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WATER TYPE AND SUITABILITY OF OKLAHOMA SURFACE WATERS FOR PUBLIC SUPPLY AND IRRIGATION

PART 3: CANADIAN, NORTH CANADIAN, AND DEEP FORK RIVER BASINS THROUGH 1979

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~~PART~~ 3: CANADIAN, NORTH CANADIAN,
AND DEEP FORK RIVER BASINS
THROUGH 1979
3

By Jerry D. Stoner

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CONVERSION FACTORS

Inch-pound units used in this report may be converted to International System of Units (SI), an updated metric system, by the following conversion factors:

<u>Multiply inch-pound unit</u>	<u>By</u>	<u>To obtain SI unit</u>
Foot (ft)	0.3048	Meter
Mile (mi)	1.609	Kilometer
Square mile (mi ²)	2.590	Square kilometer
Degree Fahrenheit (°F)	(°F - 32)5/9	Degree Celsius

WATER TYPE AND SUITABILITY OF OKLAHOMA SURFACE
WATERS FOR PUBLIC SUPPLY AND IRRIGATION

PART 3: CANADIAN, NORTH CANADIAN, AND DEEP FORK RIVER BASINS THROUGH 1979

By Jerry D. Stoner

ABSTRACT

Water-quality data through 1979 in the Canadian, North Canadian, and Deep Fork River basins within Oklahoma were examined for water type and suitability for public water supply and irrigation use. Of 105 stations with available data, 47 stations or 45 percent were considered to have sufficient data for analysis. The classification of water type was based on the relation of the major ions: calcium, magnesium, sodium, carbonate, bicarbonate, sulfate, and chloride to each other within the range of measured specific conductance. The suitability for use as a public supply was based on the concentration distribution of selected constituents. The constituents selected were those with maximum contaminant levels established by regulation, or constituents for which recommended maximum limits have been established and for which historic data are available. The irrigation classification method of Wilcox was used to relate sodium, calcium, and magnesium concentrations and the salinity distribution to the use of the water for irrigation. Where data were available, the chance of phytotoxic effects by boron was discussed.

INTRODUCTION

Surface-water-quality data for Oklahoma have been collected and published on a regular basis since 1946. These data through 1975 represent 2,733 station-years of record from 527 stations (Stoner, 1977). These data consist of tabulations of water-quality analyses of varying suites of constituents but the data are not readily usable to water planners and managers. The purpose of this report is to summarize the data at selected stations to provide information on water type, water-quality trends, and suitability for use as public and irrigation supplies. A water-quality report on selected Oklahoma surface waters that is of a more general statistical nature has recently been published (Kurklin, 1979). A statistical summary of streamflow records is provided in a report by Mize (1975); therefore, streamflow data were not included in this report.

ACKNOWLEDGMENTS

Water-quality data in Oklahoma have been collected and published on a cooperative basis with many Federal, State, county, district, and city agencies since 1946. Two of the principal cooperators are the Oklahoma Water Resources Board and the U.S. Army Corps of Engineers. The author thanks all of the agencies, past and present, for their part in the collection of surface-water-quality data in Oklahoma.

STATION SELECTION

The stations included in this report were selected using two criteria. First, stations listed in the report by Stoner (1977) were eliminated if less than 10 samples had been collected and if the stations had not been operated during 1976-79. Statistical analysis of data from less than 10 samples generally is inadequate to determine frequencies and variations during the annual hydrologic cycle. Second, only data in the U.S. Geological Survey's WATSTORE (National Water Data Storage and Retrieval System) were used. WATSTORE was accessed for each station to determine data availability. A deletion of stations was made from WATSTORE information using the same criterion of less than 10 samples. Very few of the elected stations had 10 analyses for each of the selected water-quality constituents. Most of the stations lacked data on the toxic metals -- arsenic, cadmium, chromium, lead, and mercury.

STATION ORDER

In order to reduce the physical size of the report and to make it more usable on a regional and hydrologic basis to water planners and managers, the report has been divided into five parts. The river basins included within each part are as follows:

- Part 1: Arkansas River Mainstem and Verdigris, Neosho, and Illinois River basins (Stoner, 1981).
- Part 2: Salt Fork Arkansas and Cimarron River basins (Stoner, 1982).
- Part 3: Canadian, North Canadian, and Deep Fork River basins.
- Part 4: Red River Mainstem and North Fork Red River basin.
- Part 5: Washita River basin.

Within each part the stations are grouped by river basin. All rivers and streams within Oklahoma are tributary to either the Arkansas River or the Red River. Mainstem stations are those stations on the Arkansas or Red River or are on streams whose basins are directly tributary to the Arkansas or Red River and are too small to be listed as a separate basin. The stations are arranged in alphabetical order within each basin or mainstem designation. Where more than one station on a stream is reported, those stations are arranged in downstream order.

The location of each station is shown in figure 1, and the stations are identified by their station numbers. All of the assigned station numbers in Oklahoma begin with the digits 07. These two digits are omitted from the station numbers shown in figure 1. For example, station number 07228500 is shown in figure 1 as 228500. A listing of the stations by number that provides cross-indexing of stations shown in figure 1 with their station summaries is provided in table 3, which follows the station summaries.

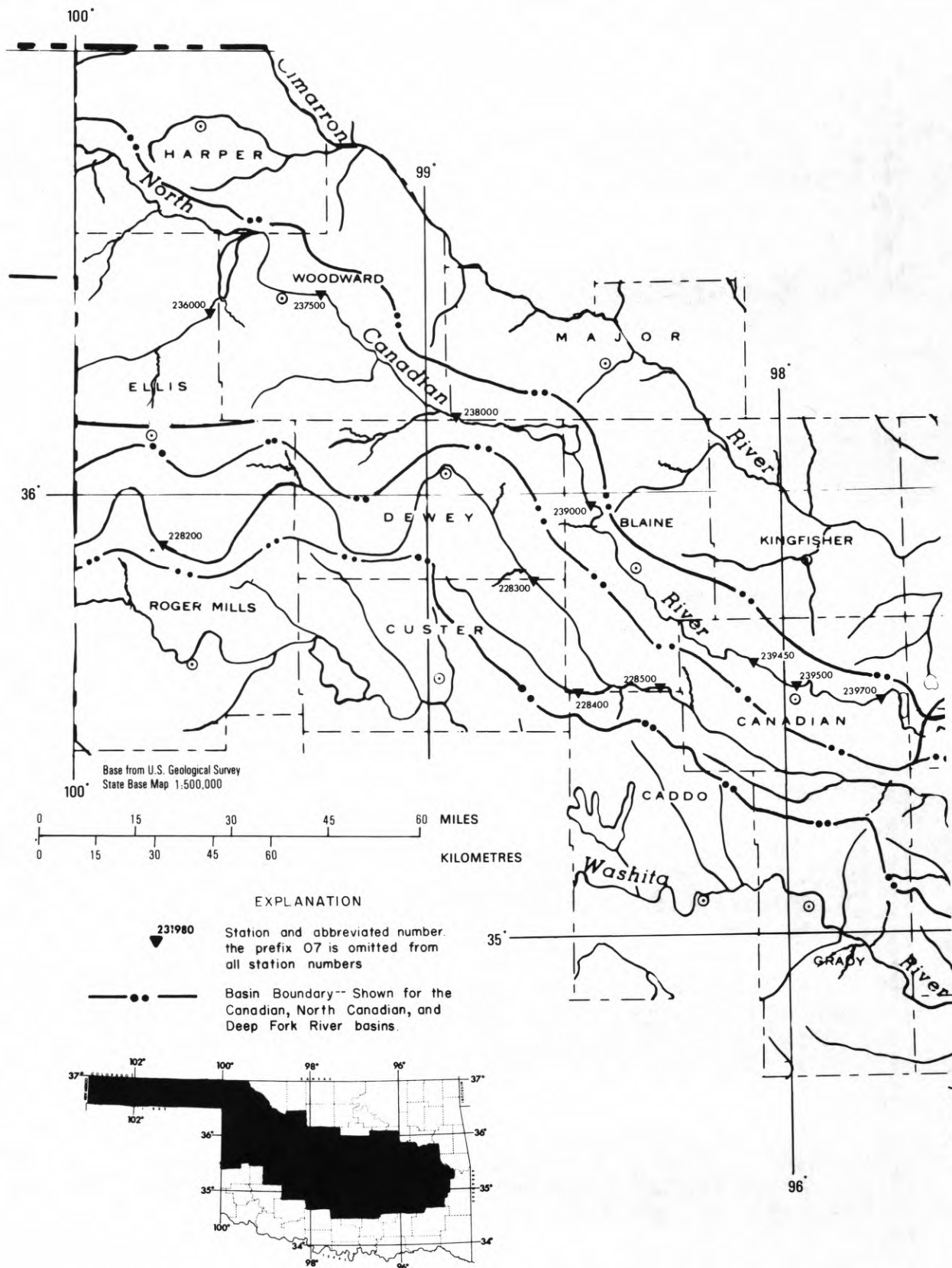
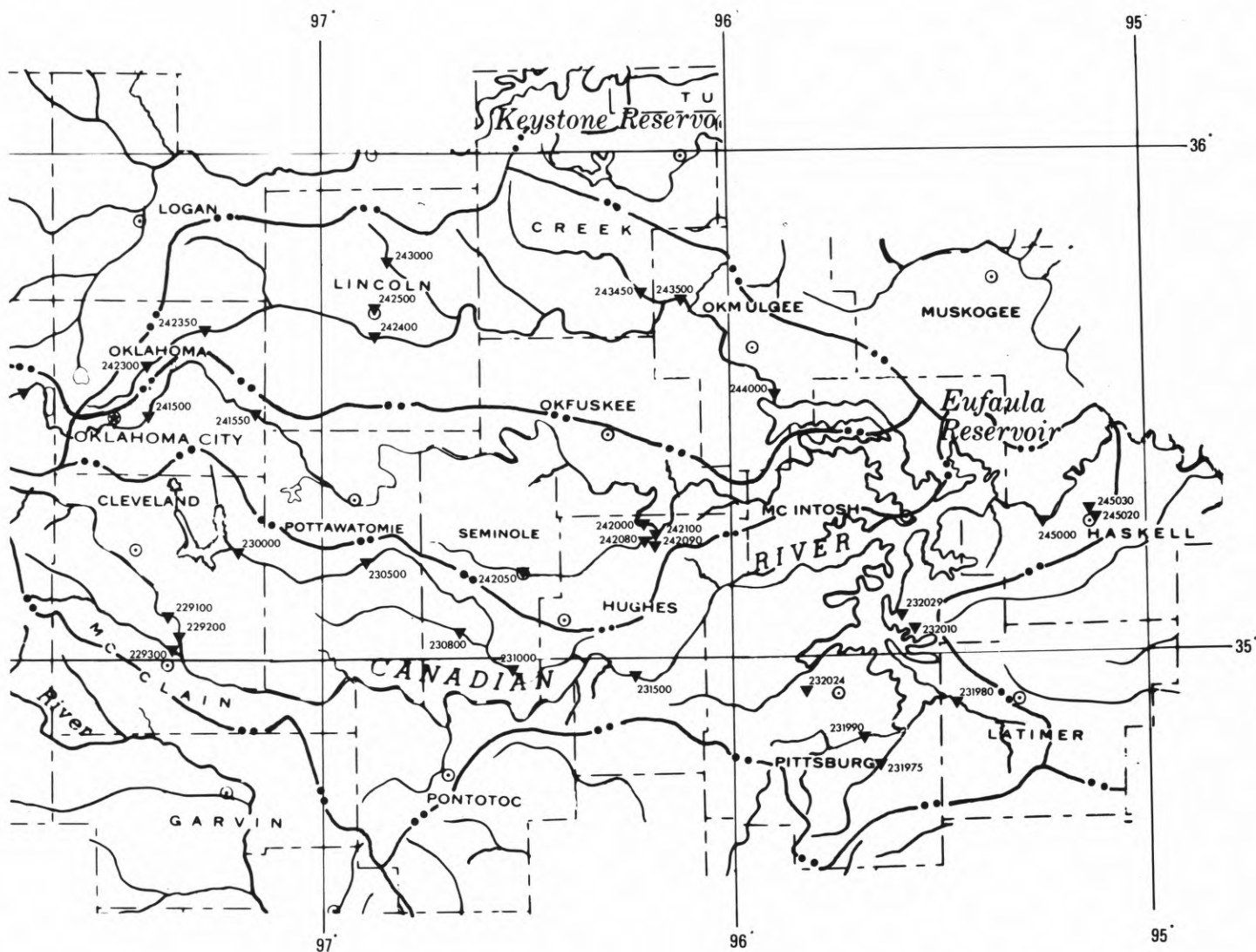
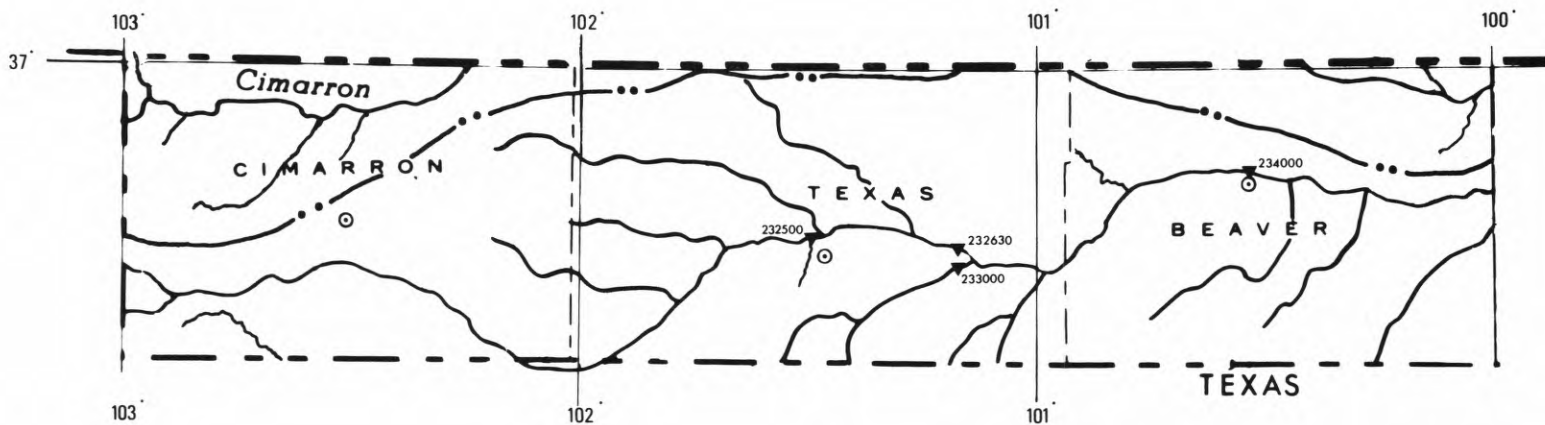


Figure 1.- Station location map



DATA PRESENTATION

Each station summary is in the following format:

1. Station location.
2. Drainage area.
3. Period of water-quality record.
4. Pertinent remarks if any.
5. A discussion of water types.
6. Trend analysis where sufficient current data are available.
7. A discussion of water quality related to use as a public water supply.
8. A discussion of water quality related to use for irrigation.
9. Two tables; one providing the univariate statistics for the selected constituents, and one showing the frequency distribution for the constituents.
10. Plots of the specific conductance versus the major cation ratios and the major anion ratios.
11. An irrigation diagram.

The selection of water-quality constituents was based on their significance to water use for public supply and irrigation. Dissolved solids as determined by the residue on evaporation at 180° Celsius method was included because it is a measure of the total amount of dissolved material present in the water.

The data are discussed in the summaries on a per value basis rather than a percentage of time basis. For some stations the percentage of values can be thought of as the percentage of time. However, when the period of record is less than 3 years or the number of values is less than 40, care needs to be taken in assuming this relationship. The data were analyzed using the Statistical Analysis System 1976 version (SAS-76), developed by Barr and others (1976), and the Supplemental Library (Helwig, 1977).

EXPLANATION OF STATION SUMMARY

Location

The location for each station is given in at least three ways: (1) by latitude (lat) and longitude (long); (2) by the township, range, and section; and (3) by distance and direction from local geographic features such as bridges, tributary streams, and towns. The location also is described, where information is available, by river mile, the distance the station is upstream from the mouth of the stream.

Drainage Area

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

Period of Record

The period of record in this report is the period of water-quality record by water year--that is, the 12-month period ending September 30. The water year is designated by the calendar year in which it ends and includes 9 of the 12 months. The period of record for the water-quality data used in this report includes all available WATSTORE data through the 1979 water year. A water year was included in the period of record when at least one sample was available for that water year.

Water Type

Water can be typed according to the percentage of each of the major ions in solution. For example, if the calcium and sulfate ions are predominant, the water would be described as calcium sulfate type. In this report a cation or anion was considered to be a predominant ion if it constituted at least 50 percent of its respective cation or anion group. The major cations, calcium, magnesium, sodium, and potassium, which are electropositive, and the major anions, carbonate, bicarbonate, chloride, and sulfate, which are electro-negative, generally constitute more than 95 percent of the total ions in solution.

Ordinarily the concentration of the potassium ion is very small in relation to the sodium ion concentration. Potassium is grouped with the sodium because of its small concentration and because it is chemically similar to sodium; and the ions are referred to as sodium rather than sodium plus potassium.

The relationship between the carbonate and bicarbonate ions is pH dependent. Both carbonate and bicarbonate ions are considered to be present in solution when the pH is greater than 8.3, and when the pH is equal to or less than 8.3 only the bicarbonate ion is considered present. Because the relation between pH and specific conductance at each station was not determined, the carbonate and bicarbonate ions are referred to as carbonate/bicarbonate.

The concentration and relationship of the major ions in solution will, to a large extent, be determined by the geology of the terrane through which the water flowed and how the constituents in the water reacted to mixing with other waters.

Cation and Anion Ratio Plots

The cation ratio plot presents the ratio of each major cation, expressed in meq/L (milliequivalents per liter), to the sum of the major cations, in meq/L, plotted versus the specific conductance. The anion ratio plot was prepared in the same manner using the major anions. Each ion ratio plot requires complete data for all major cations or all major anions. In many instances, an analysis with complete anion data will not have complete cation data. Some confusion in the comparison of the ion ratio plots can result from the different data requirements for the cation and anion plots. However, to provide as complete a water-quality summary as possible, all data that met the various plotting requirements were included. These plots were constructed to determine whether the ionic distributions changed with changes in the total concentration of dissolved materials. Example plots of the cation and anion ratios are shown in figures 2 and 3.

Trend

Trend analyses were made to determine whether the concentration of a constituent was increasing (positive trend) or decreasing (negative trend) with time. Only data collected after October 1, 1960, were used in the trend analyses. This was done because of the format in which SAS stores the dates and because it was believed that 18 years was a sufficient time span to adequately determine the presence of trend. Trend analysis was made only for those stations that had current data (data from 1977, 1978, or 1979 water years) because trend analyses based on historical data could be misleading. Trend analysis is significant because it indicates what is occurring in the present, and what possible effects may occur in the future.

Plots, not included in this report, of dissolved solids, hardness, sulfate, and chloride concentrations versus time were generated where current data were available. The plots were examined to determine if there were data for a minimum time span, 5 years, to make a statistical test for trend and to see

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=ARKANSAS RIVER AT TULSA, OK

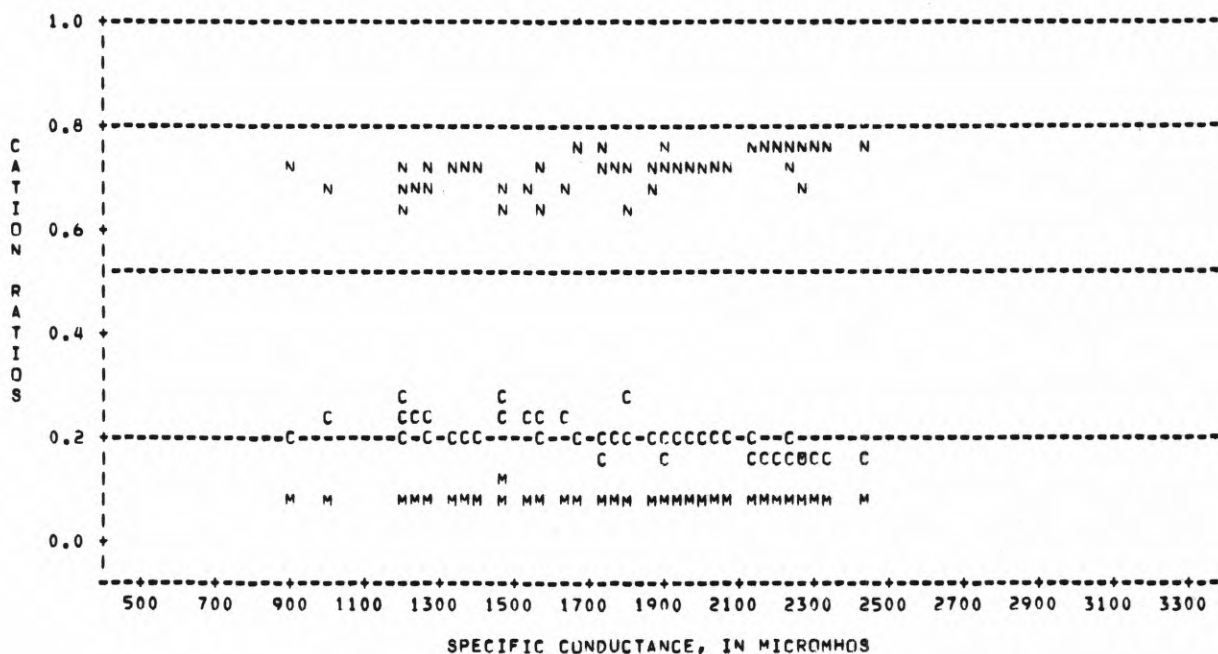


Figure 2.- Cation ratio plot for Arkansas River at Tulsa, Oklahoma.

ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=ARKANSAS RIVER AT TULSA, OK

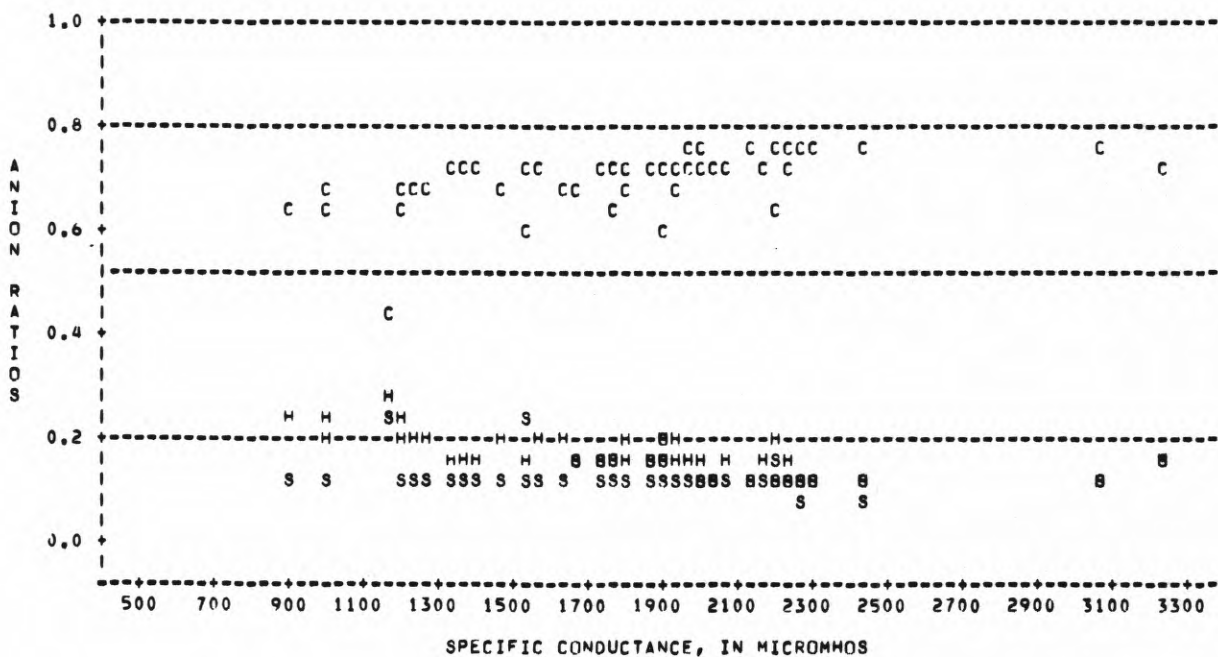


Figure 3.- Anion ratio plot for Arkansas River at Tulsa, Oklahoma.

if there were any indication of trend. The test chosen for trend analysis was a Spearman's rho technique and is fully described by Conover (1971). The test is two sided and indicates whether a trend, if any, is positive or negative. The test was made for the four constituents at the 95-percent probability level. The technique does not indicate the cause of a trend, only that a trend is or is not occurring. A trend may be the result of an extended period of drought or a period of much precipitation.

Public Water Supply

This section includes a discussion of water hardness, constituents for which maximum concentrations have been recommended, and constituents for which maximum contaminant levels have been established by regulation. Where adequate data were available, an evaluation was made as to the suitability for use as a public supply. Suitability for use as a public supply is based on available water-quality criteria and is an evaluation of the fitness of the water for its intended use. Water evaluated as unsuitable because a water-quality constituent(s) exceeds established criteria may or may not be acceptable for use by the population to be supplied. The acceptability of water for public supply depends a great deal on the availability, or more importantly, the non-availability of a more suitable supply source. In many parts of the United States, particularly in the arid West, the public water supply is accepted by the majority of the population served even though the concentrations of such constituents as sulfate and chloride commonly exceed the recommended limits, simply because a more suitable source is not available. Because the acceptability of a water supply depends on many factors other than the water quality, no evaluation of acceptability was made. All evaluations of the suitability for use were based on the water as a raw untreated source and do not reflect any evaluation of suitability after treatment. However, these evaluations need to be used with caution because, for many stations, the data were more than 10 years old and need to be updated to determine the existing water quality. Furthermore, important data were missing for many stations, particularly the toxic metals. The suitability evaluations were provided to show whether the existing data indicated a constituent concentration which might preclude the use of the water for public supply.

Hardness

Hardness was included because, in relation to public water supply, it is one of the most noticeable water-quality characteristics. No maximum hardness concentration has been recommended because hardness is not generally considered a human health hazard. As hardness increases the efficiency of soaps and detergents decreases. When the concentration of hardness is large, deposition or scaling occurs, thereby reducing the efficiency of hot water tanks and

restricting the flow of water in plumbing systems. Additional information on hardness is given by Durfor and Becker (1964), and Hem (1970). The concentration of hardness is expressed as mg/L (milligrams per liter) as CaCO_3 (calcium carbonate). The hardness classification used in this report and given in the following table is that used by Durfor and Becker (1964, p. 27).

Hardness range (mg/L as CaCO_3)	Description
0 to 60	Soft
61 to 120	Moderately hard
121 to 180	Hard
Greater than 180	Very hard

Constituents with recommended maximum concentrations

Maximum concentrations for several water-quality constituents that have not had maximum contaminant levels set by regulation have been recommended by the National Academy of Sciences and National Academy of Engineering (1973). These constituents generally are not toxic to humans at their recommended limits. Particular constituents affect such qualities as color, taste, and odor; some may cause staining of clothes and plumbing fixtures; and others produce laxative effects in humans. The selected water-quality constituents in this group are chloride, sulfate, pH, and iron. Other components such as color, odor, oil and grease, silver, and zinc, were excluded because of the lack of analytical data. Following is a brief summary of reasons for selecting each constituent:

Chloride.--Affects taste. Normal water-treatment processes do not remove chloride.

Sulfate.--Affects taste and produces laxative effects. Normal water-treatment processes do not remove sulfate.

pH.--Contributes to the corrosion of plumbing and water distribution systems. The cost of treatment for waters with pH in excess of the recommended limits may be uneconomical.

Iron.--Causes staining of plumbing fixtures and clothing, accumulation of deposits in water distribution systems, and objectional taste.

Data in the following table were taken from the National Academy of Sciences and National Academy of Engineering (1973) report.

Constituent	Recommended concentration limit(s)
Chloride	250 mg/L
Sulfate	250 mg/L
pH	5.0 and 9.0 units
Iron	300 ug/L

Constituents with maximum contaminant levels

The U.S. Environmental Protection Agency through the Safe Drinking Water Act (Public Law 93-523) announced regulations for maximum contaminant levels in public water supplies for certain constituents (U.S. Environmental Protection Agency, 1976). The constituents, fluoride, arsenic, cadmium, chromium, lead, and mercury are included in this report; however, barium, selenium, and silver were not selected because of the almost total lack of historic data. Nitrate-nitrogen was not selected because changes in analytical methods and onsite field preservation techniques have produced data that probably are not comparable.

The maximum contaminant level for fluoride is based on the annual average maximum daily air temperature at the water source and is tabulated below. The maximum contaminant levels for fluoride given in the following table are from the U.S. Environmental Protection Agency (1976).

Temperature (°F)	Maximum fluoride contaminant level (mg/L)
53.7 and below	2.4
53.8 to 58.3	2.2
58.4 to 63.8	2.0
63.9 to 70.6	1.8
70.7 to 79.2	1.6
79.3 to 90.5	1.4

Although the amount of data available at most stations was limited, the toxic metals were included because of their significance to human health. The following table lists the maximum contaminant levels established by regulation for the toxic metals, U.S. Environmental Protection Agency (1976).

Constituent	Maximum contaminant level (ug/L)
Arsenic	50
Cadmium	10
Chromium	50
Lead	50
Mercury	2.0

Irrigation

The irrigation section of each station summary is based primarily on the irrigation waters classification system developed by Wilcox (1955). This system describes the utility of waters for irrigation based on their respective salinity and sodium hazards. Where boron data were available an evaluation was made on the possible phytotoxic effects of this trace element, based in the information contained in the National Academy of Sciences and National Academy of Engineering report (1973).

Salinity and sodium hazard classification

The Wilcox classification system depicts a salinity hazard based on the specific conductance, and a sodium hazard based on the SAR (sodium adsorption ratio). The SAR is based on the ratio of sodium to calcium and magnesium and expresses the relative activity of sodium ion in exchange reactions with soil. Complete discussions of the SAR and the method for its computation are provided in Hem (1970) and Wilcox (1955).

The following descriptions of the effects of the different salinity and sodium hazard classes are taken directly from Wilcox (1955).

"Low-salinity water (C1) can be used for irrigation with most crops on most soils, with little likelihood that a salinity problem will develop. Some leaching is required, but this occurs under normal irrigation practices except in soils of extremely low permeability.

Medium-salinity water (C2) can be used if a moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most instances with special practices for salinity control.

High-salinity water (C3) cannot be used on soils with restricted drainage. Even with adequate drainage, special management for salinity control may be required and plants with good salt tolerance should be selected.

Very high salinity water (C4) is not suitable for irrigation under ordinary conditions but may be used occasionally under very special circumstances. The soils must be permeable, drainage must be adequate, irrigation water must be applied in excess to provide considerable leaching, and very salt-tolerant crops should be selected."

"Low sodium water (S1) can be used for irrigation on almost all soils with little danger of the development of harmful levels of exchangeable sodium. However, sodium-sensitive crops, such as stone-fruit trees and avocados, may accumulate injurious concentrations of sodium.

Medium-sodium water (S2) will present an appreciable sodium hazard in fine textured soils of high cation-exchange capacity, especially under low-leaching conditions, unless gypsum is present in the soil. This water may be used on coarse textured or organic soils that have good permeability.

High-sodium water (S3) may produce harmful levels of exchangeable sodium in most soils and will require special soil management--good drainage, high leaching, and additions of organic matter. Gypsiferous soils may not develop harmful levels of exchangeable sodium from such waters.

Very high sodium water (S4) is generally unsatisfactory for irrigation purposes except at low and perhaps medium salinity where the solution of calcium from the soil or the use of gypsum or other amendments may make the use of this water feasible."

Additional information on the effect of salinity and sodium on water use for irrigation is given by Wilcox (1955) and the National Academy of Sciences and National Academy of Engineering (1973).

Irrigation diagram

An irrigation diagram is included for each station where sufficient data were available. On the diagram the SAR of a sample is plotted against its specific conductance and the appropriate salinity and sodium hazards are determined (example, fig. 4). In the irrigation diagram the salinity hazard is along the horizontal axis and ranges from C1 to C4. All specific conductance values given in this report are in micromhos per centimeter at 25 degrees Celsius and are hereafter abbreviated as umho. The specific-conductance ranges for the salinity hazard classes are: less than 250 umho, low salinity hazard; 250 to 750 umho, medium salinity hazard; 751 to 2,250 umho, high salinity hazard; and greater than 2,250 umho, very high salinity hazard. The sodium hazard is along the vertical axis and the class breakpoints S1 through S4 vary with the specific conductance and are delineated by the sloping lines.

IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=BIRD CREEK NR BARNSDALL, OK

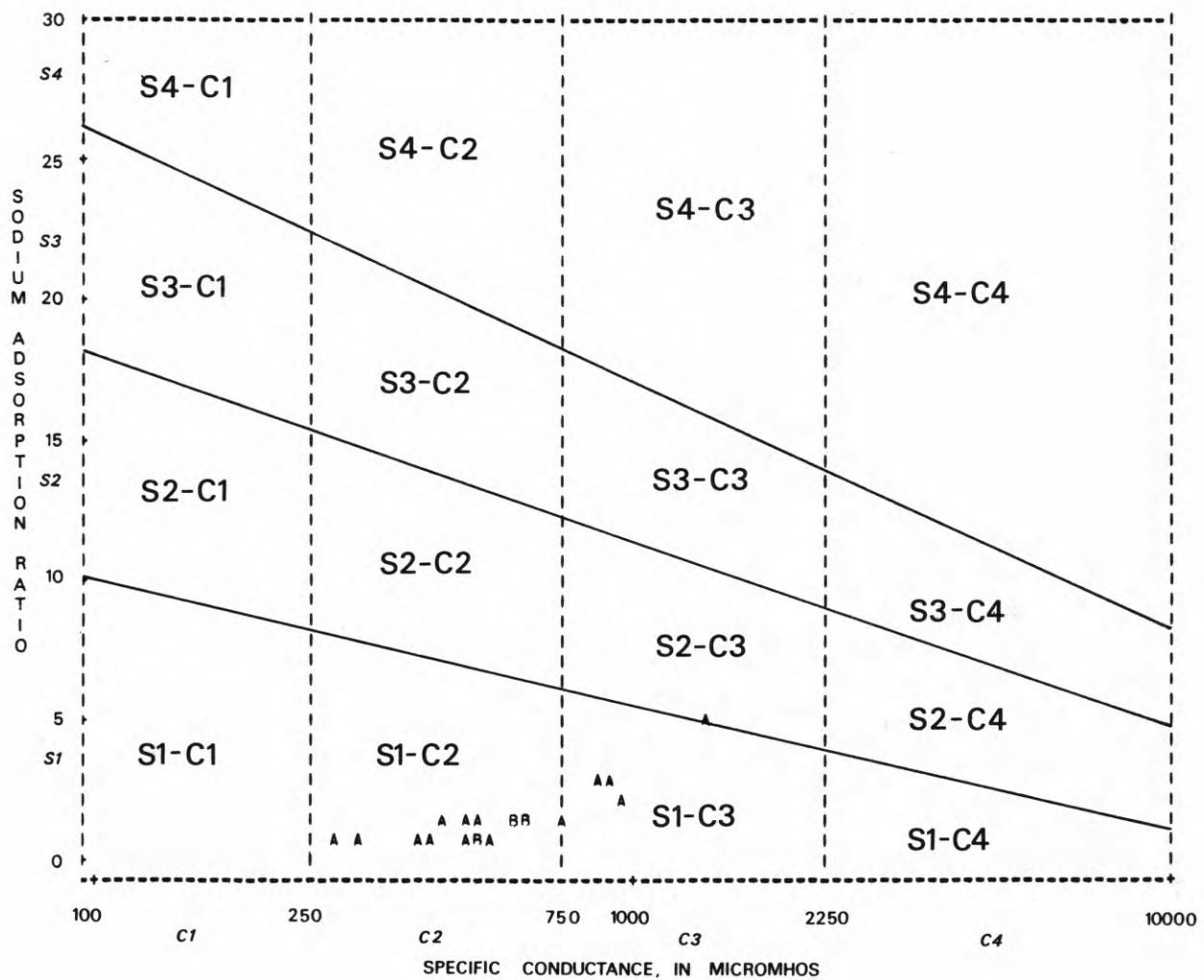


Figure 4.- Irrigation diagram for Bird Creek near Barnsdall, Oklahoma.

Boron

Boron has long been recognized as a phytotoxic trace element. The recommended maximum boron concentrations for use on all soils from the National Academy of Sciences and National Academy of Engineering (1973) report are: boron sensitive plants, 750 ug/L (micrograms per liter); boron semitolerant plants, 1,000 ug/L; and boron tolerant plants, 2,000 ug/L. The relative boron tolerances of certain plants are shown in table 1. This table was taken directly from the Wilcox (1955) report and lists many plants that are not native to or commercially grown in Oklahoma; however, it is possible that most or all of these plants may be grown in Oklahoma on a non-commercial basis.

Table 1.--Relative boron tolerance of certain plants

[From Wilcox (1955). In each group, the plants first named are considered as more tolerant; the last named, more sensitive]

Tolerant	Semitolerant	Sensitive
Athel (<u>Tamerix aphylla</u>)	Sunflower (native)	Pecan
Asparagus	Potato	Walnut (Black; and Persian or English)
Palm (<u>Phoenix canariensis</u>)	Cotton (Acala and Pima)	Jerusalem artichoke
Date Palm (<u>P. dactylifera</u>)	Tomato	Navy bean
Sugar beet	Sweet pea	American Elm
Mangel	Radish	Plum
Garden beet	Field pea	Pear
Alfalfa	Ragged robin rose	Apple
Gladiolus	Olive	Grape (Sultaninia and Malaga)
Broad bean	Barley	Kadota fig
Onion	Wheat	Persimmon
Turnip	Corn	Cherry
Cabbage	Milo	Peach
Lettuce	Oat	Apricot
Carrot	Zinnia	Thornless blackberry
	Pumpkin	Orange
	Bell pepper	Avocado
	Sweet potato	Grapefruit
	Lima bean	Lemon

Univariate Statistics

The station summaries show the univariate statistics for each constituent. The units of concentration in the summary are those units that have already been described for the constituents. The standard deviation, skewness, and kurtosis were not computed for constituents with less than 10 values. When only one value was available for a constituent, that value is listed in the mean column. In many instances the number of values for one constituent are two to three or more times greater than the number of values for another constituent. Therefore, comparison of statistics, particularly minimums and maximums, between constituents needs to be done with care.

The following are brief descriptions of the headings in the univariate statistics summary for each station.

N.--The number of values available for the period of record for that constituent.

MEAN.--The arithmetic average, except for pH which is the median or middle value.

MIN.--The minimum value recorded.

MAX.--The maximum value recorded.

STD.--The standard deviation of the constituent distribution.

SKEW.--The skewness of the constituent distribution. Skewness is a measure of the asymmetry of the distribution of the data when compared to the symmetrical normal distribution. Detailed information on the theory, use, and computational methods for the skewness and kurtosis (described in the next section) are given by Fisher (1973) and Snedecor (1956). A positive value for the skewness statistic indicates there are more values smaller than the mean than values greater than the mean, and for negative skewness values the converse is true (fig. 5). Although the statistic computed for the skewness cannot be used to determine the shape of the distribution, the skewness statistic can indicate whether the distribution curve is significantly different from a normal distribution. If the sample distribution is significantly different, tests that are based on normality are not applicable. The 95-percent probability range, plus and minus, for skewness for various sample sizes is shown in table 2. As an example: For a sample size of 100, if the skewness statistic greatly exceeded plus or minus 0.47, the distribution is not considered normal at the 95-percent probability level.

KURT.--The kurtosis of the sample distribution. Kurtosis is a measure of the deviation of the sample distribution from the normal distribution. In general, kurtosis measures the relative peakness or flatness of the sample distribution curve with respect to the normal distribution. A positive kurtosis indicates peakness and a negative kurtosis indicates flatness (fig. 6). Values for the 95-percent probability limits for kurtosis for selected sample sizes are given in table 2.

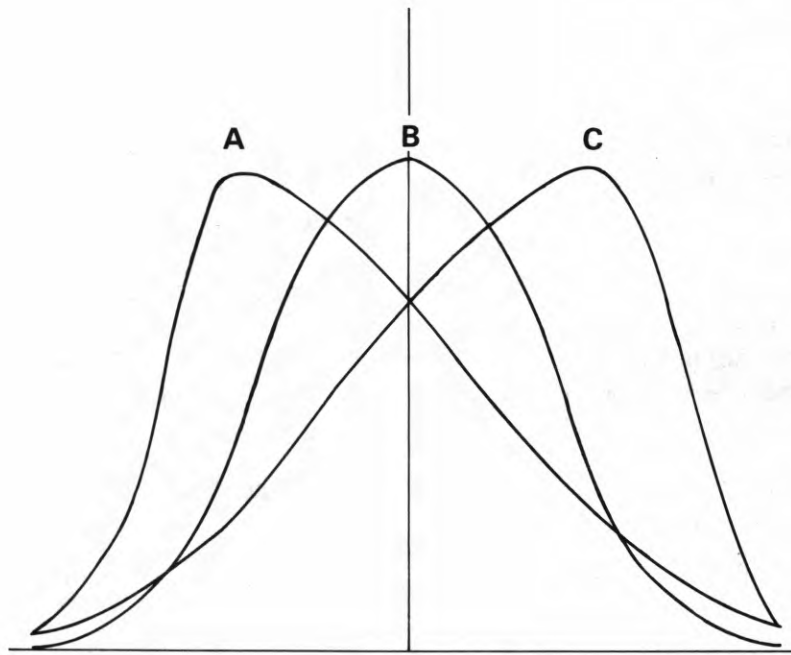


Figure 5 - Skewness and the normal distribution. Curve A is positive skewness, curve B is normal distribution, and curve C is negative skewness.

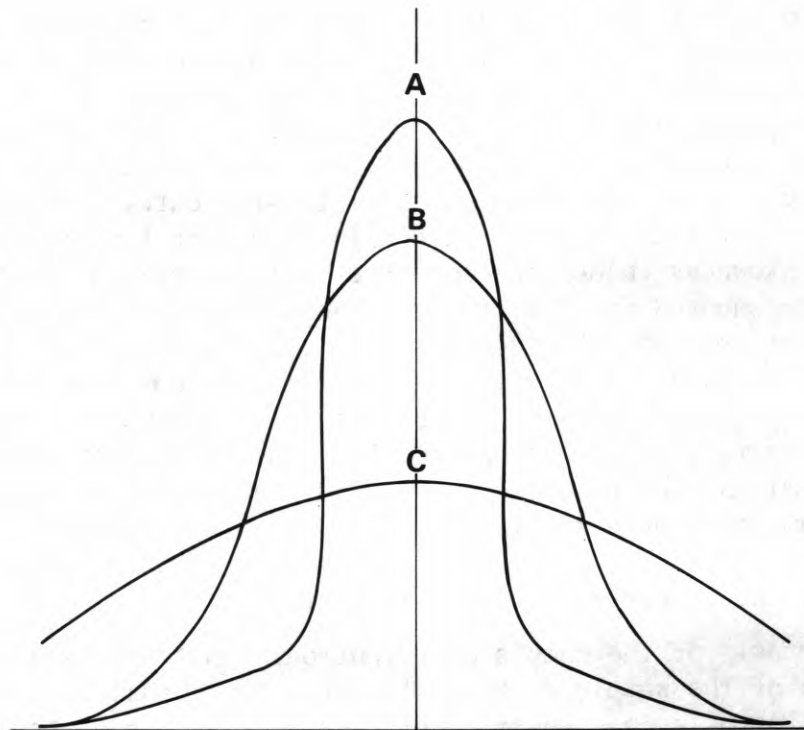


Figure 6 - Kurtosis and the normal distribution. Curve A is positive kurtosis, curve B is normal distribution, and curve C is negative kurtosis.

Table 2.--Ninety-five percent probability limits for skewness and kurtosis for selected sample sizes

Sample size	95 percent of probability limits (plus or minus)	
	Skewness	Kurtosis
10	1.35	2.61
25	.91	1.77
50	.66	1.30
75	.54	1.07
100	.47	.94
150	.39	.77
200	.34	.67
300	.28	.55
400	.24	.48
500	.21	.43
600	.20	.39
700	.18	.36

Frequency Distribution

The frequency distribution table shows selected percentile concentrations from the cumulative frequency distributions of constituents for which 10 or more values were available. The concentration units in the table are the same as previously described for the constituents. The percentile concentrations in the table are explained in the following example: The concentration shown in the 25th percentile column is that concentration for which 25 percent of the samples had concentrations less than or equal to the column value.

STATION NUMBERING SYSTEM

Stations numbers are assigned in a downstream sequence so that as one progresses downstream the numbers become larger. Station numbers on a tributary are assigned on a rank-order basis. Station numbers on a first-rank tributary are assigned so that the numbers are larger than any number assigned to an upstream station on the mainstem and are smaller than any station number assigned to a station downstream on the mainstem. The station numbers on the tributary are assigned in the same downstream method as on the mainstem. A first-rank tributary is one that flows directly into the mainstem, a second-rank tributary is one which flows into a first-rank tributary, and so on for the greater ranked tributaries. The numbering system is followed from the mainstem up through the greater ranked tributaries, first rank, second rank, third rank, and so on.

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STATION SUMMARIES

All constituent values except for pH and specific conductance are for the dissolved phase. Specific conductance and pH are measured on unfiltered samples. The values for the standard deviation, skewness, and kurtosis for pH represent the distribution of the pH values and not the distribution of the hydrogen ion concentrations and were computed from the arithmetic mean of the pH values.

The units of concentration for selected constituents in the following station summaries are as follows:

Milligrams per liter (mg/L) - dissolved solids, total hardness, chloride, sulfate, and fluoride.

Micrograms per liter (ug/L) - Iron, arsenic, cadmium, chromium, lead, mercury, and boron.

Micromhos per centimeter at 25 degrees Celsius (umho) - Specific conductance.

Standard units - pH.

Unitless - SAR.

CANADIAN RIVER BASIN

07232010 - Blue Creek near Blocker, Okla.

LOCATION.--Lat 34°02'26", long 95°34'21", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 36, T.7 N., R.16 E., Pittsburg County, at bridge on State Highway 31, 1.5 mi south of Blocker, and at mile 3.9.

DRAINAGE AREA.--12.1 mi².

PERIOD OF RECORD.--1976 to 1979.

WATER TYPE.--No ion was predominant over the range of measured specific conductance. The sodium and sulfate ion ratios were significantly higher than the other ion ratios for specific conductance greater than 60 umho, which was measured in 90 percent of the samples.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analysis.

PUBLIC WATER SUPPLY.--All of the hardness values were less than 60 mg/L and the average hardness concentration was 28 mg/L. The hardness class for this water is soft. The recommended maximum concentration for iron of 300 ug/L was exceeded by 10 percent of the iron values. The maximum contaminant level for cadmium of 10 ug/L was exceeded by 4 percent of the cadmium values, the maximum level for lead of 50 ug/L was exceeded by 9 percent of the lead values, and the maximum contaminant level for mercury of 2 ug/L was exceeded by 9 percent of the mercury values. Because the maximum contaminant levels for cadmium, lead, and mercury were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard and the sodium hazard were low for all samples. The data indicate that no phytotoxic effects from boron should occur.

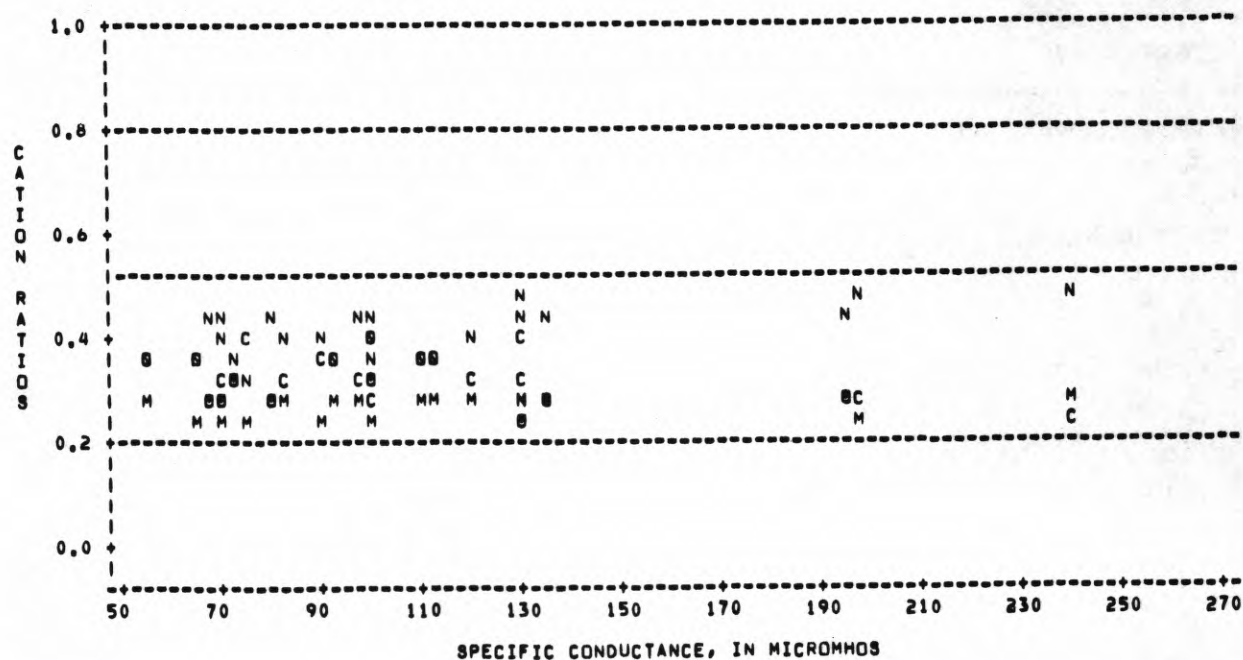
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	37	100	54	240	41	1.76	3.51
Dissolved solids	27	72	45	150	26	1.56	2.39
pH	36	7.1	6.5	8.3	.4	.91	.64
Total hardness	27	28	15	59	11	1.32	1.97
Chloride	27	7.6	3.2	23	5.0	1.99	3.14
Sulfate	27	20	9.4	56	11	1.69	3.36
Iron	28	165	0	650	154	1.89	3.45
Fluoride	27	.1	0.0	.2	.1	-.40	.19
Arsenic	31	0	0	2	.6	1.55	1.50
Cadmium	24	2	0	17	4.0	2.68	8.08
Chromium	29	2	0	10	3.9	1.57	.59
Lead	23	19	0	190	50	3.11	8.73
Mercury	31	.8	0	11	2.4	3.50	12.01
SAR	27	.6	.2	1.4	.3	1.32	2.05
Boron	28	30	0	70	15	.67	.61

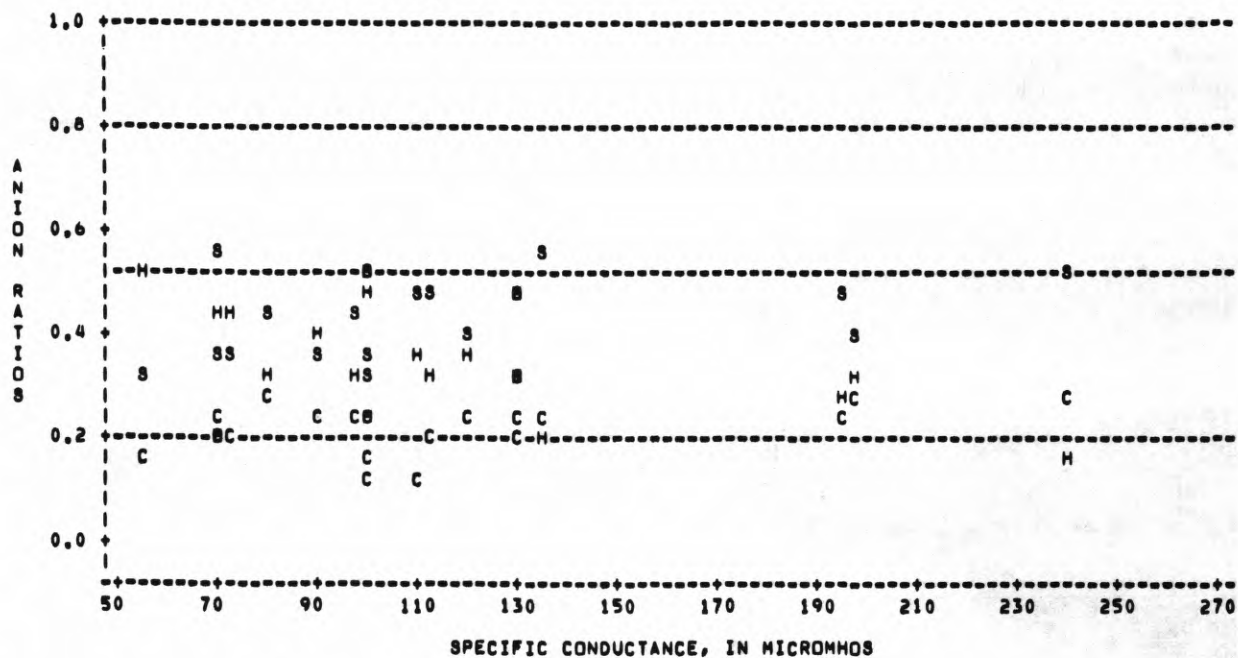
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	60	70	90	112	132
Dissolved solids	49	54	64	80	100
pH	6.7	6.8	7.0	7.4	7.6
Total hardness	17	20	25	34	37
Chloride	3.7	4.4	5.4	8.3	14
Sulfate	10	12	14	24	33
Iron	36	70	110	230	284
Fluoride	0.0	0.0	.1	.1	.1
Arsenic	0	0	0	1	1
Cadmium	0	0	0	1	7
Chromium	0	0	0	1	10
Lead	0	0	4	6	20
Mercury	0.0	0.0	0.0	.2	1.0
SAR	.4	.5	.6	.7	1.0
Boron	10	20	30	30	50

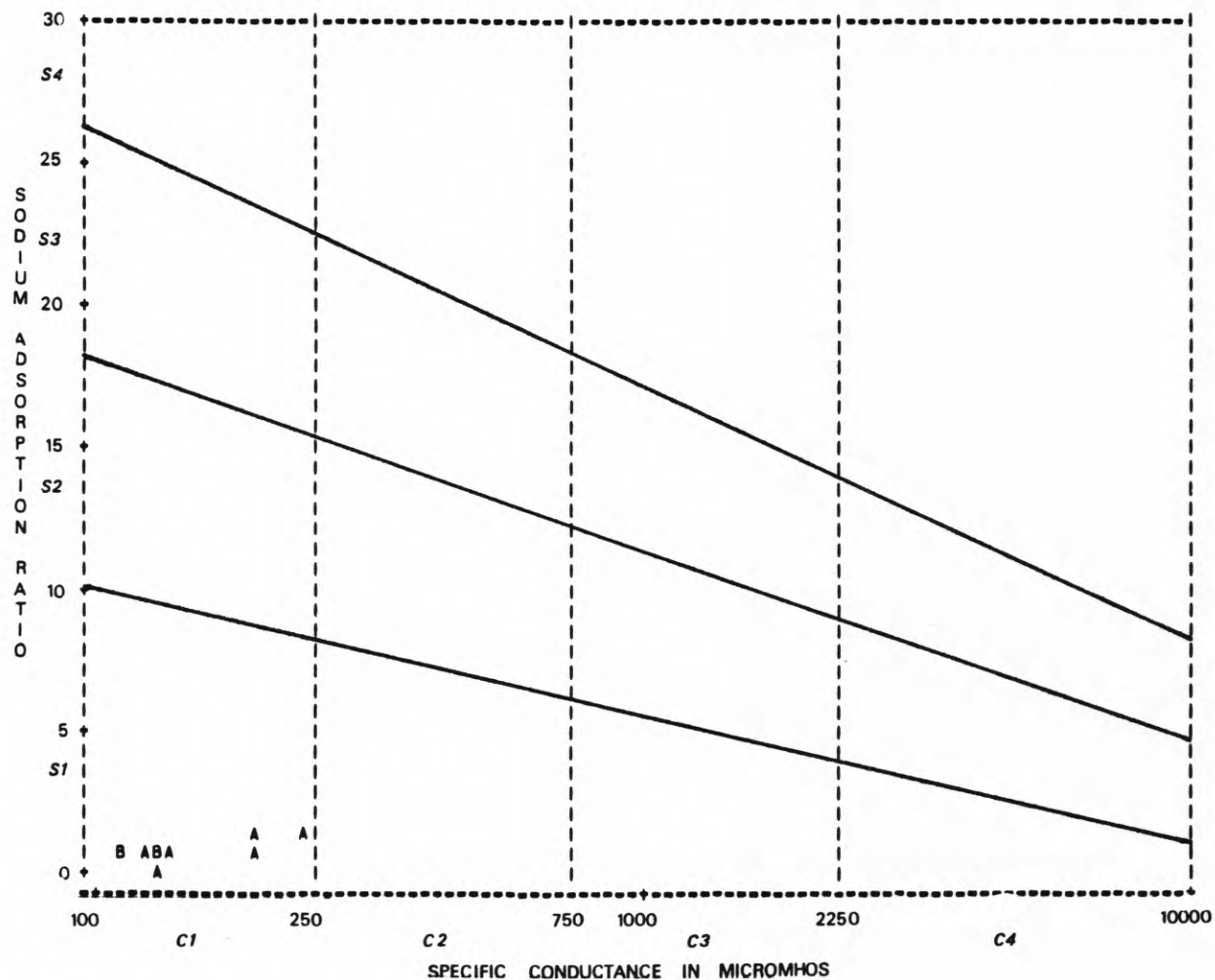
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BLUE CREEK NR BLOCKER, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BLUE CREEK NR BLOCKER, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=BLUE CREEK NR BLOCKER, OK



CANADIAN RIVER BASIN

07231975 - Brushy Creek near Haileyville, Okla.

LOCATION.--Lat 34°48'05", long 95°39'16", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 19, T.4 N., R.16 E., Pittsburg County, at county road bridge, 0.9 mi south of junction of State Highway 63 and county road, 1.2 mi northeast of Arch, 6.3 mi southwest of Haileyville, and at mile 14.3.

DRAINAGE AREA.--139 mi².

PERIOD OF RECORD.--1978 to 1979.

WATER TYPE.--This water was calcium bicarbonate type. The calcium ion ratio was slightly less than 50 percent in some of the samples; however, calcium was the dominant cation throughout the range of measured specific conductance.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--Seventy-five percent of the hardness values were less than 180 mg/L and the average concentration was 48 mg/L. Generally, the hardness class for this water is soft. The maximum contaminant level for cadmium of 10 ug/L was exceeded by 10 percent of the cadmium values. Because the maximum cadmium contaminant level was exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard was low, specific conductance less than 250 umhos, for 95 percent of the samples. All SAR values were equivalent to a low sodium hazard. The data indicate that phytotoxic effects from boron should not occur.

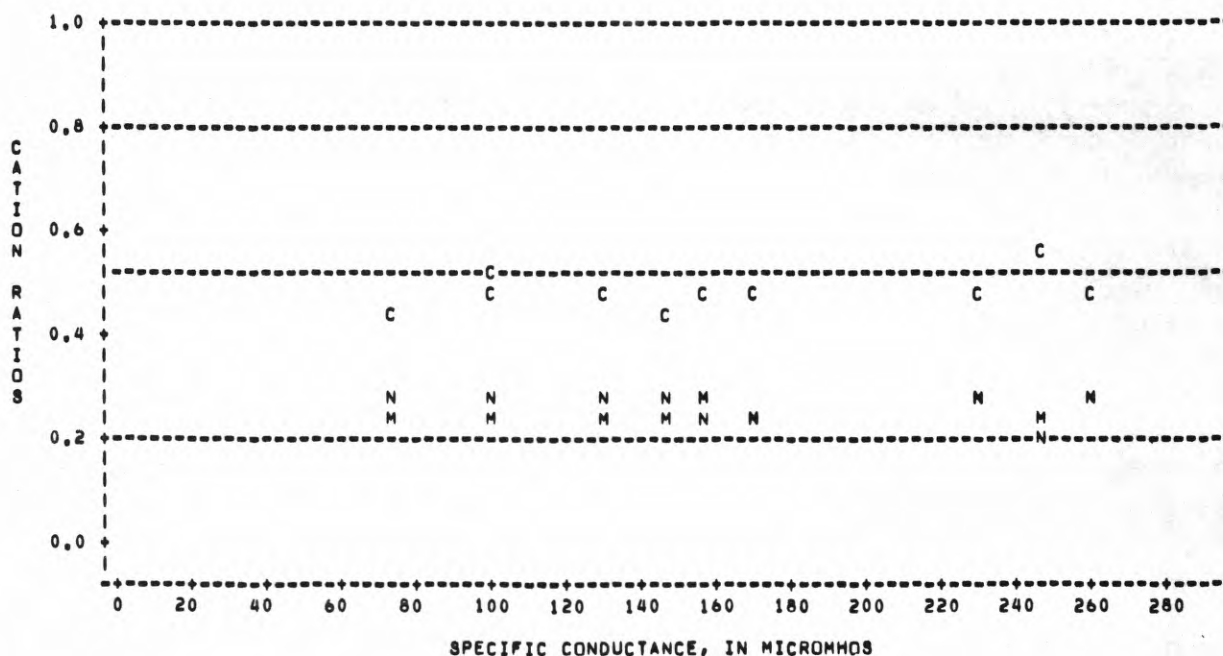
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	18	138	72	280	60	1.20	0.85
Dissolved solids	11	89	47	133	29	.01	-1.05
pH	19	7.2	6.9	7.4	.2	-.16	-.82
Total hardness	11	48	0	93	27	.01	-.26
Chloride	11	5.4	2.8	7.9	1.7	-.12	-1.22
Sulfate	11	18	11	24	5.0	-.52	-1.23
Iron	10	117	20	300	81	1.14	2.15
Fluoride	11	.1	.1	.2	0.0	1.92	2.04
Arsenic	15	1	0	2	.6	.09	-.17
Cadmium	10	3	0	16	4.8	2.30	5.89
Chromium	15	4	0	20	7.4	1.63	1.32
Lead	15	11	0	47	18	1.38	.12
Mercury	15	0.0	0.0	.2	.1	2.40	4.35
SAR	10	.4	.3	.6	.1	.39	.37
Boron	11	48	30	60	9.8	-.35	-.59

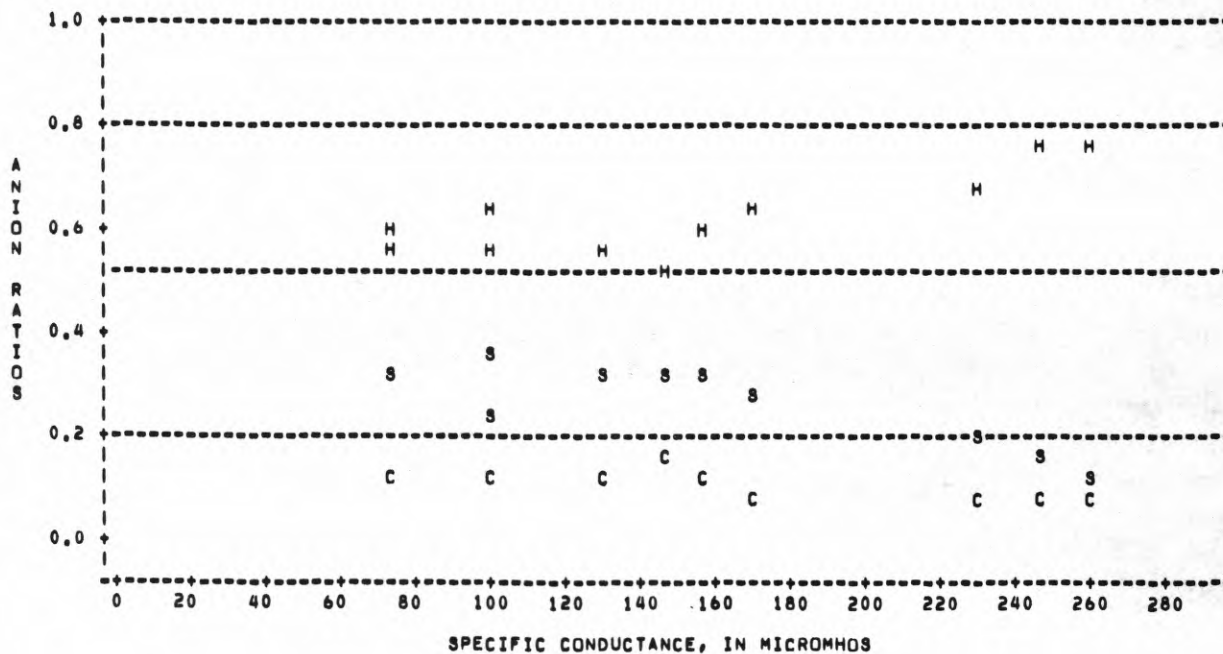
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	73	96	123	148	234
Dissolved solids	47	62	81	107	124
pH	6.9	7.0	7.2	7.3	7.4
Total hardness	2	24	45	60	82
Chloride	2.8	3.7	5.5	6.3	7.5
Sulfate	11	11	18	22	23
Iron	20	40	110	135	170
Fluoride	.1	.1	.1	.1	.2
Arsenic	0	0	1	1	1
Cadmium	0	0	1	4	5
Chromium	0	0	0	2	15
Lead	0	0	0	8	43
Mercury	0.0	0.0	0.0	0.0	.1
SAR	.3	.4	.4	.5	.5
Boron	31	40	50	52	60

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BRUSHY CREEK NR HAILEYVILLE OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BRUSHY CREEK NR HAILEYVILLE OK



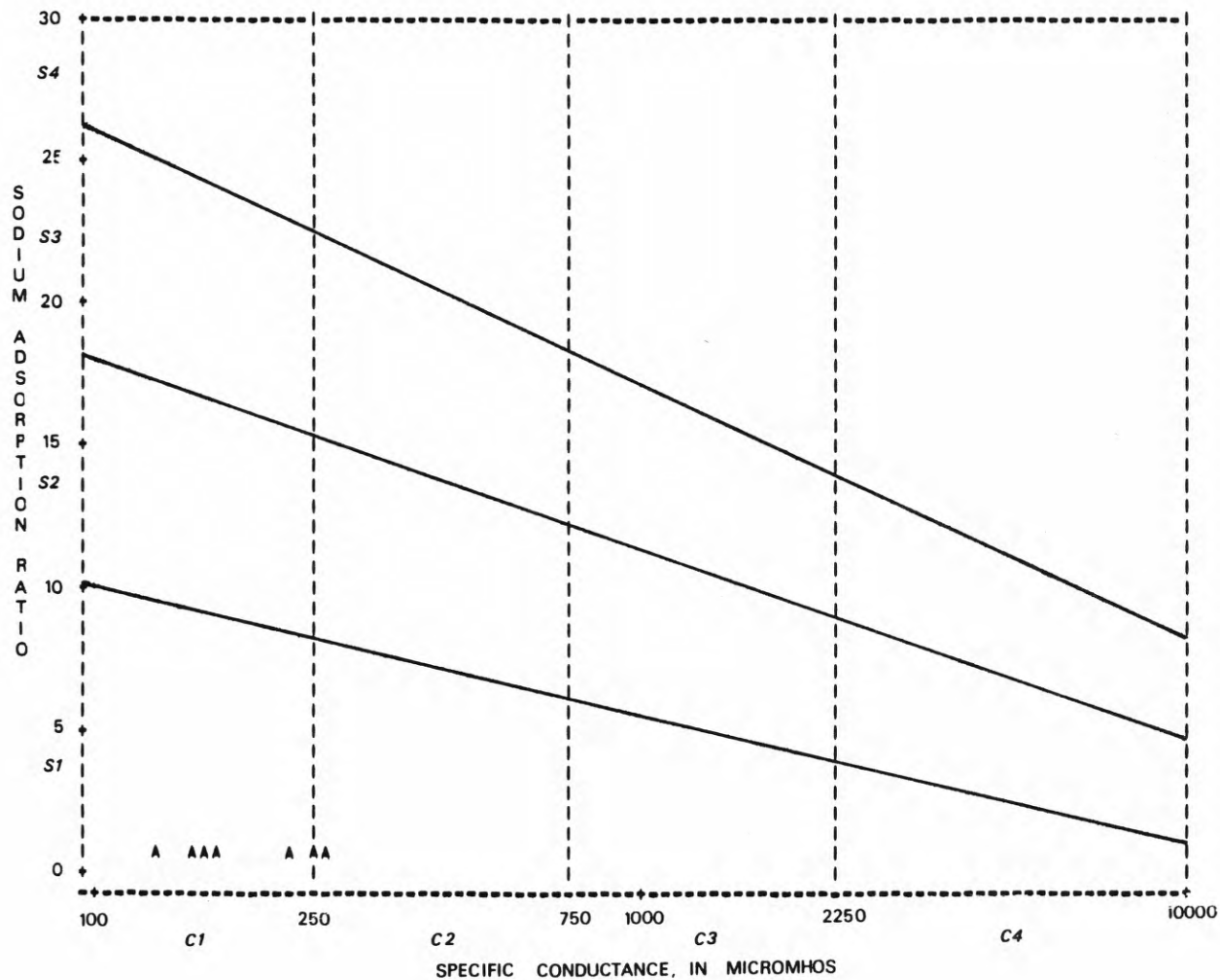
IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD

C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD

A = 1 DBS, B = 2 DBS, C = 3 DBS

STATION NAME OR LOCAL IDENTIFIER=BRUSHY CREEK NR HAILEYVILLE OK



CANADIAN RIVER BASIN

07228200 - Canadian River near Roll, Okla.

