EFFECTS OF LAND DISPOSAL OF MUNICIPAL SEWAGE SLUDGE ON SOIL, STREAMBED SEDIMENT, AND GROUND- AND SURFACE-WATER QUALITY AT A SITE NEAR DENVER, COLORADO

By Neville G. Gaggiani

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CONTENTS

PLATE
[In pocket]

FIGURES

TABLES

CONVERSION FACTORS, ABBREVIATED WATER-QUALITY UNITS, AND VERTICAL DATUM

Multiply	*By*	*To obtain*
acre	0.4047	hectare
foot (ft)	0.3048	meter
foot per year (ft/yr)	0.3048	meter per year
inch (in.)	25.4	millimeter
inch per hour (in/h)	25.4	millimeter per hour
inch per year (in/yr)	25.4	millimeter per year
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer
ton, short	0.9072	megagram

The following terms and abbreviations also are used in this report:

microgram per gram (µg/g)
microgram per liter (µg/L)
microsiemens per centimeter (µS/cm)
milligram per kilogram (mg/kg)
milligram per liter (mg/L)
milliliter (mL)

Temperature in degree Celsius (°C) can be converted to degree Fahrenheit (°F) by using the following equation:

$$°F=9/5(°C)+32.$$

National Geodetic Vertical Datum of 1929 (NGVD 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.

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ABSTRACT

From 1969 to 1986, the Metro Wastewater Reclamation District (formerly known as Metropolitan Denver Sewage Disposal District No. 1) disposed of about 233,000 dry tons of municipal sewage sludge by burial or incorporation into soil on 1,280 acres of rangeland about 15 miles southeast of Denver, Colorado. The U.S. Geological Survey, in cooperation with the Metropolitan Denver Sewage Disposal District No. 1, monitored ground-water quality from 1981 to 1987.

During the 1981-87 study, 13 of 28 wells sampled contained water that probably was affected by sewage-sludge disposal. Leachate from the disposal area probably has caused increased nitrite plus nitrate (as nitrogen) concentrations in the alluvial ground water. Ten of the affected wells were located inside the disposal area where sewage sludge had been plowed into the soil, buried deep into the hillside, or stored in holding ponds. Three of the affected wells were located downstream from the disposal area. These three wells also were affected by cattle manure near stock wells and another sewage-sludge-disposal area. The alluvial aquifers contained water that had nitrite plus nitrate (as nitrogen) concentrations ranging from less than 0.01 to 1,060 milligrams per liter; maximum background concentration was 1.70 milligrams per liter. The bedrock aquifer contained water that had concentrations ranging from less than 0.01 to 0.61 milligram per liter; maximum background concentration was 0.22 milligram per liter.

During 1983, near record precipitation probably caused nitrogen to leach out of the sewage sludge in the soil and accumulate in the alluvial ground water. In 1983, samples from two wells completed in the Senac Creek alluvial aquifer contained as much as 480 milligrams per liter of nitrite plus nitrate (as nitrogen), which exceeded the U.S. Environmental Protection Agency recommended limit for drinking water of 10 milligrams per liter as nitrogen. Throughout the study period, an occasional intense rainstorm or snowmelt caused soil from the disposal area to be eroded and mix with the streambed sediment. Trace elements generally were less than detection limits in the ground water, and, therefore, probably were retained in the soil or streambed sediments. During 1986, soil samples were obtained from seven locations and streambed-sediment samples were obtained from four locations, and they contained large concentrations of nitrogen and the trace elements manganese and zinc. Organic nitrogen was the predominant form of nitrogen, and lead was the predominant trace element of the most toxic trace elements analyzed.

Concentrations of the most toxic trace elements analyzed ranged from: less than 10 to 140 micrograms per gram for lead; less than 1 to 10 micrograms per gram for cadmium; less than 1 to 5 micrograms per gram for arsenic; and 0.01 to 3.8 micrograms per gram for mercury. The soil contained larger concentrations of nitrogen and trace elements than the streambed sediments.

Ground water in the alluvial aquifer generally flows north and follows the alluvial valleys. Presently (1990), movement of contaminated water is not a concern because there are no domestic wells completed in the alluvial aquifer in the study area.

INTRODUCTION

A national goal to decrease the discharge of pollutants resulted in Federal legislation such as the 1972 amendments to the Water Pollution Control Act (PL 92-500) and the 1977 and 1981 amendments to the Clean Water Act. This legislation has encouraged land application of municipal sewage sludge as a method to recycle sewage (Forster and Southgate, 1983, p. 35; Riodan, 1983, p. 16). Although, Federal, State, and local governments have allowed land application of sewage sludge and other methods of disposal, such as production of agricultural products (composting) and reclamation of waste water, Federal and State regulations exist to ensure elimination of environmental hazards.

From 1969 to 1986, the Metro Wastewater Reclamation District (formerly known as Metropolitan Denver Sewage Disposal District No. 1) disposed of about 233,000 dry tons of municipal sewage sludge by burial or incorporation into soil on the Lowry sewage-sludge-disposal area, a 1,280-acre area about 15 mi southeast of Denver (fig. 1). In June 1983, after more than 10 years of sludge disposal and 9 years of intermittent monitoring of ground-water quality by the U.S. Geological Survey, nitrate[1] concentrations exceeding the drinking-water standard of 10 mg/L recommended by the U.S. Environmental Protection Agency (1986) were present in samples from 7 of the observation wells that were used to monitor the shallow alluvial aquifers in the area. Samples from two of the seven wells contained nitrate concentrations of 480 mg/L. Although the large concentrations seemed to be confined to the disposal area, the Metro Wastewater Reclamation District, the U.S. Environmental Protection Agency, and local residents were concerned about the effects of the disposal area on local water quality. Temporal and areal changes in the chemical quality of the water of the alluvial and bedrock aquifers and surface water are possible if enough of the leachate from the applied sewage sludge reaches these systems.

[1]In this report nitrite plus nitrate as nitrogen will be referred to as nitrate.

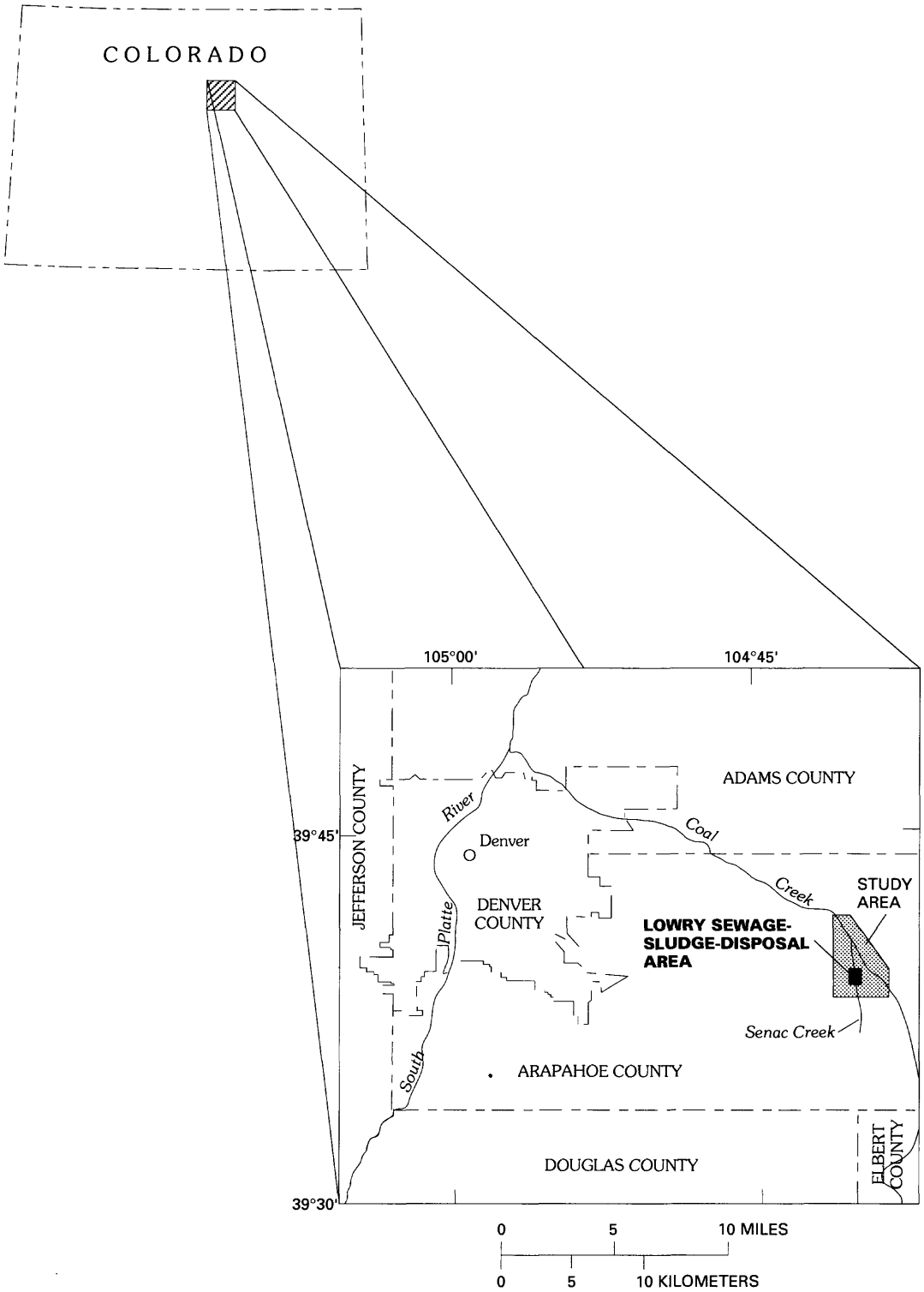

Figure 1.--Location of study area.

The U.S. Geological Survey in cooperation with Metro Wastewater Reclamation District monitored ground-water quality from 1981 to 1987. In 1984, the U.S. Geological Survey and Metro Wastewater Reclamation District expanded their study to monitor the effects of land application of sewage sludge on the soil and streambed sediment and ground- and surface-water quality at the Lowry sewage-sludge-disposal area. The results of this study can be used by local regulators and planners to better understand the long-term effects of disposal of excessive quantities of municipal sewage sludge on land. The specific objectives of this study were to:

1. Determine the effect of sewage-sludge disposal on ground- and surface-water quality.
2. Determine the location of the source areas of sewage-sludge leachate.
3. Determine the extent and rate of movement of the plume of affected ground water.
4. Determine the potential for additional sewage-sludge leaching.

Purpose and Scope

This report describes the effects of burial and land application of municipal sewage sludge on soil and streambed sediment and water quality in the underlying aquifers and surface water within and around the Lowry sewage-sludge-disposal area. The existing ground-water observation-well network at the disposal area was expanded for this study. Surface-water-sampling sites were selected so that runoff could be sampled from intense rainstorms or snowmelt. The sampling frequency for ground-water and surface-water runoff was changed from yearly to quarterly, and soil samples were collected. Four years of data were collected from 1984 to 1987 during the expanded monitoring program at the Lowry sewage-sludge-disposal area. These data, in addition to the data collected by the U.S. Geological Survey from 1981 to 1983, were used to determine effects of sewage-sludge-disposal on soil and streambed sediment and surface- and ground-water quality at the disposal area.

Previous studies

From 1974 to 1976, Robson (1976) studied the ground-water quality of a 12-mi^2 area, which included a liquid and solid waste-disposal site operated by the city of Denver and sewage-sludge-disposal areas used by the Metro Wastewater Reclamation District. During that study, 41 observation wells ranging in depth from 4 to 248 ft were installed. Periodic water-quality samples and water-level measurements were obtained from the alluvial and bedrock aquifers. Thirteen of the observation wells sampled during the Robson (1976) study were used during the 1981-87 sampling period to obtain water-quality and water-level data presented in this report.

Robson (1976) determined that there are two water-bearing geologic units in the area: the alluvial deposits, which are a maximum of 25 ft thick, and the bedrock, which is made up of the undifferentiated Dawson Arkose and Denver Formation that extend to 1,570 ft below land surface. The direction of ground-water flow in the alluvial deposits follows the surface drainage of the alluvial valleys, which generally are to the north or northwest. The direction of ground-water flow in the bedrock is generally to the north.

The best indicators of ground-water-quality degradation were dissolved solids, sodium, chloride, and nitrate (Robson, 1976, p. 13). Robson (1976) determined that the average nitrate concentrations were more than the background concentration of 0.1 mg/L in 17 of 42 observation wells and that the 17 wells were affected by waste-disposal and cattle-raising activities in the area (Robson, 1976, p. 2). Five of the 17 alluvial ground-water observation wells affected by waste-disposal activities during Robson's (1976) study also were sampled during the 1981-87 study (wells 3a, 11, 13, 22, and 24; pl. 1 and table 1). The average dissolved nitrate concentrations detected in the alluvial ground water at these five wells sampled from 1974 to 1976 (table 1) ranged from 1.5 mg/L at well 24 to 30 mg/L at well 11. Well 11 was located downgradient from a sewage-sludge burial area and sewage-sludge holding ponds (pl. 1). Local well numbers in table 1 are explained in figure 29 in the "Supplemental Information" section at the back of this report. All of the large nitrate concentrations occurred in alluvial wells. The bedrock wells sampled during the study by Robson (1976, p. 2) indicated no evidence of water-quality degradation.

Table 1.--*Average dissolved nitrate concentrations in selected wells from October 1974 to March 1976*

[Modified from Robson (1976)]

Equivalent well number 1981-87 (see pl. 1)	Local well number for wells sampled during 1974-76 (see fig. 29)	Average nitrate concentration (milligrams per liter as N)
3a	SC00506509ACD1	24.0
11	[1]SC00506504DBC	30.0
13	SC00506504CAC1	11.0
22	SC00506533BAB1	4.0
24	SC00506533BAB2	1.5

[1]This well was destroyed between 1976 and 1981 and replaced by drilling a new well nearby in 1981.

DESCRIPTION OF STUDY AREA

The Lowry sewage-sludge-disposal area is characterized by rolling hills that are covered by grass and some brush. The few trees (mostly cottonwood) grow in and near the mostly dry streambeds. Senac Creek is an ephemeral stream that winds through the middle of the disposal area and is the main drainage for surface-water runoff from the disposal area (pl. 1). About 1.5 mi north of the boundary of the disposal area, runoff from Senac Creek flows into Coal Creek. Both streams have sand channels and normally are dry except for short stream reaches where seeps provide water. During the spring and summer, when there is enough runoff from snowmelt or a rainstorm, Senac Creek and Coal Creek flow through the entire length of the study area.

Land use

The major land use in the study area is cattle grazing. Water for the stock tanks, which provide drinking water for cattle, is readily available from the alluvial aquifers by pumping wells with windmills. There are two working stock wells and one abandoned stock well in a 2-mi reach of Senac Creek in the study area (pl. 1). The study area also was used as a practice bombing range during World War II. An additional land use is the Aurora Dam and Reservoir that is located about 0.25 mi upstream from the boundary of the sewage-sludge-disposal area (see fig. 2 and pl. 1). The impounded water will provide drinking water for the city of Aurora.

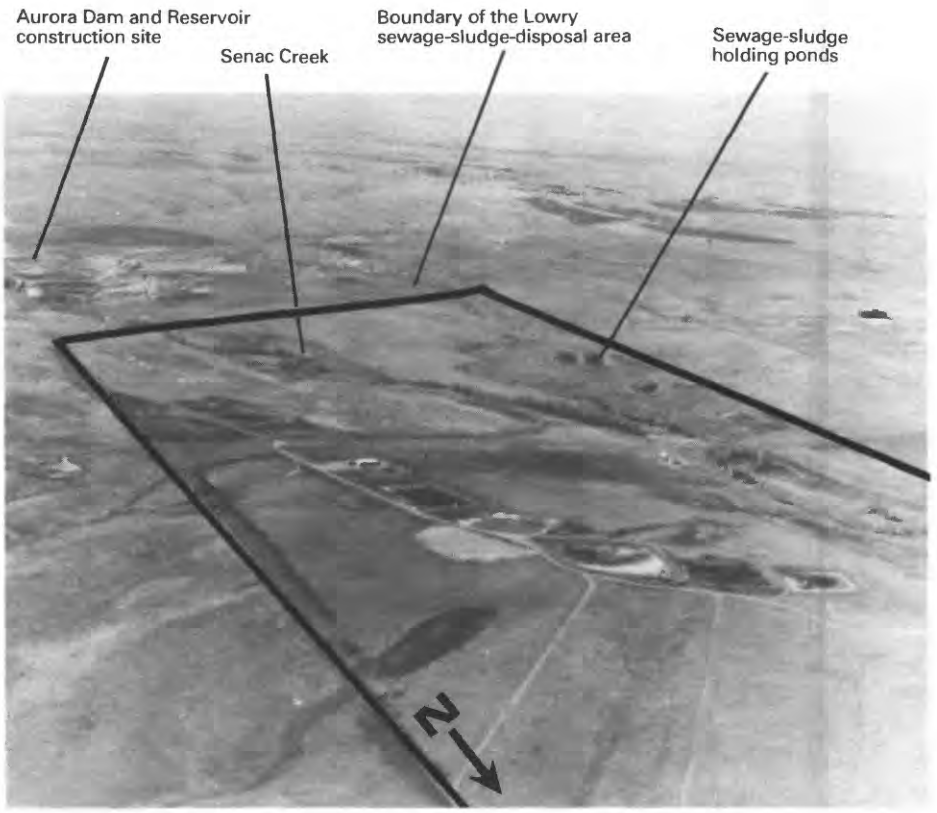

Figure 2.--Lowry sewage-sludge-disposal area including the sewage-sludge holding ponds, Senac Creek, and Aurora Dam and Reservoir (under construction). (Photograph, April 1988.)

Climate

The Lowry sewage-sludge-disposal area is located in the Front Range urban corridor of the Rocky Mountains, which has some of the most varied climate in the country (Hansen and others, 1978). The main weather modifier in the region is the Rocky Mountains, which Hansen and others (1978, p. 2) described as "..a huge climatic island surrounded by warmer drier domains." Because the Continental Divide of the Rocky Mountains is located only about 50 mi west of the study area, the mountains affect the climate of the study area. Weather systems from the west are blocked completely or are much weakened by this high barrier, whereas weather systems from the north and east occasionally produce upslope conditions that can cause intense rainfall or snowfall.

Because precipitation at the study area is assumed to be the same as that at Buckley Air National Guard Base, located about 5 miles northwest of the study area, precipitation records from Buckley were used for annual and quarterly precipitation values in this report. The mean annual precipitation in the study area is computed from 27 years of record (1961-87) from Buckley. Most years during the study (1981-87) were wetter than normal and generally were wetter than the previous 7 years (fig. 3). Annual precipitation at the study area exceeded the mean annual precipitation during 2 of 7 years from 1974 to 1980 and 5 of 7 years from 1981 to 1987. Precipitation in 1983 approached the maximum annual precipitation of 27.35 in. recorded in 1965 at Buckley Air National Guard Base.

During the 1981-87 study period, annual precipitation ranged from 13.61 in. in 1986 to 23.98 in. in 1983 (fig. 4). Most of the precipitation occurred from April through September (second and third quarters in fig. 4) and exceeded the mean annual April-through-September precipitation of 10.9 in. during 5 out of 7 years. The largest snowfalls occurred during the fourth quarter of 1982, the first quarter of 1983, and the fourth quarter of 1983.

Geohydrology

The study area is located on the transitional contact between the Dawson Arkose and the underlying Denver Formation (Robson, 1976; Romero, 1976). These formations can be identified outside of the transitional zone. However, in the study area these formations are difficult to differentiate and collectively are referred to as the undifferentiated Denver and Dawson unit (pl. 1; Robson, 1976, p. 8). The Denver Formation and Dawson Arkose were deposited during the end of the Cretaceous Period and during the beginning of the Tertiary Period by deposition of sand, silt, and clay from the Rocky Mountains and by deposition of coal-forming deposits from lakes in the Denver Basin east of the Rocky Mountains (Romero, 1976). The areal extent of the Denver Formation is about 3,100 mi^2 in the plains of east-central Colorado. The areal extent of the overlying Dawson Arkose is about 1,800 mi^2. Recharge to the aquifers is mainly from rainfall percolating through the highland areas between the stream valleys and into the outcrops of the Denver Formation along the eastern edge of the Rocky Mountains (Robson and Romero, 1981a and 1981b). The discharge areas are located at the north and northeastern edges of the formations and in stream valleys underlain by the formations. During the study period, several seeps were discharging into Senac and Coal Creeks.

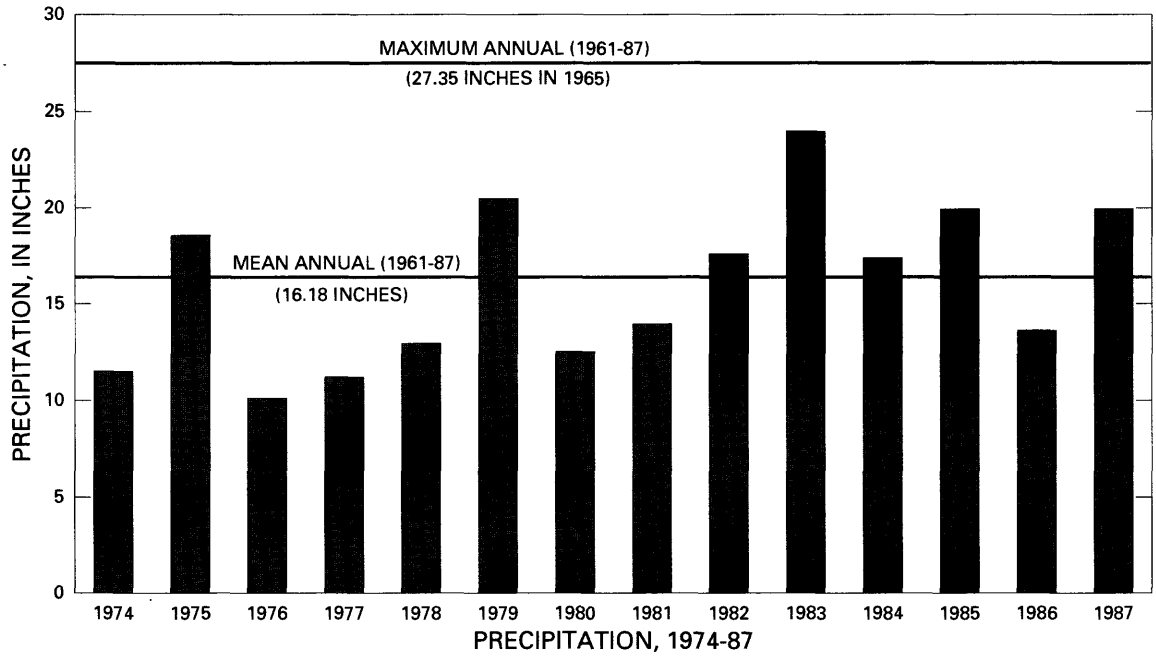

Figure 3.--Annual precipitation at Buckley Air National Guard Base, 1974-87.

The undifferentiated Denver and Dawson unit contains the bedrock ground water in the study area (Robson, 1976, p. 5). During 1981-87, the deepest bedrock wells sampled were 113 ft below land surface (wells 2 and 20; pl. 1).

A geologic section of the northern part of the sewage-sludge-disposal area that includes several alluvial observation wells, geologic logs of a core hole and a bedrock observation well, and water levels is shown in figure 5. The undifferentiated Denver and Dawson unit in the study area is mostly gray to light brown mudstone and sandy mudstone, with sandstone lenses and thin layers of lignite. Robson (1976) reported, and it was observed during drilling of bedrock wells in 1983 and 1984, that virtually all of the water in the bedrock wells came from the sandstone lenses.

Alluvial deposits consisting of poorly to well sorted, unconsolidated clay, sand, and gravel of Pleistocene and Holocene age occur at the bottom of the valleys and washes. These deposits, which reach a maximum measured thickness of 33 ft at wells 17 and 19 (pl. 1), contain the alluvial aquifer system in the study area. This system is composed of alluvial aquifers in

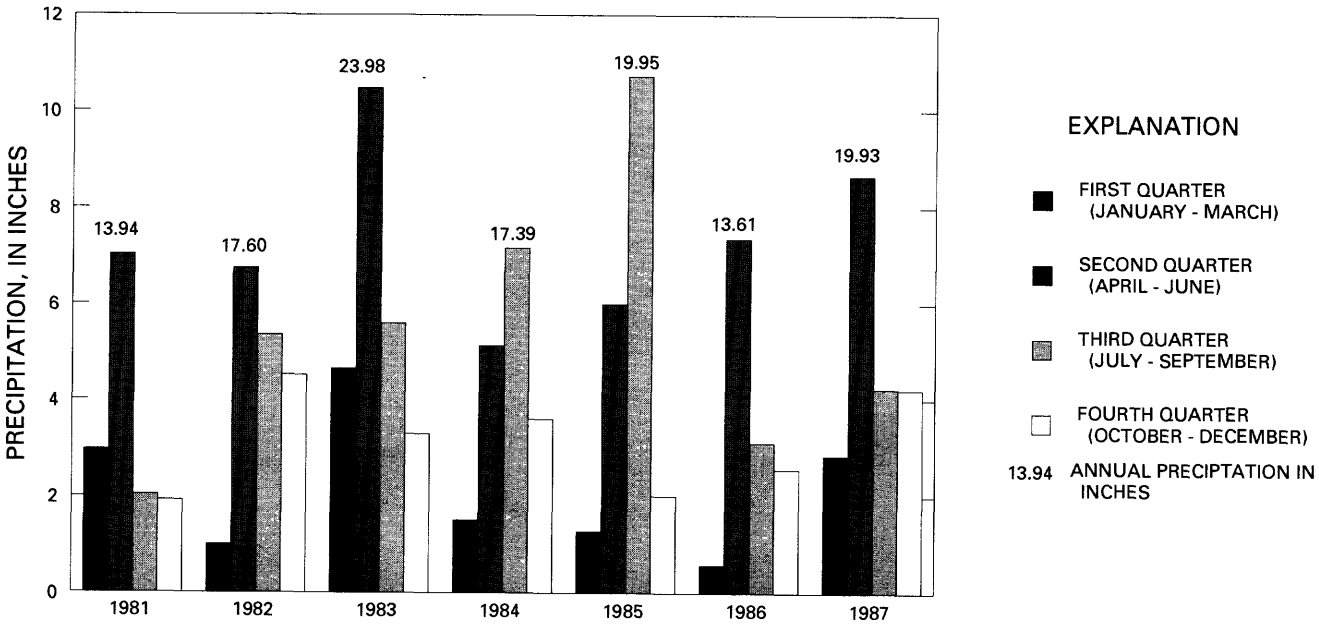

Figure 4.--Quarterly precipitation at Buckley Air National Guard Base, 1981-87.

the Senac Creek valley, the Coal Creek valley, and various smaller tributary valleys and hillside gullies, all of which are generally hydraulically connected. The Senac Creek alluvial aquifer follows the Senac Creek Valley diagonally through the middle of the sewage-sludge-disposal area, from the southeastern corner of section 9 to the northwestern corner of section 4. Within the disposal area, the alluvial aquifer in the Senac Creek valley is recharged by water from rainfall or snowmelt runoff draining the sewage-sludge-disposal area as well as from small seeps, and an aquifer along an unnamed tributary in section 9. About 1½ mi north of the disposal area, the alluvial aquifer in the Senac Creek valley is connected to the alluvial aquifer in the Coal Creek valley. The alluvial aquifer in the Coal Creek valley, which is the largest alluvial aquifer in the study area, is located northeast of the sewage-sludge-disposal area. Water coming from the disposal area flows into this aquifer by way of surface-water runoff and alluvial ground-water flow from Senac Creek and small hillside gullies at the eastern boundary of section 4 in the disposal area (pl. 1).

The direction of horizontal alluvial- and bedrock-ground-water flow generally is to the north, while the potential for vertical ground-water movement probably is from the alluvial aquifer to the bedrock aquifer. Water-level contours in the alluvial aquifer (figs. 6 and 7) indicate that the alluvial ground-water flow follows the alluvial valleys to the north or northeast.

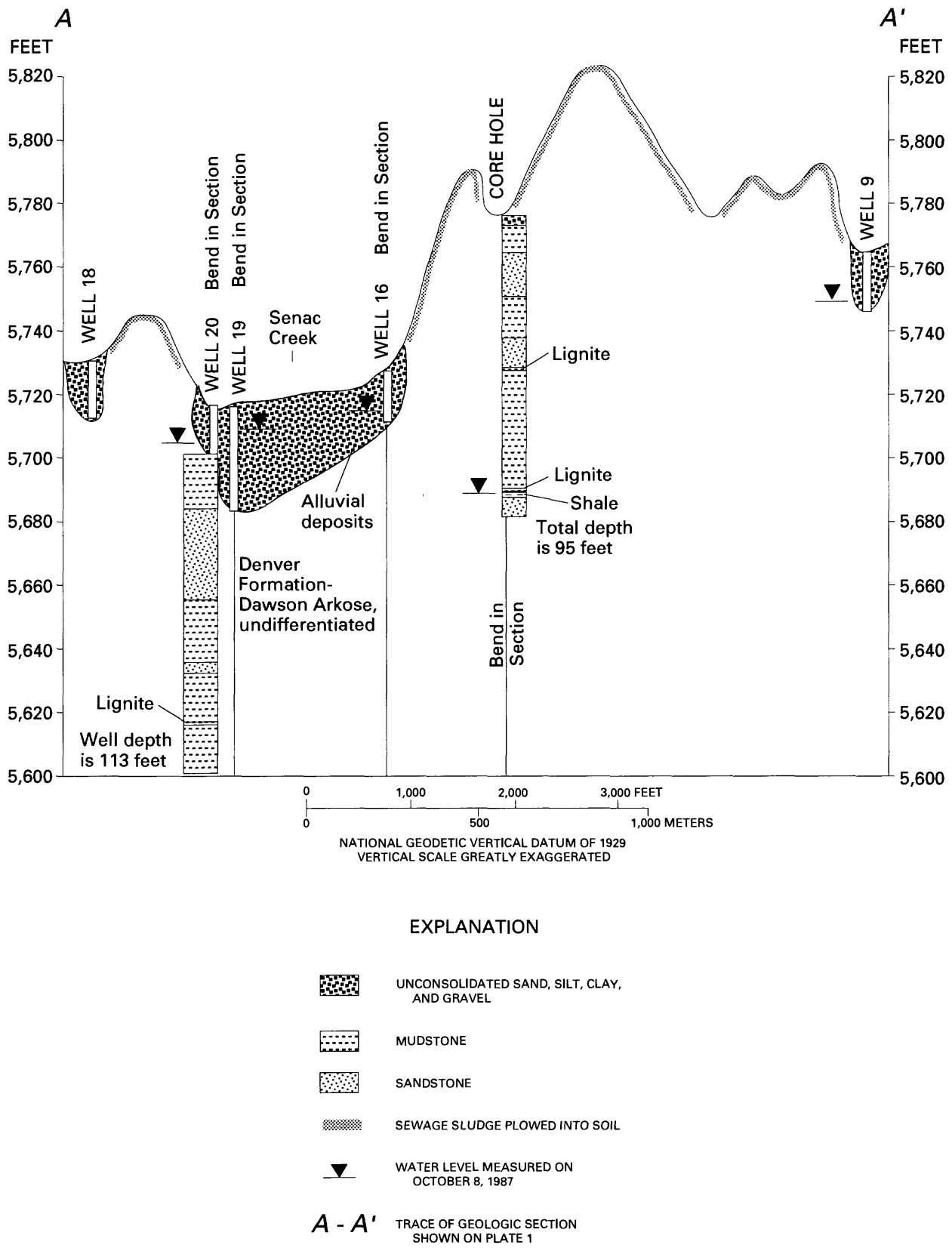

Figure 5.--Geologic section showing selected alluvial observation wells, geologic logs of a core hole and a bedrock observation well, and water levels.

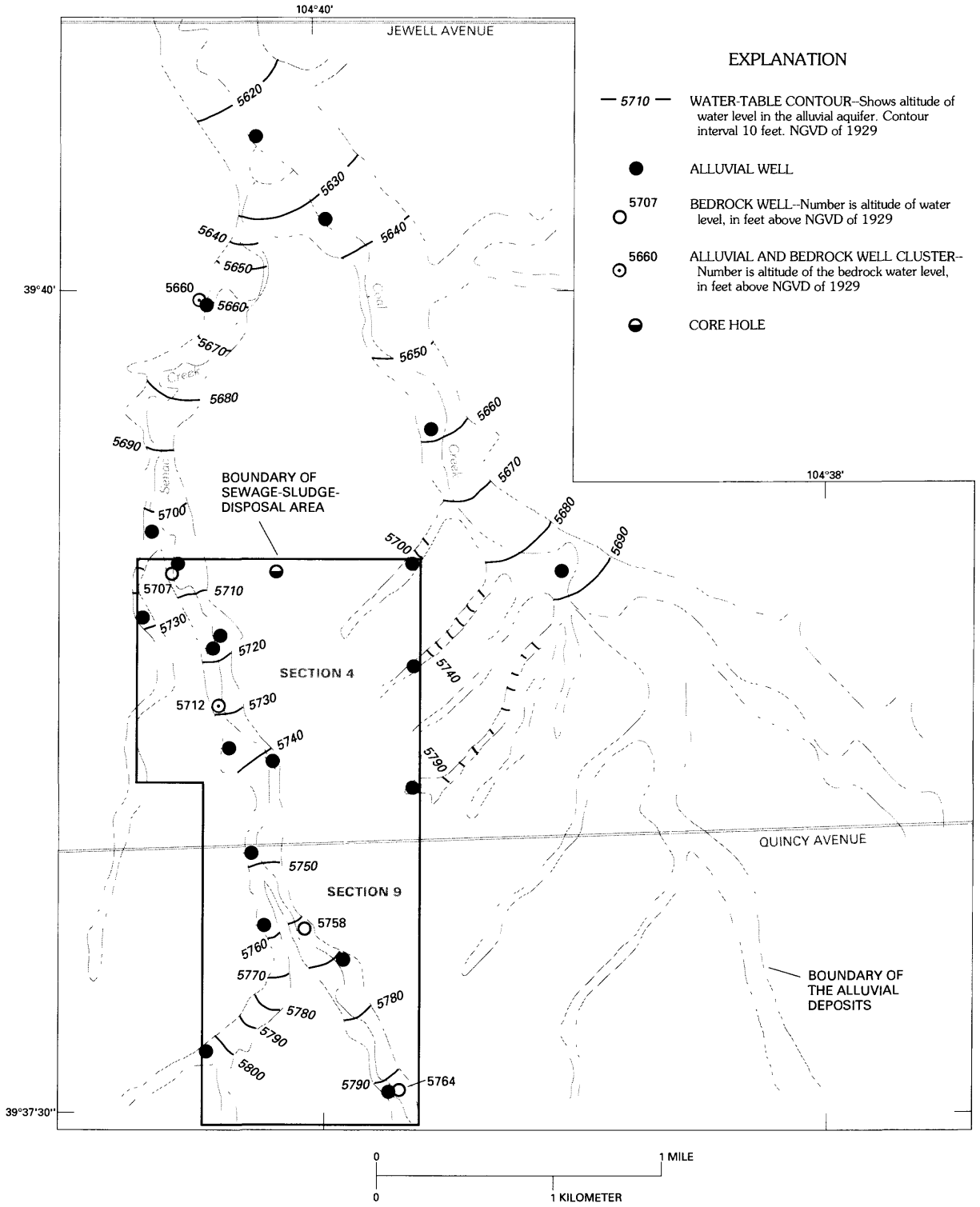

Figure 6.--Water-level contours in the alluvial aquifer and water levels in the bedrock aquifer during April 1986.

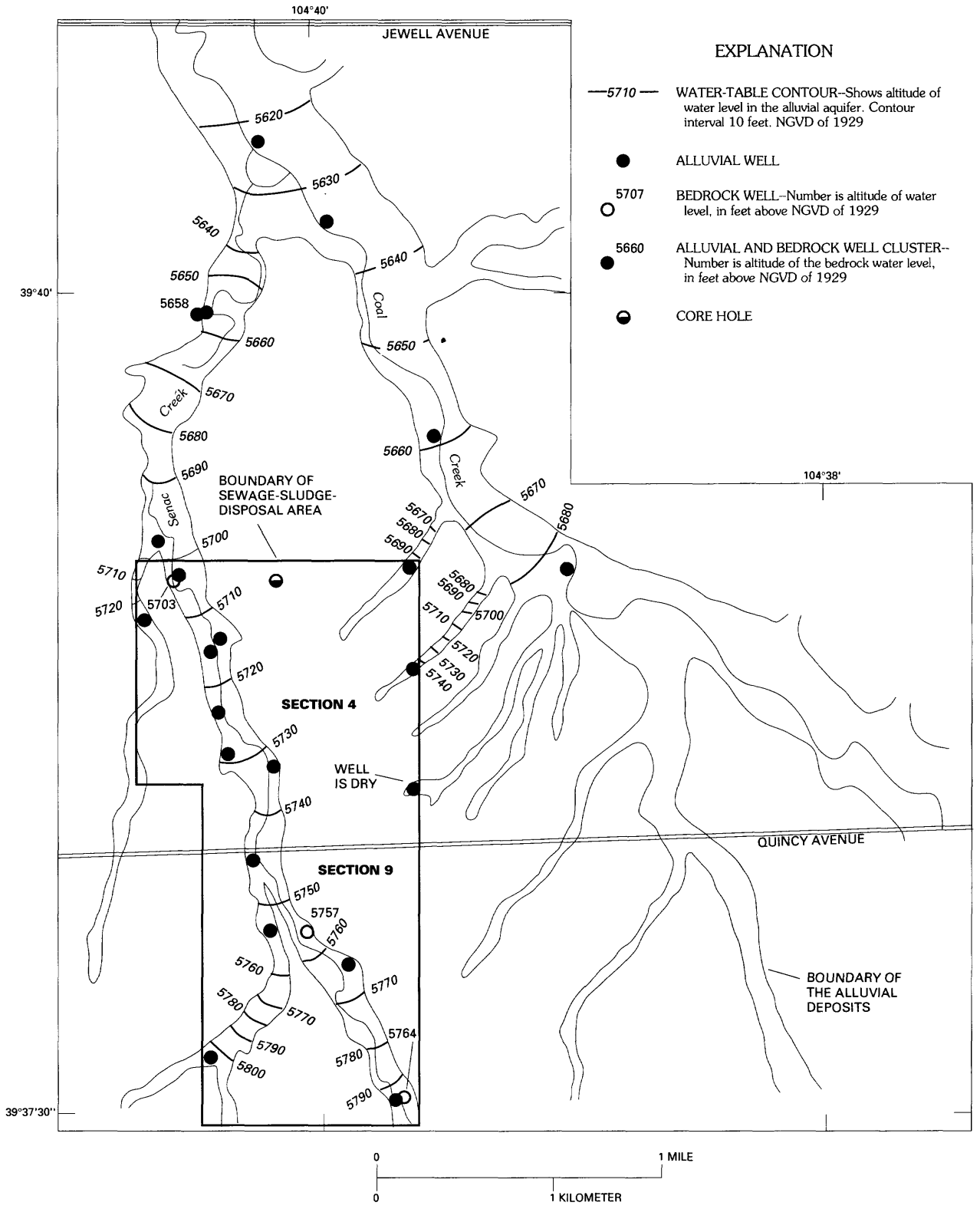

Figure 7.--Water-level contours in the alluvial aquifer and water levels in the bedrock aquifer during November 1987.

Water levels in the bedrock wells indicate that the bedrock ground water also flows generally to the north. Bedrock-water-level contours are not shown in figures 6 and 7 because there only are five bedrock wells and a bedrock core hole, which are not enough to construct a water-level contour map. Potential for vertical ground-water movement probably is from the alluvial aquifer to the bedrock aquifer because the bedrock water levels are below the alluvial water table in most of the disposal area, ranging from about 26 ft below the alluvial water table near the southern boundary of the disposal area to less than 1 ft above the alluvial water table at the northern boundary of the disposal area (figs. 6 and 7). During periods of increased runoff, such as snowmelt, the alluvial water table rises (table 5) and could increase the potential for vertical movement of alluvial ground-water into the bedrock aquifer. However, it is difficult to determine the potential for vertical movement between the alluvial and bedrock aquifers because the water-bearing sandstone lenses of the bedrock aquifer, which occur at several depths and are separated by clay and mudstone, probably have piezometric heads that are different than that indicated by the water level in a bedrock well.

Water levels in the bedrock and alluvial aquifer wells fluctuated during the study period as indicated in the hydrographs in figure 30 and the listings in table 5 in the "Supplemental Information" section at the back of this report. Water levels for well 13 generally were not measured because the well is a windmill that is nearly always pumping; therefore, the hydrograph for this well is not shown in fig. 30. Generally, the water levels rose in the spring in response to recharge from snowmelt and increased precipitation (see the 2nd quarter, fig. 4) and declined during late summer and autumn. Measured water levels in the bedrock wells during 1981-87 fluctuated from about 1 ft in well 1 to about 4 ft in well 20 (pl. 1 and fig. 30). The water level in well 15 took several months to recover each time the well was bailed dry in preparation for sampling. Water levels in the alluvial aquifer wells changed as much as about 16 ft (well 10, fig. 30) from 1981 to 1983 but generally less than 10 ft after 1983. Generally, the largest measured change in water levels in the bedrock and alluvial aquifer wells was the rise in water levels from 1981 to 1983. Precipitation during 1983 at the study area was 23.98 in., which is close to the maximum recorded annual precipitation of 27.35 in. (fig. 3). However, after 1983, the trend in water levels (excluding seasonal fluctuations) in the bedrock and alluvial aquifer wells generally decreased or showed little or no substantial change during the study period (fig. 30). The only exception was the water level in well 2, which increased about 1 ft from 1984 to 1987.

Soils

There are two major soil associations located in the study area. The alluvial Land-Nunn association is located on floodplains and terraces and is composed of nearly level, mainly loamy, and sandy soils. The Renohill-Buick-Litle association is located on the uplands and is composed of loamy soils that have a loamy, clayey subsoil on shale or sandstone (U.S. Department of Agriculture, 1970). Depth to consolidated rock for both soil associations ranges from less than 20 to more than 60 in., and soil permeability, which is the time it takes water to pass through the soil pores, ranges from 0.06 to 20 in/h (Gaggiani and others, 1987, p. 19).

During intense rainfall, some soil was eroded from the hillsides east of Senac Creek in sections 4 and 9 and deposited in the creek bed. Occasionally the erosion was extreme in section 4. Erosion from the bare hillside east of Senac Creek buried the top of well 16a under 2 ft of soil in 1983 and partially buried the surface casing of the redrilled well 16 in 1986 (pl. 1). At the present time (1990), vegetation has stabilized the soil on the hillside and soil erosion has decreased.

SEWAGE-SLUDGE-DISPOSAL OPERATIONS

The Metro Wastewater Reclamation District began disposing sewage sludge at the study area in 1969. During 1969, 33,701 dry tons were disposed of in section 9 (William Martin, Metro Wastewater Reclamation District, written commun., 1988). From 1969 to 1986, 94,015 dry tons were applied on 480 acres in section 9. From 1973 to 1986, 139,549 dry tons of sewage sludge were applied on 600 acres in section 4. The quantities and locations of sewage-sludge disposal in sections 4 and 9, which are discussed in this report, are indicated on plate 1. Before 1981, sewage sludge also was disposed of in section 32, T. 4 S., R. 65 W., and is discussed by Robson (1976). The quantity and location of sewage-sludge-disposal on section 32 is shown on plate 1.

The treatment of sewage sludge by Metro Wastewater Reclamation District changed during the disposal operations at Lowry. From 1969 to 1976, the sludge was composed of raw sludge chemically conditioned with lime and ferric chloride on vacuum filters (raw primary sewage 45 percent of total, raw waste activated sludge 55 percent of total). From 1977 to 1986, the sludge was composed of sewage that was anaerobically digested and chemically conditioned with polymer and then vacuum filtered or centrifuged (William Martin, Metro Wastewater Reclamation District, written commun., 1988).

Two methods were used to incorporate the sewage sludge into the soil. The first method was burial of sludge. The burial method, used only before 1976 (Robson, 1976), involved digging deep into the hillside on the east side of the Senac Creek valley in sections 4 and 9 (pl. 1), mixing the resulting dirt with sewage sludge and replacing the sludge and dirt mixture into the original excavation. The second method was to plow the sludge into the soil; this method was used exclusively after 1976. The liquid sewage sludge, transported by tanker truck, and the drier sewage-sludge 'cake' transported by large dump trucks, were applied directly to the soil and plowed in (fig. 8). If the weather prevented the trucks and other equipment from driving onto the soil, the sludge was stored temporarily in holding ponds (see figs. 2 and 9).

Selected chemical analyses of liquid sewage sludge and sewage-sludge cake disposed on sections 4 and 9 during 1983 are listed in table 2. The sewage-sludge cake contained large concentrations of ammonia and large total concentrations of ammonia plus organic nitrogen, phosphorus, cadmium, chromium, copper, iron, lead, nickel, and zinc. Robson (1976) also reported large concentrations of calcium in all types of sewage sludge that he analyzed.

A

B

Figure 8.--Two methods of sewage-sludge disposal at the Lowry sewage-sludge-disposal area: *A*, Liquid sewage sludge is spread on soil, which is later plowed into the soil (Photograph, February 1986). *B*, Sewage-sludge cake is delivered to the site and plowed into the soil (Photograph, February 1986).

Figure 9.--*A*, Liquid sewage sludge stored in holding ponds during adverse weather conditions (Photograph, February 1984). *B*, Sewage-sludge cake plowed into the soil (Photograph, October 1985).

Table 2.--*Selected chemical analyses of liquid sewage sludge and sewage-sludge cake applied to the Lowry sewage-sludge-disposal area during the summer of 1983*

[ppm, parts per million dry weight; µS/cm, microsiemens per centimeter at 25° Celsius; ppt, parts per thousand dry weight; chemical data are from the Metropolitan Denver Sewage Disposal District No. 1]

Chemical constituent	Concentration	
Liquid sewage sludge		
Alkalinity	5,806.7	ppm as $CaCO_3$
Total solids	2.53	percent by volume
Total cadmium	17.2	ppm
Total chromium	460.3	ppm
Total copper	670.3	ppm
Total iron	11,233.3	ppm
Total lead	314.7	ppm
Total nickel	77.3	ppm
Total zinc	1,270	ppm
Sewage-sludge cake		
Specific conductance	7,780	µS/cm
pH (standard units)	7.75	
Total potassium	2,992.5	ppm
Total solids	16.9	percent by volume
Ammonia	2.43	ppt
Nitrate	.04	ppt
Total ammonia plus organic nitrogen	4.9	ppt
Total phosphorus	2.2	ppt
Total cadmium	18.7	ppm
Total chromium	543.5	ppm
Total copper	716	ppm
Total iron	18,150	ppm
Total lead	370	ppt
Total nickel	89.5	ppm
Total zinc	1,365	ppm

METHODS OF INVESTIGATIONS

More than 500 samples of soil, streambed sediment, ground water, and surface water were obtained for onsite measurement chemical analyses in and near the Lowry sewage-sludge-disposal area. Onsite measurements on water samples included temperature, specific conductance, and pH. Chemical analyses included determination of nitrogen compounds, phosphorus, major cations and anions, and the following trace elements: Arsenic, cadmium, chromium, copper,

iron, lead, nickel, manganese, mercury, and zinc (table 6, 7, and 8 in the "Supplemental Information" section at the back of this report). Fecal coliform and fecal streptococcus bacteria also were analyzed (table 6). Because iron and zinc were the trace elements present in the largest concentrations in the liquid sewage sludge and sewage-sludge cake (table 2), ground-water samples were collected and analyzed quarterly for these constituents. Concentrations of most of the other trace elements analyzed were nearly always less than detection limits (table 6), so they were analyzed only a few times during the study period. Data in this report represent the chemical composition of soil and streambed sediment from seven soil and four streambed-sampling sites in 1986, chemical and bacterial composition of ground water from 28 wells from 1981 through 1987, and surface-water runoff from 7 of the 8 surface-water sampling sites from 1984 through 1987.

Soil and Streambed-Sediment Samples

Soil samples were collected at seven sites in November 1986 (fig. 10) after sewage-sludge disposal had ended. One sample for chemical analysis was collected at each site. Soil samples were collected from seven sites in the areas where sewage sludge had been applied in order to determine the concentrations of nutrients and trace elements from sludge-altered soil. Streambed-sediment samples were collected at four sites in November 1986 to determine if sewage-sludge leachate or sludge-altered soil had moved from the source areas.

Ground-Water and Surface-Water Samples

The ground-water sampling network is composed of 28 wells (pl. 1 and table 3). There are 23 alluvial wells (Note: Three wells were abandoned and replaced with new wells) and 5 bedrock wells. All of the wells except the stock well (well 13), which was used as a water supply for cattle, were drilled by the U.S. Geological Survey as observation wells. Well depths, aquifer type, year drilled, and altitude of land surface for all wells used during the 1981-87 study are listed in table 3. Some of the wells drilled in 1974 were included in the 1981-87 ground-water sampling network if they were still in good condition. In a few instances, such as with wells 3 and 3a, wells used since 1981 were replaced in 1983 with new wells near the same locations. The alluvial wells were cased with 2-in.-diameter polyvinyl chloride (PVC), except for the wells drilled during 1983-84, which were cased with 4-in.-PVC wells. These wells penetrate to the bottom of the alluvial aquifer. The screens are located at: the bottom 2 to 3 ft in wells drilled during 1974-75; the bottom 5 ft in wells drilled during 1981; and the bottom 3 to 6 ft in wells drilled during 1983-84. These wells sample a mixture of water from all depths of the alluvial aquifer because the gravel pack extends to within several feet of the surface. The wells are grouted from the gravel pack to the surface and have protective steel surface casings.

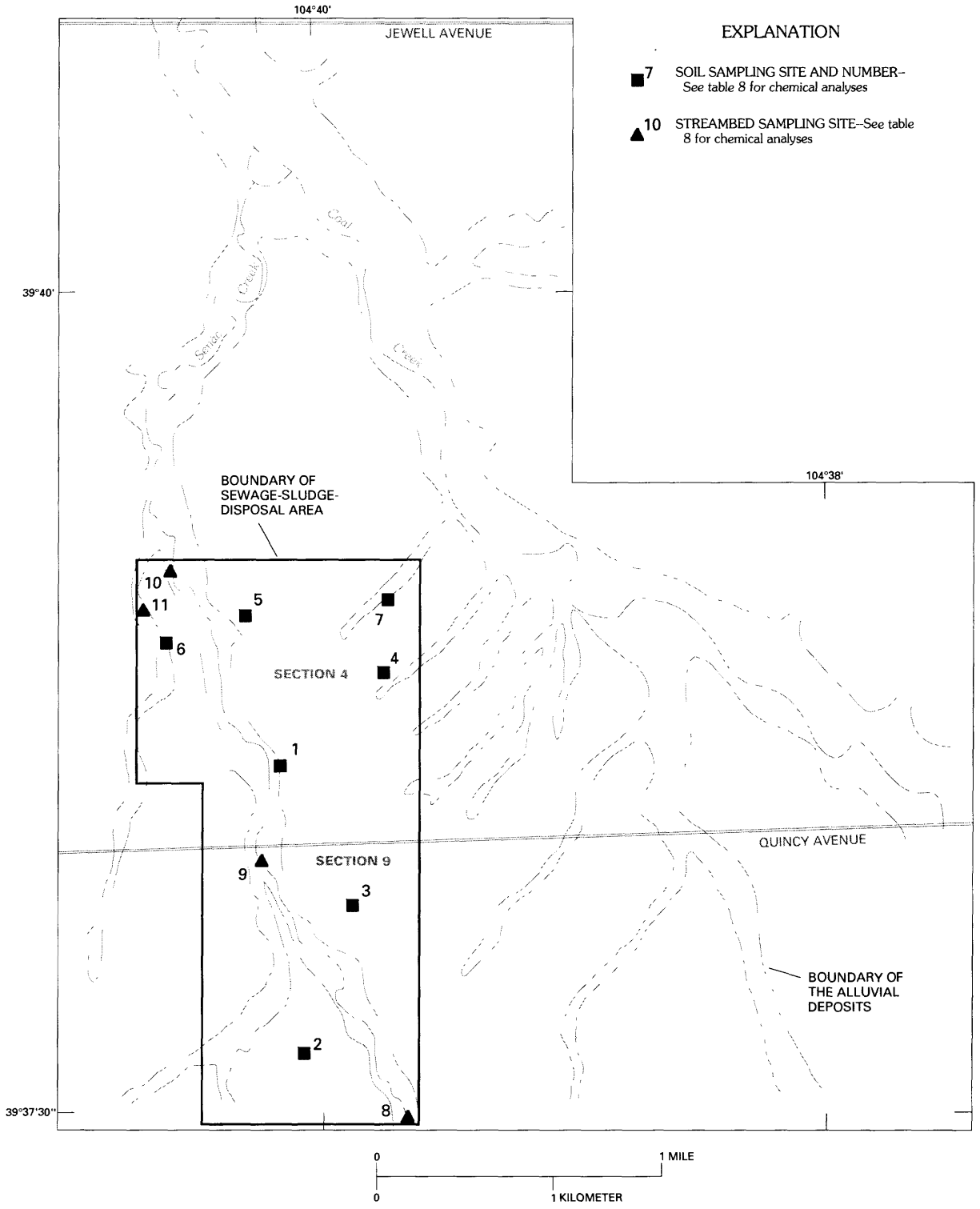

Figure 10.--Locations of soil and streambed-sediment sampling sites, November 1986.

