

WATER-QUALITY DATA FOR SELECTED WELLS IN HARRISON COUNTY, MISSISSIPPI, APRIL 1998

By Eric W. Strom and William T. Oakley

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CONVERSION FACTOR AND VERTICAL DATUM

<u>Multiply</u>	<u>By</u>	<u>To obtain</u>
foot	0.3048	meter

To convert degrees Celsius (°C) to Fahrenheit (°F), use the following:

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$

Sea level: In this report “sea level” refers to the National Geodetic Vertical Datum of 1929—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Specific conductance is reported in microsiemens per centimeter at 25 °C; pH, in standard units. Chemical concentrations are given in milligrams per liter or micrograms per liter. Milligrams and micrograms per liter are units expressing the weight of solute per volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter. For concentrations less than 7,000 milligrams per liter, milligrams per liter are equivalent to “parts per million.” Color is reported in platinum-cobalt units.

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ABSTRACT

The U.S. Geological Survey collects, on a systematic basis, data needed to determine and evaluate the ground-water resources of Harrison County, Mississippi. This report presents results from analyses of water samples collected from selected wells in April 1998 and associated historical water-quality data.

INTRODUCTION

The U.S. Geological Survey (USGS) collects, on a systematic basis, data needed to determine and evaluate the ground-water resources of Harrison County, Mississippi. The USGS collects water samples from the aquifers underlying Harrison County to assess current water-quality characteristics and to determine water-quality trends. In April 1997, a project was started to collect water-quality samples annually from about 25 wells screened in the major underlying aquifers in Harrison County. Each year, for 4 consecutive years, about 25 different wells are to be sampled. During the fifth year, the original 25 wells are to be resampled, and then the cycle is to be repeated. Using this procedure, long-term water-quality trends with a sampling increment of 5 years will be established for about 100 wells

The purpose of this report is to present results of the analyses of water samples collected from selected wells in April 1998. The water-quality constituents emphasized in this report are chloride concentrations and dissolved-solids concentrations.

METHODS

Water samples were collected in 23 wells in Harrison County (fig. 1) from (in order of shallowest to deepest) the Citronelle, Graham Ferry, Pascagoula, and Hattiesburg aquifers. The wells were pumped prior to sampling to withdraw at least twice the volume of water standing in the casing so the sample would represent water in the aquifer. The samples were shipped to the USGS Water-Quality Service Unit in Ocala, Florida, where the samples were analyzed using standard USGS procedures.

RESULTS

Most samples were analyzed for color, chloride concentration, dissolved-solids concentration, manganese concentration, pH, specific conductance, and temperature. Water-quality data for wells in each of the aquifers sampled during April, 1998 are shown in table 1. The results may not be representative of the entire areal extent of the aquifers underlying the county but are representative of the aquifers at the sampled wells. However, the continued sampling effort will, with time, produce enough long-term, distributed measurements to define water-quality trends for the aquifers underlying Harrison County. Additional information for wells discussed in this report is in table 2.

Chloride Concentrations

The secondary maximum contaminant level (SMCL) recommended by the U.S. Environmental Protection Agency (EPA) for drinking water for chloride is 250 milligrams per liter (U.S. Environmental Protection Agency, 1986). All of the water from the sampled wells had chloride concentrations below 250 milligrams per liter. A chloride concentration of 3.3 milligrams per liter was measured in water from the single well screened in the Citronelle aquifer. Chloride concentrations generally ranged from 2.5 to 4.0 milligrams per liter for the wells screened in the Graham Ferry aquifer; the exception was 16 milligrams per liter which was measured in water from well N333. Chloride concentrations ranged from 2.3 to 5.4 milligrams per liter for wells screened in the Pascagoula aquifer. The highest chloride concentration, 95.0 milligrams per liter, was from well O320 screened in the Hattiesburg aquifer.