LOCATION.--Lat 34°52'12", long 99°43'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 10, T.16 N., R.24 W., Roger Mills County, at bridge on U.S. Highway 283, 6.0 mi northwest of Roll, and at mile 383.6.

DRAINAGE AREA.--23,615 mi², of which 63.4 mi² is probably noncontributing.

PERIOD OF RECORD.--1950 to 1953, 1962 to 1963, 1976 to 1977.

WATER TYPE.--For specific conductance less than 1,200 umho, 26 percent of the samples, the water was carbonate/bicarbonate type. The water was mixed type with respect to the anions for specific conductance between 1,200 and 1,600 umho, 14 percent of the samples. The water was chloride type for specific conductance between 1,600 and 2,400 umho, 30 percent of the samples. Data indicate that the water shifts to sulfate type for specific conductance greater than 2,400 umho. There were not sufficient data to make any determination of the cation distribution.

TREND.--The current period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--Ninety-five percent of the hardness values were greater than 180 mg/L and the average concentration was 445 mg/L. Generally, the hardness class for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 61 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 48 percent of the sulfate values. No toxic metal data were available. Because of the frequency and magnitude by which the recommended maximum concentrations of chloride and sulfate were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard was high or very high, specific conductance greater than 750 umho, in 92 percent of the samples. The sodium hazard ranged from low to high with 42 percent of the SAR values equivalent to a low sodium hazard. No boron data were available.

UNIVARIATE STATISTICS

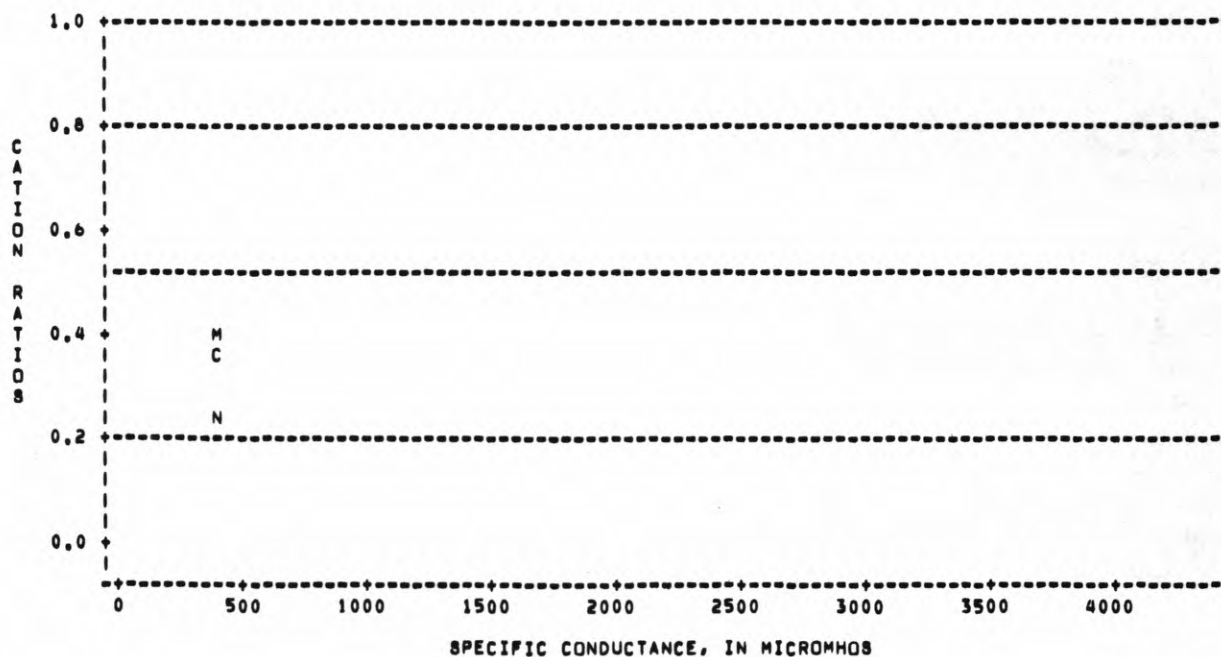
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	32	1980	412	4000	887	0.38	-0.47
Dissolved solids	21	1064	249	2550	492	1.28	3.08
pH	30	8.1	7.5	8.6	.3	-.41	-.17
Total hardness	32	445	180	1303	205	2.47	9.45
Chloride	32	343	30	685	194	-.04	-1.14
Sulfate	30	296	12	1064	221	2.58	7.26
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	19	4.4	0.7	7.6	2.1	-.34	-1.26
Boron	0						

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	840	1180	1930	2500	3240
Dissolved solids	549	742	928	1215	1558
pH	7.8	7.9	8.1	8.3	8.4
Total hardness	214	317	425	509	556
Chloride	58	175	360	495	591
Sulfate	144	186	248	293	440
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.2	2.0	4.8	6.0	6.6
Boron					

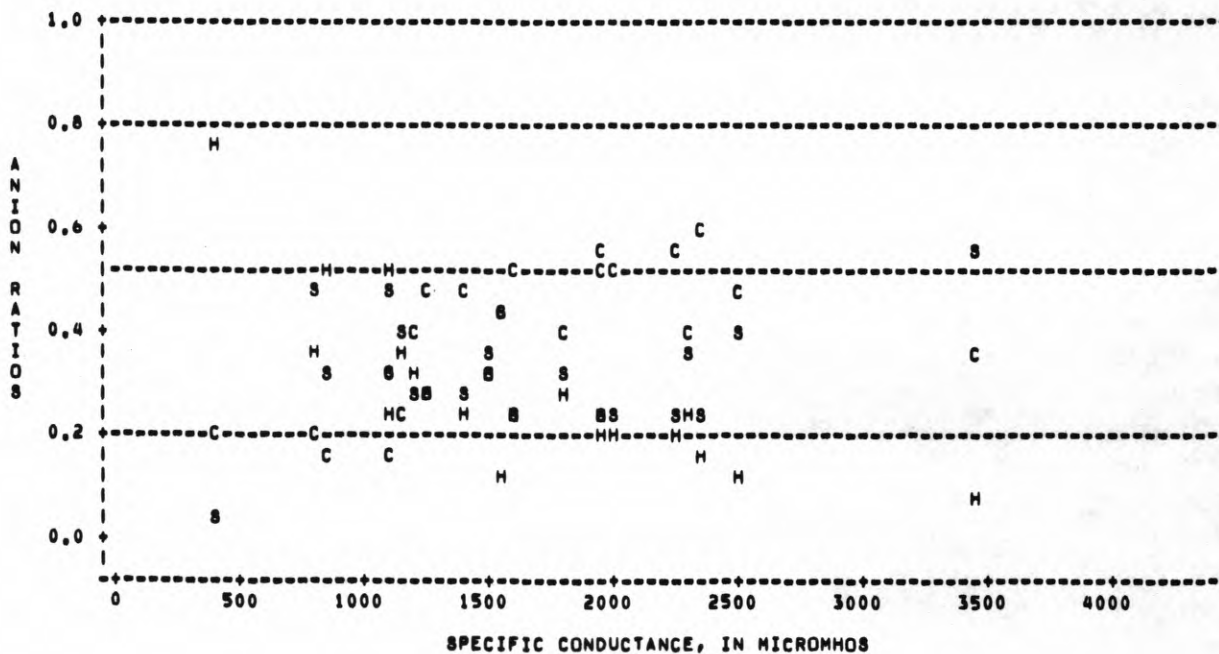
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR ROLL, OK

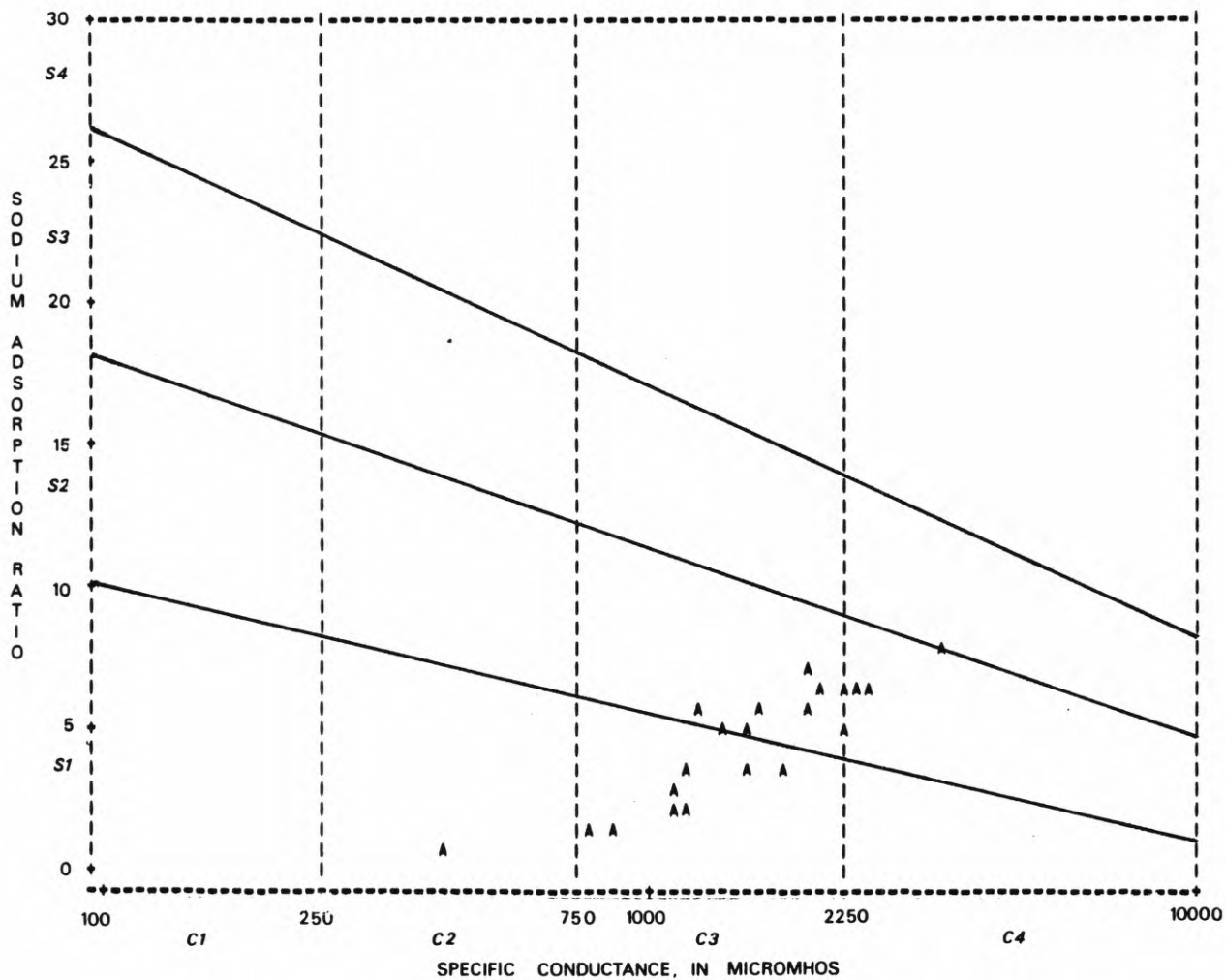


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR ROLL, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR ROLL, OK



CANADIAN RIVER BASIN

07228300 - Canadian River near Thomas, Okla.

LOCATION.--Lat 35°46'25", long 98°40'15". in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T.15 N., R.14 W., Custer County, at St. Louis and San Francisco Railroad Co. bridge, 4 mi northeast of Thomas.

DRAINAGE AREA.--24,640 mi².

PERIOD OF RECORD.--1952 to 1953, 1961 to 1963.

WATER TYPE.--For specific conductance less than 2,000 umho, 61 percent of the samples, the water was generally calcium sulfate type. For specific conductance greater than 2,000 umho and less than 3,000 umho, 35 percent of the samples, the water was generally sodium sulfate type. For specific conductance greater than 3,000 umho, the water was mixed type.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--All of the hardness values were greater than 180 mg/L and the average concentration was 636 mg/L. The hardness class for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 38 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 93 percent of the sulfate values. No toxic metal data were available. Because of the frequency and magnitude by which the recommended maximum chloride and sulfate concentrations were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard was high or very high, specific conductance greater than 750 umho, in 99 percent of the samples. The sodium hazard ranged from low to high with 80 percent of the SAR values equivalent to a low sodium hazard. The data indicate that phytotoxic effects could occur in boron sensitive plants. One percent of the boron values exceeded the 750 ug/L limit for sensitive plants.

UNIVARIATE STATISTICS

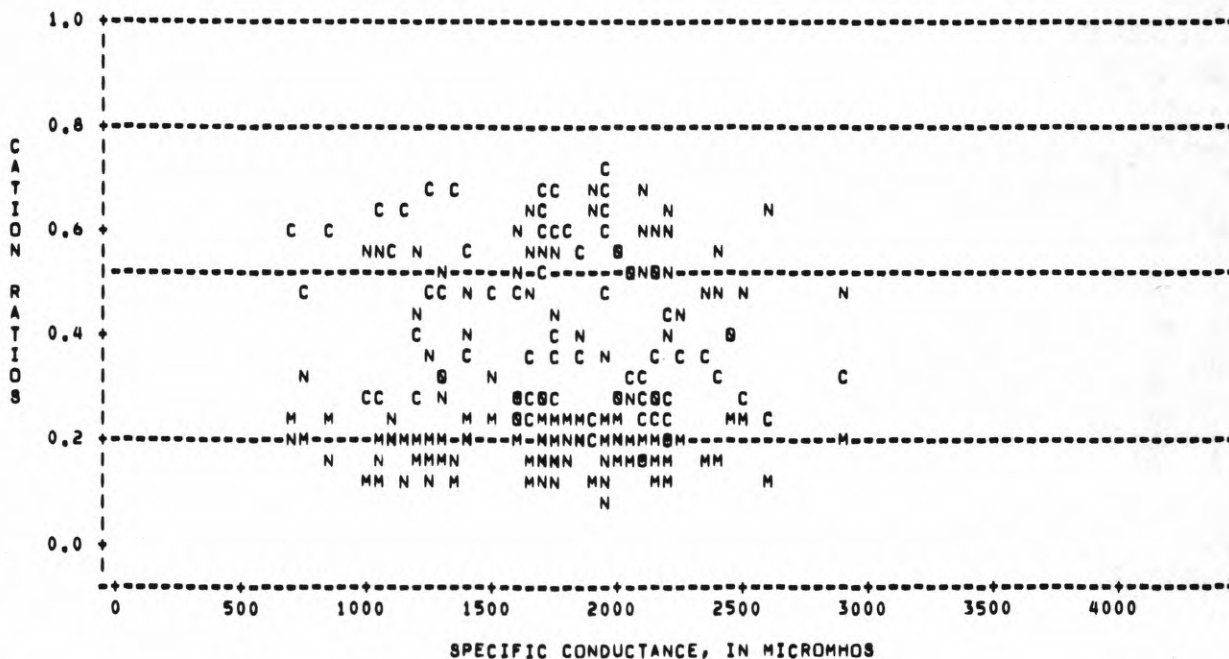
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	201	1841	697	4340	554	0.77	2.74
Dissolved solids	201	1366	480	3260	415	.56	2.28
pH	200	8.2	7.0	8.6	.2	-1.27	3.75
Total hardness	201	636	202	1250	239	.39	-.76
Chloride	202	212	27	760	148	.97	1.00
Sulfate	201	562	135	1220	243	.53	-.59
Iron	0						
Fluoride	148	0.8	0.1	1.6	0.3	.17	-.61
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	199	3.2	0.1	10	2.1	.84	.15
Boron	100	329	40	810	154	.76	.58

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	1101	1440	1840	2160	2399
Dissolved solids	810	1103	1385	1618	1818
pH	7.9	8.0	8.2	8.3	8.4
Total hardness	350	433	598	828	960
Chloride	55	82	180	318	385
Sulfate	288	377	512	767	900
Iron					
Fluoride	0.3	0.5	0.8	1.0	1.2
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.9	1.4	2.7	4.7	6.1
Boron	150	220	300	430	540

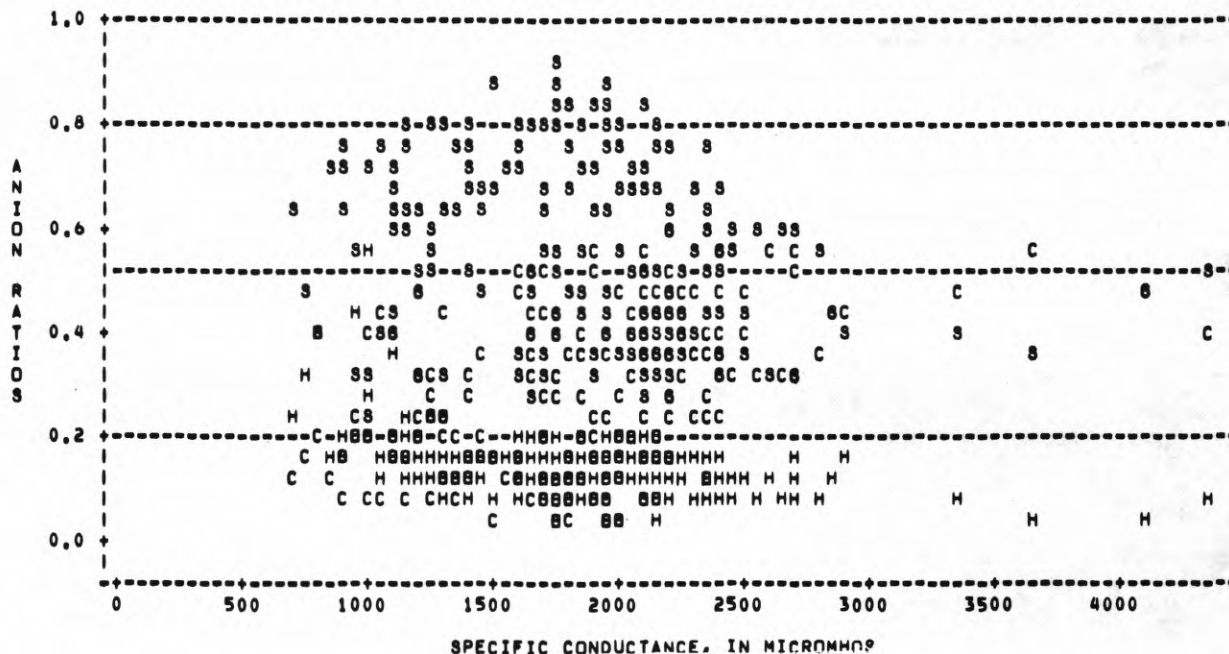
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR THOMAS, OK

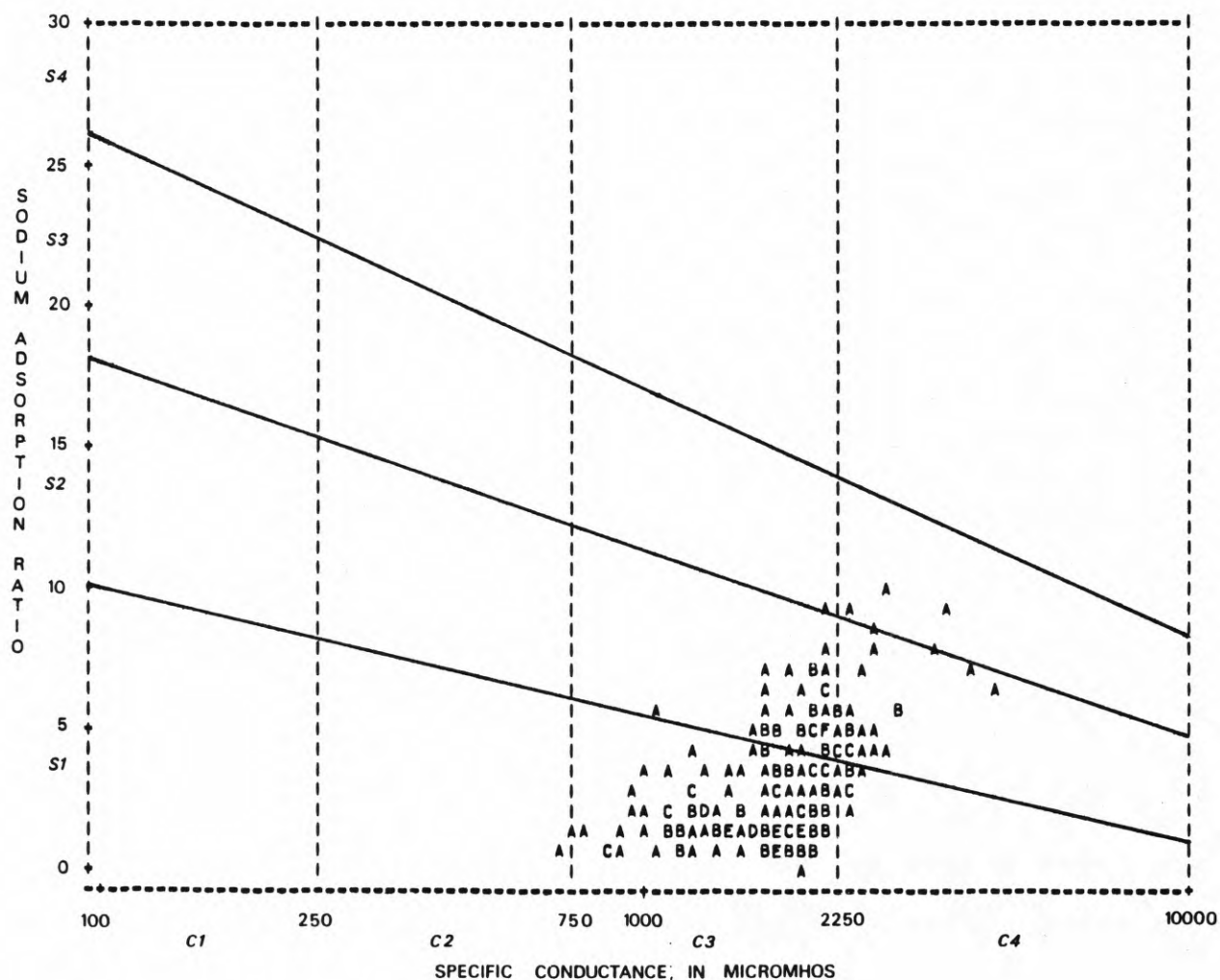


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR THOMAS, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR THOMAS, UK



CANADIAN RIVER BASIN

07228500 - Canadian River at Bridgeport, Okla.

LOCATION.--Lat 35°34'00", long 98°22'45", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28, T.13 N., R.11 W., Blaine County, at Chicago, Rock Island, and Pacific Railroad Co. bridge, 1.0 mi north of Bridgeport, 2.8 mi upstream from Lumpmouth Creek, and at mile 267.3.

DRAINAGE AREA.--25,229 mi², of which 4,801 mi² is probably noncontributing.

PERIOD OF RECORD.--1949 to 1961, 1970 to 1979.

WATER TYPE.--For specific conductance less than 500 umho, 4 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance between 500 and 1,600 umho, 74 percent of the samples, the water was calcium sulfate type and between 1,600 and 2,000 umho, 14 percent of the samples, the water was sodium sulfate type. The water was sodium chloride type for specific conductance greater than 2,000 umho.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time indicate trends of increasing concentration. The Spearman's rhos for the constituents at the 95-percent probability level also indicate positive trends.

PUBLIC WATER SUPPLY.--Ninety-six percent of the hardness values were greater than 180 mg/L and the average concentration was 415 mg/L. In general, the hardness class for this water is very hard. The recommended maximum pH limit of 9.0 was exceeded by 3 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 15 percent of the chloride values, and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 62 percent of the sulfate values. The maximum contaminant level for fluoride of 1.6 mg/L for the maximum daily air temperature of 73° F at this location was exceeded by 1 percent of the fluoride values. The toxic metals did not exceed maximum contaminant levels. Because of the frequency and magnitude by which the recommended maximum sulfate and chloride concentrations were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard was high or very high, specific conductance greater than 750 umho, in 86 percent of the samples. Eighty-nine percent of the SAR values were equivalent to a low sodium hazard. The data indicate that phytotoxic effects from boron should not occur.

UNIVARIATE STATISTICS

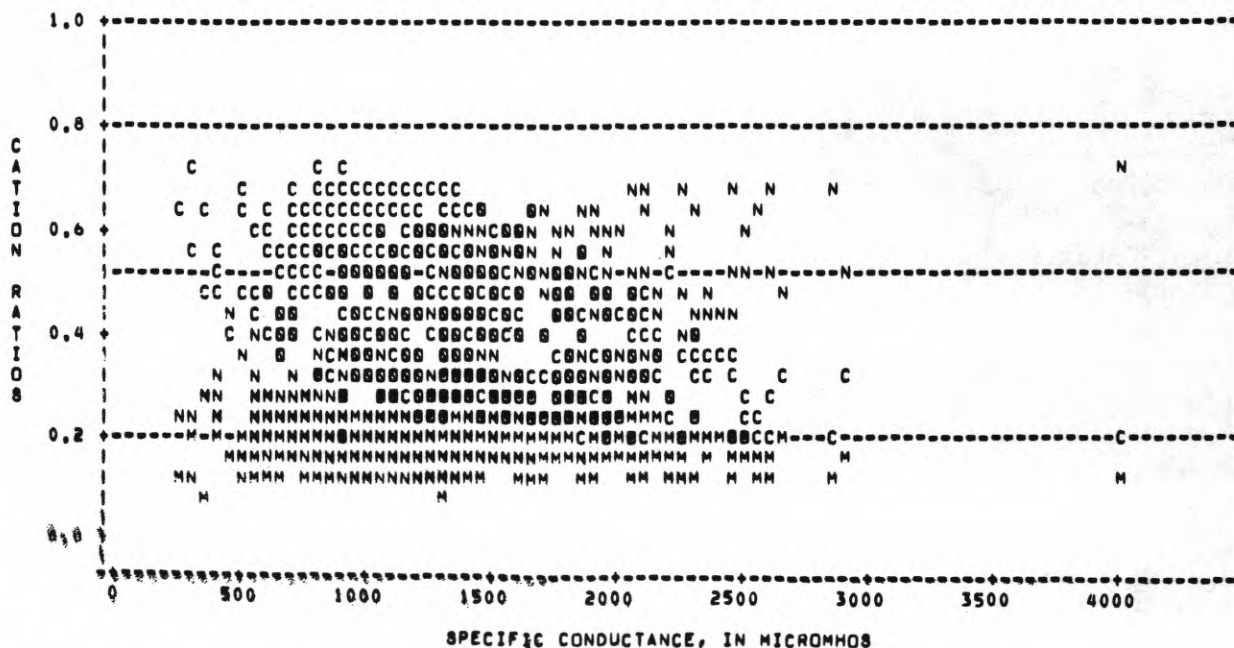
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	1364	1233	223	4000	491	0.79	0.68
Dissolved solids	1294	821	170	2450	317	.67	.40
pH	1202	8.1	6.8	9.7	.3	-.42	1.60
Total hardness	1292	415	10	920	142	.49	.29
Chloride	1293	126	3.5	825	119	1.32	1.77
Sulfate	1284	291	23	790	123	.75	.97
Iron	19	29	10	90	24	1.61	1.88
Fluoride	89	.5	0.0	2.6	.4	1.81	7.25
Arsenic	1	2					
Cadmium	18	0	0	2	0.6	.84	-.10
Chromium	16	3	0	20	6	1.89	3.03
Lead	18	3	0	20	5	2.94	9.55
Mercury	1	.1					
SAR	1041	2.3	0.2	11	1.8	1.17	.98
Boron	60	209	0	640	153	.79	.56

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	696	897	1100	1540	1946
Dissolved solids	460	604	760	1020	1270
pH	7.7	7.9	8.1	8.3	8.4
Total hardness	240	310	415	493	600
Chloride	16	26	83	190	300
Sulfate	148	206	281	350	450
Iron	10	10	20	32	62
Fluoride	.1	.2	.5	.7	1.0
Arsenic					
Cadmium	0	0	0	1	1
Chromium	0	0	0	0	10
Lead	0	1	2	3	5
Mercury					
SAR	0.7	0.9	1.7	3.4	4.9
Boron	0	90	190	270	380

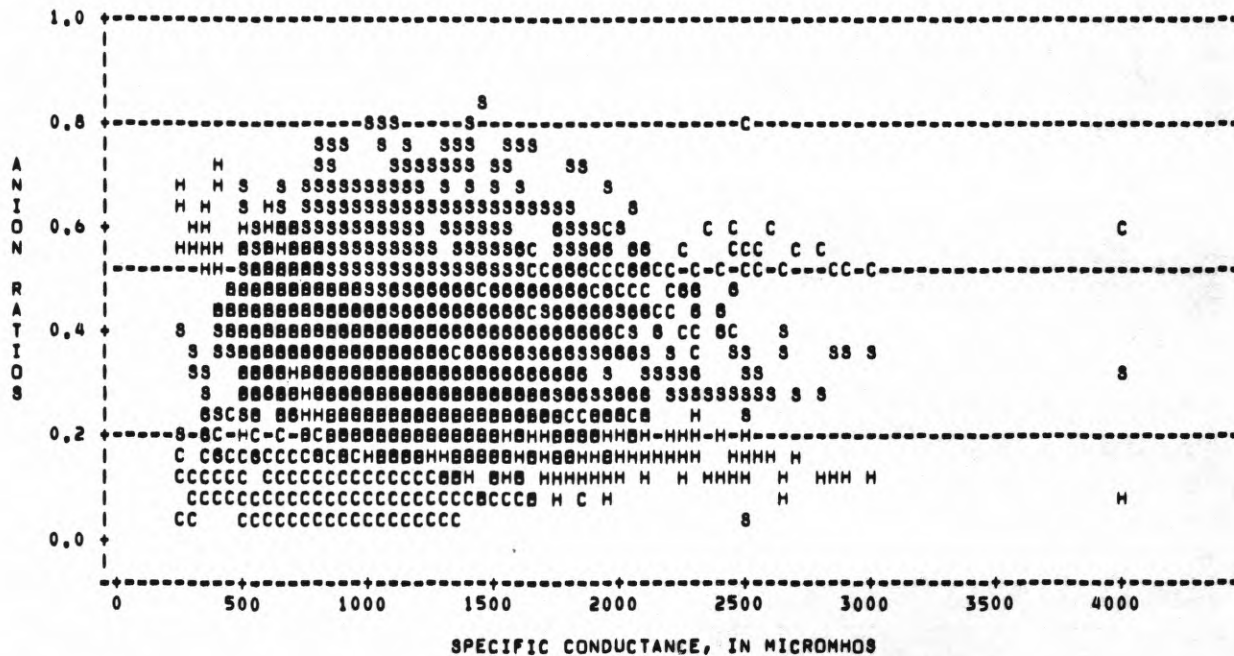
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT BRIDGEPORT, OK



ANION RATIO PLOT

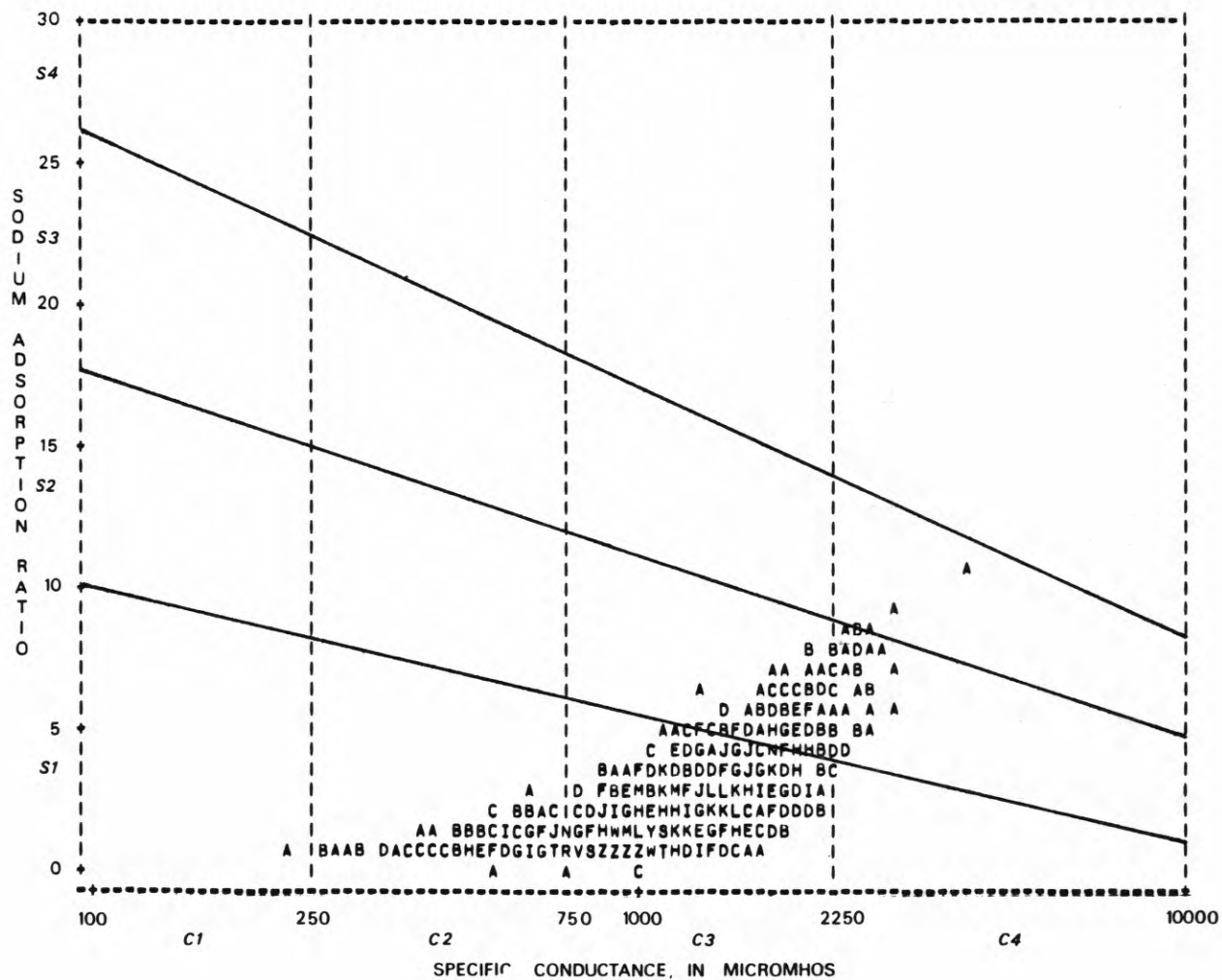
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT BRIDGEPORT, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT BRIDGEPORT, OK



CANADIAN RIVER BASIN

07229100 - Canadian River near Noble, Okla.

LOCATION.--Lat 35°04'55", long 97°22'52", in N½ sec. 14, T.7 N., R.2 W., McClain County, at Atchison, Topeka, and Santa Fe Railway Co. bridge, 3.6 mi upstream from Choteau Creek, 3.8 mi south of Noble, and at mile 190.8.

DRAINAGE AREA.--25,911 mi², of which 4,801 mi² is probably noncontributing.

PERIOD OF RECORD.--1965 to 1971, 1973 to 1975.

WATER TYPE.--For specific conductance less than 1,200 umho, 61 percent of the samples, the water was carbonate/bicarbonate type. For specific conductance greater than 1,200 umho and less than 1,700 umho, 28 percent of the samples, the water was sulfate type. The sodium ion was predominant for specific conductance between 600 and 900 umho, 26 percent of the samples; therefore, the water was sodium carbonate/bicarbonate type between 600 and 900 umho. The water was mixed type for specific conductance greater than 1,700 umho.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Seventy-nine percent of the hardness values were greater than 180 mg/L and the average concentration was 320 mg/L. In general, the hardness class for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 6 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 39 percent of the sulfate values. The data for the toxic metals cadmium, chromium, lead, and mercury indicate that maximum contaminant levels would not be exceeded. No arsenic data are available. Based on the data, this water would be marginally suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to high with 80 percent of the samples having a high salinity hazard. The sodium hazard ranged from low to medium with 91 percent of the SAR values equivalent to a low sodium hazard. Boron phytotoxic effects could occur even in tolerant plants. Twenty-seven percent of the boron values were greater than 750 ug/L, the limit for sensitive plants, 23 percent of the boron values were greater than 1,000 ug/L, the limit for semitolerant plants, and 4 percent of the boron values were greater than 2,000 ug/L, the limit for tolerant plants.

UNIVARIATE STATISTICS

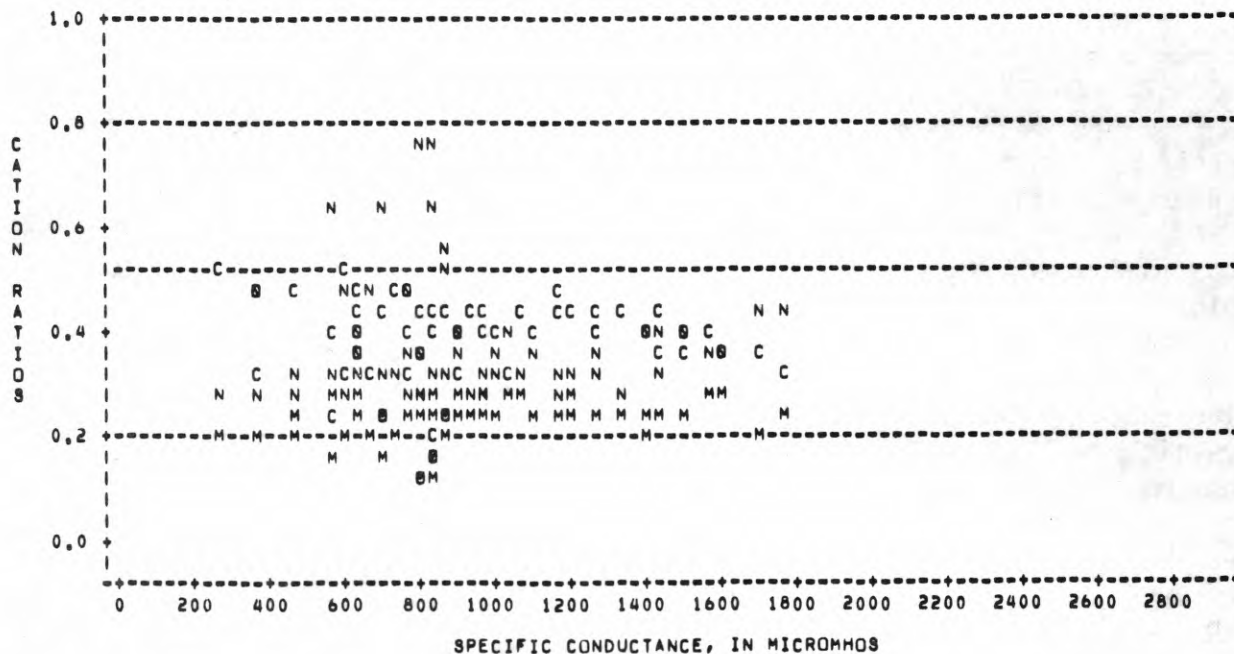
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	369	1119	198	2260	428	0.30	-0.65
Dissolved solids	181	694	110	1500	283	.50	-.20
pH	215	7.8	6.6	9.0	.4	-.13	.25
Total hardness	195	320	56	630	146	.08	-.99
Chloride	293	108	7.9	380	76	1.16	.68
Sulfate	264	217	29	530	128	.41	-.89
Iron	8	61	10	80			
Fluoride	1	.6					
Arsenic	0						
Cadmium	9	0	0	1			
Chromium	8	8	0	20			
Lead	8	2	0	4			
Mercury	1	0.0					
SAR	191	2.9	0.6	11	1.8	2.22	6.65
Boron	28	611	50	2300	601	1.47	1.19

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	618	801	1030	1450	1710
Dissolved solids	378	489	634	903	1089
pH	7.3	7.6	7.8	8.1	8.3
Total hardness	120	210	318	441	520
Chloride	39	51	75	149	220
Sulfate	59	100	200	310	408
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.4	1.8	2.4	3.5	5.2
Boron	148	220	300	970	1460

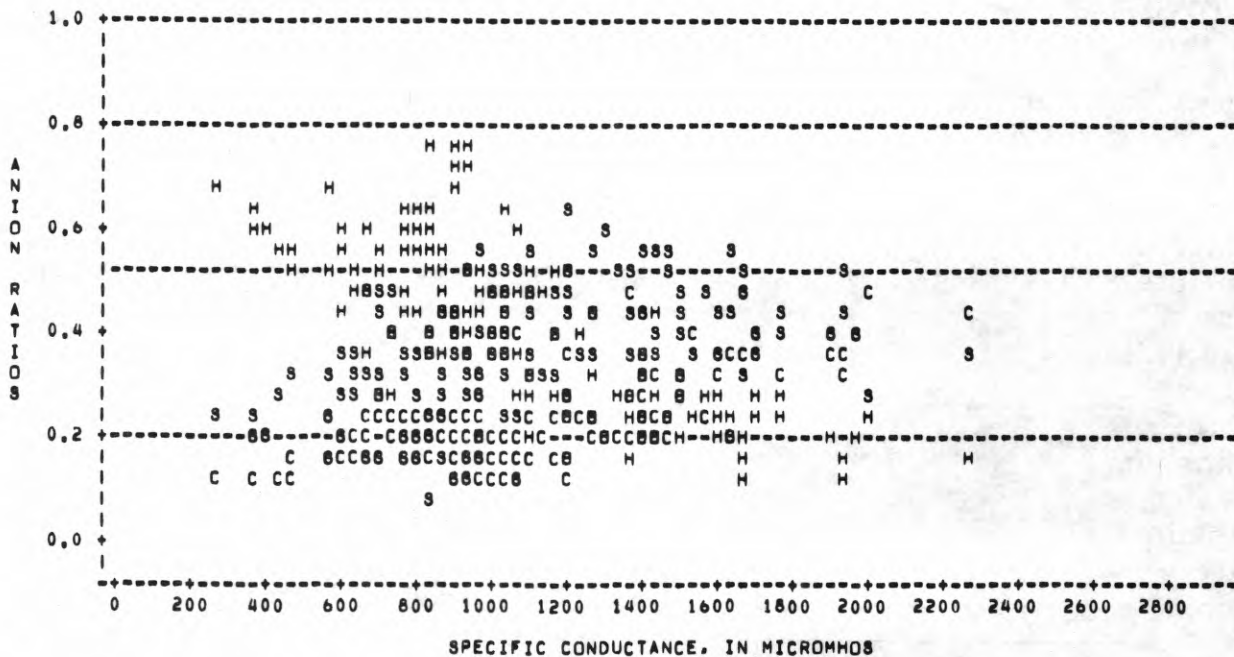
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR NOBLE, OK

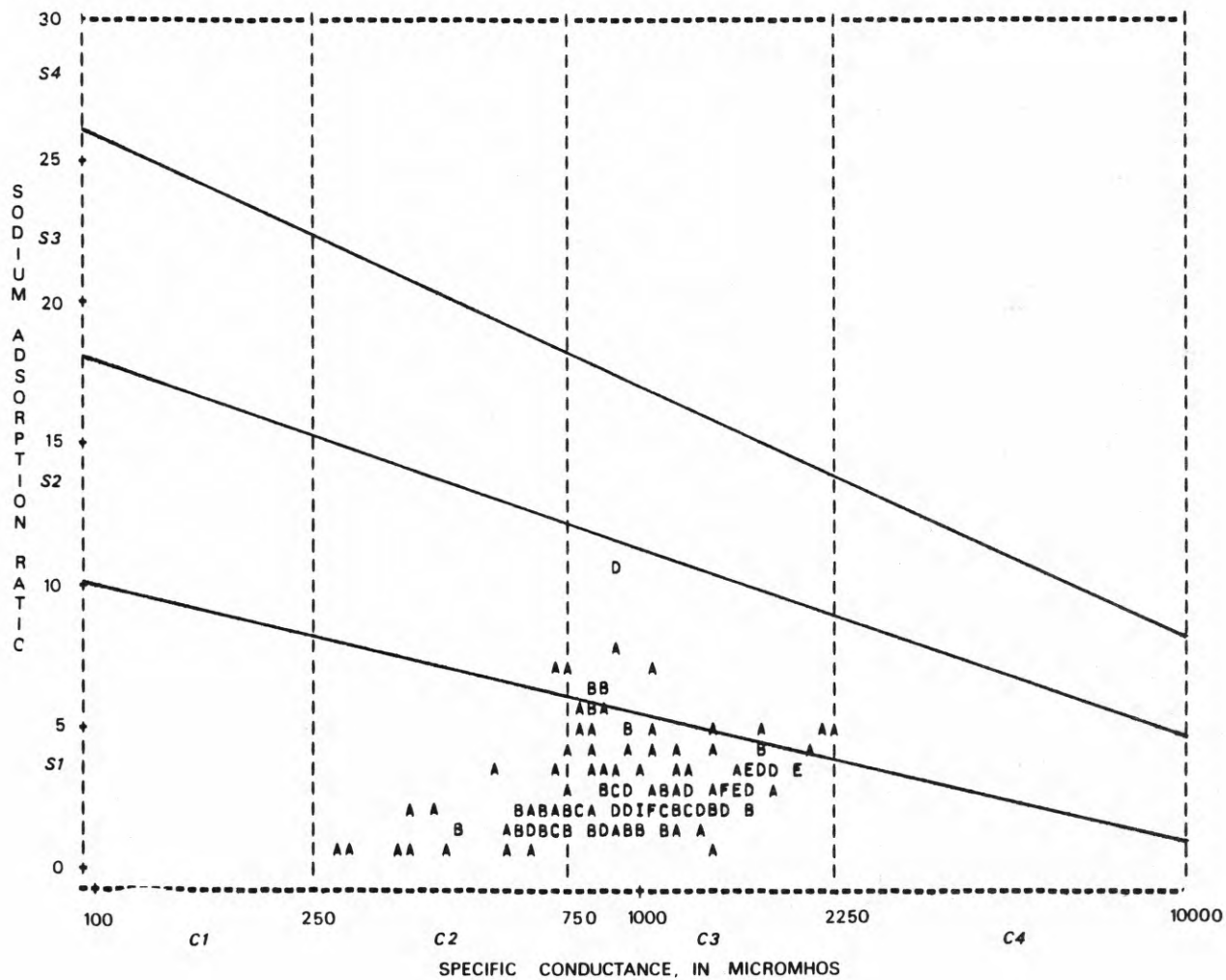


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR NOBLE, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR NOBLE, OK



CANADIAN RIVER BASIN

07229200 - Canadian River at Purcell, Okla.

LOCATION.--Lat 35°00'50", long 97°20'50", in NW¹/₄ sec. 7, T.6 N., R.1 W., McClain County, at bridge on U.S. Highway 77, 0.5 mi east of Purcell, 1 mi upstream from Walnut Creek, and at mile 184.9.

DRAINAGE AREA.--25,939 mi², of which 4,801 mi² is probably noncontributing.

PERIOD OF RECORD.--1952, 1957 to 1958, 1960 to 1963, 1974 to 1979.

WATER TYPE.--For specific conductance between 1,000 and 1,500 umho, 35 percent of the samples, the water was sulfate type. No anion was predominant for specific conductance less than 1,000 umho and greater than 1,500 umho. The cations were mixed throughout the range of measured specific conductance. The water was therefore mixed type for specific conductance less than 1,000 umho and greater than 1,500 umho.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time do not indicate any trend. The Spearman's rhos at the 95-percent probability level for these constituents also do not indicate any trends.

PUBLIC WATER SUPPLY.--Ninety percent of the hardness values were greater than 180 mg/L and the average concentration was 416 mg/L. In general, the hardness class for this water is very hard. The recommended maximum pH of 9.0 was exceeded by 9 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 10 percent of the chloride values, and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 63 percent of the sulfate values. Data for the toxic metals cadmium, chromium, and lead indicate that the maximum contaminant levels would not be exceeded. No data are available for arsenic and mercury. Based on the data, this water would be marginally suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 82 percent of the samples having a high salinity hazard. The sodium hazard ranged from low to medium with 96 percent of the SAR values equivalent to a low sodium hazard. None of the boron values exceeded the recommended limit, 750 ug/L, for boron sensitive plants.

UNIVARIATE STATISTICS

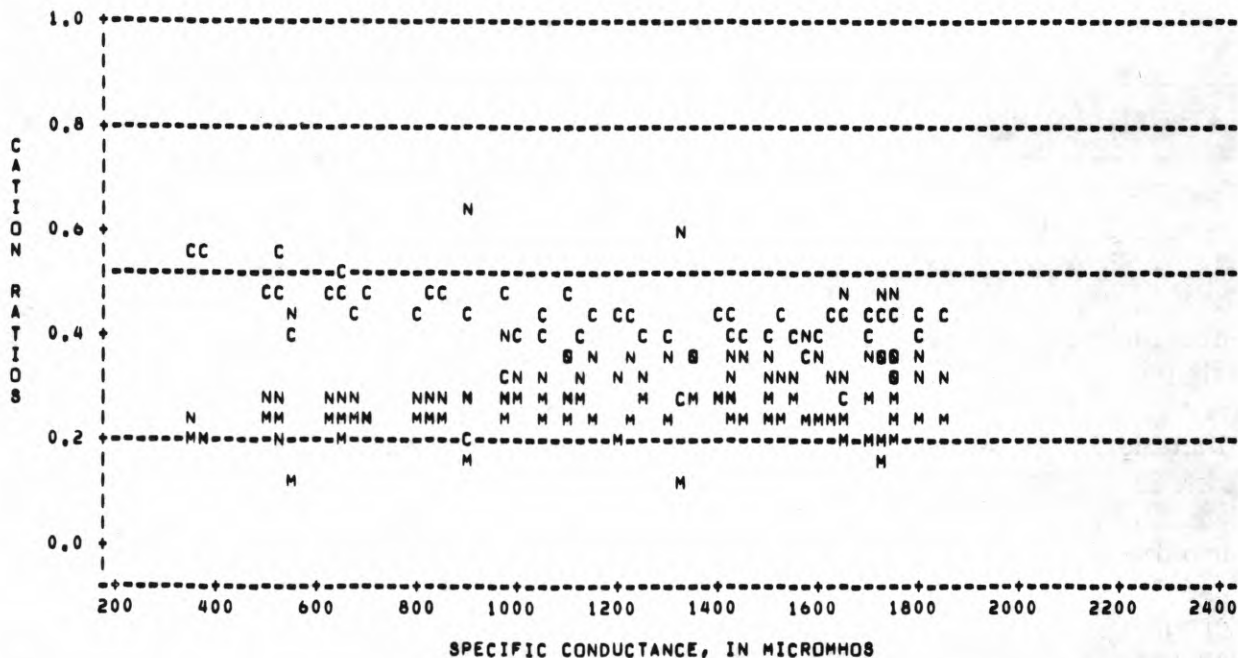
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	142	1228	346	2370	447	0.11	-0.64
Dissolved solids	85	817	209	1780	345	-.00	-.74
pH	139	8.2	6.4	10.4	.6	.92	1.71
Total hardness	112	416	30	890	171	-.10	-.63
Chloride	128	121	14	398	79	.89	.30
Sulfate	107	286	9.2	579	137	-.10	-.83
Iron	14	34	0	70	23	-.26	-1.20
Fluoride	8	.7	.5	.9			
Arsenic	0						
Cadmium	11	1	0	2	0.6	.29	-.21
Chromium	13	2	0	10	3.8	2.18	3.22
Lead	13	3	0	7	1.9	.17	-.06
Mercury	0						
SAR	74	2.3	0.6	8.4	1.2	2.06	7.43
Boron	7	356	210	690			

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	632	900	1200	1605	1748
Dissolved solids	324	490	858	1060	1235
pH	7.6	7.8	8.1	8.5	8.9
Total hardness	180	270	435	556	630
Chloride	35	56	105	170	255
Sulfate	85	181	296	392	462
Iron	0	10	40	50	56
Fluoride					
Arsenic					
Cadmium	0	0	1	1	1
Chromium	0	0	0	0	7
Lead	0	2	3	4	6
Mercury					
SAR	1.1	1.4	2.2	2.6	3.8
Boron					

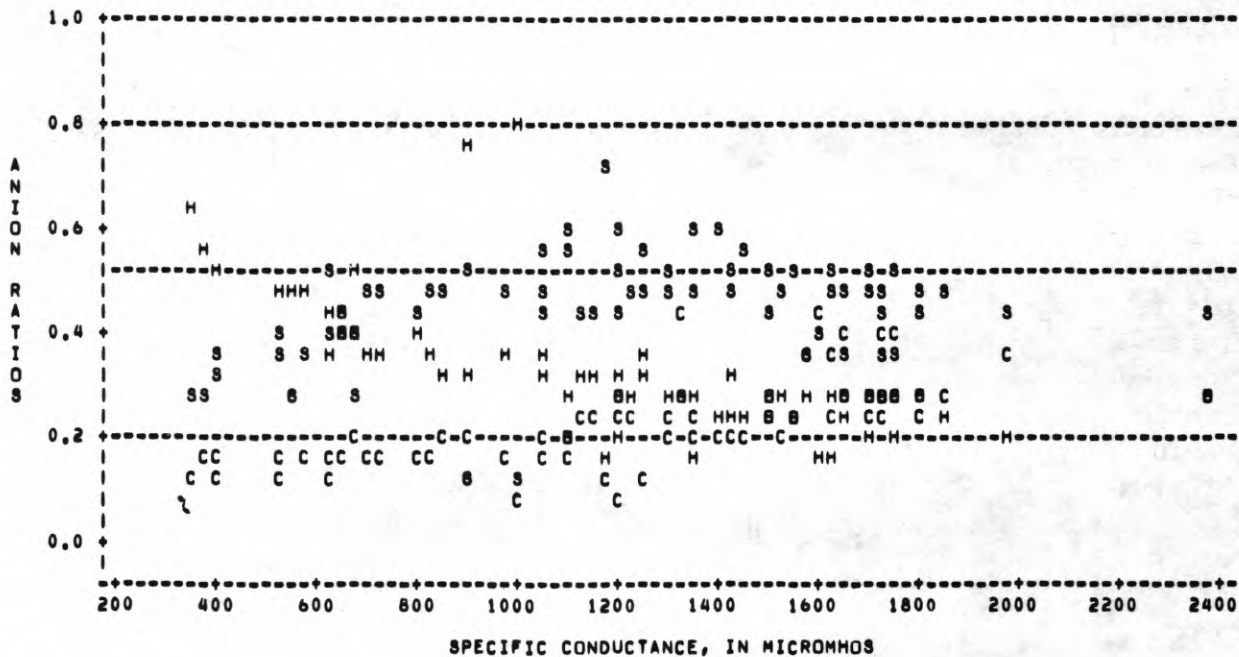
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT PURCELL, OK

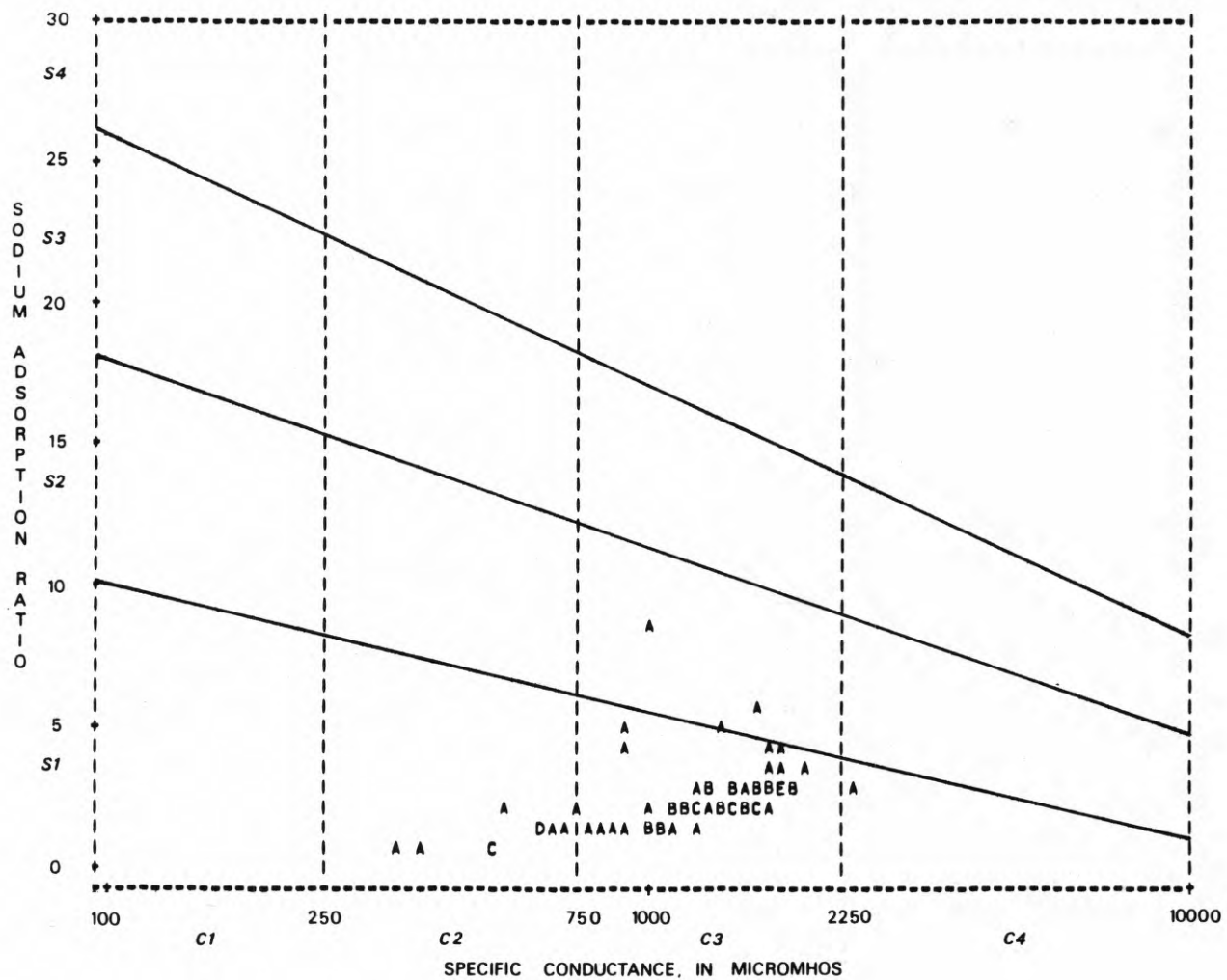


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT PURCELL, OK



STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT PURCELL, OK



CANADIAN RIVER BASIN

07231500 - Canadian River at Calvin, Okla.

LOCATION.--Lat 34°58'32", long 96°14'24", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 22, T.6 N., R.10 E., Hughes County, at bridge on old U.S. Highway 75, 0.5 mi northeast of Calvin, 2.4 mi upstream from Shawnee Creek, 8.5 mi downstream from Little River, and at mile 93.9.

DRAINAGE AREA.--27,952 mi², of which 4,801 mi² is probably noncontributing.

PERIOD OF RECORD.--1950 to 1953, 1960 to 1961, 1965 to 1979.

WATER TYPE.--For specific conductance less than 5,000 umho, more than 99 percent of the samples, the water was sodium chloride type. Cation data are not available for specific conductance greater than 5,000 umho. Based on the anion data for these high specific conductances, it is assumed that the water was also sodium chloride type for specific conductance greater than 5,000 umho.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time indicate the possibility of a trend of decreasing concentration for sulfate. The Spearman's rhos at the 95-percent probability level indicate negative trends, decreasing concentrations, for dissolved solids, chloride, and sulfate. The Spearman's rho for hardness did not indicate a trend.

PUBLIC WATER SUPPLY.--Eighty-two percent of the hardness values were greater than 180 mg/L and the average concentration was 324 mg/L. In general, the hardness class for this water is very hard. The recommended maximum pH of 9.0 was exceeded by 4 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 45 percent of the chloride values, and the recommended maximum sulfate concentration was exceeded by 5 percent of the sulfate values. The toxic metals arsenic, cadmium, lead, and mercury should not exceed maximum contaminant levels. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 80 percent of the samples having a high or very high salinity hazard. The sodium hazard ranged from low to high with about 80 percent of the SAR values equivalent to a low sodium hazard. The data indicate that phytotoxic effects from boron should not occur.