Table 3.--*Ground-water sampling sites at the Lowry sewage-sludge-disposal area*

[NGVD of 1929, National Geodetic Vertical Datum of 1929]

Well number (see pl. 1)	Local well number (see fig. 29)	Depth of well (feet)	Aquifer type	Year drilled	Altitude of land surface (NGVD of 1929)
1	SC00506509DDD1	11.0	alluvial	1974	5,794
2	SC00506509DDD2	113	bedrock	1984	5,798
3	SC00506509ACD2	15.4	alluvial	1983	5,781
[1]3a	SC00506509ACD1	20.0	alluvial	1974	5,770
4	SC00506509ACB	101	bedrock	1984	5,770
5	SC00506509BAA	24.0	alluvial	1981	5,753
6	SC00506509CAC1	25.2	alluvial	1981	5,810
7	SC00506509BDA1	22.2	alluvial	1981	5,764
8	SC00506504DDA1	14.0	alluvial	1983	5,810
9	SC00506504ADA2	17.0	alluvial	1983	5,760
10	SC00506504AAA4	29.0	alluvial	1983	5,710
[1]10a	SC00506504AAA3	20.0	alluvial	1981	5,720
11	SC00506504CAD1	18.2	alluvial	1981	5,745
12	SC00506504CAC2	18.3	alluvial	1981	5,738
[2]13	SC00506504CAC	29.0	alluvial	before 1974	5,746
14	SC00506504CAB1	18.0	alluvial	1975	5,734
15	SC00506504CAB2	107	bedrock	1975	5,734
16	SC00506504BAC2	19.3	alluvial	1983	5,728
[1]16a	SC00506504BAC1	19.0	alluvial	1981	5,730
17	SC00506504BDB	33.0	alluvial	1974	5,725
18	SC00506504BBC	19.6	alluvial	1981	5,730
19	SC00506504BBB1	33.0	alluvial	1981	5,713
20	SC00506504BBB2	113	bedrock	1984	5,714
21	SC00406533CCC1	20.5	alluvial	1984	5,708
22	SC00406533BAB1	28.0	alluvial	1975	5,670
23	SC00406533BAB2	82.0	bedrock	1975	5,670
24	SC00406533BAB3	23.0	alluvial	1974	5,665
25	SC00506503ABB	18.0	alluvial	1974	5,690
26	SC00406534CBB	16.0	alluvial	1974	5,665
27	SC00406528DCA	20.0	alluvial	1974	5,640
28	SC00406528BDD	20.0	alluvial	1974	5,635

[1]The observation well was used from 1981 to 1983, then replaced by drilling a new well nearby with a similar well number.

[2]Windmill-operated stock well.

The five bedrock wells range in depth from 82 to 113 ft below land surface. These wells sample the bedrock aquifer and are sealed by grout above and below the interface between the alluvial and bedrock aquifers so no exchange of water occurs between these aquifers through the well bore. The water quality in the two bedrock wells drilled in 1975 (wells 15 and 23, pl. 1) was affected by the grout; therefore, the pH, hardness, and concentrations of calcium, bicarbonate, carbonate, hydroxide, sulfate, and dissolved solids in these wells are not representative of the water quality of the aquifer (Robson, 1976, p. 17).

The ground-water-sampling sites are located so that they represent background (unaffected), onsite, and offsite water quality. Wells 1, 2, 6, and 25 (pl. 1) were unaffected by sewage-sludge-disposal operations because the wells were upgradient from the operations. The onsite wells sampled the ground water within the boundaries of the sewage-sludge-disposal area, and the offsite wells sampled the water quality of the ground water downgradient from the disposal area.

Eight surface-water sampling sites are included in the sampling network (table 4 and pl. 1). Surface-water sampling sites 1 and 7 are considered background sites, sites 2, 3, and 6 are onsite, and sites 4 and 8 are offsite. Surface-water runoff in the area is infrequent and usually lasts only a few hours. In most instances, by the time the runoff was sampled, the major part of the flow had passed and the water quality may not represent the early and peak-flow periods. During the study period, the maximum number of samples obtained from any surface-water site was six. Other sites have a smaller number of samples because the flow had stopped by the time the site was visited.

Table 4.--*Surface-water sampling sites at the Lowry sewage-sludge-disposal area*

[°, degrees; ′, minutes; ″, seconds]

Surface-water sampling site number (see pl. 1)	Latitude (north)	Longitude (west)	Description of site
SW-1	39°37′30″	104°39′42″	Senac Creek at southern boundary of disposal area
SW-2	39°38′15″	104°40′16″	Senac Creek at Quincy Avenue
SW-3	39°39′11″	104°40′34″	Senac Creek at northern boundary of disposal area
SW-4	39°40′22″	104°40′13″	Senac Creek at mouth
SW-5	39°39′11″	104°39′35″	Dry wash at northeast boundary of disposal area
SW-6	39°38′59″	104°40′39″	Senac Creek tributary near northwest corner of disposal area
SW-7	39°38′19″	104°37′29″	Coal Creek at Quincy Avenue
SW-8	39°40′55″	104°40′40″	Coal Creek at Jewell Avenue

Sampling Techniques

Soil and streambed-sediment samples were collected by using a hand-held metal soil-coring tube that obtained an 8-in. soil core from 12 to 20 in. below the surface. Water samples were collected for chemical and bacterial analyses from wells each June or July from 1981 to 1983. From 1984 to 1987, the sampling frequency was increased to quarterly, and surface-water runoff was added to the sampling whenever possible. Water levels were measured in the wells before bailing or pumping for each sampling. The frequency of water-level measurements was increased in 1984 to detect seasonal trends. Bailers made of PVC were used to evacuate and collect samples from all wells except 2, 4, 13, and 20. Water samples for bacterial analyses were collected using a brass sampler on a steel cable. A portable submersible pump was used to evacuate wells 2, 4, and 20, and the water samples were collected with a bailer. Most of the wells sampled were bailed or pumped dry and allowed to recover usually 1 day before the samples were collected. However, five of the wells that could not be bailed or pumped dry had three well volumes of water removed before they were sampled. During low water levels, some wells went dry and could not be sampled. Well 8 (pl. 1) was dry from October 1986 to December 1987. Water samples from well 13 were obtained from the windmill outflow pipe.

The following procedures were followed during each sampling so that representative water samples would be obtained and so that cross contamination of the wells would be prevented. Water levels in each of the wells were measured with a steel tape and then were bailed or pumped. The steel tape was wiped and dried after every measurement, and the bailer was rinsed after each sampling. After about 1 day, when the water levels in the wells recovered, the brass sampler was used to obtain bacterial samples in all wells. Before sampling each well, the sampler was sterilized by rinsing the outside with methanol and then by burning methanol within the enclosed chamber of the sampler. After the bacterial sampling was completed, water samples for chemical analyses were obtained using bailers that were rinsed after each sampling. The bailers used for collecting water for chemical analyses were composed of PVC and had a Teflon[1] ball valve at one end. The 2-in.-diameter wells were sampled with a 1.5-in.-diameter bailer. Chemical and bacterial samples were analyzed by the Metro Wastewater Reclamation District laboratory, and two split samples were sent to the U.S. Geological Survey National Water Quality Laboratory for verification. Only the results of analyses by the Metro Wastewater Reclamation District laboratory are in this report.

Samples of surface-water runoff were collected during snowmelt or rainfall at 7 of 8 surface-water sampling sites. Due to short duration of flow and difficulty of access during runoff, water-quality samples were collected during the receding part of the flow. Water samples for chemical analyses were collected by hand in plastic bottles. Water samples for biological analyses were collected in sterile plastic bottles. Chemical and biological samples were analyzed by the Metro Wastewater Reclamation District laboratory. Surface-water sampling site SW-5 was not sampled because there was no flow at the site during sampling visits.

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[1]The use of trade or product names in this report is for identification purposes only, and does not constitute endorsement by the U.S. Geological Survey.

Detection limits for chemical and bacterial analyses in tables 6 and 7 in the "Supplemental Information" section are preceeded by less than symbols (<). Detection limits varied for some chemical and bacterial analyses during the 1981-87 study period because of dilution of water samples, changes in analytical equipment, or changes in analytical methods.

RESULTS AND INTERPRETATION OF SOIL, STREAMBED-SEDIMENT, AND GROUND- AND SURFACE-WATER-QUALITY ANALYSES

In order to assess the effects of sewage-sludge-disposal on water quality, the background water quality must be known. Although there are no data on the water quality in the area before the sewage-sludge-disposal began, there are data from wells and surface-water sampling sites where the water was unaffected by the disposal operations. Wells 1, 2, 6, and 25, and surface-water sampling sites SW-1 and SW-7 (pl. 1), which were upgradient from the sewage-sludge-disposal operations, were used to determine background water quality. Chemical analyses of water from these wells and surface-water sites indicate that the maximum background nitrate concentrations during the study were: 1.70 mg/L at well 6 for the alluvial ground water; 0.22 mg/L at well 2 for the bedrock ground water; and 2.80 mg/L at SW-7 for surface-water runoff (table 7 in the "Supplemental Information" section at the back of this report). Major ions in the water of the background wells were predominantly calcium, bicarbonate, and sulfate (fig. 11). Major ions in the water of the background surface-water runoff were predominantly calcium, bicarbonate, and sulfate at SW-1 in Senac Creek, and calcium, sodium, and bicarbonate at SW-7 in Coal Creek (table 7).

Soil and Streambed Sediment

Sewage sludge deposited in the study area contained large concentrations of nitrogen and trace elements (table 2). The nitrogen and trace elements have the potential for dissolution in water and the resulting leachate could then be transported to the surface and ground water. The source areas for the sewage-sludge leachate that affect the alluvial aquifers inside the Lowry sewage-sludge-disposal area are located east and west of the Senac Creek alluvial aquifer in sections 4 and 9 (pl. 1). The largest quantity of sludge was disposed of on the hillside east of Senac Creek in sections 4 and 9.

Soil from seven soil-sampling sites (sites 1-7, fig. 10) were collected from areas where sewage sludge had been plowed into the soil or buried. Streambed-sediment samples from four streambed-sediment sampling sites were collected upstream (site 8, fig. 10), inside (site 9, fig. 10), and downstream (sites 10 and 11, fig. 10) from the sewage-sludge-disposal area. Results of the chemical analyses are shown in bar graphs in figures 12 through 14, and listed in table 8 in the "Supplemental Information" section at the back of this report. Concentrations of nitrogen compounds and trace elements shown in figures 12 through 14 generally were larger in the soil than in the streambed sediments. The smallest concentrations shown in figures 12 through 14 occurred in the streambed sediments at streambed-sediment sampling site 8, which was not affected by the leachate from the disposal area.

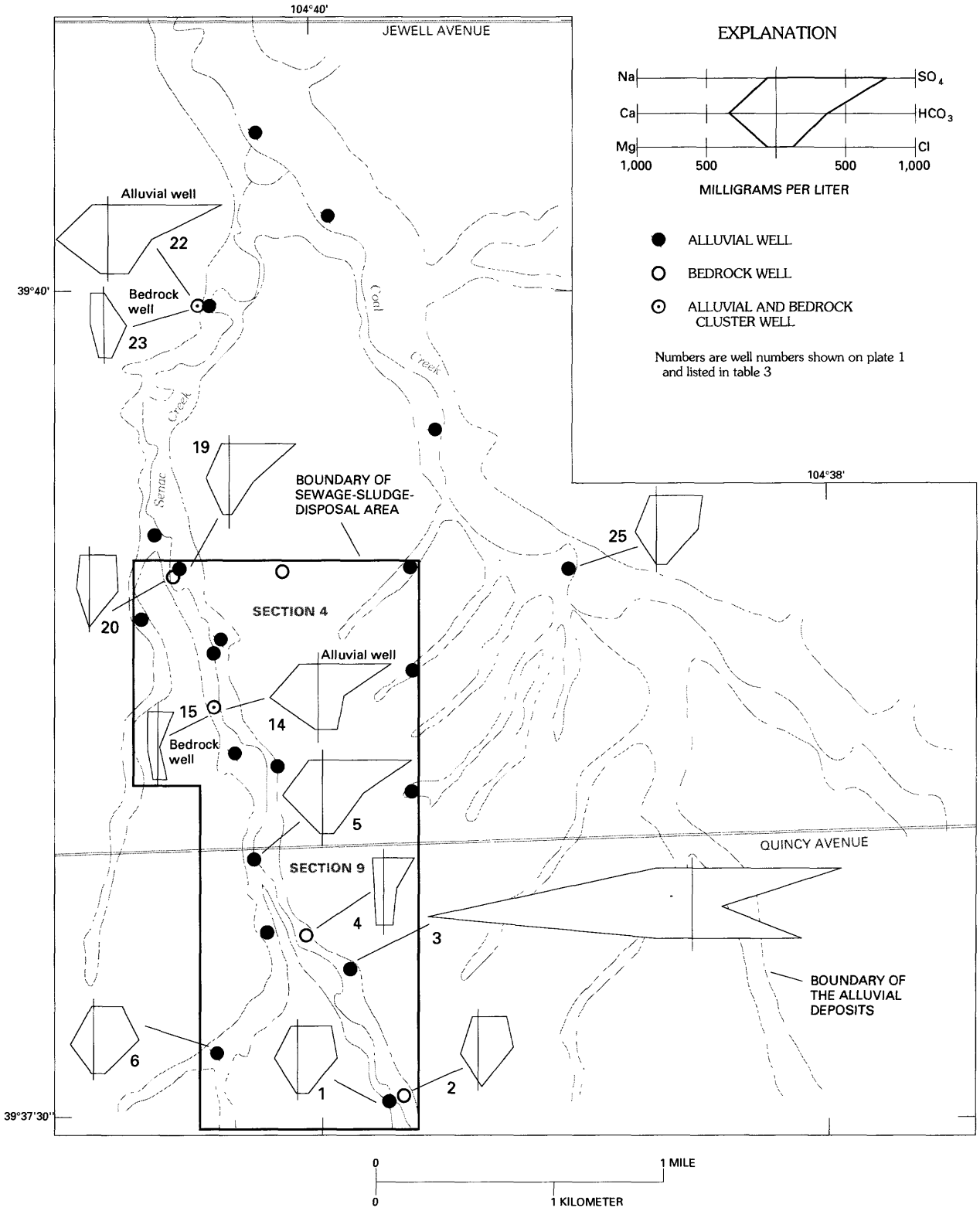

Figure 11.--Major ion concentrations in selected observation wells, summer 1987.

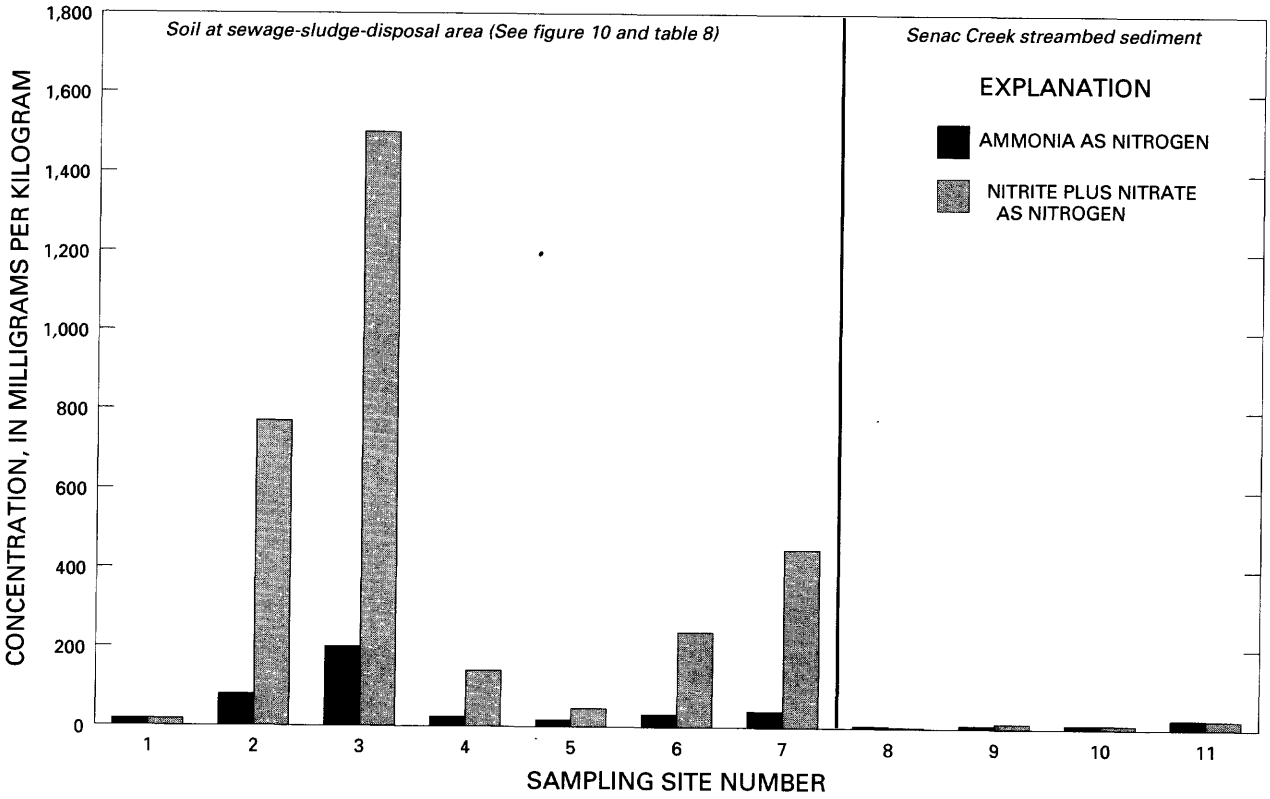

Figure 12.--Ammonia and nitrite plus nitrate concentrations, as nitrogen, in soil and streambed sediment in the sewage-sludge-disposal area, November 1986.

Nitrate concentrations at the soil and streambed-sediment sampling sites in figure 10 ranged from 3.0 to 1,500 mg/kg, and ammonia concentrations ranged from 5.7 to 200 mg/kg (fig. 12 and table 8). The smallest concentrations for both constituents were at streambed-sediment sampling site 8. Concentrations generally increased in the streambed sediment (sites 8-11) in a downstream direction, reaching concentrations of 22 mg/kg nitrate and 24 mg/kg ammonia at streambed-sediment sampling site 11. Soil sampling site 3, located in the southern part of the disposal area (fig. 10), had the largest concentrations of nitrate (1,500 mg/kg) and ammonia (200 mg/kg) of all the sites shown in figure 10.

Ammonia plus organic nitrogen concentrations for the soil and streambed-sediment sampling sites ranged from 30 to 6,200 mg/kg (fig. 13 and table 8). Concentrations in streambed sediment ranged from 30 mg/kg at site 8 to 1,300 mg/kg at site 11 (fig. 13 and table 8) and increased in a downstream direction. Soil sampling sites 2, 3, and 7 (fig. 13 and table 8) had the largest ammonia plus organic concentrations (about 6,000 mg/kg). Concentrations at soil sampling sites 1, 4, and 5 ranged from 640 mg/kg at site 1 to 3,000 mg/kg at site 4.

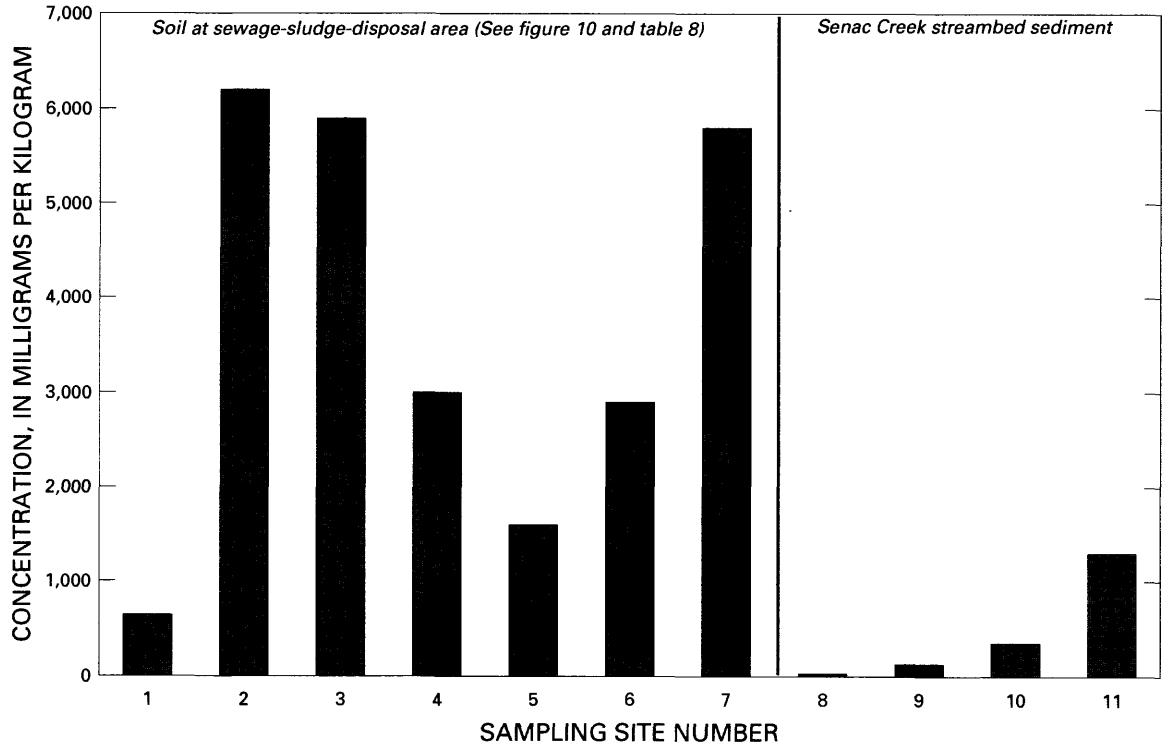

Figure 13.--Ammonia plus organic nitrogen concentrations, as nitrogen, in soil and streambed sediment in the sewage-sludge-disposal area, November 1986.

Manganese and zinc generally were the trace elements detected in the largest concentrations in the soil and streambed-sediment samples. Manganese concentrations ranged from 160 to 1,100 µg/g, and zinc concentrations ranged from 10 to 8,000 µg/g. The most toxic trace elements that were determined in the soil and streambed sediment, in order from the largest to the smallest concentrations, generally were lead, cadmium, arsenic, and mercury. These trace elements have no beneficial or desirable nutritional effects (U.S. Environmental Protection Agency, 1976, p. 83). Concentrations in the soil and streambed-sediment sampling sites ranged from: less than 10 to 140 µg/g for lead; less than 1 to 10 µg/g for cadmium; less than 1 to 5 µg/g for arsenic; and 0.01 to 3.8 µg/g for mercury (fig. 14 and table 8). Lead was present in larger concentrations than arsenic, cadmium, and mercury in the soil and the streambed sediment. In the soil, concentrations of lead ranged from 30 µg/g at site 1 to 140 µg/g at site 2 (table 8); in the streambed sediment, concentrations of lead ranged from less than 10 µg/g at site 8 and site 9 to 40 µg/g at site 11. Concentrations of arsenic and cadmium did not exceed 10 µg/g. The trace elements chromium, cobalt, and copper also were detected in the soil and streambed sediment (table 8).

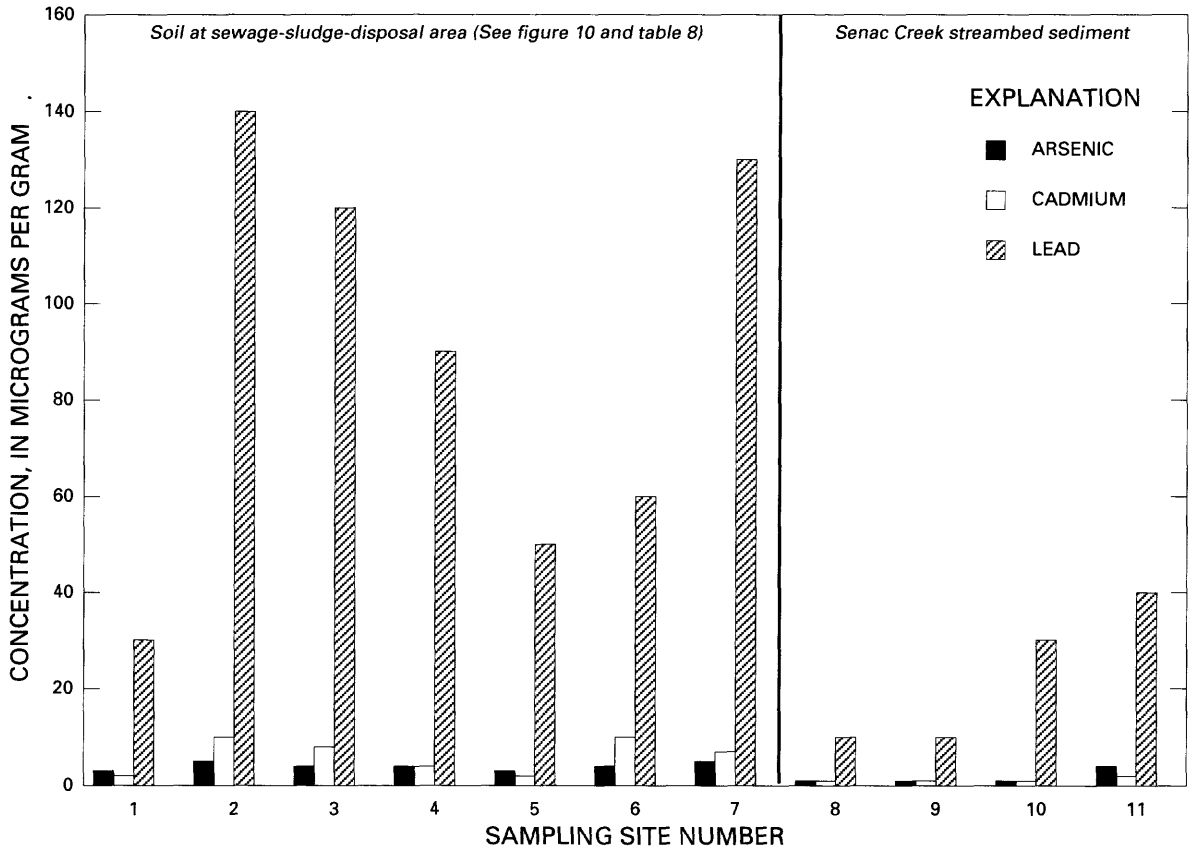

Figure 14.--Arsenic, cadmium, and lead concentrations in soil and streambed sediment in the sewage-sludge-disposal area, November 1986.

On the basis of these analyses, organic nitrogen is the dominant form of nitrogen and lead is the dominant trace element of the most toxic trace elements that occur in the soil and streambed sediment. Additionally, sites 2, 3, and 7 (table 8) contained the largest concentrations of both constituents. Trace elements generally were less than detection limits in the ground water and, therefore, probably were retained in the soil or streambed sediment.

The large concentrations of nitrate in the ground water were derived from nitrification of the ammonia and organic nitrogen in the sewage sludge by bacteria in the soil. The following equation describes the nitrogen cycle as it applies to sewage-sludge leachate affecting the ground water:

$$\text{organic N} \rightarrow NH_4 \rightarrow NO_2 \rightarrow NO_3 \rightarrow N_2O\uparrow \rightarrow N_2\uparrow \ .$$

Sewage sludge is the dominant source of organic nitrogen. Other sources of organic nitrogen include soil humus and residue of plants (P.F. Pratt, University of California, Riverside, written commun., 1975). In aerated soils, the organic nitrogen (N) is rapidly converted through the ammonia (NH_4) and nitrite (NO_2) forms to nitrate (NO_3), which is the form that most commonly occurs in the ground water in the study area. Some of the ammonia probably volatilized and was lost to the atmosphere while the sewage sludge was lying on the soil surface before being plowed into the soil (figs. 8 and 9). The Council for Agricultural Science and Technology (1976, p. 16) indicates that the quantity of ammonia lost ranges from 30 percent to essentially complete loss, depending on the properties of the sewage sludge and environmental conditions. However, because the sewage sludge was plowed into the soil daily, the loss of ammonia through volatilization probably was minimized. In anaerobic soils, such as might occur under the water-saturated sewage-sludge-holding ponds (fig. 9), volatile nitrogen compounds (N_2O and N_2) form, and escape to the atmosphere. This denitrification process is caused by microbes that use oxygen from the NO_3 and release N_2O and N_2 as waste products (P.F. Pratt, University of California, Riverside, written commun., 1975).

Because nitrate nitrogen is very mobile (Trout and others, 1976), rainfall or snowmelt can transport it through the soil and into the alluvial aquifer. Seeps at the base of several of the hillslopes have been observed after intense rain. Because the soil is underlain by clay and mudstone, which are less permeable, percolation is impeded and the water discharges laterally through the soil (Dunn and Leopold, 1978).

Ground Water

Concentrations of chloride and nitrate can be used as indicators to determine wells affected by sewage-sludge leachate. These ions are very soluble, their background concentrations are small, and they are present in large concentrations in sewage sludge. A relation of concentrations of mean chloride to mean nitrate for all wells in the study area is shown in figure 15. The mean values were determined from as many as 19 ground-water samples per well collected from 1981 to 1987.

The scatter plot is divided into three regions that correspond to observed density of plotted points. Wells in region 1 contained water that had mean concentrations of chloride less than about 60 mg/L and mean concentrations of nitrate less than 1 mg/L. Wells in region 2 contained water that had mean concentrations of chloride generally less than 30 mg/L and mean concentrations of nitrate that ranged from 1 to 10 mg/L. Wells in region 3 contained water that had mean concentrations of chloride that exceeded 60 mg/L and mean concentrations of nitrate that exceeded 10 mg/L. Region 1 includes alluvial wells 1, 6, and 25 and bedrock well 2 (pl. 1) that are upstream from the effects of the sewage-sludge-disposal area and are considered to represent background conditions unaffected by sludge leachate. Water in the 10 remaining wells in region 1, which include all the wells in the Coal Creek alluvial aquifer, all the bedrock wells, and three (onsite) wells located inside the boundaries of the sewage-sludge-disposal area, probably was not affected by leachate from the sewage sludge. Ground water from the well (19)

in region 2 (fig. 15) had an intermediate mean concentration of nitrate, and the presence of sewage-sludge leachate cannot be confirmed from these data. Region 3 includes alluvial wells (3-3a), 11, and (16-16a), which contained water that was affected by nearby sewage-sludge-disposal operations (pl. 1), and contained mean concentrations of nitrate that were much larger than the recommended limit of 10 mg/L for drinking water (U.S. Environmental Protection Agency, 1986). The remaining 10 wells in region 3 (fig. 15), 7 of which were located within the disposal area and 3 of which were located downstream from the disposal area, contained water that probably was affected by leachate from the sewage sludge.

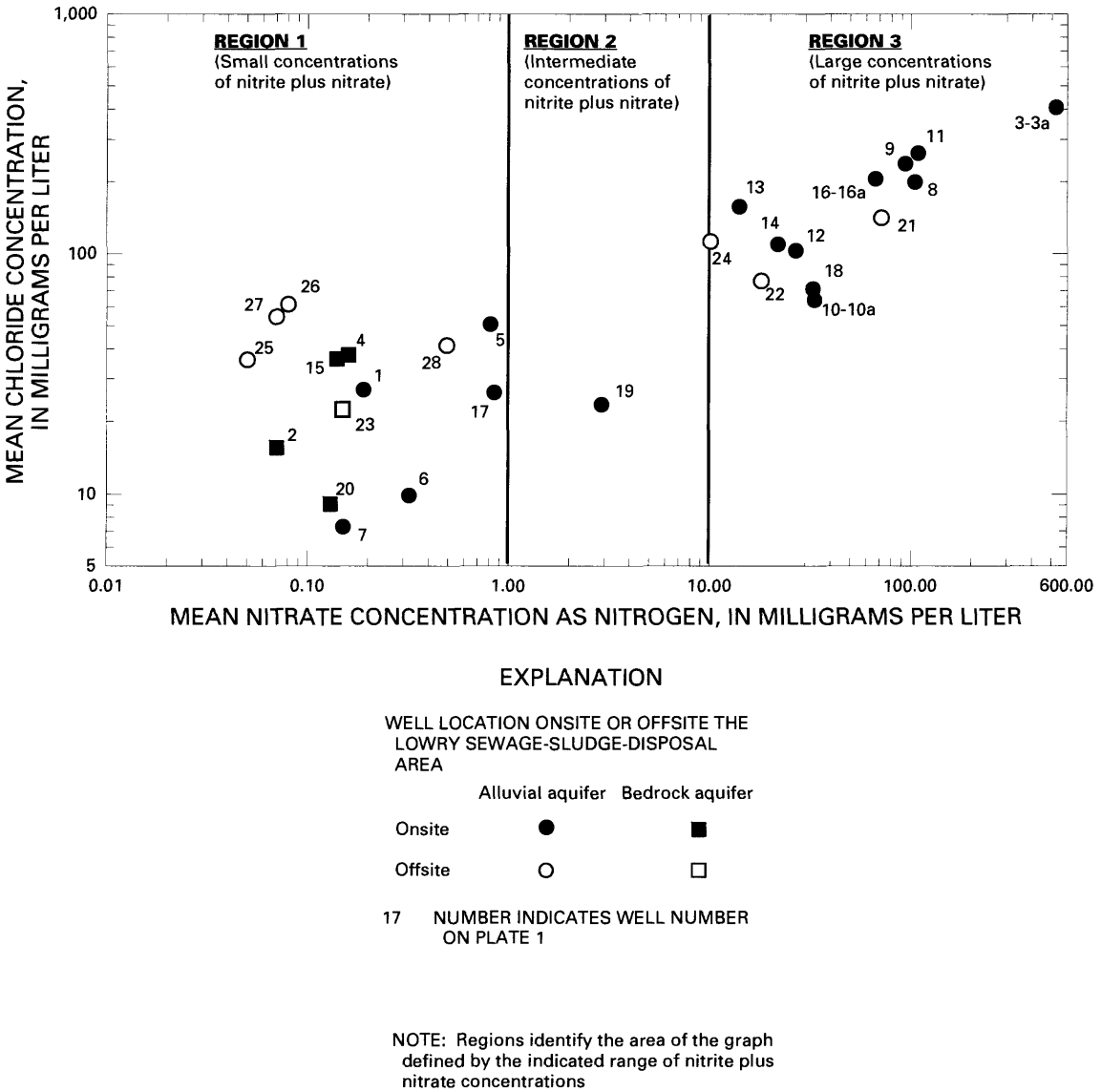

Figure 15.--Mean concentrations of chloride and nitrite plus nitrate, as nitrogen, in water from the observation wells in the study area.

Thirteen wells in the alluvial aquifer in region 3 in the study area (wells 3-3a, 8, 9, 10-10a, 11, 12, 13, 14, 16-16a, 18, 21, 22, and 24) contain water that probably was affected by sewage-sludge leachate (fig. 15). Water in ten of these wells received leachate from hillsides that were used for sewage-sludge burial, land spreading, and holding ponds. Three of these wells were located in the alluvial aquifer in the Senac Creek valley downstream from the disposal area. The bedrock aquifer probably was not affected by leachate from the disposal area. Inside the disposal area, the affected areas of the alluvial aquifer were located in: the three narrow hillside gullies at the northeast side (wells 8, 9, 10-10a); the tributary valley to Senac Creek at the northwestern corner (well 18); and Senac Creek valley (wells 3-3a, 11, 12, 13, 14, and 16-16a). A few hundred feet downstream (well 21) and about 1 mi downstream (wells 22 and 24) from the disposal area, the alluvial aquifer in Senac Creek valley contained large nitrate concentrations. Well 21 probably was affected by leachate leaving the disposal area in the alluvial aquifer in the tributary valley near well 18, and possibly by ground-water contamination by surface-water floodflow into the open, abandoned stock well (pl. 1) near well 21. Wells 22 and 24 may have been affected by the sewage-sludge-disposal area in section 32 that has been abandoned since 1980 (pl. 1).

Alluvial Aquifer

The alluvial aquifer in Senac Creek valley winds through the center of the sewage-sludge-disposal area (pl. 1) and therefore is vulnerable to contamination. The main effect of leachate from the sewage sludge is on the shallow ground water in the Senac Creek valley because most of the leachate from the disposal area drains into this valley. The nitrate concentrations in samples from wells in the alluvial aquifer during the study are shown in figures 16-20.

During 1981-83, ground-water samples from 10 wells in the sewage-sludge-disposal area were collected and analyzed for nitrate. The concentrations of nitrate in the ground-water samples collected each year and the downstream location of each well are illustrated in figure 16. The range of concentrations at each well is indicated by symbols connected with a vertical line. No water samples were collected for nitrate analysis during 1981-82 for wells 3a, 14, and 16a because there was not enough water for collection of samples.

The concentrations of nitrate in the alluvial aquifer in Senac Creek valley were greater in 1983 than in 1981-82 (fig. 16). In 1983, concentrations in 5 of the 10 wells were larger than 10 mg/L and of these, 3 were larger than 100 mg/L. The largest concentrations were along the eastern edge of the alluvial aquifer in well 3a (480 mg/L), well 11 (480 mg/L), and well 16a (261 mg/L). Concentrations were smallest at the southern boundary of the disposal area (well 1) and in the middle of the disposal area (well 5). After these increases in nitrate concentrations were detected, additional observation wells were installed and the sampling frequency was increased to quarterly.

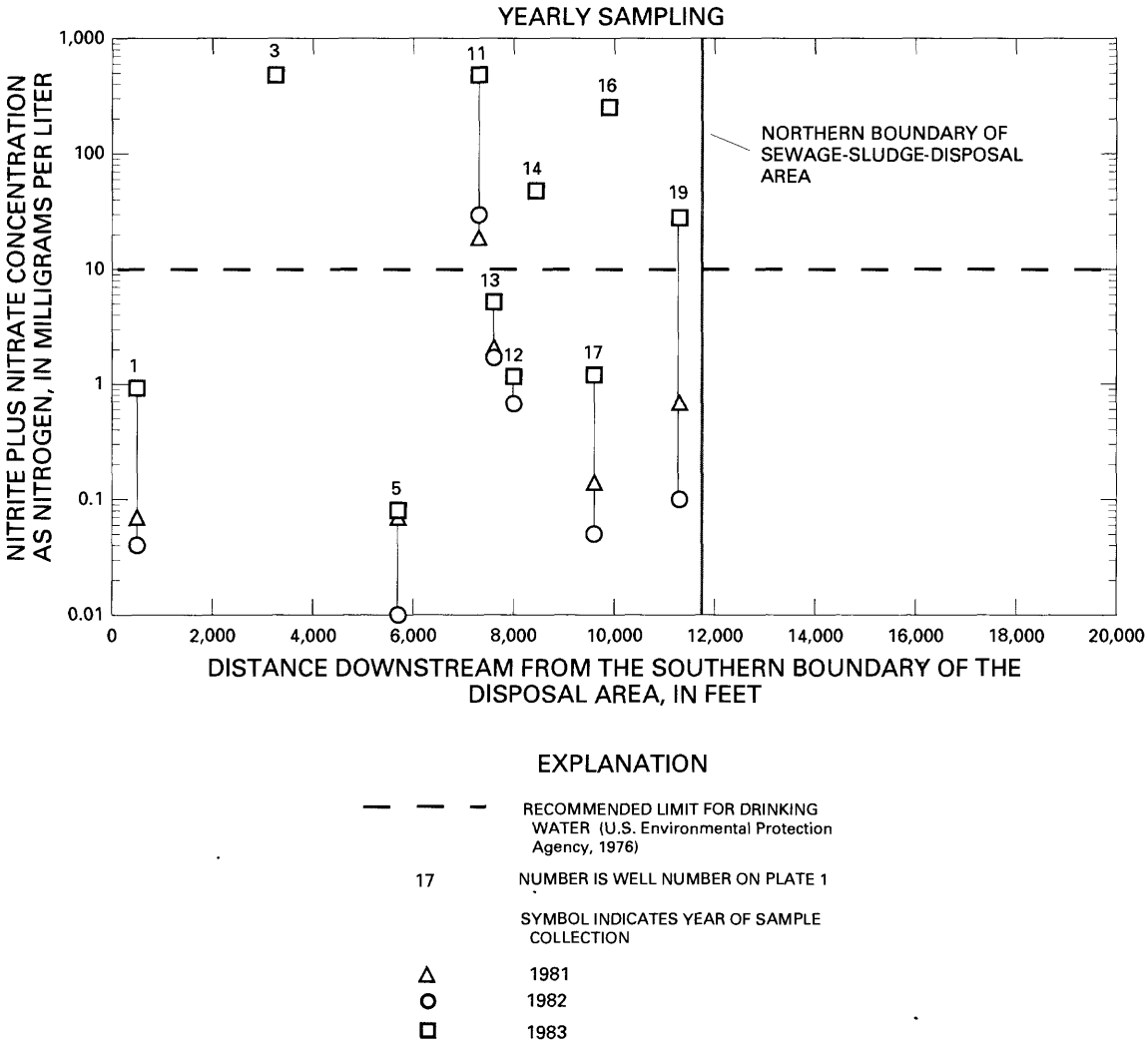

Figure 16.--Relation between concentrations of nitrite plus nitrate, as nitrogen, in ground water and distance downstream in the alluvial aquifer in Senac Creek valley, 1981-83.

The alluvial wells in Senac Creek valley generally were sampled quarterly during 1984-87. The concentrations of nitrate in ground-water samples collected during 1984-87 for one quarter of each year are shown in figures 17-20. The first quarter (fig. 17) includes the concentrations in samples collected in January, February, and March; the second quarter (fig. 18) includes April, May, and June, and so forth. The sampling area was enlarged during 1984-87; wells 21, 24, and 28 were added to the sampling network. Well 28 is in the alluvial aquifer in the Coal Creek valley (pl. 1) about 0.25 mi downstream from the mouth of Senac Creek and was used to detect contamination leaving the alluvial aquifer in Senac Creek valley.

The concentrations of nitrate increased in a downstream direction in the alluvial aquifer in Senac Creek valley through the sewage-sludge-disposal area and then decreased to background levels at well 28 (figs. 17-20). This indicates that the large nitrate concentrations probably have not yet reached the alluvial aquifer in the Coal Creek valley. Within the disposal area, wells 3, 11, 12, 13, 14, and 16 contained water with the largest concentrations or

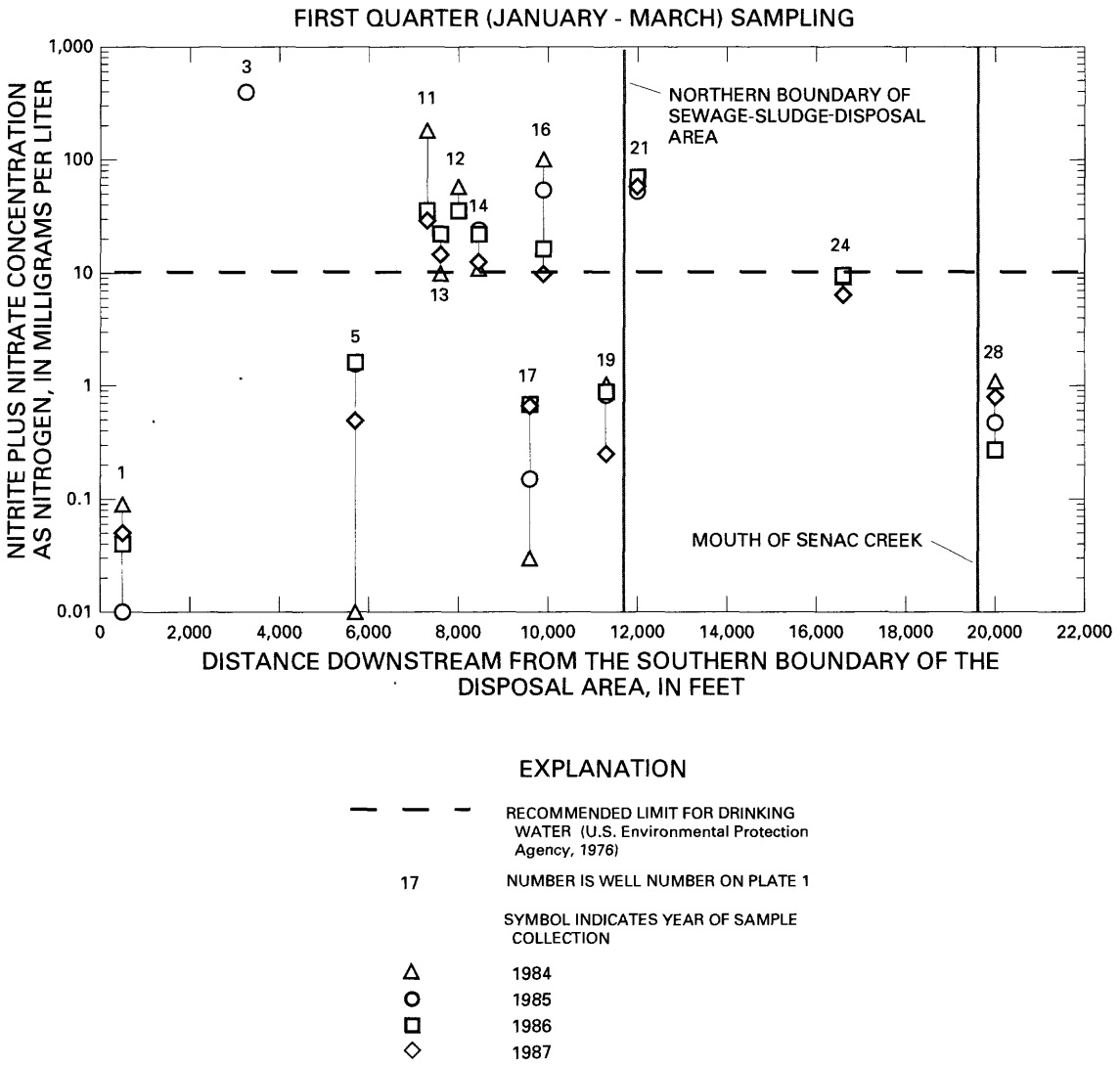

Figure 17.--Relation between concentrations of nitrite plus nitrate, as nitrogen, in ground water and distance downstream in the alluvial aquifer in Senac Creek valley and in the alluvial aquifer in Coal Creek valley downstream from the mouth of Senac Creek, first quarter (January-March), 1984-87.

ranges. Concentrations in wells 3, 11, and 16 varied several hundred milligrams per liter between quarters of the same year. Concentrations in wells 1, 5, 17, and 19 were consistently less than 10 mg/L. The overall range of concentrations were generally largest during the second quarter and smallest during the third quarter.

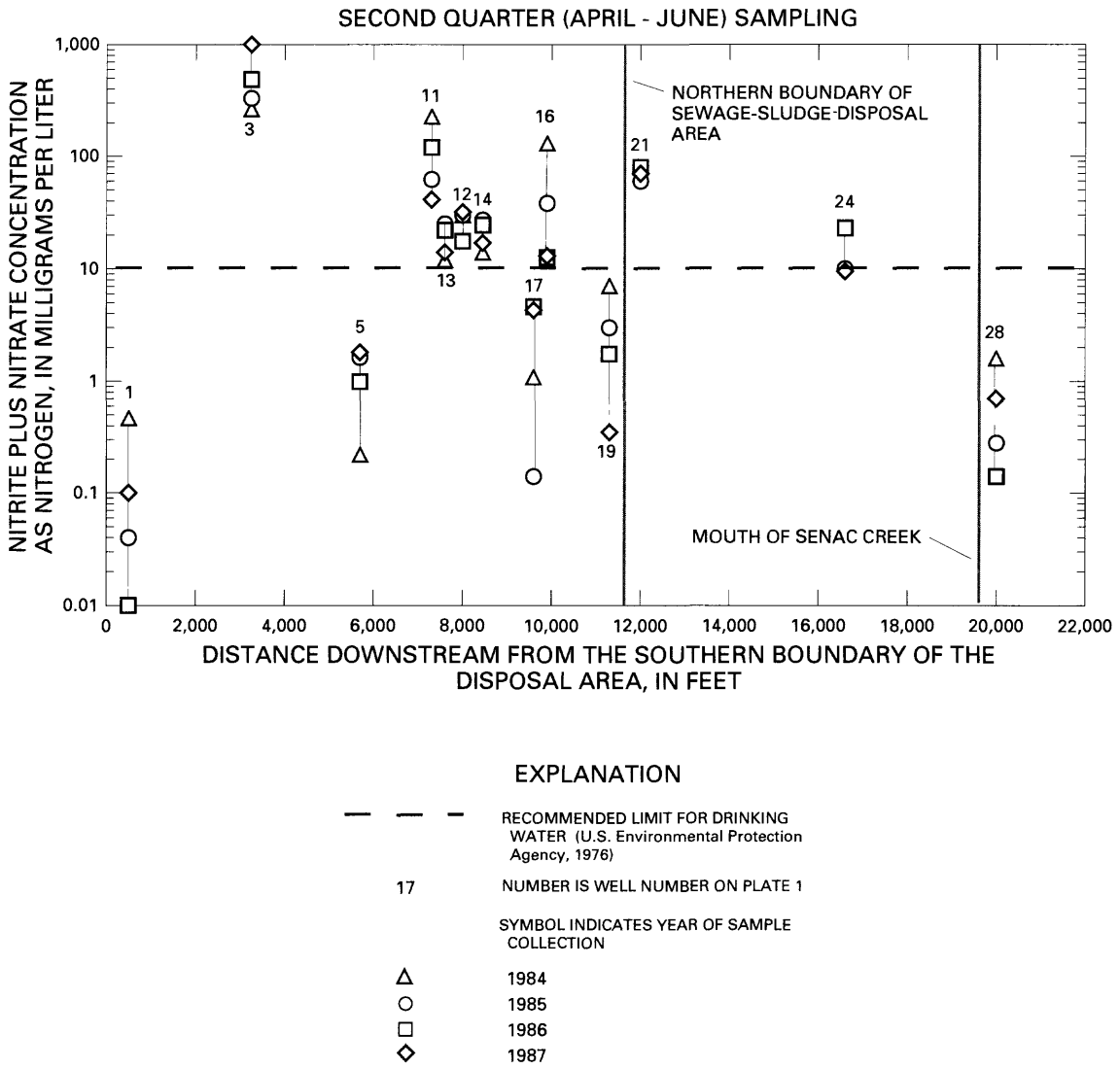

Figure 18.--Relation between concentrations of nitrite plus nitrate, as nitrogen, in ground water and distance downstream in the alluvial aquifer in Senac Creek valley and in the alluvial aquifer in Coal Creek valley downstream from the mouth of Senac Creek, second quarter (April-June), 1984-87.

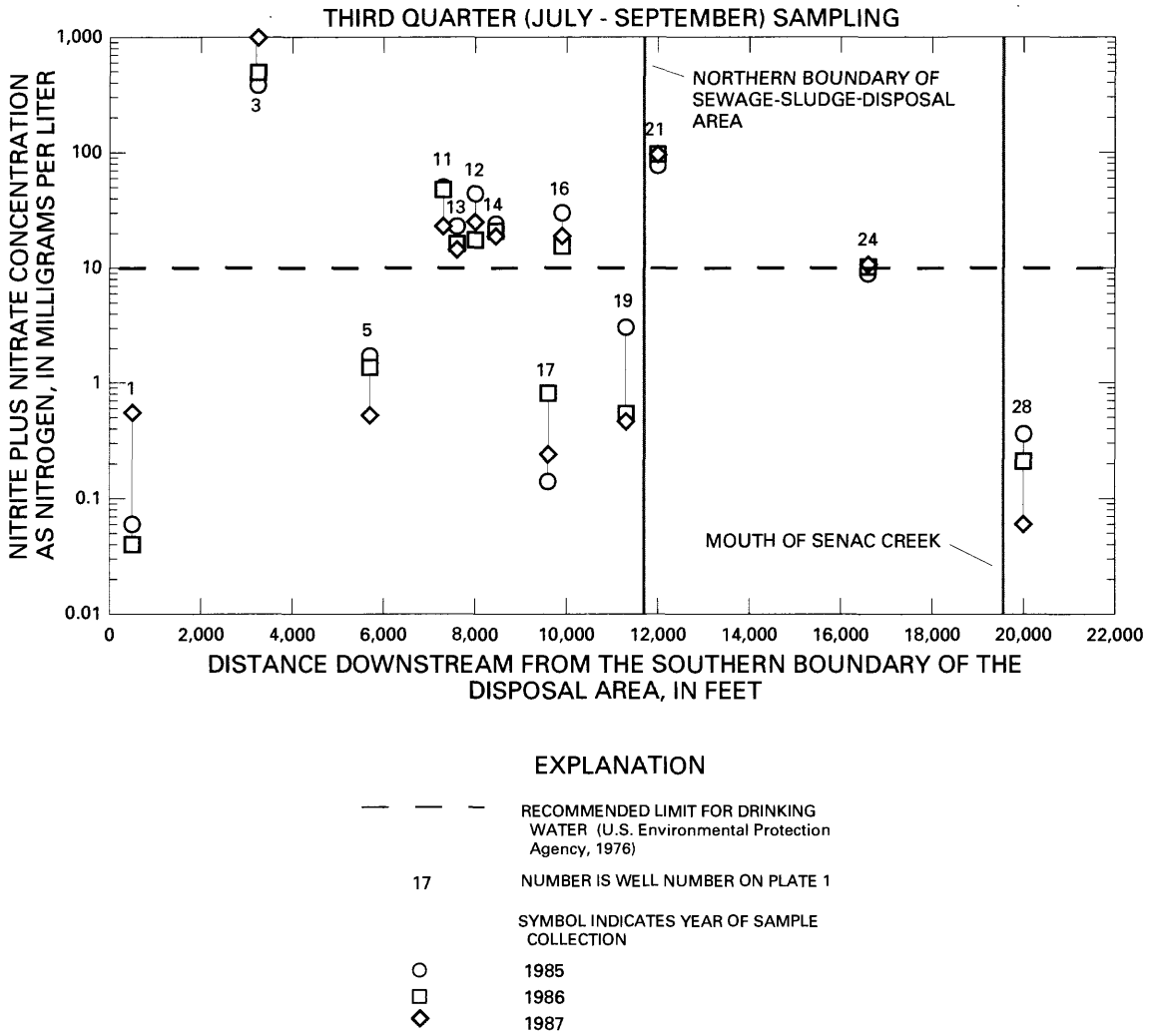

Figure 19.--Relation between concentrations of nitrite plus nitrate, as nitrogen, in gound water and distance downstream in the alluvial aquifer in Senac Creek valley and in the alluvial aquifer in Coal Creek valley downstream from the mouth of Senac Creek, third quarter (July-September), 1984-87.

