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DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

GEOHYDROLOGIC DATA FROM TWENTY-FOUR TEST HOLES  
DRILLED IN THE PICEANCE BASIN, RIO BLANCO COUNTY,  
COLORADO, 1975-76

By Frank A. Welder and George J. Saulnier, Jr.

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Lakewood, Colorado

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## METRIC CONVERSIONS

Inch-pound units in this report may be expressed as metric units by use of the following conversion factors:

<i>To convert inch-pound unit</i>	<i>Multiply by</i>	<i>To obtain metric unit</i>
inch	25.40	millimeter
foot	.3048	meter
foot squared per day	.0929	meter squared per day
gallon	3.785	liter
gallon per minute	.06309	liter per second

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ABSTRACT

Twenty-four test holes were drilled in the Piceance basin, northwestern Colorado, to obtain geohydrologic data from the Uinta and Green River Formations of Eocene age. The test holes were drilled by the air-rotary method and completed in stratigraphic intervals above and below the Mahogany zone in the Parachute Creek Member of the Green River Formation. The interval from land surface to the top of the Mahogany zone, which includes the Uinta Formation, was designated as the upper aquifer, and the interval from the base of the Mahogany zone to the base of the permeable section of the Green River Formation was designated as the lower aquifer. Depths of test holes ranged from 640 to 2,800 feet. The maximum quantity of water discharged during the air drilling of individual test holes ranged from 14 to 880 gallons per minute. The specific conductance of water discharged during drilling ranged from 100 to 50,000 micromhos per centimeter at 25 degrees Celsius.

Aquifer tests made during drilling indicate transmissivity at four sites ranged from 100 to 1,600 feet squared per day and the storage coefficient at two sites ranged from  $1 \times 10^{-4}$  to  $1.6 \times 10^{-4}$ . Depths to the static water level ranged from 30 to 695 feet.

Water levels were measured in each test well, and potentiometric maps constructed from these measurements are comparable in configuration and altitude to those previously drawn from composite-head data.

Water samples taken during drilling indicate that, except for water from the Uinta Formation, the water in Piceance basin is generally not suited for domestic water supply due to the presence of excessive amounts of certain trace constituents, notably fluoride. The average concentration of dissolved solids, based on data from the test holes, was 909 milligrams per liter for the Uinta Formation, 828 milligrams per liter for the upper part of the Parachute Creek Member of the Green River Formation, and 3,460 milligrams per liter for the lower part of the Parachute Creek Member.

## INTRODUCTION

To obtain information about the ground-water resources of the Piceance basin in response to potential oil-shale development, the U.S. Geological Survey contracted for and supervised the drilling of 24 test holes at 13 sites in Rio Blanco County, Colo. The purpose of this report is to present the ground-water data obtained from the test holes. These data will aid in determining the effects of future oil-shale development on the water resources of the basin.

Drilling began in May 1975 and ended in January 1976. Total footage drilled was 30,082 feet including two test holes that were drilled and cored a total of 5,200 feet. Depths of the holes ranged from 400 to 2,800 feet. All test holes were drilled and cored using rotary air mist. The work was accomplished through a cooperative program between the U.S. Bureau of Land Management, the U.S. Environmental Protection Agency, and the U.S. Geological Survey.

## GEOHYDROLOGIC SETTING

Test holes in stream valleys penetrated as much as 100 feet of alluvium. All test holes penetrated the Uinta Formation of Eocene age, mostly consisting of fine-grained quartz sandstone and siltstone, and the underlying Parachute Creek Member of the Green River Formation of Eocene age, consisting of marlstone with varying amounts of kerogen (oil shale and the sodium minerals, nahcolite, halite, and dawsonite).

A stratigraphic interval relatively rich in oil shale, known as the Mahogany zone, is found in the upper part of the Parachute Creek Member of the Green River Formation. Where it was penetrated, the zone is about 180 feet thick and has little permeability. Water-saturated bedrock above the Mahogany zone constitutes the upper aquifer; water-saturated bedrock below the Mahogany zone forms the lower aquifer (fig. 1). Throughout much of the Piceance basin, water in the two aquifers is under artesian pressure, which usually results in flows from holes that are drilled in valley bottoms. At any one site, the aquifers generally have different potentiometric heads.

All test holes, except TH75-6A and B, and TH75-7A and B, were drilled at sites where petroleum companies had previously drilled exploratory gas wells and had obtained electric logs for the wells. The geologic markers and completion points for each test hole were chosen by the authors from interpretation of these commercially available logs. A typical electric log with geologic interpretations is given in figure 1. The data for individual test holes included these geologic interpretations.

## CONSTRUCTION OF AND DATA COLLECTED FROM TEST HOLES

In each test hole, 8 5/8-inch OD (outside diameter) steel surface casing was installed and cemented to depths ranging from 24 to 198 feet. At most sites, two types of test holes were constructed: A test hole completed in the upper aquifer

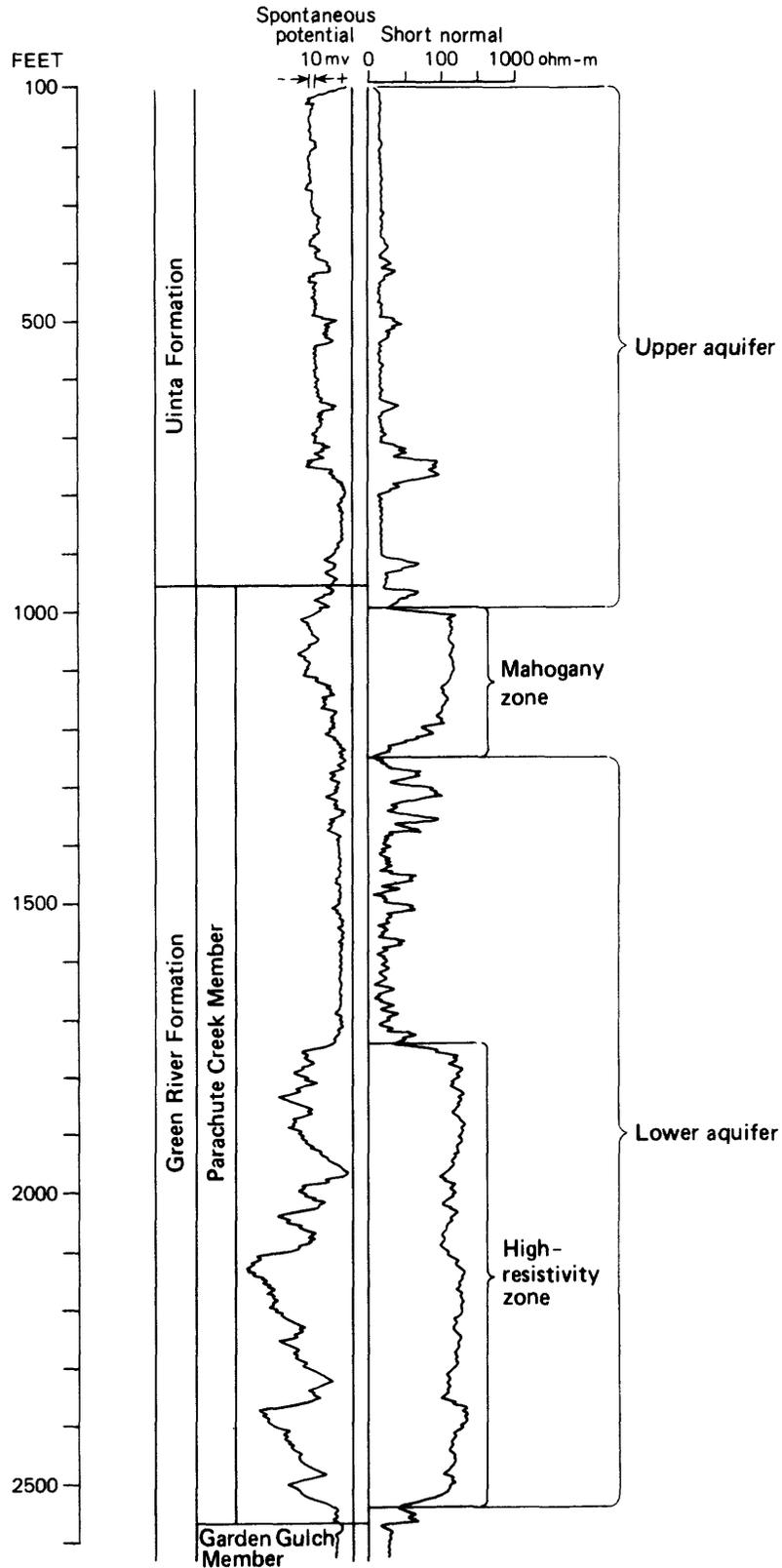


Figure 1.--Typical electric log, showing zones of the Parachute Creek Member of the Green River Formation, and the Uinta Formation (modified from Weeks and others, 1974).

that was left uncased from the bottom of the surface casing to the top of the Mahogany zone; and a test hole, about 100 feet away, completed in the lower aquifer by drilling or coring to a point in competent rock about 75 feet above the base of the Mahogany zone, installing and cementing 6 5/8-inch OD casing, and then drilling or coring at least 300 feet deeper. The uncased stratigraphic interval in the lower part of the Mahogany zone acted as part of the lower aquifer. Test holes completed in the upper aquifer are designated by the letter "A" following the test-hole number; test holes completed in the lower aquifer are designated by the letter "B" following the test-hole number.

During drilling or coring of the lower aquifer, the absence of water-level change in the nearby upper aquifer test hole indicated that the cemented casing into the lower aquifer had successfully isolated the two aquifers. This was further corroborated when the difference in potentiometric heads between the two test holes was measured after completion.

The quantity of formation water discharged during drilling was measured with a modified Parshall flume. Measurements were made at depth intervals of about 20 feet and were used to construct the individual discharge graphs of each test hole.

The locations of the test holes are shown on figure 2 and related information is summarized in table 1. The types of hydrologic data collected at the test holes are summarized in table 2.

### Aquifer Tests

Limited aquifer testing was done by air jetting the B-type test hole and measuring response in the A-type test hole at six sites after the A-type test hole had been completed and when the B-type test hole had been drilled to the top of the Mahogany zone. At sites 7, 11, and 15, steady discharge rates could not be established in the B-type test hole, and thus the tests were not successful. Steady discharge from an air-jetted well can be established only where aquifer transmissivity is relatively large and hydraulic lift is relatively small, other mechanical factors being equal.

At site 5, the test hole completed in the lower aquifer was jetted about 2 hours, and water-level recoveries were measured after jetting had ceased. At site 13, a test of the upper aquifer was conducted during construction of the B-type test hole. At site 17, two tests were made. The first test was in the upper aquifer and the second in the lower aquifer after the upper aquifer had been cased off and the hole deepened. Data from the latter test were inadequate for interpretation.

In the four tests of the upper aquifer, values of transmissivity ranged from 100 to 1,600 feet squared per day; values of storativity from two tests ranged from  $1 \times 10^{-4}$  to  $1.6 \times 10^{-4}$ . Detailed data obtained from the aquifer tests are presented in the specific section for each test hole at the back of this report.

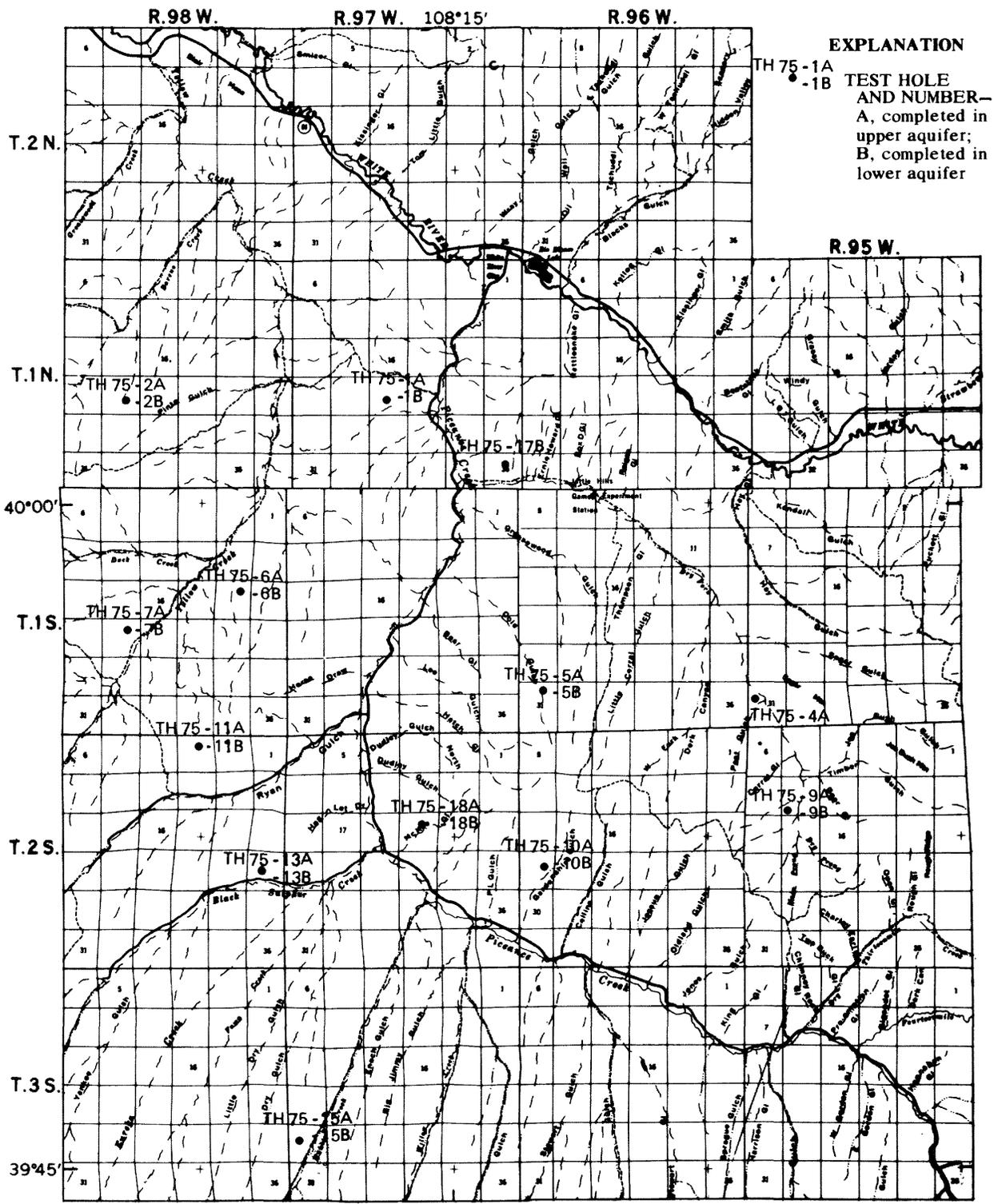


Figure 2.--Locations of test holes.

Table 1.--*Test holes drilled by the U.S. Geological Survey in 1975-76 for which data are presented in this report*

Test-hole number	Land-line location (Sixth Principal Meridian)						U.S. Geological Survey identification number	Altitude above mean sea level (feet)	
	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	Section	Section	Township			Range
TH75-1A---	SE	NE	SW	21		1 N.	97 W.	400218108170600	6,138
TH75-1B---	SE	NE	SW	21		1 N.	97 W.	400218108170601	6,138
TH75-2A---	NW	NW	SE	20		1 N.	98 W.	400228108245400	6,715
TH75-2B---	NW	NW	SE	20		1 N.	98 W.	400228108245401	6,715
TH75-4A---	NE	NW	NW	31		1 S.	95 W.	395549108060900	6,650
TH75-5A---	NW	NW	SW	31		1 S.	96 W.	395515108130100	7,135
TH75-5B---	NW	NW	SW	31		1 S.	96 W.	395515108130101	7,135
TH75-6A---	SW	SE	NE	14		1 S.	98 W.	395755108211400	6,440
TH75-6B---	SW	SE	NE	14		1 S.	98 W.	395755108211401	6,440
TH75-7A---	SW	NE	NE	20		1 S.	98 W.	395712108243402	6,361
TH75-7B---	SW	NE	NE	20		1 S.	98 W.	395712108243403	6,361
TH75-9A---	NE	SW	SW	8		2 S.	95 W.	395310108050400	7,350
TH75-9B---	NE	SW	SW	8		2 S.	95 W.	395310108050401	7,350
TH75-10A--	NW	SW	NE	19		2 S.	96 W.	395155108123100	6,840
TH75-10B--	NW	SW	NE	19		2 S.	96 W.	395155108123101	6,840
TH75-11A--	SE	NW	NE	3		2 S.	98 W.	395439108223301	6,691
TH75-11B--	SE	NW	NE	3		2 S.	98 W.	395439108223302	6,691
TH75-13A--	NW	NW	SW	24		2 S.	98 W.	395136108210000	6,390
TH75-13B--	NW	NW	SW	24		2 S.	98 W.	395136108210001	6,390
TH75-15A--	SW	SW	NE	30		3 S.	97 W.	394540108191201	6,805
TH75-15B--	SW	SW	NE	30		3 S.	97 W.	394540108191202	6,805
TH75-17B--	SW	SE	NE	36		1 N.	97 W.	400045108131401	6,100
TH75-18A--	SW	NE	NE	15		2 S.	97 W.	395255108154200	6,740
TH75-18B--	SW	NE	NE	15		2 S.	97 W.	395255108154201	6,740

Table 2.--Types of data from test holes included in this report

Test-hole number	Transmissivity	Storage coefficient	Temperature of water discharged during drilling	Specific conductance of water discharged during drilling	Quantity of water discharged during drilling	Temperature of borehole fluid	Specific conductance of borehole fluid	Common ions	Trace constituents	Geologic and geophysical markers
TH75-1A---	---	---	X	X	X	X	X	X	X	X
TH75-1B---	---	---	X	X	X	X	X	X	X	X
TH75-2A---	---	---	X	X	X	X	---	X	X	X
TH75-2B---	---	---	X	X	X	X	X	X	X	X
TH75-4A---	---	---	X	X	X	---	---	X	X	X
TH75-5A---	---	---	X	X	---	---	---	---	---	X
TH75-5B---	X	---	X	X	X	X	X	X	X	X
TH75-6A---	---	---	X	X	X	X	---	X	X	X
TH75-6B---	---	---	X	X	X	X	---	X	X	X
TH75-7A---	---	---	X	X	X	X	X	X	X	X
TH75-7B---	---	---	X	X	X	X	---	X	X	X
TH75-9A---	---	---	X	X	X	X	X	X	X	X
TH75-9B---	---	---	X	X	X	X	---	X	X	X
TH75-10A--	---	---	X	X	X	X	---	X	X	X
TH75-10B--	---	---	X	X	X	X	---	X	X	X
TH75-11A--	---	---	X	X	X	X	---	---	---	X
TH75-11B--	---	---	X	X	X	X	---	X	X	X
TH75-13A--	X	X	X	X	X	X	---	X	X	X
TH75-13B--	---	---	X	X	X	X	---	X	X	X
TH75-15A--	---	---	X	X	X	X	---	X	X	X
TH75-15B--	---	---	X	X	X	X	---	X	X	X
TH75-17B--	X	---	X	X	X	X	X	X	X	X
TH75-18A--	X	X	X	X	X	X	---	X	X	X
TH75-18B--	---	---	X	X	X	X	X	X	X	X

## Potentiometric Heads

The potentiometric head is the altitude above sea level of the static water level in a test hole. Since completion of drilling, the potentiometric head has been measured semiannually in each test hole.

The altitudes of the potentiometric heads of the upper and lower aquifers, based on April 1976 measurements in the test holes, are shown on figures 3 and 4. The potentiometric maps are in general agreement with the composite potentiometric-head map presented in Weeks, Leavesley, Welder, and Saulnier (1974, p. 32). The most noticeable differences occur in the east-central part of the basin, where previous to the drilling of the test holes for this study there had been a paucity of data. The difference in potentiometric heads between the upper aquifer and the lower aquifer ranged from 4 to 102 feet and averaged 40 feet.

## CHEMICAL ANALYSES

Water samples were collected during the drilling of each test hole, except TH75-5A, to provide information on the areal water-quality distribution in the upper and lower aquifers. The drilling of these test holes provided an opportunity to sample each aquifer separately without contamination due to drilling. To make the data more useful, the authors' discussion of the analyses is accompanied by a presentation of applicable water-quality standards in tabular form.

## Sampling Procedure

The drilling of the test holes included two types of water-quality data-collection procedures. The primary data-collection procedure was the measurement of discharge, temperature, and specific conductance of water produced from each test hole during drilling. Secondly, samples of production water were collected for laboratory analysis. The samples were collected at test-hole depths selected to give representative data on each aquifer with a minimum of interference due to mixing of waters from different rock units. Samples from the Uinta Formation were collected, where possible, although yields were generally too small to sample this unit effectively. Samples of water from the Uinta Formation were collected from test holes at sites 1, 2, 4, 5, 6, 15, and 17.

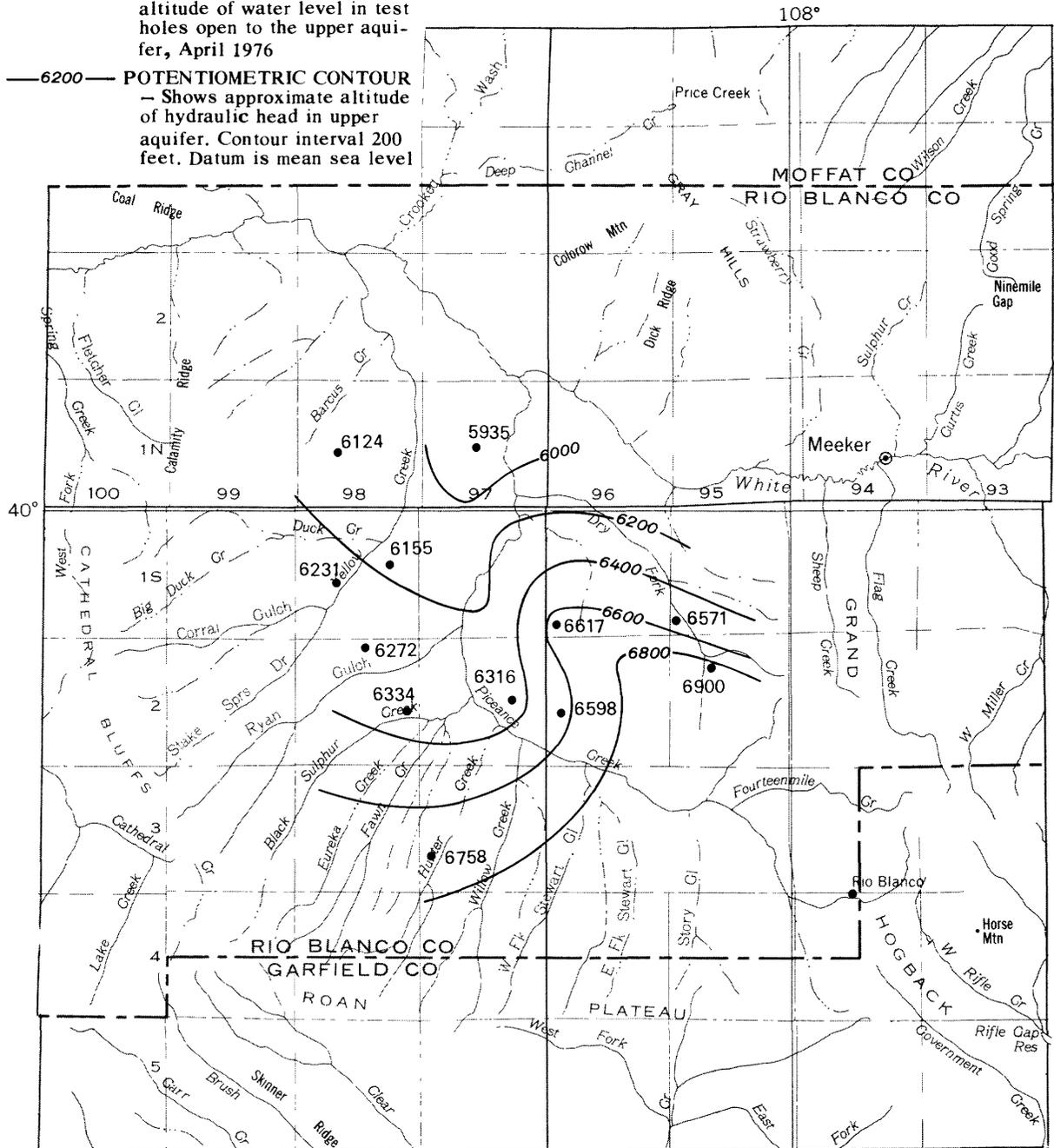
A sample was collected at the base of the upper aquifer at the culmination of the drilling of the A-type test hole. During the drilling of the B-type test hole, the primary sampling points were: The depth at which the first substantial water was produced, the top of the Mahogany zone, and the base of the drilled test hole. In addition to the above sampling points, samples were collected when significant changes in specific conductance were noted during the monitoring of production water. At sites 6, 7, and 11, the B-type test hole was used to sample the upper aquifer either for comparison with the A-type test-hole data or because the A-type test hole could not be sampled during drilling due to technical problems.

