	14.2	13.8	---	12.6	12.0	11.9	11.9	12.1	12.6	13.2
31	13.8	---	14.2	13.8	---	12.6	---	11.9	---	12.1	12.6	---



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

385

395008084011500. Local number, GR-248.

LOCATION.--Lat 39 50'08" Long 84 01'15" Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool, diameter 4.0 in. depth 31.0 ft. Cased with stainless steel to 21.0 ft; .010 in screen from 21.0 to 31.0 ft, bentonite seal.

INSTRUMENTATION.--Electronic data logger -- 60-minute punch. Data collected: water level and water temperature.

Precipitation data from NOAA.

DATUM.--Elevation of land-surface datum is 825.43 ft above sea level.

Measuring point: Floor of shelter 2.32 ft above land-surface datum.

PERIOD OF DAILY RECORD --

Water level: June 23, 1989 to current year.

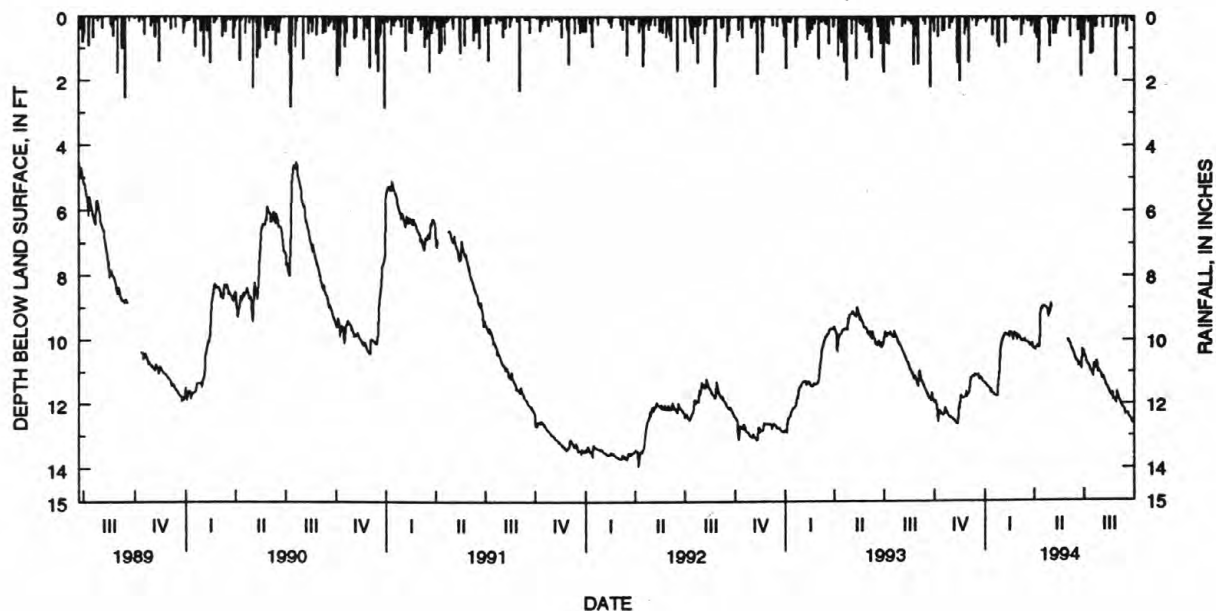
Water temperature: December 19, 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Water level: Maximum daily low 13.92 ft below land-surface datum, April 7, 1992; minimum daily low, 4.34 ft below land-surface datum, June 23, 1989. Water temperature: Maximum, 16.3°C many days in October-November 1993; minimum 11.7°C many days in 1992 and 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.96	12.45	11.70	11.35	10.06	9.86	10.27	8.87	9.96	10.44	11.11	11.78
2	11.96	12.46	11.69	11.38	10.00	9.83	10.29	8.99	10.01	10.52	11.16	11.85
3	11.92	12.47	11.69	11.38	9.94	9.84	10.31	9.06	10.04	10.53	11.20	11.90
4	11.98	12.47	11.63	11.42	9.91	9.89	10.21	9.11	10.08	10.59	11.22	10.94
5	12.02	12.49	11.35	11.44	9.84	9.93	10.23	9.16	10.11	10.65	11.16	11.98
6	12.05	12.52	11.27	11.45	9.81	9.95	10.23	9.19	10.15	10.69	11.23	12.02
7	12.30	12.55	11.23	11.46	9.81	9.98	10.17	9.18	10.18	10.74	11.28	12.06
8	12.57	12.57	11.19	11.49	9.78	10.00	10.19	9.07	10.25	10.79	11.33	12.09
9	12.35	12.59	11.17	11.51	9.83	10.00	10.23	9.17	10.29	10.79	11.38	12.12
10	12.26	12.60	11.14	11.53	9.84	10.02	10.23	9.23	10.33	10.82	11.42	12.14
11	12.24	12.62	11.14	11.53	9.84	10.01	9.63	9.25	10.38	10.88	11.45	12.16
12	12.23	12.64	11.12	11.65	9.83	10.00	9.28	9.35	10.43	10.93	11.49	12.19
13	12.29	12.63	11.17	11.55	9.87	9.98	9.07	9.27	10.48	10.96	11.52	12.22
14	12.33	12.29	11.09	11.66	9.88	9.97	9.04	9.30	10.53	10.95	11.56	12.32
15	12.35	12.04	11.08	11.67	9.77	10.00	9.00	9.29	10.57	11.02	11.60	12.29
16	12.37	12.19	11.11	11.67	9.75	10.04	8.97	9.27	10.63	11.08	11.63	12.31
17	12.36	12.11	11.10	11.69	9.76	10.04	8.95	9.35	10.65	11.12	11.67	12.33
18	12.31	11.80	11.10	11.72	9.77	10.04	8.94	9.40	10.65	10.80	11.70	12.31
19	12.35	11.76	11.10	11.73	9.78	10.07	8.94	9.44	10.71	10.74	11.74	12.36
20	12.32	11.80	11.08	11.75	9.82	10.07	8.95	9.48	10.76	10.75	11.76	12.39
21	12.13	11.81	11.11	11.75	9.98	10.08	8.96	9.53	10.81	10.83	11.65	12.42
22	12.18	11.83	11.22	11.76	9.90	10.08	8.99	9.57	10.73	10.87	11.72	12.45
23	12.24	11.83	11.17	11.76	9.85	10.10	9.01	9.63	10.79	10.67	11.87	12.48
24	12.28	11.83	11.17	11.76	9.77	10.15	9.02	9.63	10.77	10.75	11.84	12.51
25	12.31	11.83	11.21	11.60	9.78	10.18	9.05	9.66	10.87	10.79	11.88	12.53
26	12.34	11.81	11.23	11.28	9.82	10.19	9.09	9.69	10.89	11.00	11.91	12.64
27	12.37	11.81	11.27	11.20	9.85	10.16	9.27	9.75	10.28	10.93	11.96	12.60
28	12.38	11.65	11.28	10.84	9.99	10.08	9.17	9.79	10.31	10.96	11.98	12.62
29	12.42	11.68	11.30	10.36	---	10.18	9.16	9.83	10.37	11.00	11.74	12.64
30	12.43	11.79	11.32	10.19	---	10.22	9.04	9.87	10.34	11.00	11.63	12.66
31	12.43	---	11.34	10.11	---	10.27	---	9.90	---	11.06	11.70	---
MAX	12.57	12.64	11.70	11.76	10.06	10.27	10.31	9.90	10.89	11.12	11.98	12.66

CAL YR 1993 LOW 12.89  
WTR YR 1994 LOW 12.66



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-248 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	16.3	15.9	15.1	13.9	13.2	12.7	12.5	12.7	13.2	14.1	14.9
2	16.1	16.3	15.9	15.1	13.9	13.2	12.7	12.5	12.7	13.4	14.2	14.9
3	16.1	16.3	15.9	15.1	13.9	13.2	12.7	12.5	12.7	13.4	14.2	14.9
4	16.1	16.3	15.9	15.1	13.9	13.1	12.7	12.5	12.7	13.4	14.2	14.9
5	16.1	16.3	15.9	15.1	13.9	13.1	12.6	12.5	12.7	13.4	14.2	15.0
6	16.1	16.3	15.9	15.0	13.8	13.1	12.6	12.5	12.7	13.4	14.2	15.1
7	16.1	16.3	15.9	14.9	13.7	13.1	12.7	12.5	12.8	13.4	14.2	15.1
8	16.1	16.3	15.7	14.9	13.7	13.0	12.6	12.5	12.9	13.4	14.2	15.1
9	16.1	16.3	15.6	14.9	13.7	13.0	12.6	12.5	12.9	13.4	14.2	15.1
10	16.1	16.3	15.6	14.9	13.7	12.9	12.6	12.5	12.9	13.4	14.2	15.1
11	16.3	16.3	15.6	14.9	13.7	12.9	12.5	12.5	12.9	13.4	14.3	15.1
12	16.3	16.3	15.6	14.9	13.7	12.9	12.5	12.5	12.9	13.4	14.4	15.1
13	16.3	16.3	15.6	14.8	13.7	12.9	12.5	12.6	12.9	13.7	14.4	15.1
14	16.3	16.3	15.6	14.7	13.7	12.9	12.5	12.5	12.9	13.7	14.4	15.1
15	16.3	16.3	15.6	14.6	13.7	12.9	12.5	12.6	12.9	13.7	14.4	15.1
16	16.3	16.3	15.6	14.6	13.6	12.9	12.5	12.6	12.9	13.7	14.4	15.1
17	16.3	16.3	15.6	14.6	13.5	12.9	12.5	12.6	12.9	13.7	14.4	15.3
18	16.3	16.3	15.4	14.6	13.4	12.8	12.5	12.6	12.9	13.7	14.4	15.4
19	16.3	16.3	15.4	14.6	13.4	12.8	12.5	12.6	12.9	13.7	14.4	15.4
20	16.3	16.3	15.4	14.6	13.4	12.8	12.5	12.6	13.0	13.7	14.4	15.4
21	16.3	16.1	15.4	14.5	13.4	12.8	12.5	12.7	13.2	13.7	14.5	15.4
22	16.3	16.1	15.4	14.4	13.4	12.7	12.5	12.7	13.2	13.8	14.6	15.4
23	16.3	16.1	15.4	14.4	13.4	12.7	12.5	12.7	13.2	13.9	14.6	15.4
24	16.3	16.1	15.4	14.4	13.3	12.7	12.5	12.7	13.2	13.9	14.6	15.4
25	16.3	16.1	15.4	14.4	13.2	12.7	12.5	12.7	13.2	13.9	14.6	15.4
26	16.3	16.1	15.4	14.4	13.2	12.7	12.5	12.7	13.2	13.9	14.6	15.4
27	16.3	16.1	15.3	14.3	13.2	12.7	12.5	12.7	13.2	13.9	14.6	15.4
28	16.3	16.1	15.1	14.2	13.2	12.7	12.5	12.7	13.2	13.9	14.6	15.4
29	16.3	15.9	15.1	14.2	---	12.7	12.5	12.7	13.2	13.9	14.7	15.4
30	16.3	15.9	15.1	14.1	---	12.7	12.5	12.7	13.2	13.9	14.9	15.6
31	16.3	---	15.1	13.9	---	12.7	---	12.7	---	13.9	14.9	---

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

387

394645084055201. Local number, GR-329.

LOCATION.--Lat 39 46'45" Long 84 05'52" Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

AQUIFER.--Sand and gravel of Pleistocene Age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool, diameter 4.0 in., depth 55.0 ft. Cased with stainless steel to 45.0 ft; .010 in screen from 45.0 to 55.0 ft, bentonite seal.

INSTRUMENTATION.--Electronic data logger -- 60-minute record. Data collected: Water level, water temperature, and specific conductance. Precipitation data from NOAA.

DATUM.--Elevation of land-surface datum is 807.18 feet above sea level.

Measuring point: Top of measurement plug on cap 2.77 ft above land-surface datum.

PERIOD OF DAILY RECORD.--

Water level: December 1992 to current year.

Water temperature: December 1992 to current year. Specific conductance: December 1992 to current year.

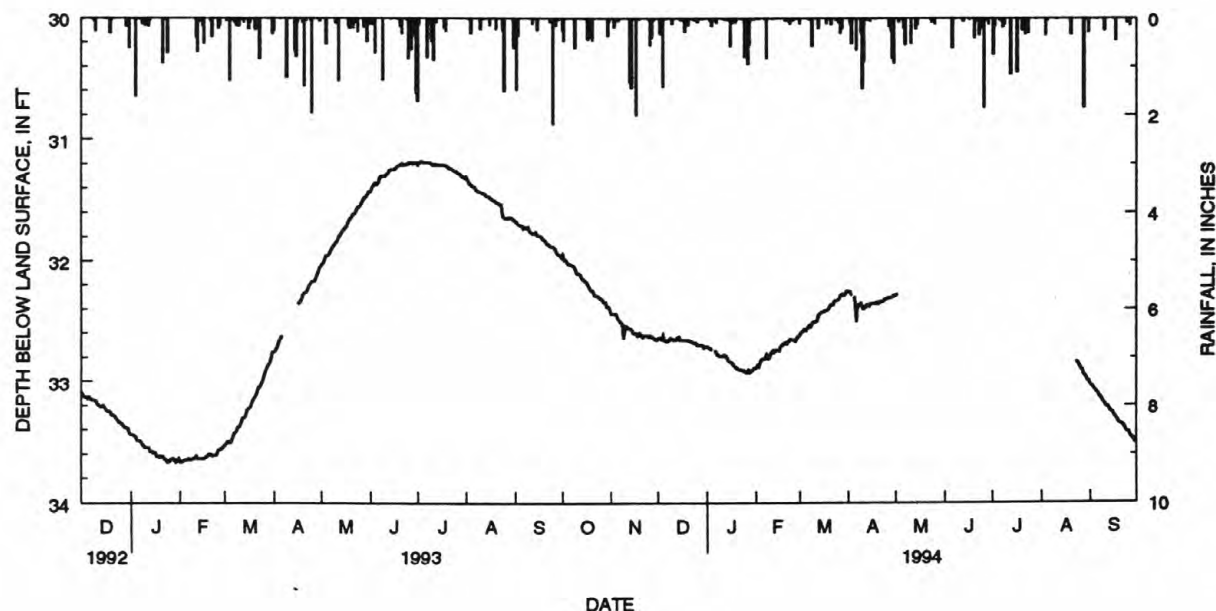
EXTREMES FOR PERIOD OF RECORD.--Water level: Maximum daily low, 33.67 ft below land-surface datum, January 24, 25, and 29, 1993, and February 1, 2, 1993; minimum daily low, 31.18 ft below land-surface datum, July 3, 1993. Water temperature: Maximum mean, 14.2°C, many days in 1993; minimum mean, 13.5°C, August 19, 20, 1993. Specific conductance: Maximum mean, 1100 microsiemens March 31, 1994. Minimum mean 953 microsiemens December 30, 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31.95	32.44	32.64	32.71	32.89	32.62	32.25	32.29	---	---	---	33.03
2	31.99	32.44	32.64	32.72	32.87	32.60	32.26	32.28	---	---	---	33.04
3	31.99	32.44	32.65	32.72	32.88	32.59	32.29	32.27	---	---	---	33.06
4	32.01	32.44	32.62	32.74	32.84	32.57	32.30	---	---	---	---	33.08
5	32.03	32.47	32.66	32.75	32.82	32.58	32.30	---	---	---	---	33.09
6	32.03	32.49	32.67	32.74	32.82	32.56	32.51	---	---	---	---	33.11
7	32.04	32.51	32.67	32.77	32.82	32.54	32.37	---	---	---	---	33.13
8	32.04	32.52	32.65	32.78	32.78	32.55	32.37	---	---	---	---	33.15
9	32.07	32.64	32.64	32.79	32.81	32.52	32.36	---	---	---	---	33.17
10	32.10	32.54	32.65	32.79	32.80	32.51	32.40	---	---	---	---	33.19
11	32.10	32.54	32.66	32.79	32.77	32.51	32.40	---	---	---	---	33.21
12	32.11	32.56	32.66	32.78	32.75	32.50	32.38	---	---	---	---	33.21
13	32.14	32.56	32.64	32.79	32.76	32.46	32.37	---	---	---	---	33.24
14	32.15	32.57	32.63	32.81	32.74	32.44	32.38	---	---	---	---	33.25
15	32.16	32.60	32.66	32.84	32.74	32.43	32.36	---	---	---	---	33.26
16	32.17	32.60	32.66	32.84	32.75	32.43	32.36	---	---	---	---	33.29
17	32.20	32.61	32.66	32.85	32.71	32.42	32.36	---	---	---	---	33.30
18	32.22	32.62	32.66	32.87	32.70	32.41	32.36	---	---	---	---	33.32
19	32.24	32.60	32.66	32.88	32.69	32.41	32.35	---	---	---	---	33.35
20	32.24	32.62	32.66	32.89	32.68	32.38	32.36	---	---	---	---	33.35
21	32.28	32.63	32.67	32.90	32.69	32.37	32.34	---	---	---	---	33.36
22	32.29	32.62	32.67	32.90	32.67	32.37	32.34	---	---	---	32.81	33.37
23	32.29	32.62	32.68	32.91	32.65	32.34	32.34	---	---	---	32.84	33.40
24	32.30	32.62	32.68	32.91	32.66	32.33	32.32	---	---	---	32.85	33.42
25	32.31	32.63	32.69	32.92	32.66	32.33	32.32	---	---	---	32.87	33.42
26	32.32	32.62	32.70	32.93	32.67	32.32	32.31	---	---	---	32.90	33.45
27	32.34	32.63	32.70	32.91	32.65	32.29	32.31	---	---	---	32.91	33.47
28	32.34	32.64	32.70	32.93	32.63	32.28	32.31	---	---	---	32.95	33.48
29	32.38	32.65	32.70	32.92	---	32.29	32.30	---	---	---	32.96	33.51
30	32.38	32.66	32.72	32.91	---	32.28	32.29	---	---	---	33.00	33.52
31	32.40	---	32.71	32.89	---	32.25	---	---	---	---	33.00	---
MAX	32.40	32.66	32.72	32.93	32.89	32.63	32.51	---	---	---	---	33.52