The alluvial wells that had nitrate concentrations generally less than 10 mg/L inside the sewage-sludge-disposal area (wells 1, 5, 17, and 19, figs. 16-20) are located on the western side of the alluvial aquifer (pl. 1). The western side of the disposal area had no deep burial of sewage sludge and fewer sewage-sludge-holding ponds.

Water from well 1, located near the upstream boundary of the disposal area (pl. 1), was not affected by the sewage-sludge-disposal operations and generally contained less than 0.5 mg/L of nitrate and had a maximum concentration of 0.92 mg/L in 1983 (fig. 16 and table 7).

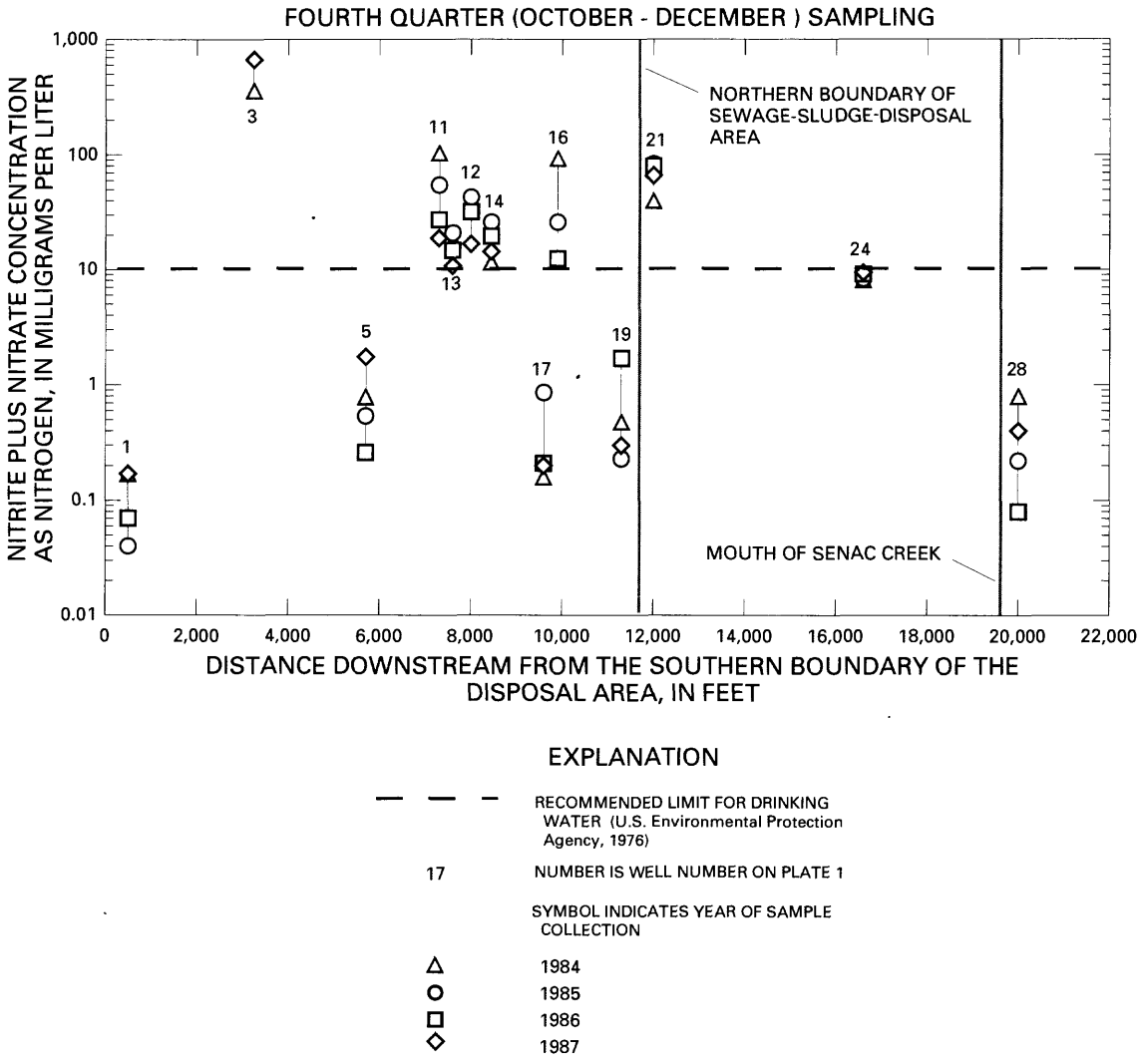

Figure 20.--Relation between concentrations of nitrite plus nitrate, as nitrogen, in ground water and distance downstream in the alluvial aquifer in Senac Creek valley and in the alluvial aquifer in Coal Creek valley downstream from the mouth of Senac Creek, fourth quarter (October-December), 1984-87.

Well 5 is located approximately in the middle of the disposal area (pl. 1) and downgradient from sewage-sludge-disposal operations, but nitrate concentrations in ground-water samples from this well did not exceed 2 mg/L.

There are several possible explanations for this: (1) The leachate from section 9 had not been transported that far downgradient, (2) the well was situated too far to the west side of the alluvial aquifer to come in contact with the leachate plume, or (3) the better quality ground water from seeps in Senac Creek and the nearby tributary diluted the effects of the leachate. Insufficient data are available to explain the smaller nitrate concentrations, but a combination of (1) and (2) seems the most reasonable explanation.

Well 17 is located near the western side of the alluvial aquifer near the northwestern corner of the sewage-sludge-disposal area, and well 19 is located at the northern boundary of the disposal area at the western side of the alluvial aquifer (pl. 1). Both of these wells contain water with nitrate concentrations that generally are substantially less than 10 mg/L (with the exception of a sample containing 28 mg/L collected during 1983 from well 19). These two wells apparently are not as affected by leachate from sewage sludge as wells on the eastern side because most of the sewage sludge was deposited on the hillsides to the east of the alluvial aquifer in Senac Creek valley (pl. 1).

Median concentrations of nitrate in samples from wells downstream from the sewage-sludge-disposal area were: 70 mg/L in well 21; 9.5 mg/L in well 24; and 0.78 mg/L in well 28 (table 7). Possible sources of the degraded water in well 21 are the alluvial aquifer in Senac Creek valley at the northern boundary of the disposal area, which is monitored by well 19, and the small alluvial aquifer that is tributary to Senac Creek, which is monitored by well 18 (pl. 1). Concentrations of nitrate in well 19, which is only about 700 ft upstream from well 21, were about one-tenth those in well 21. The smaller concentrations of nitrate from well 19 indicate that the source of the degraded water in well 21 was not from the ground water in the alluvial aquifer in Senac Creek valley near well 19. However, the water in well 18 in the tributary alluvial aquifer contained nitrate concentrations that ranged from 0.64 to 60 mg/L during the study period (tables 6 and 7). The open well of an abandoned windmill that was used as a stock well is located about 150 ft upstream from well 21. This stock well could have affected the ground water at this location by the accumulation of manure from cattle in the area or by enabling infiltration of surface runoff into the open stock well after the windmill was destroyed. Robson (1976, p. 81) sampled the nearby stock well near well 21 (pl. 1) from 1974 to 1976 and obtained nitrate concentrations ranging from 15 to 31 mg/L.

The concentrations of nitrate in well 24, which is located about 1 mi downstream from the sewage-sludge-disposal area, generally were about 10 mg/L during 1984-87 (figs. 17-20). Robson (1976, p. 81) reported that well 24 contained concentrations of nitrate ranging from 0.28 to 5.3 mg/L from 1974 to 1976. The most probable source of nitrate of the ground water in well 24 is the sewage sludge that was deposited in section 32 (pl. 1). Robson (1976, p. 81) sampled wells at the edge of the Senac Creek alluvium in section 32 and obtained concentrations of nitrate of about 10 mg/L for two wells in 1974 and in 1975. Because section 32 was not sampled as part of the 1981-87 study, the present concentrations are not known.

To illustrate the trends in nitrate concentrations in the alluvial aquifer with location and time, a line-graph format is used in figures 21-23.

Several wells are plotted on each graph to show the difference or similarity between areas. The alluvial aquifer contained water with concentrations of nitrate ranging from less than 0.01 to 1,060 mg/L; the maximum concentration was 1.7 mg/L for wells representing background conditions (fig. 21*A*).

The smallest and largest ground-water concentrations of nitrate are shown in figure 21. The wells that had background concentrations of nitrate (wells 1, 6, and 25, fig. 21*A*) were located upstream from the sewage-sludge-disposal operations and indicated the condition of the ground water unaffected by the sewage-sludge leachate in: the alluvial aquifer in Senac Creek valley (well 1), the alluvial aquifer in the unnamed tributary valley at the southwestern corner of the disposal area (well 6), and the alluvial aquifer in the Coal Creek valley (well 25).

The largest concentrations of nitrate occurred in samples of the water at the eastern edge of the alluvial aquifer in Senac Creek valley within the disposal area (fig. 21*B*) and in the alluvial aquifer in three narrow hillside gullies near the eastern boundary of the disposal area in section 4 (fig. 21*C* and pl. 1). Concentrations of nitrate in these areas generally ranged from about 7 to 1,060 mg/L (table 7). The alluvial aquifer in the narrow hillside gullies and the eastern edge of the alluvial aquifer in Senac Creek valley drain the hillsides where most of the sewage sludge was deposited.

Water collected during 1981-87 from the alluvial aquifer in the three narrow hillside gullies at the eastern boundary of the sewage-sludge-disposal area [wells 8, 9, and 10-10a (fig. 21*C* and pl. 1)] contained concentrations of nitrate that ranged from 6.8 mg/L in well 10-10a during 1982 to 190 mg/L in well 9 during 1987. Ground-water samples were collected from well 8 from June 1984 through October 1985, during which the concentrations of nitrate decreased from 150 to 77 mg/L; the well then went dry after the fourth quarter of 1985. Well 10-10a at the northeastern corner of the disposal area contained water with concentrations of nitrate of 6.8 mg/L during 1982, 73 mg/L in 1983, and 80 mg/L in 1987. However, during most of the study period, the concentrations for well 10-10a generally ranged from 20 to 50 mg/L (table 7).

Smaller concentrations of nitrate were detected in most of the water in the alluvial aquifer draining the western parts of sections 4 and 9. The nitrate concentrations during 1981-87 were: generally less than 2 mg/L in section 9 (wells 5, 6, and 7 in fig. 22*A*); generally from 10 to 30 mg/L in the southern half of section 4 (wells 13 and 14 in fig. 22*B*); and generally less than 10 mg/L in the northern half of section 4 (wells 17 and 19 in fig. 22*B*). At the northwestern corner and about 1 mi downstream from the sewage-sludge-disposal area (fig. 22*C*), larger nitrate concentrations that ranged from less than 10 to about 100 mg/L during 1983-87 were present in water from wells 18, 21, and 22. Nitrate concentrations in well 18 were less than 2 mg/L during 1981-82. About 1.5 mi downstream from the disposal area in the alluvial aquifer in Coal Creek valley, well 28 (fig. 22*C*) contained water that had nitrate concentrations less than background concentrations--less than 0.1 to 1.6 mg/L.

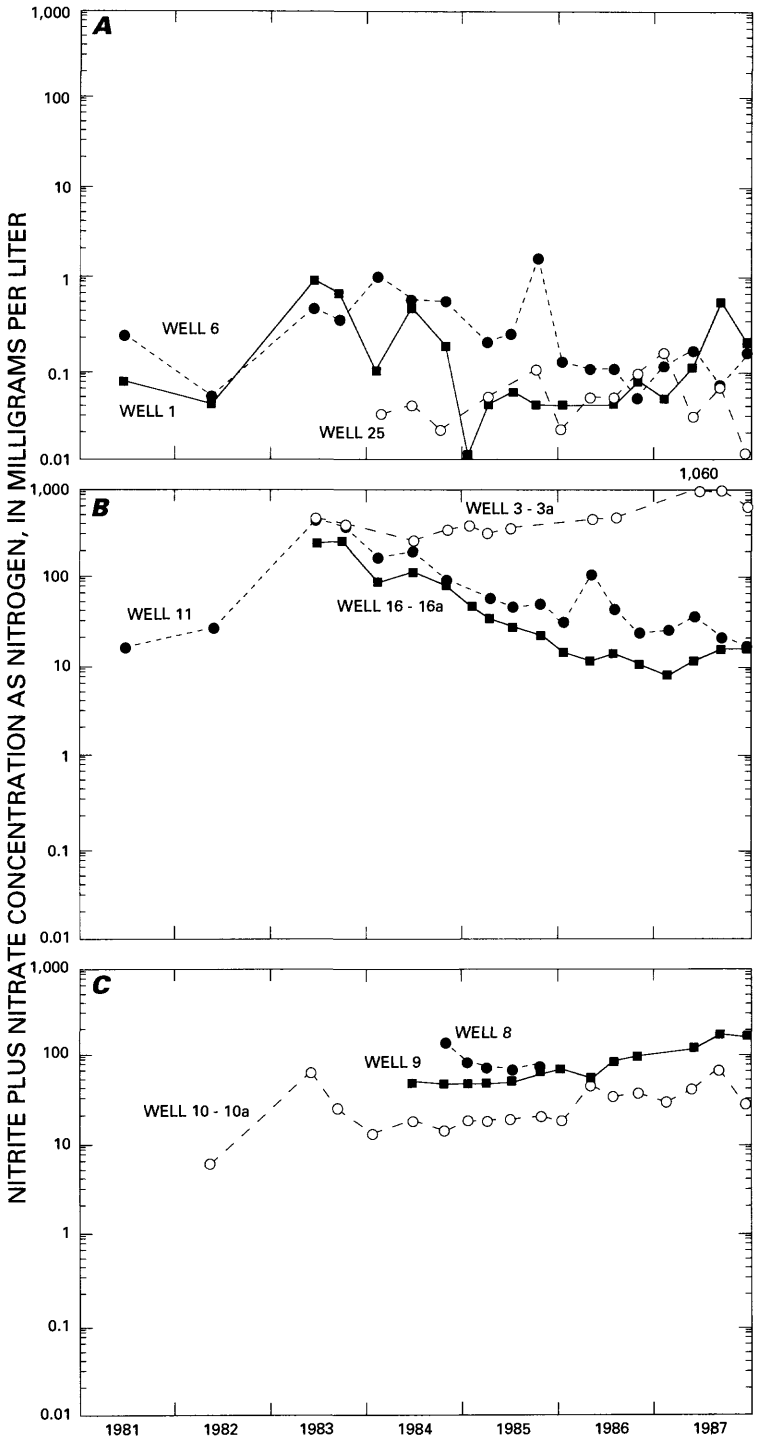

Figure 21.--Concentrations of nitrite plus nitrate, as nitrogen, in areas representing background conditions and in areas most affected by sewage-sludge contamination in the alluvial aquifer, 1981-87: *A*, Background conditions (upstream from the effects of leachate from sewage sludge; *B*, Eastern edge of the alluvial aquifer in the Senac Creek Valley; *C*, Alluvial aquifer in the narrow valleys at the eastern boundary of the disposal area.

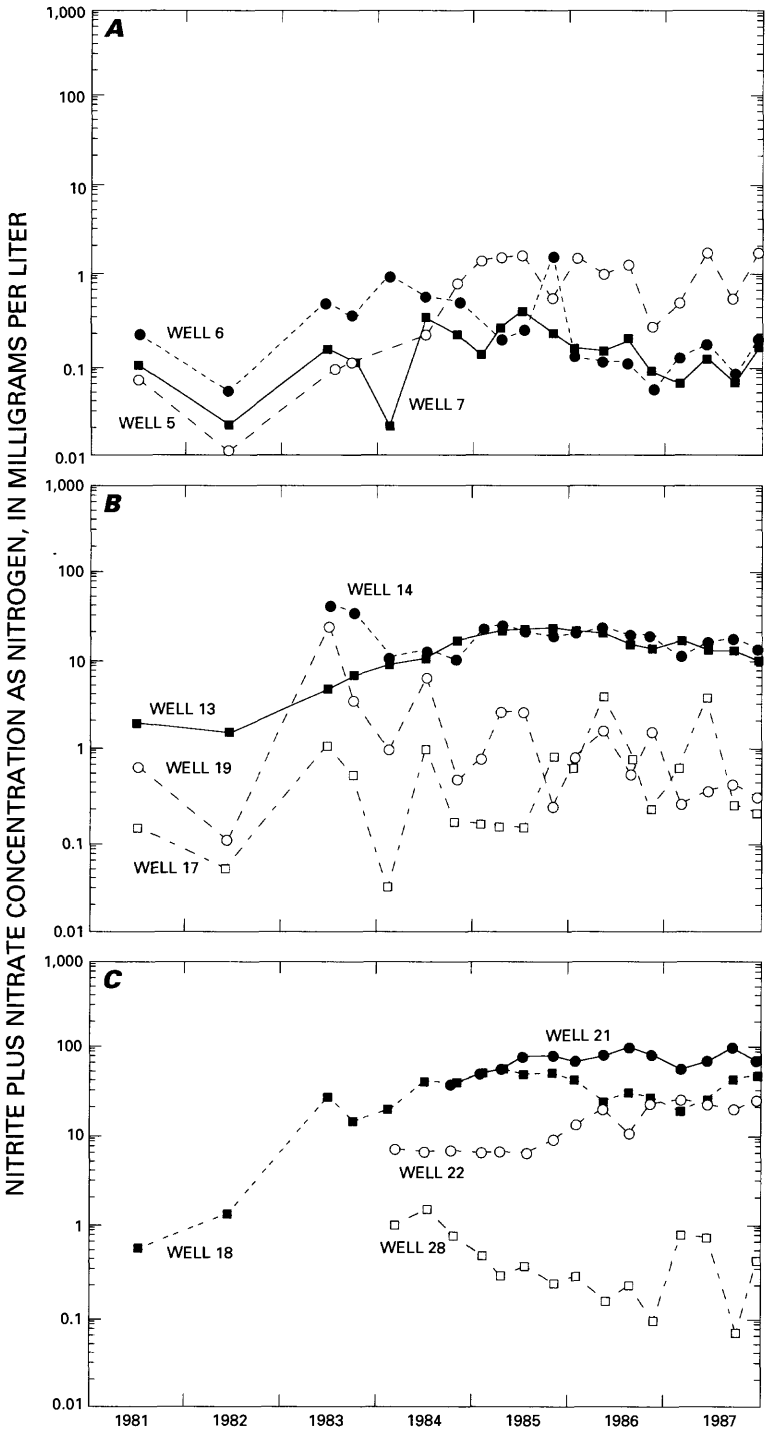

Figure 22.--Concentrations of nitrite plus nitrate, as nitrogen, in the alluvial aquifer within and downstream from the sewage-sludge-disposal area, 1981-87: *A*, Section 9, in sewage-sludge-disposal area; *B*, Section 4, in sewage-sludge-disposal area; *C*, Northwest corner and downstream from sewage-sludge-disposal area.

In the alluvial aquifer in the Coal Creek valley, concentrations of nitrate generally were less than 1 mg/L; concentrations in most samples were less than 0.1 mg/L (fig. 23*A* and *B*). The plots of nitrate concentrations for wells in the alluvial aquifer in Coal Creek valley (fig. 23*A* and *B*) show that concentrations of nitrate for well 25, which also is a background well, and wells 26 and 27 generally range from less than 0.01 to about 0.3 mg/L. The slightly larger nitrate concentrations in well 28 may have been the result of surface-water runoff from the Senac Creek valley during 1983 seeping into, and mixing with, some of the alluvial ground water from the Coal Creek valley.

The plots of concentrations of nitrate with time (figs. 21-23) show seasonal trends and trends caused by precipitation. In addition to yearly fluctuations, there were noticeable increases in ground-water concentrations of nitrate that coincided with increased precipitation. The largest increases occurred in those wells that were monitored before 1983. For example, concentrations in well 11 (fig. 21*B*) increased from about 20 mg/L in 1981 to 480 mg/L in 1983. The increases in concentrations of nitrate in the alluvial ground water in 1983 coincided with a time of near maximum annual precipitation for the study area (fig. 3). After 1983, the nitrate concentrations generally decreased or did not increase in 11 out of 13 wells, and precipitation ranged from about 13 to about 20 in/yr.

Water samples were collected quarterly for analysis of fecal-coliform and fecal-streptococci bacteria. Fecal streptococci were detected in all wells, sometimes in large concentrations. Only the stock well (well 13) contained fecal-coliform concentrations larger than detection limits reported in table 6 for three or more sampling dates during the study period.

Lin and others (1974, p. 295) used the fecal-coliform/fecal-streptococci ratio to determine whether the source of bacterial contamination was primarily from a human source (ratios greater than 4) or from warm-blooded animals other than human (ratios less than 0.7). Mean concentrations for well 13 during the study period (table 7) are about 2 colonies per 100 mL for fecal coliform and about 485 colonies per 100 mL for fecal streptococci, which is a ratio of about 0.004. Because the ratio is much less than 0.7, the bacterial contamination at this stock well probably is caused by cattle. Fecal-coliform/fecal-streptococci ratios cannot be calculated for the other alluvial wells because the coliform bacteria were almost always less than the detection limit (table 6 in the "Supplemental Information" section).

Bedrock Aquifer

The bedrock aquifer, which underlies the alluvial aquifer in the study area, mostly is composed of mudstone and scattered sandstone lenses. Observation wells penetrate to a maximum depth of 113 ft in this aquifer and obtain most of the water from sandstone lenses. The potential for vertical ground-water flow in the Senac Creek valley is difficult to determine because individual sandstone lenses probably have different piezometric heads relative to the alluvial aquifer.

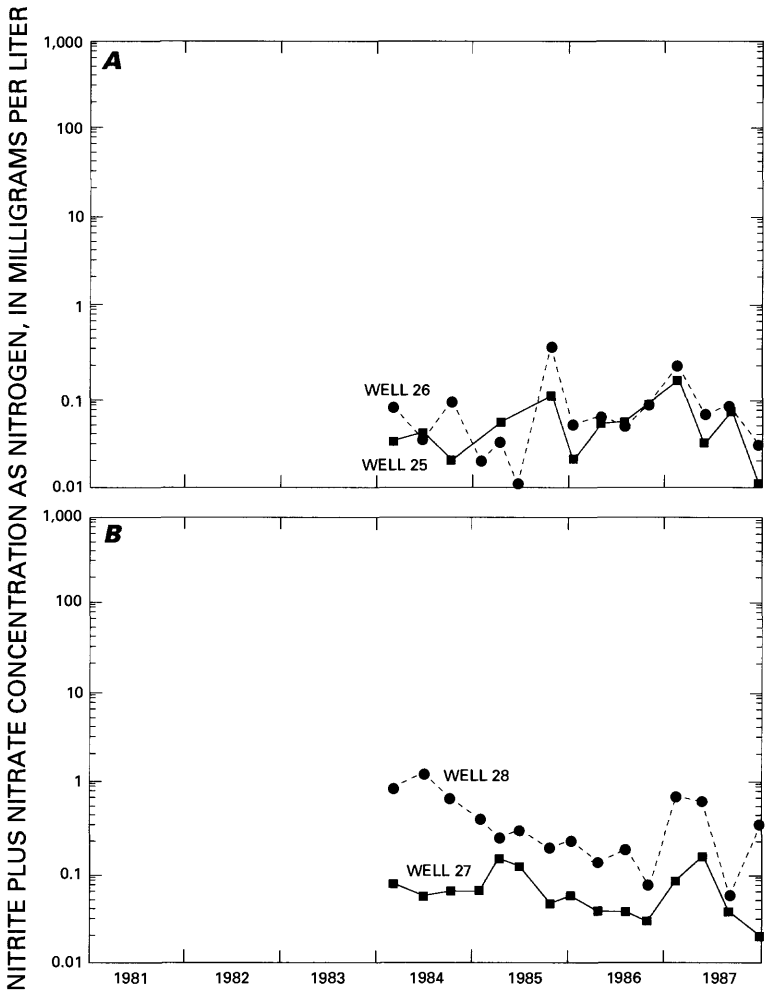

Figure 23.--Concentrations of nitrite plus nitrate, as nitrogen, in the alluvial aquifer in Coal Creek valley, 1981-87: *A*, Wells 25 and 26; *B*, Wells 27 and 28.

Concentrations of nitrate during 1981-87 in samples from wells completed in the bedrock aquifer are shown in figure 24. The bedrock aquifer contained water with concentrations ranging from less than 0.01 to 0.61 mg/L (fig. 24); the maximum ground-water concentration of nitrate for well 2, which represents background conditions, was 0.22 mg/L. The other bedrock wells monitor the bedrock ground water inside the disposal area and downgradient from the disposal area in the Senac Creek valley. The largest concentrations of nitrate were in wells 15 and 23. Well 15 had a maximum concentration of 0.59 mg/L in February 1984, and well 23 had a maximum concentration of 0.61 mg/L in

June 1984. Well 15 is located inside the disposal area, and well 23 is located about 1 mi downgradient from the disposal area. After October 1984, concentrations of nitrate in bedrock wells 2, 4, 15, 20, and 23 ranged from less than 0.01 to 0.3 mg/L (table 7).

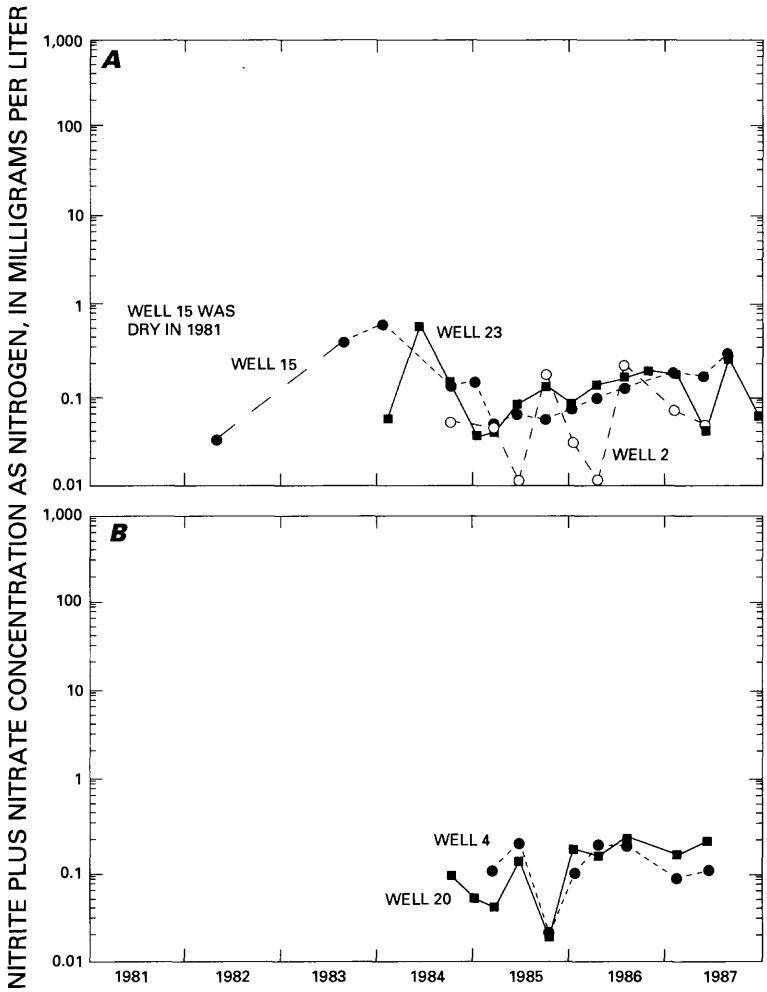

Figure 24.--Concentrations of nitrite plus nitrate, as nitrogen, in the bedrock aquifer, 1981-87: *A*, Wells 2, 15, and 23; *B*, Wells 4 and 20.

Well 15 (fig. 24*A*) is the only bedrock well that was monitored since 1981. The concentrations of nitrate in water samples from this well increased from 0.03 mg/L in 1982 (the well was dry in 1981) to about 0.4 mg/L in 1983 and then to a maximum of about 0.6 mg/L in early 1984. After 1984, concentrations of nitrate in the water in well 15 decreased to 0.05 mg/L and by 1987 had increased to about 0.3 mg/L. Because the background concentrations

of nitrate were not monitored in well 2 until October 1984, it is impossible to determine if the increase in well 15 from 1982 to early 1984 was due to sewage-sludge leachate. Sources of nitrate to the bedrock ground water, other than leachate from the sewage sludge, are indicated by the increase in concentrations of nitrate in well 2 during 1985 to 1986.

Water samples were collected quarterly for fecal-coliform and fecal-streptococci bacteria from wells in the bedrock aquifer. Fecal streptococci were detected in all wells (table 6). Only a few samples from all the bedrock wells contained fecal coliform greater than the detection limits indicated in table 6 during the study period. As with the alluvial aquifer, the cattle in the study area probably were the principal source for the bacteria.

Movement

Contaminants from sewage-sludge leachate that were detected in the alluvial ground water in some parts of the study area have the potential to move with the ground-water flow. The velocity of the ground-water flow is not well known because the porosity and hydraulic conductivity of both aquifers and the hydraulic gradient in the bedrock aquifer, are not well known. Robson (1976, p. 9) estimated the hydrologic characteristics of the alluvial and bedrock aquifers. Using a hydraulic gradient of 0.011, the velocities in the bedrock aquifer ranged from 9.1×10^{-4} to 84 ft/yr with a mean of 27 ft/yr. In the alluvium, using a hydraulic gradient of 0.011, the velocities ranged from 9.4×10^{-2} to 1,500 ft/yr with a mean of 380 ft/yr. The rate of movement of contaminants from the disposal area is difficult to estimate because the range of estimated flow velocities for the area is large, and the processes of dispersion, mixing, and dilution from surface recharge and biological degradation decrease the concentrations of the contaminants.

The pathway that the contamination would take is easier to estimate. The contamination seems to move downstream in the alluvial aquifer but also has the potential to move from the alluvial aquifer to the bedrock aquifer. Because the water levels in the bedrock aquifer generally are lower than those of the alluvial aquifer (see the "Geohydrology" section), the contamination in the alluvial aquifer could migrate to the bedrock aquifer. However, no contamination was detected in the bedrock aquifer during the study period. Development of ground-water supplies in the bedrock aquifer that result in lowering the piezometric head of the bedrock aquifer would result in an increased potential for bedrock-ground-water contamination. The bedrock aquifer mostly is mudstone that has lenses of sandstone imbedded within it. The sandstone lenses produce most of the water and probably are not connected, so a continuous pathway for ground-water flow through the bedrock aquifer would have to pass through the mudstone.

The nearest domestic wells to the disposal area are near surface-water sampling site SW-8 (pl. 1). These wells obtain water from the bedrock aquifer. There are no domestic wells completed in the alluvial aquifer in the study area.

Surface-Water Runoff

Surface-water-runoff quality probably is affected by the sewage-sludge-disposal area at sampling sites inside and downstream from the disposal area. Water samples from surface-water runoff were obtained in 1984, 1985, and 1987. Concentrations of nitrate, calcium, sulfate, and to a lesser extent sodium, magnesium, and chloride increased in the surface-water runoff passing through the sewage-sludge-disposal area in Senac Creek (fig. 25 and tables 6 and 7 in the "Supplemental Information" section). The major ions in the surface-water runoff at sites SW-1 and SW-7 (fig. 25), which were not affected by the sewage-sludge leachate, predominantly were calcium and bicarbonate. However, in the surface-water runoff at SW-2, SW-3, SW-4, and SW-8, there is a pronounced increase in the concentrations of sulfate, calcium, and chloride ions, which probably is caused by the sewage-sludge leachate.

Concentrations of nitrate in surface water were larger within and downstream of the sewage-sludge-disposal area than upstream of the disposal area (fig. 26). Data from the analyses of the water samples collected at surface-water sampling sites in Senac Creek indicate that the nitrate concentrations: were less than 0.4 mg/L at the southern boundary of the disposal area (SW-1, pl. 1); ranged from about 20 to about 600 mg/L inside the disposal area (SW-2, SW-3, and SW-6); and ranged from about 3 to about 40 mg/L at the mouth of Senac Creek (SW-4).

Because Senac Creek was dry for most of the study period, the water table was below the streambed, and ground water did not have the potential to affect surface-water quality. However, surface-water runoff, which probably was affected by the sewage-sludge leachate from the soil in the sewage-sludge-disposal area, had the potential to transport the leachate into the alluvial ground water. Chemical analyses of the infrequent surface-water runoff during the study period indicate that the nitrate concentration in surface water was greater than that of most of the alluvial ground water. The mean nitrate concentration in Senac Creek inside the disposal area (SW-2, pl. 1) was 173.87 mg/L (table 7).

Coal Creek was dry during much of the study period, with the exception of a few ground-water seeps that formed ponds and short, flowing reaches. An example of a seep is shown in figure 27. Sand-mining operations in 1986 and 1987 between well 27 and SW-8 removed sand from the channel and straightened bends in the creek, leaving water-filled ponds, stretches of stream that flowed continuously, and lower ground-water levels. Surface-water runoff in Coal Creek was sampled in 1984, 1985, and 1987. The nitrate concentrations of the surface-water flow in Coal Creek ranged from 0.18 to 2.8 mg/L at Quincy Avenue (SW-7, pl. 1) from 0.17 to 12 mg/L and at Jewell Avenue (SW-8, pl. 1) (table 7). The upper range of the nitrate concentrations was larger at the site (SW-8) downstream from the study area.

Sites that had surface-water runoff were sampled for bacteria in April 1985. Fecal streptococci were detected at all surface-water sites. Fecal coliform were detected at all sites except SW-4, which had the largest concentration of fecal-streptococci bacteria.

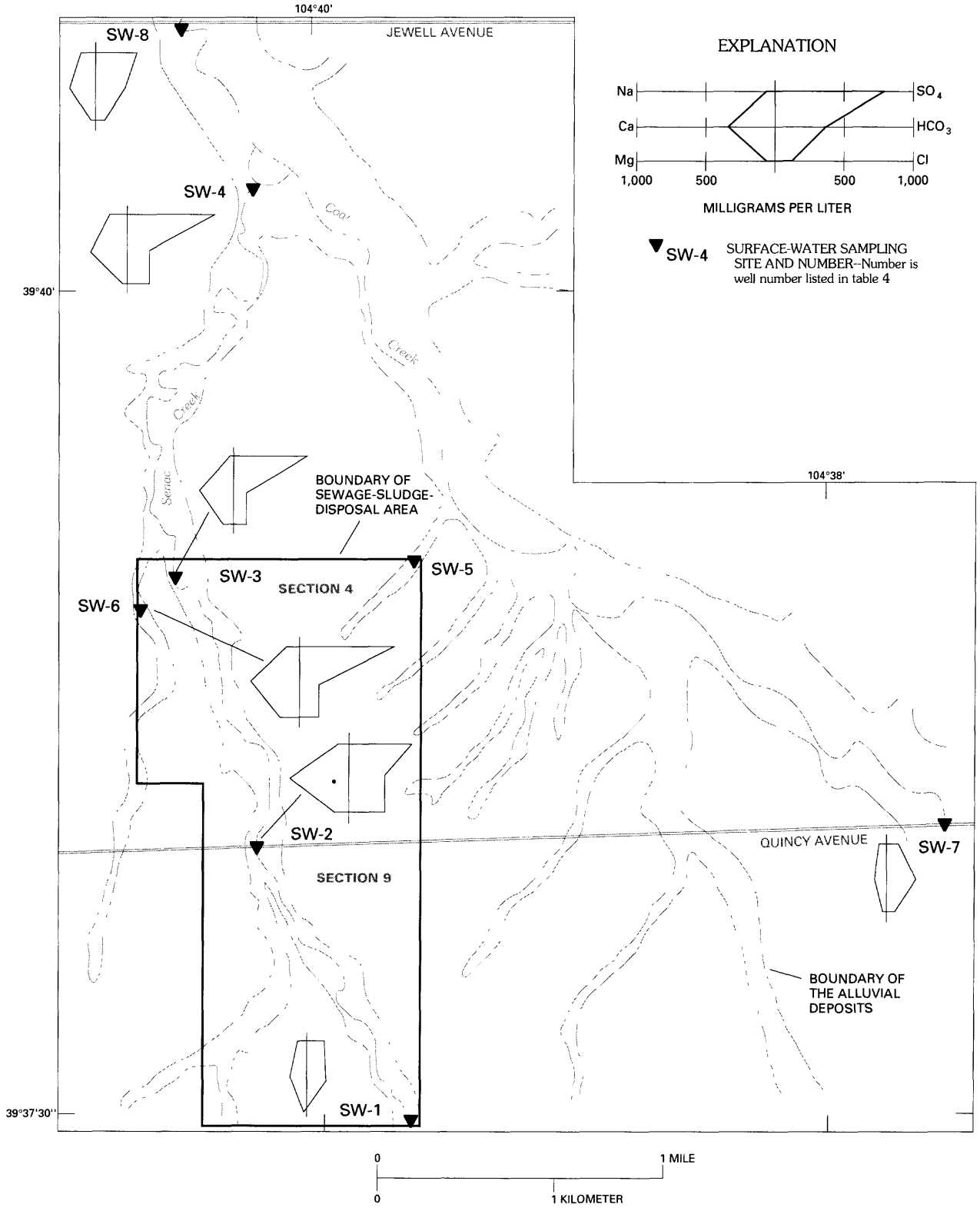

Figure 25.--Major ion concentrations in surface-water runoff.

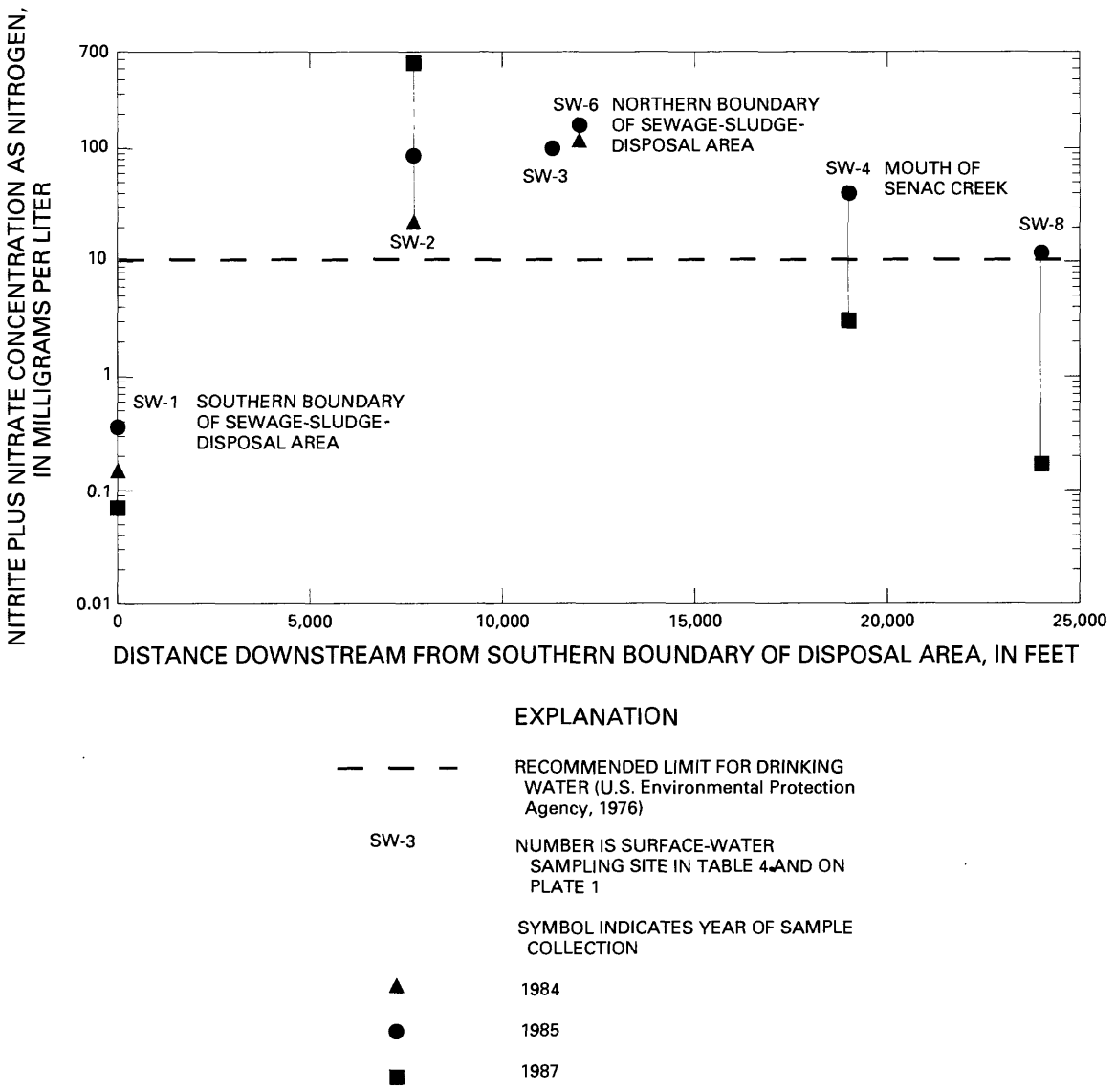

Figure 26.--Concentrations of nitrite plus nitrate, as nitrogen, in surface-water runoff.

Potential for Further Ground-Water and Surface-Water Contamination

In 11 of the 13 wells in the alluvial aquifer near the major source areas for sewage-sludge leachate, nitrate concentrations either generally decreased or did not increase since the large concentrations detected in 1983 and 1984. However, in 1986, large concentrations of organic nitrogen, zinc, lead, and other trace elements were detected in the soil (table 8 in the "Supplemental

Information" section). Because the nitrogen compounds are mobile in the soil and, in some instances migrate through the soil faster than water (Council for Agricultural Science and Technology, 1976; U.S. Environmental Protection Agency, 1983), there is a potential for further nitrogen contamination of the alluvial aquifer. Surface-water erosion also could transport trace elements in the soil into the streambed sediment and away from the disposal area.

Figure 27.--A seep near the western edge of the alluvial aquifer in Coal Creek valley (Photograph, October 1984)

The increase in nitrate concentrations in most wells in 1983 probably was caused by near record precipitation in 1983 that leached nitrogen compounds from the disposed sewage sludge. It is likely that a similar process could occur in the future. Large amounts of precipitation could cause marked increases in nitrate concentrations in the ground water followed by decreases in nitrate concentrations caused by migration, dilution, and biological degradation. Because there presently (1990) is vegetation growing in the disposal area in place of the previously bare soil, as it was in 1983, the present potential for soil erosion is less than in 1983.

NEED FOR CONTINUED WATER-QUALITY AND WATER-LEVEL MONITORING

The Lowry sewage-sludge-disposal area eventually will be restored as close as possible to its original state by Metro Wastewater Reclamation District (William Martin, Metro Wastewater Reclamation District, oral commun., 1987). The sewage-sludge pits will be plowed and contoured to blend into natural contours of the area. The sewage-sludge-disposal area, where about 233,000 dry tons of sewage sludge was deposited, will be reclaimed. However, there still is a need for continued monitoring of ground-water levels and ground-water and surface-water-runoff quality. A potentially large source of contamination exists in the soil of the disposal area because of the large concentrations of nitrogen, trace elements, and major ions such as calcium, chloride, and sulfate. Soil erosion probably will be less of a problem in the future because plant growth on the previously bare and plowed soil has begun to stabilize the soil.

Continued monitoring of the ground-water levels in the observation wells is needed so that the effects of the completed Aurora Dam and Reservoir can be determined. The reservoir (fig. 28), which recently was built about 0.25 mi upstream from the sewage-sludge-disposal area in Senac Creek, probably will have some effect on the alluvial and bedrock ground water. Water from the new reservoir could seep into the alluvial or the bedrock aquifers causing the water levels to rise, which in turn would cause the alluvial ground water to move out of the disposal area faster and would increase the potential for vertical movement of water from the alluvial aquifer into the bedrock aquifer. Streamflow in Senac Creek might increase if seepage water from the reservoir causes the water table in the alluvial aquifer to rise to land surface.

Figure 28.--Aurora Dam and Reservoir (under construction). (Photograph, April 1988.)

CONCLUSIONS

After 3 years of annual ground-water-quality monitoring and 4 years of an expanded quarterly sampling program, it has been determined that leachate from the sewage-sludge-disposal area probably has caused increased nitrite plus nitrate (as nitrogen) concentrations in the alluvial ground water.

* Soil analyses from the sewage-sludge-disposal area indicate that organic nitrogen and lead are the dominant form of nitrogen and toxic trace elements in the soil. Because nitrogen compounds are mobile, nitrite plus nitrate (as nitrogen) probably will continue to be leached into the ground water of the alluvial aquifer in the disposal area. Trace elements, however, do not seem to be moving out of the soil into the ground water.

* Major source areas for the leachate affecting the alluvial ground water are located along the eastern side of Senac Creek in section 9 and section 4 where sewage sludge was buried deep into the hillsides, stored in ponds, or plowed into the soil. A minor source of nitrate leachate is cattle manure near stock wells in the Senac Creek valley.

* Ground water from 13 wells in the alluvial aquifer in Senac Creek valley probably has been affected by the sewage-sludge leachate. Ten of these wells are located inside the sewage-sludge-disposal area and three wells are located downstream from the disposal area. There is no indication that ground water in the bedrock aquifer has been affected by the sewage-sludge leachate.

* Ground water in the alluvial aquifer generally flows north and follows the alluvial valleys. Presently (1990), movement of contaminated water is not a concern because there are no domestic wells completed in the alluvial aquifer in the study area.

* The effect of ground water on surface-water-runoff quality is negligible because surface water in the study area consists only of occasional runoff from intense rainfall or snowmelt and ground-water seepage, which causes flow in short reaches of Senac Creek and Coal Creek.

* The potential for future leaching from sewage sludge in the soil to the alluvial ground water exists. Future periods of above-average precipitation could cause increases in nitrate concentrations in the ground water by leaching nitrogen compounds from the sewage sludge in the soil.

* Aurora Dam and Reservoir, which will supply the city of Aurora with drinking water, is located about 0.25 mi upstream from the sewage-sludge-disposal area. The reservoir could affect the recharge and movement of ground water, movement and concentrations of contaminants in the alluvial aquifer, and streamflow patterns.

* Continued monitoring of ground-water levels and ground-water and surface-water-runoff quality is needed to determine the effects of the completed Aurora Dam and Reservoir and of the leaching from the sewage sludge in the soil.

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_____1986, Quality criteria for water 1986: Washington, D.C., EPA Report 440/5-86-001, 1 v.

SUPPLEMENTAL INFORMATION

System of Numbering Wells

The well locations (local well number) in tables 1, 3, and 5 are based on the U.S. Bureau of Land Management system of land subdivision and show the location of the well by quadrant, township, range, section, and position within the section. A graphic illustration of this method of well location is shown in figure 29. The first letter "S" preceding the location number means that the well is located on the area governed by the sixth principal meridian. The second letter indicates the quadrant in which the well is located. Four quadrants are formed by the intersection of the base line and the principal meridian--A indicates the northeast quadrant, B the northwest, C the southwest, and D the southeast. The first numeral indicates the township, the second the range, and the third the section in which the well is located. The letters following the section number locate the well within the section. The first letter denotes the quarter section, the second the quarter-quarter section. The letters are assigned within the section in a counter-clockwise direction, beginning with (A) in the northeast quarter. Letters are assigned within each quarter section and within each quarter-quarter section in the same manner. Where two or more locations are within the smallest subdivision, consecutive numbers beginning with 1 are added in the order in which the wells were inventoried. For example, SC00604716AAA indicates a well in the northeast quarter of the northeast quarter of the northeast quarter of sec. 16, T. 6 S., R. 47 W. The "S" refers to the sixth principal meridian. The "C" indicates the township is south of the base line and that the range is west of the principal meridian.

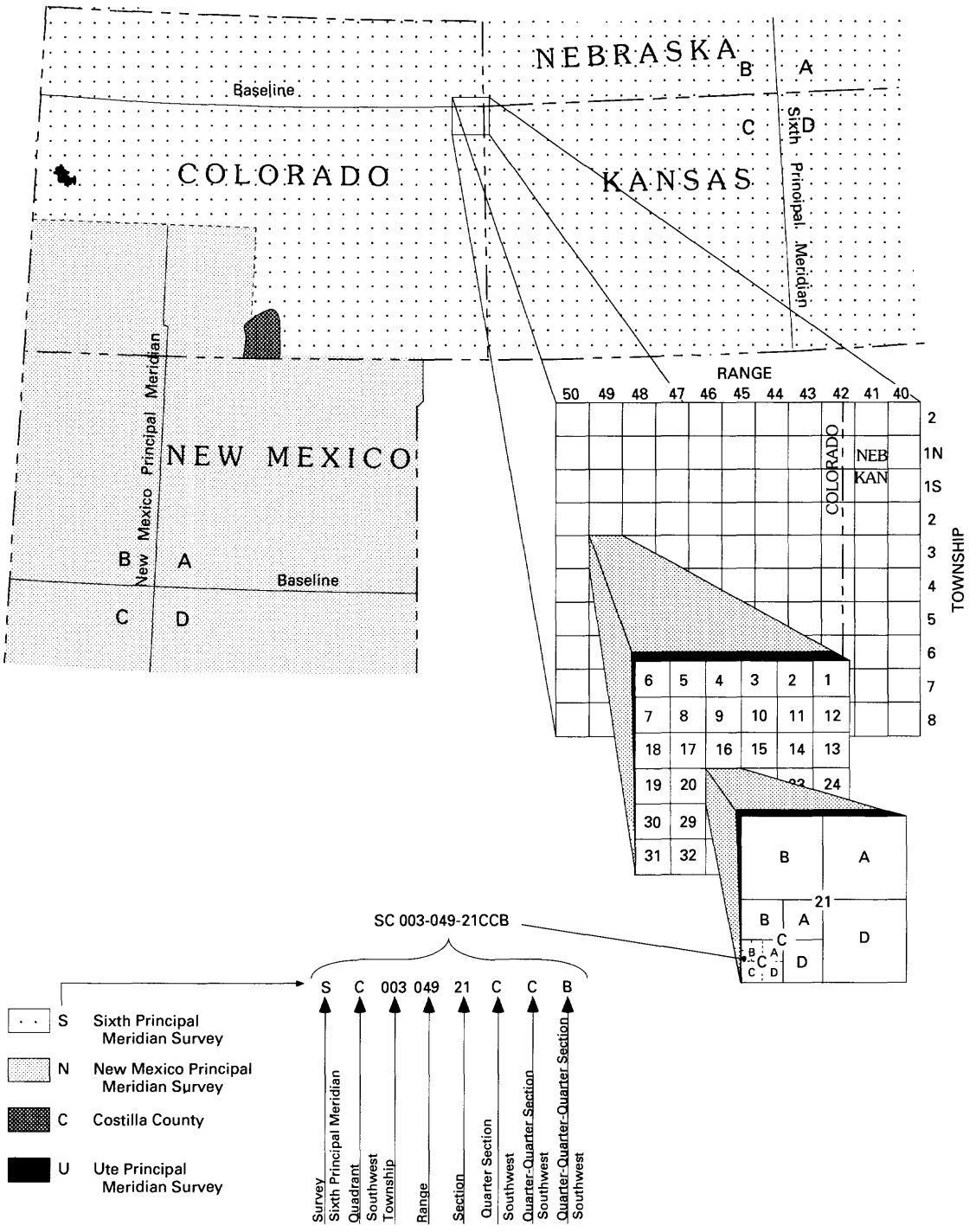

Figure 29.--Well-numbering system.

