GROUND-WATER QUALITY IN DOUGLAS COUNTY, WESTERN NEVADA

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 87-4269

Prepared in cooperation with the

DOUGLAS COUNTY DEPARTMENT OF PUBLIC WORKS

U.S. DEPARTMENT OF THE INTERIOR
March 3, 1849

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By Kerry T. Garcia

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1989

DEPARTMENT OF THE INTERIOR

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U.S. GEOLOGICAL SURVEY

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CONVERSION FACTORS AND ABBREVIATIONS

"Inch-pound" units of measure used in this report may be converted to metric (International System) units by using the following factors:

Multiply	By	To obtain
Feet (ft)	0.3048	Meters (m)
Miles (mi)	1.609	Kilometers (km)
Square miles (mi^2)	2.590	Square kilometers (km^2)

For temperature, degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) by using the formula °F = [(1.8)(°C)] + 32.

For temperature, degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) by using the formula °C = 0.5556 (°F - 32).

ALTITUDE DATUM

In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929), which is derived from a general adjustment of the first-order leveling networks of both the United States and Canada.

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ABSTRACT

A 182-percent increase in population within the last 10 years in Douglas County, Nevada, has raised concerns by county officials as to the possible effects land development may have on ground-water quality. Ground water is the principal source of drinking water in Douglas County. This study was developed in cooperation with the county to define ground-water quality conditions, examine any areal or temporal trends in the ground-water quality, and examine the need for continued ground-water monitoring program. Water-quality data were compiled and selected wells were sampled to define ground-water quality conditions.

Most ground water in Douglas County meets the State of Nevada drinking-water standards. Of the 333 sampling sites used in this analysis, water from 6 of them equaled or were greater than the standards for sulfate, 44 for fluoride, 4 for dissolved solids, 5 for nitrate as nitrate, 12 for arsenic, 33 for iron, and 18 for manganese. Ground water in the west-central, northern, and northeastern part of Carson Valley is influenced by geothermal water. Septic-tank effluent may contaminate the ground water in some areas of the county.

The predominant cations in Douglas County's ground water are calcium and sodium and the predominant anion is bicarbonate. Statistical distributions for sodium, arsenic, iron, manganese, and zinc showed one single population whereas distributions for dissolved solids, calcium, magnesium, bicarbonate, sulfate, chloride, fluoride, and nitrate as nitrate showed two discrete populations.

Analyses of water from selected wells in the county were examined for areal or temporal trends in dissolved-solids and nitrate concentrations. Dissolved-solids and nitrate concentrations for Gardnerville, Gardnerville Ranchos, and Minden municipal wells showed no overall trend for analyses spanning the years 1969-83. Dissolved-solids concentrations for the Topaz Lodge Subdivision well shows no consistent trend from 1961 to 1984. Nitrate concentrations in this well have shown a general increase from about 2 milligrams per liter (as nitrate) in 1961 to about 12 milligrams per liter in 1984.

On the basis of ground-water data in Douglas County, a continuing ground-water-quality monitoring program would include sample sites from heavily pumped municipal wells or wells in potentially high-risk pollution areas, and wells that may provide information about temporal changes in water quality.

INTRODUCTION

Ground water is the principal source of drinking water for Douglas County, Nev. (figure 1), except for the Lake Tahoe basin, where the lake is the principal source. Ground water also is used for irrigation in Carson and Antelope Valleys. In recent years, the quantity of ground water pumped for irrigation has decreased, whereas the quantity pumped for domestic supply has increased. This change in water use is due to the conversion of agricultural lands to residential developments. Rapid population growth has concerned county officials about the present and future effects of development on ground-water quality. In response to this concern, Douglas County and the U.S. Geological Survey entered into a cooperative agreement, and a general ground-water quality study began in October 1982.

Purpose and Scope

The purposes of the study and this report were to (1) define ground-water quality conditions, (2) examine any areal or temporal trends in the ground-water quality, and (3) examine components for a continuing ground-water monitoring program in Douglas County. The scope of the study reported herein involved compiling data on wells and springs from local and State agency files and beginning a supplemental sampling program of 35 wells in August and September 1983 to extend areal coverage of ground-water quality data in Douglas County.

Physical Setting

Douglas County comprises about 751 mi^2 of western Nevada (figure 1). The county is bounded on the west by Lake Tahoe and the Carson Range of the Sierra Nevada and on the east by part of the Pine Nut Mountains. North-south trending mountain ranges divide the county into three major valleys: the Lake Tahoe basin along the western border (about 56 mi^2), Carson Valley in the west-central part (about 422 mi^2), and the Nevada part of Antelope Valley in the southeastern apex of the county (about 115 mi^2). The two principal rivers in the county are the Carson River in Carson Valley and the West Walker River in Antelope Valley.

Altitudes of the higher peaks in the Carson Range and Pine Nut Mountains range from about 8,500 to 10,000 feet above sea level. Carson and Antelope Valley altitudes range from about 4,500 to 5,500 feet. Because the Sierra Nevada forms the western boundary of Douglas County, the study area lies mainly in a zone of diminished precipitation (a "rain shadow") with respect to eastward-moving storms (Glancy and Katzer, 1976, page 17).

Most winter precipitation in the mountains is snow, but winter rains on the snowpack may contribute significantly to the precipitation total. Summer thunderstorms may produce heavy, localized amounts of precipitation but do little to supplement ground water, owing to fairly rapid evapotranspiration rates.

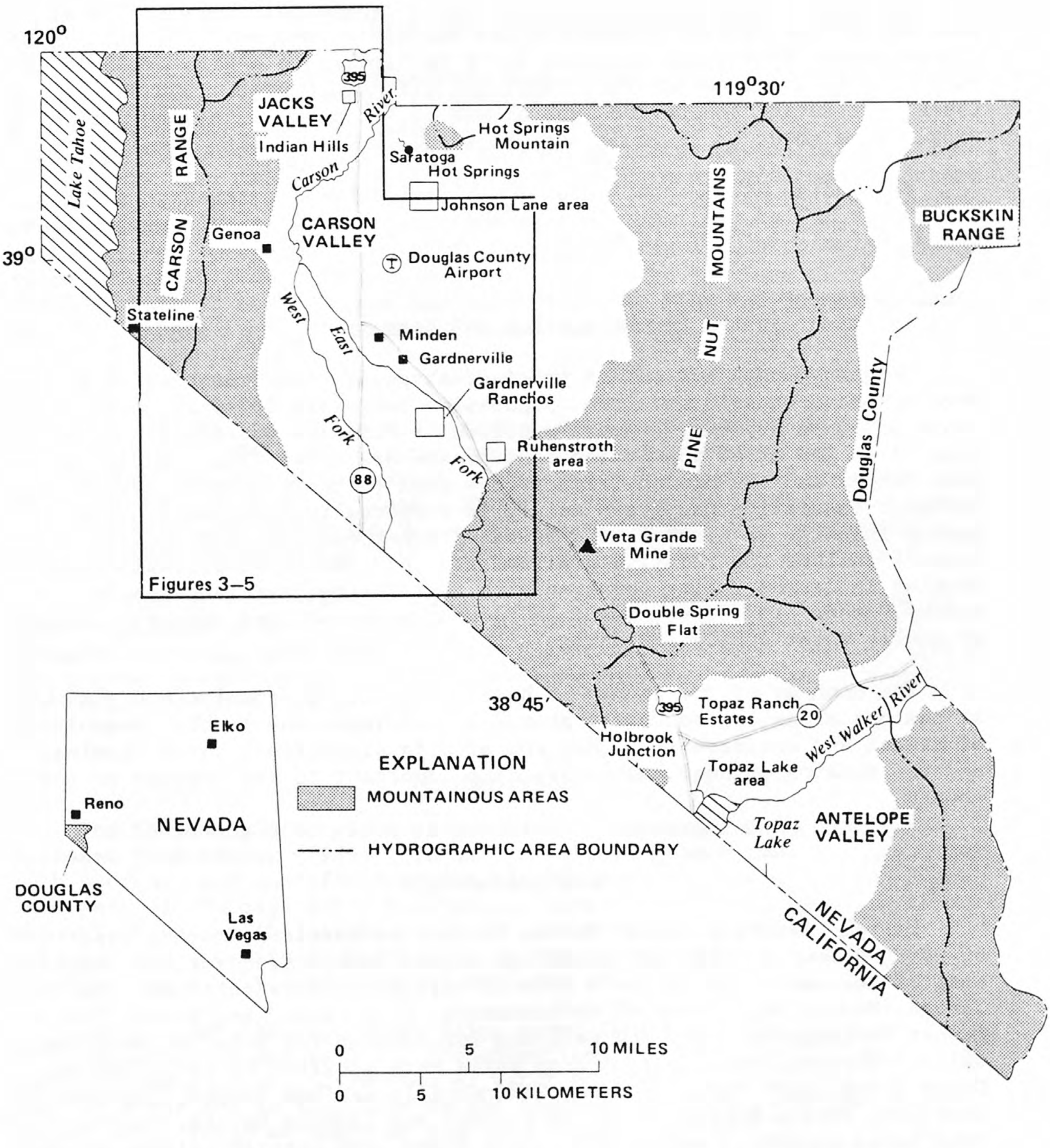


FIGURE 1.--Geographic features of Douglas County and areal extent of figures 3–5.

The mean annual temperature for 1940-81 (National Climatic Center, 1941-82) at the Douglas County Airport was 49 °F, and mean monthly temperatures ranged from a low of about 31 °F in January to a high of 69 °F in July. Mean annual temperature (National Climatic Center, 1959-82) at Topaz Lake during the period 1958-81 was 50 °F; mean monthly temperatures ranged from about 33 °F in January to about 70 °F in July.

The Indian Hills area, which local residents also refer to as Jacks Valley, is called the Indian Hills-Jacks Valley area in this report to avoid confusion with Jacks Valley proper.

Population and Economy

Douglas County has one of the fastest population growth rates in Nevada. Between 1970 and 1980, population increased 182 percent, from about 6,900 to 19,400 (Governor's Office of Planning Coordination, 1984, page 37). The major population centers are Stateline (about 3,000) at Lake Tahoe, and the Minden-Gardnerville area (about 9,200) in Carson Valley. Population has grown mainly in response to increases in the gaming industry in northwestern Nevada. Other contributing growth factors include the relative availability and lower cost of residential housing in Carson Valley compared with that in the Lake Tahoe basin. In nearby Carson City, development in recent years has been severely limited by public water supply and sewage-disposal capacity.

The economy of the county is based primarily on tourism and gaming at casinos along the southeast shore of Lake Tahoe and in the communities of Minden and Gardnerville. Hay and alfalfa production, dairy farming, and the raising of beef cattle are also important to the economy of the county.

Acknowledgments

Darrel Rasner, Consumer Health Protection Services, Nevada Department of Human Resources (NCHPS), permitted access to his agency files where most of the water-quality data used in this study were obtained. Marvin Tebeau, Nevada Department of Environmental Protection, and Robert Downer, Downer Engineering, provided well-log information for selected municipal wells. Physical locations of some wells were provided by Gault Schenk, Genoa Postmaster; Maureen Crane, Gardnerville Ranchos General Improvement District; Shiela Robison, Town of Minden; and Jeannie Cordes, Gardnerville Town Water Company. Cathie Kite, Jack Moore, and Deborah Hildman of the Douglas County Assessor's Office provided the use of county computers to help locate well owners. Dave LaBarbara of the Minden-Gardnerville Sanitation District permitted water sampling of two monitoring wells. Numerous residents permitted access to and water sampling of their wells. The help of these individuals and agencies, and others who provided assistance is greatly appreciated.

HYDROGEOLOGY

Generalized Geology

The Carson Range on the western side of Douglas County comprises mostly granitic igneous rocks (figure 2), including quartz monzonite and granodiorite (Moore, 1969, plate 1). The Pine Nut Mountains on the east-tern side of the county comprise partly consolidated basin-fill deposits of Tertiary age, including well-bedded, fine-grained, tuffaceous mudstone, siltstone, and shale (Moore, page 12); volcanic rocks, including andesite, rhyolite, and basalt; metavolcanic rocks; metasedimentary rocks, including shale, slate, tuffaceous siltstone, sandstone, and graywacke; and granitic rocks (Moore, plate 1). Erosional remnants of the Tertiary Hartford Hill Rhyolite Tuff of former usage are exposed in the Pine Nut Mountains and Buckskin Range, in the northeast part of the county (Moore, page 18).

Antelope and Carson Valleys are underlain by sedimentary basin-fill deposits of Quaternary age, derived from the surrounding mountainous areas. According to Donald H. Schaefer (U.S. Geological Survey, oral communication, 1986) qualitative inspection of the gravity map of Plouff (1984) shows the depth to bedrock in the Topaz Lake area of Antelope Valley to be less than 500 feet. Maurer (1985, plate 2) found that depth to bedrock in most of Carson Valley is greater than 1,000 feet, with a maximum depth greater than 5,000 feet on the west side of the valley.

A study of the topographic positions of the hot springs in Douglas County by Moore (1969, page 16) has shown that the hot springs are situated at topographic lows on the trace of a main fault line and that the logical point for water traveling along this fault plane to reach the surface would be at the lowest point.

Ground Water

The following discussion of ground-water movement in Carson Valley is taken from Maurer (1986). In Carson Valley, ground water occurs under both confined and unconfined conditions (Walters and others, 1970, page 16; Spane, 1977, page 139); however, no single confining layer exists over the entire valley (Dillingham, 1980). Ground-water movement in both confined and unconfined aquifers is in the direction of the hydraulic gradient, generally from areas of recharge to areas of discharge.

Water-level contours drawn using water-level measurements made during 1982 are shown in figure 3 for the unconfined aquifer and in figure 4 for the confined aquifer. Direction of water movement is perpendicular to the contour lines and is indicated in the figures by arrows. In the Jacks Valley area, water movement is southeast toward Carson Valley. In the eastern part of Carson Valley, ground-water movement is generally toward the center of the valley (toward the Carson River), then north.

Depth to water in wells completed in the unconfined aquifer ranges from about 5 feet on the valley floor to about 100 feet near the margins of the valley (figure 5). Wells completed in confined aquifers generally flow, and confined heads ranged from 5 to 20 feet above land surface.

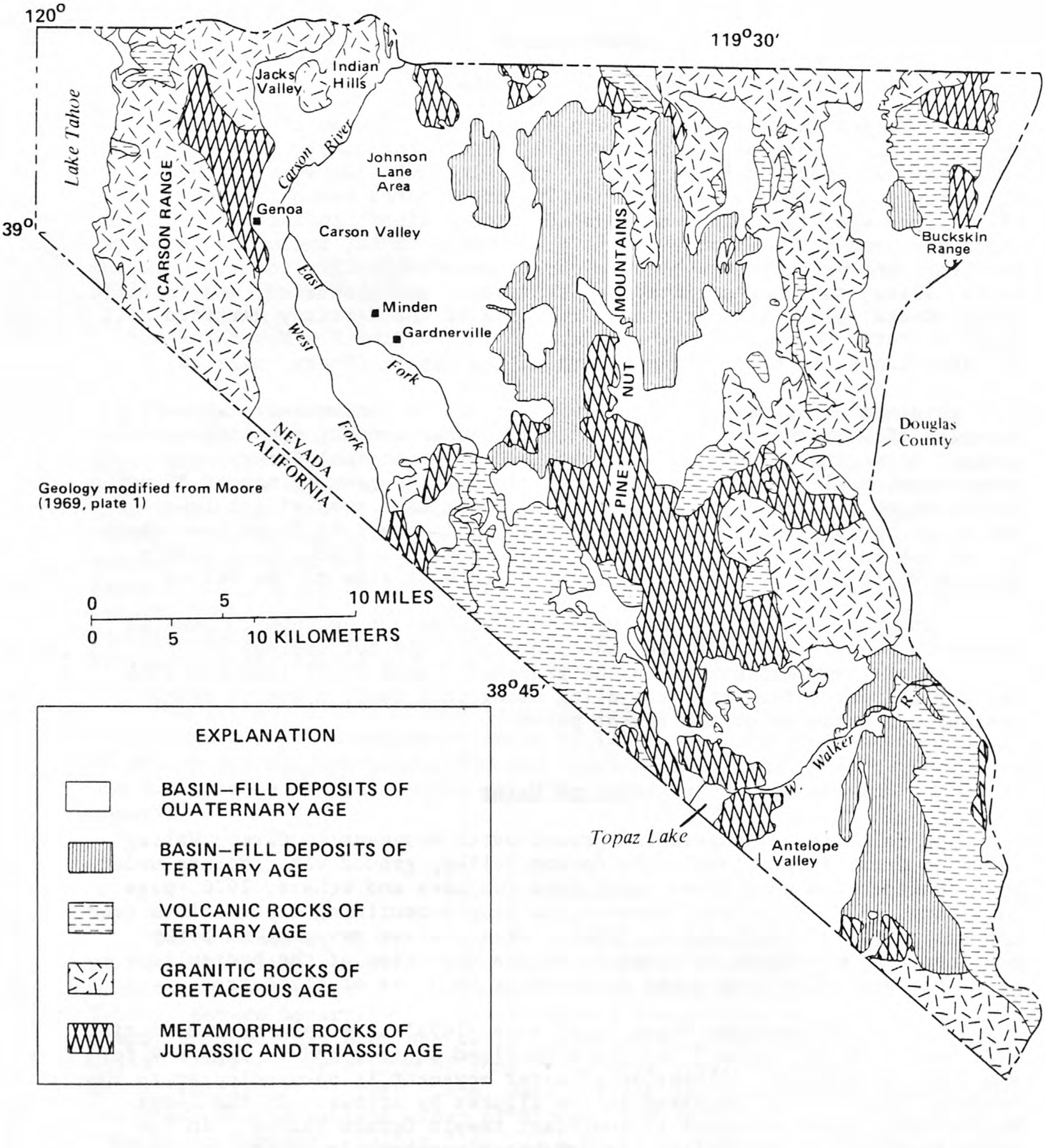


FIGURE 2.--Generalized geology.

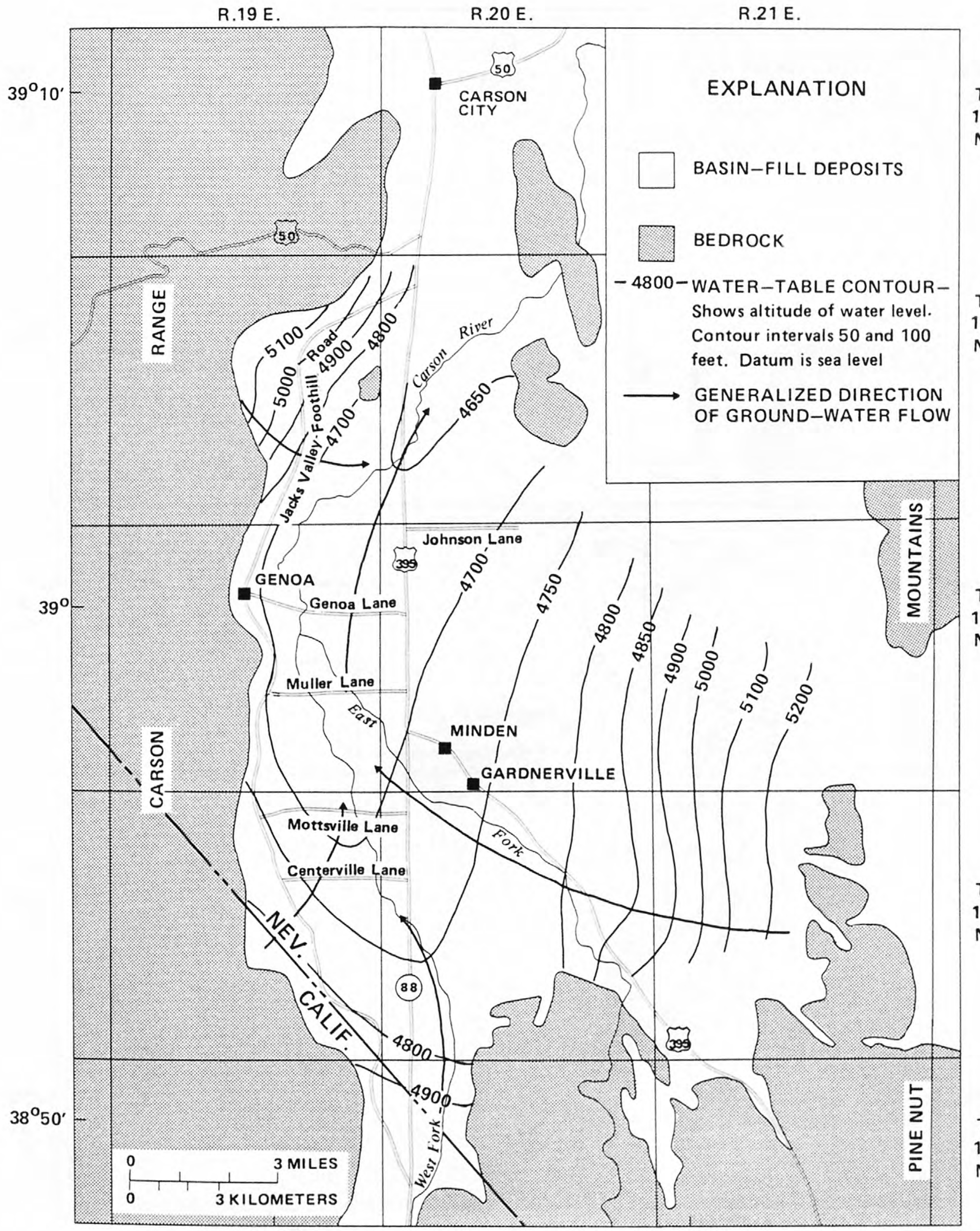


FIGURE 3.--Altitude of unconfined ground–water level in Carson Valley, May 1982 (from Maurer, 1986, fig. 3).

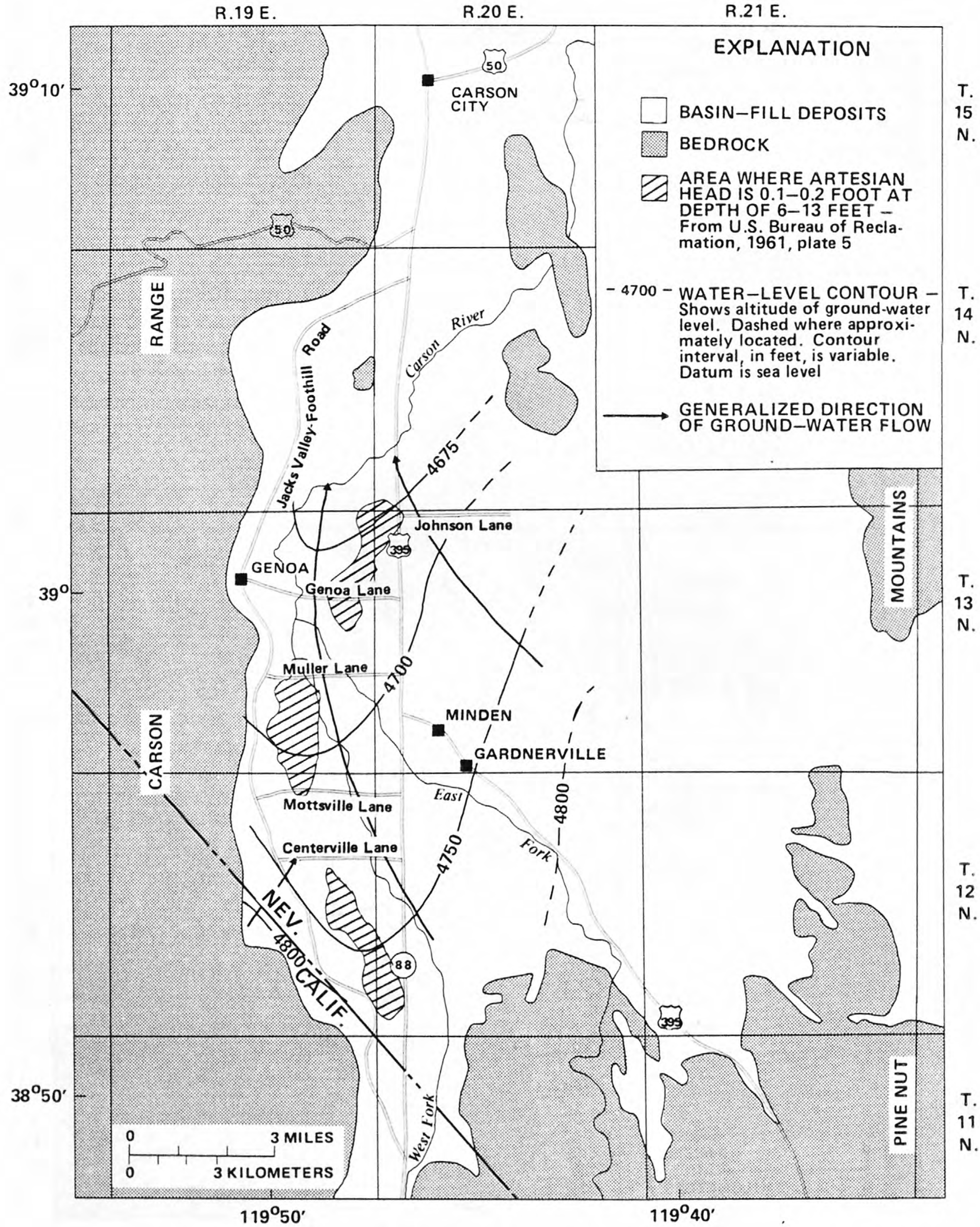


FIGURE 4.--Altitude of confined ground-water level in Carson Valley, May 1982 (from Maurer, 1986, fig. 3).

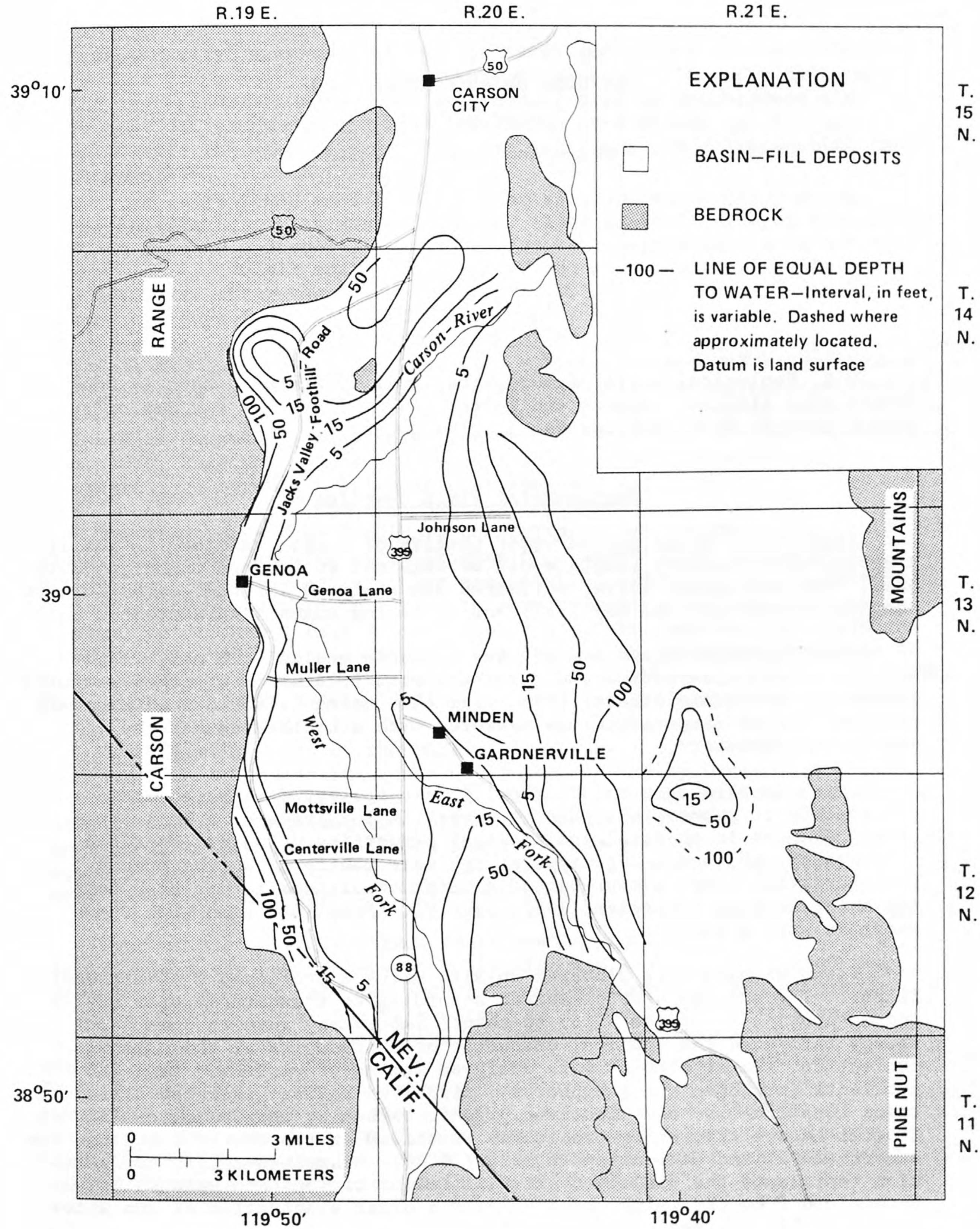


FIGURE 5.--Approximate depth to ground water in Carson Valley, 1982 (from Maurer, 1986, fig. 4).

METHODS OF DATA COLLECTION

Historical Data

State and Local Agencies

About 1,380 water analyses were compiled from NCHPS files or published reports (1959-84 data). About 800 analyses were eliminated from the data compilation because specific well location was not provided or the given location could not be verified in the field.

U.S. Geological Survey Data

U.S. Geological Survey ground-water quality historic data in Douglas County were limited. Glancy and Katzer (1976) list only six Geological Survey ground-water analyses for Douglas County.

Supplemental Field Sampling

Areas that lacked ground-water quality data were examined to see if a ground-water quality sample could be obtained to broaden the areal data base. The Geological Survey collected and analyzed 2 ground-water quality samples in February and May 1983, and 33 during August and September 1983.

Specific conductance and pH were measured onsite with calibrated meters. Field bicarbonate and carbonate were determined by fixed-endpoint titration (Brown and others, 1974, page 43), using 0.1600 N sulfuric acid titrant. Water temperature was measured with a calibrated hand-held mercury thermometer.

Water samples from existing wells were collected using either a peristaltic or submersible pump; however, in one instance a bailer was used. Changes in physical and chemical properties of water (specific conductance, pH, and water temperature) were monitored during pumping to insure that samples represented aquifer conditions rather than local non-homogeneities (Claassen, 1982, page 7). Sampling began when these readings were stable.

Water samples were filtered on-site using a prerinsed 0.45-micrometer filter. The samples were preserved according to standard methods (Feltz and Anthony, 1984, pages 3-16) to obtain laboratory results that accurately reflected the chemical character of the samples at the time of collection. Water samples were analyzed for major dissolved ions and nutrients (nitrogen and phosphorus), dissolved solids, selected dissolved trace constituents, and dissolved organic carbon by the Geological Survey Central Laboratory, using procedures described in reports by Skougstad and others (1979) and Wershaw and others (1983). Dissolved-solids concentration represents the dissolved material (major cations and anions) in water determined from the weight of dry residue after evaporation of the water sample at 180 °C (Hem, 1985, page 156).

Ground-water samples analyzed for dissolved-solids concentrations by the Nevada State Health Laboratory were dried at 105 °C. The different drying temperatures, used by the two laboratories do not produce significantly different results for most of the more dilute natural waters compared with the other factors that may influence the determination (Hem, 1985, page 156).

Data-Base Compilation

The data, after the rejection of the 800 analyses, were further reduced by comparing the balance of anions to cations for each analysis. Theoretically, the chemical balance between total milliequivalents per liter of anions and cations should be equal. Milliequivalents of a constituent are milligrams per liter divided by atomic or molecular weight, multiplied by ionic charge. Anion and cation milliequivalents seldom are equal but an analysis is generally acceptable if ions balance within a certain percentage (Hem, 1985, page 163). For this study, a 5 percent criterion was arbitrarily selected and 32 additional analysis were rejected.

The final data base (table 7) consisted of 546 analyses from 333 ground-water sampling sites (figure 6). Seventy-two of the sites (71 wells, 1 spring) had more than one chemical analysis. For purposes of interpretation within this report, mean concentrations of physical and chemical constituents from multisampled sites were computed to obtain one value per site (333 data points). Therefore, some individual analyses in the complete data base in table 7 may be higher or lower than statistics for the summary data base cited in selected tables and figures in this report.

Historically, most of the NCHPS analyses were for samples collected and submitted to the Nevada State Health Laboratory by homeowners seeking information about their domestic well water. In many such instances, the exact point of collection, the collection and preservation methods, and the type of sample container were unknown. The period of time between sample collection and laboratory analysis may have been lengthy, and under less-than-desirable storage conditions.

Many of the major dissolved constituents generally undergo little change during the period between collection and analysis. Calcium and bicarbonate, however, may decrease in concentration with time, because of precipitation of calcium carbonate. As a result, concentrations of calcium and bicarbonate, hence the concentration of dissolved solids, may be lower at the time of analysis than at the time of sampling. Denitrification (biological conversion of nitrate to nitrogen gas under anaerobic conditions) also would result in a lower concentration of nitrate in the sample at the time of analysis, but a reported nitrate concentration exceeding the Nevada public drinking-water standard would still indicate a nitrate problem in the well water.

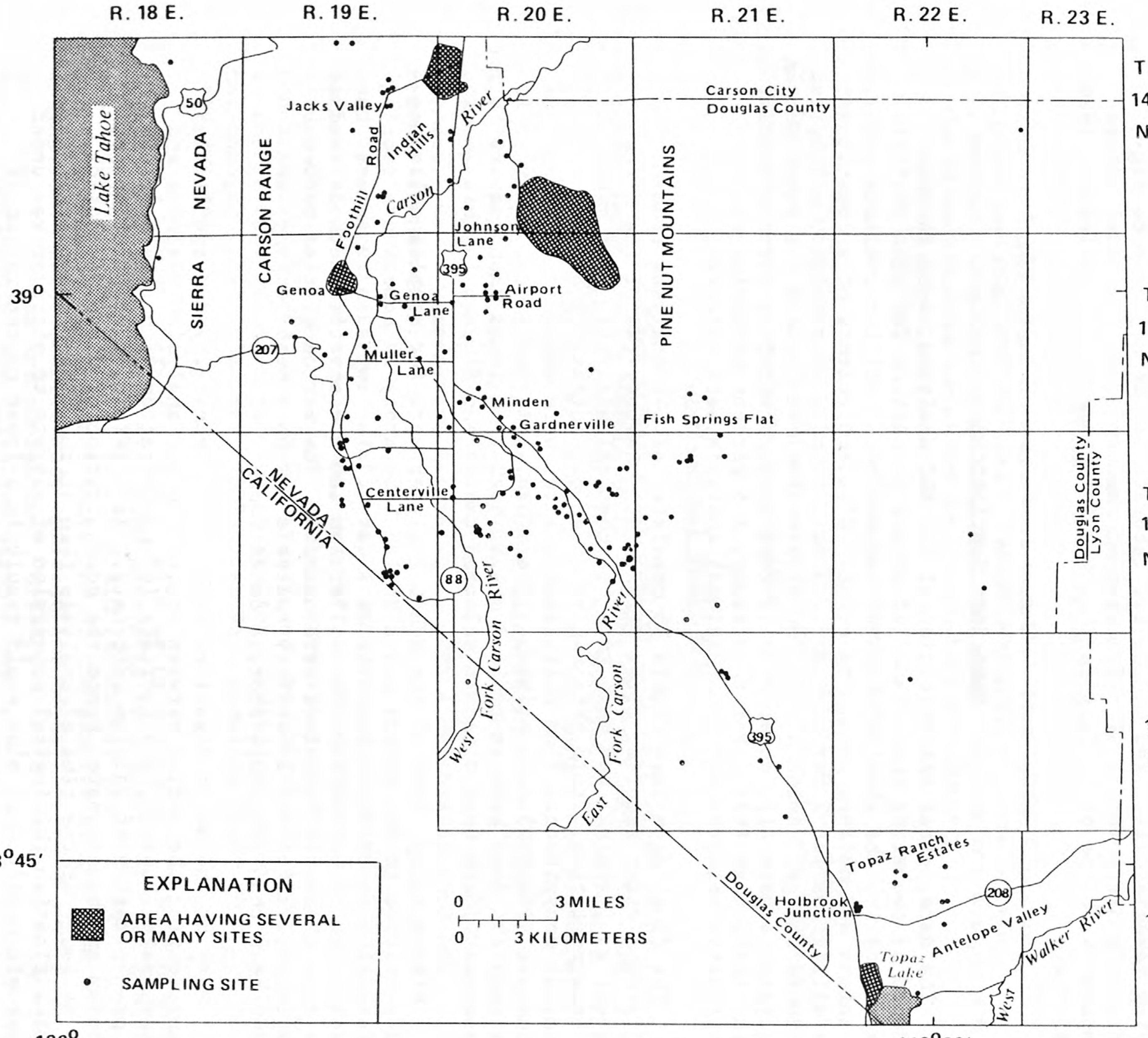


FIGURE 6.--Ground–water sampling sites for which water–quality data are available.

Concentrations of iron and manganese are determined on an aliquot that is acidified after being drawn off the unfiltered sample immediately following vigorous homogenization in the Nevada State Health Laboratory. If particulate matter containing acid-extractable iron or manganese were present in the sample at the time of collection, the measured concentrations could far exceed the amounts of iron and manganese that were in solution at the time of sampling. However, most domestic well water probably contains little, if any, particulate matter after the first few minutes of pumping. Also, if the water sample is not collected from a point between the well head and pressure tank, or if the well is not pumped adequately prior to sampling, the values obtained for iron and manganese (and for some other constituents) may not reflect the natural ground-water concentrations. Both NCHPS and U.S. Geological Survey data are considered adequate for use in evaluating general baseline water-quality conditions. However, because of the possible discrepancies, the data probably should not be used for detailed geochemical analysis.

GROUND-WATER QUALITY

The quality of ground water in Douglas County generally is suitable for most uses. Ground water in Carson Valley differs from west to east, with generally lower dissolved solids on the west side. However, ground-water quality in the valley is suitable for most uses, except in areas near geothermal springs. Ground water associated with the geothermal springs characteristically has higher concentrations of dissolved solids, sodium, and sulfate than does the nonthermal water.

Chemical Character of Ground Water

Trilinear diagrams can be used to show the chemical character of ground water. In a trilinear diagram, selected cations (positively charged ions--calcium, magnesium, and sodium plus potassium) and anions (negatively charged ions--bicarbonate plus carbonate, sulfate, and chloride) for each ground-water analysis are shown as a percentage of the total cations and anions, in milliequivalents per liter. The cations are plotted as single points on the left side triangle and anions on the right. Cation and anion plots for each sample then are projected into the central diamond field. A water type can be described depending on the location of the projected point in the central diamond. The trilinear type of diagram represented by figure 7 can be used to determine whether a particular water (1) is chemically similar to some other water, or (2) is a simple mixture of two chemically different water types (Hem, 1985, pages 177-179).

A water type in which one cation and one anion dominate (each amounts to 50 percent or more of the cations or anions, respectively) is designated by the names of the dominate cation and anion. A water type in which no one cation or anion dominate is designated a mixed-cation or mixed-anion type (Piper and others, 1953, page 26).

The trilinear diagrams for major dissolved constituents indicate that several types of ground water are present in Douglas County. However, no distinct boundaries, or chemical facies, delineating changes in chemical character were evident. Calcium-bicarbonate, sodium-bicarbonate, and calcium-sodium- or sodium-calcium-bicarbonate were the most common types (from about 73 percent of the sites analyzed). Calcium-magnesium-bicarbonate or magnesium-calcium-bicarbonate types (from about 11 percent of the sites sampled) were found throughout the county. Sodium-sulfate type water (from about 8 percent of the sites sampled) was most common near Saratoga Hot Springs in the Johnson Lane area. Waters from the remaining sites (about 8 percent) were of various chemical types.

Dashed lines on the trilinear diagram (figure 7) delineate high densities of data points and illustrate the type of ground water commonly found in the county. The points outside the dashed lines depict water samples that appear to differ in chemical character from the more common type of ground water for the area.

Trilinear diagrams for specific areas in the county provide a more detailed depiction of chemical character of ground water than the trilinear diagram for all sites in the county shown in figure 7. Figure 8A is a graphical representation of ground-water quality in the Topaz Lake, Holbrook Junction, and Topaz Ranch Estates areas near Antelope Valley and figure 8B represents the Double Spring Flat area and the area near Veta Grande Mine (figure 1).

Figures 8C-H show chemical character of ground water in most areas of Carson Valley. The chemical character of ground water on the west side of Carson Valley (generally west of Highway 395, figure 1) is somewhat similar between townships (figures 8C, E, G). However, the southwest part of the valley along Green Acres Drive has ground water with higher percentages of sodium plus potassium and sulfate (figure 8C) than other ground water found along the west side.

The chemical character of ground water on the east side of Carson Valley varies, generally among five water types (figures 8D, F, H). The ground water in the Minden-Gardnerville area and the southeast part of the valley are similar to one another (figures 8D and F).

Ground water near the Douglas County Airport has two water types (figure 8F); those associated with shallow wells (less than 150 feet total well depth) and deep wells (greater than 150 feet total well depth). The wells are drilled in alluvium and the ground water in the shallow wells appears to be less dilute compared with most other ground water in Douglas County. Calcium and magnesium comprise between 60 to 80 percent of the cations and sulfate and chloride about the same amount of the anions in these shallow wells near the airport. The shallow wells appear to be above an impervious clay layer of variable thickness, about 90 to 140 feet below land surface based on examination of drillers' logs in the area.