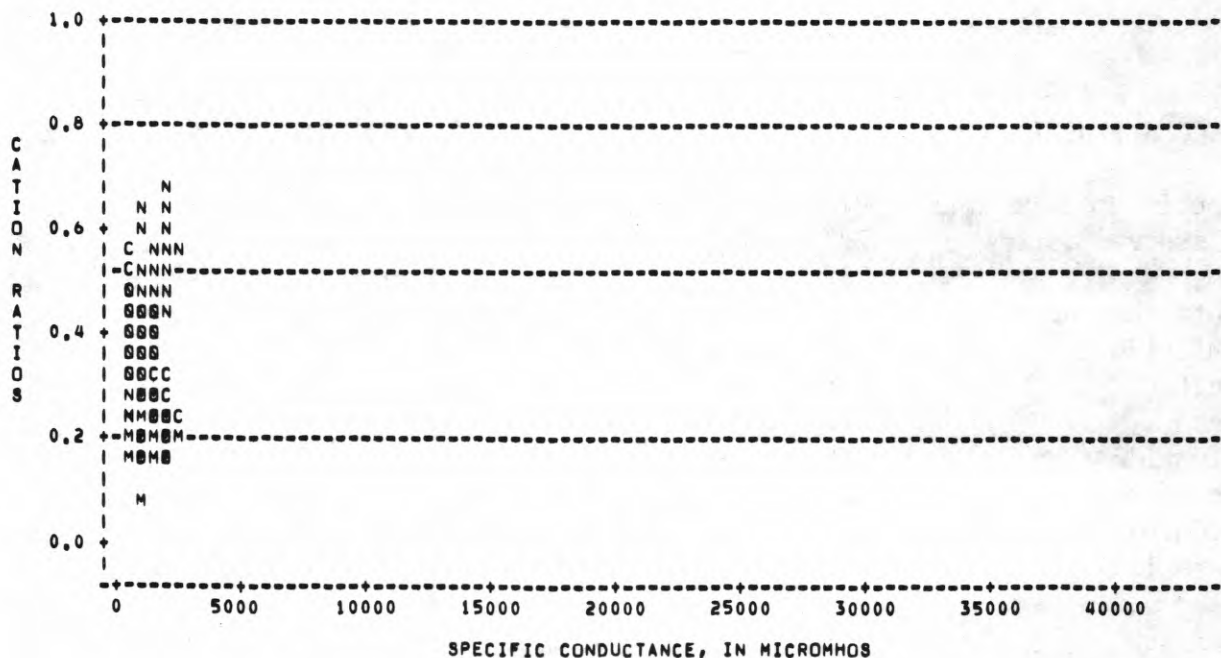
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	818	1427	190	40200	2223	13.84	221.98
Dissolved solids	727	882	85	27500	1600	13.85	216.59
pH	738	8.2	6.5	9.6	0.4	-.60	2.24
Total hardness	601	324	82	5210	333	10.78	141.73
Chloride	702	338	12	15600	920	13.96	216.49
Sulfate	668	90	7.0	382	72	1.62	2.54
Iron	20	62	10	270	66	2.01	4.43
Fluoride	140	0.5	0.2	1.2	0.2	1.32	3.53
Arsenic	19	3	1	7	1.7	.83	.44
Cadmium	20	1	0	6	1.5	2.02	4.98
Chromium	72	2	0	20	4.8	2.01	3.47
Lead	20	5	0	49	11	4.13	17.80
Mercury	21	0.0	0.0	0.4	0.1	3.07	9.96
SAR	587	3.8	0.5	18	1.9	1.99	9.93
Boron	96	173	0	410	79	.51	.85

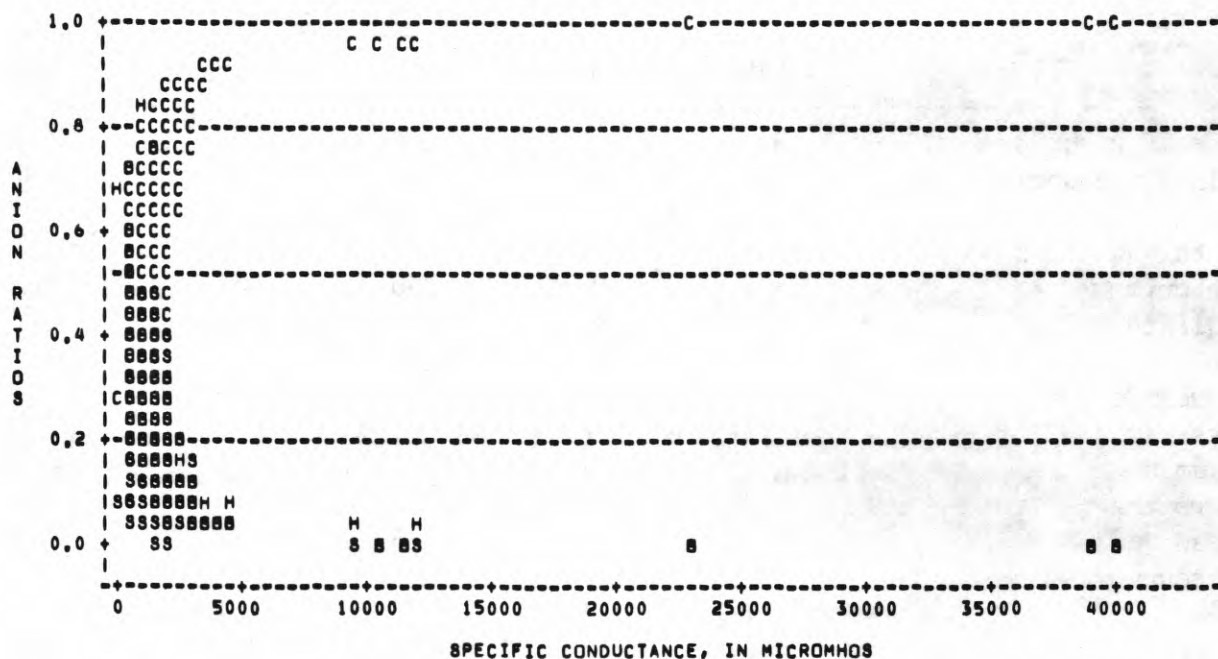
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	569	842	1200	1610	1940
Dissolved solids	335	491	720	978	1190
pH	7.7	8.0	8.2	8.4	8.6
Total hardness	144	204	295	380	450
Chloride	86	140	230	340	480
Sulfate	25	39	66	112	190
Iron	10	20	30	70	140
Fluoride	0.3	0.4	0.5	0.6	0.7
Arsenic	1	1	2	4	5
Cadmium	0	0	1	1	3
Chromium	0	0	0	0	10
Lead	0	1	3	4	8
Mercury	0.0	0.0	0.0	0.0	0.1
SAR	1.8	2.5	3.6	4.7	6.1
Boron	70	120	180	220	254

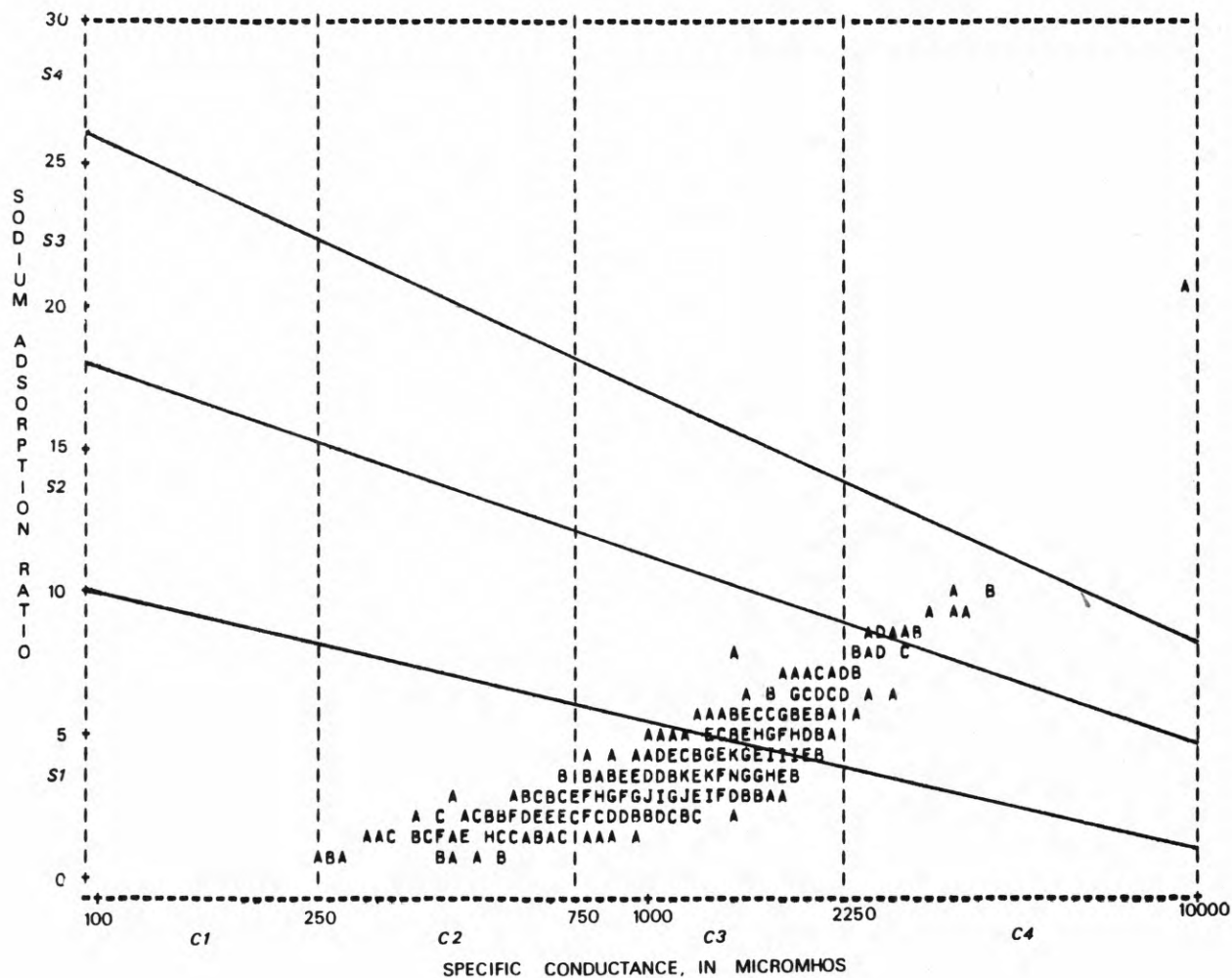
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT CALVIN, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT CALVIN, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER AT CALVIN, OK



CANADIAN RIVER BASIN

07245000 - Canadian River near Whitefield, Okla.

LOCATION.--Lat 35°15'45", long 95°14'19", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T.9 N., R.19 E., Haskell County, at bridge on State Highway 2, 0.8 mi north of Whitefield, 5.5 mi upstream from Taleka (Snake) Creek, 8.2 mi downstream from Eufaula Dam, and at mile 18.8.

DRAINAGE AREA.--47,576 mi², of which 9,700 mi² is probably noncontributing.

PERIOD OF RECORD.--1947 to 1964, 1967 to 1979.

REMARKS.--There has been a significant change in the water quality at this location since the completion of Lake Eufaula in 1964. The 1967 to 1979 period of record was used for this report because it better represents current river conditions.

WATER TYPE.--For specific conductance less than about 150 umho, 2 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance greater than 150 umho, the water was generally mixed type with the carbonate/bicarbonate ion occasionally predominant in the 150-540 umho range.

TREND.--Plots of the dissolved solids, hardness, sulfate, and chloride concentrations versus time for the 1967 to 1979 period do not indicate any trend. The Spearman's rhos at the 95-percent probability level for the same time period also do not indicate any trend.

PUBLIC WATER SUPPLY.--Fifty-five percent of the hardness values were greater than 120 mg/L and the average concentration was 123 mg/L. In general, the hardness class for this water is hard. The recommended maximum pH of 9.0 was exceeded by 2 percent of the pH values and the recommended maximum iron concentration of 300 ug/L was exceeded by 9 percent of the iron values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 1 of 17 cadmium values. Arsenic, chromium, lead, and mercury concentrations did not exceed their maximum contaminant levels. Based on the data, this water is probably suitable for use as a public water supply; however, cadmium concentrations should be closely monitored.

IRRIGATION.--The salinity hazard ranged from low to medium with 95 percent of the samples in the medium salinity hazard class. All of the SAR values were equivalent to a low sodium hazard. The data indicate that phytotoxic effects from boron should not occur.

UNIVARIATE STATISTICS

[Statistics computed from the 1967 to 1979 period of record]

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	678	450	65	694	100	-1.05	2.34
Dissolved solids	597	260	57	420	56	-.83	2.11
pH	572	8.0	6.4	9.3	0.5	-.54	.87
Total hardness	540	123	29	177	42	-.68	1.75
Chloride	620	67	2.0	125	20	-.47	1.60
Sulfate	599	32	4.6	60	11	.12	-.72
Iron	18	66	0	720	166	3.99	16.45
Fluoride	101	0.3	0.1	0.9	0.1	2.47	8.65
Arsenic	18	1	0	4	1.1	.98	1.14
Cadmium	17	2	0	11	2.6	2.73	9.08
Chromium	17	1	0	20	4.8	4.12	17.00
Lead	20	6	0	35	10	1.90	2.73
Mercury	17	0.1	0.0	0.4	0.1	2.12	4.09
SAR	529	1.6	0.3	2.8	0.4	-.48	1.38
Boron	42	115	10	220	49	-.05	-.35

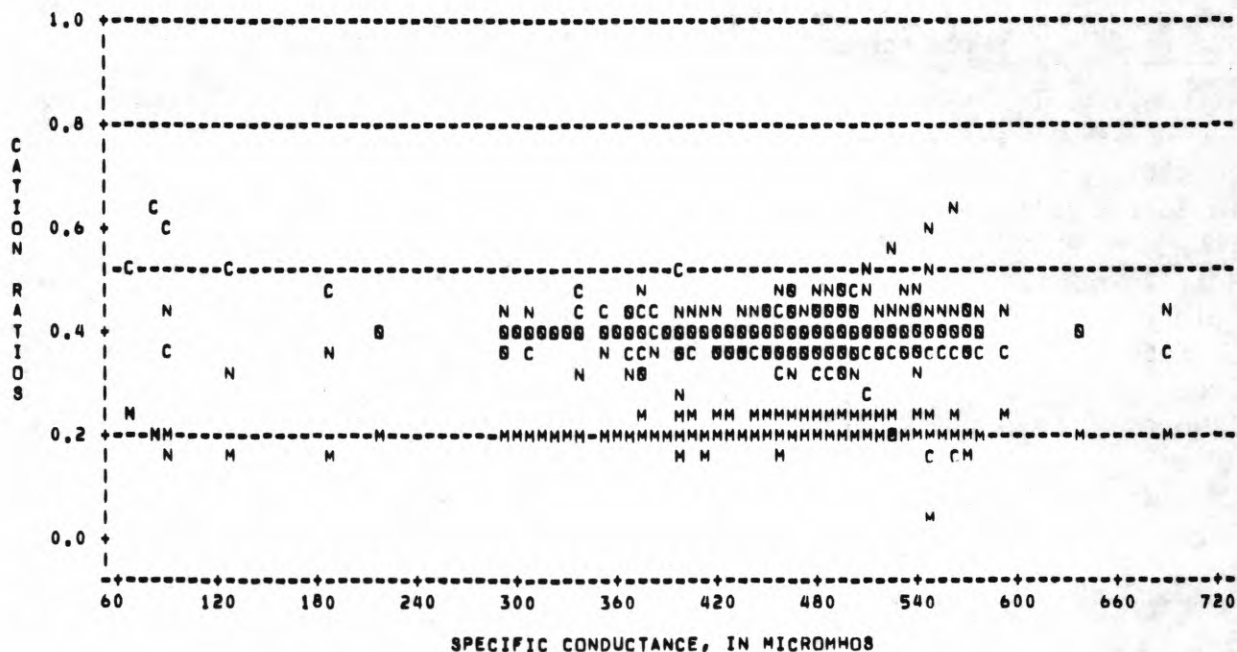
FREQUENCY DISTRIBUTION

[Statistics computed from the 1967 to 1979 period of record]

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	330	408	467	504	550
Dissolved solids	196	239	266	292	312
pH	7.5	7.8	8.0	8.2	8.4
Total hardness	86	106	120	140	156
Chloride	43	58	68	78	88
Sulfate	19	23	31	40	46
Iron	0	1	20	45	180
Fluoride	0.2	0.2	0.3	0.3	0.4
Arsenic	0	1	1	2	3
Cadmium	0	0	1	3	5
Chromium	0	0	0	0	4
Lead	0	0	2	8	29
Mercury	0.0	0.0	0.0	0.1	0.3
SAR	1.2	1.4	1.7	1.8	2.1
Boron	50	78	120	160	170

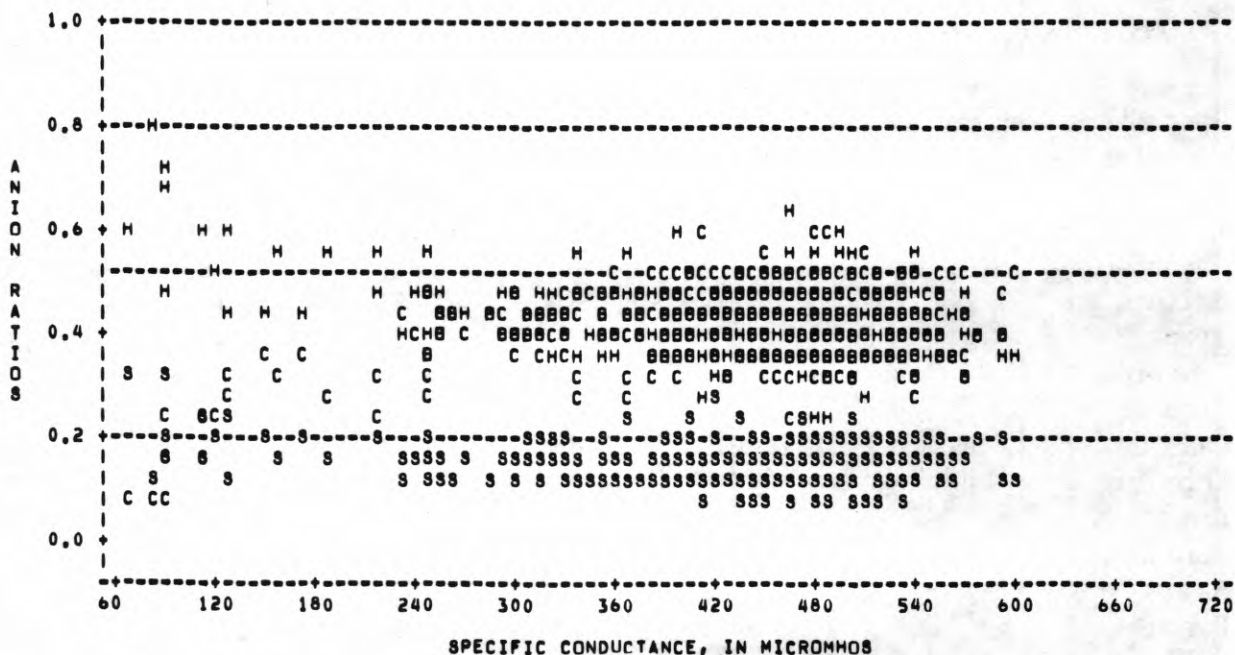
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR WHITEFIELD, OK



ANION RATIO PLOT

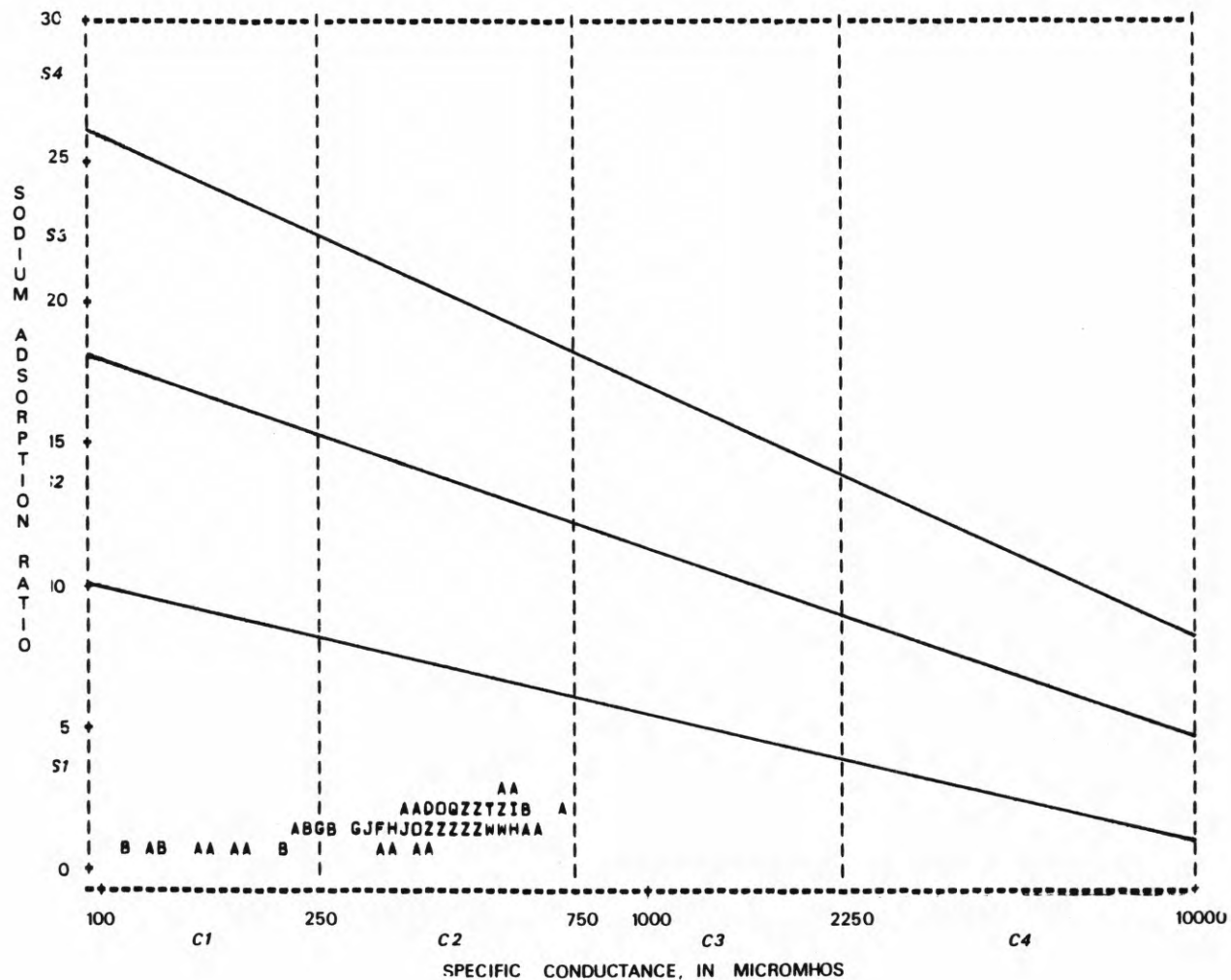
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR WHITEFIELD, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=CANADIAN RIVER NR WHITEFIELD, OK



CANADIAN RIVER BASIN

07228400 - Deer Creek at Hydro, Okla.

LOCATION.--Lat 35°32'28", long 98°34'40", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T.12 N., R.13 W., Caddo County, at bridge on State Highway 58 at south edge of Hydro, 3.2 mi downstream from Little Deep Creek, 7 mi east of Weatherford, and at mile 7.4.

DRAINAGE AREA.--274 mi².

PERIOD OF RECORD.--1951 to 1958, 1960 to 1963, 1977 to 1979.

WATER TYPE.--The water is calcium sulfate type throughout the range of measured specific conductance.

TREND.--The current period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--Ninety-five percent of the hardness values were greater than 180 mg/L and the average concentration was 605 mg/L. The hardness class for this water is very hard. The recommended maximum sulfate concentration of 250 mg/L was exceeded by 85 percent of the sulfate values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 1 of 3 cadmium values and the maximum lead contaminant level of 50 ug/L was exceeded by 1 of 4 lead values. Arsenic, chromium, and mercury did not exceed their maximum contaminant levels. Because of the frequency and magnitude by which the recommended maximum sulfate concentration was exceeded and because the maximum cadmium and lead contaminant levels were exceeded, this water would probably not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 77 percent of the samples having a high salinity hazard. All SAR values were equivalent to a low sodium hazard. None of the boron values exceeded the recommended limit, 750 ug/L, for boron sensitive plants.

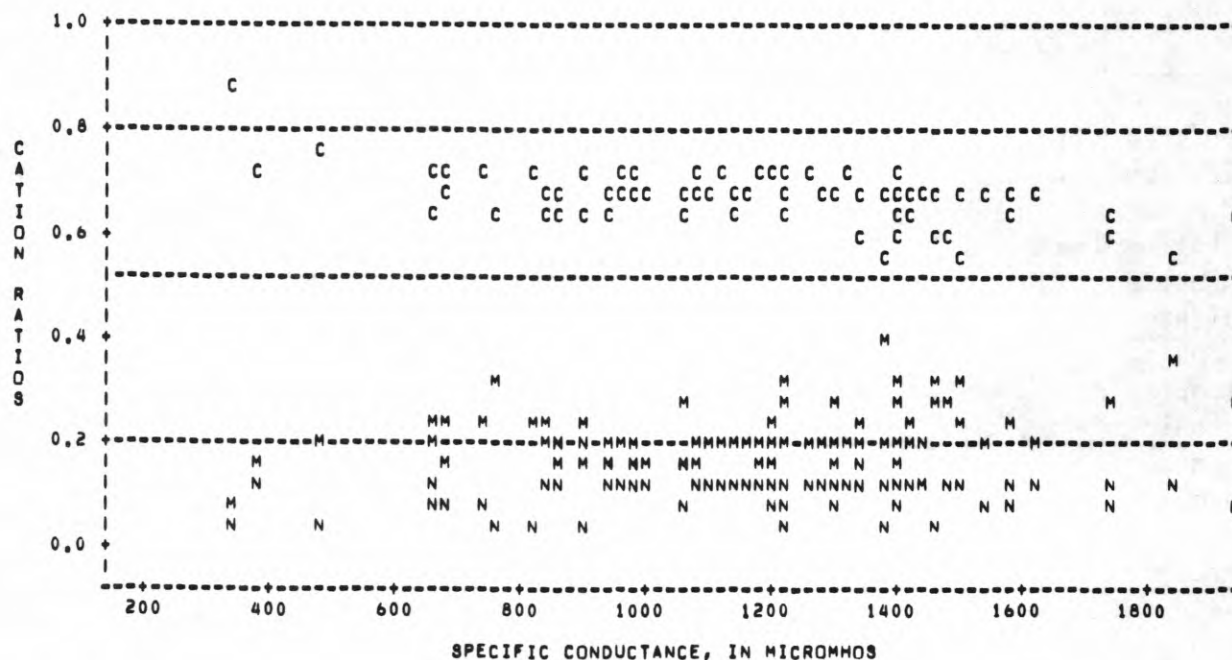
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	124	1234	290	8750	767	7.70	75.90
Dissolved solids	103	912	203	1720	336	.02	-.46
pH	102	8.0	7.0	8.8	0.3	-.46	.68
Total hardness	103	605	140	1200	227	.08	-.37
Chloride	104	19	0.3	38	8.5	.22	.05
Sulfate	121	482	58	1060	212	.18	-.30
Iron	4	60	0	180			
Fluoride	11	0.3	0.3	0.4	0.1	1.19	-.76
Arsenic	5	4	2	5			
Cadmium	5	5	0	14			
Chromium	5	2	0	10			
Lead	4	55	0	130			
Mercury	5	0.1	0.0	0.3			
SAR	103	0.6	0.0	3.4	0.3	5.28	42.94
Boron	8	131	10	200			

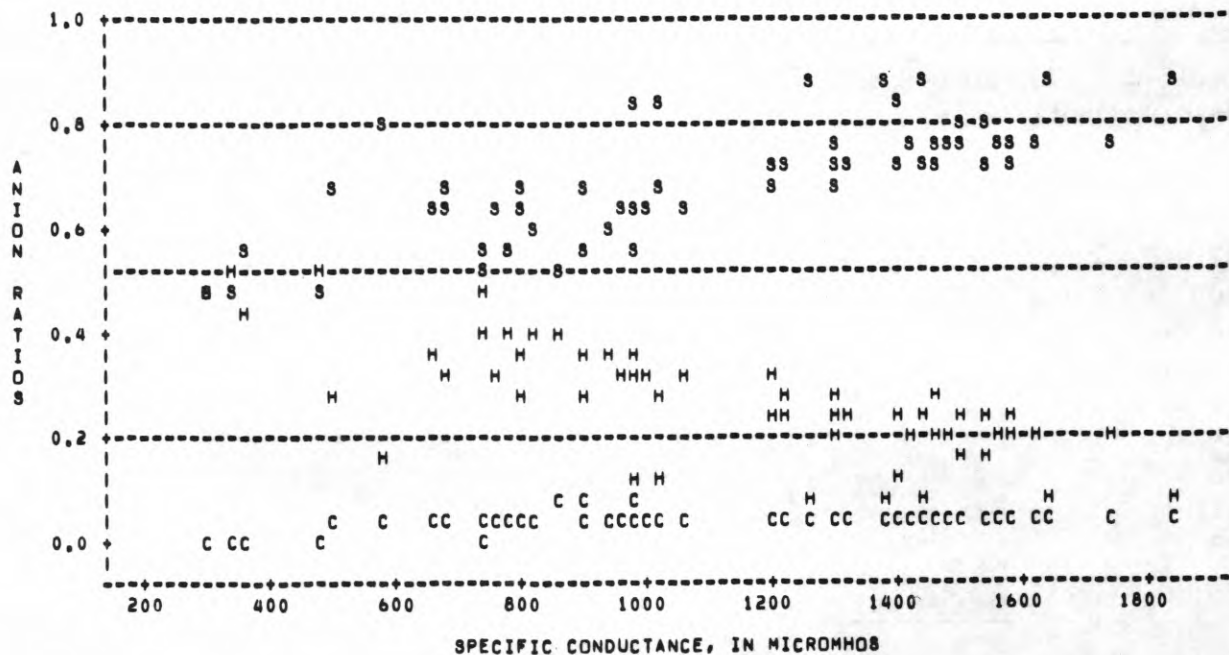
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	700	950	1220	1430	1580
Dissolved solids	480	665	918	1170	1320
pH	7.5	7.8	8.0	8.2	8.3
Total hardness	326	428	600	755	900
Chloride	6.9	13	19	23	30
Sulfate	230	320	460	649	730
Iron					
Fluoride	0.3	0.3	0.3	0.3	0.4
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.2	0.4	0.6	0.7	0.7
Boron					

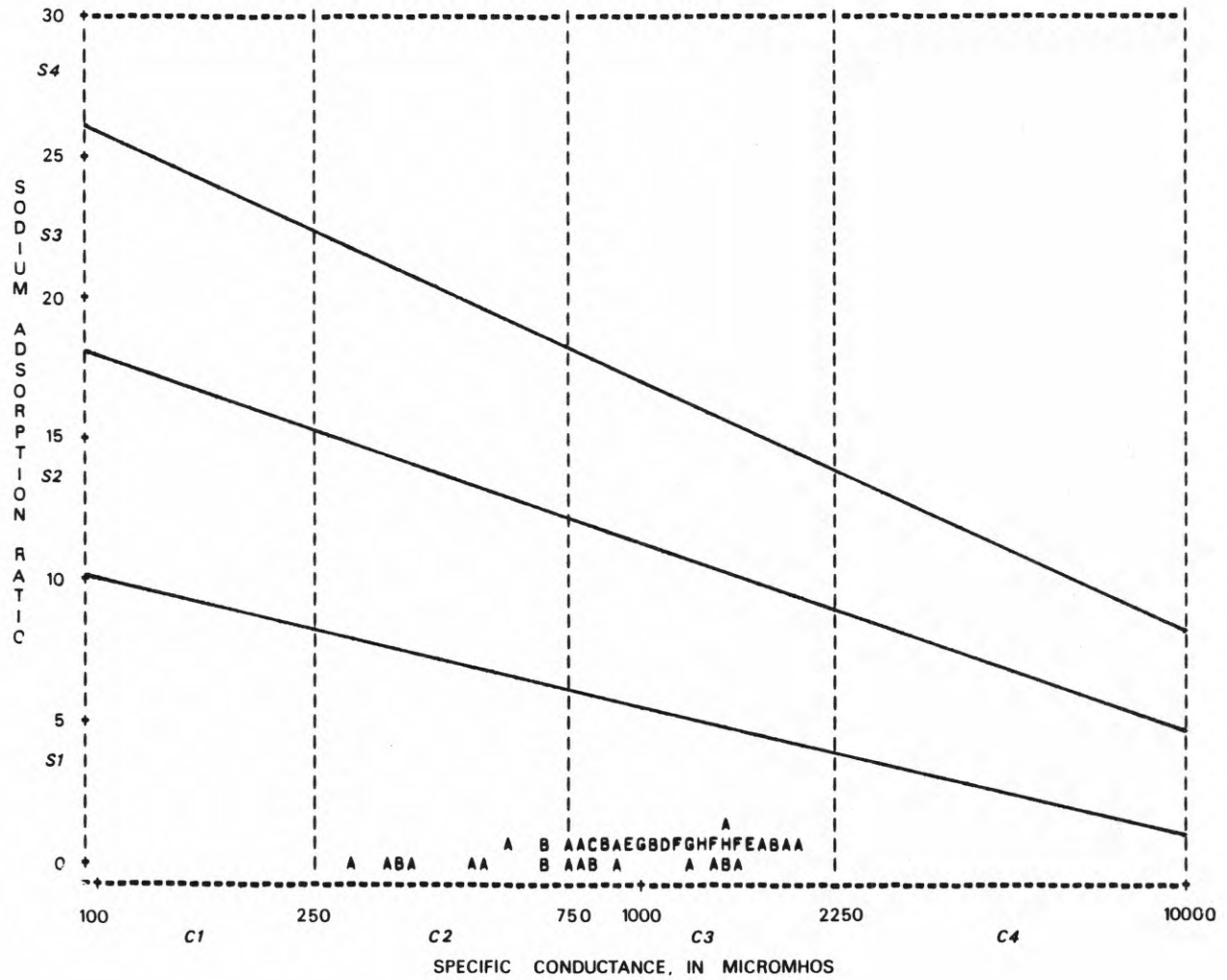
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEER CREEK AT HYDRO, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEER CREEK AT HYDRO, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DEER CREEK AT HYDRO, OK



CANADIAN RIVER BASIN

07232024 - Deer Creek near McAlester, Okla.

LOCATION.--Lat 34°56'58", long 95°51'00", near center of sec. 32, T.6 N., R.14 E., Pittsburg County, at bridge on U.S. Highway 270, 0.4 mi west of junction with Indian Nation Turnpike, 4.1 mi west of McAlester, and at mile 2.4.

DRAINAGE AREA.--38.3 mi².

PERIOD OF RECORD.--1978 to 1979.

WATER TYPE.--For specific conductance greater than 600 umho, 31 percent of the samples, the water was sodium chloride type. For specific conductance greater than 200 umho and less than 600 umho, 53 percent of the samples, the water was sodium bicarbonate type. The water was mixed type for specific conductance less than 200 umho.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analysis.

PUBLIC WATER SUPPLY.--Seventy percent of the hardness values were less than 120 mg/L and the average concentration was 111 mg/L. For most of the samples the hardness class was moderately hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 8 percent of the chloride values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 5 percent of the cadmium values and the maximum lead contaminant level of 50 ug/L was exceeded by 14 percent of the lead values. Arsenic, chromium, and mercury did not exceed their maximum contaminant levels. Because the maximum cadmium and lead contaminant levels were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to high with 80 percent of the samples having a low or medium salinity hazard. The sodium hazard ranged from low to medium with 93 percent of the SAR values equivalent to a low sodium hazard. The data indicate that phytotoxic effects from boron should not occur.

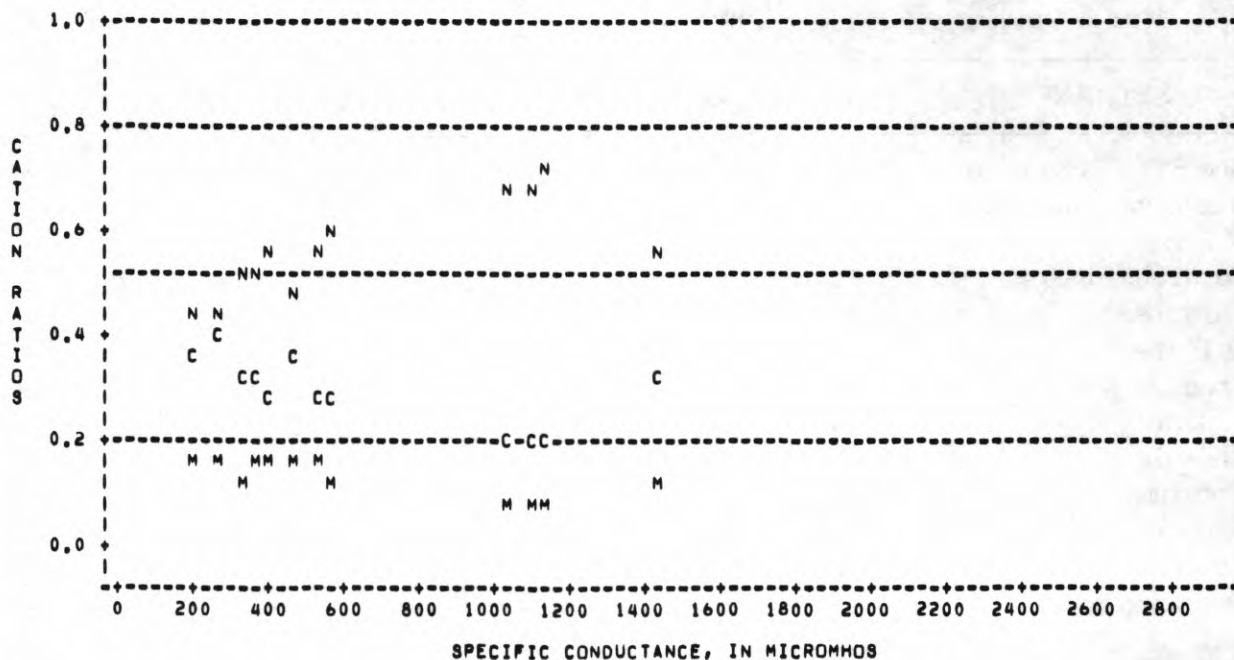
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	21	555	79	1430	360	1.01	0.37
Dissolved solids	14	369	136	646	184	.43	-1.58
pH	22	7.3	6.4	7.8	0.2	-1.30	5.47
Total hardness	15	111	54	210	47	.84	-.20
Chloride	14	108	14	260	95	.66	-1.44
Sulfate	14	51	24	100	20	.96	1.57
Iron	15	82	10	240	77	1.21	.29
Fluoride	14	0.4	0.2	1.3	0.3	2.45	7.22
Arsenic	20	3	0	7	2.1	.62	-.72
Cadmium	16	4	0	18	4.5	2.43	6.92
Chromium	20	6	0	20	7.6	1.02	-.37
Lead	20	21	0	100	33	1.62	1.34
Mercury	21	0.1	0.0	0.4	0.1	1.95	2.45
SAR	15	2.6	0.9	5.6	1.4	.88	-.16
Boron	15	212	100	380	96	.43	-1.14

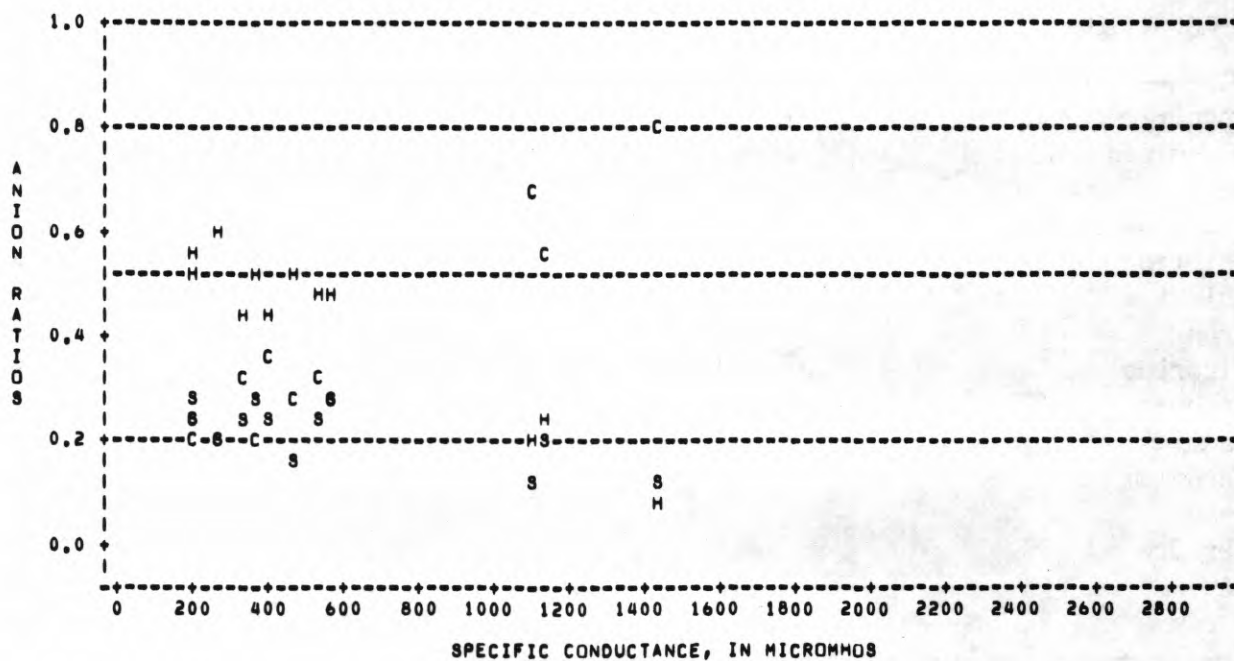
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	187	285	445	693	1103
Dissolved solids	151	217	287	550	611
pH	7.1	7.1	7.3	7.4	7.5
Total hardness	55	76	97	143	170
Chloride	16	30	50	195	244
Sulfate	26	33	50	60	67
Iron	10	20	50	98	205
Fluoride	0.2	0.3	0.3	0.5	0.6
Arsenic	1	1	2	4	6
Cadmium	0	1	2	4	7
Chromium	0	0	0	10	20
Lead	0	0	3	23	86
Mercury	0.0	0.0	0.0	0.0	0.3
SAR	1.0	1.6	2.2	3.2	4.8
Boron	100	110	195	285	340

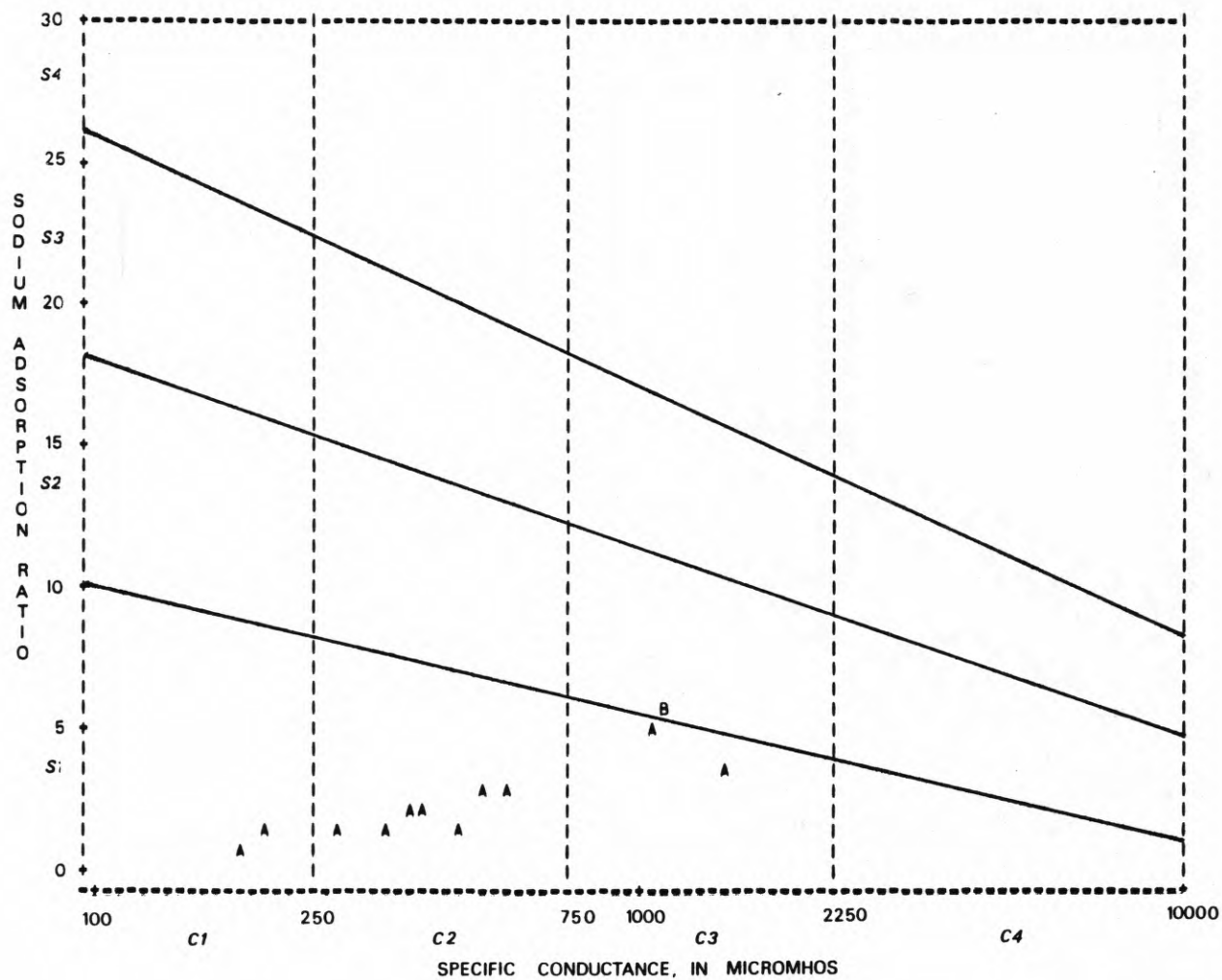
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEER CREEK NR MCALESTER OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEER CREEK NR MCALESTER OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DEER CREEK NR MCALESTER OK



CANADIAN RIVER BASIN

07231980 - Gaines Creek near Higgins, Okla.

LOCATION.--Lat 34°48'57", long 95°28'46", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 14, T.4 N., R.17 E., Latimer County, at State Highway 1 bridge, 4.5 mi southeast of Hartshorne.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1978 to 1979.

WATER TYPE.--The cations were mixed type throughout the range of measured specific conductance. No anion distribution data were available.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--Eighty-four percent of the hardness values were less than 60 mg/L and the average concentration was 32 mg/L. The hardness classification for this water is soft. The recommended maximum iron concentration of 300 ug/L was exceeded by 27 percent of the iron values. Arsenic, cadmium, chromium, lead, and mercury did not exceed their maximum contaminant levels. Based on the data, this water is probably suitable for use as a public supply; however, staining of clothes and plumbing fixtures from iron may occur.

IRRIGATION.--The salinity hazard ranged from low to medium with 94 percent of the samples having a low salinity hazard. All SAR values were equivalent to a low sodium hazard. No boron data are available.

UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	17	98	42	260	51	2.34	6.40
Dissolved solids	9	57	35	97			
pH	10	6.7	5.7	7.6	0.6	-.04	.06
Total hardness	10	32	14	64	18	1.06	-.04
Chloride	9	4.1	2.8	5.5			
Sulfate	9	6.8	3.1	10			
Iron	10	218	80	670	196	1.71	2.34
Fluoride	9	0.1	0.1	0.1			
Arsenic	10	1	0	3	1.1	.66	-.71
Cadmium	9	2	0	10			
Chromium	10	6	0	30	11	1.69	1.86
Lead	7	0	0	0			
Mercury	10	0.0	0.0	0.1	0.1	1.04	-1.22
SAR	10	0.4	0.3	0.5	0.1	-.09	1.50
Boron	0						

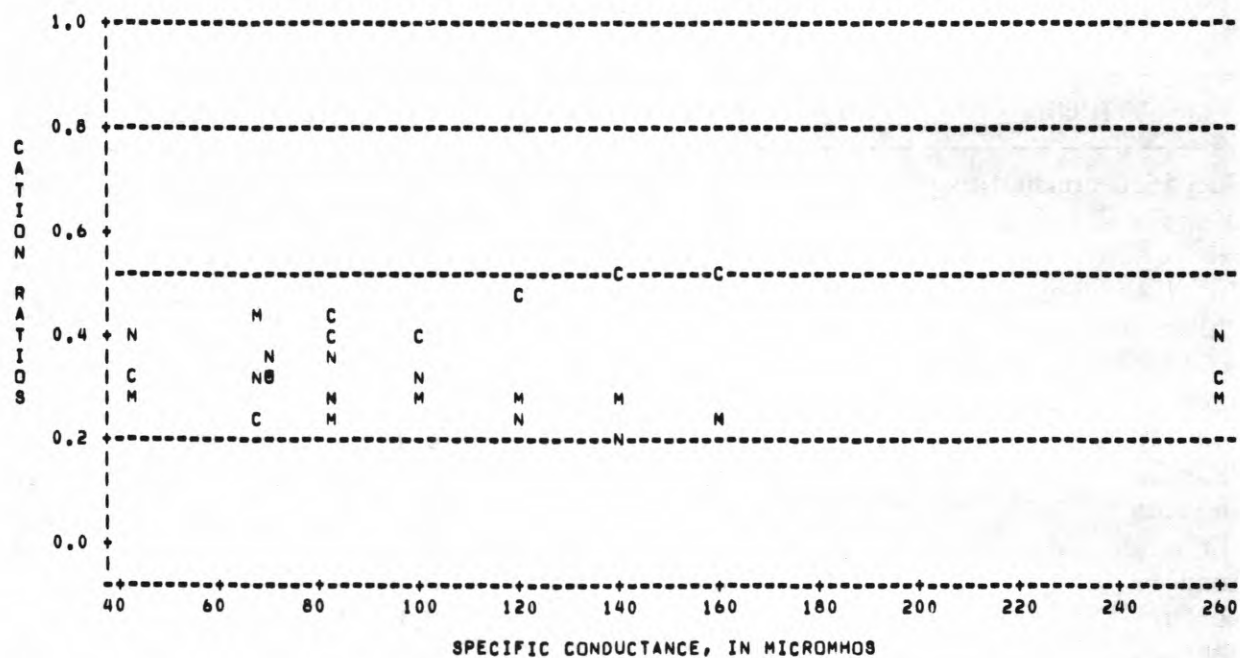
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	62	70	80	110	180
Dissolved solids					
pH	5.8	6.4	6.7	7.3	7.6
Total hardness	14	19	26	45	64
Chloride					
Sulfate					
Iron	80	80	130	335	647
Fluoride					
Arsenic	0	0	1	2	3
Cadmium					
Chromium	0	0	0	13	29
Lead					
Mercury	0.0	0.0	0.0	0.1	0.1
SAR	0.3	0.4	0.4	0.4	0.5
Boron					

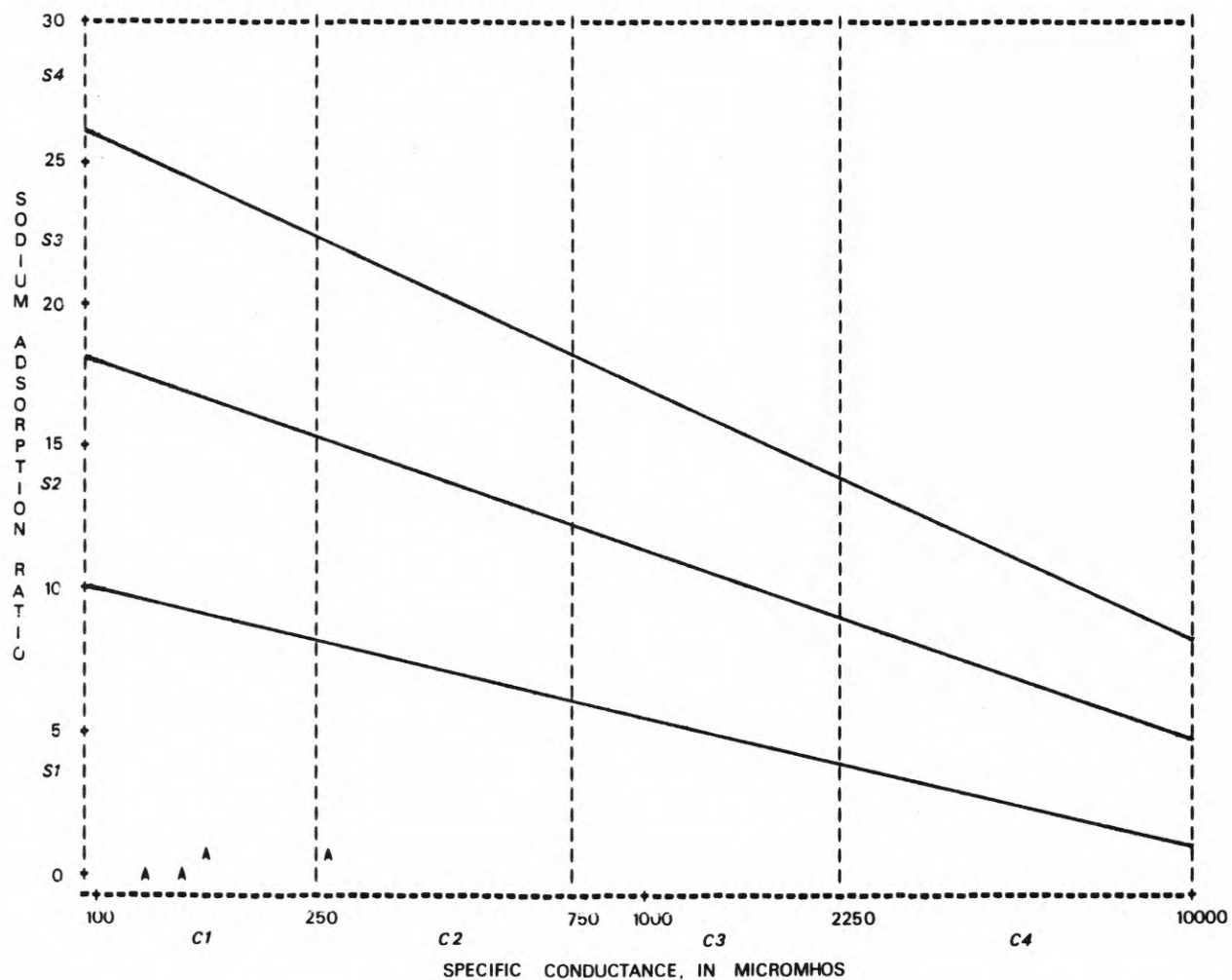
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO

STATION NAME OR LOCAL IDENTIFIER=GAINES CREEK NEAR HIGGINS, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER: GAINES CREEK NEAR HIGGINS, OK



CANADIAN RIVER BASIN

07230000 - Little River below Lake Thunderbird, near Norman, Okla.

LOCATION.--Lat 35°13'14", long 97°13'00", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T.9 N., R.1 E., Cleveland County, at outlet channel, 170 ft upstream from State Highway 9, 1,200 ft downstream from Lake Thunderbird, 1.0 mi upstream from Prairie Creek, 13.0 mi east of Norman, and at mile 96.2.

DRAINAGE AREA.--257 mi².

PERIOD OF RECORD.--1953 to 1965, 1975 to 1979.

WATER TYPE.--For specific conductance less than 500 umho, 25 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance greater than 500 umho and less than 1,000 umho, 66 percent of the samples, the water was magnesium carbonate/bicarbonate type. The water was sodium chloride type for specific conductance greater than 1,000 umho.

TREND.--Plots of the hardness, sulfate, and chloride concentrations versus time indicate a trend of decreasing concentration for hardness. The Spearman's rhos at the 95-percent probability level indicate a negative trend for hardness and positive trends, increasing concentration, for chloride and sulfate. Current data are not available for the dissolved solids.

PUBLIC WATER SUPPLY.--Seventy-seven percent of the hardness values were greater than 180 mg/L and the average concentration was 239 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 5 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 2 percent of the sulfate values. No toxic metal data are available. Based on the data, this water probably is suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 67 percent of the samples having a low or medium salinity hazard. The sodium hazard ranged from low to very high with 95 percent of the SAR values equivalent to a low sodium hazard. Phytotoxic effects from boron could occur in sensitive plants. The upper limit for boron sensitive plants of 750 ug/L was exceeded by 6 percent of the boron values.

UNIVARIATE STATISTICS

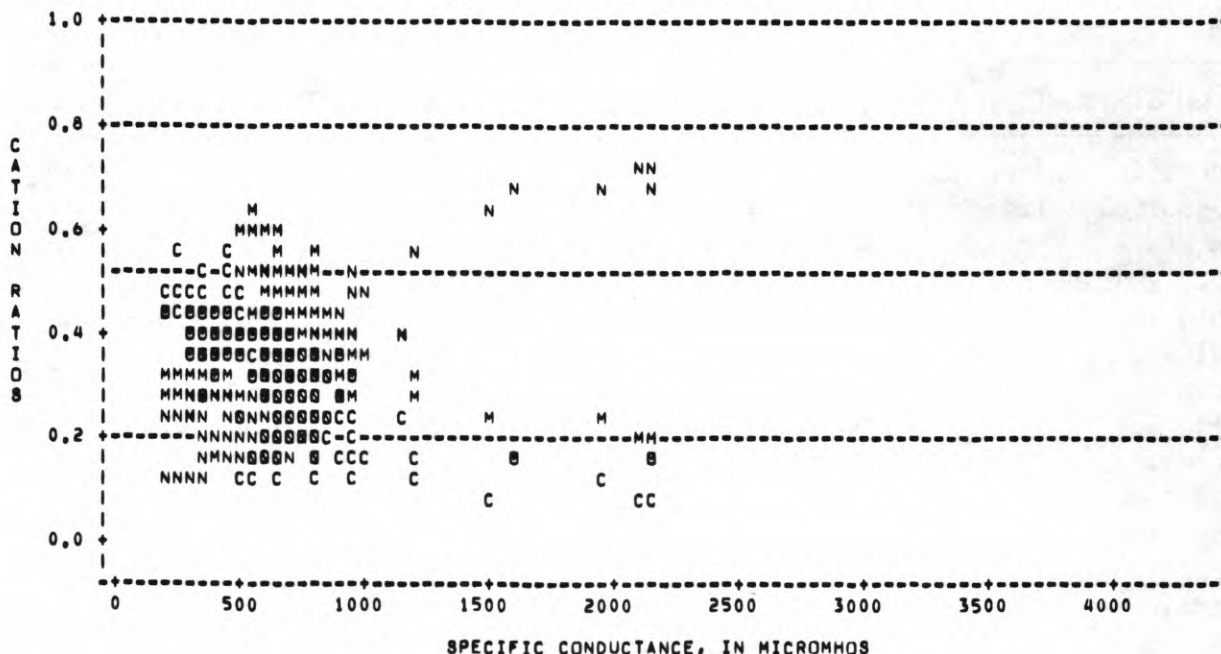
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	536	691	100	3640	335	2.84	16.44
Dissolved solids	489	396	80	2140	194	2.88	17.21
pH	530	8.2	7.0	8.8	0.3	-.87	.52
Total hardness	520	239	52	430	72	-.31	-.58
Chloride	534	72	3.8	880	76	4.51	31.28
Sulfate	516	32	0.0	372	33	4.47	30.32
Iron	0						
Fluoride	63	0.3	0.0	0.6	0.1	.17	-.49
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	487	1.7	0.1	21	1.8	4.40	30.79
Boron	54	309	0	860	194	.80	1.26

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	342	500	681	794	949
Dissolved solids	199	280	389	458	557
pH	7.8	8.0	8.2	8.5	8.6
Total hardness	134	192	248	292	325
Chloride	20	34	54	81	124
Sulfate	9.4	16	23	35	54
Iron					
Fluoride	0.1	0.2	0.3	0.4	0.5
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.6	0.8	1.1	1.8	3.2
Boron	10	220	285	415	535

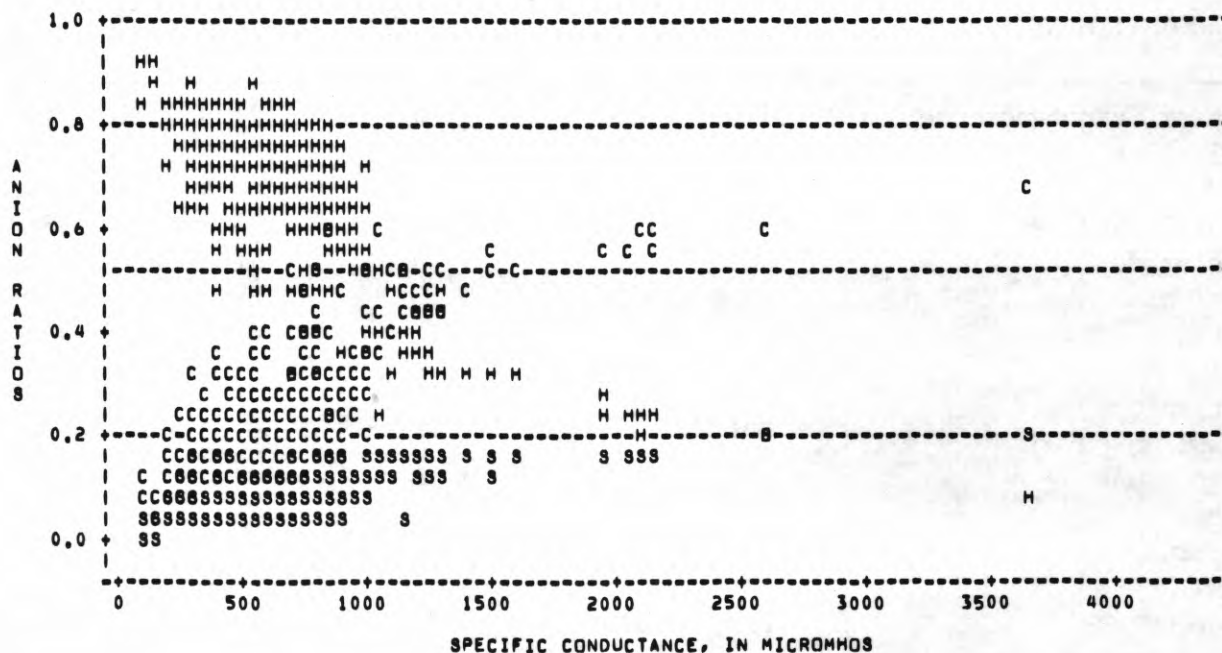
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER BLW LK THUNDERBIRD NR NORMAN, OK



ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER BLW LK THUNDERBIRD NR NORMAN, OK



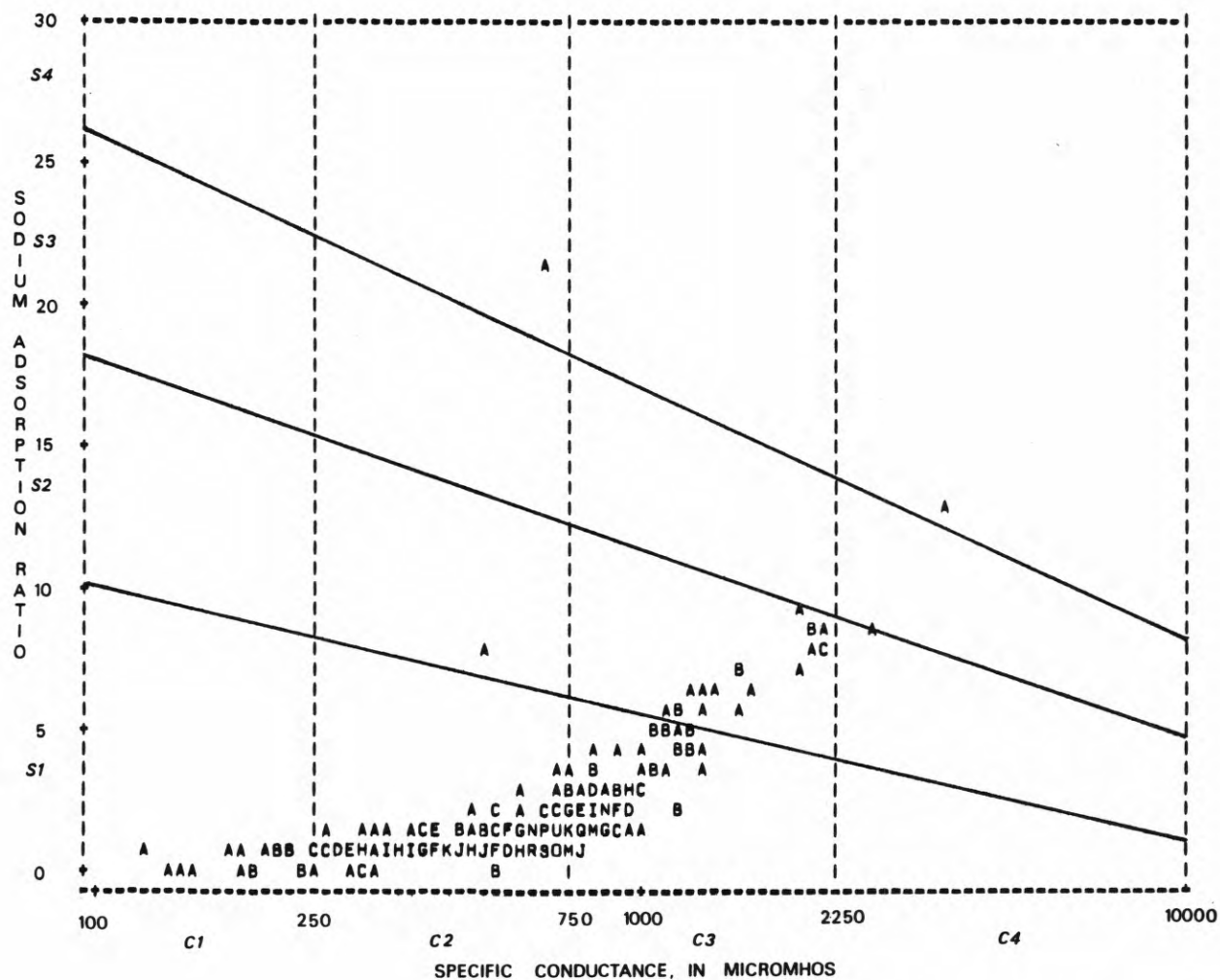
IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD

C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD

A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER BLW LK THUNDERBIRD NR NORMAN, OK



CANADIAN RIVER BASIN

07230500 - Little River near Tecumseh, Okla.

LOCATION.--Lat 35°10'25", long 96°55'55", in NW¼NW¼ sec. 18, T.8 N., R.4 E., Pottawatomie County, at bridge on U.S. Highway 177, 1.5 mi downstream from Dance Creek, 5.0 mi south of Tecumseh, and at mile 77.2.

DRAINAGE AREA.--456 mi².

PERIOD OF RECORD.--1951 to 1963.

WATER TYPE.--For specific conductance less than 1,000 umho, 56 percent of the samples, the water was carbonate/bicarbonate type with no predominant cation. For specific conductance greater than 1,000 umho, the water was sodium chloride type.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Eighty-five percent of the hardness values were greater than 180 mg/L and the average concentration was 255 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 16 percent of the chloride values. No toxic metal data are available. Based on the data, this water would be marginally suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 74 percent of the samples having a high salinity hazard. The sodium hazard ranged from low to high with 87 percent of the SAR values equivalent to a low sodium hazard. The data indicate that phytotoxic effects could occur in boron sensitive plants. One of three boron values exceeded the 750 ug/L limit for boron sensitive plants.

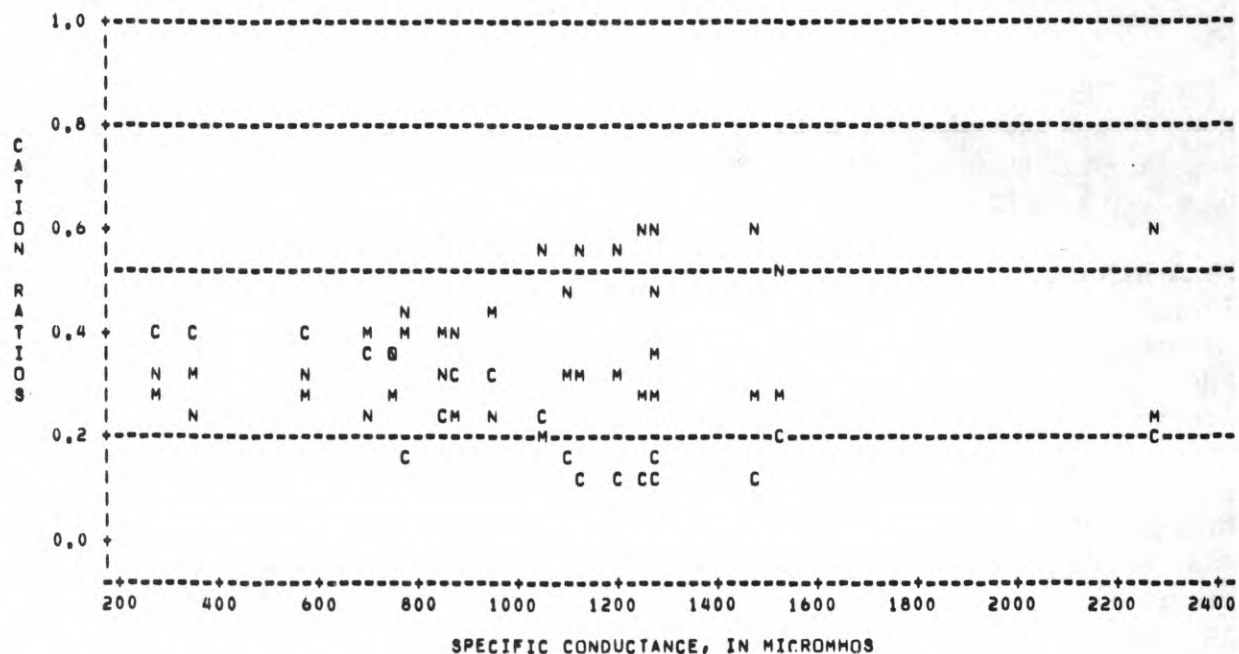
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	54	980	266	2270	429	1.02	2.13
Dissolved solids	25	474	163	1170	216	1.23	3.28
pH	36	8.2	7.6	8.7	0.2	-.28	-.19
Total hardness	45	255	86	450	74	.03	.70
Chloride	54	162	13	560	116	1.60	3.40
Sulfate	25	36	10	129	25	2.30	7.22
Iron	0						
Fluoride	3	0.4	0.1	0.6			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	45	2.8	0.5	11	2.1	1.79	4.78
Boron	3	553	290	1000			

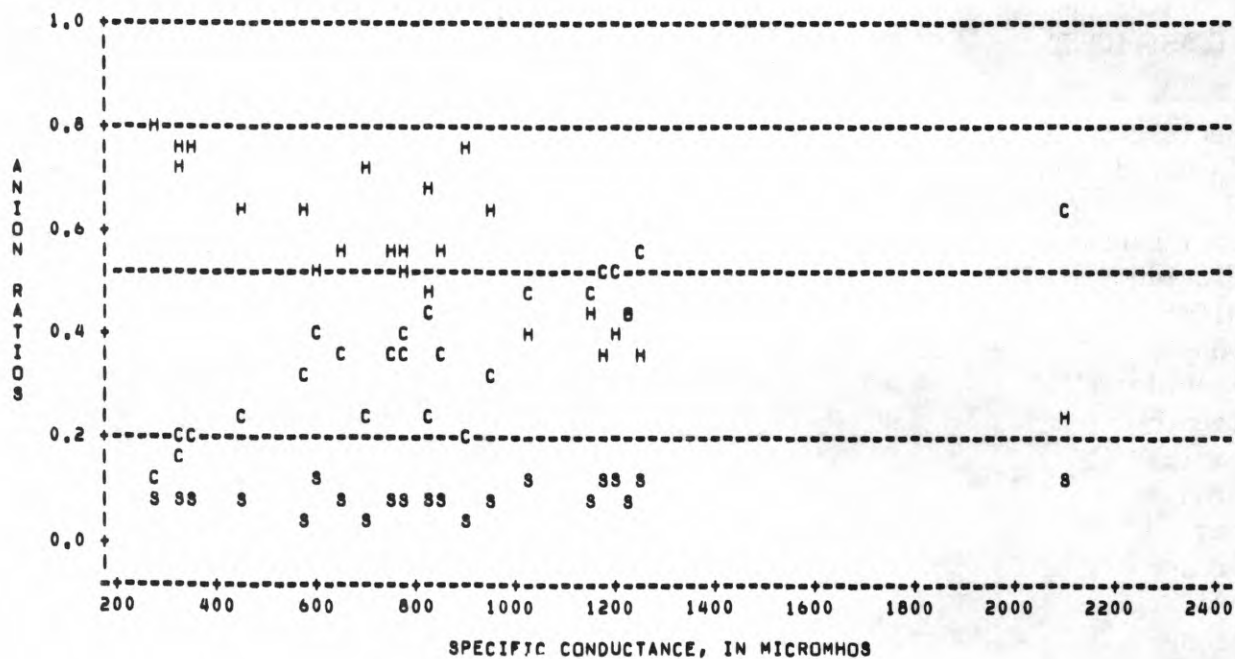
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	394	754	952	1200	1410
Dissolved solids	198	350	464	615	682
pH	7.9	8.0	8.2	8.4	8.5
Total hardness	134	221	252	303	356
Chloride	32	84	140	217	290
Sulfate	12	20	30	59	62
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.8	1.3	2.4	3.9	4.9
Boron					

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER NR TECUMSEH, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER NR TECUMSEH, OK



C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER NR TECUMSEH, OK



CANADIAN RIVER BASIN

07231000 - Little River near Sasakwa, Okla.