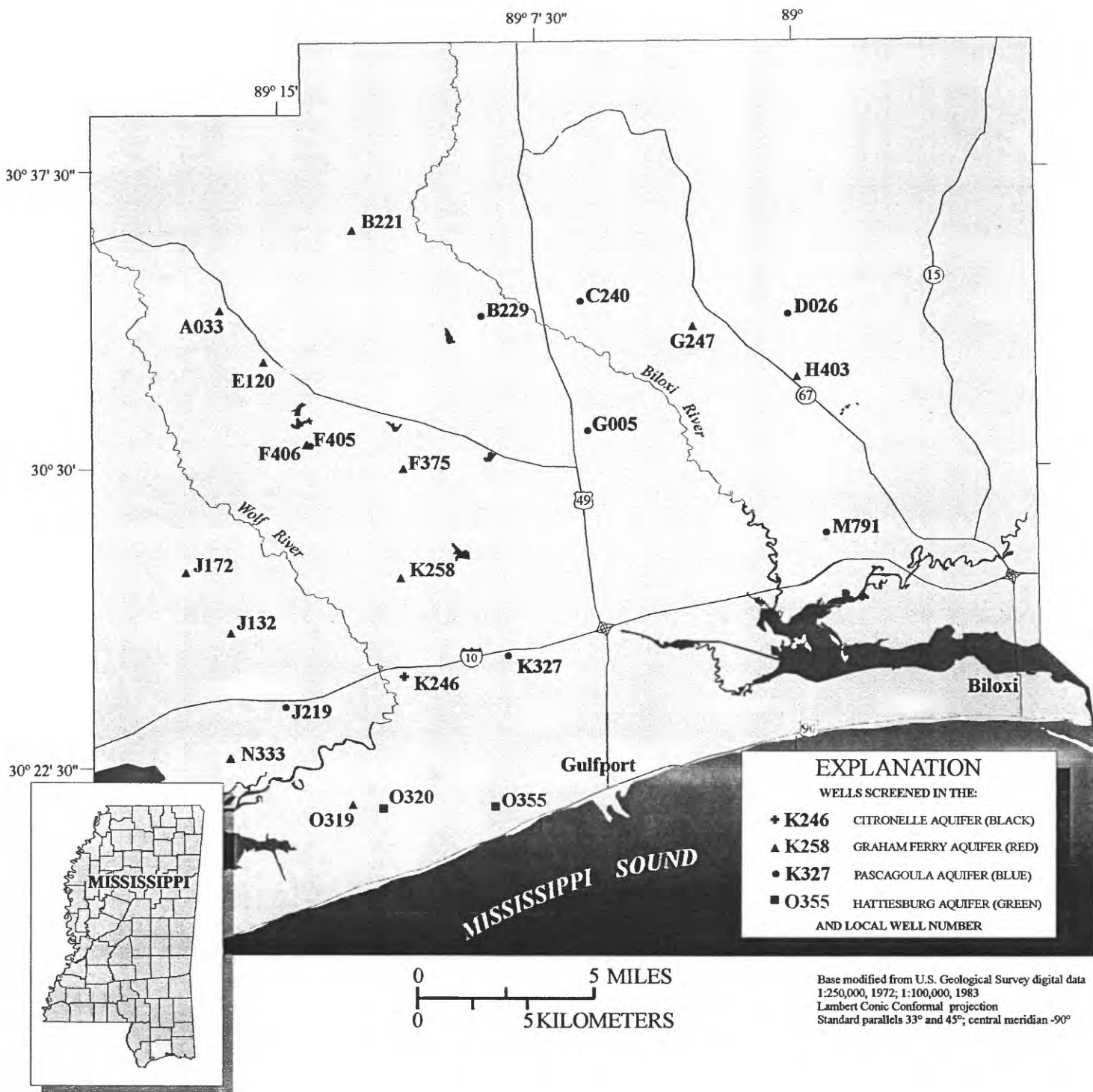


Figure 1. Location of selected wells in Harrison County, Mississippi.

Dissolved-Solids Concentrations

All of the water from the sampled wells had dissolved-solids concentrations below 500 milligrams per liter, the SMCL recommended by the EPA for dissolved solids. A dissolved-solids concentration of 162 milligrams per liter was measured in water from the single well screened in the Citronelle aquifer. Dissolved-solids concentrations generally ranged from 110 to 198 milligrams per liter for the wells screened in the Graham Ferry aquifer; the exceptions were 326 milligrams per liter which was measured in water from well N333, and 34 milligrams per liter which was measured in water from well A033. Dissolved-solids concentrations ranged from 124 to 372 milligrams per liter for wells screened in the Pascagoula aquifer. Dissolved-solids concentrations were 228 and 348 milligrams per liter for water samples from wells O355 and O320, respectively, screened in the Hattiesburg aquifer.

Color and pH Values and Manganese Concentrations

Color and pH values and manganese concentrations were determined for water from 23 wells. Color values for water from five wells exceeded the the SMCL limit of 15 platinum-cobalt units. The pH values for water from 10 wells were greater than the upper SMCL limit of 8.5. Manganese concentrations for six wells exceeded the SMCL limit of 50 milligrams per liter.