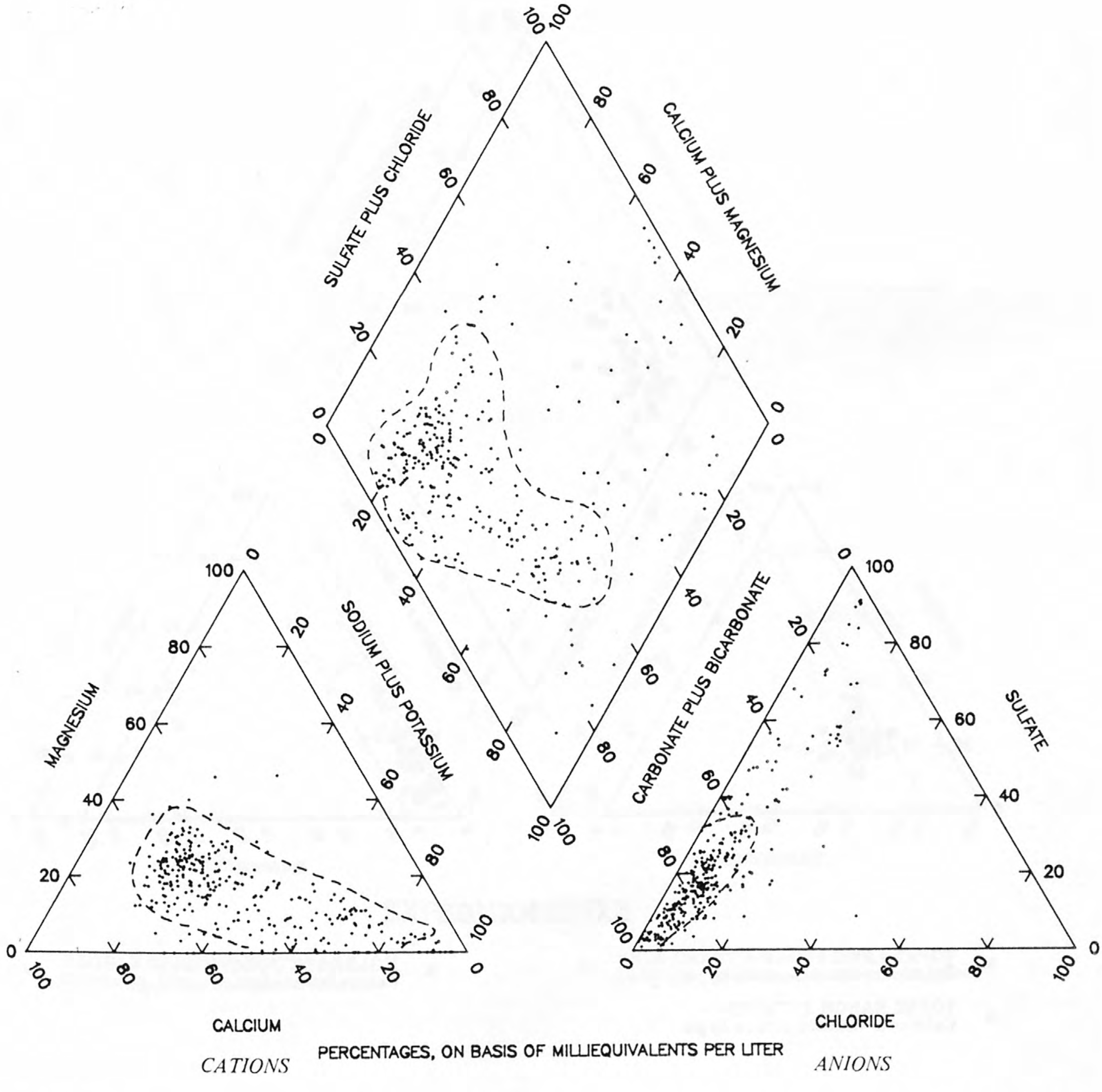
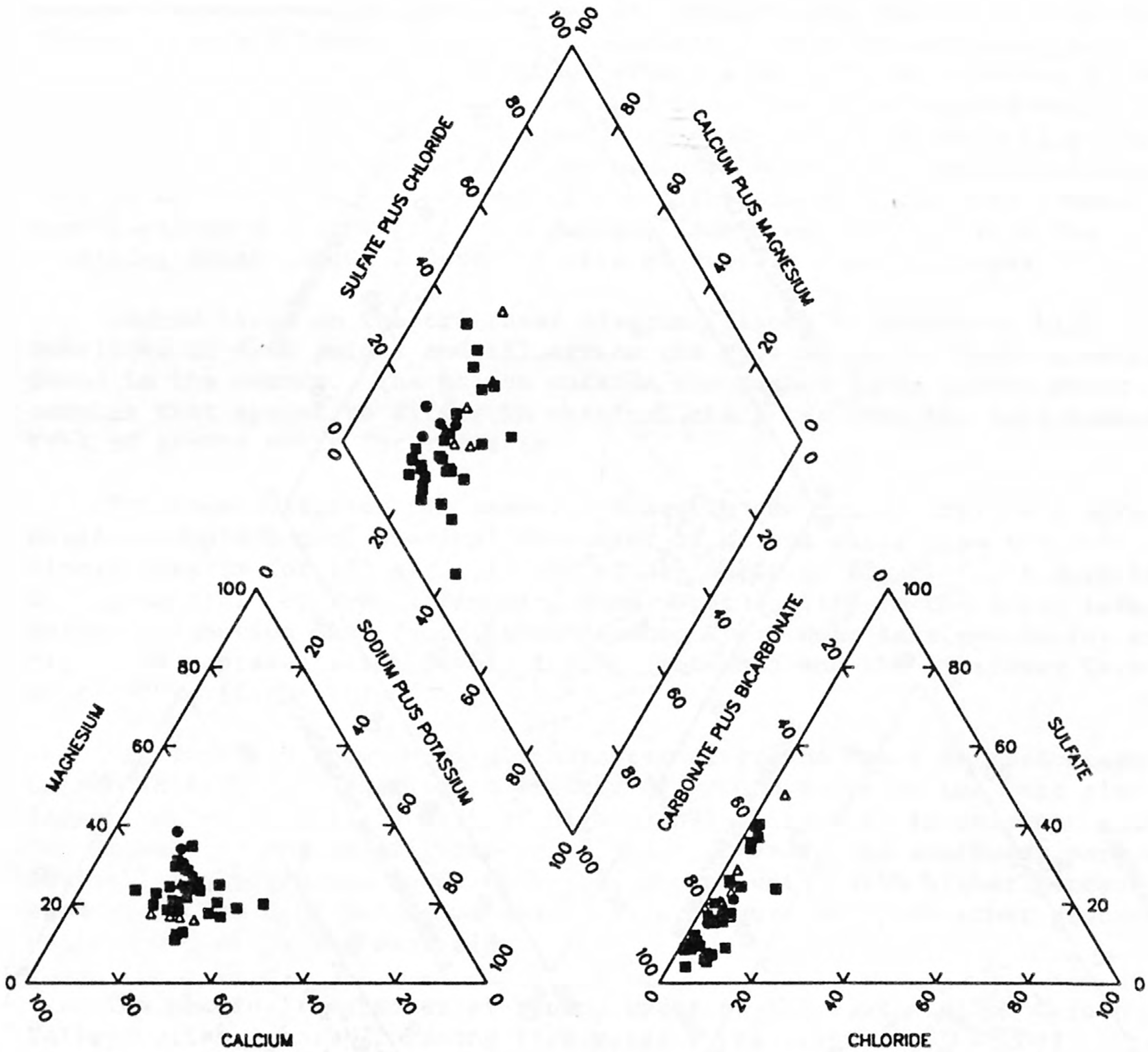


FIGURE 7.--Proportions of major dissolved constituents in ground water. Dashed lines enclose areas of most typical chemical character for sampling sites in study area. By convention, potassium, normally a minor constituent, is combined with sodium in calculating cation percentages. Similarly, carbonate, when present, is combined with bicarbonate. See text for discussion of this type of diagram.



EXPLANATION

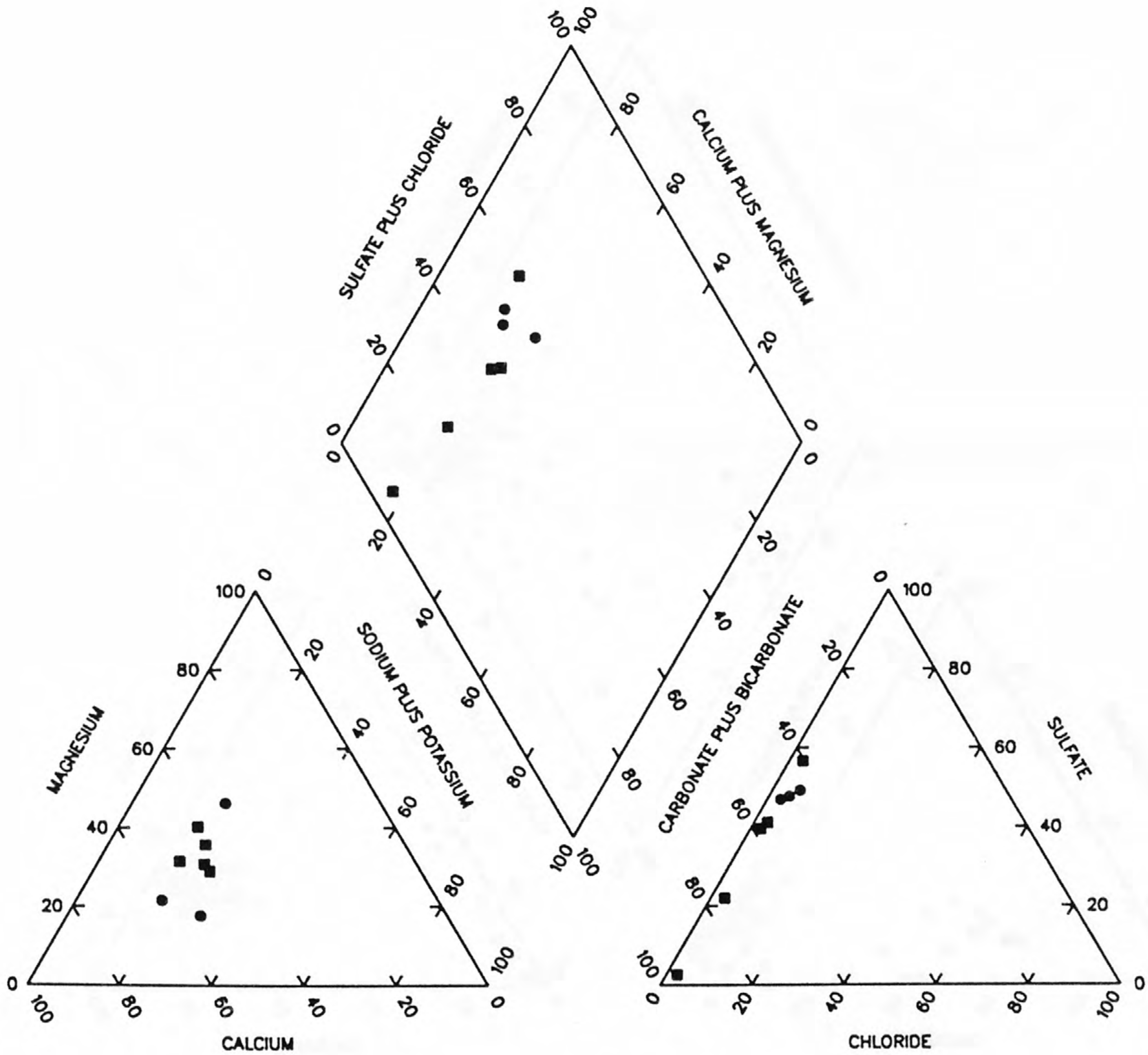
■ TOPAZ LAKE AREA-- Calcium-bicarbonate type

△ TOPAZ RANCH ESTATES-- Calcium-bicarbonate type

● HOLBROOK JUNCTION-- Calcium-bicarbonate type

A. Township 10 N., Range 22 E. (southern part of Douglas County); total, 42 samples.

FIGURE 8.--Proportions of major dissolved constituents in ground water. See figure 7 and text for discussion of this type of diagram.



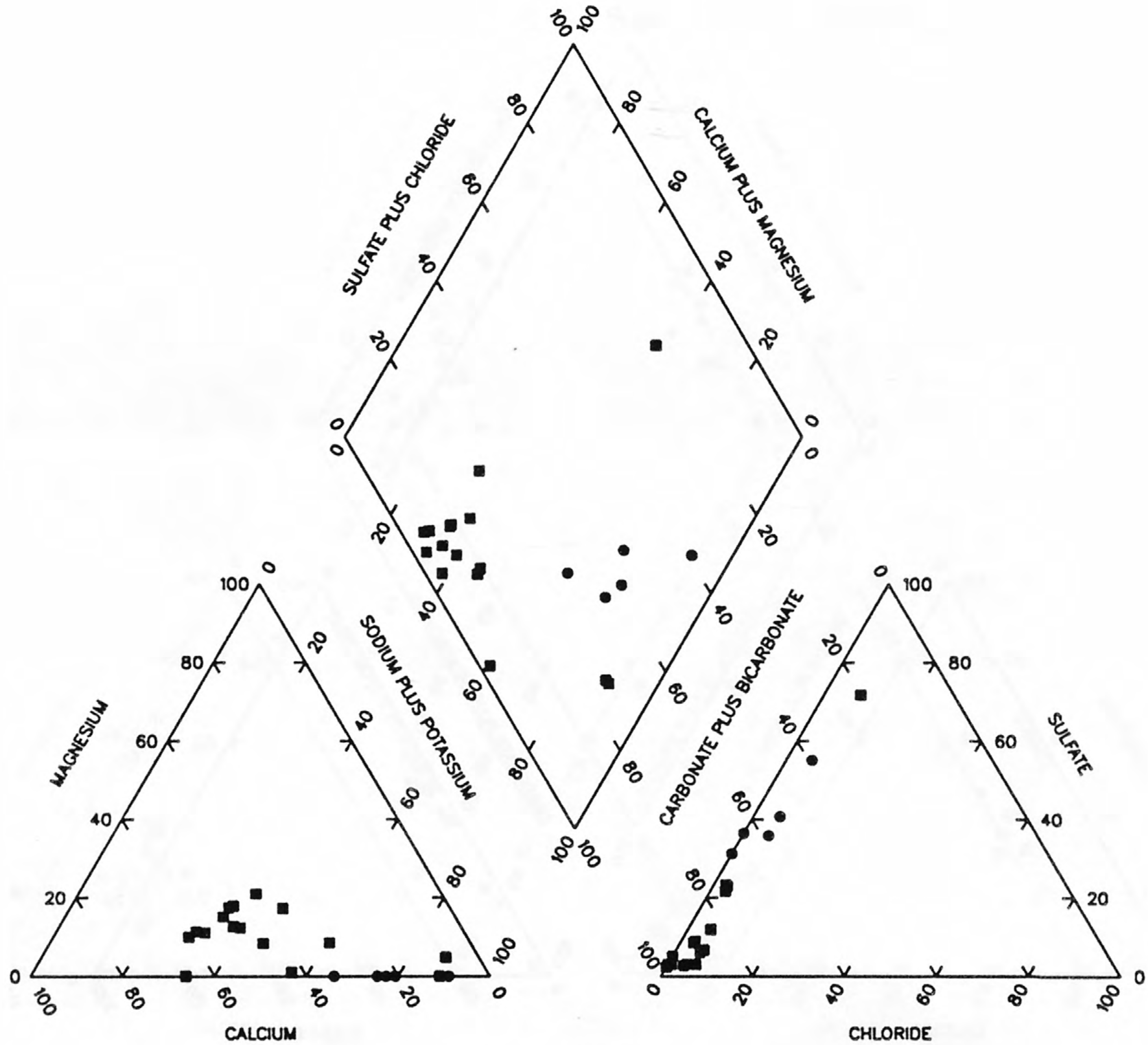
EXPLANATION

■ DOUBLE SPRINGS FLAT -- Calcium-bicarbonate type

● VETA GRANDE MINE AREA -- Calcium-sulfate-bicarbonate type

B. Township 11 N., Range 21 E. (south-central part of Douglas County); total, eight samples.

FIGURE 8.--Continued.



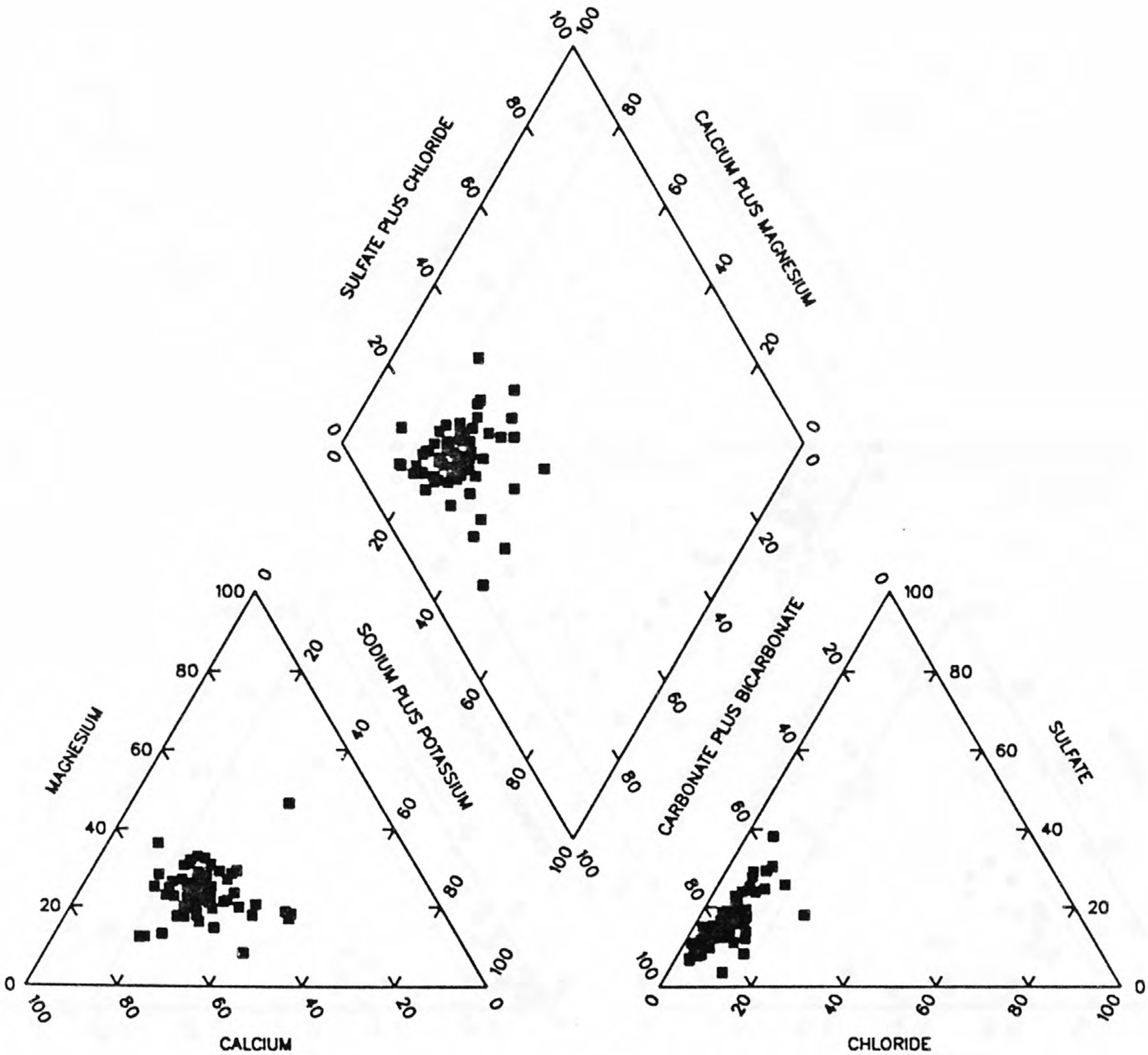
EXPLANATION

■ **KINGSBURY AND FOOTHILL AREA -- Calcium-sodium-bicarbonate type**

● **GREEN ACRES DRIVE AREA -- Sodium-bicarbonate type**

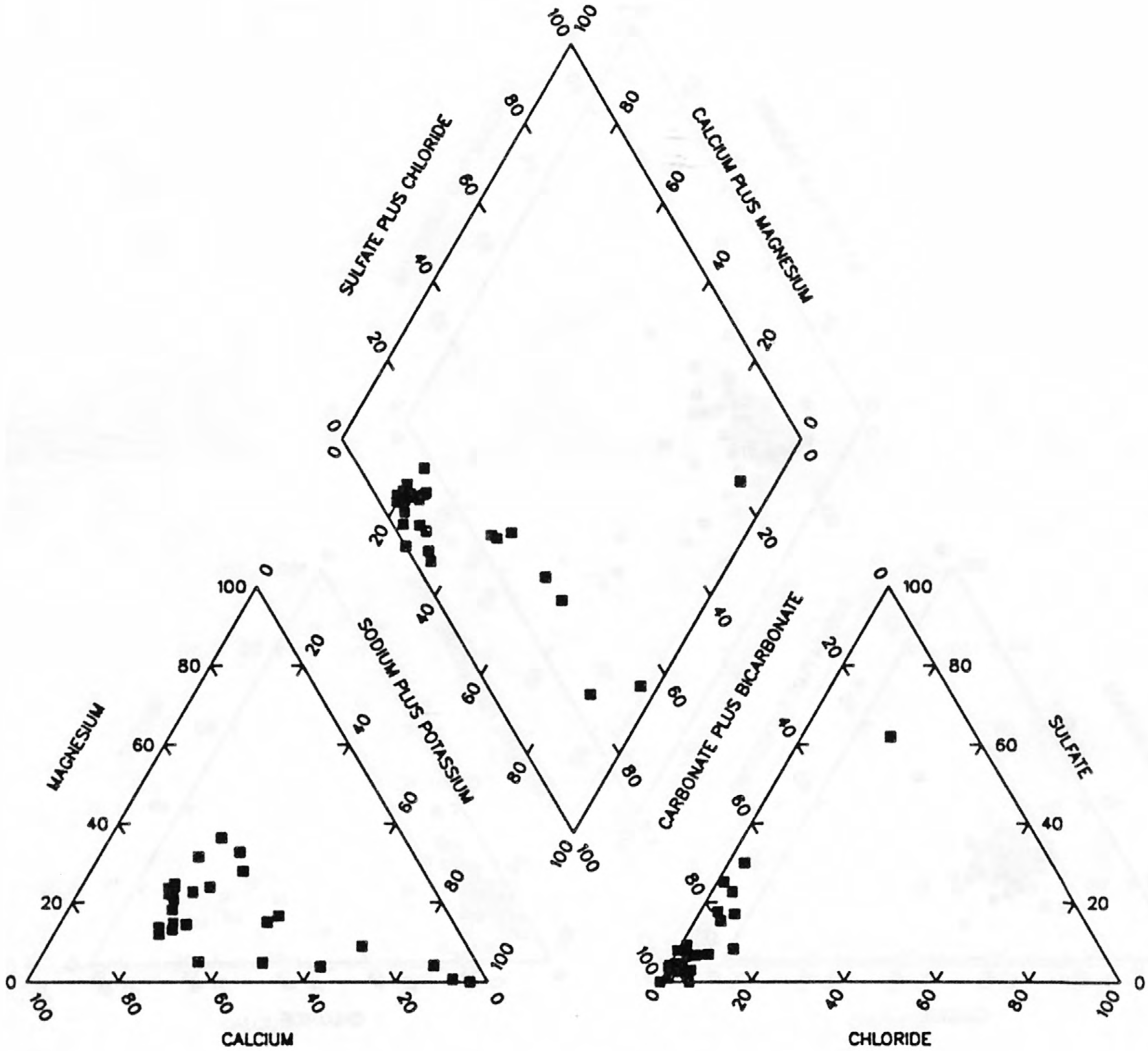
C. Township 12 N., Range 19 E. (southwest part of Carson Valley); total, 21 samples.

FIGURE 8.--Continued.



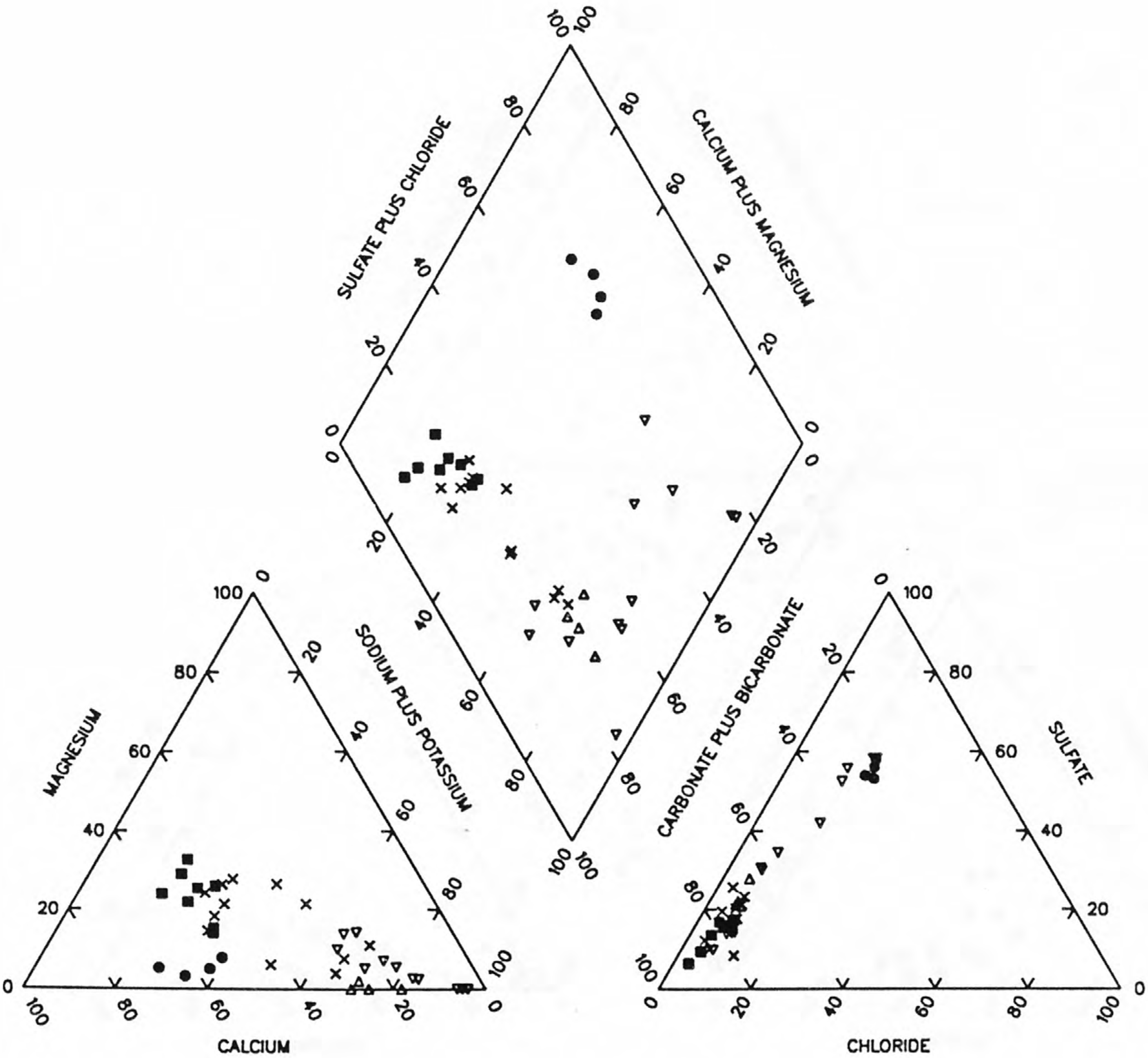
D. Township 12 N., Range 20 E. (southeast part of Carson Valley). Total, 68 samples; dominant chemical type, calcium-bicarbonate.

FIGURE 8.--Continued.



E. Township 13 N., Range 19 E. (west–central part of Carson Valley). Total, 28 samples; dominant chemical type, calcium–sodium–bicarbonate.

FIGURE 8.–Continued.



EXPLANATION

■ MINDEN–GARDNERVILLE AREA -- Calcium–bicarbonate type

● SHALLOW WELLS, AIRPORT AREA -- Calcium–sulfate type

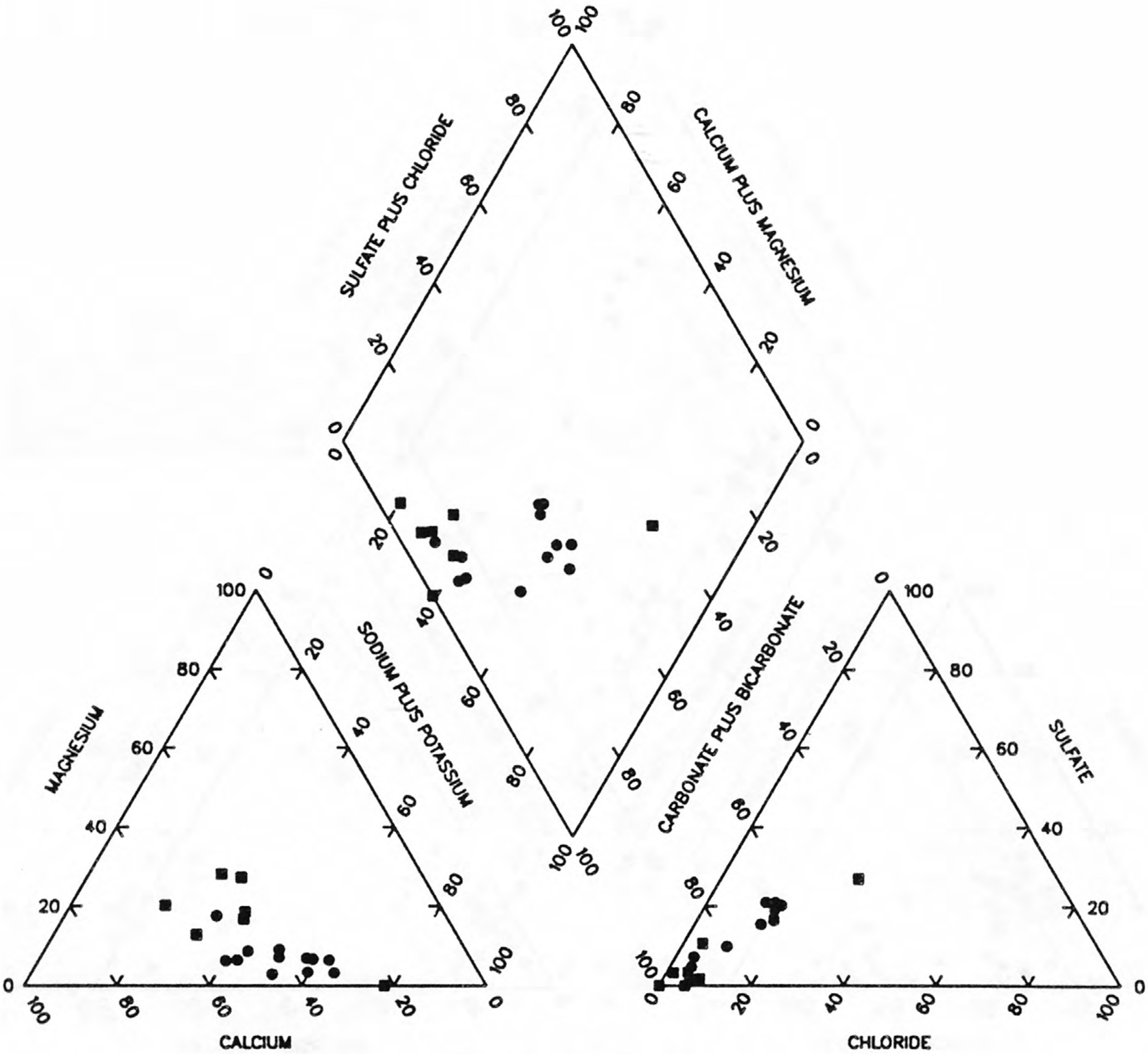
△ DEEP WELLS, AIRPORT AREA -- Sodium–bicarbonate type

▽ EAST JOHNSON LANE -- Sodium–bicarbonate type

× OTHER SITES -- Sodium–calcium–bicarbonate type

F. Township 13 N., Range 20 E. (east–central part of Carson Valley); total, 40 samples.

FIGURE 8.--Continued.



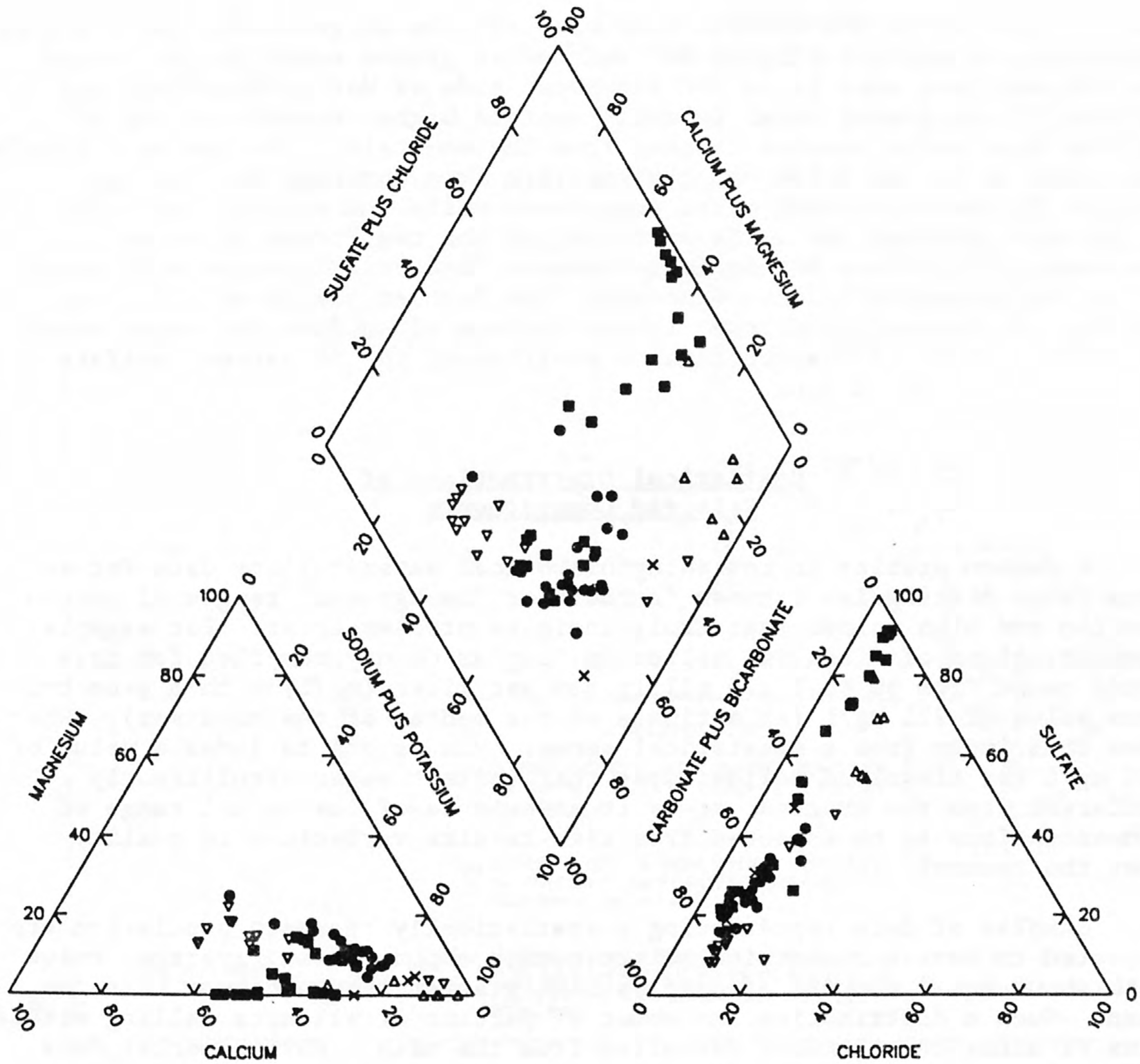
EXPLANATION

■ JACKS VALLEY -- Calcium-sodium-bicarbonate type

● JACKS VALLEY-INDIAN HILLS -- Sodium-bicarbonate type

G. Township 14 N., Range 19 E. (northwest part of Carson Valley and Jacks Valley); total, 19 samples.

FIGURE 8.--Continued.



EXPLANATION

■ **NORTH JOHNSON LANE --** Sodium-sulfate type

● **CENTRAL JOHNSON LANE --** Sodium-bicarbonate type

△ **EAST JOHNSON LANE --** Sodium-sulfate type

▽ **JACKS VALLEY-INDIAN HILLS --** Sodium-calcium-bicarbonate type

× **OTHER SITES --** Sodium-bicarbonate type

H. Township 14 N., Range 20 E. (northeast part of Carson Valley); total, 70 samples.

FIGURE 8.--Continued.

Some ground water north of Stephanie Way and east of East Valley Road (figure 9) in the Johnson Lane area (figure 1) generally has a higher percentage of sulfate (figure 8H) than other ground water in the county. The Johnson Lane area is on the southwest side of Hot Springs Mountain (figure 1) and ground water in wells contain higher concentrations of sulfate than wells located farther from the mountain. The analyses from two wells on Porter Drive and the analysis from Saratoga Hot Springs (figure 9) indicated that water from these wells and springs had over 90 percent sulfate; two wells southwest of the two Porter Drive wells are downgradient from Hot Springs Mountain, and contain water with about 49 and 53 percent sulfate. Generally, the farther west a well is from Hot Springs Mountain the lower the percentage of sulfate in ground water. Figure 9 also shows the approximate position of the 50-percent sulfate boundary by a dashed line.

Statistical Distributions of Selected Constituents

A common problem in reviewing historical water-quality data for an area is to distinguish between "normal" or "background" ranges of concentration and high values that truly indicate problem areas. For example, concentrations of dissolved solids in Douglas County compiled for this study range from 50 to 1,170 milligrams per liter (mg/L) with a geometric mean value of 221 mg/L (an estimate of the median of the data set). What does this imply from a statistical sense? How is one to judge a value of 600 mg/L for dissolved solids; does that reflect water significantly different from the average, or is it an example of the normal range of concentrations to be expected from site-to-site variations in quality over the county?

Samples of data representing a statistically "normal" population are expected to have a symmetrical distribution about a mean (average) value with about equal numbers of samples both greater than and less than the mean. Such a distribution has about 67 percent of all data falling within plus or minus one standard deviation from the mean. Environmental data generally are not normally distributed, but instead typically have fewer values higher than the mean and more values lower than the mean. Statistics such as the standard deviation have less meaning for such data; however, the logarithms of the actual data may be normally distributed, providing what is termed a log-normal distribution.

One tool available to examine the statistical distribution of water-quality data is a plot of the distribution of observed concentrations on special probability graph paper (Velz, 1970, page 522-542; Sinclair, 1974). If the concentrations of dissolved solids in the ground water of an area have a statistically normal distribution, most points will plot on a straight line on such paper, and the distribution can be described by a mean value and by the standard deviation of that mean.

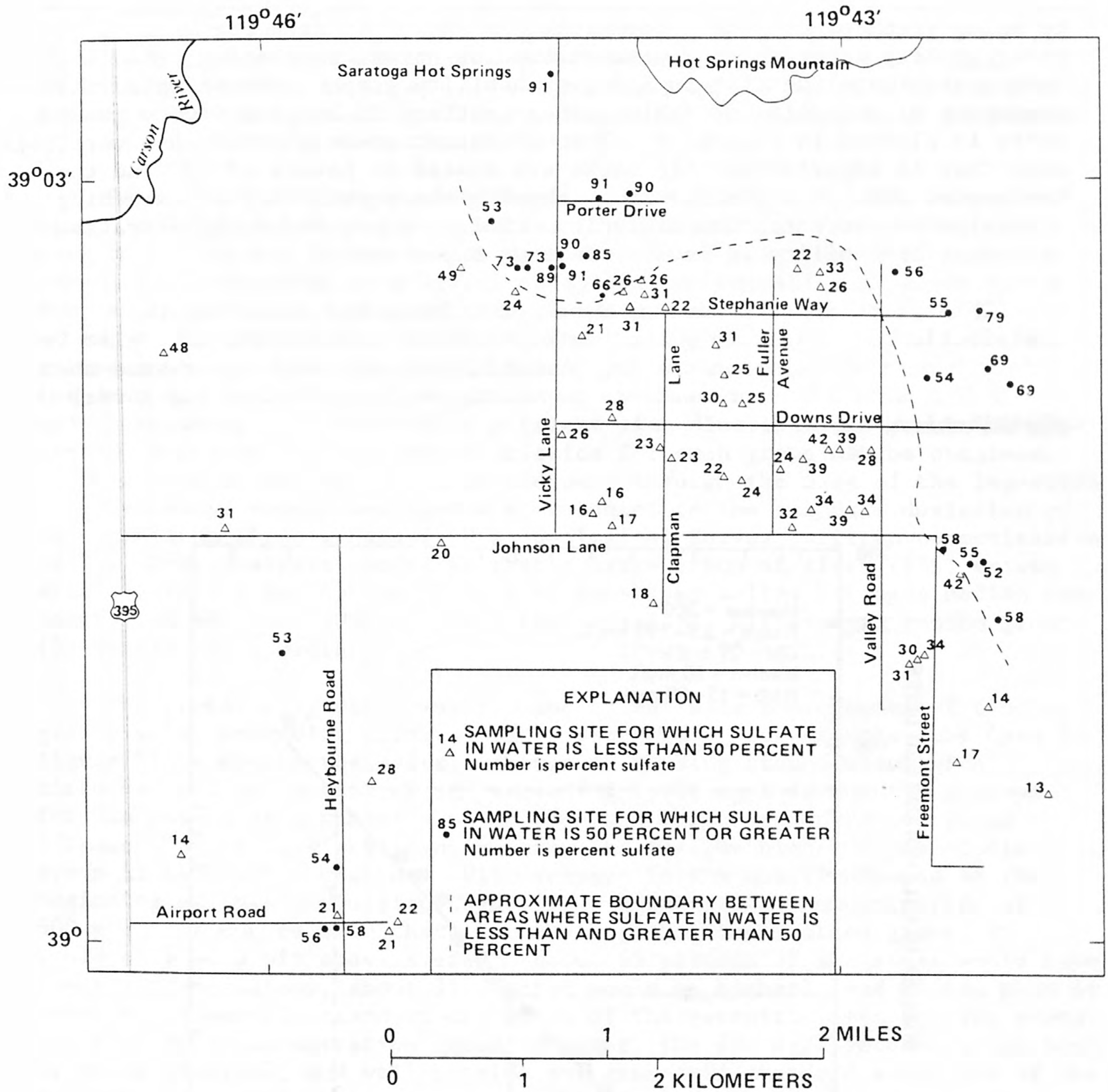


FIGURE 9.--Proportion of sulfate in water from sampling sites in the Johnson Lane area. Number indicates sulfate concentration as percentage of combined concentration of major anions (that is, sulfate plus chloride, carbonate, bicarbonate, and nitrate), with concentrations expressed in milliequivalents per liter.

The same technique can be used for data that are log-normally distributed by using graph paper with a logarithmic y axis. If data for a given water-quality constituent represent one log-normal population, they will form a straight-line plot on a log-probability graph. For example, the frequency distribution of sodium concentrations in Douglas County ground water is plotted in figure 10. The concentration is plotted on a vertical axis that is logarithmic (tic marks are spaced by powers of 10) and the horizontal axis is a special scale showing the probability of exceeding a particular concentration of sodium. Points shown in the illustration represent probability in levels of about 5 percent.

This graph imparts several types of information regarding the distribution of sodium in ground water. First, because the data plot is a fairly straight line on the log-probability graph, one can assume that the sodium analyses represent one population of data with a log-normal distribution.

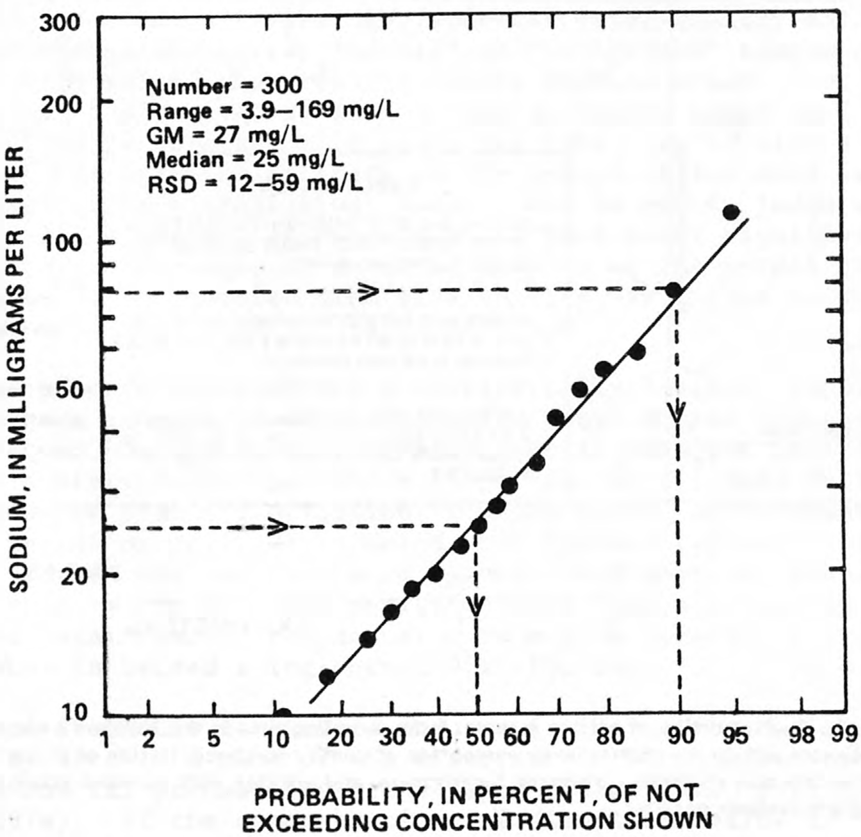


FIGURE 10.--Frequency distribution for sodium in ground water. Dashed lines show the following examples: The probability that an individual sodium concentration will not exceed 25 milligrams per liter is only 50 percent; in contrast, the probability of not exceeding 78 milligrams per liter is about 90 percent. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

Furthermore, useful statistics may be read directly off the graph. In the example for sodium (figure 10), the concentration corresponding to the 50-percent probability (25 mg/L) is the median concentration of sodium in the sampled ground water of Douglas County. Other probabilities of not exceeding a given concentration may be directly obtained; for example, if an industry wishing to locate in the county required water with a sodium concentration not exceeding 78 mg/L, figure 10 shows that about 90 percent of the sampled wells meet that criterion.