CAL YR 1993 LOW 33.67

WTR YR 1994 LOW 32.93



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-329 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.8	13.9	13.9	13.8	13.8	14.0	14.0	14.0	---	---	---	13.8
2	13.9	13.9	14.0	13.8	13.9	14.0	13.9	14.0	---	---	---	13.7
3	14.0	14.0	14.0	13.9	13.9	14.0	14.0	14.0	---	---	---	13.8
4	13.9	14.0	14.0	13.8	14.0	14.0	14.0	---	---	---	---	13.8
5	13.9	14.0	13.9	13.9	14.0	14.0	14.0	---	---	---	---	13.8
6	13.8	13.9	13.8	13.9	14.0	13.9	14.0	---	---	---	---	13.8
7	13.7	13.9	13.9	14.0	13.9	14.0	14.0	---	---	---	---	13.8
8	13.7	13.9	13.9	13.8	13.9	14.0	14.0	---	---	---	---	13.8
9	13.9	14.0	13.8	13.8	13.9	14.0	13.9	---	---	---	---	13.8
10	13.9	14.0	13.9	13.9	13.9	14.0	14.0	---	---	---	---	13.8
11	13.8	13.9	13.9	13.9	13.9	14.0	14.0	---	---	---	---	13.8
12	13.8	13.9	13.9	13.9	14.0	14.0	13.9	---	---	---	---	13.8
13	13.8	14.0	13.5	13.8	14.0	14.0	14.0	---	---	---	---	13.8
14	13.8	13.9	13.0	13.8	14.0	14.0	13.9	---	---	---	---	13.8
15	13.7	14.0	13.0	13.8	14.0	14.0	13.9	---	---	---	---	13.8
16	13.8	14.0	13.0	13.9	14.0	14.0	14.0	---	---	---	---	13.8
17	13.8	14.0	13.0	13.9	14.0	14.0	13.9	---	---	---	---	13.8
18	13.9	14.0	13.0	13.9	14.0	14.0	13.9	---	---	---	---	13.8
19	13.8	14.0	13.0	13.9	14.0	14.0	13.8	---	---	---	---	13.6
20	13.8	13.9	13.2	13.9	14.0	14.0	14.0	---	---	---	---	---
21	13.7	14.0	13.9	13.9	14.0	14.0	14.0	---	---	---	---	---
22	13.8	14.0	13.8	13.9	14.0	14.0	13.9	---	---	---	13.8	---
23	13.8	14.0	13.8	13.9	14.0	13.9	13.9	---	---	---	13.8	---
24	13.8	14.0	13.9	14.0	13.9	13.8	13.8	---	---	---	13.8	---
25	13.7	14.0	13.9	14.0	14.0	14.0	13.9	---	---	---	13.8	---
26	13.7	14.0	13.8	13.9	13.9	14.0	13.8	---	---	---	13.8	---
27	13.8	14.0	13.8	14.0	13.9	14.0	13.9	---	---	---	13.8	---
28	13.7	13.9	13.9	13.9	14.0	14.0	13.9	---	---	---	13.8	---
29	13.7	13.9	13.8	13.9	---	14.0	13.9	---	---	---	13.8	---
30	13.7	14.0	13.7	13.9	---	14.0	14.0	---	---	---	13.9	---
31	14.0	---	13.8	13.9	---	14.0	---	---	---	---	13.8	---

SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-329 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	966	956	957	964	971	971	1040	983	---	---	---	1030
2	965	957	954	965	969	972	980	984	---	---	---	1030
3	962	956	953	964	969	972	978	983	---	---	---	1030
4	965	956	954	965	968	972	978	---	---	---	---	1030
5	964	956	957	965	968	972	978	---	---	---	---	1030
6	967	956	959	963	968	973	980	---	---	---	---	1030
7	968	957	959	962	968	972	981	---	---	---	---	1030
8	967	956	959	967	970	973	979	---	---	---	---	1030
9	963	957	962	966	970	974	979	---	---	---	---	1030
10	963	956	959	964	971	973	979	---	---	---	---	1030
11	963	957	960	965	970	973	979	---	---	---	---	1030
12	965	956	964	966	970	973	981	---	---	---	---	1030
13	964	954	981	967	970	974	979	---	---	---	---	1030
14	964	955	1000	966	970	973	981	---	---	---	---	1030
15	965	954	1010	968	969	973	981	---	---	---	---	1040
16	964	955	1010	967	970	974	979	---	---	---	---	1030
17	963	955	1010	965	970	975	981	---	---	---	---	1030
18	961	955	1010	968	969	974	983	---	---	---	---	1040
19	963	956	1000	969	969	975	983	---	---	---	---	1040
20	964	956	998	968	969	974	981	---	---	---	---	---
21	964	956	980	969	969	975	980	---	---	---	---	---
22	962	956	979	967	970	975	983	---	---	---	1020	---
23	963	956	974	966	970	977	983	---	---	---	1020	---
24	963	955	964	965	971	979	984	---	---	---	1020	---
25	963	956	961	965	971	975	984	---	---	---	1020	---
26	963	956	963	967	972	976	986	---	---	---	1020	---
27	962	957	965	966	972	976	986	---	---	---	1020	---
28	963	956	961	966	972	976	984	---	---	---	1030	---
29	962	957	965	968	---	977	984	---	---	---	1030	---
30	962	956	967	967	---	1050	984	---	---	---	1030	---
31	956	---	965	967	---	1100	---	---	---	---	1030	---

\*\*This set of records for recorder well GR-329 is incomplete, because the recorder well was not functioning properly from May through September.



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

389

394815084020701. Local number, GR-330.

LOCATION.--Lat 39 48'15" Long 84 02'07" Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

AQUIFER.--Sand of Pleistocene Age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool, diameter 4.0 in., depth 49.5 ft. Cased with stainless steel to 39.5 ft;.010 in screen from 39.5 to 49.5 ft, bentonite seal.

INSTRUMENTATION.--Electronic data logger -- 60-minute record. Data collected: Water level, water temperature, and specific conductance. Precipitation data from NOAA.

DATUM.--Elevation of land-surface datum is 839.19 feet above sea level.

Measuring point: Top of measurement plug on cap 2.70 ft above land-surface datum.

PERIOD OF DAILY RECORD.--

Water level: April 1991 to current year.

Water temperature: April 1991 to current year. Specific conductance: April 1991 to current year.

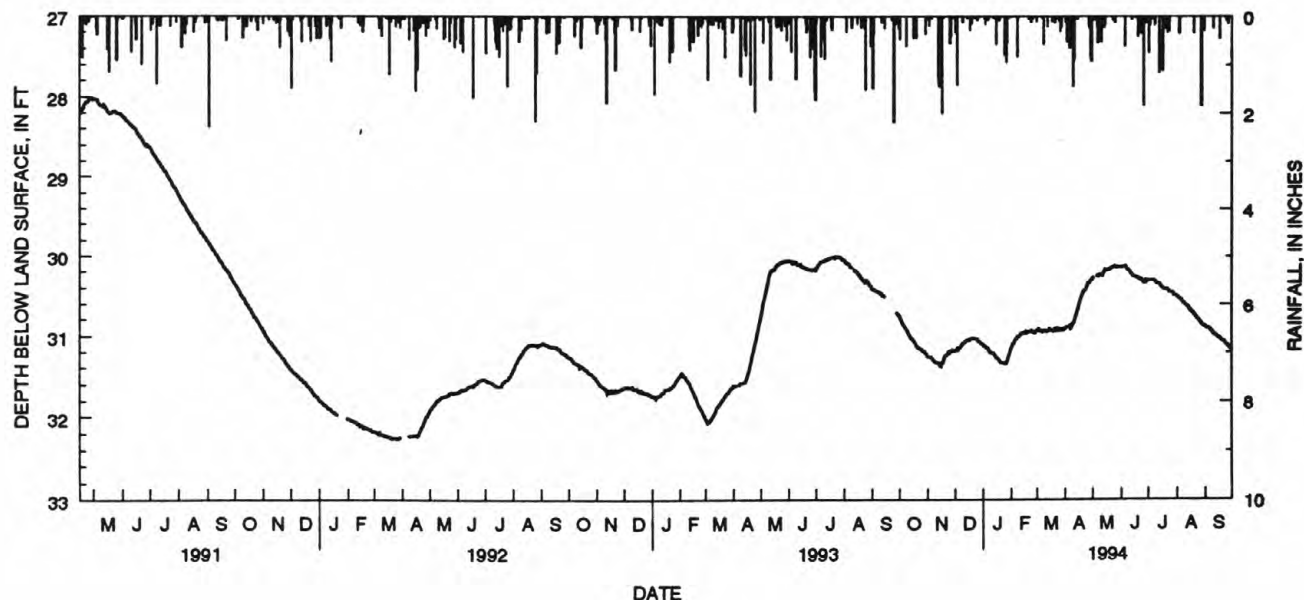
EXTREMES FOR PERIOD OF RECORD.--Water level: Maximum daily low, 32.26 ft below land-surface datum, many days in March 1992; minimum daily low, 27.99 ft below land-surface datum, April 29, 1991. Water temperature: Maximum mean, 13.8°C, many days in 1991; minimum mean, 13.1°C, many days in 1991, 1992, 1993, and 1994. Specific conductance: Maximum mean, 1090 microsiemens, many days in October, 1992. Minimum mean 903 microsiemens, many days in September 1993.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30.75	31.25	31.19	31.11	31.15	30.94	30.91	30.28	30.13	30.31	30.50	30.88
2	30.79	31.26	31.18	31.12	31.12	30.93	30.90	30.27	30.14	30.30	30.51	30.89
3	30.80	31.26	31.18	31.12	31.10	30.92	30.89	30.25	30.13	30.30	30.52	30.90
4	30.83	31.26	31.16	31.14	31.09	30.93	30.88	30.23	30.13	30.30	30.52	30.90
5	30.86	31.27	31.17	31.15	31.06	30.94	30.87	30.24	30.13	30.30	30.54	30.90
6	30.87	31.29	31.15	31.16	31.04	30.94	30.88	30.25	30.12	30.30	30.55	30.91
7	30.89	31.29	31.15	31.17	31.04	30.95	30.91	30.24	30.14	30.30	30.57	30.93
8	30.91	31.31	31.12	31.19	31.01	30.94	30.88	30.25	30.16	30.31	30.57	30.93
9	30.93	31.32	31.11	31.21	31.01	30.93	30.85	30.23	30.17	30.32	30.59	30.95
10	30.95	31.32	31.09	31.21	31.00	30.94	30.85	30.23	30.17	30.34	30.60	30.96
11	30.97	31.33	31.09	31.21	30.98	30.95	30.82	30.23	30.20	30.34	30.61	30.98
12	30.99	31.33	31.08	31.21	30.97	30.95	30.78	30.24	30.21	30.34	30.62	30.98
13	31.01	31.35	31.07	31.22	30.97	30.94	30.74	30.22	30.23	30.35	30.63	30.99
14	31.03	31.36	31.05	31.24	30.96	30.92	30.70	30.19	30.24	30.36	30.64	31.00
15	31.04	31.35	31.05	31.27	30.97	30.92	30.66	30.17	30.25	30.38	30.66	31.01
16	31.05	31.36	31.06	31.27	30.97	30.93	30.62	30.18	30.25	30.39	30.68	31.02
17	31.07	31.33	31.05	31.28	30.95	30.93	30.59	30.18	30.26	30.40	30.69	31.02
18	31.09	31.32	31.04	31.30	30.96	30.93	30.55	30.17	30.26	30.41	30.70	31.04
19	31.11	31.28	31.04	31.31	30.95	30.94	30.51	30.17	30.27	30.41	30.71	31.05
20	31.12	31.26	31.03	31.32	30.95	30.93	30.48	30.16	30.27	30.42	30.73	31.06
21	31.14	31.24	31.03	31.33	30.95	30.92	30.45	30.16	30.28	30.41	30.74	31.06
22	31.15	31.24	31.03	31.33	30.95	30.93	30.44	30.15	30.29	30.42	30.76	31.07
23	31.16	31.22	31.04	31.33	30.94	30.91	30.43	30.14	30.28	30.43	30.77	31.09
24	31.16	31.20	31.04	31.34	30.95	30.92	30.40	30.13	30.30	30.45	30.79	31.10
25	31.17	31.21	31.04	31.35	30.95	30.93	30.38	30.12	30.32	30.45	30.80	31.11
26	31.18	31.19	31.05	31.35	30.96	30.92	30.35	30.14	30.33	30.45	30.81	31.12
27	31.19	31.19	31.07	31.33	30.96	30.92	30.33	30.14	30.33	30.45	30.82	31.13
28	31.19	31.18	31.07	31.29	30.94	30.92	30.33	30.14	30.33	30.46	30.84	31.15
29	31.21	31.19	31.08	31.26	---	30.93	30.31	30.13	30.30	30.48	30.85	31.16
30	31.22	31.19	31.09	31.22	---	30.93	30.30	30.13	30.31	30.49	30.87	31.17
31	31.23	---	31.10	31.19	---	30.92	---	30.13	---	30.49	30.87	---
MAX	31.23	31.36	31.19	31.35	31.15	30.95	30.91	30.28	30.33	30.49	30.87	31.17