LOCATION.--Lat 34°59'02", long 96°33'01", in NE¼ sec. 22, T.6 N., R.7 E., Seminole County, at county road bridge, 2.8 mi northwest of Sasakwa, 8.7 mi downstream from Salt Creek, and at mile 24.1.

DRAINAGE AREA.--865 mi².

PERIOD OF RECORD.--1951 to 1979.

WATER TYPE.--The water was sodium chloride type throughout the range of measured specific conductance.

TREND.--Plots of the dissolved solids, hardness, and chloride concentrations versus time indicate the possibility of trends of decreasing concentration. The sulfate plot did not indicate any trend. The Spearman's rhos at the 95-percent probability level indicate negative trends for dissolved solids, hardness, and chloride and do not indicate any trend for sulfate.

PUBLIC WATER SUPPLY.--Eighty-eight percent of the hardness values were greater than 180 mg/L and the average concentration was 1,286 mg/L. The hardness classification for this water is very hard. The recommended minimum pH of 5.0 was exceeded by 2 percent of the pH values, the recommended maximum sulfate concentration of 250 mg/L was exceeded by 2 percent of the sulfate values, and the recommended maximum chloride concentration of 250 mg/L was exceeded by 80 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 51 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with about 20 percent of the SAR values equivalent to a very high sodium hazard. Phytotoxic effects from boron could occur even in tolerant plants. The sensitive plant limit of 750 ug/L was exceeded by 25 percent of the boron values, the semitolerant plant limit of 1,000 ug/L was exceeded by 24 percent of the boron values, and the tolerant plant limit of 2,000 ug/L was exceeded by 13 percent of the boron values.

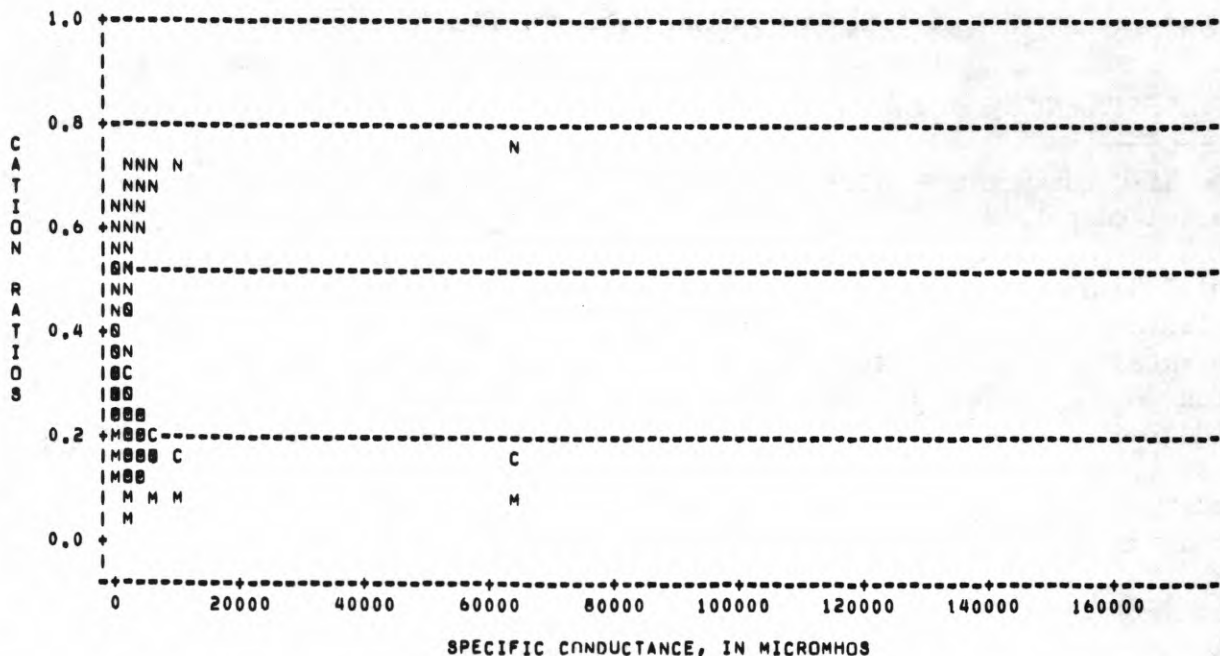
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	1298	7390	142	130000	17066	3.94	16.58
Dissolved solids	1213	4780	106	129000	12981	4.80	26.51
pH	1239	8.1	4.0	8.8	0.3	-.30	.50
Total hardness	1133	1286	48	24400	2906	4.24	20.72
Chloride	1250	2981	16	73100	8189	4.52	23.53
Sulfate	1090	33	0.0	410	29	4.46	35.78
Iron	0						
Fluoride	31	0.3	0.0	0.7	0.2	.54	-1.05
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	900	12	0.6	101	16	2.83	7.85
Boron	24	689	80	2600	768	1.54	.92

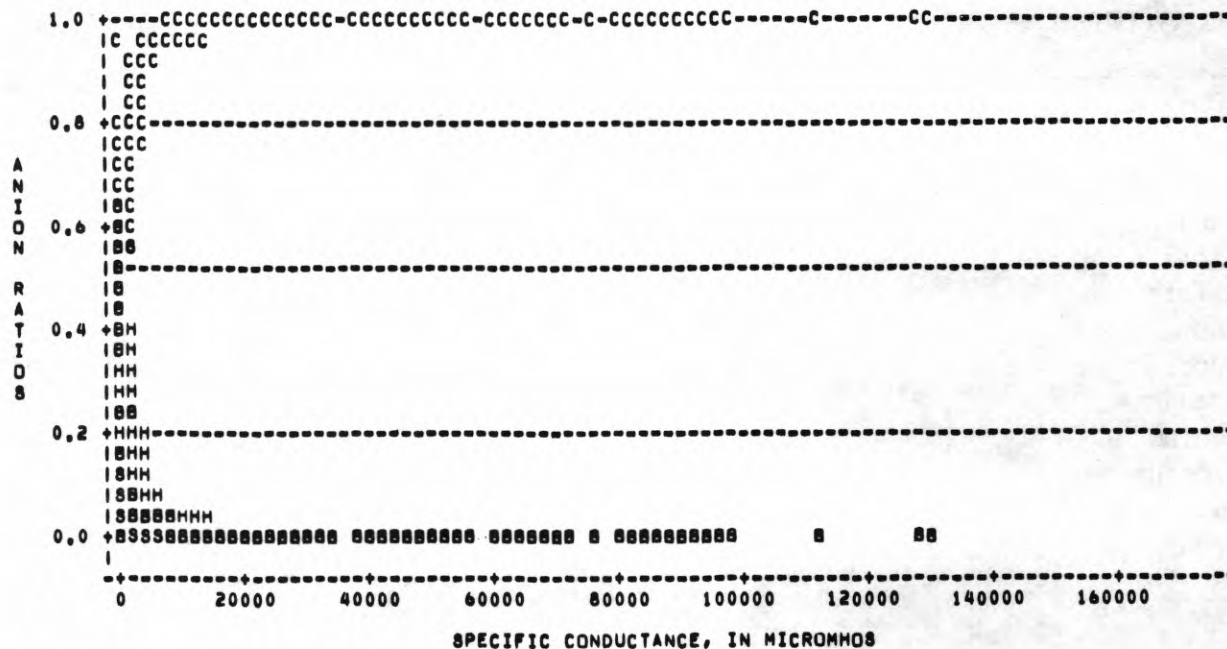
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	720	1280	2300	3710	15740
Dissolved solids	411	730	1310	2160	6758
pH	7.5	7.8	8.1	8.3	8.4
Total hardness	166	270	435	640	2870
Chloride	150	310	625	1100	5815
Sulfate	12	18	27	39	54
Iron					
Fluoride	0.0	0.1	0.2	0.4	0.7
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	2.5	4.2	6.7	10	30
Boron	125	220	365	702	2155

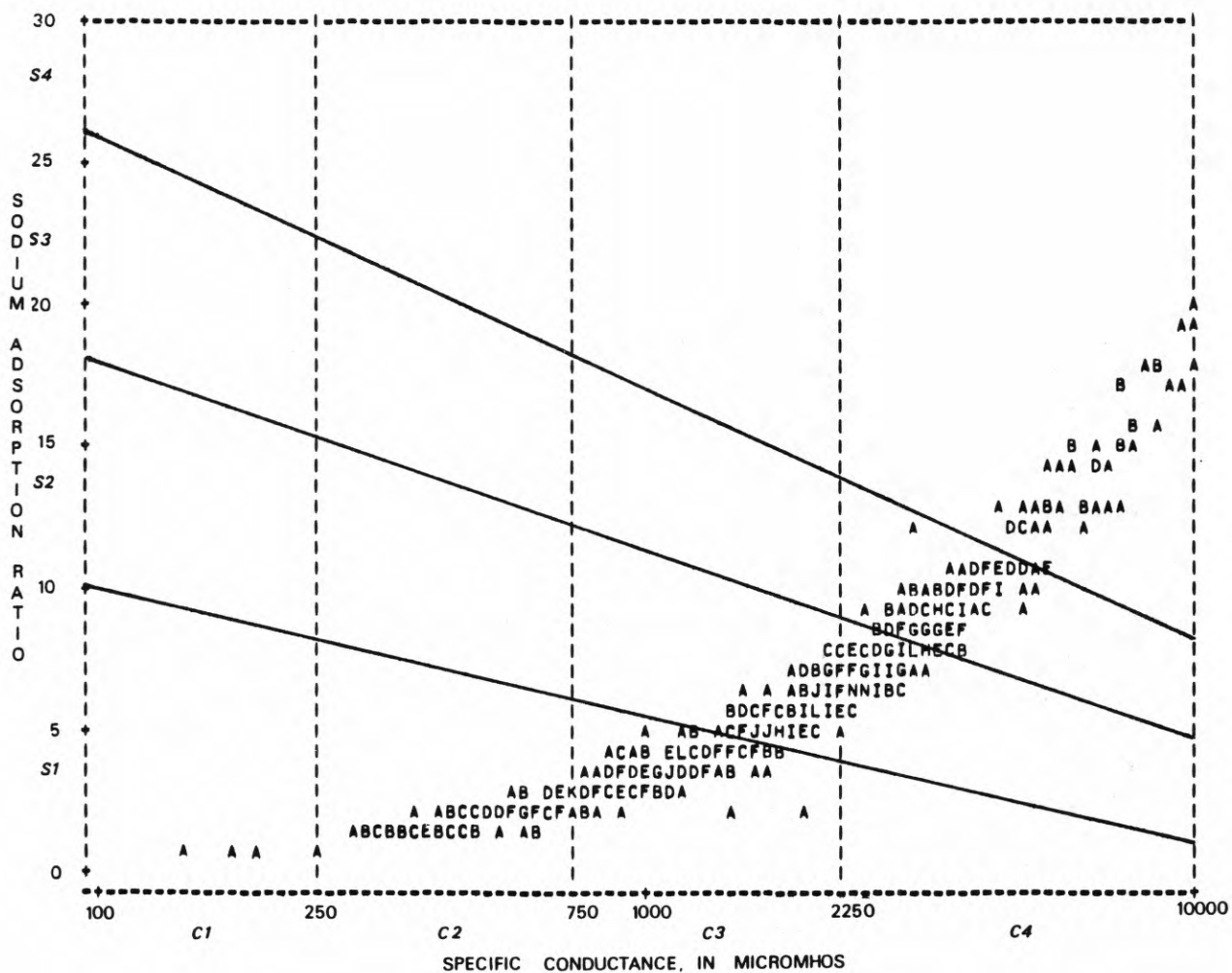
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER NR SASAKWA, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER NR SASAKWA, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OHS, B = 2 OHS, C = 3 OHS
 STATION NAME OR LOCAL IDENTIFIER=LITTLE RIVER NR SASAKWA, OK



CANADIAN RIVER BASIN

07232029 - Mathuldy Creek near Crowder, Okla.

LOCATION.--Lat 35°04'17", long 95°36'47", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 21, T.7 N., R.16 E., Pittsburg County, at county road bridge, 4.3 mi southeast of Crowder, and at mile 6.7.

DRAINAGE AREA.--5.41 mi².

PERIOD OF RECORD.--1976 to 1979.

WATER TYPE.--For the specific conductance range from 150 to 350 umho, 41 percent of the samples, the water was sulfate type. For specific conductance outside this range, the anions were mixed. The cations were mixed throughout the range of measured specific conductance.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analysis.

PUBLIC WATER SUPPLY.--Seventy-four percent of the hardness values were less than 60 mg/L and the average concentration was 51 mg/L. In general, the hardness classification for this water is soft. The recommended maximum iron concentration of 300 ug/L was exceeded by 13 percent of the iron values. The maximum contaminant level for lead of 50 ug/L was exceeded by 9 percent of the lead values and the maximum contaminant level for mercury of 2.0 ug/L was exceeded by 13 percent of the mercury values. Arsenic, cadmium, and chromium did not exceed maximum contaminant levels. Because the maximum lead and mercury contaminant levels were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to medium with 83 percent of the samples having a low salinity hazard. All of the SAR values were equivalent to a low sodium hazard. Phytotoxic effects from boron should not occur.

UNIVARIATE STATISTICS

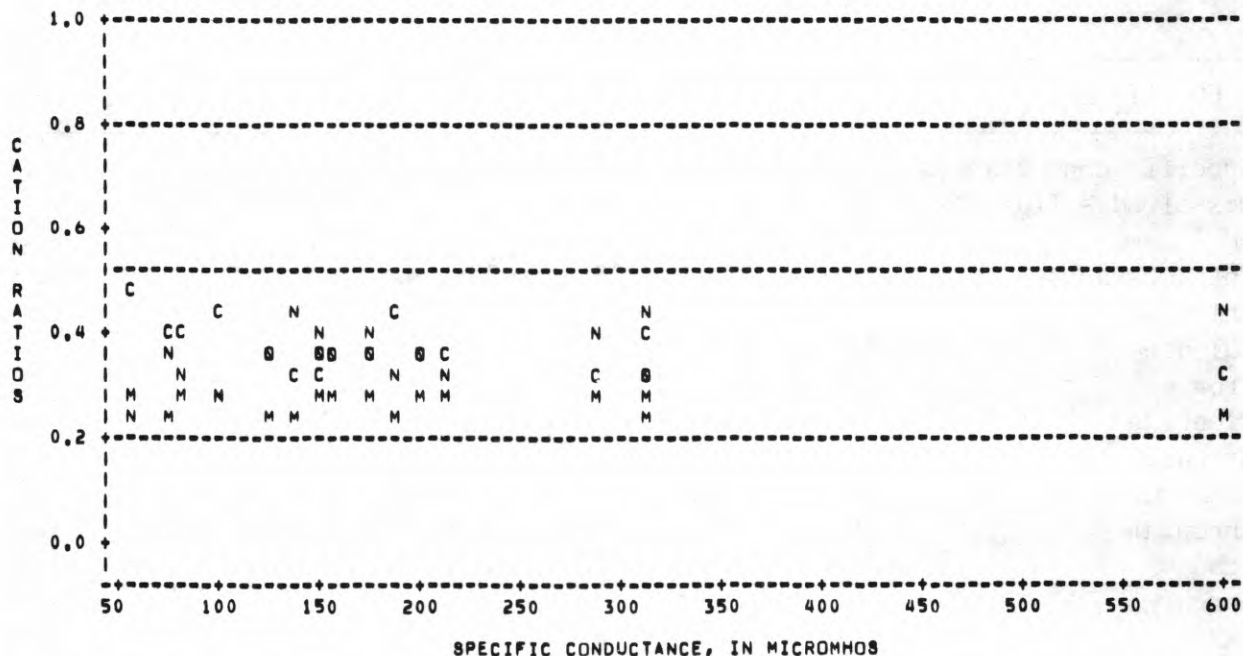
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	29	173	57	600	106	2.54	8.75
Dissolved solids	21	119	50	359	65	2.74	9.55
pH	30	7.2	6.4	8.8	0.6	.73	.47
Total hardness	21	51	23	140	28	1.92	4.20
Chloride	21	14	2.6	87	18	3.76	15.48
Sulfate	21	40	10	110	24	1.34	2.38
Iron	25	157	10	500	125	1.31	1.66
Fluoride	21	0.1	0.1	0.2	0.1	.76	-1.58
Arsenic	26	0	0	2	0.6	1.00	.11
Cadmium	22	1	0	6	1.6	2.19	4.77
Chromium	25	2	0	20	5.0	2.41	5.77
Lead	21	10	0	140	30	4.38	19.65
Mercury	26	1.4	0.0	25	5.2	4.23	18.58
SAR	21	0.7	0.3	1.6	0.3	1.47	2.63
Boron	25	40	0	150	27	2.92	12.27

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	74	122	150	192	314
Dissolved solids	64	81	108	132	180
pH	6.5	6.8	7.2	7.8	7.9
Total hardness	24	34	44	62	96
Chloride	3.5	5.8	9.7	12	28
Sulfate	14	21	37	52	78
Iron	20	70	130	215	366
Fluoride	0.1	0.1	0.1	0.2	0.2
Arsenic	0	0	0	1	1
Cadmium	0	0	0	1	4
Chromium	0	0	0	0	10
Lead	0	0	2	5	19
Mercury	0.0	0.0	0.0	0.1	4.0
SAR	0.4	0.5	0.7	0.8	1.3
Boron	16	30	40	45	60

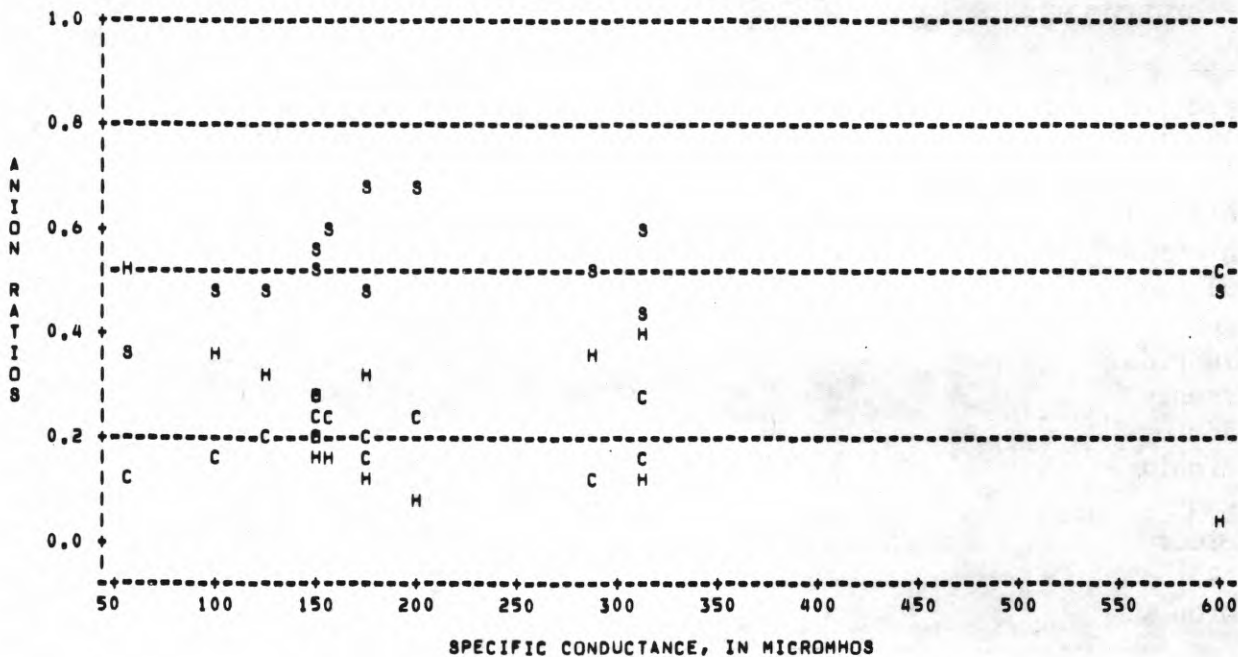
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=MATHULDY CREEK NR CROWDER, OK



ANION RATIO PLOT

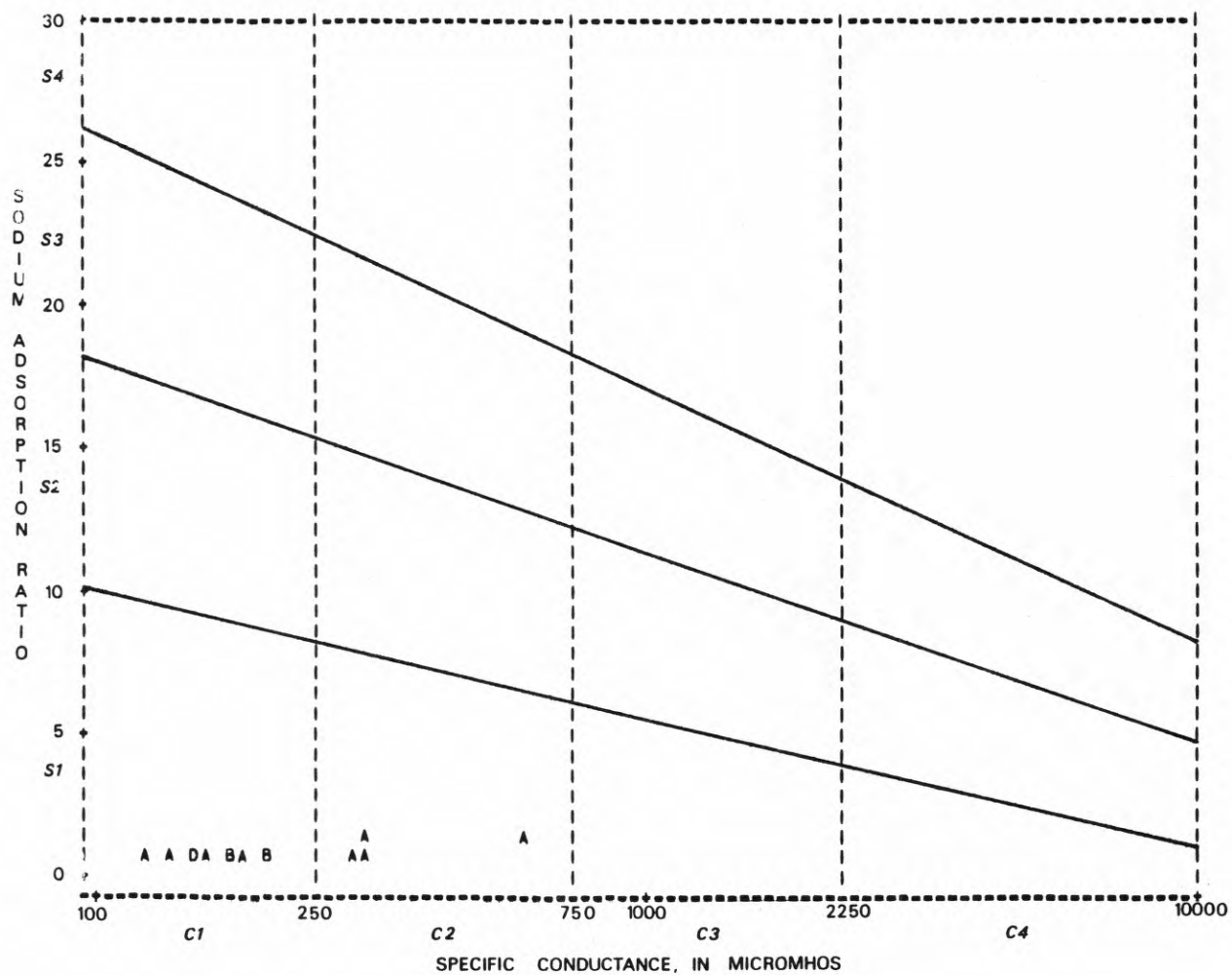
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=MATHULDY CREEK NR CROWDER, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=MATHULDY CREEK NR CROWDER, OK



CANADIAN RIVER BASIN

07231990 - Peaceable Creek near Haileyville, Okla.

LOCATION.--Lat 34°51'07", long 95°39'15", on east edge NE¼ sec. 6, T.4 N., R.16 E., Pittsburg County, at county road bridge, 3.3 mi south of Bache, 5 mi west of Haileyville, and at mile 5.7.

DRAINAGE AREA.--134 mi².

PERIOD OF RECORD.--1978 to 1979.

WATER TYPE.--The water was bicarbonate type throughout the range of measured specific conductance. The cations were mixed type for all samples.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--Sixty-six percent of the hardness values were less than 60 mg/L and the average concentration was 52 mg/L. In general, the hardness classification for this water is soft. The recommended maximum iron concentration of 300 ug/L was exceeded by 14 percent of the iron values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 26 percent of the cadmium values and the maximum lead contaminant level of 50 ug/L was exceeded by 24 percent of the lead values. Arsenic, chromium, and mercury did not exceed maximum contaminant levels. Because the maximum cadmium and lead contaminant levels were exceeded, this water probably would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to high with 96 percent of the samples having a low salinity hazard. All of the SAR values were equivalent to a low sodium hazard. Phytotoxic effects from boron should not occur.

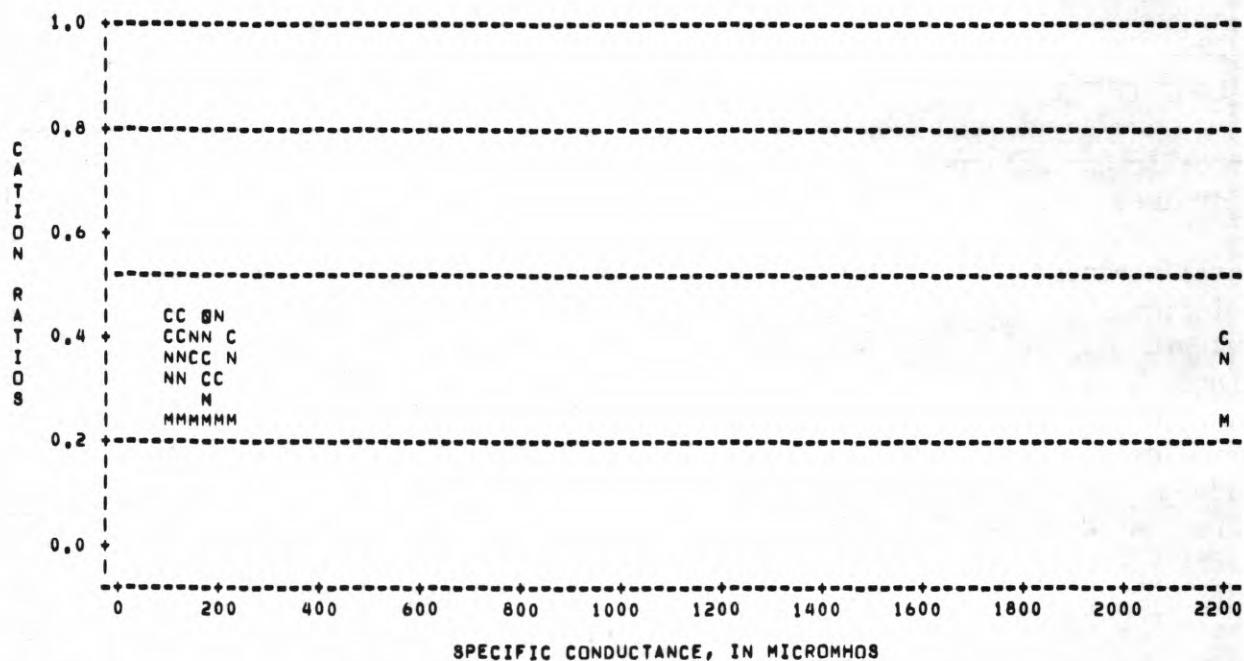
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	21	261	92	2200	446	4.52	20.60
Dissolved solids	12	108	72	138	20	-.67	-.40
pH	21	7.2	7.0	7.8	0.2	1.21	.75
Total hardness	13	52	28	68	13	-.29	-.75
Chloride	12	11	5.5	20	4.2	.74	.47
Sulfate	12	18	10	30	6.2	.72	-.41
Iron	12	192	10	430	116	.18	.70
Fluoride	12	0.2	0.1	0.3	0.1	.74	-.19
Arsenic	18	1	0	2	0.5	.32	.92
Cadmium	15	7	0	32	8.2	2.35	6.36
Chromium	18	5	0	20	6.1	1.08	.44
Lead	18	55	0	350	98	2.34	4.92
Mercury	19	0.0	0.0	0.3	0.1	2.16	3.82
SAR	13	0.7	0.4	1.0	0.2	-.23	-.99
Boron	13	52	30	70	13	.23	-.74

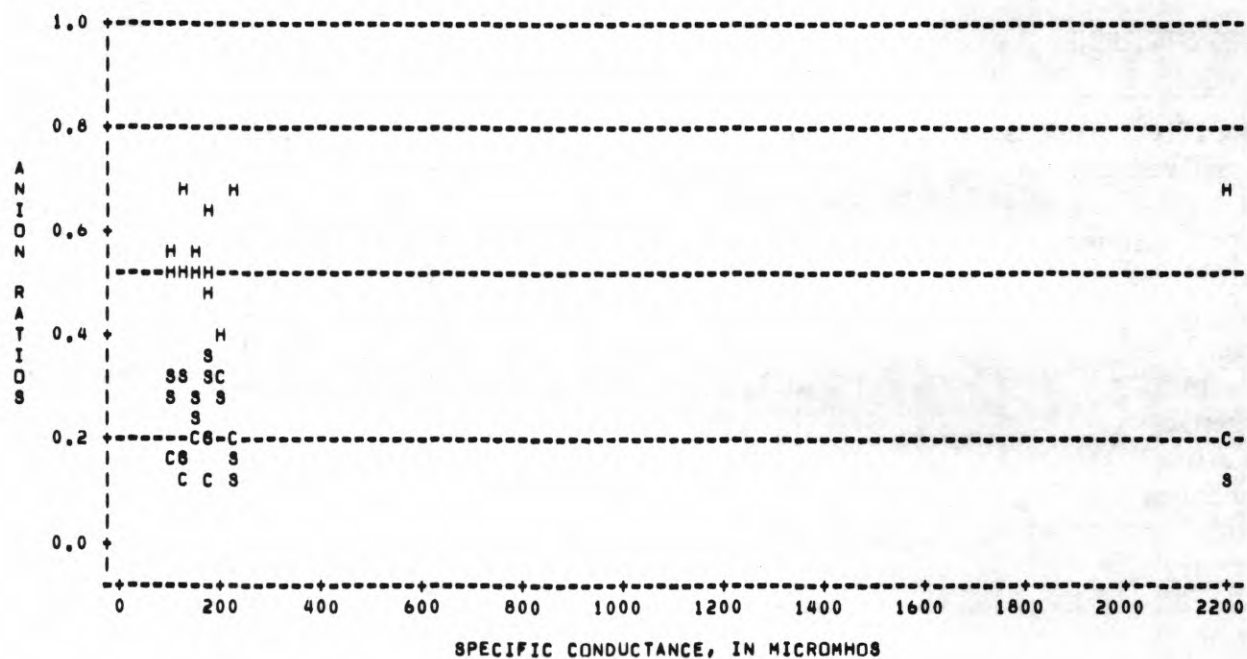
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	99	130	170	210	220
Dissolved solids	74	89	114	120	135
pH	7.0	7.1	7.2	7.4	7.7
Total hardness	32	42	51	65	68
Chloride	5.7	7.7	10	14	18
Sulfate	11	13	17	24	28
Iron	13	108	210	260	382
Fluoride	0.1	0.1	0.2	0.2	0.3
Arsenic	1	1	1	1	2
Cadmium	1	2	3	11	21
Chromium	0	0	0	10	11
Lead	0	0	18	46	269
Mercury	0.0	0.0	0.0	0.1	0.3
SAR	0.4	0.5	0.7	0.8	1.0
Boron	34	40	50	65	70

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=PEACEABLE CREEK NR HAILEYVILLE OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=PEACEABLE CREEK NR HAILEYVILLE OK



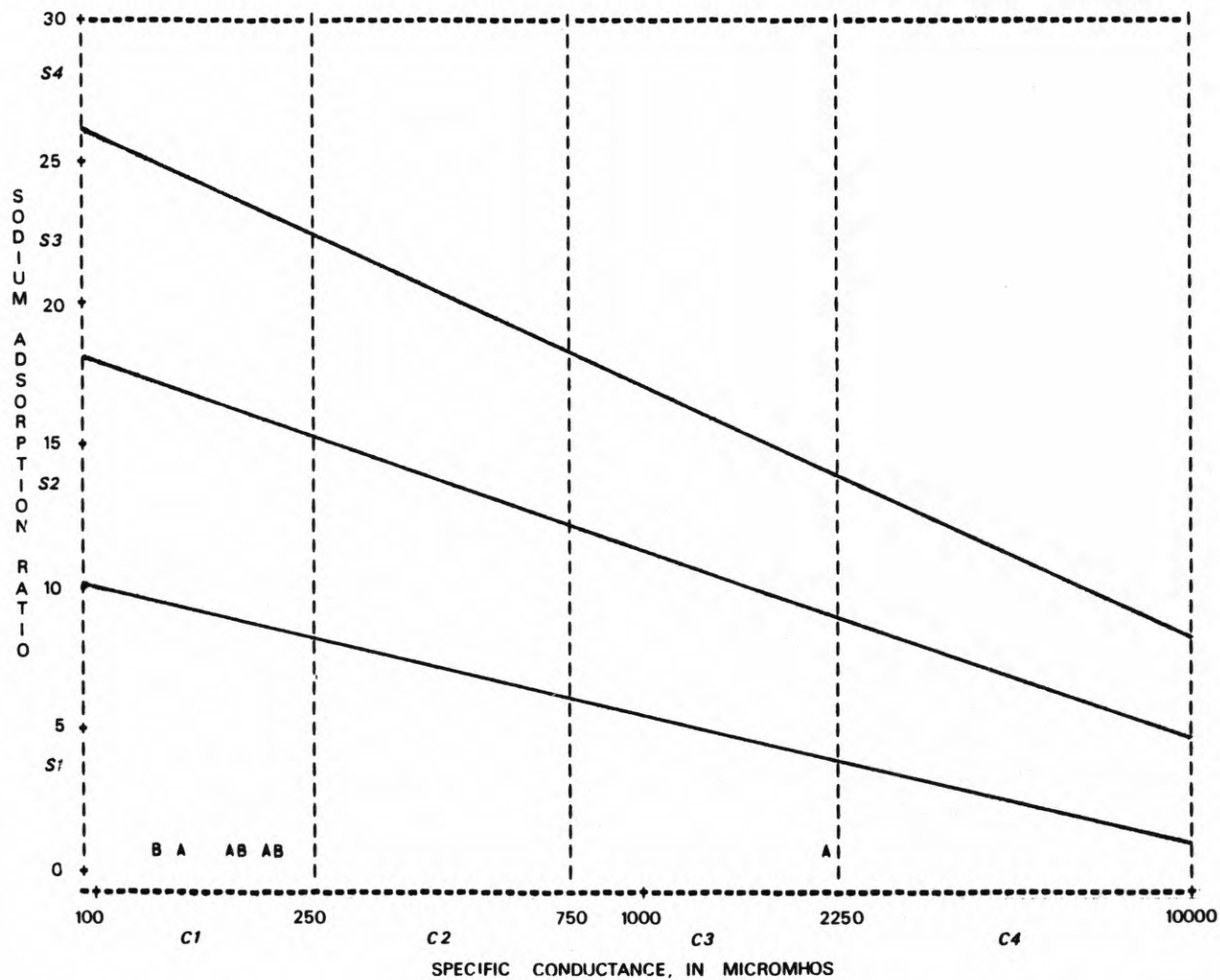
C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD

C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD

A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=PEACEABLE CREEK NR HAILEYVILLE OK



CANADIAN RIVER BASIN

07230800 - Salt Creek near Dewright, Okla.

LOCATION.--Lat 35°02'52", long 96°40'10", in NW¼SW¼ sec. 27, T.7 N., R.6 E., Seminole County, at bridge on State Highway 99, 2.3 mi south of Dewright, 8 mi northeast of Konawa, and at mile 7.3.

DRAINAGE AREA.--210 mi².

PERIOD OF RECORD.--1952 to 1963.

WATER TYPE.--The water was sodium chloride type throughout the range of measured specific conductance.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Ninety-eight percent of the hardness values were greater than 180 mg/L and the average concentration was 848 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 93 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 66 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with about 60 percent of the SAR values equivalent to a very high sodium hazard. The data indicate that phytotoxic effects from boron could occur even in tolerant plants.

UNIVARIATE STATISTICS

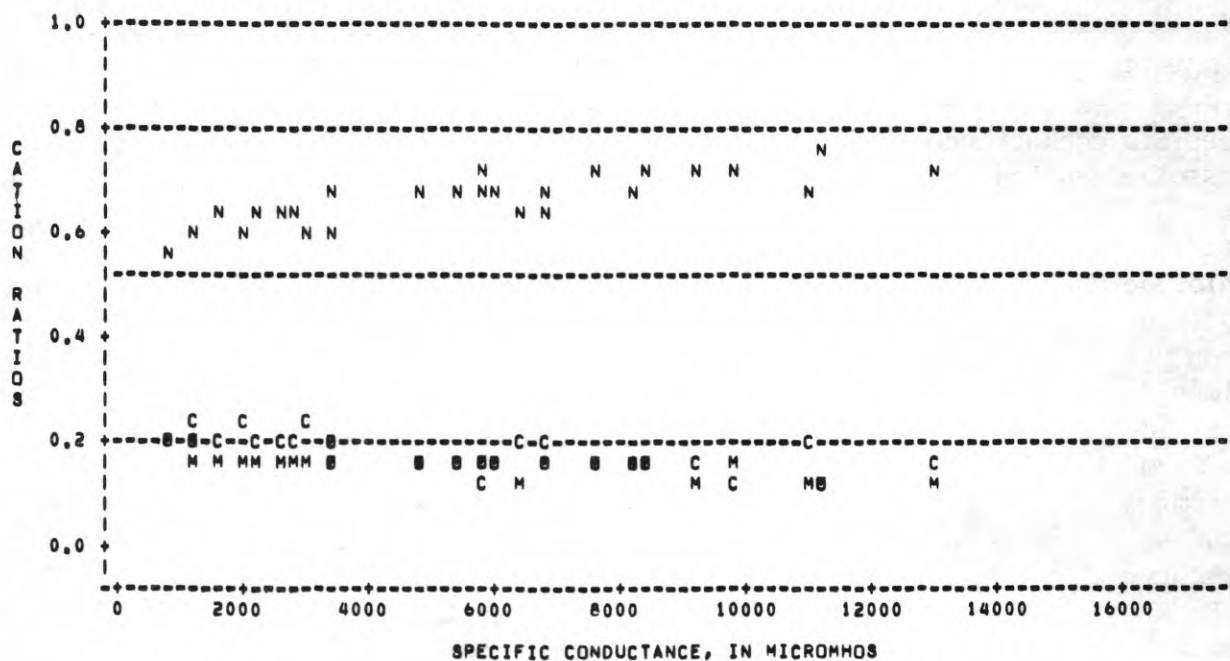
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	76	5721	749	13000	3071	0.27	-0.82
Dissolved solids	75	3503	441	8340	1940	.34	-.69
pH	76	8.0	7.4	8.6	0.2	-.36	-.12
Total hardness	76	848	148	1790	407	.21	-.79
Chloride	76	1848	171	4600	1089	.38	-.71
Sulfate	75	39	9.1	72	17	-.07	-1.04
Iron	0						
Fluoride	10	0.2	0.0	0.5	0.2	-.09	-1.39
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	75	12	3.3	23	5.1	.04	-.95
Boron	9	533	140	2200			

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	1604	3100	5720	8060	10290
Dissolved solids	957	1840	3460	5010	6290
pH	7.7	7.9	8.0	8.3	8.4
Total hardness	264	531	805	1190	1413
Chloride	437	915	1810	2638	3483
Sulfate	14	25	41	53	61
Iron					
Fluoride	0.0	0.0	0.3	0.3	0.5
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	5.7	7.8	13	16	19
Boron					

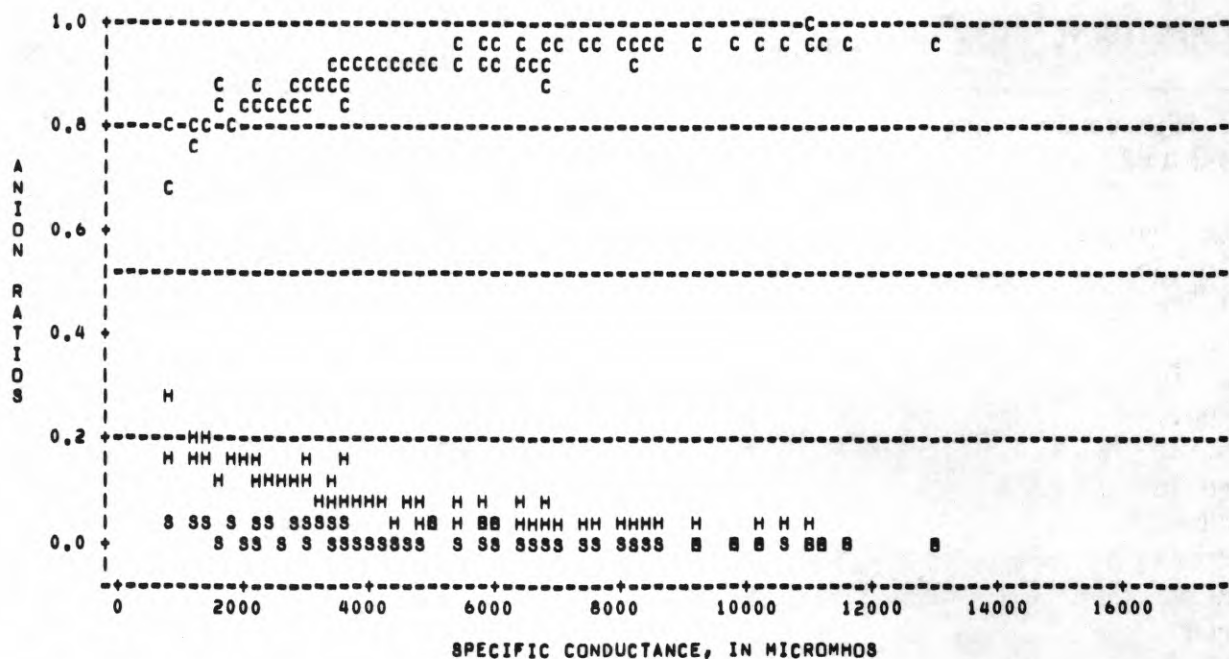
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=SALT CREEK NR DEWRIGHT, OK

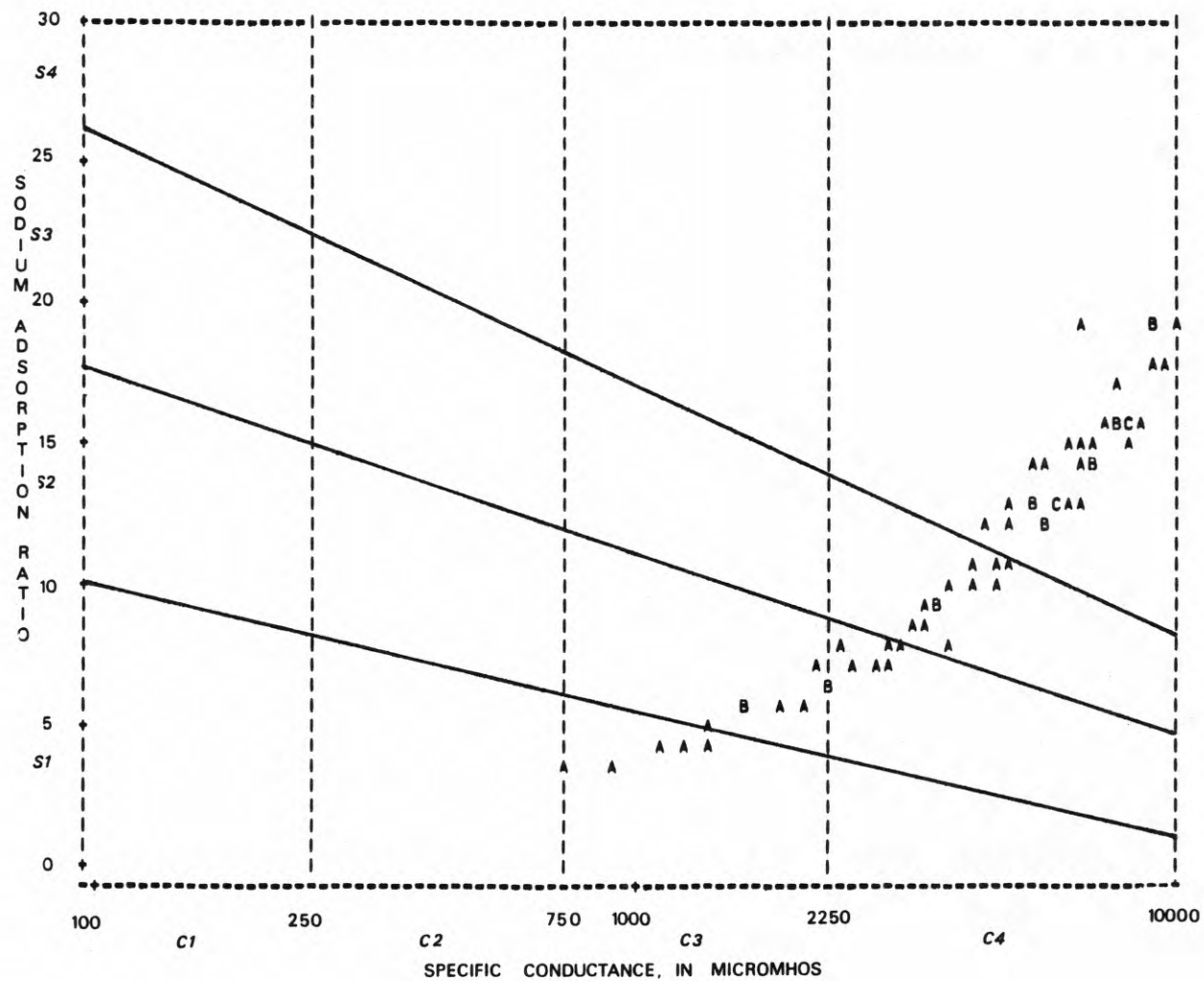


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=SALT CREEK NR DEWRIGHT, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=SALT CREEK NR DEWRIGHT, OK



CANADIAN RIVER BASIN

07245020 - Taloka Creek at Stigler, Okla.

LOCATION.--Lat 35°16'09", long 95°05'49", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T.9 N., R.21 E., Haskell County, at county road bridge, 0.6 mi north of State Highway 9, 1.6 mi northeast of Stigler, and at mile 14.0.

DRAINAGE AREA.--3.98 mi².

PERIOD OF RECORD.--1979.

WATER TYPE.--The cations were mixed type throughout the range of measured specific conductance. No anion distribution data were available.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--All of the hardness values were less than 60 mg/L and the average concentration was 26 mg/L. The hardness classification for this water is soft. The recommended maximum iron concentration of 300 ug/L was exceeded by 15 percent of the iron values. The maximum lead contaminant level of 50 ug/L was exceeded by 1 of 7 lead values and the maximum mercury contaminant level of 2.0 ug/L was exceeded by 1 of 13 mercury values. Arsenic, cadmium, and chromium did not exceed maximum contaminant levels. Because the maximum lead and mercury contaminant levels were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity and sodium hazards were low for all available data. Phytotoxic effects from boron should not occur.

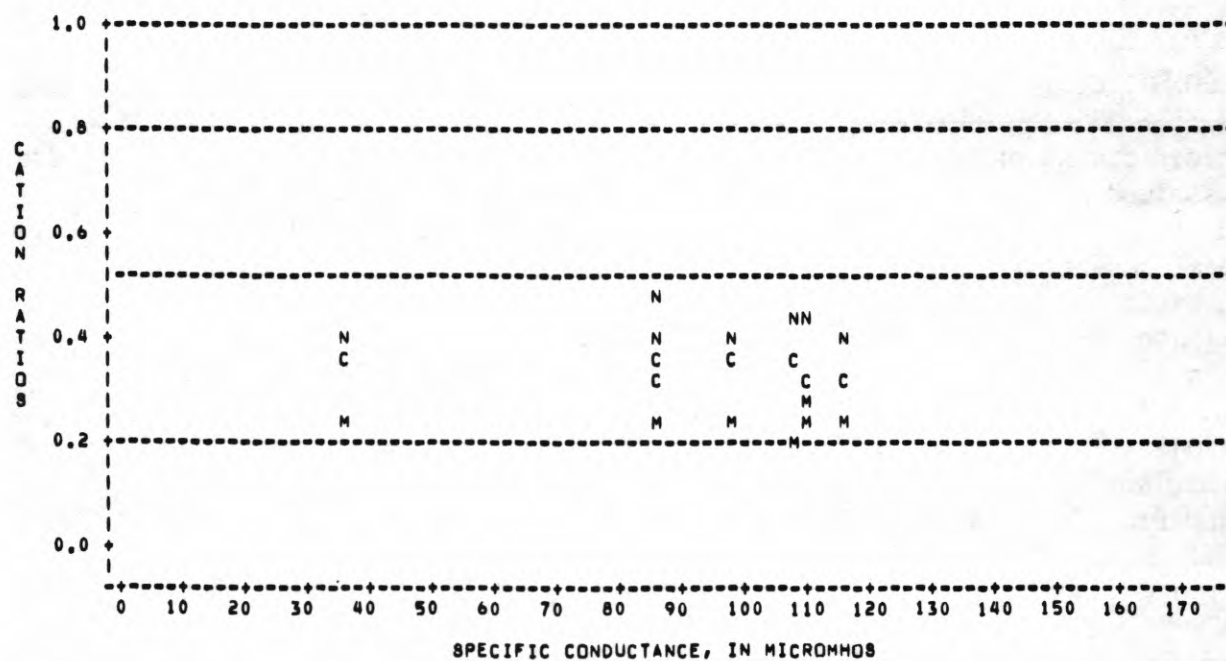
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	14	100	36	166	29	0.10	2.67
Dissolved solids	8	64	34	77			
pH	14	7.2	6.4	8.2	0.4	.35	1.84
Total hardness	8	26	11	34			
Chloride	8	11	3.1	18			
Sulfate	8	11	7.6	16			
Iron	13	160	40	360	105	1.11	.26
Fluoride	8	0.1	0.0	0.1			
Arsenic	13	0	0	1	0.4	1.45	.09
Cadmium	8	1	0	7			
Chromium	13	1	0	10	2.8	3.61	13.00
Lead	7	14	0	96			
Mercury	13	3.3	0.0	29	8.1	3.09	9.92
SAR	8	0.6	0.3	0.8			
Boron	13	25	10	40	11	.11	-1.28

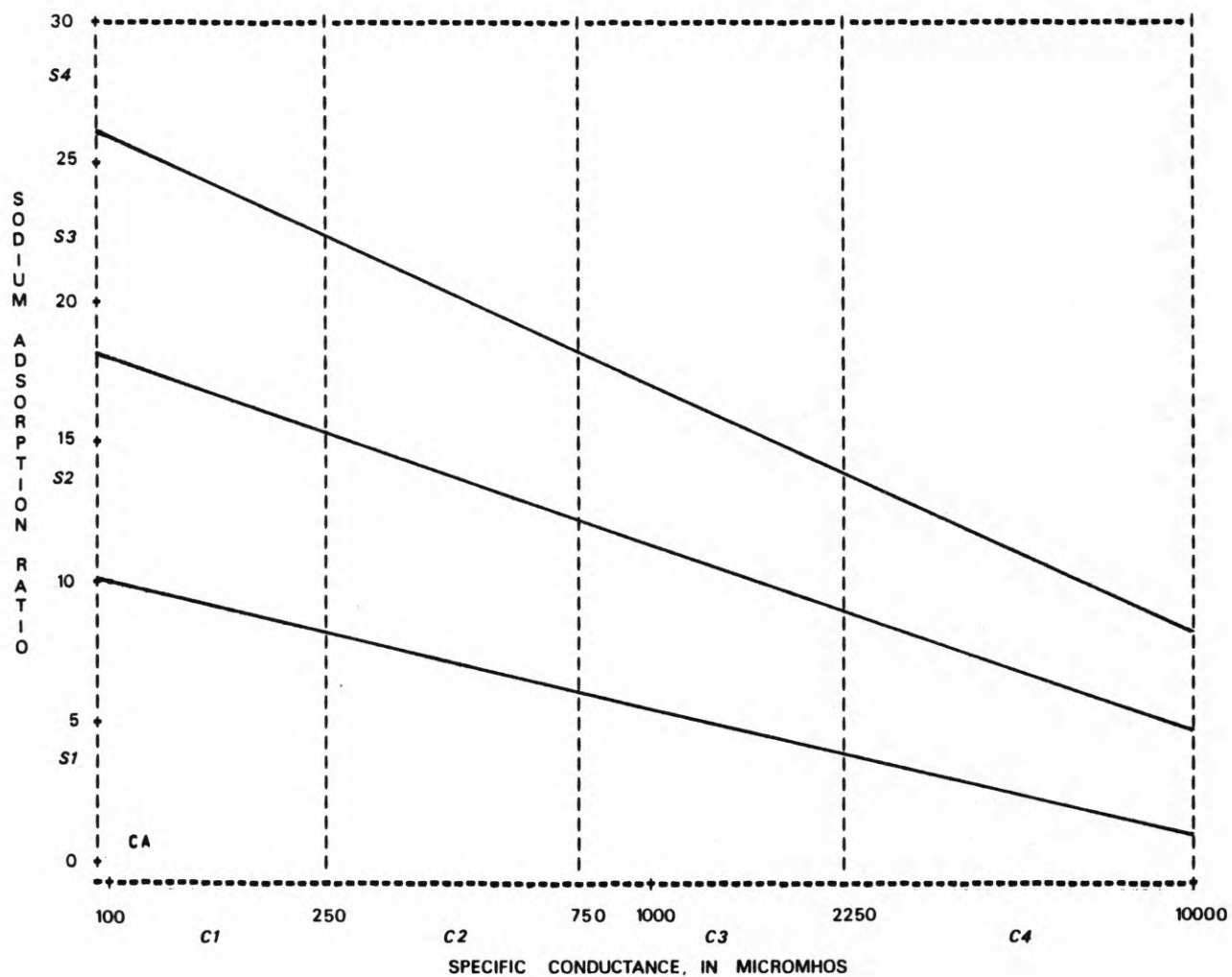
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	58	86	102	111	146
Dissolved solids					
pH	6.5	7.0	7.2	7.4	7.9
Total hardness					
Chloride					
Sulfate					
Iron	52	80	120	215	360
Fluoride					
Arsenic	0	0	0	0	1
Cadmium					
Chromium	0	0	0	0	6
Lead					
Mercury	0.0	0.0	0.1	2.3	21
SAR					
Boron	10	15	20	35	40

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=TALOKA CREEK AT STIGLER OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=TALOKA CREEK AT STIGLER OK



CANADIAN RIVER BASIN

07245030 - Taloka Creek near Stigler, Okla.

LOCATION.--Lat 35°17'46", long 95°07'56", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 36, T.10 N., R.20 E., Haskell County, at county road bridge, 2.4 mi north on county road at west edge of Stigler, and at mile 9.6.

DRAINAGE AREA.--20.1 mi².

PERIOD OF RECORD.--1979.

WATER TYPE.--The water was sodium type throughout the range of measured specific conductance. No anion distribution data are available.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analysis.

PUBLIC WATER SUPPLY.--Forty-eight percent of the hardness values were greater than 180 mg/L and the average hardness concentration was 208 mg/L. The hardness classification for this water varies between hard and very hard. The recommended maximum sulfate concentration of 250 mg/L was exceeded by 63 percent of the sulfate values and the recommended maximum iron concentration of 300 ug/L was exceeded by 8 percent of the iron values. The maximum lead contaminant level of 50 ug/L was exceeded by 7 percent of the lead values and the maximum mercury contaminant level of 2.0 ug/L was exceeded by 5 percent of the mercury values. Because of the frequency and magnitude by which the recommended maximum sulfate concentration was exceeded and because the maximum lead and mercury contaminant levels were exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 55 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with 38 percent of the SAR values equivalent to a very high sodium hazard. Phytotoxic effects could occur in boron sensitive plants. The limit for boron sensitive plants of 750 ug/L was exceeded by 6 percent of the boron values.

UNIVARIATE STATISTICS

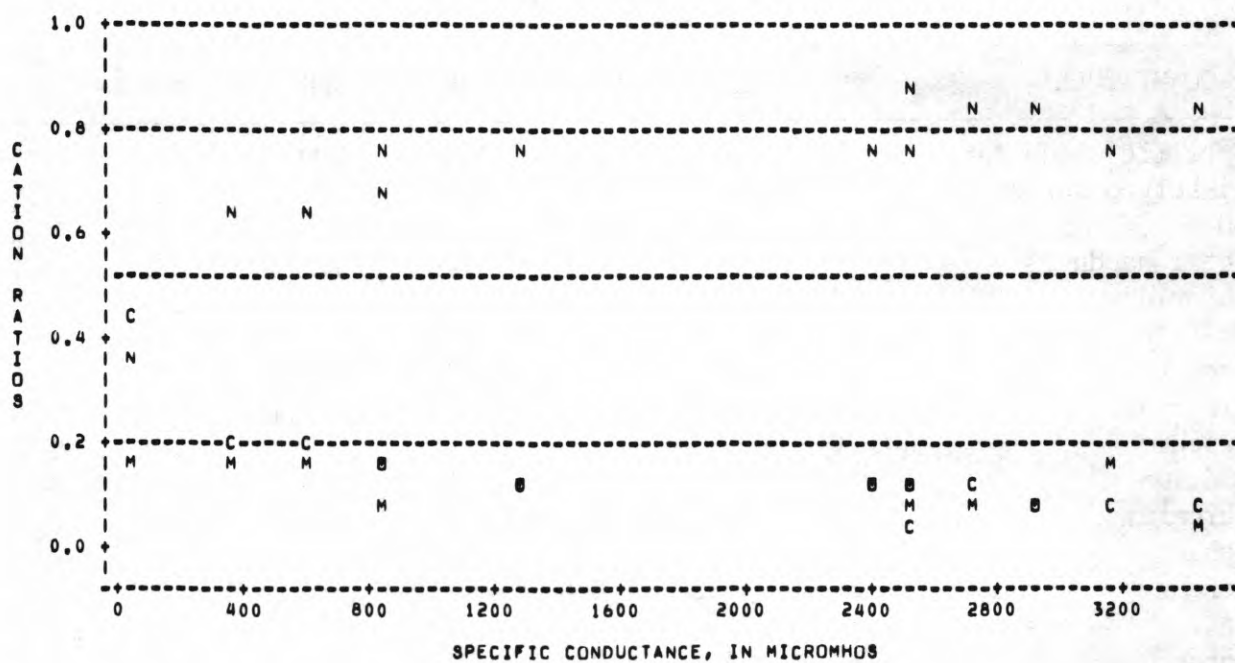
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	22	1605	58	3140	1109	-0.05	-1.72
Dissolved solids	13	1241	57	2340	831	-.11	-1.74
pH	22	8.2	6.8	8.6	0.5	-1.20	.56
Total hardness	13	208	20	440	131	.31	-1.13
Chloride	13	18	3.8	29	7.1	-.15	-.27
Sulfate	13	542	11	1200	406	.21	-1.41
Iron	20	104	10	370	105	1.31	.67
Fluoride	13	0.2	0.1	0.4	0.1	.21	-.55
Arsenic	20	2	0	6	1.6	2.01	3.77
Cadmium	16	1	0	10	3.4	2.46	4.74
Chromium	20	5	0	20	6.9	1.08	.08
Lead	15	40	0	300	91	2.31	4.66
Mercury	20	3.3	0.0	53	12	4.35	19.22
SAR	13	10	0.4	19	6.3	-.02	-1.47
Boron	18	351	40	770	256	.17	-1.73

FREQUENCY DISTRIBUTION

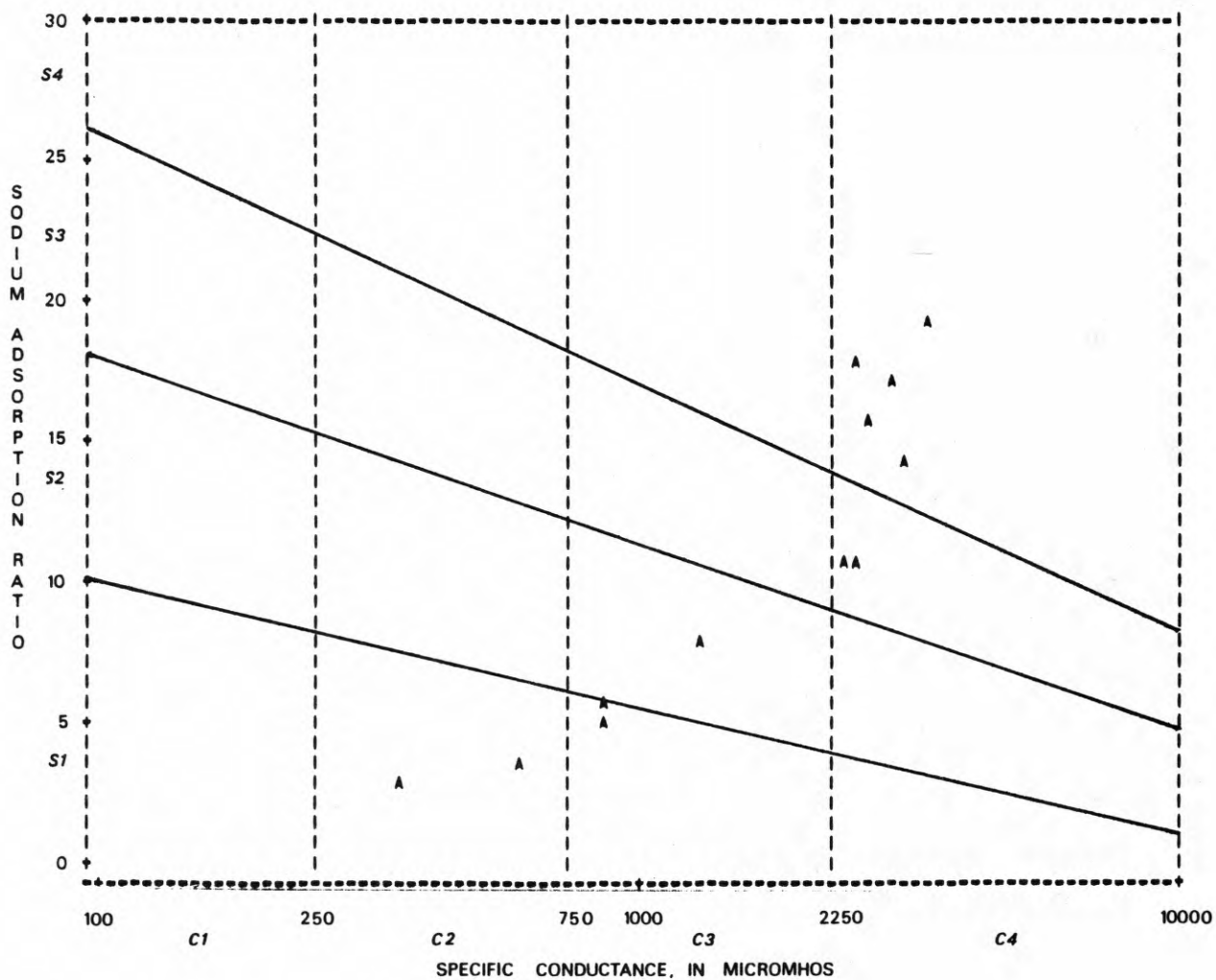
CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	134	525	1710	2550	3014
Dissolved solids	131	440	1670	1910	2336
pH	6.9	7.6	8.2	8.2	8.4
Total hardness	37	102	150	330	408
Chloride	6.3	12	17	23	28
Sulfate	45	150	570	860	1160
Iron	20	32	50	185	268
Fluoride	0.1	0.2	0.2	0.3	0.4
Arsenic	0	1	1	2	6
Cadmium	0	0	0	1	10
Chromium	0	0	0	10	19
Lead	0	0	0	0	240
Mercury	0.0	0.0	0.1	0.6	5.9
SAR	1.4	4.2	11	16	19
Boron	67	90	325	620	662

CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=TALOKA CREEK NEAR STIGLER UK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=TALOKA CREEK NEAR STIGLER OK



CANADIAN RIVER BASIN

07229300 - Walnut Creek at Purcell, Okla.

LOCATION.--Lat 34°59'56", long 97°22'00", in NW¹/₄NW¹/₄ sec. 13, T.6 N., R.2 W., McClain County, at bridge on U.S. Highway 77, at south edge of Purcell, and at mile 1.0.

DRAINAGE AREA.--202 mi².

PERIOD OF RECORD.--1960, 1976 to 1977.

WATER TYPE.--For specific conductance greater than 480 umho, 91 percent of the samples, the water was magnesium carbonate/bicarbonate type. For specific conductance less than 480 umho, the water was mixed cation type. No anion distribution data are available for specific conductance less than 480 umho.

TREND.--The period of record is insufficient, less than 5 years, to perform trend analyses.

PUBLIC WATER SUPPLY.--Ninety-four percent of the hardness values were greater than 180 mg/L and the average concentration was 315 mg/L. The hardness classification for this water is very hard. The recommended maximum pH of 9.0 was exceeded by 4 percent of the pH values. No toxic metal data are available. Based on the data, this water probably is suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to high with 65 percent of the samples having a medium salinity hazard. All of the SAR values were equivalent to a low sodium hazard. The boron data are not adequate to determine whether phytotoxic effects could occur.