Figure 11A is a log-probability plot for dissolved-solids concentrations in Douglas County ground water. Unlike the plot for sodium, the data seem to follow two linear trends rather than one straight line, with the two segments intersecting at a dissolved-solids concentration of about 340 mg/L. Such a distribution indicates that the data may represent two populations of sites, perhaps reflecting differing geochemical processes or sources of dissolved solids in ground water (Sinclair, 1974; Nowlin, 1982, page 24). If the data are replotted in two groups by concentration, those below 340 mg/L and those above, two reasonably straight-line distributions result as presented in figure 11B, and the statistics for each group may be obtained. The lines drawn on figure 11B should pass through the mean of the logarithm (the geometric means) and have a slope equal to the standard deviation of the logarithm (Dennis Helsel, U.S. Geological Survey, written communication, 1987). This analysis indicates that a large group of sites (275) exists with relatively low concentrations of dissolved solids having a median concentration of about 200 mg/L, and that a second, high-concentration group (52 sites) has a median concentration of about 490 mg/L.

The probability plots may be used to estimate the chances of finding ground-water exceeding drinking-water standards. For example, the data in figure 11A indicate the overall chance of finding ground water with dissolved-solids concentrations exceeding 1,000 mg/L is about 2 percent for the county as a whole; however, for the lower concentration group (figure 11B) it is significantly less, and for the higher concentration group it is about 6 percent. With respect to the question posed at the beginning of this discussion regarding a hypothetical concentration of 600 mg/L, it can be seen that, for the higher concentration group, this would only be a bit above average (about 65 percent of the sites would have lower concentrations, about 35 percent would be higher), and within plus or minus one geometric standard deviation of the geometric mean for the group. For the lower concentration group, however, the 600 mg/L concentration would be quite abnormal, and well outside one geometric standard deviation of the geometric mean. To compute one standard deviation above the geometric mean, multiply the geometric mean by the geometric standard deviation. To compute one standard deviation below the geometric mean, divide the geometric mean by the geometric standard deviation.

Log-probability plots for some of the common ions contributing to dissolved solids (calcium, magnesium, sodium, bicarbonate, sulfate, chloride, fluoride, and nitrate) and selected minor elements (iron, manganese, zinc, and arsenic) are shown in figures 10-20. Of the common ions, only sodium (figure 10) appears to be adequately represented by a single lognormal population. Arsenic, iron, manganese, and zinc also plot as one lognormal distribution (figures 19 and 20). All the others may be divided into two discrete lognormal populations--a lower concentration group generally representing two-thirds or more of the sampled sites, and a higher concentration group generally representing less than one-third of the sites.

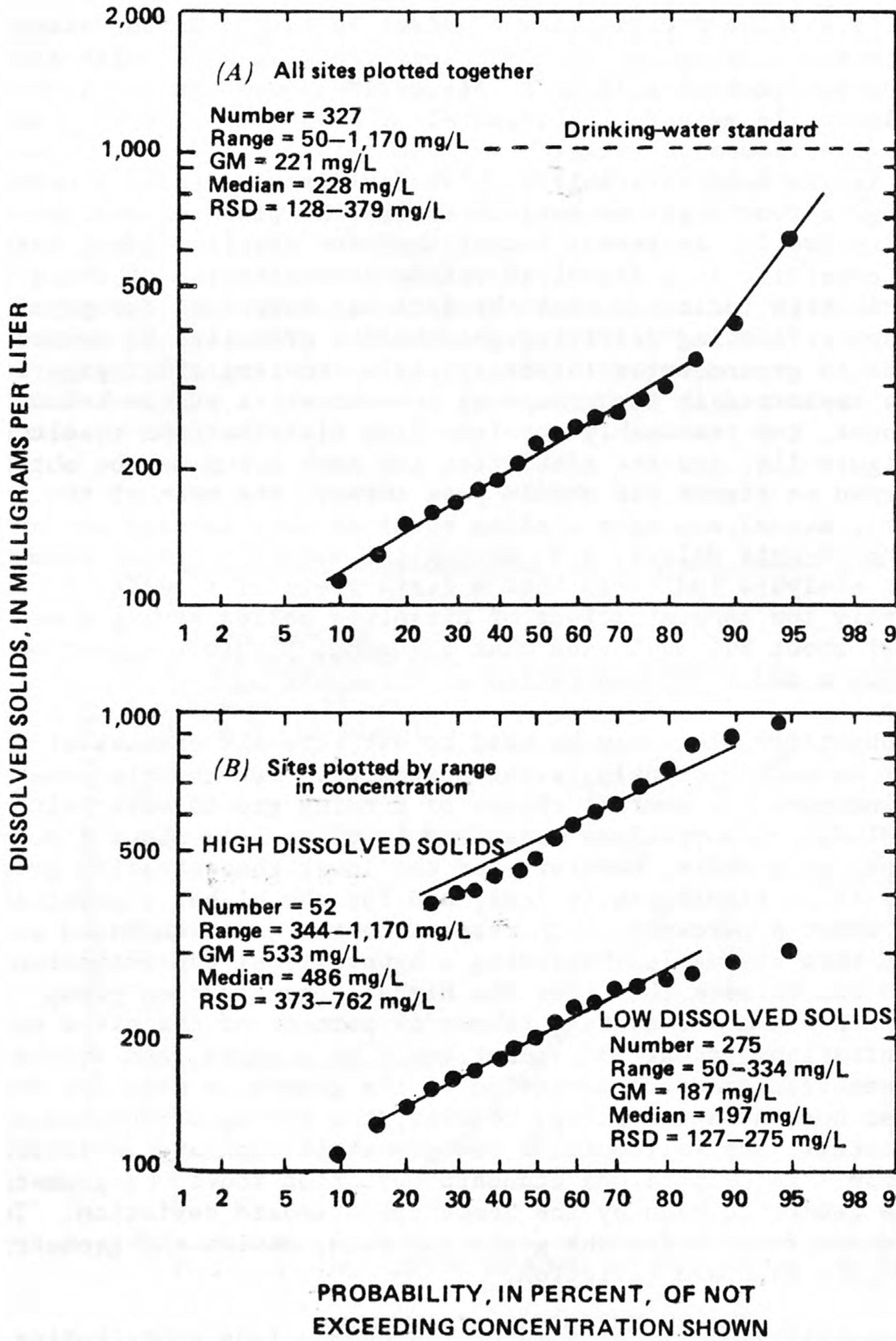


FIGURE 11.--Frequency distribution for dissolved solids in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

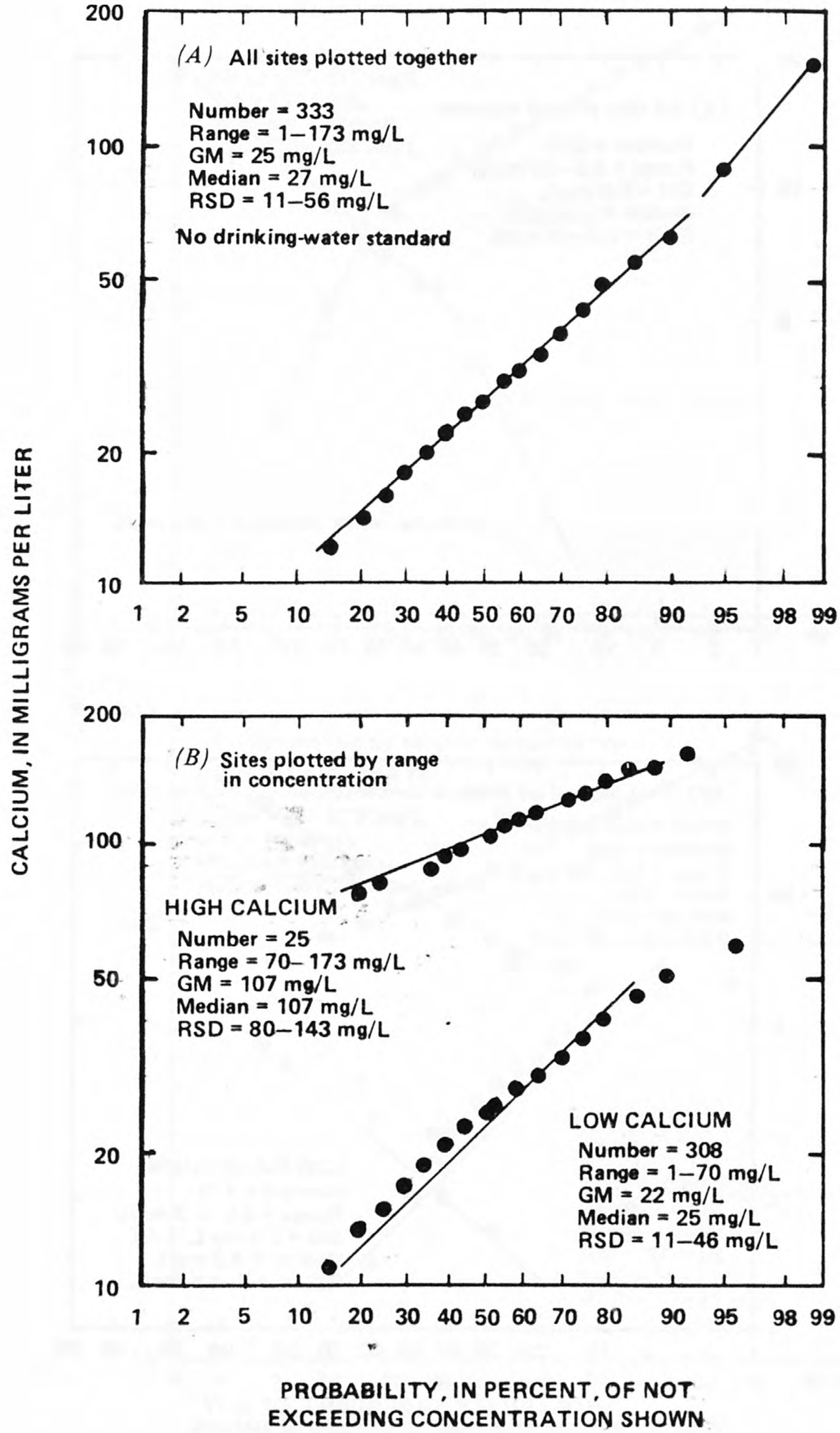


FIGURE 12.--Frequency distribution for calcium in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

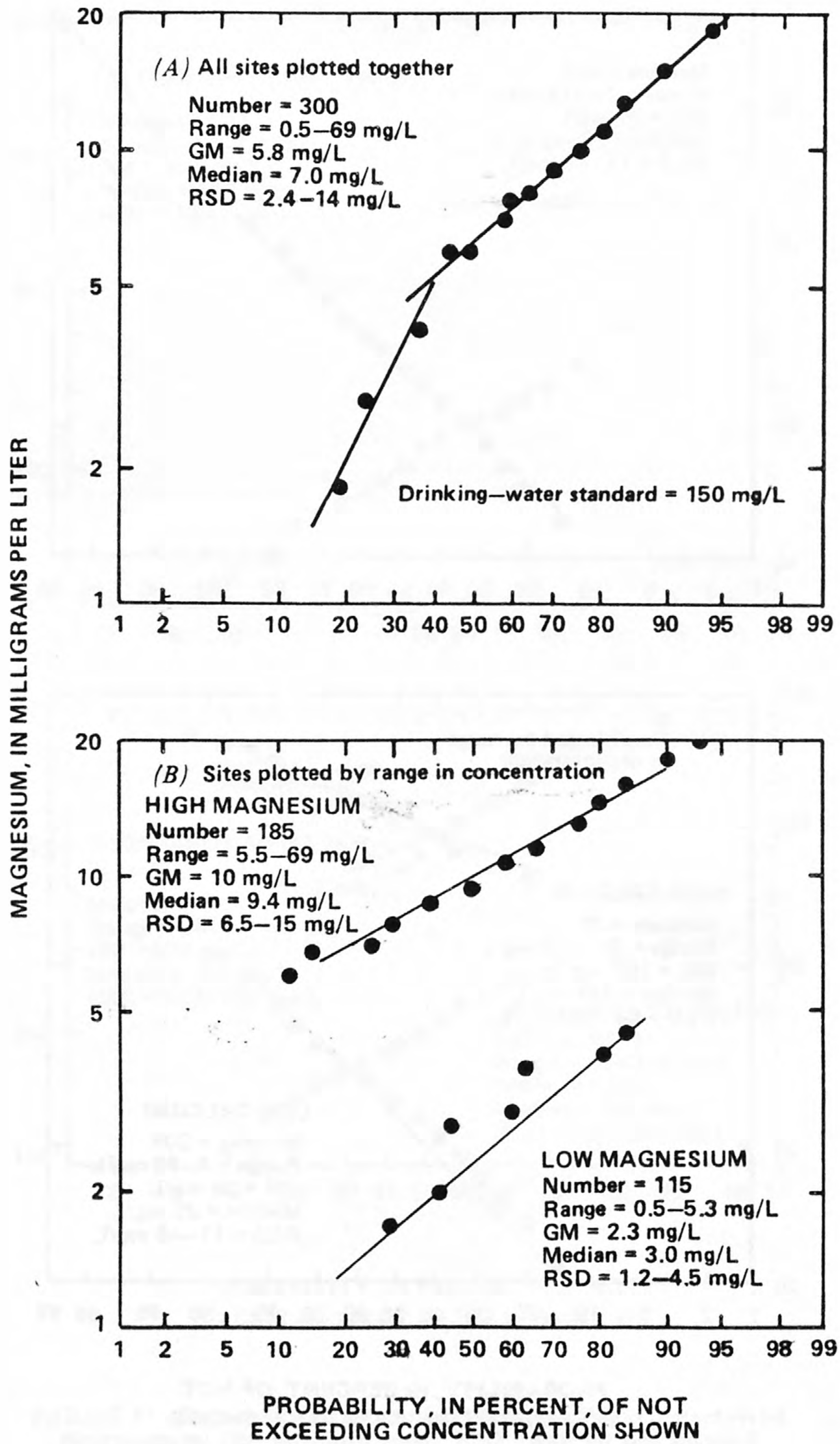


FIGURE 13.–Frequency distribution for magnesium in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

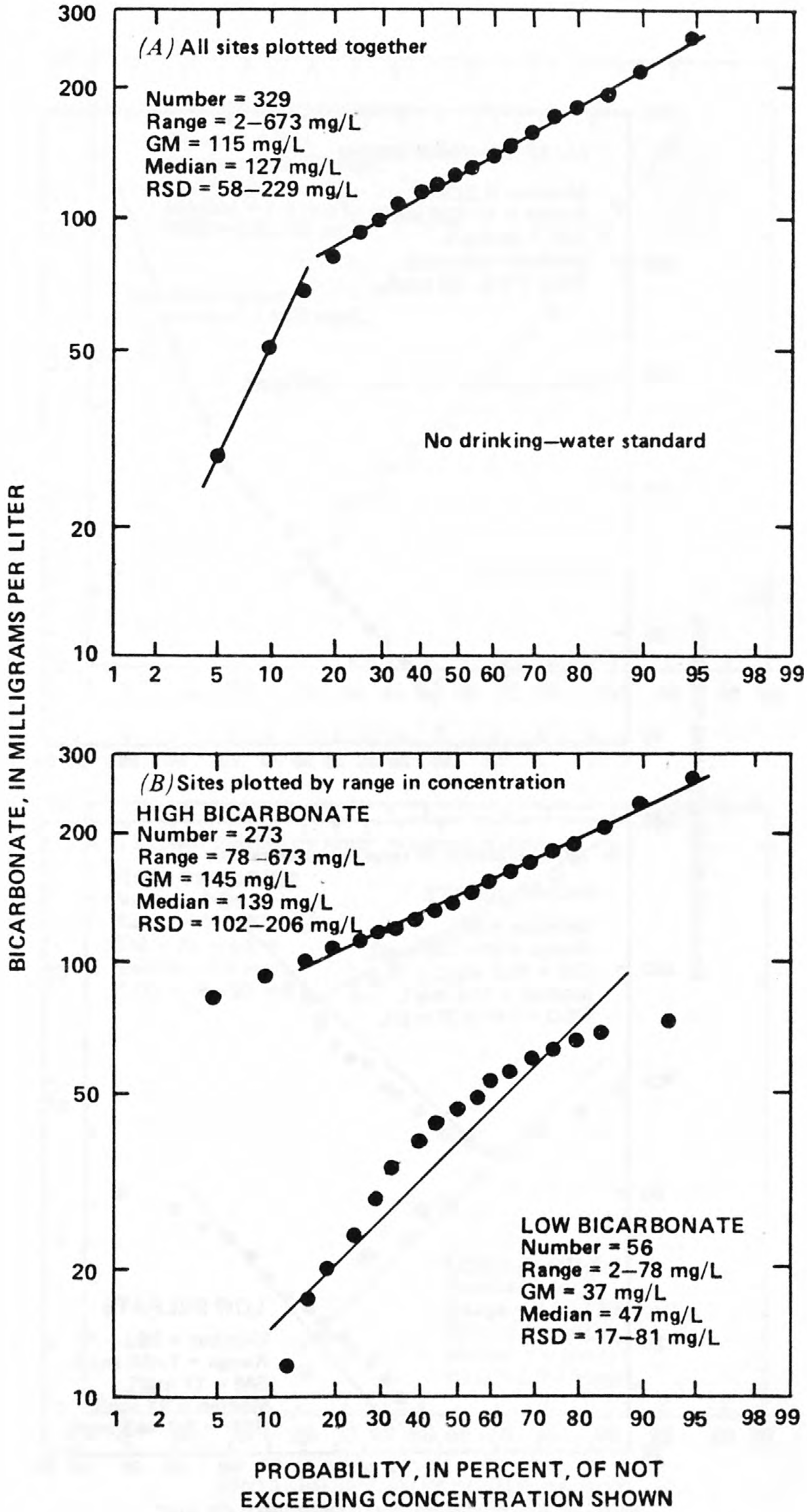


FIGURE 14.--Frequency distribution for bicarbonate in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

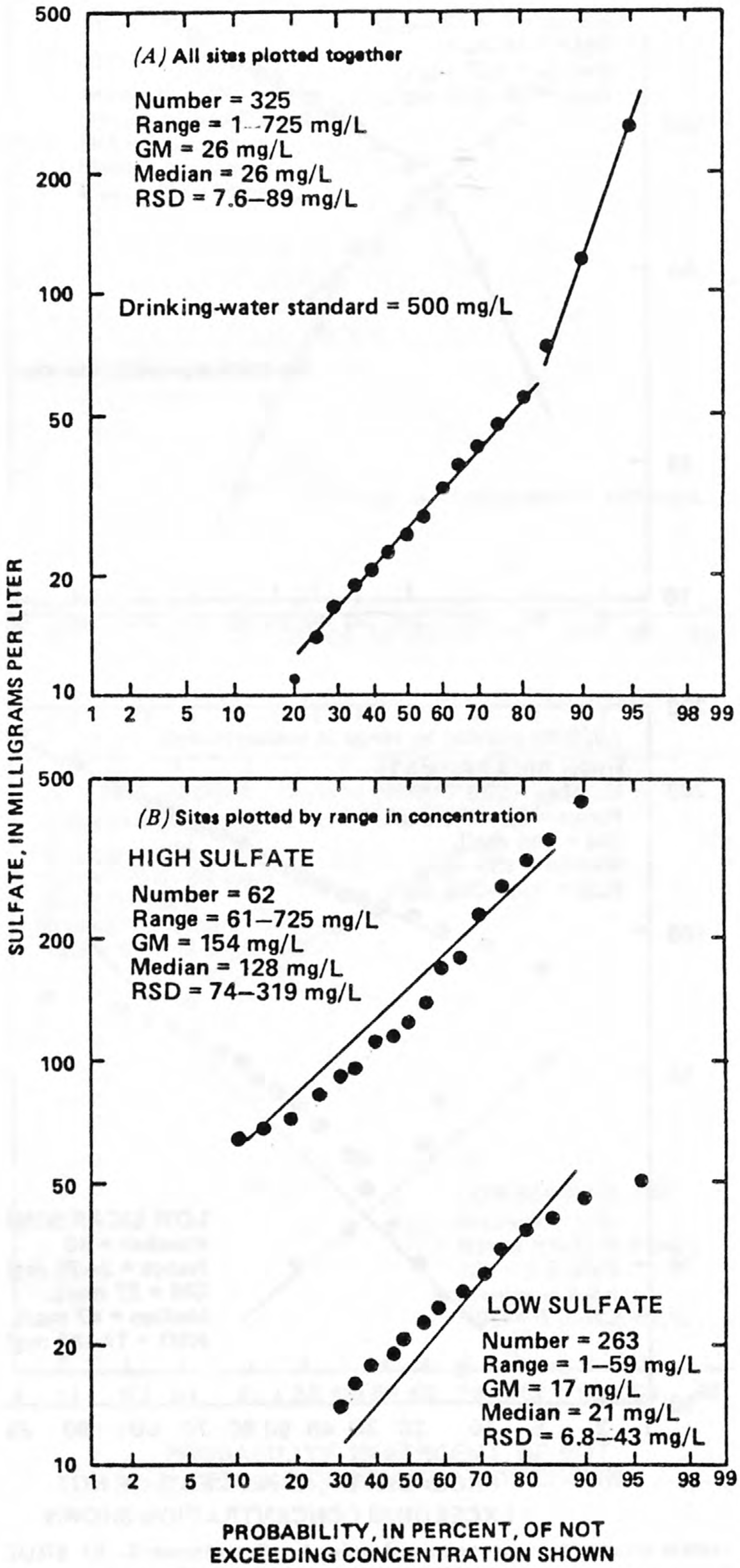


FIGURE 15.--Frequency distribution for sulfate in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

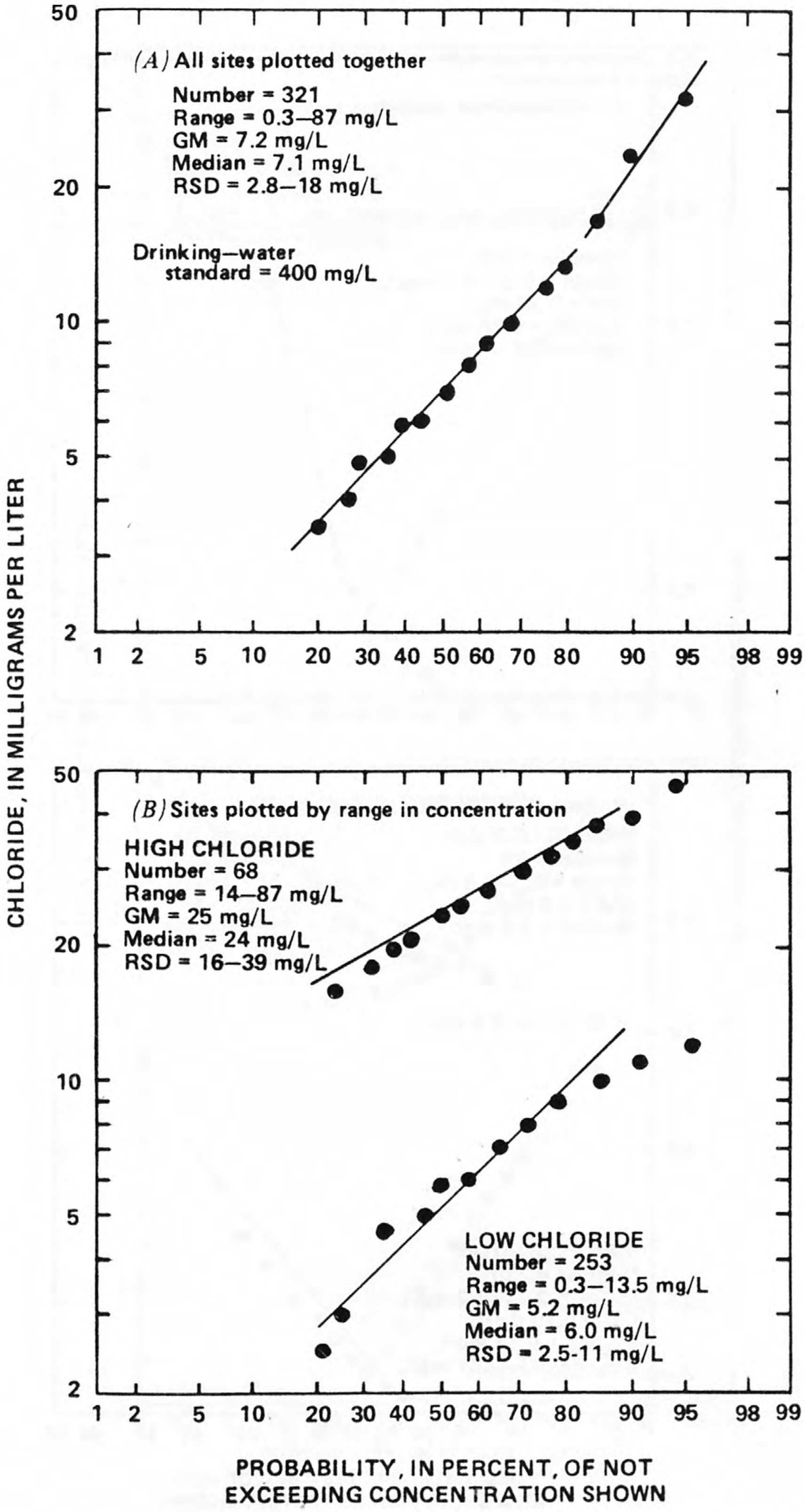


FIGURE 16.–Frequency distribution for chloride in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

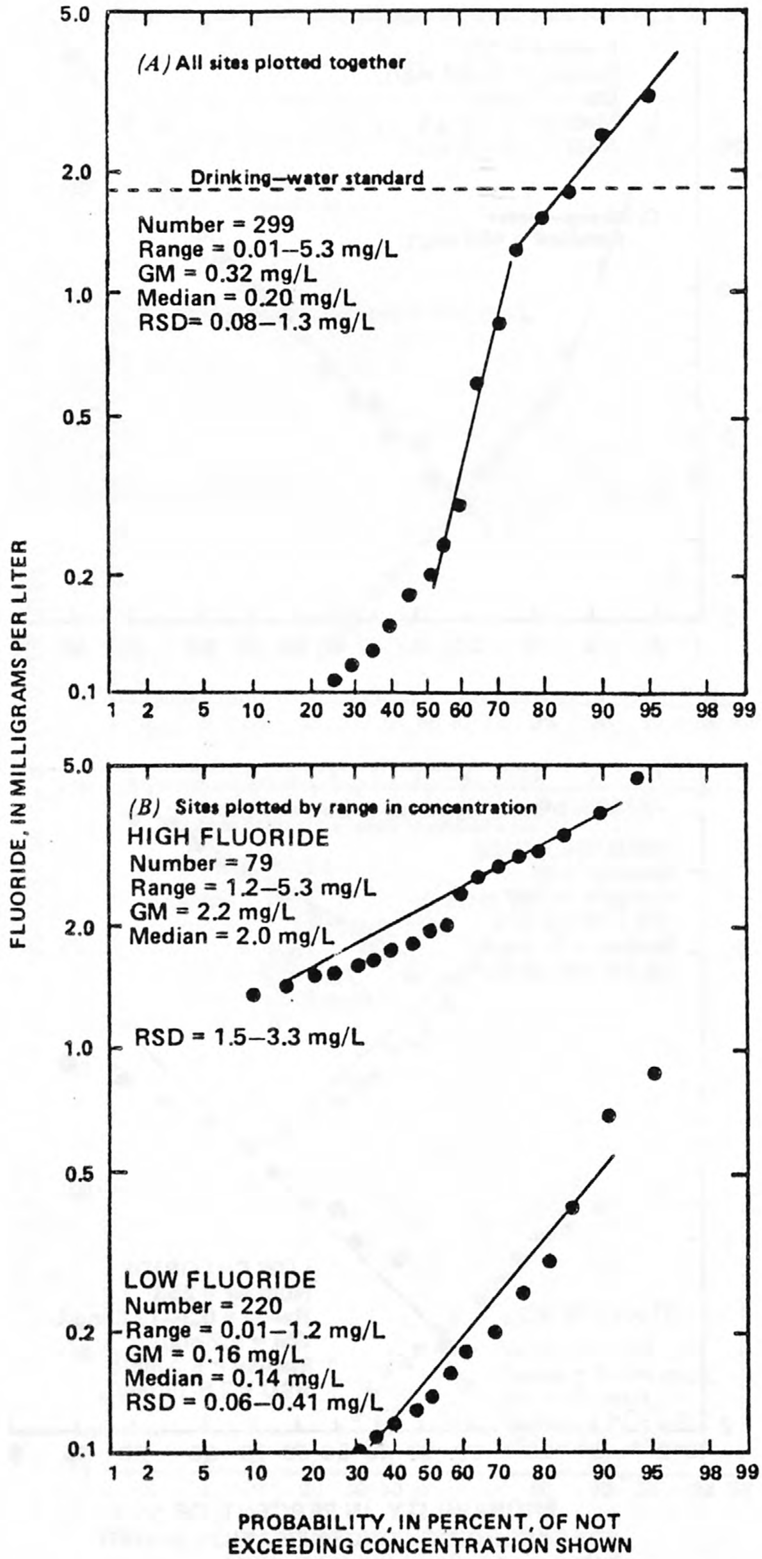


FIGURE 17.–Frequency distribution for fluoride in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

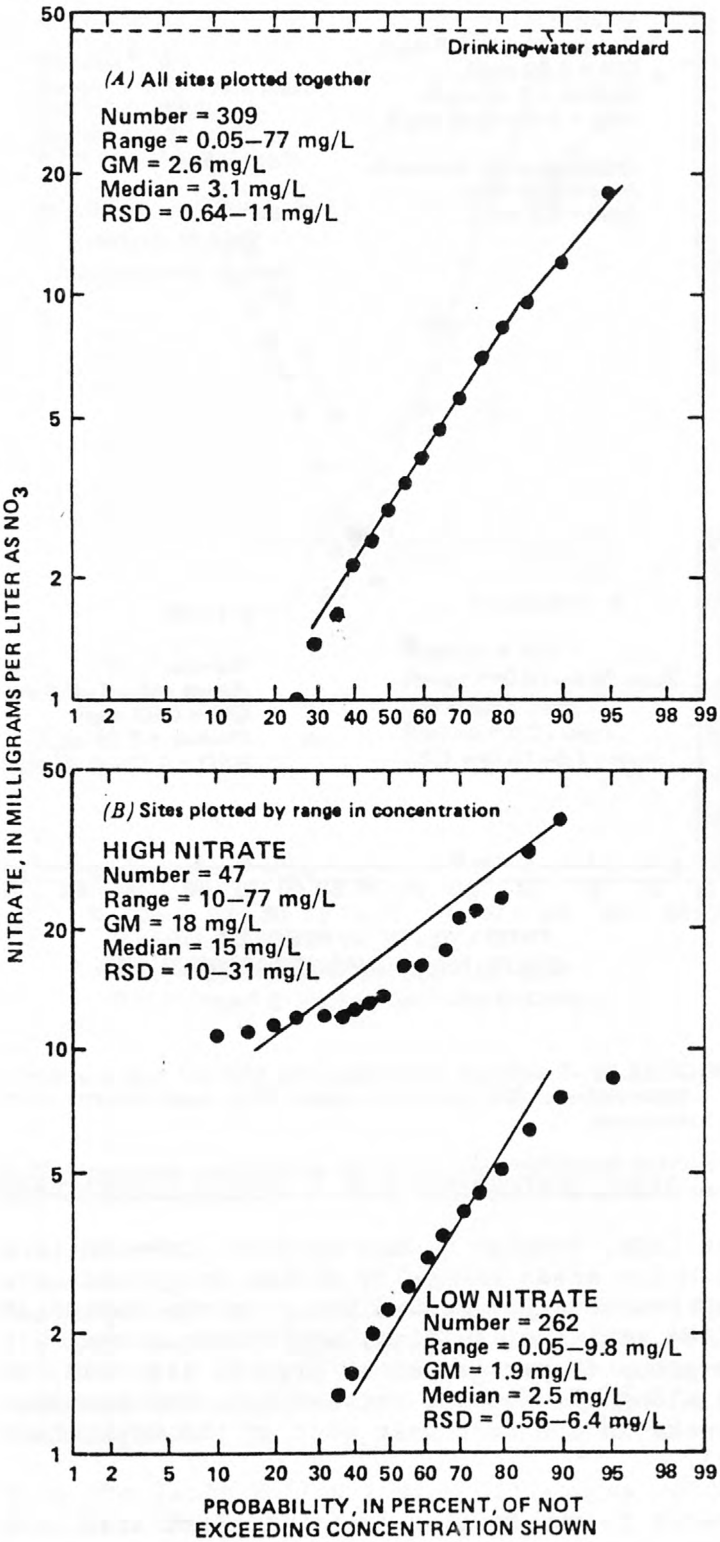


FIGURE 18.--Frequency distribution for nitrate in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

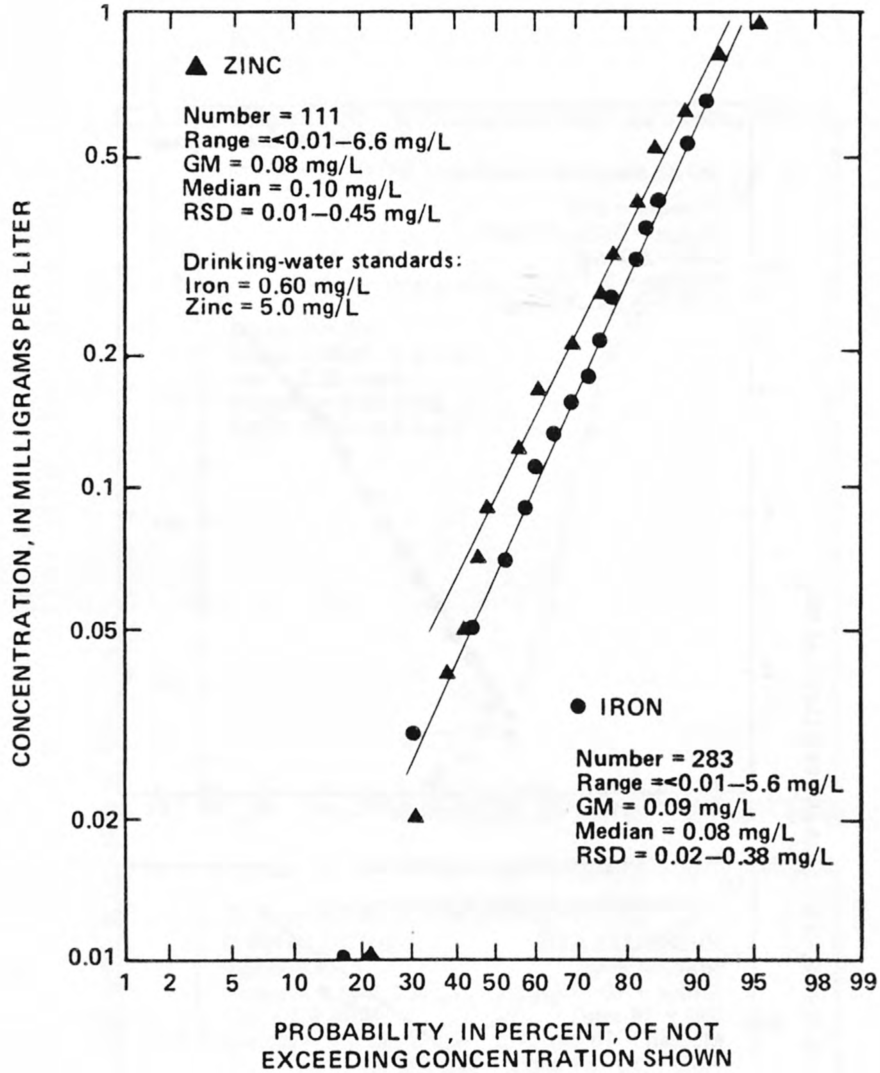


FIGURE 19.--Frequency distributions for iron and zinc in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

Areal Distribution of Selected Constituents

The Topaz Lake, Douglas County Airport, Johnson Lane, and Jacks Valley-Indian Hills areas generally differ in ground-water chemistry from other parts of the county. Ground water in the Topaz Lake area contains dissolved solids, calcium, sulfate, and nitrate, that plot in the high concentration group (upper graphs on figures 11B, 12B, 15B, and 18B). This water is along the contact between alluvial-fan deposits and meta-sedimentary rocks in the northwest part of the Topaz Lake area (Nowlin, 1982, page 24).

Ground water in the Douglas County Airport area contains dissolved solids, calcium, sulfate, and chloride that plot in the high concentratio group. This water generally is associated with the shallow wells (less than 150 feet deep) in the area.

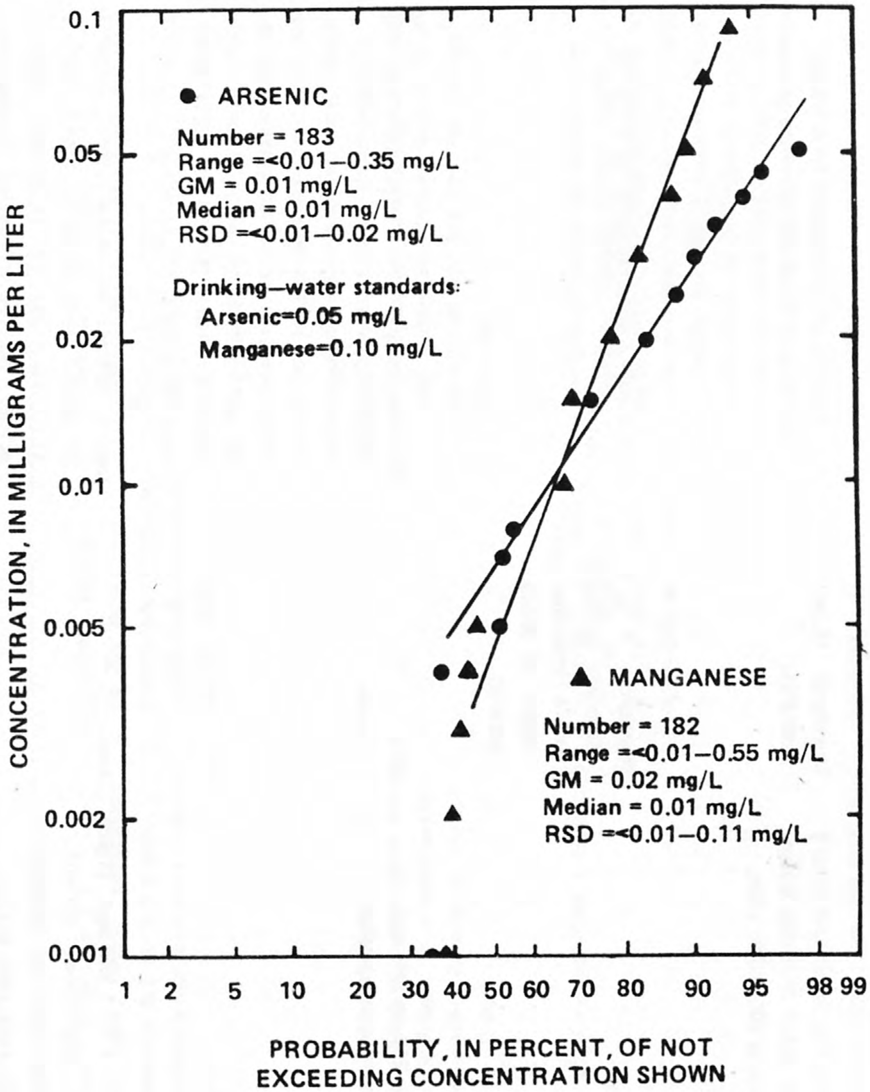


FIGURE 20.--Frequency distributions for arsenic and manganese in ground water. Abbreviations: GM, geometric mean; RSD, range for one standard deviation.

Ground water in the Johnson Lane area contains dissolved solids, calcium, sulfate, chloride, and fluoride that are in the high concentration group. Ground water in the northeast part of this area generally contains high concentrations of sulfate that reflect mixing of sulfate-rich geothermal water.

Ground water in the Jacks Valley-Indian Hills area contains fluoride and chloride that are in the high concentration group. The water in this area also is influenced by geothermal water but does not contain sulfate concentrations as high as those in the northeastern part of the Johnson Lane area.

TABLE 1.--Source, significance, and standards or criteria for dissolved constituents and properties of water

[Modified slightly from Nowlin (1982, table 2). Abbreviations: NCHPS, Nevada Consumer Health Protection Services, 1977; EPA, U.S. Environmental Protection Agency, 1976; mg/L, milligrams per liter]

Constituent or characteristic	Source or cause of occurrence	Normal range in concentration	Standards or criteria for use[1]	Significance for use
Color	Organic compounds derived from decaying organic matter, peat, and other natural organic deposits, industrial wastes, and sewage.	Generally low in ground water; surface water draining swamps may exceed 200 units (Hem, 1985).	Standard: 15 units (NCHPS).	Esthetically objectionable in drinking water and in food and beverage processing.
Turbidity	Suspended sediments, precipitates, and colloids. May be derived from soil erosion, industrial wastes, sewage, or chemical reactions, such as the oxidation of dissolved iron.	--	Standards: 1 to 5 standard turbidity units depending upon number of hookups (NCHPS).	Esthetically objectionable in drinking water.
Hardness (as $CaCO_3$)	Derived principally from dissolved calcium and magnesium. With the exception of alkalies such as sodium and potassium, all metals in water contribute to hardness.	Commonly 200 to 300 mg/L in carbonate ground water.	None	Consumes soap and detergents before a lather will form, resulting in soap curds depositing on sinks and bathtubs. Hard water form scales in pipes, boilers, and water heaters. Water of hardness up to 60 mg/L considered soft; 61 to 120 mg/L, moderately hard; 121 to 180 mg/L, hard; more than 180 mg/L, very hard.
Calcium (Ca) and magnesium (Mg)	Dissolved from rocks and soils, especially those containing limestone, dolomite, and gypsum.	Calcium: 1 to 1,000 mg/L (Todd, 1970). Magnesium: Normally much less than calcium and usually less than sodium. (Hem, 1985).	None	Impart hardness and scale-forming properties to water (see hardness). High concentrations unsuitable for laundries, steam plants, textile processing, dyeing, and electroplating. Small amounts desirable to prevent corrosion.