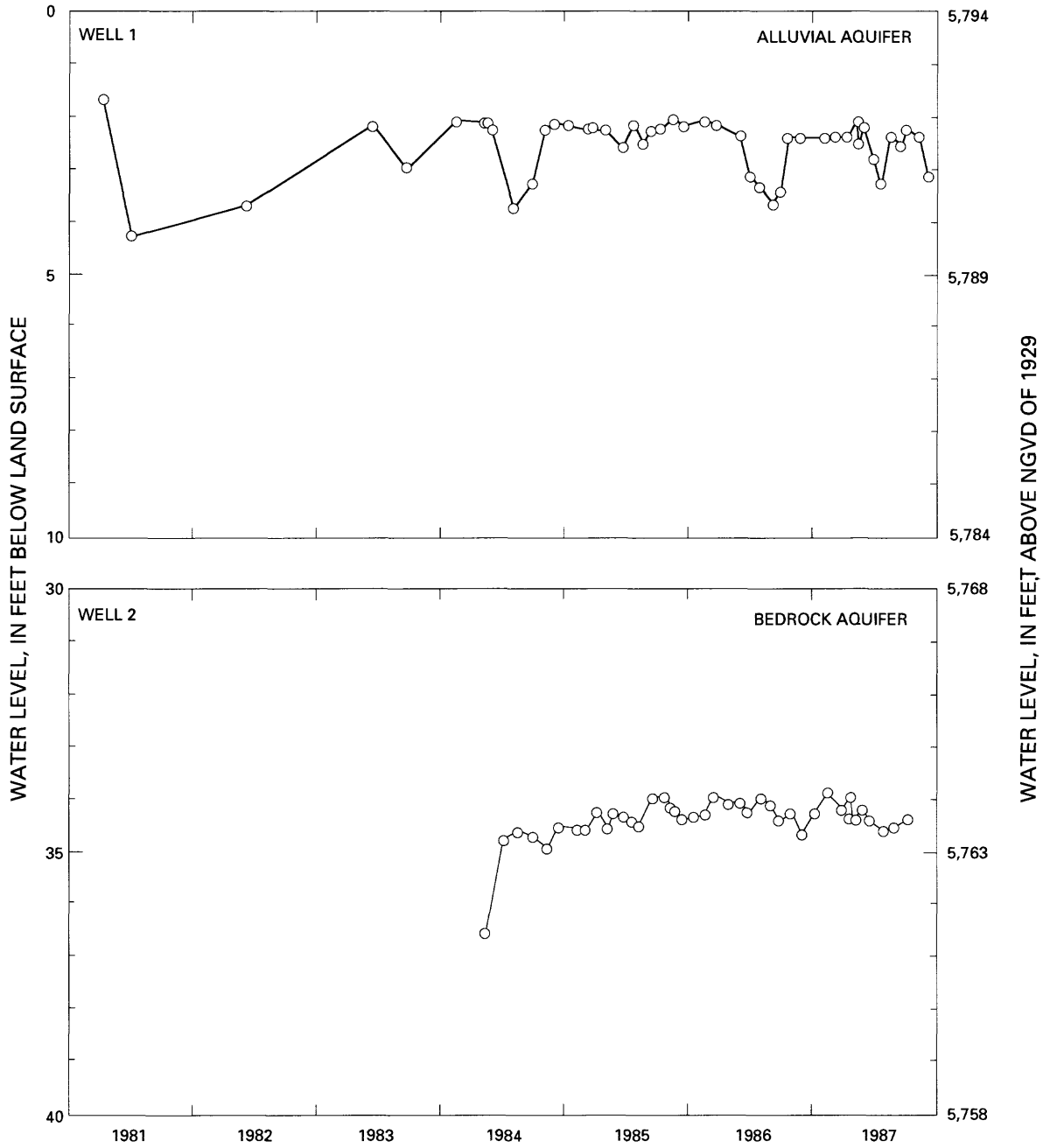

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.

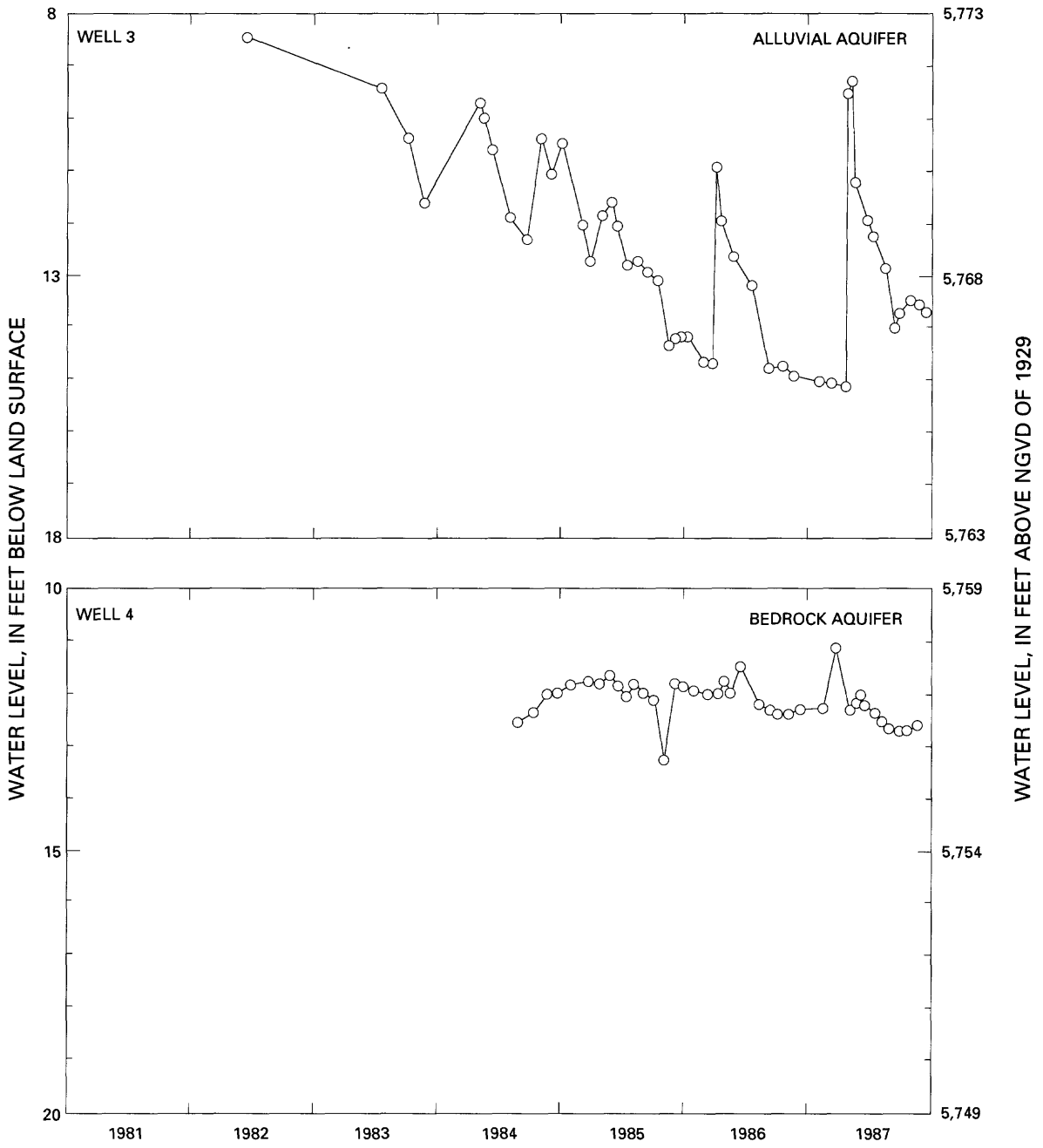

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

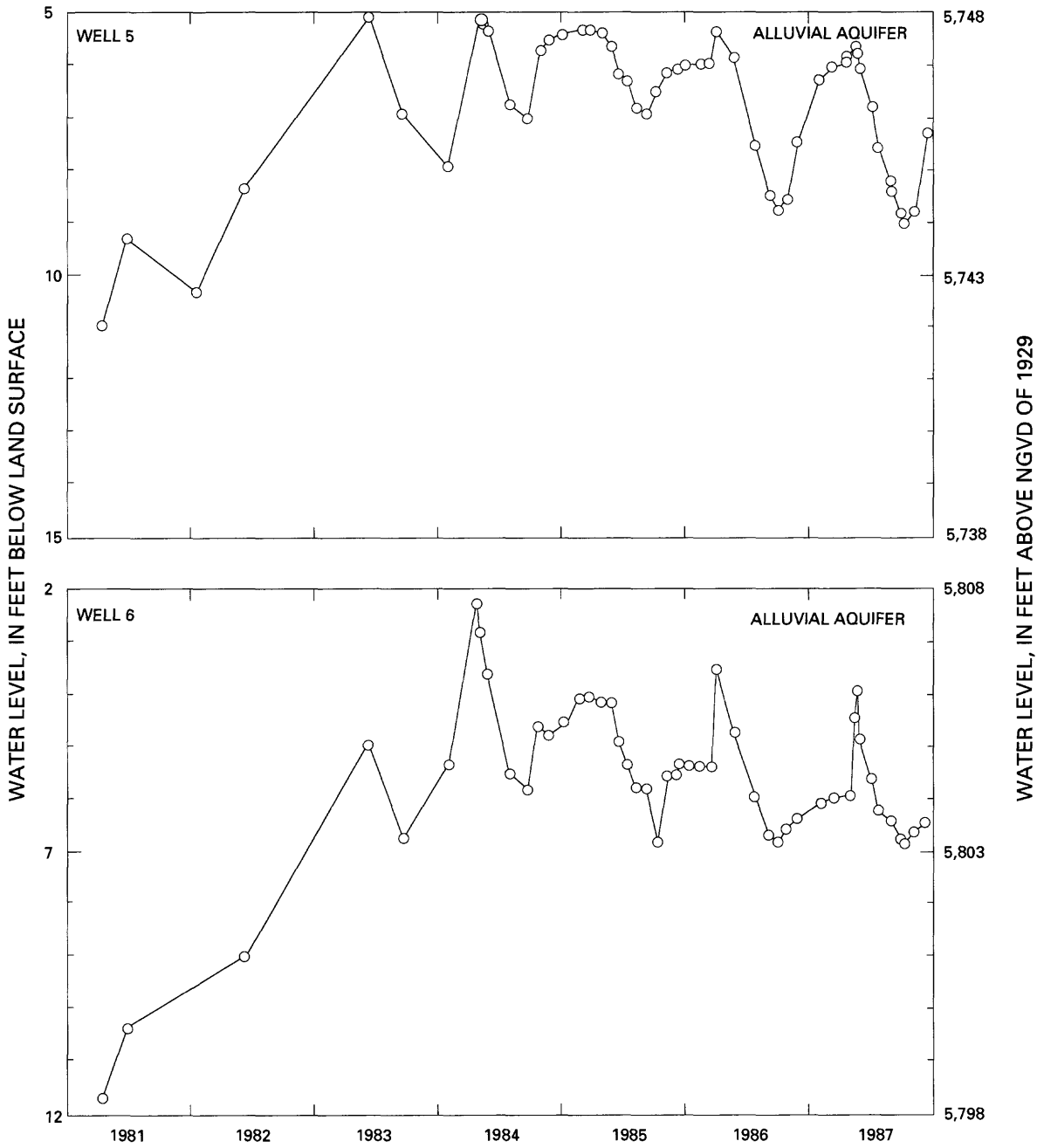

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

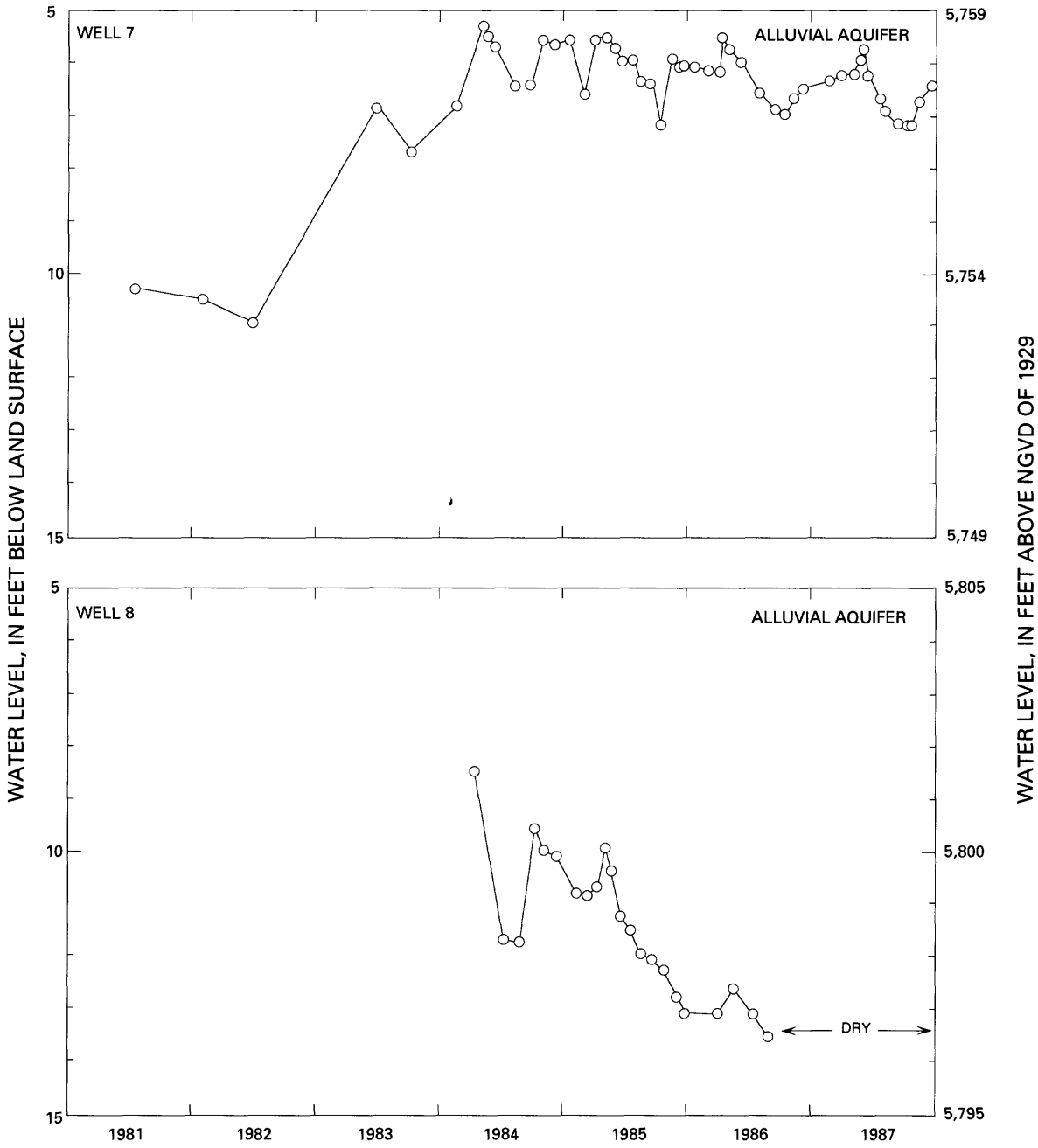

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

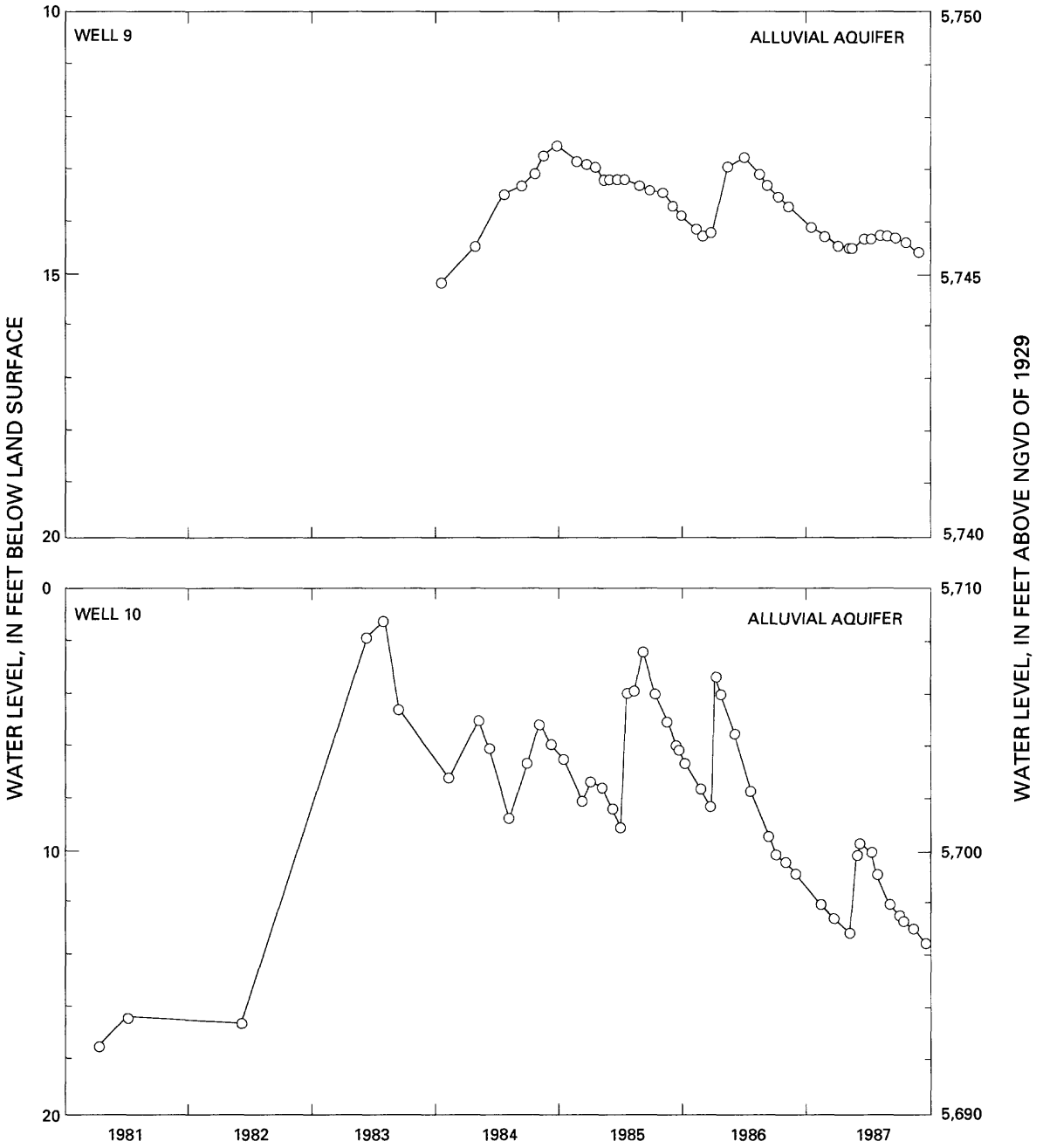

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

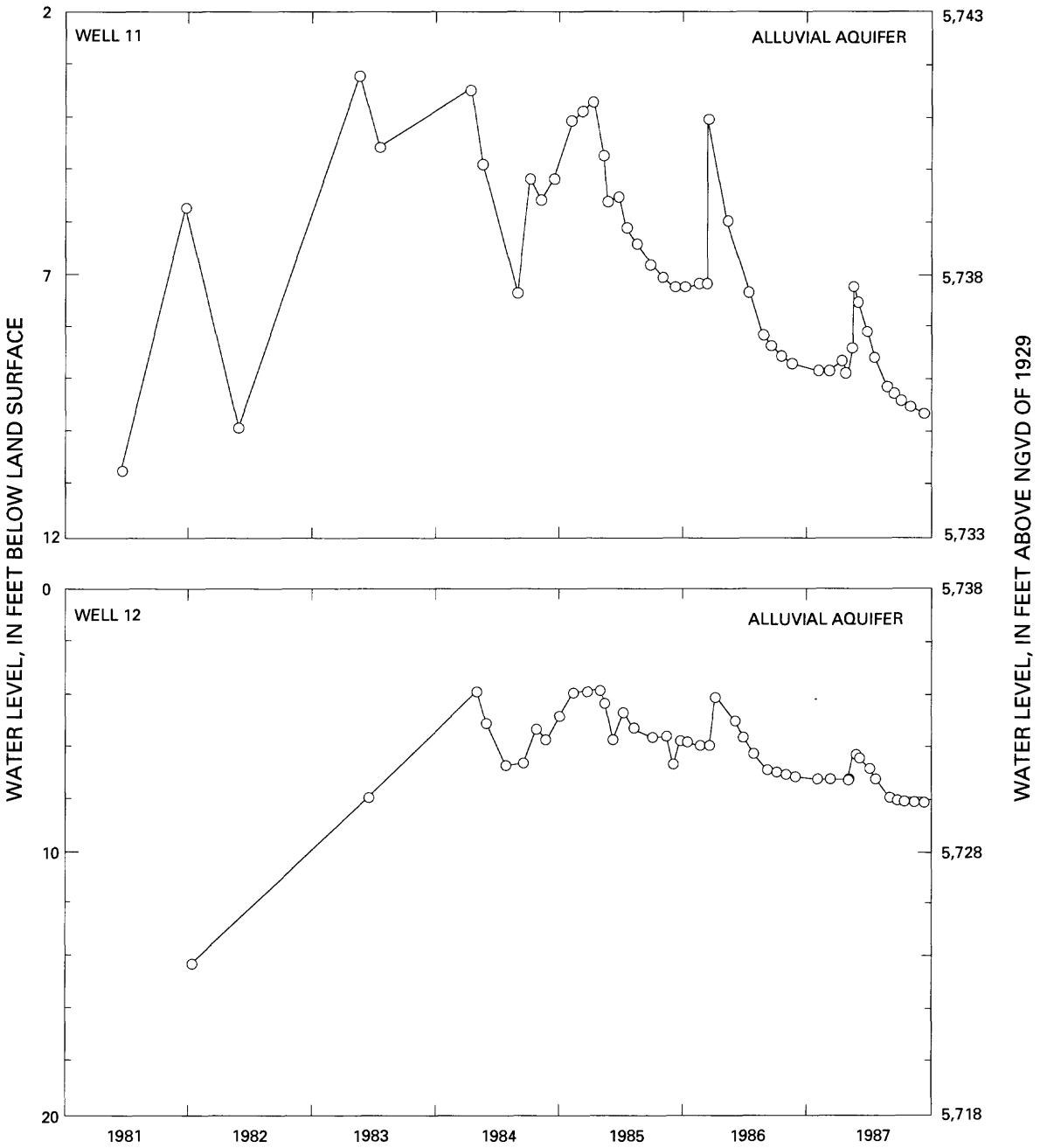

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

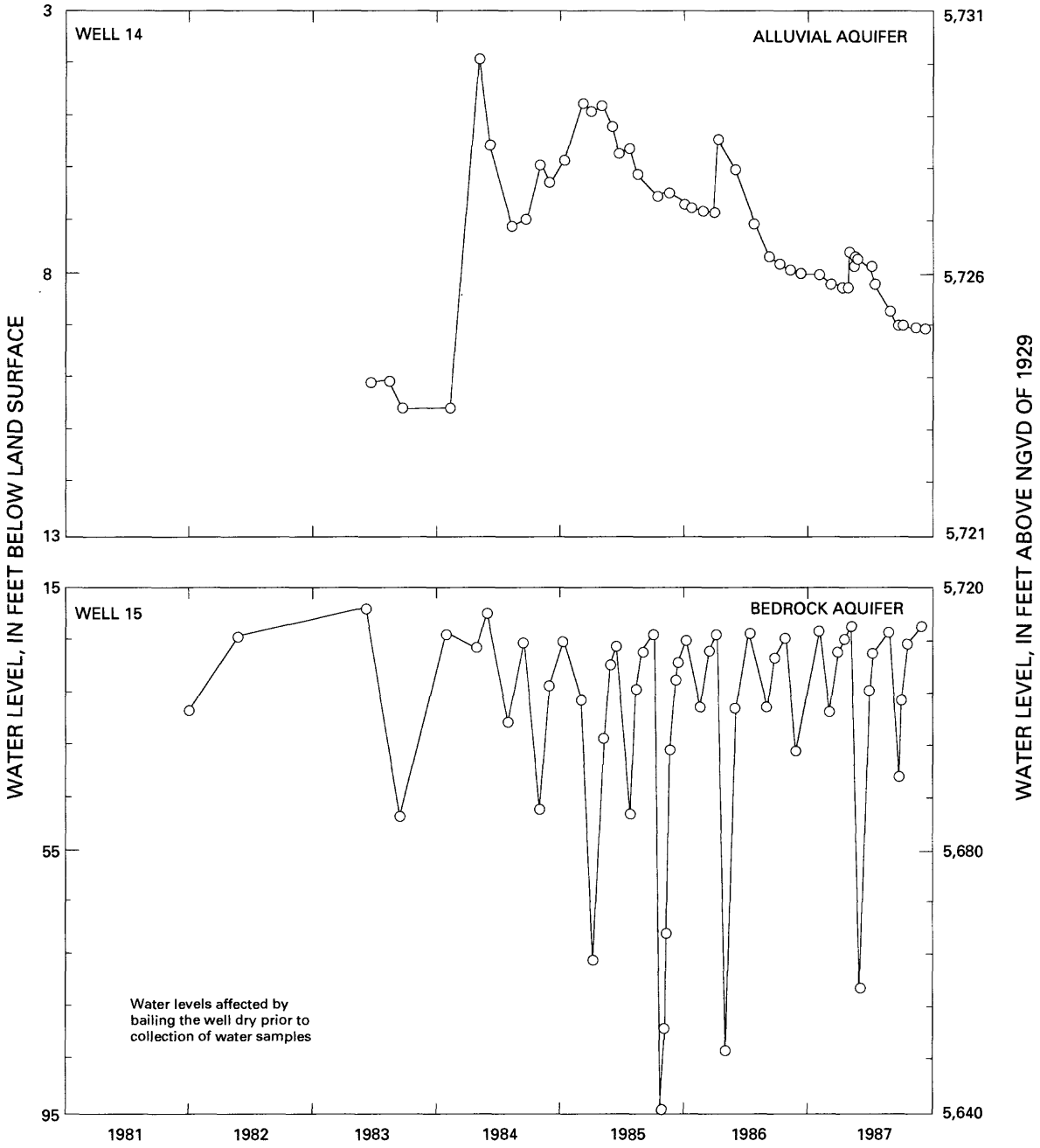

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

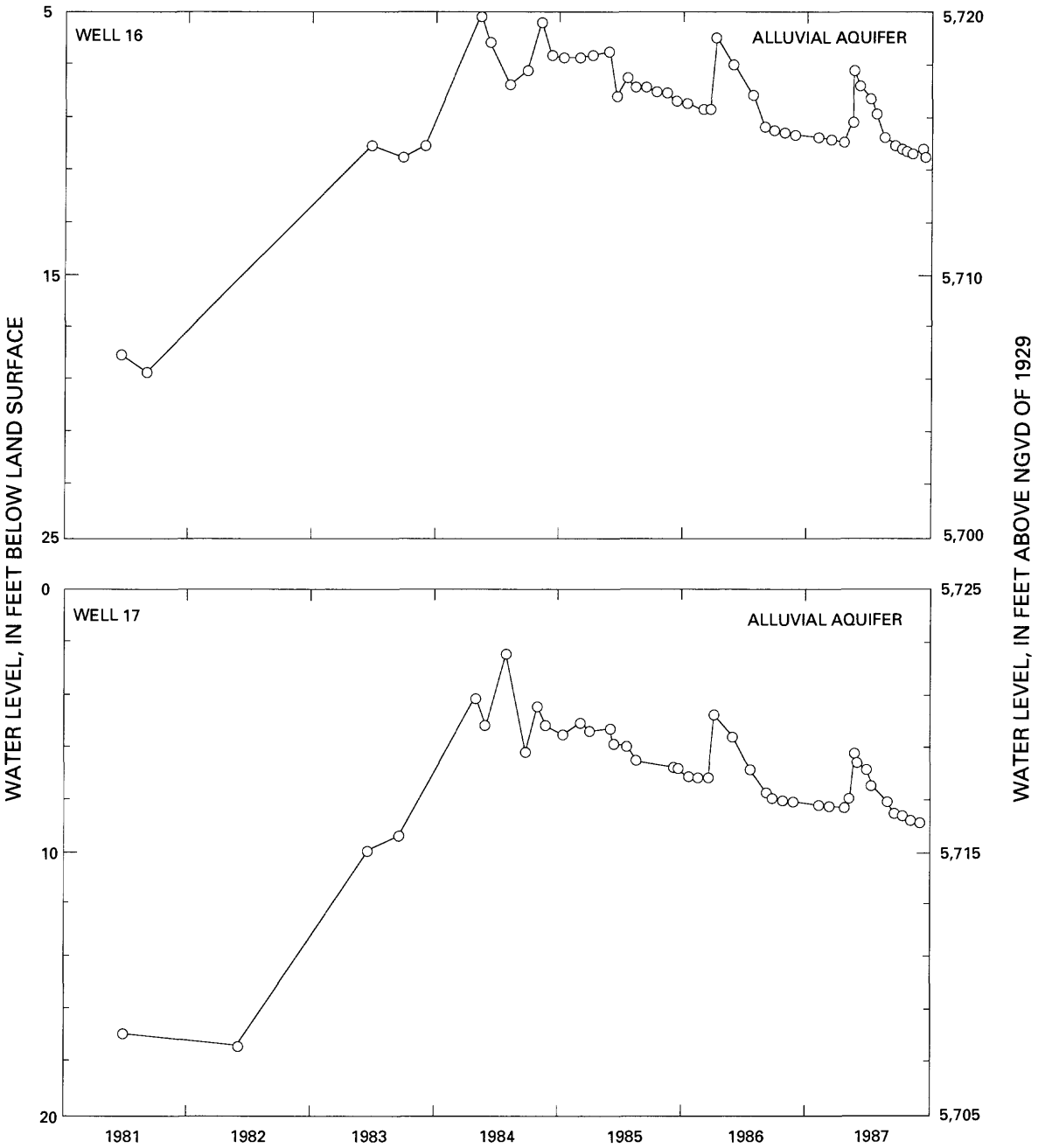

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

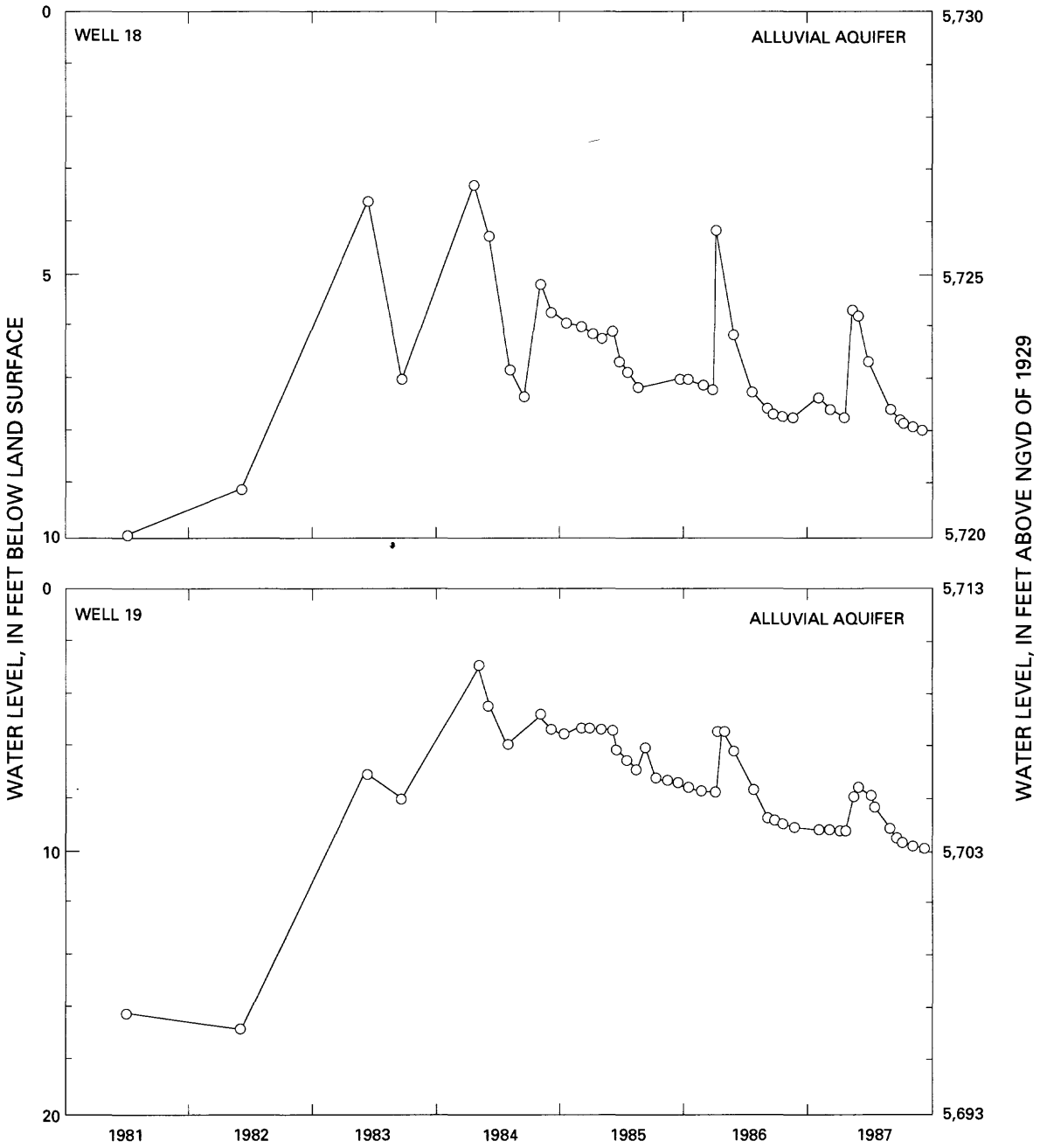

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

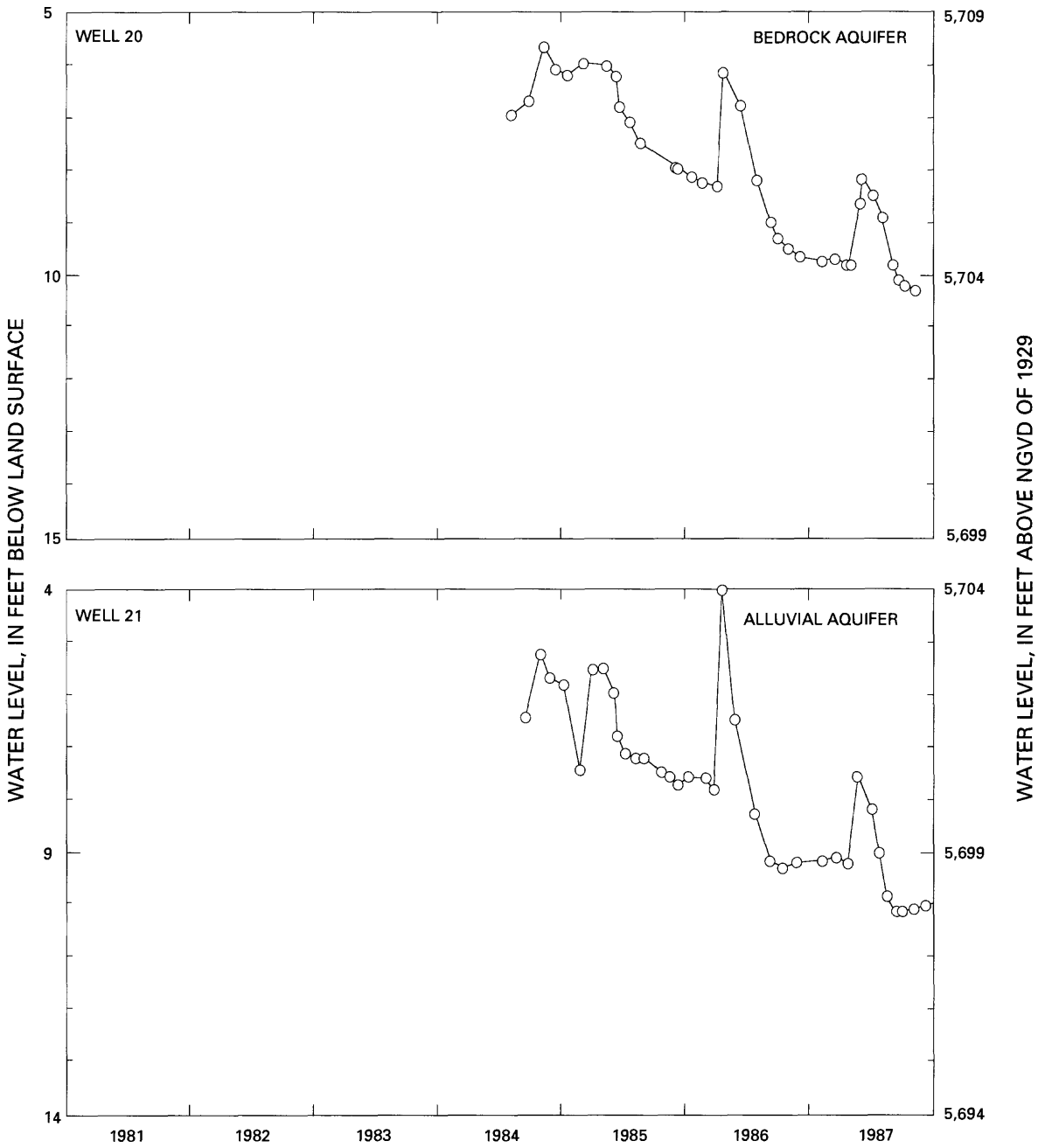

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

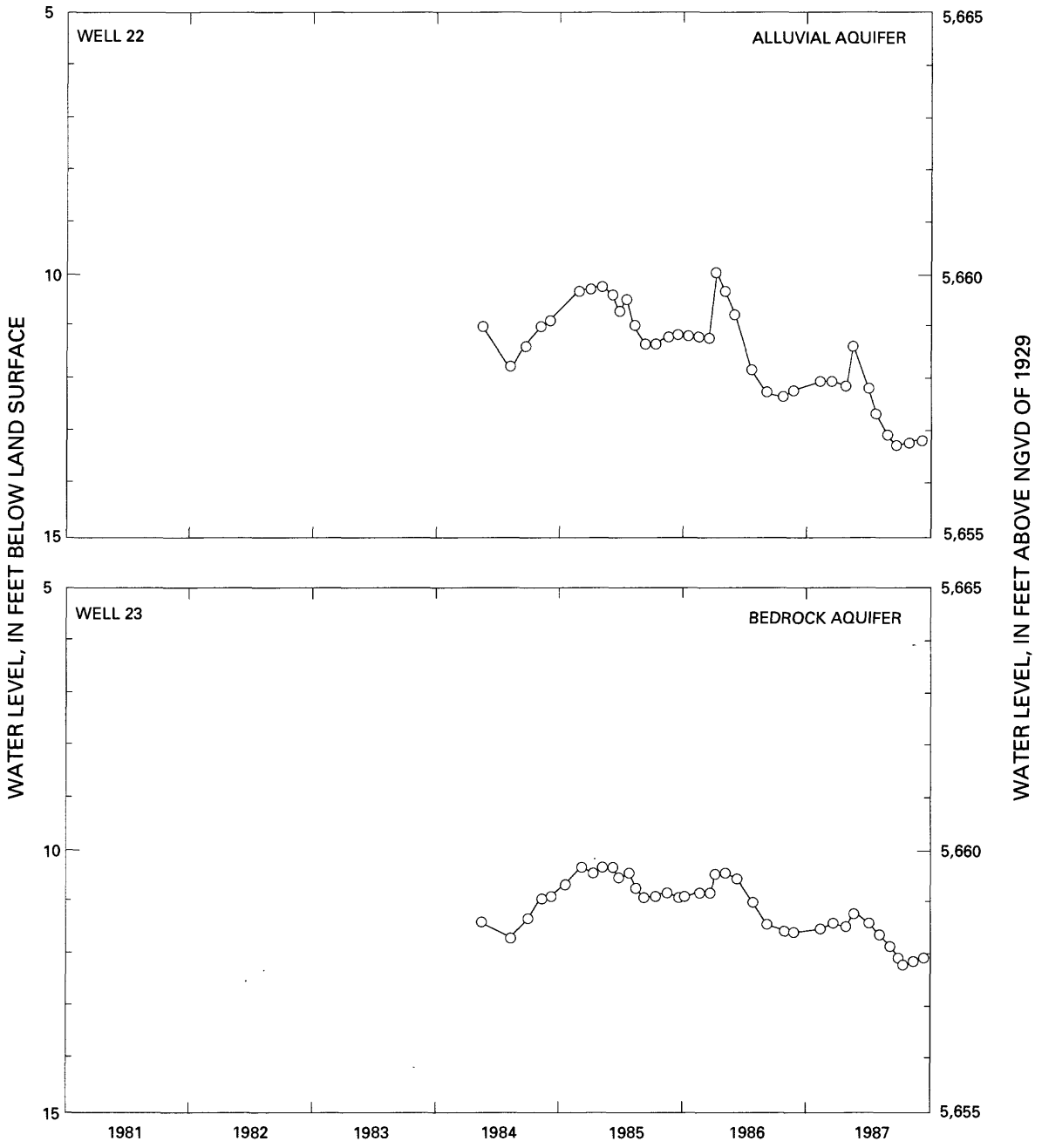

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

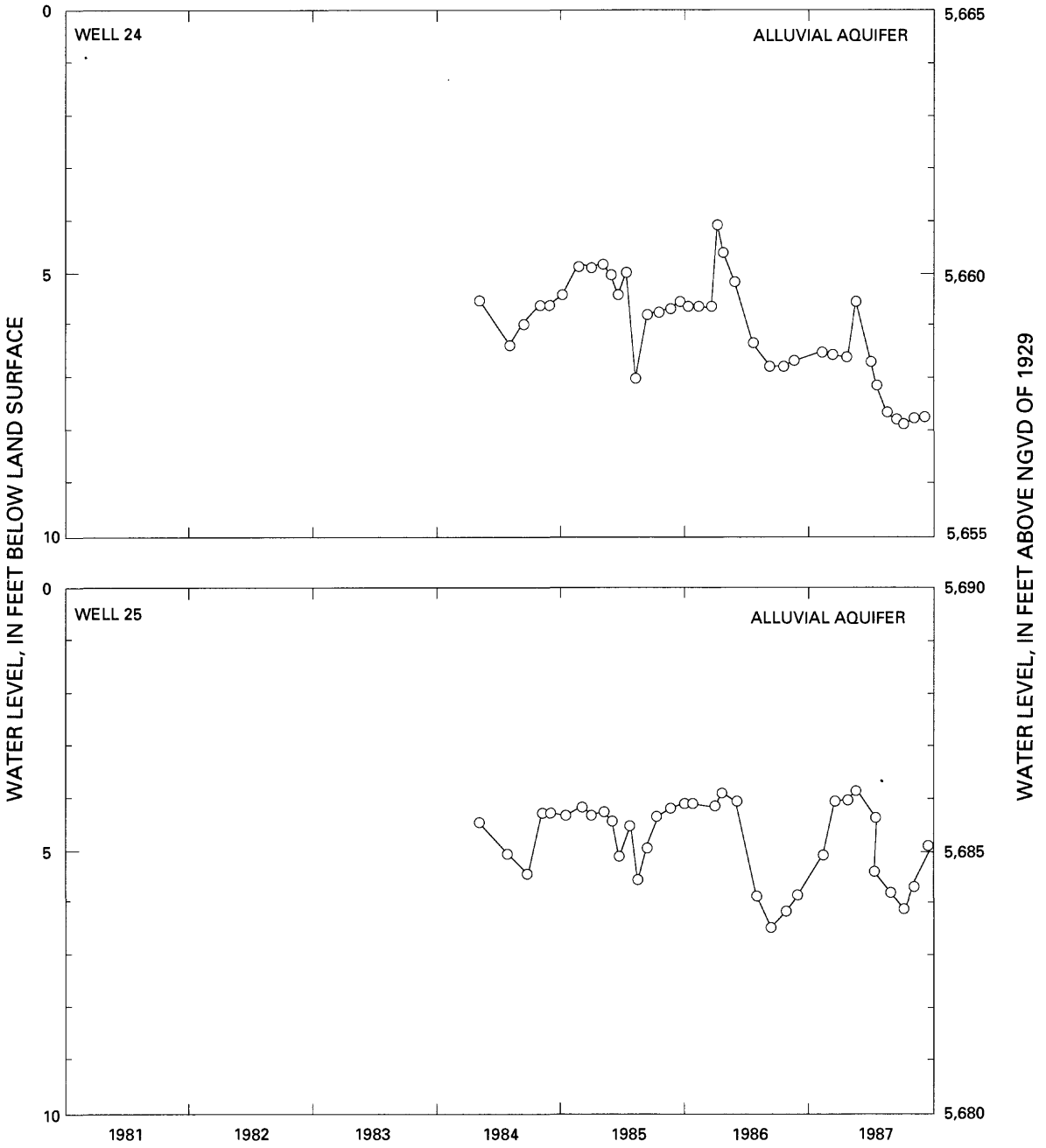

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

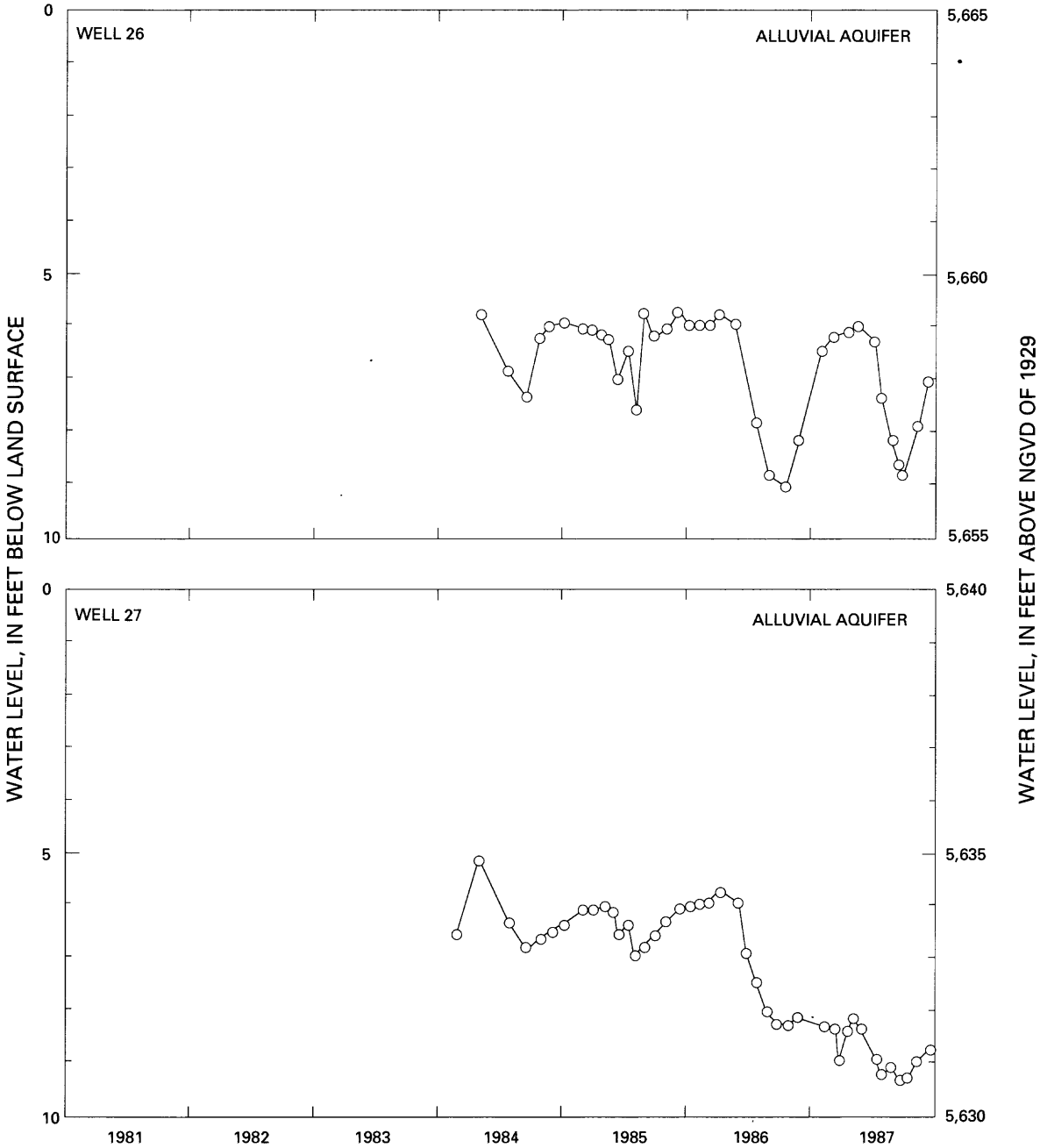

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

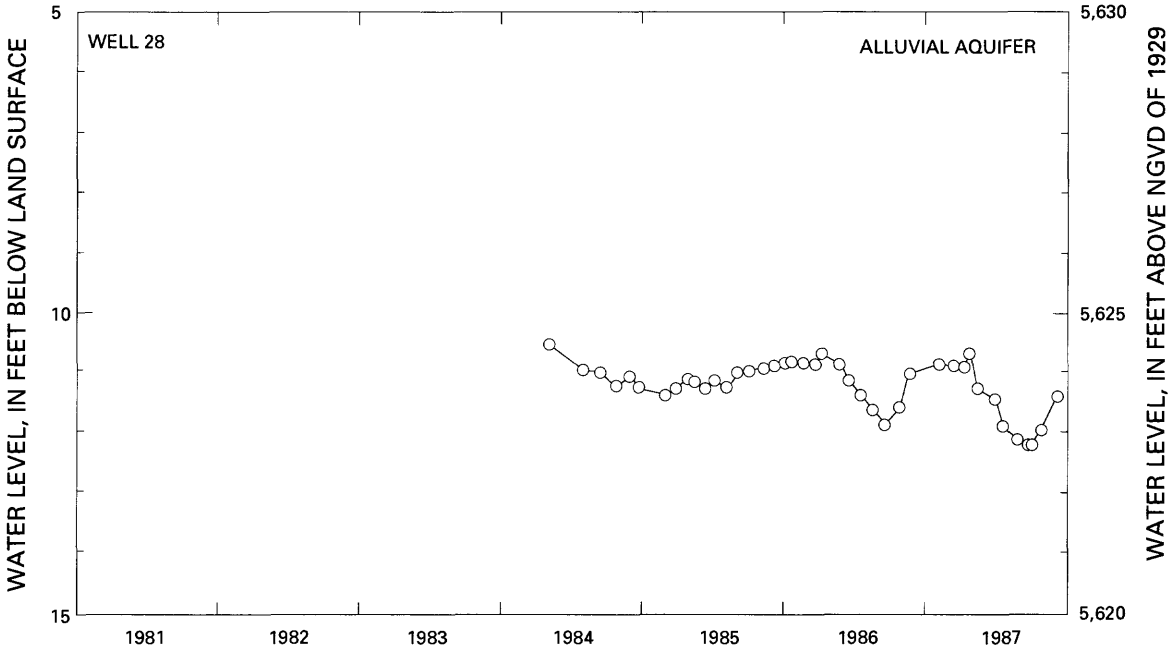

Figure 30.--Water-level hydrographs for wells in the study area, 1981-87.--Continued

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*

[ft, feet; water level, in feet below land surface; steel tape was used to measure the water level; see figure 29 for an explanation of the local well numbers; see figure 30 for hydrographs of these water levels; depth of wells in feet below land surface; see plate 1 for well location]

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Well 1; Local well number SC00506509DDD1; Depth of well 11.0 ft							
APR 13, 1981	1.70	DEC 07, 1984	2.13	DEC 13, 1985	2.14	NOV 28, 1986	2.34
JULY 01	4.30	JAN 15, 1985	2.18	DEC 23	2.17	FEB 09, 1987	2.34
JUNE 07, 1982	3.70	MAR 11	2.24	JAN 13, 1986	2.15	MAR 19	2.30
JUNE 23, 1983	2.24	APR 02	2.23	FEB 28	2.09	MAY 01	2.30
SEPT 27	3.00	MAY 10	2.28	MAR 28	2.13	MAY 22	2.42
FEB 22, 1984	2.14	JUNE 07	2.41	APR 16	2.35	MAY 26	2.05
MAY 15	2.13	JUNE 25	2.55	JUNE 05	2.36	JUNE 05	2.13
MAY 22	2.18	JULY 23	2.16	JULY 03	3.11	JULY 07	2.74
JUNE 13	2.23	AUG 19	2.47	JULY 28	3.31	JULY 24	3.24
AUG 08	3.73	SEPT 13	2.27	SEPT 10	3.61	AUG 31	2.29
SEPT 26	3.29	OCT 15	2.19	OCT 01	3.38	SEPT 24	2.43
NOV 07	2.24	NOV 21	2.04	OCT 29	2.37	OCT 06	2.23
						NOV 05	2.32
						DEC 14	3.02
		HIGHEST	1.70	APR 13, 1981			
		LOWEST	4.30	JULY 01, 1981			
Well 2; Local well number SC00506509DDD2; Depth of well 113 ft							
JUNE 13, 1984	36.58	JUNE 25, 1985	34.28	MAR 28, 1986	34.31	FEB 09, 1987	34.28
AUG 08	34.79	JULY 23	34.32	APR 16	34.02	MAR 19	33.89
SEPT 26	34.59	AUG 19	34.41	JUNE 05	34.13	MAY 01	34.22
NOV 07	34.70	SEPT 13	34.53	JULY 03	34.10	MAY 22	34.34
DEC 07	34.87	OCT 22	34.03	JULY 28	34.18	MAY 26	34.02
JAN 15, 1985	34.53	NOV 21	33.99	SEPT 10	34.03	JUNE 05	34.39
MAR 11	34.58	DEC 13	34.20	OCT 01	34.07	JULY 07	34.31
APR 02	34.59	DEC 23	34.24	OCT 29	34.40	JULY 24	34.41
MAY 10	34.29	JAN 13, 1986	34.37	NOV 28	34.28	AUG 31	34.62
JUNE 07	34.54	FEB 28	34.32	JAN 06, 1987	34.67	SEPT 24	34.58
						NOV 05	34.41
		HIGHEST	33.89	MAR 19, 1987			
		LOWEST	36.58	JUNE 13, 1984			
Well 3a, 1981-83; Local well number SC00506509ACD1; Depth of well 20.0 ft							
[1]JULY 01, 1981		JUNE 23, 1983	9.58	SEPT 27, 1983	11.56		
JUNE 07, 1982	8.70	AUG 18	10.73				
		HIGHEST	8.70	JUNE 07, 1982			
		LOWEST	11.56	SEPT 27, 1983			