CAL YR 1993 LOW 32.07

WTR YR 1994 LOW 31.36





## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-330 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.6	13.1	13.1	13.1	13.1	13.1	13.3	13.4	13.3	13.3	13.3	13.4
2	13.6	13.1	13.1	13.1	13.1	13.1	13.3	13.3	13.4	13.3	13.3	13.4
3	13.5	13.3	13.1	13.1	13.1	13.2	13.3	13.4	13.3	13.3	13.3	13.3
4	13.6	13.4	13.1	13.1	13.1	13.2	13.3	13.4	13.3	13.3	13.4	13.3
5	13.5	13.4	13.1	13.1	13.1	13.2	13.3	13.4	13.3	13.3	13.4	13.3
6	13.5	13.4	13.1	13.1	13.1	13.3	13.2	13.4	13.4	13.4	13.3	13.3
7	13.5	13.4	13.1	13.1	13.1	13.2	13.4	13.4	13.4	13.3	13.3	13.3
8	13.5	13.4	13.1	13.1	13.1	13.1	13.5	13.4	13.4	13.4	13.3	13.2
9	13.5	13.4	13.1	13.1	13.1	13.1	13.5	13.4	13.4	13.3	13.4	13.2
10	13.4	13.3	13.1	13.1	13.1	13.1	13.4	13.4	13.3	13.3	13.3	13.2
11	13.4	13.3	13.1	13.1	13.1	13.2	13.4	13.4	13.3	13.3	13.4	13.2
12	13.4	13.4	13.1	13.1	13.1	13.2	13.5	13.4	13.4	13.3	13.3	13.2
13	13.4	13.4	13.1	13.1	13.1	13.1	13.4	13.4	13.3	13.4	13.3	13.3
14	13.4	13.4	13.1	13.1	13.1	13.1	13.5	13.4	13.3	13.3	13.4	13.2
15	13.4	13.4	13.1	13.1	13.1	13.2	13.4	13.4	13.4	13.3	13.3	13.3
16	13.4	13.2	13.1	13.1	13.1	13.1	13.4	13.4	13.3	13.3	13.2	13.3
17	13.4	13.3	13.1	13.1	13.2	13.2	13.4	13.4	13.3	13.3	13.3	13.3
18	13.4	13.3	13.1	13.1	13.2	13.2	13.4	13.4	13.3	13.3	13.3	13.3
19	13.4	13.2	13.1	13.1	13.3	13.2	13.4	13.4	13.3	13.3	13.3	13.2
20	13.4	13.1	13.1	13.1	13.2	13.3	13.4	13.4	13.3	13.3	13.4	13.2
21	13.4	13.1	13.1	13.1	13.1	13.3	13.4	13.3	13.3	13.3	13.4	13.2
22	13.4	13.2	13.1	13.1	13.1	13.3	13.4	13.4	13.3	13.4	13.3	13.2
23	13.4	13.1	13.1	13.1	13.2	13.3	13.4	13.3	13.4	13.3	13.3	13.2
24	13.4	13.2	13.1	13.1	13.1	13.4	13.4	13.3	13.4	13.3	13.3	13.2
25	13.4	13.1	13.1	13.1	13.1	13.2	13.4	13.4	13.4	13.3	13.3	13.2
26	13.4	13.2	13.1	13.1	13.1	13.2	13.3	13.4	13.4	13.4	13.3	13.2
27	13.3	13.1	13.1	13.1	13.1	13.2	13.4	13.4	13.4	13.4	13.3	13.2
28	13.2	13.1	13.1	13.1	13.1	13.2	13.4	13.4	13.3	13.4	13.3	13.2
29	13.3	13.1	13.1	13.1	---	13.2	13.4	13.3	13.4	13.4	13.3	13.2
30	13.1	13.1	13.1	13.1	---	13.2	13.4	13.3	13.4	13.4	13.5	13.2
31	13.1	---	13.1	13.1	---	13.3	---	13.3	---	13.3	13.6	---

SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-330 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	940	974	949	1030	1020	1030	1020	1030	1040	1020	1010	983
2	939	973	957	1030	1020	1030	1020	1040	1030	1020	1010	983
3	943	951	960	1030	1020	1030	1020	1030	1030	1020	1010	985
4	944	930	962	1030	1010	1030	1020	1030	1030	1030	1000	987
5	948	930	965	1030	1020	1030	1020	1030	1030	1030	1000	988
6	951	933	967	1030	1020	1030	1020	1030	1030	1030	1000	990
7	954	938	968	1030	1020	1030	996	1030	1030	1030	1000	991
8	957	946	970	1020	1030	1030	994	1040	1030	1030	1000	993
9	960	956	970	1020	1030	1030	999	1040	1030	1030	998	994
10	964	962	969	1020	1030	1030	1010	1040	1030	1020	999	994
11	965	965	969	1020	1030	1030	1020	1040	1030	1020	996	995
12	967	962	970	1020	1030	1030	1020	1030	1030	1020	998	995
13	967	964	973	1020	1030	1030	1020	1030	1040	1020	999	995
14	968	966	979	1020	1030	1030	1020	1030	1030	1020	998	996
15	969	973	986	1020	1030	1030	1020	1030	1030	1020	999	995
16	969	975	993	1020	1030	1030	1020	1030	1030	1020	999	996
17	969	971	998	1020	1030	1030	1010	1030	1030	1010	999	994
18	970	963	1000	1020	1030	1030	1020	1030	1030	1010	998	995
19	970	946	1000	1020	1030	1030	1020	1030	1030	1010	999	997
20	970	933	1000	1010	1030	1020	1020	1030	1030	1010	998	997
21	971	919	1000	1010	1030	1020	1020	1040	1030	1010	996	997
22	972	911	1000	1010	1030	1020	1030	1040	1030	1010	999	998
23	972	907	1010	1010	1030	1020	1030	1040	1020	1010	1000	997
24	972	909	1020	1010	1030	1020	1030	1040	1020	1010	1000	998
25	971	908	1020	1010	1030	1030	1030	1030	1020	1010	1000	997
26	969	908	1030	1010	1030	1030	1030	1030	1020	1010	1000	999
27	969	911	1030	1010	1030	1020	1030	1030	1020	1010	1000	999
28	972	916	1040	1020	1030	1020	1030	1030	1020	1000	1000	1000
29	971	926	1030	1020	---	1020	1030	1030	1030	1000	998	999
30	974	938	1030	1030	---	1020	1030	1030	1020	1000	983	999
31	974	---	1030	1030	---	1020	---	1040	---	1010	979	---

## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

391

394815084020703. Local number, GR-332.

LOCATION.--Lat 39 48'15" Long 84 02'07" Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

AQUIFER.--Sand of Pleistocene Age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool, diameter 4.0 in., depth 196.0 ft. Cased with stainless steel to 185.5.0 ft;.010 in screen from 185.5 to 195.5 ft, bentonite seal.

INSTRUMENTATION.--Electronic data logger -- 60-minute record. Data collected: Water level, water temperature, and specific conductance. Precipitation data from NOAA.

DATUM.--Elevation of land-surface datum is 839.19 feet above sea level.

Measuring point: Top of measurement plug on cap 2.45 ft above land-surface datum.

PERIOD OF DAILY RECORD.--

Water level: April 1991 to current year.

Water temperature: April 1991 to current year. Specific conductance: April 1991 to current year.

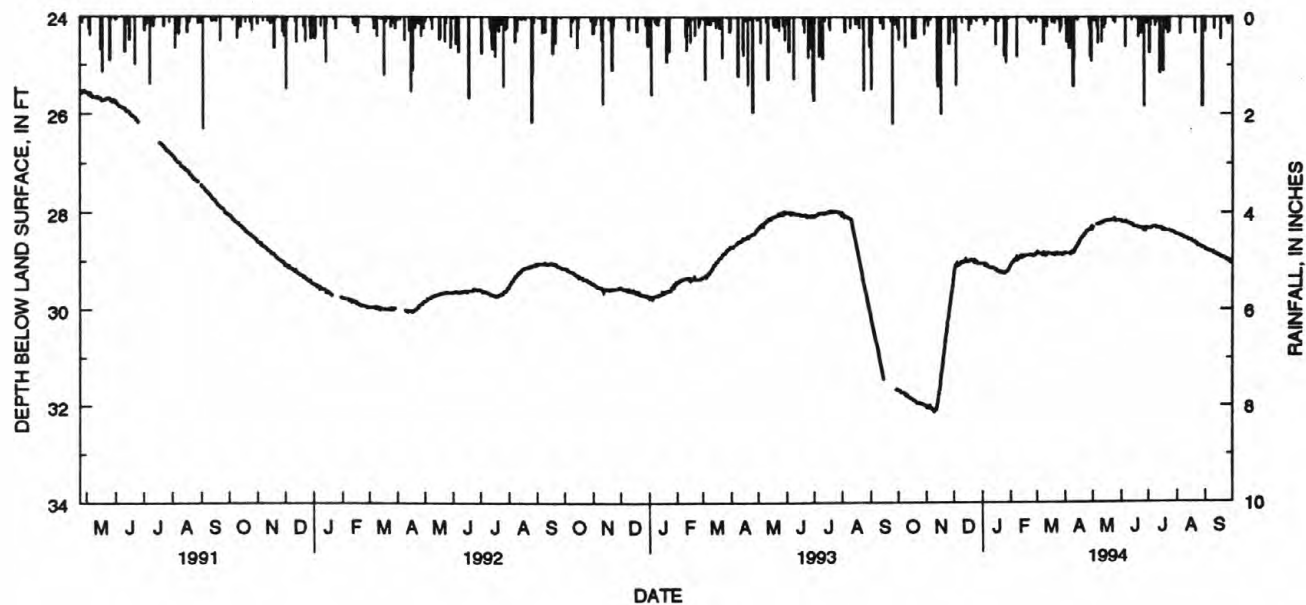
EXTREMES FOR PERIOD OF RECORD.--Water level: Maximum daily low, 32.12 ft below land-surface datum, November 9, 1993; minimum daily low, 25.48 ft below land-surface datum, April 28, 1991. Water temperature: Maximum mean, 12.5°C, many days in 1993 and 1994; minimum mean, 12.1°C, many days in 1991 and 1992. Specific conductance: Maximum mean, 940 microsiemens, August 24, 1993. Minimum mean 669 microsiemens, May 23, 24, 1991.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31.67	32.03	29.28	29.04	29.09	28.85	28.83	28.32	28.18	28.32	28.44	28.76
2	31.69	32.04	29.12	29.05	29.05	28.82	28.83	28.29	28.19	28.33	28.45	28.77
3	31.69	32.01	29.08	29.04	29.05	28.83	28.84	28.27	28.19	28.33	28.46	28.78
4	31.72	32.01	29.04	29.08	29.01	28.85	28.84	28.25	28.19	28.30	28.46	28.78
5	31.73	32.06	29.08	29.09	28.98	28.85	28.82	28.25	28.19	28.30	28.49	28.78
6	31.73	32.06	29.07	29.07	28.97	28.85	28.85	28.25	28.18	28.29	28.49	28.80
7	31.73	32.07	29.07	29.10	28.98	28.85	28.86	28.24	28.19	28.28	28.50	28.80
8	31.74	32.09	29.04	29.12	28.92	28.87	28.84	28.25	28.22	28.28	28.51	28.81
9	31.78	32.12	29.02	29.13	28.96	28.83	28.82	28.22	28.22	28.29	28.52	28.82
10	31.79	32.10	29.03	29.13	28.94	28.86	28.83	28.22	28.22	28.31	28.52	28.84
11	31.78	32.10	29.03	29.14	28.92	28.88	28.82	28.21	28.23	28.31	28.53	28.84
12	31.82	32.05	29.01	29.12	28.90	28.87	28.75	28.22	28.24	28.31	28.54	28.86
13	31.83	31.89	28.99	29.14	28.92	28.83	28.72	28.20	28.25	28.30	28.55	28.86
14	31.84	31.78	28.97	29.14	28.90	28.82	28.70	28.18	28.26	28.31	28.56	28.87
15	31.85	31.65	29.00	29.17	28.91	28.85	28.66	28.18	28.28	28.34	28.57	28.88
16	31.84	31.52	29.00	29.17	28.91	28.85	28.63	28.18	28.28	28.35	28.57	28.89
17	31.88	31.34	28.99	29.19	28.89	28.84	28.59	28.18	28.28	28.34	28.59	28.91
18	31.89	31.24	28.98	29.21	28.88	28.86	28.56	28.17	28.29	28.34	28.60	28.92
19	31.90	31.03	28.98	29.20	28.88	28.84	28.52	28.16	28.30	28.36	28.61	28.93
20	31.91	30.88	28.97	29.22	28.88	28.85	28.51	28.17	28.30	28.36	28.61	28.93
21	31.94	30.74	28.98	29.21	28.88	28.87	28.49	28.17	28.31	28.36	28.63	28.94
22	31.94	30.59	28.98	29.22	28.88	28.85	28.46	28.16	28.31	28.36	28.65	28.95
23	31.95	30.43	29.00	29.23	28.87	28.83	28.43	28.15	28.31	28.37	28.67	28.96
24	31.94	30.27	28.98	29.23	28.88	28.85	28.41	28.15	28.31	28.38	28.67	28.98
25	31.95	30.14	29.01	29.24	28.89	28.86	28.38	28.13	28.35	28.38	28.69	28.98
26	31.96	29.97	29.02	29.25	28.90	28.85	28.37	28.16	28.34	28.39	28.69	28.99
27	31.96	29.83	29.04	29.21	28.89	28.84	28.36	28.18	28.36	28.39	28.70	29.02
28	31.97	29.67	29.04	29.21	28.86	28.84	28.35	28.17	28.34	28.41	28.71	29.03
29	31.99	29.55	29.05	29.20	---	28.87	28.34	28.16	28.31	28.42	28.73	29.05
30	31.99	29.44	29.05	29.16	---	28.86	28.30	28.17	28.33	28.43	28.73	29.05
31	32.01	---	29.05	29.12	---	28.85	---	28.16	---	28.44	28.75	---
MAX	32.01	32.12	29.28	29.25	29.09	28.88	28.86	28.32	28.36	28.44	28.75	29.05

CAL YR 1993 LOW 32.12

WTR YR 1994 LOW 32.12



## GROUND-WATER RECORDS FOR THE BASE WIDE MONITORING PROGRAM

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-332 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.3	12.3	12.3	12.3	12.4	12.3	12.4	12.4	12.4	12.4	12.4	12.5
2	12.3	12.3	12.4	12.3	12.4	12.3	12.4	12.4	12.4	12.4	12.4	12.5
3	12.3	12.3	12.4	12.3	12.3	12.4	12.4	12.5	12.4	12.5	12.4	12.5
4	12.3	12.3	12.4	12.3	12.3	12.4	12.4	12.5	12.4	12.4	12.4	12.5
5	12.3	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.5	12.5
6	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.5	12.4	12.4	12.4	12.5
7	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.5	12.4	12.4	12.4	12.5
8	12.3	12.3	12.3	12.4	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.5
9	12.3	12.3	12.3	12.4	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4
10	12.3	12.3	12.4	12.3	12.3	12.3	12.5	12.4	12.4	12.4	12.4	12.4
11	12.3	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.5
12	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.4
13	12.3	12.3	12.3	12.3	12.3	12.4	12.5	12.4	12.4	12.4	12.4	12.4
14	12.3	12.4	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
15	12.3	12.4	12.3	12.5	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
16	12.3	12.3	12.3	12.4	12.4	12.3	12.5	12.5	12.4	12.4	12.4	12.4
17	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.5	12.5
18	12.3	12.3	12.3	12.5	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.5
19	12.3	12.3	12.3	12.5	12.4	12.3	12.4	12.4	12.4	12.4	12.4	12.5
20	12.3	12.3	12.3	12.4	12.5	12.4	12.4	12.4	12.4	12.4	12.4	12.5
21	12.3	12.3	12.3	12.4	12.4	12.5	12.4	12.4	12.4	12.4	12.4	12.5
22	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.5
23	12.3	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.5	12.5
24	12.3	12.4	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	12.5
25	12.3	12.3	12.3	12.3	12.3	12.4	12.4	12.5	12.4	12.4	12.4	12.5
26	12.3	12.3	12.4	12.3	12.3	12.3	12.4	12.5	12.5	12.4	12.4	12.5
27	12.3	12.3	12.3	12.3	12.4	12.5	12.4	12.4	12.5	12.4	12.4	12.5
28	12.3	12.3	12.3	12.4	12.4	12.4	12.5	12.4	12.4	12.5	12.4	12.5
29	12.3	12.3	12.4	12.3	---	12.4	12.5	12.4	12.4	12.5	12.4	12.5
30	12.3	12.3	12.4	12.3	---	12.3	12.4	12.4	12.4	12.4	12.5	12.5
31	12.3	---	12.3	12.3	---	12.4	---	12.4	---	12.4	12.4	---

SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
GR-332 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	842	864	875	887	897	901	905	907	913	916	919	923
2	842	864	875	887	896	902	903	909	912	917	919	923
3	844	864	875	889	897	901	903	906	912	915	920	923
4	845	863	875	889	897	900	905	907	913	917	920	923
5	845	864	877	890	898	901	903	909	913	918	919	921
6	846	865	877	889	896	900	904	907	914	918	920	923
7	846	866	877	890	898	899	905	906	914	918	920	924
8	847	866	878	889	899	901	906	909	912	917	920	924
9	847	866	877	890	899	904	903	909	913	917	920	925
10	848	866	877	891	899	902	902	909	913	916	920	924
11	849	866	879	890	899	902	904	910	914	916	920	924
12	850	866	880	890	900	902	904	909	914	917	922	925
13	851	866	881	891	899	901	903	911	915	917	923	925
14	852	865	880	893	898	902	905	909	916	918	923	926
15	854	867	881	892	897	901	904	909	916	918	921	926
16	854	869	881	894	898	903	904	909	916	918	922	926
17	855	868	883	894	898	903	904	910	916	917	921	925
18	856	869	883	894	898	902	906	911	916	918	922	926
19	857	869	884	895	897	903	905	911	917	918	922	926
20	858	870	884	894	896	903	906	911	916	920	922	926
21	858	869	885	895	898	901	904	912	916	919	922	926
22	859	870	885	895	900	904	907	913	915	918	922	926
23	860	871	885	894	898	904	907	912	915	918	922	926
24	860	870	886	894	901	902	907	911	916	919	922	926
25	860	871	886	894	901	903	906	911	914	918	923	926
26	860	872	886	896	902	904	907	911	913	918	924	924
27	861	873	888	895	900	901	907	912	914	918	924	924
28	862	874	888	893	900	903	906	913	915	917	924	926
29	862	875	887	896	---	904	906	912	917	918	923	927
30	863	875	887	895	---	906	906	912	915	918	923	927
31	864	---	888	897	---	905	---	912	---	919	923	---

# BACTERIOLOGICAL AND SELECTED WATER-QUALITY DATA OF THE CUYAHOGA RIVER AND LAKE ERIE

393

The following tables list the results of bacteriological, chemical, and physical measurements collected at one location in Lake Erie and two locations in the Cuyahoga River in Cuyahoga County, Ohio. Samples were collected and analyzed as part of a study to investigate regrowth of chlorine-injured fecal-indicator bacteria in receiving waters.

## 04208506 CUYAHOGA R AT W THIRD ST BRIDGE IN CLEVELAND OH

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI-	COLI-	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)
			WATER			FORM,	FORM,	
			WHOLE			0.45	0.45	
			FIELD			UM-MF,	ENHANCE	
			(STAND- ARD UNITS)			RECOVERY	RECOVERY	
			(COLS./ 100 ML)	(COLS./ 100 ML)				
JUN								
27...	1530	892	7.2	22.0	5.5	17000	30000	32
28...	1300	838	7.1	22.0	4.9	4600	13000	78
29...	0430	905	7.1	22.0	4.7	K1100	2400	32
30...	0930	692	7.2	22.0	5.3	20000	32000	184

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
JUN							
27...	0.09	4.2	0.34	1.7	0.23	0.15	9.0
28...	0.06	5.2	0.42	2.6	0.35	0.23	9.2
29...	0.03	4.1	0.45	1.8	0.20	0.14	8.4
30...	2.49	4.7	0.28	0.06	0.54	0.47	9.5

## 411359081330400 CUYAHOGA R NR PENINSULA OH

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI-	COLI-	COLI-	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)
			WATER			FORM,	FECAL,		
			WHOLE			FORM,	UM-MF		
			FIELD			0.45	ENHANCE		
			(STAND-			UM-MF	RECOVERY		
ARD	(COLS./	(COLS./							
		100 ML)	100 ML)						
JUN									
27...	1200	932	8.0	20.0	6.8	K41000	94000	104	
28...	1100	943	7.4	19.5	7.5	10000	28000	48	
29...	1130	635	7.2	20.0	7.0	130000	180000	96	

K Results based on colony count outside the ideal range.

# BACTERIOLOGICAL AND SELECTED WATER-QUALITY DATA OF THE CUYAHOGA RIVER AND LAKE ERIE

411359081330400

CUYAHOGA R NR PENINSULA OH--Continued

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + DIS- ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
JUN							
27...	0.20	3.0	0.22	1.7	0.32	0.21	6.6
28...	0.27	5.0	0.36	1.7	0.34	0.19	6.9
29...	0.05	1.5	0.42	3.7	1.5	1.3	23

412941081433600

LAKE ERIE AT CLEVELAND

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, UM-MF (COLS./ 100 ML)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)
MAY								
17...	1600	455	8.0	12.5	9.3	1100	3500	20
18...	1200	560	7.8	12.5	8.9	280	730	18
19...	1045	571	7.8	13.5	8.1	--	--	9
AUG								
16...	1330	360	7.7	23.5	6.8	1100	2100	20
17...	1010	446	7.6	22.0	4.8	--	3600	13
18...	0945	400	7.2	22.5	5.9	310	340	18

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + DIS- ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
MAY							
17...	0.03	1.3	0.19	1.5	0.09	0.07	4.3
18...	0.03	1.6	0.26	1.2	0.10	0.07	4.7
19...	0.05	1.6	0.24	1.3	0.08	0.05	5.1
AUG							
16...	0.04	0.75	0.40	1.1	0.09	0.06	4.6
17...	0.03	0.97	0.30	0.72	0.10	0.08	5.0
18...	0.05	0.82	0.39	0.63	0.09	0.07	4.5



# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 395 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

## Ground-Water-Quality Data

The following tables contain chemical analyses of wells located in Montgomery and Greene counties. Also reported are static ground-water levels measured prior to sampling. The data were collected as part of a cooperative study with the Miami Conservancy District, the City of Dayton, and over 20 other municipal, federal, industrial, and educational entities located in the Dayton area. The study began in 1993 and is funded through 1996. The objective of the study is to develop a regional ground-water-flow model of the Great Miami buried-valley aquifer system. The model is expected to have implications for the evaluation, management, and protection of this sole-source aquifer. To assist in calibration of the model, an environmental tracer study is being conducted in which wells located along regional flow paths are being sampled for various environmental tracer compounds (chlorofluorocarbons, tritium-He). These environmental tracers are being used to estimate the age of the ground water at various locations in the aquifer. Knowledge of the age distribution of water in the aquifer helps investigators to refine and calibrate the ground-water-flow model. Results of the environmental tracer sampling will be presented in a separate USGS Water Resources Investigations Report. The chemical and water-level data presented below were collected to characterize geochemical and hydrologic conditions in the aquifer at the time the environmental tracer samples were collected.

394852084042600. Local number, GR-216  
LOCATION.--Lat 39°48'52", long 84°04'26", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
OWNER.--Wright-Patterson Air Force Base  
AQUIFER.--Sand and gravel of Pleistocene age.  
WELL CHARACTERISTICS.--Observation well drilled by auger method, 31.8 feet deep, 4 inch diameter stainless steel casing with 5 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
DATUM.--Elevation of land surface datum is 795.5 ft. above National GVD of 1929. Measuring point: Top of casing 2.33 ft. above land surface datum.  
PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 18...	5.72	869	7.2	100	14.0	0.3	410	100	38	25	1.8
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 18...	415	336	76	44	0.3	0.11	15	508	<0.01	0.58	0.12
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 18...	<0.01	30	930	910	50	45	0.5				

**396 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395004084013701. Local number, GR-256

LOCATION.--Lat 39°50'04", long 84°01'37", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright- Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cableMAGNE-MAGNE- 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 822.3 ft. above National GVD of 1929. Measuring point: Top of casing

1.86 ft. above land surface datum.

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 22...	16.16	1080	7.2	60	14.0	0.2	410	100	40	61	2.1
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 22...	397	323	120	83	0.2	0.13	15	620	<0.01	<0.05	0.11
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 22...	<0.01	30	2800	2700	50	43	0.6				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 397 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

395030084011901. Local number, GR-299  
 LOCATION.--Lat 39°50'30", long 84°01'19", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 22.2 feet deep, 4 inch diameter stainless steel casing with 10 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 829.3 ft. above National GVD of 1929. Measuring point: Top of casing 1.75 ft. above land surface datum.  
 PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 22...	17.0	739	7.1	200	13.0	7.8	350	88	31	21	3.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 22...	372	301	48	28	0.2	0.06	11	414	<0.01	<0.05	0.04
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 22...	<0.01	40	100	33	<10	2	0.7				

**398 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394929084015001. Local number, GR-318

LOCATION.--Lat 39°49'29", long 84°01'50", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 48.4 feet deep, 4 inch diameter stainless steel casing with 5 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 821.7 ft. above National GVD of 1929. Measuring point: Top of casing 2.23 ft. above land surface datum.

PERIOD OF RECORD.--April 1990 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
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AUG 23...	16.71	837	7.2	350	14.5	4.1	380	96	33	22	4.8
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DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
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AUG 23...	403	327	53	45	0.2	0.07	11	477	<0.01	3.1	0.02
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DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
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AUG 23...	<0.01	20	10	<3	<10	<1	0.4
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# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 399 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394929084015002. Local number, GR-319

LOCATION.--Lat 39°49'29", long 84°01'50", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 160.5 feet deep, 4 inch diameter stainless steel casing with 10 feet 4 of inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 822.0 ft. above National GVD of 1929. Measuring point: Top of casing 2.19 ft. above land surface datum.

PERIOD OF RECORD.--November 1989 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 23...	20.24	1050	7.2	43	14.0	0.1	460	110	45	17	1.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 23...	373	306	47	120	0.3	0.14	16	556	<0.01	0.06	0.17
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 23...	<0.01	30	2500	2400	180	160	0.6				



**400 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394855084033901. Local number, GR-321  
 LOCATION.--Lat 39°48'55", long 84°03'39", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 22.2 feet deep, 4 inch diameter stainless steel casing with 5.5 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 798.6 ft. above National GVD of 1929. Measuring point: Top of casing 1.62 ft. above land surface datum.  
 PERIOD OF RECORD.--September 1989 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 24...	4.34	851	7.2	170	13.7	0.1	380	96	34	22	1.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 24...	378	305	65	50	0.2	0.09	12	479	<0.01	2.7	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 24...	<0.01	40	<10	<3	10	13	0.4				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 401 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394855084033902. Local number, GR-322

LOCATION.--Lat 39°48'55", long 84°03'39", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 147.2 feet deep, 4 inch diameter stainless steel casing with 10 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 798.7 ft. above National GVD of 1929. Measuring point: Top of casing 1.51 ft. above land surface datum.

PERIOD OF RECORD.--November 1989 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 24...	3.38	822	7.3	59	13.5	<0.1	400	95	39	6.2	1.6
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 24...	378	307	46	55	0.2	0.12	13	452	<0.01	1.8	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 24...	<0.01	20	1700	1600	80	74	0.3				

**402 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394831084042701. Local number, GR-323  
 LOCATION.--Lat 39°48'31", long 84°04'27", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 50.6 feet deep, 4 inch diameter stainless steel casing with 5 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 796.6 ft. above National GVD of 1929. Measuring point: Top of casing 1.87 ft. above land surface datum.  
 PERIOD OF RECORD.--August 1989 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 24...	7.45	853	7.2	110	12.5	0.1	380	99	33	24	1.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 24...	376	303	80	46	0.2	0.10	13	483	<0.01	0.06	0.07
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 24...	<0.01	40	590	510	50	51	0.7				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 403 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394831084042702. Local number, GR-324  
 LOCATION.--Lat 39°48'31", long 84°04'27", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 127.7 feet deep, 4 inch diameter stainless steel casing with 10 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 796.8 ft. above National GVD of 1929. Measuring point: Top of casing 1.46 ft. above land surface datum.  
 PERIOD OF RECORD.--August 1989 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 24...	6.99	644	7.4	46	13.0	<0.1	320	77	31	5.4	1.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 24...	366	286	27	11	0.4	0.08	15	349	<0.01	<0.05	0.13
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 24...	<0.01	30	1300	1200	120	110	0.4				

**404 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394743084024301. Local number, GR-326

LOCATION.--Lat 39°47'43", long 84°02'43", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by air rotary method, 38.6 feet deep, 4 inch diameter stainless steel casing with 5 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 838.9 ft. above National GVD of 1929. Measuring point: Top of casing 2.15 ft. above land surface datum.

PERIOD OF RECORD.--September 1989 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 23...	29.64	1080	7.5	230	12.0	4.7	280	78	20	100	1.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 23...	285	234	52	150	0.3	0.10	8.6	560	0.01	2.1	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 23...	<0.01	30	30	12	<10	<1	0.9				



# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 405 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394825084050804. Local number, GR-414

LOCATION.--Lat 39°48'25", long 84°05'08", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by rotosonic method, 158.3 feet deep, 2 inch diameter stainless steel casing with 10 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 789.9 ft. above National GVD of 1929. Measuring point: Top of casing 1.65 ft. above land surface datum.

PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 18...	8.14	620	7.3	49	13.0	0.1	320	77	32	7.9	1.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 18...	378	306	22	9.1	0.5	0.10	16	356	<0.01	0.41	0.15
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 18...	<0.01	30	1700	1700	50	43	0.4				

**406 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394825084050803. Local number, GR-415

LOCATION.--Lat 39°48'25", long 84°05'08", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 110.3 feet deep, 2 inch diameter stainless steel casing with 10 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 789.8 ft. above National GVD of 1929. Measuring point: Top of casing 1.88 ft. above land surface datum.

PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 18...	8.28	607	7.3	55	12.5	0.1	330	78	32	4.6	1.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 18...	372	301	28	4.2	0.5	0.06	16	350	<0.01	<0.05	0.13
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 18...	<0.01	20	1800	2000	50	46	0.4				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 407 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394825084050802. Local number, GR-416  
 LOCATION.--Lat 39°48'25", long 84°05'08", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by rotosonic method, 66.3 feet deep, 2 inch diameter stainless steel casing with 10 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 789.9 ft. above National GVD of 1929. Measuring point: Top of casing 1.65 ft. above land surface datum.  
 PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 19...	8.01	977	7.0	110	12.0	0.2	500	140	37	8	1.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 19...	476	386	94	43	0.3	0.09	15	587	<0.01	<0.05	0.08
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 19...	<0.01	40	3700	3800	170	180	1.4				

**408 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394829084050204. Local number, GR-419  
 LOCATION.--Lat 39°48'29", long 84°05'02", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 129.8 feet deep, 2 inch diameter stainless steel casing with 10 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 788.3 ft. above National GVD of 1929. Measuring point: Top of casing 3.78 ft. above land surface datum.  
 PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 17...	4.34	610	7.3	59	13.0	0.2	330	78	32	6.3	1.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 17...	384	308	20	5.6	0.7	0.08	17	353	<0.01	0.14	0.14
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 17...	<0.01	30	1800	1800	50	50	0.4				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 409 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394829084050203. Local number, GR-420

LOCATION.--Lat 39°48'29", long 84°05'02", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 94.6 feet deep, 2 inch diameter stainless steel casing with 10 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 789.3 ft. above National GVD of 1929. Measuring point: Top of casing 1.83 ft. above land surface datum.

PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 17...	6.08	609	7.4	53	12.5	0.3	330	78	32	4.5	1.2
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 17...	372	301	26	4.3	0.3	0.05	16	349	<0.01	0.35	0.13
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 17...	<0.01	20	2100	2200	50	48	0.4				



**410 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394829084050202. Local number, GR-421

LOCATION.--Lat 39°48'29", long 84°05'02", Hydrologic Unit 0508 POTAS-0001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 65.1 feet deep, 2 inch diameter stainless steel casing with 10 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 790.2 ft. above National GVD of 1929. Measuring point: Top of casing 1.77 ft. above land surface datum.

PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 17...	7.55	988	7.0	100	12.5	0.1	500	140	37	18	1.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 17...	488	388	93	48	0.3	0.11	14	596	<0.01	0.08	0.08
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 17...	<0.01	30	3400	3600	130	130	1.4				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 411 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

395045084013701. Local number, GR-426  
 LOCATION.--Lat 39°50'45", long 84°01'37", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 24.5 feet deep, 2 inch diameter stainless steel casing with 15 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 825.8 ft. above National GVD of 1929. Measuring point: Top of casing 2.1 ft. above land surface datum.  
 PERIOD OF RECORD.--July 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 23...	14.8	801	7.1	100	13.5	3.4	380	100	31	12	5.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 23...	384	310	77	26	0.1	0.09	8.4	461	<0.01	2.8	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 23...	<0.01	30	50	<3	<10	<1	0.6				

**412 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395003084011603. Local number, GR-439

LOCATION.--Lat 39°50'03", long 84°01'16", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 88 feet deep, 2 inch diameter stainless steel casing with 4.7 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 825.8 ft. above National GVD of 1929. Measuring point: Top of casing 1.87 ft. above land surface datum.

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 22...	12.91	966	7.3	64	15.0	0.1	490	120	46	12	1.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 22...	381	305	71	97	0.3	0.13	17	555	<0.01	<0.05	0.13
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 22...	<0.01	30	2800	2900	120	120	0.7				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 413 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394623084064401. Local number, MT-152  
 LOCATION.--Lat 39°46'23", long 84°06'44", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 36 feet deep, 4 inch diameter stainless steel casing with 10 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 792.3 ft. above National GVD of 1929. Measuring point: Top of casing 2.11 ft. above land surface datum.  
 PERIOD OF RECORD.--May 1990 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTEN- TIAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 19...	24.92	895	7.0	160	14.5	0.4	420	110	36	28	1.8
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 19...	427	344	70	47	0.2	0.07	15	469	<0.01	0.05	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 19...	0.01	40	260	60	20	24	0.6				

**414 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394623084064402. Local number, MT-153

LOCATION.--Lat 39°46'23", long 84°06'44", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 90.2 feet deep, 4 inch diameter stainless steel casing with 10 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 792.0 ft. above National GVD of 1929. Measuring point: Top of casing 2.10 ft. above land surface datum.

PERIOD OF RECORD.--November 1990 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 19...	24.50	792	7.1	110	14.5	0.1	400	100	37	11	1.6
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINIT WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 19...	458	369	45	23	0.3	0.07	17	464	<0.01	0.73	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 19...	0.02	40	560	560	50	42	0.6				



# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 415 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394701084070001. Local number, MT-238  
 LOCATION.--Lat 39°47'01", long 84°07'00", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.  
 OWNER.--Wright-Patterson Air Force Base  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by hollow stem auger method, 35 feet deep, 2 inch diameter stainless steel casing with 15 feet of 2 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.  
 INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.  
 DATUM.--Elevation of land surface datum is 781.5 ft. above National GVD of 1929. Measuring point: Top of casing 2.68 ft. above land surface datum.  
 PERIOD OF RECORD.--April 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 19...	25.62	737	7.2	200	14.0	9.8	330	84	29	27	1.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 19...	366	291	33	40	0.1	0.05	10	413	<0.01	1.9	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 19...	<0.01	40	530	27	20	7	0.6				

**416 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394701084070002. Local number, MT-244

LOCATION.--Lat 39°47'01", long 84°07'00", Hydrologic Unit 05080001, at Wright-Patterson Air Force Base, Ohio.

OWNER.--Wright-Patterson Air Force Base

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 77.3 feet deep, 4 inch diameter stainless steel casing with 10 feet of 4 inch diameter stainless steel 0.01 inch slot wire-wrapped screen.

INSTRUMENTATION.--Periodic measurement with steel tape by USGS personnel.

DATUM.--Elevation of land surface datum is 781.9 ft. above National GVD of 1929. Measuring point: Top of casing 1.91 ft. above land surface datum.

PERIOD OF RECORD.--June 1993 to current year. (See section on Ground-water Records for the Basewide-Monitoring Program for complete listing of water-level data collected during the current year).

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 19...	29.26	937	7.1	100	14.0	<0.1	430	110	38	30	2.2
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 19...	439	358	65	58	0.2	0.08	14	534	<0.01	<0.05	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 19...	<0.01	40	750	700	50	44	0.6				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 417 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393710084175401. Local number, MT-312, Owner Number, P035

LOCATION.--Lat 39°37'10", long 84°17'54", Hydrologic Unit 05080002, about 300' west of end of Bell Park Lane, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 25.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.

INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from May 1993 through current year.

DATUM.--Elevation of land surface datum is 687.01 ft. above National GVD of 1929. Measuring point: Top of casing 0.11 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies)

PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 18...	4.76	729	7.2	-36	19.0	<0.1	280	73	24	36	3.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 18...	308	252	58	57	0.4	0.06	11.0	418	<0.01	<0.05	0.43
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 18...	<0.01	120	1000	900	270	240	2.9				

**418 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393710084175402. Local number, MT-314, Owner Number, P036

LOCATION.--Lat 39°37'10", long 84°17'54", Hydrologic Unit 05080002, about 300' west of end of Bell Park Lane, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 55.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.

INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from April 1993 through current year.

DATUM.--Elevation of land surface datum is 686.99 ft. above National GVD of 1929. Measuring point: Top of casing 0.21 ft. above land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 18...	4.89	1017	7.2	-26	16.0	0.1	350	89	31	65	3.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 18...	386	310	65	110	0.3	0.20	12.0	569	<0.01	<0.05	<0.01
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 18...	<0.01	120	1700	1600	30	18	1.0				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 419 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393710084175403. Local number, MT-315, Owner Number, P037

LOCATION.--Lat 39°37'10", long 84°17'54", Hydrologic Unit 05080002, about 300' west of end of Bell Park Lane, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 85.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.

INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from May 1993 through current year.

DATUM.--Elevation of land surface datum is 687.28 ft. above National GVD of 1929. Measuring point: Top of casing 0.15 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 18...	5.76	631	7.3	13	16.0	0.1	240	63	19	33	4.2
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 18...	255	202	35	50	0.3	0.06	8.6	340	<0.01	<0.05	0.35
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 18...	0.03	60	720	620	380	350	1.8				



**420 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393710084175404. Local number, MT-316, Owner Number, P038

LOCATION.--Lat 39°37'10", long 84°17'54", Hydrologic Unit 05080002, about 300' west of end of Bell Park Lane, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 98.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.

INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from May 1993 through current year.

DATUM.--Elevation of land surface datum is 686.73 ft. above National GVD of 1929. Measuring point: Top of casing 0.01 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 18...	5.08	825	7.2	15	16.0	0.1	330	84	28	38	3.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINIT WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 18...	360	288	38	78	0.4	0.24	11.0	460	<0.01	<0.05	0.41
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 18...	0.12	120	980	910	340	300	1.8				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 421 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393732084175200. Local number, MT-317, Owner Number, 007  
 LOCATION.--Lat 39°37'32", long 84°17'52", Hydrologic Unit 05080002, 1000' west of Cincinnati-Dayton Pike, about 50' behind Miami Conservancy District maintenance shed, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by rotary method, 80.0 feet deep, 2 inch diameter polyvinyl chloride casing with 2 feet of steel #12 slot screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from January 1988 through current year.  
 DATUM.--Elevation of land surface datum is 692.80 ft. above National GVD of 1929. Measuring point: Top of casing 2.28 ft. above land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPR- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 11...	19.47	943	7.3	83	18.0	0.5	310	79	28	67	3.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 11...	354	283	55	97	0.2	0.11	13.0	520	0.02	0.08	0.86
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 11...	<0.01	120	3800	1300	190	190	1.2				

**422 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393726084175100. Local number, MT-318, Owner Number, 0130

LOCATION.--Lat 39°37'51", long 84°17'51", Hydrologic Unit 05080002, 1000' west of Dayton-Cincinnati Pike, at SW corner of trailer park, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 20.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride 10 feet stainless steel screen.

INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from January 1988 through current year.

DATUM.--Elevation of land surface datum is 693.6 ft. above National GVD of 1929. Measuring point: Top of casing 0.92 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 3...	11.96	839	7.1	280	15.0	<0.1	350	88	32	43	2.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 3...	354	290	44	62	0.4	0.08	13.0	464	<0.01	<0.05	3.5
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 3...	<0.01	130	30	<3	380	390	1.2				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 423 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393712084175001. Local number, MT-319, Owner Number, P039

LOCATION.--Lat 39°37'12", long 84°17'50", Hydrologic Unit 05080002, about 300' west of end of Saxony Road, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 98.0 feet deep, 2-inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.

INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from May 1993 through current year.

DATUM.--Elevation of land surface datum is 688.2 ft. above National GVD of 1929. Measuring point: Top of casing 0.13 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPR- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 19...	9.95	572	7.1	280	13.0	4.7	260	75	18	12	1.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 19...	255	207	33	28	0.3	0.03	7.2	315	<0.01	3.2	0.04
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 19...	<0.01	30	30	<3	<10	<3	1.1				

**424 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393712084175002. Local number, MT-320, Owner Number, P040

LOCATION.--Lat 39°37'12", long 84°17'50", Hydrologic Unit 05080002, about 300' west of end of Saxony Road, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by rotasonic method, 42.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.

INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from May 1993 through current year.

DATUM.--Elevation of land surface datum is 688.26 ft. above National GVD of 1929. Measuring point: Top of casing 0.4 ft below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 19...	7.02	706	7.1	-38	13.0	0.2	290	75	25	27	2.2
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONI DIS- SOLVED (MG/L AS N)
JULY 19...	301	246	50	53	0.3	0.07	10.0	395	<0.01	0.10	0.93
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 19...	0.39	60	2000	1900	120	100	2.2				



**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      425**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393712084175003. Local number, MT-321, Owner Number, P041  
 LOCATION.--Lat 39°37'12", long 84°17'50", Hydrologic Unit 05080002, about 300' west of end of Saxony Road, on east bank of Great Miami River, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 52.0 feet deep, 2 inch diameter polyvinyl chloride casing with 5 feet of polyvinyl chloride continuous 0.01 inch slot screen.  
 INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Applied Technologies personnel from May 1993 through current year.  
 DATUM.--Elevation of land surface datum is 688.15 ft. above National GVD of 1929. Measuring point: Top of casing 0.22 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 19...	6.80	739	7.2	-53	14.0	0.2	290	68	28	32	2.8
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 19...	299	243	50	57	0.4	0.12	13.0	406	<0.01	0.77	1.9
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 19...	<0.01	90	1600	1600	20	19	2.4				

**426 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393740084174501. Local number, MT-323, Owner Number, 0311

LOCATION.--Lat 39°37'40", long 84°17'45", Hydrologic Unit 05080002, about 250' west of Cincinnati-Dayton Pike, about 150' north of Bell Park Lane, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 31.2 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless 0.01 inch wire wrap screen.

INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from February 1990 through current year.

DATUM.--Elevation of land surface datum is 694.04 ft. above National GVD of 1929. Measuring point: Top of casing 0.44 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 2...	11.75	772	7.1	220	17.0	0.5	320	85	27	36	2.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LILITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 2...	322	264	47	57	0.3	0.08	9.4	454	<0.01	2.30	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 2...	0.17	90	70	7	<10	3	1.0				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 427 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393740084174502. Local number, MT-324, Owner Number, 0301  
 LOCATION.--Lat 39°37'40", long 84°17'45", Hydrologic Unit 05080002, about 250' west of Cincinnati-Dayton Pike, about 150' north of Bell Park Lane, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies.  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 86.2 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless 0.01 inch wire wrap slotted screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from February 1990 through current year.  
 DATUM.--Elevation of land surface datum is 693.61 ft. above National GVD of 1929. Measuring point: Top of casing 0.51 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 3...	11.62	1020	6.9	-13	16.0	<0.1	320	81	29	76	1.1
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 3...	293	236	7.9	160	0.4	1.3	11.0	513	<0.01	<0.05	0.12
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 3...	<0.01	150	4000	200	500	360	0.3				

**428 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393733084174800. Local number, MT-325, Owner Number, 0127  
 LOCATION.--Lat 39°37'33", long 84°17'48", Hydrologic Unit 05080002, about 600' west of Cincinnati-Dayton Pike, 100' west of Miami Conservancy District maintenance shed, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 25.0 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from January 1988 through current year.  
 DATUM.--Elevation of land surface datum is 692.78 ft. above National GVD of 1929. Measuring point: Top of casing 1.96 ft above land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 19...	10.23	825	7.0	260	16.0	0.2	340	89	28	34	3.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 19...	332	271	49	71	0.3	0.08	10.0	452	<0.01	0.73	0.15
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 19...	0.02	110	10	<3	40	35	1.2				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 429 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393732084174801. Local number, MT-326, Owner Number,0106  
 LOCATION.--Lat 39°37'32", long 84°17'48", Hydrologic Unit 05080002, about 600' west of Cincinnati-Dayton Pike, 100' west of Miami Conservancy District maintenance shed, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well, 50.0 feet deep, 2 inch diameter steel casing with 2 feet of steel screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from February 1990 through current year.  
 DATUM.--Elevation of land surface datum is 692.80 ft. above National GVD of 1929. Measuring point: Top of casing 1.68 feet above land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 1...	10.92	780	7.1	150	16.0	<0.1	300	75	28	42	3.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 1...	311	252	57	55	0.4	0.05	11.0	425	ND	ND	ND
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 1...	ND	120	50	21	230	230	1.5				



**430 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393732084174802. Local number, MT-327, Owner Number,0302  
 LOCATION.--Lat 39°37'32", long 84°17'48", Hydrologic Unit 05080002, about 50' west of Cincinnati-Dayton Pike, adjacent to dirt pullout between two trailer parks, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 120.0 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel 0.01 inch wire wrap slotted screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from February 1990 through current year.  
 DATUM.--Elevation of land surface datum is 692.47 ft above National GVD of 1929. Measuring point: Top of casing 0.89 feet below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 1...	10.79	1010	6.9	38	16.0	<0.1	380	99	32	56	2.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 1...	326	265	44	120	0.3	0.13	16.0	532	<0.01	<0.05	0.10
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 1...	<0.01	120	2800	1900	60	41	0.8				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      431  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393733084174101. Local number, MT-328, Owner Number, 0383  
 LOCATION.--Lat 39°37'33", long 84°17'41", Hydrologic Unit 05080002, about 100' east of Cincinnati-Dayton Pike, near access road to Miami Conservancy District maintenance shed, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 29.0 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel #10 slot screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from April 1993 through current year.  
 DATUM.--Elevation of land surface datum is 695.24 ft. above National GVD of 1929. Measuring point: Top of casing 0.19 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
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AUG 2...	13.61	910	6.9	270	15.0	2.6	370	98	31	48	2.9
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DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
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AUG 2...	353	289	53	77	0.3	0.09	9.4	505	<0.01	2.6	0.04
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DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
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AUG 2...	0.03	90	120	9	<10	1	0.8
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432 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