TABLE 1.--Source, significance, and standards or criteria for dissolved constituents and properties of water--Continued

Constituent or characteristic	Source or cause of occurrence	Normal range in concentration	Standards or criteria for use[1]	Significance for use
Sodium (Na) and potassium (K)	Dissolved from most rocks and soils. High concentrations may be found in natural brines, industrial waste, and sewage.	Sodium: Generally 1 to 1,000 mg/L (Hem, 1985). Potassium: Commonly 0.1 to 0.5 times sodium; generally less than 10 mg/L.	Criteria: Sodium, 10 to 200 mg/L; Potassium, 1,000 to 2,000 mg/L (McKee and Wolfe, 1963).	Concentrations greater than 50 mg/L may cause foaming in boilers. Combine with chloride to impart salty taste. Sodium may contribute to hypertension and cardiovascular diseases. Sodium may be objectionable in irrigation water in concentrations that vary with the type of crops and soils.
Bicarbonate (HCO_3) and carbonate (CO_3)	Dissolved from most rocks and soils by carbon dioxide reacting with carbonate minerals such as limestone and dolomite. The carbonate species (CO_3) can only exist if pH is 8.3 or more.	Bicarbonate: Generally less than 200 mg/L in surface water and 500 mg/L in ground water. Carbonate: Generally less than 10 mg/L.	None	Increase the alkalinity and usually the pH of water. In combination with calcium and magnesium, causes scales in pipes and, upon heating, may release corrosive carbon dioxide.
Sulfate (SO_4)	Dissolved from rocks and soils containing gypsum and sulfide or sulfate minerals. Commonly associated with coal deposits, metallic ore deposits, and geothermal areas. May be derived from industrial wastes and atmospheric pollution.	Generally ranges from 1 to 1,000 mg/L.	Standards: 250 mg/L unless alternate supply unavailable, then 500 mg/L (NCHPS).	Forms boiler scale in combination with calcium. Causes bitter taste when combined in high concentrations with other ions and may have laxative effects when ingested in higher concentrations than an individual is accustomed to. Combines with hydrogen ions in low pH water to form sulfuric acid.
Chloride (Cl)	Dissolved in varying amounts from all rocks and soils. High concentrations may be derived from marine and desert evaporites containing brines. Commonly present in sewage and industrial wastes. May be derived from salts used for control of ice on streets and highways.	Commonly less than 100 mg/L in potable water (Hem, 1985).	Standards: 250 mg/L unless alternate supply unavailable, then 400 mg/L (NCHPS).	May contribute to corrosiveness of water. Imparts salty taste in concentrations as low as 100 mg/L. The chloride ion is very stable in ground water and is often used as a tracer of the movement of wastes in aquifers.

TABLE 1.--Source, significance, and standards or criteria for dissolved constituents and properties of water--Continued

Constituent or characteristic	Source or cause of occurrence	Normal range in concentration	Standards or criteria for use[1]	Significance for use
Fluoride (F)	Dissolved in small amounts from most rocks and soils. Added to many public water supplies to inhibit tooth decay.	Commonly less than 1.0 mg/L in potable natural water (Hem, 1985).	Standards: 1.4 to 2.4 mg/L depending upon average air temperatures (NCHPS).	Concentrations between 0.6 and 1.7 mg/L may have beneficial effects on the structure and resistance to decay of children's teeth. Concentrations in excess of 6.0 mg/L may cause mottling and disfiguration of teeth.
Dissolved solids	Sum of all minerals dissolved from rocks and soils. Concentrations may be increased by industrial wastes or sewage.	Ground water generally in the range of 25 to 1,000 mg/L (Hem, 1985).	Standards: 500 mg/L unless alternate supply not available, then 1,000 mg/L (NCHPS).	General indicator of the mineralization or inorganic chemical content of water. Specific effects upon water uses depend upon the individual constituents present. Water containing more than 1,000 mg/L are unsuitable for most uses.
Nitrate (NO_3)	Derived from the atmosphere or may be leached from decaying organic matter, fertilizers, sewage, industrial wastes, or animal wastes.	0 to 10 mg/L.	Standard: 45 mg/L as NO_3 (10 mg/L as N) (NCHPS).	Concentrations in excess of 45 mg/L (as O_3) may cause methemoglobinemia (infant cyanosis or "blue-baby" syndrome) in infants. May be internally reduced to form nitrite compounds suspected to be carcinogenic. Encourages growth of algae and other organisms that may produce objectionable tastes and odors.
Phosphorus (P), phosphate (PO_4)	Derived from phosphate minerals (notably apatite) common in many rocks and soils. May be present in sewage from human or animal wastes and from additives to synthetic detergents.	--	Recommendation for fresh water aquatic life: 0.025 to 0.05 mg/L as P (EPA).	Encourages growth of nuisance algae in lakes and streams.
Arsenic (As)	Associated with volcanic minerals and metallic ore deposits. Common in water of thermal springs.	--	Standard: 0.05 mg/L (NCHPS).	Toxic to humans, animals, and vegetation.

TABLE 1.--Source, significance, and standards or criteria for dissolved constituents and properties of water--Continued

Constituent or characteristic	Source or cause of occurrence	Normal range in concentration	Standards or criteria for use[1]	Significance for use
Iron (Fe)	Dissolved from iron-bearing minerals present in most rocks and soils. Found in some industrial wastes and can be corroded from pipes, well casings, pumps, and other equipment. Also can be concentrated in wells and springs by certain bacteria.	Concentrations in ground water as high as 1,000 to 10,000 ug/L may be common in some aquifers. Areal distribution is often erratic (Hem, 1985).	Standards: 0.3 mg/L unless alternate supply is unavailable, then 0.6 mg/L (NCHPS).	Oxidizes to a reddish-brown sediment. Stains utensils, enamelware, clothing, and plumbing fixtures. May cause taste and odor problems objectionable for food and beverage processing.
Manganese (Mn)	Dissolved from some rocks, soils, and lake-bottom sediments. Generally associated with iron; often associated with acid drainage from mines.	Generally less than 20 ug/L; usually less than iron.	Standard: 0.10 mg/L (NCHPS).	Oxidizes to dark brown or black sediment. Problems similar to those of iron.
Methylene-blue active substances (MBAS)	Synthetic detergents in domestic and industrial wastes.	Not found in natural water.	None	Objectionable tastes and odors, causes foam. Presence in water serves as an indicator of recent contamination by wastes.

[1] Standards are legal limits for concentrations or values of given constituents in water; criteria are recommended limits for specific water uses, based on current scientific knowledge. Standards and criteria quoted above are for drinking water unless otherwise stated.

The source, normal range, criteria for various types of water use, and significance of various water-quality constituents reported in this study are given in table 1. A comparison of the analyses in table 7 with these standards and criteria indicate that ground water in most of Douglas County is suitable for most drinking-water uses. Concentrations of most constituents generally increase in northerly and easterly directions in Carson Valley.

Table 2 shows the mean concentrations of selected constituents at sites where the depth is less than 200 feet and also where the depth is 200 feet or more. Generally, the ground water from depths of 200 feet or more is of slightly better quality. However, the ratio of the number of sites less than 200 feet deep to the number of sites equal to or greater than 200 feet deep is about 3.5:1, and may reflect some bias.

Comparison of Water-Quality Conditions with Water-Quality Standards

Nevada public drinking-water standards for selected chemical constituents are listed in table 3 (Nevada Legislative Counsel Bureau, 1986). Both primary and secondary standards have been established for community-supply wells. Only primary standards for nitrate and secondary standards for other chemical constituents are applicable for noncommunity supply wells (restaurant, church). State drinking-water standards have not been established for calcium, sodium, potassium, alkalinity, bicarbonate, and carbonate. Nevada public-supply standards are not enforced for individual private water supplies; however, they are used as recommended maximum concentrations (Darrel Rasner, NCHPS, oral communication, 1986).

The following discussions describe the major ions, nitrate, and trace constituents that equaled or exceeded the recommended drinking water standards. Concentrations of copper and zinc exceeded the criteria in one well and two wells, respectively. Concentrations of chloride, magnesium, and barium were within recommended levels in all wells sampled.

Sulfate

Concentrations above 750 mg/L may have a laxative effect on consumers (National Academy of Science and National Academy of Engineering, 1973, page 89). Sulfate concentrations in water from six sites (eight analyses) exceeded the drinking-water standard of 500 mg/L and ranged from 514 to 725 mg/L (table 7). Five sites are in the Johnson Lane area (figures 1 and 21) near Saratoga Hot Springs, where geothermal water probably contributes to the sulfate concentration in the ground water. The sixth site is Saratoga Hot Springs.

TABLE 2.--Statistical data for selected constituents in water from sites less than 200 feet deep and sites greater than or equal to 200 feet deep

[Concentrations, in milligrams per liter, constituents were averaged for sites with more than one analysis; values are rounded.]

Constituent	Number of sites: Less than 200 feet	Number of sites: Greater than or equal to 200 feet	25th percentile: Less than 200 feet	25th percentile: Greater than or equal to 200 feet	50th percentile: Less than 200 feet	50th percentile: Greater than or equal to 200 feet	75th percentile: Less than 200 feet	75th percentile: Greater than or equal to 200 feet	Mean: Less than 200 feet	Mean: Greater than or equal to 200 feet
Calcium	258	76	17	13	27	25	44	39	36	28
Magnesium	252	76	3.0	1.2	6.1	6.1	10	10	7.7	6.5
Sodium	231	69	14	15	25	25	49	50	37	37
Potassium	228	69	2.0	1.0	3.0	2.5	4.0	3.0	2.9	2.5
Bicarbonate	255	76	98	81	130	120	170	180	140	130
Carbonate	251	76	0.0	0.0	0.0	0.0	0.0	1.8	.6	2.0
Sulfate	254	76	13	16	27	24	48	51	60	47
Chloride	256	76	4.0	4.6	7.0	7.0	12	10	11	9.1
Fluoride	230	74	.1	.1	.2	.2	1.4	1.1	.8	.9
Dissolved solids	254	76	160	157	230	215	284	294	267	233
Nitrate as NO_3	250	73	1.2	0.6	3.1	2.4	7.6	4.6	6.2	4.1
Arsenic	214	68	0.00	0.00	< .01	< .01	.02	.02	.01	.01
Barium	53	20	.02	.03	.04	.06	.08	.11	.05	.07
Boron	41	13	.02	.01	.10	.07	.20	.14	.20	.09
Copper	66	30	0.00	0.00	.02	0.00	.05	.02	.07	< .01
Iron	237	74	.02	.02	.06	.10	.17	.30	.20	.23
Manganese	219	65	0.00	0.00	.01	< .01	.02	.02	.03	.02
Zinc	83	32	.03	.01	.14	.02	.34	.10	.30	.30

Fluoride

Fluoride in low concentrations has proven to be helpful in preventing dental caries. Significantly high concentrations of fluoride in drinking water (6 mg/L), however, can produce dental fluorosis (mottling of teeth), which primarily affects children (National Academy of Science and National Academy of Engineering, 1973, page 66).

Fluoride concentrations in water from 44 sites (48 analyses) exceeded the drinking-water standard of 1.8 mg/L and ranged from 1.8 to 5.3 mg/L (table 7). Most excessive fluoride concentrations were in the Johnson Lane and Jacks Valley-Indian Hills areas (figures 1 and 21), where geothermal water may influence the ground-water chemistry. Geothermal water generally contains 1-10 mg/L fluoride (Ellis and Mahon, 1977, page 66).

TABLE 3.--Nevada drinking-water standards for selected chemical constituents

[Concentrations in milligrams per liter]

Primary standard		Secondary standard	
Constituent	Concentration	Constituent	Concentration
Fluoride	[a]1.8	Magnesium	150
Nitrate as NO_3	45	Sulfate as SO_4	500
Arsenic	.05	Chloride	400
Barium	1.0	Dissolved solids	1,000
		Copper	1.0
		Iron	.60
		Manganese	.10
		Zinc	5.0

[a] Recommended maximum concentrations for fluoride are temperature dependent. The 1.8 mg/L is based on the maximum annual average daily air temperature at Minden, Nev., of 66.8 °F.

Dissolved Solids

High concentrations of dissolved solids in drinking water can affect its taste and, like sulfate, can have laxative effects. High concentrations of dissolved solids in drinking water also can corrode or encrust water-supply pipes.

Dissolved-solids concentrations in water from three wells in the Johnson Lane area exceeded the drinking-water standard of 1,000 mg/L and ranged from 1,030 to 1,170 mg/L (table 7). These high concentrations are associated with the high sulfate concentrations near Saratoga Hot Springs (figures 1 and 21). The dissolved-solids concentrations of Saratoga Hot Springs is estimated to be about 1,100 mg/L.

Dissolved-solids concentrations in water from four wells (five analyses) in the Douglas County Airport area (figure 1) were greater than 660 mg/L and averaged 841 mg/L (table 7). Three of these wells have an average depth of about 120 feet; the depth of the fourth well is not known. Average dissolved-solids concentrations from five other wells (eight analyses) in the same area was about 166 mg/L. Four of these wells have an average depth of about 365 feet; the depth of the fifth well is not known. The clay layer mentioned earlier appears to separate the deep wells from the shallow. Dissolved-solids concentrations in water from wells drilled through the clay layer are generally less than 200 mg/L. Dissolved-solids concentrations in water from wells completed above the clay are generally greater than 600 mg/L. Thus, the area of high dissolved-solids concentrations near the airport probably is restricted to the shallower wells (figure 22). For a well having more than one analysis, dissolved-solids concentrations were averaged to provide one point for plotting in figure 22.

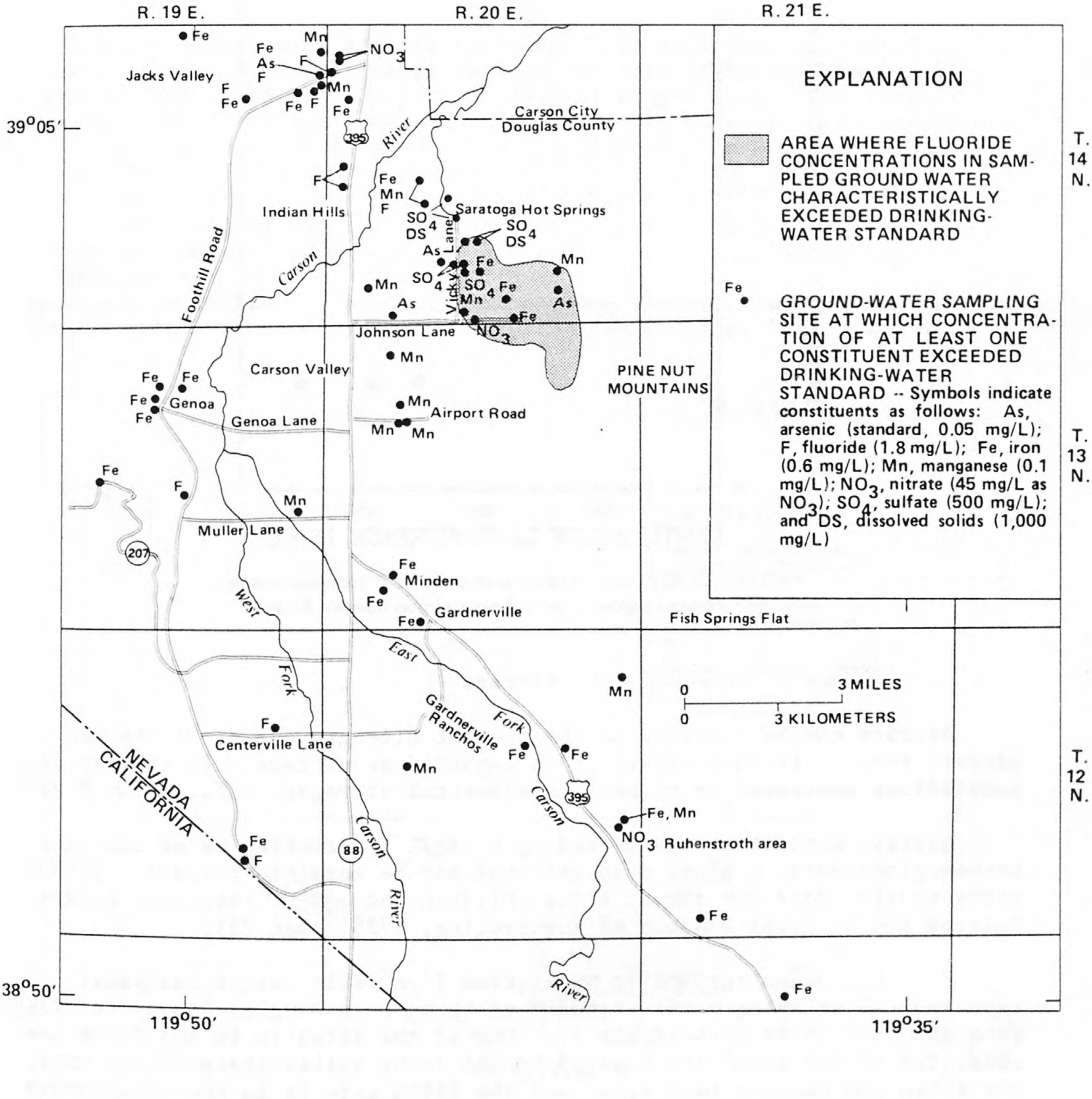


FIGURE 21.--Ground-water sampling sites in northern Douglas County where Nevada drinking-water standards were exceeded.

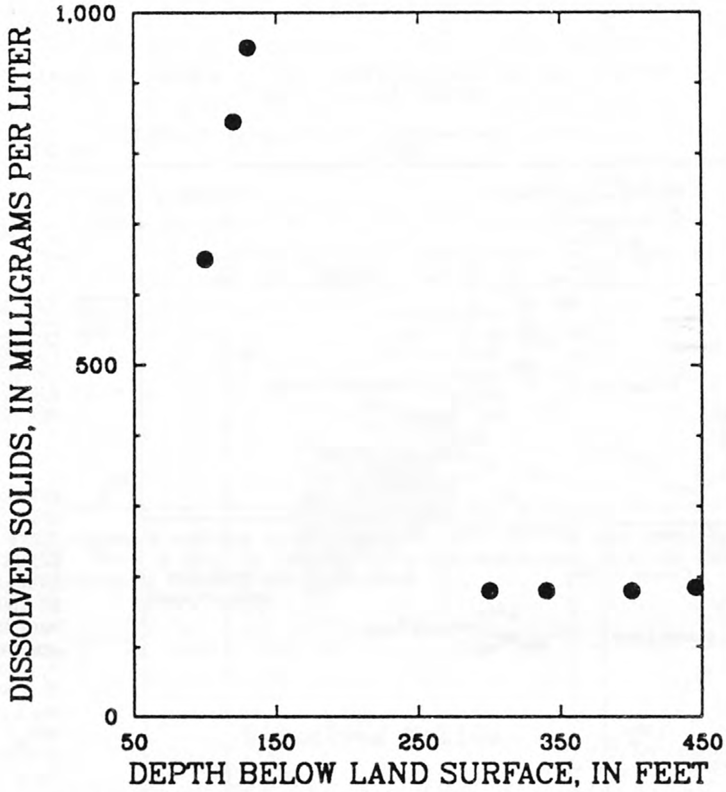


FIGURE 22.--Relation between well depth and dissolved-solids concentration in ground water near Douglas County Airport.

Nitrate

Nitrate can be reported as the element nitrogen (N) or as the ion nitrate (NO_3). In this report it is reported as nitrate. To convert concentrations expressed as nitrate to elemental nitrogen, multiply by 0.2259.

Nitrate concentrations exceeding 45 mg/L in drinking water can cause methemoglobinemia, a blood disorder that may be fatal to infants. This disorder usually does not affect older children and adults (National Academy of Science and National Academy of Engineering, 1973, page 73).

Nitrate concentrations in water from five wells (eight analyses) exceeded the drinking water standard of 45 mg/L in Douglas County and ranged from about 48 to 84 mg/L (table 7). One of the sites is in the Topaz Lake area, two of the sites are located in the Jacks Valley-Indian Hills area, one is in the Johnson Lane area, and the fifth site is in the Ruhenstroth area (figures 21 and 23). Sources of high nitrate in ground water may be from dissolution of mineral deposits, contamination from septic tank effluent, leaching of fertilizers, and buried decomposed natural organic material (Feth, 1966).

Nowlin (1982, page 46) states that elevated nitrate concentrations in the Topaz Lake area may indicate contamination by septic-tank effluent. Although the concentrations did not exceed the drinking-water criteria, they were within 50 percent of applicable State standards for public-water supplies.

Arsenic

Concentrations of arsenic exceeding 0.05 mg/L can cause mild chronic poisoning resulting in fatigue and loss of energy (National Academy of Science and National Academy of Engineering, 1973, page 56). Arsenic concentrations equaled or exceeded the drinking-water standards of 0.05 mg/L in water from 12 wells (21 analyses) in Douglas County and ranged from 0.05 to 0.38 mg/L. Two of the wells are in the Johnson Lane area, one is along Johnson Lane, and another is in the Jacks Valley-Indian Hills area (figure 21). The other eight wells (17 analyses) are in the Topaz Lake area (figure 23), and averaged about 0.15 mg/L of arsenic with a maximum of 0.38 mg/L. The occurrence of arsenic in the Topaz Lake area probably is related to mineralization along the alluvium-bedrock contact at the northern boundary of the alluvial fan (Nowlin, 1982, page 46).

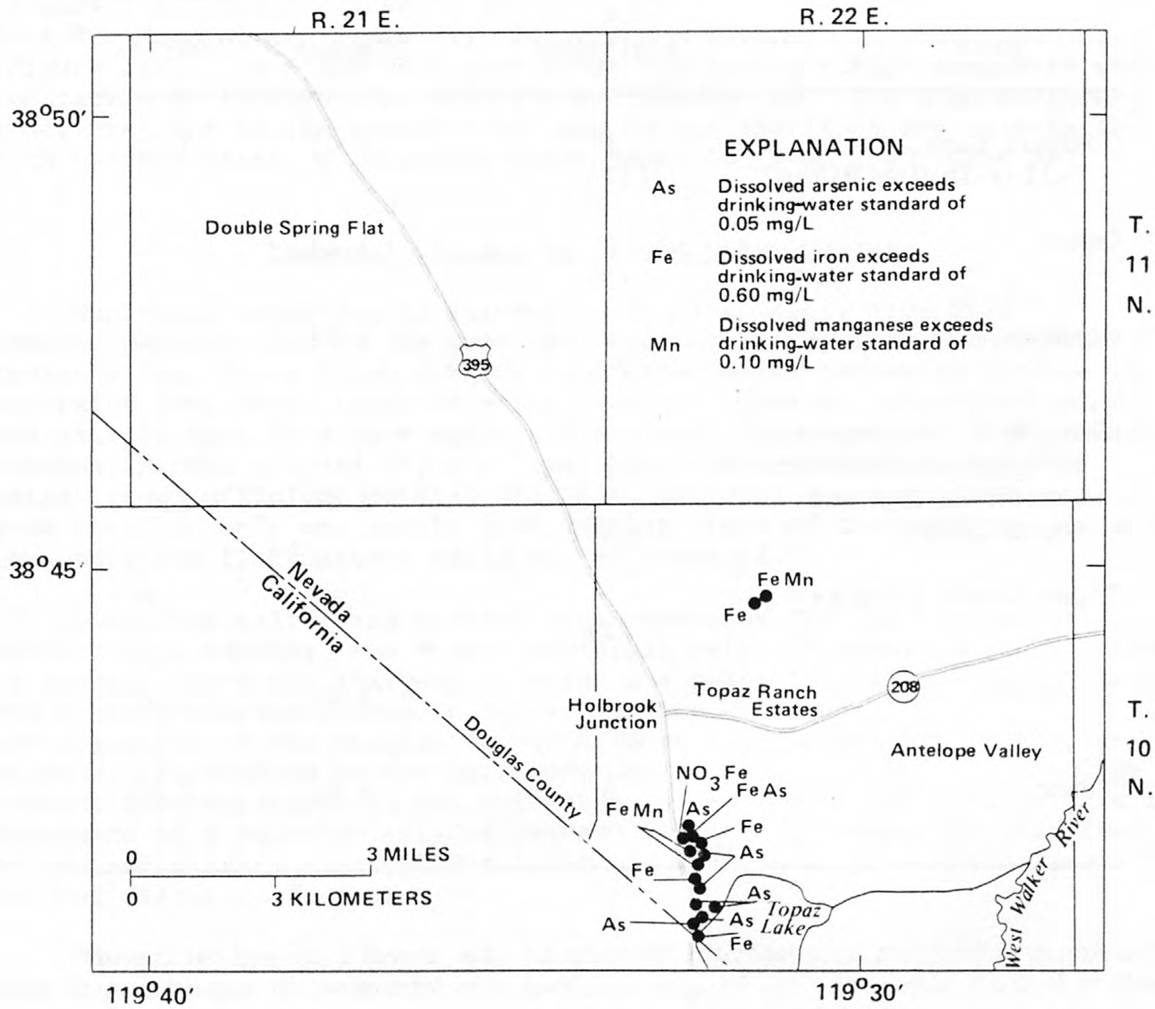


FIGURE 23.--Ground-water sampling sites in southern Douglas County where Nevada drinking-water standards were exceeded.

Iron

Concentrations of iron exceeding 0.30 mg/L in drinking water may make water esthetically unsuitable for use. Excessive iron may cause spotting of laundered clothes, iron deposits in drinking-water supply pipes, and metallic taste (National Academy of Science and National Academy of Engineering, 1973, page 69).

Iron concentrations exceeded the drinking-water standard of 0.60 mg/L in water from 33 wells (39 analyses) in Douglas County (figures 21 and 23) and ranged from 0.63 to 5.6 mg/L.

Area	Number of sites (number of analyses)	Iron concentration (milligrams per liter)	
		Highest	Average
Johnson Lane, Jacks Valley-Indian Hills	6 (7)	2.01	1.05
Genoa	4 (4)	1.13	.93
Minden-Gardnerville	3 (3)	1.76	1.27
Along U.S. Highway 395 between southeastern Carson Valley and Topaz Lake	5 (6)	2.50	1.36
Topaz Ranch Estates	2 (2)	.99	.96
Topaz Lake	7 (11)	3.42	1.46
Other	6 (6)	5.60	2.01

The excessive iron concentrations may be the result of oxidation of reduced iron minerals; or biogeochemical reactions with organic and inorganic materials (Hem, 1985, page 77-84).

Manganese

Concentrations of manganese exceeding 0.05 mg/L affect drinking water in a manner much like iron (National Academy of Science and National Academy of Engineering, 1973, page 71). The spotting of clothes, deposits in pipes and plumbing fixtures, and detectable taste are common problems.

Manganese concentrations equaled or exceeded the drinking-water standard of 0.10 mg/L in water from 18 wells (21 analyses) and ranged from 0.10 to 0.55 mg/L. Four of these are the same shallow wells in the Douglas County Airport area (figures 1 and 21) where the water contained elevated dissolved-solids concentrations. The highest manganese concentration in water from these wells was 0.55 mg/L; the average was 0.26 mg/L. Four wells with water containing high manganese concentrations are in the Jacks Valley-Indian Hills and Johnson Lane areas, two are northwest of Saratoga Hot Springs, and one is between the Carson River and Johnson Lane (figure 21). Six other wells are in the southeastern part of Carson Valley, Pine Nut Mountains (figure 21), Topaz Ranch Estates, and the Topaz Lake area (figure 23). The other well with water containing a high manganese concentration is located near Muller Lane (figure 21). The high manganese concentrations in the ground water may be the result of the association with thermal water or manganese-oxide deposits (Hem, 1985, page 89).

Temporal Changes in Ground-Water Quality

Municipal water-supply systems in Douglas County have been sampled periodically in the past, but few data were available for the Indian Hills, Topaz Ranch Estates, and other small community systems to determine long-term trends in water quality. However, dissolved-solids and nitrate data from four municipal systems--Gardnerville, Gardnerville Ranchos, Minden (figure 24) and Topaz Lodge Subdivision (figure 25) wells--were sufficient to draw graphs of temporal changes. Data points were based on only one sample from varying times of the year, so seasonal concentration fluctuations could not be assessed.

Dissolved-solids and nitrate concentrations for the Gardnerville, Gardnerville Ranchos, and Minden municipal wells (figures 26 and 27) showed no overall trend for analyses spanning the years 1969-83. Dissolved-solids and nitrate concentrations in the wells were statistically correlated with precipitation at the Douglas County Airport to determine if a relation existed. Streamflow in the East Fork Carson River and dissolved-solids and nitrate concentrations in the wells were also statistically correlated to determine if a relation existed between wet and dry years and dissolved solids and nitrate fluctuations. Correlations were generally poor and are not discussed further.

Though no overall trend was observed, the temporal changes do not appear to be due to seasonal changes, precipitation, or streamflow. The temporal changes may be the result of a combination of changes in land use, improved collection techniques, improved analytical methods, or inaccuracies in the data.

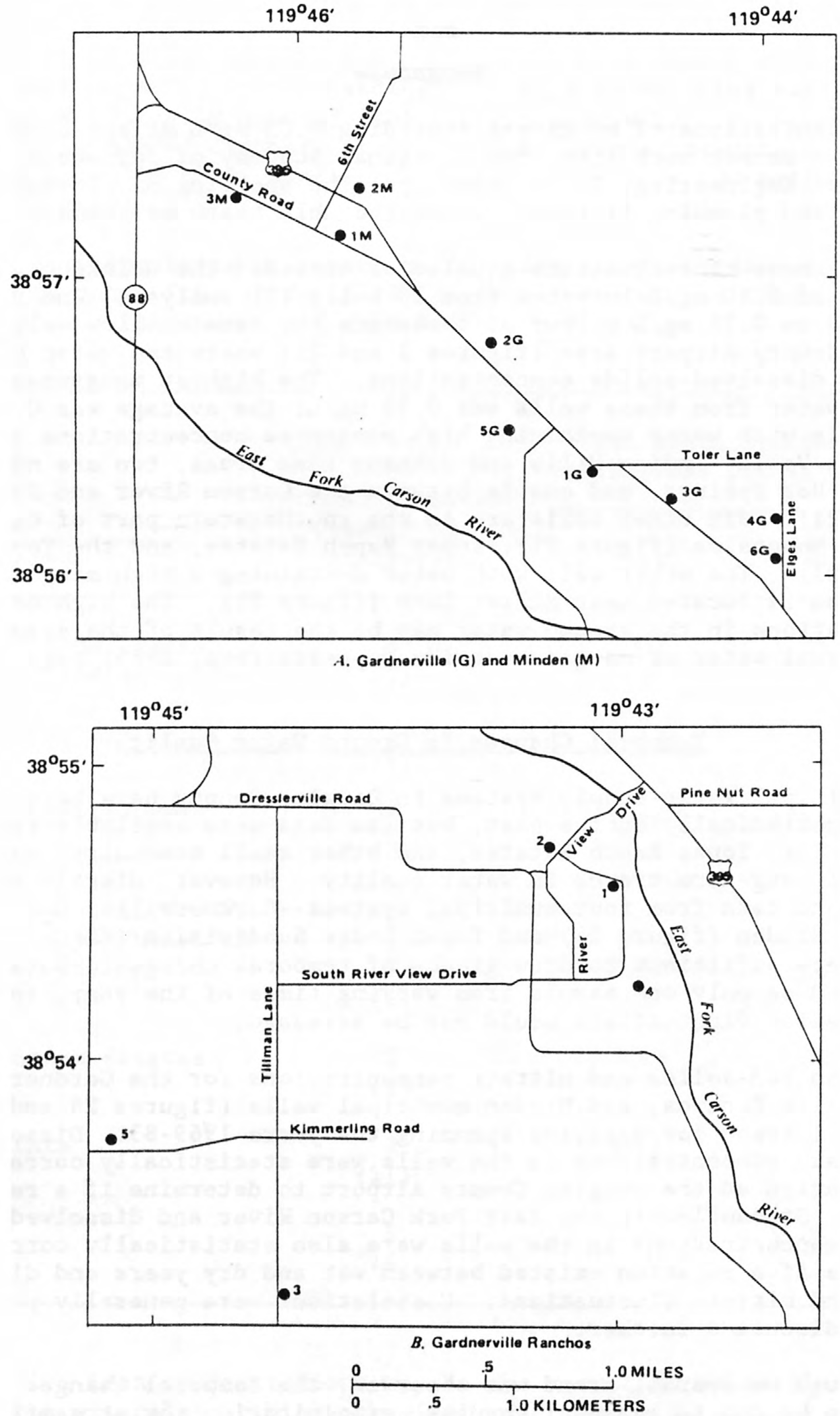


FIGURE 24.–Municipal wells in Minden, Gardnerville, and Gardnerville Ranchos. Well numbers are indicated and are referenced to figures 26 and 27.

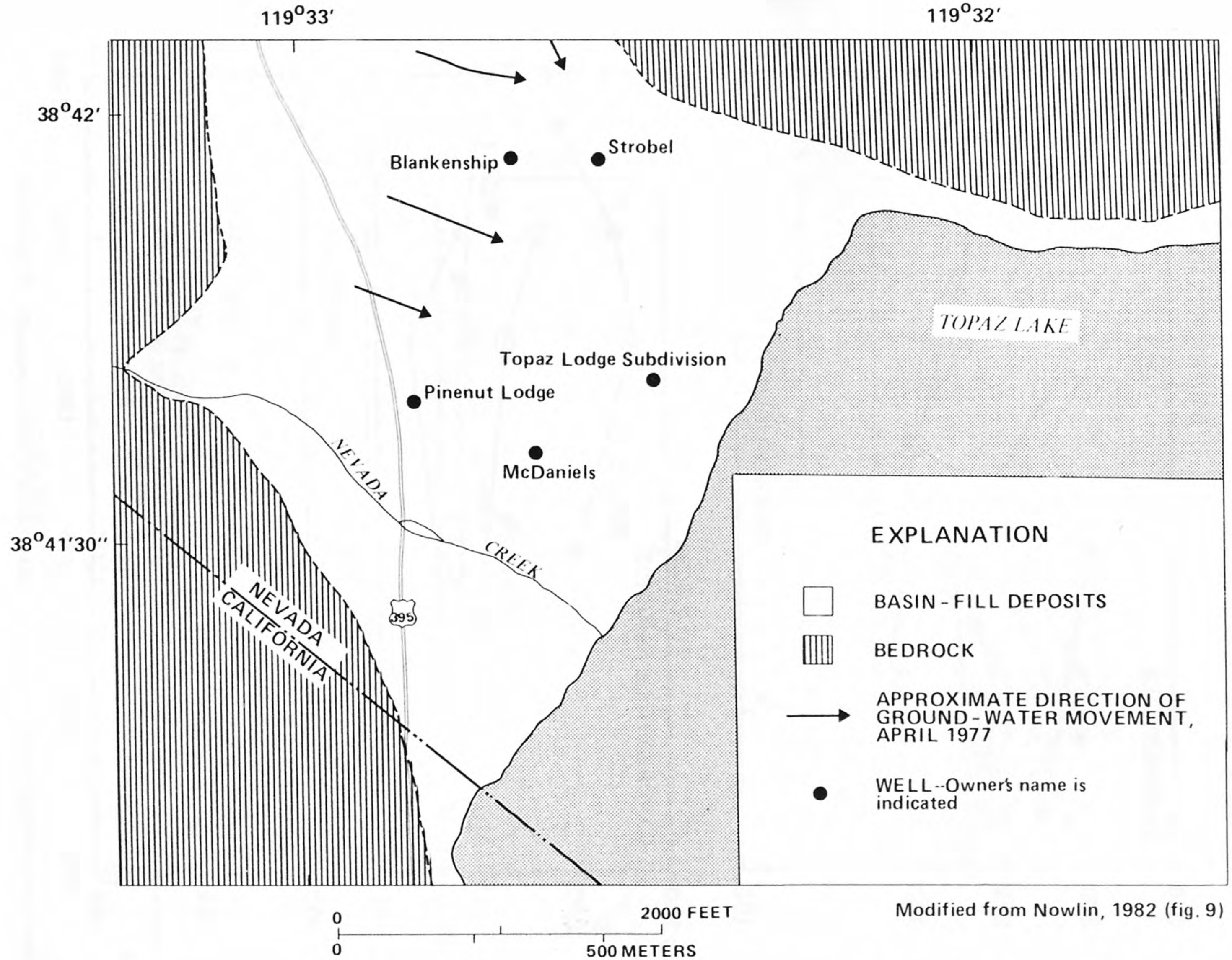


FIGURE 25.--Topaz Lodge Subdivision well and four other wells near Topaz Lake.

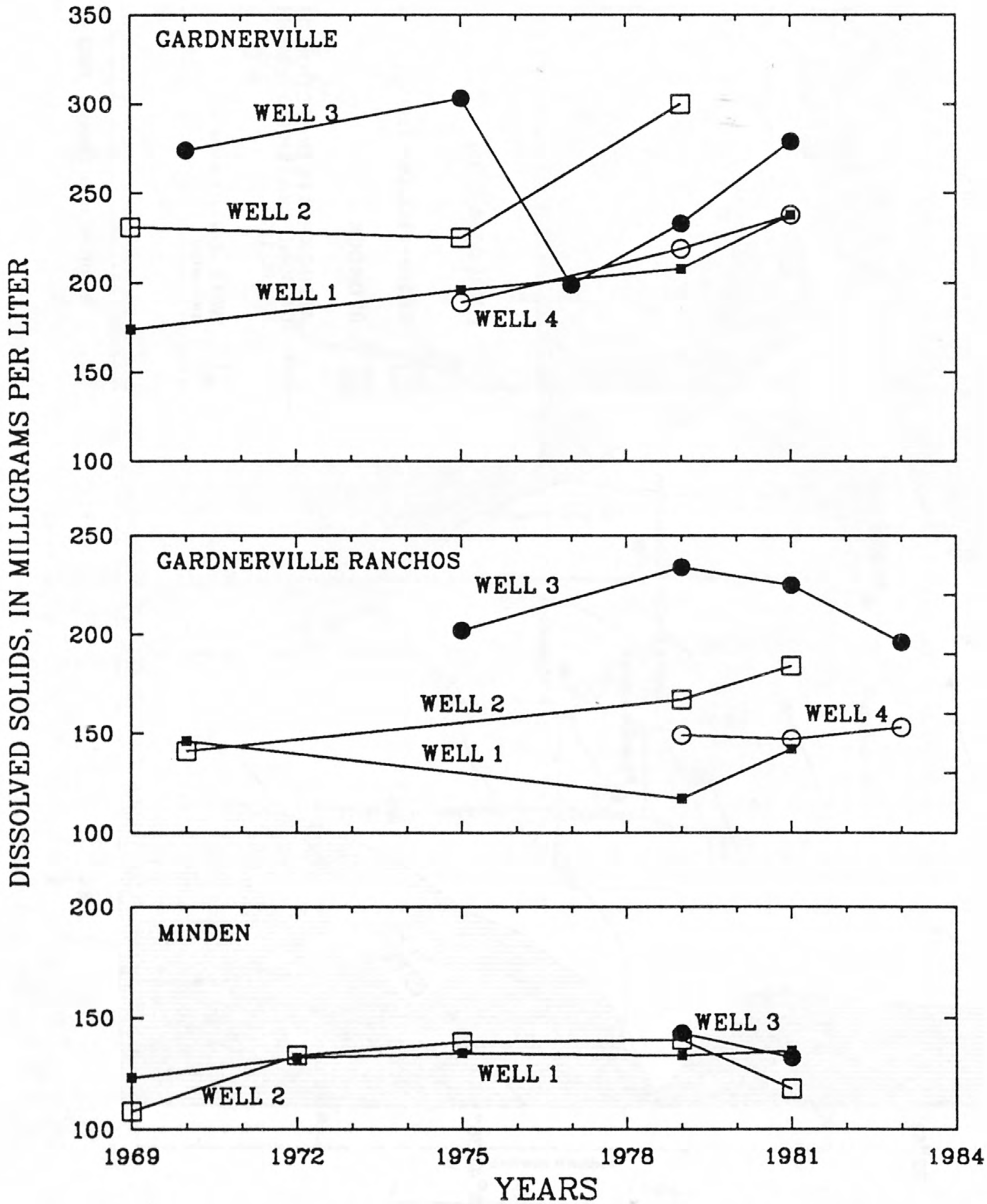


FIGURE 26.--Changes in dissolved-solids concentration with time in water from municipal wells.

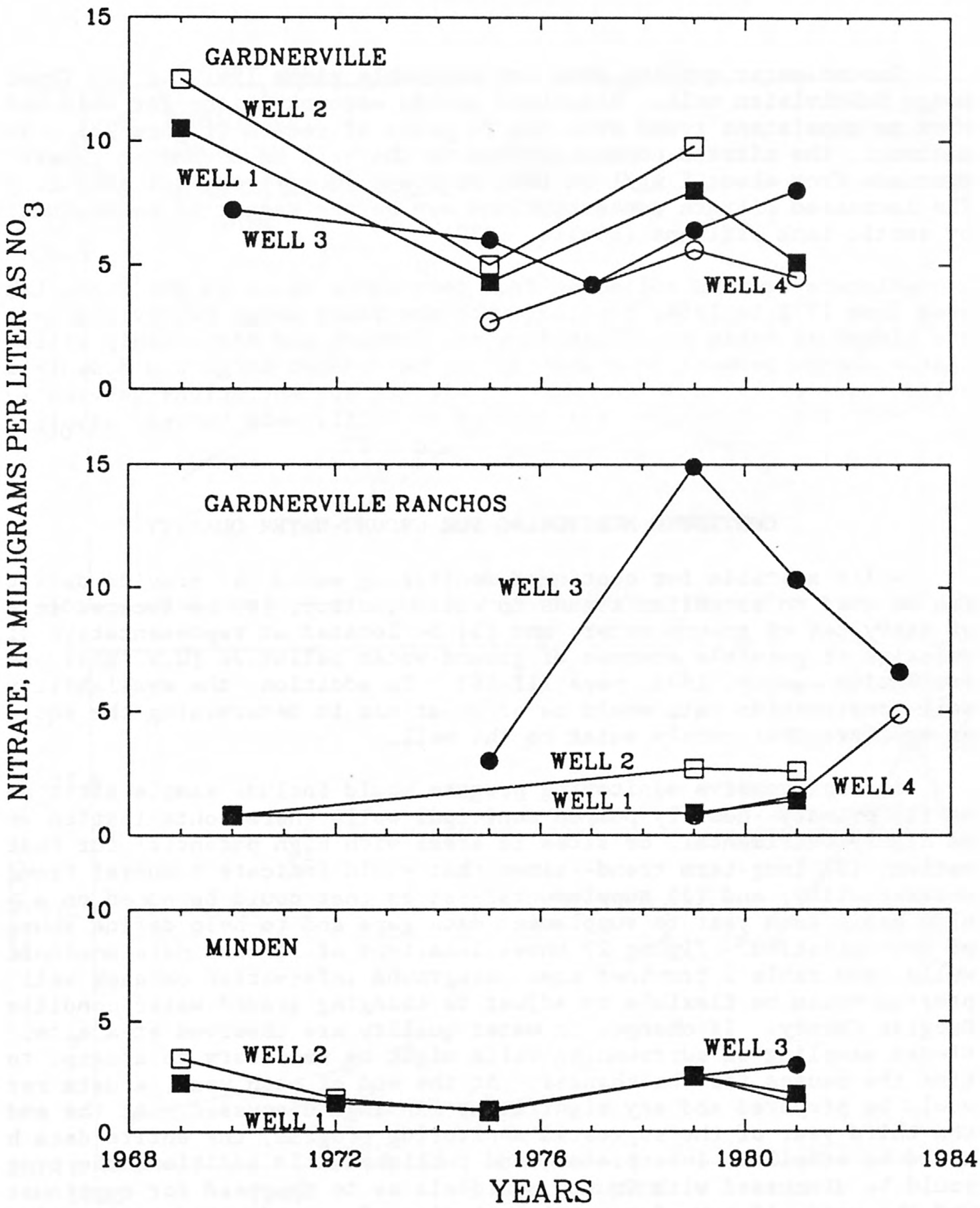


FIGURE 27.--Changes in nitrate concentration with time in water from municipal wells.

Ground-water quality data are available since 1961 for the Topaz Lodge Subdivision well. Dissolved-solids concentrations for this well show no consistent trend over the 24 years of record (figure 28). In contrast, the nitrate concentrations in the well have shown a general increase from about 2 mg/L in 1961 to about 12 mg/L in 1984 (figure 28). The increased nitrate concentrations may be the result of contamination by septic-tank effluent (Nowlin, 1982).