Air-rotary drilling methods provide the best opportunity to sample formation water with a minimum of contamination from foreign materials used during drilling.

**EXPLANATION**

● 5935 TEST HOLE – Number shows altitude of water level in test holes open to the upper aquifer, April 1976

—6200— POTENTIOMETRIC CONTOUR – Shows approximate altitude of hydraulic head in upper aquifer. Contour interval 200 feet. Datum is mean sea level



Base from U. S. Geological Survey State base map, 1969

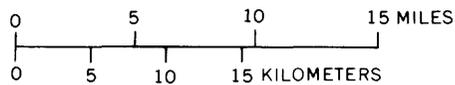
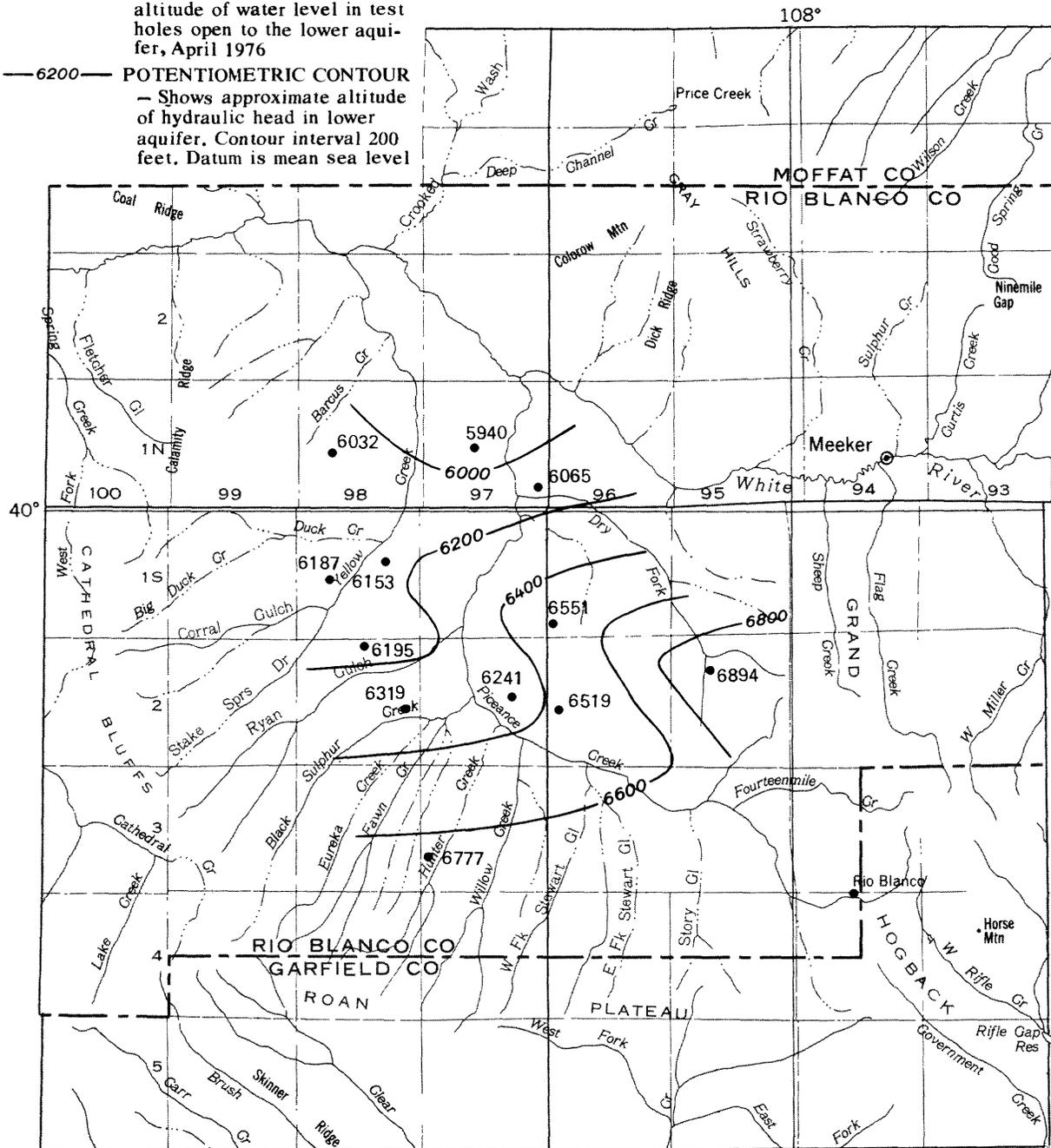


Figure 3.--Approximate configuration of the potentiometric surface in the upper aquifer, April 1976.

**EXPLANATION**

● 5935 TEST HOLE - Number shows altitude of water level in test holes open to the lower aquifer, April 1976

— 6200 — POTENTIOMETRIC CONTOUR - Shows approximate altitude of hydraulic head in lower aquifer. Contour interval 200 feet. Datum is mean sea level



Base from U. S. Geological Survey State base map, 1969

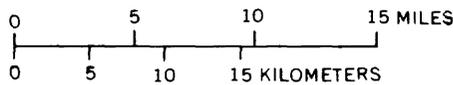


Figure 4.--Approximate configuration of the potentiometric surface in the lower aquifer, April 1976.

Compressed air is the primary circulation medium. A water and detergent solution was injected into the airstream at a rate of 5 to 10 gallons per minute to cool the bit and to aid in the flotation of cuttings so that they are more easily moved out of the test hole. The presence of the detergent is usually detected by the degree of clarity of the discharged water. Tests indicate that the detergent causes the specific conductance of the discharged water to vary less than 10 percent from that of the formation water. At discharges of approximately 10 gallons per minute, the specific conductance of the injection water was checked against that of the water produced from the test hole. The check was made to determine whether the specific conductance of the sampled water was affected by injection water. If the specific conductances of production and injection water were equal, the sample was rejected. Before collecting a water sample for laboratory analysis, the water-detergent injection was stopped and the test hole was air jetted until the water produced was clear of cuttings and detergent, and the temperature and specific conductance of the discharged water were constant. The time for this jetting varied with each test hole but an average time was about 1 to 2 hours. A 5-gallon sample was collected at each sample point, and field pH and specific conductance were measured before the sample was treated for laboratory analysis.

#### Analytical Procedure

Each sample was analyzed for major ions and trace constituents by the U.S. Geological Survey according to standard Survey procedures (Brown and others, 1970). The trace constituents were chosen on the basis of health significance (arsenic, fluoride, and selenium) and the degree to which certain constituents indicate differences between aquifers (barium, boron, lithium, and strontium).

#### Discussion of Data Collected

Summaries of the water-quality analyses of samples from the test holes are presented in table 3 and in figure 5. It should be noted that because of the air injected into the well during drilling, the pH's measured at the test holes may not be accurate (Neil Plummer, oral commun., 1977).

The analyses of water samples from the 24 test holes helped to refine the understanding of ground-water quality in the Piceance basin. On the basis of these data, the upper aquifer appears to have two distinct water-quality zones; one in the Uinta Formation and one in the upper part of the Parachute Creek Member of the Green River Formation. Water in the Uinta Formation generally has a greater concentration of dissolved solids and sulfate and a smaller concentration of fluoride than water in the upper part of the Parachute Creek Member.

Water in the lower aquifer generally contains larger concentrations of dissolved solids and fluoride than does the upper aquifer. The lower aquifer also contains smaller concentrations of calcium, magnesium, and sulfate than does the upper aquifer.

Table 3.--Maximum, minimum, and average concentrations of major dissolved constituents, dissolved solids, and dissolved fluoride in water samples collected from test holes penetrating the Uinta Formation, upper part of the Parachute Creek Member of the Green River Formation, and lower part of the Parachute Creek Member of the Green River Formation

Concentration, in milligrams per liter								
	Dis- solved solids	Cal- cium	Magne- sium	Sodium plus potas- sium	Bicar- bonate	Chlo- ride	Sul- fate	Fluo- ride
Uinta Formation (upper aquifer)								
Maximum-----	1,720	110	160	320.6	780	72	880	3.8
Minimum-----	470	8.7	15	110.6	332	5.7	34	.2
Average <sup>1</sup> -----	909	38	53	217	536	18	292	1.11
Upper Part of Parachute Creek Member (upper aquifer)								
Maximum-----	2,220	75	90	862.1	1,930	260	450	18
Minimum-----	510	1.1	.6	150.3	367	5.1	11	.5
Average <sup>2</sup> -----	828	18	32	309	723	32	153	7.15
Lower Part of Parachute Creek Member (lower aquifer)								
Maximum-----	33,300	21	23	14,079	29,400	2,400	200	19.0
Minimum-----	650	4.2	2.8	251.2	607	5	4.8	5.0
Average <sup>3</sup> -----	3,460	10	10	1,436	3,102	211	66	14.0

<sup>1</sup>Arithmetic mean of eight samples from eight sites.

<sup>2</sup>Arithmetic mean of 17 samples from 13 sites.

<sup>3</sup>Arithmetic mean of 15 samples from 12 sites.

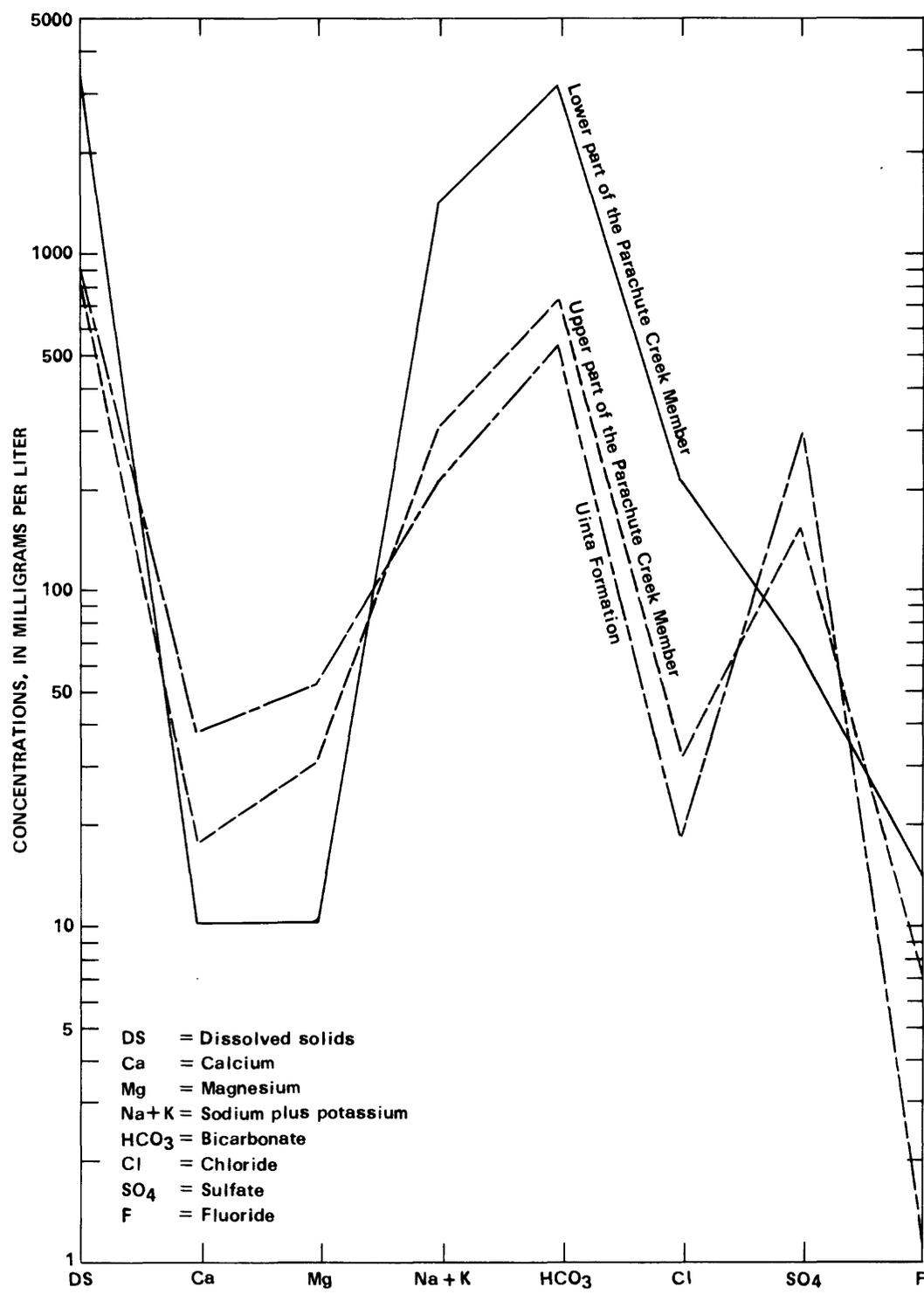


Figure 5.--Average concentrations of major dissolved constituents, dissolved solids, and dissolved fluoride for water samples collected from test holes.

## Upper Aquifer

Water samples from the Uinta Formation were collected for analysis at sites 1, 2, 4, 5, 6, 15, and 17. Water from some test holes completed in the upper aquifer contained dissolved-solids, fluoride, and sulfate concentrations in excess of the recommended limits for domestic water supplies (table 4). Dissolved-solids concentrations exceeded 1,000 mg/L (milligrams per liter) in water from TH75-2 (1,720 mg/L), TH75-6 (1,020 mg/L), and TH75-15 (1,160 mg/L). Fluoride concentrations exceeded 1.3 mg/L in water from TH75-15 (2.2 mg/L) and TH75-17 (3.8 mg/L). Sulfate concentrations exceeded 250 mg/L in water from TH75-2 (700 mg/L) and TH75-6 (470 mg/L).

Water samples from the upper part of the Parachute Creek Member were collected for analysis from test holes at all sites. Water from some test holes contained arsenic, dissolved solids, and fluoride in concentrations that exceeded the recommended limits for domestic water supplies (table 4). Arsenic concentrations exceeded 0.05 mg/L in two samples of water from TH75-1 (0.08 and 0.09 mg/L). Dissolved-solids concentrations exceeded 1,000 mg/L in water from TH75-1 (2,220 mg/L), TH75-10 (1,210 mg/L), and TH75-15 (2,200 mg/L). Fluoride concentrations exceeded 1.3 mg/L in water from all test holes except TH75-2.

## Lower Aquifer

Water samples from the lower aquifer were collected for chemical analysis from test holes at all sites. The quality of water in the lower aquifer varied with stratigraphic interval. Concentrations of dissolved solids ranged from less than 1,000 mg/L to greater than 9,000 mg/L. Water samples with less than 1,000 mg/L were collected from TH75-2 (849 mg/L), TH75-6 (928 mg/L), TH75-7 (736 and 650 mg/L), TH75-9 (957 mg/L), TH75-10 (751 mg/L), TH75-13 (825 mg/L), and TH75-18 (715 mg/L). Fluoride concentrations in all water from the lower aquifer were greater than 1.3 mg/L, making the water unfit for all but very temporary domestic water supply (McKee and Wolf, 1963). TH75-1 was the only hole that yielded very saline water (dissolved solids=33,300 mg/L) from the lower aquifer. At sites 2, 6, and 17, saline water (dissolved solids less than 1,000 mg/L) occurred throughout much of the lower aquifer. However, slight to moderately saline water (dissolved solids=2,480 to 9,610 mg/L) occurred in the lower aquifer at these sites at total well depth.

Significant concentrations of boron occurred in the lower aquifer in water from TH75-1 (2 mg/L), TH75-2 (1.5 mg/L), TH75-6 (2.9 mg/L), TH75-9 (2.0 and 1.8 mg/L), and TH75-15 (9.0 mg/L). This water would be unfit for irrigation of sensitive and some semitolerant crops (table 5).

### In-Hole Dissolution of Saline Minerals

Data collected during the drilling of the 24 test holes indicate that the concentration of dissolved solids in parts of the lower aquifer may be less than previously reported (Weeks and others, 1974; Saulnier, 1976). Water samples previously collected from wells may have been contaminated by in-hole dissolution

Table 4.--Comparative drinking-water standards for certain major and trace constituents presented in this report

[Concentrations in milligrams per liter; 1,000 micrograms per liter= 1 milligram per liter]

Water-quality parameter	U.S. Public Health Service (1962, 1970); Colorado Department of Health (1971)		Other standards
	Maximum permissible concentration	Recommended limit	
Arsenic-----	0.05	0.01	<sup>1</sup> 0.005
Barium-----	1.0	-----	<sup>1</sup> 4.0
Cadmium-----	.01	-----	<sup>1</sup> 0.01, <sup>2</sup> 2.05
Chloride-----	-----	250	-----
Copper-----	-----	1.0	<sup>1</sup> 1.0, <sup>2</sup> 3.0
Fluoride-----	1.3	1.0	<sup>1,2</sup> 1.5
Iron-----	-----	.3	<sup>1</sup> 1.5
Lead-----	.05	-----	<sup>1</sup> 1.1
Lithium-----	-----	-----	<sup>2</sup> 5.0
Manganese-----	-----	.5	-----
Mercury-----	-----	.005	<sup>1</sup> 0.005, <sup>3</sup> 0.002
Molybdenum-----	-----	-----	<sup>1</sup> 0.05
Selenium-----	.01	-----	-----
Sulfate-----	-----	250	-----
Zinc-----	-----	5.0	<sup>1</sup> 1.0
Dissolved solids-----	1,000	500	-----

<sup>1</sup>U.S.S.R. standards for reservoir water (Arthur D. Little, Inc., 1971, p.238).

<sup>2</sup>California Water Quality Criteria (McKee and Wolf, 1963).

<sup>3</sup>National Academy of Sciences and National Academy of Engineering (1972).

Table 5.--Rating of irrigation water for various crops on the basis of boron concentration in the water

[After Hem, 1970, p. 329]

Classes of water		Sensitive crops (mg/L)	Semitolerant crops (mg/L)	Tolerant crops (mg/L)
Rating	Grade			
1	Excellent----	<0.33	<0.67	<1.00
2	Good-----	.33-.67	.67-1.33	1.00-2.00
3	Permissible--	.67-1.00	1.33-2.00	2.00-3.00
4	Doubtful----	1.00-1.25	2.00-2.50	3.00-3.75
5	Unsuitable---	>1.25	>2.50	>3.75

of the highly soluble halite and nahcolite zones encountered by the wells. These minerals commonly occur in nonpermeable zones and dissolution results almost immediately upon contact with water during drilling. Thus the saline water produced by dissolution during drilling infers the presence of the minerals. The drilling of TH75-6B confirmed this postulate as specific-conductance values in producing water increased significantly without increases in temperature or discharge when drilling encountered nahcolite beds in the high-resistivity zone (see data section for TH75-6B). For this reason, previous water analyses should be compared to lithologic information and time of well-water residence before estimating the extent of saline water in the aquifer outside of the area of the individual well being considered.

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DATA FOR INDIVIDUAL TEST HOLES

Test Hole TH75-1A

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 21, T. 1 N., R. 97 W.  
lat 40°02'18" N., long 108°17'06" W.

Altitude of land surface: 6,138 feet above mean sea level

Drilled: November 1975

Total depth: 1,060 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 182 feet

Depth to static water level: 202.86 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 670 feet  
Top of Mahogany zone . . . . . 1,060-1,070 feet  
Bottom of Mahogany zone. . . . . 1,300 feet  
Top of high-resistivity zone . . . . . 1,730 feet

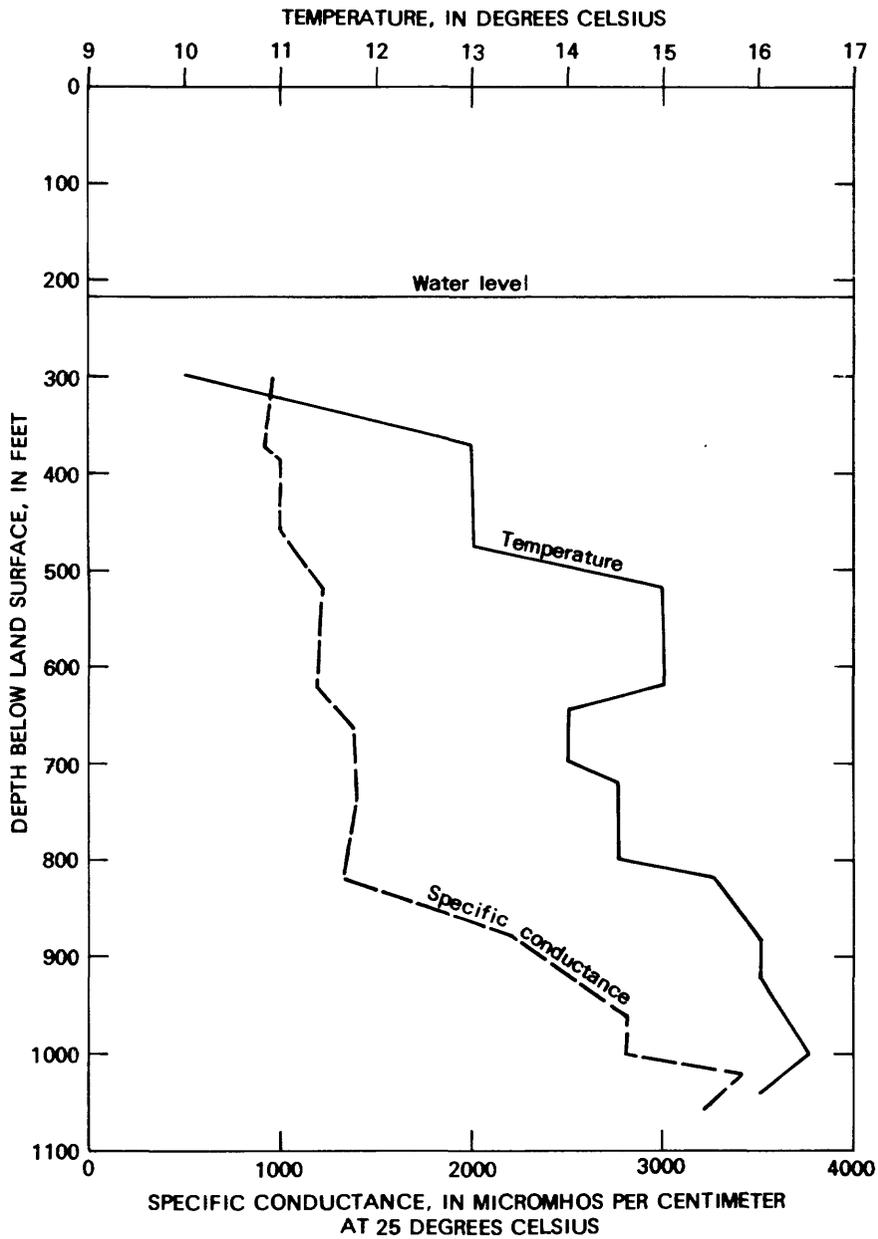


Figure 6.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-1A.

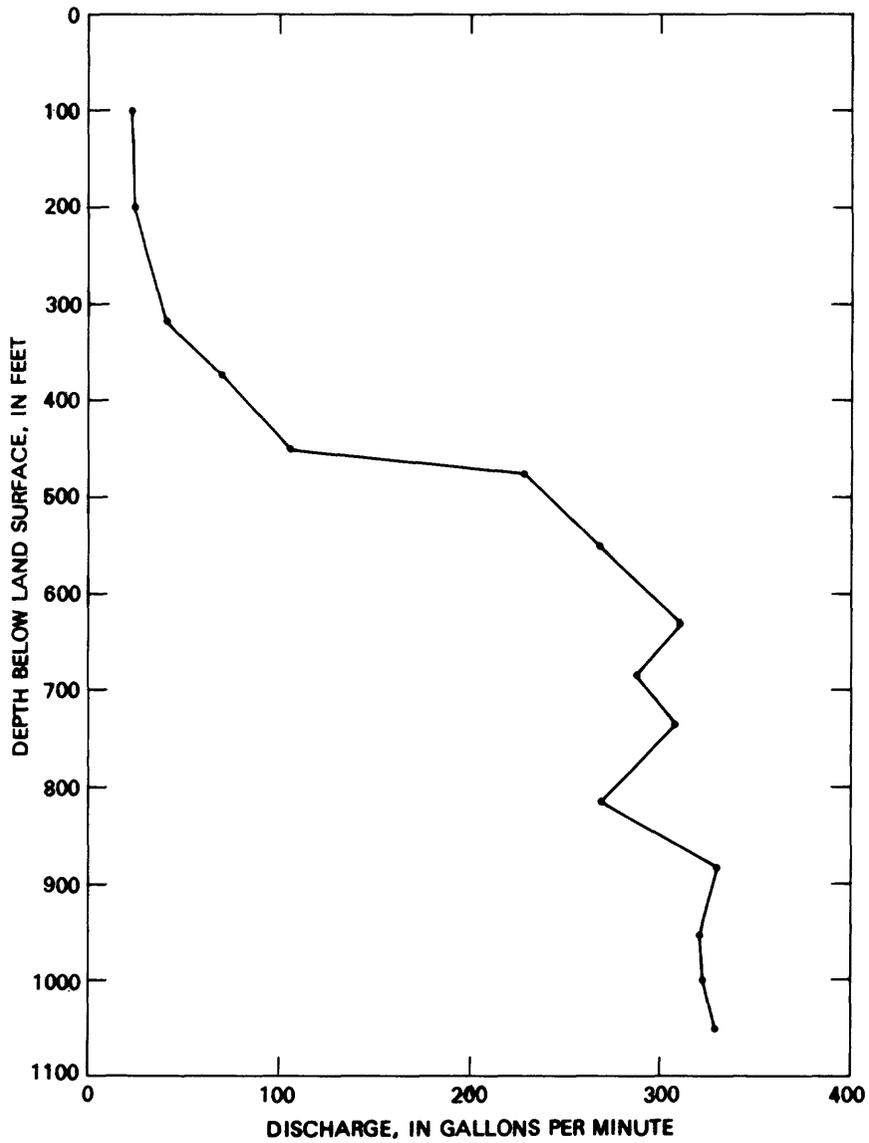


Figure 7.--Water discharged during the drilling of test hole TH75-1A.