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Well 3, 1984-87; Local well number SC00506509ACD2; Depth of well 15.4 ft							
MAY 15, 1984	9.78	JUNE 07, 1985	11.61	MAR 28, 1986	14.68	MAY 01, 1987	15.11
MAY 22	10.05	JUNE 25	12.07	APR 16	10.96	MAY 22	9.55
JUNE 13	10.65	JULY 23	12.82	APR 28	11.97	MAY 26	9.31
AUG 08	11.91	AUG 19	12.75	JUNE 05	12.64	JUNE 05	11.21
SEPT 26	12.38	SEPT 13	12.93	JULY 28	13.19	JULY 07	11.91
NOV 07	10.42	OCT 15	13.10	SEPT 10	14.79	JULY 24	12.24
DEC 07	11.09	NOV 21	14.34	OCT 01	14.74	AUG 31	12.85
JAN 15, 1985	10.51	DEC 13	14.23	OCT 29	14.69	SEPT 24	14.00
MAR 11	12.08	DEC 23	14.18	NOV 28	14.90	OCT 08	13.70
APR 02	12.80	JAN 13, 1986	14.16	FEB 09, 1987	15.00	NOV 05	13.46
MAY 10	11.86	FEB 28	14.70	MAR 19	15.02	DEC 15	13.58
			HIGHEST	9.31	MAY 26, 1987		
			LOWEST	15.11	MAY 01, 1987		
Well 4; Local well number SC00506509ACB; Depth of well 101 ft							
AUG 08, 1984	12.39	JUNE 25, 1985	11.84	MAR 28, 1986	11.86	FEB 09, 1987	12.13
SEPT 26	12.26	JULY 23	11.70	APR 16	11.61	MAR 19	11.02
NOV 07	11.87	AUG 19	11.86	APR 28	11.80	MAY 01	12.16
DEC 07	11.88	SEPT 13	11.96	JUNE 05	11.37	MAY 22	12.05
JAN 15, 1985	11.70	OCT 22	13.14	JULY 28	12.05	MAY 26	11.89
MAR 11	11.64	NOV 21	11.69	SEPT 10	12.13	JUNE 05	12.07
APR 02	11.73	DEC 13	11.74	OCT 01	12.17	JULY 07	12.23
MAY 10	11.55	JAN 13, 1986	11.82	OCT 29	12.24	JULY 24	12.36
JUNE 07	11.70	FEB 28	11.86	NOV 28	12.15	AUG 31	12.45
						SEPT 24	12.50
						OCT 08	12.53
						NOV 05	12.44
			HIGHEST	11.02	MAR 19, 1987		
			LOWEST	13.14	OCT 22, 1985		
Well 5; Local well number SC00506509BAA; Depth of well 24.0 ft							
APR 13, 1981	11.00	DEC 07, 1984	5.57	DEC 23, 1985	6.10	MAY 01, 1987	5.99
JULY 01	9.32	JAN 15, 1985	5.48	JAN 13, 1986	6.03	MAY 05	5.91
JAN 13, 1982	10.36	MAR 11	5.41	FEB 28	6.02	MAY 22	5.74
JUNE 07	8.38	APR 02	5.40	MAR 28	6.04	MAY 26	5.82
JUNE 23, 1983	5.14	MAY 10	5.45	APR 16	5.44	JUNE 06	6.17
SEPT 27	6.95	JUNE 07	5.67	JUNE 05	5.89	JULY 07	6.84
FEB 10, 1984	7.97	JUNE 25	6.22	JULY 28	7.58	JULY 24	7.63
MAY 15	5.18	JULY 23	6.35	SEPT 10	8.56	AUG 26	8.26
MAY 22	5.29	AUG 19	6.85	OCT 01	8.83	AUG 31	8.44
JUNE 13	5.44	SEPT 13	6.94	OCT 29	8.62	SEPT 24	8.87
AUG 08	6.79	OCT 15	6.57	NOV 28	7.54	OCT 06	9.03
SEPT 26	7.03	NOV 21	6.20	FEB 09, 1987	6.36	NOV 05	8.83
NOV 07	5.78	DEC 13	6.18	MAR 19	6.08	DEC 15	7.36
			HIGHEST	5.14	JUNE 23, 1983		
			LOWEST	11.00	APR 13, 1981		

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Well 6; Local well number SC00506509CAC1; Depth of well 25.2 ft							
APR 13, 1981	11.70	DEC 07, 1984	4.79	DEC 13, 1985	5.58	NOV 28, 1986	6.44
JULY 01	10.40	JAN 15, 1985	4.61	DEC 23	5.38	FEB 10, 1987	6.12
JUNE 07, 1982	8.98	MAR 11	4.16	JAN 13, 1986	5.42	MAR 19	6.05
JUNE 23, 1983	5.04	APR 04	4.12	FEB 28	5.42	MAY 01	6.01
SEPT 27	6.80	MAY 10	4.22	MAR 28	5.42	MAY 22	4.54
FEB 13, 1984	5.40	JUNE 07	4.22	APR 16	3.60	MAY 26	4.03
MAY 15	2.37	JUNE 25	4.92	APR 28	4.20	JUNE 06	4.92
MAY 22	2.88	JULY 23	5.39	JUNE 05	4.77	JULY 07	5.69
JUNE 13	3.67	AUG 19	5.81	JULY 28	6.05	JULY 24	6.28
AUG 08	5.54	SEPT 13	5.84	SEPT 10	6.73	AUG 31	6.46
SEPT 26	5.87	OCT 15	6.82	OCT 01	6.87	SEPT 24	6.80
NOV 07	4.66	NOV 21	5.59	OCT 29	6.61	OCT 06	6.90
						NOV 05	6.69
						DEC 14	6.51
		HIGHEST	2.37	MAY 15, 1984			
		LOWEST	11.70	APR 13, 1981			
Well 7; Local well number SC00506509BDA1; Depth of well 22.2 ft							
JULY 01, 1981	10.22	DEC 07, 1984	5.62	DEC 13, 1985	6.04	NOV 28, 1986	6.43
JAN 13, 1982	10.44	JAN 15, 1985	5.49	DEC 23	6.00	FEB 10, 1987	6.30
JUNE 07	10.90	MAR 11	6.52	JAN 13, 1986	6.03	MAR 19	6.20
JUNE 23, 1983	6.85	APR 05	5.50	FEB 28	6.10	MAY 01	6.16
SEPT 27	7.55	MAY 10	5.44	MAR 28	6.13	MAY 22	5.94
FEB 13, 1984	6.82	JUNE 07	5.71	APR 16	5.52	MAY 26	5.74
MAY 15	5.29	JUNE 25	5.94	APR 28	5.71	JUNE 06	6.22
MAY 22	5.44	JULY 23	5.93	JUNE 05	5.96	JULY 07	6.64
JUNE 13	5.64	AUG 19	6.32	JULY 28	6.56	JULY 24	6.91
AUG 08	6.36	SEPT 13	6.38	SEPT 10	6.87	AUG 31	7.13
SEPT 26	6.37	OCT 15	7.10	OCT 01	6.94	SEPT 24	7.17
NOV 07	5.51	NOV 21	5.94	OCT 29	6.67	OCT 06	7.18
						NOV 05	6.72
						DEC 14	6.42
		HIGHEST	5.29	MAY 15, 1984			
		LOWEST	10.90	JUNE 07, 1982			
Well 8; Local well number SC00506504DDA1; Depth of well 14.0 ft							
[1]FEB 01, 1984		JUNE 07, 1985	9.92	[1]MAR 28, 1986		[1]MAY 01, 1987	
MAY 15	8.49	JUNE 25	10.36	APR 16	13.07	[1]MAY 26	
AUG 08	11.69	JULY 23	11.21	JUNE 05	12.63	[1]JUNE 06	
SEPT 26	11.70	AUG 19	11.49	JULY 28	13.08	[1]JULY 07	
NOV 07	9.61	SEPT 13	11.94	SEPT 10	13.50	[1]JULY 27	
DEC 07	9.97	OCT 15	12.06	[1]OCT 01		[1]AUG 31	
JAN 15, 1985	10.11	NOV 21	12.24	[1]OCT 29		[1]SEPT 24	
MAR 11	10.77	DEC 23	12.74	[1]NOV 28		[1]OCT 08	
APR 08	10.81	JAN 14, 1986	13.07	[1]FEB 09, 1987			
MAY 10	10.70	[1]FEB 28		[1]MAR 19			
		HIGHEST	8.49	MAY 15, 1984			
		LOWEST	13.50	SEPT 10, 1986			

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level

Well 9; Local well number SC00506504ADA2; Depth of well 17.0 ft

FEB 10, 1984	15.18	JUNE 07, 1985	13.19	MAR 28, 1986	14.25	MAY 01, 1987	14.45
MAY 15	14.50	JUNE 25	13.22	APR 16	14.21	MAY 26	14.50
AUG 08	13.54	JULY 23	13.20	JUNE 05	12.98	JUNE 06	14.52
SEPT 26	13.35	AUG 19	13.20	JULY 28	12.80	JULY 07	14.33
NOV 07	13.09	SEPT 13	13.36	SEPT 10	13.11	JULY 27	14.32
DEC 07	12.77	OCT 15	13.42	OCT 01	13.30	AUG 31	14.27
JAN 15, 1985	12.59	NOV 21	13.48	OCT 29	13.56	SEPT 24	14.28
MAR 11	12.90	DEC 23	13.73	NOV 28	13.74	OCT 08	14.33
APR 08	12.92	JAN 14, 1986	13.89	FEB 09, 1987	14.10	NOV 06	14.40
MAY 10	12.97	FEB 28	14.15	MAR 19	14.30	DEC 16	14.61

HIGHEST 12.59 JAN 15, 1985
LOWEST 15.18 FEB 10, 1984

Well 10a, 1981-84; Local well number SC00506504AAA3; Depth of well 20.0 ft

APR 13, 1981	17.25	JUNE 07, 1982	16.49	AUG 18, 1983	1.28	FEB 09, 1984	6.36
JULY 01	16.04	JUNE 23, 1983	1.76	SEPT 27	4.68	JUNE 13	5.70

HIGHEST 1.28 AUG 18, 1983
LOWEST 17.25 APR 13, 1981

Well 10, 1984-87; Local well number SC00506504AAA4; Depth of well 29.0 ft

FEB 09, 1984	7.10	MAY 10, 1985	7.43	JAN 14, 1986	6.53	NOV 28, 1986	10.66
MAY 15	4.92	JUNE 07	8.19	FEB 28	7.44	FEB 09, 1987	11.81
JUNE 13	5.89	JUNE 25	8.93	MAR 28	8.12	MAR 19	12.33
AUG 08	8.59	JULY 23	3.86	APR 16	3.24	MAY 01	12.89
SEPT 26	6.57	AUG 19	3.73	APR 29	3.87	MAY 26	9.89
NOV 07	5.07	SEPT 13	2.25	JUNE 05	5.34	JUNE 06	9.42
DEC 07	5.76	OCT 15	3.81	JULY 28	7.59	JULY 07	9.77
JAN 15, 1985	6.36	NOV 21	4.92	SEPT 10	9.28	JULY 27	10.62
MAR 11	7.91	DEC 13	5.75	OCT 01	9.93	AUG 31	11.76
APR 05	7.26	DEC 23	5.94	OCT 29	10.29	SEPT 24	12.19
						OCT 08	12.43
						NOV 06	12.69
						DEC 16	13.19

HIGHEST 2.25 SEPT 13, 1985
LOWEST 12.89 MAY 01, 1987

Well 11; Local well number SC00506504CAD1; Depth of well 18.2 ft

JULY 01, 1981	10.74	MAR 11, 1985	4.13	JAN 13, 1986	7.27	MAR 19, 1987	8.87
JAN 13, 1982	5.77	APR 08	3.95	FEB 28	7.21	APR 16	8.66
JUNE 07	9.92	MAY 10	3.77	MAR 28	7.21	MAY 01	8.85
JUNE 23, 1983	3.26	JUNE 07	4.80	APR 16	4.07	MAY 05	8.88
AUG 18	4.59	JUNE 25	5.64	JUNE 05	6.01	MAY 22	8.43
MAY 15, 1984	3.51	JULY 23	5.53	JULY 28	7.39	MAY 27	7.28
JUNE 13	4.93	AUG 19	6.16	SEPT 10	8.20	JUNE 06	7.56
SEPT 26	7.38	SEPT 13	6.44	OCT 01	8.39	JULY 07	8.13
NOV 07	5.23	OCT 15	6.85	OCT 29	8.58	JULY 27	8.58
DEC 07	5.57	NOV 21	7.09	NOV 28	8.70	AUG 31	9.15
JAN 15, 1985	5.19	DEC 23	7.23	FEB 09, 1987	8.84	SEPT 24	9.31
						OCT 08	9.42
						NOV 06	9.52
						DEC 16	9.67

HIGHEST 3.26 JUNE 23, 1983
LOWEST 10.74 JULY 01, 1981

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level

Well 12; Local well number SC00506504CAC2; Depth of well 18.3 ft

JAN 13, 1982	14.10	MAY 10, 1985	3.78	MAR 28, 1986	5.89	MAY 01, 1987	7.28
JUNE 23, 1983	7.84	JUNE 07	4.33	APR 16	4.09	MAY 05	7.20
MAY 15, 1984	3.87	JUNE 25	5.67	JUNE 05	5.00	MAY 22	6.91
JUNE 13	5.01	JULY 23	4.60	JULY 03	5.62	MAY 26	6.30
AUG 08	6.57	AUG 19	5.34	JULY 29	6.20	JUNE 05	6.45
SEPT 26	6.59	OCT 15	5.60	SEPT 10	6.79	JULY 07	6.81
NOV 07	5.35	NOV 21	5.61	OCT 01	6.93	JULY 27	7.25
DEC 07	5.63	DEC 12	6.64	OCT 29	7.00	AUG 31	7.85
JAN 15, 1985	4.80	DEC 23	5.76	NOV 28	7.08	SEPT 24	8.02
MAR 11	3.88	JAN 13, 1986	5.82	FEB 09, 1987	7.19	OCT 08	8.03
APR 08	3.91	FEB 28	5.84	MAR 19	7.22	NOV 06	8.05
						DEC 16	8.14

HIGHEST	3.78	MAY 10, 1985
LOWEST	14.10	JAN 13, 1982

Well 13; Local well number SC00506504CAC; Depth of well 29.0 ft

[3]JUNE 23, 1983	14.95

Well 14; Local well number SC00506504CAB1; Depth of well 18.0 ft

[1]JULY 01, 1981		DEC 07, 1984	6.22	JAN 13, 1986	6.67	APR 16, 1987	8.20
[1]JAN 13, 1982		JAN 15, 1985	5.90	FEB 28	6.77	MAY 01	8.23
[1]JUNE 07		MAR 11	4.77	MAR 28	6.86	MAY 05	7.56
JUNE 23, 1983	10.12	APR 08	4.95	APR 16	5.45	MAY 22	7.85
AUG 18	10.06	MAY 10	4.87	JUNE 05	5.99	MAY 27	7.63
SEPT 27	10.54	JUNE 07	5.19	JULY 29	6.98	JUNE 05	7.69
FEB 10, 1984	10.56	JUNE 25	5.70	SEPT 10	7.66	JULY 07	7.86
MAY 15	3.98	JULY 23	5.61	OCT 01	7.76	JULY 24	8.15
JUNE 13	5.55	AUG 19	6.15	OCT 29	7.84	AUG 31	8.72
AUG 08	7.11	OCT 15	6.49	NOV 28	7.92	SEPT 24	8.92
SEPT 26	7.03	NOV 21	6.47	FEB 09, 1987	8.02	OCT 08	8.94
NOV 07	5.98	DEC 23	6.61	MAR 19	8.13	NOV 06	8.96
						DEC 16	9.04

HIGHEST	3.98	MAY 15, 1984
LOWEST	10.56	FEB 10, 1984

Well 15; Local well number SC00506504CAB2; Depth of well 107 ft

[2]JULY 01, 1981		MAR 11, 1985	32.07	DEC 12, 1985	28.85	NOV 28, 1986	39.37
JAN 13, 1982	33.87	[3]APR 08	71.08	DEC 23	25.94	FEB 09, 1987	21.29
JUNE 07	22.95	MAY 10	37.69	JAN 13, 1986	22.96	[3]MAR 19	33.15
JUNE 23, 1983	18.27	JUNE 07	26.46	[1]JAN 15		APR 16	23.88
SEPT 27	49.49	JUNE 25	23.67	FEB 28	32.77	MAY 01	22.20
FEB 10, 1984	22.16	JULY 23	49.21	MAR 28	24.47	MAY 05	21.92
MAY 15	24.05	AUG 19	30.47	APR 16	22.30	MAY 22	21.15
JUNE 13	18.82	SEPT 13	24.62	[3]APR 28	84.96	MAY 27	20.97
AUG 08	35.07	OCT 15	21.90	JUNE 05	33.20	[3]JUNE 05	74.92
SEPT 26	23.59	[3]OCT 17	94.96	JULY 29	21.91	JULY 07	30.33
NOV 07	48.49	OCT 22	81.17	SEPT 10	32.63	JULY 24	24.66
DEC 07	30.12	OCT 30	67.45	OCT 01	25.37	AUG 31	21.35
JAN 15, 1985	23.03	NOV 21	39.51	OCT 29	22.12	[3]SEPT 27	43.09
						OCT 08	31.32
						NOV 06	23.11
						DEC 16	20.93

HIGHEST	18.82	JUNE 13, 1984
LOWEST	81.17	OCT 22, 1985

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level

Well 16a, 1981-83; Local well number SC00506504BAC1; Depth of well 19.0 ft

APR 13, 1981	18.6	[1]JUNE 07, 1982		AUG 18, 1983	10.91		
JULY 01	18.80	JUNE 23, 1983	10.51	SEPT 27	10.73		

HIGHEST 10.51 JUNE 23, 1983
LOWEST 18.80 JULY 01, 1981

Well 16, 1984-87; Local well number SC00506504BAC2; Depth of well 19.3 ft

MAY 15, 1984	5.19	JUNE 25, 1985	8.23	MAR 28, 1986	8.81	MAY 01, 1987	10.01
JUNE 13	6.32	JULY 23	7.48	APR 16	5.99	MAY 22	9.23
AUG 08	7.90	AUG 19	7.88	JUNE 05	6.98	MAY 26	7.26
SEPT 26	7.39	SEPT 13	7.90	JULY 28	8.22	JUNE 06	7.88
NOV 07	5.48	OCT 15	8.08	SEPT 10	9.37	JULY 07	8.29
DEC 07	6.66	NOV 21	8.10	OCT 01	9.49	JULY 27	8.87
JAN 15, 1985	6.80	DEC 13	8.39	OCT 29	9.59	AUG 31	9.84
MAR 11	6.80	DEC 23	8.37	NOV 28	9.69	SEPT 24	10.17
APR 08	6.71	JAN 14, 1986	8.49	FEB 09, 1987	9.81	OCT 08	10.22
JUNE 07	6.61	FEB 28	8.67	MAR 19	9.91	NOV 06	10.29
						DEC 16	10.50

HIGHEST 5.19 MAY 15, 1984
LOWEST 10.17 SEPT 24, 1987

Well 17; Local well number SC00506504BDB; Depth of well 33.0 ft

JULY 01, 1981	17.01	JAN 15, 1985	5.53	FEB 28, 1986	7.10	MAR 19, 1987	8.26
JUNE 07, 1982	17.39	MAR 11	5.13	MAR 28	7.17	MAY 01	8.40
JUNE 23, 1983	9.99	APR 08	5.36	APR 16	4.83	MAY 22	7.80
SEPT 27	9.43	JUNE 07	5.27	JUNE 05	5.56	MAY 26	6.31
MAY 15, 1984	4.24	JUNE 25	5.85	JULY 28	6.74	JUNE 06	6.56
JUNE 13	5.19	JULY 23	5.95	SEPT 10	7.69	JULY 07	6.86
AUG 08	2.56	AUG 19	6.51	OCT 01	7.89	JULY 27	7.40
SEPT 26	6.19	DEC 13	6.77	OCT 29	7.98	AUG 31	8.09
NOV 07	4.53	DEC 23	6.79	NOV 28	8.03	SEPT 24	8.52
DEC 07	5.24	JAN 14, 1986	6.89	FEB 09, 1987	8.17	OCT 08	8.58
						NOV 06	8.68
						DEC 16	8.84

HIGHEST 2.56 AUG 08, 1984
LOWEST 17.39 JUNE 07, 1982

Well 18; Local well number SC00506504BBC; Depth of well 19.6 ft

JULY 01, 1981	10.01	JAN 15, 1985	5.96	FEB 28, 1986	7.11	MAR 19, 1987	7.55
JUNE 07, 1982	9.14	MAR 11	5.93	MAR 28	7.21	MAY 01	7.65
JUNE 23, 1983	3.69	APR 08	6.14	APR 16	4.20	MAY 26	5.65
SEPT 27	7.00	MAY 10	6.21	JUNE 05	6.15	JUNE 05	5.80
MAY 05, 1984	3.35	JUNE 07	6.08	JULY 29	7.25	JULY 07	6.61
JUNE 13	4.29	JUNE 25	6.68	SEPT 10	7.53	SEPT 01	7.57
AUG 08	6.80	JULY 23	6.87	OCT 01	7.61	SEPT 24	7.70
SEPT 26	7.33	AUG 19	7.11	OCT 29	7.64	OCT 08	7.76
NOV 07	5.19	DEC 23	6.96	NOV 28	7.66	NOV 06	7.80
DEC 07	5.70	JAN 14, 1986	6.98	FEB 09, 1987	7.33	DEC 16	7.88

HIGHEST 3.35 MAY 05, 1984
LOWEST 10.01 JULY 01, 1981

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Well 19; Local well number SC00506504BBB1; Depth of well 33.0 ft							
JULY 10, 1981	16.30	APR 05, 1985	5.40	JAN 14, 1986	7.46	FEB 09, 1987	9.07
JUNE 07, 1982	16.75	MAY 10	5.30	FEB 28	7.63	MAR 19	9.10
JUNE 23, 1983	7.13	JUNE 07	5.47	MAR 28	7.71	APR 16	9.18
SEPT 27	8.09	JUNE 25	6.15	APR 16	5.44	MAY 01	9.17
MAY 15, 1984	2.96	JULY 23	6.46	APR 29	5.37	MAY 26	7.87
JUNE 13	4.48	AUG 19	6.86	JUNE 05	6.11	JUNE 05	7.46
AUG 08	5.95	SEPT 13	6.06	JULY 29	7.56	JULY 07	7.80
NOV 07	4.80	OCT 15	7.15	SEPT 10	8.60	JULY 24	8.21
DEC 07	5.30	NOV 21	7.20	OCT 01	8.69	SEPT 01	9.13
JAN 15, 1985	5.54	DEC 13	7.37	OCT 29	8.87	SEPT 24	9.46
MAR 11	5.36	DEC 23	7.38	NOV 28	8.97	OCT 08	9.58
						NOV 06	9.68
						DEC 16	9.81
		HIGHEST	2.96	MAY 15, 1984			
		LOWEST	16.75	JUNE 07, 1982			
Well 20; Local well number SC00506504BBB2; Depth of well 113 ft							
AUG 08, 1984	6.97	JULY 23, 1985	7.08	JULY 29, 1986	8.15	MAY 26, 1987	8.53
SEPT 26	6.73	AUG 19	7.47	SEPT 10	8.96	JUNE 05	8.11
NOV 07	5.68	DEC 13	7.95	OCT 01	9.25	JULY 07	8.42
DEC 07	6.05	DEC 23	7.96	OCT 29	9.44	JULY 24	8.82
JAN 15, 1985	6.20	JAN 14, 1986	8.04	NOV 28	9.55	SEPT 01	9.72
MAR 11	6.00	FEB 22	8.20	FEB 09, 1987	9.67	SEPT 24	10.04
MAY 10	5.98	MAR 28	8.27	MAR 19	9.63	OCT 08	10.14
JUNE 07	6.18	APR 16	6.13	APR 16	9.71	NOV 06	10.24
JUNE 25	6.80	JUNE 05	6.74	MAY 01	9.72		
		HIGHEST	5.68	NOV 07, 1984			
		LOWEST	10.04	SEPT 24, 1987			
Well 21; Local well number SC00406533CCC1; Depth of well 20.5 ft							
SEPT 26, 1984	6.50	JUNE 25, 1985	6.84	FEB 28, 1986	7.66	FEB 10, 1987	9.15
NOV 07	5.31	JULY 23	7.13	MAR 28	7.83	MAR 19	9.08
DEC 07	5.75	AUG 19	7.26	APR 16	4.02	MAY 01	9.16
JAN 15, 1985	5.90	SEPT 13	7.23	JUNE 05	6.50	MAY 30	7.59
MAR 11	7.45	OCT 15	7.46	JULY 29	8.26	JULY 07	8.18
APR 09	5.58	NOV 21	7.53	SEPT 10	9.18	JULY 29	8.95
MAY 10	5.59	DEC 23	7.75	OCT 27	9.30	AUG 31	9.81
JUNE 07	6.02	JAN 14, 1986	7.61	NOV 28	9.21	SEPT 24	10.07
						OCT 08	10.12
						NOV 06	10.05
						DEC 16	9.97
		HIGHEST	4.02	APR 16, 1986			
		LOWEST	10.07	SEPT 24, 1987			

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level

Well 22; Local well number SC00406533BAB1; Depth of well 28.0 ft

MAY 15, 1984	11.01	JUNE 25, 1985	10.73	MAR 28, 1986	11.24	MAR 19, 1987	12.09
AUG 08	11.75	JULY 23	10.49	APR 16	10.00	MAY 01	12.16
SEPT 26	11.35	AUG 19	11.01	APR 29	10.30	MAY 27	11.45
NOV 07	10.96	SEPT 13	11.34	JUNE 05	10.78	JULY 07	12.21
DEC 07	10.90	OCT 15	11.33	JULY 29	11.79	JULY 29	12.65
MAR 11, 1985	10.33	NOV 21	11.23	SEPT 10	12.28	AUG 31	13.09
APR 09	10.31	DEC 23	11.15	OCT 27	12.34	SEPT 24	13.27
MAY 10	10.25	JAN 14, 1986	11.19	NOV 28	12.24	NOV 06	13.25
JUNE 07	10.39	FEB 28	11.19	FEB 10, 1987	12.09	DEC 16	13.22

HIGHEST 10.00 APR 16, 1986
LOWEST 13.27 SEPT 24, 1987

Well 23; Local well number SC00406533BAB2; Depth of well 82.0 ft

MAY 15, 1984	11.30	JUNE 07, 1985	10.30	FEB 28, 1986	10.81	FEB 10, 1987	11.48
AUG 08	11.66	JUNE 25	10.53	MAR 28	10.81	MAR 19	11.40
SEPT 26	11.30	JULY 23	10.46	APR 16	10.44	MAY 01	11.49
NOV 07	10.89	AUG 19	10.71	APR 29	10.41	MAY 27	11.20
DEC 07	10.84	SEPT 13	10.90	JUNE 05	10.51	JULY 07	11.40
JAN 15, 1985	10.64	OCT 14	10.90	JULY 29	10.95	JULY 29	11.58
MAR 11	10.31	NOV 21	10.80	SEPT 10	11.36	AUG 31	11.81
APR 09	10.40	DEC 23	10.86	OCT 27	11.54	SEPT 24	12.06
MAY 10	10.29	JAN 14, 1986	10.81	NOV 28	11.55	OCT 08	12.14
						NOV 06	12.12
						DEC 16	12.06

HIGHEST 10.29 MAY 10, 1985
LOWEST 12.06 SEPT 24, 1987

Well 24; Local well number SC00406533BAB3; Depth of well 23.0 ft

MAY 15, 1984	5.55	JUNE 07, 1985	5.05	FEB 28, 1986	5.67	FEB 10, 1987	6.56
AUG 08	6.38	JUNE 25	5.43	MAR 28	5.70	MAR 19	6.58
SEPT 26	6.06	JULY 23	5.06	APR 16	4.15	MAY 01	6.63
NOV 07	5.63	AUG 19	7.03	APR 29	4.68	MAY 27	5.60
DEC 07	5.62	SEPT 13	5.81	JUNE 05	5.24	JULY 07	6.70
JAN 15, 1985	5.42	OCT 15	5.84	JULY 29	6.33	JULY 27	7.19
MAR 11	4.94	NOV 21	5.73	SEPT 10	6.86	SEPT 01	7.67
APR 09	4.97	DEC 23	5.61	OCT 27	6.85	SEPT 24	7.88
MAY 10	4.93	JAN 14, 1986	5.68	NOV 28	6.78	OCT 08	7.94
						NOV 06	7.80
						DEC 16	7.77

HIGHEST 4.15 APR 16, 1986
LOWEST 7.88 SEPT 24, 1987

Well 25; Local well number SC00506503ABB; Depth of well 18.0 ft

MAY 15, 1984	4.49	JUNE 07, 1985	4.45	FEB 28, 1986	4.15	MAR 19, 1987	4.08
AUG 08	5.03	JUNE 25	5.14	MAR 28	4.17	MAY 01	4.07
SEPT 26	5.44	JULY 23	4.52	APR 16	3.94	MAY 27	3.89
NOV 07	4.29	AUG 19	5.54	JUNE 05	4.08	JULY 07	4.35
DEC 07	4.28	SEPT 13	5.00	JULY 29	5.86	JULY 09	5.41
JAN 15, 1985	4.33	OCT 15	4.32	SEPT 10	6.44	SEPT 01	5.85
MAR 11	4.20	NOV 21	4.21	OCT 27	6.15	OCT 08	6.14
APR 09	4.32	DEC 23	4.14	NOV 28	5.86	NOV 06	5.72
MAY 10	4.29	JAN 14, 1986	4.10	FEB 10, 1987	5.09	DEC 16	4.96

HIGHEST 3.89 MAY 27, 1987
LOWEST 6.44 SEPT 10, 1986

Table 5.--*Water levels in wells where ground-water samples were obtained, 1981-87*--Continued

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Well 26; Local well number SC00406534CBB; Depth of well 16.0 ft							
MAY 15, 1984	5.78	JUNE 07, 1985	6.25	JAN 15, 1986	5.90	MAR 19, 1987	6.19
AUG 08	6.79	JUNE 25	6.95	FEB 28	5.94	MAR 30	6.18
SEPT 26	7.31			MAR 28	5.95	MAY 01	6.07
NOV 07	6.13	JULY 23	6.43	APR 16	5.78	MAY 27	5.96
DEC 07	5.93			JUNE 05	5.94	JULY 07	6.27
JAN 15, 1985	5.90	AUG 19	7.53	JULY 29	7.78	JULY 27	7.32
MAR 11	6.01	SEPT 13	5.71	SEPT 10	8.79	SEPT 01	8.11
APR 09	6.08	OCT 15	6.13	OCT 27	8.96	SEPT 24	8.62
MAY 10	6.11	NOV 21	5.98	NOV 28	8.10	OCT 08	8.76
JUNE 07	6.25	DEC 23	5.74	FEB 10, 1987	6.47	NOV 06	7.84
						DEC 16	7.07
		HIGHEST	5.71	SEPT 13, 1985			
		LOWEST	8.96	OCT 27, 1986			
Well 27; Local well number SC00406528DCA; Depth of well 20.0 ft							
MAR 07, 1984	6.59	JUNE 07, 1985	6.17	MAR 28, 1986	6.08	MAR 19, 1987	8.41
MAY 05	5.24	JUNE 25	6.63	APR 16	5.80	MAR 30	8.96
AUG 08	6.41	JULY 23	6.42	JUNE 05	6.05	MAY 01	8.40
SEPT 26	6.83	AUG 09	7.03	JULY 03	6.93	MAY 04	8.23
NOV 07	6.69	SEPT 13	6.86	JULY 28	7.49	MAY 27	8.43
DEC 07	6.63	OCT 16	6.64	SEPT 10	8.07	JULY 07	8.93
JAN 15, 1985	6.44	NOV 12	6.40	OCT 01	8.29	JULY 27	9.25
MAR 11	6.20	DEC 23	6.16	OCT 29	8.35	SEPT 01	9.09
APR 09	6.16	JAN 14, 1986	6.08	NOV 28	8.20	SEPT 24	9.36
MAY 10	6.09	FEB 28	6.08	FEB 10, 1987	8.38	OCT 08	9.33
						NOV 06	9.00
						DEC 15	8.84
		HIGHEST	5.24	MAY 05, 1984			
		LOWEST	9.36	SEPT 24, 1987			
Well 28; Local well number SC00406528BDD; Depth of well 20.0 ft							
MAY 15, 1984	10.53	JUNE 25, 1985	11.27	APR 16, 1986	10.70	MAY 01, 1987	10.87
AUG 08	10.94	JULY 25	11.17	JUNE 05	10.82	MAY 04	10.71
SEPT 26	10.97	AUG 19	11.25	JULY 03	11.13	MAY 27	11.25
NOV 07	11.15	SEPT 13	10.96	JULY 28	11.38	JULY 07	11.47
DEC 07	11.07	OCT 16	10.95	SEPT 10	11.65	JULY 27	11.83
JAN 05, 1985	11.18	NOV 21	10.90	OCT 01	11.80	SEPT 01	12.04
MAR 11	11.37	DEC 23	10.89	OCT 29	11.56	SEPT 24	12.16
APR 09	11.24	JAN 14, 1986	10.84	NOV 28	10.97	OCT 08	12.20
MAY 10	11.10	FEB 28	10.84	FEB 10, 1987	10.84	NOV 06	11.95
JUNE 07	11.14	MAR 28	10.86	MAR 19	10.85	DEC 15	11.43
		HIGHEST	10.53	MAY 15, 1984			
		LOWEST	12.16	SEPT 24, 1987			

[1]Dry, water level is below bottom of well.
[2]Obstruction in well.
[3]Well was recently pumped or bailed. Also, well was pumping most of the time; therefore; water levels were not measured.

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*

[deg. C, degrees Celsius, µS/cm; microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, less than detection limit; --, no data; dis., dissolved; NO_2+NO_3, nitrite plus nitrate; cols. per 100 mL, colonies per 100 milliliters]

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
1	07-06-81	18.0	1,400	6.80	410	<1	923	<0.050	<0.010
	06-08-82	13.5	1,000	7.40	200	--	806	<0.050	<0.010
	06-24-83	12.0	1,150	6.80	370	<1	824	<0.100	<0.010
	09-29-83	--	--	--	370	<1	865	<0.100	<0.010
	02-16-84	7.0	825	7.50	310	<1	626	0.100	<0.010
	06-25-84	13.0	700	7.30	300	<1	660	0.200	0.020
	10-29-84	12.0	820	6.90	260	--	775	<0.100	<0.010
	01-24-85	--	--	--	290	--	548	0.100	<0.010
	04-02-85	6.5	720	7.20	280	<1	572	0.100	0.040
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	16.0	780	7.10	210	<1	531	<0.100	<0.010
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	13.0	900	7.00	260	<1	627	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	6.0	870	7.20	310	<1	573	0.300	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-28-86	9.5	900	7.00	290	<1	631	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	17.0	1,000	6.80	360	<1	700	0.200	<0.010
	10-30-86	14.0	1,250	7.10	250	<1	628	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-11-87	7.0	850	7.20	270	<1	642	0.100	<0.010
	05-29-87	10.0	1,100	7.00	260	<1	674	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	15.0	1,330	6.90	320	<1	733	0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-17-87	10.0	740	7.20	330	<1	719	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
1	07-06-81	0.50	0.070	<0.020	180	24	65	8.0	35	330	--
	06-08-82	0.40	0.040	0.020	170	17	58	6.5	24	380	--
	06-24-83	0.90	0.920	<0.020	180	20	68	8.2	30	270	--
	09-29-83	0.30	0.640	<0.020	180	20	58	9.2	30	260	1
	02-16-84	6.5	0.090	<0.020	150	16	50	8.0	23	210	--
	06-25-84	0.30	0.470	0.010	140	18	54	7.0	25	200	--
	10-29-84	0.40	0.170	0.030	160	20	43	8.0	28	230	--
	01-24-85	<0.90	0.010	<0.020	140	13	48	7.6	17	160	--
	04-02-85	0.40	0.040	<0.020	110	12	40	5.3	20	170	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	1.5	0.060	<0.020	130	13	39	5.0	19	180	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	2.5	0.040	<0.020	130	15	48	6.2	25	190	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	0.80	0.040	<0.020	130	16	47	5.2	27	190	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	1.6	<0.010	0.150	130	13	48	5.0	35	190	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	0.80	0.040	<0.020	160	19	56	6.6	26	190	--
	10-30-86	0.90	0.070	<0.020	140	13	44	5.0	27	230	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-11-87	<0.30	0.050	<0.020	150	16	43	5.0	27	210	--
	05-29-87	0.50	0.100	0.030	150	17	44	5.4	32	240	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	0.50	0.550	0.030	160	19	52	6.8	29	230	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-17-87	0.60	0.170	0.070	160	19	48	5.8	28	220	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
1	07-06-81	--	3,600	--	--	--	650	<1	560	<1	<1
	06-08-82	--	<10	--	--	--	140	--	490	<1	5
	06-24-83	--	3,700	--	--	--	100	<1	530	<1	<1
	09-29-83	<10	3,900	<10	1,200	<10	30	<1	540	--	--
	02-16-84	--	630	--	--	--	30	<1	430	--	--
	06-25-84	--	--	--	--	--	20	<1	420	--	--
	10-29-84	--	1,500	--	--	--	20	--	480	<1	--
	01-24-85	--	50	--	--	--	50	--	400	<1	2
	04-02-85	--	30	--	--	--	10	<1	330	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<10	<1
	07-03-85	--	1,500	--	--	--	30	<1	370	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	140
	10-17-85	<10	3,400	<10	1,400	220	10	<1	390	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	2
	01-16-86	--	1,700	--	--	--	30	<1	390	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	4
	04-28-86	--	2,500	--	1,500	--	<20	<1	390	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	4,900	--	2,000	--	<20	<1	480	--	--
	10-30-86	--	<50	--	--	--	<20	<1	400	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-11-87	--	350	--	--	--	<20	<1	450	--	--
	05-29-87	--	1,700	--	--	--	<20	<1	450	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	3,200	--	--	--	<20	<1	490	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-17-87	--	<50	--	--	--	40	<1	470	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
2	10-29-84	0.70	0.050	<0.020	110	16	43	8.0	11	190	--
	01-28-85	<0.03	<0.090	0.030	110	13	50	9.4	11	200	--
	04-02-85	<0.30	0.040	0.050	110	12	45	8.5	14	180	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	0.60	<0.010	<0.020	110	14	35	7.2	13	200	--
	10-22-85	<0.30	0.180	0.060	120	23	50	6.4	18	190	<1
	01-22-86	--	--	--	--	--	--	--	--	--	--
	01-22-86	0.30	0.030	<0.020	110	12	50	6.1	16	190	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	1.5	<0.010	0.150	120	12	47	7.0	27	190	--
	08-12-86	--	--	--	--	--	--	--	--	--	--
	08-12-86	1.1	0.220	<0.020	120	13	56	6.0	14	190	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-11-87	<0.30	0.070	<0.020	130	14	45	6.7	16	210	--
	06-06-87	0.70	0.040	<0.020	120	14	47	6.5	16	210	--
3-3a	06-24-83	2.2	480	0.460	900	110	--	28	300	600	--
	09-29-83	3.2	400	0.240	810	100	--	21	260	520	1
	06-25-84	3.7	265	0.160	620	100	64	25	250	520	--
	10-29-84	9.1	360	0.200	880	120	77	30	370	650	--
	01-24-85	18	395	0.040	980	130	100	28	390	750	--
	04-02-85	8.1	330	0.100	760	110	81	25	360	610	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	5.0	380	0.070	830	110	90	30	140	740	--
	04-28-86	1.2	488	0.100	1,100	150	160	31	460	1,100	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	4.6	491	<0.020	1,200	130	100	21	390	800	--
	05-29-87	1.1	1,060	0.090	1,900	250	190	39	760	1,100	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	4.6	990	0.130	1,600	190	130	26	640	740	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-17-87	7.4	667	0.100	1,400	170	92	21	560	890	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
2	10-29-84	12.0	780	7.20	230	--	834	<0.100	<0.010
	01-28-85	9.5	775	7.40	230	--	551	0.100	<0.010
	04-02-85	12.0	790	7.40	230	<1	545	0.200	0.040
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	12.0	800	7.20	230	<1	537	0.100	<0.010
	10-22-85	11.5	950	7.40	230	<1	565	<0.100	0.060
	01-22-86	--	--	--	--	--	--	--	--
	01-22-86	11.0	775	7.30	250	<1	560	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-28-86	11.0	790	7.30	240	<1	574	0.200	<0.010
	08-12-86	--	--	--	--	--	--	--	--
	08-12-86	12.5	820	8.00	240	<1	550	0.150	<0.010
	02-11-87	--	--	--	--	--	--	--	--
	02-11-87	12.0	820	7.40	230	<1	583	0.100	<0.010
	06-06-87	14.0	850	7.30	240	<1	579	0.200	<0.010
3-3a	06-24-83	11.0	4,500	6.90	230	<1	4,300	0.500	0.550
	09-29-83	--	--	--	250	<1	3,910	0.100	0.020
	06-25-84	9.0	3,800	6.90	340	--	3,780	0.600	5.08
	10-29-84	11.5	4,500	6.70	330	--	4,150	<0.100	17.8
	01-24-85	8.5	5,250	7.00	340	--	4,870	0.500	41.0
	04-02-85	10.0	4,400	7.10	320	<1	3,870	0.600	17.5
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	11.5	5,250	7.00	330	<1	5,470	0.400	1.98
	04-28-86	10.5	6,900	6.80	230	<1	6,520	0.200	0.040
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.0	6,800	6.50	300	<1	6,090	0.200	0.800
	05-29-87	9.5	11,000	6.70	180	<1	9,170	<0.100	0.030
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.5	11,500	6.90	230	<1	8,150	0.300	0.990
	12-17-87	--	--	--	--	--	--	--	--
	12-17-87	11.0	5,000	7.10	260	<1	6,460	<0.100	0.300

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
2	10-29-84	--	320	--	--	--	<10	--	340	<1	160
	01-28-85	--	580	--	--	--	<10	--	340	<1	1,500
	04-02-85	--	360	--	--	--	<10	<1	330	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<10	14
	07-03-85	--	30	--	--	--	20	<1	330	--	--
	10-22-85	<10	30	<10	70	240	20	<1	390	<1	30
	01-22-86	--	--	--	--	--	--	--	--	<1	<1
	01-22-86	--	430	--	--	--	<10	<1	330	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-28-86	--	10	--	170	--	<10	<1	340	--	--
	08-12-86	--	--	--	--	--	--	--	--	60	3
	08-12-86	--	<10	--	150	--	<10	<1	340	--	--
	02-11-87	--	--	--	--	--	--	--	--	<2	2
	02-11-87	--	430	--	--	--	<10	<1	370	--	--
	06-06-87	--	550	--	--	--	<10	<1	370	<2	13
3-3a	06-24-83	--	470	--	--	--	200	<1	2,700	<1	75
	09-29-83	30	20	10	60	10	80	<1	2,400	--	--
	06-25-84	--	20	--	--	--	20	--	2,000	--	--
	10-29-84	--	20	--	--	--	<10	--	2,700	<1	--
	01-24-85	--	10	--	--	--	70	--	3,000	<1	280
	04-02-85	--	<10	--	--	--	30	<1	2,400	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	32
	07-03-85	--	<10	--	--	--	70	<1	2,500	--	--
	04-28-86	--	10	--	<20	--	<10	<1	3,400	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<100
	08-05-86	--	<10	--	<10	--	<10	<1	3,500	--	--
	05-29-87	--	<50	--	--	--	<20	<1	5,800	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	8
	09-02-87	--	--	--	--	--	--	--	--	<2	--
	09-02-87	--	<20	--	--	--	<60	<1	4,700	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	--
	12-17-87	--	<100	--	--	--	100	<1	4,100	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
4	04-02-85	11.0	800	8.20	86	<1	517	0.400	0.100
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	11.5	800	8.00	83	<1	516	0.300	0.010
	10-22-85	11.0	860	8.20	82	<1	520	0.200	0.070
	01-22-86	--	--	--	--	--	--	--	--
	01-22-86	11.0	740	8.00	87	<1	516	<0.100	0.020
	04-28-86	--	--	--	--	--	--	--	--
	04-28-86	10.5	810	8.20	88	<1	522	0.200	<0.010
	08-12-86	--	--	--	--	--	--	--	--
	08-12-86	12.0	790	8.50	85	<1	497	<0.100	<0.010
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	820	8.40	--	85	500	0.300	0.00
	06-06-87	13.0	780	7.90	93	<1	530	<0.100	<0.010
5	07-06-81	13.5	1,500	7.40	300	<1	1,170	0.090	<0.010
	06-07-82	13.5	1,500	7.80	310	--	1,200	0.080	<0.010
	06-24-83	10.5	1,500	7.30	320	<1	1,300	<0.100	<0.010
	09-29-83	--	--	--	330	<1	1,420	<0.100	<0.010
	02-16-84	9.0	1,650	7.70	340	<1	1,400	<0.100	<0.010
	06-25-84	10.5	1,700	7.40	330	<1	1,390	0.400	<0.010
	10-29-84	13.0	1,620	7.20	310	--	1,410	<0.100	0.130
	01-24-85	9.0	1,670	7.50	310	--	1,400	<0.100	0.030
	04-02-85	8.5	1,790	7.30	300	<1	1,380	0.100	0.050
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	12.0	1,700	7.20	290	<1	1,370	<0.100	0.020
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	13.0	1,500	7.40	280	<1	1,200	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.0	1,680	7.40	320	<1	1,390	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-28-86	9.5	1,710	7.40	290	<1	1,390	<0.100	<0.010
	08-04-86	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
4	04-02-85	<0.30	0.120	0.040	84	6.0	71	6.3	38	250	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	<0.30	0.290	<0.020	81	6.0	55	5.3	34	250	--
	10-22-85	<0.30	0.030	0.020	86	5.0	78	4.2	39	240	<1
	01-22-86	--	--	--	--	--	--	--	--	--	--
	01-22-86	<0.30	0.090	<0.020	77	4.0	78	3.8	36	240	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	1.1	0.220	0.150	79	5.0	74	4.0	49	240	--
	08-12-86	--	--	--	--	--	--	--	--	--	--
	08-12-86	1.2	0.250	<0.020	73	5.0	73	4.0	36	240	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.080	<0.020	84	5.0	68	4.2	34	240	--
	06-06-87	0.50	0.190	<0.020	80	5.6	71	4.4	36	230	--
5	07-06-81	0.80	0.070	<0.020	210	27	96	8.0	37	530	--
	06-07-82	<0.30	0.010	0.020	230	26	94	8.4	37	560	--
	06-24-83	0.60	0.080	<0.020	270	29	110	8.6	41	600	--
	09-29-83	<0.30	<0.010	<0.020	280	32	94	8.9	43	640	1
	02-16-84	1.0	<0.010	<0.020	300	34	110	11	47	680	--
	06-25-84	<0.30	0.220	<0.020	260	33	120	8.0	51	630	--
	10-29-84	0.70	0.790	0.020	270	34	85	8.0	49	670	--
	01-24-85	0.50	1.55	<0.020	280	29	120	10	54	660	--
	04-02-85	<0.30	1.63	0.050	260	36	110	8.8	55	660	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	<0.30	1.72	<0.020	260	36	120	8.1	54	660	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	<0.30	0.540	<0.020	220	25	100	6.9	47	510	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	1.61	<0.020	250	31	110	6.3	62	660	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	0.90	0.990	0.150	270	28	110	6.0	72	650	--
	08-04-86	--	--	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
4	04-02-85	--	<10	--	--	--	<10	<1	230	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	37
	07-03-85	--	<10	--	--	--	30	<1	230	--	--
	10-22-85	<10	<10	<10	60	160	<10	<1	240	<1	2
	01-22-86	--	--	--	--	--	--	--	--	<1	3
	01-22-86	--	<10	--	--	--	<10	<1	210	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-28-86	--	<10	--	40	--	<10	<1	220	--	--
	08-12-86	--	--	--	--	--	--	--	--	<1	2
	08-12-86	--	<10	--	<20	--	<10	<1	200	--	--
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	<10	--	--	--	<10	<1	230	--	--
	06-06-87	--	<10	--	--	--	<10	<1	220	<2	<2
5	07-06-81	--	60	--	--	--	180	<1	630	<1	6
	06-07-82	--	650	--	--	--	90	--	680	<1	<1
	06-24-83	--	200	--	--	--	60	<1	800	<1	<1
	09-29-83	10	480	10	190	10	50	<1	830	--	--
	02-16-84	--	30	--	--	--	210	<1	890	--	--
	06-25-84	--	10	--	--	--	20	<1	790	--	--
	10-29-84	--	<10	--	--	--	<10	--	820	<1	--
	01-24-85	--	<10	--	--	--	30	--	810	<1	880
	04-02-85	--	60	--	--	--	<10	<1	810	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	14
	07-03-85	--	<10	--	--	--	20	<1	800	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	690
	10-17-85	<10	50	<10	320	160	<10	<1	660	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	8
	01-16-86	--	30	--	--	--	<10	<1	760	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-28-86	--	<10	--	160	--	<10	<1	790	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	12-17-87	--	<50	--	--	--	20	<1	780	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
5	08-05-86	12.0	1,750	6.90	290	<1	1,330	<0.100	0.060
	10-30-86	13.0	2,200	7.40	290	<1	1,260	<0.100	0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	8.5	1,700	7.40	290	<1	1,320	<0.100	<0.010
	05-29-87	9.0	2,000	7.40	280	<1	1,330	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.0	1,890	7.40	280	<1	1,260	<0.100	0.120
	12-17-87	--	--	--	--	--	--	--	--
	12-17-87	10.0	1,240	8.00	330	<1	1,350	<0.100	<0.010
6	07-06-81	14.0	700	7.20	330	<1	473	0.350	<0.010
	06-07-82	13.5	520	7.60	250	--	319	0.190	<0.010
	06-24-83	11.0	1,650	7.40	180	<1	230	0.200	<0.010
	09-29-83	--	--	--	200	<1	437	<0.100	<0.010
	02-16-84	9.0	600	7.90	230	<1	372	0.100	<0.010
	06-25-84	12.0	500	7.50	220	<1	430	0.600	0.020
	10-26-84	13.0	680	7.00	250	--	511	<0.100	<0.010
	01-24-85	8.0	820	7.50	270	--	578	<0.100	<0.010
	04-04-85	7.0	890	7.30	290	<1	636	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	12.0	960	7.30	300	<1	675	<0.100	<0.010
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	14.0	920	7.20	300	<1	653	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.0	930	7.30	360	<1	723	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-28-86	11.0	960	7.30	340	<1	664	0.100	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.0	980	6.70	340	<1	672	<0.100	<0.010
	10-30-86	13.0	1,350	7.30	340	<1	680	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-11-87	10.5	980	7.40	350	<1	684	0.100	<0.010
	05-29-87	9.5	1,100	7.30	330	<1	652	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
5	08-05-86	<0.30	1.36	<0.020	260	29	110	5.6	52	640	--
	10-30-86	1.7	0.260	<0.020	250	29	100	6.0	48	540	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.030	0.490	<0.020	290	32	110	5.7	48	610	--
	05-29-87	<0.30	1.81	<0.020	270	31	98	5.8	63	600	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	<0.30	0.520	0.030	260	28	100	5.4	48	580	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-17-87	0.60	1.75	0.020	260	30	96	6.1	59	560	--
6	07-06-81	1.3	0.230	<0.020	110	13	28	7.0	3.0	88	--
	06-07-82	0.50	0.050	0.040	84	9.2	20	5.1	2.0	41	--
	06-24-83	1.3	0.460	<0.020	55	7.0	13	4.3	3.0	20	--
	09-29-83	0.40	0.350	<0.020	97	11	12	5.1	<1.0	110	1
	02-16-84	0.50	0.970	<0.020	95	11	10	5.0	9.0	88	--
	06-25-84	<0.30	0.570	0.060	100	13	12	4.0	6.0	110	--
	10-26-84	<0.30	0.530	<0.020	130	15	14	5.0	6.0	140	--
	01-24-85	0.30	<0.010	<0.020	150	16	27	5.5	11	170	--
	04-04-85	1.2	0.190	<0.020	160	17	15	5.0	18	210	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	<0.30	0.250	<0.020	180	26	19	4.1	15	230	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	<0.30	1.70	0.100	160	18	19	4.6	13	200	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.120	<0.020	170	20	22	4.4	16	200	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	0.90	0.100	0.100	170	17	24	4.0	16	200	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.1	0.100	<0.020	180	21	24	4.3	11	210	--
	10-30-86	0.60	0.050	<0.020	160	18	25	4.0	12	210	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-11-87	0.30	0.110	<0.020	190	21	24	4.0	14	210	--
	05-29-87	<0.30	0.160	<0.020	170	19	25	3.8	10	210	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
5	08-05-86	--	<10	--	60	--	30	<1	760	--	--
	10-30-86	--	520	--	--	--	<20	<1	750	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	160	--	--	--	1,600	<1	850	--	--
	05-29-87	--	<50	--	--	--	<20	<1	810	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	<10	--	--	--	<10	<1	760	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
6	07-06-81	--	<10	--	--	--	150	<1	330	<1	8
	06-07-82	--	1,100	--	--	--	90	--	250	<1	80
	06-24-83	--	70	--	--	--	90	<1	170	--	--
	09-29-83	10	1,800	10	1,400	10	20	<1	290	--	--
	02-16-84	--	<10	--	--	--	30	<1	280	--	--
	06-25-84	--	<10	--	--	--	30	<1	310	--	--
	10-26-84	--	<10	--	--	--	<10	--	400	<1	--
	01-24-85	--	40	--	--	--	30	--	430	<1	7,200
	04-04-85	--	30	--	--	--	<10	<1	470	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	58
	07-03-85	--	30	--	--	--	40	<1	550	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	650
	10-17-85	<10	<10	<10	580	220	10	<1	470	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	6
	01-16-86	--	510	--	--	--	<10	<1	500	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	3
	04-28-86	--	<10	--	200	--	<10	<1	500	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	40	--	<10	<1	540	--	--
	10-30-86	--	1,600	--	--	--	30	<1	490	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	3
	02-11-87	--	<10	--	--	--	<10	<1	570	--	--
	05-29-87	--	<50	--	--	--	<20	<1	510	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
6	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.0	1,050	7.20	310	<1	700	0.200	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-17-87	11.0	772	7.10	360	<1	761	<0.100	<0.010
7	07-06-81	13.5	750	7.00	210	<1	543	<0.050	<0.010
	06-08-82	13.0	800	7.80	210	--	564	<0.050	<0.010
	06-24-83	11.0	770	6.80	210	<1	588	<0.010	<0.010
	09-29-83	--	--	--	190	<1	534	<0.100	<0.010
	02-16-84	9.0	750	7.40	210	<1	492	0.200	<0.010
	06-25-84	10.5	800	7.00	200	<1	600	0.600	<0.010
	10-29-84	12.0	700	6.90	190	--	504	<0.100	<0.010
	01-24-85	8.0	670	7.10	190	--	500	<0.100	<0.010
	04-05-85	7.0	710	7.00	190	<1	475	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	11.0	670	7.20	180	<1	453	<0.100	<0.010
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	11.5	650	6.90	270	<1	491	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.0	650	7.00	210	<1	447	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-28-86	9.0	680	6.90	190	<1	451	0.100	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.0	760	6.20	210	<1	508	<0.100	<0.010
	10-30-86	13.0	950	7.00	200	<1	491	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-11-87	10.5	760	6.80	200	<1	520	<0.100	<0.100
	05-29-87	9.0	860	6.90	200	<1	488	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	11.5	930	6.90	210	<1	542	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-17-87	10.0	560	7.20	220	<1	514	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
6	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	0.40	0.070	0.040	170	20	26	3.6	10	230	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-17-87	0.60	0.150	0.020	160	20	28	3.7	12	190	--
7	07-06-81	0.40	0.090	0.220	99	11	52	6.0	8.0	210	--
	06-08-82	<0.30	0.020	0.240	110	13	52	5.4	8.0	220	--
	06-24-83	0.70	0.140	0.110	110	14	58	6.0	13	220	--
	09-29-83	<0.30	0.100	0.090	97	12	48	5.8	1.0	170	1
	02-16-84	0.60	0.020	0.110	100	13	55	6.0	9.0	210	--
	06-25-84	<0.30	0.350	0.170	110	15	60	5.0	10	200	--
	10-29-84	0.40	0.210	0.140	87	14	53	5.0	2.0	180	--
	01-24-85	0.40	0.120	0.030	93	11	53	6.2	6.0	160	--
	04-05-85	0.30	0.260	0.210	89	11	52	4.8	6.0	170	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	<0.30	0.400	0.120	79	13	38	3.7	7.0	160	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	<0.30	0.210	0.190	100	9.0	54	3.3	5.0	160	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.140	0.120	79	11	53	3.8	6.0	160	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	1.0	0.130	0.250	84	9.0	49	4.0	16	150	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	0.90	0.190	0.040	95	12	54	3.9	8.0	180	--
	10-30-86	<0.30	0.080	0.140	95	11	53	4.0	8.0	180	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-11-87	<0.30	0.060	0.150	100	12	51	3.8	8.0	190	--
	05-29-87	<0.30	0.110	0.260	95	12	49	3.8	6.0	190	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	<0.30	0.060	0.200	100	13	54	3.6	5.0	210	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-17-87	0.30	0.210	0.170	98	13	85	5.0	6.0	240	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
6	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	320	--	--	--	<20	<1	520	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-17-87	--	<50	--	--	--	<20	<1	490	--	--
7	07-06-81	--	<10	--	--	--	170	<1	290	<1	6
	06-08-82	--	<10	--	--	--	150	--	330	<1	3
	06-24-83	--	<10	--	--	--	80	<1	330	<1	1
	09-29-83	10	<10	10	10	10	30	<1	290	--	--
	02-16-84	--	<10	--	--	--	30	<1	310	--	--
	06-25-84	--	<10	--	--	--	10	<1	330	--	--
	10-29-84	--	<10	--	--	--	<10	--	270	<1	--
	01-24-85	--	<10	--	--	--	30	--	280	<1	3,900
	04-05-85	--	<10	--	--	--	70	<1	270	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	47
	07-03-85	--	<10	--	--	--	30	<1	250	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	450
	10-17-85	<10	10	<10	10	310	10	<1	290	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	14
	01-16-86	--	<10	--	--	--	30	<1	240	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	14
	04-28-86	--	<10	--	<20	--	<10	<1	250	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	100
	08-05-86	--	<10	--	<20	--	<10	<1	290	--	--
	10-30-86	--	<50	--	--	--	<20	<1	280	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	2
	02-11-87	--	--	--	--	--	--	--	--	<2	2
	02-11-87	--	<10	--	--	--	<10	<1	310	--	--
	05-29-87	--	<50	--	--	--	<20	<1	290	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	2
	09-02-87	--	<50	--	--	--	<20	<1	310	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-17-87	--	<50	--	--	--	<20	<1	300	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
8	06-28-84	11.5	3,900	7.30	350	--	3,880	<0.100	0.900
	10-29-84	13.5	3,900	7.30	350	--	3,700	<0.100	0.660
	01-24-85	10.0	3,800	7.40	320	--	3,690	<0.100	0.200
	04-08-85	9.5	3,000	7.50	340	<1	3,720	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	12.0	3,800	7.30	320	<1	3,700	<0.100	0.070
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.0	3,900	7.20	320	<1	3,650	<0.100	0.050
9	06-28-84	10.5	3,900	7.40	300	--	3,530	<0.100	0.190
	10-29-84	13.0	3,750	7.30	330	--	3,590	<0.100	0.710
	01-24-85	11.0	3,600	7.40	360	--	3,560	<0.100	0.110
	04-08-85	10.0	3,900	7.60	380	<1	3,590	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	13.0	4,000	7.30	400	<1	3,650	<0.100	<0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.0	4,100	7.30	390	<1	3,750	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	11.5	4,100	7.30	470	<1	3,800	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	10.5	4,400	7.30	440	<1	3,830	<0.100	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.0	4,300	7.10	450	<1	3,890	<0.100	<0.010
	10-30-86	13.0	5,900	7.40	430	<1	3,860	<0.100	0.070
	11-05-86	--	--	--	--	--	--	--	--
	02-18-87	--	--	--	--	--	--	--	--
	05-30-87	12.0	4,900	7.30	380	<1	4,200	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.5	6,300	7.30	370	<1	4,340	<0.100	0.060
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	12.0	3,500	7.20	390	<1	4,110	<0.100	0.080