393733084174102. Local number, MT-329, Owner Number, 0343  
LOCATION.--Lat 39°37'33", long 84°17'41", Hydrologic Unit 05080002, about 100' east of Cincinnati-Dayton Pike, near access road to Miami Conservancy District maintenance shed, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
OWNER.--EG&G Mound Applied Technologies  
AQUIFER.--Sand and gravel of Pleistocene age.  
WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 89.0 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel #10 slot screen.  
INSTRUMENTATION.--Electronic data logger -- 60 minute record. Operated by EG&G Mound Technologies personnel from May 1993 through current year.  
DATUM.--Elevation of land surface datum is 695.55 ft. above National GVD of 1929. Measuring point: Top of casing 0.14 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
PERIOD OF RECORD.--Current year only.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 29...	14.17	939	7.3	13	17.0	0.1	360	96	29	28	1.8
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 29...	311	250	4.1	140	0.6	0.15	11.0	472	<0.01	<0.05	2.7
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 29...	0.03	80	5400	4700	420	400	1.4				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      433**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393723084174001. Local number, MT-330, Owner Number, 0156  
 LOCATION.--Lat 39°37'23", long 84°17'40", Hydrologic Unit 05080002, about 50' west of Cincinnati-Dayton Pike, adjacent to dirt pullout between two trailer parks, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 36.2 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from January 1988 through current year.  
 DATUM.--Elevation of land surface datum is 691.46 ft. above National GVD of 1929. Measuring point: Top of casing 0.88 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 4...	10.24	799	7.0	390	14.0	0.1	360	97	29	33	2.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 4...	365	294	47	46	0.3	0.08	10.0	451	<0.01	1.4	0.32
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 4...	<0.01	110	1900	<3	30	1	ND				

**434 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393723084174001. Local number, MT-331, Owner Number, 0157  
 LOCATION.--Lat 39°37'23", long 84°17'40", Hydrologic Unit 05080002, about 50' west of Cincinnati-Dayton Pike, adjacent to dirt pullout between two trailer parks, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 61.8 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from January 1988 through current year.  
 DATUM.--Elevation of land surface datum is 691.51 ft. above National GVD of 1929. Measuring point: Top of casing 0.59 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 4...	10.11	916	7.0	310	15.5	<0.1	320	79	29	55	3.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 4...	323	260	58	91	0.2	0.12	9.8	487	<0.01	0.15	1.5
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 4...	<0.01	140	<10	<3	130	120	ND				



**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      435**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393723084174003. Local number, MT-332, Owner Number, 0304  
 LOCATION.--Lat 39°37'23", long 84°17'40", Hydrologic Unit 05080002, about 50' west of Cincinnati-Dayton Pike, adjacent to dirt pullout between two trailer parks, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 102 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel 0.01 inch wire wrap slot screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from February 1990 through current year.  
 DATUM.--Elevation of land surface datum is 691.34 ft. above National GVD of 1929. Measuring point: Top of casing 0.64 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 8...	10.40	613	7.5	34	15.0	<0.1	260	68	23	11	8.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 8...	278	226	28	43	0.3	0.08	13.0	333	<0.01	<0.05	0.16
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 8...	<0.01	40	4700	1200	130	54	0.6				

**436 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393723084174004. Local number, MT-333, Owner Number, 0342

LOCATION.--Lat 39°37'23", long 84°17'40", Hydrologic Unit 05080002, about 50' west of Cincinnati-Dayton Pike, adjacent to dirt pullout between two trailer parks, west of EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 160 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel #10 slot screen.

INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from April 1993 through current year.

DATUM.--Elevation of land surface datum is 691.34 ft. above National GVD of 1929. Measuring point: Top of casing 0.14 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 4...	10.23	709	7.4	-14	15.0	<0.1	330	80	31	21	1.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 4...	336	270	28	43	0.5	0.33	14.0	390	<0.01	0.55	0.35
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 4...	<0.01	60	2400	2200	40	39	0.5				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL    437**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393738084171600. Local number, MT-335, Owner Number, 0345  
 LOCATION.--Lat 39°37'38", long 84°17'16", Hydrologic Unit 05080002, at EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 42 feet deep, 4 inch diameter stainless steel casing with 5 feet of stainless steel #10 slot screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from April 1993 through current year.  
 DATUM.--Elevation of land surface datum is 751.93 ft. above National GVD of 1929. Measuring point: Top of casing 3.01 ft. above land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 9...	23.74	1340	7.1	350	14.0	0.7	420	110	36	110	3.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 9...	390	314	85	190	0.1	0.54	8.2	742	<0.01	1.50	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 9...	<0.01	140	80	4	30	28	0.6				

**438 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393738084175200. Local number, MT-337, Owner Number, 0346

LOCATION.--Lat 39°37'38", long 84°17'52", Hydrologic Unit 05080002, at EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.

OWNER.--EG&G Mound Applied Technologies

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 46 feet deep, 4 inch diameter stainless steel casing with 5 feet of stainless steel #10 slot screen.

INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from May 1993 through current year.

DATUM.--Elevation of land surface datum is 744.16 ft. above National GVD of 1929. Measuring point: Top of casing 0.62 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 10...	17.32	2080	7.0	120	15.0	0.1	560	140	50	200	4.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LILITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 10...	454	369	130	370	0.3	0.89	10.0	1130	<0.01	0.22	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 10...	<0.01	160	1300	1100	40	39	0.6				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      439**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393737084172400. Local number, MT-338, Owner Number, 0119  
 LOCATION.--Lat 39°37'37", long 84°17'24", Hydrologic Unit 05080002, at EG&G Mound Applied Technologies Plant, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 42.7 feet deep, 4 inch diameter stainless steel casing with 10 feet of stainless steel screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from January 1988 through current year.  
 DATUM.--Elevation of land surface datum is 742.03 ft. above National GVD of 1929. Measuring point: Top of casing 1.21 ft below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 10...	23.97	1790	7.1	100	15.5	0.1	500	130	42	160	3.2

DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 10...	421	337	120	320	0.2	0.38	9.3	993	<0.01	<0.05	0.06

DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
AUG 10...	<0.01	90	6900	1100	150	40	0.7



**440 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393734084173601. Local number, MT-340, Owner Number, 0392  
 LOCATION.--Lat 39°37'34", long 84°17'36", Hydrologic Unit 05080002, about 100' west of EG&G Mound Applied Technology  
 Plant boundary, next to Conrail railroad track access road, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 45.0 feet deep, 4 inch diameter stainless steel  
 casing with 5 feet of stainless steel #10 slot screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel  
 from May 1993 through current year.  
 DATUM.--Elevation of land surface datum is 721.64 ft. above National GVD of 1929. Measuring point: Top of casing  
 0.14 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 9...	40.29	1235	6.8	240	17.0	4.0	510	140	39	61	3.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 9...	519	417	120	89	0.1	0.12	10.0	731	<0.01	3.0	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 9...	<0.01	120	170	42	10	6	0.7				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      441**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

393734084173602. Local number, MT-341, Owner Number, 0387  
 LOCATION.--Lat 39°37'34", long 84°17'36", Hydrologic Unit 05080002, about 100' west of EG&G Mound Applied Technology Plant boundary, next to Conrail railroad track access road, Miamisburg, Ohio.  
 OWNER.--EG&G Mound Applied Technologies  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by roto sonic method, 82.0 feet deep, 4 inch diameter stainless steel casing with 5 feet of stainless steel #10 slot screen.  
 INSTRUMENTATION.--Periodic measurement by steel tape or electric tape by EG&G Mound Applied Technologies personnel from May 1993 to July 1993. Electronic data logger, 60 minute-record operated by EG&G Mound Applied Technologies personnel from July 1993 to May 1994.  
 DATUM.--Elevation of land surface datum is 721.67 ft. above National GVD of 1929. Measuring point: Top of casing 0.14 ft. below land surface datum. (Levels by EG&G Mound Applied Technologies).  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 9...	39.60	1250	6.9	300	15.0	2.5	520	140	42	58	3.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 9...	506	408	120	100	0.1	0.19	11.0	735	<0.01	2.7	0.02
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 9...	<0.01	160	40	10	10	7	0.8				

442 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

395020084101901 Local number, MT-342, Owner Number MI-1S  
LOCATION.--Lat 39°50'20", long 84°10'19", Hydrologic Unit 05080001, about 0.2 mi. west of bridge on Rip-Rap Road that crosses the Great Miami River at north end of Rip-Rap Island, Dayton, Ohio.  
OWNER.--City of Dayton  
AQUIFER.--Sand and gravel of Pleistocene age.  
WELL CHARACTERISTICS.--Observation well drilled by auger method, 52.5 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
DATUM.--Elevation of land surface datum is 764.1 ft. above National GVD of 1929. Measuring point: Top of casing 1.68 ft. above land surface datum. (Levels by City of Dayton.)  
PERIOD OF RECORD.--Current year only.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 30...	10.14	791	7.3	280	14.0	<0.1	360	94	31	24	2.1
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 30...	348	282	75	45	0.1	0.09	9.4	453	<0.01	0.20	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 30...	<0.01	70	10	4	60	54	0.8				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      443**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395020084101902 Local number, MT-343, Owner Number MI-1D  
 LOCATION.--Lat 39°50'20", long 84°10'19", Hydrologic Unit 05080001, about 0.2 mi. west of bridge on Rip-Rap Road that crosses the Great Miami River at north end of Rip-Rap Island, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 110 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
 DATUM.--Elevation of land surface datum is 764.1 ft. above National GVD of 1929. Measuring point: Top of casing 1.7 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 30...	14.35	919	7.4	44	14.5	<0.1	410	100	38	29	1.7
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 30...	427	346	75	61	0.1	0.11	12	531	<0.01	0.09	0.06
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 30...	0.02	60	2100	2100	100	93	0.6				

444 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

395006084101901 Local number, MT-344, Owner Number MI-2S  
LOCATION.--Lat 39°50'06", long 84°10'19", Hydrologic Unit 05080001, about 0.2 mi. west of Rip-Rap Road at location about 0.3 mi south of bridge that crosses the Great Miami River at north end of Rip-Rap Island, Dayton, Ohio.  
OWNER.--City of Dayton  
AQUIFER.--Sand and gravel of Pleistocene age.  
WELL CHARACTERISTICS.--Observation well drilled by auger method, 47.0 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
DATUM.--Elevation of land surface datum is 761.7 ft. above National GVD of 1929. Measuring point: Top of casing 1.67 ft. above land surface datum. (Levels by City of Dayton.)  
PERIOD OF RECORD.--Current year only.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 30...	9.49	767	7.3	110	13.0	0.1	320	80	29	35	2.7
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 30...	323	258	73	49	0.1	0.17	9.9	439	<0.01	0.09	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 30...	<0.01	90	450	410	50	44	0.8				



**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL    445**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395006084101902 Local number, MT-345, Owner Number MI-2D  
 LOCATION.--Lat 39°50'06", long 84°10'19", Hydrologic Unit 05080001, about 0.2 mi. west of Rip-Rap Road at location about 0.3 mi south of bridge that crosses the Great Miami River at north end of Rip-Rap Island, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 110 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
 DATUM.--Elevation of land surface datum is 761.8 ft. above National GVD of 1929. Measuring point: Top of casing 2.09 ft. above land surface datum.(Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 30...	8.96	777	7.4	52	13.5	0.1	390	92	40	5.2	1.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 30...	390	315	64	30	0.2	0.08	13	440	<0.01	<0.05	0.06
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 30...	<0.01	30	2400	2400	80	79	0.4				

**446 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394952084100800 Local number, MT-352, Owner Number MI-5D  
 LOCATION.--Lat 39°49'52", long 84°10'08", Hydrologic Unit 05080001, about 0.7 mi. south of bridge that crosses north end Rip-Rap Road bridge that crosses Great Miami River at north end of Rip-Rap Island. Well is about 10 feet east of road behind chain-link fence. Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 100 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
 DATUM.--Elevation of land surface datum is 760.2 ft. above National GVD of 1929. Measuring point: Top of casing 1.94 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
JULY 12...	9.89	756	7.3	40	13.5	0.1	390	90	39	4.0	1.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
JULY 12...	410	334	62	25	0.3	0.08	13	439	<0.01	<0.05	0.08
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
JULY 12...	<0.01	20	2400	2300	70	58	0.9				

**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      447**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394836084101900 Local number, MT-355, Owner Number MI-7S  
 LOCATION.--Lat 39°48'36", long 84°10'19", Hydrologic Unit 05080001, about 0.3 mi northeast of intersection between Wagner Ford and Beardshear Roads, about 50 feet east of Wagner Ford Road along western edge of Kittyhawk Public Golf Course, Miami well field, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 73.0 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
 DATUM.--Elevation of land surface datum is 774.71 ft. above National GVD of 1929. Measuring point: Top of casing 2.69 ft. above land surface datum.(Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 31...	45.46	679	7.3	55	16.0	0.2	300	83	23	18	2.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 31...	232	187	100	41	0.3	0.06	8.7	393	<0.01	0.20	0.06
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 31...	<0.01	70	1700	1300	150	50	ND				

448 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394905084095400 Local number, MT-359, Owner Number MI-9S  
LOCATION.--Lat 39°49'05", long 84°09'54", Hydrologic Unit 05080001, about 0.15 mi. east of Wagner Ford Road at northern boundary of Kittyhawk Public Golf Course, Miami well field, Dayton, Ohio.  
OWNER.--City of Dayton  
AQUIFER.--Sand and gravel of Pleistocene age.  
WELL CHARACTERISTICS.--Observation well drilled by auger method, 57.8 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
DATUM.--Elevation of land surface datum is 765.35 ft. above National GVD of 1929. Measuring point: Top of casing 2.48 ft. above land surface datum.(Levels by City of Dayton.)  
PERIOD OF RECORD.--Current year only.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 31...	32.17	869	6.9	360	14.5	0.1	390	100	35	26	2.7
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 31...	354	286	90	56	0.2	0.08	10	495	0.01	0.18	0.03
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 31...	0.01	70	20	<3	110	100	0.8				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 449 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394905084095800 Local number, MT-360, Owner Number MI-9D  
 LOCATION.--Lat 39°49'05", long 84°09'58", Hydrologic Unit 05080001, about 0.15 mi. east of Wagner Ford Road at northern boundary of Kittyhawk Public Golf Course, Miami well field, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 93.0 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
 DATUM.--Elevation of land surface datum is 764.55 ft. above National GVD of 1929. Measuring point: Top of casing 2.55 ft. above land surface datum.(Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 31...	31.29	788	7.3	61	14.5	0.2	380	91	36	16	1.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 31...	336	269	81	44	0.3	0.07	12	449	<0.01	<0.05	0.10
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 31...	<0.01	70	1700	1600	90	87	1.2				



**450 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

394822084100301 Local number, MT-366, Owner Number MI-12S

LOCATION.--Lat 39°48'22", long 84°10'03", Hydrologic Unit 05080001, about 0.2 mi. southwest of intersection between Wagner Ford Road and Beardshear Road, about 100 feet east of Wagner Ford Road, Miami well field, Dayton, Ohio.

OWNER.--City of Dayton

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by auger method, 63.0 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.

INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year..

DATUM.--Elevation of land surface datum is 771.43 ft. above National GVD of 1929. Measuring point: Top of casing 3.5 ft. above land surface datum. (Levels by City of Dayton.)