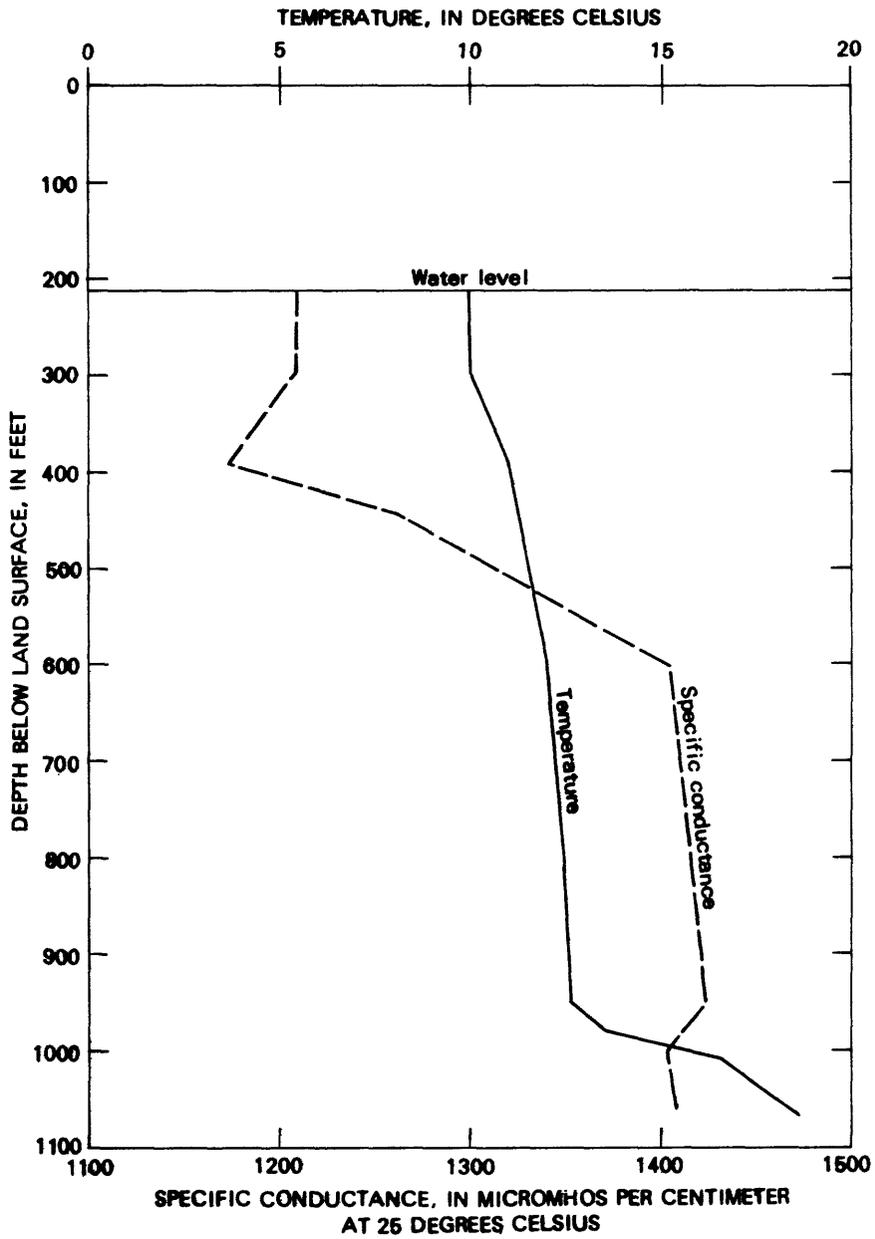


Figure 8.--Fluid temperature and specific conductance in test hole TH75-1A, May 7, 1976.

Table 6.--Chemical analyses of water samples from test hole TH75-1A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO 30'-TOP OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
NOV. 1975										
19...	1930	192	380	13	10	40	10	8.7	18	210
22...	1030	192	772	21	20	40	20	29	59	230
23...	0600	182	1060	21	10	360	5	22	44	810

DATE	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
NOV. 1975									
19...	0.5	564	0	463	71	12	0.5	0.1	0.22
22...	.3	724	0	594	230	7.7	.5	.1	.01
23...	1.3	1850	0	1520	180	220	2.8	.3	.08

DATE	DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	SPECIFIC CONDUCTANCE (MICROMHOS) (MG/L)	PH (UNITS)	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
NOV. 1975									
19...	0.00	0.00	615	900	8.1	12.0	6	100	80
22...	.01	.03	947	1350	8.0	14.5	90	100	210
23...	.05	.15	2220	3575	8.4	16.0	80	700	280

DATE	DIS-SOLVED CADMIUM (CO) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV. 1975									
19...	0	0	2	50	0.0	8	0	1900	0
22...	0	0	1	90	.0	44	0	12000	10
23...	0	0	1	190	.0	8	0	9100	20

Test Hole TH75-1B

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 21, T. 1 N., R. 97 W.  
lat 40°02'18" N., long 108°17'06" W.

Altitude of land surface: 6,138 feet above mean sea level

Drilled: December 1975

Total depth: 1,540 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 173 feet  
6 5/8-inch steel pipe cemented to a depth of 1,215 feet

Depth to static water level: 228.01 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 670 feet  
Top of Mahogany zone . . . . . 1,060-1,070 feet  
Bottom of Mahogany zone. . . . . 1,300 feet  
Top of high-resistivity zone . . . . . 1,730 feet

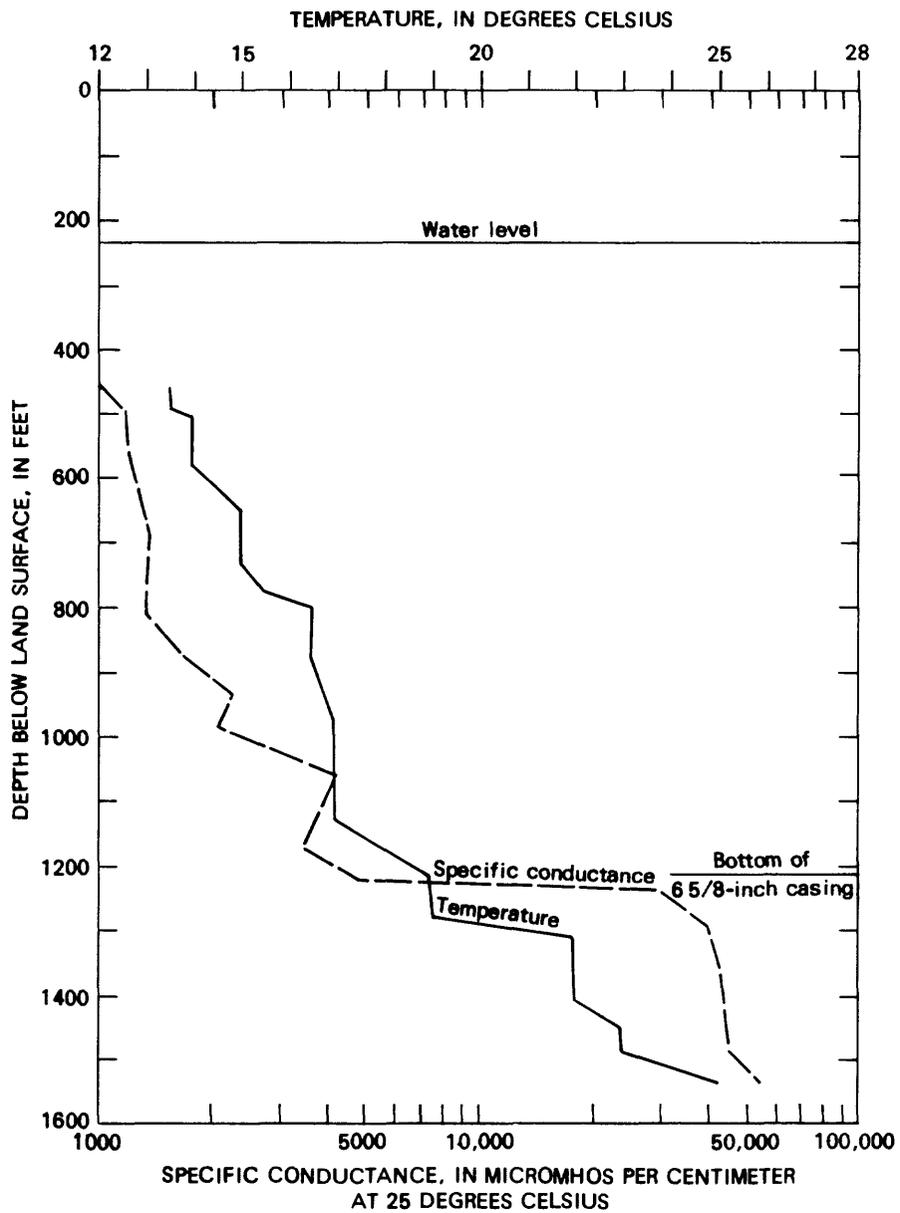


Figure 9.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-1B.

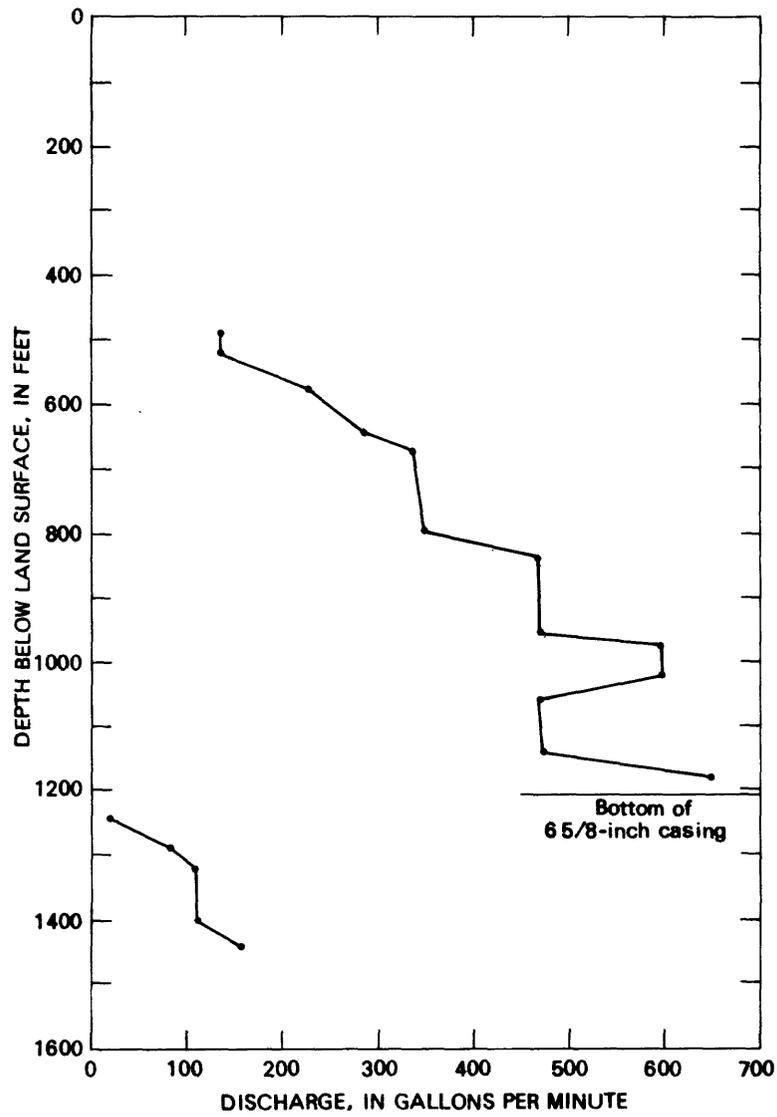


Figure 10.--Water discharged during the drilling of test hole TH75-1B.

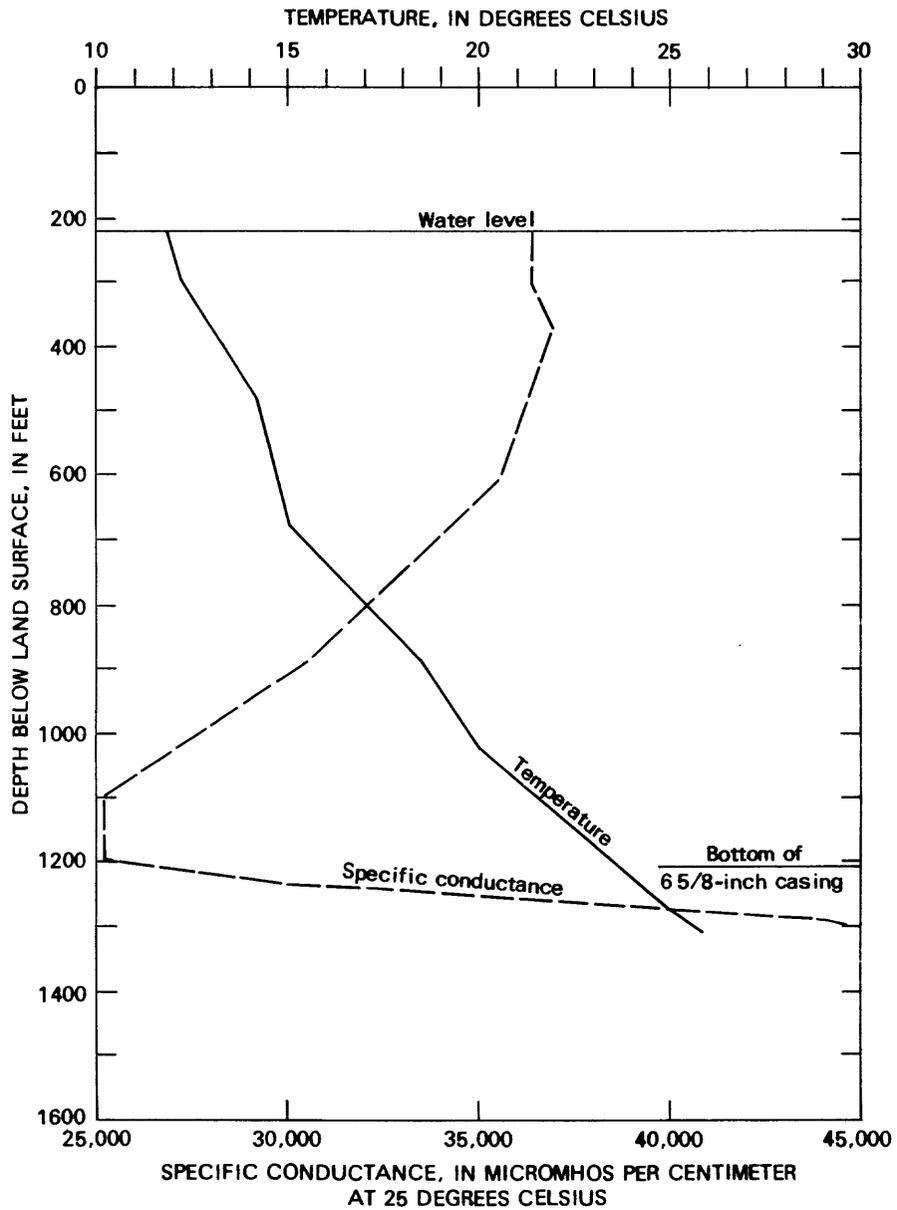


Figure 11.--Fluid temperature and specific conductance in test hole TH75-1B, May 5, 1976.

Table 7.--Chemical analysis of water sample from test hole TH75-1B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)
DEC. 1975 08...	1800	1215	1303	30	2600	40	4.2	2.8	14000	79	29400
DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)
DEC. 1975 08...	1650	26900	190	2400	5.3	3.6	0.03	38300	8.3	20.5	29
DATE	TIME	ALCALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	SPECIFIC CONDUCTANCE (MICROMHOS) (UNITS)	PH	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)
DEC. 1975 08...	5300	2000	1	2	29	2400	0.0	15	0	1200	60
DATE	TIME	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (MG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)

Test Hole TH75-2A

Location: Center of sec. 20, T. 1 N., R. 98 W.  
lat 40°02'28" N., long 108°24'54" W.

Altitude of land surface: 6,715 feet above mean sea level

Drilled: November 1975

Total depth: 1,122 feet

Casing: 8 5/8-inch steel pipe cemented at 24 feet  
6 5/8-inch steel pipe cemented at 402 feet

Depth to static water level: 578.8 feet, September 22, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 800 feet  
Top of Mahogany zone . . . . . 1,125 feet  
Bottom of Mahogany zone. . . . . 1,300 feet  
Top of high-resistivity zone . . . . . 1,915-1,950 feet

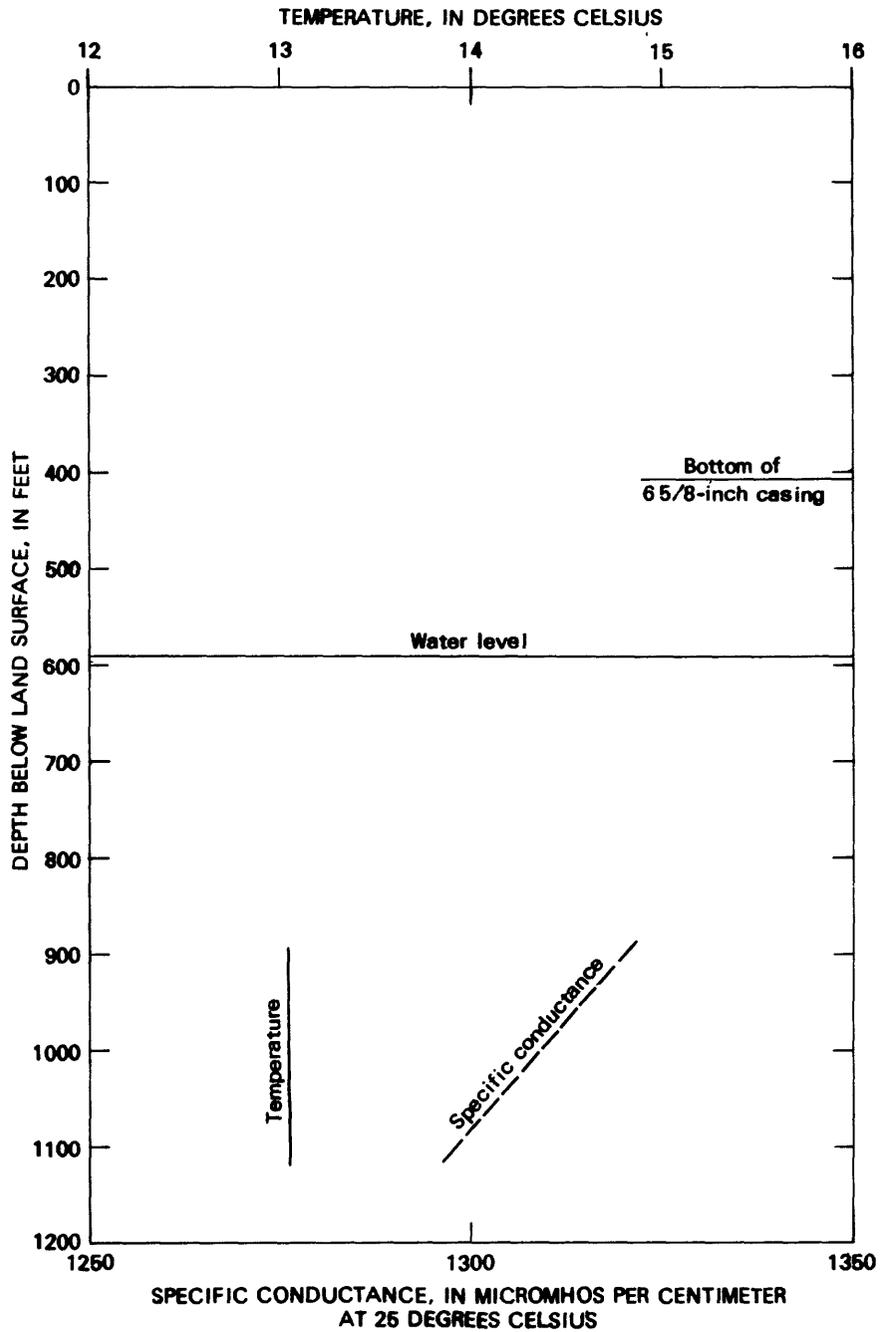


Figure 12.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-2A.

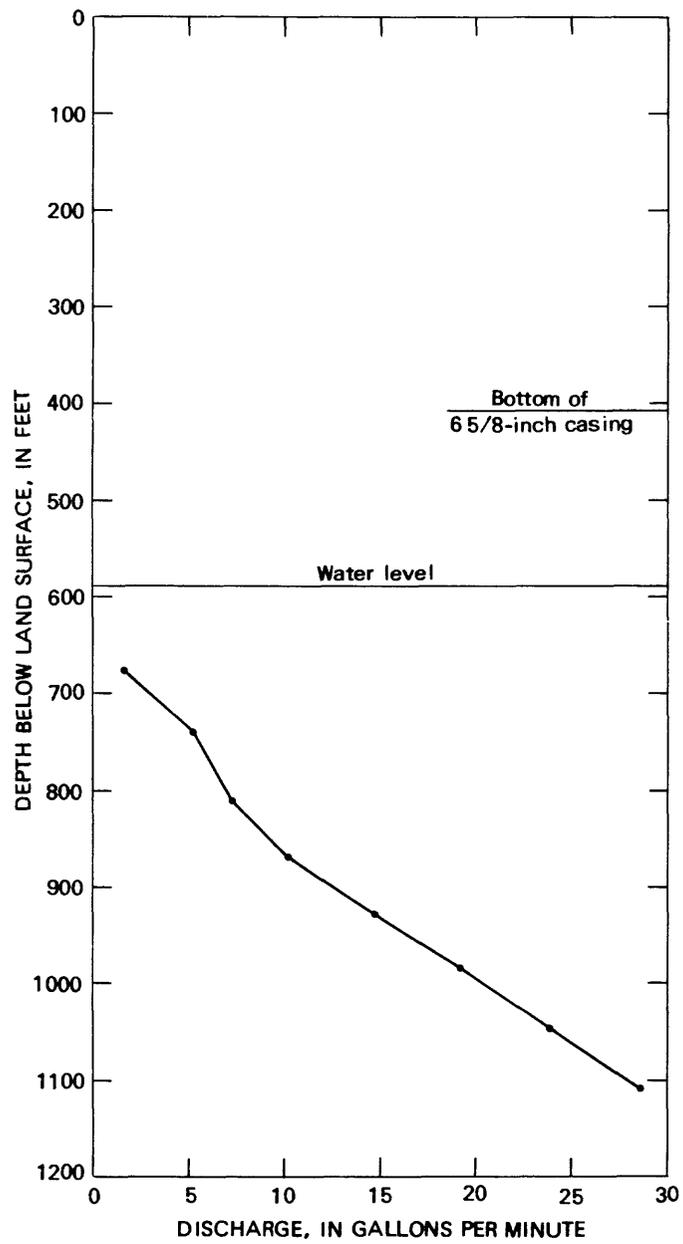


Figure 13.--Water discharged during the drilling of test hole TH75-2A.