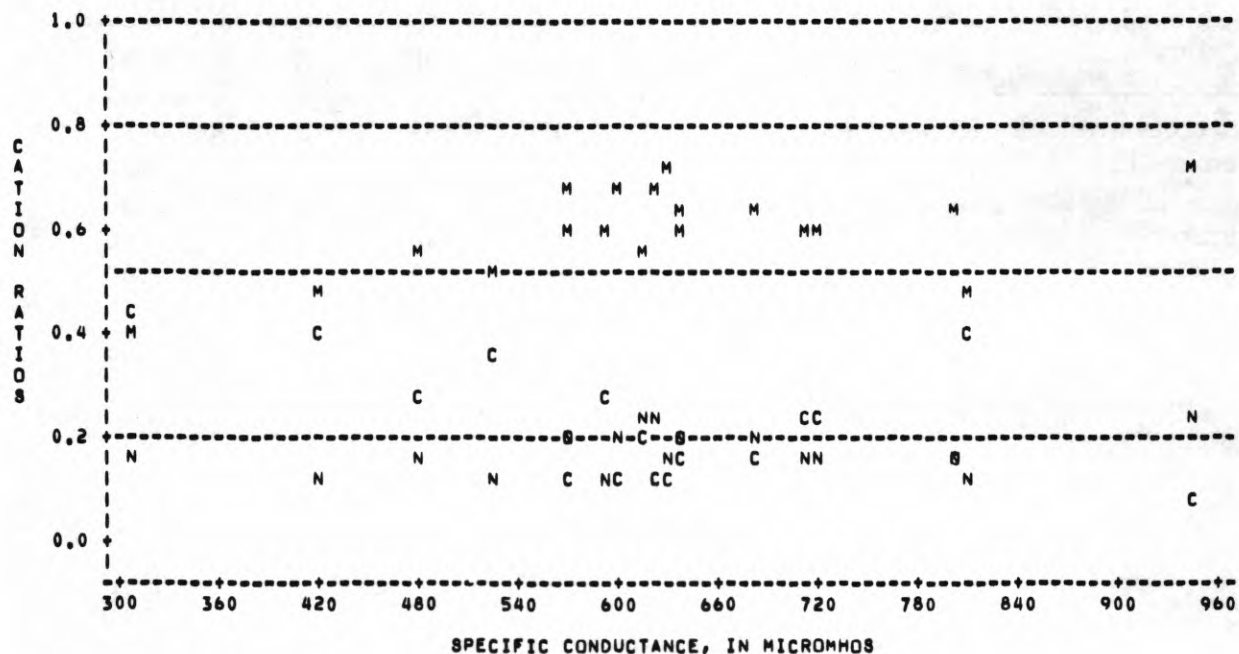
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	53	681	311	947	139	-0.39	0.19
Dissolved solids	20	355	265	422	48	-.28	-.92
pH	48	8.4	7.1	9.4	0.4	-.62	3.36
Total hardness	51	315	136	482	78	.02	-.20
Chloride	51	31	9.2	86	18	1.01	.62
Sulfate	29	37	18	61	9.0	-.13	1.15
Iron	0						
Fluoride	2	0.5	0.4	0.5			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	26	0.8	0.4	1.3	0.2	0.45	0.23
Boron	1	170					

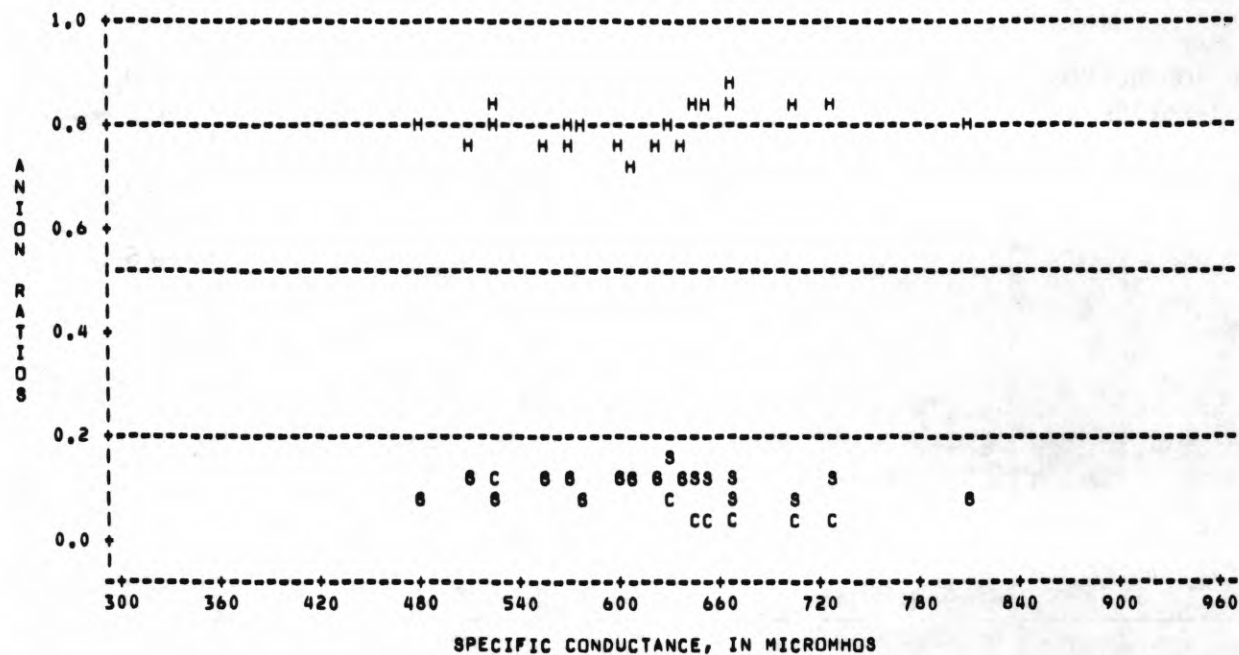
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	514	596	670	800	869
Dissolved solids	287	316	356	402	420
pH	8.0	8.2	8.4	8.7	8.8
Total hardness	215	264	310	361	429
Chloride	12	16	26	42	57
Sulfate	22	32	39	42	45
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.5	0.6	0.8	0.9	1.0
Boron					

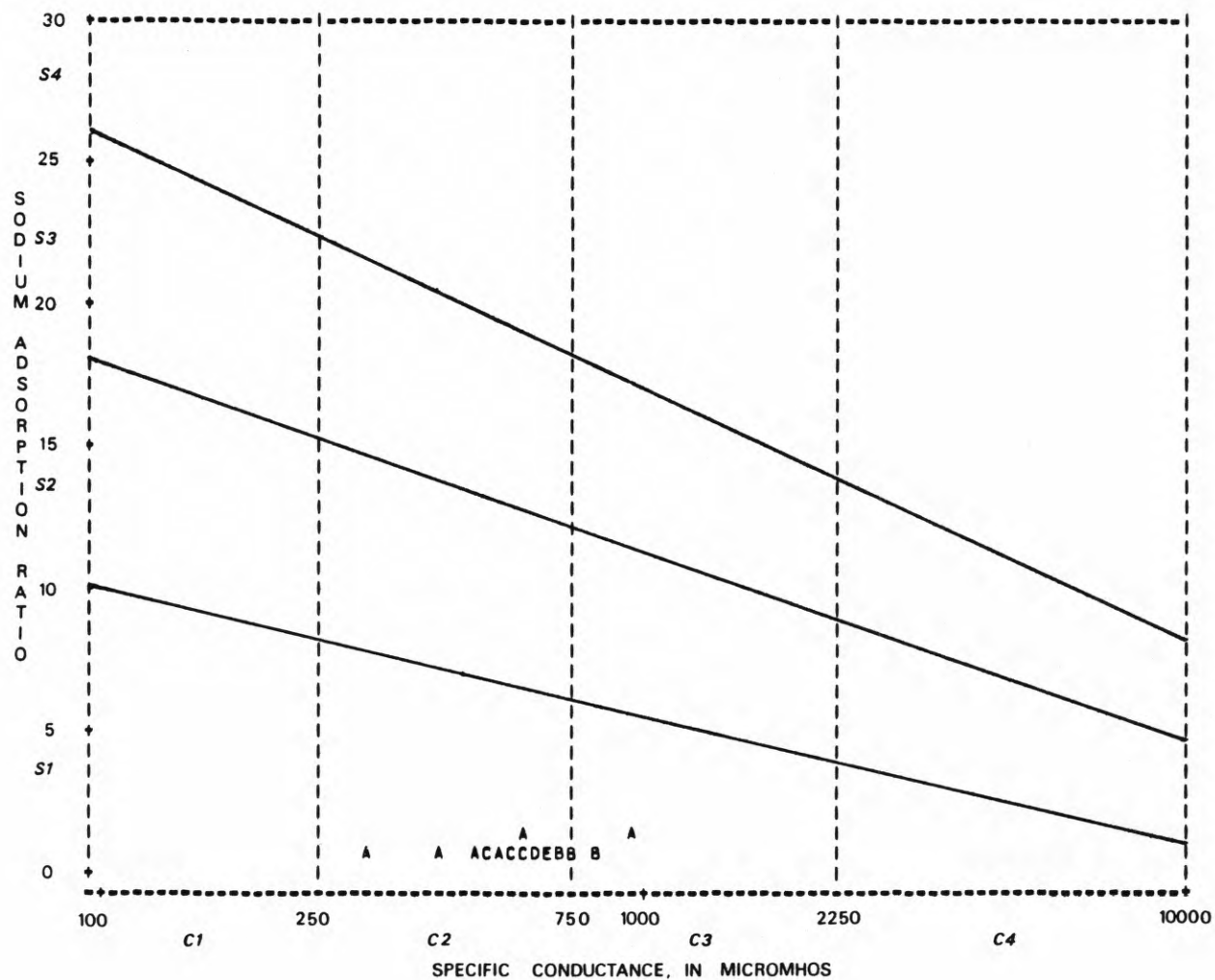
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=WALNUT CREEK AT PURCELL, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=WALNUT CREEK AT PURCELL, OK



IMMIGRATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=WALNUT CREEK AT PURCELL, OK



NORTH CANADIAN RIVER BASIN

07232500 - Beaver River near Guymon, Okla.

LOCATION.--Lat $36^{\circ}43'24''$, long $101^{\circ}29'30''$, in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 18, T.3 N., R.15 E., Texas County, at bridge on U.S. Highway 64 at Dry Sand Draw, 1.2 mi upstream from Goff Creek, 2.5 mi north of Guymon, and at mile 650.7.

DRAINAGE AREA.--2,139 mi², includes that of Dry Sand Draw, of which 964 mi² is probably noncontributing.

PERIOD OF RECORD.--1952, 1954 to 1963, 1968 to 1979.

WATER TYPE.--For specific conductance less than 500 umho, 30 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance greater than 500 umho, the data are inadequate to determine the relationship of water type to specific conductance. The data indicate, however, that as specific conductance increases the water may become sodium chloride type and with still further increase of specific conductance the water may again become calcium carbonate/bicarbonate type.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time do not indicate any trends. The Spearman's rhos for these constituents at the 95-percent probability level also do not indicate the presence of any trends.

PUBLIC WATER SUPPLY.--Ninety percent of the hardness values were greater than 180 mg/L and the average concentration was 221 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by less than 1 percent of the chloride values. The maximum fluoride contaminant level for the average annual maximum daily air temperature at this location was exceeded by 1 percent of the fluoride values. Arsenic, cadmium, chromium, lead, and mercury did not exceed their maximum contaminant levels. Based on the data, this water probably is suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 93 percent of the samples having a medium salinity hazard. The sodium hazard ranged from low to medium with more than 99 percent of the SAR values equivalent to a low sodium hazard. One of 66 boron values exceeded the limit for boron sensitive and semitolerant plants.

UNIVARIATE STATISTICS

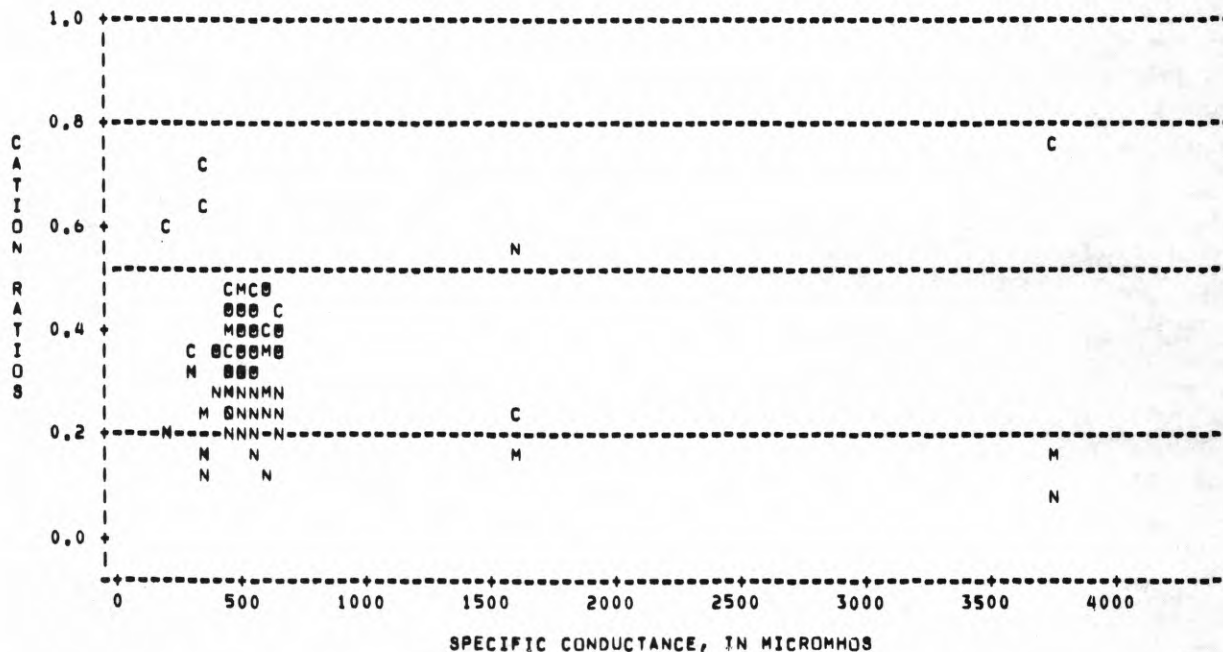
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	255	553	210	3800	312	9.06	90.69
Dissolved solids	214	329	124	937	61	3.95	45.42
pH	235	8.2	6.9	9.0	0.3	-.93	1.92
Total hardness	218	221	82	330	34	-.76	2.54
Chloride	220	16	1.5	290	19	13.95	202.68
Sulfate	219	52	6.5	150	14	.48	11.14
Iron	5	60	10	160			
Fluoride	95	1.6	0.4	2.4	0.4	-1.08	2.43
Arsenic	5	4	2	6			
Cadmium	5	1	0	2			
Chromium	5	2	0	10			
Lead	5	3	2	6			
Mercury	5	0.0	0.0	0.1			
SAR	215	0.9	0.1	4.8	0.3	7.12	83.66
Boron	66	295	10	1900	259	3.93	22.57

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	433	494	534	558	600
Dissolved solids	279	311	334	348	374
pH	7.8	8.0	8.2	8.4	8.5
Total hardness	180	202	223	240	258
Chloride	9.5	13	15	16	18
Sulfate	40	47	53	59	65
Iron					
Fluoride	1.2	1.6	1.6	1.8	2.0
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.7	0.8	0.9	0.9	1.1
Boron	94	140	250	358	536

CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER NR GUYMON, OK



C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS
STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER NR GUYMON, OK



NORTH CANADIAN RIVER BASIN

07232630 - Beaver River near Hooker, Okla.

LOCATION.--Lat $36^{\circ}41'22''$, long $101^{\circ}12'19''$, in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 35, T.3 N., R.2 E., Texas County, at bridge on State Highway 94, 12 mi south of Hooker, and at mile 628.6.

DRAINAGE AREA.--3,017 mi², of which 1,488 mi² is probably noncontributing.

PERIOD OF RECORD.--1972 to 1973, 1975 to 1979.

WATER TYPE.--The water was mixed type throughout the range of measured specific conductance. Although no ion was predominant, calcium was the principal cation and carbonate/bicarbonate was the principal anion.

TREND.--The data collected over the period of record are inadequate to perform trend analyses.

PUBLIC WATER SUPPLY.--Eighty-eight percent of the hardness values were greater than 180 mg/L and the average concentration was 277 mg/L. In general, the hardness classification for this water is very hard. None of the measured constituents exceeded their recommended maximum limits. No toxic metal data are available. Based on the data, this water should be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to high with 65 percent of the samples having a high salinity hazard. All of the SAR values were equivalent to a low sodium hazard. No boron data are available.

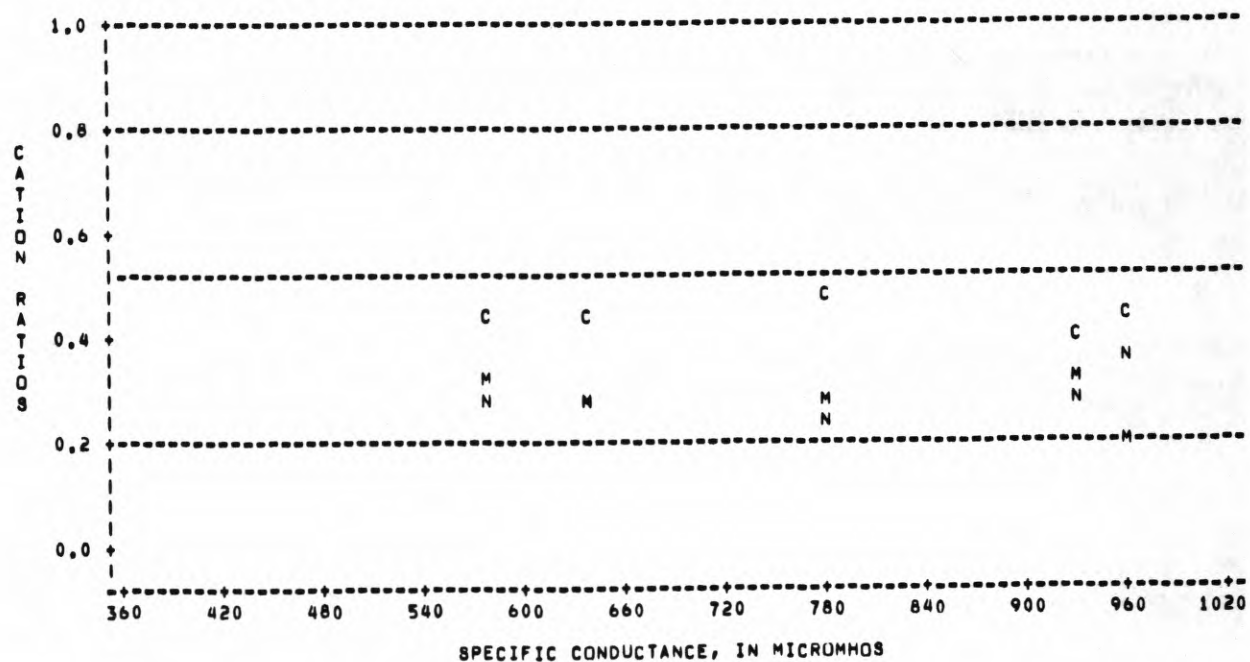
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	14	765	360	989	168	-1.00	1.29
Dissolved solids	10	538	371	713	98	-.01	.53
pH	14	8.2	7.5	8.9	0.4	-.13	-.46
Total hardness	14	277	114	340	62	-1.67	2.68
Chloride	14	38	11	100	25	1.49	1.85
Sulfate	14	161	22	230	52	-1.19	3.09
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	10	1.4	0.9	2.0	0.4	.36	-.94
Boron	0						

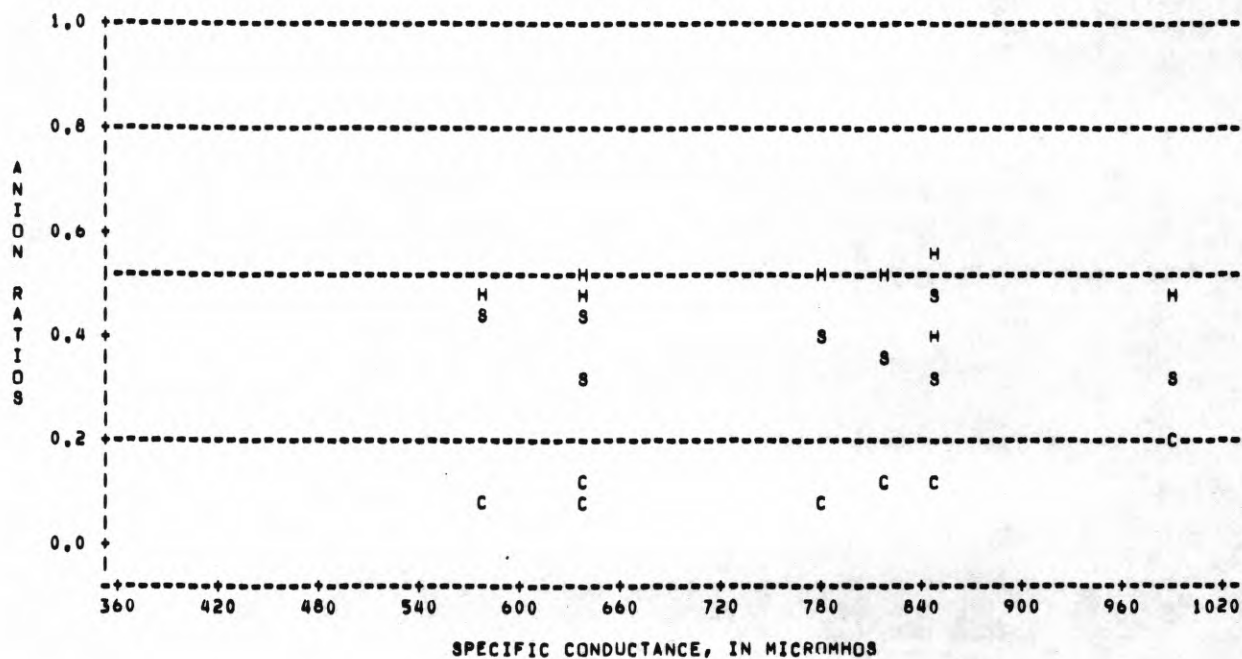
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	467	638	795	868	974
Dissolved solids	376	478	546	583	706
pH	7.6	7.8	8.2	8.4	8.7
Total hardness	158	235	300	320	330
Chloride	14	21	30	46	88
Sulfate	76	138	160	200	230
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.9	1.2	1.4	1.8	2.0
Boron					

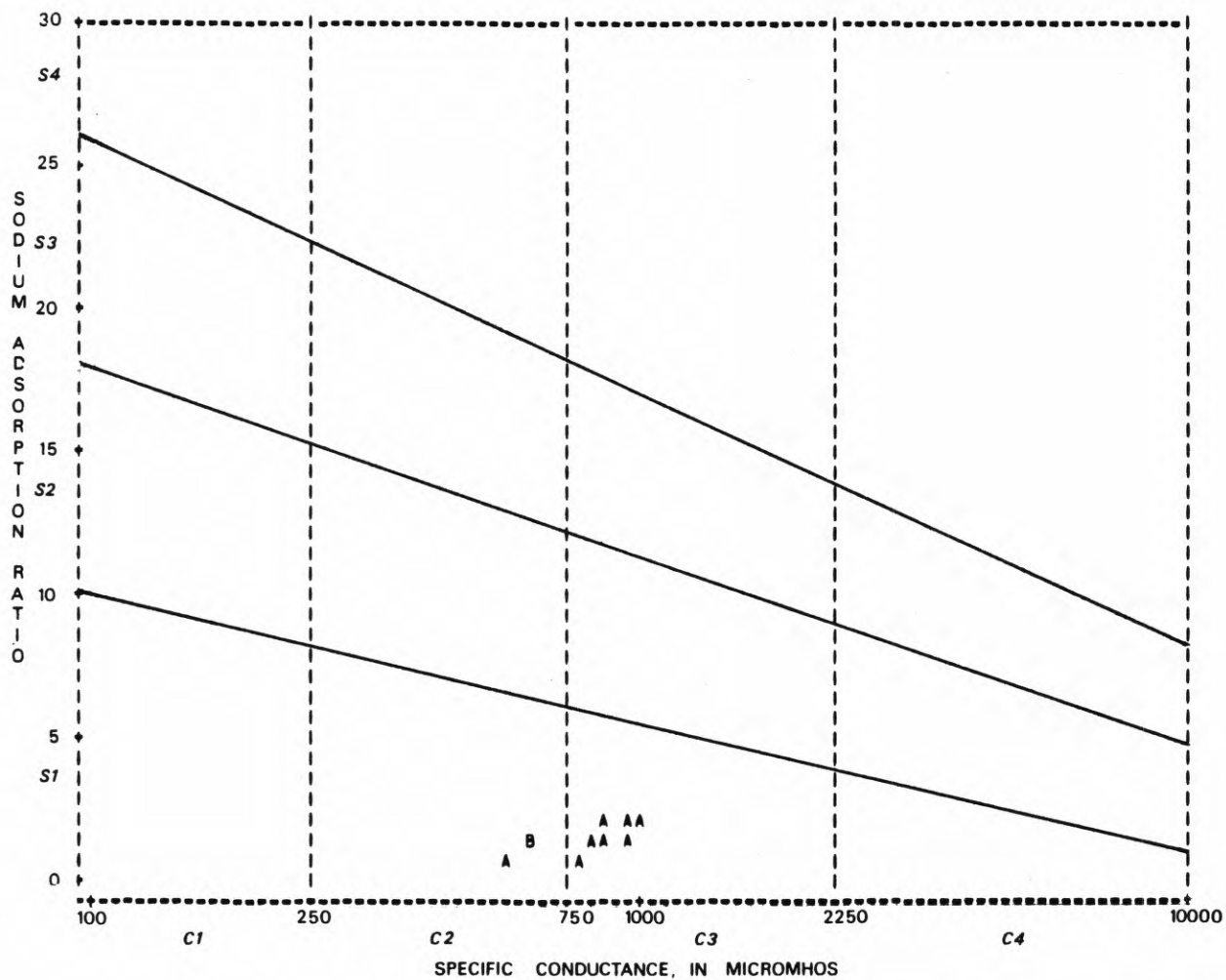
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER NR HOOKER, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER NR HOOKER, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER NR HOOKER, OK



NORTH CANADIAN RIVER BASIN

07234000 - Beaver River at Beaver, Okla.

LOCATION.--Lat 36°49'20", long 100°31'05", in SW¼ sec. 7, T.4 N., R.24 E., Beaver County, at bridge on U.S. Highway 270 at Beaver, 1.5 mi downstream from Home Creek, 5 mi upstream from Clear Creek, and at mile 576.0.

DRAINAGE AREA.--7,955 mi², of which 4,270 mi² is probably noncontributing.

PERIOD OF RECORD.--1952, 1958 to 1959, 1962 to 1979.

WATER TYPE.--For specific conductance greater than 1,000 umho, 89 percent of the samples, the water was sodium chloride type. For specific conductance less than 1,000 umho, the water was calcium carbonate/bicarbonate type.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time indicate trends of increasing concentration. The Spearman's rhos at the 95-percent probability level also show positive trends for all four constituents.

PUBLIC WATER SUPPLY.--Ninety-four percent of the hardness values were greater than 180 mg/L and the average concentration was 622 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 84 percent of the chloride values, the recommended maximum sulfate concentration of 250 mg/L was exceeded by 71 percent of the sulfate values, and the recommended maximum iron concentration of 300 ug/L was exceeded by 10 percent of the iron values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 7 percent of the cadmium values and the maximum lead contaminant level of 50 ug/L was exceeded by 10 percent of the lead values. Arsenic, chromium, and mercury did not exceed their maximum contaminant levels. Because of the frequency and magnitude by which the recommended maximum sulfate and chloride concentrations were exceeded and because the maximum cadmium and lead contaminant levels were exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 74 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with 51 percent of the SAR values equivalent to a high or very high sodium hazard. No boron data are available.

UNIVARIATE STATISTICS

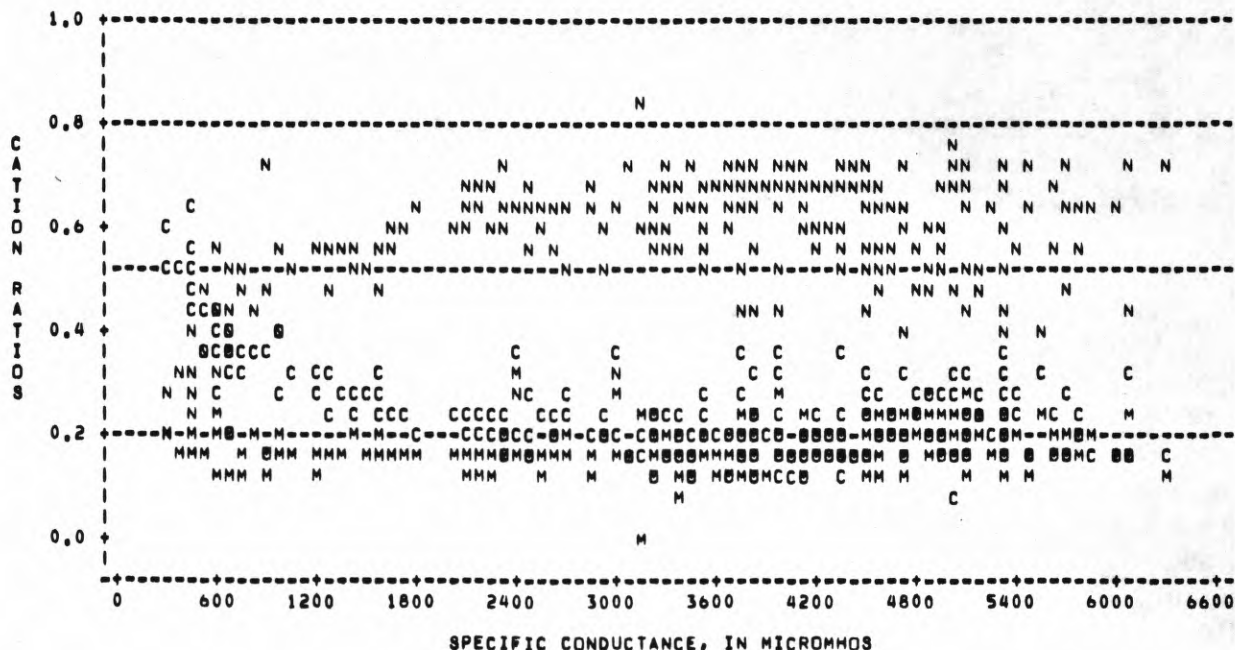
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	502	3331	286	57800	3117	12.25	200.25
Dissolved solids	472	2006	164	4190	940	-.17	-.74
pH	485	8.2	7.0	9.0	0.4	-.63	.12
Total hardness	473	622	110	1800	329	.90	.80
Chloride	488	712	14	1700	367	-.12	-.60
Sulfate	490	398	18	1100	236	.54	-.13
Iron	10	93	0	660	201	3.06	9.48
Fluoride	31	1.0	0.4	1.7	0.4	.21	-1.27
Arsenic	10	4	2	7	1.6	1.37	1.02
Cadmium	11	8	0	74	22	3.25	10.68
Chromium	10	4	0	20	8.3	1.69	1.19
Lead	10	14	0	75	23	2.46	6.32
Mercury	10	0.0	0.0	0.1	0.1	.48	-2.28
SAR	470	7.7	0.5	16	3.1	-.27	-.23
Boron	0						

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	891	2142	3335	4142	5067
Dissolved solids	541	1330	2110	2660	3290
pH	7.5	7.9	8.2	8.3	8.5
Total hardness	215	389	590	770	1100
Chloride	130	460	750	960	1200
Sulfate	82	220	370	550	729
Iron	1	18	20	55	604
Fluoride	0.7	0.7	0.9	1.4	1.5
Arsenic	2	3	3	4	7
Cadmium	0	0	2	2	61
Chromium	0	0	0	8	20
Lead	0	1	4	16	70
Mercury	0.0	0.0	0.0	0.1	0.1
SAR	2.7	5.9	8.0	9.8	11
Boron					

CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER AT BEAVER, OK



ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER AT BEAVER, OK



C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS
STATION NAME OR LOCAL IDENTIFIER=BEAVER RIVER AT BEAVER, OK



NORTH CANADIAN RIVER BASIN

07233000 - Coldwater Creek near Hardesty, Okla.

LOCATION.--Lat 36°38'38", long 101°12'38", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T.2 N., R.17 E., Texas County, at bridge on State Highway 3, 2 mi northwest of Hardesty, and at mile 5.7.

DRAINAGE AREA.--1,967 mi², of which 1,200 mi² is probably noncontributing.

PERIOD OF RECORD.--1952 to 1963.

WATER TYPE.--For specific conductance less than 750 umho, 19 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance greater than 750 umho the water was mixed type.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--All of the hardness values were greater than 180 mg/L and the average concentration was 333 mg/L. The hardness classification for this water is very hard. The recommended maximum sulfate concentration of 250 mg/L was exceeded by 1 percent of the sulfate values. No toxic metal data are available. Based on the data, this water should be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to high with 81 percent of the samples in the high salinity hazard class. All of the SAR values were equivalent to a low sodium hazard. None of the boron values exceeded the recommended limit of 750 ug/L for boron sensitive plants.

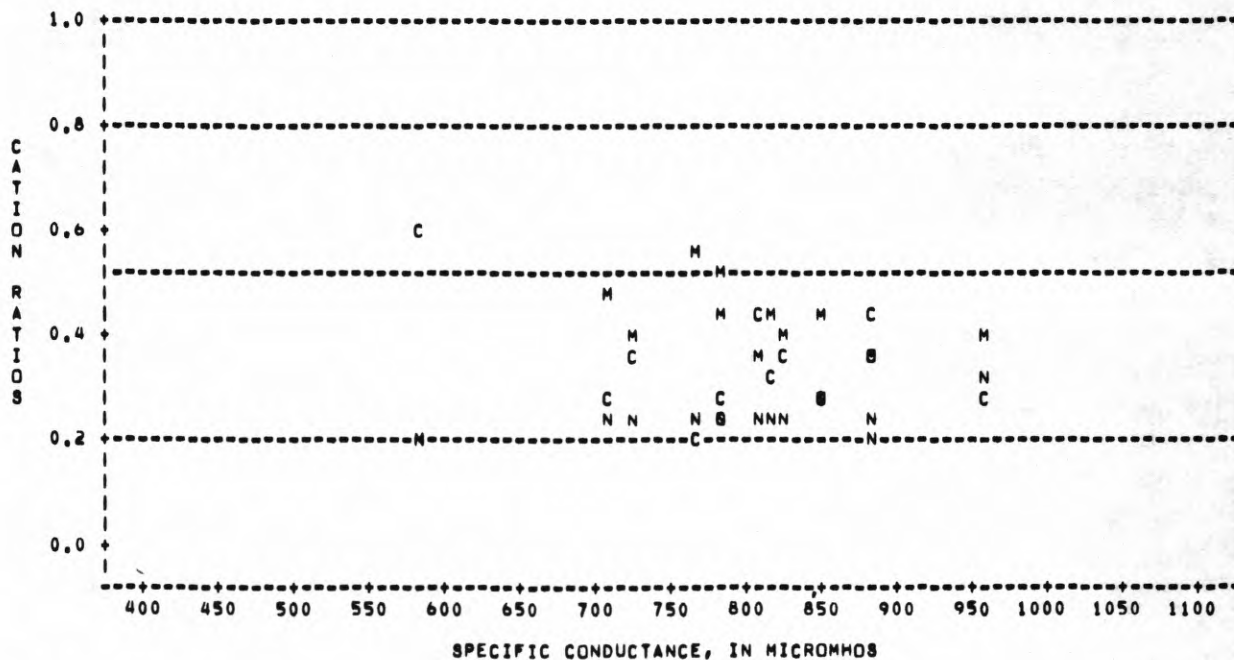
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	50	839	407	1080	147	-1.15	1.41
Dissolved solids	25	556	295	748	131	-.88	-.08
pH	38	8.0	7.4	8.4	0.2	-.93	.56
Total hardness	38	333	200	430	54	-.74	.16
Chloride	50	39	2.7	61	13	-1.17	1.50
Sulfate	25	176	16	252	75	-1.52	1.02
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	38	1.3	0.2	2.6	0.5	-.02	2.10
Boron	2	290	250	330			

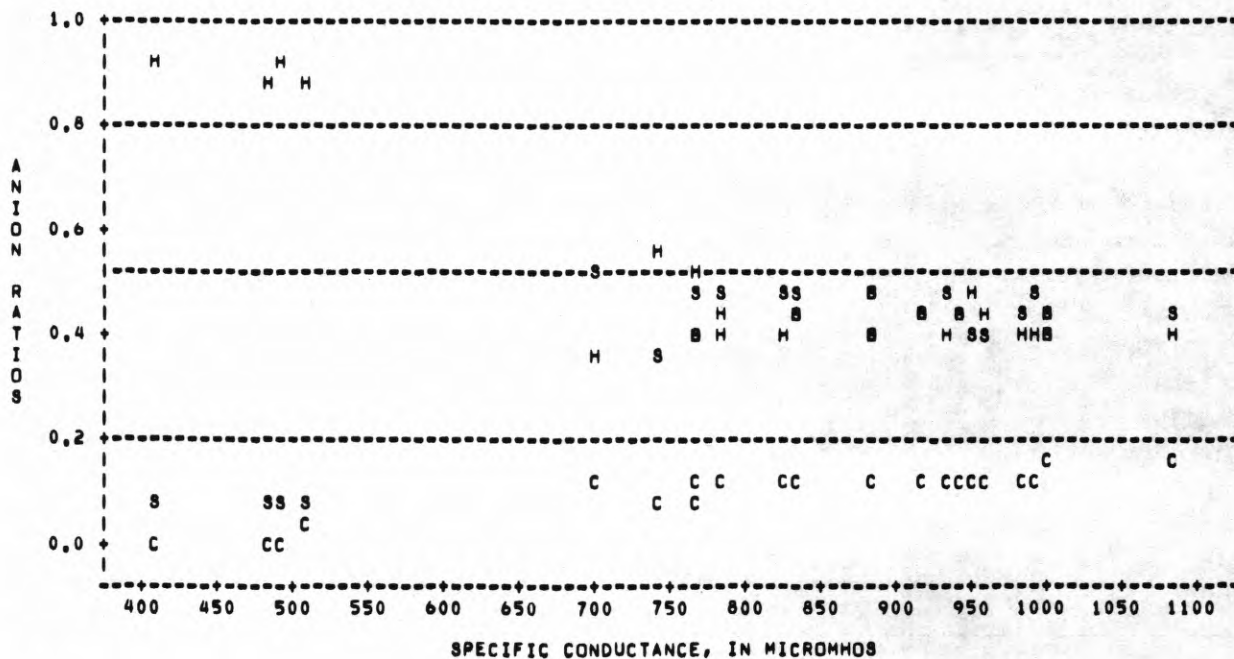
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	593	776	869	942	991
Dissolved solids	308	500	568	657	688
pH	7.5	7.9	8.0	8.2	8.2
Total hardness	253	305	343	372	392
Chloride	20	33	41	47	54
Sulfate	17	170	205	218	243
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.3	1.1	1.3	1.5	1.6
Boron					

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=COLDWATER CREEK NR HARDESTY, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=COLDWATER CREEK NR HARDESTY, OK



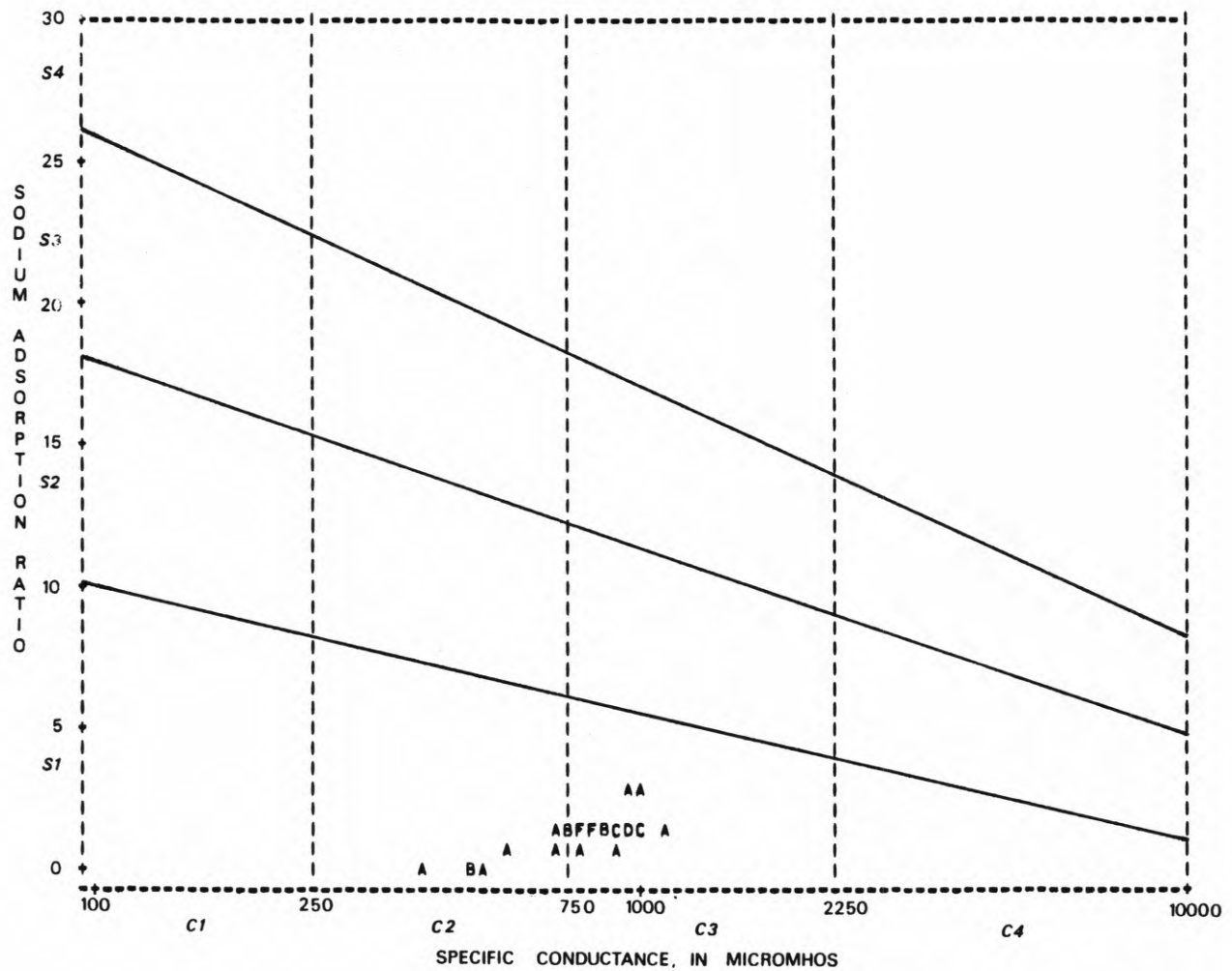
IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD

C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD

A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=COLDWATER CREEK NR HARDESTY, OK



NORTH CANADIAN RIVER BASIN

07242090 - Grief Creek near Wetumka, Okla.

LOCATION.--Lat 35°10'40", long 96°15'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T.8 N., R.10 E., Hughes County, at county road bridge 3 mi south of Wetumka.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1962 to 1963.

WATER TYPE.--For specific conductance greater than 200 umho, 90 percent of the samples, the water was chloride type. For specific conductance less than 200 umho, the water was carbonate/bicarbonate type. The data are not adequate to determine the cation-specific conductance distribution.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Fifty-four percent of the hardness values were greater than 120 mg/L and the average concentration was 121 mg/L. The hardness classification for this water varies from moderately hard to hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 17 percent of the chloride values. No toxic metal data are available. Because of the frequency by which the recommended maximum chloride concentration was exceeded, the suitability of this water for use as a public supply may be marginal.

IRRIGATION.--The salinity hazard ranged from medium to high with 64 percent of the samples having a medium salinity hazard. All of the SAR values were equivalent to a low sodium hazard. No boron data are available.

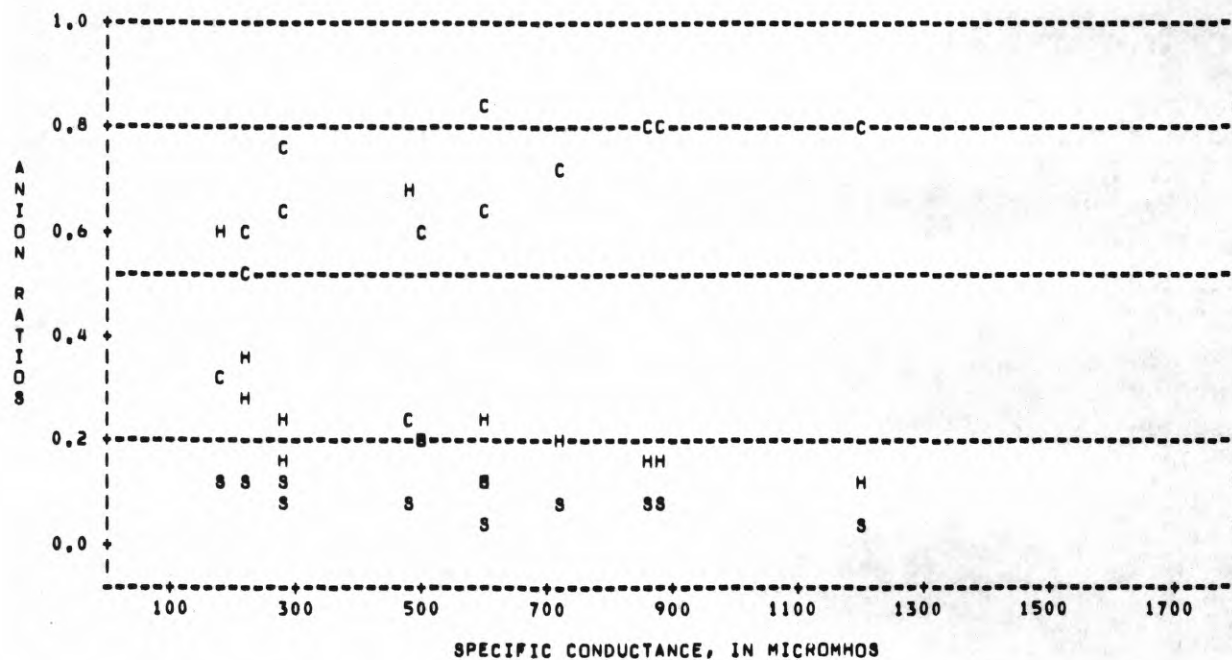
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	15	645	177	1810	441	1.37	2.32
Dissolved solids	15	393	122	1080	265	1.37	2.09
pH	15	7.8	7.2	8.4	0.3	.12	-.69
Total hardness	15	121	44	330	75	1.52	3.25
Chloride	15	155	19	525	134	1.64	3.31
Sulfate	15	22	8.0	56	13	1.26	2.46
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	3	3.7	2.8	4.4			
Boron	0						

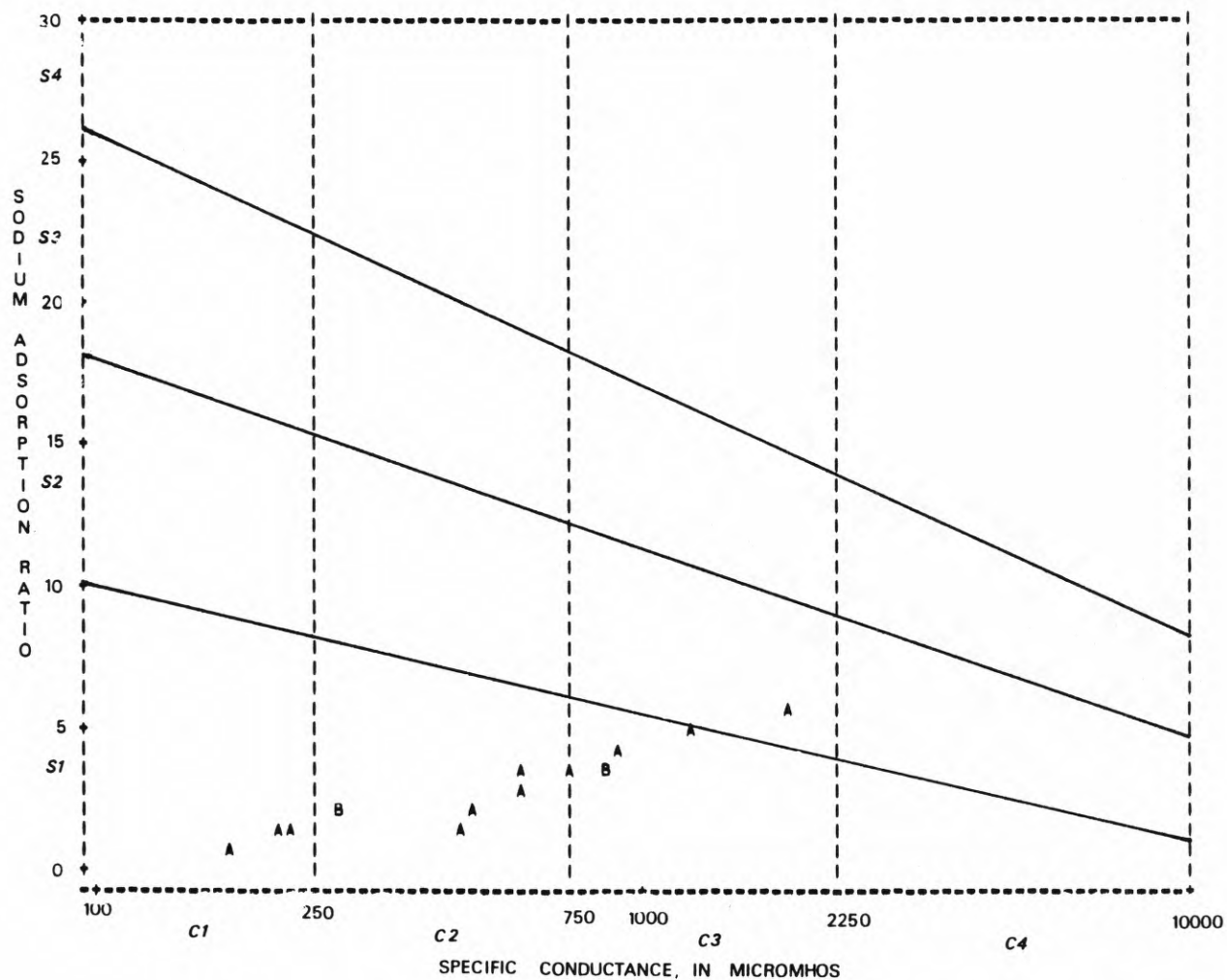
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	200	282	594	853	1450
Dissolved solids	135	161	355	508	899
pH	7.3	7.5	7.8	8.0	8.3
Total hardness	46	58	124	148	253
Chloride	31	44	130	210	402
Sulfate	8.6	11	23	29	42
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR					
Boron					

ANION RATIO PLOT
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=GRIEF CREEK NR WETUMKA, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=GRIEF CREEK NR WETUMKA, OK



NORTH CANADIAN RIVER BASIN

07242080 - Little Wewoka Creek near Wetumka, Okla.

LOCATION.--Lat 35°13'00", long 96°17'45", in SW¹/₄SW¹/₄ sec. 19, T.9 N., R.10 E., Hughes County, at State Highway 9 bridge, 3 mi west of Wetumka.

DRAINAGE AREA.--56 mi².

PERIOD OF RECORD.--1962 to 1963.

WATER TYPE.--The water was chloride type throughout the range of measured specific conductance. The data are not adequate to determine the cation-specific conductance distribution.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Seventy-eight percent of the hardness values were greater than 180 mg/L and the average concentration was 759 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 91 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 72 percent of the samples in the very high salinity hazard class. The sodium hazard ranged from low to very high with 33 percent of the SAR values equivalent to a very high sodium hazard. No boron data are available.

UNIVARIATE STATISTICS

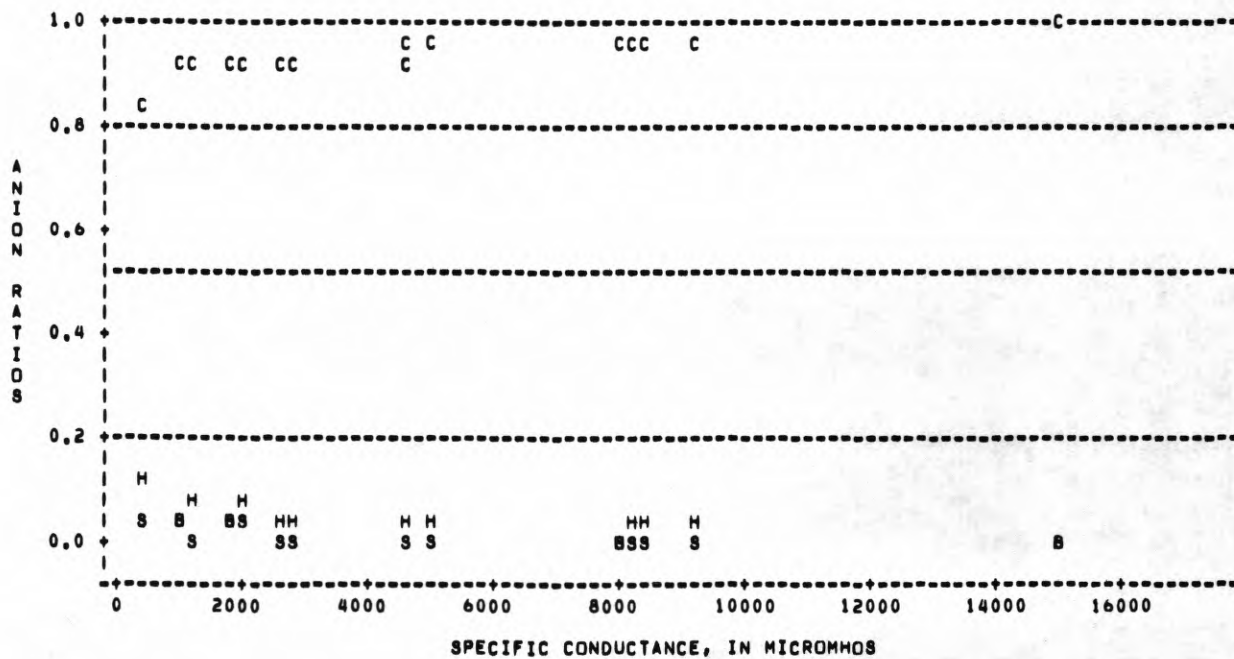
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	18	5550	488	15100	4385	1.07	0.60
Dissolved solids	18	3616	326	10600	2944	1.14	.87
pH	18	7.8	7.3	8.1	0.2	-.29	-.17
Total hardness	18	759	66	2250	629	.98	.33
Chloride	18	1837	124	5380	1582	1.23	1.00
Sulfate	18	25	6.2	70	15	1.90	4.88
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	12	9.5	1.7	23	6.4	.90	.19
Boron	0						

FREQUENCY DISTRIBUTION

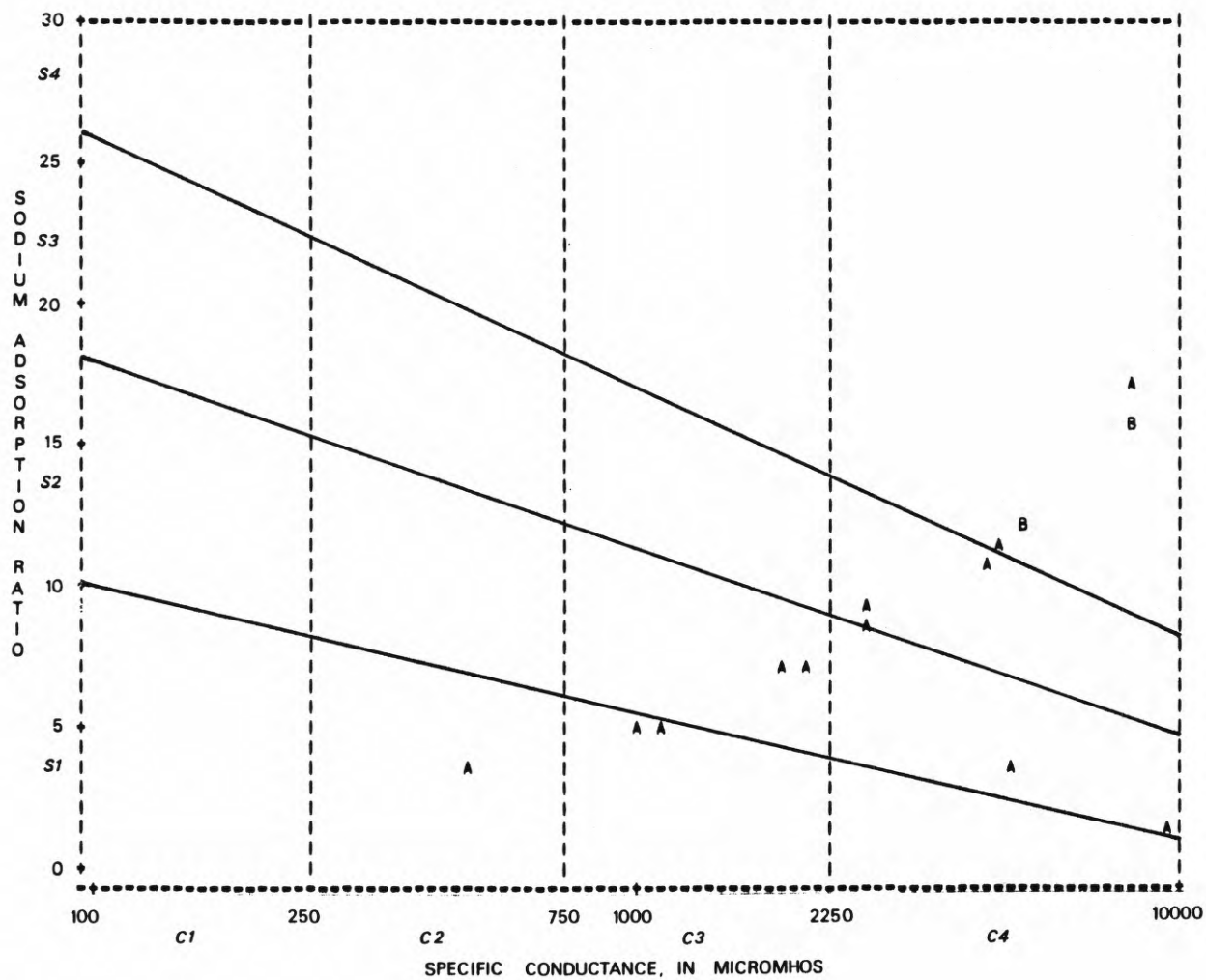
CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	933	2028	4760	8245	15101
Dissolved solids	529	1248	3115	5313	9610
pH	7.6	7.6	7.8	7.9	8.1
Total hardness	136	231	660	1205	1881
Chloride	266	600	1500	2750	5371
Sulfate	6.9	17	22	28	51
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	2.2	4.0	7.9	15	21
Boron					

ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=LITTLE WENOKA CREEK NR WETUMKA, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 DBS, B = 2 DBS, C = 3 DBS
 STATION NAME OR LOCAL IDENTIFIER=LITTLE WENOKA CREEK NR WETUMKA, OK



NORTH CANADIAN RIVER BASIN

07237500 - North Canadian River at Woodward, Okla.

LOCATION.--Lat 36°26'18", long 99°16'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T.23 N., R.20 W., Woodward County, at bridge on State Highway 15, 200 ft downstream from Atchison, Topeka, and Santa Fe Railway Co. bridge, 6.0 mi east of Woodward, 7.2 mi upstream from Indian Creek, 27.5 mi downstream from Wolf Creek, and at mile 460.2.

DRAINAGE AREA.--11,589 mi², of which 4,812 mi² is probably noncontributing.

PERIOD OF RECORD.--1955, 1961 to 1963, 1975 to 1979.

WATER TYPE.--The water was generally mixed type throughout the range of measured specific conductance. The sodium and chloride ions were dominant throughout the specific conductance range and their ratios were generally 40 to 50 percent. Therefore, although this water was classed as mixed, it is very nearly sodium chloride type.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time indicate trends of increasing concentration. The Spearman's rhos at the 95-percent probability level also indicate positive trends, increasing concentration, for the four constituents.

PUBLIC WATER SUPPLY.--Ninety-nine percent of the hardness values were greater than 180 mg/L and the average concentration was 509 mg/L. The hardness classification for this water is very hard. The recommended maximum pH of 9.0 was exceeded by 8 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 60 percent of the chloride values, and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 55 percent of the sulfate values. The toxic metals arsenic, cadmium, chromium, lead, and mercury did not exceed their maximum contaminant levels. Because of the frequency by which the recommended maximum sulfate and chloride concentrations were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 37 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to high with 55 percent of the SAR values equivalent to a low sodium hazard. No boron data are available.

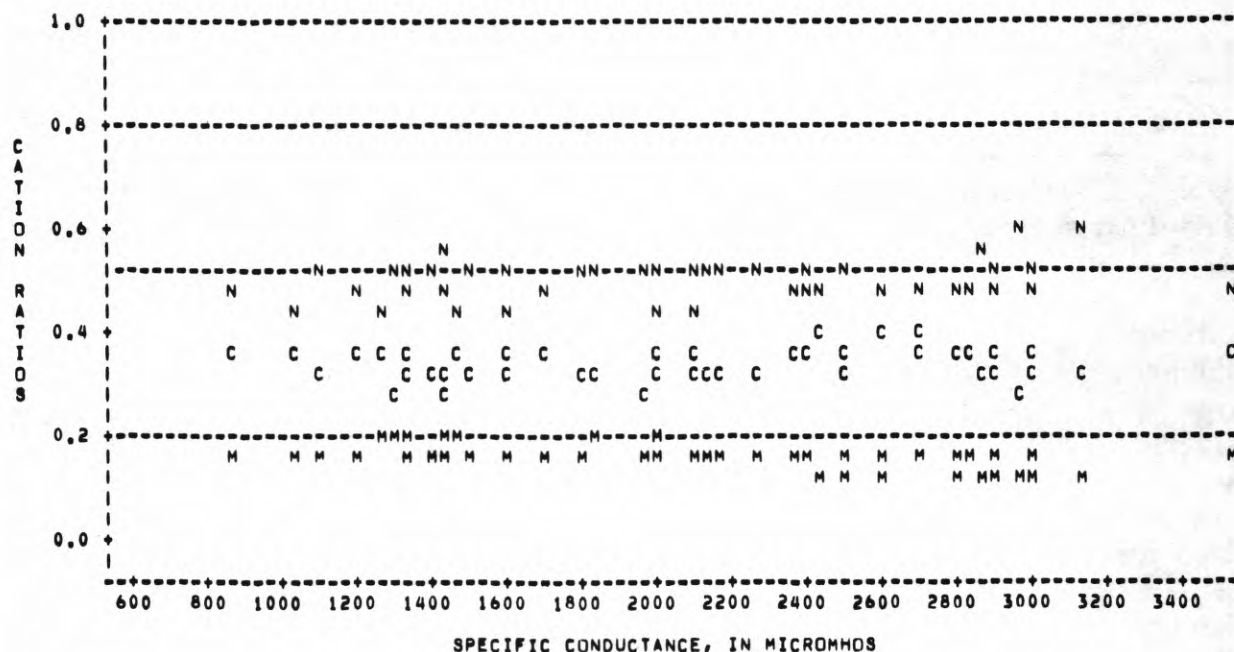
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	113	1982	693	3540	676	0.27	-1.04
Dissolved solids	74	1306	400	3110	549	.83	.78
pH	101	8.3	7.3	9.4	0.5	.13	-.36
Total hardness	75	509	172	970	187	.39	-.63
Chloride	87	307	100	600	120	.55	-.38
Sulfate	86	344	75	930	190	.71	-.21
Iron	19	39	10	140	35	2.39	5.05
Fluoride	54	0.7	0.3	1.0	0.1	-.54	3.77
Arsenic	19	4	2	7	1.5	.73	-.23
Cadmium	19	1	0	4	1.0	1.39	2.32
Chromium	19	5	0	40	10	2.67	7.92
Lead	19	4	0	31	7.0	3.50	13.58
Mercury	19	0.0	0.0	0.1	0.0	1.17	-.72
SAR	75	4.4	2.1	8.3	1.1	.57	1.15
Boron	0						

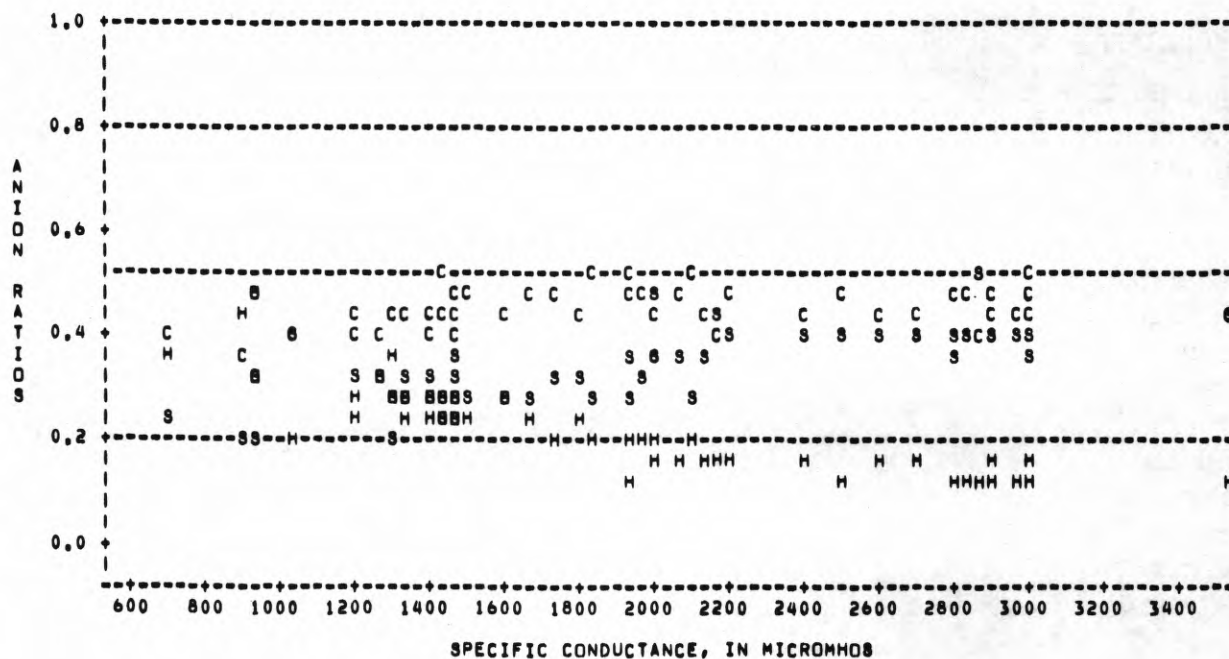
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	1226	1410	1860	2600	2900
Dissolved solids	703	853	1215	1730	1965
pH	7.7	8.0	8.3	8.7	8.9
Total hardness	286	360	470	680	780
Chloride	175	210	295	380	502
Sulfate	137	190	278	515	583
Iron	20	20	30	40	130
Fluoride	0.6	0.7	0.7	0.8	0.9
Arsenic	2	3	3	5	6
Cadmium	0	0	1	1	3
Chromium	0	0	0	10	20
Lead	0	0	2	4	9
Mercury	0.0	0.0	0.0	0.1	0.1
SAR	3.0	3.5	4.3	5.0	5.7
Boron					

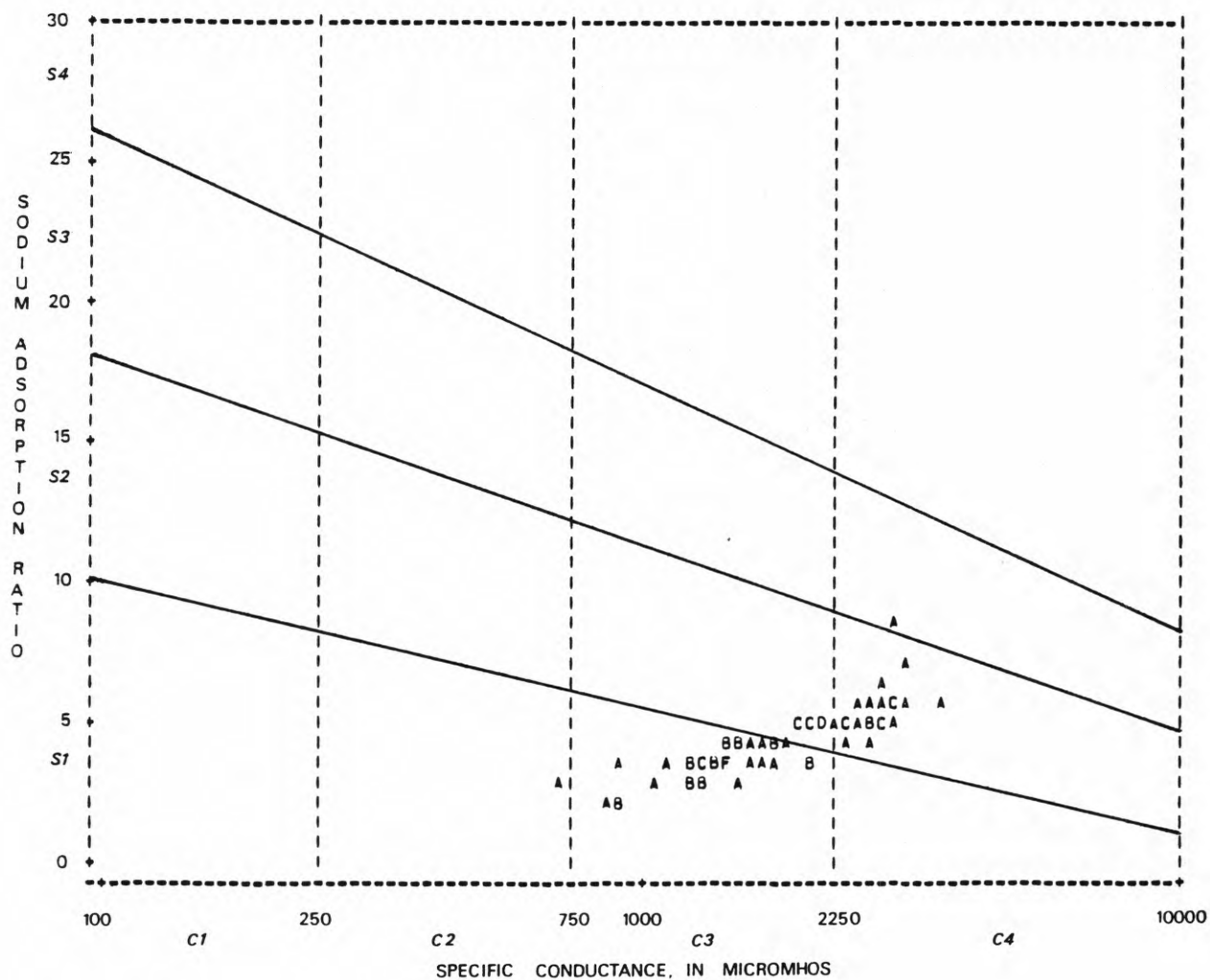
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER AT WOODWARD, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER AT WOODWARD, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER AT WOODWARD, OK



NORTH CANADIAN RIVER BASIN

07238000 - North Canadian River near Seiling, Okla.