Table 1. Analyses of selected constituents in wells sampled in April 1998, Harrison County, Mississippi [--, indicates no data available; C, Citronelle; G, Graham Ferry; P, Pascagoula; H, Hattiesburg; SMCL, secondary maximum contaminant level]

Local well number	Aquifer	Chloride, dissolved (milligrams per liter)	Solids, residue at 180 degrees Celsius, dissolved (milligrams per liter) (SMCL = 200)	Specific conductance (micro-siemens per centimeter)	Temperature, water (degrees Celsius)	Color (platinum-cobalt units) (SMCL = 15)	pH, (lab standard units) (SMCL = 6.5-8.5)	Manganese, dissolved (micrograms per liter) (SMCL = 50)
A033	G	3.5	34	49	22.0	5	6.5	1.9
B221	G	3.2	110	104	--	5	6.9	18.
B229	P	2.6	152	183	24.0	5	8.6	5.3
C240	P	3.0	124	105	--	20	7.0	42.
D026	P	3.1	372	594	--	40	8.9	16.
E120	G	3.4	142	158	--	20	7.4	120.
F375	G	4.0	174	251	--	5	8.4	1.5
F405	P	2.3	194	303	26.0	10	9.1	1.6
F406	G	--	104	122	--	5	6.9	4.0
G005	P	2.4	176	282	26.0	5	9.0	1.6
G247	G	3.0	124	123	--	20	7.3	59.
H403	G	2.5	194	268	--	5	7.9	97.
J132	G	3.3	166	201	22.0	5	7.7	70.
J172	G	3.5	164	204	23.5	10	7.7	100.
J219	P	2.7	256	405	--	10	9.1	5.9
K246	C	3.3	162	200	--	5	8.2	47.
K258	G	3.4	160	192	--	5	7.6	63.
K327	P	3.1	196	276	25.0	5	8.6	3.3
M791	P	5.4	194	295	26.0	10	9.1	4.5
N333	G	16.	326	530	25.0	20	9.0	12.
O319	G	3.5	198	226	--	5	8.0	2.4
O320	H	95.	348	631	--	5	8.7	26.
O355	H	16.	228	160	32.0	10	8.9	12.

Table 2. Data for selected wells in Harrison County, Mississippi
[Altitude in feet; C, Citronelle; G, Graham Ferry; P, Pascagoula; H, Hattiesburg]

Local well number	Aquifer	Landnet Location	Latitude	Longitude	Screen bottom altitude	Listed Owner
A033	G	T. 05 S., R. 13 W. sec. 35	303356	891644	515	Dale Ladner
B221	G	T. 05 S., R. 12 W. sec. 20	303556	891252	430	Mike Holbrook
B229	P	T. 05 S., R. 12 W. sec. 36	303347	890909	600	John Skinner
C240	P	T. 05 S., R. 11 W. sec. 32	303408	890615	635	W. B. Querbes
D026	P	T. 05 S., R. 10 W. sec. 32	303349	890010	705	L. W. Parker
E120	G	T. 06 S., R. 13 W. sec. 11	303240	891527	600	Allen Lizanna
F375	G	T. 06 S., R. 12 W. sec. 28	302959	891126	560	Pervy Nix
F405	P	T. 06 S., R. 12 W. sec. 19	303035	891411	950	Harrison County Schools
F406	G	T. 06 S., R. 12 W. sec. 19	303035	891410	270	Harrison County Schools
G005	P	T. 06 S., R. 11 W. sec. 16	303056	890605	758	Harrison Central School
G247	G	T. 06 S., R. 11 W. sec. 01	303329	890258	500	MS Forestry Commission
H403	G	T. 06 S., R. 10 W. sec. 09	303213	885957	540	Dr. Mitchell
J132	G	T. 07 S., R. 13 W. sec. 15	302556	891626	357	Dick Gay
J172	G	T. 07 S., R. 13 W. sec. 09	302723	891743	430	James C. Ladner
J219	P	T. 07 S., R. 13 W. sec. 25	302404	891450	940	Waring Oil (Stuckeys)
K246	C	T. 07 S., R. 12 W. sec. 21	302448	891126	70	Deep South Trucking
K258	G	T. 07 S., R. 12 W. sec. 09	302714	891131	570	Clyde Whitfield
K327	P	T. 07 S., R. 12 W. sec. 24	302518	890824	780	Sutter Water Company
M791	P	T. 07 S., R. 10 W. sec. 03	302818	885906	751	Superior Utilities
N333	G	T. 08 S., R. 13 W. sec. 16	302244	891626	700	Gulf Coast Comm. Action
O319	G	T. 08 S., R. 12 W. sec. 08	302134	891257	467	Pineville School
O320	H	T. 08 S., R. 12 W. sec. 09	302132	891204	1,860	MS Gulf Coast College
O355	H	T. 08 S., R. 12 W. sec. 12	302132	890849	1,670	Long Beach

REFERENCE

U.S. Environmental Protection Agency, 1986, Quality criteria for water: U.S.
Environmental Protection Agency, EPA-440/5-86-001, variously paginated.