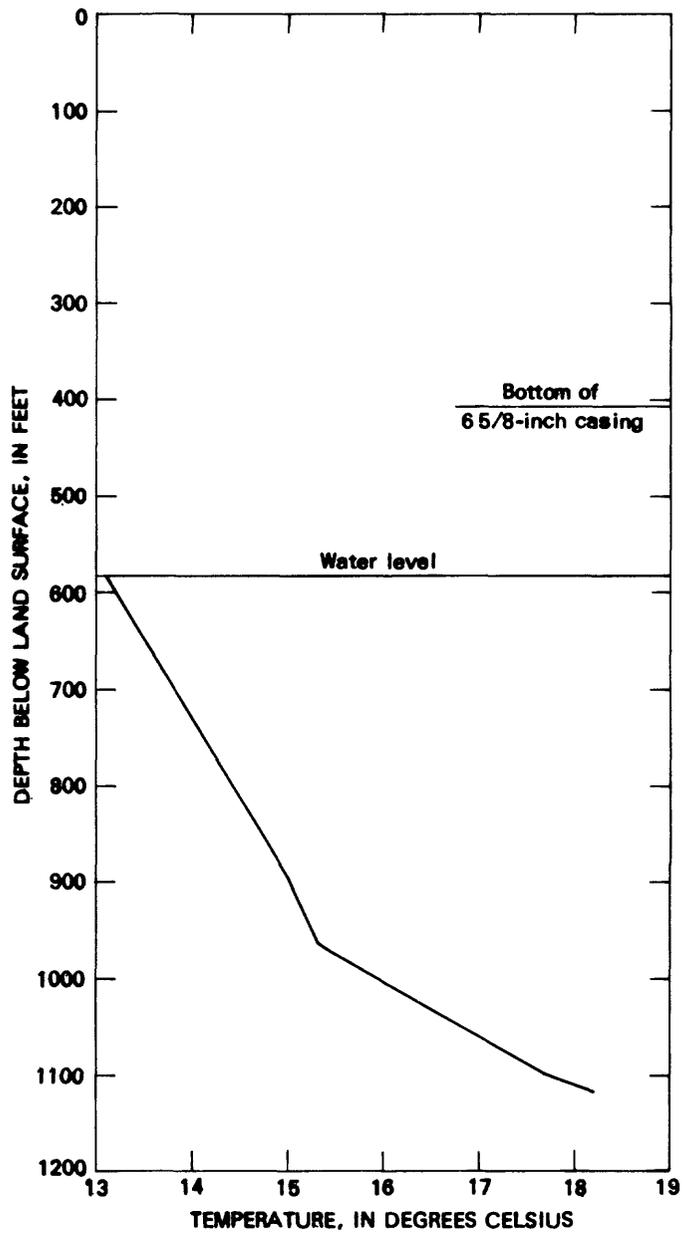


Figure 14.--Fluid temperature in test hole TH75-2A, May 6, 1976.

Table 8.--Chemical analyses of water samples from test hole TH75-2A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
NOV. 1975										
10...	1200	402	900	20	10	0	70	110	160	240
12...	0930	402	1122	14	10	10	120	31	57	240

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
NOV. 1975									
10...	1.1	575	0	472	880	14	0.2	0.1	.02
12...	.9	601	19	525	300	5.2	1.0	.0	.02

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (UNITS)	PH	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
NOV. 1975									
10...	0.01	0.03	1720	2080	8.5	13.0	1	0	100
12...	.00	.00	973	1295	8.6	14.0	5	100	320

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV. 1975									
10...	1	2	2	80	0.0	12	0	8000	6
12...	0	1	3	120	.0	110	1	7500	0

Test Hole TH75-2B

Location: Center of sec. 20, T. 1 N., R. 98 W.  
lat 40°02'28" N., long 108°24'54" W.

Altitude of land surface: 6,715 feet above mean sea level

Drilled: November 1975

Total depth: 1,528 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 147 feet  
6 5/8-inch steel pipe cemented to a depth of 1,240 feet

Depth to static water level: 681.1 feet, September 20, 1976

Remarks: Because of poor returns of cuttings, discharge was erratic and impossible to measure accurately

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 800 feet  
Top of Mahogany zone . . . . . 1,125 feet  
Bottom of Mahogany zone. . . . . 1,300 feet  
Top of high-resistivity zone . . . . . 1,915-1,950 feet

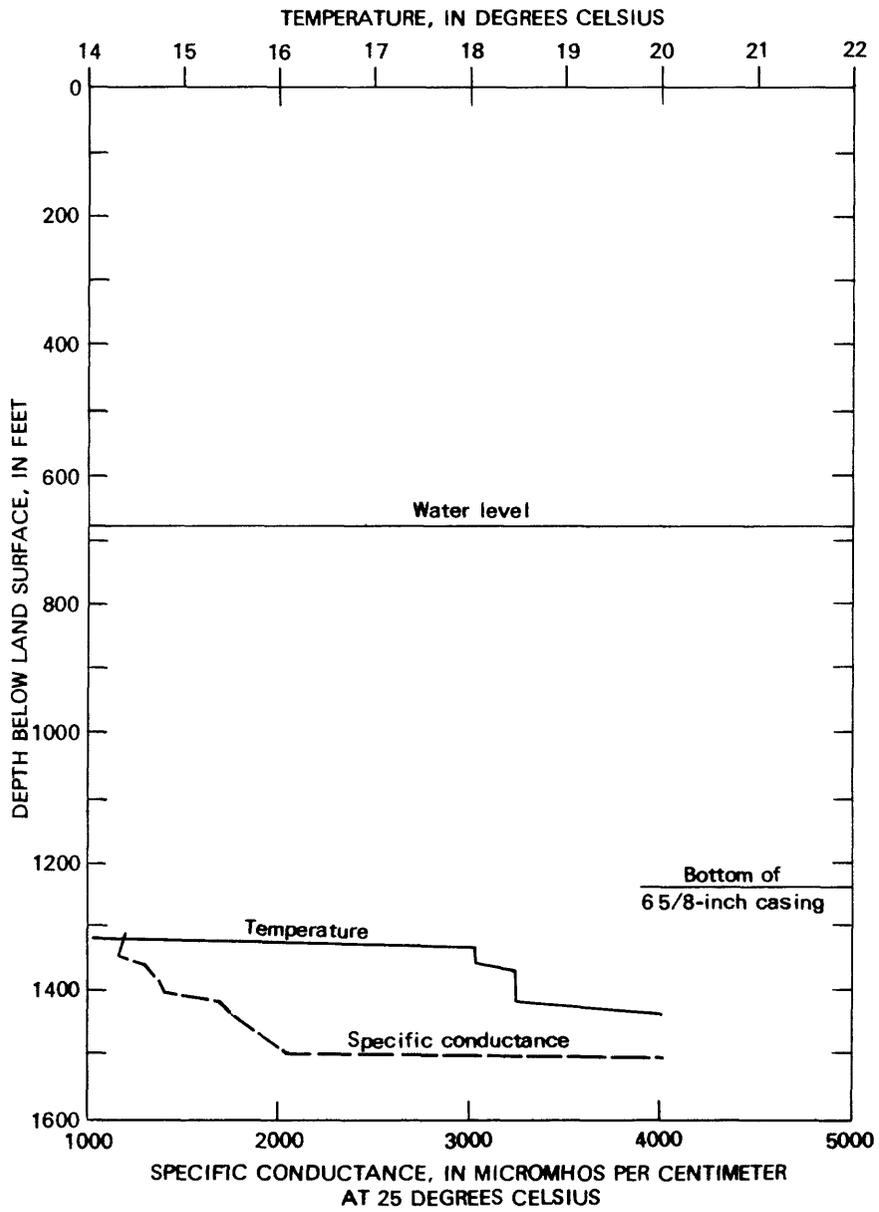


Figure 15.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-2B.

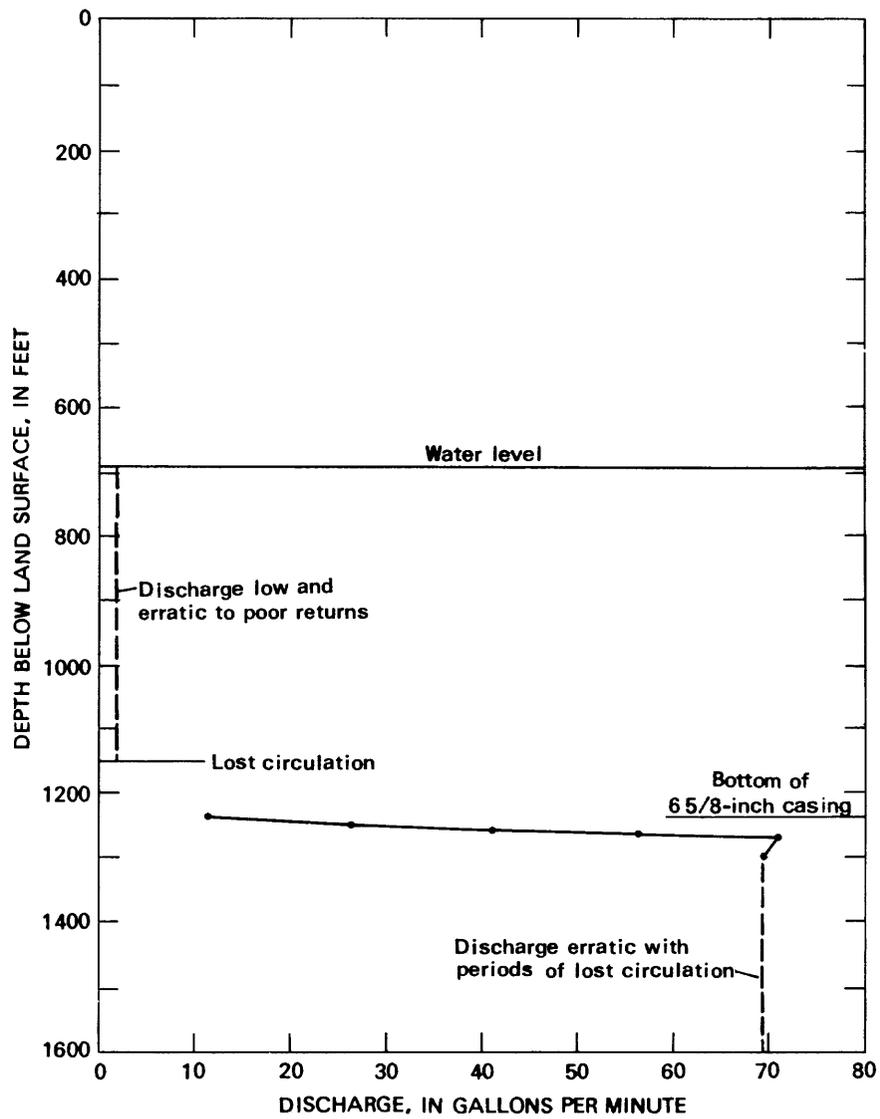


Figure 16.--Water discharged during the drilling of test hole TH75-2B.

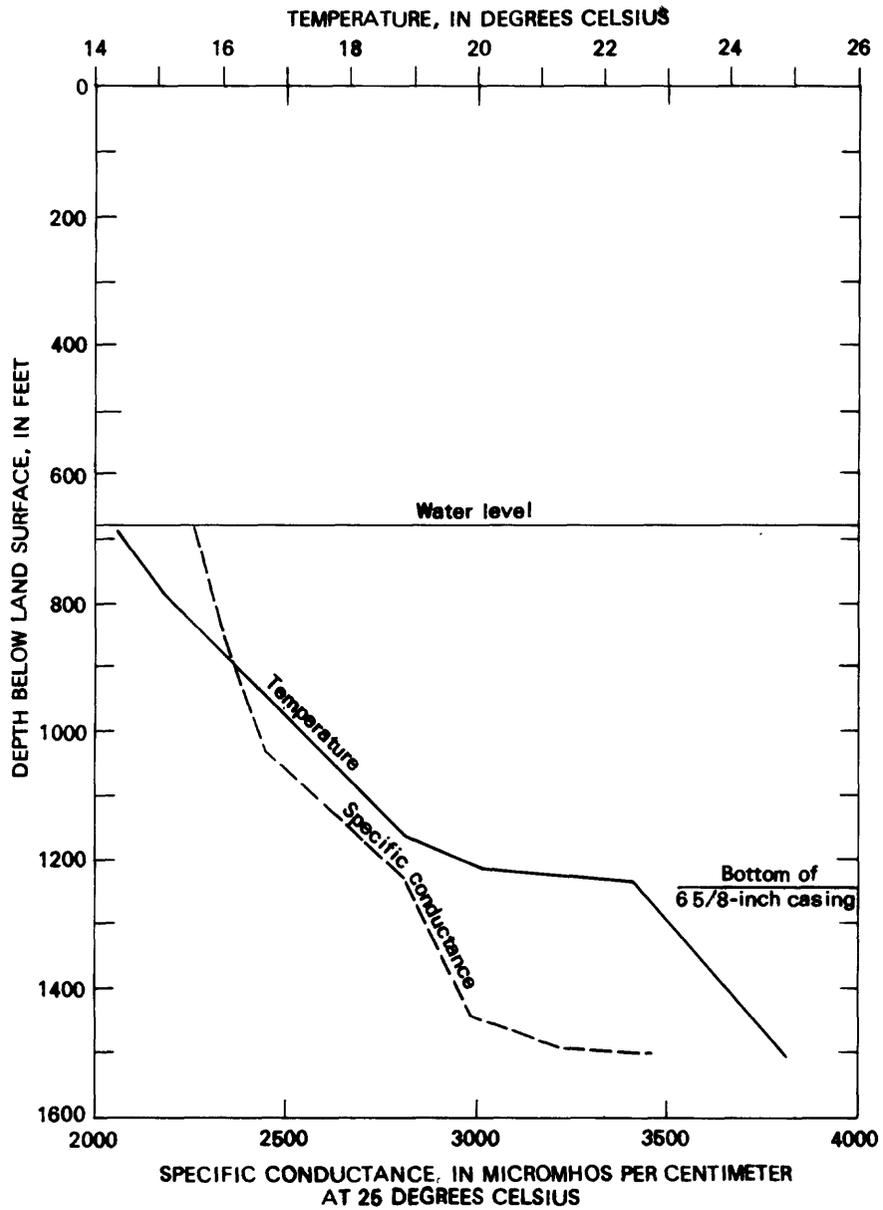


Figure 17.--Fluid temperature and specific conductance in test hole TH75-2B, May 6, 1976.

Table 9.--Chemical analyses of water samples from test hole TH75-2B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
NOV. 1975										
14...	1945	1250	1302	11	40	30	40	21	10	320
16...	2100	1250	1510	9.7	50	120	40	11	4.5	1500

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (MCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
NOV. 1975									
14...	0.7	731	31	651	78	5.1	9.6	0.0	0.01
16...	3.6	3480	187	3170	95	22	24	.1	.12

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (UNITS)	PH	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
NOV. 1975									
14...	0.01	0.03	849	1270	8.5	18.0	29	200	600
16...	.12	.37	3580	5340	8.5	17.5	50	200	1500

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV. 1975									
14...	0	0	2	140	0.0	34	0	1200	20
16...	0	0	5	350	.0	300	--	590	30

Test Hole TH75-4A

Location: Center of NW¼NW¼ sec. 31, T. 1 S., R. 95 W.  
lat 39°55'49" N., long 108°06'09" W.

Altitude of land surface: 6,650 feet above mean sea level

Drilled: January 1976

Total depth: 790 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 160 feet

Depth to static water level: 78.08 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 500 feet  
Top of Mahogany zone . . . . . 790 feet  
Bottom of Mahogany zone. . . . . 1,000 feet  
Top of Garden Gulch Member . . . . . 2,270 feet

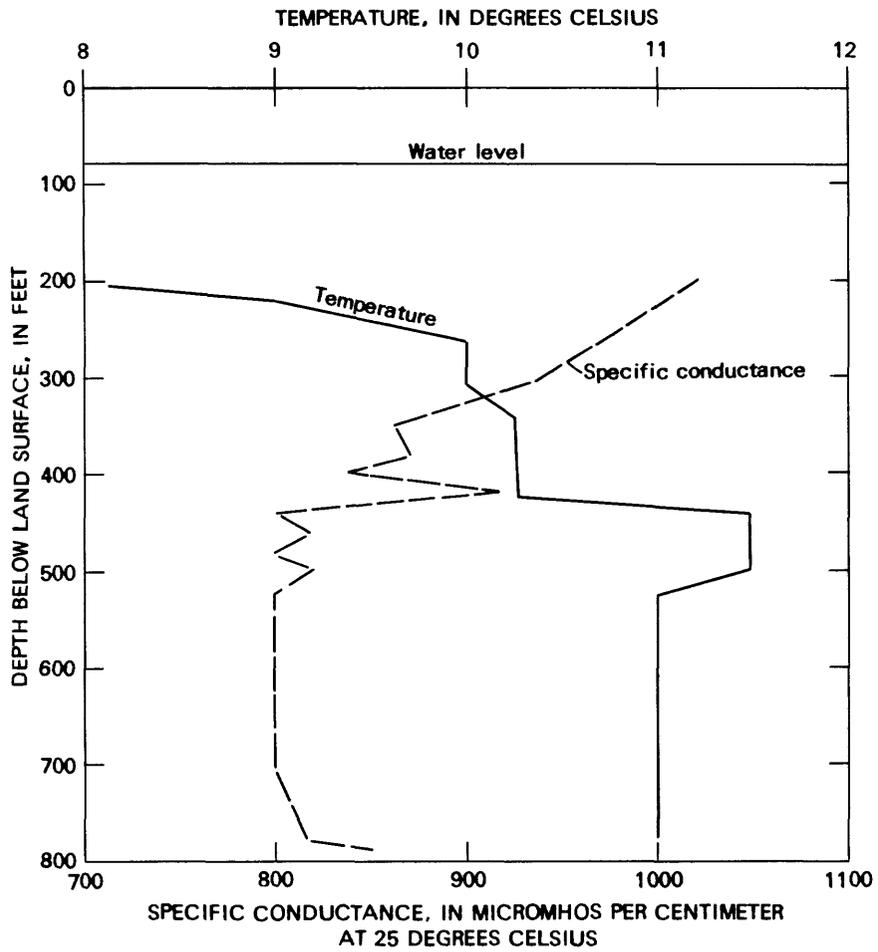


Figure 18.--Temperature and specific conductance of water discharged during the drilling of test hole TH-75-4A.

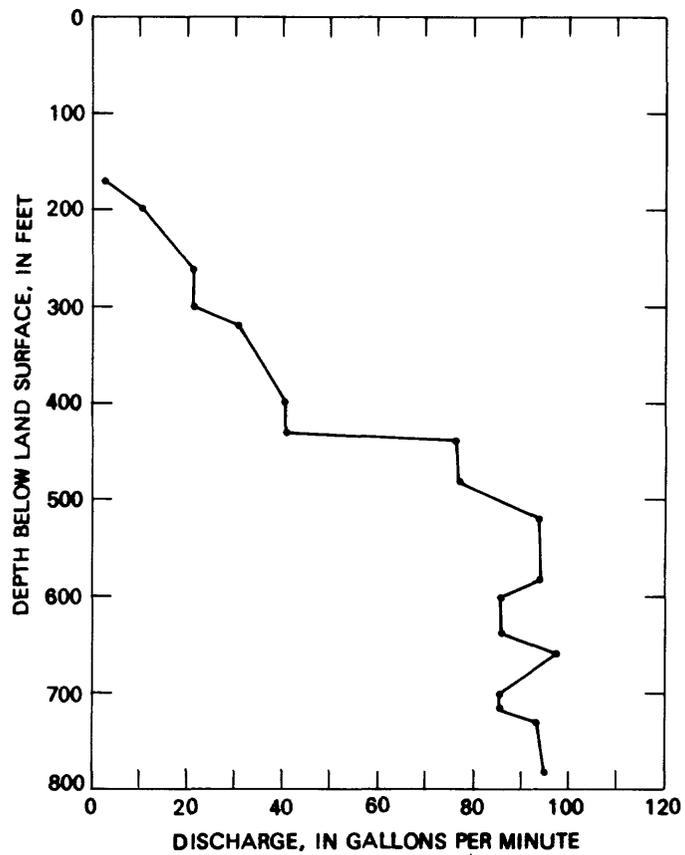


Figure 19.--Water discharged during the drilling of test hole TH75-4A.

Table 10.--Chemical analyses of water samples from test hole TH75-4A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
JAN. 1976										
22...	1545	155	300	30	0	0	50	47	37	110
23...	1415	155	560	17	10	10	20	15	16	150
26...	1700	155	790	17	10	60	20	18	16	160

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
JAN. 1976									
22...	0.6	417	0	342	160	6.9	0.3	0.0	0.21
23...	.6	381	28	359	58	6.8	4.0	.1	.06
26...	.6	470	0	386	55	5.1	3.8	.1	.11

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
JAN. 1976									
22...	0.01	0.03	601	940	8.3	10.0	0	0	70
23...	.00	.00	485	800	8.5	11.0	0	400	250
26...	.01	.03	510	850	8.3	11.0	2	400	260

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (MG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN. 1976									
22...	0	0	0	30	0.0	3	0	2400	10
23...	0	0	2	70	.0	1	0	1100	0
26...	0	0	2	60	.0	2	0	1200	10

Test Hole TH75-5A

Location: NW¼NW¼SW¼ sec. 31, T. 1 S., R. 96 W.  
lat 39°55'15" N., long 108°13'01" W.

Altitude of land surface: 7,135 feet above mean sea level

Drilled: August 1975

Total depth: 895 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 173 feet

Depth to static water level: 452.3 feet, September 20, 1976

Remarks: Driller did not encounter a measurable amount of ground water until reaching a depth of 835 feet, where the discharge was about 6 gallons per minute. At a depth of 875 feet, the discharge was the same, the specific conductance of the discharged water was 880 micromhos per centimeter, and the temperature was 17°C.

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.850 feet
Top of Mahogany zone . . . . .	.1,210 feet
Bottom of Mahogany zone. . . . .	.1,420 feet
Top of high-resistivity zone . . . . .	.2,130 feet
Top of Garden Gulch Member . . . . .	.2,544 feet

Test Hole TH75-5B

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 31, T. 1 S., R. 96 W.  
 lat 39°55'15" N., long 108°13'01" W.

Altitude of land surface: 7,135 feet above mean sea level

Drilled: June 1975

Total depth: 2,800 feet

Casing: 9 5/8-inch steel pipe cemented to a depth of 105 feet  
 7-inch steel pipe set to a depth of 1,130 feet

Depth to static water level: 695.0 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
 Green River Formation:  
 Top of Parachute Creek Member. . . . . .850 feet  
 Top of Mahogany zone . . . . . .1,210 feet  
 Bottom of Mahogany zone. . . . . .1,420 feet  
 Top of high-resistivity zone . . . . . .2,130 feet  
 Top of Garden Gulch Member . . . . . .2,544 feet

Table 11.--*Transmissivity and related data from test hole TH75-5B*

Test date-----	June 3, 1975
Hydrologic unit tested-----	Upper aquifer
Transmissivity, in feet squared per day-----	100
Depth to static water level, in feet-----	*
Depth to top of interval open to well, in feet-----	105
Depth to bottom of interval open to well, in feet-----	1,350
Average discharge during testing, in gallons per minute-----	58

\*Not determined during test.

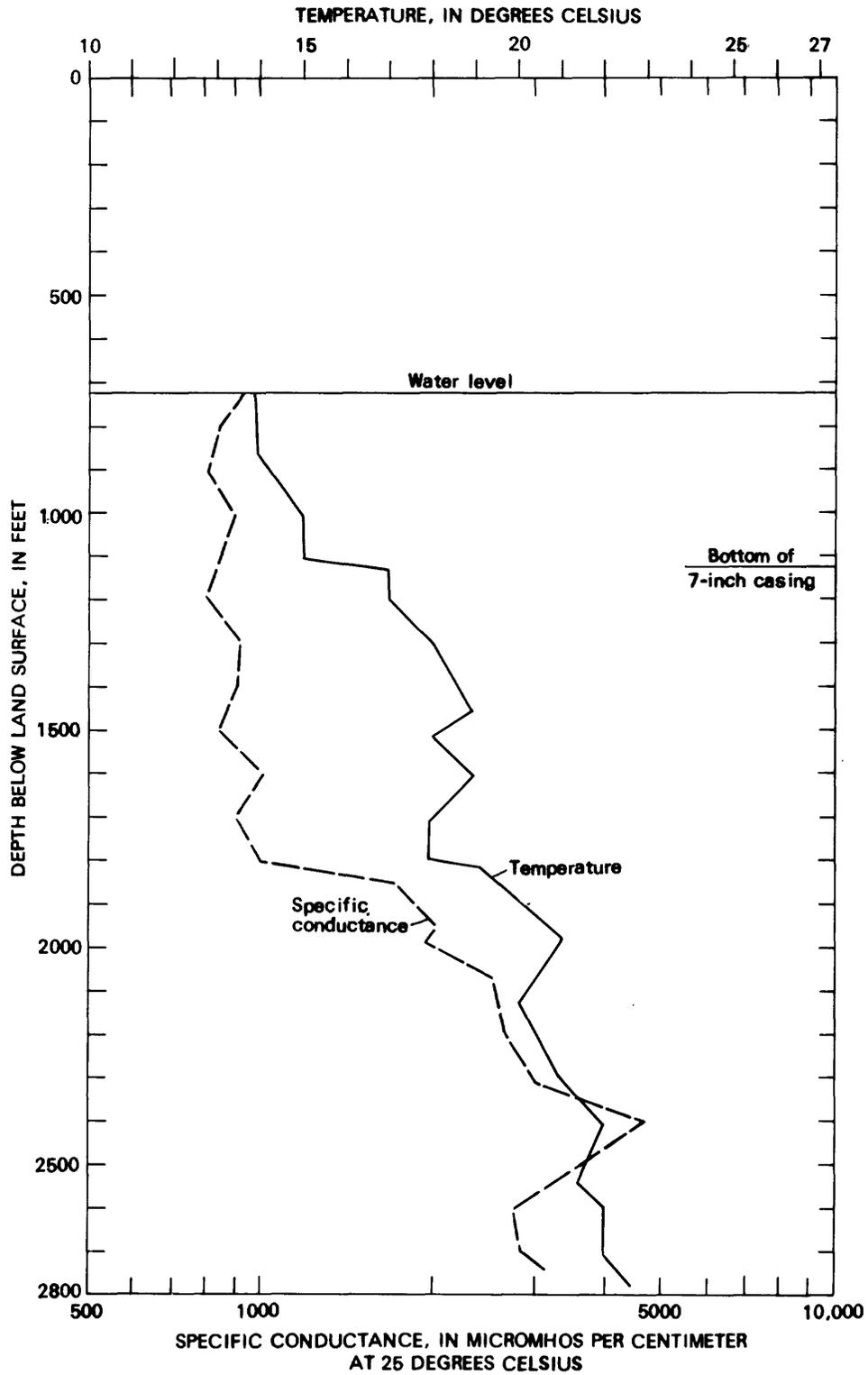


Figure 20.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-5B.