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 2...	42.15	724	7.4	350	15.0	2.8	300	78	26	26	2.8

DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 2...	275	219	78	49	0.4	0.04	8.6	415	<0.01	2.4	0.01

DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
SEPT 2...	<0.01	100	10	<3	<10	1	0.8

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 451 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394937084101600 Local number, MT-374, Owner Number MI-16S  
 LOCATION.--Lat 39°49'37", long 84°10'16", Hydrologic Unit 05080001, about 0.3 mi. west-southwest of bridge on Rip Rap Road that crosses south end of Rip Rap Island, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 52.5 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.  
 DATUM.--Elevation of land surface datum is 762.5 ft. above National GVD of 1929. Measuring point: Top of casing 1.92 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 1...	21.54	881	7.3	110	13.5	0.1	360	90	32	37	2.5
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 1...	342	273	87	66	0.2	0.31	11	496	<0.01	0.18	0.09
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
SEPT 1...	<0.01	90	570	520	50	44	0.8				

**452 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395035084100500 Local number, MT-375, Owner Number MI-17S

LOCATION.--Lat 39°50'35", long 84°10'05", Hydrologic Unit 05080001, about 300 feet north-northeast of intersection between Fishburg and Rip-Rap Road, about 30 feet west of Rip Rap road, Dayton, Ohio.

OWNER.--City of Dayton

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by auger method, 53.0 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.

INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.

DATUM.--Elevation of land surface datum is 771.9 ft. above National GVD of 1929. Measuring point: Top of casing 2.1 ft. above land surface datum. (Levels by City of Dayton.)

PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENTIAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 1...	17.12	733	7.3	400	13.5	0.2	340	85	30	16	2.4

DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 1...	336	269	48	36	0.2	0.10	9.5	412	<0.01	4.4	0.02

DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
SEPT 1...	<0.01	90	10	<3	<10	<1	0.5

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 453 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

394905084100500 Local number, MT-376, Owner Number MI-18S

LOCATION.--Lat 39°49'05", long 84°10'05", Hydrologic Unit 05080001, about 50 feet east of Wagner Ford Road at northeast corner of Kittyhawk Public Golf Course, Miami well field, Dayton, Ohio.

OWNER.--City of Dayton

AQUIFER.--Sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Observation well drilled by auger method, 68.5 feet deep, 4 inch diameter polyvinyl chloride casing with 10 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.

INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from November 1987 through current year.

DATUM.--Elevation of land surface datum is 775.6 ft. above National GVD of 1929. Measuring point: Top of casing 2.0 ft. above land surface datum. (Levels by City of Dayton.)

PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
AUG 31...	42.34	697	7.3	45	15.0	0.2	340	84	31	18	2.4
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
AUG 31...	311	251	73	41	0.2	0.08	10	417	<0.01	0.32	0.07
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
AUG 31...	<0.01	60	1400	1400	110	110	0.8				

**454 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395031084102600 Local number, MT-404, Owner Number MI-43S  
 LOCATION.--Lat 39°50'31", long 84°10'26", Hydrologic Unit 05080001, about 0.2 mi north of Montgomery County Sheriff shooting range (shooting range at base of hill at end of Webster Street), Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 45.9 feet deep, 4 inch diameter polyvinyl chloride casing with 20 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from September 1990 through current year (with gaps).  
 DATUM.--Elevation of land surface datum is 763.8 ft. above National GVD of 1929. Measuring point: Top of casing 2.61 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 1...	9.27	890	7.2	330	13.0	0.1	340	83	32	46	3.3
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 1...	354	286	76	72	0.2	0.38	9.8	498	<0.01	0.32	0.05
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
SEPT 1...	<0.01	120	<10	<3	60	53	0.9				



**GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL      455**  
**AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

395028084103000 Local number, MT-405, Owner Number MI-43D  
 LOCATION.--Lat 39°50'28", long 84°10'30", Hydrologic Unit 05080001, about 0.2 mi north of Montgomery County Sheriff shooting range (shooting range at base of hill at end of Webster Street), Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by cable tool method, 92.0 feet deep, 4 inch diameter polyvinyl chloride casing with 5 feet of 4 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from September 1990 through current year (with gaps).  
 DATUM.--Elevation of land surface datum is 763.9 ft. above National GVD of 1929. Measuring point: Top of casing 2.55 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 1...	9.85	742	7.4	66	13	0.1	350	84	35	12	1.8
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS ECO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 1...	409	330	32	20	1.1	0.16	16	405	<0.01	0.08	0.95
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
SEPT 1...	0.02	60	680	500	80	78	0.8				

**456 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO**

3947460841101600 Local number, MT-414, Owner Number MI-48S  
 LOCATION.--Lat 39°47'46", long 84°10'16", Hydrologic Unit 05080001, about 0.3 mi east of intersection between Commerce  
 Park Avenue and Heid Road, about 75 feet north of Heid Road behind parking lot, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 72.8 feet deep, 2 inch diameter polyvinyl chloride  
 casing with 9.6 feet of 2 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from March  
 1993 through current year.  
 DATUM.--Elevation of land surface datum is 760.43 ft. above National GVD of 1929. Measuring point: Top of casing  
 2.63 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

**WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994**

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM, DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 2...	36.94	670	7.3	320	17.0	0.1	300	79	25	18	3.0
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 2...	323	261	56	37	0.3	0.02	7.3	386	<0.01	0.23	0.04
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
SEPT 2...	<0.01	60	280	<3	80	68	0.8				

# GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL 457 AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO

3947460841101200 Local number, MT-415, Owner Number MI-48D  
 LOCATION.--Lat 39°47'46", long 84°10'12", Hydrologic Unit 05080001, about 0.3 mi east of intersection between Commerce Park Avenue and Heid Road, about 75 feet north of Heid Road behind parking lot, Dayton, Ohio.  
 OWNER.--City of Dayton  
 AQUIFER.--Sand and gravel of Pleistocene age.  
 WELL CHARACTERISTICS.--Observation well drilled by auger method, 100.7 feet deep, 2 inch diameter polyvinyl chloride casing with 9.6 feet of 2 inch diameter polyvinyl chloride 0.01 inch slot screen.  
 INSTRUMENTATION.--Monthly measurements with electric tape by City of Dayton Division of Water personnel from March 1993 through current year.  
 DATUM.--Elevation of land surface datum is 761.45 ft. above National GVD of 1929. Measuring point: Top of casing 2.66 ft. above land surface datum. (Levels by City of Dayton.)  
 PERIOD OF RECORD.--Current year only.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WHOLE FIELD WATER (STAND- ARD UNITS)	OXIDA- TION-RE- DUCTION POTENT- IAL (MILLI- VOLTS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM, DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
SEPT 2...	38.01	814	7.2	66	16.0	<0.1	360	96	29	24	2.9
DATE	BICAR- BONATE TOT-FET FIELD (MG/L AS HCO3)	ALKA- LINITY WAT-WH DIS- SOLVED (MG/L CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROM- IDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, DISSOLVED CALCULATED SUM OF CONSTIT- UENTS (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
SEPT 2...	370	300	63	47	0.4	0.06	9.7	456	<0.01	<0.05	0.08
DATE	PHOSPHORUS DISSOLVED ORTHO- PHOSPHATE (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)				
SEPT 2...	<0.01	80	1900	1700	60	52	1.0				

**458 GROUND-WATER DATA FOR THE DAYTON AREA REGIONAL GROUND-WATER-FLOW MODEL  
AND ENVIRONMENTAL TRACER STUDY, DAYTON, OHIO  
WATER YEAR 1993 (REVISED)**

REVISIONS.---In "Water Resources Data, Ohio, Water Year 1993", water-level and oxidation-reduction potential data for ground water samples collected in water year 1993 for the Dayton Regional Ground-Water Flow Model and Environmental Tracer Study were found to be in error. Water levels published were for depth below measuring point, not depth below land surface as reported. Also, the oxidation-reduction potential data were not reported relative to the Standard Hydrogen Electrode (SHE) reference. Corrected water-level and oxidation-reduction potential (corrected to SHE) data are given below:

Site ID	Local Well Number	Depth Below Land Surface (Water Level) ft	Oxidation- Reduction Potential mv
395032084023101	GR-316	7.17	490
395032084023102	GR-317	13.59	140
394831084042701	GR-323	8.70	150
394831084042702	GR-324	7.89	86
394852084023101	GR-333	12.60	470
394852084023102	GR-334	12.59	100
394802084053401	GR-540	10.50	330
394802084053402	GR-541	12.28	160
394025084162800	MT-49	16.80	90
394626084093400	MT-65	23.99	110
394123084124900	MT-68	36.59	150
395217084165901	MT-281	31.71	140
395217084165902	MT-282	31.45	190
395217084165903	MT-283	31.23	130
395226084100000	MT-284	8.89	260
395230084095703	MT-286	25.65	280
395230084095704	MT-287	22.99	300
395310084094700	MT-288	16.67	250
395307084094400	MT-289	19.54	330
394924084091000	MT-290	19.54	280
394624084094500	MT-291	15.84	83
394913084093100	MT-296	20.12	-38
395130084160600	MT-297	6.38	85
394317084135400	MT-299	25.67	270
394347084120500	MT-300	13.94	240
394147084134400	MT-301	21.86	57
394059084134400	MT-302	16.40	190
394055084141500	MT-303	17.90	27
394522084093700	MT-305	15.32	85
394448084120200	MT-306	45.48	130
393819084173900	MT-307	8.51	390
393808084174500	MT-308	14.19	360
393813084174700	MT-309	18.08	330
395332084094700	MT-310	11.00	140
394340084061400	MT-311	11.90	100
394442084111600	MT-426	77.55	140
393851084171100	MT-944	7.80	290
393853084170701	MT-946	18.39	290
394752084074300	MT-1022	32.63	70

# MAD RIVER GAIN/LOSS STUDY

459

Base flow discharges were measured on July 28 and September 22, 1994 on the Mad River and its tributaries from State Route 36 near Urbana to State Route 245 near West Liberty, Ohio. The tributaries include Muddy Creek, Kings Creek, Gladly Creek, Macochee Ditch, Muddy Run, and Macochee Creek. The discharge for Macochee Creek and Muddy Run were determined from discharge measurements made at sites located upstream and downstream from the respective confluences of each creek. The data were collected as part of a cooperative study with the Ohio Department of Natural Resources for use in a ground-water-flow model.

The following table contains the latitude and longitude, or station number, of each discharge measurement site. They are presented in order proceeding downstream, with each tributary inserted where it enters the main stream. Outfall or withdrawal data reported by the cooperator is not listed.

Date	Station Number	Station Name	Discharge in ft <sup>3</sup> /s
July 28, 1994	03266560	Mad River at West Liberty, Ohio	18.7
	401458834518	Mad River at State Route 68 at West Liberty, Ohio	22.6
	401437834552	Mad River at Pimtown Road at West Liberty, Ohio	26.1
	03266647	Mad River at Lippincott, Ohio	39.6
	401139834716	Macochee Ditch at Lippincott, Ohio	7.20
	401119834849	Gladly Creek at Lippincott, Ohio	3.53
	03266897	Kings Creek near Urbana, Ohio	21.6
	400918834718	Mad River at State Route 29 near Urbana, Ohio	83.9
	400758834835	Muddy Creek at mouth near Urbana, Ohio	4.42
	03267000	Mad River near Urbana, Ohio	91.1
September 22, 1994	03266560	Mad River at West Liberty, Ohio	14.5
	401458834518	Mad River at State Route 68 at West Liberty, Ohio	14.7
	401437834552	Mad River at Pimtown Road at West Liberty, Ohio	17.2
	03266647	Mad River at Lippincott, Ohio	27.9
	401139834716	Macochee Ditch at Lippincott, Ohio	5.68
	401119834849	Gladly Creek at Lippincott, Ohio	3.10
	03266897	Kings Creek near Urbana, Ohio	16.1
	400918834718	Mad River at State Route 29 near Urbana, Ohio	60.4
	400758834835	Muddy Creek at mouth near Urbana, Ohio	1.30
	03267000	Mad River near Urbana, Ohio	67.3



## 1994 SYNOPTIC WATER-LEVEL SURVEY, GEAGA COUNTY

The following table lists the location, formation of completion, and water-level altitudes for wells used in the 1994 synoptic water-level survey in Geauga County, Ohio. The data were collected as part of a cooperative study with the Geauga County Planning Commission and Board of County Commissioners. The purpose of the study is to determine ground-water levels in the aquifers of Geauga County and to compare them with previous ground-water levels measured by the U.S. Geological Survey in Geauga County in 1986. This project began in July 1994 and is funded through September 1995.

[Prefix on well number indicates county in which well is located: AB, Ashtabula County; GE, Geauga County; L, Lake County; PO, Portage County; T, Trumbull County. Aquifer codes are as follows: 112OTSH, glacial outwash; 324PSVL, Pottsville Formation; 330CYHG, Cuyahoga Shale; 330BERE, Berea Sandstone. Datum for altitudes is mean sea level]

Well number	Latitude (degrees)	Longitude (degrees)	Township	Aquifer code	Altitude of land surface (feet)	Water-level altitude (feet) Sept. 1994
GE-22	412331	811230	Auburn	324PSVL	1,160	1,146
GE-23	412309	812024	Bainbridge	324PSVL	1,160	1,141
GE-29	412449	812327	Bainbridge	330BERE	955	917
GE-36	412439	811830	Bainbridge	324PSVL	1,260	1,189
GE-39	412514	812022	Bainbridge	324PSVL	1,200	1,160
GE-42	412901	810453	Middlefield	112OTSH	1,105	1,056
GE-48	413202	810157	Huntsburg	330CYHG	1,090	1,085
GE-60	412051	811657	Auburn	324PSVL	1,200	1,140
GE-64	412749	811452	Newbury	324PSVL	1,235	1,205
GE-67	412522	810928	Troy	330CYHG	1,100	1,098
GE-69	413151	811258	Munson	324PSVL	1,260	1,232
GE-72	413433	810755	Hambden	324PSVL	1,220	1,201
GE-73	413629	810828	Hambden	324PSVL	1,300	1,252
GE-76	413138	811520	Munson	112OTSH	1,170	1,147
GE-77	413028	812210	Chester	330CYHG	1,140	1,098
GE-83	412627	810754	Burton	324PSVL	1,220	1,188
GE-89	412749	811715	Newbury	324PSVL	1,270	1,190
GE-91	412748	811439	Newbury	112OTSH	1,250	1,206
GE-92	412713	811232	Newbury	112OTSH	1,170	1,136
GE-101	413757	811223	Chardon	112OTSH	990	966
GE-102	413450	811730	Chardon	330BERE	1,025	980
GE-103	413755	811012	Hambden	330BERE	1,160	1,070
GE-104	413606	811021	Hambden	330BERE	1,215	1,119
GE-105	413544	810605	Hambden	330CYHG	1,220	1,180
GE-106	413456	810416	Montville	330CYHG	1,255	1,220
GE-107	413249	811732	Munson	112OTSH	1,045	985
GE-108	413106	811719	Munson	112OTSH	1,120	1,075
GE-109	413002	811302	Munson	324PSVL	1,280	1,204
GE-110	413049	810839	Claridon	324PSVL	1,280	1,240
GE-112	413207	810444	Huntsburg	324PSVL	1,265	1,218
GE-113	413633	810518	Montville	330CYHG	1,250	1,227
GE-114	412901	810702	Burton	324PSVL	1,265	1,222
GE-115	412737	810633	Burton	324PSVL	1,170	1,145
GE-116	412926	811443	Newbury	112OTSH	1,180	1,137
GE-117	412600	811448	Newbury	324PSVL	1,205	1,187
GE-119	412658	810412	Middlefield	324PSVL	1,185	1,172
GE-121	412746	812020	Russell	330BERE	1,085	1,015
GE-122	412410	812239	Bainbridge	330BERE	1,010	948
GE-123	412633	811644	Newbury	330BERE	1,160	1,063
GE-124	413016	811525	Munson	330BERE	1,130	1,106
GE-125	413100	811055	Claridon	330BERE	1,235	1,154
GE-126	412212	810253	Parkman	330BERE	1,070	949
GE-130	413623	811010	Hambden	330BERE	1,215	1,124
GE-135	412959	810307	Middlefield	112OTSH	1,110	1,098
GE-136	412841	810232	Middlefield	330CYHG	1,130	1,111
GE-137	413318	810043	Huntsburg	330CYHG	1,100	1,092
GE-137A	413348	810043	Huntsburg	330BERE	1,100	1,035
GE-138	412159	811041	Troy	324PSVL	1,180	1,134
GE-139	412138	810720	Troy	324PSVL	1,170	1,134
GE-141	412224	810843	Troy	112OTSH	1,120	1,111
GE-144	412211	811834	Bainbridge	324PSVL	1,160	1,120
GE-145	413729	810247	Montville	330CYHG	1,210	1,165
GE-147	412845	810301	Middlefield	330CYHG	1,120	1,106
GE-150	413155	812149	Chester	324PSVL	1,220	1,194
GE-151	412319	811350	Auburn	324PSVL	1,270	1,185
GE-153	413415	811609	Chardon	112OTSH	1,275	1,210
GE-157	413628	810605	Hambden	112OTSH	1,185	1,176
GE-159	412420	811021	Troy	330BERE	1,140	1,100
GE-160	412520	810845	Troy	330CYHG	1,135	1,114
GE-161	412304	811023	Troy	324PSVL	1,180	1,157
GE-163	412415	810335	Parkman	324PSVL	1,180	1,165