LOCATION.--Lat 36°11'06", long 98°55'15", in NW¼ sec. 28, T.20 N., R.16 W., Major County, at bridge on U.S. Highway 60, 2.0 mi upstream from Seiling Creek, 2.2 mi north of Seiling, 2.8 mi downstream from Deep Creek, and at mile 422.6.

DRAINAGE AREA.--12,261 mi², of which 4,847 mi² is probably noncontributing.

PERIOD OF RECORD.--1951, 1953 to 1959, 1968 to 1971, 1974 to 1975.

WATER TYPE.--For specific conductance less than 800 umho, 6 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance greater than 800 umho, the data indicate that the water probably was sodium sulfate type.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Ninety-six percent of the hardness values were greater than 180 mg/L and the average concentration was 487 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 31 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 64 percent of the sulfate values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride and sulfate concentrations were exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high, with 85 percent of the samples having a high salinity hazard. The sodium hazard ranged from low to medium with 88 percent of the SAR values equivalent to a low sodium hazard. No boron data are available.

UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	170	1678	465	6900	660	3.03	22.79
Dissolved solids	94	1206	276	2750	436	.55	1.43
pH	170	8.2	6.3	8.8	0.4	-1.27	3.71
Total hardness	117	487	57	1590	228	1.59	4.30
Chloride	132	213	20	455	84	-.01	.03
Sulfate	92	321	36	935	178	.77	.59
Iron	0						
Fluoride	8	0.5	0.0	0.8			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	88	3.2	0.5	5.3	1.0	-.46	.11
Boron	0						

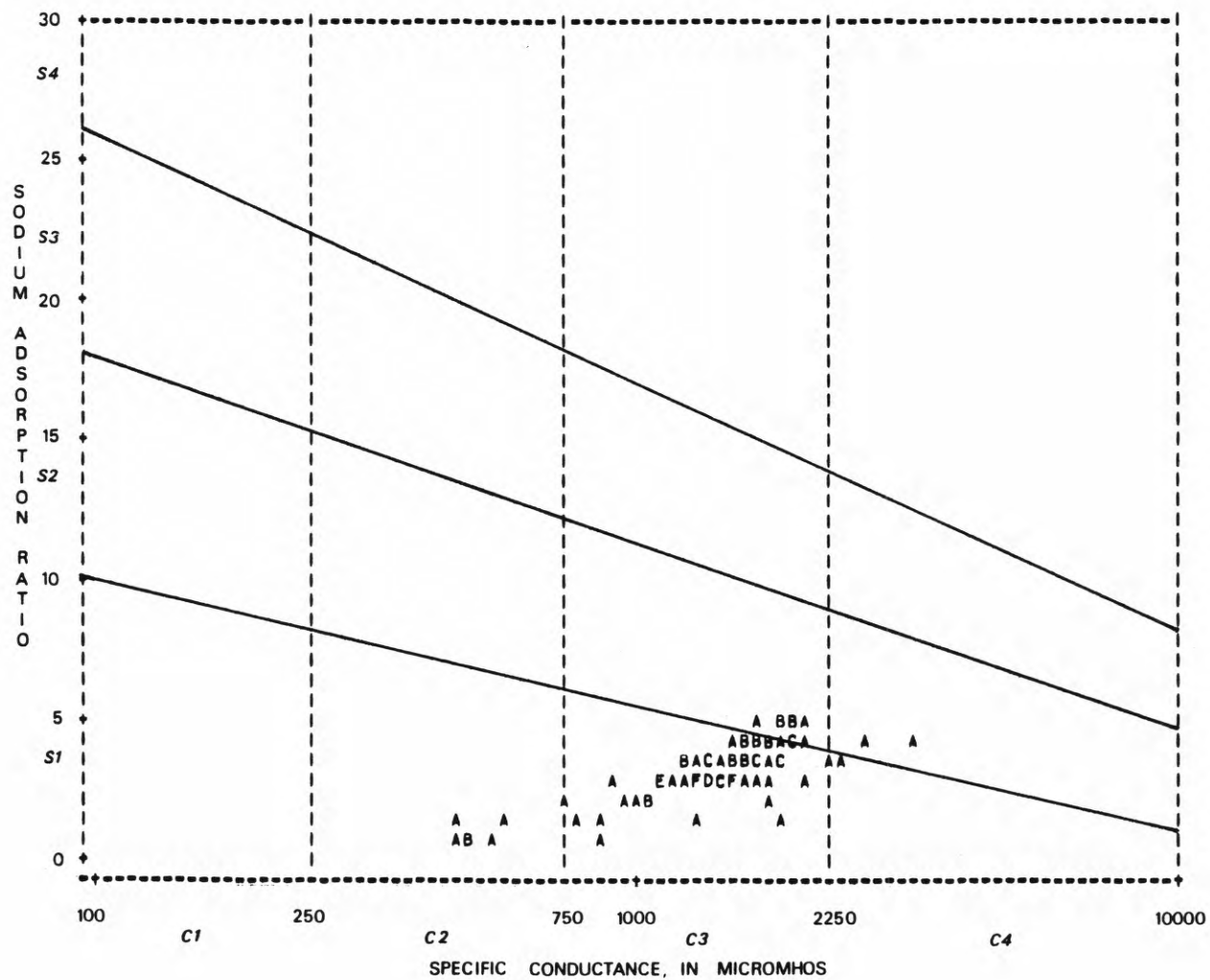
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	962	1308	1680	2000	2247
Dissolved solids	650	977	1170	1460	1725
pH	7.6	8.0	8.2	8.4	8.5
Total hardness	263	345	430	560	813
Chloride	109	170	208	271	335
Sulfate	98	200	284	459	594
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.5	2.6	3.2	3.9	4.4
Boron					

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR SEILING, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR SEILING, OK



NORTH CANADIAN RIVER BASIN

07239000 - North Canadian River at Canton, Okla.

LOCATION.--Lat 36°04'45", long 98°35'25", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 33, T.19 N., R.13 W., Blaine County, 2,700 ft downstream from Canton Dam, 1.5 mi northwest of Canton, 4.8 mi upstream from Minnehaha Creek, and at mile 393.8.

DRAINAGE AREA.--12,484 mi², of which 4,883 mi² is probably noncontributing.

PERIOD OF RECORD.--1951 to 1959, 1973 to 1979.

WATER TYPE.--The water was mixed type throughout the range of measured specific conductance.

TREND.--Plots of the hardness, chloride, and sulfate concentrations versus time indicate the possibility of negative trends for hardness and chloride. The Spearman's rhos for hardness and chloride at the 95-percent probability level indicate negative trends. The Spearman's rho for sulfate indicates no trend. Current data are not available for the dissolved solids.

PUBLIC WATER SUPPLY.--Ninety-eight percent of the hardness values were greater than 180 mg/L and the average concentration was 348 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 12 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 28 percent of the sulfate values. No toxic metal data are available. Even though the recommended maximum sulfate and chloride concentrations were frequently exceeded, the concentrations were not so large as to make this water completely unsuitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to high, with 86 percent of the samples having a high salinity hazard. All of the SAR values were equivalent to a low sodium hazard. The data indicate boron phytotoxic effects should not occur.

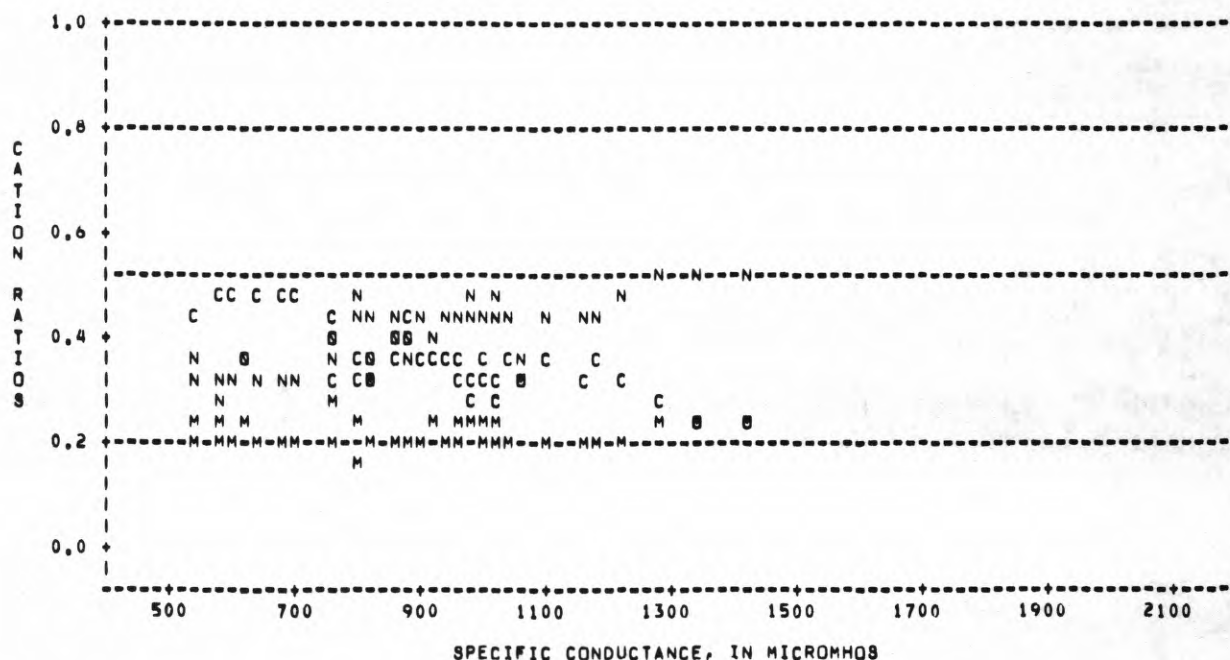
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	94	1249	533	2000	405	-0.09	-1.22
Dissolved solids	47	557	314	861	132	.18	-.21
pH	93	8.1	7.1	8.8	0.4	-.53	-.26
Total hardness	81	348	174	794	122	.87	.68
Chloride	92	205	16	350	90	.50	1.50
Sulfate	67	202	20	735	109	1.85	7.55
Iron	0						
Fluoride	48	0.7	0.3	1.3	0.2	.59	.38
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	47	2.3	1.2	4.0	0.7	.33	.03
Boron	45	154	0	580	116	1.44	3.36

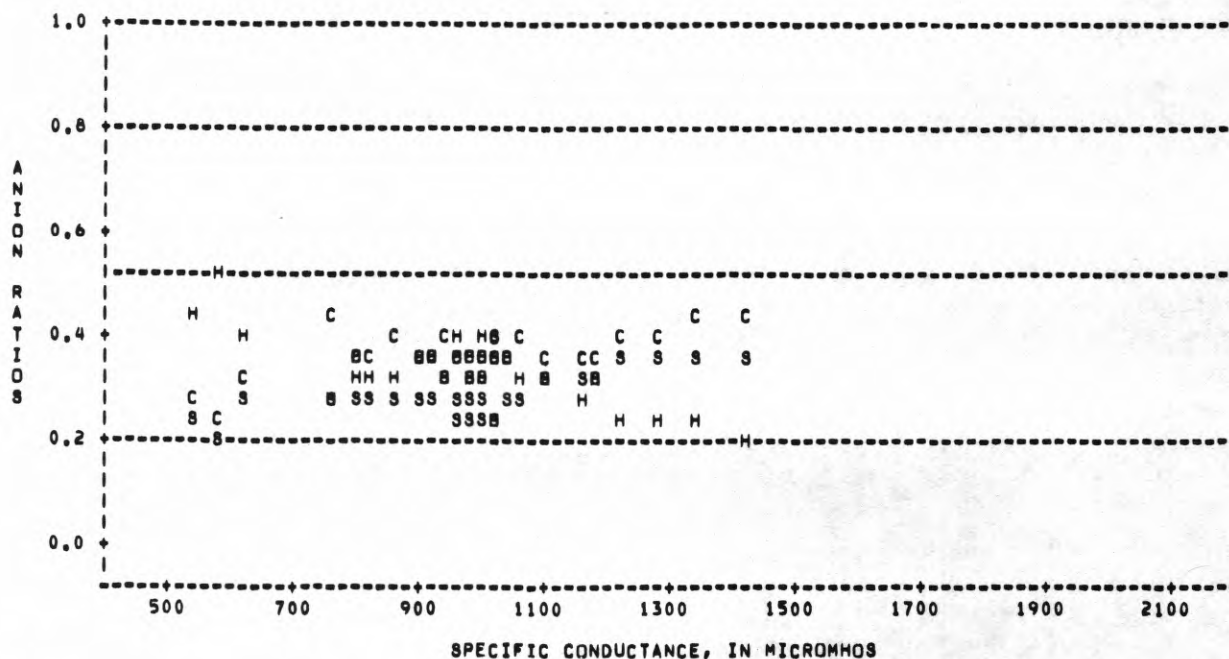
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	663	920	1295	1600	1775
Dissolved solids	362	463	575	621	758
pH	7.4	7.7	8.1	8.2	8.4
Total hardness	208	256	320	449	504
Chloride	106	130	205	228	258
Sulfate	94	124	202	260	306
Iron					
Fluoride	0.5	0.6	0.7	0.9	1.0
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.3	1.8	2.3	2.7	3.0
Boron	12	60	150	195	300

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER AT CANTON, OK



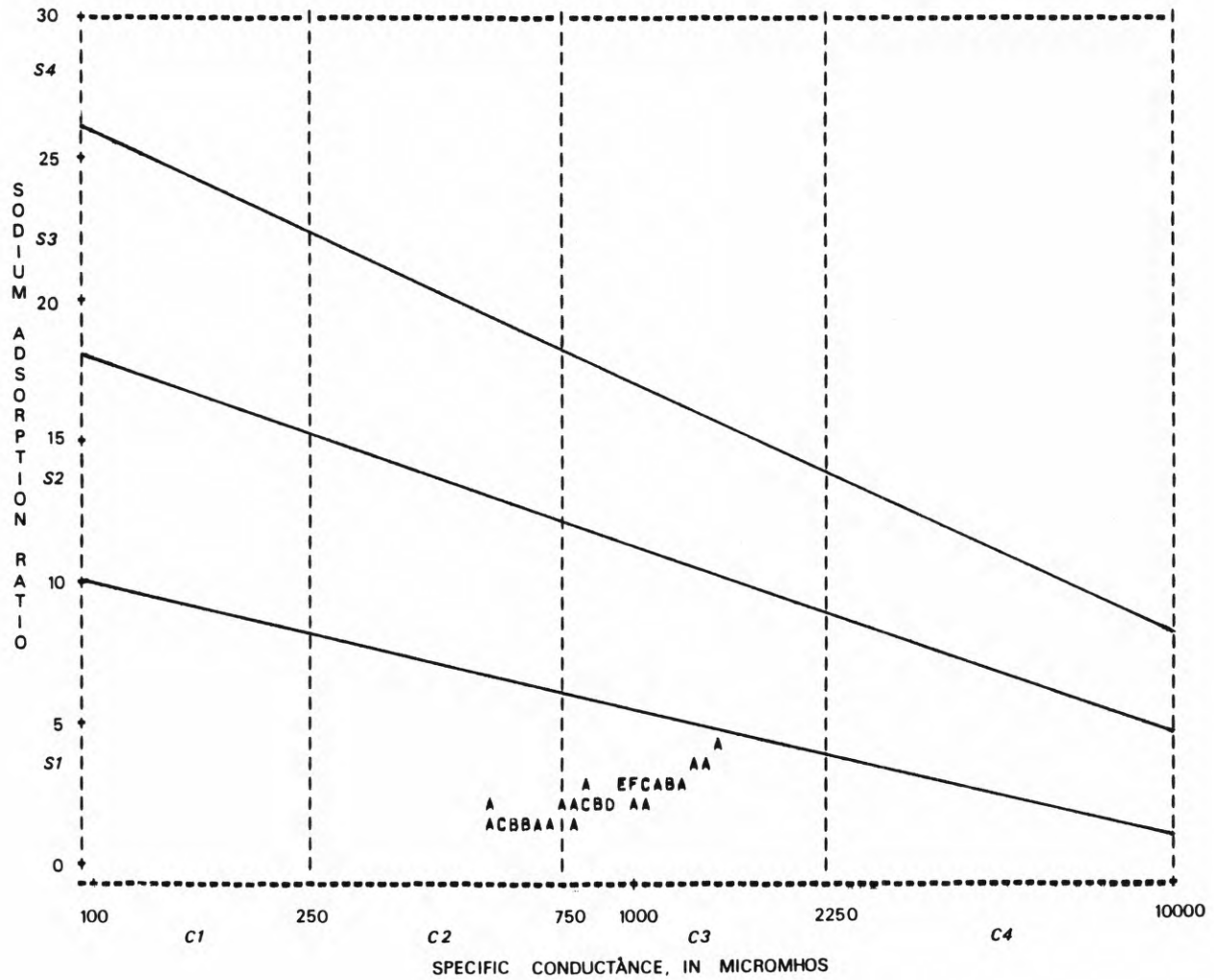
ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER AT CANTON, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER AT CANTON, OK



NORTH CANADIAN RIVER BASIN

07239450 - North Canadian River near Fort Reno, Okla.

LOCATION.--Lat 35°36'59", long 98°03'57", in E½ sec. 9, T.13 N., R.8 W., Canadian County, at bridge on county road, 4 mi northwest of Fort Reno, 3 mi east and 1 mi north of Calumet.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1974 to 1975.

WATER TYPE.--The anions were mixed type throughout the range of measured specific conductance. There are no cation distribution data.

PUBLIC WATER SUPPLY.--There are no hardness data. One of eight sulfate values exceeded the recommended maximum sulfate concentration of 250 mg/L. The recommended maximum pH of 9.0 was exceeded by 4 percent of the pH values. No toxic metal data are available. The data are insufficient to evaluate the suitability of this water for use as a public supply.

IRRIGATION.--The salinity hazard was high for all samples. No SAR or boron data are available.

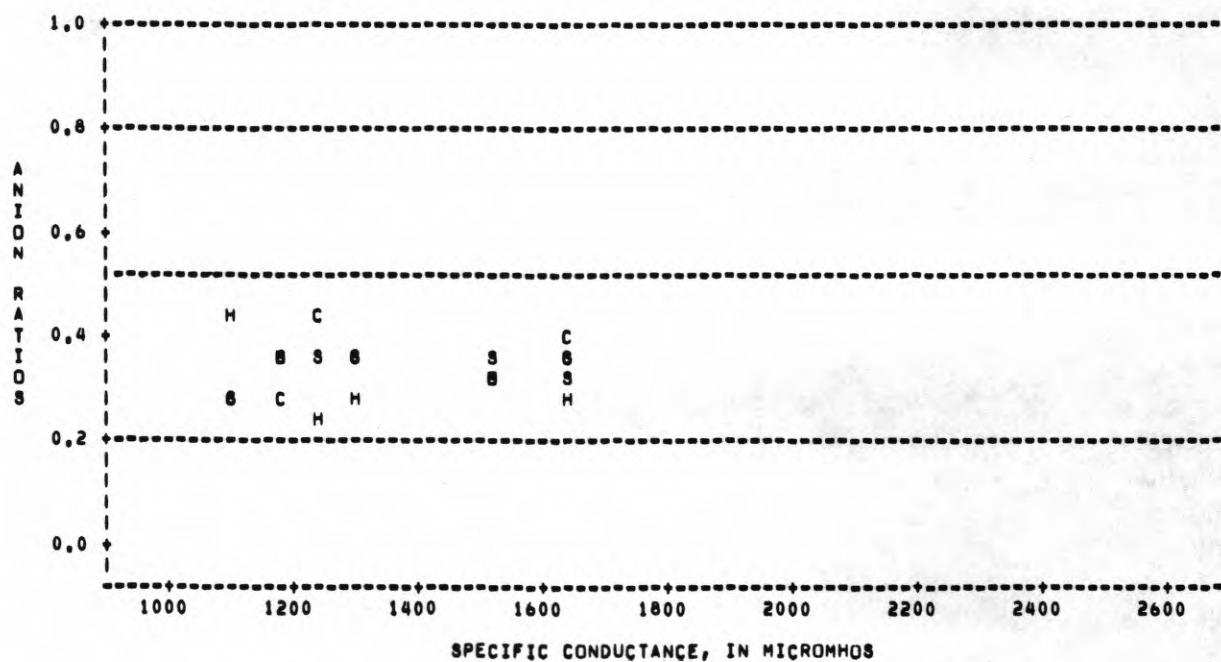
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	34	1578	1080	2200	268	-0.11	-0.02
Dissolved solids	38	1011	634	1450	192	-.10	-.29
pH	39	8.3	7.6	9.5	0.3	.99	4.38
Total hardness	0						
Chloride	8	170	110	240			
Sulfate	8	226	150	270			
Iron	0						
Fluoride	8	0.7	0.4	1.0			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	0						
Boron	0						

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	1080	1437	1600	1750	2065
Dissolved solids	642	894	990	1160	1326
pH	7.8	8.1	8.3	8.5	8.9
Total hardness					
Chloride					
Sulfate					
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR					
Boron					

ANION RATIO PLOT
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR FORT RENO, OK



NORTH CANADIAN RIVER BASIN

07239500 - North Canadian River near El Reno, Okla.

LOCATION.--Lat 35°33'44", long 97°57'32", on east line of sec. 32, T.13 N., R.7 W., Canadian County, at bridge on old U.S. Highway 81, 2.0 mi north of courthouse in El Reno, 2.2 mi downstream from Target Creek, and at mile 307.4.

DRAINAGE AREA.--13,042 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--1950 to 1951, 1953, 1973 to 1979.

WATER TYPE.--For specific conductance less than 400 umho, 10 percent of the samples, the water was calcium carbonate/bicarbonate type. For specific conductance greater than 400 umho, the water was mixed type.

TREND.--Plots of the hardness, chloride, and sulfate concentrations versus time do not indicate any trends. However, the Spearman's rho for each of the three constituents indicates a positive trend at the 95-percent probability level. There are no current data for the dissolved solids.

PUBLIC WATER SUPPLY.--Eighty percent of the hardness values were greater than 180 mg/L and the average concentration was 321 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum pH of 9.0 was exceeded by 3 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 5 percent of the chloride values, the recommended maximum sulfate concentration of 250 mg/L was exceeded by 29 percent of the sulfate values, and the recommended maximum iron concentration of 300 ug/L was exceeded by 12 percent of the iron values. The data indicate that arsenic, cadmium, chromium, lead, and mercury should not exceed their maximum contaminant levels. Because the recommended maximums for pH, chloride, sulfate, and iron were exceeded, the suitability of this water for use as a public water supply may be questionable.

IRRIGATION.--The salinity hazard ranged from low to high with 72 percent of the samples having a high salinity hazard. All of the SAR values were equivalent to a low sodium hazard. The data indicate that boron phytotoxic effects should not occur.

UNIVARIATE STATISTICS

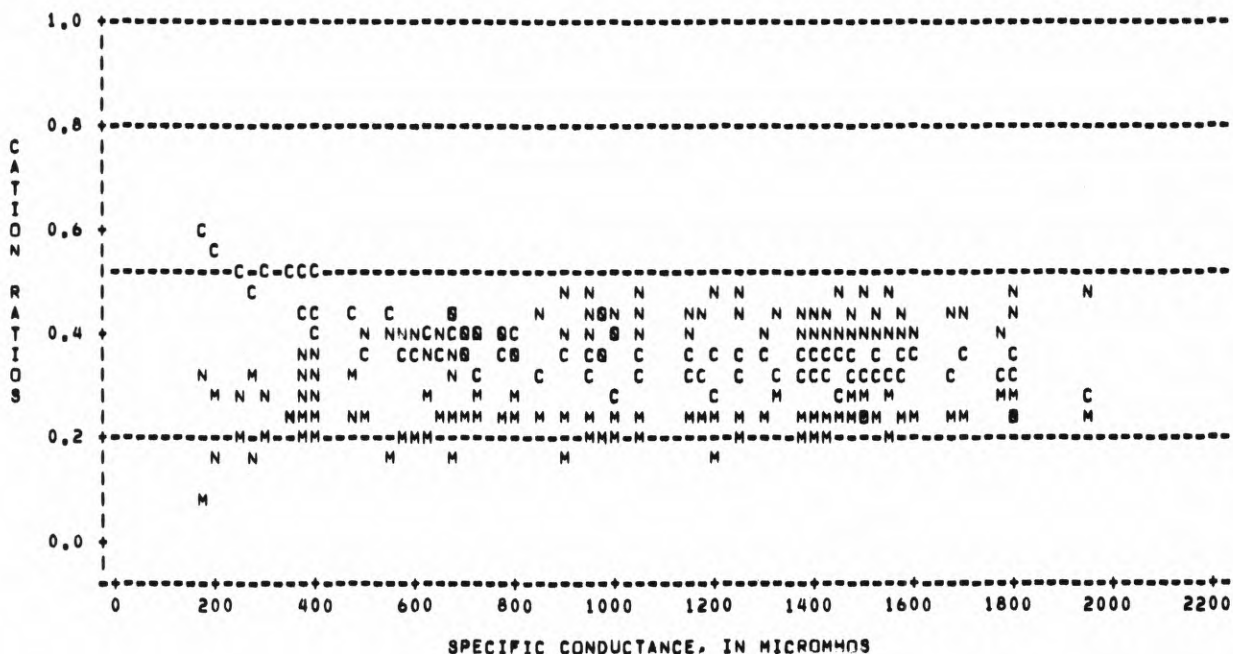
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	236	1145	187	2200	516	-0.10	-1.12
Dissolved solids	173	621	120	1210	309	.19	-1.16
pH	238	8.0	7.0	9.4	0.4	.01	.29
Total hardness	204	321	80	727	148	.24	-1.04
Chloride	216	136	6.6	394	77	.19	-.57
Sulfate	207	189	13	1013	137	1.81	7.08
Iron	17	86	0	780	197	3.24	10.78
Fluoride	12	0.7	0.1	0.9	0.2	-1.97	3.97
Arsenic	1	3					
Cadmium	16	1	0	3	1.0	1.42	1.10
Chromium	15	2	0	10	4.1	1.61	.77
Lead	17	3	0	10	3.2	1.48	.98
Mercury	1	0.1					
SAR	160	2.2	0.4	4.1	0.9	-.06	-.95
Boron	11	198	70	300	70	-.27	-.60

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	290	678	1195	1588	1783
Dissolved solids	160	366	596	906	1050
pH	7.3	7.7	8.0	8.3	8.5
Total hardness	108	194	300	460	520
Chloride	18	70	130	200	230
Sulfate	28	83	165	270	340
Iron	0	10	20	50	436
Fluoride	0.1	0.6	0.8	0.8	0.9
Arsenic					
Cadmium	0	0	0	1	2
Chromium	0	0	0	2	10
Lead	0	0	1	4	9
Mercury					
SAR	0.7	1.5	2.2	3.0	3.3
Boron	70	150	180	260	294

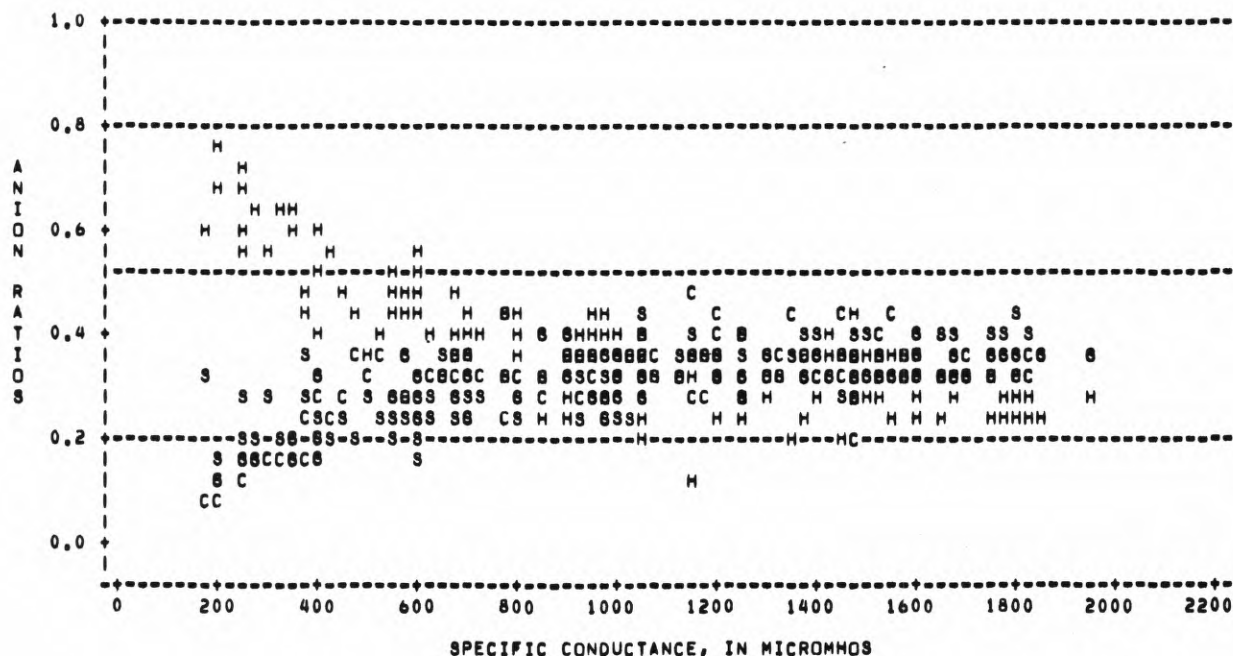
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR EL RENO, OK



ANION RATIO PLOT

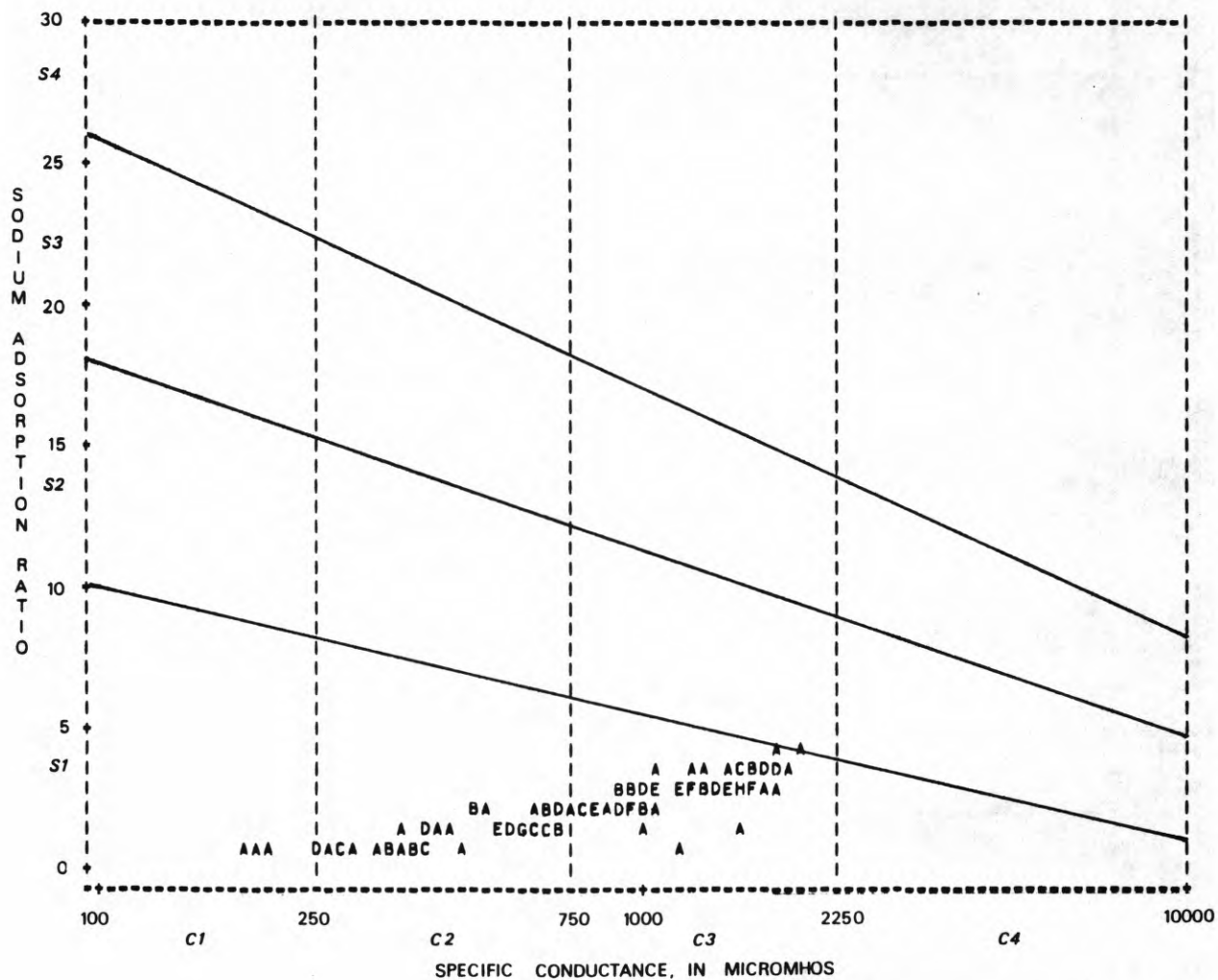
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR EL RENO, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR EL RENO, OK



NORTH CANADIAN RIVER BASIN

07239700 - North Canadian River near Yukon, Okla.

LOCATION.--Lat 35°32'27", long 97°44'31", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 5, T.12 N., R.5 W., Canadian County, at bridge on State Highway 4, 3 mi north of Yukon.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1952 to 1954.

WATER TYPE.--The water was mixed type throughout the range of measured specific conductance.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Eighty-five percent of the hardness values were greater than 180 mg/L and the average concentration was 255 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 5 percent of the chloride values and the recommended maximum sulfate concentration of 250 mg/L was exceeded by 8 percent of the sulfate values. Only one analysis was available for the toxic metals cadmium, chromium, and lead and the concentrations were well within their maximum contaminant levels. No data are available for arsenic or mercury. Based on the data, this water should be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to high with 64 percent of the samples having a high salinity hazard. The sodium hazard ranged from low to medium with 96 percent of the SAR values equivalent to a low sodium hazard. The data indicate that boron phytotoxic effects should not occur.

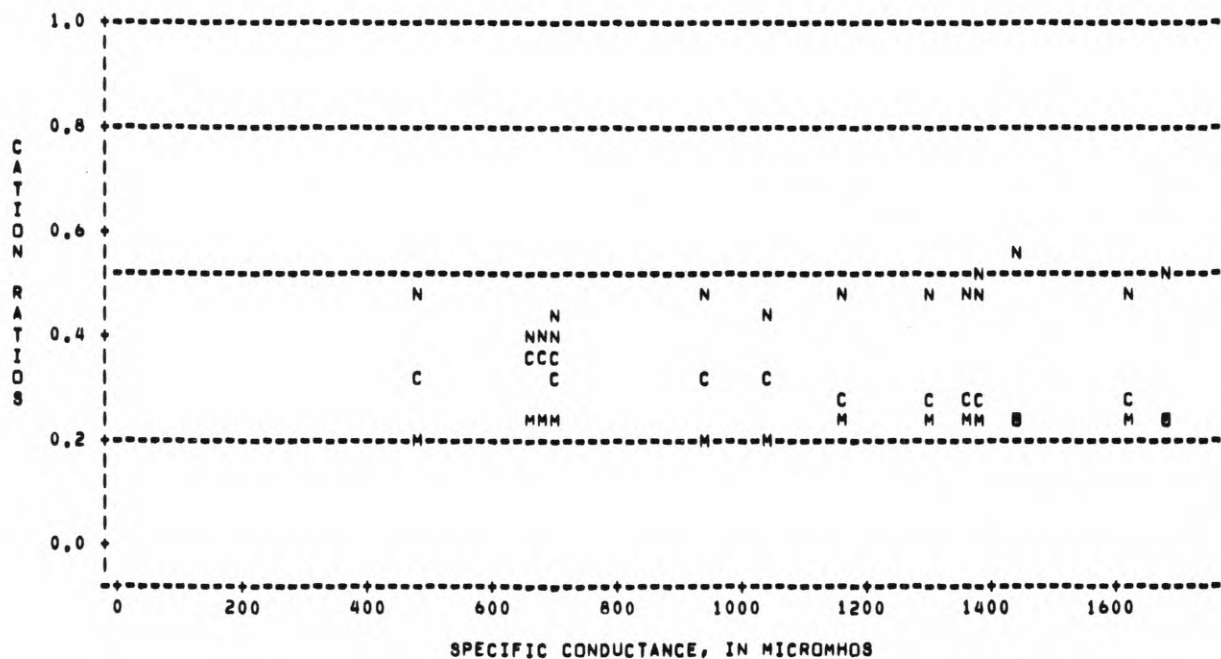
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	57	1001	179	1690	386	0.04	-0.85
Dissolved solids	56	607	98	1060	241	.13	-.91
pH	56	8.0	7.2	8.4	0.3	-.76	.03
Total hardness	56	255	64	416	84	.00	-.42
Chloride	56	138	11	278	68	.16	-1.07
Sulfate	56	151	23	301	68	.18	-.96
Iron	1	40					
Fluoride	14	0.6	0.5	0.9	0.2	1.05	-.70
Arsenic	0						
Cadmium	1	0					
Chromium	1	0					
Lead	1	0					
Mercury	0						
SAR	56	3.0	0.6	5.0	1.1	-.15	-1.02
Boron	16	338	170	670	180	.93	-.81

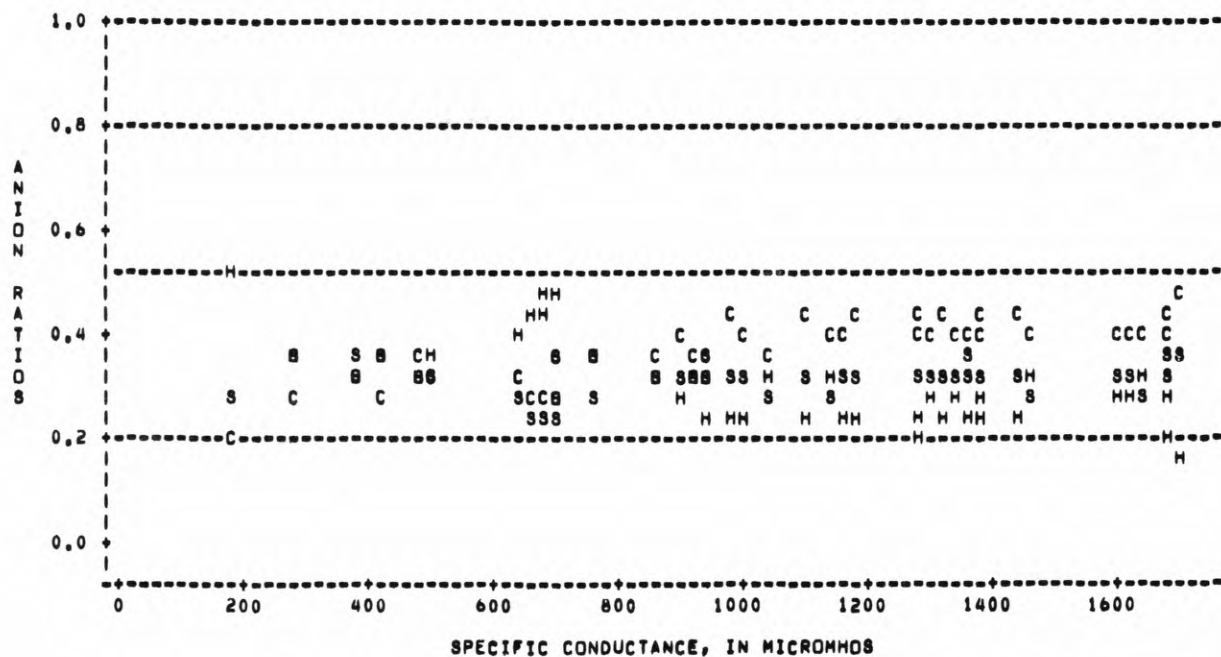
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	490	682	950	1350	1670
Dissolved solids	287	396	588	817	1040
pH	7.4	7.7	8.0	8.1	8.3
Total hardness	130	207	235	324	408
Chloride	60	72	134	198	250
Sulfate	73	83	151	206	264
Iron					
Fluoride	0.5	0.5	0.5	0.8	0.9
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.8	1.8	3.2	3.9	4.6
Boron	177	210	240	525	670

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR YUKON, OK



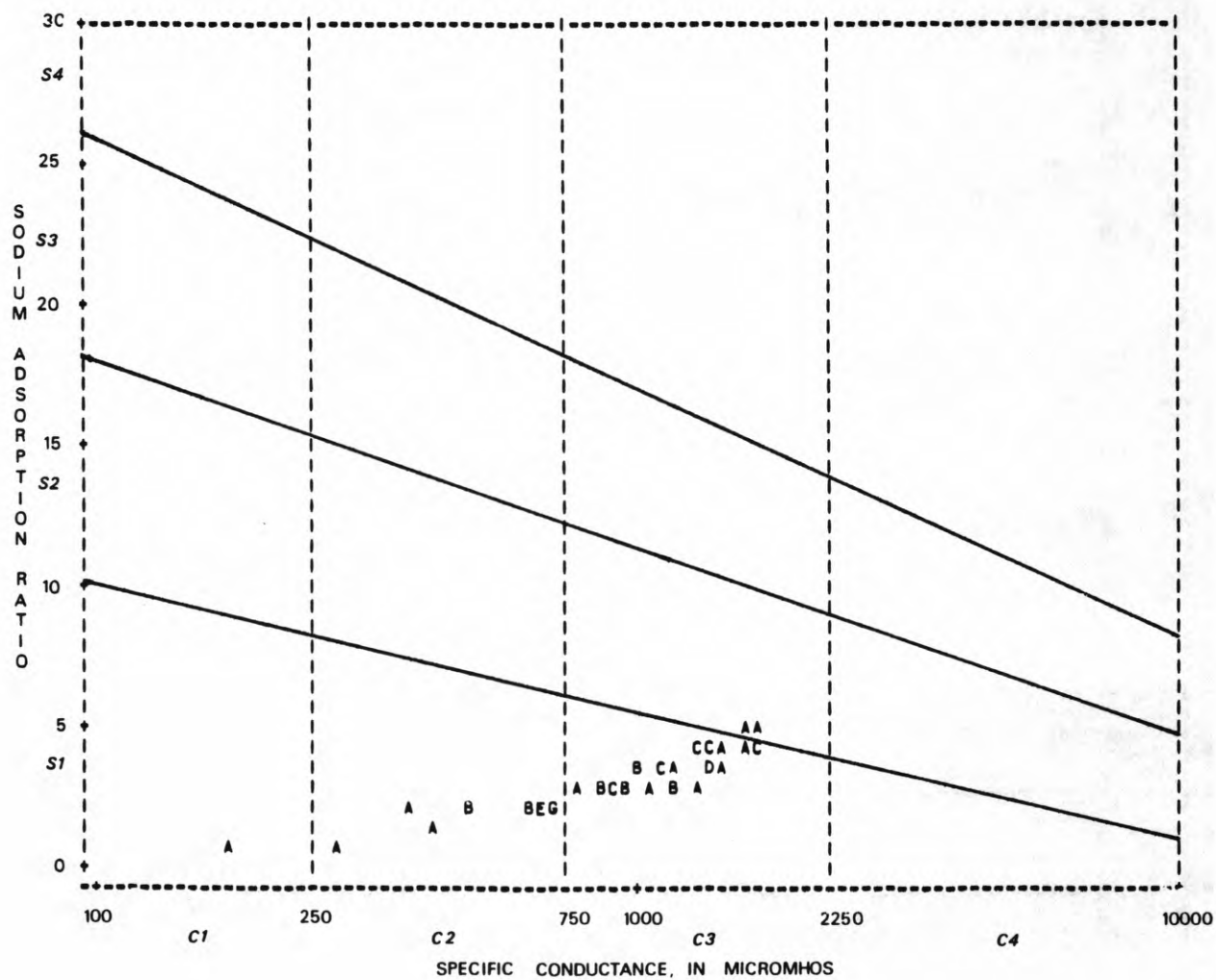
ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR YUKON, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR YUKON, OK



NORTH CANADIAN RIVER BASIN

07241500 - North Canadian River near Oklahoma City, Okla.

LOCATION.--Lat 35°29'40", long 97°25'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 20, T.12 N., R.2 W., Oklahoma County, at bridge on U.S. Highway 62, 4.5 mi east of State Capitol in Oklahoma City, 5 mi upstream from Crutcho Creek, and at mile 261.2.

DRAINAGE AREA.--13,354 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--1952, 1960 to 1963.

WATER TYPE.--For specific conductance greater than 2,000 umho, 65 percent of the samples, the water was sodium chloride type. For specific conductance less than 2,000 umho, the water generally was mixed type.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Ninety-five percent of the hardness values were greater than 180 mg/L and the average concentration was 433 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 80 percent of the chloride values. For the only analysis available for cadmium and lead, their concentrations did not exceed maximum contaminant levels. No other toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water may not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 53 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to high with 86 percent of the SAR values equivalent to a low or medium sodium hazard. The data indicate that phytotoxic effects could occur in boron sensitive and semitolerant plants.

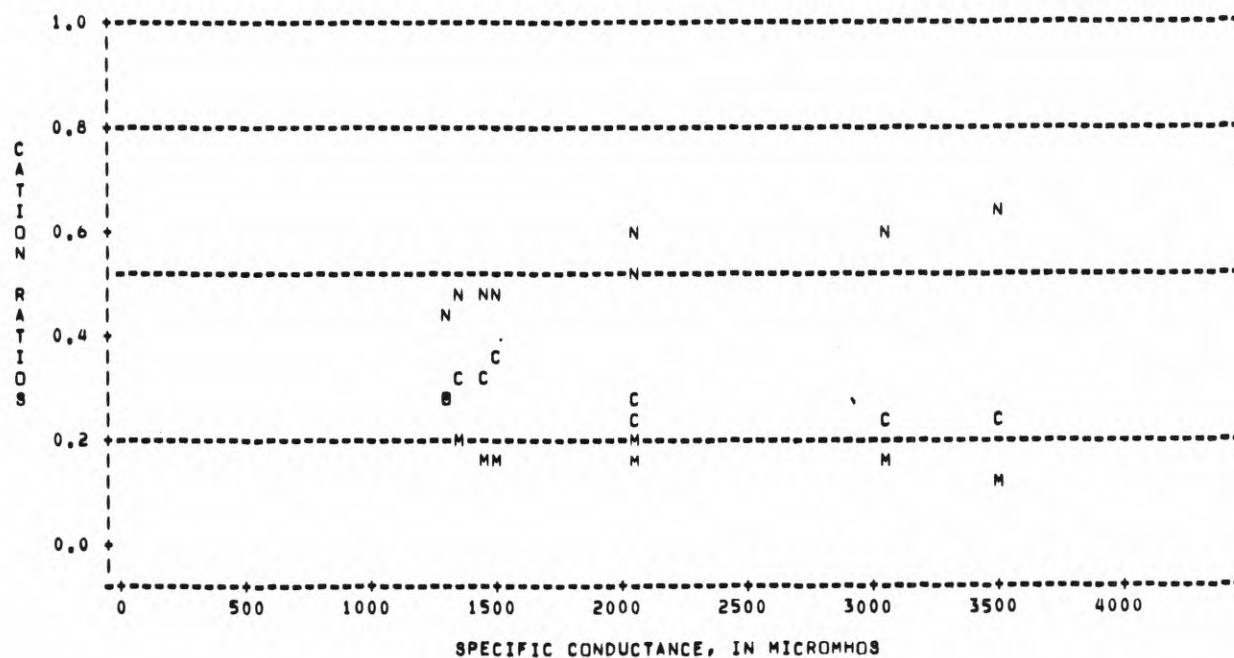
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	22	2269	564	4040	812	0.06	0.06
Dissolved solids	21	1420	333	2600	543	.10	.05
pH	22	8.0	7.1	8.6	0.5	-.11	-1.42
Total hardness	21	433	152	635	110	-.26	1.09
Chloride	21	523	79	1120	252	.34	.30
Sulfate	21	172	32	225	50	-1.86	3.17
Iron	1	10					
Fluoride	8	1.3	0.5	5.6			
Arsenic	0						
Cadmium	1	1					
Chromium	0						
Lead	1	8					
Mercury	0						
SAR	21	6.4	1.9	11	2.3	-.27	-.36
Boron	8	504	180	1500			

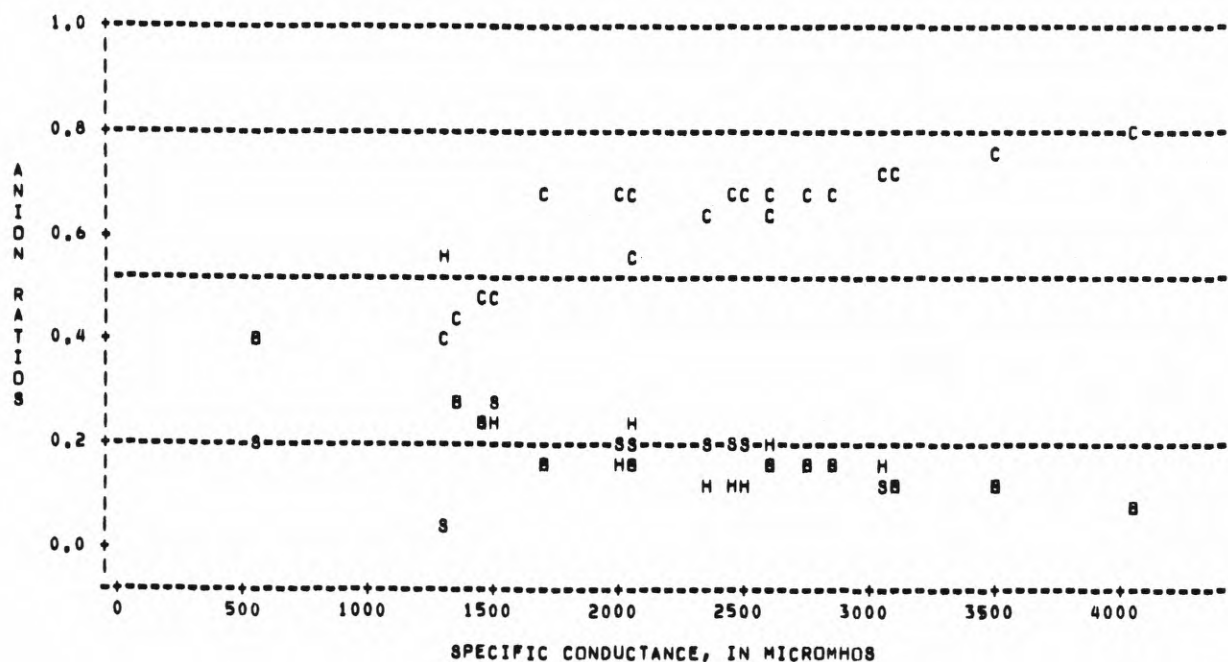
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	1312	1607	2390	2775	3369
Dissolved solids	719	1002	1520	1775	2174
pH	7.3	7.5	8.0	8.3	8.5
Total hardness	325	368	410	520	602
Chloride	187	318	550	655	875
Sulfate	64	169	180	202	219
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	3.0	4.4	6.9	8.2	8.6
Boron					

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR OK CITY, OK



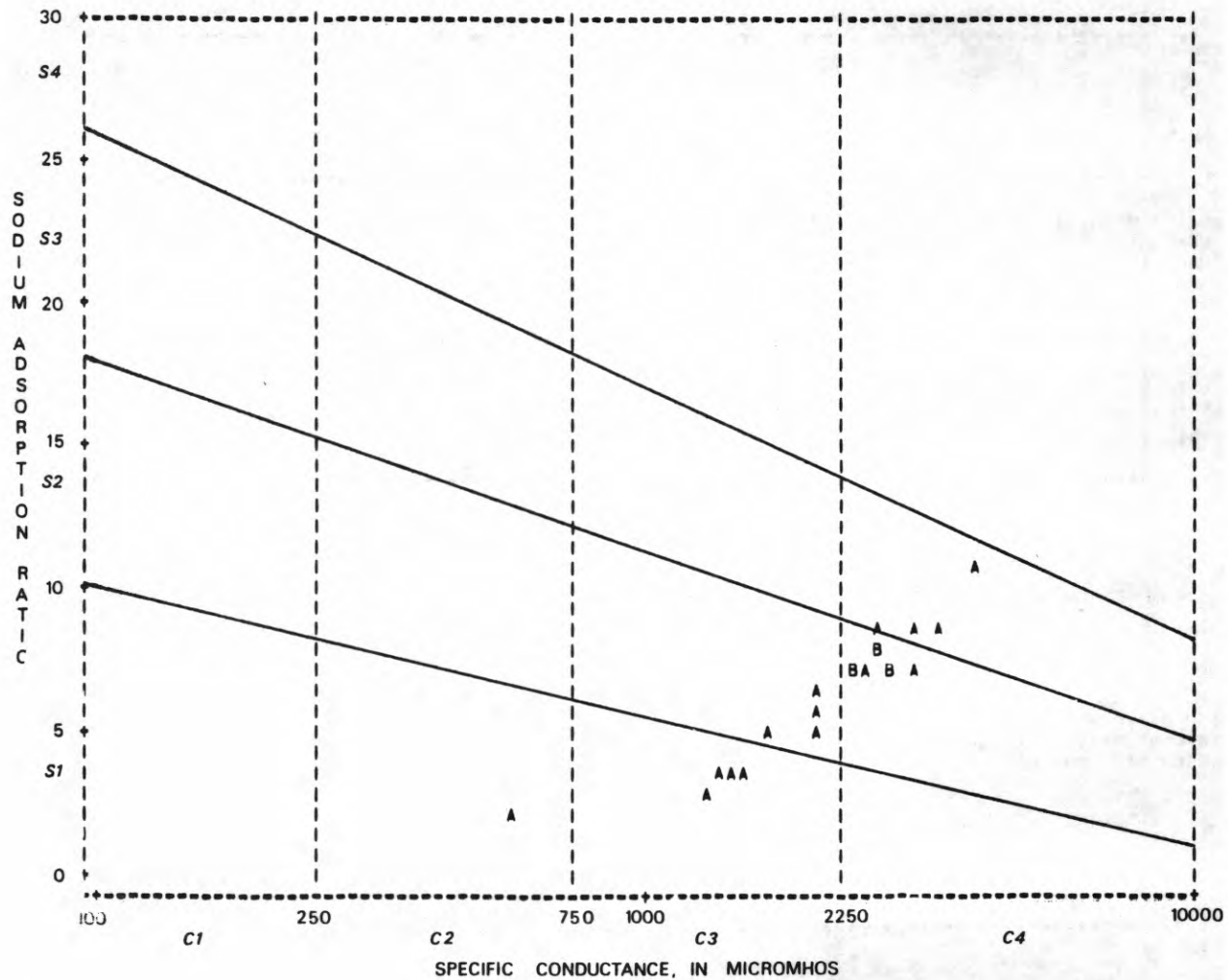
ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR OK CITY, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR OK CITY, OK



NORTH CANADIAN RIVER BASIN

07241550 - North Canadian River near Harrah, Okla.

LOCATION.--Lat 35°30'01", long 97°11'37", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T.12 N., R.1 E., Oklahoma County, at county road bridge, 2.2 mi northwest of Harrah, 3.8 mi downstream from Choctaw Creek, and at mile 230.0

DRAINAGE AREA.--13,501 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--1969 to 1979.

WATER TYPE.--For specific conductance greater than 500 umho, 95 percent of the samples, the water was sodium chloride type. For specific conductance less than 500 umho, the water was calcium carbonate/bicarbonate type.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time do not indicate any trend. The Spearman's rhos for dissolved solids and hardness at the 95-percent probability level do not indicate trends. However, the Spearman's rho for chloride indicates a negative trend and the Spearman's rho for sulfate indicates a positive trend.

PUBLIC WATER SUPPLY.--Eighty-two percent of the hardness values were greater than 180 mg/L and the average concentration was 296 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum pH of 9.0 and the recommended minimum pH of 5.0 were each exceeded by less than 1 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 52 percent of the chloride values, and the recommended maximum iron concentration of 200 ug/L was exceeded by 6 percent of the iron values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 9 percent of the cadmium values and the maximum lead contaminant level of 50 ug/L was exceeded by 4 percent of the lead values. Arsenic, chromium, and mercury concentrations did not exceed their maximum contaminant levels. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded and because cadmium and lead maximum contaminant levels were exceeded, this water probably is not suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 84 percent of the samples having a high or very high salinity hazard. The sodium hazard ranged from low to very high with 62 percent of the SAR values equivalent to a low sodium hazard. About 10 percent of the boron values exceeded the 750 ug/L limit for sensitive plants. Some boron concentrations, about 5 percent, were large enough to cause phytotoxic effects in semitolerant and tolerant plants.

UNIVARIATE STATISTICS

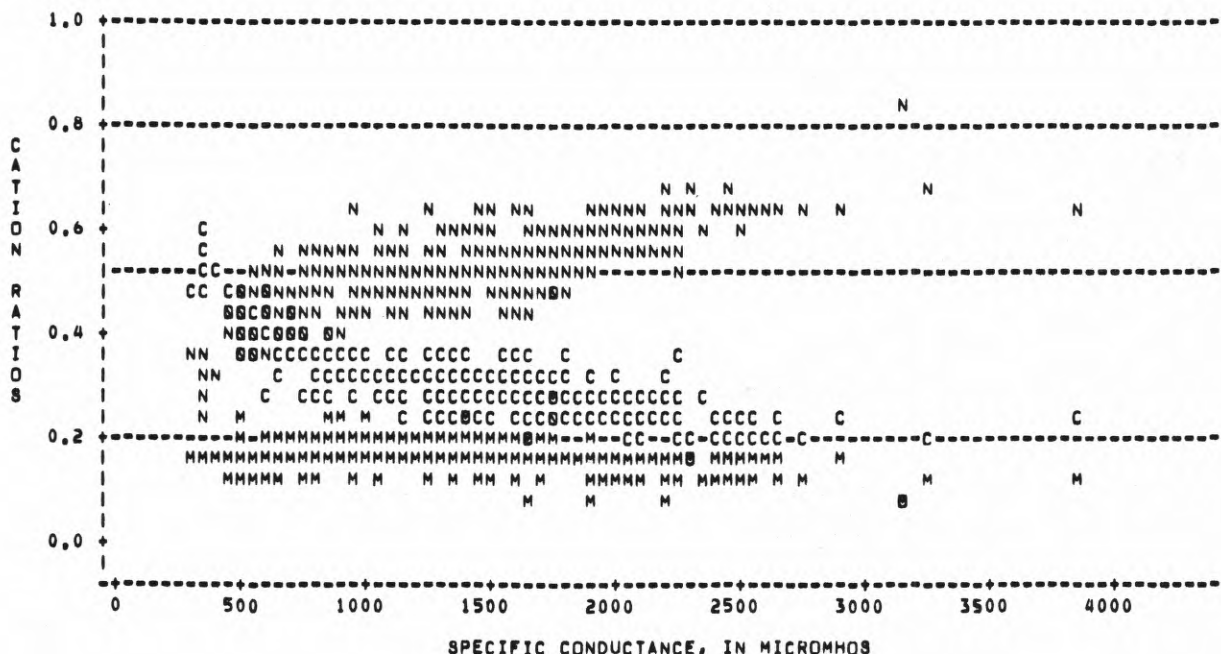
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	804	1441	165	3840	569	0.04	-0.34
Dissolved solids	693	854	167	2310	345	.04	-.36
pH	786	8.0	4.2	9.8	0.4	-.75	5.57
Total hardness	620	296	88	630	101	-.06	-.83
Chloride	624	269	26	1000	147	.63	.69
Sulfate	622	127	14	225	80	2.50	5.25
Iron	72	124	0	3300	390	7.83	64.26
Fluoride	5	1.0	0.8	1.3			
Arsenic	2	4	2	5			
Cadmium	93	3	0	30	5.0	3.11	11.46
Chromium	185	13	0	30	6.5	3.45	22.22
Lead	73	9	0	200	25	6.93	53.00
Mercury	7	0.0	0.0	0.1			
SAR	615	4.3	0.8	13	1.7	.24	.20
Boron	85	498	90	5100	925	3.97	14.93

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	626	993	1500	1850	2140
Dissolved solids	356	565	896	1100	1266
pH	7.3	7.7	8.0	8.2	8.4
Total hardness	150	208	310	370	430
Chloride	84	152	260	370	460
Sulfate	44	75	120	150	190
Iron	0	20	50	120	207
Fluoride					
Arsenic					
Cadmium	0	0	1	2	9
Chromium	0	0	0	10	20
Lead	0	1	4	7	16
Mercury					
SAR	2.1	3.0	4.2	5.7	6.4
Boron	138	185	270	400	512

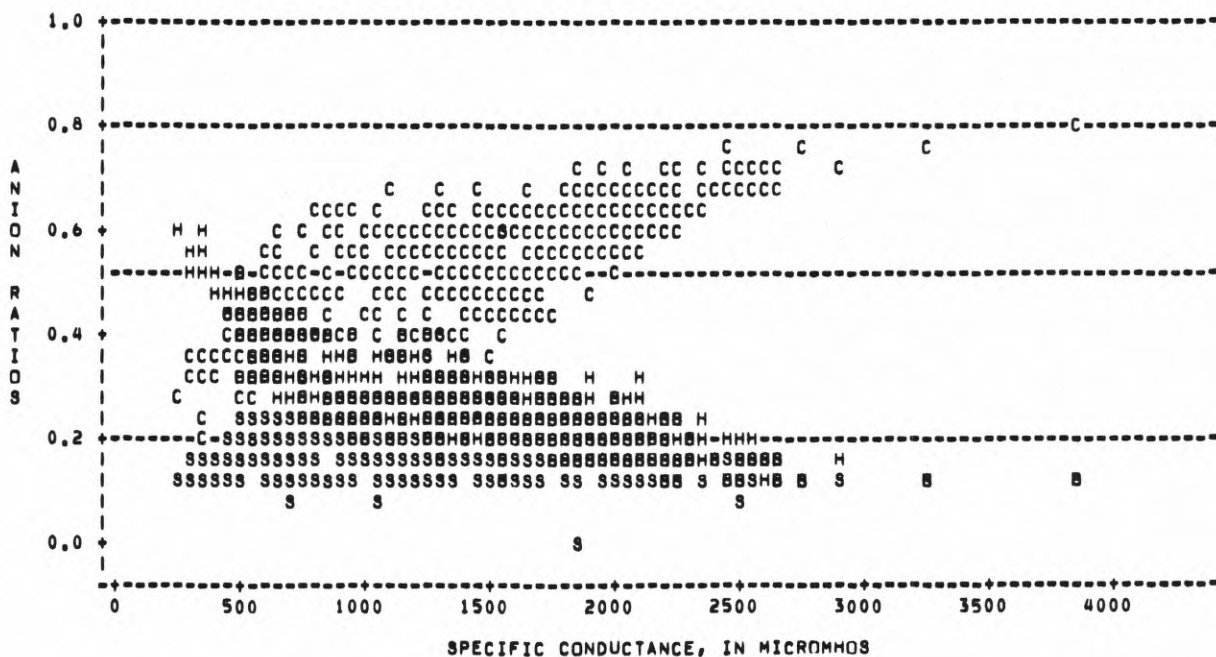
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR HARRAH, OK



ANION RATIO PLOT

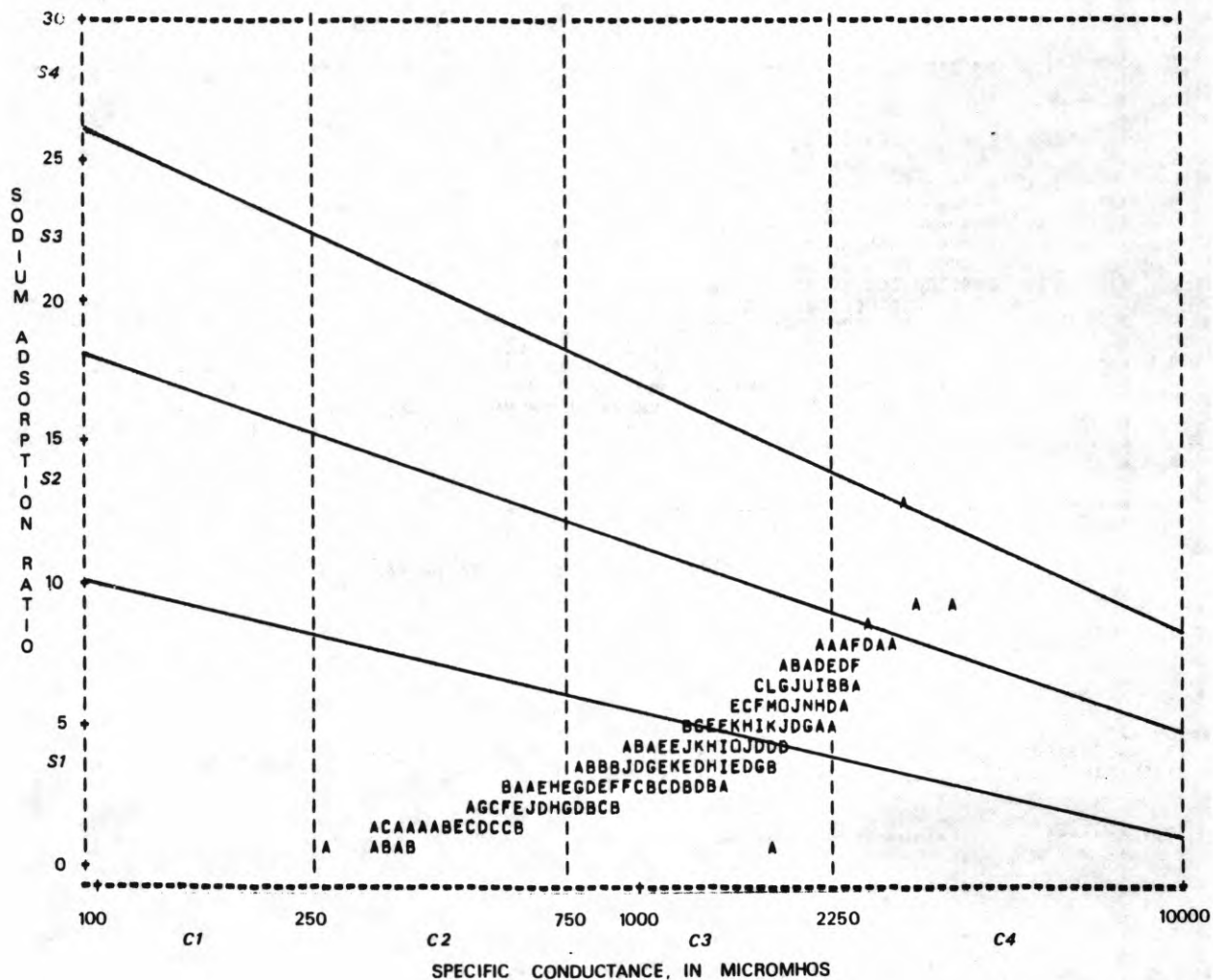
H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR HARRAH, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR HARRAH, OK



NORTH CANADIAN RIVER BASIN

07242000 - North Canadian River near Wetumka, Okla.