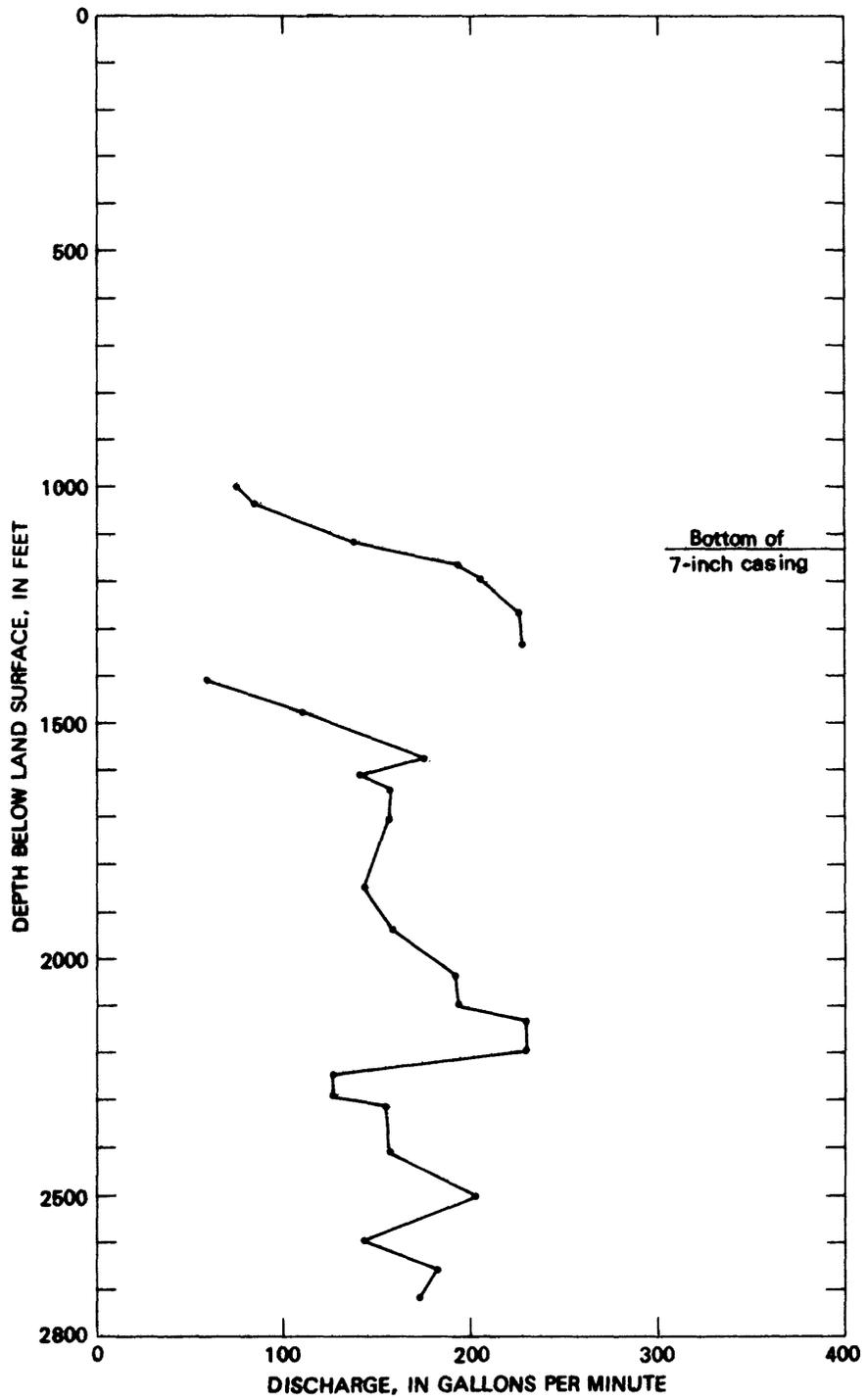


Figure 21.--Water discharged during the drilling of test hole TH75-5B.

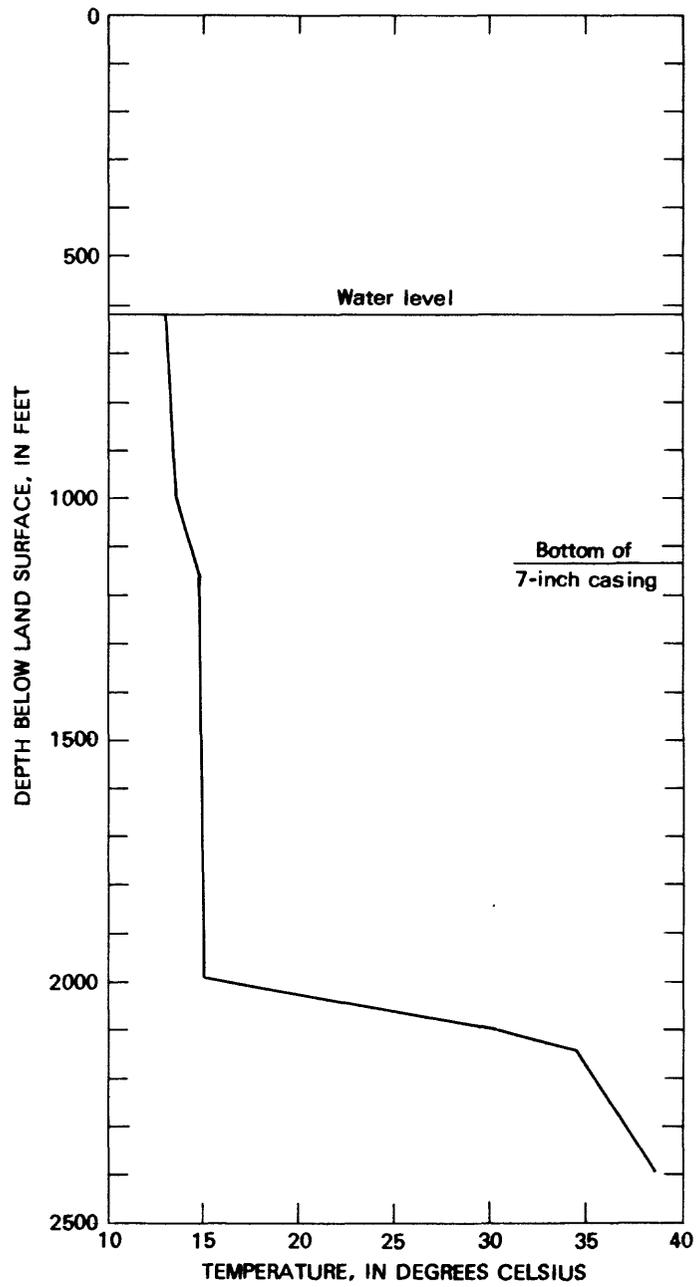


Figure 22.--Fluid temperature in test hole TH75-5B, May 3, 1976.

Table 12.--Chemical analyses of water samples from test hole TH75-5B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
MAY 1975	0045	105	900	23	10	40	0	17	15	130	0.8
JUN 03...	0827	105	1350	22	10	10	0	19	16	150	.3
JUN 13...	0731	1130	2800	16	80	40	50	20	16	390	1.3

DATE	TIME	ALKALINITY AS CAC03 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (P04) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (P) (MG/L)	DIS-SOLVED SILICIC ACID (SIC) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	SPECIFIC CONDUCTANCE (MICROMHOS)
MAY 1975	332	272	110	5.7	1.3	0.1	0.02	0.01	0.03	470	810	
JUN 03...	371	304	130	5.6	4.1	.1	.02	.01	.03	533	875	
JUN 13...	903	741	200	14	14	.1	.01	.00	.00	1120	1700	

DATE	PH	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAY 1975	--	14.5	8	0	70	3	20	0	3500	0
JUN 03...	--	15.0	28	0	140	2	30	1	2600	0
JUN 13...	8.1	21.0	9	200	500	7	70	2	1500	20

Test Hole TH75-6A

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 1 S., R. 96 W.  
lat 39°57'55" N., long 108°21'14" W.

Altitude of land surface: 6,440.4 feet above mean sea level

Drilled: August 1975

Total depth: 1,260 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 111 feet

Depth to static water level: 280.6 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.800 feet
Top of Mahogany zone . . . . .	.1,260 feet
Bottom of Mahogany zone. . . . .	.1,440 feet
Top of high-resistivity zone . . . . .	.1,735-1,755 feet

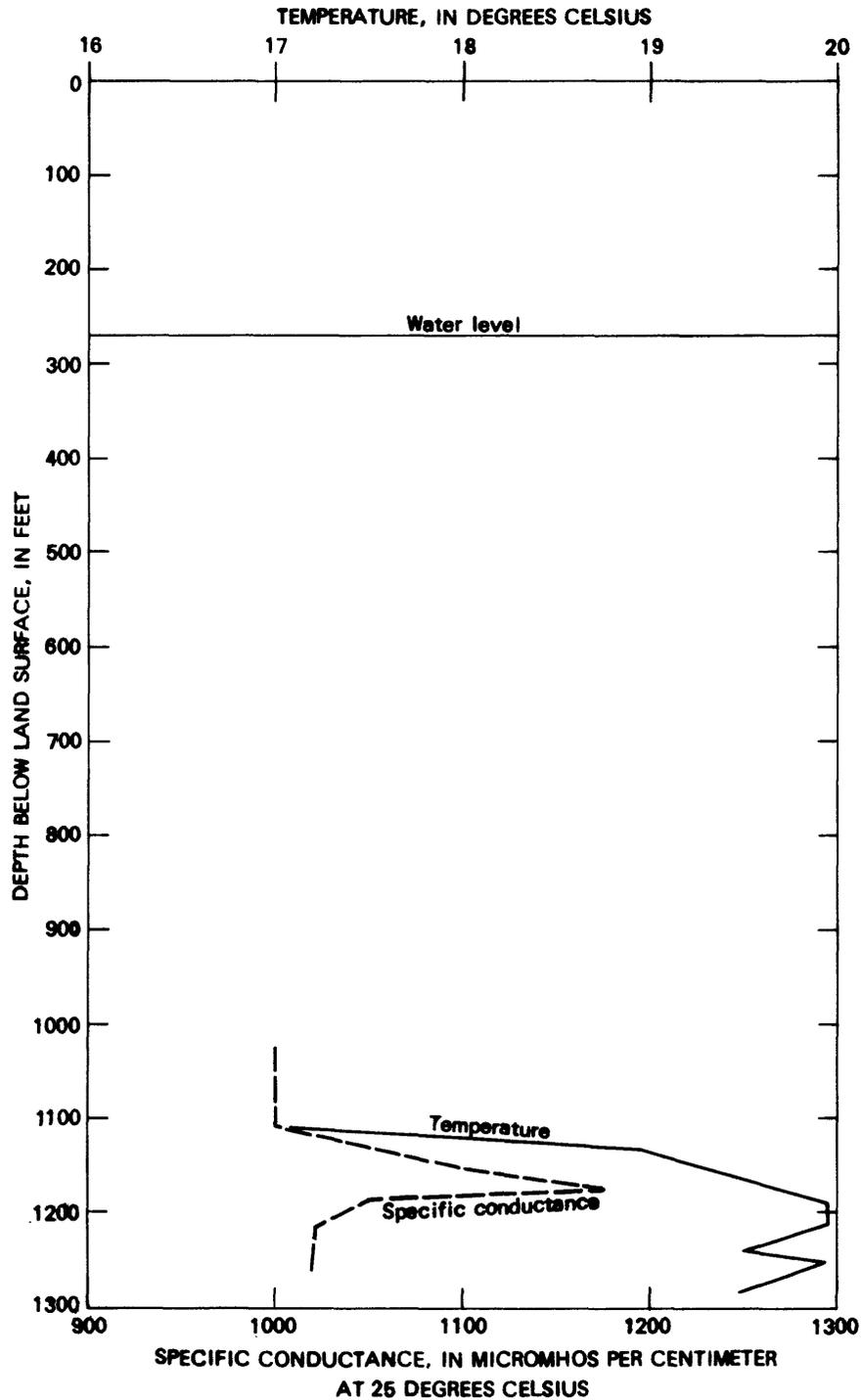


Figure 23.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-6A.

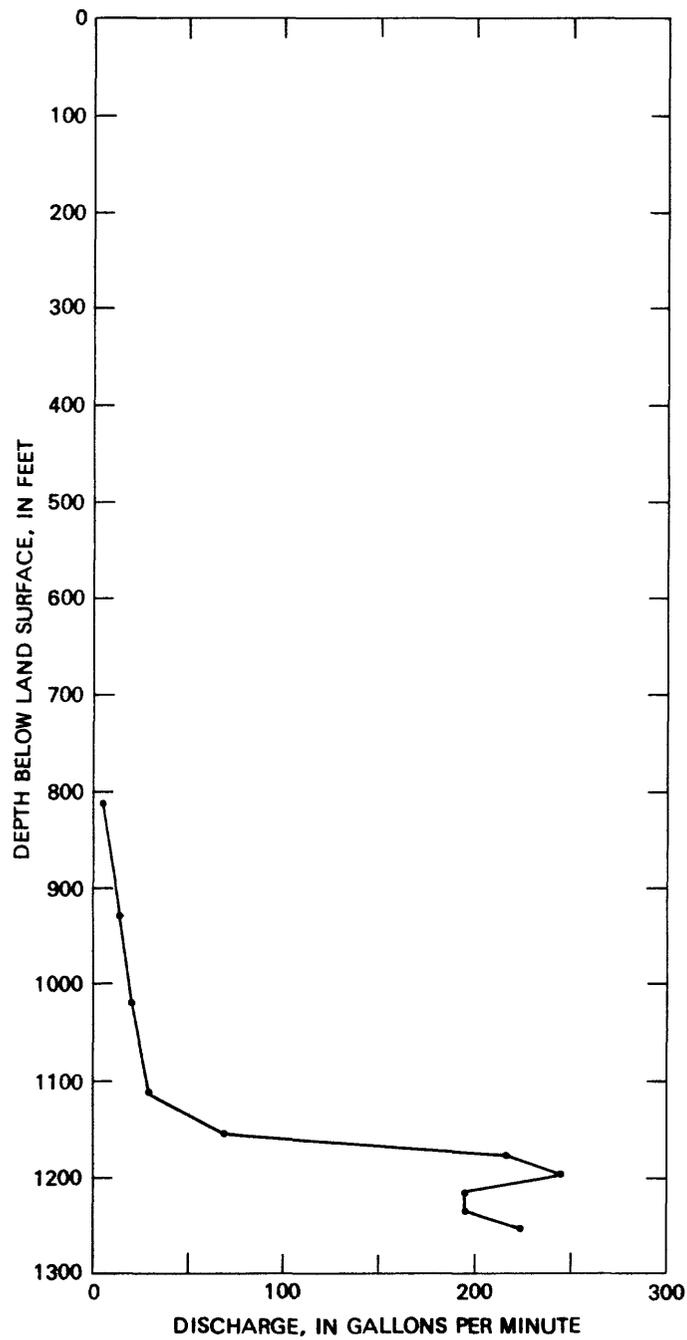


Figure 24.--Water discharged during the drilling of test hole TH75-6A.

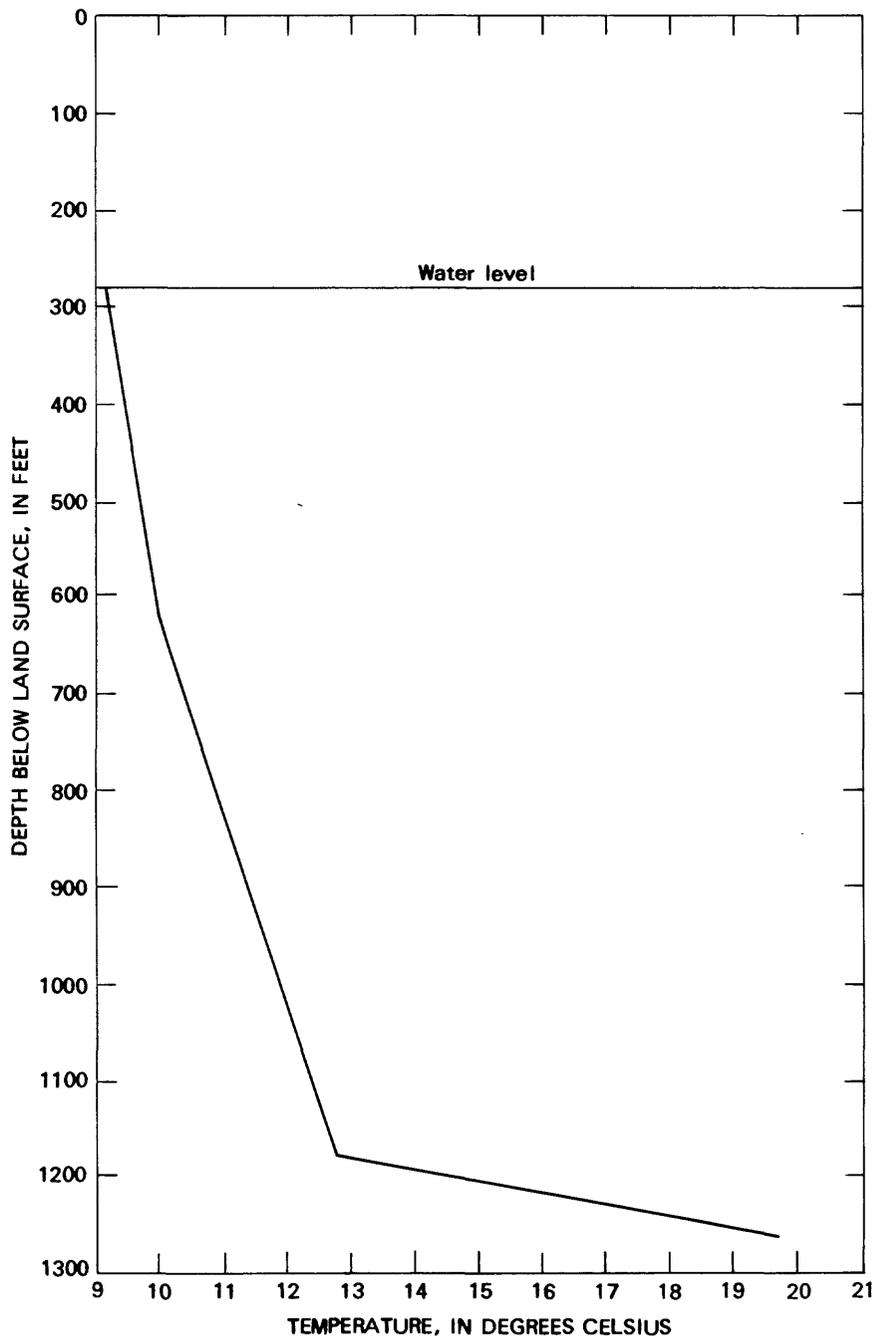


Figure 25.--Fluid temperature in test hole TH75-6A, May 5, 1976.

Table 13.--Chemical analyses of water samples from test hole TH75-6A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
AUG. 1975										
21...	1315	110	1260	13	70	60	0	2.4	1.6	250
OCT										
21...	1600	110	350	12	10	0	20	11	18	320

DATE	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CALCIUM (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
AUG. 1975									
21...	0.3	567	22	502	11	12	18	0.1	0.02
OCT									
21...	.6	347	0	285	470	12	.3	.1	.00

DATE	DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONDUCTANCE) (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
AUG. 1975								
21...	0.05	0.15	612	975	8.7	20.0	20	500
OCT								
21...	.00	.00	1020	1550	7.8	11.0	16	90

DATE	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
AUG. 1975									
21...	0	0	1	130	0.0	13	0	550	0
OCT									
21...	1	0	1	80	.3	6	0	1660	30

Test Hole TH75-6B

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 14, T. 1 S., R. 96 W.  
lat 39°57'55" N., long 108°21'14" W.

Altitude of land surface: 6,439.7 feet above mean sea level

Drilled: August 1975

Total depth: 1,755 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 120 feet  
6 5/8-inch steel pipe cemented to a depth of 1,381 feet

Depth to static water level: 285.48 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . .800 feet  
Top of Mahogany zone . . . . . .1,260 feet  
Bottom of Mahogany zone. . . . . .1,440 feet  
Top of high-resistivity zone . . . . . .1,735-1,755 feet

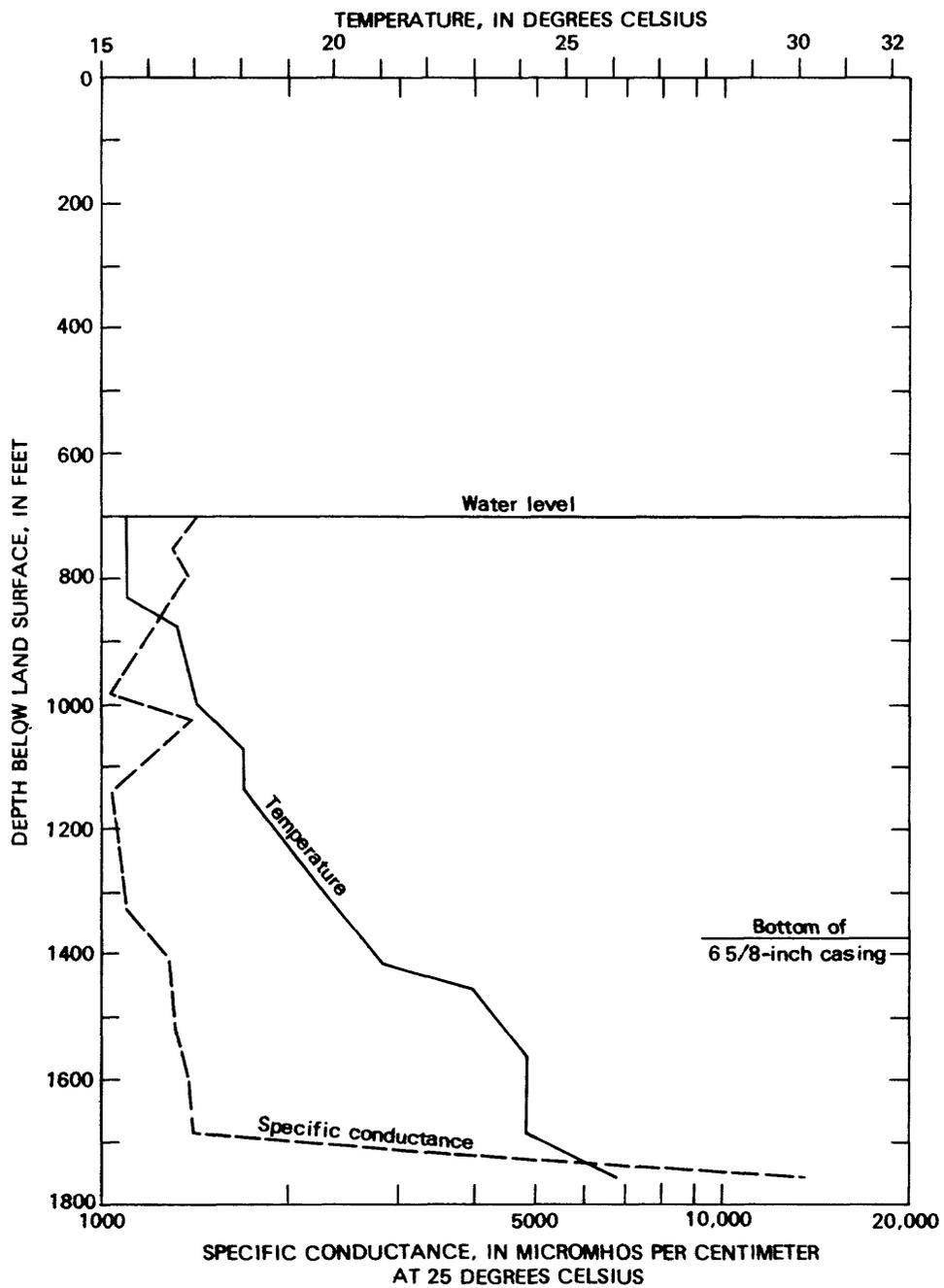


Figure 26.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-6B.