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
8	06-28-84	2.0	150	<0.020	560	120	250	11	260	1,200	--
	10-29-84	2.9	153	0.050	630	120	290	11	220	1,300	--
	01-24-85	2.5	93.0	<0.020	640	110	160	12	190	1,400	--
	04-08-85	2.0	80.0	<0.020	660	110	330	9.7	190	1,700	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	2.1	75.0	<0.020	590	110	340	10	170	1,800	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	1.9	77.0	<0.020	670	100	320	6.2	170	1,800	<1
9	06-28-84	0.80	55.0	<0.020	510	140	250	10	170	1,600	--
	10-29-84	1.6	54.0	0.020	600	130	170	10	180	1,600	--
	01-24-85	1.3	54.5	<0.020	620	120	160	12	180	1,500	--
	04-08-85	1.6	55.0	<0.020	640	120	290	10	190	1,700	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	1.0	58.0	<0.020	590	120	300	10	220	1,700	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	1.2	85.0	0.060	710	130	290	6.1	280	1,600	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	1.4	77.5	<0.020	600	120	290	5.7	280	1,600	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	2.2	63.0	0.150	560	130	260	6.0	280	1,500	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.3	93.5	<0.020	680	140	250	5.0	240	1,500	--
	10-30-86	3.2	106	0.030	690	130	260	<10	260	1,400	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-18-87	--	--	--	--	--	--	--	--	--	--
	05-30-87	1.8	136	<0.020	730	140	250	5.9	260	1,400	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	<0.30	190	0.030	730	140	250	6.0	280	1,600	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	1.6	182	<0.020	870	150	260	6.4	270	1,800	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
8	06-28-84	--	<10	--	--	--	30	--	1,900	--	--
	10-29-84	--	20	--	--	--	<10	--	2,100	<1	--
	01-24-85	--	<10	--	--	--	30	--	2,000	<1	130
	04-08-85	--	<10	--	20	--	40	<1	2,100	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	5
	06-26-85	--	--	--	--	--	--	--	--	<10	19
	07-03-85	--	<10	--	--	--	60	<1	1,900	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	160
	10-18-85	10	<10	<10	40	100	30	<1	2,100	--	--
9	06-28-84	--	<10	--	--	--	20	--	1,800	--	--
	10-29-84	--	<10	--	--	--	<10	--	2,000	<1	--
	01-24-85	--	<10	--	--	--	20	--	2,000	<2	<2
	04-08-85	--	<10	--	--	--	50	<1	2,100	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<10	6
	07-03-85	--	20	--	--	--	30	<1	2,000	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	210
	10-18-85	<10	<10	<10	10	130	10	<1	2,300	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	5
	01-16-86	--	20	--	--	--	<10	<1	2,000	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	<20	--	<10	<1	1,900	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	<20	--	<10	<1	2,300	--	--
	10-30-86	--	<500	--	--	--	<200	<1	2,300	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-18-87	--	<100	--	--	--	<40	--	--	--	--
	05-30-87	--	<50	--	--	--	<20	<1	2,400	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	<200	--	--	--	<60	<1	2,400	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	--
	12-18-87	--	<10	--	--	--	<10	<1	2,500	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
10-10a	07-06-81	--	--	--	--	--	--	--	--
	06-08-82	14.0	1,300	7.50	290	--	1,050	0.110	0.020
	06-24-83	10.5	2,200	6.90	240	<1	1,990	0.200	1.25
	09-29-83	--	--	--	290	<1	1,610	<0.100	<0.010
	02-10-84	10.5	1,520	7.40	290	<1	1,270	0.400	0.020
	06-28-84	10.5	1,600	7.20	260	<1	1,270	<0.100	0.180
	10-29-84	14.5	1,300	7.20	290	--	1,060	<0.100	0.070
	01-24-85	10.0	1,450	7.10	290	--	1,140	0.100	0.070
	04-05-85	8.0	1,470	7.20	300	<1	1,120	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-03-85	11.0	1,500	7.30	320	<1	1,150	<0.100	0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.5	1,600	7.10	320	<1	1,310	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	10.5	1,710	7.10	430	<1	1,430	<0.100	0.020
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	10.0	1,890	6.90	350	<1	1,520	0.200	0.070
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	11.5	1,950	6.70	430	<1	1,550	<0.100	0.310
	10-30-86	12.5	2,650	7.00	360	<1	1,540	<0.100	0.020
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.5	1,900	7.00	330	<1	1,480	<0.100	<0.010
	05-29-87	10.5	1,650	7.00	290	<1	1,560	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.0	2,200	7.00	300	<1	1,560	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	969	7.30	290	<1	1,370	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
10-10a	07-06-81	--	--	--	--	--	--	--	--	--	--
	06-08-82	0.40	6.80	0.050	210	33	51	6.5	35	480	--
	06-24-83	4.1	73.0	<0.020	400	58	54	6.7	120	640	--
	09-29-83	3.0	27.0	<0.020	380	45	57	6.8	94	660	<1
	02-10-84	1.0	15.0	0.040	290	34	58	8.4	41	530	--
	06-28-84	0.70	21.0	<0.020	260	42	58	4.0	68	490	--
	10-29-84	1.1	17.2	0.030	220	35	50	5.0	38	320	--
	01-24-85	0.80	21.0	<0.020	250	33	51	6.3	45	430	--
	04-05-85	1.2	21.0	0.070	240	36	53	5.3	49	400	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-03-85	0.50	22.8	<0.020	250	41	51	4.8	51	380	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	1.8	25.0	0.060	300	40	490	4.1	43	490	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	1.9	22.0	0.030	340	45	61	5.3	48	510	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	4.1	52.0	0.150	340	49	54	5.0	80	440	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	3.4	39.4	<0.020	330	50	48	4.8	65	490	--
	10-30-86	1.2	42.3	0.030	370	52	54	6.0	79	510	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	0.80	33.0	<0.020	310	44	52	4.8	72	510	--
	05-29-87	0.60	46.0	0.020	320	45	56	4.9	80	520	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	<0.30	80.0	0.020	320	45	54	4.9	74	350	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.60	33.5	<0.020	340	42	53	3.9	73	570	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
10-10a	07-06-81	--	--	--	--	--	--	--	--	<1	>100
	06-08-82	--	150	--	--	--	80	--	660	<1	800
	06-24-83	--	<10	--	--	--	50	<1	1,200	1	77
	09-29-83	20	10	30	70	10	30	<1	1,100	--	--
	02-10-84	--	20	--	--	--	20	<1	860	--	--
	06-28-84	--	<10	--	--	--	30	<1	820	--	--
	10-29-84	--	<10	--	--	--	60	--	700	<1	--
	01-24-85	--	<10	--	--	--	30	--	770	<1	460
	04-05-85	--	<10	--	--	--	60	<1	750	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<10	15
	07-03-85	--	20	--	--	--	110	<1	790	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	<1
	10-18-85	20	<10	<10	10	300	30	<1	910	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	9
	01-16-86	--	40	--	--	--	40	<1	1,000	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	100
	04-29-86	--	<10	--	40	--	<10	<1	1,000	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	80	--	<10	<1	1,000	--	--
	10-30-86	--	<100	--	--	--	<40	<1	1,100	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	<10	--	--	--	720	<1	960	--	--
	05-29-87	--	<50	--	--	--	<20	<1	980	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	18
	09-02-87	--	<50	--	--	--	<20	<1	980	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	1,000	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
11	07-07-81	14.0	1,700	7.00	330	<1	1,320	1.30	0.410
	06-08-82	13.0	1,000	7.30	320	--	1,600	0.590	0.030
	06-24-83	11.0	6,000	7.00	160	<1	4,620	--	0.050
	09-29-83	--	--	--	190	<1	5,630	--	0.060
	02-15-84	9.5	4,000	7.00	370	<1	3,540	0.200	2.20
	06-28-84	11.0	4,500	6.90	370	<1	4,540	<0.100	0.160
	10-26-84	13.0	3,250	6.90	610	--	3,170	<0.100	0.400
	01-18-85	--	--	--	--	--	--	--	--
	04-08-85	7.0	3,750	6.90	710	<1	3,020	<0.100	0.080
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	11.5	3,500	6.70	730	<1	3,190	0.100	0.020
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.0	3,550	6.80	680	<1	3,130	<0.100	0.030
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	10.0	3,800	6.90	770	<1	3,090	<0.100	0.050
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	10.0	4,400	6.80	610	<1	3,590	0.200	0.050
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.0	3,800	6.50	720	<1	3,340	<0.100	<0.010
	10-30-86	13.0	4,600	6.80	690	<1	3,210	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	3,700	6.70	680	<1	3,200	0.100	<0.010
	05-29-87	13.0	4,400	6.90	630	<1	3,270	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	14.0	4,100	6.90	700	<1	3,220	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	12.5	2,080	6.80	680	<1	3,130	<0.100	0.020
12	06-07-82	12.5	1,400	7.70	310	--	1,160	<0.050	<0.010
	06-24-83	11.0	1,600	7.30	310	<1	1,260	<0.100	<0.010
	09-29-83	--	--	--	300	<1	1,240	<0.100	0.640
	02-15-84	10.0	1,500	7.20	270	<1	1,110	0.300	1.82
	04-08-85	8.0	1,100	7.30	210	<1	876	<0.100	0.100

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
11	07-07-81	3.3	18.8	0.400	240	31	110	11	100	470	--
	06-08-82	1.3	29.5	0.170	270	38	100	8.9	150	540	--
	06-24-83	0.10	480	0.310	1,000	96	140	14	400	750	--
	09-29-83	1.9	400	0.240	1,300	120	160	16	730	1,100	2
	02-15-84	2.5	181	0.330	780	77	190	11	360	950	--
	06-28-84	<0.30	228	0.220	690	110	170	9.0	370	880	--
	10-26-84	1.5	104	0.360	700	88	150	7.0	280	1,100	--
	01-18-85	--	--	--	--	--	--	--	--	--	--
	04-08-85	15	62.0	0.100	720	86	170	7.3	250	1,100	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.1	50.0	0.220	650	77	200	8.0	240	980	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	0.80	55.0	0.260	690	70	190	4.1	230	1,200	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	0.70	35.5	0.170	590	77	190	3.5	220	1,200	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	1.9	120	0.290	730	84	190	4.0	270	1,200	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.7	47.4	0.120	700	91	200	3.0	220	1,200	--
	10-30-86	2.0	27.4	0.200	680	80	200	<10	190	1,200	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	0.50	29.0	0.120	760	88	200	4.4	190	1,400	--
	05-29-87	0.50	41.0	0.120	730	89	190	3.9	190	1,300	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.50	23.0	0.200	680	80	200	4.2	180	1,300	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.70	18.9	0.170	690	83	180	3.9	170	1,300	--
12	06-07-82	0.40	0.670	0.040	230	25	67	7.1	120	410	--
	06-24-83	0.20	1.16	<0.020	290	29	84	7.6	100	500	--
	09-29-83	1.2	19.6	<0.020	260	26	73	7.8	110	400	1
	02-15-84	5.0	58.0	0.600	260	27	76	8.0	80	300	--
	04-08-85	1.4	30.0	<0.020	180	19	59	5.7	63	240	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
11	07-07-81	--	<10	--	--	--	480	<1	720	<1	560
	06-08-82	--	<10	--	--	--	190	--	840	<1	11
	06-24-83	--	<10	--	--	--	80	<1	2,900	<1	33
	09-29-83	40	20	20	140	<10	90	<1	3,600	--	--
	02-15-84	--	10	--	--	--	90	<1	2,300	--	--
	06-28-84	--	<10	--	--	--	50	<1	2,200	--	--
	10-26-84	--	20	--	--	--	<10	--	2,100	<1	--
	01-18-85	--	--	--	--	--	--	--	--	<1	630
	04-08-85	--	<10	--	--	--	120	<1	2,200	--	--
	04-11-85	--	--	--	--	--	--	--	--	<2	6
	06-26-85	--	--	--	--	--	--	--	--	<10	3
	07-05-85	--	<10	--	--	--	90	<1	1,900	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	180
	10-18-85	10	<10	<10	170	240	30	<1	2,000	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	5
	01-16-86	--	10	--	--	--	40	<1	1,800	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	17
	04-29-86	--	<10	--	170	--	<10	<1	2,200	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	100
	08-05-86	--	<10	--	100	--	<10	<1	2,100	--	--
	10-30-86	--	<500	--	--	--	--	<1	2,000	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	200	--	--	--	2,800	<1	2,300	--	--
	05-29-87	--	<50	--	--	--	<20	<1	2,200	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	10
	09-03-87	--	<100	--	--	--	<40	<1	2,000	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<100	--	--	--	<40	<1	2,100	--	--
12	06-07-82	--	<10	--	--	--	150	--	680	<1	20
	06-24-83	--	<10	--	--	--	180	<1	850	<1	15
	09-29-83	10	<10	<10	350	290	30	<1	760	--	--
	02-15-84	--	<10	--	--	--	30	<1	760	--	--
	04-08-85	--	<10	--	--	--	10	<1	520	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
12	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	11.0	1,500	7.10	240	<1	1,140	<0.100	0.090
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	12.0	1,610	7.20	250	<1	1,210	<0.100	0.140
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.5	1,500	7.30	290	<1	1,130	<0.100	0.030
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	9.5	1,400	7.30	270	<1	1,040	0.200	0.040
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.0	1,400	7.30	250	<1	1,040	<0.100	0.040
	10-30-86	13.0	2,400	7.30	260	<1	1,270	<0.100	0.020
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	10.0	1,900	7.20	290	<1	1,560	<0.100	0.010
	05-29-87	10.5	2,300	7.20	330	<1	1,640	<0.100	0.070
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	12.0	2,250	7.30	310	<1	1,670	<0.100	0.020
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	12.0	1,560	7.10	330	<1	1,610	<0.100	<0.010
13	07-07-81	13.5	1,600	7.20	280	<1	1,280	0.050	<0.010
	06-07-82	13.0	1,600	8.00	270	--	1,220	<0.050	<0.010
	06-24-83	11.0	1,650	7.40	300	<1	1,280	<0.100	<0.010
	09-29-83	--	--	--	300	<1	1,360	<0.100	<0.010
	02-15-84	10.5	1,690	7.30	290	<1	1,290	0.200	<0.010
	06-28-84	11.5	1,800	7.50	290	<1	1,360	<0.100	0.010
	10-26-84	12.0	1,790	8.50	280	--	1,510	<0.100	<0.010
	04-11-85	10.5	1,910	7.30	270	<1	1,530	<0.100	<0.010
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	13.0	2,100	7.10	280	<1	1,680	<0.100	<0.010
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	11.5	2,110	7.40	250	<1	1,820	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
12	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.4	44.0	<0.020	220	28	70	5.9	82	300	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	1.3	43.0	0.060	260	28	72	4.8	93	360	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	1.1	35.5	0.020	250	25	66	4.8	89	340	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	2.0	17.6	0.190	230	24	62	4.0	110	330	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.9	17.5	<0.020	200	23	63	4.7	81	310	--
	10-30-86	1.5	32.0	<0.020	300	32	64	5.0	100	420	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	1.1	27.0	<0.200	350	36	60	5.4	110	500	--
	05-29-87	1.3	31.8	0.020	380	40	61	5.5	130	580	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	1.6	25.0	0.020	390	43	64	5.6	130	590	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	1.5	16.8	0.020	370	36	58	5.9	140	670	--
13	07-07-81	<0.30	2.10	0.050	250	31	85	6.0	100	540	--
	06-07-82	0.40	1.70	0.060	240	27	77	6.0	95	510	--
	06-24-83	0.20	5.20	<0.020	270	29	88	6.5	130	490	--
	09-29-83	<0.30	7.20	<0.020	290	30	86	6.7	140	500	<1
	02-15-84	3.8	9.90	0.060	290	33	94	7.0	130	510	--
	06-28-84	<0.30	12.0	<0.020	270	36	89	5.0	140	460	--
	10-26-84	0.40	18.1	<0.020	320	44	78	6.0	160	570	--
	04-11-85	0.60	25.0	<0.020	290	34	110	5.8	150	540	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.70	23.0	<0.020	300	44	120	5.4	170	630	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	<0.30	21.0	0.070	370	43	130	3.5	180	670	<1

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
12	04-11-85	--	--	--	--	--	--	--	--	<1	10
	06-26-85	--	--	--	--	--	--	--	--	<10	8
	07-05-85	--	<10	--	--	--	<10	<1	670	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	320
	10-17-85	<10	<10	<10	380	320	10	<1	770	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	8
	01-16-86	--	20	--	--	--	10	<1	720	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	220	--	<10	<1	680	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	220	--	<10	<1	590	--	--
	10-30-86	--	<50	--	--	--	<20	<1	880	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	1
	02-12-87	--	<10	--	--	--	100	<1	1,000	--	--
	05-29-87	--	<50	--	--	--	<20	<1	1,100	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-03-87	--	<50	--	--	--	20	<1	1,100	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<100	--	--	--	<40	<1	1,100	--	--
13	07-07-81	--	30	--	--	--	170	<1	740	5	1,200
	06-07-82	--	30	--	--	--	150	--	710	<1	16
	06-24-83	--	30	--	--	--	20	<1	790	--	710
	09-29-83	<10	50	<10	<10	<10	20	<1	840	--	--
	02-15-84	--	<10	--	--	--	10	<1	850	--	--
	06-28-84	--	70	--	--	--	30	<1	820	--	--
	10-26-84	--	<10	--	--	--	<10	--	980	<1	960
	04-11-85	--	20	--	--	--	20	<1	870	<1	110
	06-26-85	--	--	--	--	--	--	--	--	<1	18
	07-05-85	--	30	--	--	--	70	<1	930	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	300
	10-17-85	<10	140	<10	<10	340	10	<1	1,100	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
13	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	11.0	2,250	7.60	310	<1	1,870	<0.100	<0.01
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	11.0	2,400	7.40	290	<1	1,890	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.0	2,550	7.30	340	<1	2,080	<0.100	<0.010
	10-30-86	13.0	3,100	7.40	340	<1	1,950	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	2,500	7.50	330	<1	1,960	<0.100	<0.010
	05-29-87	13.5	2,650	7.60	280	<1	795	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	16.0	2,450	7.60	330	<1	1,900	<0.100	<0.010
	12-18-87	10.0	1,700	7.60	370	<1	1,880	<0.100	<0.010
14	06-24-83	10.0	1,190	7.60	180	<1	944	<0.100	0.140
	09-29-83	--	--	--	230	<1	1,220	1.60	0.070
	02-10-84	11.0	1,650	7.20	280	<1	1,270	<0.100	<0.010
	06-28-84	10.0	1,220	7.30	230	--	880	<0.100	0.020
	10-29-84	13.0	1,370	7.20	260	--	1,070	<0.100	0.060
	01-25-85	9.5	1,800	7.30	270	--	1,410	<0.100	0.020
	04-08-85	7.0	1,820	7.20	280	<1	1,460	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	10.0	1,990	7.10	290	<1	1,580	<0.100	0.020
	10-16-85	--	--	--	--	--	--	--	--
	10-17-85	11.5	2,010	7.20	300	<1	1,690	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.5	2,100	7.30	340	<1	1,680	<0.100	0.020
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	9.0	2,000	7.20	310	<1	1,650	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.0	2,000	7.30	310	<1	1,660	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
13	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	0.50	22.2	0.040	430	46	130	3.9	190	810	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	<0.30	22.0	0.190	400	40	140	4.0	200	760	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.1	16.2	<0.020	390	47	150	3.7	190	740	--
	10-30-86	0.60	14.8	0.020	440	46	130	4.0	180	900	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	14.5	<0.020	380	44	120	3.6	180	740	--
	05-29-87	0.50	14.0	<0.020	380	44	120	3.9	170	720	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.50	14.4	0.030	390	45	120	3.7	160	820	--
	12-18-87	0.30	10.8	<0.020	420	29	110	3.1	160	700	--
14	06-24-83	1.9	48.0	<0.020	190	21	50	4.6	49	230	--
	09-29-83	1.6	36.0	0.060	240	27	51	6.1	100	310	1
	02-10-84	<0.30	11.0	0.170	290	30	59	7.4	130	470	--
	06-28-84	<0.30	14.0	0.090	180	24	50	4.0	70	300	--
	10-29-84	1.3	11.6	0.060	250	29	45	5.0	10	420	--
	01-25-85	1.5	24.0	<0.020	300	33	73	7.0	140	520	--
	04-08-85	1.8	27.0	0.070	300	36	70	5.8	110	540	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.3	24.0	0.080	300	41	75	5.3	130	580	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-17-85	0.80	26.0	0.150	360	41	84	4.1	140	630	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	0.70	22.0	0.090	420	44	75	3.1	130	680	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	<0.30	24.5	0.190	370	38	88	4.0	150	650	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	4.0	20.8	0.040	320	37	86	3.8	110	500	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
13	01-15-86	--	--	--	--	--	--	--	--	<1	<1
	01-16-86	--	110	--	--	--	10	<1	1,300	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	9
	04-29-86	--	20	--	<20	--	<10	<1	1,200	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	69
	08-05-86	--	90	--	50	--	<10	<1	1,200	--	--
	10-30-86	--	<100	--	--	--	<40	<1	1,300	--	--
	11-05-86	--	--	--	--	--	--	--	--	4	2,700
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	120	--	--	--	220	<1	1,100	--	--
	05-29-87	--	<50	--	--	--	20	<1	1,100	--	--
	06-02-87	--	--	--	--	--	--	--	--	3	5
	09-02-87	--	--	--	--	--	--	--	--	10	690
	09-03-87	--	120	--	--	--	<20	<1	1,200	--	--
	12-18-87	--	60	--	--	--	50	<1	1,200	--	--
14	06-24-83	--	<10	--	--	--	40	<1	570	3	12
	09-29-83	<10	<10	<10	<10	<10	30	<1	720	--	--
	02-10-84	--	<10	--	--	--	<10	<1	850	--	--
	06-28-84	--	<10	--	--	--	<10	<1	560	--	--
	10-29-84	--	<10	--	--	--	<10	--	730	<1	--
	01-25-85	--	30	--	--	--	20	--	900	<1	620
	04-08-85	--	<10	--	--	--	30	<1	910	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<10	4
	07-05-85	--	<10	--	--	--	10	<1	930	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	860
	10-17-85	<10	<10	10	10	400	40	<1	1,100	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	9
	01-16-86	--	<10	--	--	--	<10	<1	1,200	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	7
	04-29-86	--	<10	--	<20	--	<10	<1	1,100	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	<20	--	30	<1	960	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
14	10-30-86	13.0	2,600	7.30	310	<1	1,560	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	9.5	1,950	7.30	310	<1	2,160	<0.100	<0.010
	05-29-87	9.0	2,200	7.30	300	<1	1,490	<0.100	0.020
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	12.0	2,800	7.40	307	<1	1,510	<0.100	0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	1,440	7.30	340	<1	1,510	<0.100	<0.010
15	06-08-82	14.0	3,000	11.70	<1	58	719	1.40	<0.010
	09-29-83	--	--	--	<1	60	570	2.70	<0.010
	02-16-84	11.5	2,000	11.90	<1	60	566	1.60	<0.010
	06-28-84	12.0	1,690	11.80	<1	76	501	1.00	0.310
	10-29-84	12.5	1,350	11.50	<1	32	444	0.900	0.030
	01-25-85	11.5	1,380	11.90	<1	32	427	1.20	0.020
	04-08-85	11.5	1,120	11.80	<1	38	423	1.00	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	13.0	1,080	11.70	<1	32	375	1.10	<0.010
	10-22-85	13.0	1,050	11.50	<1	24	397	1.00	0.070
	01-22-86	--	--	--	--	--	--	--	--
	01-22-86	11.0	975	11.60	<1	36	382	1.10	0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	12.0	1,000	11.10	<1	28	382	1.20	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.5	970	11.40	<1	48	388	1.00	0.060
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	13.0	900	11.80	130	20	477	0.900	0.010
	05-29-87	12.5	1,000	11.60	27	100	356	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	13.5	1,100	11.60	<1	42	381	0.9	0.020
	12-17-87	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
14	10-30-86	1.1	19.6	0.050	310	34	90	4.0	110	590	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	12.5	0.070	340	38	90	3.8	110	610	--
	05-29-87	2.8	17.0	0.080	310	26	86	4.0	120	540	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	1.3	18.8	0.12	320	35.7	97	4.1	124	560	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.90	14.4	0.050	320	32	96	3.8	130	580	--
15	06-08-82	2.3	0.030	<0.020	270	0.03	73	8.2	42	9.0	--
	09-29-83	3.9	0.390	<0.020	130	0.14	65	7.0	38	40	<1
	02-16-84	2.0	0.590	<0.020	140	<1.0	71	11	49	42	--
	06-28-84	<1.0	<0.010	<0.020	110	<1.0	72	6.0	41	65	--
	10-29-84	1.4	0.120	<0.020	96	<1.0	71	5.0	28	85	--
	01-25-85	1.8	0.140	<0.020	88	<1.0	71	7.4	37	96	--
	04-08-85	1.8	0.050	<0.020	74	<1.0	76	6.3	38	100	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.4	0.060	<0.020	78	<5.0	70	5.6	32	88	--
	10-22-85	1.1	0.050	<0.020	70	<1.0	79	5.3	39	100	<1
	01-22-86	--	--	--	--	--	--	--	--	--	--
	01-22-86	2.1	0.070	<0.020	57	<1.0	75	3.7	34	83	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	1.3	0.090	0.050	57	<1.0	76	5.0	38	99	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	2.0	0.120	<0.020	60	<1.0	75	4.6	36	99	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	0.60	0.190	<0.020	57	<1.0	70	4.0	33	110	--
	05-29-87	1.3	0.170	<0.020	60	<1.0	67	4.4	39	120	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	1.7	0.310	0.020	60	<1.0	70	4.6	39	113	--
	12-17-87	--	--	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
14	10-30-86	--	280	--	--	--	<40	<1	900	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	240	--	--	--	360	<1	1,000	--	--
	05-29-87	--	<50	--	--	--	<20	<1	880	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	2
	09-02-87	--	--	--	--	--	--	--	--	<2	7
	09-03-87	--	<50	--	--	--	<20	<1	215	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	940	--	--
15	06-08-82	--	<10	--	--	--	60	620	680	<1	2
	09-29-83	<10	50	<10	<10	<10	30	356	330	--	--
	02-16-84	--	30	--	--	--	1,300	379	--	--	--
	06-28-84	--	<10	--	--	--	50	227	--	--	--
	10-29-84	--	<10	--	--	--	<10	232	--	<1	--
	01-25-85	--	30	--	--	--	<10	207	--	<1	<2
	04-08-85	--	0	--	--	--	40	168	--	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	20	--	--	--	30	158	--	--	--
	10-22-85	30	<10	<10	<10	170	20	153	170	<1	<1
	01-22-86	--	--	--	--	--	--	--	--	<1	<1
	01-22-86	--	20	--	--	--	<10	146	140	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	<20	--	<10	135	140	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	<10	--	<10	109	150	--	--
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	<10	--	--	--	<10	<1	140	--	--
	05-29-87	--	<50	--	--	--	<20	<1	150	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	2
	09-02-87	--	--	--	--	--	--	--	--	<2	--
	09-03-87	--	<50	--	--	--	<20	96	247	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	18

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
16-16a	06-24-83	9.0	4,800	7.10	210	--	3,600	0.300	0.090
	09-29-83	--	--	--	210	--	3,240	<0.100	0.230
	02-15-84	11.0	4,000	7.20	260	<1	3,660	0.400	1.90
	06-25-84	10.5	4,000	7.10	210	<1	3,910	0.100	0.550
	10-26-84	12.0	3,700	7.10	210	--	3,450	<0.100	0.510
	01-25-85	9.0	2,900	7.20	210	--	2,430	0.100	0.180
	04-08-85	8.0	2,450	7.30	210	<1	1,840	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	11.5	2,010	7.30	230	<1	1,610	<0.100	0.020
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.0	2,900	7.20	230	<1	1,700	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	10.5	2,300	7.30	390	<1	1,900	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	11.0	2,600	7.20	240	<1	1,880	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.5	2,250	7.00	230	<1	1,980	<0.100	<0.010
	10-30-86	13.0	3,100	7.20	190	<1	1,870	<1.00	0.020
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	2,590	7.10	190	<1	2,200	<0.100	<0.010
	05-29-87	10.0	2,550	7.10	180	<1	2,300	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	12.5	2,700	7.30	180	<1	2,290	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.5	1,850	7.30	210	<1	2,200	<0.100	<0.010
17	07-06-81	14.0	1,100	7.50	200	<1	880	0.140	<0.010
	06-07-82	13.5	900	7.90	200	--	870	0.080	<0.010
	06-24-83	9.5	1,600	7.50	210	<1	820	<0.100	<0.010
	09-29-83	--	--	--	--	<1	884	<0.100	<0.010
	02-16-84	9.0	1,070	7.90	210	<1	872	0.200	<0.010
	06-28-84	10.5	1,210	7.50	220	<1	867	<0.100	<0.010
	10-26-84	12.5	1,050	7.40	230	--	840	<0.100	<0.010
	01-25-85	9.5	1,120	7.60	220	--	824	<0.100	<0.010
	04-08-85	7.0	1,190	7.50	210	<1	872	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
16-16a	06-24-83	8.5	261	0.030	720	80	170	14	280	900	--
	09-29-83	6.2	280	<0.020	670	70	110	13	200	900	--
	02-15-84	4.4	101	0.050	730	80	250	20	410	1,300	--
	06-25-84	2.9	131	0.020	600	100	240	14	340	1,200	--
	10-26-84	3.6	93.0	0.050	670	84	250	14	240	1,400	--
	01-25-85	2.5	54.0	<0.020	420	52	170	12	130	1,100	--
	04-08-85	2.2	38.0	<0.020	300	41	170	9.5	110	790	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.0	30.0	<0.020	280	40	180	8.1	130	660	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	0.60	26.0	0.080	350	37	150	6.0	190	710	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	0.60	16.3	0.040	350	40	150	6.5	200	770	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	0.80	12.6	0.100	380	40	130	6.0	170	820	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.4	15.4	<0.020	380	44	140	6.5	200	720	--
	10-30-86	0.50	12.5	0.050	390	44	130	6.0	190	920	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	0.50	9.80	<0.020	460	51	140	6.0	210	1,100	--
	05-29-87	0.60	13.0	0.020	450	50	120	7.0	190	1,100	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.50	18.9	0.050	470	55	130	6.4	170	1,000	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.60	19.2	<0.020	420	48	130	6.8	150	1,100	--
17	07-06-81	1.2	0.140	<0.020	150	18	80	8.0	16	440	--
	06-07-82	0.40	0.050	<0.020	160	18	72	7.0	11	450	--
	06-24-83	0.30	1.20	<0.020	170	17	80	7.1	24	460	--
	09-29-83	<0.30	0.570	<0.020	170	19	70	7.4	19	380	1
	02-16-84	2.8	0.030	<0.020	170	19	72	8.0	20	420	--
	06-28-84	<0.30	1.09	<0.020	160	22	76	7.0	34	400	--
	10-26-84	0.50	0.160	<0.020	170	24	55	6.0	24	400	--
	01-25-85	0.20	0.150	<0.020	160	18	79	7.6	22	390	--
	04-08-85	0.30	0.140	<0.020	160	20	76	6.9	25	410	--
	04-11-85	--	--	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
16-16a	06-24-83	--	10	--	--	--	70	<1	2,100	<1	11
	09-29-83	30	20	30	60	20	60	<1	2,000	--	--
	02-15-84	--	<10	--	--	--	180	<1	2,200	--	--
	06-25-84	--	<10	--	--	--	40	<1	1,900	--	--
	10-26-84	--	20	--	--	--	30	--	2,000	<1	--
	01-25-85	--	<10	--	--	--	30	--	1,300	<1	120
	04-08-85	--	<10	--	--	--	60	<1	920	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	6
	07-05-85	--	30	--	--	--	120	<1	850	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	180
	10-18-85	<10	<10	<10	30	480	<10	<1	1,000	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	6
	01-16-86	--	<10	--	--	--	10	<1	1,100	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	<20	--	<10	--	1,100	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	40	--	60	<1	1,100	--	--
	10-30-86	--	<100	--	--	--	<40	<1	1,200	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	<10	--	--	--	450	<1	1,400	--	--
	05-29-87	--	<50	--	--	--	<20	<1	1,300	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	5
	09-03-87	--	<10	--	--	--	<40	<1	1,400	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<100	--	--	--	<40	<1	1,200	--	--
17	07-06-81	--	40	--	--	--	42	<1	450	<1	180
	06-07-82	--	360	--	--	--	140	--	490	<1	<1
	06-24-83	--	<10	--	--	--	70	<1	510	<1	<1
	09-29-83	<10	70	<10	420	<10	40	<1	500	--	--
	02-16-84	--	<10	--	--	--	140	<1	500	--	--
	06-28-84	--	<10	--	--	--	30	<1	500	--	--
	10-26-84	--	20	--	--	--	30	--	520	<1	--
	01-25-85	--	<10	--	--	--	50	--	480	<1	1,200
	04-08-85	--	<10	--	--	--	30	<1	490	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	2

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
17	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	10.0	1,160	7.40	220	<1	826	<0.100	<0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	11.0	1,150	7.40	220	<1	882	<0.100	0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.0	1,260	7.50	220	<1	928	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	9.0	1,570	7.50	240	<1	977	0.200	0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	11.5	1,250	7.40	230	<1	943	<0.100	<0.010
	10-30-86	12.0	1,600	7.50	220	<1	862	<0.100	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	10.0	1,200	7.40	200	<1	902	0.100	<0.010
	05-29-87	9.5	1,450	7.40	220	<1	955	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	12.0	1,450	7.60	220	<1	874	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	910	7.50	230	<1	856	<0.100	<0.010
18	07-07-81	13.0	580	7.30	260	<1	380	0.260	0.030
	06-08-82	12.0	650	8.00	290	--	406	0.200	0.020
	06-24-83	10.0	1,050	7.20	320	<1	711	0.200	0.180
	09-29-83	--	--	--	340	<1	704	<0.100	0.130
	02-15-84	9.0	1,100	7.40	330	<1	736	0.400	0.040
	06-28-84	11.0	1,290	7.30	330	<1	959	<0.100	<0.010
	10-29-84	13.0	1,410	7.20	260	--	1,170	<0.100	0.030
	01-25-85	9.0	1,790	7.40	410	--	1,360	<0.100	0.630
	04-08-85	7.5	2,200	7.30	440	<1	1,580	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	11.0	2,100	7.00	430	<1	1,690	<0.100	0.020
	10-16-85	--	--	--	--	--	--	--	--
	10-18-85	13.0	1,790	7.20	410	<1	1,410	0.200	0.130
	01-15-86	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
17	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.40	0.140	<0.020	170	23	73	6.1	22	420	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	<0.30	0.860	0.060	180	20	81	4.8	29	420	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.680	<0.020	170	18	92	5.4	23	400	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	0.60	4.60	0.100	200	22	78	5.0	67	460	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	0.90	0.810	<0.020	170	23	82	5.2	32	460	--
	10-30-86	0.70	0.210	<0.020	180	21	74	5.0	23	450	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.660	<0.020	180	21	71	4.8	19	430	--
	05-29-87	0.30	4.29	0.030	200	23	72	4.9	40	440	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	<0.30	0.240	<0.020	180	22	75	5.0	28	460	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.30	0.200	<0.020	180	20	74	5.5	22	430	--
18	07-07-81	1.6	0.640	0.140	94	10	19	5.0	4.0	63	--
	06-08-82	0.40	1.54	0.030	100	13	17	4.4	8.0	56	--
	06-24-83	0.20	29.0	0.030	170	23	18	5.0	30	92	--
	09-29-83	0.50	16.0	0.020	180	22	15	5.0	28	130	1
	02-15-84	2.2	22.0	<0.020	190	26	16	5.0	53	130	--
	06-28-84	<0.30	42.0	0.030	210	32	20	4.0	71	130	--
	10-29-84	1.5	42.0	<0.020	250	40	25	6.0	74	240	--
	01-25-85	2.4	54.0	<0.020	320	42	34	6.5	93	340	--
	04-08-85	1.8	60.0	0.030	340	50	36	6.1	110	370	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.3	49.0	<0.020	320	51	40	5.1	120	390	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	3.4	52.0	0.060	330	46	35	3.9	110	360	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
17	06-26-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	190	--	--	--	60	<1	530	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	100
	10-18-85	<10	20	<10	540	170	10	<1	540	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	12
	01-16-86	--	<10	--	--	--	20	<1	500	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	<20	--	<10	<1	600	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	40	--	40	<1	530	--	--
	10-30-86	--	50	--	--	--	<20	--	530	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	4
	02-12-87	--	<10	--	--	--	<10	<1	540	--	--
	05-29-87	--	<50	--	--	--	<20	<1	590	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	5
	09-03-87	--	<50	--	--	--	<20	<1	540	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<100	--	--	--	<40	<1	540	--	--
18	07-07-81	--	50	--	--	--	290	<1	280	<1	600
	06-08-82	--	50	--	--	--	30	--	320	<1	9
	06-24-83	--	<10	--	--	--	10	<1	530	<1	11
	09-29-83	30	<10	<10	1,100	<10	30	<1	530	--	--
	02-15-84	--	<10	--	--	--	60	<1	590	--	--
	06-28-84	--	<10	--	--	--	30	<1	650	--	--
	10-29-84	--	<10	--	--	--	30	--	780	<1	--
	01-25-85	--	<10	--	--	--	40	--	980	<1	1,500
	04-08-85	--	<10	--	--	--	30	<1	1,100	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<10	2
	07-05-85	--	<10	--	--	--	40	<1	1,000	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	330
	10-18-85	<10	<10	<10	710	140	20	<1	1,000	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	50

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
18	01-16-86	9.0	1,800	7.20	480	<1	1,370	<0.100	0.130
	04-29-86	9.5	2,000	7.30	510	<1	1,360	0.300	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.5	1,710	7.30	490	<1	1,330	<0.100	0.040
	10-30-86	12.5	2,100	7.30	480	<1	1,130	0.200	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	9.5	1,550	7.30	490	<1	1,120	0.100	<0.010
	05-29-87	10.5	1,700	7.20	460	<1	1,070	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	12.0	1,950	7.10	460	<1	1,240	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	1,370	7.20	470	<1	1,300	<0.100	<0.010
19	07-06-81	14.0	1,200	7.50	210	<1	976	0.130	<0.010
	06-07-82	13.5	1,200	8.00	210	--	929	0.160	0.060
	06-24-83	10.0	1,470	7.40	200	<1	--	<0.100	0.260
	09-29-83	--	--	--	200	<1	--	<0.100	0.370
	02-15-84	10.0	1,150	7.50	220	<1	843	0.300	0.040
	06-28-84	11.5	1,300	7.60	200	<1	959	<0.100	<0.010
	10-29-84	12.5	1,150	7.50	200	--	920	<0.100	0.210
	01-25-85	9.0	1,290	7.80	210	--	932	<0.100	<0.010
	04-05-85	7.0	1,310	7.50	210	<1	994	<0.100	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	10.0	1,270	7.60	210	<1	978	<0.100	0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	11.0	1,150	7.40	200	<1	902	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.0	1,170	7.60	230	<1	910	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	9.5	1,600	7.50	220	<1	976	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	11.5	1,220	7.60	220	<1	954	<0.100	0.190

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
18	01-16-86	1.2	41.5	<0.020	310	40	36	3.4	110	270	--
	04-29-86	<0.30	23.5	0.190	300	42	42	4.0	94	300	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	2.3	30.9	<0.020	290	38	39	3.5	77	220	--
	10-30-86	0.90	26.0	0.040	270	38	40	4.0	69	250	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	19.1	<0.020	270	38	39	3.3	60	240	--
	05-29-87	0.70	23.0	<0.020	260	35	43	3.3	61	220	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	1.2	44.0	0.050	280	40	46	3.6	80	250	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	1.2	43.0	<0.020	330	40	42	3.9	96	240	--
19	07-06-81	1.2	0.690	0.050	170	23	76	6.0	28	480	--
	06-07-82	0.90	0.100	<0.020	170	21	70	5.6	20	450	--
	06-24-83	0.90	28.0	<0.020	220	27	87	6.2	42	450	--
	09-29-83	0.60	3.90	<0.020	190	21	68	6.2	26	450	1
	02-15-84	3.2	1.03	<0.020	180	20	74	6.0	20	420	--
	06-28-84	<0.30	7.10	<0.020	180	24	79	5.0	30	480	--
	10-29-84	0.40	0.480	<0.020	180	24	58	5.0	18	440	--
	01-25-85	0.50	0.820	0.040	180	22	79	6.0	25	470	--
	04-05-85	0.90	3.00	0.030	190	24	81	5.3	29	480	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.60	3.05	<0.020	200	29	88	4.6	25	470	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	0.40	0.230	<0.020	170	19	83	3.5	23	430	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.880	<0.020	180	18	71	3.2	20	400	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	<0.30	1.75	0.100	190	22	80	4.0	23	460	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.5	0.540	<0.020	170	21	78	3.7	21	390	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
18	01-16-86	--	<10	--	--	--	40	<1	940	--	--
	04-29-86	--	<10	--	280	--	<10	<1	930	<1	<1
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	440	--	30	<1	880	--	--
	10-30-86	--	<50	--	--	--	<20	--	830	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<1	1
	02-12-87	--	<10	--	--	--	260	<1	840	--	--
	05-29-87	--	<50	--	--	--	50	<1	790	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-03-87	--	<50	--	--	--	<20	<1	870	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	20	<1	1,000	--	--
19	07-06-81	--	<10	--	--	--	230	<1	510	<1	11
	06-07-82	--	120	--	--	--	120	--	520	<1	3
	06-24-83	--	30	--	--	--	40	<1	660	<1	<1
	09-29-83	<10	<10	<10	200	<10	30	<1	560	--	--
	02-15-84	--	<10	--	--	--	50	<1	520	--	--
	06-28-84	--	<10	--	--	--	10	<1	540	--	--
	10-29-84	--	<10	--	--	--	<10	--	560	<1	--
	01-25-85	--	<10	--	--	--	30	--	550	<1	430
	04-05-85	--	<10	--	--	--	30	<1	580	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	20	--	--	--	60	<1	610	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	180
	10-18-85	<10	<10	<10	140	200	<10	<1	520	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	36
	01-16-86	--	10	--	--	--	30	<1	520	--	--
	04-28-86	--	--	--	--	--	--	--	--	--	4
	04-29-86	--	10	--	<20	--	<10	<1	560	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<10
	08-05-86	--	<10	--	50	--	<10	<1	510	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
19	10-30-86	12.0	1,650	7.60	210	<1	929	0.200	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	10.0	1,200	7.60	210	<1	892	0.100	<0.010
	05-29-87	10.0	1,350	7.70	180	<1	874	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	10.5	1,440	7.60	220	<1	892	0.200	0.190
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.5	910	7.40	240	<1	879	<0.100	0.090
20	10-29-84	13.5	830	7.50	240	--	592	<0.100	<0.010
	01-28-85	11.0	790	7.70	230	--	530	0.300	<0.010
	04-05-85	10.0	825	7.70	240	<1	528	0.200	<0.010
	04-11-85	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--
	07-05-85	10.5	800	7.60	240	<1	527	0.300	0.010
	10-22-85	11.0	775	7.80	240	<1	564	0.200	0.070
	01-22-86	10.5	775	7.70	250	<1	539	0.300	0.010
	01-22-86	--	--	--	--	--	--	--	--
	04-28-86	--	--	--	--	--	--	--	--
	04-30-86	10.0	800	7.60	250	<1	539	0.300	<0.010
	08-12-86	--	--	--	--	--	--	--	--
	08-12-86	12.0	810	7.80	240	<1	552	<0.100	<0.010
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	830	--	230	<1	563	0.200	0.080
	06-06-87	13.0	700	7.50	230	<1	476	0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
19	10-30-86	0.50	1.70	<0.020	190	22	76	3.0	22	480	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.250	<0.020	180	20	68	3.2	16	430	--
	05-29-87	0.30	0.350	<0.020	170	20	66	3.2	21	460	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.30	0.460	0.020	180	20	71	3.3	19	470	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	<0.30	0.300	<0.020	190	21	67	3.5	19	420	--
20	10-29-84	0.60	0.090	<0.020	110	10	60	6.0	11	220	--
	01-28-85	<0.30	0.050	0.040	100	8.0	77	7.6	8.0	180	--
	04-05-85	0.60	0.040	0.040	100	8.1	68	5.8	10	180	--
	04-11-85	--	--	--	--	--	--	--	--	--	--
	06-26-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.50	0.140	<0.020	120	7.0	69	5.1	9.0	180	--
	10-22-85	<0.30	0.020	0.040	110	7.0	70	4.6	9.0	190	<1
	01-22-86	<0.30	0.180	<0.020	95	5.0	79	4.3	10	180	--
	01-22-86	--	--	--	--	--	--	--	--	--	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-30-86	<0.30	0.150	<0.020	93	6.0	65	5.0	7.0	180	--
	08-12-86	--	--	--	--	--	--	--	--	--	--
	08-12-86	0.42	0.230	<0.020	100	6.0	78	5.0	8.0	190	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.150	<0.020	110	8.0	61	4.3	8.0	200	--
	06-06-87	0.50	0.210	<0.020	100	6.0	70	4.7	11	200	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
19	10-30-86	--	170	--	--	--	<20	--	560	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	4
	02-11-87	--	--	--	--	--	--	--	--	<2	18
	02-12-87	--	<10	--	--	--	<10	<1	530	--	--
	05-29-87	--	<50	--	--	--	<20	<1	510	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-03-87	--	140	--	--	--	<20	<1	530	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	20	<1	570	--	--
20	10-29-84	--	<30	--	--	--	<10	--	320	<1	23
	01-28-85	--	<10	--	--	--	40	--	290	<1	1,800
	04-05-85	--	<10	--	--	--	<10	<1	290	--	--
	04-11-85	--	--	--	--	--	--	--	--	<1	<1
	06-26-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	80	--	--	--	<10	<1	320	--	--
	10-22-85	<10	<10	<10	230	220	<10	<1	300	<1	9
	01-22-86	--	<10	--	--	--	<10	<1	260	--	--
	01-22-86	--	--	--	--	--	--	--	--	<1	<1
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-30-86	--	10	--	150	--	<10	<1	260	--	--
	08-12-86	--	--	--	--	--	--	--	--	<1	1
	08-12-86	--	<10	--	<20	--	<10	<1	280	--	--
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	<10	--	--	--	<10	<1	310	--	--
	06-06-87	--	<10	--	--	--	<10	<1	270	<2	<2