LOCATION.--Lat 35°15'53", long 96°12'25", in center of SE $\frac{1}{4}$ sec. 12, T.9 N., R.10 E., Hughes County, at bridge on U.S. Highway 75, 2.3 mi upstream from Wewoka Creek, 2.5 mi northeast of Wetumka, and at mile 84.4.

DRAINAGE AREA.--14,290 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--1952, 1954 to 1979.

WATER TYPE.--For specific conductance greater than 500 μ mho, 94 percent of the samples, the water was sodium chloride type. For specific conductance less than 500 μ mho, the water was calcium carbonate/bicarbonate type.

TREND.--Plots of the dissolved solids, hardness, sulfate, and chloride concentrations versus time indicate no trend for hardness, positive trend for sulfate, and negative trend for chloride and dissolved solids. The Spearman's rhos at the 95-percent probability level for these constituents also indicate no trend for hardness, positive trend for sulfate, and negative trend for chloride and dissolved solids.

PUBLIC WATER SUPPLY.--Eighty-four percent of the hardness values were greater than 180 mg/L and the average concentration was 552 mg/L. In general, the hardness classification for this water is very hard. The recommended minimum pH of 5.0 was exceeded by less than 1 percent of the pH values, the recommended maximum pH of 9.0 was exceeded by 4 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 66 percent of the chloride values, and the recommended maximum sulfate concentration of 250 mg/L was exceeded by less than 1 percent of the sulfate values. Arsenic, cadmium, chromium, lead, and mercury concentrations did not exceed their maximum contaminant values. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 29 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with 28 percent of the SAR values equivalent to a very high sodium hazard. Four percent of the boron values were greater than 750 μ g/L and could cause phytotoxic effects in boron sensitive plants.

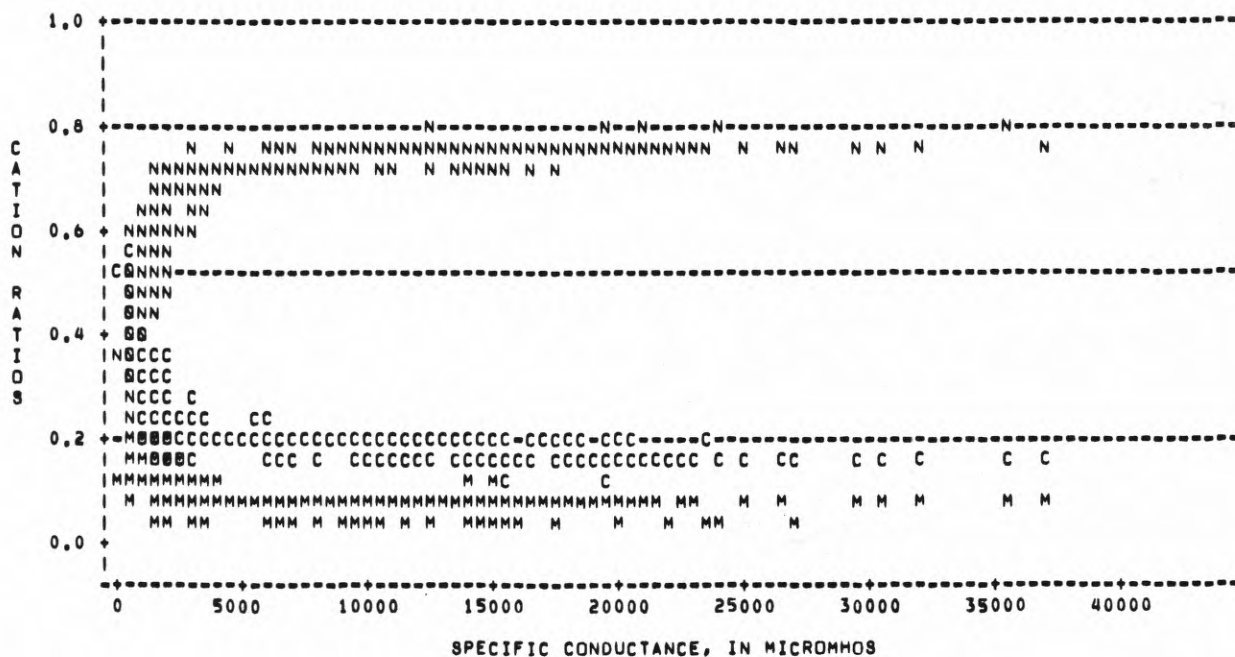
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	1461	3619	193	37100	5161	2.56	6.83
Dissolved solids	1415	2276	119	25800	3382	2.73	8.29
pH	1458	8.1	4.8	10.1	0.5	-.59	4.61
Total hardness	1376	552	26	4640	628	2.58	7.26
Chloride	1435	1112	17	14300	1898	2.76	8.46
Sulfate	1431	73	4.9	351	42	1.16	2.73
Iron	7	67	20	240			
Fluoride	159	0.5	0.0	1.1	0.2	.61	.84
Arsenic	8	6	2	10			
Cadmium	8	2	1	6			
Chromium	8	6	0	30			
Lead	8	8	0	45			
Mercury	8	0.0	0.0	0.1			
SAR	1001	9.7	0.6	60	9.3	1.48	1.61
Boron	143	295	0	870	177	1.03	1.10

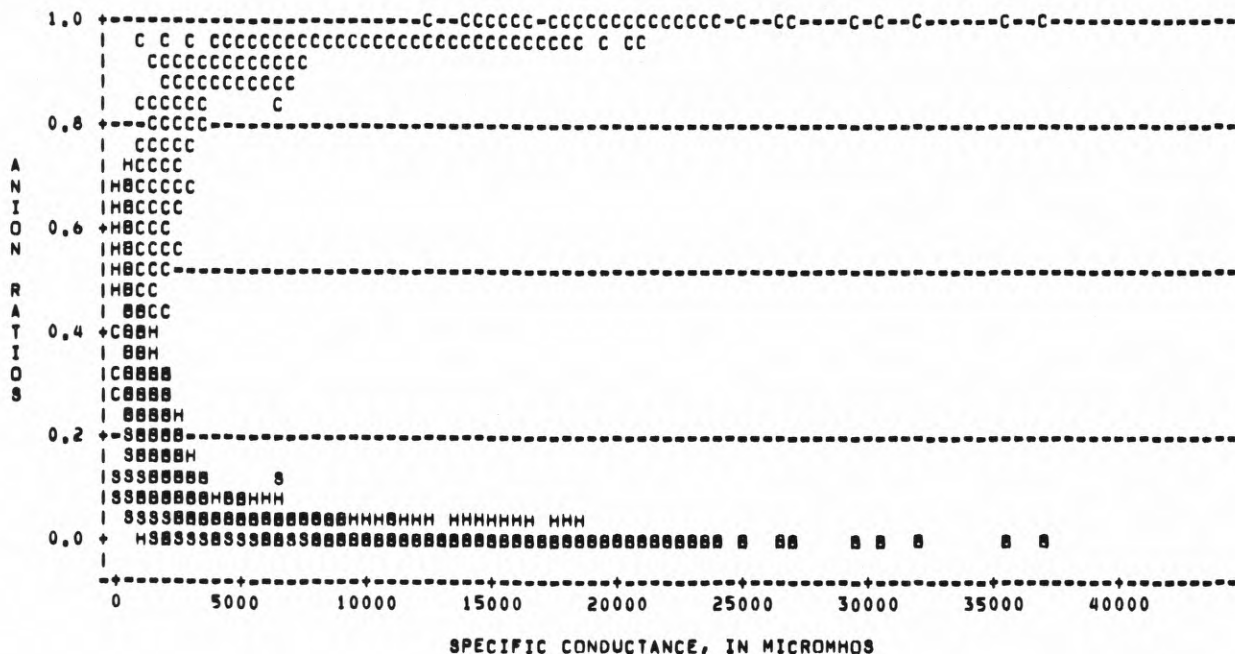
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	644	1060	1590	2765	11680
Dissolved solids	378	621	944	1740	7424
pH	7.4	7.8	8.1	8.4	8.6
Total hardness	152	228	330	469	1556
Chloride	109	200	340	770	3980
Sulfate	24	43	66	97	130
Iron					
Fluoride	0.4	0.4	0.5	0.6	0.8
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	2.3	3.5	5.0	14	25
Boron	100	160	280	390	516

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR WETUMKA, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=NORTH CANADIAN RIVER NR WETUMKA, OK



C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

NORTH CANADIAN RIVER BASIN

07242050 - Wewoka Creek at Wewoka, Okla.

LOCATION.--Lat 35°09'10", long 96°29'30", in SW¹/₄NW¹/₄ sec. 17, T.8 N., R.8 E., Seminole County, at bridge on State Highway 56, at Wewoka.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1962 to 1963.

WATER TYPE.--The water was chloride type throughout the range of measured specific conductance. No cation-specific conductance distribution data are available.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--All of the hardness values were greater than 180 mg/L and the average concentration was 591 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 95 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from high to very high with 72 percent of the samples having a very high salinity hazard. The sodium hazard ranged from medium to very high with 35 percent of the SAR values equivalent to a very high sodium hazard. No boron data are available.

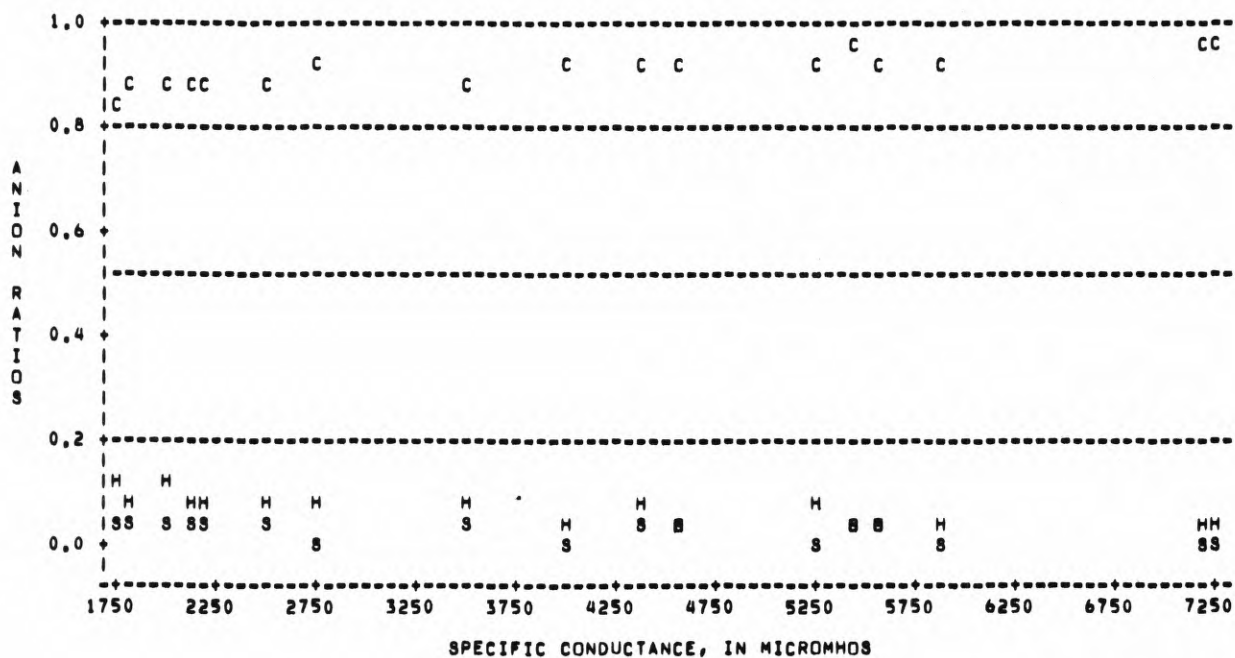
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	17	4012	1770	7270	1868	0.37	-1.12
Dissolved solids	17	2438	1020	4570	1183	.40	-1.05
pH	17	8.1	7.8	8.4	0.2	.09	-1.73
Total hardness	17	591	248	1090	272	.45	-1.00
Chloride	17	1250	490	2400	638	.49	-.92
Sulfate	17	40	17	91	19	1.29	2.13
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	17	11	6.7	16	3.1	.47	-1.02
Boron	0						

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	1786	2145	3980	5510	7222
Dissolved solids	1028	1270	2370	3390	4466
pH	7.8	7.9	8.1	8.4	8.4
Total hardness	275	332	580	835	1050
Chloride	530	630	1230	1775	2400
Sulfate	19	25	33	50	66
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	7.2	7.7	11	13	16
Boron					

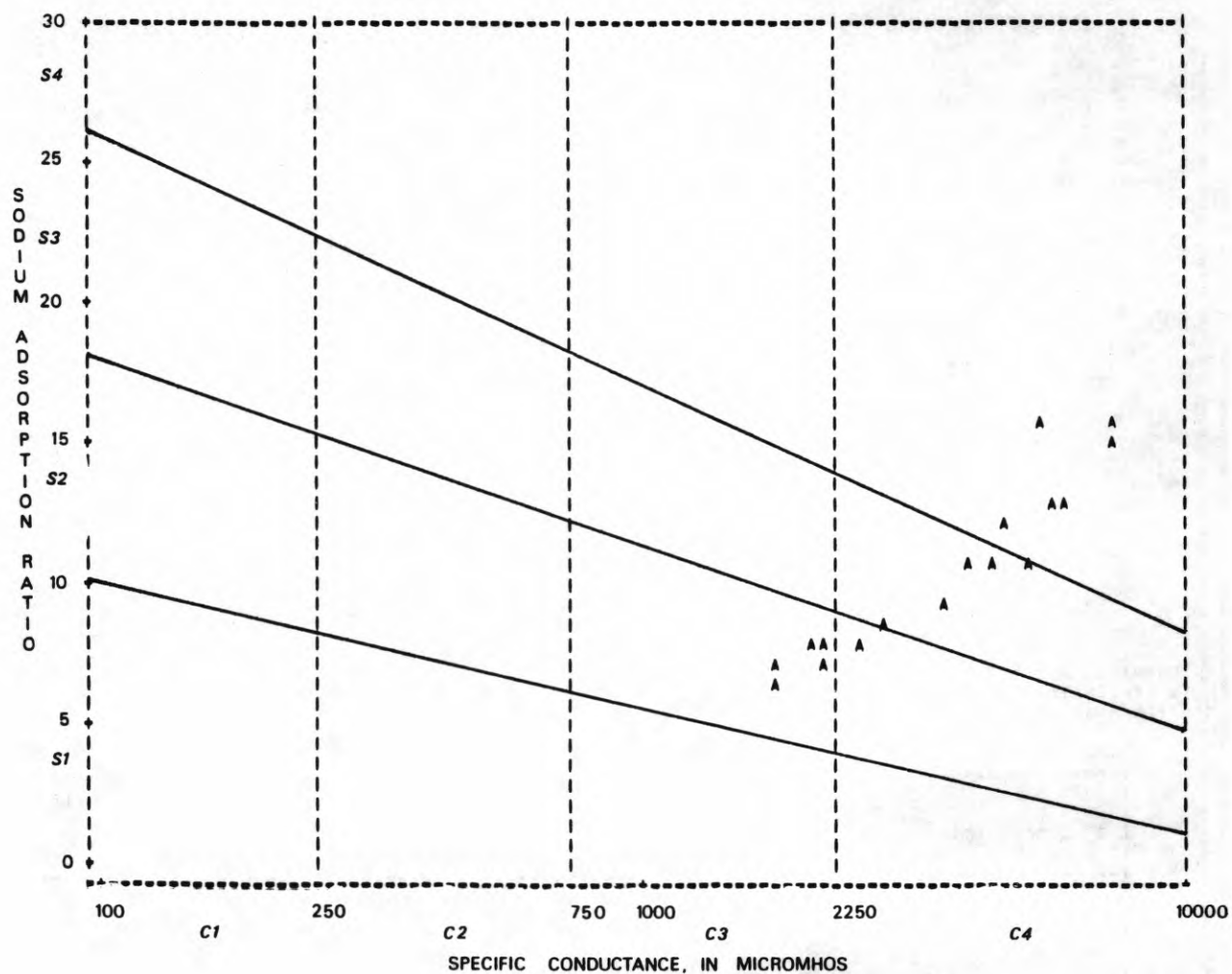
ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=WEWOKA CREEK AT WEWOKA, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS

STATION NAME OR LOCAL IDENTIFIER=WEWOKA CREEK AT WEWOKA, OK



NORTH CANADIAN RIVER BASIN

07242100 - Wewoka Creek near Wetumka, Okla.

LOCATION.--Lat 35°13'15", long 96°13'10", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 4, T.8 N., R.10 E., Hughes County, at bridge on U.S. Highway 75, 0.2 mi downstream from Grief Creek, 1.8 mi upstream from Little Grief Creek, 2.5 mi south of Wetumka, and at mile 8.2.

DRAINAGE AREA.--396 mi².

PERIOD OF RECORD.--1952 to 1957, 1960 to 1964.

WATER TYPE.--The water was sodium chloride type throughout the range of measured specific conductance.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Eighty percent of the hardness values were greater than 180 mg/L and the average concentration was 1,202 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 89 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 59 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with about 12 percent of the SAR values equivalent to a very high sodium hazard. The data indicate that boron phytotoxic effects should not occur.

UNIVARIATE STATISTICS

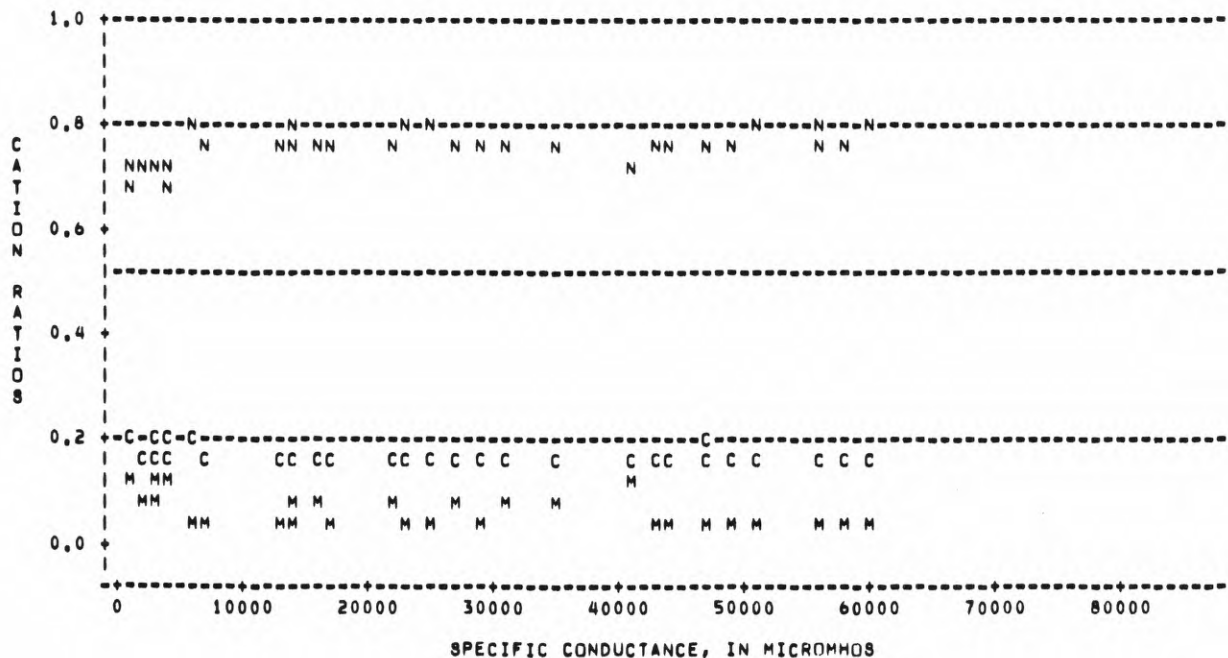
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	242	8365	183	87900	15558	2.93	8.39
Dissolved solids	198	1982	108	35600	3247	7.67	68.90
pH	242	7.8	6.0	8.6	0.4	-1.15	2.07
Total hardness	242	1202	34	15600	2324	3.41	12.81
Chloride	242	3337	40	48100	7400	3.57	13.90
Sulfate	194	22	5.0	72	12	1.18	1.67
Iron	0						
Fluoride	18	0.2	0.0	0.4	0.1	.46	.20
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	33	36	5.3	64	19	-.20	-1.24
Boron	15	236	60	550	125	1.18	1.67

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	905	1450	2930	4885	29400
Dissolved solids	487	741	1375	2315	3212
pH	7.1	7.5	7.8	8.0	8.2
Total hardness	143	204	435	716	3998
Chloride	239	395	880	1600	11450
Sulfate	9.0	14	19	29	38
Iron					
Fluoride	0.1	0.1	0.2	0.2	0.4
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	8.2	18	39	54	63
Boron	96	140	200	290	448

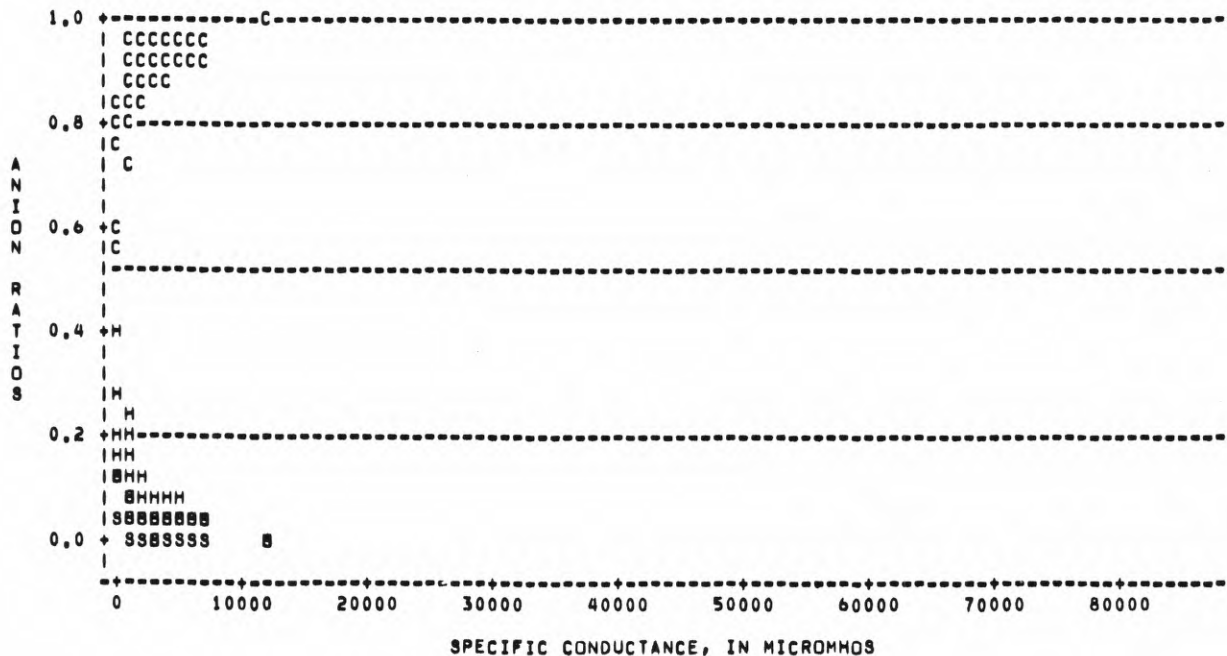
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=WEWOKA CREEK NR WETUMKA, OK

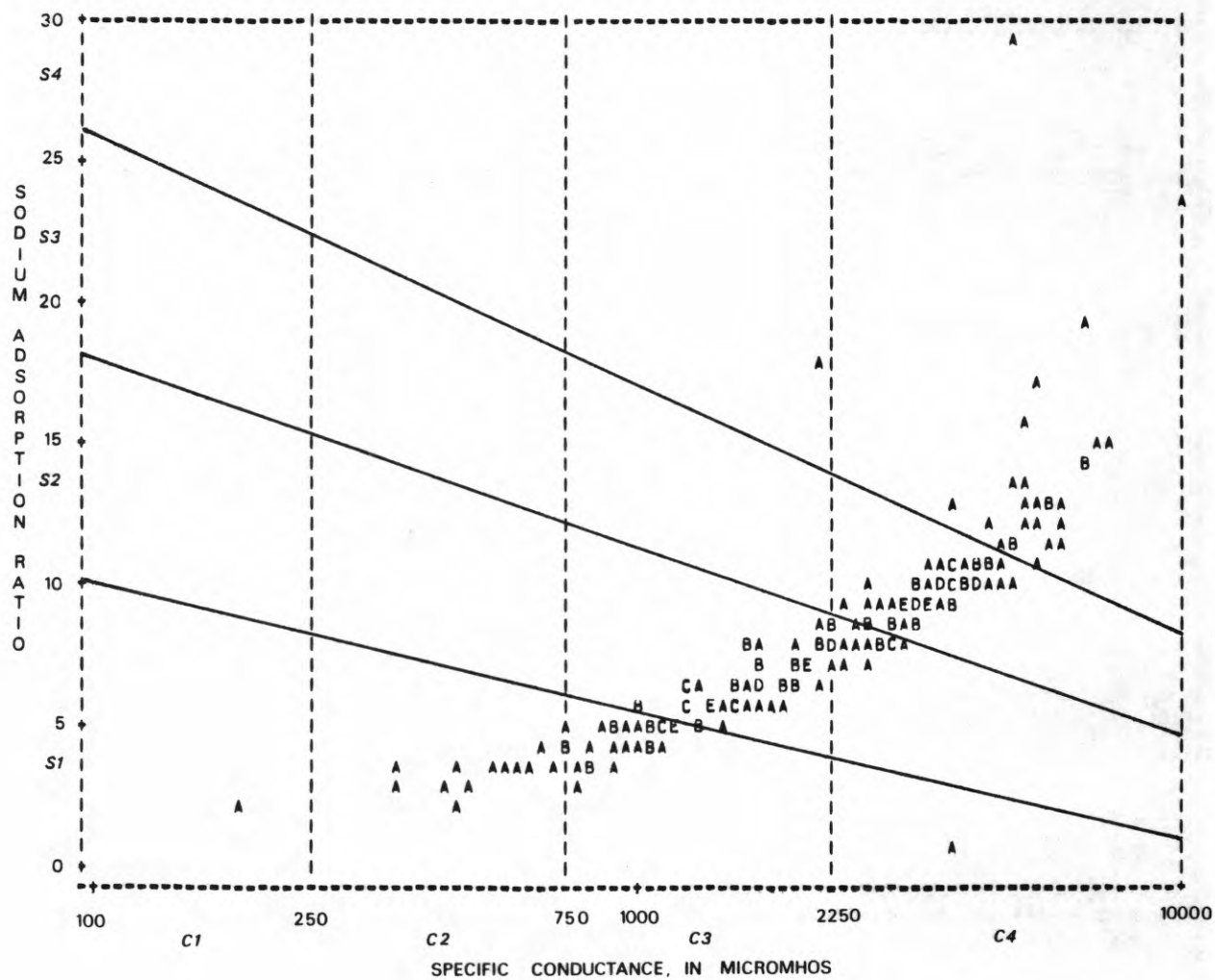


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=WEWOKA CREEK NR WETUMKA, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=WEWOKA CREEK NR WETUMKA, OK



NORTH CANADIAN RIVER BASIN

07236000 - Wolf Creek near Fargo, Okla.

LOCATION.--Lat 36°24'00", long 99°37'25", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T.22 N., R.23 W., Ellis County, at county road bridge, 0.2 mi downstream from Boggy Creek, 1.2 mi downstream from Sixteen Mile Creek, 1.5 mi north of Fargo, and at mile 18.7.

DRAINAGE AREA.--1,624 mi², of which 238 mi² is probably noncontributing.

PERIOD OF RECORD.--1958, 1960 to 1963.

WATER TYPE.--For specific conductance less than 700 umho, 21 percent of the samples, the water was bicarbonate type. For specific conductance greater than 700 umho the water was mixed type. There was no predominant cation throughout the range of measured specific conductance.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Eighty-five percent of the hardness values were greater than 180 mg/L and the average concentration was 244 mg/L. In general, the hardness classification for this water is very hard. None of the measured constituents exceeded recommended maximum limits. No toxic metal data are available. Based on the data, this water should be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to high with 78 percent of the samples having a high salinity hazard. All of the SAR values were equivalent to a low sodium hazard. None of the boron values exceeded the 750 ug/L recommended limit for boron sensitive plants.

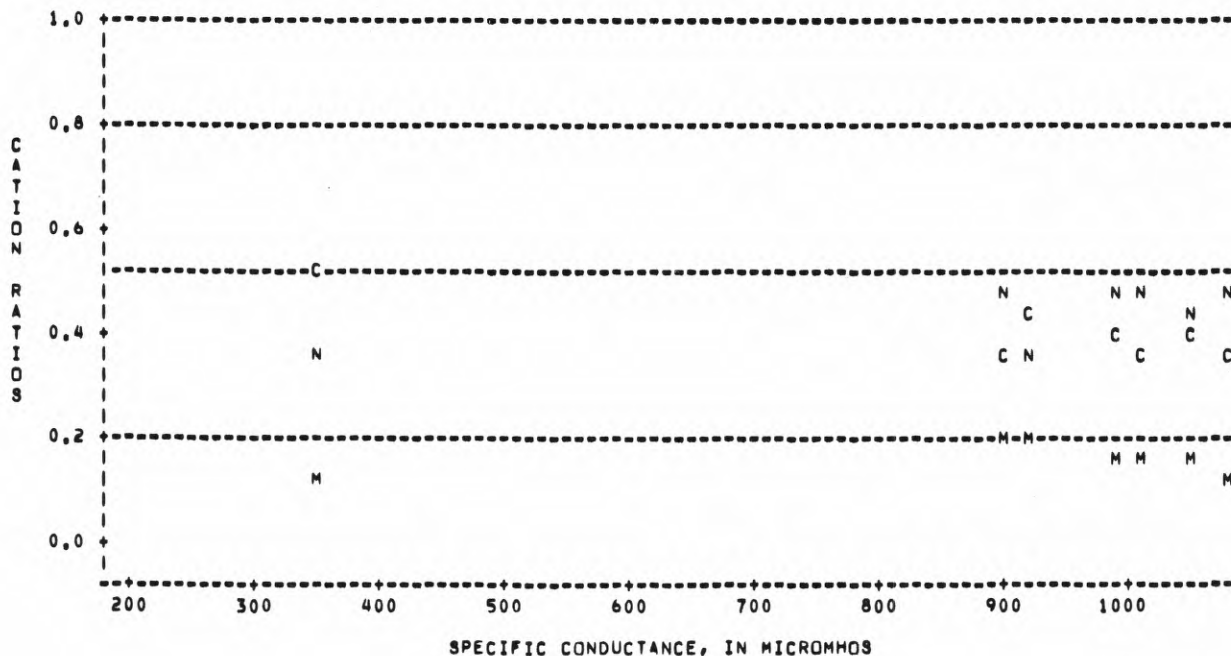
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	44	866	320	1080	218	-1.37	0.70
Dissolved solids	18	481	214	674	151	-.60	-1.10
pH	23	7.9	7.5	8.3	0.2	-.18	-.38
Total hardness	33	244	114	330	50	-.66	.33
Chloride	44	121	8.3	177	48	-1.10	.11
Sulfate	18	64	11	124	36	-.13	-1.14
Iron	0						
Fluoride	1	0.7					
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	23	2.2	0.3	3.6	1.0	-.66	-.77
Boron	6	158	80	310			

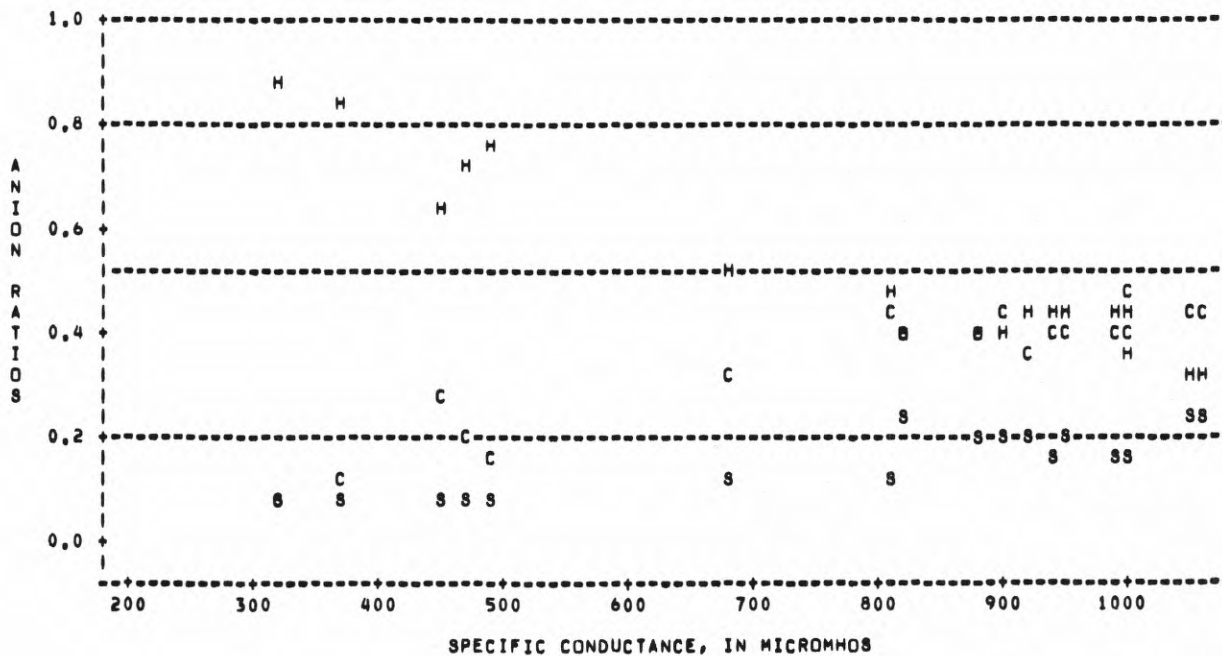
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	459	825	931	1018	1055
Dissolved solids	245	299	532	592	671
pH	7.6	7.8	7.9	8.1	8.2
Total hardness	163	217	250	278	309
Chloride	34	106	135	156	169
Sulfate	12	21	74	88	117
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.4	1.2	2.6	3.0	3.5
Boron					

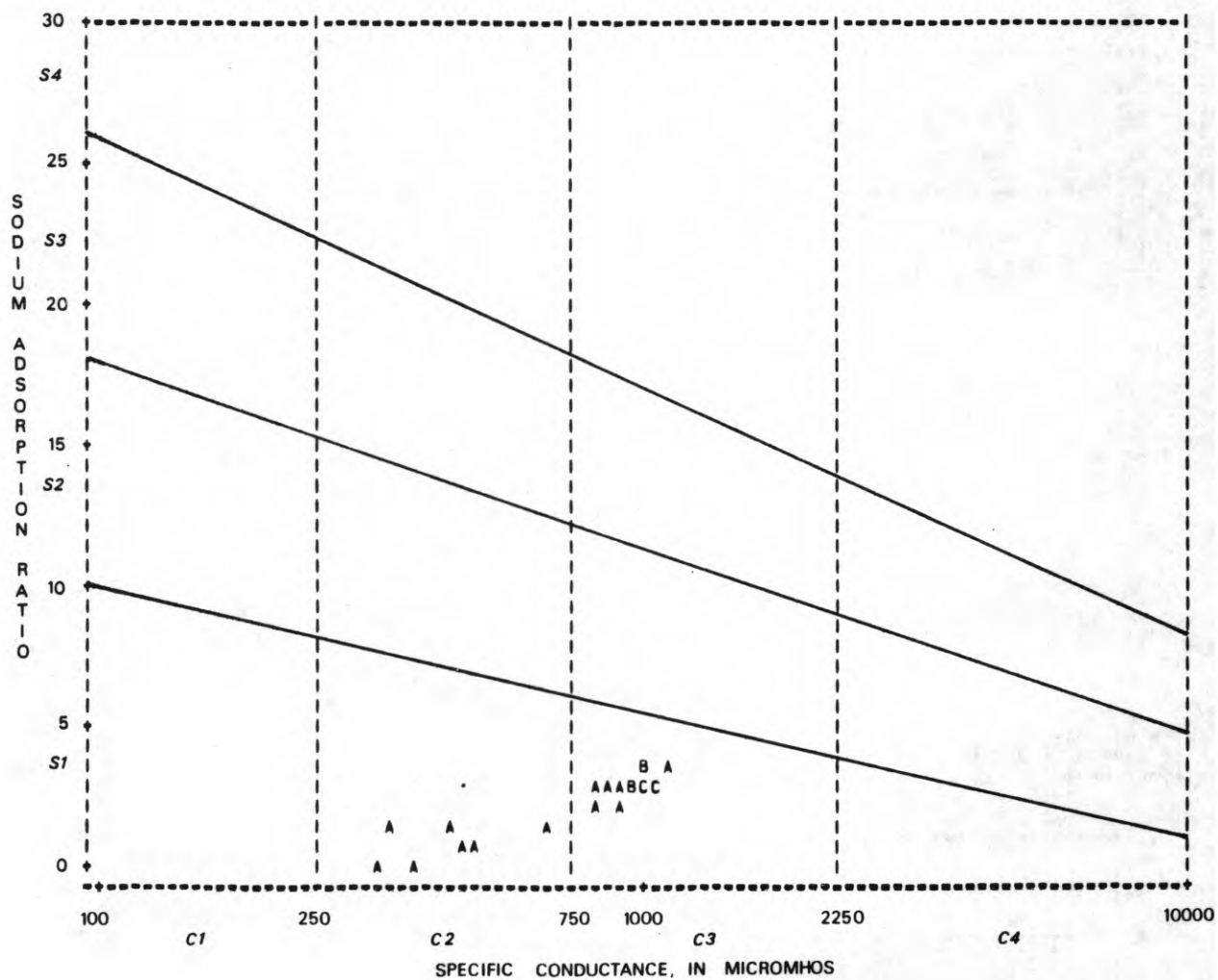
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=WOLF CREEK NR FARGO, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=WOLF CREEK NR FARGO, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=WOLF CREEK NR FARGO, OK



DEEP FORK BASIN

07242500 - Bellcow Creek at Chandler, Okla.

LOCATION.--Lat 35°42'08", long 96°53'20", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 9, T.14 N., R.4 E., Lincoln County, at county road bridge in Chandler, 0.5 mi upstream from U.S. Highway 66 bridge, 1.2 mi downstream from Bellcalf Creek, and at mile 5.7.

DRAINAGE AREA.--46 mi².

PERIOD OF RECORD.--1949 to 1954.

WATER TYPE.--For specific conductance less than about 680 umho, 84 percent of the samples, the water was magnesium carbonate/bicarbonate type. For specific conductance greater than 680 umho the water was mixed type.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Eighty-five percent of the hardness values were greater than 180 mg/L and the average concentration was 282 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum pH of 9.0 was exceeded by 1 of 14 pH values. No toxic metal data are available. Based on the data, this water should be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to high with 89 percent of the samples having a medium salinity hazard. All of the SAR values were equivalent to a low sodium hazard. No boron data are available.

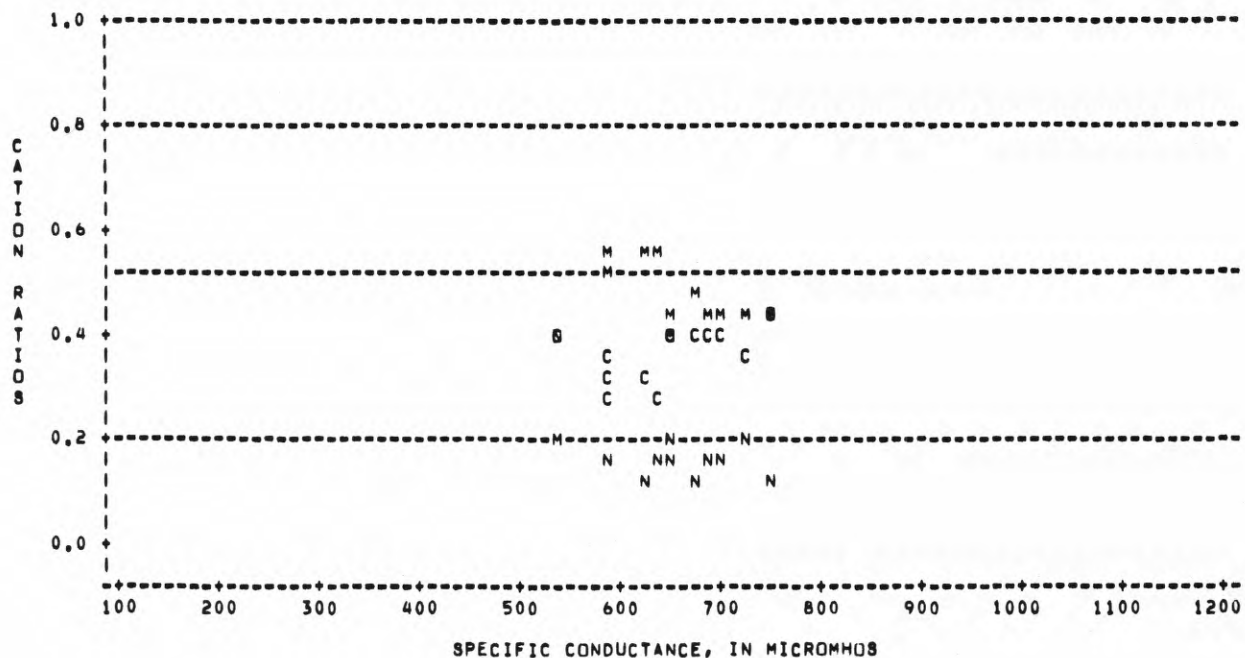
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	58	584	130	1180	154	-0.32	5.36
Dissolved solids	51	335	77	644	85	-.94	4.87
pH	14	8.2	6.9	9.1	0.5	-.94	4.77
Total hardness	58	282	50	382	74	-1.67	2.37
Chloride	58	34	5.0	230	30	4.89	30.77
Sulfate	53	16	8.3	48	6.8	2.95	10.82
Iron	0						
Fluoride	8	0.2	0.1	0.4			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	14	0.7	0.5	1.6	0.3	2.54	7.42
Boron	0						

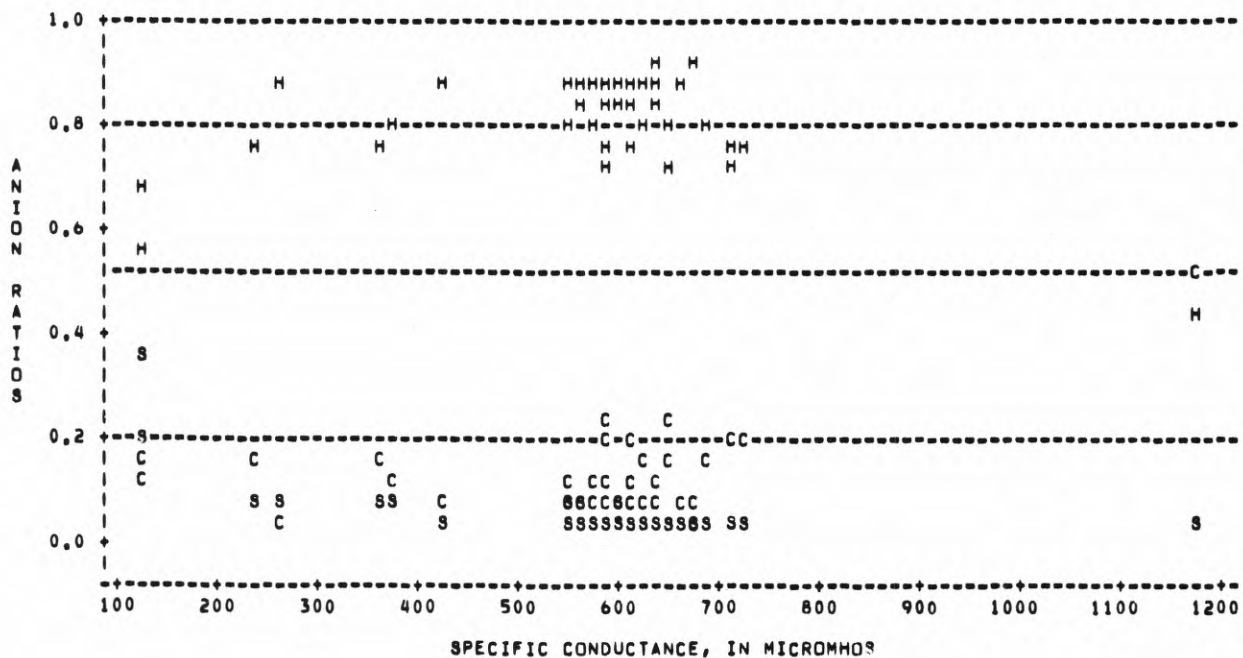
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	365	566	594	651	696
Dissolved solids	211	320	343	373	399
pH	7.4	8.1	8.2	8.3	8.8
Total hardness	150	273	303	327	350
Chloride	16	19	26	42	59
Sulfate	11	12	15	18	20
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.5	0.5	0.6	0.8	1.2
Boron					

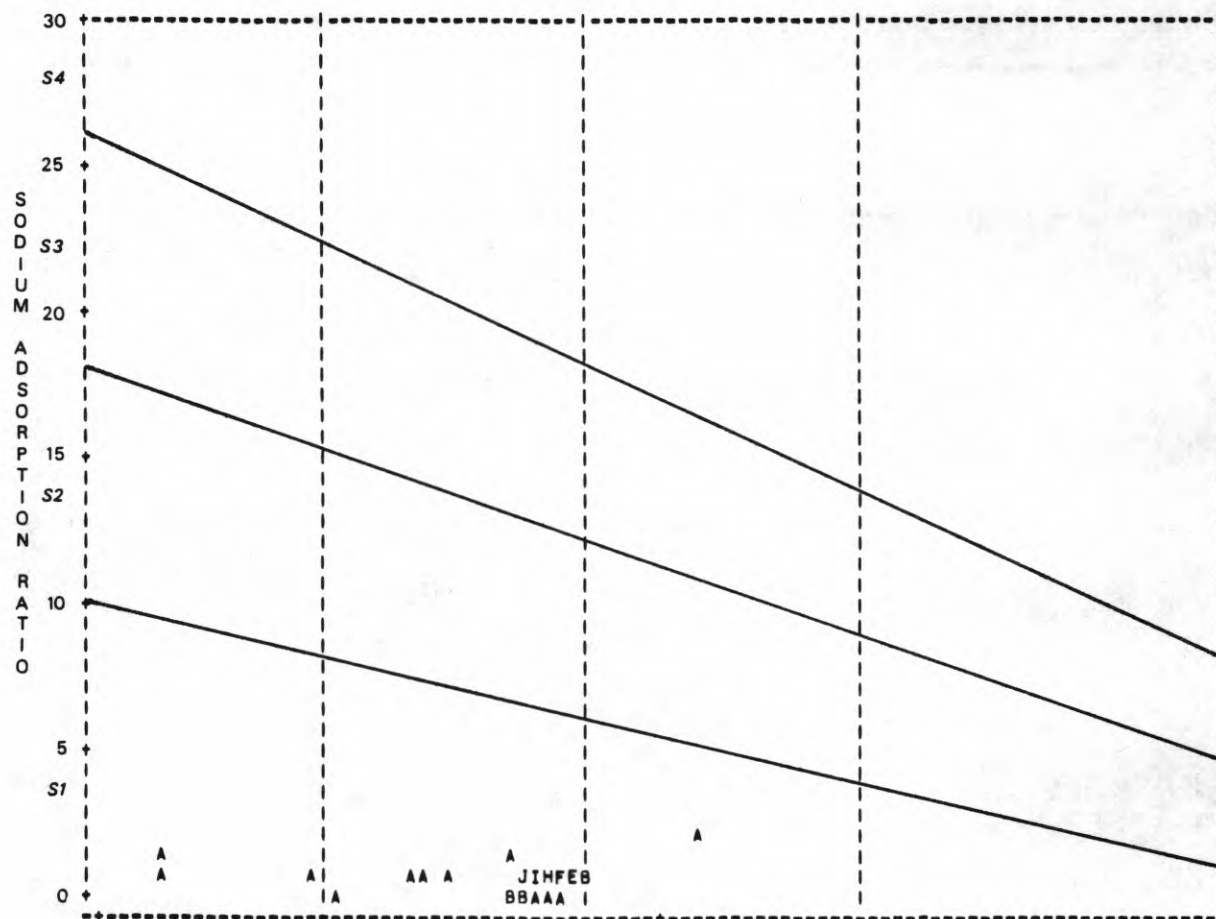
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BELLCOW CREEK AT CHANDLER, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=BELLCOW CREEK AT CHANDLER, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=BELLCOW CREEK AT CHANDLER, OK



DEEP FORK BASIN

07242300 - Deep Fork at Witcher, Okla.

LOCATION.--Lat 35°35'41", long 97°25'06", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 16, T.13 N., R.2 W., Oklahoma County, at bridge on N.E. 122nd Street, 0.4 east of Witcher.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1961 to 1962.

WATER TYPE.--For specific conductance greater than 1,400 umho, 52 percent of the samples, the water was sodium chloride type. The data are inadequate to determine water type for specific conductance less than 1,400 umho.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--All of the hardness values were greater than 180 mg/L and the average concentration was 327 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 53 percent of the chloride values. No toxic metal data are available. Because of the frequency by which the recommended maximum chloride concentration was exceeded, the suitability of this water for use as a public supply may be marginal.

IRRIGATION.--The salinity hazard ranged from medium to high with 87 percent of the samples having a high salinity hazard. The sodium hazard ranged from low to medium with 73 percent of the SAR values equivalent to a low sodium hazard. No boron data are available.

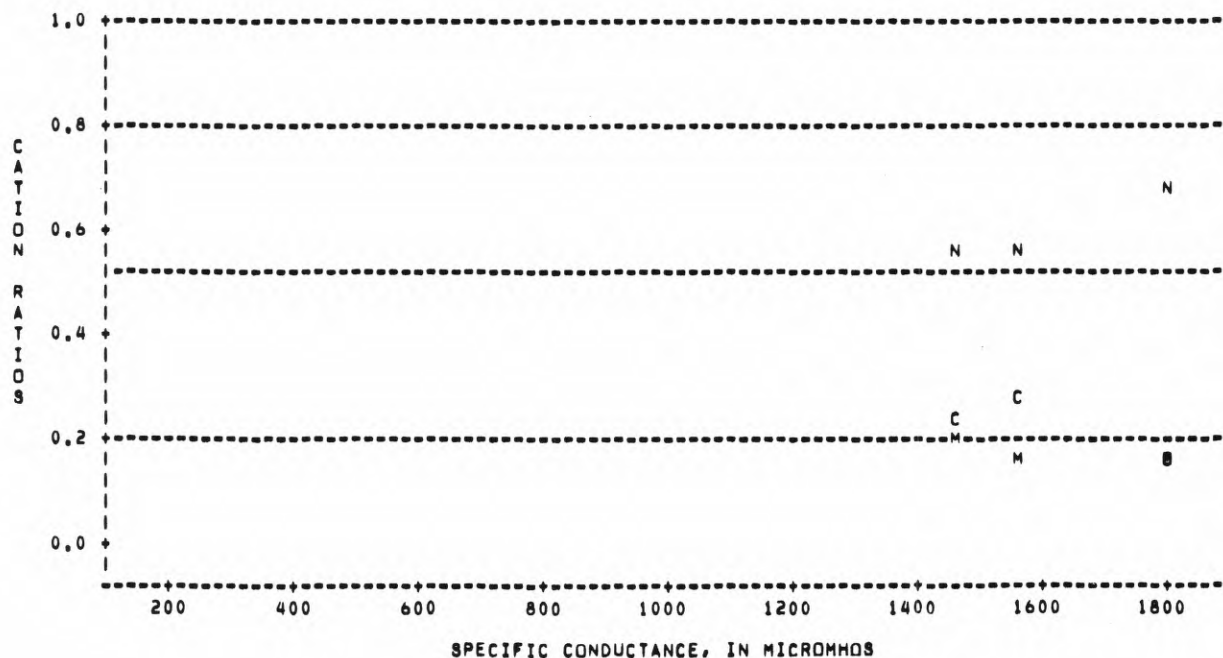
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	16	1340	300	1800	405	-1.29	1.81
Dissolved solids	11	898	650	1100	161	-.22	-1.17
pH	15	8.2	7.3	8.6	0.4	-.35	-.82
Total hardness	11	327	260	364	32	-.99	.68
Chloride	11	260	138	360	69	-.31	-.57
Sulfate	11	124	100	149	17	.19	-1.37
Iron	0						
Fluoride	6	0.6	0.4	0.8			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	11	4.4	2.6	7.2	1.2	.80	1.95
Boron	0						

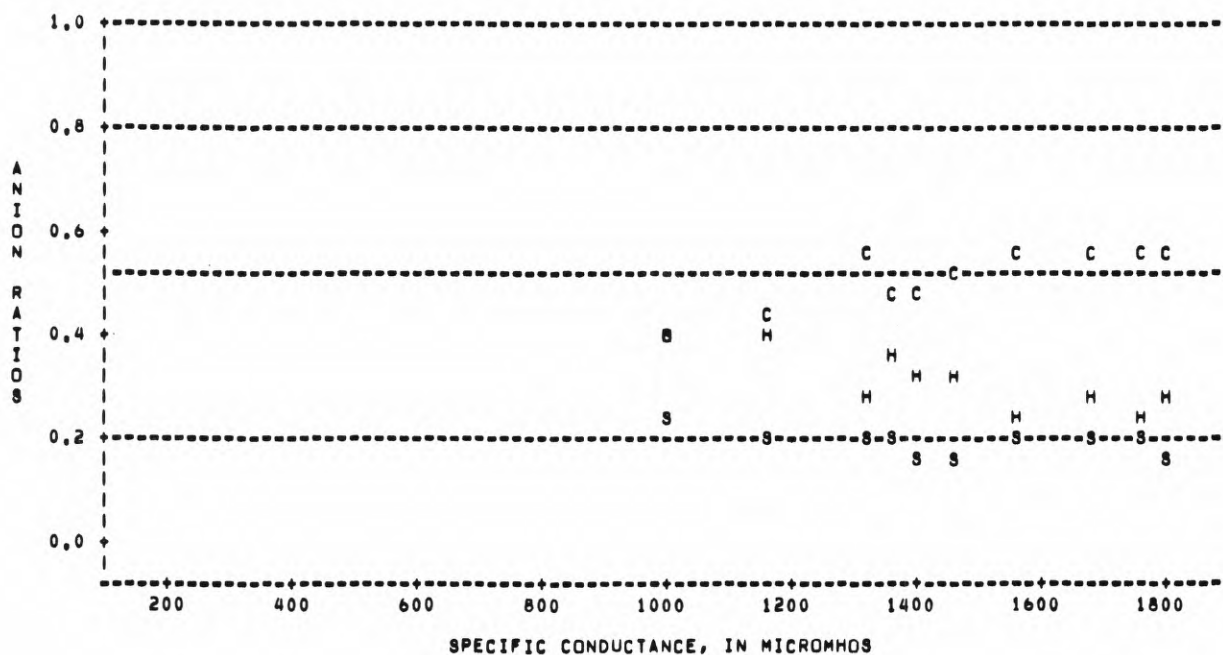
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	580	1183	1420	1650	1793
Dissolved solids	654	766	898	1080	1096
pH	7.4	7.7	8.2	8.4	8.6
Total hardness	266	315	335	354	363
Chloride	144	220	255	310	356
Sulfate	101	108	119	143	148
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	2.6	3.7	4.5	4.7	6.8
Boron					

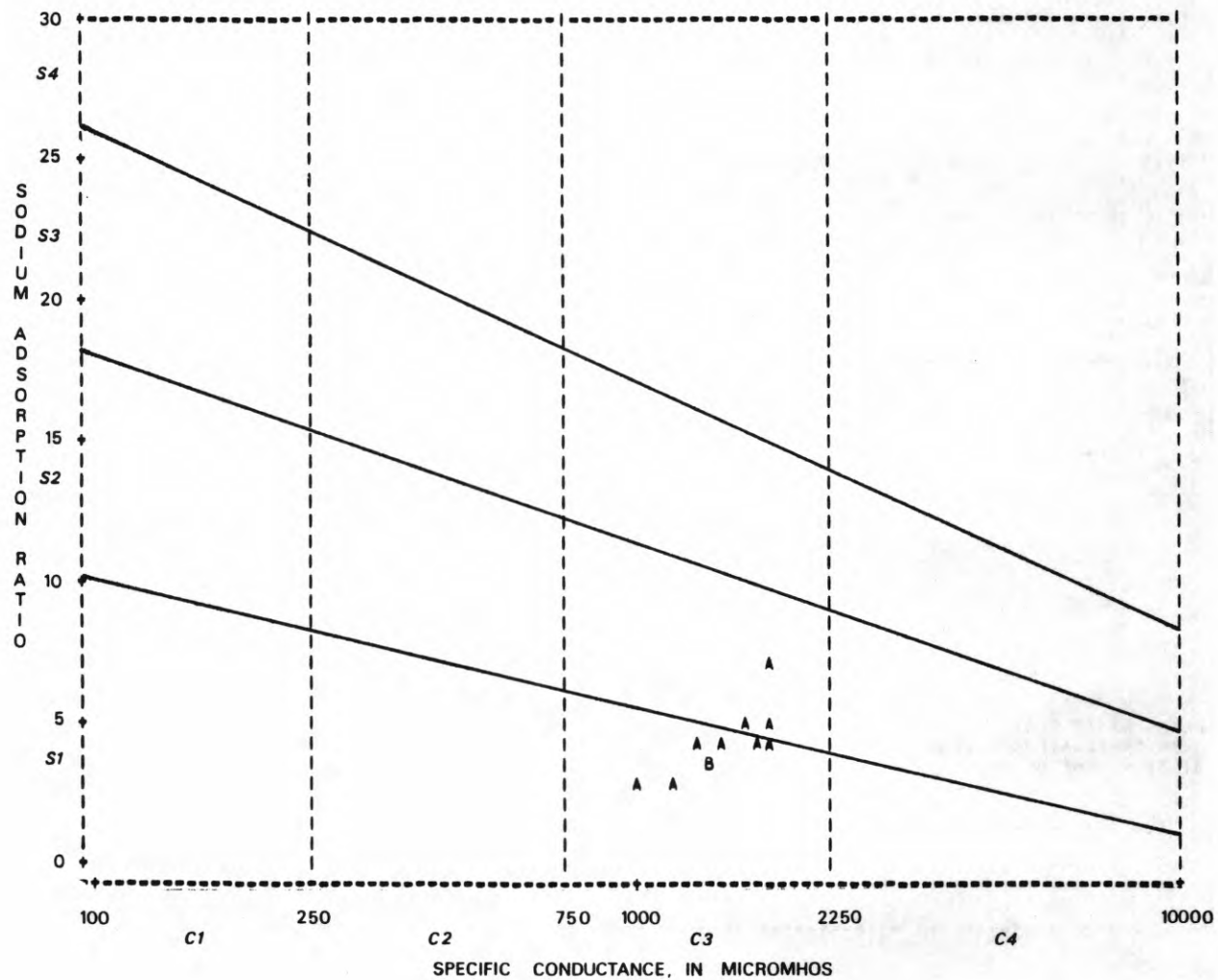
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK AT WITCHER, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK AT WITCHER, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK AT WITCHER, OK



DEEP FORK BASIN

07242350 - Deep Fork near Arcadia, Okla.

LOCATION.--Lat 36°38'58", long 97°21'12", on east line of NE¼ sec. 36, T.14 N., R.2 W., Oklahoma County, at county road bridge, 1.9 mi southwest of Arcadia, 2.0 mi upstream from Coffee Creek, and at mile 213.1.

DRAINAGE AREA.--105 mi².

PERIOD OF RECORD.--1970 to 1979.

WATER TYPE.--For specific conductance greater than 600 umho, 87 percent of the samples, the water was sodium chloride type. For specific conductance less than 600 umho, the water was generally calcium carbonate/bicarbonate type.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time indicate the possibility of negative trends for dissolved solids, chloride, and sulfate. The Spearman's rhos at the 95-percent probability level show negative trends for dissolved solids, chloride, and sulfate and no trend for hardness.

PUBLIC WATER SUPPLY.--Eighty percent of the hardness values were greater than 180 mg/L and the average concentration was 242 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 22 percent of the chloride values, the recommended maximum sulfate concentration of 250 mg/L was exceeded by less than 1 percent of the sulfate values, and the recommended maximum iron concentration of 300 ug/L was exceeded by 8 percent of the iron values. The maximum cadmium contaminant level of 10 ug/L was exceeded by 2 percent of the cadmium values. Arsenic, chromium, lead, and mercury concentrations did not exceed their maximum contaminant levels. Because cadmium exceeded its maximum contaminant level, the suitability of this water for use as a public supply may be marginal.

IRRIGATION.--The salinity hazard ranged from low to very high with 80 percent of the samples in the high-salinity hazard class. The sodium hazard ranged from low to high with about 80 percent of the SAR values equivalent to a low sodium hazard. None of the boron values exceeded the recommended maximum limit of 750 ug/L for boron sensitive plants.