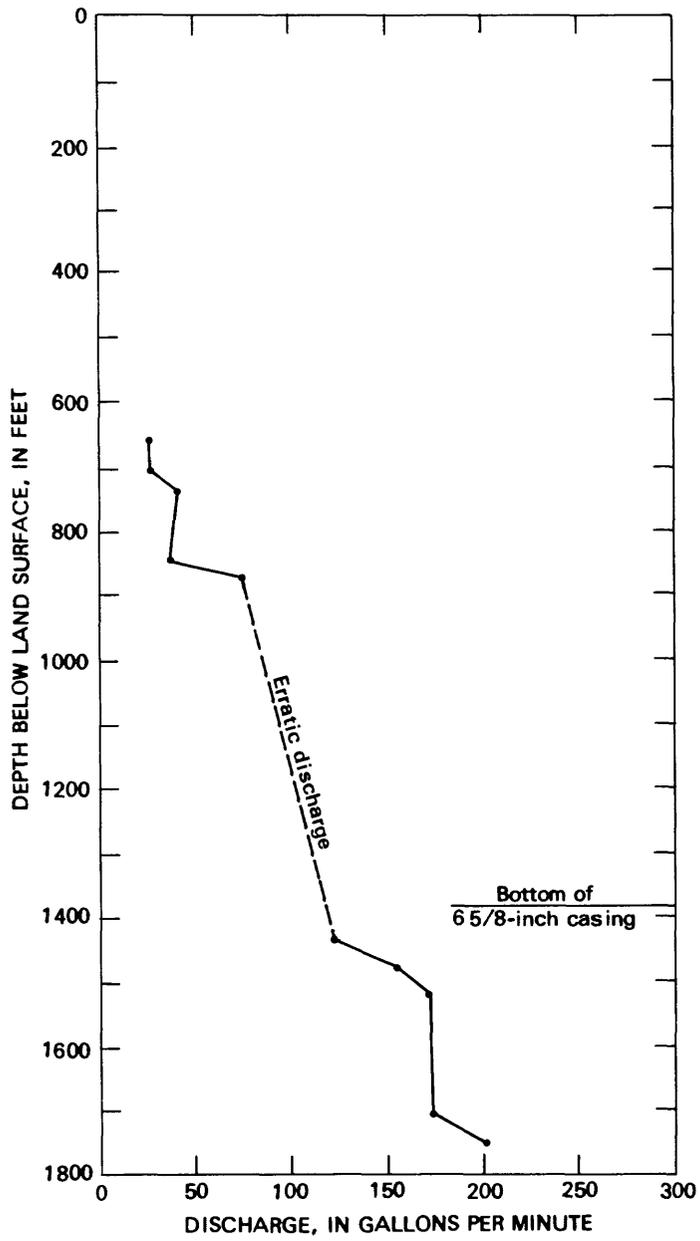


Figure 27.--Water discharged during the drilling of test hole TH75-6B.

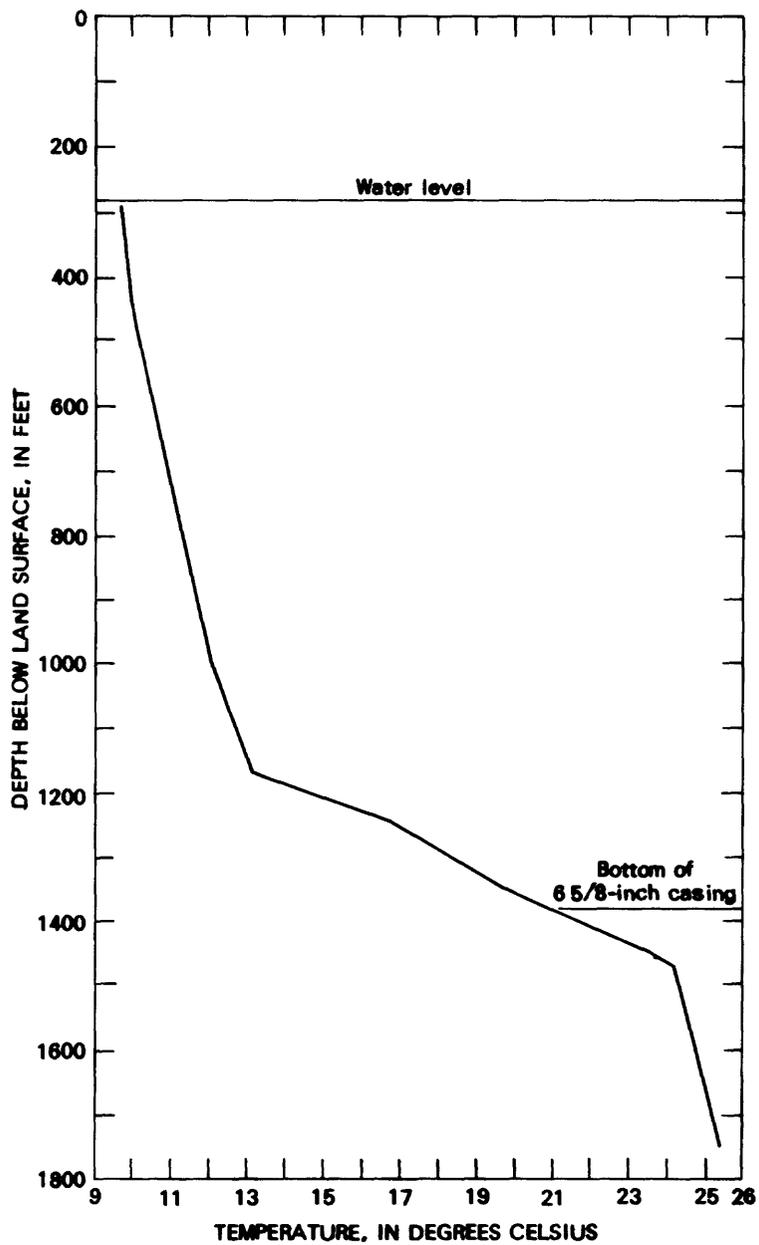


Figure 28.--Fluid temperature in test hole TH75-6B, May 5, 1976.

Table 14.--Chemical analyses of water samples from test hole TH75-6B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)
AUG. 1975	1515	120	1019	12	30	730	30	3.1	1.2	270	0.6	367
	04....	1380	1455	14	30	650	10	5.4	2.9	380	3.6	827
	11....	1380	1755	9.3	20	230	50	2.5	8.7	3900	6.0	1500

50

DATE	PH	TEMPER-ATURE (DEG C)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CAC03 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (P04) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CON-DUCT-ANCE MICRO-MHOS)
AUG. 1975	57	396	150	11	13	0.1	0.02	0.00	0.00	0.00	701	1040
	72	798	5.8	14	19	.1	.02	.00	.00	.00	928	1400
	1240	3300	63	3600	26	5.6	.05	.60	1.8	1.8	9610	15100

DATE	PH	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
AUG. 1975	8.6	16.5	12	0	210	1	1	170	0	410	10
	8.7	23.0	4	300	590	6	1	30	0	950	50
	9.0	26.0	15	100	2900	0	2	460	0	500	20

Test Hole TH75-7A

Location: SW¼NE¼NE¼ sec. 20, T. 1 S., R. 98 W.  
lat 39°57'12" N., long 108°24'34" W.

Altitude of land surface: 6,361 feet above mean sea level

Drilled: July 1975

Total depth: 1,080 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 157 feet

Depth to static water level: 131.32 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.700 feet
Top of Mahogany zone . . . . .	.1,075 feet
Bottom of Mahogany zone. . . . .	.1,250 feet
Top of high-resistivity zone . . . . .	.1,650 feet

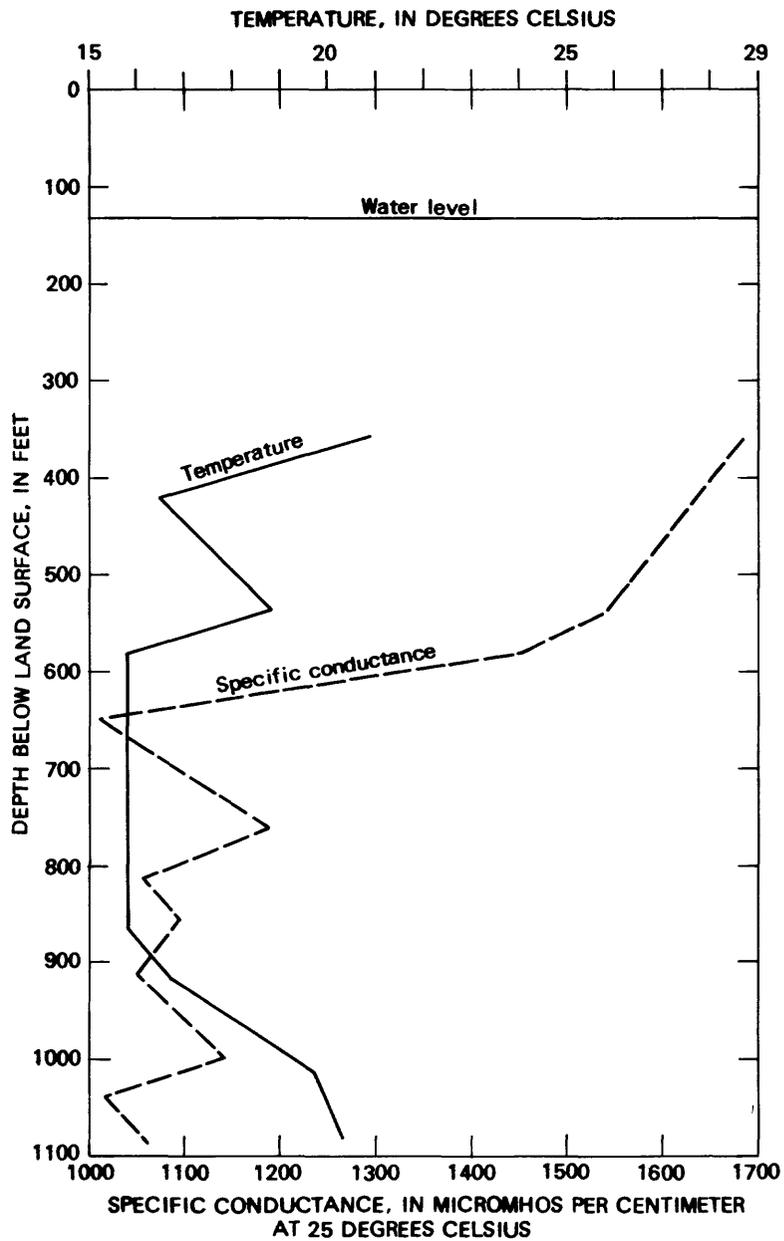


Figure 29.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-7A.

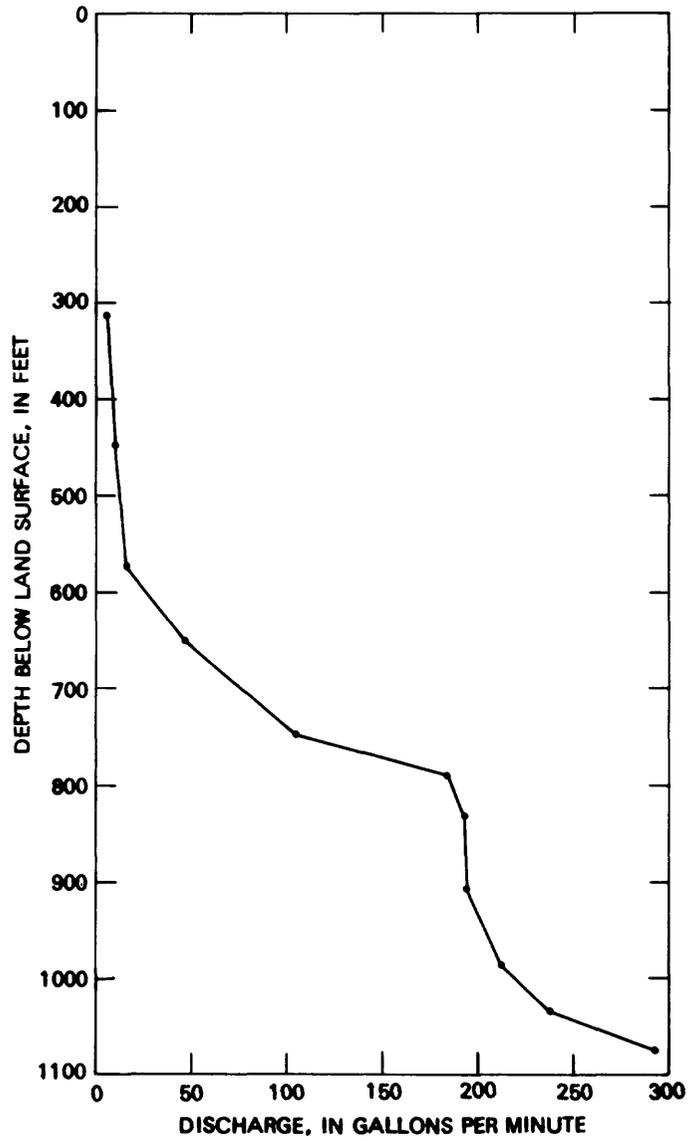


Figure 30.--Water discharged during the drilling of test hole TH75-7A.

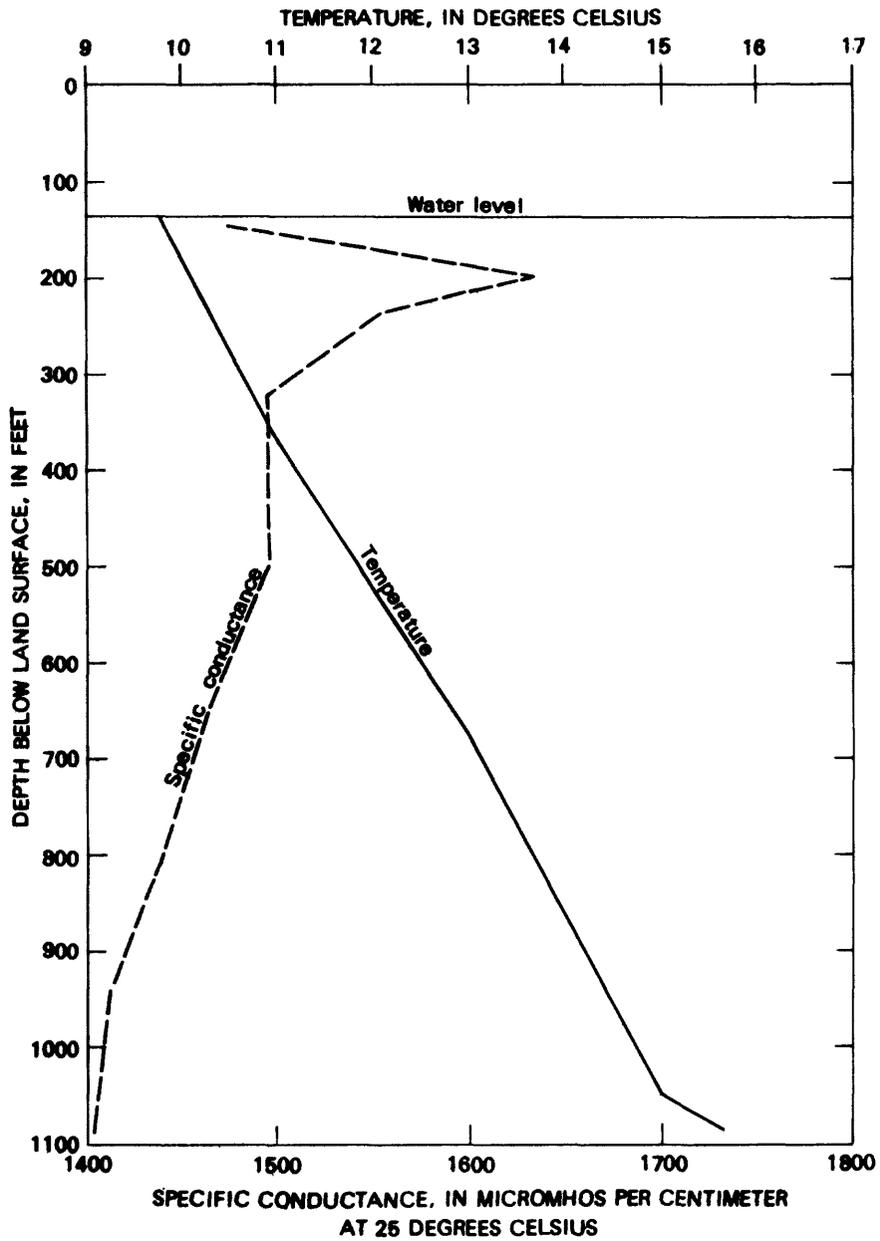


Figure 31.--Fluid temperature and specific conductance in test hole TH75-7A, August 17, 1976.

Table 15.--Chemical analysis of water sample from test hole TH75-7A  
 [Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter;  
 UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
JUL. 1975	1800	157	1035	11	220	20	20	2.7	0.6	250	0.9
23...											
				DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED PHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
DATE		BICARBONATE (HCO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	401	10	13	0.1	0.02	0.00	0.00	651
JUL. 1975	410	39	401	120	10	13	0.1	0.02	0.00	0.00	651
23...											
				DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DATE		PH	TEMPERATURE (DEG C)	3	100	150	2	200	0	460	20
JUL. 1975	1030	9.7	18.0	3	100	150	2	200	0	460	20
23...											

Test Hole TH75-7B

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 20, T. 1 S., R. 98 W.  
lat 39°57'12" N., long 108°24'34" W.

Altitude of land surface: 6,362 feet above mean sea level

Drilled: August 1975

Total depth: 1,498 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 147 feet  
6 5/8-inch steel pipe cemented to a depth of 1,183 feet

Depth to static water level: 178.15 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.700 feet
Top of Mahogany zone . . . . .	.1,075 feet
Bottom of Mahogany zone. . . . .	.1,250 feet
Top of high-resistivity zone . . . . .	.1,650 feet

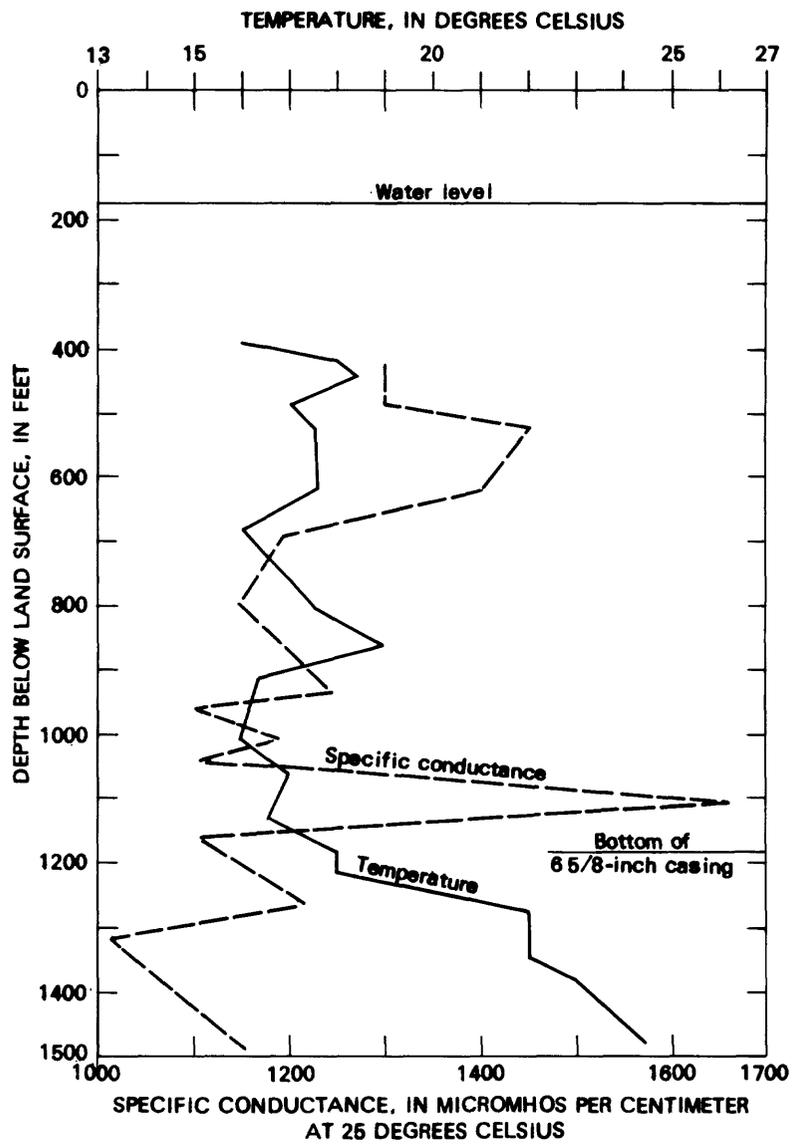


Figure 32.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-7B.

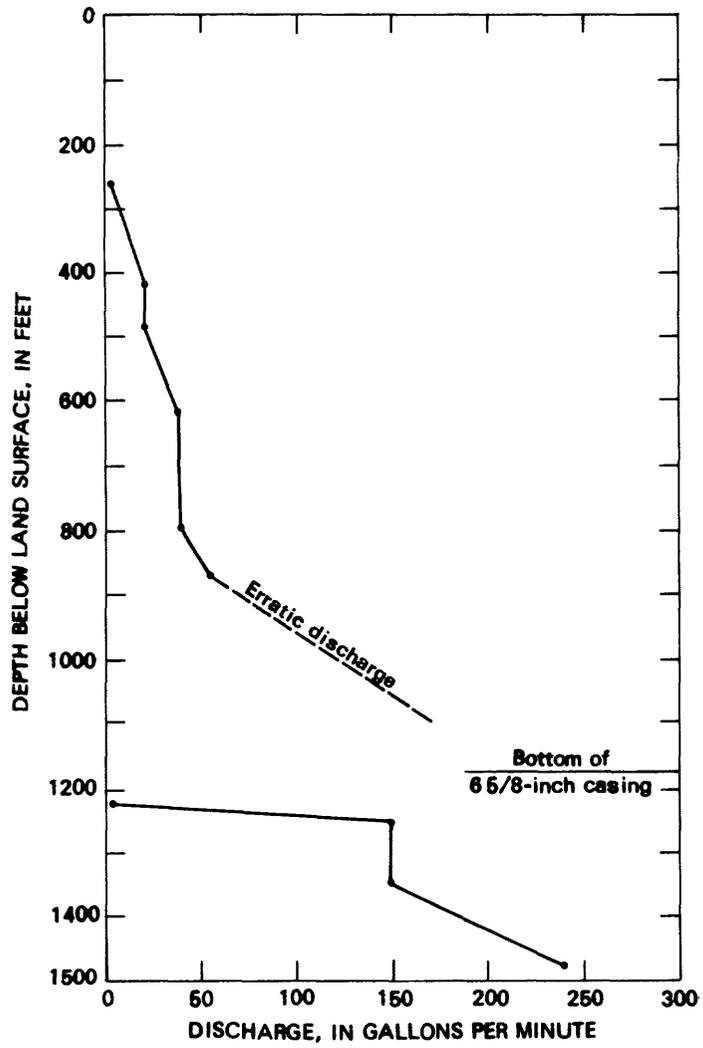


Figure 33.--Water discharged during the drilling of test hole TH75-7B.