Nitrate samples collected from four other wells in the Topaz Lake area from 1972 to 1984, together with the Topaz Lodge Subdivision samples, are listed in table 4. Water from the Strobel and Blankenship wells show little change between 1977 and 1983. The Pinenut Lodge and McDaniels wells, however, show an increase in nitrate concentrations between 1977 and 1983. This might have been due to the difference between sample-preservation procedures used in 1977 and 1983.

CONTINUED MONITORING FOR GROUND-WATER QUALITY

Wells suitable for continued monitoring would (1) provide data that can be used to establish trends in water quality, (2) be located in areas of heavy use of ground water, and (3) be located at representative sites relative to possible sources of ground-water pollution (U.S. Environmental Protection Agency, 1975, page III-16). In addition, the availability of well-construction data would be of great use in determining the aquifer or aquifers that supply water to the well.

A comprehensive monitoring program would include sample sites defined as (1) primary--heavily pumped municipal wells where contamination would be highly detrimental, or sites in areas with high potential for contamination; (2) long-term trend--sites that would indicate temporal trends in water-quality; and (3) supplemental--sites that could be added on a one-time basis each year to supplement data gaps and to help define sources of contamination. Figure 29 shows locations of 31 candidate monitoring wells, and table 5 provides some background information on each well. The program would be flexible to adjust to changing ground-water conditions in Douglas County. If changes in water quality are observed at a site, additional sampling of surrounding wells might be necessary to attempt to define the causes for the changes. At the end of each year, a data report would be prepared and any significant findings discussed. At the end of the third year of the suggested monitoring program, the entire data base would be compiled, interpreted, and published. In addition, the program would be discussed with County officials as to the need for continuation and the need, if any, for special studies of ground-water quality in Douglas County.

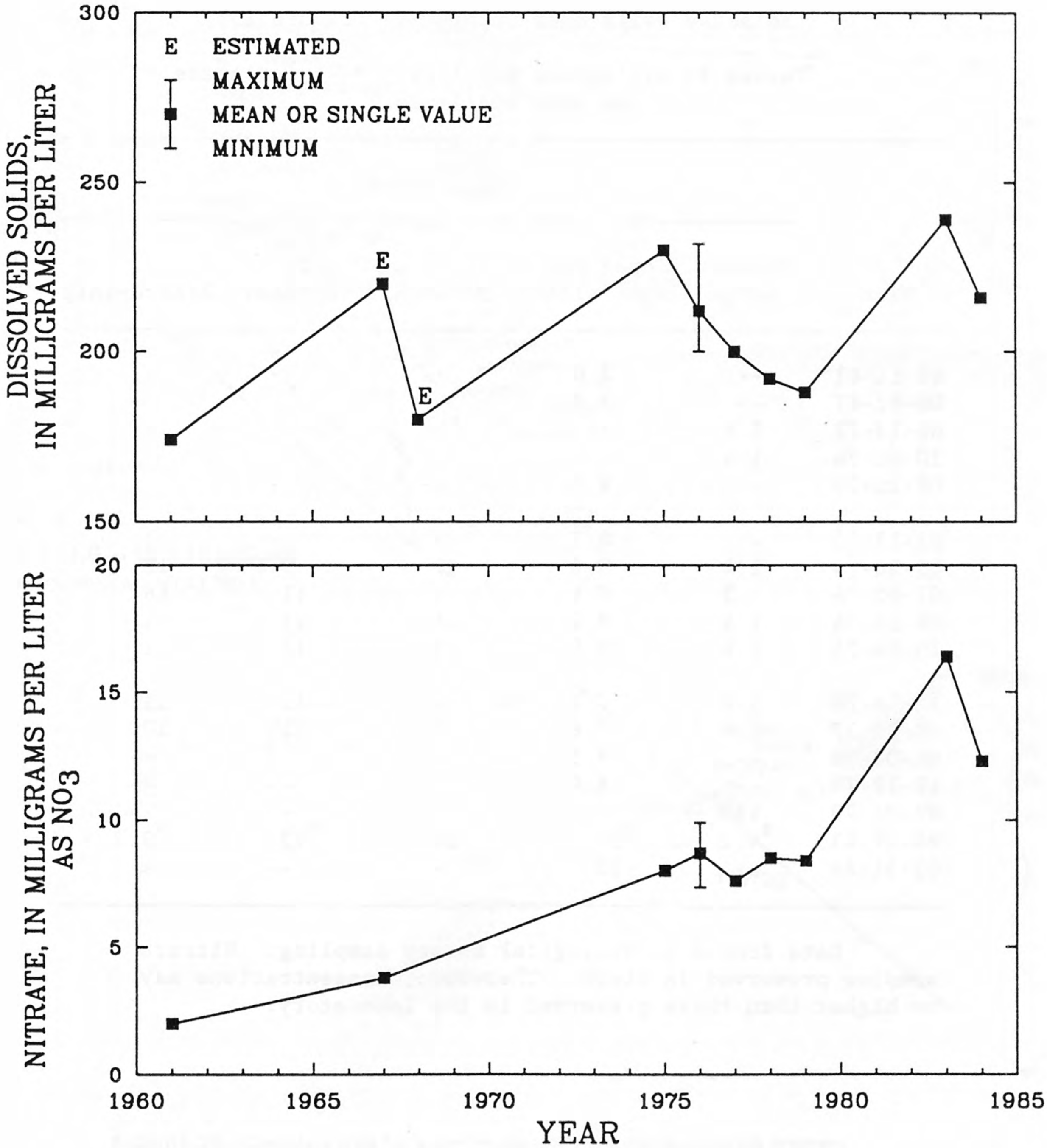


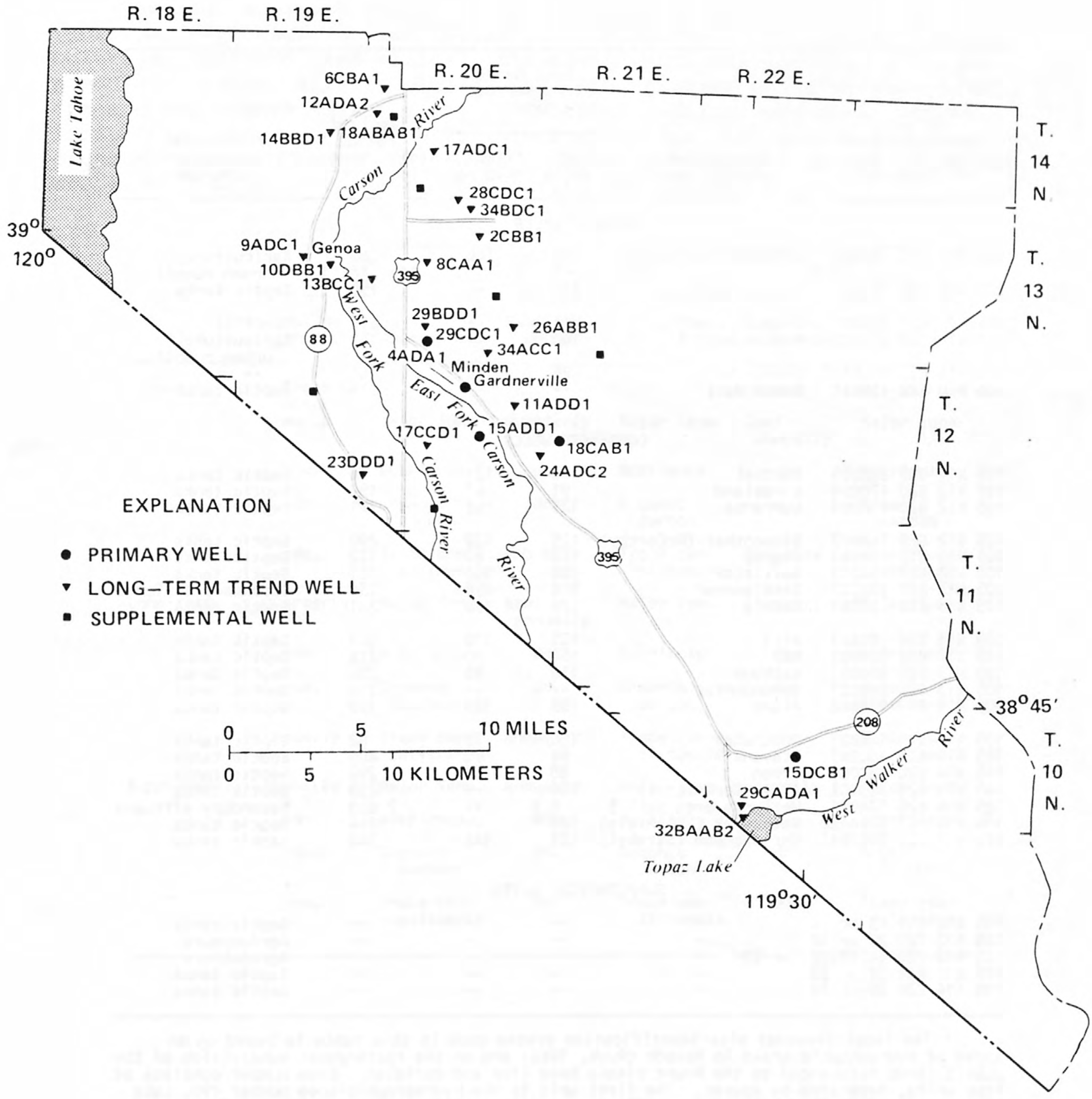
FIGURE 28.--Changes in dissolved-solids and nitrate concentrations with time in water from the Topaz Lodge Subdivision well near Topaz Lake.

TABLE 4.--Concentrations of nitrate (as NO_3) in water from selected wells near Topaz Lake (figure 25)

[Values in milligrams per liter; "--" indicates no data available.]

	Well owner				
Date	Pinenut Lodge	Topaz Lodge Subdivision	J. McDaniels	F. Strobel	J. Blankenship
09-11-61	--	2.0	--	--	--
06-02-67	--	3.8	--	--	--
06-13-72	1.8	--	--	--	--
10-02-74	1.6	--	--	--	--
09-26-75	--	8.0	--	--	--
02-17-76	--	8.7	9.6	--	11
05-20-76	1.4	9.8	11	9.5	12
07-02-76	.3	9.6	14	11	16
08-16-76	1.6	8.2	16	11	14
10-26-76	1.6	8.0	15	11	11
12-16-76	1.8	7.7	11	11	11
03-02-77	1.4	7.6	9.2	11	10
06-08-78	--	8.5	--	--	--
10-18-79	--	8.4	--	--	--
07-26-79	1.3	--	--	--	--
08-17-83	[a]4.2	[a]16	[a]20	[a]12	[a]9.7
01-31-84	--	12	--	--	--

[a] Data from U.S. Geological Survey sampling. Nitrate samples preserved in field. Therefore, concentrations may be higher than those preserved in the laboratory.



EXPLANATION

- ● PRIMARY WELL
- ▼ LONG–TERM TREND WELL
- ■ SUPPLEMENTAL WELL

0 5 10 MILES

0 5 10 KILOMETERS

FIGURE 29.--Candidate sites for a continuing ground-water monitoring program. Abbreviated local well numbers (table 5) are indicated for primary and trend wells.

TABLE 5.--Data on candidate sites for a continuing ground-water monitoring program

["--" indicates no data available]

Site identification[1] (see fig. 29 for location)	Name of owner (former owner)	Feet below land-surface datum: Total depth	Feet below land-surface datum: First opening	Dissolved solids (milligrams per liter)	Potential contaminant sources
PRIMARY WELLS					
105 N12 E20 4ADA1	Gardnerville Well 6	300	100	266	Agriculture, urban runoff
105 N12 E20 15ADD1	Ranchos Well 4	370	--	150	Septic tanks
105 N12 E21 18CAB1	Douglas Landfill	--	--	219	Landfill
105 N13 E20 29CDC1	Minden Well 1	398	--	131	Agriculture, urban runoff
105 N14 E20 18ABAB1	Impala Well	425	151	166	--
106 N10 E22 15DCB1	Ranch Well	--	--	316	Septic tanks
LONG-TERM WELLS					
105 N12 E19 23DDD1	Casteel	141	121	74	Septic tanks
105 N12 E20 17CCD1	Kingsland	91	67	150	Septic tanks
105 N12 E20 11ADD1	Currence	125	105	191	Septic tanks
105 N12 E20 24ADC2	Blumenthal (McCarthy)	145	122	290	Septic tanks
105 N13 E19 10DBB1	Rogney	115	80	132	Septic tanks
105 N13 E19 9ADC1	Hollister	180	156	182	Septic tanks
105 N13 E19 13BCC1	Settlemeyer	518	150	134	Secondary effluent
105 N13 E20 2CBB1	Hastie	176	156	261	Septic tanks
105 N13 E20 8CAA1	Witt	135	110	951	Septic tanks
105 N13 E20 26ABB1	May	150	90	226	Septic tanks
105 N13 E20 29BDD1	Rathbun	118	93	286	Septic tanks
105 N13 E20 34ACC1	Spoonhunter	--	--	216	Septic tanks
105 N14 E19 12ADA2	Plume	155	120	159	Septic tanks
105 N14 E19 14BBD1	Southwick	100	76	82	Septic tanks
105 N14 E20 6CBA1	Stevens	94	70	409	Septic tanks
105 N14 E20 28CDC1	Erven	88	68	290	Septic tanks
105 N14 E20 34BDC1	Avey (Bernasconi)	100	--	233	Septic tanks
105 N14 E20 17ADC1	Wetlands area well 5	8.5	--	2,650	Secondary effluent
106 N10 E22 32BAAB2	Ratkoviak (McDaniels)	160	--	264	Septic tanks
106 N10 E22 29CADA1	Christenson (Strobel)	183	140	348	Septic tanks
SUPPLEMENTAL SITES					
105 N12 E19 3 or 4	--	--	--	--	Septic tanks
105 N12 E20 29 or 32	--	--	--	--	Agriculture
105 N13 E20 14,15,22, or 23	--	--	--	--	Agriculture
105 N13 E21 32 or 33	--	--	--	--	Septic tanks
105 N14 E20 29 or 32	--	--	--	--	Septic tanks

[1] The local (Nevada) site-identification system used in this table is based on an index of hydrographic areas in Nevada (Rush, 1968) and on the rectangular subdivision of the public lands referenced to the Mount Diablo base line and meridian. Each number consists of four units, separated by spaces. The first unit is the hydrographic-area number (90, Lake Tahoe basin; 102, Churchill Valley; 105, Carson Valley; 106, Antelope Valley). The second unit is the township, preceded by an N to indicate location north of the base line. The third unit is the range, preceded by an E to indicate location east of the meridian. The fourth unit consists of the section number and letters designating the quarter section, quarter-quarter section, and so on (A, B, C, and D indicate the northeast, northwest, southwest, and southeast quarters, respectively), followed by a number indicating the sequence in which the well was recorded. For example, well 105 N12 E20 4ADA1 is in Carson Valley. It is the first well recorded in the NE 1/4 of the SE 1/4 of the NE 1/4 of section 4, Township 12 North, Range 20 East, Mount Diablo base line and meridian.

Chemical analyses would include major dissolved constituents (calcium, magnesium, sodium, potassium, bicarbonate, carbonate, sulfate, chloride, fluoride, and silica), dissolved nutrients (organic nitrogen, ammonia, nitrite, nitrite plus nitrate, phosphorus, and orthophosphate), trace constituents (arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, and zinc), and dissolved organic carbon. The following table shows the sites, sampling frequency, and constituents to be determined during the program.

	First year		Second year		Third year	
Site	Sampling frequency	Constituents	Sampling frequency	Constituents	Sampling frequency	Constituents
Primary	Every other month	Major ions	Quarterly	Major ions	Semi-annually	Major ions
	do.	Nutrients	do.	Nutrients	do.	Nutrients
	do.	Organic carbon	do.	Organic carbon	do.	Organic carbon
	do.	Trace constituents	Annually	Trace constituents	Annually	Trace constituents
Long-term	Quarterly	Major ions	Semi-annually	Major ions	Annually	Major ions
	do.	Nutrients	do.	Nutrients	do.	Nutrients
	do.	Organic carbon	do.	Organic carbon	do.	Organic carbon
	Annually	Trace constituents	Annually	Trace constituents	do.	Trace constituents
Supplemental	Annually	Major ions	Annually	Major ions	Annually	Major ions
	do.	Nutrients	do.	Nutrients	do.	Nutrients
	do.	Organic carbon	do.	Organic carbon	do.	Organic carbon
	do.	Trace constituents	do.	Trace constituents	do.	Trace constituents

SUMMARY AND CONCLUSIONS

During the last decade, Douglas County, Nev., experienced a 182-percent increase in population. Ground water is the principal source of drinking water for much of the county, especially in Carson Valley (figure 1). Carson Valley is noted for its irrigated agriculture, light industry, and housing development. In recent years, withdrawal of ground water for agricultural purposes has decreased, whereas the use of ground water for domestic purposes has increased. Rapid population growth in Douglas County has concerned local decisionmakers about present and future effects of development on ground-water quality (and quantity).

This report defines the general quality of sampled ground water, by mainly using data from 1959 to 1984; and examines water-quality trends in time and space in Douglas County. A summary of water-quality information for sampled ground water, by major populated areas, is given in table 6. The amount of data in the Lake Tahoe area and in sparsely populated outlying areas of the county is limited; therefore, these data are not included in table 6.

In general, the quality of ground water in much of the county meets drinking-water standards and criteria and is, therefore, suitable for most purposes. In Carson Valley, concentrations of most constituents generally increase in a northerly and easterly direction, corresponding to the direction of ground-water flow. Countywide, calcium and sodium are the predominant cations, and bicarbonate is the predominant anion in the sampled ground water. The ionic type of ground water most common throughout the study area are calcium-bicarbonate, sodium-bicarbonate, and calcium-sodium or sodium-calcium bicarbonate.

A statistical evaluation of constituents in ground water indicates that sodium, arsenic, iron, manganese, and zinc each have a single statistical "population," whereas dissolved solids, calcium, magnesium, bicarbonate, sulfate, chloride, fluoride, and nitrate each have two discrete "populations." Because of known hydrogeologic conditions in certain areas of Douglas County, the two data distributions may be caused by: Water flowing from metasedimentary rocks into alluvial-fan deposits in the Topaz Lake area; water above the clay layers underlying the Douglas County Airport; and geothermal water in the Jacks Valley-Indian Hills and Saratoga Hot Springs areas.

The concentrations of most chemical constituents in ground water in Douglas County meet drinking-water standards. Water samples that exceeded drinking-water standards for fluoride, nitrate, arsenic, iron, and manganese were found in the Jacks Valley-Indian Hills area; for sulfate, fluoride, dissolved solids, nitrate, arsenic, iron, and manganese in the Johnson Lane area; for iron in wells in the Genoa, Minden-Gardnerville, and Gardnerville Ranchos areas; for manganese in shallow wells near the Douglas County Airport; for nitrate, iron, and manganese in wells in the Ruhenstroth area; and for nitrate, arsenic, iron, and manganese in the Topaz Lake area (figures 21, 23, and table 7).

TABLE 6.--Summary of water-quality information for sampled ground water, by major populated area

[N, number of sites; Max., maximum; Min., minimum; E, estimated]

Area[3]	Site depth[1]				Dissolved solids[2]				Constituents exceeding drinking-water criteria[4]	Potential sources of contamination
	N	Median	Max.	Min.	N	Median	Max.	Min.		
Entire county	264	145	580	0	327	228	1,170	50	See below	See below
Jacks Valley-Indian Hills	22	134	350	94	23	182	409	97	Arsenic 1/23 (0.05) Fluoride 3/23 (2.0) Iron 3/23 (1.03) Manganese 2/21 (0.20) Nitrate 2/22 (69.5)	Septic tanks
Johnson Lane	45	135	420	60	64	272	1,170	204	Arsenic 2/64 (0.065) Dissolved solids 3/64 (1,170) Fluoride 33/65 (5.3) Iron 3/64 (2.01) Manganese 2/62 (0.39) Nitrate 1/65 (70) Sulfate 5/65 (725)	Septic tanks
Saratoga Hot Springs	1	0	--	--	1	1,100E	--	--	Dissolved solids Sulfate (678)	Geothermal water
Genoa	9	159	225	83	14	145	182	91	Iron 4/14 (1.13)	Septic tanks
Douglas County Airport	8	298	440	100	9	186	951	160	Manganese 4/9 (0.55)	Agriculture
Minden-Gardnerville	13	300	398	90	14	234	344	130	Iron 3/14 (1.76)	Agriculture, urban runoff
Ruhenstroth	13	169	480	100	15	285	519	238	Iron 1/15 (2.50) Manganese 1/15 (0.80) Nitrate 1/15 (84)	Septic tanks
Gardnerville Ranchos	11	200	450	77	11	162	382	115	Iron 1/11 (2.45)	Urban runoff
Topaz Lake	24	165	318	0	30	234	536	154	Arsenic 8/30 (0.38) Iron 7/30 (3.42) Manganese 2/29 (0.56) Nitrate 1/30 (48)	Septic tanks, urban runoff

[1]Depth, in feet below land surface.
[2]Concentration, in milligrams per liter.
[3]See figure 1 for location.
[4]For each constituent: number to left of slash indicates number of sites exceeding criteria; number to right of slash indicates total number of sites; and number in parentheses is maximum determined concentration, in milligrams per liter.

Ground water in the west-central, northern, and northeastern part of Carson Valley is influenced by mixing with geothermal water.

Dissolved-solids and nitrate concentrations in water from the Gardnerville, Gardnerville Ranchos, and Minden municipal wells indicated no overall trend for the years from 1969 to 1983. Dissolved-solids concentrations in water from the Topaz Lodge Subdivision well indicated no consistent trend from 1961 to 1984. In contrast, nitrate concentrations in water from the Topaz Lodge Subdivision well indicated a general increase from 1961 to 1984.

These conclusions are based primarily on water-quality data from the historical data base, which consists largely of analyses for major dissolved constituents and a limited number of trace elements. Because of the paucity of available data concerning manmade organic compounds and indicator bacteria, an evaluation of these variables in ground water of Douglas County was beyond the scope of this study.

A comprehensive program for future monitoring of ground-water quality in Douglas County would need to include periodic sampling of primary (heavily pumped or high potential for contamination) wells, long-term trend (possible changes with time) sites, and supplemental (to supplement data gaps) sites. The frequency of sample collection could be quarterly or more frequent for the heavily used wells and sites used for determining long-term water-quality trends during the first year, and probably annually for the supplemental wells. Frequency of sample collection after the first year might be changed for the heavily pumped wells and sites with possible changes in time to meet changing needs for problem identification. Supplemental wells would be selected and sampled as considered necessary.

BASIC DATA ON GROUND-WATER QUALITY

The following tabulation includes analytical results for 546 samples from 333 ground-water sites (wells and springs). The sites are listed in order of increasing hydrographic-area, township, range, and section numbers.

Each sample has been assigned a sequential reference number (from 1 through 546). The site information and analytical results for each sample are listed herein, by reference number, in four groups of data (group 1, pages 65-74; group 2, pages 75-84; group 3, pages 85-94; and group 4, pages 95-104). For example, data for sample number 35 appear in four places: on pages 65, 75, 85, and 95.

TABLE 7.--Water-quality data

Site Identification: Indicates section number, location within the section, and sequence number. See table 5, footnote 1 (p. 58), for description of complete site-numbering system.

Total depth of well: Sources of information: L, driller's log (on file at Nevada Division of Water Resources, Carson City); M, measured in field; R, reported. Reported depths should be considered approximate due to inconsistencies between using land surface or top of casing as datum.

Analyst: D, Douglas County Sewer Improvement District No. 1; E, Environmental Science Laboratory; N, Nevada State Health Laboratory; U, U.S. Geological Survey.

Solids, residue: "c" indicates computed dissolved-solids sum with bicarbonate multiplied by 0.492 to make result comparable with residue value.

Abbreviations: E, estimated; MG/L, milligrams per liter; NTU, nephelometric turbidity units.

REF. NO.	SITE IDENTI-FICATION	NAME	LOCATION	TOTAL DEPTH OF WELL (FEET)	DATE SAMPLED MONTH	DAY	YEAR	ANA-LYST
			Lake Tahoe basin (90), T. 13 N., R. 18 E.					
1	3CDD1	DOUGLAS COUNTY FIRE	ZEPHYR COVE	95L	7	11	1963	N
2	3CDD2	DOUGLAS COUNTY SCHOOL	GEORGE WHITTELL HIGH SCHOOL	264L	7	11	1963	N
3					1	2	1973	N
			Lake Tahoe basin (90), T. 14 N., R. 18 E					
4	3D	GLENBROOK GOLF COURSE	GLENBROOK	0M	6	20	1961	N
			Churchill Valley basin (102), T. 14 N., R. 22 E.					
5	13D1	SUNRISE CAMP SPRING	N14E2213D	0M	9	17	1979	N
6	13D2	SUNRISE CAMP SPRING	N14E2213D	0M	9	17	1979	N
			Carson Valley basin (105), T. 11 N., R. 20 E.					
7	7ADC1	NEDDENRIEP	0.9MI S STATELINE .3MI E 395	--	8	24	1983	U
			Carson Valley basin (105), T. 11 N., R. 21 E.					
8	9ABD1	B. ZERBY	CARTERS STATION	140R	6	19	1981	N
9	9A1	VETA GRANDE MINE	N11E219A	--	5	22	1975	N
10	9BAA1	ELDON HANNEMAN	CARTERS STATION	175R	7	16	1978	N
11	20CD1	DOUD SPRING	DOUBLE SPRING FLAT AREA	0R	5	7	1970	U
12	22DDB1	ALFRED KNOOP	DOUBLE FLAT	180R	8	20	1973	N
13					4	--	1977	N
14	26BA1	DOUBLE SPRING	DOUBLE SPRING FLAT AREA	0R	5	6	1970	U
15	26BCA1	DANIEL HUDDY	DOUBLE SPRING FLAT AREA	145L	11	24	1980	N
16	35ADD1	LUDEL	DEAD HORSE FLAT AREA	175L	3	4	1981	N
			Carson Valley basin (105), T. 11 N., R. 22 E.					
17	9B1	MILL CANYON SPRING N	N11E229B	0R	9	17	1979	N
18	9B2	MILL CANYON SPRING N	N11E229B	0R	9	17	1979	N
			Carson Valley basin (105), T. 12 N., R. 19 E.					
19	2BDD1	FEIL ARTESIAN	ON MOTTSVILLE LN 2MI W 395	262R	8	18	1983	U
20	3BBA1	PAUL BRITTENDAHL	228 BEVERLY	--	10	28	1980	N
21	3BBA3	GENE WALTERS	232 BEVERLY	--	3	22	1982	N
22	3BBC1	JOE VARGA	274 BEVERLY	--	9	8	1980	N
23	3BBC2	M.BRODIE	FOOTHILL	94R	2	6	1980	N
24	3BCB1	H.M. EVANS	MOTT COURT	115R	10	19	1978	N
25	3CDC1	CRAIG LODATO	1207 FOOTHILL ROAD	90R	9	10	1978	N
26	11CDC1	BROCKLISS ARTESIAN	ON CNTRVILLE LN 2.2MI W 395	60R	8	18	1983	U
27	12CCC1	SAYED	1008 MARSHA LANE	117R	5	--	1977	N
28	13BAA1	BIEGELOW ARTESIAN	ON CNTRVILLE LN 1.1MI W 395	222R	8	18	1983	U
29	14CCA1	TED WHITE	797 FOOTHILL	--	10	28	1980	N
30	15AAB1	KENNETH PINNON	986 BOLLEN CIRCLE	300R	11	--	1977	N
31	15BBB1	TOMERLIN	FOOTHILL	176R	9	--	1976	N
32	23BAA1	INDIAN ROAD RANCH	FOOTHILL ROAD	--	10	3	1974	N
33	23BDA2	NORMAN MCMURRAY	741 INDIAN TRAIL	82R	4	25	1978	N
34	23DDD1	GARY CASTEEL	581 GREEN ACRES	141L	11	3	1980	N
35	25CDD1	HERITAGE RANCH	0.1MI N FAIRVIEW LN 1MI W 395	--	8	24	1983	U
36	26AAB1	AL WASKOVIAK	567 GREEN ACRES	100R	4	--	1976	N
37	26ABB2	PEDRO VILLALOBOS	507 GREEN ACRES	122L	10	9	1979	N
38	26ACC1	DAVID HELLWINKEL	500 FOOTHILL	--	12	16	1981	N
39	26BAD1	CASINELLA	SE CORNER GREEN ACRES FOOTHILL	--	9	8	1980	N

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Carson Valley basin (105), T. 12 N., R. 20 E.					
40	1DCC1	NANCIE COZZA	1228 FISH SPRINGS ROAD	--	3	4	1982	N
41	1DCD1	SKINNER	SHEEP CAMP FISH SPRGS ROAD	192R	3	17	1976	N
42	4AAD1	A. CECIL STODIEK	ELGES LANE	96R	6	13	1972	N
43	4AAD2	GARDNERVILLE TOWN 4	0.2MI S OF TOLLER ON ELGES	305L	6	24	1975	N
44					6	14	1979	N
45					4	14	1981	N
46	4ABC1	GARDNERVILLE TOWN 3	NEAR HIGHWAY MAINT STATION	335L	5	11	1970	N
47					6	24	1975	N
48					4	26	1977	N
49					6	14	1979	N
50					4	14	1981	N
51	4ACB1	DOUGLAS COUNTY	LAMPE PARK	270L	6	29	1979	N
52	4ADA1	GARDNERVILLE TOWN 6	0.2MI N 395 ON ELGES	300L	2	5	1984	N
53	4BAB1	GARNDERVILLE TOWN 1	AT WATER CO YARD	--	2	3	1969	N
54					6	24	1975	N
55					6	14	1979	N
56					4	14	1981	N
57	5BBD1	STODIECK	0.3MI N WATERLOO 0.7MI E 395	--	8	30	1983	U
58	7CAA1	KEITH CORNFORTH	HIGHWAY 88	79L	11	12	1967	N
59	7DCC1	CENTERVILLE BAR	CENTERVILLE ROAD & 395	--	7	6	1978	N
60					7	8	1980	N
61	8CDC1	ELMER HELLWINKEL	CENTERVILLE ROAD	--	4	10	1975	N
62	8DAD1	JAMES LAWRENCE	ROCK CREEK RANCH	70L	5	19	1969	N
63	8DDC1	GARY STONE	CENTERVILLE ROAD	130R	1	28	1972	N
64	9BAC1	GORDON FRICKE	CENTERVILLE ROAD	--	4	--	1975	N
65	9BBA1	LEONARD WEISSMAN	1186 CENTERVILLE	--	8	18	1982	N
66	9CAD1	NINA FOSTER	1188 DRESSLERVILLE	--	12	29	1980	N
67	10CCB1	ROBINSON	1029 DRESSLERVILLE ROAD	110R	3	14	1978	N
68	10CCC1	GARY GARCIA	1025 DRESSLERVILLE ROAD	140R	5	3	1977	N
69	10DAD1	7-11 MARKET	SOUTH 395	200L	9	9	1982	N
70	10DCC1	GARD RANCHOS NO 2	OFF RIVERVIEW NEAR FAIRWAY	445L	4	29	1970	N
71					6	25	1979	N
72					5	12	1981	N
73	11ADC1	ROBERT LANGE	1122 LINDA ANNE	121R	9	16	1975	N
74	11ADD1	TOM CURRENCE	1119 LINDA ANNE	125L	5	1	1981	N
75	11CAA1	PAUL FAULSTICH	S.E. OF GARDNERVILLE	343L	8	14	1962	N
76	12CAA1	D. KENT BYERS	HELLMAN DRIVE	180R	2	23	1971	N
77	12CAC1	DAVE DURYEE	1069 SEGO CIRCLE	158L	8	28	1967	N
78	12CAC1	ROBERT OSBORNE	1056 JEWEL CIRCLE	--	7	12	1974	N
79	12CAD1	ROSEMARY NELSON	HELLMAN DRIVE	200L	3	--	1979	N
80	12CBA1	ROBERT FERRIS	1818 HELLMAN	150R	6	11	1975	N
81	14ADDC1	U.S. BUREAU SPORT FISH	WELL 4	400L	8	13	1962	N
82					1	4	1965	U
83	14BDA1	WASHOE TRIBAL OFFICE	SOUTH 395	61R	9	4	1979	N
84	15AAB1	GARD RANCHOS NO 1	ON FAIRWAY DRIVE	450L	4	28	1970	N
85					6	25	1979	N
86					5	12	1981	N
87	15ABB1	JOHN WINTERS	965 DRESSLERVILLE ROAD	230R	6	--	1979	N
88	15ABD2	DON WOODWARD	961 RIVERVIEW	77R	10	25	1976	N
89	15ABD1	HOOVER	961 RIVERVIEW	130R	2	20	1973	N
90	15ADD1	GARD RANCHOS NO 4	BTWN GREEN CT/PUTTER DRIVE	370L	9	5	1979	N
91					5	12	1981	N
92					2	16	1983	N
93	16CCD1	BING GRAVEL PIT	PIT ROAD	385R	10	17	1972	N
94	16DCA1	DAVID ANDERSON	1325 MUIR DRIVE	--	9	11	1979	N

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Carson Valley basin (105), T. 12 N., R. 20 E.					
95	17BAA1	GUS HERZOG	1089 CENTERVILLE	81L	8	29	1979	N
96	17CBD1	J. HELLWINKEL	VERDE WAY	82R	10	18	1972	N
97	17CCD1	BRUCE KINGSLAND	KINGSLAND COURT	91L	3	3	1978	N
98	17CDB1	L.E. BANKUS	816 ROJO	84L	8	18	1969	N
99	17CDC1	J. BAILEY	807 ROJO	105R	10	17	1972	N
100	17CDC2	C. WASS	1071 ORO	105R	10	17	1972	N
101	17CDD1	JERRY CLARK	1091 ORO WAY	90L	11	2	1977	N
102	17DBB1	ALEX MALAVAZOS	1125 AMARILLO	104R	8	16	1982	N
103	19BBB1	SCHWAKE	1.1MI S CNTRVILLE .5MI W 395	--	8	22	1983	U
104	21DBC1	GARD RANCHOS NO 3	ON TILLMAN 0.6MI S KIMMERLING	460L	6	20	1975	N
105					6	25	1979	N
106					5	12	1981	N
107					2	16	1983	N
108	23DCA1	FISH HATCHERY	SOUTH 395	--	6	5	1972	N
109	23ACA1	SETTLEMEYER	SOUTH 395	240R	5	9	1974	N
110	23DAD1	BETTY ADAMS	660 STONESTHROW	172L	3	7	1978	N
111	23DAD1	GARY WILLIAMS	ABOVE FISH HATCHERY	182L	3	2	1976	N
112	24AAC1	RICHARD SANDBORN	754 MUSTANG	--	11	20	1979	N
113					4	14	1982	N
114	24AAD1	WALT LEE	1976 SORREL	200R	7	--	1978	N
115	24ACA1	LANE HOLDEMAN	1933 SORREL	150R	10	9	1979	N
116	24ADC1	PHIL SULLIVAN	716 MUSTANG LANE	190L	11	--	1976	N
117	24ADC2	ANDREW MCCARTHY	ARABIAN	145L	1	20	1977	N
118					8	29	1978	N
119	24ADC2	HAWKS	MUSTANG LANE	180R	11	--	1976	N
120	24BCA1	BECKER	1830 COLT LANE	100R	1	20	1977	N
121	24DAA1	F.J. MCCANN	1965 ARABIAN	170R	6	7	1979	N
122	24DAD1	STEVEN BOHLER	1986 PALOMINO	480R	10	27	1977	N
123	24DBD1	JOHN GRANT	1940 PALOMINO	220R	11	19	1974	N
124	24DCA1	NORMAN SCOTT	629 APPALOOSA	168R	4	--	1976	N
125					1	20	1977	N
126	24DCA2	HILL	1902 PALOMINO	150R	12	27	1976	N
127	24DCB1	RAY WILLIAMS	628 APPALOOSA	150R	12	16	1976	N
128					12	27	1976	N
129					5	12	1977	N
130					8	8	1978	N
131	24DCB2	MORRIS RANSTROM	SW CORNER APPALOOSA PALOMINO	140R	8	23	1978	N
132	24DDD1	DAN SHIPMAN	619 STAGECOACH	--	8	8	1978	N
133	25BDB1	WASHOE TRIBE CAMPGRO	SOUTH OF GARDNERVILLE	60L	9	2	1975	N
			Carson Valley basin (105), T. 12 N., R. 21 E.					
134	4DBA1	MARSHALL	1263 MARJ LANE	--	1	18	1979	N
135	5CAC1	NORRIS	1250 RON LANE	71L	2	10	1976	N
136					9	15	1980	N
137	5CAC2	ELDON MILLER	1261 RON LANE	--	8	12	1980	N
138	5CAC3	R. HINTZMAN	1260 RON LANE	74L	2	10	1976	N
139	5DBA1	BOBEK VEHLING	1261 MYERS	80L	2	10	1976	N
140	5DBB1	CAROL KRULL	1277 MYERS	169R	2	12	1976	N
141	5DBC1	KARL AMDAL	1256 MYERS	--	6	8	1978	N
142					5	1	1979	N
143	5DBD3	RON FINCH	2331 JAN COURT OR 1250 MYERS	62L	2	10	1976	N
144	17CCA1	FRED SMITH	0.5 MI S PINENUT ROAD	435L	8	31	1982	N
145	18CAB1	DOUGLAS COUNTY ANIMAL	LANDFILL	--	2	27	1980	N
146					4	13	1981	N
147					2	1	1983	U
148	18CCC1	DOUGLAS COUNTY PARKS	E END PINTO CIRCLE	380L	3	19	1979	N
149	32CBA1	WASHOE INDIAN TRIBAL	BODIE FLAT	580L	1	--	1981	N
150					2	10	1981	N
151	35BAA1	RICHARD MORGAN	CALLE PEQUENO	100R	5	15	1979	N

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Carson Valley basin (105), T. 12 N., R. 22 E.					
152	14CC1	SLATERS MINE SPRING	UNKNOWN	OM	6	4	1979	N
153	14CC2	SLATERS MINE SPRING	UNKNOWN	OM	9	17	1979	N
154	26	WINTERS MINE SPRING	UNKNOWN	OM	9	17	1979	N
155	26	WINTERS MINE SPRING	UNKNOWN	OM	9	17	1979	N
			Carson Valley basin (105), T. 13 N., R. 19 E.					
156	3BDA1	HOMER ANGELO	JACKS VALLEY ROAD	128L	5	9	1974	N
157	3CCB1	S. HOLTEN	HOLTEN CIRCLE	210R	6	11	1979	N
158	3CCC1	CHARLES CROWL	TRAIL COURT	180R	2	--	1979	N
159	4DDA1	D.J. HENRY	CENTENNIAL DRIVE	231L	5	9	1974	N
160	9AAA1	ANTHONY STEPHENSON	2398 CENTENNIAL DRIVE	--	9	--	1981	N
161	9AAC1	ALDUS BAGNE	2330 MARJORY LANE	225L	4	23	1974	N
162					5	13	1980	N
163	9ACD1	BOB BRUSH	TOBOGGAN ROAD	208R	7	5	1976	N
164	9ACD2	M. MILUCK	END OF 5TH GENOA	225L	7	28	1976	N
165	9ADC1	STANLEY HOLLISTER	NW CORNER GENOA FIFTH	180L	3	12	1969	N
166	9DAA1	W. MERRELL	PINK HOUSE	--	7	6	1978	N
167					6	19	1979	N
168					7	8	1980	N
169	9DAA2	A. JUCHTZER	GENOA	83L	6	2	1976	N
170	9DAA3	NEVADA STATE PARK	MORMON STATION	159L	6	14	1979	N
171	9DAB1	ROBERT CARVER	GENOA SALOON	--	7	6	1978	N
172	9DABD1	R. BOMMERITO	GENOA	100R	6	2	1976	N
173	10ACC1	ROBERT STEEN	2279 MEADOWLARK LANE	--	8	21	1979	N
174	10BBA1	L.E. GOODNIGHT	2399 JACKS VALLEY ROAD	--	6	28	1982	N
175	10BBD1	BRENDAN RILEY	2290 PIONEER TRAILS	--	8	8	1975	N
176	10BDD1	JOHN LERETTE	264 SCHOOLHOUSE DRIVE	90R	3	--	1977	N
177	11ACC1	SETTLEMEYER	STP EFFLUENT PROJECT	--	1	29	1982	D
178					3	24	1982	D
179					4	10	1982	D
180					4	22	1982	D
181					5	5	1982	D
182	11CCA1	STONE ELEMORE	WILLOW BEND	110R	9	17	1976	N
183	12BBA1	SETTLEMEYER ARTESIAN	1MI N GENOA LN 1.3MI W 395	--	8	18	1983	U
184	13BCC1	SETTLEMEYER ARTESIAN	0.5MI S GENOA LN 1.4MI W 395	518L	8	25	1983	U
185	14AAA1	SETTLEMEYER	STP EFFLUENT PROJECT	--	1	29	1982	D
186					3	24	1982	D
187					4	10	1982	D
188					4	22	1982	D
189					5	5	1982	D
190	17	FOREST SERVICE	SPRING IN SECTION 17	OM	9	26	1973	N
191	20ABA1	SPRING	SPRING IN SECTION 20	OM	7	7	1971	N
192	21	FOREST SERVICE	SPRING IN SECTION 21	OM	8	30	1973	N
193	22ABC1	WALLEYS HOT SPRINGS	FOOTHILL ROAD	OM	11	10	1959	U
194	24CAD1	DANGBERG ARTESIAN	1 MI W 395 0.1 MI N MULLER	401R	8	18	1983	U
195	27BAC1	MIKE SARGENT	FOOTHILL ROAD	80L	5	17	1973	N
196					11	--	1973	N
197	34BCA1	GEOFF BLAKESLEE	1483 FOOTHILL	--	9	27	1982	N
198	35CBB1	KNOX JOHNSON	0.3MI N WATERLOO 2.3MI W 395	--	9	1	1983	U