UNIVARIATE STATISTICS

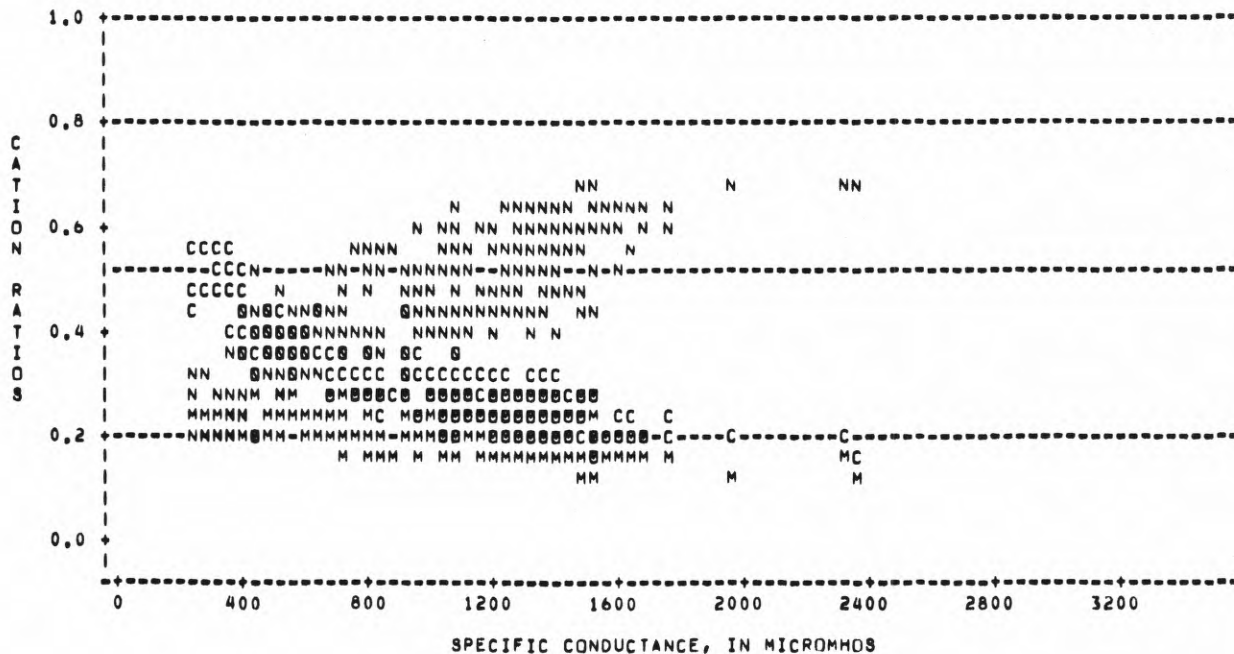
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	694	1145	180	3100	400	-0.34	0.33
Dissolved solids	519	658	136	1320	237	-.41	-.73
pH	684	7.7	6.3	8.5	0.4	-.45	1.15
Total hardness	522	242	7.0	430	70	-.08	-.16
Chloride	550	175	9.3	540	87	.18	.15
Sulfate	521	123	12	600	35	1.86	1.87
Iron	80	171	0	3800	527	6.04	37.44
Fluoride	6	0.7	0.6	0.8			
Arsenic	2	6	4	8			
Cadmium	81	1	0	11	2.0	2.98	9.63
Chromium	86	3	0	40	7.0	2.92	10.34
Lead	87	4	0	35	5.6	2.71	10.05
Mercury	10	0.5	0.0	2.0	0.7	1.21	.65
SAR	510	3.6	0.4	8.0	1.6	.05	-.59
Boron	9	250	34	450			

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	524	858	1250	1420	1550
Dissolved solids	294	455	733	828	919
pH	6.9	7.2	7.7	8.0	8.2
Total hardness	140	190	250	280	330
Chloride	50	108	190	230	280
Sulfate	44	74	120	150	160
Iron	20	30	70	110	169
Fluoride					
Arsenic					
Cadmium	0	0	1	1	3
Chromium	0	0	0	2	10
Lead	0	0	3	5	13
Mercury	0.0	0.0	0.2	1.1	1.9
SAR	1.4	2.5	3.6	4.8	5.5
Boron					

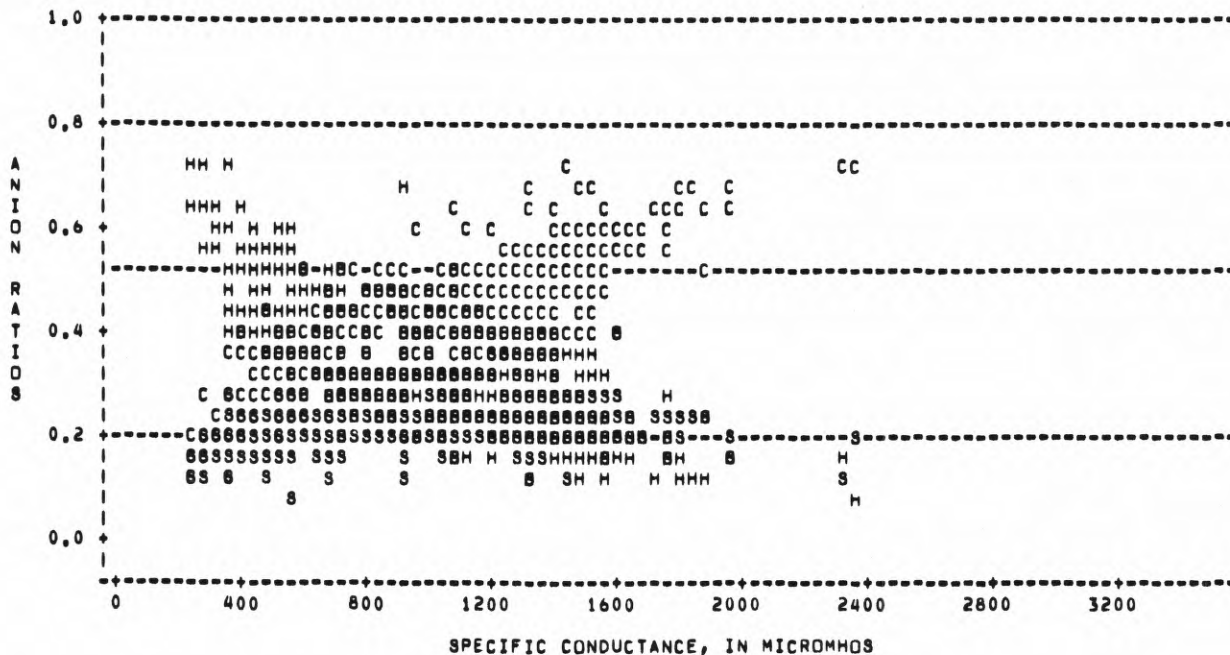
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR ARCADIA, OK

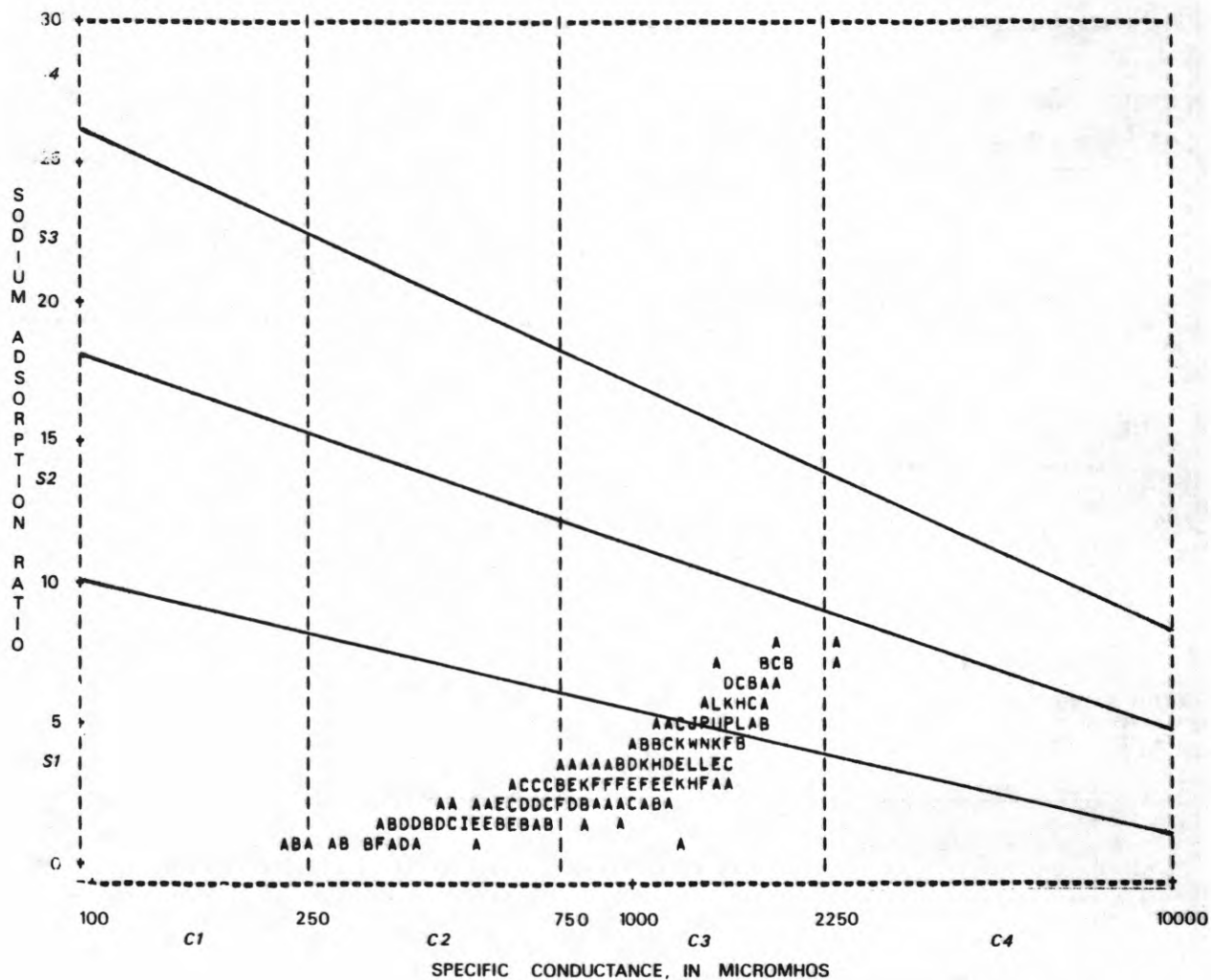


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR ARCADIA, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR ARCADIA, OK



DEEP FORK BASIN

07242400 - Deep Fork near Chandler, Okla.

LOCATION.--Lat 35°38'30", long 96°53'30", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 21, T.14 N., R.4 E., Lincoln County, at bridge on State Highway 18, 3 mi south of Chandler.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1960 to 1962.

WATER TYPE.--For specific conductance greater than about 1,500 umho, 9 percent of the samples, the water was sodium chloride type. For specific conductance less than 1,500 umho and greater than 1,000 umho, 71 percent of the samples, the water was mixed type. The water was carbonate/bicarbonate type for specific conductance less than 1,000 umho. There are no cation distribution data for specific conductance less than 1,000 umho.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Ninety-eight percent of the hardness values were greater than 180 mg/L and the average concentration was 373 mg/L. The hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 25 percent of the chloride values. No toxic metal data are available. Because of the frequency by which the recommended maximum chloride concentration was exceeded, the suitability of this water for use as a public supply may be marginal.

IRRIGATION.--The salinity hazard ranged from medium to high with 92 percent of the samples in the high salinity hazard class. All of the SAR values were equivalent to a low sodium hazard. No boron data are available.

UNIVARIATE STATISTICS

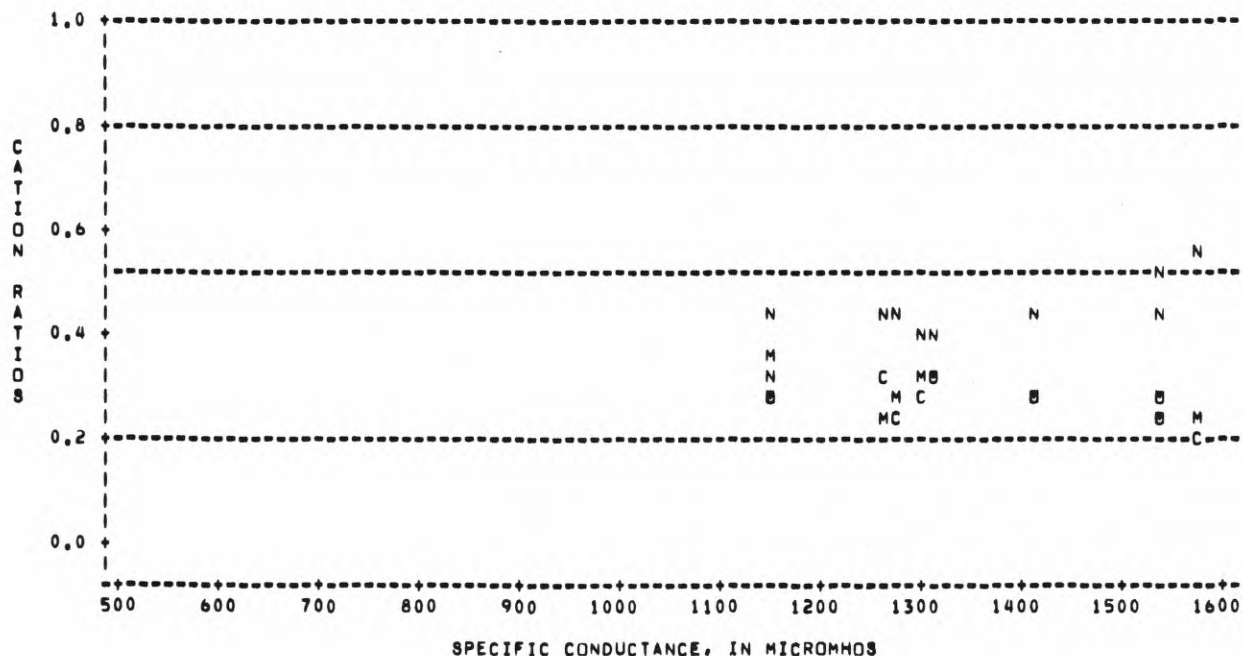
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKLEW	KURT
Specific conductance	20	1249	546	1580	267	-1.06	1.09
Dissolved solids	18	757	303	982	169	-1.30	1.87
pH	20	8.7	7.3	8.9	0.4	-1.98	3.14
Total hardness	20	373	178	480	65	-1.48	3.30
Chloride	20	199	74	300	57	-.29	-.23
Sulfate	18	64	19	100	19	-.41	.96
Iron	0						
Fluoride	1	0.4					
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	18	3.0	1.5	4.5	0.8	.01	-.11
Boron	0						

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	879	1150	1285	1468	1540
Dissolved solids	484	700	784	872	935
pH	7.4	8.5	8.7	8.8	8.9
Total hardness	288	345	389	414	425
Chloride	126	162	198	251	270
Sulfate	33	55	66	74	95
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.9	2.4	3.0	3.4	4.2
Boron					

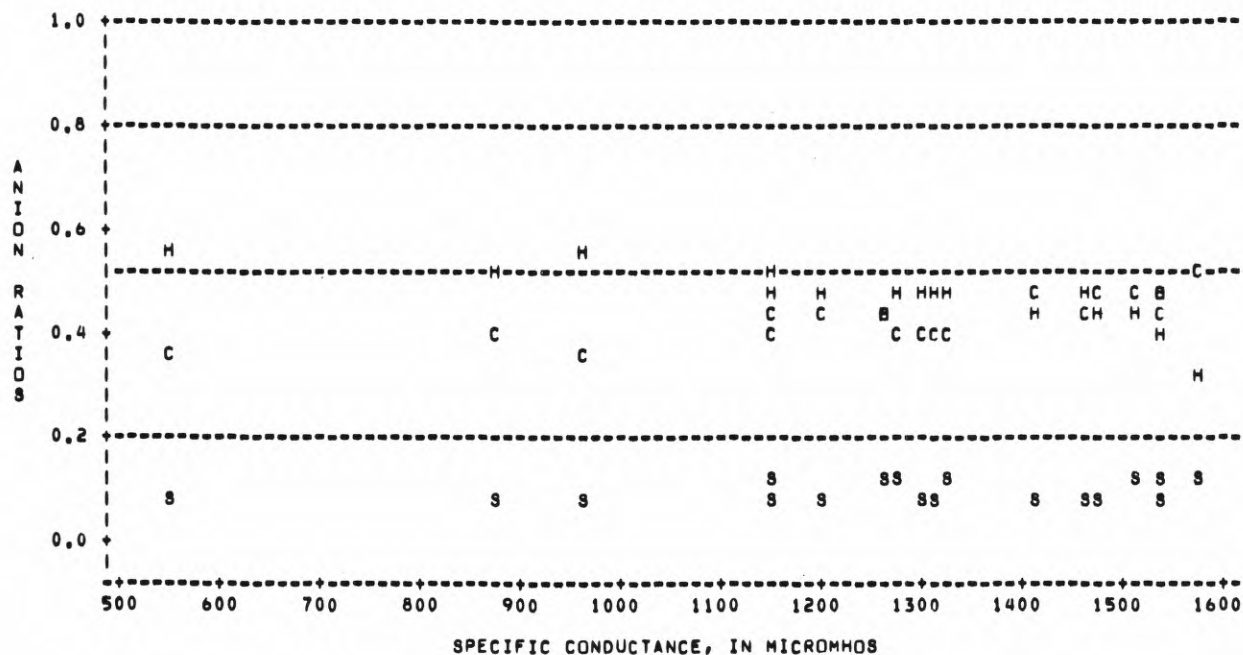
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR CHANDLER, OK

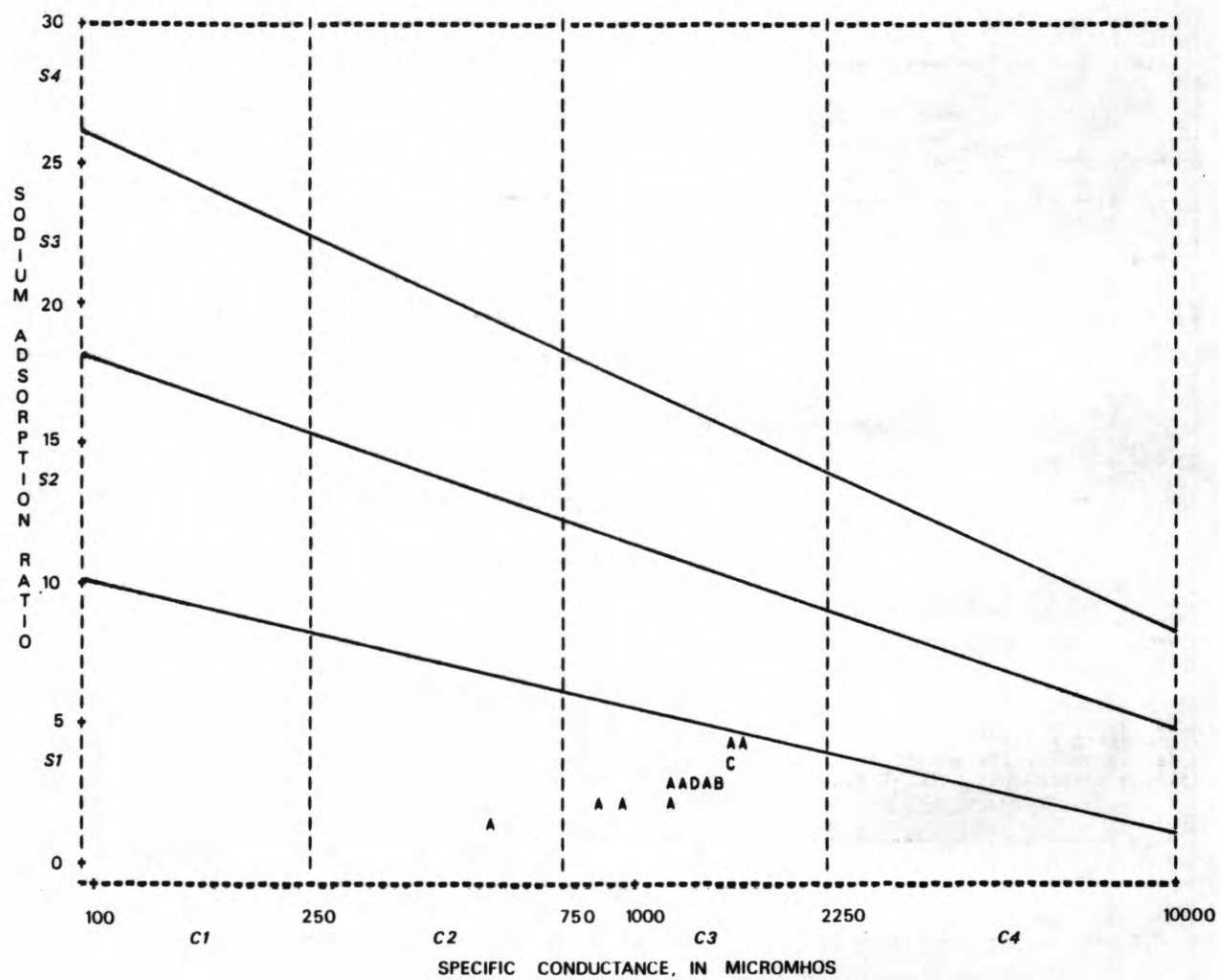


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR CHANDLER, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR CHANDLER, OK



DEEP FORK BASIN

07243500 - Deep Fork near Beggs, Okla.

LOCATION.--Lat 35°40'15", long 96°04'08", on line between sec. 19 and 26, T.14 N., R.12 E., Okmulgee County, at county road bridge, 3.0 mi upstream from Adams Creek, 4.0 mi south of Beggs, 8.0 mi downstream from Flat Rock (Checkerboard) Creek, and at mile 85.0.

DRAINAGE AREA.--2,018 mi².

PERIOD OF RECORD.--1952 to 1979.

WATER TYPE.--The water was sodium chloride type throughout the range of measured specific conductance.

TREND.--Plots of the dissolved solids, hardness, chloride, and sulfate concentrations versus time indicate a negative trend for chloride and a positive trend for sulfate. The Spearman's rhos at the 95-percent probability level also indicate negative trend for chloride and positive trend for sulfate. No trend was indicated for hardness and dissolved solids by either the plots or the Spearman's rhos.

PUBLIC WATER SUPPLY.--Sixty-five percent of the hardness values were greater than 180 mg/L and the average concentration was 248 mg/L. The hardness classification for this water varies between hard and very hard. The recommended maximum pH of 9.0 was exceeded by less than 1 percent of the pH values, the recommended maximum chloride concentration of 250 mg/L was exceeded by 37 percent of the chloride values, and the recommended maximum sulfate concentration of 250 mg/L was exceeded by less than 1 percent of the sulfate values. The maximum contaminant level for fluoride was exceeded by 1 out of 96 fluoride values. Arsenic, cadmium, chromium, lead, and mercury concentrations did not exceed their maximum contaminant values. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water probably would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 71 percent of the samples having a high or very high salinity hazard. The sodium hazard ranged from low to very high with 83 percent of the SAR values equivalent to a low sodium hazard. The data indicate that boron phytotoxic effects should not occur.

UNIVARIATE STATISTICS

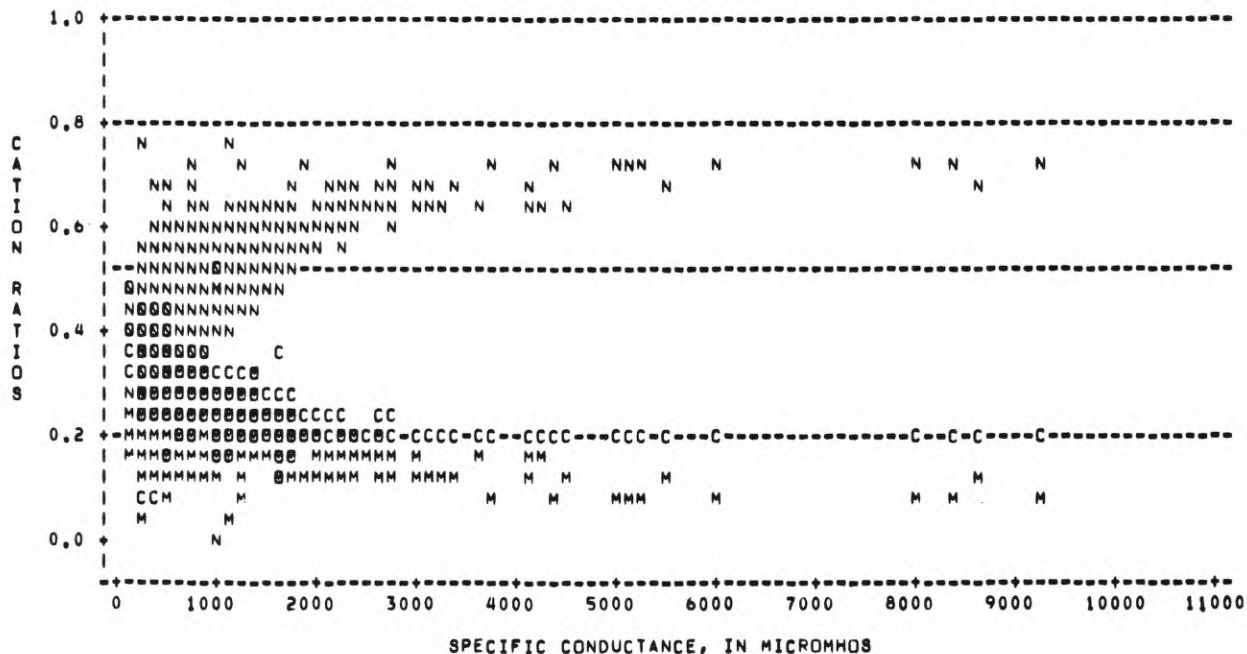
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	1822	1227	83	9250	1058	3.23	14.48
Dissolved solids	1780	697	86	5340	589	3.32	16.04
pH	1721	8.0	6.2	9.6	0.4	-.45	.94
Total hardness	1737	248	16	1310	149	2.01	7.49
Chloride	1791	286	7.3	3000	337	3.82	19.06
Sulfate	1795	38	1.6	313	27	2.57	12.20
Iron	12	69	0	250	90	1.35	.51
Fluoride	96	0.4	0.0	3.1	0.3	5.78	47.02
Arsenic	7	3	1	6			
Cadmium	7	1	0	2			
Chromium	7	4	0	20			
Lead	7	11	0	32			
Mercury	7	0.0	0.0	0.3			
SAR	1303	3.6	0.4	18	2.3	2.43	8.37
Boron	74	304	0	750	173	.40	.05

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	384	624	987	1413	2167
Dissolved solids	229	360	561	809	1240
pH	7.5	7.8	8.0	8.3	8.5
Total hardness	89	148	230	312	400
Chloride	64	114	190	310	560
Sulfate	13	20	31	46	72
Iron	0	2	25	125	244
Fluoride	0.2	0.3	0.4	0.5	0.6
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	1.6	2.2	3.1	4.2	6.3
Boron	55	197	300	402	545

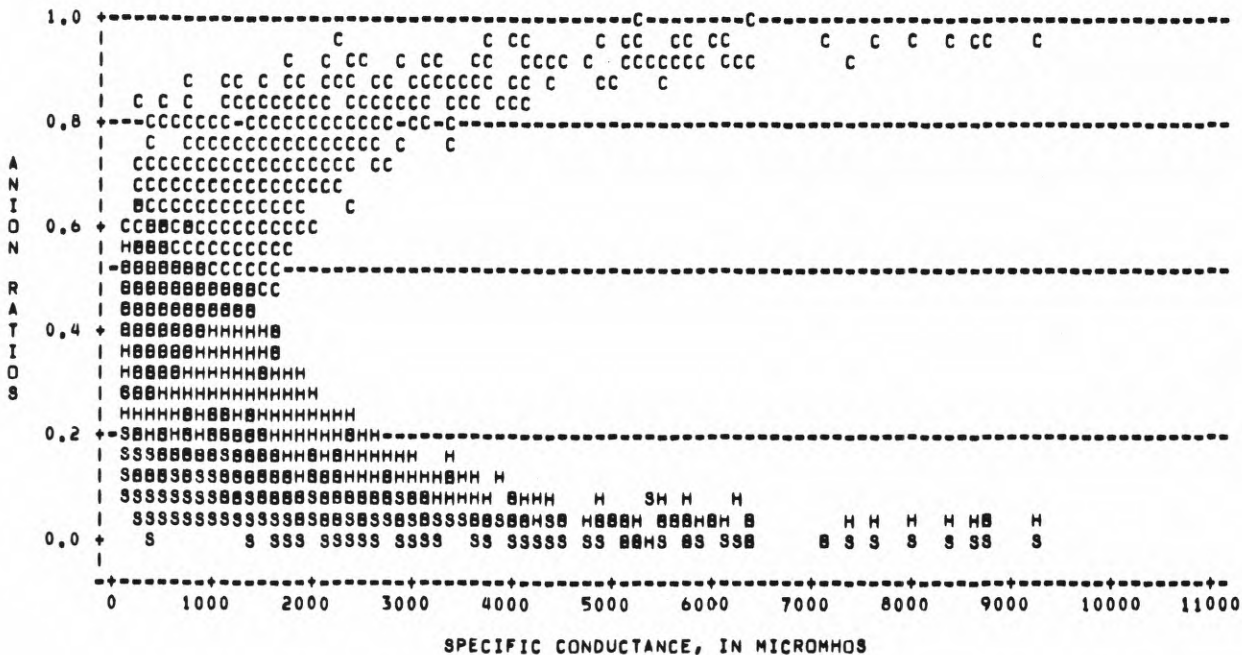
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR BEGGS, OK

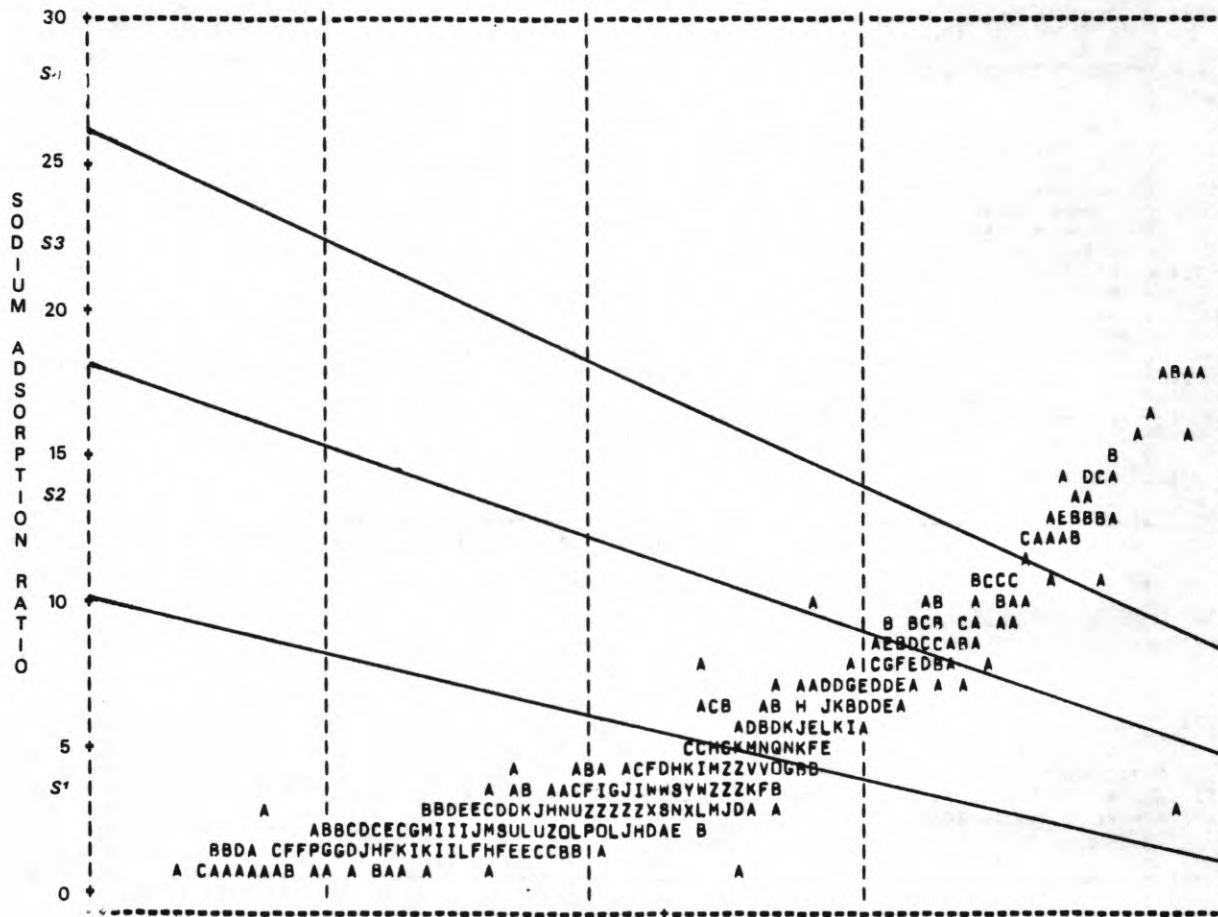


ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR BEGGS, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NR BEGGS, OK



DEEP FORK BASIN

07244000 - Deep Fork near Dewar, Okla.

LOCATION.--Lat 35°28'43", long 95°52'57", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T.12 N., R.13 E., Okmulgee County, at bridge on U.S. Highway 266, 3.5 mi east of Dewar, and at mile 43.9.

DRAINAGE AREA.--2,307 mi².

PERIOD OF RECORD.--1949 to 1951.

WATER TYPE.--The water was sodium chloride type throughout the range of measured specific conductance.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Sixty-two percent of the hardness values were greater than 180 mg/L and the average concentration was 246 mg/L. The hardness classification for this water varies between hard and very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 45 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water probably would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to very high with 74 percent of the samples having a high or very high salinity hazard. The sodium hazard ranged from low to very high with 54 percent of the SAR values equivalent to a low sodium hazard. No boron data are available.

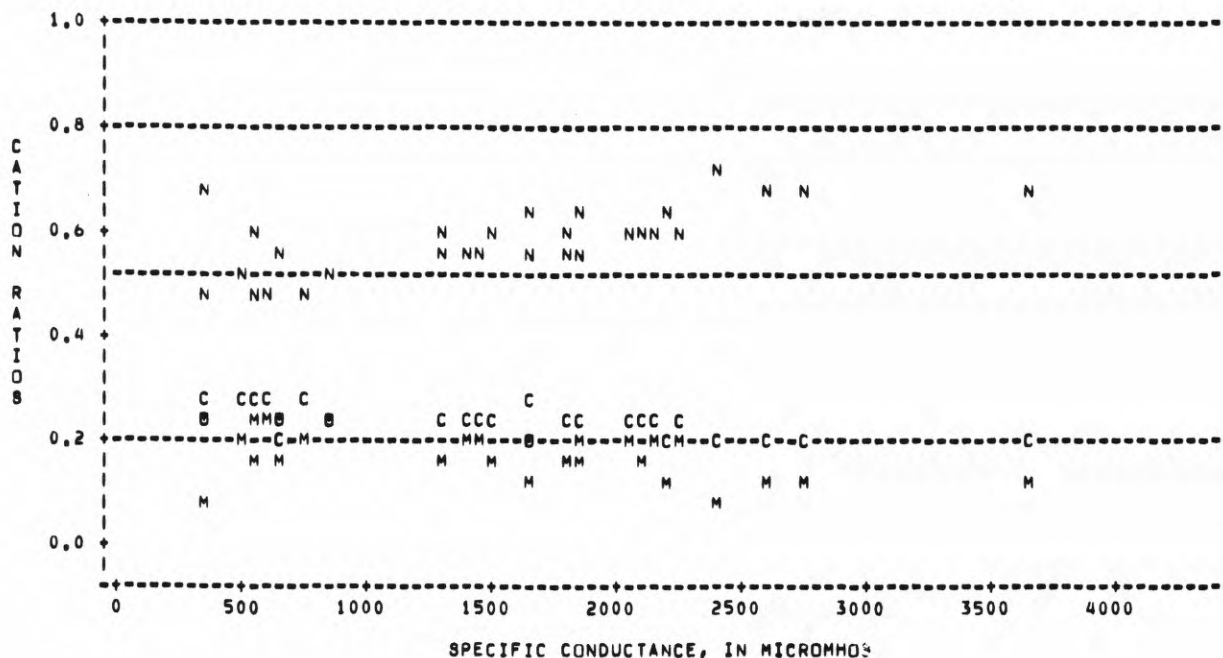
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	285	1276	172	4120	819	1.06	0.59
Dissolved solids	285	751	166	2580	495	1.28	1.19
pH	81	7.9	6.8	8.7	0.5	-.18	-.39
Total hardness	285	246	40	624	128	.68	-.27
Chloride	285	326	31	1550	276	1.62	2.68
Sulfate	285	27	7.2	71	11	.58	.43
Iron	0						
Fluoride	24	0.2	0.0	0.5	0.1	.94	.18
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	30	4.9	1.7	10	2.2	.64	-.08
Boron	0						

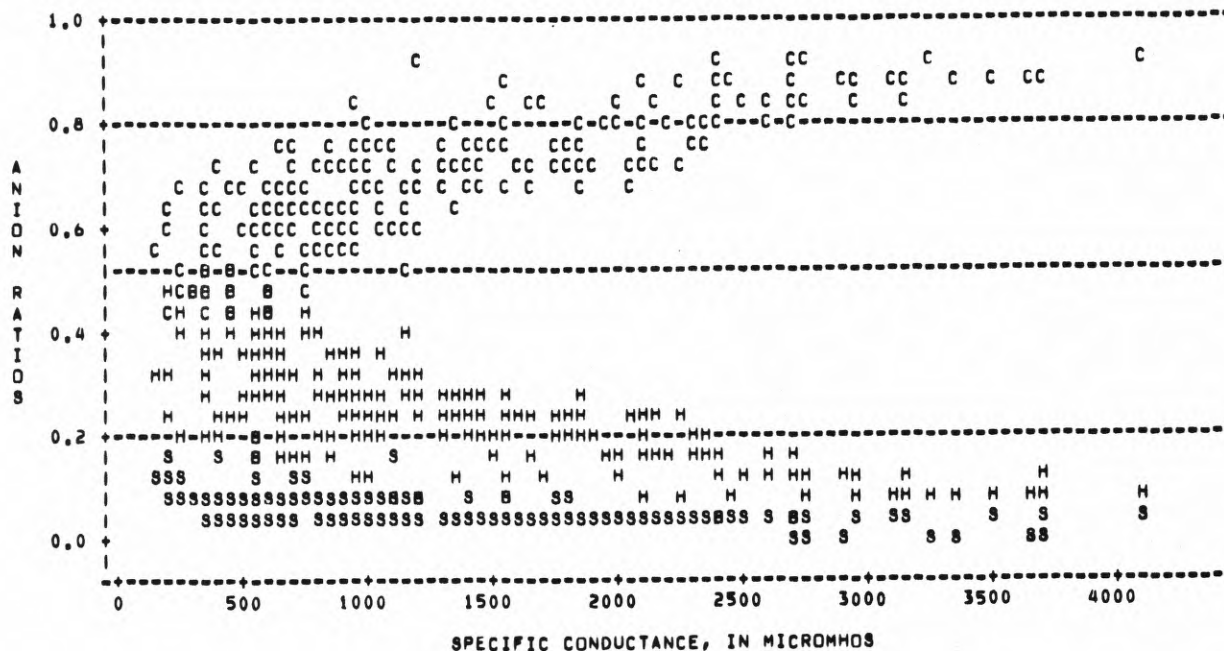
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	429	644	1010	1770	2480
Dissolved solids	262	382	588	1015	1494
pH	7.0	7.5	7.9	8.1	8.5
Total hardness	106	142	212	337	429
Chloride	76	137	228	444	715
Sulfate	14	19	25	34	41
Iron					
Fluoride	0.1	0.1	0.1	0.3	0.4
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	2.2	2.8	5.0	6.0	8.9
Boron					

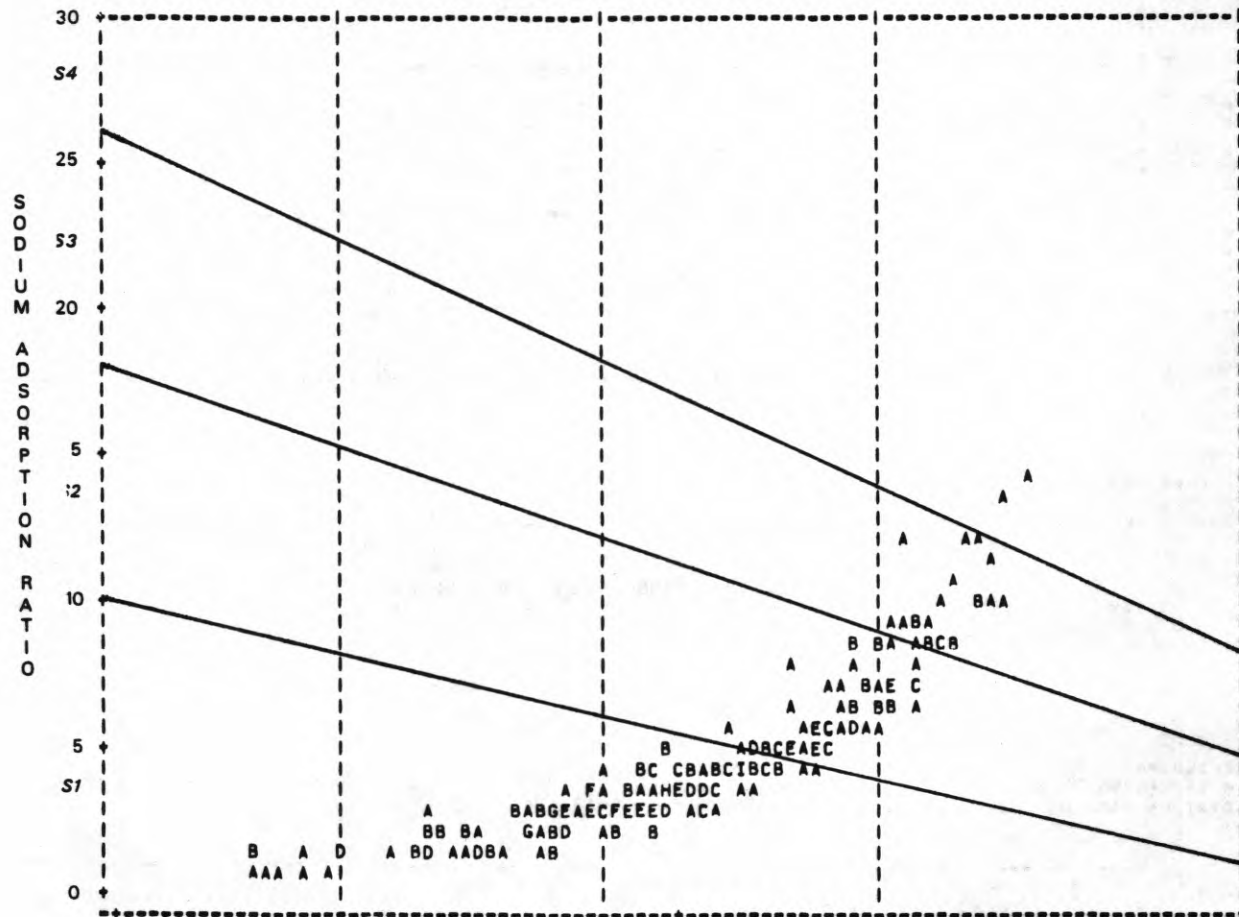
CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NEAR DEWAR, OK



ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NEAR DEWAR, OK



C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
A = 1 OBS, B = 2 OBS, C = 3 OBS
STATION NAME OR LOCAL IDENTIFIER=DEEP FORK NEAR DENAR, OK



DEEP FORK BASIN

07243000 - Dry Creek near Kendrick, Okla.

LOCATION.--Lat 34°46'55", long 96°51'20", in NW¹/₄NW¹/₄ sec. 14, T.15 N., R.4 E., Lincoln County, at county road bridge, 1.0 mi downstream from Beaver Creek, and 4.5 mi west of Kendrick.

DRAINAGE AREA.--69.0 mi².

PERIOD OF RECORD.--1955, 1958 to 1960, 1966 to 1968, 1970 to 1973.

WATER TYPE.--For specific conductance less than 700 umho, 73 percent of the samples, the water was carbonate/bicarbonate type. For specific conductance greater than 700 umho the water was chloride type. The data are not adequate to assess the cation-specific conductance distribution.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Forty-four percent of the hardness values were greater than 180 mg/L and the average concentration was 143 mg/L. The hardness classification for this water varies between hard and very hard. None of the measured constituents exceeded their recommended maximum concentrations. No toxic metal data are available. Based on the data, this water would be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from low to high with 76 percent of the samples having a low salinity hazard. All of the SAR values were equivalent to a low sodium hazard. None of the boron values exceeded the recommended 750 ug/L maximum concentration for boron sensitive plants.

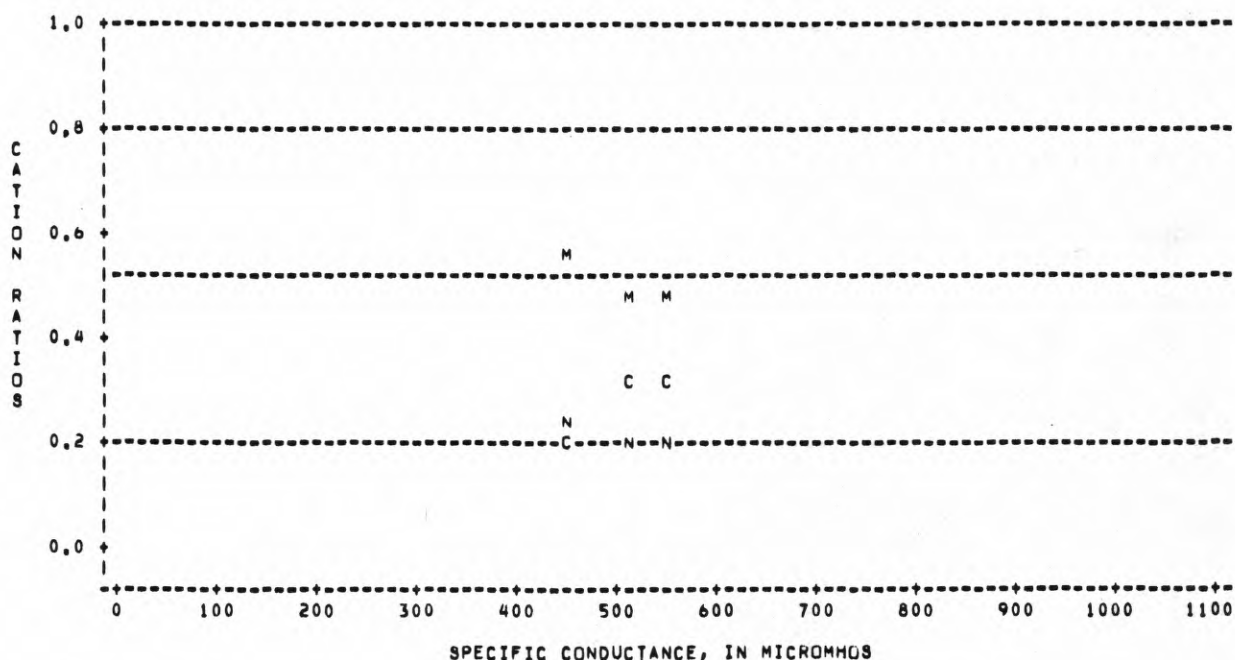
UNIVARIATE STATISTICS

CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	16	437	103	1020	323	0.62	-1.06
Dissolved solids	14	239	55	618	199	.89	-.88
pH	16	7.8	6.5	8.5	0.7	-.37	-1.30
Total hardness	17	143	24	302	102	.32	-1.74
Chloride	16	48	4.9	178	56	1.48	.98
Sulfate	13	12	1.8	22	5.8	.32	-.45
Iron	0						
Fluoride	3	0.3	0.3	0.3			
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	17	1.1	0.2	4.3	1.0	2.22	5.63
Boron	3	50	30	80			

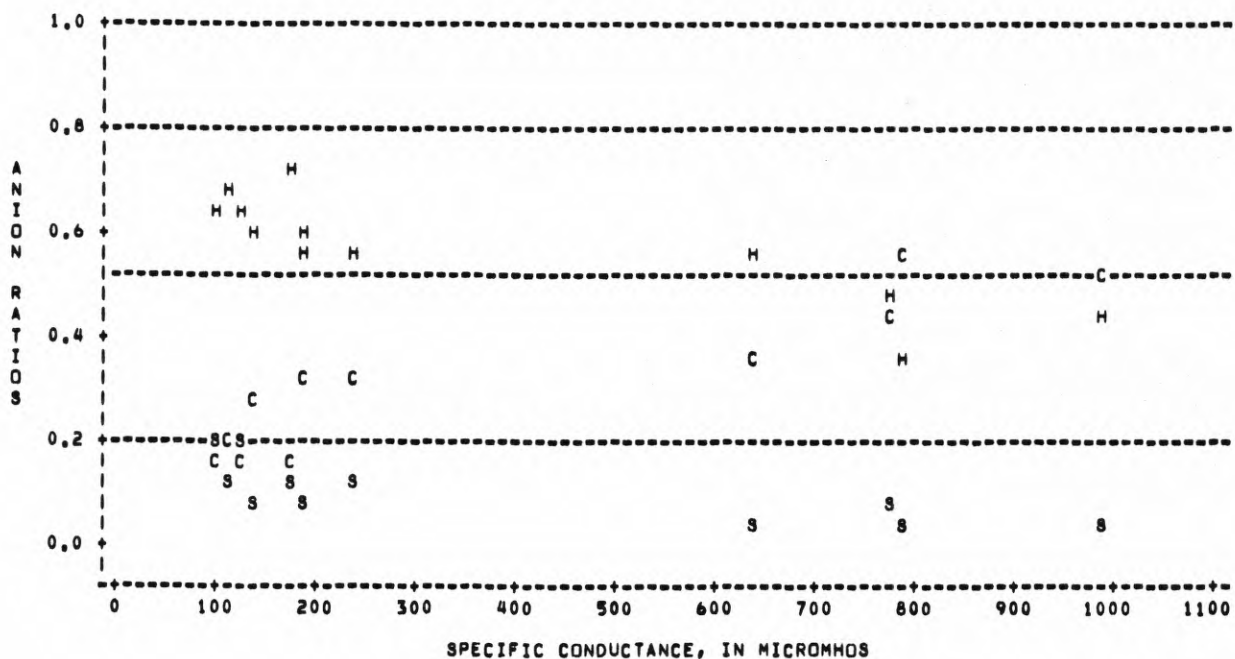
FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	113	152	340	738	995
Dissolved solids	66	90	126	431	588
pH	6.8	7.0	7.8	8.4	8.5
Total hardness	37	54	72	235	299
Chloride	5.0	8.3	24	75	164
Sulfate	3.9	7.0	10	16	21
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	0.3	0.4	0.7	1.4	2.6
Boron					

CATION RATIO PLOT
 N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DRY CREEK NR KENDRICK, OK

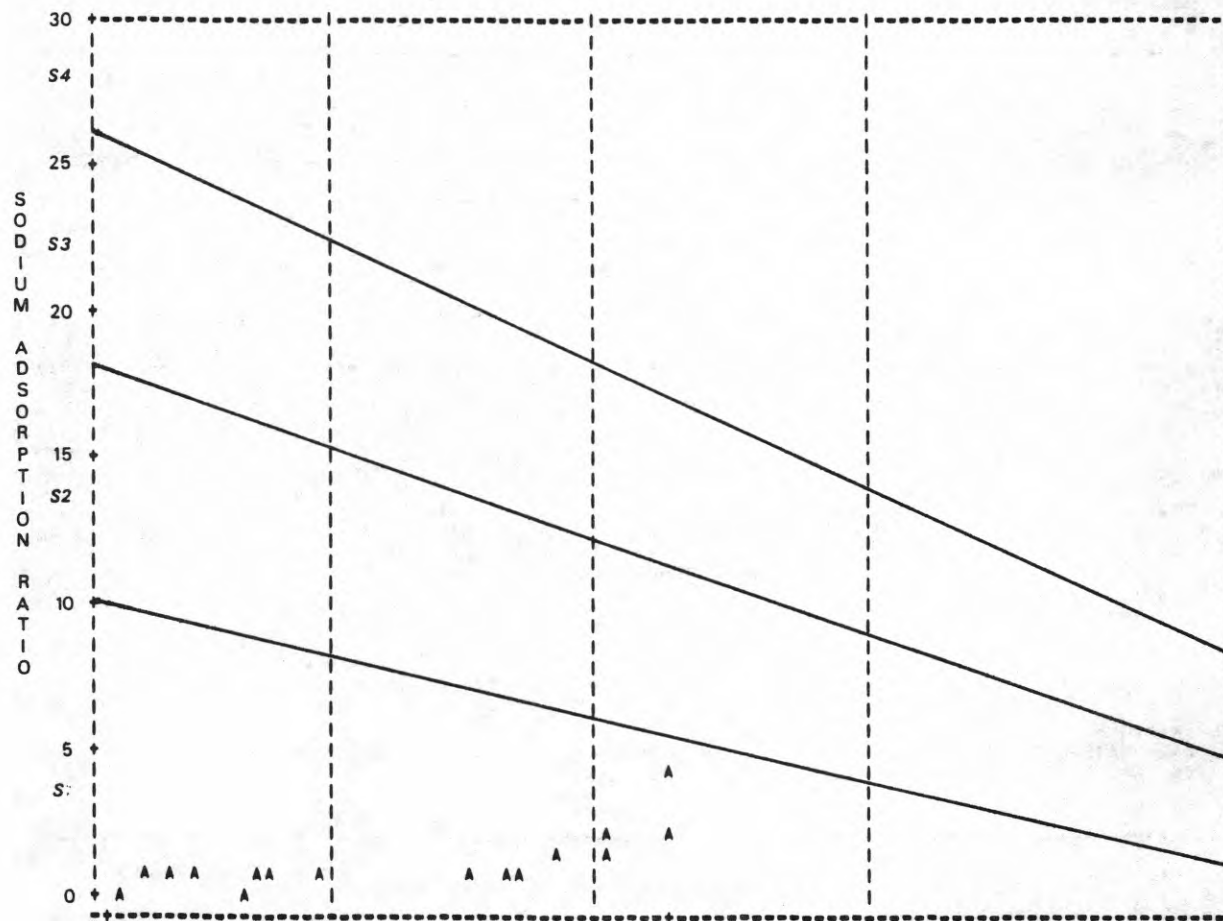


ANION RATIO PLOT
 H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
 STATION NAME OR LOCAL IDENTIFIER=DRY CREEK NR KENDRICK, OK



IRRIGATION DIAGRAM

C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=DRY CREEK NR KENDRICK, OK



DEEP FORK BASIN

07243450 - Little Deep Fork near Edna, Okla.

LOCATION.--Lat 35°42'00", long 96°13'50", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T.14 N., R.10 E., Creek County, at county road bridge, 0.2 mi south of Edna.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--1951 to 1957, 1960 to 1962.

WATER TYPE.--The water was sodium chloride type throughout the range of measured specific conductance.

TREND.--No current data are available.

PUBLIC WATER SUPPLY.--Eighty-five percent of the hardness values were greater than 180 mg/L and the average concentration was 665 mg/L. In general, the hardness classification for this water is very hard. The recommended maximum chloride concentration of 250 mg/L was exceeded by 87 percent of the chloride values. No toxic metal data are available. Because of the frequency and magnitude by which the recommended maximum chloride concentration was exceeded, this water would not be suitable for use as a public supply.

IRRIGATION.--The salinity hazard ranged from medium to very high with 62 percent of the samples having a very high salinity hazard. The sodium hazard ranged from low to very high with 33 percent of the SAR values equivalent to a high or very high sodium hazard. No boron data are available.

UNIVARIATE STATISTICS

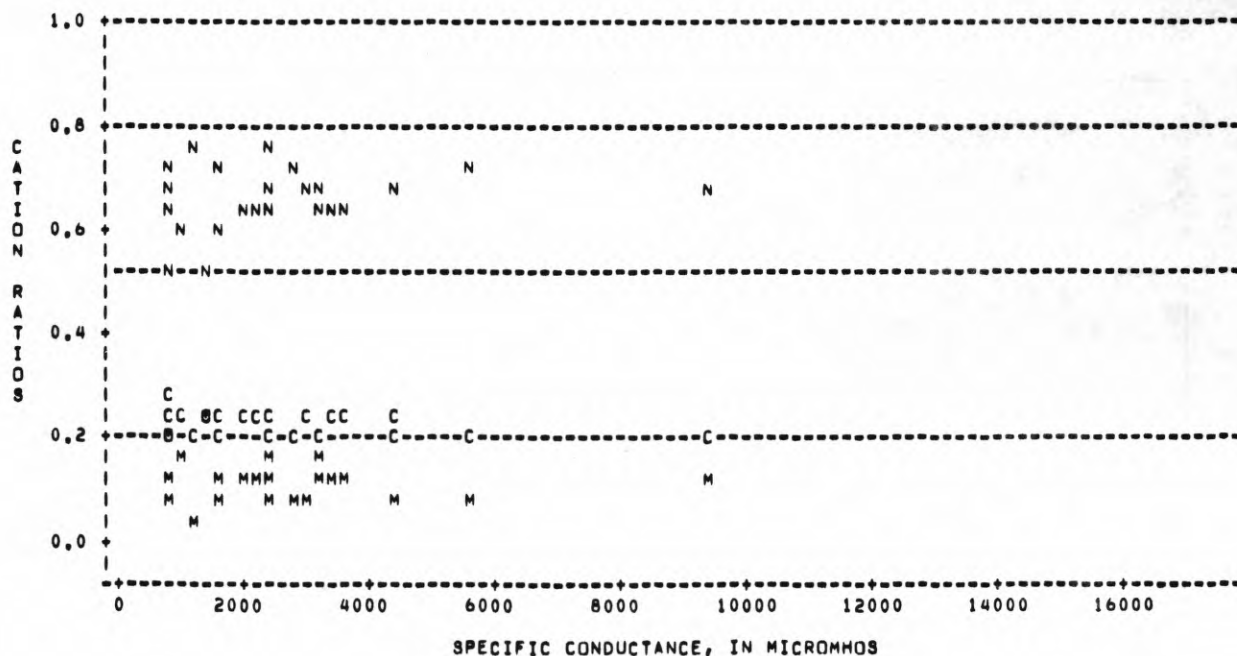
CONSTITUENT	N	MEAN	MIN	MAX	STD	SKEW	KURT
Specific conductance	53	4569	554	14400	4050	1.15	0.02
Dissolved solids	16	1148	317	2450	586	.62	.15
pH	54	7.7	6.6	8.5	0.5	-.40	-.89
Total hardness	54	665	95	1990	544	1.11	-.01
Chloride	54	1511	130	4880	1451	1.14	-.10
Sulfate	17	19	4.1	31	8.4	-.11	-1.15
Iron	0						
Fluoride	0						
Arsenic	0						
Cadmium	0						
Chromium	0						
Lead	0						
Mercury	0						
SAR	33	7.2	2.8	16	3.0	.92	1.23
Boron	0						

FREQUENCY DISTRIBUTION

CONSTITUENT	PERCENTILE CONCENTRATION				
	10th	25th	50th	75th	90th
Specific conductance	812	1735	2780	6035	11660
Dissolved solids	388	649	1085	1472	2079
pH	7.0	7.3	7.7	8.1	8.3
Total hardness	126	296	410	834	1605
Chloride	224	489	860	2152	4060
Sulfate	7.4	12	19	28	30
Iron					
Fluoride					
Arsenic					
Cadmium					
Chromium					
Lead					
Mercury					
SAR	3.5	5.0	6.9	8.8	11
Boron					

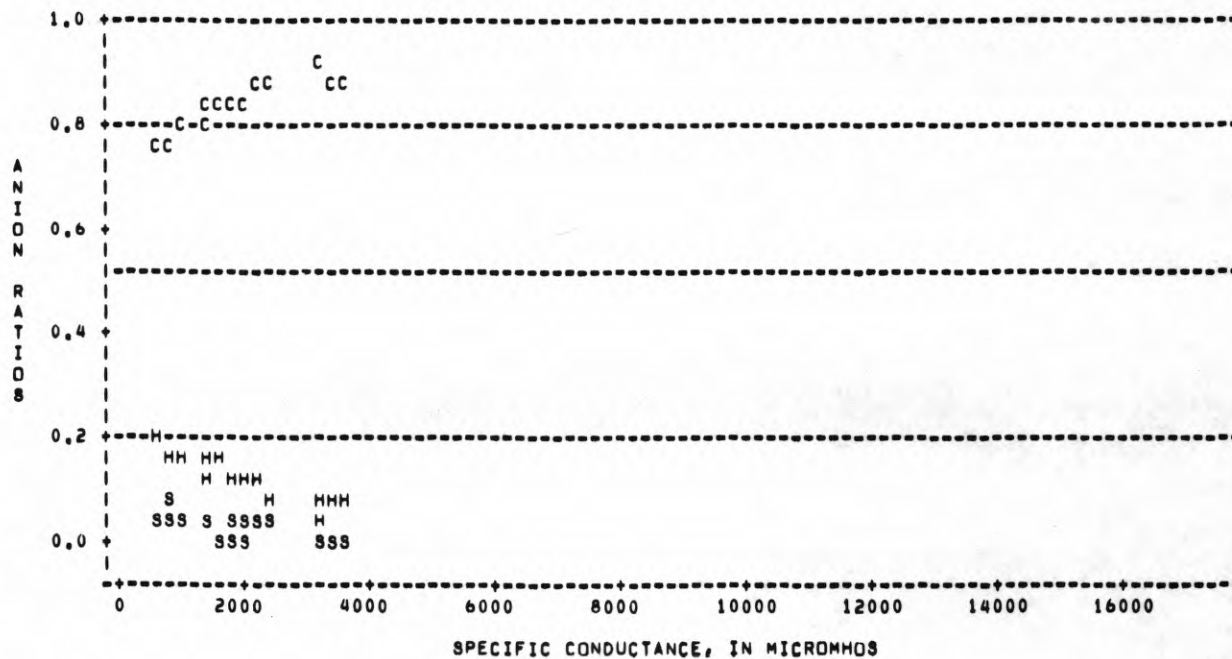
CATION RATIO PLOT

N IS SODIUM ION RATIO, C IS CALCIUM ION RATIO, M IS MAGNESIUM ION RATIO
STATION NAME OR LOCAL IDENTIFIER=LITTLE DEEP FORK NR EDNA, OK



ANION RATIO PLOT

H IS CARBONATE/BICARBONATE ION RATIO, C IS CHLORIDE ION RATIO, S IS SULFATE ION RATIO
STATION NAME OR LOCAL IDENTIFIER=LITTLE DEEP FORK NR EDNA, OK



IRRIGATION DIAGRAM
 C1 AND S1 ARE LOW HAZARD, C2 AND S2 ARE MEDIUM HAZARD
 C3 AND S3 ARE HIGH HAZARD, C4 AND S4 ARE VERY HIGH HAZARD
 A = 1 OBS, B = 2 OBS, C = 3 OBS
 STATION NAME OR LOCAL IDENTIFIER=LITTLE DEEP FORK NR EDNA, OK

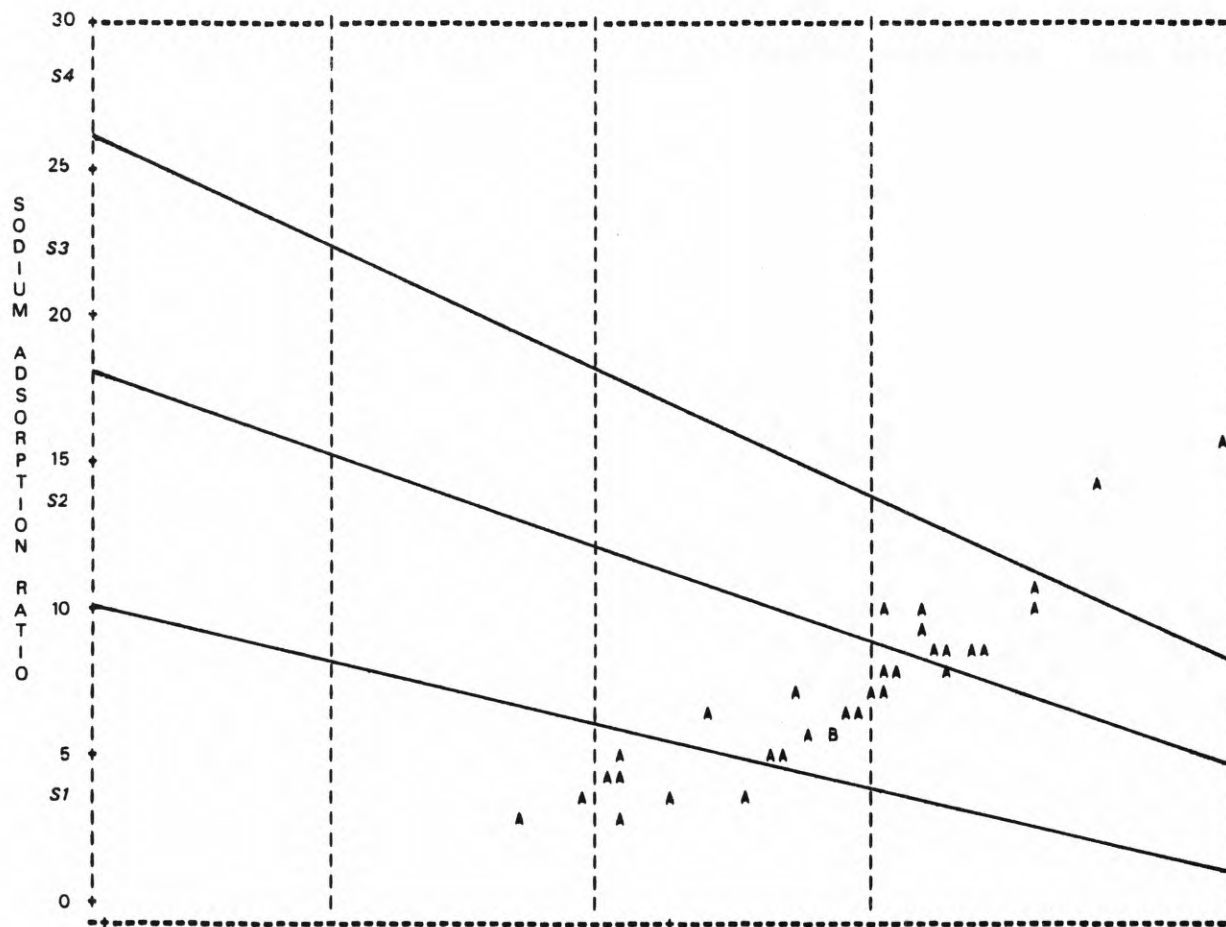


Table 3.--List of stations in downstream order

Number	Station name	Page
07228200	Canadian River near Roll, Okla.-----	30
07228300	Canadian River near Thomas, Okla.-----	34
07228400	Deer Creek at Hydro, Okla.-----	58
07228500	Canadian River at Bridgeport, Okla.-----	38
07229100	Canadian River near Noble, Okla.-----	42
07229200	Canadian River at Purcell, Okla.-----	46
07229300	Walnut Creek at Purcell, Okla.-----	102
07230000	Little River below Lake Thunderbird, near Norman, Okla.-----	70
07230500	Little River near Tecumseh, Okla.-----	74
07230800	Salt Creek near Dewright, Okla.-----	90
07231000	Little River near Sasakwa, Okla.-----	78
07231500	Canadian River at Calvin, Okla.-----	50
07231975	Brushy Creek near Haileyville, Okla.-----	26
07231980	Gaines Creek near Higgins, Okla.-----	66
07231990	Peaceable Creek near Haileyville, Okla.-----	86
07232010	Blue Creek near Blocker, Okla.-----	22
07232024	Deer Creek near McAlester, Okla.-----	62
07232029	Mathuldy Creek near Crowder, Okla.-----	82
07232500	Beaver River near Guymon, Okla.-----	106
07232630	Beaver River near Hooker, Okla.-----	110
07233000	Coldwater Creek near Hardesty, Okla.-----	118
07234000	Beaver River at Beaver, Okla.-----	114
07236000	Wolf Creek near Fargo, Okla.-----	173
07237500	North Canadian River at Woodward, Okla.-----	130
07238000	North Canadian River near Seiling, Okla.-----	134
07239000	North Canadian River at Canton, Okla.-----	138
07239450	North Canadian River near Fort Reno, Okla.-----	142
07239500	North Canadian River near El Reno, Okla.-----	145
07239700	North Canadian River near Yukon, Okla.-----	149
07241500	North Canadian River near Oklahoma City, Okla.-----	153
07241550	North Canadian River near Harrah, Okla.-----	157
07242000	North Canadian River near Wetumka, Okla.-----	161
07242050	Wewoka Creek at Wewoka, Okla.-----	165
07242080	Little Wewoka Creek near Wetumka, Okla.-----	126
07242090	Grief Creek near Wetumka, Okla.-----	122
07242100	Wewoka Creek near Wetumka, Okla.-----	169
07242300	Deep Fork at Witcher, Okla.-----	181
07242350	Deep Fork near Arcadia, Okla.-----	185
07242400	Deep Fork near Chandler, Okla.-----	189
07242500	Bellcow Creek at Chandler, Okla.-----	177
07243000	Dry Creek near Kendrick, Okla.-----	201

Table 3.--List of stations in downstream order--Continued

Number	Station name	Page
07243450	Little Deep Fork near Edna, Okla.-----	205
07243500	Deep Fork near Beggs, Okla.-----	193
07244000	Deep Fork near Dewar, Okla.-----	197
07245000	Canadian River near Whitefield, Okla.-----	54
07245020	Taloka Creek at Stigler, Okla.-----	94
07245030	Taloka Creek near Stigler, Okla.-----	98

131740