Well number	Latitude (degrees)	Longitude (degrees)	Township	Aquifer code	Altitude of land surface (feet)	Water-level altitude (feet) Sept. 1994
GE-165	412319	811630	Auburn	1120TSH	1,165	1,154
GE-166	412454	811624	Auburn	324PSVL	1,260	1,203
GE-169	412628	811228	Newbury	330CYHG	1,115	1,116
GE-170	412311	812130	Bainbridge	330CYHG	1,110	1,062
GE-171	412511	812259	Bainbridge	330CYHG	985	931
GE-173	412142	812123	Bainbridge	324PSVL	1,095	1,088
GE-176	413521	811431	Chardon	324PSVL	1,310	1,261
GE-177	413408	810830	Claridon	1120TSH	1,190	1,171
GE-178	413138	810842	Claridon	324PSVL	1,310	1,254
GE-180	413114	812016	Chester	324PSVL	1,210	1,180
GE-181	413118	811936	Chester	324PSVL	1,230	1,220
GE-183	412429	810451	Parkman	324PSVL	1,220	1,178
GE-185	413630	811450	Chardon	330CYHG	1,260	1,237
GE-186	413647	811200	Chardon	330CYHG	1,150	1,107
GE-190A	413734	811521	Chardon	1120TSH	1,070	1,039
GE-193	413506	811618	Chardon	324PSVL	1,300	1,248
GE-195	413513	811107	Hambden	1120TSH	1,130	1,115
GE-196	413808	810347	Montville	324PSVL	1,300	1,232
GE-197	413957	810118	Thompson	330BERE	1,135	1,088
GE-198	414058	810100	Thompson	330BERE	1,070	1,054
GE-199	414106	810414	Thompson	324PSVL	1,255	1,239
GE-202	413607	810325	Montville	324PSVL	1,245	1,215
GE-204	413256	810458	Huntsburg	324PSVL	1,230	1,219
GE-220	412451	811347	Auburn	324PSVL	1,220	1,209
GE-221	412429	811342	Auburn	324PSVL	1,230	1,190
GE-222	412438	811500	Auburn	324PSVL	1,220	1,200
GE-223	412122	811536	Auburn	324PSVL	1,210	1,145
GE-224	412055	811344	Auburn	324PSVL	1,155	1,133
GE-225	412054	812132	Bainbridge	1120TSH	1,040	985
GE-227	412142	812243	Bainbridge	1120TSH	1,020	969
GE-228	412408	812215	Bainbridge	330CYHG	1,060	1,057
GE-229	412313	811815	Bainbridge	324PSVL	1,155	1,141
GE-230	412558	810736	Burton	324PSVL	1,195	1,170
GE-231	412948	810706	Burton	324PSVL	1,315	1,255
GE-232	412818	810804	Burton	324PSVL	1,245	1,197
GE-233	412613	811134	Burton	1120TSH	1,130	1,102
GE-234	412948	810900	Burton	324PSVL	1,170	1,157
GE-235	412733	810946	Burton	1120TSH	1,105	1,092
GE-236	412724	811109	Burton	1120TSH	1,155	1,140
GE-237	412541	810950	Burton	324PSVL	1,135	1,086
GE-238	412828	811035	Burton	324PSVL	1,175	1,149
GE-239	413723	811340	Chardon	330CYHG	1,130	1,083
GE-240	413543	811739	Chardon	1120TSH	885	878
GE-241	413426	811503	Chardon	324PSVL	1,285	1,248
GE-242	413613	811337	Chardon	330CYHG	1,175	1,106
GE-243	413557	811154	Chardon	1120TSH	1,130	1,073
GE-244	413559	811431	Chardon	330CYHG	1,278	1,246
GE-245	413529	811639	Chardon	330CYHG	1,190	1,145
GE-246	413755	811344	Chardon	1120TSH	1,125	1,086
GE-247	413026	811841	Chester	1120TSH	1,080	1,049
GE-248	413352	811958	Chester	330BERE	1,070	1,020
GE-249	413125	812147	Chester	330CYHG	1,125	1,033
GE-250	413211	812054	Chester	324PSVL	1,240	1,198
GE-251	413238	811915	Chester	330BERE	1,082	1,015
GE-252	413026	812115	Chester	330CYHG	1,100	1,028
GE-253	413215	812312	Chester	330BERE	1,072	1,005
GE-255	413357	812148	Chester	330BERE	1,075	1,022
GE-256	413053	811810	Chester	1120TSH	1,130	1,041
GE-257	413258	810921	Claridon	324PSVL	1,215	1,204
GE-258	413234	810635	Claridon	330CYHG	1,185	1,161
GE-259	413120	810948	Claridon	324PSVL	1,225	1,201
GE-260	413130	811008	Claridon	330CYHG	1,138	>1,138
GE-261	413102	810731	Claridon	324PSVL	1,265	1,247
GE-262	413634	811035	Hambden	330CYHG	1,200	1,163
GE-263	413742	811056	Hambden	330BERE	1,142	1,059
GE-264	413708	810606	Hambden	330BERE	1,205	1,170
GE-265	413522	811049	Hambden	1120TSH	1,180	1,098
GE-266	413744	811056	Hambden	330BERE	1,140	1,061
GE-267	413746	810745	Hambden	330CYHG	1,260	1,224
GE-268	413814	810858	Hambden	324PSVL	1,160	1,068

## 1994 SYNOPTIC WATER-LEVEL SURVEY, GEAUGA COUNTY

Well number	Latitude (degrees)	Longitude (degrees)	Township	Aquifer code	Altitude of land surface (feet)	Water-level altitude (feet) Sept. 1994
GE-269	413458	810759	Hambden	330CYHG	1,275	1,230
GE-270	413453	810605	Hambden	112OTSH	1,197	1,197
GE-271	413658	810606	Hambden	330CYHG	1,198	1,123
GE-272	413452	810929	Hambden	112OTSH	1,275	>1,275
GE-273	413225	810416	Huntsburg	324PSVL	1,255	1,216
GE-274	413031	810504	Huntsburg	330CYHG	1,175	1,169
GE-275	413040	810514	Huntsburg	324PSVL	1,180	1,170
GE-276	413347	810309	Huntsburg	324PSVL	1,235	1,198
GE-277	413308	810516	Huntsburg	324PSVL	1,195	1,190
GE-278	413046	810014	Huntsburg	330CYHG	1,105	1,076
GE-279	413118	810236	Huntsburg	330CYHG	1,115	1,102
GE-280	413127	810259	Huntsburg	330CYHG	1,145	1,110
GE-281	413346	810136	Huntsburg	330CYHG	1,105	1,101
GE-282	413303	810159	Huntsburg	330CYHG	1,110	1,101
GE-283	412936	810142	Middlefield	330CYHG	1,135	1,091
GE-284	412645	810557	Middlefield	324PSVL	1,230	1,181
GE-286	412936	810231	Middlefield	112OTSH	1,110	1,086
GE-287	412619	810334	Middlefield	324PSVL	1,165	1,137
GE-288	412831	810014	Middlefield	330CYHG	1,161	1,120
GE-289	412631	810312	Middlefield	330CYHG	1,120	1,110
GE-290	412727	810156	Middlefield	330CYHG	1,150	1,121
GE-291	412709	810308	Middlefield	330CYHG	1,185	1,165
GE-292	412938	810513	Middlefield	324PSVL	1,235	1,198
GE-293	412536	810412	Middlefield	324PSVL	1,170	1,169
GE-294	413446	810318	Montville	324PSVL	1,280	1,202
GE-295	413828	810359	Montville	324PSVL	1,283	1,224
GE-296	413544	810407	Montville	324PSVL	1,265	1,229
GE-297	413502	810413	Montville	330CYHG	1,255	1,228
GE-298	413818	810049	Montville	330CYHG	1,133	1,063
GE-299	413708	810332	Montville	324PSVL	1,275	1,223
GE-300	413630	810048	Montville	330CYHG	1,130	1,079
GE-303	413350	811635	Munson	330CYHG	1,230	1,168
GE-304	413246	811740	Munson	112OTSH	1,035	995
GE-305	413026	811124	Munson	324PSVL	1,310	1,222
GE-306	413355	811521	Munson	330BERE	1,230	1,063
GE-307	413018	811445	Munson	330CYHG	1,303	1,198
GE-308	413315	811342	Munson	330CYHG	1,165	1,143
GE-309	412656	811445	Newbury	324PSVL	1,225	1,198
GE-310	412557	811541	Newbury	112OTSH	1,190	1,184
GE-311	412926	811633	Newbury	324PSVL	1,190	1,161
GE-312	412934	811632	Newbury	330CYHG	1,175	1,163
GE-313	412945	811136	Newbury	324PSVL	1,310	1,251
GE-314	412619	811706	Newbury	324PSVL	1,180	1,156
GE-315	412805	811136	Newbury	330CYHG	1,230	1,163
GE-316	412126	810340	Parkman	324PSVL	1,090	1,076
GE-317	412435	810322	Parkman	324PSVL	1,205	1,177
GE-318	412304	810452	Parkman	324PSVL	1,170	1,144
GE-319	412244	810220	Parkman	330CYHG	1,060	1,021
GE-320	412500	810504	Parkman	324PSVL	1,270	1,200
GE-321	412318	810032	Parkman	112OTSH	925	895
GE-322	412056	810941	Troy	324PSVL	1,095	1,094
GE-323	412103	810643	Troy	324PSVL	1,110	1,096
GE-324	412227	810628	Troy	324PSVL	1,245	1,214
GE-325	412425	810703	Troy	324PSVL	1,220	1,182
GE-326	412342	810737	Troy	324PSVL	1,200	1,170
GE-327	412053	810723	Troy	112OTSH	1,115	1,096
GE-328	412241	811017	Troy	324PSVL	1,170	1,142
GE-329	412126	811111	Troy	324PSVL	1,162	1,117
GE-330	412514	810839	Troy	324PSVL	1,140	1,134
GE-331	412548	811954	Russell	324PSVL	1,225	1,163
GE-332	412558	811842	Russell	324PSVL	1,180	1,146
GE-333	412608	811840	Russell	324PSVL	1,195	1,161
GE-334	412618	811843	Russell	324PSVL	1,185	1,155
GE-335	412617	811841	Russell	324PSVL	1,190	1,160
GE-336	412821	812031	Russell	112OTSH	1,042	1,037
GE-337	412806	811947	Russell	330CYHG	1,125	1,061
GE-338	412743	811957	Russell	330BERE	1,078	1,019
GE-339	412745	812153	Russell	112OTSH	1,075	1,012
GE-340	414050	810228	Thompson	330CYHG	1,290	1,244
GE-341	414121	810308	Thompson	330CYHG	1,267	1,257

## 1994 SYNOPTIC WATER-LEVEL SURVEY, GEAUGA COUNTY

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GE-342	414059	810555	Thompson	330BERE	1,080	1,054
GE-343	413957	810521	Thompson	330BERE	1,145	1,072
GE-344	414002	810053	Thompson	330BERE	1,097	1,076
GE-345	413850	810515	Thompson	330CYHG	1,190	1,176
GE-346	413829	810449	Thompson	112OTSH	1,230	1,227
GE-347	414034	810214	Thompson	330CYHG	1,225	1,996
AB-126	413646	805931	Hartsgrove	330BERE	1,080	1,066
AB-127	413944	805926	Trumbull	330BERE	1,060	1,047
L-86	414008	810644	Leroy	330BERE	1,080	1,055
L-88	413841	810850	Leroy	112OTSH	1,145	1,069
PO-7	411950	810227	Nelson	330CYHG	970	916
PO-8	411939	810300	Nelson	324PSVL	1,130	1,100
PO-9	411840	810541	Nelson	330CYHG	1,050	1,029
PO-10	411858	810540	Nelson	324PSVL	1,100	1,072
PO-11	411713	810823	Hiram	324PSVL	1,100	1,055
PO-12	411743	810941	Hiram	324PSVL	1,310	1,268
PO-13	411958	810815	Hiram	330CYHG	1,100	1,087
PO-14	411915	811319	Mantua	324PSVL	1,210	1,197
PO-15	411839	811656	Mantua	324PSVL	1,170	1,135
T-6	412333	805824	Farmington	330BERE	885	869



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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	$2.54 \times 10^1$	millimeter
	$2.54 \times 10^{-2}$	meter
foot (ft)	$3.048 \times 10^{-1}$	meter
mile (mi)	$1.609 \times 10^0$	kilometer
<i>Area</i>		
acre	$4.047 \times 10^{-3}$	square meter
	$4.047 \times 10^{-1}$	square hectometer
	$4.047 \times 10^{-3}$	square kilometer
square mile (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometer
<i>Volume</i>		
gallon (gal)	$3.785 \times 10^0$	liter
	$3.785 \times 10^0$	cubic decimeter
	$3.785 \times 10^{-3}$	cubic meter
million gallons (Mgal)	$3.785 \times 10^3$	cubic meter
	$3.785 \times 10^{-3}$	cubic hectometer
cubic foot (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeter
	$2.832 \times 10^{-2}$	cubic meter
cubic-foot-per-second day [(ft <sup>3</sup> /s) d]	$2.447 \times 10^3$	cubic meter
	$2.447 \times 10^{-3}$	cubic hectometer
acre-foot (acre-ft)	$1.233 \times 10^3$	cubic meter
	$1.233 \times 10^{-3}$	cubic hectometer
	$1.233 \times 10^{-6}$	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liter per second
	$2.832 \times 10^1$	cubic decimeter per second
	$2.832 \times 10^{-2}$	cubic meter per second
gallon per minute (gal/min)	$6.309 \times 10^{-2}$	liter per second
	$6.309 \times 10^{-2}$	cubic decimeter per second
	$6.309 \times 10^{-5}$	cubic meter per second
million gallons per day (Mgal/d)	$4.381 \times 10^1$	cubic decimeter per second
	$4.381 \times 10^{-2}$	cubic meter per second
<i>Mass</i>		
ton (short)	$9.072 \times 10^{-1}$	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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