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Carson Valley basin (105), T. 13 N., R. 20 E.					
199	2ACB1	W. BOLT	2555 LENA	263R	6	1	1982	N
200	2BAA1	AUGUST BELLAS	2578 MCKAY	310L	9	18	1979	N
201					9	18	1979	N
202	2BAB1	JOHN SOUTHERN	2589 FREMONT	223R	8	28	1978	N
203					9	22	1978	N
204	2BAC1	DENNIS KNESEK	2554 NYE DRIVE	--	7	16	1979	N
205	2BAD1	ERNEST TWISS	2571 NYE DRIVE	230L	7	28	1980	N
206	2CBA1	PAUL MANNING	1639 NANSUE LANE	210R	9	7	1977	N
207	2CBA2	SAUNDERS	1635 NANSUE LANE	172L	6	8	1978	N
208	2CBB1	JOHN HASTIE	1631 NANSUE LANE	176R	10	3	1978	N
209	2CDA1	FRED STANFIELD	1708 DAVIS LANE	200R	3	10	1980	N
210	3BCB1	UNKNOWN	2533 CLAPHAM	--	6	4	1979	N
211	4ADA1	EARL P. IFLAND	JOHNSON AND CLAPHAM	132L	9	27	1971	N
212	5AAA1	L. A. ENGINEERING	75 FT S JOHNSON LANE	300L	2	26	1981	N
213	5CBA1	JOHN INDIANO	OFF HEYBOURNE	100L	11	--	1978	N
214	7ACD1	ALDAX	ALDAX RANCH	400L	12	15	1969	N
215					1	15	1970	N
216	8ABB1	VALMAN CORP	150 FT E HEYBOURNE	297L	1	6	1981	N
217					1	15	1981	N
218	8CAA1	HERB WITT	MILKY WAY FARMS	135L	12	10	1975	N
219	8CAD1	HERB WITT	MILKY WAY FARMS	440L	6	25	1976	N
220	8CDA1	EXO SYSTEMS	1089 AIRPORT ROAD	--	3	8	1982	N
221	8CDA2	C. MILLER	1051 AIRPORT ROAD	115L	1	31	1973	N
222					6	30	1976	N
223	8DCA1	DOUGLAS COUNTY AIRPORT	AIRPORT OLD WELL	--	5	18	1973	N
224					6	6	1980	N
225	8DCA2	DOUGLAS COUNTY AIRPORT	AIRPORT NEW WELL	330L	6	6	1980	N
226	11ABD1	CECIL REED	REED CIRCLE	202L	6	1	1974	N
227	11BAB1	HARRY POWERS	2433 FREMONT	--	12	29	1981	N
228	12BCA1	COULTER	0.6 MI S SUNRISE ROAD	300L	8	19	1983	U
229	18BAA1	SETTLEMEYER ARTESIAN	GENOA LANE AND 395	--	8	22	1983	U
230	19AAA1	DANGBERG ARTESIAN	0.8MI N MULLER 0.45MI E 395	318R	8	18	1983	U
231	19CBA1	DOUGLAS STP NORTH WE	0.3 MI W 395 0.35 MI N MULLER	10M	8	31	1983	U
232	19CCB1	DOUGLAS STP WEST WEL	0.5 MI W 395 0.1 MI N MULLER	9M	8	31	1983	U
233	26ABB1	EARL MAY	EAST VALLEY ROAD	150L	8	19	1983	U
234	29BCD1	DON CALLAHAN	FRIEDA LANE	90R	2	27	1970	N
235	29CDC1	TOWN OF MINDEN	WELL 1 NEAR BENTLEY	398R	2	3	1969	N
236					12	22	1972	N
237					6	24	1975	N
238					1	21	1981	N
239	30DCA1	ALDO BIAGGI	COUNTY ROAD	108R	1	2	1980	N
240	30DDC1	TOWN OF MINDEN	WELL 3 1648 COUNTY ROAD	310L	6	25	1979	N
241	31BCC1	DANGBERG ORIG HOME	0.5MI W 395 1MI N WATERLOO	--	8	22	1983	U
242	31CAA1	DANGBERG	N13E2031CAA	413L	12	--	1969	N
243	32BAC1	TOWN OF MINDEN	WELL 2 BETWEEN 4TH AND 5TH	300L	2	3	1969	N
244					12	22	1972	N
245					6	24	1975	N
246					6	25	1979	N
247	32DAB1	GARDNERVILLE TOWN 2	OXOBY TRAILER COURT	290L	2	3	1969	N
248					6	24	1975	N
249					6	14	1979	N
250	32DDA1	GARDNERVILLE TOWN 5	ON HUSSMAN AVE	310L	8	31	1978	N
251					2	19	1980	N
252					4	14	1981	N
253	33CBA1	CARSON VALLEY MEAT	GARDNERVILLE	137L	5	23	1968	N
254					6	2	1969	N
255					8	18	1969	N
256	34ACC1	SPOONHUNTER	ORCHARD ROAD	--	8	22	1983	U

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Carson Valley basin (105), T. 13 N., R. 21 E.					
257	28CCB1	FISH SPRING FLAT WELL	FISH SPRING FLAT	95R	5	14	1970	U
258	29DBC1	ROBERT CARLSON	1651 CARLSON	102L	3	20	1979	N
259					7	24	1980	N
260	29DBC2	JOHN SHERWOOD	1650 CARLSON	140L	9	9	1982	N
261	33CDD1	FINGAR	FISH SPRING FLAT	132L	8	23	1983	U
			Carson Valley basin (105), T. 14 N., R. 19 E.					
262	1ADC1	AMES ROBINSON	3677 CINDY LANE	174R	6	15	1976	N
263	1DAB1	JERRY GAGE	3669 BUCKS WAY	125L	6	18	1976	N
264	1DAD1	DONALD SWEZEY	3666 CHEROKEE	123L	9	8	1976	N
265					4	24	1978	N
266	1DDD1	L.G. DUFFRIN	3615 CINDYS TRAIL	118L	7	13	1977	N
267	3BBD1	JIM HALEN	3000 OLD CLEAR CREEK ROAD	94L	6	29	1973	N
268					9	--	1975	N
269	4ABA1	VICTORIA LINDERHOLM	OLD CLEAR CREEK ROAD	165L	5	27	1974	N
270	11CAA1	RHONDA KILTY	3488 ZURICH	175R	3	28	1978	N
271	11CAA2	CHARLENE ROSS	3489 ZURICH COURT	--	9	2	1982	N
272	11CAD1	H.L.ROSSE	478 BAVARIAN	165L	6	8	1975	N
273	11CBD1	J.R. STEVENS	3459 ALPINE VIEW	80R	2	22	1979	N
274	12AAA1	K. PORTH	3577 CHEROKEE	120R	6	14	1972	N
275	12ADA1	ROBERT LARSON	3526 CHEROKEE	146L	4	2	1976	N
276	12ADA2	ROBERT FOSTER	3530 CHEROKEE	100R	9	17	1976	N
277	12ADA3	ROBERT PENNINGTON	3523 CHEROKEE	142L	7	14	1981	N
278	12ADB1	BERNING	3543 ARCADIA COURT	101R	3	17	1980	N
279	12ADC1	HARVEY MILLARD	3522 ARCADIA	103R	3	6	1973	N
280	12ADD1	RAY BACON	780 PAWNEE	109R	8	22	1977	N
281	12BDA1	DOUGLAS COUNTY SCHOOL	JACKS VALLEY ELEM SCHOOL	350L	5	20	1980	N
282	14BAA1	ANTHONY E. BOWERS	500 ALPINE VIEW COURT	210R	11	28	1977	N
283	14BAB1	KIRBY CLENDENON	3396 BERNICE COURT	85L	12	--	1979	N
284	15CDB1	ASCUAGA	0.5 MI SE OF RANCH	--	8	23	1983	U
285	26CAD1	HARVEY GROSS	HARVEYS GUN CLUB	--	10	18	1979	N
286	26CCA1	MEADOW GOLD	JAMES CANYON RANCH	385R	6	16	1975	N
287	26CCA1	MEADOW GOLD	JAMES CANYON RANCH	--	11	7	1961	N
288	26CCB1	HARVEY GROSS	JAMES CANYON RANCH	--	8	23	1983	U
289	35CBB1	TYSON ARTESIAN	2.2MI N GENOA 0.4MI E FOOTHILL	--	8	18	1983	U
			Carson Valley basin (105), T. 14 N., R. 20 E.					
290	6CAA1	MORRIS	3695 SUMMERHILL	175R	12	13	1979	N
291	6CAB1	ROBERT HOOD	3686 SILVERADO	120R	1	21	1981	N
292					8	26	1982	N
293	6CBA1	STUART STEVENS	3687 SHAWNEE	94L	3	5	1979	N
294	6CBA2	ELAINE CUNNINGHAM	3689 SHAWNEE	107R	9	24	1979	N
295	6CDC1	TAYLOR GOATS	3607 SILVERADO	154L	1	18	1979	N
296	7BBB1	KEITH NEUMAN	3592 GREEN ACRES	150R	2	11	1980	N
297	7BCB1	NEIL LEONARD	3519 GREEN ACRES	165L	5	14	1982	N
298	7BCD1	RICH MCGILL	3514 SHAWNEE	--	5	15	1976	N
299	7BDD1	OPALITE WELL	INDIAN HILLS	252L	12	13	1977	N
300					12	13	1977	N
301	7CBC1	LITTLE CANYON WELL	INDIAN HILLS	345L	6	22	1980	N
302	7DBA1	R. COX	3480 VISTA GRANDE	--	4	25	1979	N
303	18CDA1	HOBO HOT SPRINGS WELL	INDIAN HILLS	340L	11	26	1977	N
304	19BAD1	LUTTRELL	1.5MI N CARSONR 0.05MI W 395	160R	8	24	1983	U
305	20AAB1	WETLANDS WELL	1.25MI E395, 3.5MI N STEPH. WAY	25M	--	--	1979	E
306					8	29	1983	U
307	20DAA1	WETLANDS WARM WELL	1.5MI E395, 3MI N STEPH. WAY	27M	--	--	1979	E
308					8	26	1983	U
309	21CDD1	SARATOGA HOT SPRINGS	N END OF VICKY LANE	0M	5	14	1970	U

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Carson Valley basin (105), T. 14 N., R. 20 E.					
310	26CCB1	CATHY AUSTIN	1616 TERRY ANN	--	9	21	1980	N
311	26CDC1	GLORIA LOHNER	1650 STEPHANIE	245R	6	16	1980	N
312	26CDD1	WILLIAM BARDO	1680 STEPHANIE WAY	262R	6	28	1978	N
313	27DCB1	SANDY MCFALL	2844 WADE	--	3	24	1980	N
314	27DCD1	BOB LAWRENCE	2832 SQUIRES	165R	7	8	1978	N
315	27DCD1	JOHN SCHWEITZER	2820 SQUIRES	190R	2	2	1981	N
316	28ACD1	TERRY BROWN	101 PORTER	125R	12	10	1981	N
317	28ADC1	JIM LIEBHEN	1360 PORTER	90L	11	--	1978	N
318					9	8	1981	N
319	28CBA1	UNRUHS TURF FARM	JOHNSON LANE AREA	420L	5	19	1980	N
320	28CCB1	JANSSEN	1212 ESTHER WAY	97R	11	20	1979	N
321	28CDA1	VIRGIL STIDHAM	2848 VICKY LANE	--	3	19	1979	N
322	28CDB1	E.M. ROBERTS	1262 ESTHER WAY	--	10	8	1971	N
323					10	10	1978	N
324	28CDB2	D. ROBINSON	1268 ESTHER	--	7	20	1981	N
325	28CDC1	STEVE ERVEN	1269 MELBOURNE	88L	4	18	1979	N
326					9	11	1980	N
327	28DBC1	LOU GLASGLOW	2855 VICKY	--	6	11	1980	N
328	28DBD1	OZNOWICZ	1322 SARATOGA	100R	12	21	1977	N
329	28DCB1	CUSHMAN	2847 VICKY	60R	2	28	1979	N
330					1	14	1982	N
331	28DCC1	H. KUNKEL	KIM PLACE	100R	10	26	1972	N
332	28DCD1	VERNON PACK	1347 KIM PLACE	--	10	22	1981	N
333	28DDA1	LARRY HICKMAN	1378 KIM PLACE	110R	8	--	1979	N
334	28DDC1	B. FORD	1353 KIM PLACE	115R	8	24	1978	N
335	28DDC2	PERRY WINGERT	1350 STEPHANIE WAY	108R	2	22	1979	N
336					8	30	1982	N
337	28DDD1	PEG QUIRK	1375 KIM PLACE	92L	8	--	1979	N
338	28DDD2	SHARON MURRAY	1396 STEPHANIE WAY	--	12	3	1979	N
339	30BDB1	STOKES	CRADLEBAUGH RANCH	115L	8	23	1983	U
340	31AAC1	DANGBERG ARTESIAN WELL	0.5 MI S CARSON R 0.2 MI E 395	--	8	30	1983	U
341	32CDC1	MARTIN JOHNSON	50 FEET N OF JOHNSON LANE	436L	3	3	1970	N
342	33ABB1	NANCY KING	1314 RAELINE	--	1	14	1981	N
343	33ADC1	JAMES TILMAN	1330 DOWNS	84R	8	25	1981	N
344	33DAA1	RAY HOFFMAN	2664 CLAPHAM LANE	--	9	27	1979	N
345	33DAD1	CHARLES PORTERFIELD	2653 CLAPHAM LANE	119R	7	18	1978	N
346	33DBB1	PETE FERLISI	2679 VICKY	--	3	17	1982	N
347	33DCA1	ROBERT QUILICI	1338 JUDY	--	9	10	1980	N
348	33DCD1	ROBERT GOODPASTURE	1319 JUDY	146R	9	18	1980	N
349	33DDC1	W.E. JOHNSTON	1354 JOHNSON LANE	135R	8	--	1979	N
350	34BAB1	GARY SALTSGIVER	2618 GORDON	112R	9	5	1978	N
351	34BCA1	UNKNOWN	KAYNE DRIVE	--	4	3	1978	N
352	34BCC1	PARDEW	2717 CLAPHAM	85R	5	8	1983	U
353	34BDB1	HARLEY KULKIN	2739 GORDON	120R	12	--	1980	N
354	34BDC1	ANGELO BERNASCONI	2716 STEWART	100R	12	--	1978	N
355	34BDC2	DON COOK	2721 GORDON	--	7	26	1979	N
356	34CAC1	JIM WORDEN	2651 GORDON	115R	12	--	1975	N
357	34CDB1	MIERAU LOUZETTA	2642 STEWART	105R	12	--	1975	N
358	34DAA1	RICHARD VADENAIS	1588 JONES	147L	1	14	1979	N
359	34DAB1	SCOTT MILLER	1552 JONES	120R	5	10	1978	N
360	34DAB2	KUPER	1558 JONES	--	7	16	1979	N
361	34DBC1	TRANSAMERICA MORTGAGE	2653 FULLER	140R	7	16	1979	N
362	34DBD1	LARRY REED	2661 WADE	100R	11	21	1979	N
363	34DCC1	LEONARD LARSON	1510 JOHNSON LANE	150R	2	3	1976	N
364	34DCC2	RENE OJEDA	2626 WADE	--	5	--	1981	N
365	34DDC1	JOE ALOTTA	1569 CHIQUITA	--	7	--	1978	N
366	34DDD1	TREADWAY	1575 CHIQUITA	--	3	17	1980	N
367	35BAD1	G.P. LUNGSTROM	1668 CHOWBUCK	213L	6	2	1978	N
368	35BCA1	JOHN DESMOND	1649 CHOWBUCK	210R	9	13	1976	N
369	35BDA1	ROLAND SAMUELSON	1690 CHOWBUCK	275L	4	--	1981	N

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA- LYST
			Antelope Valley basin (106), T. 10 N., R. 22 E.					
370	9BBC1	LLOYD GATHRIGHT	1238 SANDSTONE	320L	9	4	1978	N
371	9BDB1	JAMES DELIMA	3666 TOPAZ RANCH DRIVE	--	10	--	1978	N
372	9CBB1	MERLE WILLIAMS	1290 SANDSTONE	202R	7	13	1978	N
373	10ABB1	WELL 6	SHALE DR TOPAZ RANCH ESTATE	--	5	19	1980	N
374	10ABB2	RAY LAGUE	3986 SHALE DRIVE	--	12	18	1980	N
375	15ABC1	DON BENGES	3950 WALKER VIEW ROAD	267L	4	4	1977	N
376	15ABC2	LEO HAWKINS	3962 WALKER VIEW ROAD	196R	7	--	1978	N
377	18ABD1	HOLBROOK JUNCTION WELL	HOLBROOK JUNCTION	100R	12	17	1980	N
378	18ADB1	JUNCTION BAR WELL	HOLBROOK JUNCTION	--	5	12	1981	N
379	18ADC1	JUANITAS	HOLBROOK JUNCTION	--	7	6	1978	N
380	18ADC2	SIERRA SAVINGS	HOLBROOK JUNCTION	--	5	12	1981	N
381	28DDD1	TOPAZ STATE PARK	TOPAZ LAKE	--	7	26	1979	N
382	29BBCD1	FAIR R	TOPAZ LAKE AREA	196R	3	5	1976	N
383					5	20	1976	N
384					7	2	1976	N
385					8	16	1976	N
386					10	26	1976	N
387					3	2	1977	N
388	29BBDB1	MOORE P	TOPAZ LAKE AREA	80R	5	20	1976	N
389					7	2	1976	N
390					8	16	1976	N
391					10	26	1976	N
392					12	16	1976	N
393					3	2	1977	N
394	29BCCB1	GLENCO SPRING	TOPAZ LAKE AREA	0M	3	5	1976	N
395					5	20	1976	N
396					7	2	1976	N
397					8	16	1976	N
398					10	26	1976	N
399					12	16	1976	N
400	29BDCA2	BRECKENRIDGE J	TOPAZ LAKE AREA	150L	5	20	1976	N
401					7	2	1976	N
402					8	16	1976	N
403					10	26	1976	N
404					3	2	1977	N
405	29BDDA1	HALLERT J	TOPAZ LAKE AREA	158M	8	16	1976	N
406					10	26	1976	N
407					12	16	1976	N
408					3	2	1977	N
409	29BDDC1	CASALE M	TOPAZ LAKE AREA	230R	8	16	1976	N
410					3	2	1977	N
411	29BDDD1	BROWN D	TOPAZ LAKE AREA	140R	5	20	1976	N
412					7	2	1976	N
413					8	16	1976	N
414					10	26	1976	N
415					12	16	1976	N
416					3	2	1977	N
417	29CACA1	BLANKENSHIP J	TOPAZ LAKE AREA	170L	2	17	1976	N
418					5	20	1976	N
419					7	2	1976	N
420					8	16	1976	N
421					10	26	1976	N
422					12	16	1976	N
423					3	2	1977	N
424					8	17	1983	U
425	29CACC1	BARNICLE L	TOPAZ LAKE AREA	245R	2	17	1976	N
426					5	20	1976	N
427					7	2	1976	N
428					8	16	1976	N
429					10	26	1976	N

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANALYST
			Antelope Valley basin (106), T. 10 N., R. 22 E.					
430					12	16	1976	N
431					3	2	1977	N
432	29CACC2	CULLISON R D	TOPAZ LAKE AREA	--	10	26	1976	N
433	29CADA1	STROBEL F	TOPAZ LAKE AREA	183L	5	20	1976	N
434					7	2	1976	N
435					8	16	1976	N
436					10	26	1976	N
437					12	16	1976	N
438					3	2	1977	N
439					8	17	1983	U
440	29CADD1	BINGHAM L	TOPAZ LAKE AREA	140L	10	26	1976	N
441					12	16	1976	N
442					3	2	1977	N
443	29CBDB1	CLUB HORIZONS	TOPAZ LAKE AREA	285L	6	13	1972	N
444					8	5	1974	N
445					5	20	1976	N
446					7	2	1976	N
447					8	16	1976	N
448					10	26	1976	N
449					12	16	1976	N
450					3	2	1977	N
451	29CCAA1	GREG MAR SITE	TOPAZ LAKE AREA	200M	10	27	1976	N
452	29CCDA1	TOPAZ LODGE	TOPAZ LAKE AREA	318L	7	7	1972	N
453					10	2	1974	N
454					5	20	1976	N
455					7	2	1976	N
456					8	16	1976	N
457					10	26	1976	N
458					12	16	1976	N
459					3	2	1977	N
460					1	21	1981	N
461	29CCDD1	PINENUT LODGE	TOPAZ LAKE AREA	240R	6	13	1972	N
462					10	2	1974	N
463					5	20	1976	N
464					7	2	1976	N
465					8	16	1976	N
466					10	26	1976	N
467					12	16	1976	N
468					3	2	1977	N
469					7	26	1979	N
470					8	17	1983	U
471	29CDAB1	WESTON M	TOPAZ LAKE AREA	--	2	17	1976	N
472					5	20	1976	N
473					7	2	1976	N
474					8	16	1976	N
475					10	26	1976	N
476					12	16	1976	N
477					3	2	1977	N
478	29CDBA1	PAOLOZZI J	TOPAZ LAKE AREA	175L	10	26	1976	N
479	29CDCC1	TOPAZ SUNRISE SUBD	TOPAZ LAKE AREA	203L	10	1	1967	N
480					10	26	1967	N
481					4	12	1971	N
482					5	30	1972	N
483					12	16	1976	N
484					12	27	1976	N
485					3	2	1977	N
486	29DCCC1	TOPAZ LODGE SUBD LOT	TOPAZ LAKE AREA	83L	9	11	1961	N
487					6	2	1967	N
488					10	29	1968	N
489					9	26	1975	N

REF. NO.	SECTION	NAME	LOCATION	DEPTH OF WELL, TOTAL (FEET)	SAMPLE DATE MONTH	DAY	YEAR	ANA-LYST
			Antelope Valley basin (106), T. 10 N., R. 22 E.					
490	29DCCC1	TOPAZ LODGE SUBD LOT (Continued)			2	17	1976	N
491					5	20	1976	N
492					7	2	1976	N
493					8	16	1976	N
494					10	26	1976	N
495					12	16	1976	N
496					3	2	1977	N
497					6	8	1978	N
498					10	18	1979	N
499					8	17	1983	U
500					1	31	1984	N
501	32ABBB1	DEVENPECK G	TOPAZ LAKE AREA	--	4	12	1972	N
502					10	26	1976	N
503					12	16	1976	N
504					3	2	1977	N
505	32BAAA1	BOYINGER	TOPAZ LAKE AREA	--	3	23	1972	N
506					2	17	1976	N
507					5	20	1976	N
508					7	2	1976	N
509					8	16	1976	N
510					10	26	1976	N
511					12	16	1976	N
512					3	2	1977	N
513	32BAAB1	KAY B	TOPAZ LAKE AREA	100L	4	12	1971	N
514					10	26	1976	N
515	32BAAB2	MCDANIELS J	TOPAZ LAKE AREA	160M	2	17	1976	N
516					5	20	1976	N
517					7	2	1976	N
518					8	16	1976	N
519					10	26	1976	N
520					12	16	1976	N
521					3	2	1977	N
522					8	17	1983	U
523	32BADA1	SAVAGE B	TOPAZ LAKE AREA	80L	5	20	1976	N
524					7	2	1976	N
525					8	16	1976	N
526					10	26	1976	N
527					12	16	1976	N
528					3	2	1977	N
529	32BADB1	BOXSTALLER	TOPAZ LAKE AREA	--	2	17	1976	N
530					5	20	1976	N
531					8	16	1976	N
532					10	26	1976	N
533					3	2	1977	N
534	32BCDA1	KAHN M	TOPAZ LAKE AREA	200M	9	1	1970	N
535	32BCDD1	KOCH H	TOPAZ LAKE AREA	95L	3	2	1977	N
536	32BDBA1	GIOMI LOT 11	TOPAZ LAKE AREA	--	5	20	1976	N
537					7	2	1976	N
538					8	16	1976	N
539					12	16	1976	N
540	32BDBB1	RIORDAN	TOPAZ LAKE AREA	146R	9	17	1974	N
541					2	17	1976	N
542					7	2	1976	N
543					8	16	1976	N
544					10	26	1976	N
545					12	16	1976	N
546					3	2	1977	N

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
Lake Tahoe basin (90), T. 13 N., R. 18 E.									
1	6.6	0	0.0	120	34	9	--	37	--
2	6.6	3	.0	80	13	12	--	36	--
3	7.4	3	.8	84	22	7	--	6.0	--
Lake Tahoe basin (90), T. 14 N., R. 18 E.									
4	7.6	0	0.0	132	46	4.4	--	46	--
Churchill Valley basin (102), T. 14 N., R. 22 E.									
5	7.0	--	28	--	21	--	12	--	1.5
6	6.9	--	4.0	--	21	--	11	--	.9
Carson Valley basin (105), T. 11 N., R. 20 E.									
7	6.7	--	0.5	90	24	7.4	9.3	--	3.3
Carson Valley basin (105), T. 11 N., R. 21 E.									
8	7.5	7	3.1	404	119	26	42	--	1
9	8.2	7	.8	399	120	24	71	--	6
10	7.8	3	.5	491	83	69	55	--	4
11	8.2	--	--	145	32	16	--	18	--
12	7.5	7	2.2	286	70	27	28	--	1
13	7.4	7	3.5	275	69	25	26	--	1
14	8.1	--	--	212	52	20	--	33	--
15	7.3	3	1.3	154	37	15	21	--	1
16	7.4	3	.4	102	21	12	8	--	3
Carson Valley basin (105), T. 11 N., R. 22 E.									
17	7.5	--	16	--	25	--	8.7	--	5.2
18	7.8	--	15	--	24	--	8.1	--	2.6
Carson Valley basin (105), T. 12 N., R. 19 E.									
19	7.4	--	0.3	33	8.6	2.7	9	--	0.7
20	7.3	3	.2	51	17	2	9	--	2
21	7.4	5	2.9	51	17	2	10	--	2
22	7.2	7	1.4	45	13	3	10	--	2
23	7.5	7	.3	41	13	2	11	--	2
24	7.6	3	.5	19	6	1	13	--	1
25	7.2	3	.3	36	11	2	8	--	1
26	6.9	--	.8	28	9.0	1.4	7.4	--	.8
27	7.7	7	.3	184	72	1	107	--	3
28	8.4	--	.3	7	1.7	.7	23	--	1
29	7.9	3	.2	29	10	1	5	--	1
30	7.4	3	.2	30	12	0	7	--	0
31	7.5	5	2.8	27	9.0	1	10	--	1
32	7.4	3	.8	5	2.0	0	18	--	1
33	7.1	3	1.7	26	7.0	2	9	--	2
34	7.4	7	2.8	13	5.0	0	17	--	1
35	6.6	--	.5	22	6.4	1.4	3.9	--	2.3
36	8.5	3	6.8	10	4	0	17	--	1
37	7.8	3	.3	13	5	0	19	--	1
38	9.3	15	3.2	10	4	0	45	--	2
39	8.1	7	4.4	18	7	0	15	--	1

REF. NO.	pH (STANDARD UNITS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	HARDNESS (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM DISSOLVED (MG/L AS MG)	SODIUM DISSOLVED (MG/L AS NA)	SODIUM+POTASSIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
				Carson Valley basin (105), T. 12 N., R. 20 E.					
40	7.9	3	1.2	96	27	7	15	--	3
41	8.1	3	.2	111	38	4	37	--	3
42	7.6	3	.7	200	59	13	--	30	--
43	8.0	3	.7	115	33	8	18	--	2
44	7.9	3	.1	159	39	15	19	--	3
45	7.8	5	.2	141	40	10	18	--	3
46	7.6	5	.1	208	58	16	--	21	--
47	7.9	3	1.0	231	66	16	21	--	4
48	7.9	3	.1	144	38	12	17	--	3
49	7.9	3	.1	177	43	17	18	--	4
50	7.4	3	.2	208	57	16	19	--	3
51	7.6	3	.1	110	26	11	15	--	3
52	7.8	3	.6	189	51	15	23	--	4
53	7.2	2	.8	144	40	11	--	20	--
54	7.4	3	.5	131	36	10	22	--	3
55	7.5	3	.2	166	40	16	18	--	4
56	7.2	3	.4	175	47	14	19	--	3
57	7.4	--	.5	88	23	7.5	14	--	2.9
58	7.6	3	.0	108	13	18	--	25	--
59	7.2	3	.2	85	19	9	16	--	3
60	7.5	7	.7	90	21	9	17	--	3
61	7.8	0	.3	130	34	11	21	--	3
62	7.6	6	2.4	84	22	7	--	14	--
63	7.1	1	.3	100	24	10	--	6	--
64	7.3	0	.5	91	25	7	19	--	2
65	7.5	5	2.0	90	26	6	13	--	2
66	7.3	3	.6	79	20	7	10	--	2
67	7.9	5	5.0	92	22	9	15	--	2
68	7.4	7	.3	83	25	5	14	--	2
69	8.1	5	.9	193	54	14	58	--	3
70	7.9	4	.0	76	22	5	--	15	--
71	7.5	8	.1	120	30	11	17	--	3
72	7.4	3	.2	105	29	8	16	--	2
73	8.0	3	.7	142	42	9	24	--	2
74	7.8	3	.4	105	32	6	15	--	3
75	7.8	0	.0	132	40	11	--	21	--
76	8.0	3	.4	124	35	9	--	24	--
77	8.1	0	.0	108	30	8	--	16	--
78	7.8	0	.4	120	33	9	21	--	3
79	8.0	3	.3	110	31	8	17	--	2
80	8.0	3	1.0	107	33	6	19	--	3
81	7.3	4	3.0	220	62	16	--	30	--
82	7.3	--	--	204	58	14	24	--	3
83	7.1	35	14	86	23	7	14	--	3
84	7.8	5	.0	76	24	4	--	13	--
85	7.7	3	.3	81	21	7	15	--	3
86	7.8	17	9.9	76	22	5	14	--	2
87	7.3	2	.4	96	27	7	16	--	2
88	7.4	3	10	81	21	7	32	--	2
89	7.0	10	.8	84	22	7	--	13	--
90	7.2	--	.5	86	23	7	14	--	2
91	7.5	--	.2	80	22	6	14	--	2
92	7.7	3	.5	77	21	6	14	--	2
93	8.0	3	.6	112	30	9	--	47	--
94	7.6	3	.4	89	24	7	19	--	2

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
				Carson Valley basin (105), T. 12 N., R. 20 E.					
95	7.0	3	0.3	120	30	11	15	--	3
96	7.1	3	.9	108	27	10	--	12	--
97	7.5	3	.3	108	25	11	13	--	3
98	7.2	3	1.1	96	24	9	--	15	--
99	7.6	3	.7	132	35	11	--	16	--
100	7.0	5	.9	88	24	7	--	13	--
101	7.8	3	.7	128	30	13	14	--	3
102	8.0	5	2.2	93	24	8	39	--	2
103	7.2	--	.3	90	24	7.2	12	--	2.7
104	8.2	7	2.3	61	18	4.0	44	--	2
105	7.8	3	.2	179	42	18	19	--	4
106	7.6	3	.9	131	36	10	25	--	3
107	8.0	3	.3	73	21	5	40	--	2
108	8.1	5	.4	92	29	5	--	22	--
109	8.1	0	.3	221	62	16	17	--	3
110	7.9	3	2.7	106	26	10	19	--	4
111	7.6	3	2.5	139	36	12	19	--	2
112	7.6	7	.3	304	102	12	32	--	3
113	8.3	3	.4	294	101	10	28	--	3
114	7.8	3	.3	193	64	8	25	--	3
115	7.6	3	.8	304	87	21	31	--	4
116	8.2	3	3.4	195	60	11	27	--	3
117	8.0	7	.2	215	68	11	31	--	2
118	8.0	5	.3	170	50	11	23	--	3
119	8.1	3	1.8	193	54	14	27	--	4
120	8.0	7	.2	213	72	8	23	--	2
121	7.6	3	.4	236	63	19	18	--	2
122	8.3	7	6.1	140	33	14	26	--	4
123	7.9	5	1.1	139	36	12	30	--	4
124	7.9	7	1.6	174	50	12	30	--	4
125	7.9	25	14	183	50	14	35	--	4
126	8.1	3	2.8	286	70	27	31	--	4
127	8.0	7	1.7	346	102	22	37	--	5
128	8.0	7	1.4	326	96	21	35	--	5
129	8.0	5	.3	326	96	21	33	--	5
130	7.7	5	.6	348	85	33	33	--	6
131	8.0	3	.2	175	42	17	19	--	2
132	8.2	3	.5	154	45	10	23	--	3
133	7.7	3	.5	131	36	10	31	--	6
				Carson Valley basin (105), T. 12 N., R. 21 E.					
134	7.8	3	0.2	178	50	13	24	--	1
135	8.0	3	.7	96	32	4	53	--	2
136	7.9	7	1.2	101	32	5	53	--	3
137	8.0	7	.2	120	38	6	43	--	2
138	8.1	3	.8	106	36	4	51	--	2
139	7.8	3	.4	191	55	13	25	--	1
140	8.0	3	2.9	164	49	10	24	--	2
141	8.1	3	.5	157	48	9	28	--	2
142	7.9	3	1.9	163	47	11	28	--	2
143	8.0	3	.8	150	47	8	31	--	2
144	8.9	5	2.2	23	9.0	0	85	--	1
145	7.8	3	.4	79	25	4	45	--	2
146	7.5	7	.5	84	27	4	42	--	2
147	--	--	4.0	81	26	3.8	45	--	2.3
148	7.9	7	2.1	111	36	5	37	--	2
149	7.8	7	3.6	229	57	21	30	--	6
150	7.9	7	3.0	238	59	22	25	--	6
151	7.7	3	.6	144	38	12	29	--	3

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
				Carson Valley basin (105), T. 12 N., R. 22 E.					
152	6.9	--	11	--	10	--	8.4	--	0.6
153	7.2	--	3.8	--	38	--	16	--	2.1
154	7.5	--	20	--	5.4	--	5.0	--	1.5
155	6.9	--	27	--	7.5	--	6.4	--	1.9
				Carson Valley basin (105), T. 13 N., R. 19 E.					
156	7.7	0	0.3	54	20	1	12	--	2
157	7.7	3	.3	113	27	11	13	--	2
158	7.6	5	1.4	113	32	8	11	--	2
159	7.9	3	.3	75	20	6	12	--	2
160	7.2	3	.3	118	39	5	14	--	2
161	8.9	5	3.3	0	0	0	27	--	1
162	9.6	7	1.2	5	2	0	29	--	1
163	7.7	5	.4	82	23	6	10	--	4
164	8.1	7	8.0	42	15	1	29	--	3
165	7.4	8	5.8	124	40	6	--	18	--
166	7.2	3	.2	104	30	7	10	--	4
167	6.7	3	.1	101	29	7	11	--	4
168	6.8	5	.6	121	37	7	13	--	4
169	6.8	5	.7	94	31	4	12	--	4
170	7.4	3	.1	88	27	5	10	--	3
171	6.9	7	3.3	76	22	5	8	--	2
172	7.2	3	.7	80	27	3	9	--	3
173	7.6	7	4.0	96	27	7	10	--	2
174	7.5	7	3.6	90	26	6	9	--	2
175	8.0	5	3.2	90	26	6	9	--	2
176	7.6	3	.4	94	26	7	10	--	1
177	8.5	--	--	--	40	2	128	--	--
178	--	--	--	--	43	18	75	--	--
179	--	--	--	--	55	27	82	--	--
180	7.4	--	--	--	--	--	--	--	--
181	--	--	--	--	--	--	--	--	--
182	8.2	5	2.0	44	16	1	18	--	2
183	8.6	--	.4	8	2.3	.6	22	--	2.6
184	8.2	--	.4	47	13	3.5	16	--	4.3
185	8.2	--	--	--	30	24	75	--	--
186	--	--	--	--	27	14	32	--	--
187	--	--	--	--	46	17	39	--	--
188	7.3	--	--	--	--	--	--	--	--
189	--	--	--	--	--	--	--	--	--
190	8.0	5	.5	86	18	10	9	--	6
191	7.8	9	.2	72	26	2	--	16	--
192	8.1	3	.4	80	17	9	12	--	6
193	9.1	--	--	26	9.6	.5	137	--	2.9
194	8.3	--	.4	26	7.6	1.8	24	--	3.4
195	8.2	2	.5	52	16	3.0	28	--	3.0
196	7.2	0	.8	85	24	6	18	--	5
197	7.6	10	.6	62	20	3	9	--	3
198	7.2	--	.4	38	8.8	3.8	7.9	--	1

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
				Carson Valley basin (105), T. 13 N., R. 20 E.					
199	8.9	3	5.5	13	5	0	87	--	1
200	8.2	7	4.8	38	15	0	101	--	2
201	7.7	3	.6	62	15	6	57	--	4
202	7.9	10	3.8	10	4	0	86	--	1
203	8.5	7	4.8	10	4	0	88	--	1
204	7.7	3	.3	70	23	3	78	--	3
205	7.6	25	13.0	92	27	6	71	--	2
206	7.7	2	.5	27	9	1	57	--	4
207	8.0	3	1.1	27	9	1	57	--	4
208	8.1	5	.3	27	9	1	63	--	4
209	8.4	17	5.7	8	3	0	86	--	2
210	7.8	3	.2	122	29	12	23	--	5
211	7.9	2	.3	120	30	11	--	23	--
212	8.3	3	.4	37	13	1	31	--	2
213	7.8	3	2.0	350	130	6	55	--	7
214	8.4	5	.3	52	19	1	--	26	--
215	8.1	3	.1	64	21	2	--	19	--
216	8.3	3	.4	25	10	0	35	--	3
217	8.3	3	.6	34	12	1	30	--	3
218	8.1	3	.3	418	146	13	120	--	7
219	8.5	3	.4	18	7	0	35	--	2
220	8.0	3	.8	431	164	5	97	--	5
221	8.1	5	.6	336	130	3	--	70	--
222	8.1	3	.4	484	172	13	112	--	6
223	7.9	2	1.1	20	8	--	32	--	3
224	8.3	3	.5	28	11	0	29	--	3
225	8.5	5	.6	28	11	0	29	--	3
226	8.0	3	.3	67	17	6	49	--	4
227	7.9	3	.4	45	13	3	58	--	3
228	8.0	--	.4	63	15	6.2	51	--	4.5
229	8.3	--	.3	32	10	1.7	26	--	3.6
230	8.1	--	.4	70	22	3.7	14	--	3.0
231	7.5	--	.5	240	54	25	110	--	2.7
232	7.4	--	.5	440	97	49	140	--	10
233	7.5	--	.6	120	32	9.1	25	--	2.6
234	7.4	12	1.8	224	64	16	--	35	--
235	8.1	2	1.8	72	22	4	--	12	--
236	8.2	5	.2	72	24	3	--	13	--
237	8.0	3	.8	57	18	3	17	--	2
238	8.1	7	1.1	66	20	4	12	--	3
239	7.4	3	.4	193	46	19	19	--	4
240	7.7	3	.1	90	23	8	15	--	3
241	8.3	--	.5	24	6.2	2.1	24	--	2.1
242	7.7	7	.4	84	22	7	--	14	--
243	8.3	4	2.7	68	21	4	--	13	--
244	8.2	3	.2	76	24	4	--	11	--
245	8.0	3	.7	53	18	2	17	--	2
246	7.8	4	1.3	87	25	6	14	--	2
247	7.4	4	2.0	168	43	15	--	16	--
248	7.9	3	1.7	162	45	12	20	--	3
249	7.8	3	.2	249	60	24	20	--	4
250	7.2	3	.7	100	27	8	16	--	3
251	7.6	35	12	125	32	11	16	--	3
252	7.7	3	.2	115	31	9	16	--	2
253	7.3	5	1.7	220	62	16	--	24	--
254	8.0	0	.3	216	59	17	--	21	--
255	7.9	2	.3	220	64	15	--	22	--
256	7.9	--	.4	120	36	8.1	26	--	1.9

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
			Carson Valley basin (105), T. 13 N., R. 21 E.						
257	7.8	--	--	109	29	9	--	35	--
258	7.9	5	2.5	163	39	16	35	--	7
259	7.2	7	.3	157	38	15	32	--	5
260	7.9	10	3.8	123	31	11	37	--	4
261	7.9	--	.4	160	43	12	25	--	2.2
			Carson Valley basin (105), T. 14 N., R. 19 E.						
262	8.0	7	8.5	37	13	1	12	--	1
263	7.6	7	5.3	39	14	1	11	--	2
264	7.6	3	2.7	37	13	1	12	--	2
265	8.1	3	1.9	43	14	2	15	--	1
266	8.0	8	1.0	47	14	3	10	--	1
267	7.8	7	4.8	101	24	10	20	--	4
268	7.4	3	1.6	52	19	1	14	--	1
269	7.7	3	.6	59	17	4	13	--	1
270	7.3	20	12	51	12	5	11	--	1
271	7.9	3	.6	38	15	0	60	--	1
272	7.3	3	2.4	82	23	6	23	--	1
273	8.1	3	.7	45	13	3	12	--	2
274	7.8	45	18	68	26	1	--	32	--
275	7.9	3	6.0	49	18	1	32	--	2
276	8.0	3	1.8	44	16	1	37	--	2
277	7.4	5	2.1	51	17	2	33	--	1
278	7.4	7	2.0	67	22	3	31	--	1
279	7.8	15	4.0	56	19	2	--	27	--
280	8.1	5	1.9	48	16	2	36	--	2
281	8.7	17	4.0	51	17	2	31	--	1
282	7.2	3	.5	115	28	11	20	--	2
283	7.6	7	1.2	89	29	4	17	--	2
284	7.1	--	5.0	60	18	3.7	5.6	--	2.5
285	7.3	3	.8	14	4.0	1	71	--	2
286	7.2	3	.6	118	39	5	13	--	3
287	6.8	0	.0	88	27	5	--	20	--
288	7.0	--	1.5	86	27	4.5	7.6	--	3.1
289	7.9	--	.3	77	26	2.8	38	--	2.5
			Carson Valley basin (105), T. 14 N., R. 20 E.						
290	7.7	7	1.7	71	22	4	27	--	1
291	7.6	3	.3	119	36	7	27	--	2
292	7.6	3	.3	111	33	7	27	--	1
293	7.6	3	.3	187	60	9	44	--	2
294	7.1	3	.3	170	55	8	40	--	2
295	7.8	3	.7	96	27	7	27	--	1
296	7.8	17	5.6	60	19	3	33	--	2
297	7.3	3	1.2	110	31	8	32	--	1
298	7.8	7	8.0	125	37	8	45	--	2
299	7.9	7	2.8	96	27	7	50	--	1
300	7.9	7	2.2	96	27	7	50	--	1
301	7.6	7	1.3	120	35	8	46	--	2
302	8.1	3	1.3	119	31	10	30	--	2
303	8.0	10	1.5	12	3.0	1	62	--	1
304	8.3	--	.6	13	3.5	1	44	--	1
305	7.6	--	--	139	54	1	122	--	4
306	7.4	--	9.7	140	53	.7	110	--	2.7
307	7.0	--	--	186	74	< .1	162	--	4
308	7.3	--	34	170	66	.7	170	--	4
309	9.0	--	--	429	172	0	--	160	--

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
				Carson Valley basin (105), T. 14 N., R. 20 E.					
310	8.2	7	0.5	43	14	2	84	--	2
311	8.7	7	.3	18	7	0	93	--	0
312	7.7	3	.7	160	59	3	150	--	2
313	--	3	.4	77	21	6	43	--	5
314	8.0	3	.5	6[illegible]	18	4	57	--	2
315	7.9	7	1.1	77	21	6	41	--	3
316	8.9	5	.6	433	173	0	169	--	4
317	8.7	3	.5	445	178	0	177	--	4
318	8.0	5	1.8	308	123	0	151	--	4
319	8.2	7	1.2	107	38	3	54	--	7
320	7.4	3	.9	136	43	7	53	--	5
321	7.9	3	1.0	297	117	1	152	--	5
322	8.2	2	.1	172	69	0	--	120	--
323	8.1	3	.2	139	54	1	134	--	2
324	8.2	5	.3	184	72	1	121	--	4
325	7.2	3	.4	108	35	5	65	--	5
326	7.9	7	2.2	62	15	6	50	--	5
327	8.1	7	1.0	330	132	0	156	--	4
328	7.6	7	1.6	203	78	2	136	--	4
329	8.6	3	.3	263	105	0	142	--	3
330	8.9	3	.4	273	109	0	138	--	3
331	8.2	3	.5	76	30	0	--	77	--
332	8.2	15	5.3	127	46	3	77	--	3
333	7.8	7	2.4	64	19	4	69	--	5
334	8.1	3	.6	77	21	6	41	--	4
335	8.1	3	2.6	68	19	5	41	--	4
336	8.0	3	.7	77	21	6	46	--	4
337	7.8	3	.3	61	18	4	53	--	4
338	7.8	25	13	58	15	5	55	--	4
339	8.4	--	.6	14	4.4	.8	33	--	2.2
340	8.2	--	.5	17	4.7	1.3	42	--	4.3
341	8.1	18	1.1	28	11	0	--	36	--
342	7.9	3	2.4	56	16	4	48	--	5
343	7.8	3	.3	46	12	4	57	--	3
344	7.8	5	1.7	53	13	5	59	--	4
345	7.2	3	.3	65	16	6	52	--	4
346	7.8	5	.6	61	16	5	57	--	4
347	7.5	7	.6	80	19	8	45	--	4
348	7.6	5	.5	71	17	7	52	--	4
349	7.6	3	.7	182	45	17	42	--	6
350	8.0	5	1.5	41	10	4	63	--	3
351	7.7	3	.6	76	19	7	45	--	4
352	--	--	--	110	27	9.5	87	--	--
353	7.8	3	.4	37	10	3	55	--	4
354	7.9	7	4.4	56	14	5	54	--	3
355	8.0	3	.1	61	16	5	53	--	4
356	8.2	3	.6	51	14	4	50	--	4
357	8.2	3	.5	47	14	3	50	--	4
358	8.2	3	3.3	46	15	2	60	--	4
359	7.9	7	9.1	61	18	4	56	--	5
360	7.6	3	.3	66	20	4	52	--	6
361	7.8	3	.2	56	16	4	52	--	5
362	7.3	3	.4	47	14	3	61	--	5
363	8.2	3	.4	40	11	3	57	--	4
364	7.8	5	.8	56	14	5	59	--	4
365	7.5	3	2.2	95	25	8	38	--	5
366	7.8	7	2.1	50	15	3	54	--	5
367	8.8	3	1.3	35	14	0	132	--	1
368	9.2	7	4.8	8	3	0	96	--	0
369	9.1	3	.9	20	8	0	113	--	0