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
21	10-12-84	11.0	2,200	7.20	270	--	2,060	<0.100	0.060
	01-25-85	8.5	2,400	7.40	260	--	2,250	<0.100	0.140
	04-09-85	8.5	2,810	7.10	260	<1	2,310	<0.100	0.040
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	11.0	2,850	7.10	270	<1	2,260	<0.100	0.050
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	11.5	2,700	7.20	270	<1	2,340	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	9.0	2,700	7.30	290	<1	2,370	<0.100	0.020
	04-28-86	--	--	--	--	--	--	--	--
	04-30-86	8.5	3,200	7.10	280	<1	2,750	0.300	0.020
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	10.5	3,400	7.20	310	<1	2,940	<0.100	0.030
	10-30-86	11.0	4,200	7.20	310	<1	2,710	0.200	0.080
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	10.0	3,300	7.20	310	<1	2,850	<0.100	0.020
	05-30-87	9.0	3,400	7.20	290	<1	2,910	<0.100	0.020
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	11.5	3,900	7.20	320	<1	3,390	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	2,500	7.10	340	<1	2,920	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
21	10-12-84	1.7	40.0	0.060	440	59	150	7.0	110	920	--
	01-25-85	0.70	52.5	<0.020	400	66	160	8.0	110	1,000	--
	04-09-85	1.4	60.0	<0.020	380	68	170	6.2	120	1,000	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	1.8	77.0	<0.020	380	64	170	5.5	110	880	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	2.1	83.0	0.060	420	59	170	3.6	130	920	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	1.5	70.0	0.020	420	60	160	3.4	130	920	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-30-86	1.7	79.5	<0.020	510	73	180	38	130	1,200	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	4.5	96.2	<0.020	530	77	200	3.0	160	1,200	--
	10-30-86	2.8	80.0	0.040	490	74	160	4.0	160	950	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	2.0	58.0	<0.020	560	79	170	3.2	160	1,200	--
	05-30-87	1.8	70.0	<0.020	570	86	170	3.7	150	1,200	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	2.4	96.0	0.060	630	92	180	4.0	190	1,300	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	3.0	66.3	<0.020	690	77	130	3.7	170	1,300	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
21	10-12-84	--	<10	--	--	--	20	--	1,300	<1	4
	01-25-85	--	50	--	--	--	<10	--	1,300	<1	250
	04-09-85	--	<10	--	--	--	30	<1	1,200	<1	1
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	<10	--	--	--	50	<1	1,200	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	93
	10-18-85	<10	<10	<10	90	370	<10	<1	1,300	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	12
	01-16-86	--	<10	--	--	--	<10	<1	1,300	--	--
	04-28-86	--	--	--	--	--	--	--	--	--	2
	04-30-86	--	<10	--	30	--	<10	<1	1,600	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	380
	08-05-86	--	<10	--	100	--	<10	<1	1,600	--	--
	10-30-86	--	<100	--	--	--	<40	--	1,500	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	210	--	--	--	330	<1	1,700	--	--
	05-30-87	--	<50	--	--	--	<20	<1	1,800	--	--
	06-02-87	--	--	--	--	--	--	--	--	10	10
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-03-87	--	<100	--	--	--	<40	<1	2,000	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<100	--	--	--	<40	<1	2,000	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
22	03-08-84	12.0	1,450	7.30	250	<1	1,160	0.200	<0.010
	06-28-84	11.0	1,520	7.30	270	<1	1,190	<0.100	<0.010
	10-12-84	13.0	1,490	7.30	260	--	1,200	<0.100	<0.010
	01-25-85	10.5	1,500	7.40	280	--	1,190	<0.100	<0.010
	04-09-85	11.0	1,600	7.20	280	<1	1,220	<0.010	<0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	12.5	1,520	7.20	260	<1	1,160	<0.100	<0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.0	1,570	7.20	260	<1	1,210	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-17-86	11.0	1,650	7.30	300	<1	1,360	<0.100	0.020
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	7.0	2,290	7.20	280	<1	1,560	0.300	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.0	1,610	7.4	257	<1	1,260	<0.100	<0.010
	10-30-86	12.0	2,600	7.30	280	<1	1,610	0.400	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.5	2,800	7.30	290	<1	1,760	<0.100	<0.010
	05-30-87	12.0	2,200	7.30	300	<1	1,850	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.0	2,350	7.30	300	<1	1,780	<0.100	0.02
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	12.0	1,650	7.20	300	<1	1,740	<0.100	0.030

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
22	03-08-84	<0.30	7.40	<0.020	250	31	75	6.3	68	530	--
	06-28-84	<0.30	7.00	0.080	230	33	73	4.0	70	540	--
	10-12-84	<0.30	7.20	0.060	260	31	78	4.0	68	540	--
	01-25-85	<0.30	6.70	<0.020	250	31	77	5.3	62	530	--
	04-09-85	<0.30	7.00	<0.020	250	30	83	4.2	68	540	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.50	6.70	<0.020	220	34	81	3.8	62	520	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	0.40	9.70	<0.020	260	30	86	2.7	74	550	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-17-86	<0.30	14.2	<0.020	270	30	82	2.8	80	540	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	0.50	36.9	0.050	320	41	84	3.0	91	640	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.0	10.7	<0.020	268	30	82	2.9	62	550	--
	10-30-86	<0.30	22.0	0.030	310	40	82	4.0	85	700	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	0.40	19.0	<0.020	360	46	83	2.5	86	790	--
	05-30-87	0.60	24.0	<0.020	380	48	88	2.8	97	800	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	0.4	67.5	0.04	380	47	92	4.6	91	530	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.40	23.3	<0.020	390	42	68	2.5	94	800	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
23	03-08-84	11.0	370	8.70	150	<1	209	0.200	<0.010
	06-28-84	11.0	925	7.40	49	<1	475	0.400	0.090
	10-12-84	13.0	510	8.80	63	16	344	0.300	<0.010
	01-25-85	10.5	375	8.90	92	23	224	0.200	<0.010
	04-09-85	11.0	555	8.80	52	8	362	0.200	<0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	12.0	420	8.90	76	16	256	0.300	<0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	12.0	340	8.90	110	18	196	0.200	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-17-86	10.5	365	9.00	140	19	236	0.200	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	11.5	380	8.70	120	22	206	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	12.5	410	8.8	136	16	226	0.200	<0.010
	10-30-86	12.0	550	9.10	120	26	230	0.600	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	420	9.20	168	37	267	0.200	<0.010
	05-30-87	11.5	410	9.00	160	<1	230	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	12.0	500	8.80	165	<1	235	<0.100	0.020
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	275	8.80	170	<1	203	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
	10-12-84	--	<10	--	--	--	30	--	780	<1	13
	01-25-85	--	<10	--	--	--	30	--	760	<1	<2
	04-09-85	--	<10	--	--	--	20	<1	740	<1	<1
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	<10	--	--	--	20	<1	690	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	250
	10-18-85	<10	<10	<10	70	400	<10	<1	780	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	170
	01-17-86	--	<10	--	--	--	50	<1	790	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	38
	04-29-86	--	<10	--	<20	--	<10	<1	970	--	--
	08-04-86	--	--	--	--	--	--	--	--	6	51
	08-05-86	--	<10	--	<20	--	<10	<1	793	--	--
	10-30-86	--	<100	--	--	--	<40	--	930	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	14
	02-12-87	--	100	--	--	--	80	<1	1,100	--	--
	05-30-87	--	<50	--	--	--	<20	<1	1,100	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	2
	09-02-87	--	110	--	--	--	<20	<1	1,090	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	1,100	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
23	03-08-84	0.70	0.060	<0.020	12	<1.0	71	5.4	23	8.0	--
	06-28-84	<0.30	0.610	<0.020	40	3.0	100	5.0	36	250	--
	10-12-84	0.60	0.130	<0.020	21	1.2	78	4.0	27	130	--
	01-25-85	1.8	0.040	0.100	12	<1.0	67	3.2	20	34	--
	04-09-85	0.30	0.040	<0.020	25	1.0	84	3.9	26	160	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.60	0.080	<0.020	20	<5.0	71	2.4	21	78	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	<0.30	0.130	<0.020	8.0	<1.0	75	1.7	25	20	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-17-86	<0.30	0.080	<0.020	9.0	<1.0	79	1.9	22	5.0	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	1.2	0.130	0.050	9.0	1.0	68	2.0	17	3.0	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	0.4	0.170	<0.020	10	<1.0	80	2.2	21	6.0	--
	10-30-86	0.30	0.200	<0.020	9.0	<1.0	69	2.0	21	4.0	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	0.1	0.200	<0.02	10	<1.0	70	2.0	17	11	--
	05-30-87	0.60	0.050	<0.020	8.0	<1.0	71	2.1	20	<0.20	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	0.3	0.040	0.03	10	<1.0	80	1.9	21	7.0	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.10	0.050	<0.020	9.0	<1.0	76	3.7	19	<0.20	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
23	03-08-84	--	10	--	--	--	<10	<1	--	--	--
	06-28-84	--	<10	--	--	--	<10	<1	110	--	--
	10-12-84	--	<10	--	--	--	<10	<1	58	<1	100
	01-25-85	--	20	--	--	--	<10	<1	--	<1	32
	04-09-85	--	<10	--	--	--	<10	<1	67	<1	44
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	<10	--	--	--	10	<1	--	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	230
	10-18-85	<10	<10	<10	<20	320	<10	<1	20	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	430
	01-17-86	--	<10	--	--	--	<10	<1	22	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	12
	04-29-86	--	<10	--	<20	--	<10	<1	27	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	3
	08-05-86	--	<10	--	<20	--	<10	<1	23	--	--
	10-30-86	--	<50	--	--	--	<20	--	--	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	2
	02-11-87	--	--	--	--	--	--	--	--	<2	1
	02-12-87	--	<10	--	--	--	<10	107	25	--	--
	05-30-87	--	<50	--	--	--	<20	<1	24	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	17
	09-02-87	--	<50	--	--	--	<20	<1	28	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
24	03-08-84	8.5	1,000	7.50	210	<1	768	0.200	<0.010
	10-12-84	13.5	1,320	7.30	240	--	1,070	<0.100	<0.010
	01-25-85	8.5	1,570	7.50	250	--	1,330	<0.100	0.030
	04-09-85	7.5	1,700	7.40	250	<1	1,450	<0.100	<0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	13.0	1,940	7.20	250	<1	1,570	<0.100	1.02
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	13.0	2,010	7.30	260	<1	1,750	<0.100	0.060
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	8.5	2,200	7.40	290	<1	1,850	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	9.5	2,100	7.30	260	<1	1,720	0.200	0.080
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.5	2,300	7.40	280	<1	1,870	<0.100	0.140
	10-30-86	12.5	1,900	7.50	320	<1	1,060	0.500	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	9.0	2,300	7.30	290	<1	1,980	<0.100	<0.010
	05-30-87	10.0	2,400	7.40	290	<1	2,030	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	13.0	2,800	7.30	280	<1	2,030	<0.100	0.160
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	12.0	1,730	7.20	310	<1	2,000	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
24	03-08-84	<0.30	9.20	<0.020	160	19	58	6.3	39	290	--
	10-12-84	0.80	8.10	<0.020	230	29	64	5.0	66	490	--
	01-25-85	<0.30	9.50	<0.020	280	37	72	6.6	90	600	--
	04-09-85	0.50	10.0	<0.020	280	37	77	5.7	110	640	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.50	8.90	<0.020	320	44	77	5.5	120	680	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	1.2	8.30	<0.020	360	42	92	4.4	140	770	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	0.40	9.50	<0.020	380	44	87	4.6	150	830	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	<0.30	23.0	0.050	360	46	90	4.4	130	760	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	3.7	10.2	<0.020	380	46	90	5.0	140	760	--
	10-30-86	0.60	9.10	0.030	200	30	96	6.0	61	430	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	6.40	<0.020	430	51	92	4.0	130	940	--
	05-30-87	0.80	9.50	<0.020	420	54	100	4.7	140	930	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.70	10.7	0.030	440	56	90	4.6	130	950	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.50	9.40	<0.020	380	40	73	4.1	130	750	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
24	03-08-84	--	20	--	--	--	20	<1	480	--	--
	10-12-84	--	<10	--	--	--	<10	--	690	<1	8
	01-25-85	--	<10	--	--	--	30	--	860	<1	4
	04-09-85	--	<10	--	--	--	30	<1	860	<1	<1
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	<10	--	--	--	100	<1	970	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	230
	10-18-85	<10	<10	<10	320	230	10	<1	1,100	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	32
	01-16-86	--	<10	--	--	--	<10	<1	1,100	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	21
	04-29-86	--	<10	--	<20	--	<10	<1	1,100	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	4
	08-05-86	--	<10	--	50	--	<10	<1	1,100	--	--
	10-30-86	--	<50	--	--	--	<20	--	620	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<2	8
	02-12-87	--	<10	--	--	--	60	<1	1,300	--	--
	05-30-87	--	<50	--	--	--	<20	<1	1,300	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	3
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-03-87	--	<100	--	--	--	<40	<1	1,300	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	1,100	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
25	03-08-84	7.5	1,150	7.40	290	<1	851	<0.100	<0.010
	06-28-84	11.0	1,000	7.30	270	<1	714	<0.100	<0.010
	10-12-84	15.0	1,050	7.20	270	--	786	<0.100	<0.010
	01-25-85	6.5	1,010	7.40	280	--	756	0.100	<0.010
	04-09-85	7.0	1,100	7.40	300	<1	801	<0.100	<0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	12.0	1,050	7.20	280	<1	735	0.100	<0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	14.0	1,050	7.20	260	<1	742	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	8.0	970	7.30	300	<1	741	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	7.0	1,060	7.40	280	<1	744	0.400	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.0	1,050	7.40	290	<1	736	<0.100	<0.010
	10-31-86	13.0	1,090	7.40	290	<1	738	0.400	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	8.0	1,100	7.30	280	<1	752	0.200	<0.010
	05-30-87	9.0	1,300	7.40	280	<1	916	0.10	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	14.0	1,270	7.40	290	<1	769	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	11.0	1,070	7.30	300	<1	738	<0.100	<0.010
26	03-08-84	3.0	1,450	7.50	310	<1	1,060	<0.100	<0.010
	06-28-84	9.0	1,200	7.50	290	<1	869	<0.100	<0.010
	10-12-84	15.0	1,300	7.30	310	--	1,030	<0.100	<0.010
	01-25-85	5.0	1,120	7.50	280	--	825	<0.100	<0.010
	04-09-85	5.0	1,100	7.50	290	<1	801	<0.100	0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	13.5	1,170	7.40	310	<1	820	<0.100	<0.010
	10-17-85	--	--	--	--	--	--	--	--
	10-18-85	13.5	1,270	7.40	290	<1	939	<0.100	0.020
	01-15-86	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
25	03-08-84	0.07	0.030	<0.020	170	25	82	7.6	42	320	--
	06-28-84	<0.30	0.040	0.050	130	23	70	5.0	32	300	--
	10-12-84	1.1	0.020	0.120	150	23	71	7.0	34	290	--
	01-25-85	<0.30	<0.010	<0.020	150	22	75	6.8	31	280	--
	04-09-85	0.50	0.050	<0.020	150	21	72	5.7	37	280	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.50	<0.010	0.060	150	22	72	4.8	33	250	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	<0.30	0.100	0.600	140	19	74	4.5	38	260	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.020	0.120	130	17	69	4.1	36	230	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	0.70	0.050	0.100	130	20	72	4.0	25	260	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	1.3	0.050	0.040	100	19	84	4.0	36	220	--
	10-31-86	<0.30	0.080	0.060	130	20	61	5.0	35	230	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.150	0.050	150	21	57	3.9	31	250	--
	05-30-87	0.40	0.030	0.050	180	27	78	4.1	60	340	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.40	0.070	0.070	140	21	76	4.3	36	240	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.50	0.010	0.050	160	21	66	3.8	36	260	--
26	03-08-84	<0.30	0.070	<0.020	200	33	110	8.7	68	440	--
	06-28-84	<0.30	0.030	0.050	140	29	100	6.0	47	270	--
	10-12-84	1.2	0.090	0.060	180	30	120	8.0	61	410	--
	01-25-85	0.40	0.020	<0.020	140	24	100	8.8	44	290	--
	04-09-85	<0.30	0.030	<0.020	140	22	95	6.3	44	290	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.50	0.010	<0.020	150	27	100	6.4	43	290	--
	10-17-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	3.2	0.340	0.060	160	25	110	6.0	54	350	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
25	03-08-84	--	580	--	--	--	20	<1	520	--	--
	06-28-84	--	--	--	--	--	<10	<1	420	--	--
	10-12-84	--	210	--	--	--	<10	--	470	<1	14
	01-25-85	--	440	--	--	--	10	--	460	<1	2
	04-09-85	--	270	--	--	--	20	<1	470	<1	<1
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	510	--	--	--	20	<1	460	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	27
	10-18-85	<10	<10	<10	680	440	20	<1	440	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	24
	01-16-86	--	570	--	--	--	60	<1	380	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	750	--	610	--	<10	<1	410	--	--
	08-04-86	--	--	--	--	--	--	--	--	1	2
	08-05-86	--	390	--	630	--	<10	<1	330	--	--
	10-31-86	--	<50	--	--	--	<20	--	420	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	<1
	02-11-87	--	--	--	--	--	--	--	--	<1	<1
	02-12-87	--	660	--	--	--	<10	<1	450	--	--
	05-30-87	--	850	--	--	--	<10	<1	570	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	2
	09-03-87	--	<50	--	--	--	<20	<1	440	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	490	--	--	--	<20	<1	480	--	--
26	03-08-84	--	<10	--	--	--	30	<1	640	--	--
	06-28-84	--	<10	--	--	--	10	<1	470	--	--
	10-12-84	--	<10	--	--	--	<10	--	580	<1	7
	01-25-85	--	<10	--	--	--	<10	--	450	<1	110
	04-09-85	--	<10	--	--	--	120	<1	430	<1	<1
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	50	--	--	--	20	<1	500	--	--
	10-17-85	--	--	--	--	--	--	--	--	<1	150
	10-18-85	<10	<10	<10	1,200	300	10	<1	510	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	5

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
26	01-16-86	6.0	1,300	7.50	320	<1	1,010	0.200	0.020
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	7.0	1,250	7.50	310	<1	890	0.200	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.5	1,180	7.50	290	<1	831	<0.100	<0.010
	10-30-86	13.0	2,900	7.30	280	<1	1,900	0.500	0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	7.5	1,700	7.50	310	<1	1,220	0.100	<0.010
	05-30-87	9.0	1,490	7.50	290	<1	1,050	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-03-87	14.5	1,700	7.50	290	<1	1,030	0.100	0.030
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	10.0	1,500	7.40	300	<1	1,120	<0.100	<0.010
27	03-08-84	6.0	1,150	7.40	280	<1	873	0.200	0.020
	06-28-84	11.0	975	7.40	250	<1	672	<0.100	<0.010
	10-12-84	14.5	1,110	7.40	240	--	784	<0.100	<0.010
	01-28-85	9.0	1,020	7.30	260	--	816	<0.100	<0.010
	04-09-85	8.5	1,150	7.30	270	<1	836	<0.100	<0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	13.0	1,120	7.20	230	<1	789	<0.100	<0.010
	10-16-85	--	--	--	--	--	--	--	--
	10-18-85	14.5	1,220	7.30	260	<1	876	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	8.5	1,220	7.40	330	<1	954	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	9.5	1,500	7.30	340	<1	1,100	0.300	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	15.0	1,300	7.10	310	<1	931	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
26	01-16-86	0.60	0.050	0.040	180	28	110	5.2	58	360	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	<0.30	0.060	0.050	150	25	100	5.0	51	320	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	3.5	0.050	<0.020	130	22	110	5.0	48	300	--
	10-30-86	0.30	0.080	<0.020	390	46	86	4.0	130	940	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.230	<0.020	210	34	110	5.5	66	510	--
	05-30-87	0.40	0.060	0.020	180	31	110	5.0	68	420	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-03-87	0.70	0.080	0.050	180	30	110	5.9	64	440	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.60	0.030	<0.020	160	26	79	5.9	76	300	--
27	03-08-84	<0.30	0.080	0.030	150	26	100	7.6	50	380	--
	06-28-84	<0.30	0.060	0.090	100	19	85	4.0	39	210	--
	10-12-84	0.60	0.070	0.090	140	25	82	5.0	44	300	--
	01-28-85	<0.30	0.070	0.100	150	24	89	6.0	45	310	--
	04-09-85	0.20	0.160	<0.020	140	22	95	5.0	47	330	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	0.70	0.130	0.030	130	24	74	4.3	44	300	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	<0.30	0.050	0.100	150	24	100	4.5	52	340	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.060	0.040	160	24	110	4.0	52	310	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	<0.30	0.040	0.050	200	33	110	4.0	57	420	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	5.0	0.040	<0.020	160	25	110	4.0	51	340	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
26	01-16-86	--	10	--	--	--	80	<1	560	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	3
	04-29-86	--	10	--	1,100	--	<10	<1	470	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	100	--	1,100	--	<10	<1	420	--	--
	10-30-86	--	<100	--	--	--	<40	--	1,200	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	8
	02-11-87	--	--	--	--	--	--	--	--	<2	<2
	02-12-87	--	<10	--	--	--	60	<1	650	--	--
	05-30-87	--	<10	--	--	--	<10	<1	570	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-03-87	--	130	--	--	--	<20	<1	570	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	500	--	--
27	03-08-84	--	<10	--	--	--	20	<1	480	--	--
	06-28-84	--	<10	--	--	--	20	<1	330	--	--
	10-12-84	--	<10	--	--	--	<10	--	460	<1	1
	01-28-85	--	<10	--	--	--	10	--	470	<1	110
	04-09-85	--	30	--	--	--	10	<1	450	<1	3
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	<10	--	--	--	20	<1	430	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	1,100
	10-18-85	20	<10	10	650	310	10	<1	460	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	4
	01-16-86	--	210	--	--	--	<10	<1	500	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	140	--	<10	<1	630	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	620	--	<10	<1	510	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
27	10-31-86	15.0	1,410	7.30	350	<1	1,040	0.500	<0.010
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	9.5	1,720	7.40	320	<1	1,170	<0.100	<0.010
	05-30-87	9.5	1,490	7.60	290	<1	1,180	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	17.0	1,810	7.30	320	<1	1,120	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	13.5	1,720	7.40	300	<1	1,140	<0.100	<0.010
28	03-08-84	10.0	1,100	7.40	270	<1	812	<0.100	<0.010
	06-28-84	11.0	925	7.40	240	<1	631	<0.100	<0.010
	10-12-84	15.0	1,050	7.30	270	--	839	<0.100	<0.010
	01-28-85	11.0	1,070	7.30	270	--	796	<0.100	<0.010
	04-09-85	10.5	1,090	7.40	270	<1	791	<0.100	<0.010
	06-27-85	--	--	--	--	--	--	--	--
	07-05-85	12.5	975	7.30	230	<1	662	<0.100	0.050
	10-16-85	--	--	--	--	--	--	--	--
	10-18-85	13.5	1,050	7.30	210	<1	743	<0.100	<0.010
	01-15-86	--	--	--	--	--	--	--	--
	01-16-86	10.5	990	7.40	250	<1	779	<0.100	<0.010
	04-28-86	--	--	--	--	--	--	--	--
	04-29-86	11.0	1,160	7.30	270	<1	819	0.400	<0.010
	08-04-86	--	--	--	--	--	--	--	--
	08-05-86	13.5	1,350	7.10	300	<1	897	<0.100	<0.010
	10-31-86	13.0	1,450	7.40	330	<1	1,080	0.600	<0.010
	11-05-86	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--
	02-12-87	11.0	850	7.40	210	<1	578	<0.100	<0.100
	05-30-87	11.0	900	7.30	220	<1	617	<0.100	<0.010
	06-02-87	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--
	09-02-87	14.5	1,550	7.40	310	<1	922	<0.100	<0.010
	12-17-87	--	--	--	--	--	--	--	--
	12-18-87	12.0	1,140	7.40	280	<1	700	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87--Continued*

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
27	10-31-86	0.30	0.030	0.080	180	26	100	6.0	58	400	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.090	0.020	220	32	120	5.2	67	470	--
	05-30-87	<0.30	0.160	0.040	200	32	130	5.1	74	500	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	0.70	0.040	0.100	190	30	120	5.5	66	490	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	<0.30	0.020	<0.020	210	31	150	6.1	74	480	--
28	03-08-84	0.40	1.09	<0.020	150	23	88	8.1	43	330	--
	06-28-84	<0.30	1.60	0.070	100	19	79	6.0	30	190	--
	10-12-84	0.60	0.800	0.080	150	24	84	7.0	44	300	--
	01-28-85	<0.30	0.470	0.070	150	23	88	7.7	42	310	--
	04-09-85	0.70	0.280	<0.020	140	20	90	6.3	43	300	--
	06-27-85	--	--	--	--	--	--	--	--	--	--
	07-05-85	<0.30	0.360	<0.020	130	21	76	4.8	36	240	--
	10-16-85	--	--	--	--	--	--	--	--	--	--
	10-18-85	<0.30	0.220	0.100	120	19	78	5.0	45	280	<1
	01-15-86	--	--	--	--	--	--	--	--	--	--
	01-16-86	<0.30	0.270	0.030	120	17	78	4.4	43	240	--
	04-28-86	--	--	--	--	--	--	--	--	--	--
	04-29-86	0.30	0.140	0.080	150	23	76	5.0	29	310	--
	08-04-86	--	--	--	--	--	--	--	--	--	--
	08-05-86	2.5	0.210	<0.020	180	27	91	5.0	50	320	--
	10-31-86	0.40	0.080	0.050	190	28	96	6.0	62	430	--
	11-05-86	--	--	--	--	--	--	--	--	--	--
	02-11-87	--	--	--	--	--	--	--	--	--	--
	02-12-87	<0.30	0.790	<0.020	100	15	50	4.1	25	190	--
	05-30-87	<0.30	0.700	<0.020	120	18	54	4.6	37	220	--
	06-02-87	--	--	--	--	--	--	--	--	--	--
	09-02-87	0.40	0.06	0.050	190	28	66	5.3	50	370	--
	12-17-87	--	--	--	--	--	--	--	--	--	--
	12-18-87	0.90	0.40	<0.02	156	23	66	5.2	42	300	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Hardness, total (mg/L as $CaCO_3$)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal (cols. per 100 mL)
27	10-31-86	--	<50	--	--	--	<20	--	560	--	--
	02-11-87	--	--	--	--	--	--	--	--	<2	1
	02-12-87	--	120	--	--	--	100	<1	670	--	--
	05-30-87	--	<50	--	--	--	<20	<1	640	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	<50	--	--	--	20	<1	610	--	--
	12-17-87	--	--	--	--	--	--	--	--	--	<2
	12-18-87	--	<50	--	--	--	<20	<1	660	--	--
28	03-08-84	--	10	--	--	--	10	<1	480	--	--
	06-28-84	--	<10	--	--	--	10	<1	340	--	--
	10-12-84	--	<10	--	--	--	<10	--	480	<1	1
	01-28-85	--	<10	--	--	--	10	--	460	<1	630
	04-09-85	--	<10	--	--	--	10	<1	430	<1	<1
	06-27-85	--	--	--	--	--	--	--	--	<1	<1
	07-05-85	--	<10	--	--	--	<10	<1	400	--	--
	10-16-85	--	--	--	--	--	--	--	--	<1	300
	10-18-85	<10	<10	10	360	330	10	<1	380	--	--
	01-15-86	--	--	--	--	--	--	--	--	<1	16
	01-16-86	--	<10	--	--	--	<10	<1	380	--	--
	04-28-86	--	--	--	--	--	--	--	--	<1	<1
	04-29-86	--	<10	--	60	--	<10	<1	470	--	--
	08-04-86	--	--	--	--	--	--	--	--	<1	<1
	08-05-86	--	<10	--	140	--	<10	<1	550	--	--
	10-31-86	--	<50	--	--	--	<20	--	580	--	--
	11-05-86	--	--	--	--	--	--	--	--	<1	2
	02-11-87	--	--	--	--	--	--	--	--	<2	2
	02-12-87	--	<10	--	--	--	<10	<1	320	--	--
	05-30-87	--	<50	--	--	--	<20	<1	370	--	--
	06-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	--	--	--	--	--	--	--	<2	<2
	09-02-87	--	<50	--	--	--	<20	<1	590	--	--
	12-17-87	--	--	--	--	--	--	--	--	<2	<2
	12-18-87	--	<50	--	--	--	<20	<1	480	--	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Temperature, water (deg. C)	Specific conductance (µS/cm)	pH (standard units)	Bicarbonate (mg/L as HCO_3)	Carbonate (mg/L as CO_3)	Residue at 105 deg. C, dissolved (mg/L)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)
SW-1	02-23-84	1.0	320	7.90	84	<1	296	0.200	0.030
	06-25-84	23.0	650	8.40	160	<1	460	<0.100	0.040
	04-02-85	18.0	700	8.30	190	<1	504	0.200	0.040
	04-09-85	--	--	--	--	--	--	--	--
	07-20-85	--	--	--	170	<1	478	<0.100	0.020
	05-04-87	7.0	875	8.00	210	<1	618	<0.100	<0.010
SW-2	02-14-84	1.0	1,670	--	290	<1	1,260	11.4	1.51
	04-02-85	21.0	1,690	8.20	300	<1	1,260	0.100	0.160
	04-09-85	--	--	--	--	--	--	--	--
	07-20-85	--	--	--	110	<1	1,670	9.00	3.50
	11-20-86	--	--	--	--	--	--	--	--
	05-04-87	7.5	5,800	8.10	220	<1	6,030	1.10	0.430
SW-3	07-20-85	--	--	--	85	<1	2,370	18.5	7.20
	11-20-86	--	--	--	--	--	--	--	--
SW-4	04-02-85	17.0	2,420	8.00	210	<1	2,060	0.100	0.170
	04-09-85	--	--	--	--	--	--	--	--
	07-20-85	--	--	--	77	<1	1,010	6.00	2.60
	05-04-87	8.0	2,000	8.30	230	<1	1,780	<0.100	0.100
SW-6	02-15-84	2.0	1,800	7.00	67	<1	1,830	7.40	2.30
	07-20-85	--	--	--	160	<1	3,880	47.0	31.0
SW-7	02-14-84	0.0	650	8.10	230	<1	420	0.300	<0.010
	04-02-85	21.0	670	8.50	250	<1	478	0.100	0.060
	04-09-85	--	--	--	--	--	--	--	--
	07-20-85	--	--	--	91	<1	273	0.100	0.040
	05-04-87	7.0	620	8.20	210	<1	471	<0.100	0.020
SW-8	02-14-84	1.0	1,500	--	240	<1	1,260	0.200	<0.010
	04-02-85	21.0	1,080	8.40	270	<1	818	<0.100	0.070
	04-09-85	--	--	--	--	--	--	--	--
	07-20-85	--	--	--	110	<1	633	1.80	0.830
	05-04-87	7.0	900	8.20	210	<1	664	<0.100	<0.010

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87--Continued*

Well or surface-water site number (see pl. 1)	Date	Nitrogen, ammonia plus organic dis. (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Cadmium, dissolved (µg/L as Cd)
SW-1	02-23-84	1.8	0.150	0.150	36	4.1	14	7.2	4.0	60	--
	06-25-84	<0.30	0.060	<0.020	90	12	36	4.0	19	130	--
	04-02-85	<0.30	0.070	0.070	110	10	35	5.1	18	170	--
	04-09-85	--	--	--	--	--	--	--	--	--	--
	07-20-85	<0.30	0.360	<0.020	99	10	31	8.0	14	140	<1
	05-04-87	1.2	0.070	0.040	130	14	41	4.9	21	230	--
SW-2	02-14-84	22	22.5	1.46	270	36	72	20	140	420	--
	04-02-85	1.1	27.0	0.100	260	39	89	12	130	430	--
	04-09-85	--	--	--	--	--	--	--	--	--	--
	07-20-85	19	86.0	10.2	220	70	50	26	64	390	3
	11-20-86	--	--	--	--	--	--	--	--	--	--
	05-04-87	12	560	2.08	1,000	220	150	35	640	720	--
SW-3	07-20-85	33	100	10.4	270	89	46	35	92	530	6
	11-20-86	--	--	--	--	--	--	--	--	--	--
SW-4	04-02-85	0.50	5.55	<0.020	340	76	180	7.5	190	1,000	--
	04-09-85	--	--	--	--	--	--	--	--	--	--
	07-20-85	17	40.2	1.92	150	24	33	17	52	230	<1
	05-04-87	0.90	3.05	0.030	330	54	130	4.3	120	800	--
SW-6	02-15-84	29	118	12.0	300	80	47	29	82	580	--
	07-20-85	120	160	8.78	430	140	70	44	170	840	10
SW-7	02-14-84	0.90	0.190	0.150	79	12	40	6.8	25	78	--
	04-02-85	<0.30	0.180	0.090	94	16	45	6.2	27	96	--
	04-09-85	--	--	--	--	--	--	--	--	--	--
	07-20-85	1.0	2.80	0.170	44	5.0	28	9.0	12	68	<1
	05-04-87	0.80	0.310	0.120	88	14	38	4.0	30	89	--
SW-8	02-14-84	2.7	0.170	<0.020	250	35	110	8.6	63	600	--
	04-02-85	0.40	0.200	0.080	150	28	94	7.2	48	300	--
	04-09-85	--	--	--	--	--	--	--	--	--	--
	07-20-85	5.7	12.0	0.560	100	14	41	13	29	190	<1
	05-04-87	0.50	0.170	0.060	110	21	68	4.9	42	240	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Chromium, total recoverable (µg/L as Cr)	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead dissolved (µg/L as Pb)	Manganese, dissolved (µg/L	Nickel, dissolved (µg/L as Ni)	Zinc, dissolved (µg/L as Zn)	Hydroxide (mg/L as OH)	Nitrogen, NO_2+NO_3 total (mg/L as N)
SW-1	02-23-84	--	--	90	--	--	--	10	<1	--
	06-25-84	--	--	<10	--	--	--	<10	<1	--
	04-02-85	--	--	<10	--	--	--	<10	<1	--
	04-09-85	--	--	--	--	--	--	--	--	--
	07-20-85	<10	--	30	--	--	--	40	<1	--
	05-04-87	--	--	40	--	--	--	40	<1	--
SW-2	02-14-84	--	--	10	--	--	--	<10	<1	--
	04-02-85	--	--	<10	--	--	--	<10	<1	--
	04-09-85	--	--	--	--	--	--	--	--	--
	07-20-85	20	--	90	--	--	--	50	<1	86.0
	11-20-86	--	--	--	--	--	--	--	--	--
	05-04-87	--	--	100	--	--	--	<10	<1	--
SW-3	07-20-85	10	--	110	--	--	--	50	<1	115
	11-20-86	--	--	--	--	--	--	--	--	--
SW-4	04-02-85	--	--	30	--	--	--	<10	<1	--
	04-09-85	--	--	--	--	--	--	--	--	--
	07-20-85	20	--	100	--	--	--	80	<1	48.0
	05-04-87	--	--	40	--	--	--	60	<1	--
SW-6	02-15-84	--	--	<10	--	--	--	30	<1	--
	07-20-85	10	--	110	--	--	--	60	<1	170
SW-7	02-14-84	--	--	30	--	--	--	10	<1	--
	04-02-85	--	--	<10	--	--	--	<10	<1	--
	04-09-85	--	--	--	--	--	--	--	--	--
	07-20-85	20	--	180	--	--	--	10	<1	--
	05-04-87	--	--	200	--	--	--	<10	<1	--
SW-8	02-14-84	--	--	20	--	--	--	<10	<1	--
	04-02-85	--	--	<10	--	--	--	<10	<1	--
	04-09-85	--	--	--	--	--	--	--	--	--
	07-20-85	30	--	40	--	--	--	90	<1	13.0
	05-04-87	--	--	20	--	--	--	220	<1	--

Table 6.--*Chemical analyses from ground-water and surface-water sites, 1981-87*--Continued

Well or surface-water site number (see pl. 1)	Date	Hardness, total (mg/L as $CaCO_3$)	Calcium, total recoverable (mg/L as Ca)	Magnesium, total recoverable (mg/L as Mg)	Potassium, total recoverable (mg/L as K)	Cadmium, total recoverable (µg/L as Cd)	Iron, total recoverable (µg/L as Fe)	Zinc, total recoverable (µg/L as Zn)	Coliform, fecal (cols. per 100 mL)	Streptococci, fecal, (cols. per 100 mL)
SW-1	02-23-84	110	--	--	--	--	--	--	--	--
	06-25-84	270	--	--	--	--	--	--	--	--
	04-02-85	320	--	--	--	--	--	--	--	--
	04-09-85	--	--	--	--	--	--	--	8	78
	07-20-85	290	90	9.0	8.0	3	1,000	20	--	--
	05-04-87	390	--	--	--	--	--	--	--	--
SW-2	02-14-84	820	--	--	--	--	--	--	--	--
	04-02-85	800	--	--	--	--	--	--	--	--
	04-09-85	--	--	--	--	--	--	--	6	120
	07-20-85	840	190	61	28	6	1,900	40	--	--
	11-20-86	--	--	--	--	--	--	--	--	--
	05-04-87	3,500	--	--	--	--	--	--	--	--
SW-3	07-20-85	1,000	280	82	37	8	1,600	60	--	--
	11-20-86	--	--	--	--	--	--	--	--	--
SW-4	04-02-85	1,200	--	--	--	--	--	--	--	--
	04-09-85	--	--	--	--	--	--	--	<1	3,200
	07-20-85	470	140	23	18	1	6,100	60	--	--
	05-04-87	1,000	--	--	--	--	--	--	--	--
SW-6	02-15-84	1,100	--	--	--	--	--	--	--	--
	07-20-85	1,700	460	120	48	15	440	60	--	--
SW-7	02-14-84	250	--	--	--	--	--	--	--	--
	04-02-85	300	--	--	--	--	--	--	--	--
	04-09-85	--	--	--	--	--	--	--	25	120
	07-20-85	130	47	7.0	10	2	5,500	50	--	--
	05-04-87	280	--	--	--	--	--	--	--	--
SW-8	02-14-84	760	--	--	--	--	--	--	--	--
	04-02-85	480	--	--	--	--	--	--	--	--
	04-09-85	--	--	--	--	--	--	--	15	200
	07-20-85	320	120	20	17	3	12,000	80	--	--
	05-04-87	370	--	--	--	--	--	--	--	--

[1]Water samples were obtained from windmill outflow pipe.

Table 7.--*Summary statistics of water-quality analyses*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; deg. C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; cols. per 100 mL, colonies per 100 milliliters; --, no data; <, less than; see plate 1 for well and surface-water site location; statistics are listed only for those constituents for which more than two analyses were done]