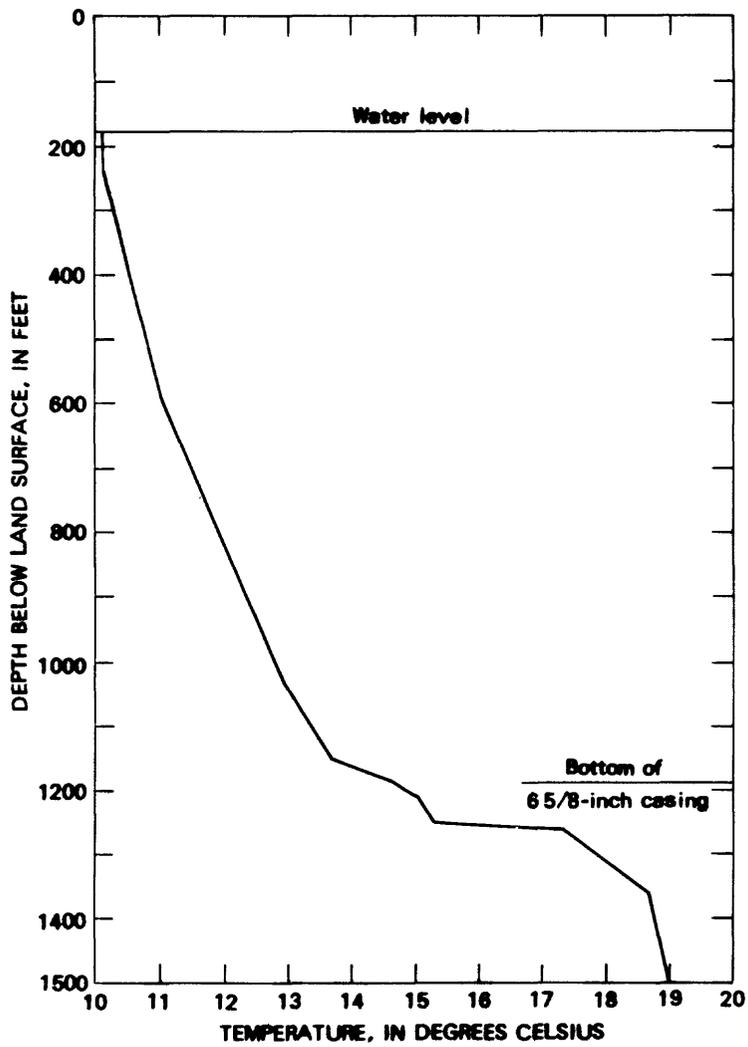


Figure 34.--Fluid temperature in test hole TH75-7B, August 17, 1976.

Table 16.--Chemical analyses of water samples from test hole TH75-7B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
AUG. 1975										
22...	1915	125	1179	14	10	20	90	6.7	25	250
26...	1300	1191	1255	13	20	60	10	8.6	3.4	260

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO <sub>3</sub> ) (MG/L)	CAR-BONATE (CO <sub>3</sub> ) (MG/L)	ALKA-LINITY AS CaCO <sub>3</sub> (MG/L)	DIS-SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
AUG. 1975									
22...	0.7	530	12	455	140	9.4	12	0.1	.08
26...	1.0	644	0	528	8.8	17	19	.2	.01

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO <sub>4</sub> ) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
AUG. 1975									
22...	0.81	2.5	736	1140	8.8	18.0	10	<100	180
26...	.01	.03	650	1220	8.2	21.0	1	<200	410

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
AUG. 1975									
22...	0	0	2	110	0.0	15	0	1000	0
26...	0	0	3	50	.0	2	0	730	0

Test Hole TH75-9A

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 2 S., R. 95 W.  
lat 39°53'10" N., long 108°05'04" W.

Altitude of land surface: 7,350 feet above mean sea level

Drilled: September 1975

Total depth: 1,182 feet

Casing: 8 5/8-inch steel casing cemented to a depth of 119 feet

Depth to static water level: 448.2 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.900 feet
Top of Mahogany zone . . . . .	.1,200 feet
Bottom of Mahogany zone. . . . .	.1,390 feet
Top of Garden Gulch Member . . . . .	.2,210 feet

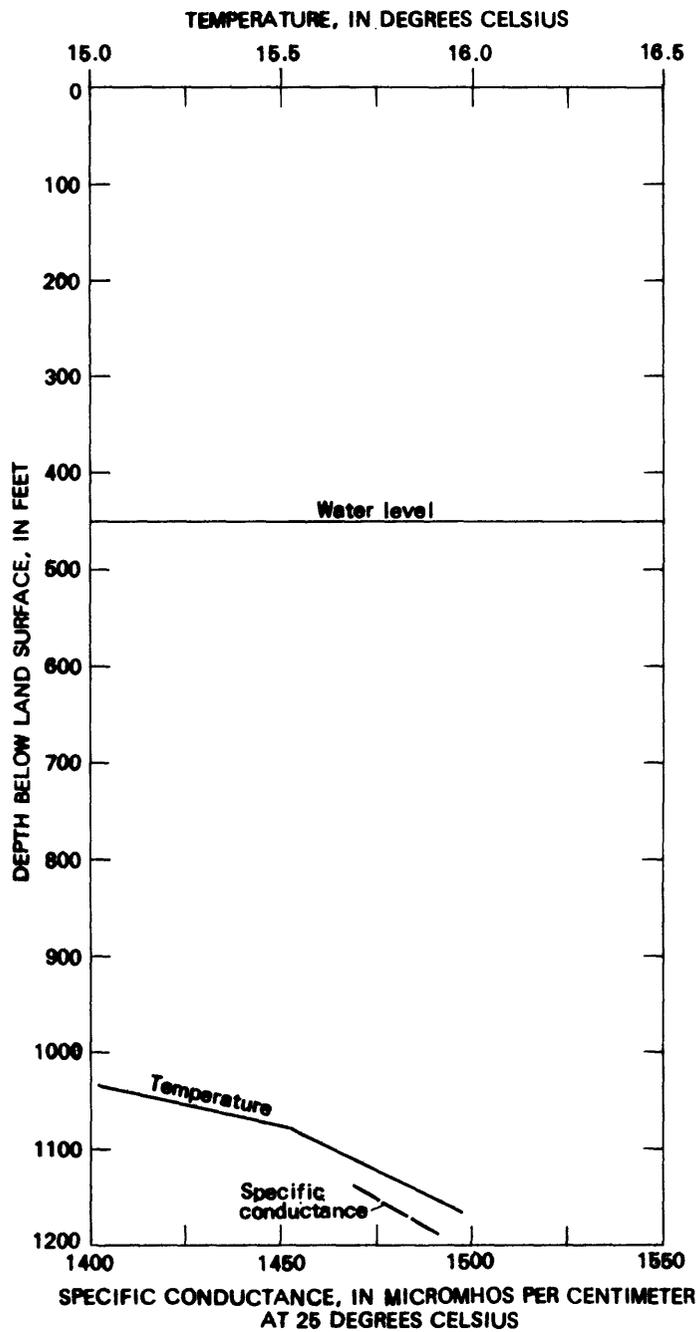


Figure 35.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-9A.

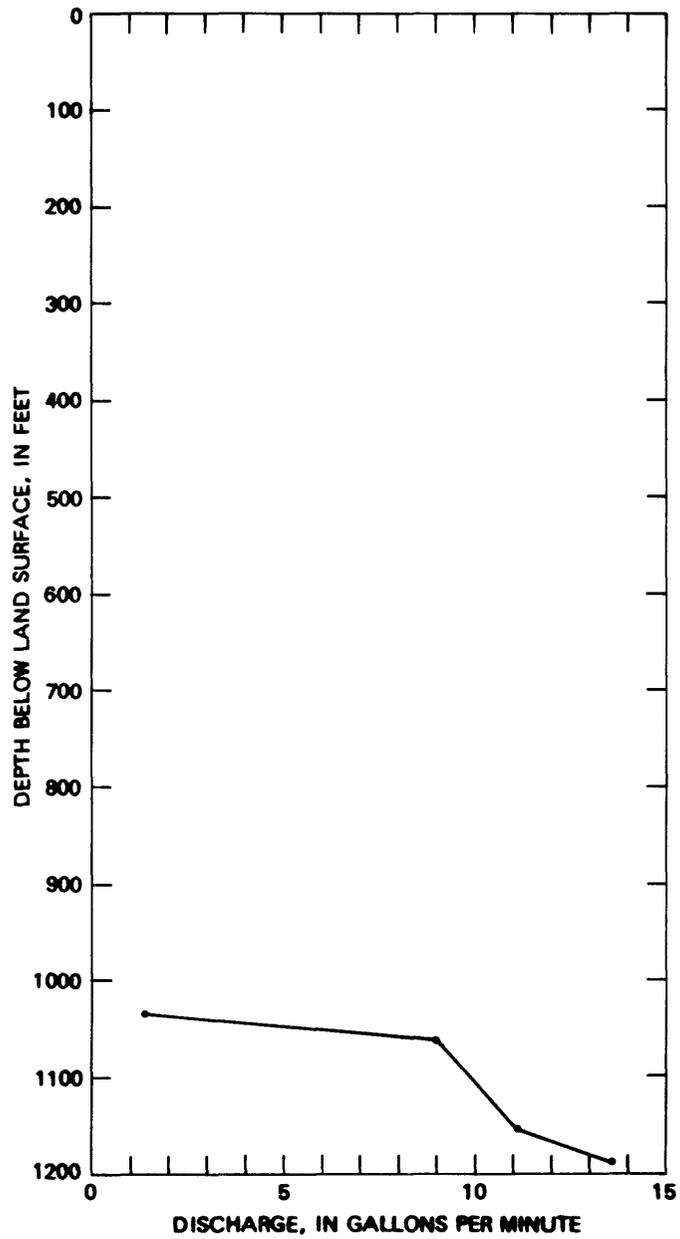


Figure 36.--Water discharged during the drilling of test hole TH75-9A.

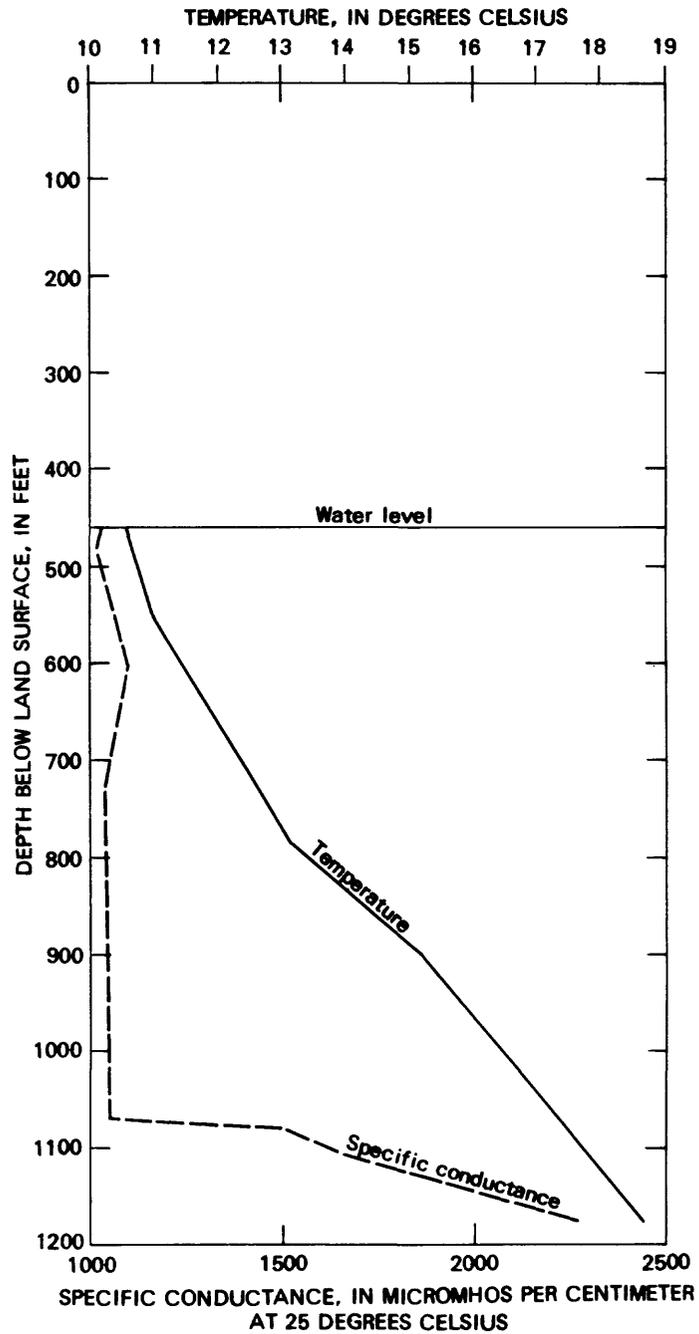


Figure 37.--Fluid temperature and specific conductance in test hole TH75-9A, August 20, 1976.

Table 17.--Chemical analysis of water sample from test hole TH75-9A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED GANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESE (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)
SEP. 1975	2000	119	1182	30	60	1.1	0.3	390	1.4	990
DATE				DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED GANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESE (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)
SEP. 1975	812	13	12	0.1	0.02	0.06	929	1490	15.0	42
DATE				DIS-SOLVED BROMIDE (BR) (MG/L)	DIS-SOLVED PHOSPHORUS (P) (MG/L)	DIS-SOLVED PHOSPHATE (P04) (MG/L)	DIS-SOLVED TUENTS (MG/L)	DIS-SOLVED MICRO-MODS (MG/L)	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)
SEP. 1975	1800	1300	1300	0	0	0.0	28	1	110	10
DATE				DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED DENYUM (MO) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
SEP. 1975	1800	<200	1300	0	0	0.0	28	1	110	10
DATE				DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	

Test Hole TH75-9B

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 8, T. 2 S., R. 95 W.  
lat 39°53'10" N., long 108°05'04" W.

Altitude of land surface: 7,350 feet above mean sea level

Drilled: October 1975

Total depth: 1,575 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 116 feet  
6 5/8-inch steel pipe cemented to a depth of 1,297 feet

Depth to static water level: 455.5 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 900 feet  
Top of Mahogany zone . . . . . 1,200 feet  
Bottom of Mahogany zone. . . . . 1,390 feet  
Top of Garden Gulch Member . . . . . 2,210 feet

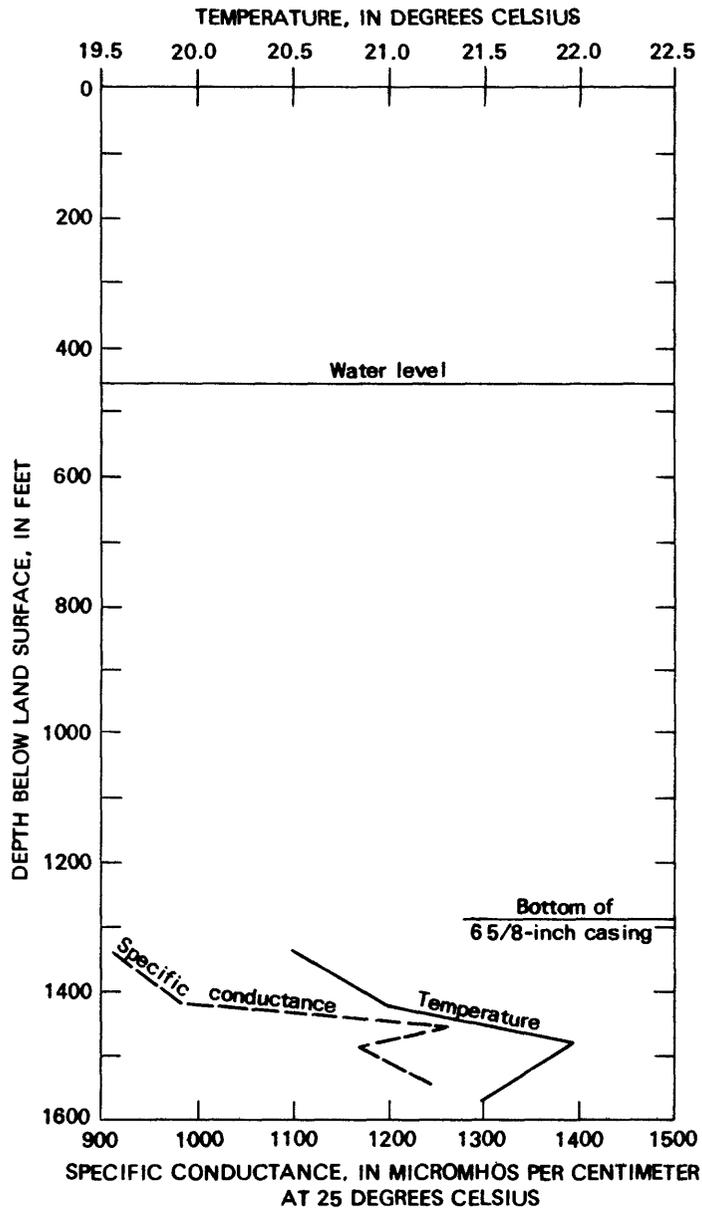


Figure 38.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-9B.

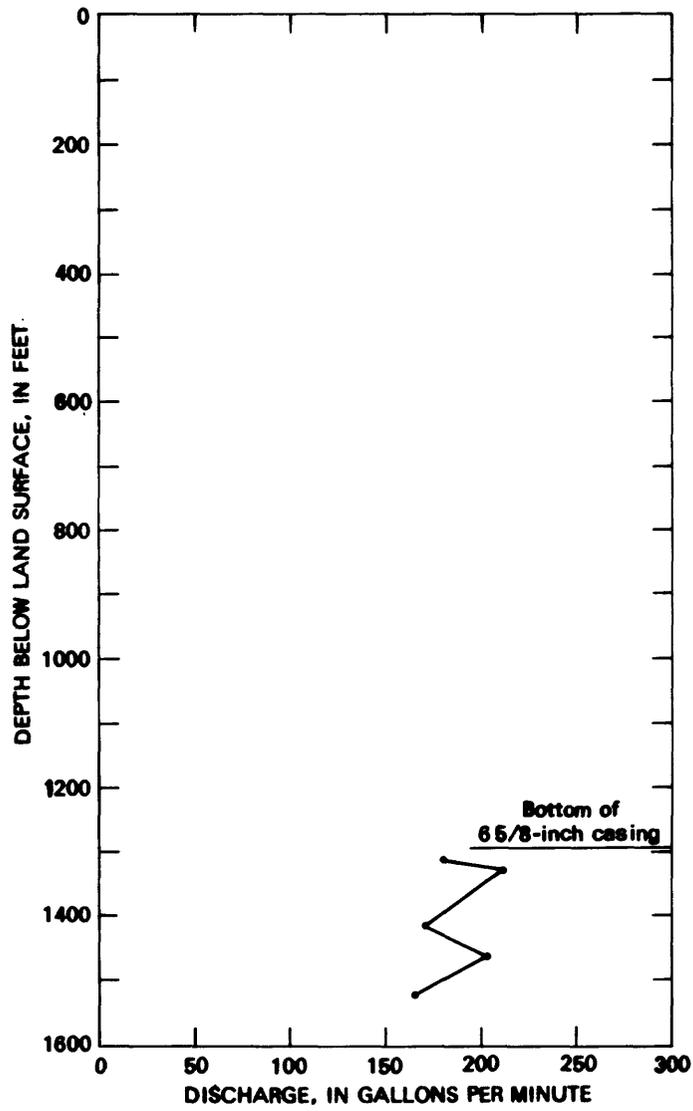


Figure 39.--Water discharged during the drilling of test hole TH75-9B.

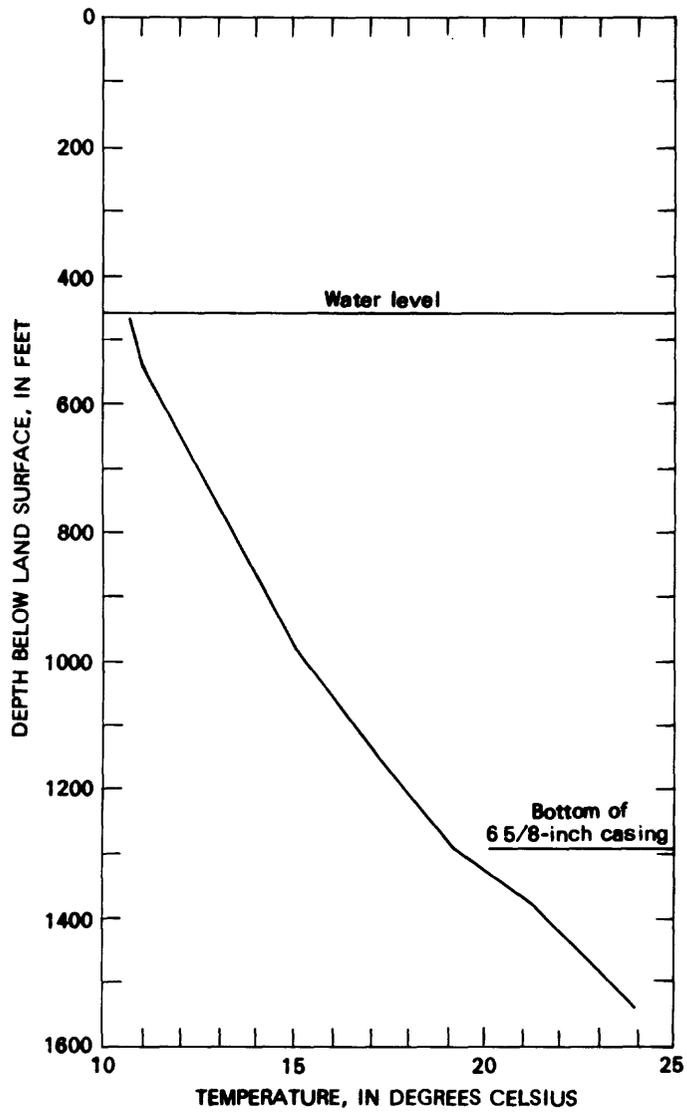


Figure 40.--Fluid temperature in test hole TH75-9B, August 20, 1976.

Table 18.--Chemical analyses of water samples from test hole TH75-9B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
SEP. 1975										
28...	2220	1297	1335	13	10	60	10	9.2	4.4	410
OCT										
04...	1835	1297	1575	11	20	20	20	9.4	3.9	390

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO <sub>3</sub> ) (MG/L)	CAR-BONATE (CO <sub>3</sub> ) (MG/L)	ALKA-LINITY AS CaCO <sub>3</sub> (MG/L)	DIS-SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
SEP. 1975									
28...	1.1	1090	0	894	4.8	16	16	0.1	0.03
OCT									
04...	1.7	973	0	798	27	15	16	.1	.01

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO <sub>4</sub> ) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (MG/L)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
SEP. 1975									
28...	0.00	0.00	1020	1610	8.3	20.5	11	<200	2000
OCT									
04...	.05	.15	957	1130	8.2	21.5	26	200	1800

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (MG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
SEP. 1975									
28...	0	2	3	370	0.0	6	0	550	10
OCT									
04...	0	0	0	500	.1	50	0	460	20

Test Hole TH75-10A

Location: NW¼SW¼NE¼ sec. 19, T. 2 S., R. 96 W.  
lat 39°51'55" N., long 108°12'31" W.

Altitude of land surface: 6,840 feet above mean sea level

Drilled: May 1975

Total depth: 495 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 87 feet

Depth to static water level: 241.95 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.230 feet
Top of Mahogany zone . . . . .	.500 feet
Bottom of Mahogany zone. . . . .	.730 feet
Top of high-resistivity zone . . . . .	.1,330 feet
Top of Garden Gulch Member . . . . .	.1,725 feet

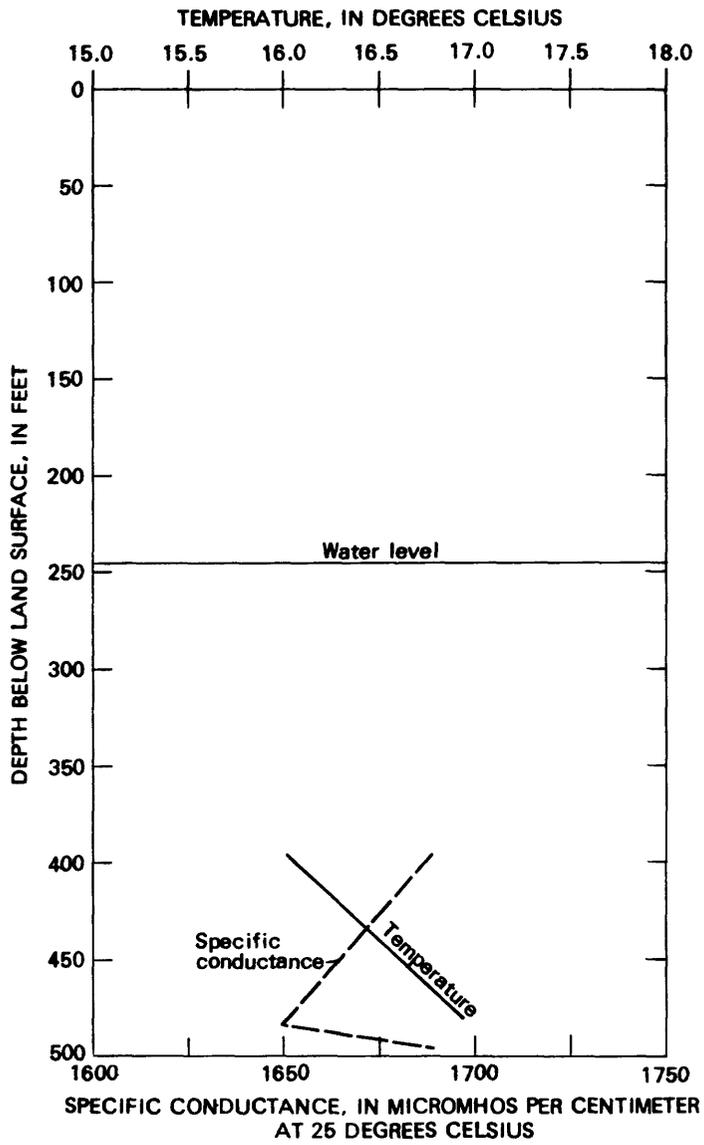


Figure 41.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-10A.