REF. NO.	pH (STANDARD UNITS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	HARDNESS (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM+POTASSIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)
				Antelope Valley basin (106), T. 10 N., R. 22 E.					
370	7.8	5	2	268	84	14	27	--	1
371	8.0	5	1.3	168	46	13	20	--	1
372	7.8	7	3.5	197	59	12	24	--	1
373	8.2	7	.4	186	58	10	28	--	1
374	8.1	3	.4	143	39	11	21	--	1
375	8.0	7	1.5	169	52	9	30	--	1
376	8.1	5	.6	189	59	10	25	--	1
377	7.4	3	.1	200	52	17	25	--	3
378	7.2	3	.5	220	55	20	22	--	3
379	7.1	3	.2	269	60	29	18	--	3
380	7.3	3	.2	202	48	20	17	--	3
381	7.6	3	.2	181	51	13	46	--	2
382	7.5	8	10	127	36	9	20	--	1
383	7.6	7	7	126	34	10	20	--	1
384	7.6	70	--	117	32	9	--	--	--
385	7.4	7	--	129	35	10	--	--	--
386	7.3	35	11	129	35	10	21	--	1
387	7.4	25	10	126	34	10	18	--	1
388	7.5	3	1	95	28	6	18	--	1
389	7.7	3	--	91	28	5	--	--	--
390	7.3	3	--	97	29	6	--	--	--
391	7.2	3	1	97	29	6	22	--	1
392	7.5	7	1	101	29	7	20	--	1
393	7.3	7	8	102	31	6	17	--	1
394	8.0	3	1	373	110	24	23	--	1
395	8.0	3	1	397	116	26	23	--	1
396	8.0	5	--	373	108	25	--	--	--
397	7.7	3	--	379	112	24	--	--	--
398	7.8	3	2	375	112	23	23	--	2
399	7.8	3	2	387	112	26	24	--	1
400	8.1	7	10	157	48	9	21	--	1
401	8.0	3	--	155	47	9	--	--	--
402	8.0	17	--	157	48	9	--	--	--
403	7.9	25	13	157	48	9	24	--	1
404	8.0	7	6	159	49	9	19	--	.0
405	7.9	3	2	145	48	6	26	--	.0
406	7.6	3	2	145	48	6	27	--	.0
407	7.8	7	1	149	48	7	24	--	1
408	7.6	3	0	144	48	6	24	--	.0
409	7.5	5	--	150	45	5	--	--	--
410	7.5	25	10	116	40	4	21	--	.0
411	7.8	3	1	118	39	5	17	--	.0
412	7.6	3	--	116	40	4	--	--	--
413	7.7	3	--	123	41	5	--	--	--
414	7.5	5	3	126	42	5	23	--	.0
415	7.8	7	--	132	43	6	22	--	1
416	7.5	3	--	125	42	5	19	--	.0
417	7.9	3	4	151	44	10	20	--	3
418	7.9	3	2	160	46	11	18	--	3
419	7.9	3	--	154	45	10	--	--	--
420	7.8	3	--	156	46	10	--	--	--
421	7.7	3	2	159	47	10	18	--	3
422	7.8	7	4	160	46	11	18	--	3
423	7.6	3	1	157	48	9	16	--	2
424	7.2	--	.8	154	45	10	17	--	2.8
425	7.7	3	2	129	40	7	19	--	3
426	7.8	3	2	140	41	9	14	--	3
427	8.2	3	--	131	41	7	--	--	--
428	7.7	3	--	136	43	7	--	--	--
429	7.5	5	3	140	43	8	17	--	3

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
				Antelope Valley basin (106), T. 10 N., R. 22 E.					
430	7.7	7	3	135	41	8	13	--	3
431	7.6	5	1	133	40	8	12	--	3
432	7.7	3	2	152	46	9	20	--	3
433	7.6	3	3	232	65	17	23	--	2
434	7.7	3	--	221	62	16	--	--	--
435	7.6	3	--	216	60	16	--	--	--
436	7.4	7	8	213	59	16	23	--	2
437	7.8	7	8	216	60	16	23	--	2
438	7.4	5	3	207	60	14	21	--	1
439	7.2	--	.5	225	62	17	23	--	1.7
440	7.4	3	3	110	31	8	14	--	4
441	7.7	3	5	112	30	9	12	--	4
442	7.5	3	2	117	32	9	11	--	4
443	7.7	5	1	308	93	18	--	35	--
444	7.9	5	0	299	90	18	30	--	2
445	7.9	3	1	302	93	17	28	--	2
446	8.0	3	--	290	88	17	--	--	--
447	7.8	3	--	295	90	17	--	--	--
448	7.6	3	3	286	88	16	28	--	2
449	8.0	7	3	282	85	17	28	--	2
450	7.9	7	0	287	87	17	26	--	2
451	7.4	3	4	101	29	7	13	--	3
452	7.7	3	1	108	32	7	--	12	--
453	7.5	0	1	99	28	7	16	--	3
454	7.8	3	1	103	28	8	10	--	4
455	7.9	3	--	92	27	6	--	--	--
456	7.6	3	--	99	28	7	--	--	--
457	7.6	3	1	105	29	8	14	--	4
458	7.8	3	0	100	27	8	10	--	4
459	7.5	3	0	100	27	8	8	--	4
460	7.4	5	1	125	32	11	11	--	5
461	7.4	5	0	100	30	6	--	13	--
462	7.4	0	0	90	26	6	15	--	4
463	7.6	3	1	89	24	7	8	--	4
464	8.0	7	--	56	16	4	--	--	--
465	7.7	3	--	95	25	8	--	--	--
466	7.4	3	1	94	26	7	11	--	4
467	7.8	3	1	94	26	7	10	--	3
468	7.5	3	0	94	26	7	8	--	4
469	7.3	3	.3	90	23	8	9	--	4
470	7.0	--	.2	88	23	7.3	8.9	--	3.5
471	7.7	3	1	110	31	8	18	--	4
472	7.9	3	1	100	27	8	11	--	4
473	7.6	3	--	96	27	7	--	--	--
474	7.7	3	--	98	26	8	--	--	--
475	7.4	3	2	103	28	8	11	--	4
476	7.7	7	1	112	30	9	10	--	4
477	7.5	3	1	110	31	8	10	--	4
478	7.5	3	2	109	32	7	12	--	4
479	7.4	10	10	160	40	15	--	--	--
480	7.7	0	0	152	40	13	--	19	--
481	8.3	3	0	196	59	12	--	24	--
482	7.5	2	1	208	51	19	--	13	--
483	7.7	17	10	205	64	11	14	--	6
484	7.8	7	4	174	53	10	13	--	6
485	8.0	3	4	126	49	1	12	--	5
486	7.6	0	0	92	16	13	--	28	--
487	7.8	0	0	98	34	3	--	31	--
488	8.0	--	--	106	28	9	--	15	--
489	7.8	3	0	117	32	9	22	--	5

REF. NO.	pH (STAND-ARD UNITS)	COLOR (PLAT-NUM-COBALT UNITS)	TUR-BID-ITY (NTU)	HARD-NESS (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM-DIS-SOLVED (MG/L AS MG)	SODIUM-DIS-SOLVED (MG/L AS NA)	SODIUM+ POTAS-SIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
			Antelope Valley basin (106), T. 10 N., R. 22 E.						
490	7.8	3	.0	114	29	10	22	--	5
491	8.1	3	.0	116	30	10	22	--	5
492	8.1	3	--	107	28	9	--	--	--
493	7.6	3	--	110	29	9	--	--	--
494	7.7	3	1	110	29	9	17	--	5
495	7.9	3	1	114	29	10	16	--	5
496	7.7	3	.0	112	30	9	15	--	5
497	7.8	3	.8	116	30	10	16	--	5
498	7.6	3	.4	115	28	11	17	--	5
499	7.4	--	.4	146	37	13	22	--	5.5
500	7.7	3	.4	137	35	12	21	--	5
501	7.4	2	2	148	40	12	--	18	--
502	7.7	3	1	155	39	14	15	--	6
503	7.9	3	4	150	37	14	14	--	6
504	7.4	7	1	151	39	13	13	--	6
505	7.6	0	1	124	35	9	--	17	--
506	7.6	3	1	132	33	12	18	--	6
507	7.8	3	.0	130	34	11	11	--	6
508	8.2	3	--	139	34	13	--	--	--
509	7.6	3	--	139	36	12	--	--	--
510	7.5	3	1	137	35	12	13	--	5
511	7.7	3	2	138	34	13	12	--	6
512	7.5	3	1	137	35	12	11	--	5
513	7.7	5	.0	168	42	16	--	13	--
514	7.6	3	1	169	43	15	13	--	6
515	7.5	3	1	147	39	12	18	--	5
516	7.9	3	1	159	42	13	11	--	5
517	7.6	3	--	167	42	15	--	--	--
518	7.3	3	--	181	46	16	--	--	--
519	7.4	3	2	181	46	16	15	--	6
520	7.7	7	2	169	43	15	13	--	6
521	7.5	3	2	160	41	14	11	--	5
522	7.0	--	.6	204	52	18	14	--	6.4
523	8.0	3	.0	94	26	7	10	--	5
524	8.0	3	--	91	25	7	--	--	--
525	7.7	3	--	91	25	7	--	--	--
526	7.6	3	1	94	26	7	11	--	5
527	8.0	7	1	95	25	8	11	--	5
528	7.8	3	.0	94	26	7	9	--	5
529	7.8	3	1	86	23	7	17	--	4
530	7.7	3	.0	89	24	7	8	--	4
531	7.6	3	--	93	24	8	--	--	--
532	7.7	3	1	86	23	7	10	--	4
533	7.5	3	.0	84	22	7	8	--	4
534	7.8	2	1	180	48	15	--	59	--
535	8.2	7	7	195	55	14	39	--	3
536	7.9	3	.0	87	20	9	7	--	3
537	7.8	3	--	80	19	8	--	--	--
538	7.6	3	--	90	21	9	--	--	--
539	7.9	3	1	91	20	10	8	--	3
540	8.0	3	1	101	29	7	23	--	3
541	8.2	3	1	100	30	6	22	--	4
542	8.1	3	--	104	30	7	--	--	--
543	8.1	3	--	99	28	7	--	--	--
544	8.1	5	1	98	31	5	21	--	4
545	8.2	7	4	102	31	6	21	--	4
546	8.1	7	1	100	32	5	20	--	3

REF. NO.	BICAR- BONATE, (MG/L AS HCO3)	CAR- BONATE, (MG/L AS CO3)	ALKA- LINITY (MG/L AS CACO3)	SULFATE, DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS- PHATE TOTAL, (MG/L AS PO4)
Lake Tahoe basin (90), T. 13 N., R. 18 E.											
1	137	0	112	48	13	--	--	--	210	25.0	--
2	120	0	98	53	4	--	--	--	119	--	--
3	98	0	80	4	5	0.06	--	--	131	8.3	--
Lake Tahoe basin (90), T. 14 N., R. 18 E.											
4	181	0	148	77	2	--	--	--	160	--	--
Churchill Valley basin (102), T. 14 N., R. 22 E.											
5	67	--	--	32	5.5	--	--	--	430	0.05	--
6	88	--	--	5.9	6.1	--	--	--	480	.05	--
Carson Valley basin (105), T. 11 N., R. 20 E.											
7	60	0	51	9.6	38	0.10	34	179	--	3.6	--
Carson Valley basin (105), T. 11 N., R. 21 E.											
8	293	0	240	231	16	0.20	--	--	622	0.8	--
9	261	16	246	254	23	.01	--	--	754	.3	--
10	351	0	288	259	12	.10	--	--	691	.5	--
11	169	0	--	39	4.0	--	--	--	--	--	--
12	161	0	132	180	6	.11	--	--	469	2.9	--
13	161	0	132	183	8	.33	--	--	433	3.5	--
14	194	0	--	112	6.0	--	--	--	--	--	--
15	129	0	106	72	3	.13	--	--	249	5.7	--
16	134	0	110	3	2	.13	--	--	178	5.2	--
Carson Valley basin (105), T. 11 N., R. 22 E.											
17	82	--	--	7.8	7.7	--	--	--	400	6.0	--
18	94	--	--	7.4	7.0	--	--	--	480	.08	--
Carson Valley basin (105), T. 12 N., R. 19 E.											
19	64	0	54	1.5	0.3	0.20	31	74	--	--	--
20	83	0	68	2	2	.16	--	--	102	4.8	--
21	78	0	64	2	0	.20	21	--	109	3.3	--
22	73	0	60	2	2	.20	--	--	90	2.3	--
23	73	0	60	2	3	.19	--	--	76	2.6	--
24	49	0	40	1	0	.56	--	--	63	2.4	--
25	46	0	38	3	2	.50	--	--	80	8.2	--
26	43	0	37	5.5	1.7	.20	28	74	--	5.3	--
27	90	0	74	278	23	2.48	--	--	589	2.3	--
28	55	1	48	13	1.1	.70	31	93	--	--	--
29	46	0	38	2	0	.18	--	--	68	.8	--
30	37	0	30	9	1	.23	--	--	72	1.8	--
31	49	0	40	4	1	.09	--	--	88	4.0	--
32	39	0	32	10	1	.29	--	--	77	1.1	--
33	46	0	38	3	2	.21	--	--	76	3.3	--
34	29	0	24	19	2	.77	--	--	74	.4	--
35	32	0	30	2.8	.7	.20	19	50	--	2.4	--
36	20	6	28	17	2	.84	--	--	74	.4	--
37	37	0	30	18	0	.87	--	--	83	.2	--
38	5	18	40	53	4	2.02	--	--	159	.0	--
39	41	0	34	15	0	.26	--	--	75	.2	--

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
					Carson Valley basin (105), T. 12 N., R. 20 E.						
40	105	0	86	21	9	0.11	32	--	145	4.1	--
41	159	0	130	46	10	.10	--	--	247	5.1	--
42	205	0	168	63	20	.03	--	--	301	4.8	--
43	129	0	106	27	16	.12	--	--	189	2.7	--
44	168	0	138	30	12	.10	--	--	219	5.6	--
45	163	0	134	30	10	.15	--	--	238	4.5	--
46	266	0	218	17	8	.10	--	--	274	7.2	--
47	295	0	242	24	10	.11	--	--	303	6.0	--
48	146	0	120	37	11	.12	--	--	199	4.2	--
49	200	0	164	22	7	.12	--	--	233	6.4	--
50	266	0	218	24	6	.17	--	--	279	8.0	--
51	122	0	100	25	7	.14	--	--	166	3.8	--
52	217	0	178	37	11	.06	--	--	266	4.5	--
53	159	0	130	24	10	.17	--	--	196	4.3	--
54	190	0	156	24	8	.12	--	--	208	8.0	--
55	217	0	178	24	6	.21	--	--	238	5.1	--
56	176	0	144	27	5	.07	--	--	174	10.5	--
57	120	0	94	16	4.0	.20	34	149	--	4.0	--
58	144	0	118	24	7	--	--	--	185	13.6	--
59	117	0	96	15	3	.10	--	--	161	7.9	--
60	124	0	102	14	3	.15	--	--	178	6.2	--
61	154	0	126	23	9	.05	--	--	207	6.7	--
62	76	0	62	20	4	.12	--	--	172	31.0	--
63	112	0	92	12	3	.13	--	--	178	5.6	--
64	100	0	82	23	8	.13	--	--	158	7.7	--
65	112	0	92	23	4	.10	32	--	180	7.7	--
66	95	0	78	18	4	.11	--	--	133	12.1	--
67	112	0	92	20	7	.16	--	--	155	4.0	--
68	107	0	88	17	5	.31	--	--	115	2.9	--
69	315	0	258	39	9	.11	36	--	382	10.4	--
70	110	0	90	11	5	.08	--	--	141	.8	--
71	146	0	120	24	8	.12	--	--	167	2.7	--
72	127	0	104	23	7	.14	--	--	184	2.6	--
73	168	0	138	25	11	.08	--	--	232	6.0	--
74	117	0	96	22	9	.18	--	--	191	4.0	--
75	183	0	150	14	6	--	--	--	110	5.0	--
76	154	0	126	27	13	.14	--	--	209	4.1	--
77	134	0	110	5	12	--	--	--	189	12.6	--
78	142	0	116	19	8	.16	--	--	196	7.7	--
79	115	0	94	32	6	.13	--	--	197	3.2	--
80	122	0	100	19	12	.07	--	--	124	7.1	--
81	281	0	230	24	8	--	--	--	296	25.0	--
82	253	0	--	21	10	.10	33	--	307c	19	--
83	100	0	82	20	4	.15	--	--	139	1.1	0.16
84	105	0	86	11	5	.04	--	--	146	.8	--
85	100	0	82	18	8	.11	--	--	117	.9	--
86	93	0	76	21	6	.15	--	--	142	1.4	--
87	120	0	98	17	5	.07	--	--	180	5.4	--
88	110	0	90	28	26	.61	--	--	212	6.0	--
89	95	0	78	23	5	.10	--	--	154	3.3	--
90	98	0	80	21	6	.13	--	--	149	.8	--
91	98	0	80	21	5	.13	--	--	147	1.6	--
92	95	0	78	24	4	.14	--	--	153	4.9	--
93	195	0	160	35	8	1.09	--	--	253	9.0	--
94	112	0	92	19	8	.14	--	--	162	3.2	--

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
				Carson Valley basin (105), T. 12 N., R. 20 E.							
95	129	0	106	25	6	0.10	--	--	176	9.0	--
96	139	0	114	11	3	.23	--	--	170	5.4	--
97	115	0	94	30	5	.15	--	--	150	4.8	--
98	127	0	104	13	5	--	--	--	168	5.0	--
99	171	0	140	13	6	.24	--	--	191	5.5	--
100	115	0	94	11	5	.17	--	--	134	4.8	--
101	163	0	134	14	5	.11	--	--	186	3.0	--
102	176	0	144	18	2	.88	28	--	202	5.3	--
103	120	0	99	14	2.8	--	35	154	--	8.0	--
104	105	12	110	32	15	.42	--	--	202	3.0	--
105	207	0	170	16	7	.12	--	--	234	14.9	--
106	176	0	144	20	7	.16	--	--	225	10.3	--
107	149	0	122	24	7	.31	--	--	196	6.6	--
108	110	0	90	39	6	.00	--	--	186	1.0	--
109	268	0	220	17	5	.00	--	--	317	3.7	--
110	127	0	104	36	10	.13	--	--	186	1.0	--
111	200	0	164	14	6	.08	--	--	236	3.6	--
112	246	0	202	94	36	.12	--	--	430	23.4	--
113	222	10	202	86	39	.09	--	--	456	19.8	--
114	232	0	190	36	7	< .10	--	--	309	7.7	--
115	351	0	288	52	5	.12	--	--	394	11.3	--
116	220	10	200	34	9	.04	--	--	284	6.9	--
117	207	0	170	64	15	.04	--	--	324	11.9	--
118	156	0	128	64	7	.10	--	--	257	10.4	--
119	242	0	198	37	7	.05	--	--	279	7.0	--
120	239	0	196	29	10	.02	--	--	285	9.6	--
121	283	0	232	17	6	.09	--	--	285	10.1	--
122	119	6	110	71	8	.13	--	--	253	1.3	--
123	149	0	122	61	14	.08	--	--	261	4.6	--
124	227	0	186	24	18	.11	--	--	290	8.3	--
125	240	0	196	30	20	.08	--	--	294	8.6	--
126	290	0	238	41	32	.01	--	--	444	37.6	--
127	320	0	262	30	40	.10	--	--	544	84.0	0.24
128	312	0	256	32	40	.00	--	--	509	81.3	--
129	307	0	252	27	41	.01	--	--	518	75.0	--
130	293	0	240	40	43	< .10	--	--	505	69.4	--
131	183	0	150	24	11	< .10	--	--	239	16.8	--
132	154	0	126	48	10	< .10	--	--	238	9.2	--
133	146	0	120	55	12	.09	--	--	296	1.9	--
				Carson Valley basin (105), T. 12 N, R. 21 E.							
134	232	0	190	22	4	0.28	--	--	232	1.4	--
135	188	0	154	43	6	.19	--	--	251	.7	--
136	183	0	150	55	5	.39	--	--	264	1.0	--
137	195	0	160	40	5	.21	--	--	256	.9	--
138	188	0	154	45	7	.14	--	--	244	1.0	--
139	249	0	204	26	6	.22	--	--	261	2.4	--
140	215	0	176	21	5	.12	--	--	231	1.5	--
141	220	0	180	19	5	.15	--	--	221	1.0	--
142	212	0	174	23	4	.20	--	--	238	1.3	--
143	220	0	180	24	6	.12	--	--	248	1.3	--
144	56	7	58	131	4	.26	28	--	284	.1	--
145	142	0	116	27	15	.18	--	--	196	21.1	--
146	149	0	122	28	17	.13	--	--	243	21.3	--
147	--	--	117	27	16	.20	30	217	--	19.5	--
148	139	0	114	49	8	.12	--	--	212	7.9	--
149	205	0	168	102	11	.05	--	--	426	4.4	--
150	207	0	170	91	6	.16	--	--	384	4.1	--
151	178	0	146	34	6	.18	--	--	220	1.3	--

TABLE 7.--Water-quality data--Continued

REF. NO.	BICARBONATE, (MG/L AS HCO3)	CARBONATE, (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DISSOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL, (MG/L AS NO3)	PHOSPHATE TOTAL, (MG/L AS PO4)
				Carson Valley basin (105), T. 12 N., R. 22 E.							
152	78	--	--	--	5.5	--	--	--	--	<0.02	--
153	160	--	--	7.6	10	--	--	--	630	.17	--
154	24	--	--	5.6	5.5	--	--	--	140	.17	--
155	30	--	--	6.4	6.3	--	--	--	180	.16	--
				Carson Valley basin (105), T. 13 N., R. 19 E.							
156	102	0	84	3	0	0.01	--	--	112	2.1	--
157	151	0	124	6	1	.06	--	--	159	3.5	--
158	132	0	108	3	2	.11	--	--	155	16.4	--
159	110	0	90	4	1	.00	--	--	122	1.6	--
160	163	0	134	11	0	.09	21	--	161	.5	--
161	24	14	48	13	3	.11	--	--	90	.0	--
162	20	14	44	23	0	.13	--	--	92	.0	--
163	122	0	100	10	1	.16	--	--	177	1.5	--
164	88	0	72	25	1	1.38	--	--	131	.4	--
165	181	0	148	10	3	--	--	--	182	1.3	--
166	134	0	110	6	5	< .10	--	--	151	12.2	--
167	117	0	96	7	5	.12	--	--	144	23.8	--
168	127	0	104	15	11	.09	--	--	201	28.5	--
169	112	0	92	8	4	.09	--	--	178	22.8	0.09
170	117	0	96	3	4	.09	--	--	140	10.9	--
171	107	0	88	4	2	< .10	--	--	122	6.3	--
172	115	0	94	4	0	.03	--	--	127	3.9	.06
173	122	0	100	3	1	.08	--	--	98	8.4	--
174	132	0	108	3	1	.09	28	--	150	7.7	--
175	112	0	92	3	4	.09	--	--	160	7.6	--
176	124	0	102	2	4	.00	--	--	131	9.5	--
177	--	--	220	--	--	--	--	--	748	1.7	--
178	--	--	246	--	--	--	--	--	543	--	--
179	--	--	300	--	--	--	--	--	502	.5	--
180	--	--	--	--	--	--	--	--	616	2.4	--
181	--	--	--	--	--	--	--	--	--	.7	--
182	83	0	68	15	5	.39	--	--	151	.0	--
183	57	3	52	10	1.6	.70	55	116	--	--	--
184	83	0	69	13	3.5	.40	50	134	--	1.1	--
185	--	--	140	--	--	--	--	--	452	.8	--
186	--	--	120	--	--	--	--	--	365	--	--
187	--	--	130	--	--	--	--	--	295	.3	--
188	--	--	--	--	--	--	--	--	308	.3	--
189	--	--	--	--	--	--	--	--	--	.1	--
190	124	0	102	1	1	.01	--	--	124	1.2	--
191	132	0	108	--	1	.07	--	--	121	.1	--
192	126	0	104	0	5	.13	--	--	113	1.2	--
193	12	24	--	200	46	5.00	61	--	492c	.3	.06
194	81	0	66	18	2.6	.40	48	137	--	--	--
195	110	0	90	13	3	.56	--	--	160	.7	--
196	85	0	70	5	16	.09	--	--	168	23.9	--
197	93	0	76	0	0	.09	21	--	102	1.2	--
198	63	0	54	1.5	.6	.20	22	70	--	.5	--

REF. NO.	BICARBONATE, (MG/L AS HCO3)	CARBONATE, (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DISSOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL, (MG/L AS NO3)	PHOSPHATE TOTAL, (MG/L AS PO4)
					Carson Valley basin (105), T. 13 N., R. 20 E.						
199	20	12	40	113	25	4.68	--	--	307	0.7	--
200	27	6	34	171	27	3.72	--	--	362	.1	--
201	120	0	98	49	15	2.26	--	--	275	2.9	--
202	49	0	40	112	27	4.20	--	--	298	.0	--
203	20	10	36	114	25	4.20	--	--	304	.2	--
204	105	0	86	93	23	2.94	--	--	308	9.8	--
205	93	0	76	144	25	2.12	--	--	348	2.6	--
206	108	0	88	54	10	1.50	--	--	265	.3	--
207	110	0	90	44	8	1.82	--	--	293	.9	--
208	132	0	108	54	9	1.60	--	--	261	3.5	--
209	146	10	140	26	12	3.12	--	--	296	4.5	--
210	146	0	120	13	14	.19	--	--	233	11.5	--
211	151	0	124	29	10	.18	--	--	235	3.9	--
212	81	6	78	21	5	.94	--	--	186	.1	--
213	149	0	122	237	66	.75	--	--	663	.4	--
214	107	8	88	13	5	.45	--	--	163	.5	--
215	90	0	74	19	9	.45	--	--	163	--	--
216	63	6	64	28	3	1.04	--	--	160	.4	--
217	63	6	64	24	5	1.04	--	--	175	.0	--
218	237	0	194	357	87	.25	--	--	951	.1	--
219	51	14	70	19	5	1.15	--	--	175	.0	--
220	185	0	152	356	82	.28	56	--	894	.6	--
221	120	0	98	271	77	.53	--	--	701	.0	--
222	244	0	200	382	84	.29	--	--	996	6.4	--
223	76	0	62	20	4	.80	--	--	170	--	--
224	68	6	68	19	4	.60	--	--	160	.6	--
225	63	8	68	19	4	.59	--	--	159	.4	--
226	168	0	138	24	10	.83	--	--	269	2.4	--
227	146	0	120	28	9	3.04	--	--	243	2.2	--
228	180	0	156	17	8.9	1.20	58	238	--	.7	--
229	84	0	72	19	4.9	.40	52	152	--	--	--
230	98	0	85	17	4.8	.20	45	152	--	1.1	--
231	456	0	379	92	14	.50	59	569	--	1.5	--
232	673	0	524	180	40	.30	63	873	--	12.0	--
233	160	0	134	30	8.4	.20	51	226	--	2.9	--
234	293	0	240	39	10	.12	--	--	344	6.2	--
235	93	0	76	16	5	.10	--	--	123	2.2	--
236	88	0	72	17	6	.04	--	--	132	1.3	--
237	83	0	68	15	7	.06	--	--	134	1.0	--
238	78	0	64	16	3	.08	--	--	135	1.7	--
239	200	0	164	33	10	.10	--	--	276	12.8	--
240	107	0	88	17	7	.13	--	--	143	2.5	--
241	69	0	61	20	1.9	.30	39	124	--	.4	--
242	117	0	96	11	5	.12	--	--	156	.8	--
243	90	0	74	15	4	.07	--	--	108	3.3	--
244	93	0	76	16	5	.13	--	--	133	1.5	--
245	88	0	72	15	8	.08	--	--	139	.9	--
246	102	0	84	17	4	.13	--	--	140	2.5	--
247	200	0	164	22	5	.05	--	--	231	12.5	--
248	202	0	166	20	9	.05	--	--	225	5.0	--
249	300	0	246	20	8	.14	--	--	300	9.8	--
250	129	0	106	21	5	.21	--	--	182	.4	--
251	146	0	120	29	5	.75	--	--	188	3.7	--
252	142	0	116	22	5	.20	--	--	170	3.7	--
253	281	0	230	19	7	--	--	--	293	16.5	--
254	283	0	232	15	5	--	--	--	288	8.0	--
255	285	0	234	14	7	--	--	--	297	10.7	--
256	180	0	153	21	5	.20	36	216	--	3.1	--

TABLE 7.--Water-quality data--Continued

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
Carson Valley basin (105), T. 13 N., R. 21 E.											
257	140	0	--	57	8	--	--	--	--	--	--
258	166	0	136	45	25	0.18	--	--	339	20.9	--
259	156	0	128	44	31	.24	--	--	320	14.7	--
260	171	0	140	45	7	.17	56	--	271	.7	--
261	230	0	179	27	7.1	.10	22	239	--	3.1	--
Carson Valley basin (105), T. 14 N., R. 19 E.											
262	73	0	60	1	3	0.12	--	--	100	5.9	--
263	76	0	62	5	2	.00	--	--	128	1.7	--
264	78	0	64	4	0	.06	--	--	116	.3	--
265	81	0	66	3	5	.35	--	--	114	7.6	--
266	73	0	60	1	3	.14	--	--	97	8.5	--
267	124	0	102	19	7	.09	--	--	227	4.1	--
268	98	0	80	0	4	.00	--	--	102	.5	--
269	100	0	82	3	2	.04	--	--	120	.7	--
270	66	0	54	7	2	.14	--	--	97	5.0	--
271	81	0	66	44	36	2.70	32	--	230	.4	--
272	127	0	104	2	7	.36	--	--	187	10.0	--
273	78	0	64	0	0	< .10	--	--	98	4.5	--
274	110	0	90	29	13	2.00	--	--	191	.2	--
275	100	0	82	21	15	1.53	--	--	182	.0	--
276	98	0	80	20	15	1.66	--	--	170	.1	--
277	105	0	86	19	13	1.32	--	--	168	.1	--
278	98	0	80	25	15	1.74	--	--	158	5.2	--
279	90	0	74	23	12	1.81	--	--	185	--	--
280	95	0	78	25	15	1.40	--	--	172	.0	--
281	90	8	90	11	8	.28	--	--	145	6.5	--
282	171	0	140	0	6	.30	--	--	190	3.9	--
283	129	0	106	4	4	.01	--	--	143	9.2	--
284	88	0	75	2.4	.8	--	22	90	--	.8	--
285	183	0	150	9	7	.11	--	--	203	.1	--
286	122	0	100	12	9	.05	--	--	199	14.6	--
287	112	0	92	34	3	--	--	--	126	3.0	--
288	120	0	100	5	1.2	--	28	130	--	4.1	--
289	140	0	118	30	10	1.30	24	197	--	2.5	--
Carson Valley basin (105), T. 14 N., R. 20 E.											
290	117	0	96	16	10	1.44	--	--	182	3.0	--
291	134	0	110	25	13	.72	--	--	261	28.1	--
292	120	0	98	20	12	.63	62	--	259	40.6	--
293	183	0	150	31	17	.69	--	--	409	69.5	--
294	185	0	152	27	15	.68	--	--	371	59.6	--
295	137	0	112	12	10	.99	--	--	200	15.1	--
296	112	0	92	22	13	1.93	--	--	174	.7	--
297	161	0	132	18	12	1.45	--	--	244	6.6	--
298	173	0	142	18	32	1.28	--	--	239	9.8	--
299	183	0	150	27	15	.45	--	--	259	3.9	--
300	178	0	146	26	15	.45	--	--	285	4.4	--
301	224	0	184	18	17	.31	--	--	265	4.7	--
302	166	0	136	14	12	.61	--	--	245	13.3	--
303	61	0	50	68	20	2.84	--	--	229	.5	--
304	66	0	54	42	10	2.00	38	166	--	.4	--
305	47	--	--	300	21	--	--	--	603	.4	--
306	50	0	41	300	23	2.90	39	548	--	.4	--
307	17	--	--	418	37	--	--	--	842	.3	--
308	39	0	12	470	38	5.10	35	798	--	.4	--
309	4	7	--	678	39	--	20	--	1,100e	--	--

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
				Carson Valley basin (105) T. 14 N., R. 20 E.							
310	59	2	52	125	28	3.76	--	--	295	1.4	--
311	37	10	50	123	31	5.32	--	--	306	.0	--
312	56	0	46	362	31	3.20	--	--	719	.0	--
313	144	0	118	35	6	1.55	--	--	236	2.6	--
314	115	0	94	58	14	3.08	--	--	269	3.1	--
315	129	0	106	40	6	1.22	--	--	256	1.9	--
316	10	2	12	725	38	3.36	--	--	1173	.1	--
317	0	4	8	710	39	3.30	--	--	1170	.3	--
318	27	0	22	522	30	1.53	28	--	946	2.5	--
319	110	0	90	121	11	1.12	--	--	344	1.5	--
320	124	0	102	117	14	1.12	--	--	347	2.3	--
321	24	0	20	553	28	3.60	--	--	926	.2	--
322	98	0	80	308	23	3.30	--	--	618	.6	--
323	81	0	66	288	23	3.13	--	--	607	7.2	--
324	85	0	70	319	25	2.98	--	--	663	12.3	--
325	183	0	150	63	19	1.51	--	--	327	1.2	--
326	142	0	116	34	8	1.57	--	--	253	2.1	--
327	12	0	10	600	34	3.58	--	--	1032	.2	--
328	41	0	34	400	24	2.80	--	--	689	.0	--
329	0	4	10	533	26	3.96	--	--	898	.6	--
330	0	4	8	514	28	3.80	49	--	859	.5	--
331	171	0	140	75	16	2.82	--	--	331	2.9	--
332	93	0	76	182	11	1.79	47	--	402	1.1	--
333	139	0	114	54	28	1.54	--	--	284	1.7	--
334	134	0	110	43	8	1.58	--	--	245	2.4	--
335	144	0	118	36	8	1.50	--	--	247	.8	--
336	146	0	120	34	8	1.52	73	--	253	2.8	--
337	146	0	120	38	9	1.75	--	--	254	2.9	--
338	144	0	118	37	9	1.65	--	--	248	.7	--
339	81	1	70	16	4.8	1.00	51	152	--	--	--
340	54	0	45	47	6.1	.80	59	193	--	.4	--
341	78	0	64	32	6	1.10	--	--	142	.0	--
342	154	0	126	37	7	1.65	--	--	250	2.6	--
343	122	0	100	47	11	2.78	68	--	258	1.9	--
344	137	0	112	40	12	2.56	--	--	266	2.2	--
345	137	0	112	38	7	1.78	--	--	262	2.6	--
346	132	0	108	46	12	2.66	66	--	274	1.7	--
347	156	0	128	27	11	1.15	--	--	204	.4	--
348	161	0	132	28	10	1.94	--	--	233	5.9	--
349	173	0	142	44	21	.70	--	--	367	70.0	--
350	120	0	98	54	13	3.00	--	--	271	.3	--
351	159	0	130	35	8	1.40	--	--	235	4.2	--
352	--	--	--	56	27	1.73	61	--	--	23.9	--
353	129	0	106	38	6	1.70	--	--	240	2.3	--
354	122	0	100	39	10	1.62	--	--	233	2.4	--
355	122	0	100	52	15	1.41	--	--	248	5.2	--
356	134	0	110	38	16	1.98	--	--	228	3.3	--
357	105	12	110	40	13	2.02	--	--	226	3.2	--
358	117	0	96	46	12	2.46	--	--	251	1.8	--
359	105	0	86	82	19	1.37	--	--	297	2.7	--
360	102	0	84	70	17	1.30	--	--	269	3.8	--
361	134	0	110	41	11	1.68	--	--	261	4.2	--
362	98	0	80	68	18	1.52	--	--	276	3.6	--
363	110	0	90	52	11	2.12	--	--	252	3.1	--
364	102	0	84	59	21	1.75	--	--	249	3.8	--
365	112	0	92	74	18	.82	--	--	290	.4	--
366	107	0	88	55	11	1.63	--	--	269	2.7	--
367	17	10	34	202	35	4.72	--	--	461	.1	--
368	22	14	46	111	30	4.96	--	--	322	.1	--
369	2	16	34	174	28	4.96	--	--	386	.0	--

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
					Antelope Valley basin (106), T. 10 N., R. 22 E.						
370	181	0	148	140	8.0	0.24	--	--	414	0.3	--
371	176	0	144	32	10	.15	--	--	235	7.6	--
372	220	0	180	48	5.0	.12	--	--	289	4.1	--
373	173	2	146	87	6	.20	--	--	297	2.0	--
374	171	0	140	38	5	.14	--	--	193	8.5	--
375	200	0	164	52	7	.01	--	--	281	8.9	--
376	205	0	168	68	5	--	--	--	277	2.5	--
377	239	0	196	56	11	.15	--	--	347	7.8	--
378	232	0	190	44	11	.21	--	--	334	11	--
379	264	0	216	50	10	.16	--	--	349	12.2	--
380	227	0	186	34	5	.19	--	--	268	8.6	--
381	195	0	160	62	26	.22	--	--	331	12.5	--
382	132	0	108	60	4	.0	--	--	233	1.5	0.19
383	129	0	106	64	6	.2	--	--	255	2.0	.37
384	115	0	94	59	5	--	--	--	282	3.4	.47
385	124	0	102	60	3	--	--	--	--	2.2	.45
386	124	0	102	64	3	.2	--	--	244	2.2	--
387	124	0	102	63	2	.1	--	--	258	2.4	.57
388	120	0	98	33	7	.2	--	--	219	1.4	.94
389	117	0	96	32	5	--	--	--	234	1.5	.97
390	117	0	96	32	5	--	--	--	--	1.4	.96
391	115	0	94	33	5	.3	--	--	232	1.3	--
392	119	0	98	34	8	.4	--	--	220	1.4	.93
393	122	0	100	34	4	.3	--	--	219	1.2	1.00
394	295	0	242	163	7	.1	--	--	505	7.9	.10
395	298	0	244	172	4	.1	--	--	541	7.6	.09
396	293	0	240	159	5	--	--	--	559	7.5	.09
397	288	0	236	162	3	--	--	--	--	7.6	.09
398	293	0	240	158	8	.0	--	--	535	7.2	--
399	293	0	240	165	5	.3	--	--	540	6.3	.08
400	195	0	160	31	6	.1	--	--	250	.0	.13
401	195	0	160	30	5	--	--	--	259	.0	.04
402	195	0	160	30	3	--	--	--	--	.1	.10
403	190	0	156	32	5	.1	--	--	261	.4	--
404	200	0	164	30	4	.1	--	--	254	.0	.07
405	200	0	164	29	5	.3	--	--	255	1.3	.67
406	195	0	160	31	7	.2	--	--	276	1.4	--
407	195	0	160	31	7	.3	--	--	244	2.1	.61
408	195	0	160	31	5	.2	--	--	259	1.2	.69
409	173	0	142	26	5	--	--	--	--	2.0	.15
410	171	0	140	27	6	.1	--	--	225	1.3	.14
411	134	0	110	14	10	.2	--	--	223	20	.35
412	142	0	116	12	10	--	--	--	229	23	.37
413	149	0	122	14	10	--	--	--	--	22	.33
414	156	0	128	16	21	.2	--	--	267	23	--
415	159	0	130	17	13	.1	--	--	232	23	.28
416	156	0	128	15	10	.2	--	--	236	26	.38
417	168	0	138	45	3	.1	--	--	234	11	.46
418	159	0	130	46	5	.2	--	--	253	12	.51
419	163	0	134	41	4	--	--	--	268	16	.42
420	161	0	132	43	3	--	--	--	--	14	.47
421	159	0	130	54	4	.2	--	--	262	11	--
422	159	0	130	56	5	.2	--	--	262	11	.31
423	154	0	126	56	3	.1	--	--	276	10	.37
424	170	0	--	47	2.4	.2	35	239	--	9.7	--
425	149	0	122	38	2	.0	--	--	210	2.5	.24
426	142	0	116	42	4	.1	--	--	228	2.4	.27
427	144	0	118	43	2	--	--	--	223	2.6	.26
428	142	0	116	46	2	--	--	--	--	2.9	.28
429	139	0	114	43	5	.1	--	--	240	2.9	--

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
				Antelope Valley (106), T. 10 N., R. 22 E.							
430	146	0	120	43	5	0.0	--	--	217	2.9	0.21
431	149	0	122	38	0	.2	--	--	222	2.6	.21
432	146	0	120	63	4	.1	--	--	280	2.5	--
433	200	0	164	95	5	.1	--	--	367	9.5	.14
434	190	0	156	99	4	--	--	--	355	11	.31
435	188	0	154	91	3	--	--	--	--	11	.31
436	185	0	152	89	4	.2	--	--	335	11	--
437	195	0	160	86	5	.2	--	--	335	11	.22
438	190	0	156	83	5	.1	--	--	347	11	.28
439	200	0	--	100	3.5	.1	39	350	--	12	--
440	144	0	118	30	2	.2	--	--	228	.9	--
441	146	0	120	29	5	.0	--	--	202	2.1	.08
442	146	0	120	31	0	.0	--	--	203	1.8	.12
443	256	0	210	148	3	--	--	--	443	20	--
444	237	0	194	142	3	.0	--	--	454	17	--
445	239	0	196	133	5	.1	--	--	455	18	.32
446	237	0	194	130	3	--	--	--	460	21	.17
447	237	0	194	131	3	--	--	--	--	14	.24
448	232	0	190	137	3	.2	--	--	430	14	--
449	220	0	180	129	4	.1	--	--	432	14	.20
450	241	0	198	117	4	.1	--	--	449	14	.22
451	127	0	104	19	4	.2	--	--	200	.7	--
452	134	0	110	14	4	.0	--	--	152	3.8	--
453	132	0	108	13	4	.1	--	--	192	2.2	--
454	132	0	108	13	3	.1	--	--	178	1.9	.25
455	134	0	110	11	2	--	--	--	176	2.3	.21
456	132	0	108	11	1	--	--	--	--	2.2	.21
457	134	0	110	18	2	.1	--	--	206	2.0	--
458	134	0	110	13	5	.0	--	--	171	2.1	.22
459	132	0	108	12	0	.2	--	--	177	1.6	.21
460	146	0	120	13	3	.1	--	--	206	8.6	--
461	137	0	112	13	0	.0	--	--	171	1.8	--
462	127	0	104	11	2	.0	--	--	171	1.6	--
463	122	0	100	11	1	.1	--	--	171	1.4	.17
464	90	0	74	7	1	--	--	--	146	.3	.10
465	127	0	104	11	0	--	--	--	--	1.6	.22
466	129	0	106	11	3	.1	--	--	192	1.6	--
467	129	0	106	12	4	.2	--	--	175	1.8	.18
468	132	0	108	11	2	.1	--	--	173	1.4	.18
469	112	0	92	12	2	.1	--	--	145	1.3	--
470	120	0	100	11	1.7	<.1	48	152	--	4.2	--
471	139	0	114	26	5	.0	--	--	182	1.4	.14
472	127	0	104	17	2	.1	--	--	181	1.4	.37
473	132	0	108	16	1	--	--	--	214	1.7	.32
474	129	0	106	17	2	--	--	--	--	1.4	.35
475	129	0	106	22	3	.2	--	--	179	1.5	--
476	134	0	110	28	2	.2	--	--	183	1.5	.24
477	134	0	110	28	0	.1	--	--	199	1.3	.29
478	134	0	110	25	7	.2	--	--	178	1.5	--
479	195	0	160	14	14	--	--	--	246	33	--
480	181	0	148	24	9	--	--	--	240	48	--
481	215	14	204	15	13	.0	--	--	289	13	--
482	251	0	206	13	8	.0	--	--	288	7.1	--
483	246	0	202	14	20	.1	--	--	289	4.9	.06
484	220	0	180	13	14	.1	--	--	284	4.1	--
485	163	0	134	14	8	.1	--	--	223	3.2	.04
486	149	0	122	24	3	--	--	--	174	2.0	--
487	167	0	138	14	6	--	--	--	--	3.8	--
488	151	0	124	14	1	--	--	--	--	--	--
489	159	0	130	13	8	.2	--	--	230	8.0	--