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 1					
Specific conductance	µS/cm	17	960.88	215.742	700.00	800.00	900.00	1,125.00	1,400.00
pH	standard	17	7.08	0.210	6.80	6.90	7.10	7.20	7.50
Temperature	deg. C	17	11.74	3.738	6.00	8.25	12.00	14.50	18.00
Hardness (as $CaCO_3$)	mg/L	19	444.26	62.126	329.00	389.00	449.00	489.00	559.00
Dissolved solids (residue)	mg/L	19	687.21	110.076	531.00	626.00	660.00	775.00	923.00
Calcium	mg/L	19	150.53	20.131	110.00	130.00	150.00	170.00	180.00
Magnesium	mg/L	19	16.84	3.202	12.00	13.00	17.00	19.00	24.00
Sodium	mg/L	19	50.21	7.969	39.00	44.00	48.00	56.00	68.00
Potassium	mg/L	19	6.52	1.342	5.00	5.20	6.50	8.00	9.20
Bicarbonate	mg/L	19	297.89	54.831	200.00	260.00	290.00	330.00	410.00
Sulfate	mg/L	19	225.79	55.108	160.00	190.00	210.00	240.00	380.00
Chloride	mg/L	19	26.68	4.843	17.00	24.00	27.00	30.00	35.00
Nitrite N	mg/L		--	--	--	--	--	--	--
Nitrite + nitrate N	mg/L	19	0.19	0.259	< 0.01	0.04	0.07	0.17	0.92
Ammonia N	mg/L	19	0.10	0.076	< 0.05	0.05	0.08	0.10	0.30
Ammonia + organic N	mg/L	19	1.05	1.438	< 0.30	0.39	0.68	0.90	6.50
Orthophosphate P	mg/L	19	0.02	0.035	0.01	0.01	0.01	0.03	0.15
Iron	µg/L	19	1,946.95	1,653.824	< 10.00	50.00	1,700.00	3,600.00	4,900.00
Manganese	µg/L	4	1,525.00	340.343	1,200.00	--	--	--	2,000.00
Zinc	µg/L	19	62.24	146.687	< 10.00	8.39	20.00	40.00	650.00
Fecal streptococci	cols. per 100 mL	15	10.38	35.893	< 1.00	0.11	0.57	2.00	140.00
				Well 2					
Specific conductance	µS/cm	10	815.00	53.125	775.00	778.75	795.00	827.50	950.00
pH		10	7.39	0.228	7.20	7.27	7.35	7.40	8.00
Temperature	deg. C	10	11.75	1.161	9.50	11.00	12.00	12.13	14.00
Hardness (as $CaCO_3$)	mg/L	10	347.00	20.976	329.00	329.00	339.00	369.00	389.00
Dissolved solids (residue)	mg/L	10	587.80	87.809	537.00	548.75	562.50	580.00	834.00
Calcium	mg/L	10	116.00	6.992	110.00	110.00	115.00	120.00	130.00
Magnesium	mg/L	10	14.30	3.302	12.00	12.00	13.50	14.50	23.00
Sodium	mg/L	10	46.80	5.534	35.00	44.50	47.00	50.00	56.00
Potassium	mg/L	10	7.18	1.117	6.00	6.32	6.85	8.13	9.40
Bicarbonate	mg/L	10	235.00	7.071	230.00	230.00	230.00	240.00	250.00
Sulfate	mg/L	10	195.00	9.718	180.00	190.00	190.00	202.50	210.00
Chloride	mg/L	10	15.60	4.600	11.00	12.50	15.00	16.50	27.00
Nitrite N	mg/L		--	--	--	--	--	--	--
Nitrite + nitrate N	mg/L	10	0.07	0.072	< 0.01	0.02	0.04	0.08	0.22
Ammonia N	mg/L	10	0.12	0.059	< 0.10	0.09	0.10	0.20	0.20
Ammonia + organic N	mg/L	10	0.56	0.459	< 0.30	0.22	0.45	0.80	1.50
Orthophosphate P	mg/L	10	3.03	9.487	< 0.02	0.00	0.01	0.08	30.03
Iron	µg/L	10	274.52	233.097	< 10.00	25.00	340.00	460.00	580.00
Manganese	µg/L	3	130.00	52.915	70.00	70.00	150.00	170.00	170.00
Fecal streptococci	cols. per 100 mL	10	171.14	445.007	< 1.00	0.96	13.00	160.00	1,500.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 3-3a					
Specific conductance	µS/cm	11	6,263.64	2,645.003	3,800.00	4,500.00	5,250.00	6,900.00	11,500.00
pH		11	6.9	0.185	6.50	6.70	6.90	7.00	7.10
Temperature	deg. C	11	10.73	1.403	8.50	9.50	11.00	11.50	13.00
Hardness (as $CaCO_3$)	mg/L	12	3,265.67	1,113.825	1,999.00	2,424.00	2,849.00	3,949.00	5,799.00
Dissolved solids (residue)	mg/L	12	5,561.67	1,772.506	3,780.00	3,970.00	5,170.00	6,505.00	9,170.00
Calcium	mg/L	12	1,081.67	380.402	620.00	815.00	940.00	1,350.00	1,900.00
Magnesium	mg/L	12	139.17	44.814	100.00	110.00	125.00	165.00	250.00
Sodium	mg/L	10	108.40	39.783	64.00	80.00	96.00	137.50	190.00
Potassium	mg/L	12	27.17	5.096	21.00	22.75	27.00	30.00	39.00
Bicarbonate	mg/L	12	279.17	55.507	180.00	230.00	280.00	330.00	340.00
Sulfate	mg/L	12	752.50	196.150	520.00	602.50	740.00	867.50	1,100.00
Chloride	mg/L	12	406.67	175.361	140.00	270.00	380.00	535.00	760.00
Nitrite N	mg/L	12	7.17	12.498	0.02	0.10	0.89	14.39	41.00
Nitrite + nitrate N	mg/L	12	525.50	254.694	265.00	365.00	440.00	623.00	1060.00
Ammonia N	mg/L	12	0.30	0.208	< 0.10	0.12	0.25	0.50	0.60
Ammonia + organic N	mg/L	12	5.68	4.655	1.10	2.45	4.60	7.93	18.00
Orthophosphate P	mg/L	12	0.14	0.117	< 0.02	0.07	0.10	0.19	0.46
Iron	µg/L	11	51.22	139.102	< 10.00	3.96	11.20	31.65	470.00
Zinc	µg/L	12	51.89	57.050	< 10.00	8.75	23.32	77.50	200.00
Fecal streptococci	cols. per 100 mL	6	79.17	115.945	< 1.00	3.60	32.00	177.50	280.00
				Well 4					
Specific conductance	µS/cm	8	800.00	34.226	740.00	782.50	800.00	817.50	860.00
pH		8	8.2	0.205	7.90	8.00	8.20	8.32	8.50
Temperature	deg. C	8	11.37	0.791	10.50	11.00	11.00	11.88	12.50
Hardness (as $CaCO_3$)	mg/L	8	222.50	12.817	200.00	212.50	225.00	230.00	240.00
Dissolved solids (residue)	mg/L	8	514.75	11.042	497.00	504.00	516.50	521.55	530.00
Calcium	mg/L	8	80.50	4.243	73.00	77.50	80.50	84.50	86.00
Magnesium	mg/L	8	5.20	0.659	4.00	5.00	5.00	5.90	6.00
Sodium	mg/L	8	71.00	7.329	55.00	68.75	72.00	77.00	78.00
Potassium	mg/L	8	5.53	0.850	3.80	4.00	4.20	5.08	6.30
Bicarbonate	mg/L	7	86.29	3.638	82.00	83.00	86.00	88.00	93.00
Sulfate	mg/L	8	241.25	6.409	230.00	240.00	240.00	247.50	250.00
Chloride	mg/L	8	37.75	4.862	34.00	34.50	36.00	38.75	49.00
Nitrite N	mg/L	8	0.29	0.036	< 0.01	0.01	0.01	0.56	0.10
Nitrite + nitrate N	mg/L	8	0.16	0.092	0.03	0.09	0.16	0.24	0.29
Ammonia N	mg/L	8	0.21	0.113	< 0.10	0.10	0.20	0.30	0.40
Ammonia + organic N	mg/L	8	0.50	0.424	< 0.30	0.30	0.30	0.95	1.20
Orthophosphate P	mg/L	8	0.03	0.049	< 0.02	0.01	0.02	0.04	0.15
Fecal streptococci	cols. per 100 mL	8	6.	12.558	< 1.00	0.26	2.00	2.75	37.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 5					
Specific conductance	µS/cm	18	1,683.89	211.914	1,240.00	1,500.00	1,690.00	1,760.00	2,200.00
pH		18	7.42	0.238	6.90	7.30	7.40	7.42	8.00
Temperature	deg. C	18	10.86	1.869	8.50	9.00	10.50	13.00	13.50
Hardness (as $CaCO_3$)	mg/L	19	776.89	63.995	629.00	759.00	789.00	809.00	889.00
Dissolved solids (residue)	mg/L	19	1,330.00	78.102	1,170.00	1,260.00	1,350.00	1,390.00	1,420.00
Calcium	mg/L	19	261.58	21.412	210.00	250.00	260.00	270.00	300.00
Magnesium	mg/L	19	30.53	3.151	25.00	28.00	30.00	33.00	36.00
Sodium	mg/L	19	104.89	9.938	85.00	96.00	110.00	110.00	120.00
Potassium	mg/L	19	7.45	1.627	5.40	6.00	8.00	8.60	11.00
Bicarbonate	mg/L	19	305.79	18.653	280.00	290.00	310.00	320.00	340.00
Sulfate	mg/L	19	613.68	52.727	510.00	560.00	630.00	660.00	680.00
Chloride	mg/L	19	50.89	8.894	37.00	47.00	49.00	55.00	72.00
Nitrite N	mg/L	19	0.03	0.039	< 0.01	0.00	0.01	0.03	0.13
Nitrite + nitrate N	mg/L	19	0.81	0.698	< 0.01	0.08	0.54	1.61	1.81
Ammonia N	mg/L	19	0.10	0.077	0.08	0.03	0.05	0.08	0.40
Ammonia + organic N	mg/L	19	0.50	0.394	< 0.30	0.13	0.27	0.70	1.70
Orthophosphate P	mg/L	19	0.02	0.035	< 0.02	0.01	0.01	0.02	0.15
Iron	µg/L	19	131.05	195.020	< 10.00	--	--	--	650.00
Manganese	µg/L	4	182.50	97.622	60.00	--	--	--	320.00
Zinc	µg/L	19	122.68	362.691	< 10.00	4.48	20.00	60.00	1,600.00
Fecal streptococci	cols. per 100 mL	15	106.59	277.796	< 1.00	0.00	0.15	8.00	880.00
				Well 6					
Specific conductance	µS/cm	18	909.00	282.117	500.00	695.00	925.00	997.50	1650.00
pH		18	.7.3	0.251	6.70	7.20	7.30	7.42	7.90
Temperature	deg. C	18	11.25	2.081	7.00	9.37	11.50	13.00	14.00
Hardness (as $CaCO_3$)	mg/L	19	423.74	117.301	169.00	309.00	469.00	509.00	569.00
Dissolved solids (residue)	mg/L	19	571.05	152.415	230.00	437.00	652.00	680.00	761.00
Calcium	mg/L	19	142.16	39.614	55.00	100.00	160.00	170.00	190.00
Magnesium	mg/L	19	16.43	4.771	7.00	13.00	17.00	20.00	26.00
Sodium	mg/L	19	20.42	6.012	10.00	14.00	22.00	25.00	28.00
Potassium	mg/L	19	4.55	0.812	3.60	4.00	4.30	5.00	7.00
Bicarbonate	mg/L	19	294.74	56.898	180.00	250.00	310.00	340.00	370.00
Sulfate	mg/L	19	161.42	65.655	20.00	110.00	200.00	210.00	230.00
Chloride	mg/L	19	9.95	5.020	< 1.00	6.00	11.00	14.00	18.00
Nitrite + nitrate N	mg/L	19	0.33	0.410	< 0.01	0.10	0.16	0.46	1.70
Ammonia N	mg/L	19	0.11	0.148	< 0.10	0.04	0.08	0.19	0.60
Ammonia + organic N	mg/L	19	0.55	0.409	< 0.30	0.26	0.40	0.90	1.30
Orthophosphate P	mg/L	19	0.02	0.031	< 0.02	0.00	0.01	0.04	0.10
Iron	µg/L	19	291.85	565.827	< 10.00	1.34	12.49	320.00	1,800.00
Manganese	µg/L	4	555.00	607.152	40.00	80.00	390.00	1,195.00	1,400.00
Zinc	µg/L	19	29.84	39.290	< 10.00	5.63	13.91	30.00	150.00
Fecal streptococci	cols. per 100 mL	14	572.02	1,915.352	< 1.00	0.18	3.00	63.50	7,200.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 7					
Specific conductance	µS/cm	18	745.56	99.305	560.00	670.00	750.00	800.00	950.00
pH		18	7.0	0.312	6.20	6.90	7.00	7.12	7.80
Temperature	deg. C	18	10.58	1.817	7.00	9.00	10.75	12.00	13.50
Hardness (as $CaCO_3$)	mg/L	19	289.00	26.667	239.00	269.00	289.00	309.00	329.00
Dissolved solids (residue)	mg/L	19	510.79	43.132	447.00	488.00	504.00	542.00	600.00
Calcium	mg/L	19	95.79	9.217	79.00	89.00	97.00	100.00	110.00
Magnesium	mg/L	19	12.05	1.580	9.00	11.00	12.00	13.00	15.00
Sodium	mg/L	19	53.89	8.755	38.00	51.00	53.00	54.00	85.00
Potassium	mg/L	19	4.69	0.987	3.30	3.80	4.80	5.80	6.20
Bicarbonate	mg/L	19	204.74	18.964	180.00	190.00	200.00	210.00	270.00
Sulfate	mg/L	19	187.37	25.570	150.00	160.00	180.00	210.00	240.00
Chloride	mg/L	19	7.26	3.397	1.00	6.00	7.00	8.00	16.00
Nitrite + nitrate N	mg/L	19	0.15	0.103	0.02	0.08	0.13	0.21	0.40
Ammonia N	mg/L	19	0.05	0.142	< 0.01	0.00	0.01	0.04	0.60
Ammonia + organic N	mg/L	19	0.34	0.277	< 0.30	0.18	0.28	0.40	1.00
Orthophosphate P	mg/L	19	0.16	0.066	0.03	0.11	0.15	0.21	0.26
Zinc	µg/L	19	35.73	49.101	< 10.00	6.89	16.77	30.00	170.00
Fecal streptococci	cols. per 100 mL	15	302.75	1,001.793	< 1.00	1.07	3.00	47.00	3,900.00
				Well 8					
Specific conductance	µS/cm	6	3,883.33	75.277	3,800.00	3,800.00	3,900.00	3,925.00	4,000.00
pH		6	7.3	0.103	7.20	7.27	7.30	7.42	7.50
Temperature	deg. C	6	11.42	1.463	9.50	9.87	11.75	12.37	13.50
Hardness (as $CaCO_3$)	mg/L	6	2,015.67	98.319	1,899.00	1,899.00	2,049.00	2,099.00	2,099.00
Dissolved solids (residue)	mg/L	6	3,723.33	80.166	3,650.00	3,680.00	3,700.00	3,760.00	3,880.00
Calcium	mg/L	6	625.00	42.308	560.00	582.50	635.00	662.50	670.00
Magnesium	mg/L	6	111.67	7.528	100.00	107.50	110.00	120.00	120.00
Sodium	mg/L	6	281.67	67.946	160.00	227.50	305.00	332.50	340.00
Potassium	mg/L	6	9.98	2.026	6.20	8.82	10.50	11.25	12.00
Bicarbonate	mg/L	6	335.00	17.607	320.00	320.00	330.00	352.50	360.00
Sulfate	mg/L	6	1,533.33	265.832	1,200.00	1,275.00	1,550.00	1,800.00	1,800.00
Chloride	mg/L	6	200.00	34.641	170.00	170.00	190.00	230.00	260.00
Nitrite N	mg/L	6	0.31	0.374	< 0.01	0.03	0.13	0.72	0.90
Nitrite + nitrate N	mg/L	6	104.67	36.828	75.00	76.50	86.50	150.75	153.00
Ammonia + organic N	mg/L	6	2.23	0.388	1.90	1.97	2.05	2.60	2.90
Zinc	µg/L	6	34.63	14.284	< 10.00	18.23	30.00	45.00	60.00
Fecal streptococci	cols. per 100 mL	4	78.50	77.968	5.00	8.50	74.50	152.50	160.00
				Well 9					
Specific conductance	µS/cm	13	4,357.69	856.798	3,500.00	3,825.00	4,100.00	4,650.00	6,300.00
pH		13	7.3	0.117	7.10	7.30	7.30	7.40	7.60
Temperature	deg. C	13	11.85	1.068	10.00	10.75	12.00	13.00	13.00
Hardness (as $CaCO_3$)	mg/L	13	2,153.00	220.880	--	--	--	--	2,500.00
Dissolved solids (residue)	mg/L	13	3,823.08	257.727	3,530.00	3,590.00	3,800.00	4,000.00	4,340.00
Calcium	mg/L	13	656.92	93.842	510.00	595.00	640.00	720.00	870.00
Magnesium	mg/L	13	132.31	10.919	120.00	120.00	130.00	140.00	150.00
Sodium	mg/L	13	254.62	43.897	160.00	250.00	260.00	290.00	310.00
Potassium	mg/L	13	7.64	2.351	5.00	6.08	7.38	10.00	12.00
Bicarbonate	mg/L	13	392.31	47.636	300.00	365.00	390.00	435.00	470.00
Sulfate	mg/L	13	1,576.92	116.575	1,400.00	1,500.00	1,600.00	1,650.00	1,800.00
Chloride	mg/L	13	238.46	44.318	170.00	185.00	260.00	280.00	280.00
Nitrite N	mg/L	13	0.10	0.191	< 0.01	0.00	0.01	0.09	0.71
Nitrite + nitrate N	mg/L	13	93.04	48.018	54.00	55.00	77.50	121.00	190.00
Ammonia + organic N	mg/L	13	1.51	0.657	< 0.30	1.10	1.40	1.70	3.20
Orthophosphate P	mg/L	13	0.02	0.041	< 0.02	0.01	0.01	0.03	0.15
Zinc	µg/L	13	13.86	13.419	< 10.00	5.25	9.82	18.37	50.00
Fecal streptococci	cols. per 100 mL	10	22.12	66.055	< 1.00	0.01	0.19	5.25	210.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 10-10a					
Specific conductance	µS/cm	17	1,698.76	402.945	969.00	1,465.00	1,600.00	1,925.00	2,650.00
pH		17	7.11	0.200	6.70	7.00	7.10	7.25	7.50
Temperature	deg. C	17	11.24	1.552	8.00	10.50	11.00	12.25	14.50
Hardness (as $CaCO_3$)	mg/L	18	920.11	148.636	659.00	784.00	969.00	999.00	1,199.00
Dissolved solids (residue)	mg/L	18	1,387.78	241.796	1,050.00	1,147.50	1,400.00	1,552.50	1,990.00
Calcium	mg/L	18	303.89	55.534	210.00	250.00	315.00	340.00	400.00
Magnesium	mg/L	18	42.72	6.927	33.00	35.75	43.00	46.00	58.00
Sodium	mg/L	18	78.06	102.859	48.00	51.00	54.00	57.25	490.00
Potassium	mg/L	18	5.42	1.159	3.90	4.80	5.00	6.35	8.40
Bicarbonate	mg/L	18	316.11	50.192	240.00	290.00	300.00	335.00	430.00
Sulfate	mg/L	18	485.56	88.797	320.00	422.50	495.00	522.50	660.00
Chloride	mg/L	18	64.17	22.403	35.00	44.50	66.50	79.25	120.00
Nitrite N	mg/L	18	0.12	0.294	< 0.01	0.01	0.02	0.07	1.25
Nitrite + nitrate N	mg/L	18	33.22	19.528	6.80	21.00	26.00	43.22	80.00
Ammonia N	mg/L	18	0.07	0.102	< 0.10	0.03	0.06	0.10	0.40
Ammonia + organic N	mg/L	18	1.52	1.269	< 0.30	0.60	1.05	2.17	4.10
Orthophosphate P	mg/L	18	0.03	0.036	< 0.02	0.01	0.02	0.04	0.15
Iron	µg/L	18	15.88	34.972	< 10.00	2.50	6.41	16.45	150.00
Manganese	µg/L	4	50.00	31.623	10.00	17.50	55.00	77.50	80.00
Zinc	µg/L	18	72.78	164.019	< 10.00	11.74	27.97	60.00	720.00
Fecal streptococci	col. per 100 mL	15	106.03	233.827	< 1.00	0.12	1.89	82.75	800.00
				Well 11					
Specific conductance	µS/cm	17	3,713.53	1,053.826	1,700.00	3,375.00	3,800.00	4,400.00	6,000.00
pH		17	6.9	0.169	6.50	6.80	6.90	6.95	7.30
Temperature	deg. C	17	11.68	1.837	7.00	10.50	12.00	13.00	14.00
Hardness (as $CaCO_3$)	mg/L	18	2,080.11	625.703	719.00	1,974.00	2,099.00	2,224.00	3,599.00
Dissolved solids (residue)	mg/L	18	3,322.78	966.740	1,320.00	3,120.00	3,205.00	3,552.50	5,630.00
Calcium	mg/L	18	700.56	225.688	240.00	672.50	695.00	737.50	1,300.00
Magnesium	mg/L	18	81.39	20.870	31.00	77.00	83.50	89.50	120.00
Sodium	mg/L	18	174.44	31.290	100.00	157.50	190.00	200.00	200.00
Potassium	mg/L	18	7.14	3.855	3.00	4.45	6.28	8.86	16.00
Bicarbonate	mg/L	18	553.33	200.705	160.00	360.00	655.00	702.50	770.00
Sulfate	mg/L	18	1,065.56	259.620	470.00	932.50	1,150.00	1,225.00	1,400.00
Chloride	mg/L	18	263.89	140.300	100.00	187.50	225.00	300.00	730.00
Nitrite N	mg/L	18	0.20	0.515	< 0.01	0.01	0.04	0.10	2.20
Nitrite + nitrate N	mg/L	18	108.36	134.440	18.80	28.60	48.70	135.25	480.00
Ammonia N	mg/L	16	0.16	0.338	< 0.10	0.02	0.06	0.17	1.30
Ammonia + organic N	mg/L	18	2.01	3.353	0.10	0.50	1.20	1.92	15.00
Orthophosphate P	mg/L	18	0.22	0.088	0.10	0.16	0.21	0.30	0.40
Iron	µg/L	18	18.12	50.778	< 10.00	1.68	4.92	14.38	200.00
Manganese	µg/L	4	145.00	33.166	100.00	110.00	155.00	170.00	170.00
Zinc	µg/L	17	246.47	667.448	< 10.00	--	--	--	2,800.00
Fecal streptococci	cols. per 100 mL	15	103.77	205.818	< 1.00	1.48	10.00	100.00	630.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 12					
Specific conductance	µS/cm	14	1,672.86	389.268	1,100.00	1,400.00	1,530.00	1,987.50	2,400.00
pH		14	7.27	0.144	7.10	7.20	7.30	7.30	7.70
Temperature	deg. C	14	10.93	1.412	8.00	9.88	11.00	12.00	13.00
Hardness (as $CaCO_3$)	mg/L	15	811.00	188.118	519.00	679.00	759.00	999.00	1,099.00
Dissolved solids (residue)	mg/L	15	1,263.73	244.343	876.00	1,110.00	1,210.00	1,560.00	1,670.00
Calcium	mg/L	15	278.00	66.890	180.00	230.00	260.00	350.00	390.00
Magnesium	mg/L	15	29.40	6.706	19.00	25.00	28.00	36.00	43.00
Sodium	mg/L	15	66.67	7.247	58.00	61.00	64.00	72.00	84.00
Potassium	mg/L	15	5.85	1.229	4.00	4.80	5.60	7.10	8.00
Bicarbonate	mg/L	15	282.00	35.295	210.00	250.00	290.00	310.00	330.00
Sulfate	mg/L	15	418.00	126.784	240.00	310.00	400.00	500.00	670.00
Chloride	mg/L	15	103.20	22.153	63.00	82.00	100.00	120.00	140.00
Nitrite N	mg/L	15	0.20	0.475	< 0.01	0.01	0.04	0.10	1.82
Nitrite + nitrate N	mg/L	15	26.64	15.436	0.67	17.50	27.00	35.50	58.00
Ammonia + organic N	mg/L	15	1.53	1.071	0.20	1.10	1.40	1.60	5.00
Orthophosphate P	mg/L	15	0.07	0.155	< 0.02	0.01	0.02	0.04	0.60
Manganese	µg/L	4	292.50	84.607	220.00	--	--	--	380.00
Zinc	µg/L	15	37.73	57.447	< 10.00	6.29	15.82	39.78	180.00
Fecal streptococci	cols. per 100 mL	13	29.51	87.527	< 1.00	0.31	1.85	12.50	320.00
				Well 13					
Specific conductance	µS/cm	17	2,108.82	443.817	1,600.00	1,695.00	2,100.00	2,475.00	3,100.00
pH		17	7.51	0.326	7.10	7.30	7.40	7.60	8.50
Temperature	deg. C	17	12.00	1.510	10.00	11.00	11.50	13.00	16.00
Hardness (as $CaCO_3$)	mg/L	18	1,011.78	197.865	709.00	834.00	1,039.00	1,199.00	1,299.00
Dissolved solids (residue)	mg/L	18	1,591.94	350.047	795.00	1,287.50	1,605.00	1,892.50	2,080.00
Calcium	mg/L	18	340.00	66.244	240.00	285.00	345.00	392.50	440.00
Magnesium	mg/L	18	38.50	7.056	28.00	30.75	41.50	44.25	47.00
Sodium	mg/L	18	109.83	22.485	77.00	87.50	115.00	130.00	150.00
Potassium	mg/L	18	4.88	1.290	3.10	3.70	4.50	6.00	7.00
Bicarbonate	mg/L	18	301.11	30.076	250.00	280.00	290.00	330.00	370.00
Sulfate	mg/L	18	646.67	134.558	460.00	510.00	650.00	745.00	900.00
Chloride	mg/L	18	157.50	29.618	95.00	137.50	160.00	180.00	200.00
Nitrite + nitrate N	mg/L	18	14.12	7.081	1.70	9.22	14.45	21.25	25.00
Ammonia N	mg/L	18	0.05	0.058	< 0.05	0.02	0.04	0.07	0.20
Ammonia + organic N	mg/L	18	0.59	0.842	0.20	0.21	0.40	0.60	3.80
Orthophosphate P	mg/L	18	0.03	0.045	< 0.02	0.01	0.02	0.05	0.19
Iron	µg/L	18	56.77	43.310	< 10.00	20.83	39.28	100.00	140.00
Zinc	µg/L	18	45.85	65.236	< 10.00	9.06	21.22	55.00	220.00
Fecal coliform	cols. per 100 mL	13	2.23	2.787	< 1.00	0.10	0.41	3.50	10.00
Fecal streptococci	cols. per 100 mL	14	484.93	756.875	< 1.00	8.00	89.50	772.50	2,700.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 14					
Specific conductance	µS/cm	16	1,885.00	446.617	1,190.00	1,492.50	1,970.00	2,077.50	2,800.00
pH		16	7.28	0.111	7.10	7.20	7.30	7.30	7.60
Temperature	deg. C	16	10.44	1.611	7.00	9.50	10.00	11.88	13.00
Hardness (as $CaCO_3$)	mg/L	17	849.88	237.580	214.00	724.00	899.00	979.00	1,199.00
Dissolved solids (residue)	mg/L	17	1,455.53	311.078	880.00	1,245.00	1,510.00	1,655.00	2,160.00
Calcium	mg/L	17	302.35	59.847	180.00	270.00	310.00	335.00	420.00
Magnesium	mg/L	17	33.34	6.454	21.00	28.00	34.00	38.00	44.00
Sodium	mg/L	17	74.41	17.450	45.00	55.00	75.00	89.00	97.00
Potassium	mg/L	17	4.70	1.222	3.10	3.90	4.10	5.55	7.40
Bicarbonate	mg/L	17	286.88	40.945	180.00	265.00	300.00	310.00	340.00
Sulfate	mg/L	17	512.94	129.265	230.00	445.00	540.00	605.00	680.00
Chloride	mg/L	17	109.59	35.981	10.00	105.00	120.00	130.00	150.00
Nitrite N	mg/L	17	0.03	0.035	< 0.01	0.00	0.02	0.02	0.14
Nitrite + nitrate N	mg/L	17	21.84	9.389	11.00	14.20	20.80	25.25	48.00
Ammonia + organic N	mg/L	17	1.34	0.934	< 0.30	0.45	1.30	1.70	4.00
Orthophosphate P	mg/L	17	0.08	0.048	< 0.02	0.05	0.07	0.11	0.19
Fecal streptococci	cols. per 100 mL	13	117.04	280.811	< 1.00	0.32	4.00	10.50	860.00
				Well 15					
Specific conductance	µS/cm	14	1,451.79	688.520	900.00	993.75	1,105.00	1,767.50	3,000.00
pH		14	11.3	1.153	7.40	11.47	11.65	11.80	11.90
Temperature	deg. C	14	12.36	0.864	11.00	11.50	12.25	13.00	14.00
Hardness (as $CaCO_3$)	mg/L	9	238.56	177.775	140.00	--	--	--	680.00
Dissolved solids (residue)	mg/L	15	452.53	99.953	356.00	--	--	--	719.00
Calcium	mg/L	15	93.80	55.736	57.00	--	--	--	270.00
Sodium	mg/L	15	72.07	3.674	65.00	70.00	72.00	76.00	79.00
Potassium	mg/L	15	5.87	1.910	3.70	4.40	5.30	7.00	11.00
Carbonate	mg/L	15	43.82	23.278	< 1.00	28.00	36.00	60.00	100.00
Hydroxide	mg/L	15	206.15	149.299	< 1.00	110.00	160.00	230.00	620.00
Sulfate	mg/L	15	76.20	35.655	9.00	42.00	88.00	100.00	120.00
Chloride	mg/L	15	36.33	6.422	28.00	33.00	38.00	39.00	49.00
Nitrite N	mg/L	15	0.04	0.079	< 0.01	0.00	0.01	0.03	0.31
Nitrite + nitrate N	mg/L	15	0.14	0.155	< 0.01	0.05	0.09	0.17	0.59
Ammonia N	mg/L	15	1.16	0.497	< 0.10	0.90	1.00	1.20	2.70
Ammonia + organic N	mg/L	15	1.62	0.838	< 0.10	1.10	1.40	2.00	3.90
Iron	µg/L	15	17.26	11.823	< 10.00	3.50	7.72	17.01	50.00
Zinc	µg/L	15	103.09	331.721	< 10.00	2.22	9.60	40.00	1,300.00
Fecal streptococci	cols. per 100 mL	11	2.05	5.348	< 1.00	0.07	0.30	2.00	18.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 16-16a					
Specific conductance	µS/cm	16	2,918.75	813.739	1,850.00	--	--	--	4,800.00
pH		16	7.20	0.096	7.00	--	--	--	7.30
Temperature	deg. C	16	10.94	1.401	8.00	--	--	--	13.00
Hardness (as $CaCO_3$)	mg/L	17	1,421.57	468.902	840.00	--	--	--	2,200.00
Dissolved solids (residue)	mg/L	17	2,474.11	771.800	1,610.00	--	--	--	3,910.00
Calcium	mg/L	17	472.94	147.638	280.00	--	--	--	730.00
Magnesium	mg/L	17	56.24	19.123	37.00	--	--	--	100.00
Sodium	mg/L	17	162.35	44.656	110.00	--	--	--	250.00
Potassium	mg/L	17	9.52	4.195	6.00	--	--	--	20.00
Bicarbonate	mg/L	17	222.94	47.928	180.00	--	--	--	390.00
Sulfate	mg/L	17	970.47	216.304	660.00	--	--	--	1,400.00
Chloride	mg/L	17	206.47	76.480	110.00	--	--	--	410.00
Nitrite N	mg/L	17	0.21	0.468	<0.010	--	--	--	1.90
Nitrite + nitrate N	mg/L	17	66.57	84.757	9.80	--	--	--	280.00
Ammonia N	mg/L	17	0.18	0.229	<0.100	--	--	--	1.00
Ammonia + organic N	mg/L	17	2.20	2.318	0.50	--	--	--	8.50
Orthophosphate P	mg/L	17	0.03	0.025	<0.020	--	--	--	0.10
Iron	µg/L	17	25.29	30.024	<10	--	--	--	30.00
Manganese	µg/L	4	37.50	17.078	<20.00	--	--	--	60.00
Zinc	µg/L	17	73.53	106.592	<10.00	--	--	--	450.00
Fecal streptococci	cols. per 100 mL	13	25.84	56.528	<1	--	--	--	180.00
				Well 17					
Specific conductance	µS/cm	18	1,236.67	217.337	900.00	1,095.00	1,195.00	1,450.00	1,600.00
pH		18	7.5	0.152	7.40	7.40	7.50	7.52	7.90
Temperature	deg. C	18	10.58	1.776	7.00	9.37	10.25	12.00	14.00
Hardness (as $CaCO_3$)	mg/L	19	519.00	35.901	450.00	499.00	519.00	539.00	600.00
Dissolved solids (residue)	mg/L	19	880.74	43.707	820.00	856.00	872.00	902.00	977.00
Calcium	mg/L	19	172.63	12.842	150.00	160.00	170.00	180.00	200.00
Magnesium	mg/L	19	20.47	2.118	17.00	18.00	21.00	22.00	24.00
Sodium	mg/L	19	75.37	7.159	55.00	72.00	75.00	80.00	92.00
Potassium	mg/L	19	6.14	1.167	4.80	5.00	6.00	7.10	8.00
Bicarbonate	mg/L	18	218.33	10.981	200.00	210.00	220.00	222.50	240.00
Sulfate	mg/L	19	427.89	25.729	380.00	400.00	430.00	450.00	460.00
Chloride	mg/L	19	26.32	11.837	11.00	20.00	23.00	29.00	67.00
Nitrite + nitrate N	mg/L	19	0.85	1.317	0.03	0.14	0.24	0.86	4.60
Ammonia N	mg/L	19	0.09	0.045	0.08	0.05	0.07	0.10	0.20
Ammonia + organic N	mg/L	19	0.51	0.627	0.20	0.21	0.30	0.60	2.80
Orthophosphate P	mg/L	19	0.01	0.026	<0.02	0.00	0.00	0.01	0.10
Iron	µg/L	18	44.06	91.022	<10.00	-1.69	7.24	31.05	360.00
Manganese	µg/L	4	251.37	268.875	<20.00	26.09	230.00	510.00	540.00
Zinc	µg/L	19	39.98	39.864	<10.00	13.32	26.00	50.00	140.00
Fecal streptococci	cols. per 100 mL	15	100.24	308.438	<1.00	0.06	0.91	12.00	1,200.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 18					
Specific conductance	µS/cm	18	1,563.33	481.151	580.00	1,242.50	1,705.00	1,962.50	2,200.00
pH		18	7.3	0.203	7.00	7.20	7.30	7.30	8.00
Temperature	deg. C	18	10.83	1.680	7.50	9.37	11.00	12.50	13.00
Hardness (as $CaCO_3$)	mg/L	19	780.05	235.653	280.00	589.00	839.00	979.00	1,100.00
Dissolved solids (residue)	mg/L	19	1,106.63	369.836	380.00	736.00	1,170.00	1,360.00	1,690.00
Calcium	mg/L	19	254.42	76.654	94.00	190.00	270.00	320.00	340.00
Magnesium	mg/L	19	35.05	11.399	10.00	26.00	38.00	42.00	51.00
Sodium	mg/L	19	31.68	10.837	15.00	19.00	36.00	40.00	46.00
Potassium	mg/L	19	4.47	0.987	3.30	3.60	4.00	5.00	6.50
Bicarbonate	mg/L	19	404.21	82.078	270.00	330.00	430.00	480.00	510.00
Sulfate	mg/L	19	226.37	102.540	56.00	130.00	240.00	300.00	390.00
Chloride	mg/L	19	71.47	35.072	4.00	53.00	74.00	96.00	120.00
Nitrite N	mg/L	19	0.07	0.145	<0.01	0.00	0.02	0.13	0.63
Nitrite + nitrate N	mg/L	19	32.59	16.896	0.64	22.00	30.90	44.00	60.00
Ammonia N	mg/L	19	0.14	0.101	<0.01	0.02	0.06	0.20	0.40
Ammonia + organic N	mg/L	19	1.25	0.884	0.20	0.40	1.20	1.80	3.40
Orthophosphate P	mg/L	19	0.04	0.049	<0.02	0.01	0.02	0.04	0.19
Manganese	ug/L	4	632.50	358.643	280.00	320.00	575.00	1,002.50	1,100.00
Zinc	ug/L	19	54.29	79.253	<10.00	20.00	30.00	40.00	290.00
Fecal streptococci	cols. per 100 mL	15	166.90	405.652	<1.00	0.12	1.81	50.00	1,500.00
				Well 19					
Specific conductance	µS/cm	18	1,280.00	177.200	910.00	1,165.00	1,245.00	1,372.50	1,650.00
pH		18	7.6	0.148	7.40	7.50	7.60	7.60	8.00
Temperature	deg. C	18	10.69	1.699	7.00	9.87	10.25	11.62	14.00
Hardness (as $CaCO_3$)	mg/L	19	547.42	38.480	509.00	519.00	539.00	559.00	659.00
Dissolved solids (residue)	mg/L	17	925.82	42.747	843.00	892.00	929.00	967.50	994.00
Calcium	mg/L	19	183.68	13.000	170.00	170.00	180.00	190.00	220.00
Magnesium	mg/L	19	22.05	2.677	18.00	20.00	21.00	24.00	29.00
Sodium	mg/L	19	74.74	7.709	58.00	68.00	76.00	80.00	88.00
Potassium	mg/L	19	4.55	1.213	3.00	3.30	4.60	6.00	6.20
Bicarbonate	mg/L	19	211.05	13.289	180.00	200.00	210.00	220.00	240.00
Sulfate	mg/L	19	450.53	28.766	390.00	430.00	450.00	480.00	490.00
Chloride	mg/L	19	23.53	5.891	16.00	20.00	22.00	26.00	42.00
Nitrite N	mg/L	19	0.08	0.110	<0.01	0.00	0.01	0.19	0.37
Nitrite + nitrate N	mg/L	19	2.88	6.328	0.10	0.35	0.82	3.00	28.00
Ammonia N	mg/L	19	0.10	0.075	<0.10	0.05	0.08	0.16	0.30
Ammonia + organic N	mg/L	19	0.68	0.723	<0.30	0.27	0.50	0.90	3.20
Orthophosphate P	mg/L	19	0.02	0.025	<0.02	0.00	0.01	0.02	0.10
Iron	µg/L	19	27.62	52.704	<10.00	1.62	5.99	22.13	170.00
Manganese	µg/L	4	101.45	84.025	<20.00	28.47	95.00	185.00	200.00
Zinc	µg/L	19	36.41	54.865	<10.00	6.89	20.00	40.00	230.00
Fecal streptococci	cols. per 100 mL	15	45.86	115.738	<1.00	0.33	2.31	18.00	430.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 20					
Specific conductance	µS/cm	10	795.50	38.662	700.00	--	--	--	830.00
pH		9	7.7	0.113	7.5	--	--	--	7.8
Temperature	deg. C	10	11.3	1.208	10.0	--	--	--	13.5
Hardness (as $CaCO_3$)	mg/L	10	290.00	22.608	260.00	--	--	--	320.00
Dissolved solids (residue)	mg/L	10	541.00	30.649	476.00	--	--	--	592.00
Calcium	mg/L	10	103.80	8.364	93.00	--	--	--	120.00
Magnesium	mg/L	10	7.11	1.456	5.00	--	--	--	10.00
Sodium	mg/L	10	69.70	6.701	60.00	--	--	--	79.00
Potassium	mg/L	10	5.24	1.004	4.30	--	--	--	7.60
Bicarbonate	mg/L	10	239.00	7.379	230.00	--	--	--	250.00
Sulfate	mg/L	10	190.00	13.333	180.00	--	--	--	220.00
Chloride	mg/L	10	9.10	1.370	7.00	--	--	--	11.00
Nitrite N	mg/L	10	0.02	0.028	<0.01	--	--	--	0.08
Nitrite + nitrate N	mg/L	10	0.13	0.073	0.02	--	--	--	0.23
Ammonia N	mg/L	10	0.21	0.087	<0.10	--	--	--	0.30
Ammonia + organic N	mg/L	10	0.38	0.182	<0.30	--	--	--	0.60
Orthophosphate P	mg/L	10	0.03	0.010	<0.02	--	--	--	0.04
Iron	µg/L	10	15.36	26.841	<10.00	--	--	--	80.00
Zinc	µg/L	10	5.00	12.693	<10.00	--	--	--	40.00
Fecal streptococci	cols. per 100 mL	10	183.00	567.883	<1	--	--	--	1,800.00
				Well 21					
Specific conductance	µS/cm	13	3,043.08	589.101	2,200.00	2,600.00	2,850.00	3,400.00	4,200.00
pH		13	7.2	0.086	7.10	7.10	7.20	7.20	7.40
Temperature	deg. C	13	10.08	1.205	8.50	8.75	10.50	11.00	11.50
Hardness (as $CaCO_3$)	mg/L	13	1,522.08	286.222	1,199.00	1,299.00	1,499.00	1,749.00	1,999.00
Dissolved solids (residue)	mg/L	13	2,620.00	383.449	2,060.00	2,285.00	2,710.00	2,915.00	3,390.00
Calcium	mg/L	13	494.62	98.117	380.00	415.00	490.00	565.00	690.00
Magnesium	mg/L	13	71.85	10.399	59.00	62.00	73.00	78.00	92.00
Sodium	mg/L	13	166.92	16.525	130.00	160.00	170.00	175.00	200.00
Potassium	mg/L	13	7.18	9.395	3.00	3.50	4.00	6.60	38.00
Bicarbonate	mg/L	13	291.54	25.445	260.00	270.00	290.00	310.00	340.00
Sulfate	mg/L	13	1,076.15	158.300	880.00	920.00	1,000.00	1,200.00	1,300.00
Chloride	mg/L	13	141.54	25.115	110.00	120.00	130.00	160.00	190.00
Nitrite N	mg/L	13	0.04	0.037	<0.01	0.02	0.02	0.05	0.14
Nitrite + nitrate N	mg/L	13	71.42	16.351	40.00	59.00	70.00	81.50	96.20
Ammonia + organic N	mg/L	13	2.11	0.934	0.70	1.60	1.80	2.60	4.50
Orthophosphate P	mg/L	13	0.03	0.021	<0.02	0.01	0.02	0.05	0.06
Manganese	µg/L	3	73.33	37.859	30.00	30.00	90.00	100.00	100.00
Zinc	µg/L	13	35.19	89.804	<10.00	1.33	5.45	22.24	330.00
Fecal streptococci	cols. per 100 mL	13	57.89	119.809	<1.00	0.37	2.00	52.50	380.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 22					
Specific conductance	µS/cm	15	1,854.67	457.257	1,450.00	1,520.00	1,610.00	2,290.00	2,800.00
pH		15	7.28	0.068	7.20	7.20	7.30	7.30	7.40
Temperature	deg. C	15	11.43	1.387	7.00	11.00	12.00	12.00	13.00
Hardness (as $CaCO_3$)	mg/L	15	863.20	147.048	690.00	759.00	789.00	969.00	1,100.00
Dissolved solids (residue)	mg/L	15	1,398.67	248.218	1,160.00	1,190.00	1,260.00	1,610.00	1,850.00
Calcium	mg/L	15	289.20	54.231	220.00	250.00	268.00	320.00	390.00
Magnesium	mg/L	15	35.53	6.266	30.00	30.00	33.00	41.00	48.00
Sodium	mg/L	15	80.93	6.029	68.00	77.00	82.00	84.00	92.00
Potassium	mg/L	15	3.66	1.089	2.50	2.80	3.80	4.10	6.30
Bicarbonate	mg/L	15	277.80	17.640	250.00	--	--	--	300.00
Sulfate	mg/L	15	606.67	109.392	520.00	--	--	--	800.00
Chloride	mg/L	15	77.20	12.565	62.00	--	--	--	97.00
Nitrite + nitrate N	mg/L	15	17.95	16.370	6.70	--	--	--	67.50
Ammonia N	mg/L	15	0.11	0.112	<0.01	0.00	0.01	0.06	0.40
Ammonia + organic N	mg/L	15	0.40	0.350	<0.30	0.16	0.29	0.50	1.00
Orthophosphate P	mg/L	15	0.03	0.034	<0.02	0.00	0.01	0.05	0.08
Iron	µg/L	15	11.88	24.109	<10.00	--	--	--	110.00
Manganese	µg/L	3	36.67	28.868	<20	4.52	10.56	45.00	70.00
Zinc	µg/L	15	21.60	20.661	<10.00	8.41	15.38	28.12	80.00
Fecal streptococci	cols. per 100 mL	13	37.78	78.882	<1.00	0.27	2.00	26.00	250.00
				Well 23					
Specific conductance	µS/cm	15	453.67	152.227	275.00	--	--	--	925.00
pH		15	8.7	0.543	7.4	--	--	--	9.2
Temperature	deg. C	15	11.5	0.693	10.5	--	--	--	13.0
Hardness (as $CaCO_3$)	mg/L	10	40.40	29.36	20.00	--	--	--	110.00
Dissolved solids (residue)	mg/L	15	259.93	76.562	196.00	--	--	--	475.00
Calcium	mg/L	15	14.13		8.00	--	--	--	40.00
Magnesium	mg/L	15	1.41	1.120	<1.00	--	--	--	3.00
Sodium	mg/L	15	75.40	8.559	67.00	--	--	--	100.00
Potassium	mg/L	15	2.94	1.205	1.70	--	--	--	5.40
Bicarbonate	mg/L	15	118.07	42.814	49.00	--	--	--	170.00
Sulfate	mg/L	15	47.76	74.998	<0.20	--	--	--	250.00
Chloride	mg/L	15	22.40	4.748	17.00	--	--	--	36.00
Nitrite + nitrate N	mg/L	15	0.15	0.148	0.04	--	--	--	0.61
Ammonia N	mg/L	15	0.02	0.021	<0.10	--	--	--	0.09
Ammonia + organic N	mg/L	15	0.56	0.462	0.10	--	--	--	1.80
Orthophosphate P	mg/L	15	0.03	0.021	<0.02	--	--	--	0.10
Fecal streptococci	cols. per 100 mL	13	71.07	125.211	1.00	--	--	--	430.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 24					
Specific conductance	µS/cm	14	1,947.86	465.406	1,000.00	1,700.00	2,010.00	2,300.00	2,800.00
pH		14	7.4	0.099	7.20	7.30	7.30	7.40	7.50
Temperature	deg. C	14	10.77	2.195	7.50	8.50	10.00	13.00	13.50
Hardness (as $CaCO_3$)	mg/L	14	991.43	258.691	480.00	859.00	1,099.00	1,099.00	1,300.00
Dissolved solids (residue)	mg/L	14	1,605.57	412.039	768.00	1,265.00	1,735.00	1,985.00	2,030.00
Calcium	mg/L	14	330.00	87.881	160.00	280.00	360.00	380.00	440.00
Magnesium	mg/L	14	41.07	10.171	19.00	37.00	44.00	46.00	56.00
Sodium	mg/L	14	82.71	12.591	58.00	73.00	90.00	92.00	100.00
Potassium	mg/L	14	5.06	0.826	4.00	4.40	4.70	5.70	6.60
Bicarbonate	mg/L	14	271.43	30.598	210.00	250.00	270.00	292.50	320.00
Sulfate	mg/L	14	701.43	196.815	290.00	600.00	760.00	830.00	950.00
Chloride	mg/L	14	112.57	34.736	39.00	90.00	130.00	140.00	150.00
Nitrite N	mg/L	14	0.11	0.268	<0.01	0.00	0.01	0.09	1.02
Nitrite + nitrate N	mg/L	14	10.13	3.848	6.40	8.90	9.50	10.20	23.00
Ammonia + organic N	mg/L	14	0.74	0.902	<0.30	0.28	0.50	0.80	3.70
Orthophosphate P	mg/L	14	0.02	0.013	<0.02	0.01	0.01	0.02	0.05
Zinc	µg/L	14	20.58	28.006	<10.00	4.86	11.07	25.20	100.00
Fecal streptococci	cols. per 100 mL	13	23.98	62.623	<1.00	0.62	4.00	14.50	230.00
				Well 25					
Specific conductance	µS/cm	15	1,088.00	91.355	970.00	--	--	--	1,300.00
pH		15	7.3	0.082	7.2	--	--	--	7.4
Temperature	deg. C	15	10.4	2.977	6.5	--	--	--	15.0
Hardness (as $CaCO_3$)	mg/L	15	448.00	56.087	330.00	--	--	--	570.00
Dissolved solids (residue)	mg/L	15	767.93	53.061	714.00	--	--	--	916.00
Calcium	mg/L	15	144.00	19.198	100.00	--	--	--	180.00
Magnesium	mg/L	15	21.40	2.472	17.00	--	--	--	27.00
Sodium	mg/L	15	71.93	7.096	57.00	--	--	--	84.00
Potassium	mg/L	15	4.97	1.240	3.80	--	--	--	7.60
Bicarbonate	mg/L	15	284.67	13.020	260.00	--	--	--	310.00
Sulfate	mg/L	15	268.67	33.566	220.00	--	--	--	340.00
Chloride	mg/L	15	36.13	7.643	25.00	--	--	--	60.00
Nitrite N	mg/L	15	0.01	0.003	<0.01	--	--	--	0.01
Nitrite + nitrate N	mg/L	15	0.48	0.039	<0.01	--	--	--	0.15
Ammonia N	mg/L	15	0.14	0.112	<0.10	--	--	--	0.40
Ammonia + organic N	mg/L	15	0.47	0.346	<0.30	--	--	--	1.30
Orthophosphate P	mg/L	15	0.95	0.143	<0.02	--	--	--	0.60
Iron	µg/L	14	415.71	267.516	<10.00	--	--	--	850.00
Zinc	µg/L	15	15.33	15.055	<10.00	--	--	--	60.00
Fecal streptococci	cols. per 100 mL	13	6.07	9.332	<1	--	--	--	27.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 26					
Specific conductance	µS/cm	15	1,443.33	445.977	1,100.00	1,180.00	1,300.00	1,500.00	2,900.00
pH		15	7.5	0.074	7.30	7.40	7.50	7.50	7.50
Temperature	deg. C	15	9.63	3.975	3.00	6.00	9.00	13.50	15.00
Hardness (as $CaCO_3$)	mg/L	15	567.00	188.649	419.00	469.00	509.00	579.00	1,199.00
Dissolved solids (residue)	mg/L	15	1,026.33	271.841	801.00	831.00	1,010.00	1,060.00	1,900.00
Calcium	mg/L	15	179.33	62.845	130.00	140.00	160.00	180.00	390.00
Magnesium	mg/L	15	28.87	6.022	22.00	25.00	28.00	31.00	46.00
Sodium	mg/L	15	104.00	11.408	79.00	100.00	110.00	110.00	120.00
Potassium	mg/L	15	6.11	1.391	4.00	5.00	5.90	6.40	8.80
Bicarbonate	mg/L	15	298.67	12.459	280.00	290.00	300.00	310.00	320.00
Sulfate	mg/L	15	396.67	166.247	280.00	290.00	350.00	440.00	940.00
Chloride	mg/L	15	61.47	21.613	43.00	47.00	58.00	68.00	130.00
Nitrite N	mg/L	15	0.01	0.009	< 0.01	0.00	0.01	0.01	0.03
Nitrite + nitrate N	mg/L	15	0.08	0.088	0.01	0.03	0.06	0.08	0.34
Ammonia N	mg/L	15	0.09	0.131	< 0.10	0.03	0.06	0.10	0.50
Ammonia + organic N	mg/L	15	0.79	1.083	< 0.30	0.21	0.40	0.70	3.50
Orthophosphate P	mg/L	15	0.03	0.018	< 0.02	0.01	0.02	0.05	0.06
Iron	µg/L	14	22.32	41.750	< 10.00	1.53	5.44	19.36	130.00
Manganese	µg/L	3	1,133.33	57.735	1,100.00	1,100.00	1,100.00	1,200.00	1,200.00
Zinc	µg/L	15	23.79	35.384	< 10.00	4.28	10.80	27.25	120.00
Fecal streptococci	cols. per 100 mL	13	21.87	48.757	< 1.00	0.15	1.11	7.50	150.00
				Well 27					
Specific conductance	µS/cm	15	1,327.67	267.254	975.00	1,120.00	1,220.00	1,500.00	1,810.00
pH		15	7.3	0.112	7.10	7.30	7.30	7.40	7.60
Temperature	deg. C	15	11.60	3.225	6.00	9.00	11.00	14.50	17.00
Hardness (as $CaCO_3$)	mg/L	15	523.00	99.628	329.00	459.00	499.00	629.00	669.00
Dissolved solids (residue)	mg/L	15	952.07	162.641	672.00	816.00	931.00	1,120.00	1,180.00
Calcium	mg/L	15	166.00	33.123	100.00	150.00	160.00	200.00	220.00
Magnesium	mg/L	15	26.53	4.224	19.00	24.00	25.00	31.00	33.00
Sodium	mg/L	15	105.00	19.813	74.00	89.00	100.00	120.00	150.00
Potassium	mg/L	15	5.09	1.032	4.00	4.00	5.00	6.00	7.60
Bicarbonate	mg/L	15	290.00	37.796	230.00	260.00	290.00	320.00	350.00
Sulfate	mg/L	15	372.67	86.559	210.00	310.00	340.00	480.00	500.00
Chloride	mg/L	15	54.67	11.082	39.00	45.00	52.00	66.00	74.00
Nitrite + nitrate N	mg/L	15	0.07	0.044	0.02	0.04	0.06	0.09	0.16
Ammonia N	mg/L	15	0.10	0.138	< 0.10	0.01	0.02	0.08	0.50
Ammonia + organic N	mg/L	15	0.59	1.241	0.20	0.07	0.19	0.60	5.00
Orthophosphate P	mg/L	15	0.05	0.035	< 0.02	0.02	0.04	0.09	0.10
Iron	µg/L	15	26.90	59.098	< 10.00	0.20	1.43	10.22	210.00
Manganese	µg/L	3	470.00	286.182	140.00	140.00	620.00	650.00	650.00
Zinc	µg/L	15	16.06	24.206	< 10.00	6.31	11.25	20.00	100.00
Fecal streptococci	cols. per 100 mL	12	101.62	315.968	< 1.00	0.09	0.90	3.75	1,100.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Well 28					
Specific conductance	µS/cm	15	1,110.67	199.525	850.00	975.00	1,080.00	1,160.00	1,550.00
pH		15	7.3	0.083	7.10	7.30	7.40	7.40	7.40
Temperature	deg. C	15	12.00	1.570	10.00	11.00	11.00	13.50	15.00
Hardness (as $CaCO_3$)	mg/L	15	446.33	83.535	319.00	379.00	459.00	479.00	589.00
Dissolved solids (residue)	mg/L	15	777.73	131.325	578.00	662.00	791.00	839.00	1,080.00
Calcium	mg/L	15	143.33	28.950	100.00	120.00	150.00	160.00	190.00
Magnesium	mg/L	15	21.87	3.944	15.00	19.00	23.00	24.00	28.00
Sodium	mg/L	15	77.33	13.425	50.00	66.00	78.00	88.00	96.00
Potassium	mg/L	15	5.63	1.197	4.10	4.80	5.20	6.30	8.10
Bicarbonate	mg/L	15	263.33	34.983	210.00	230.00	270.00	280.00	330.00
Sulfate	mg/L	15	289.33	66.812	190.00	240.00	300.00	320.00	440.00
Chloride	mg/L	15	41.40	9.264	25.00	36.00	43.00	45.00	62.00
Nitrite + nitrate N	mg/L	15	0.50	0.428	0.06	0.21	0.36	0.79	1.60
Ammonia + organic N	mg/L	15	0.46	0.620	<0.30	0.17	0.30	0.60	2.50
Orthophosphate P	mg/L	15	0.05	0.027	<0.02	0.01	0.03	0.07	0.10
Manganese	µg/L	3	186.67	155.349	60.00	60.00	140.00	360.00	360.00
Zinc	µg/L	15	10.00	0.000	<10.00	10.00	10.00	10.00	10.00
Fecal streptococci cols.	per 100 mL	13	73.17	186.540	<1.00	0.06	0.73	9.00	630.00
				Senac Creek at south border of disposal area, site (SW-1)					
Specific conductance	µS/cm	4	636.25	231.854	320.00	402.50	675.00	831.25	875.00
pH		4	8.2	0.238	7.90	7.92	8.15	8.37	8.40
Temperature	deg. C	4	12.25	10.046	1.00	2.50	12.50	21.75	23.00
Hardness (as $CaCO_3$)	mg/L	5	275.00	103.344	109.00	189.00	289.00	354.00	389.00
Dissolved solids (residue)	mg/L	5	471.20	115.643	296.00	378.00	478.00	561.00	618.00
Calcium	mg/L	5	93.00	35.185	36.00	63.00	99.00	120.00	130.00
Magnesium	mg/L	5	10.02	3.702	4.10	7.05	10.00	13.00	14.00
Sodium	mg/L	5	31.40	10.359	14.00	22.50	35.00	38.50	41.00
Potassium	mg/L	5	5.84	1.683	4.00	4.45	5.10	7.60	8.00
Bicarbonate	mg/L	5	164.80	49.651	84.00	122.00	170.00	205.00	210.00
Sulfate	mg/L	5	146.00	61.887	60.00	95.00	140.00	200.00	230.00
Chloride	mg/L	5	15.20	6.760	4.00	9.00	18.00	20.00	21.00
Nitrite N	mg/L	5	0.03	0.012	<0.01	0.02	0.03	0.04	0.04
Nitrite + nitrate N	mg/L	5	0.14	0.127	0.06	0.06	0.07	0.25	0.36
Orthophosphate P	mg/L	5	0.06	0.058	<0.02	0.01	0.04	0.11	0.15
Iron	µg/L	5	35.46	33.445	<10.00	7.45	30.00	65.00	90.00
Zinc	µg/L	5	19.35	19.064	<10.00	6.56	10.00	40.00	40.00
				Senac Creek at Quincy Avenue, site (SW-2)					
Specific conductance	µS/cm	3	3,056.67	2,375.801	1,680.00	1,680.00	1,690.00	5,800.00	5,800.00
Temperature	deg. C	3	9.83	10.202	1.00	1.00	7.50	21.00	21.00
Hardness (as $CaCO_3$)	mg/L	4	1,489.00	1,340.099	799.00	804.00	829.00	2,834.00	3,499.00
Dissolved solids (residue)	mg/L	4	2,555.00	2,324.715	1,260.00	1,260.00	1,465.00	4,940.00	6,030.00
Calcium	mg/L	4	437.50	375.622	220.00	230.00	265.00	817.50	1,000.00
Magnesium	mg/L	4	91.25	87.199	36.00	36.75	54.50	182.50	220.00
Sodium	mg/L	4	90.25	42.914	50.00	55.50	80.50	134.75	150.00
Potassium	mg/L	4	23.50	10.116	12.00	14.00	23.00	33.50	36.00
Bicarbonate	mg/L	4	230.00	87.559	110.00	137.50	255.00	297.50	300.00
Sulfate	mg/L	4	495.00	158.008	390.00	397.50	430.00	657.50	730.00
Chloride	mg/L	4	243.50	266.475	64.00	80.50	135.00	515.00	640.00
Nitrite N	mg/L	4	1.40	1.517	0.16	0.23	0.97	3.00	3.50
Nitrite + nitrate N	mg/L	4	173.87	259.037	22.50	23.62	56.50	441.50	560.00
Ammonia N	mg/L	4	5.40	5.643	0.10	0.35	5.05	10.80	11.40
Ammonia + organic N	mg/L	4	13.52	9.283	1.10	3.82	15.50	21.25	22.00
Orthophosphate P	mg/L	4	3.46	4.569	0.10	0.44	1.77	8.17	10.20
Iron	µg/L	4	50.45	51.709	<10.00	9.55	50.00	97.50	100.00

Table 7.--*Summary statistics of water-quality analyses*--Continued

Property or constituent	Units	Number of samples	Mean	Standard deviation	Minimum	Lower quartile	Median	Upper quartile	Maximum
				Senac Creek at mouth, site (SW-4)					
Hardness (as $CaCO_3$)	mg/L	3	889.00	377.227	469.00	469.00	999.00	1,199.00	1,199.00
Dissolved solids (residue)	mg/L	3	1,616.67	543.722	1,010.00	1,010.00	1,780.00	2,060.00	2,060.00
Calcium	mg/L	3	273.33	106.927	150.00	150.00	330.00	340.00	340.00
Magnesium	mg/L	3	51.33	26.102	24.00	24.00	54.00	76.00	76.00
Sodium	mg/L	3	114.33	74.742	33.00	33.00	130.00	180.00	180.00
Potassium	mg/L	3	9.60	6.605	4.30	4.30	7.50	17.00	17.00
Bicarbonate	mg/L	3	172.33	83.164	77.00	77.00	210.00	230.00	230.00
Sulfate	mg/L	3	676.67	399.541	230.00	230.00	800.00	1,000.00	1,000.00
Chloride	mg/L	3	120.67	69.002	52.00	52.00	120.00	190.00	190.00
Nitrite N	mg/L	3	0.96	1.424	0.10	0.10	0.17	2.60	2.60
Nitrite + nitrate N	mg/L	3	16.27	20.765	3.05	3.05	5.55	40.20	40.20
Ammonia + organic N	mg/L	3	6.13	9.413	0.50	0.50	0.90	17.00	17.00
Iron	µg/L	3	56.67	37.859	30.00	30.00	40.00	100.00	100.00
				Coal Creek at Quincy Avenue, site (SW-7)					
Specific conductance	µS/cm	3	646.67	25.166	620.00	620.00	650.00	670.00	670.00
pH		3	8.3	0.208	8.10	8.10	8.20	8.50	8.50
Hardness (as $CaCO_3$)	mg/L	4	239.00	76.158	129.00	159.00	264.00	294.00	299.00
Dissolved solids (residue)	mg/L	4	410.50	95.242	273.00	309.75	445.50	476.25	478.00
Calcium	mg/L	4	76.25	22.366	44.00	52.75	83.50	92.50	94.00
Magnesium	mg/L	4	11.75	4.787	5.00	6.75	13.00	15.50	16.00
Sodium	mg/L	4	37.75	7.136	28.00	30.50	39.00	43.75	45.00
Potassium	mg/L	4	6.50	2.056	4.00	4.55	6.50	8.45	9.00
Bicarbonate	mg/L	4	195.25	71.393	91.00	120.75	220.00	245.00	250.00
Sulfate	mg/L	4	82.75	12.312	68.00	70.50	83.50	94.25	96.00
Chloride	mg/L	4	23.50	7.937	12.00	15.25	26.00	29.25	30.00
Nitrite N	mg/L	4	0.03	0.023	<0.01	0.01	0.03	0.05	0.06
Nitrite + nitrate N	mg/L	4	0.87	1.288	0.18	0.18	0.25	2.18	2.80
Ammonia N	mg/L	4	0.13	0.117	<0.10	0.05	0.10	0.25	0.30
Ammonia + organic N	mg/L	4	0.84	0.149	<0.30	0.41	0.85	0.97	1.00
Orthophosphate P	mg/L	4	0.13	0.035	0.09	0.10	0.13	0.16	0.17
Iron	µg/L	4	104.32	99.704	<10.00	15.49	105.00	195.00	200.00
				Coal Creek at Jewell Avenue, site (SW-8)					
Specific conductance	µS/cm	3	1,160.00	307.896	900.00	900.00	1,080.00	1,500.00	1,500.00
Temperature	deg. C	3	9.67	10.263	1.00	1.00	7.00	21.00	21.00
Hardness (as $CaCO_3$)	mg/L	4	481.50	196.702	319.00	331.50	424.00	689.00	759.00
Dissolved solids (residue)	mg/L	4	843.75	289.052	633.00	640.75	741.00	1,149.50	1,260.00
Calcium	mg/L	4	152.50	68.496	100.00	102.50	130.00	225.00	250.00
Magnesium	mg/L	4	24.50	9.037	14.00	15.75	24.50	33.25	35.00
Sodium	mg/L	4	78.25	30.270	41.00	47.75	81.00	106.00	110.00
Potassium	mg/L	4	8.42	3.410	4.90	5.47	7.90	11.90	13.00
Bicarbonate	mg/L	4	210.00	71.181	110.00	135.00	230.00	265.00	270.00
Sulfate	mg/L	4	332.50	183.916	190.00	202.50	270.00	525.00	600.00
Chloride	mg/L	4	45.50	14.107	29.00	32.25	45.00	59.25	63.00
Nitrite + nitrate N	mg/L	4	3.13	5.910	0.17	0.17	0.18	9.05	12.00
Ammonia + organic N	mg/L	4	2.32	2.488	0.40	0.42	1.60	4.95	5.70
Orthophosphate P	mg/L	4	0.18	0.258	<0.02	0.02	0.07	0.44	0.56
Iron	µg/L	4	22.27	12.897	<10.00	12.02	20.00	35.00	40.00

Table 8.--*Chemical analyses of soils and streambed sediment at selected sites in the Lowry sewage-sludge-disposal area*

[Site ID, site identification number used to retrieve data from a computer data base; NH_4 + org., ammonia plus organic nitrogen; NH_4, ammonia; NO_2+NO_3, nitrite plus nitrate; mg/kg, milligrams per kilogram; µg/g, micrograms per gram; <, less than]

Sampling site number (fig. 10)	Site ID	Date of sample	Nitrogen, NH_4 + org. total (mg/kg as N)	Nitrogen, NO_2+NO_3 (mg/kg as N)	Nitrogen, NH_4 total (mg/kg as N)	Phosphorus, total (mg/kg as P)	Arsenic, total (µg/g as As)	Cadmium, recoverable (µg/g as Cd)
			SOILS					
1	393733104400902	11-20-86	640	17	17	1,600	3	2
2	393744104400601	11-20-86	6,200	770	79	11,000	5	10
3	393801104394701	11-20-86	5,900	1,500	200	7,700	4	8
4	393845104394301	11-20-86	3,000	140	24	5,700	4	4
5	393858104402001	11-20-86	1,600	46	17	4,000	3	2
6	393859104380601	11-20-86	2,900	240	32	2,500	4	3
7	393902104394401	11-20-86	5,800	450	40	9,000	5	7
			STREAMBED SEDIMENT					
8	393730104374201	11-20-86	30	3.0	5.7	180	<1	<1
9	393815104401601	11-20-86	130	13	7.5	230	<1	<1
10	393911104403401	11-20-86	350	10	10	620	1	<1
11	393911104393502	11-20-86	1,300	22	24	1,400	4	2

Sampling site number (fig. 10)	Site ID	Date of sample	Chromium (µg/g as Cr)	Cobalt (µg/g as Co)	Copper (µg/g as Cu)	Lead (µg/g as Pb)	Manganese (µg/g as Mn)	Mercury (µg/g as Hg)	Zinc (µg/g as Zn)
			SOILS						
1	393733104400902	11-20-86	10	10	30	30	1,100	0.13	70
2	393744104400601	11-20-86	120	10	230	140	450	2.6	440
3	393801104394701	11-20-86	300	10	210	120	580	3.8	8,000
4	393845104394301	11-20-86	80	10	120	90	490	0.83	270
5	393858104402001	11-20-86	30	10	50	50	710	0.38	110
6	393859104380601	11-20-86	30	10	80	60	420	0.91	160
7	393902104394401	11-20-86	240	10	210	130	400	2.4	380
			STREAMBED SEDIMENT						
8	393730104374201	11-20-86	2	<10	4	<10	220	0.01	10
9	393815104401601	11-20-86	2	<10	4	<10	160	0.03	10
10	393911104403401	11-20-86	7	<10	10	30	170	0.13	40
11	393911104393502	11-20-86	20	10	30	40	390	0.28	70

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