REF. NO.	BICAR-BONATE, (MG/L AS HCO3)	CAR-BONATE, (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEGREES CELSIUS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEGREES CELSIUS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL, (MG/L AS NO3)	PHOS-PHATE TOTAL, (MG/L AS PO4)
					Antelope Valley basin (106), T. 10 N., R. 22 E.						
490	168	0	138	14	5	0.1	--	--	206	8.7	0.76
491	168	0	138	14	5	.1	--	--	235	9.8	.79
492	159	0	130	14	4	--	--	--	212	9.6	.66
493	156	0	128	13	4	--	--	--	--	8.2	.64
494	154	0	126	13	5	.2	--	--	206	8.0	--
495	149	0	122	12	5	.2	--	--	201	7.7	.59
496	151	0	124	15	4	.2	--	--	200	7.6	.61
497	146	0	120	12	5	.14	--	--	192	8.5	--
498	156	0	128	14	5	.16	--	--	188	8.4	--
499	200	0	--	16	5.9	.1	50	239	--	16.4	--
500	181	0	148	15	5	.08	--	--	216	12.3	--
501	178	0	146	14	10	--	--	--	241	17	--
502	188	0	154	13	8	.1	--	--	249	14	--
503	185	0	152	15	10	.1	--	--	240	14	.24
504	195	0	160	13	8	.1	--	--	258	15	.39
505	154	0	126	12	7	.1	--	--	204	15	--
506	159	0	130	10	9	.1	--	--	217	16	.39
507	168	0	138	11	8	.1	--	--	240	15	.51
508	154	0	126	11	9	--	--	--	254	18	.49
509	159	0	130	10	7	--	--	--	--	18	.47
510	163	0	134	10	10	.0	--	--	233	17	--
511	163	0	134	10	10	.1	--	--	221	16	.31
512	159	0	130	10	8	.1	--	--	241	16	.37
513	195	0	160	8	11	.1	--	--	246	15	--
514	195	0	160	12	10	.0	--	--	249	9.4	--
515	183	0	150	11	8	.0	--	--	224	9.6	.33
516	195	0	160	12	8	.0	--	--	255	11	.29
517	198	0	162	11	9	--	--	--	261	14	.35
518	212	0	174	11	10	--	--	--	--	16	.36
519	212	0	174	13	12	.3	--	--	300	15	--
520	207	0	170	12	10	.3	--	--	262	11	.25
521	207	0	170	12	8	.1	--	--	260	9.2	.17
522	240	0	--	13	15	<.1	51	286	--	19.9	--
523	134	0	110	11	1	.1	--	--	192	2.0	.63
524	134	0	110	9	1	--	--	--	183	1.8	.60
525	139	0	114	9	4	--	--	--	--	2.1	.57
526	134	0	110	10	3	.3	--	--	173	2.1	--
527	134	0	110	12	4	.4	--	--	187	2.2	.56
528	137	0	112	11	2	.1	--	--	188	1.5	.44
529	127	0	104	10	2	.0	--	--	160	.9	.34
530	122	0	100	11	0	.1	--	--	180	1.2	.29
531	117	0	96	9	0	--	--	--	--	1.4	.37
532	112	0	92	9	2	.1	--	--	168	1.4	--
533	117	0	96	5	1	.1	--	--	173	1.1	.33
534	312	0	256	12	8	.1	--	--	353	38	--
535	188	34	222	41	12	.2	--	--	328	7.4	.13
536	115	0	94	10	1	.2	--	--	160	.7	.65
537	110	0	90	9.0	1	--	--	--	145	.3	.60
538	117	0	96	8.0	0	--	--	--	--	.8	.64
539	122	0	100	10	2	.3	--	--	157	.5	.66
540	171	0	140	16	1	.0	--	--	212	4.0	--
541	127	12	128	18	3	.12	--	--	185	2.0	.65
542	156	0	128	16	1	--	--	--	227	3.9	.55
543	151	0	124	16	1	--	--	--	--	2.7	.64
544	149	0	122	19	2	.2	--	--	188	2.6	--
545	156	0	128	20	4	.1	--	--	199	2.1	.59
546	159	0	130	18	1	.2	--	--	196	2.3	.58

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Lake Tahoe basin (90), T. 13 N., T. 18 E.					
1	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	0.13	--	--	--
3	--	--	--	--	--	.11	--	--	--
				Lake Tahoe basin (90), T. 14 N., R. 18 E.					
4	--	--	--	--	--	--	--	--	--
				Churchill Valley basin (102), T. 14 N., R. 22 E.					
5	--	--	--	--	--	--	<0.01	--	--
6	--	--	--	--	--	--	< .01	--	--
				Carson Valley basin (105), T. 11 N., R. 20 E.					
7	0.04	<0.001	0.054	0.02	<0.01	0.005	<0.001	0.036	--
				Carson Valley basin (105), T. 11 N., R. 21 E.					
8	--	0.000	0.020	--	0.00	0.48	0.04	0.31	--
9	--	.040	--	--	--	.92	.04	--	--
10	--	.000	--	--	--	.19	.05	--	--
11	--	--	--	--	--	--	--	--	--
12	--	--	--	--	--	.55	.05	--	--
13	--	.000	--	--	--	.56	.01	--	--
14	--	--	--	--	--	--	--	--	--
15	--	.000	--	--	.40	.11	.02	.19	--
16	--	.000	--	--	.02	.02	.01	.59	--
				Carson Valley basin (105), T. 11 N., R. 22 E.					
17	--	--	--	--	--	--	<0.01	--	--
18	--	--	--	--	--	--	< .01	--	--
				Carson Valley basin (105), T. 12 N., R. 19 E.					
19	0.03	<0.001	0.01	0.01	<0.01	<0.003	<0.001	<0.003	--
20	--	.000	--	--	.20	.06	.00	2.04	--
21	--	.000	.02	.0	.25	.28	.01	.87	--
22	--	.000	--	--	.02	.17	.01	.52	--
23	--	.000	--	--	--	.08	.00	--	--
24	--	.000	--	--	--	.02	.00	--	--
25	--	.000	--	--	--	.04	.00	--	--
26	.05	< .001	.016	.01	< .01	< .003	.001	.007	--
27	--	.025	--	--	--	.01	.02	--	--
28	.09	.008	.014	.05	< .01	.011	< .001	< .003	--
29	--	.000	--	--	.00	.14	.00	.19	--
30	--	.000	--	--	--	.00	.00	--	--
31	--	.000	--	--	--	.13	.00	--	--
32	--	--	--	--	--	.09	.00	--	--
33	--	.000	--	--	--	.19	.05	--	--
34	--	.000	--	--	.08	.40	.03	.31	--
35	.05	< .001	.034	< .01	< .01	.003	< .001	.011	--
36	--	.000	--	--	--	.29	.01	--	--
37	--	.000	--	--	--	.01	.01	--	--
38	--	.013	.00	--	.00	.42	.00	.03	--
39	--	.000	--	--	.34	1.15	.01	.39	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
			Carson Valley basin (105), T. 12 N., R. 20 E.						
40	--	0.005	0.06	0.2	0.03	0.25	0.12	0.53	--
41	--	.005	--	--	--	.00	.00	--	--
42	--	--	--	--	--	.05	--	--	--
43	--	.000	.1	--	--	.04	.00	--	--
44	--	.000	< .25	--	.00	.00	.01	.00	<0.1
45	--	.000	.13	--	.00	.00	.00	.04	< .1
46	--	--	--	--	--	--	--	--	--
47	--	.005	.2	--	--	.10	.00	--	--
48	--	.000	--	--	.00	.00	.00	.01	< .2
49	--	.000	< .25	--	.00	.01	.00	.00	< .1
50	--	.000	.16	--	.00	.00	.00	.01	< .1
51	--	.000	--	--	.00	.00	.00	.00	< .1
52	--	.000	.14	.2	.02	.09	.00	.01	< .1
53	--	--	--	--	--	.02	--	--	--
54	--	.015	.1	--	--	.00	.00	--	--
55	--	.000	< .25	--	.00	.02	.00	.04	< .1
56	--	.000	.12	--	.00	.10	.00	.07	< .1
57	0.04	.004	.091	.17	< .01	.014	.001	.071	--
58	--	--	--	--	--	.15	--	--	--
59	--	.000	--	--	.01	.04	.00	.22	< .2
60	--	.000	--	--	.00	.03	.00	.26	--
61	--	.005	--	--	--	.00	.00	--	--
62	--	--	--	--	--	.10	--	--	--
63	--	.005	--	--	--	.00	--	--	--
64	--	.000	--	--	--	.00	.00	--	--
65	--	.000	.08	.1	1.29	.49	.06	1.66	--
66	--	.000	--	--	.07	.04	.02	.20	--
67	--	.005	--	--	--	.38	.00	--	--
68	--	.000	--	--	--	.01	.01	--	--
69	--	.000	.13	.1	.01	.28	.04	.10	--
70	--	--	--	--	--	.02	--	--	--
71	--	.000	< .25	--	.00	.00	.00	.19	< .1
72	--	.000	.1	--	.00	.02	.00	.01	--
73	--	.005	--	--	--	.10	.00	--	--
74	--	.005	--	--	.19	.02	.01	.22	--
75	--	--	--	--	--	--	--	--	--
76	--	--	--	--	--	.05	--	--	--
77	--	--	--	--	--	.08	--	--	--
78	--	--	--	--	--	.00	.00	--	--
79	--	.010	--	--	--	.03	.00	--	--
80	--	.010	--	--	--	.05	.00	--	--
81	--	--	--	--	--	.28	--	--	--
82	--	--	--	.3	--	--	.00	--	--
83	.09	.000	--	--	--	.81	.01	--	--
84	--	--	--	--	--	.00	--	--	--
85	--	.005	< .25	--	.00	.03	.01	.02	< .1
86	--	.005	.05	--	.02	2.45	.02	.02	--
87	--	.000	--	--	--	.02	.01	--	--
88	--	.000	--	--	--	.53	.01	--	--
89	--	--	--	--	--	.10	--	--	--
90	--	.000	< .25	--	.00	.04	.00	.00	< .1
91	--	.005	.06	--	.01	.00	.00	.01	--
92	--	.025	.06	.1	.01	.08	.00	.01	--
93	--	.015	--	--	--	.05	--	--	--
94	--	.005	--	--	--	.01	.00	--	--

Carson Valley basin (105), T. 12 N., R. 20 E.

REF. NO.	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	ARSENIC, DISSOLVED (MG/L AS AS)	BARIUM, DISSOLVED (MG/L AS BA)	BORON, DISSOLVED (MG/L AS B)	COPPER, DISSOLVED (MG/L AS CU)	IRON, DISSOLVED (MG/L AS FE)	MANGANESE, DISSOLVED (MG/L AS MN)	ZINC, DISSOLVED (MG/L AS ZN)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)
95	--	0.005	--	--	--	0.00	0.00	--	--
96	--	--	--	--	--	.02	--	--	--
97	--	.000	--	--	--	.04	.00	--	--
98	--	--	--	--	--	.15	--	--	--
99	--	--	--	--	--	.03	--	--	--
100	--	--	--	--	--	.04	--	--	--
101	--	.000	--	--	--	.24	.00	--	--
102	--	.005	0.08	0.1	0.00	.45	.10	0.80	--
103	0.07	< .001	.041	.03	< .01	< .003	< .001	.009	--
104	--	.040	--	--	--	.22	.00	--	--
105	--	.005	--	--	.01	.01	.00	.02	--
106	--	.015	.08	--	.06	.10	.00	.03	--
107	--	.000	.04	.1	.01	.01	.00	.01	--
108	--	.015	--	--	--	.03	--	--	--
109	--	--	--	--	--	.00	.00	--	--
110	--	.000	--	--	--	.26	.02	--	--
111	--	.000	--	--	--	.09	.01	--	--
112	--	.000	--	--	--	.02	.00	--	--
113	--	.000	.11	--	.05	.03	.01	.42	--
114	--	.000	--	--	--	.05	.01	--	--
115	--	.000	--	--	--	.16	.01	--	--
116	--	.000	--	--	--	.07	.00	--	--
117	--	.000	--	--	--	.01	.00	--	--
118	--	.000	--	--	--	.02	.00	--	--
119	--	.005	--	--	--	.06	.00	--	--
120	--	.000	--	--	--	.00	.00	--	--
121	--	.000	--	--	--	.05	.00	--	--
122	--	.000	--	--	--	.27	.00	--	--
123	--	--	--	--	--	.00	.00	--	--
124	--	.000	--	--	--	.07	.01	--	--
125	--	.000	--	--	--	2.50	.80	--	--
126	--	.000	--	--	--	.07	.01	--	--
127	.20	.000	--	--	--	.03	.00	--	0.0
128	--	.000	--	--	--	.04	.01	--	--
129	--	.000	--	--	--	.02	.00	--	--
130	--	.000	--	--	--	.02	.00	--	--
131	--	.000	--	--	--	.09	.00	--	--
132	--	.000	--	--	--	.03	.00	--	--
133	--	.005	--	--	--	.00	.00	--	--

Carson Valley basin (105), T. 12 N., R. 21 E.

REF. NO.	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	ARSENIC, DISSOLVED (MG/L AS AS)	BARIUM, DISSOLVED (MG/L AS BA)	BORON, DISSOLVED (MG/L AS B)	COPPER, DISSOLVED (MG/L AS CU)	IRON, DISSOLVED (MG/L AS FE)	MANGANESE, DISSOLVED (MG/L AS MN)	ZINC, DISSOLVED (MG/L AS ZN)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)
134	--	0.000	--	--	--	0.02	0.00	--	--
135	--	.010	--	--	--	.01	.01	--	--
136	--	.010	--	--	0.31	.12	.01	0.12	--
137	--	.005	--	--	.00	.04	.00	.09	--
138	--	.015	--	--	--	.04	.01	--	--
139	--	.005	--	--	--	.01	.01	--	--
140	--	.005	--	--	--	.30	.00	--	--
141	--	.005	--	--	--	.00	.00	--	--
142	--	.000	--	--	--	.05	.00	--	--
143	--	.005	--	--	--	.02	.01	--	--
144	--	.005	0.00	0.1	.00	.15	.00	.19	--
145	--	.010	--	--	--	.03	.02	--	--
146	--	.010	--	--	.00	.03	.00	.27	--
147	0.03	.015	.088	.04	< .01	.009	.003	.072	0.04
148	--	.005	--	--	--	.17	.01	--	--
149	--	.000	--	--	.01	.75	.06	.30	--
150	--	.000	--	--	.02	.71	.03	.88	--
151	--	.020	--	--	--	.03	.01	--	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Carson Valley basin (105), T. 12 N., R. 22 E.					
152	--	--	--	--	--	--	<0.01	--	--
153	--	--	--	--	--	--	< .01	--	--
154	--	--	--	--	--	--	< .01	--	--
155	--	--	--	--	--	--	< .01	--	--
				Carson Valley basin (105), T. 13 N., R. 19 E.					
156	--	--	--	--	--	0.00	0.00	--	--
157	--	0.000	--	--	--	.02	.01	--	--
158	--	.000	--	--	--	.14	.04	--	--
159	--	--	--	--	--	.00	.00	--	--
160	--	.000	0.01	0.00	0.15	.00	.04	0.66	--
161	--	.005	--	--	--	1.13	.00	--	--
162	--	.000	--	--	.00	.18	.01	.05	--
163	--	.010	--	--	--	.01	.00	--	--
164	--	.000	--	--	.06	.80	.01	--	--
165	--	--	--	--	--	.52	--	--	--
166	--	.000	--	--	.07	.03	.00	.02	<0.2
167	--	.000	--	--	--	.00	.01	--	--
168	--	.000	--	--	.09	.01	.00	.02	--
169	0.09	.000	--	--	--	.19	.00	--	.0
170	--	.000	--	--	.00	.01	.00	.14	< .1
171	--	.000	--	--	.01	.84	.04	.40	< .2
172	.03	.000	--	--	--	.07	.00	--	.0
173	--	.000	--	--	--	.17	.01	--	--
174	--	.000	.01	.10	.02	.36	.02	.84	--
175	--	.000	--	--	--	.94	.04	--	--
176	--	.000	--	--	--	.04	.08	--	--
177	--	--	--	--	--	--	--	--	--
178	--	--	--	--	--	--	--	--	--
179	--	--	--	--	--	--	--	--	--
180	--	--	--	--	--	--	--	--	--
181	--	--	--	--	--	--	--	--	--
182	--	.000	--	--	--	.15	.08	--	--
183	.22	.033	.024	.07	< .01	.047	.04	.007	--
184	.11	.010	.057	.07	< .01	.048	.085	.017	--
185	--	--	--	--	--	--	--	--	--
186	--	--	--	--	--	--	--	--	--
187	--	--	--	--	--	--	--	--	--
188	--	--	--	--	--	--	--	--	--
189	--	--	--	--	--	--	--	--	--
190	--	--	--	--	--	.00	.00	--	--
191	--	--	--	--	--	.97	--	--	--
192	--	--	--	--	--	.01	.00	--	--
193	--	--	--	--	--	.01	--	--	--
194	.06	.018	.053	.07	< .01	.029	.11	.008	--
195	--	.010	--	--	--	.00	.00	--	--
196	--	--	--	--	--	.08	.03	--	--
197	--	.000	.01	.0	.01	.08	.00	.04	--
198	.10	< .001	.017	.01	< .01	.055	< .001	.004	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Carson Valley basin (105), T. 13 N., R. 20 E.					
199	--	0.005	0.00	--	0.00	0.00	0.00	0.05	--
200	--	.010	--	--	--	.11	.02	--	--
201	--	.005	--	--	--	.09	.00	--	--
202	--	.010	--	--	--	.44	.03	--	--
203	--	.005	--	--	--	.41	.02	--	--
204	--	.005	--	--	--	.06	.00	--	--
205	--	.000	--	--	.00	.44	.02	6.56	--
206	--	.030	--	--	--	.05	.00	--	--
207	--	.045	--	--	--	.08	.00	--	--
208	--	.025	--	--	--	.01	.01	--	--
209	--	.010	--	--	--	.37	.04	--	--
210	--	.010	--	--	--	.04	.00	--	--
211	--	.010	--	--	--	.38	--	--	--
212	--	.045	--	--	.00	.03	.00	.01	--
213	--	.020	--	--	--	.27	.13	--	--
214	--	.035	--	--	--	.32	--	--	--
215	--	.013	--	--	--	.00	--	--	--
216	--	.025	--	--	.00	.46	.04	.00	--
217	--	.035	--	--	.00	.15	.02	.00	--
218	--	.030	--	--	--	.04	.24	--	--
219	--	.030	--	--	--	.02	.00	--	--
220	--	.020	.04	0.10	.02	.12	.55	.16	--
221	--	.030	--	--	--	.08	--	--	--
222	--	.015	--	--	--	.00	.12	--	--
223	--	.035	--	--	--	--	--	--	--
224	--	.035	--	--	.00	.02	.00	.17	--
225	--	.035	--	--	.00	.04	.00	.02	--
226	--	.005	--	--	--	.00	.00	--	--
227	--	.010	.0	--	.00	.04	.00	.00	--
228	0.03	.025	.062	.14	< .01	.005	< .001	.28	--
229	.04	.032	.049	.16	< .01	.031	.045	.003	--
230	.02	.014	.061	.15	< .01	.01	< .001	< .003	--
231	.23	.044	.098	.61	< .01	.003	.09	< .003	--
232	.34	.034	.14	.72	< .01	< .003	.026	< .003	--
233	.04	.008	.094	.05	< .01	.039	.004	.045	--
234	--	--	--	--	--	.18	--	--	--
235	--	.005	--	--	--	1.40	--	--	--
236	--	.010	--	--	--	.07	--	--	--
237	--	.010	< .20	--	--	.03	.01	--	--
238	--	.010	.06	--	.02	.01	.00	.00	--
239	--	.000	--	--	--	.59	.00	--	--
240	--	.005	--	--	.00	.00	.00	.02	--
241	.05	.011	.032	.04	< .01	.003	< .001	< .003	--
242	--	--	--	--	--	.06	--	--	--
243	--	.010	--	--	--	.66	--	--	--
244	--	.010	--	--	--	.01	--	--	--
245	--	.010	--	--	--	.05	--	--	--
246	--	.000	< .25	--	.00	.30	.03	.02	<0.1
247	--	--	--	--	--	.30	--	--	--
248	--	.000	.20	--	--	.14	.01	--	--
249	--	.000	< .25	--	.00	.03	.00	.10	< .1
250	--	.000	--	--	--	.02	.01	--	--
251	--	.000	--	--	.00	1.76	.05	.04	< .1
252	--	.000	.09	--	.00	.00	.00	.01	< .1
253	--	--	--	--	--	.24	--	--	--
254	--	--	--	--	--	.08	--	--	--
255	--	--	--	--	--	.06	--	--	--
256	.04	.007	.082	.11	< .01	< .003	.002	.041	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
Carson Valley basin (105), T. 13 N., R. 21 E.									
257	--	--	--	--	--	--	--	--	--
258	--	0.020	--	--	--	0.27	0.01	--	--
259	--	.020	--	--	0.00	.06	.00	0.14	--
260	--	.010	0.10	0.00	.01	.25	.08	.91	--
261	0.03	.005	.077	.02	< .01	.003	.001	.01	--
Carson Valley basin (105), T. 14 N., R. 19 E.									
262	--	0.000	--	--	--	0.18	0.03	--	--
263	--	.010	--	--	--	.01	.01	--	--
264	--	.005	--	--	--	.00	.00	--	--
265	--	.000	--	--	--	.13	.18	--	--
266	--	.000	--	--	--	.14	.03	--	--
267	--	--	--	--	--	1.62	.05	--	--
268	--	.000	--	--	--	.01	.01	--	--
269	--	--	--	--	--	.02	.01	--	--
270	--	.000	--	--	--	1.54	.01	--	--
271	--	.040	0.0	0.60	0.02	.01	.02	0.04	--
272	--	.000	--	--	--	.20	.07	--	--
273	--	.000	--	--	--	.03	.01	--	--
274	--	.050	--	--	--	.80	--	--	--
275	--	.010	--	--	--	.15	.20	--	--
276	--	.005	--	--	--	.09	.00	--	--
277	--	.000	.02	--	.02	.16	.02	1.79	--
278	--	.005	--	--	--	.35	.02	--	--
279	--	.010	--	--	--	.48	--	--	--
280	--	.000	--	--	--	.13	.00	--	--
281	--	.005	--	--	.04	1.03	.02	.06	--
282	--	.000	--	--	--	.20	.00	--	--
283	--	.000	--	--	--	.06	.01	--	--
284	0.02	< .001	.052	< .01	< .01	.016	.002	.004	--
285	--	.005	--	--	.01	.16	.01	3.12	<0.1
286	--	.000	--	--	--	.03	.02	--	--
287	--	--	--	--	--	--	--	--	--
288	.03	.001	.044	< .01	< .01	.005	.001	.003	--
289	.01	< .001	.072	.26	< .01	< .003	< .001	.004	--
Carson Valley basin (105), T. 14 N., R. 20 E.									
290	--	0.005	--	--	--	0.21	0.00	--	--
291	--	.005	--	--	0.03	.04	.01	0.27	--
292	--	.020	--	--	--	.06	.02	--	--
293	--	.000	--	--	--	.05	.00	--	--
294	--	.000	--	--	--	.00	.00	--	--
295	--	.015	--	--	--	.04	.02	--	--
296	--	.005	--	--	--	.42	.03	--	--
297	--	.000	0.00	--	.02	.04	.00	.20	--
298	--	.000	--	--	--	.56	.03	--	--
299	--	.000	--	--	--	.98	.04	--	--
300	--	.000	--	--	--	.85	.03	--	--
301	--	.000	--	--	.00	.27	.01	.33	--
302	--	.000	--	--	--	.06	.00	--	--
303	--	.010	--	--	--	.12	.03	--	--
304	0.17	.006	.022	0.24	< .01	.069	.053	.023	--
305	--	--	--	--	--	--	--	--	--
306	.03	.011	.02	.64	< .01	1.20	.110	.092	--
307	--	--	--	--	--	--	--	--	--
308	.01	.009	.023	1.0	< .01	5.60	.33	.007	--
309	--	--	--	--	--	--	--	--	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Carson Valley basin (105), T. 14 N., R. 20 E.					
310	--	0.005	--	--	0.02	0.11	0.00	0.22	--
311	--	.015	--	--	.00	.01	.00	.10	--
312	--	.000	--	--	--	.31	.39	--	--
313	--	.020	--	--	--	.04	.00	--	--
314	--	.015	--	--	--	.15	.00	--	--
315	--	.015	--	--	.00	.04	.02	.23	--
316	--	.005	0.00	--	.01	.06	.01	.01	--
317	--	.005	--	--	--	.03	.01	--	--
318	--	.005	.02	0.80	.04	.29	.01	.16	--
319	--	.065	--	--	.02	.17	.03	.01	--
320	--	.020	--	--	--	.08	.01	--	--
321	--	.020	--	--	--	.19	.02	--	--
322	--	.020	--	--	--	.01	--	--	--
323	--	.020	--	--	--	.02	.00	--	--
324	--	.020	.02	--	.04	.04	.01	.11	--
325	--	.020	--	--	--	.04	.00	--	--
326	--	.020	--	--	.07	.19	.04	.61	--
327	--	.005	--	--	.00	.22	.01	.06	--
328	--	.020	--	--	--	.27	.03	--	--
329	--	.010	--	--	--	.03	.01	--	--
330	--	.005	.02	1.00	.02	.02	.00	.03	--
331	--	.025	--	--	--	.00	--	--	--
332	--	.010	.01	.20	.01	.46	.02	.21	--
333	--	.010	--	--	--	.27	.02	--	--
334	--	.020	--	--	--	.02	.01	--	--
335	--	.010	--	--	--	.19	.04	--	--
336	--	.020	.04	.10	.00	.06	.00	.03	--
337	--	.030	--	--	--	.00	.00	--	--
338	--	.005	--	--	--	1.04	.05	--	--
339	0.05	.005	.03	.15	< .01	.066	.041	.005	--
340	.14	.046	.043	.19	< .01	.033	.01	.003	--
341	--	.080	--	--	--	.43	--	--	--
342	--	.020	--	--	.10	.07	.01	.02	--
343	--	.015	.03	.20	.00	.00	.00	.12	--
344	--	.025	--	--	--	.08	.00	--	--
345	--	.020	--	--	--	.02	.01	--	--
346	--	.015	.04	.20	.06	.07	.02	.26	--
347	--	.005	--	--	.03	.16	.10	.77	--
348	--	.015	--	--	.03	.04	.00	.10	--
349	--	.010	--	--	--	.12	.01	--	--
350	--	.015	--	--	--	.07	.03	--	--
351	--	.010	--	--	--	.01	.02	--	--
352	--	--	--	--	--	--	--	--	--
353	--	.020	--	--	.01	.03	.00	.07	--
354	--	.015	--	--	--	.63	.05	--	--
355	--	.015	--	--	--	.00	.00	--	--
356	--	.020	--	--	--	.02	.01	--	--
357	--	.020	--	--	--	.00	.01	--	--
358	--	.020	--	--	--	.13	.01	--	--
359	--	.025	--	--	--	.10	.04	--	--
360	--	.025	--	--	--	.13	.01	--	--
361	--	.015	--	--	--	.02	.00	--	--
362	--	.020	--	--	--	.06	.02	--	--
363	--	.020	--	--	--	.00	.00	--	--
364	--	.010	--	--	.02	2.01	.07	.27	--
365	--	.015	--	--	--	.15	.02	--	--
366	--	.040	--	--	--	.01	.01	--	--
367	--	.050	--	--	--	.08	.00	--	--
368	--	.005	--	--	--	.52	.00	--	--
369	--	.005	--	--	.00	.09	.10	.16	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Antelope Valley basin (106), T. 10 N., R. 22 E.					
370	--	0.000	--	--	--	0.99	0.11	--	--
371	--	.000	--	--	--	.04	.01	--	--
372	--	.000	--	--	--	.92	.04	--	--
373	--	.000	--	--	0.00	.13	.00	0.13	--
374	--	.000	--	--	.14	.03	.01	.03	--
375	--	.000	--	--	--	.13	.01	--	--
376	--	.000	--	--	--	.12	.01	--	--
377	--	.000	--	--	.01	.03	.00	.34	<0.1
378	--	.005	--	--	.08	.08	.00	.05	< .1
379	--	.000	--	--	.01	.00	.00	--	< .2
380	--	.000	--	--	.01	.00	.00	.41	--
381	--	.010	--	--	.00	.01	.00	.18	< .1
382	--	.010	--	--	--	.87	.56	--	--
383	--	.010	--	--	--	1.24	.15	--	0
384	--	--	--	--	--	--	--	--	0
385	--	--	--	--	--	--	--	--	0
386	--	.020	--	--	--	1.49	.07	--	0
387	--	.025	--	--	--	1.97	.07	--	0
388	--	.040	--	--	--	.00	.00	--	0
389	--	--	--	--	--	--	--	--	0
390	--	--	--	--	--	--	--	--	0
391	--	.050	--	--	--	.01	.00	--	0
392	--	.055	--	--	--	.04	.00	--	0
393	--	.065	--	--	--	3.42	.01	--	0
394	--	.020	--	--	--	.01	.00	--	--
395	--	.015	--	--	--	.03	.00	--	0
396	--	--	--	--	--	--	--	--	0
397	--	--	--	--	--	--	--	--	0
398	--	.010	--	--	--	.08	.00	--	0
399	--	.010	--	--	--	.06	.01	--	0
400	--	.015	--	--	--	1.07	.27	--	0
401	--	--	--	--	--	--	--	--	0
402	--	--	--	--	--	--	--	--	0
403	--	.015	--	--	--	1.44	.27	--	0
404	--	.020	--	--	--	.44	.20	--	0
405	--	.324	--	--	--	.15	.00	--	0
406	--	.375	--	--	--	.07	.01	--	0
407	--	.370	--	--	--	.01	.00	--	0
408	--	.325	--	--	--	.05	.00	--	0
409	--	--	--	--	--	--	--	--	0
410	--	.015	--	--	--	1.50	.06	--	0
411	--	.005	--	--	--	.01	.00	--	0
412	--	--	--	--	--	--	--	--	0
413	--	--	--	--	--	--	--	--	0
414	--	.005	--	--	--	.05	.01	--	0
415	--	.010	--	--	--	.03	.01	--	0
416	--	.015	--	--	--	.08	.00	--	0
417	--	.030	--	--	--	2.52	.09	--	0
418	--	.030	--	--	--	.00	.00	--	0
419	--	--	--	--	--	--	--	--	0
420	--	--	--	--	--	--	--	--	0
421	--	.020	--	--	--	.45	.01	--	0
422	--	.025	--	--	--	.22	.01	--	0
423	--	.035	--	--	--	.06	.00	--	0
424	0.13	.025	0.068	0.01	.03	< .003	.002	.36	--
425	--	.035	--	--	--	.38	.00	--	0
426	--	.030	--	--	--	.02	.00	--	0
427	--	--	--	--	--	--	--	--	0
428	--	--	--	--	--	--	--	--	0
429	--	.030	--	--	--	.27	.01	--	0

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Antelope Valley basin (106), T. 10 N., R. 22 E.					
430	--	0.035	--	--	--	0.20	0.00	--	0
431	--	.035	--	--	--	.23	.00	--	0
432	--	.015	--	--	--	.06	.01	--	0
433	--	.010	--	--	--	.07	.01	--	0
434	--	--	--	--	--	--	--	--	0
435	--	--	--	--	--	--	--	--	0
436	--	.015	--	--	--	.32	.01	--	0
437	--	.015	--	--	--	.39	.01	--	0
438	--	.020	--	--	--	.41	.01	--	0
439	0.09	.020	0.081	0.01	0.02	.011	.001	0.18	--
440	--	.005	--	--	--	.04	.01	--	0
441	--	.050	--	--	--	.02	.01	--	0
442	--	.015	--	--	--	.20	.03	--	0
443	--	.015	--	--	--	.04	--	--	--
444	--	.005	--	--	--	.02	.01	--	--
445	--	.015	--	--	--	.00	.00	--	0
446	--	--	--	--	--	--	--	--	0
447	--	--	--	--	--	--	--	--	0
448	--	.015	--	--	--	.12	.00	--	0
449	--	.015	--	--	--	.14	.01	--	0
450	--	.020	--	--	--	.21	.01	--	0
451	--	.050	--	--	--	.14	.01	--	0
452	--	.010	--	--	--	.06	--	--	--
453	--	.015	--	--	--	.03	.00	--	--
454	--	.020	--	--	--	.02	.00	--	0
455	--	--	--	--	--	--	--	--	0
456	--	--	--	--	--	--	--	--	0
457	--	.015	--	--	--	.27	.01	--	0
458	--	.020	--	--	--	.01	.00	--	0
459	--	.025	--	--	--	.05	.00	--	0
460	--	.010	--	--	.03	.02	.00	.53	--
461	--	--	--	--	--	.01	--	--	--
462	--	.015	--	--	--	.01	.00	--	--
463	--	.015	--	--	--	.06	.01	--	0
464	--	--	--	--	--	--	--	--	0
465	--	--	--	--	--	--	--	--	0
466	--	.015	--	--	--	.00	.01	--	0
467	--	.020	--	--	--	.01	.00	--	0
468	--	.020	--	--	--	.04	.00	--	0
469	--	.015	--	--	.00	.00	.00	.06	--
470	.06	.017	.053	.01	< .01	< .003	< .001	.025	--
471	--	.010	--	--	--	.01	.00	--	0
472	--	.020	--	--	--	.01	.00	--	0
473	--	--	--	--	--	--	--	--	0
474	--	--	--	--	--	--	--	--	0
475	--	.020	--	--	--	.03	.00	--	0
476	--	.025	--	--	--	.01	.00	--	0
477	--	.035	--	--	--	.17	.00	--	0
478	--	.020	--	--	--	.07	.00	--	0
479	--	--	--	--	--	.15	--	--	--
480	--	--	--	--	--	.02	--	--	--
481	--	--	--	--	--	.03	--	--	--
482	--	.010	--	--	--	.00	--	--	0
483	--	.005	--	--	--	.69	.00	--	0
484	--	.000	--	--	--	.15	.01	--	--
485	--	.015	--	--	--	.59	.00	--	0
486	--	--	--	--	--	--	--	--	--
487	--	--	--	--	--	.08	--	--	--
488	--	--	--	--	--	--	--	--	--
489	--	.035	--	--	--	.00	.00	--	--

REF. NO.	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC, DIS-SOLVED (MG/L AS AS)	BARIUM, DIS-SOLVED (MG/L AS BA)	BORON, DIS-SOLVED (MG/L AS B)	COPPER, DIS-SOLVED (MG/L AS CU)	IRON, DIS-SOLVED (MG/L AS FE)	MANGA-NESE, DIS-SOLVED (MG/L AS MN)	ZINC, DIS-SOLVED (MG/L AS ZN)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
				Antelope Valley basin (106), T. 10 N., R. 22 E.					
490	--	0.045	--	--	--	0.01	0.00	--	0
491	--	.040	--	--	--	.00	.00	--	0
492	--	--	--	--	--	--	--	--	0
493	--	--	--	--	--	--	--	--	0
494	--	.035	--	--	--	.01	.00	--	0
495	--	.035	--	--	--	.00	.00	--	0
496	--	.045	--	--	--	.13	.00	--	0
497	--	.025	--	--	0.00	.06	.01	0.15	--
498	--	.035	--	--	.07	.01	.00	.05	--
499	0.18	.024	0.092	0.02	< .01	< .003	< .001	.009	--
500	--	.035	.08	.0	.04	.00	.00	.04	--
501	--	.020	--	--	--	.04	--	--	--
502	--	.020	--	--	--	.05	.00	--	0
503	--	.150	--	--	--	.20	.01	--	0
504	--	.035	--	--	--	.15	.00	--	0
505	--	.250	--	--	--	.03	--	--	--
506	--	.025	--	--	--	.16	.00	--	0
507	--	.020	--	--	--	.00	.00	--	0
508	--	--	--	--	--	--	--	--	0
509	--	--	--	--	--	--	--	--	0
510	--	.025	--	--	--	.04	.00	--	0
511	--	.020	--	--	--	.04	.03	--	0
512	--	.025	--	--	--	.04	.00	--	0
513	--	.005	--	--	--	.02	--	--	--
514	--	.010	--	--	--	.07	.01	--	0
515	--	.020	--	--	--	.01	.01	--	0
516	--	.015	--	--	--	.01	.01	--	0
517	--	--	--	--	--	--	--	--	0
518	--	--	--	--	--	--	--	--	0
519	--	.015	--	--	--	.03	.01	--	0
520	--	.015	--	--	--	.00	.00	--	0
521	--	.025	--	--	--	.18	.01	--	0
522	.07	.017	.13	.02	< .01	.007	< .001	.62	--
523	--	.035	--	--	--	.00	.00	--	0
524	--	--	--	--	--	--	--	--	0
525	--	--	--	--	--	--	--	--	0
526	--	.045	--	--	--	.00	.00	--	0
527	--	.040	--	--	--	.00	.00	--	0
528	--	.040	--	--	--	.01	.00	--	0
529	--	.025	--	--	--	.02	.00	--	0
530	--	.020	--	--	--	.00	.00	--	0
531	--	--	--	--	--	--	--	--	0
532	--	.020	--	--	--	.02	.00	--	0
533	--	.030	--	--	--	.04	.00	--	0
534	--	.040	--	--	--	.34	--	--	--
535	--	.010	--	--	--	.69	.06	--	0
536	--	.050	--	--	--	.00	.00	--	0
537	--	--	--	--	--	--	--	--	0
538	--	--	--	--	--	--	--	--	0
539	--	.045	--	--	--	.01	.00	--	0
540	--	.075	--	--	--	.00	.00	--	--
541	--	.075	--	--	--	.13	.00	--	0
542	--	--	--	--	--	--	--	--	0
543	--	--	--	--	--	--	--	--	0
544	--	.095	--	--	--	.13	.00	--	0
545	--	.080	--	--	--	.25	.01	--	0
546	--	.095	--	--	--	.10	.00	--	0

REFERENCES CITED

Brown, Eugene, Skougstad, M.W., and Fishman, M.J., 1974, Methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Chapter A1, 160 p.

Claassen, H.C., 1982, Guidelines and techniques for obtaining water samples that accurately represent the water chemistry of an aquifer: U.S. Geological Survey Open-File Report 82-1024, 49 p.

Dillingham, H.L., 1980, Carson Valley, Nevada, ground-water geology and resources, definite plan appendix: Sacramento, Calif., U.S. Bureau of Reclamation, 82 p.

Ellis, A.J., and Mahon, W.A.J., 1977, Chemistry and geothermal systems: New York, Academic Press, 392 p.

Feltz, H.R., and Anthony, E.R., eds., 1984, 1985 Water-quality laboratory services catalog: U.S. Geological Survey Open-File Report 84-171, 138 p.

Feth, J.H., 1966, Nitrogen compounds in natural water--A review: Water Resources Research, v. 2, no. 1, p. 41-56.

Glancy, P.A., and Katzer, T.K., 1976, Water-resources appraisal of the Carson River basin, western Nevada: Nevada Division of Water Resources, Reconnaissance Report 59, 126 p.

Governor's Office of Planning Coordination, 1984, Nevada statistical abstract, 1983-84 edition: State of Nevada, 282 p.

Hem, J.D., 1985, Study and interpretation of the chemical characteristics of natural water (3d ed.): U.S. Geological Survey Water-Supply Paper 2254, 263 p.

Maurer, D.K., 1985, Gravity survey and depth to bedrock in Carson Valley, Nevada-California: U.S. Geological Survey Water-Resources Investigations Report 84-4202, 20 p.

-----1986, Geohydrology and simulated response to ground-water pumpage in Carson Valley, a river-dominated basin in Douglas County, Nevada, and Alpine County, California: U.S. Geological Survey Water-Resources Investigations Report 86-4328, 109 p.

McKee, J.E., and Wolfe, H.W., 1963, Water quality criteria (2d ed.): California Water Quality Control Board Publication 3-A, 548 p.

Moore, J.G., 1969, Geology and mineral deposits of Lyon, Douglas, and Ormsby Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 75, 45 p.

National Academy of Science and National Academy of Engineering, 1973, Water quality criteria, 1972, A report of the committee on water-quality criteria: U.S. Environmental Protection Agency, EPA R3-73-033, 594 p.

National Climatic Center, 1941-82, Climatological data, annual summaries, Nevada, 1940-81: Asheville, N.C., U.S. National Oceanic and Atmospheric Administration, v. 55-v. 96, no. 13 (Nevada).

Nevada Legislative Counsel Bureau, 1986, Public water systems: Nevada Administrative Code, Chapter 445, p. 175-184.

Nowlin, J.O., 1982, Ground-water levels and water quality in an area near Topaz Lake, Douglas County, Nevada: U.S. Geological Survey Open-File Report 80-2046, 76 p.

Piper, A.M., and Garrett, A.A., and others, 1953, Native and contaminated ground waters in the Long Beach-Santa Ana area, California: U.S. Geological Survey Water-Supply Paper 1136, 320 p.

Plouff, Donald, 1984, Bouguer gravity map of Nevada, Walker Lake sheet: Nevada Bureau of Mines and Geology Map 83.

Rush, F.E., 1968, Index of hydrographic areas in Nevada: Nevada Division of Water Resources, Information Report 6, 38 p.

Sinclair, A.A., 1974, Selection of threshold values in geochemical data using probability graphs: Journal of Geochemical Exploration, v. 3, p. 129-149.

Skougstad, M.W., Fishman, M.J., Friedman, L.C., Erdmann, D.E., and Duncan, S.S., eds., 1979, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Chapter A1, 626 p.

Spane, F.A., 1977, Evaluation of factors influencing the inorganic water-quality regimen of Carson River, Carson Valley, Nevada-California: University of Nevada, Reno, unpublished Ph. D. thesis, 205 p.

Todd, D.K., ed., 1970, The water encyclopedia: New York, The Water Information Center, Inc., 559 p.

U.S. Bureau of Reclamation, 1961, Project land and drainage appendix, Volume 2: Carson City, Nev., Watasheamu Division, Washoe Project, Nevada-California, 177 p.

U.S. Environmental Protection Agency, 1975, Model state water monitoring program: U.S. Environmental Protection Agency Report EPA-440/9-74-002, 62 p.

-----1976, Quality criteria for water: U.S. Environmental Protection Agency Report EPA 440/9-76-023, 501 p.

Velz, C.J., 1970, Applied stream sanitation: New York, John Wiley, 619 p.

Walters, B.B., Ball, G.W., Jr., Hibdon, R.H., and Shaw, G.E., 1970, Carson Valley ground-water investigation: Reno, Nev., Civil Engineering Consultants, report prepared for Carson Water Company, 59 p.

Wershaw, P.L., Fishman, M.J., Grabbe, R.R., and Lowe, L.E., eds., 1983, Methods for the determination of organic substances in water and fluvial sediments: U.S. Geological Survey Techniques of Water Resources Investigations, Book 5, Chapter A3, 173 p.