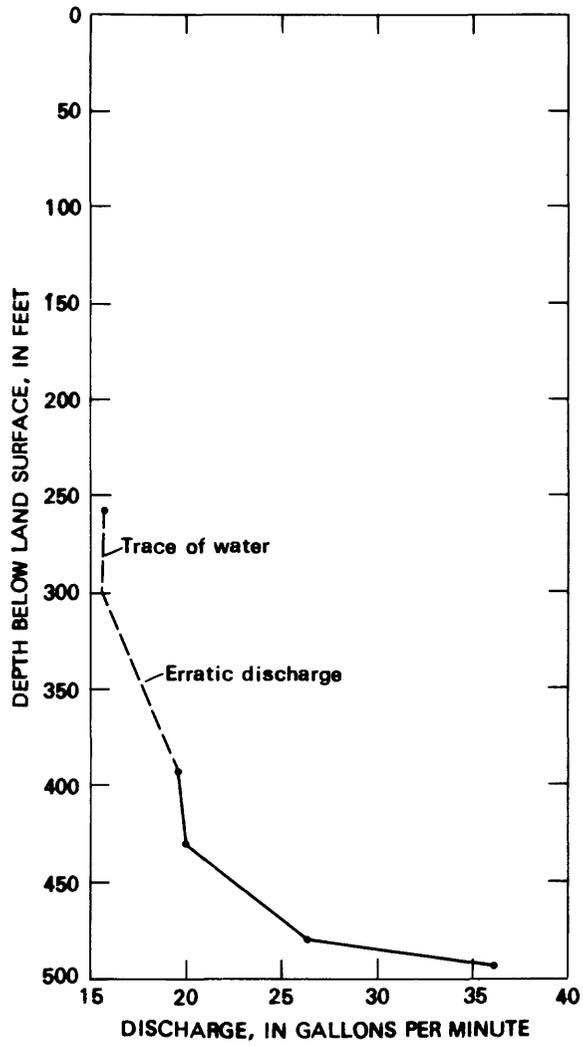


Figure 42.--Water discharged during the drilling of test hole TH75-10A.

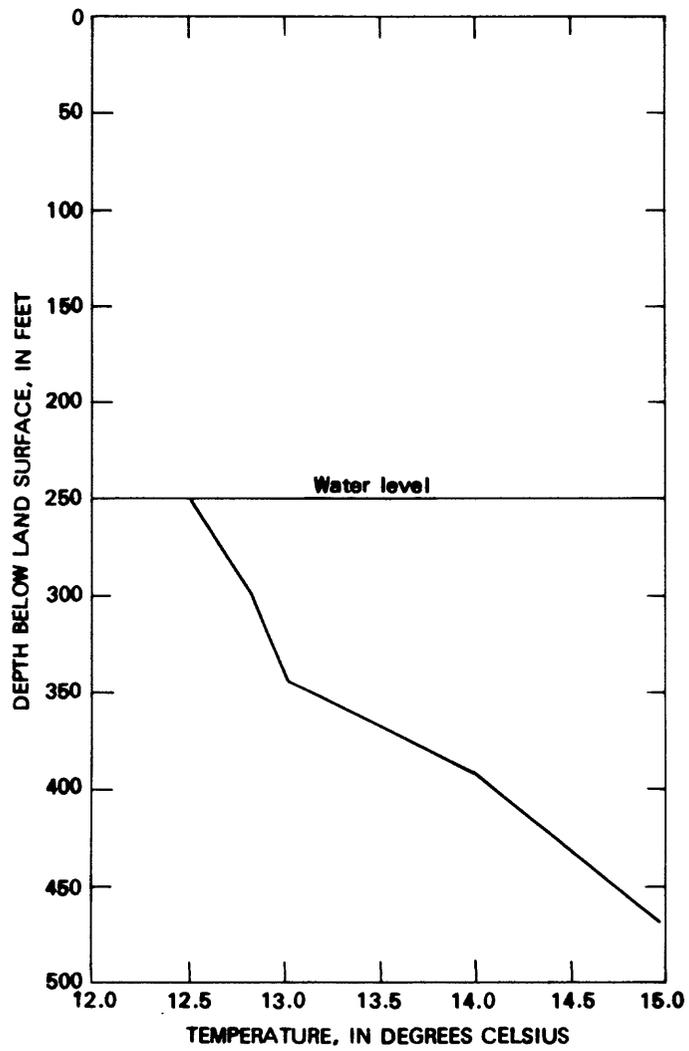


Figure 43.--Fluid temperature in test hole TH75-10A, May 14, 1975.

Table 19.--Chemical analysis of water sample from test hole TH75-10A  
 [Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter;  
 UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
MAY 1975	1900	87	495	39	20	6800	490	75	90	220	0.5
12...											
DATE		CARBONATE (CO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
MAY 1975	605	0	496	450	23	0.6	0.2	0.02	0.16	0.49	1210
12...											
DATE		PH	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED TITANIUM (TI) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAY 1975	1700	8.8	16.0	15	100	120	0	40	0	3000	20
12...											
DATE		SPECIFIC CONDUCTANCE (MICROMHOS)									
MAY 1975	1700										
12...											

Test Hole TH75-10B

Location: NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 19, T. 2 S., R. 96 W.  
lat 39°51'55" N., long 108°12'31" W.

Altitude of land surface: 6,840 feet above mean sea level

Drilled: May 1975

Total depth: 823 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 104 feet  
6 5/8-inch steel pipe cemented to a depth of 561 feet

Depth to static water level: 319.5 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.230 feet
Top of Mahogany zone . . . . .	.500 feet
Bottom of Mahogany zone. . . . .	.730 feet
Top of high-resistivity zone . . . . .	.1,330 feet
Top of Garden Gulch Member . . . . .	.1,725 feet

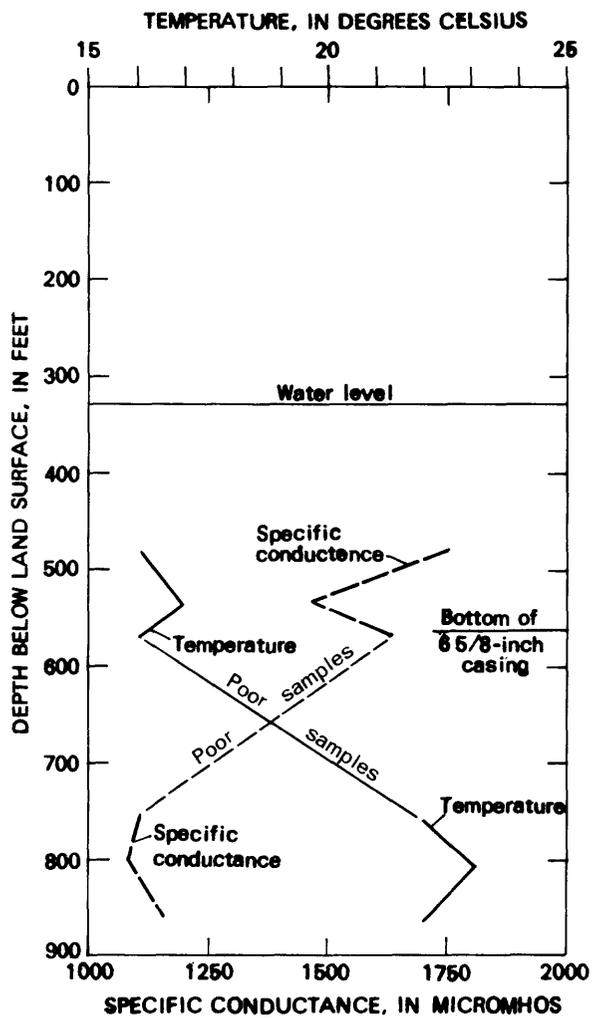


Figure 44.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-10B.

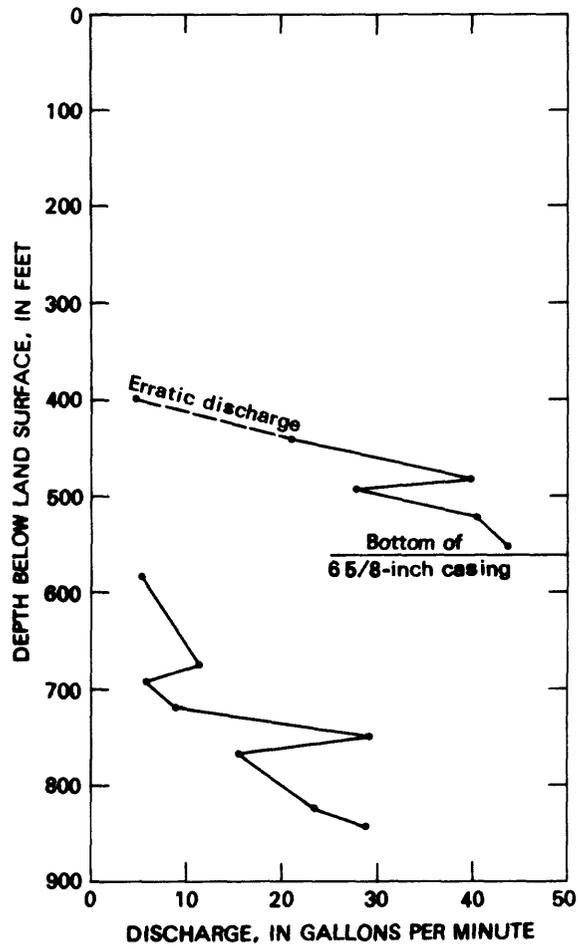


Figure 45.--Water discharged during the drilling of test hole TH75-10B.

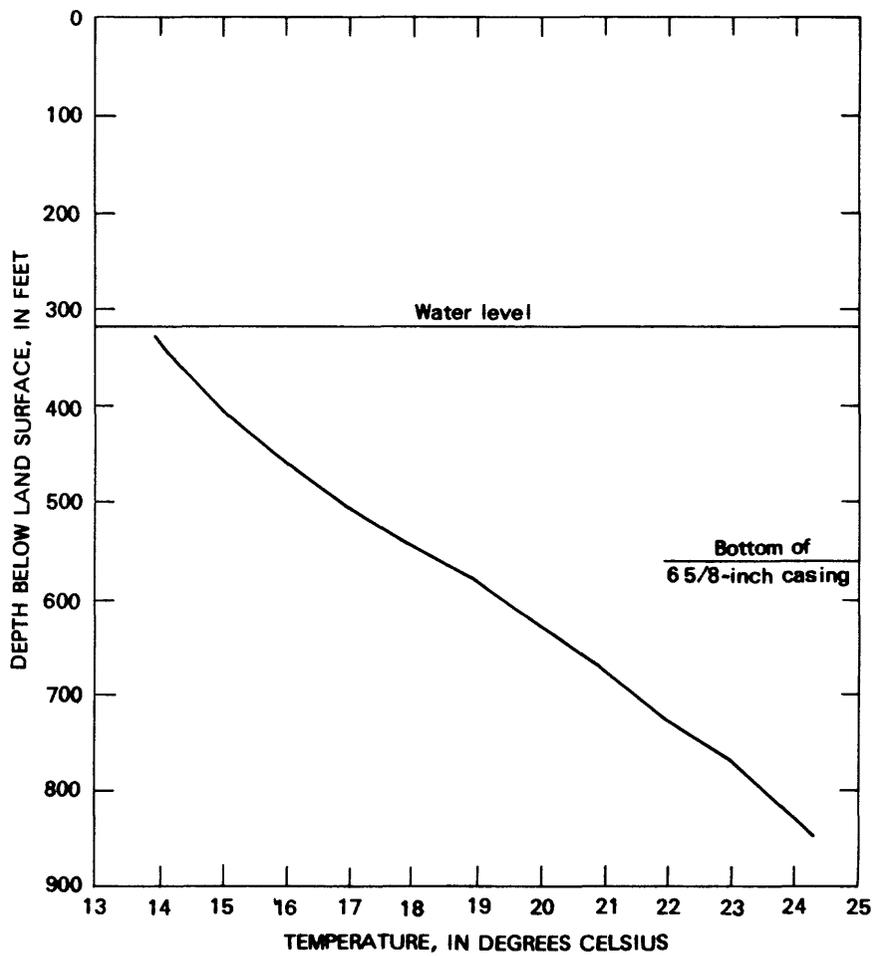


Figure 46.--Fluid temperature in test hole TH75-10B, June 16, 1976.

Table 20.--Chemical analysis of water sample from test hole TH75-10B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
MAY 1975 27...	2015	561	853	12	20	140	80	7.4	22	250	1.2
				DIS-SOLVED SILICATE (S04) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (P04) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
MAY 1975 27...	607	0	498	140	5.0	11	0.1	0.03	0.00	0.00	751
				ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	LITHIUM (LI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	
				TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	
MAY 1975 27...		1140	22.0	0	0	640	1	20	0	2200	10
				DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)

Test Hole TH75-11A

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 2 S., R. 98 W.  
lat 39°54'39" N., long 108°22'33" W.

Altitude of land surface: 6,691 feet above mean sea level

Drilled: September 1975

Total depth: 1,175 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 124 feet  
6 5/8-inch steel pipe cemented to a depth of 760 feet

Depth to static water level: 418.8 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 1,000 feet  
Top of Mahogany zone . . . . . 1,195 feet  
Bottom of Mahogany zone. . . . . 1,410 feet  
Top of high-resistivity zone . . . . . 1,710 feet

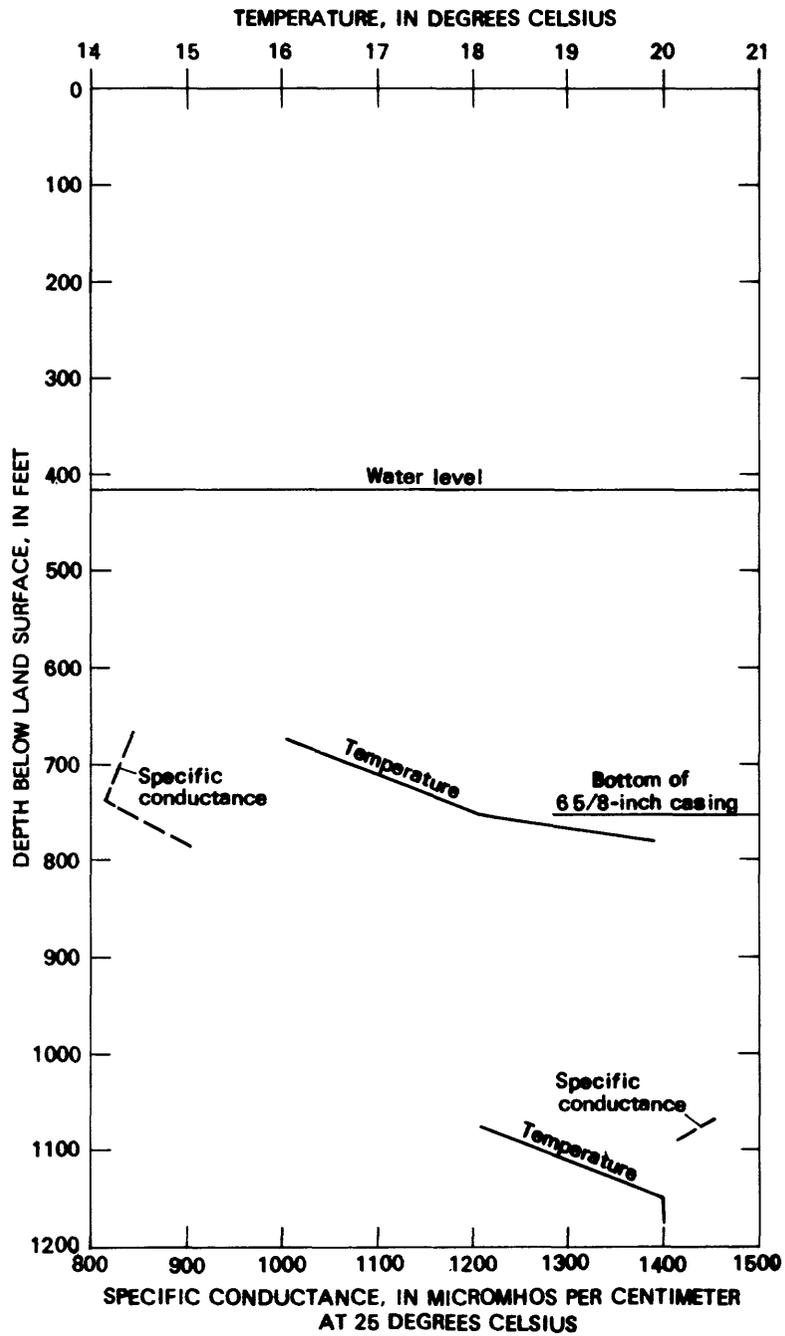


Figure 47.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-11A.

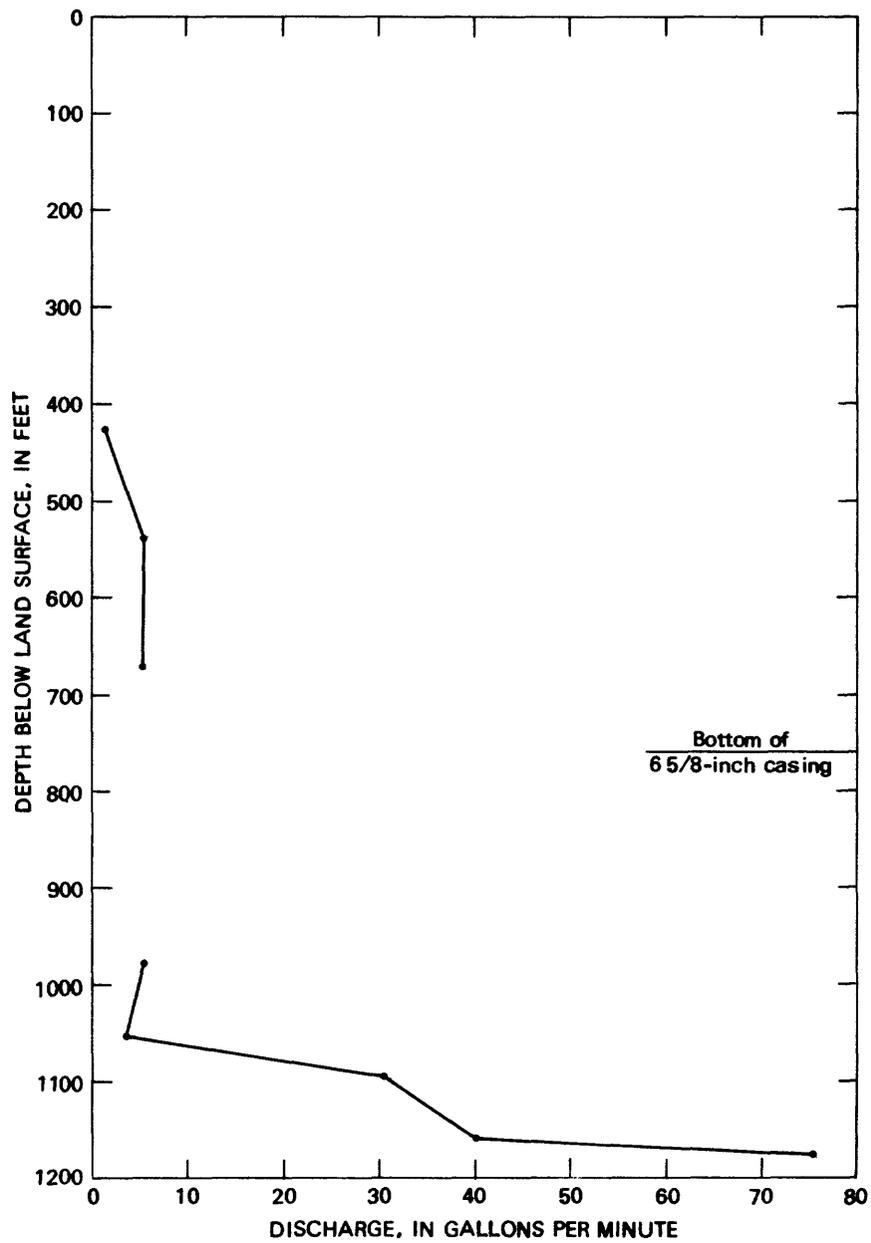


Figure 48.--Water discharged during the drilling of test hole TH75-11A.

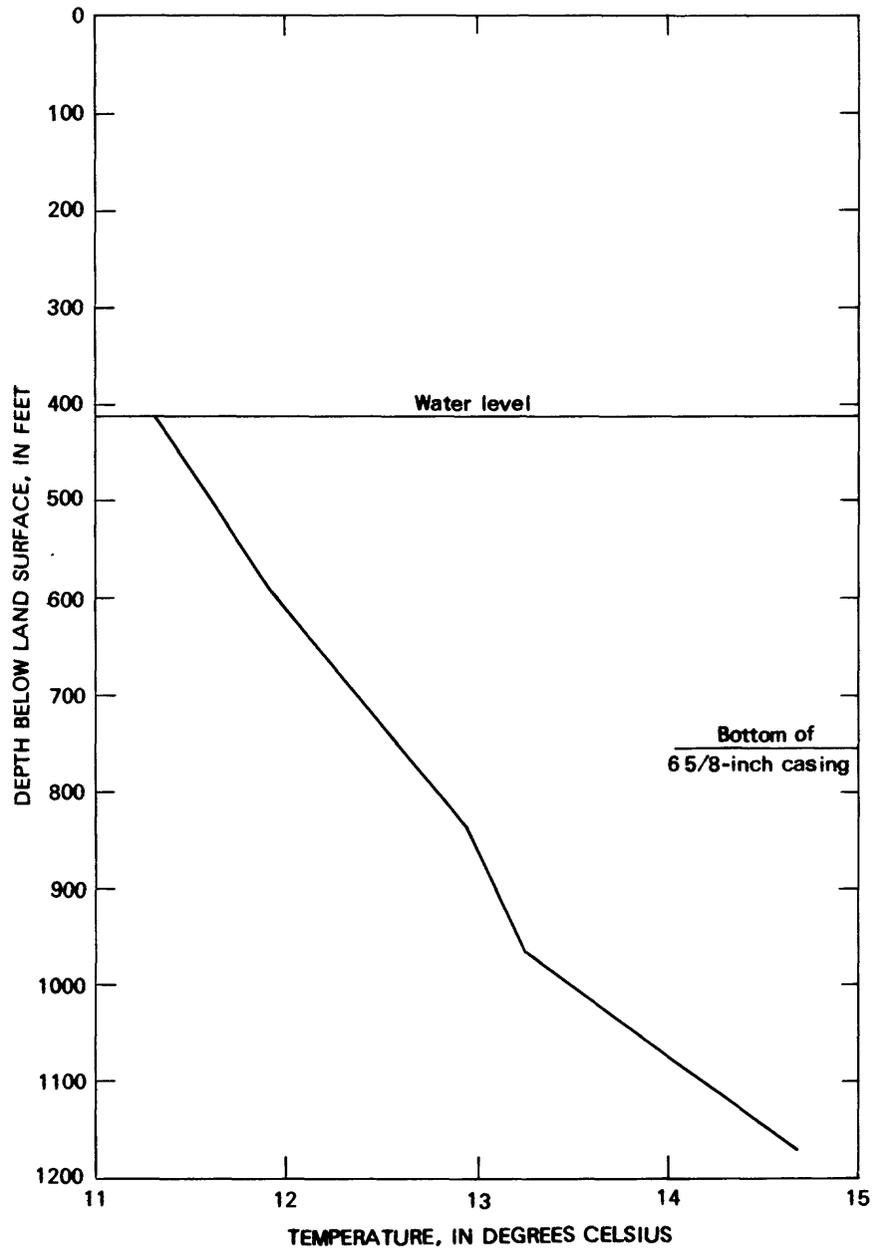


Figure 49.--Fluid temperature in test hole TH75-11A, August 25, 1976.

Test Hole TH75-11B

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 3, T. 2 S., R. 98 W.  
lat 39°54'39" N., long 108°22'33" W.

Altitude of land surface: 6,691 feet above mean sea level

Drilled: July 1975

Total depth: 1,715 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 125 feet  
6 5/8-inch steel pipe cemented to a depth of 1,273 feet

Depth to static water level: 496.8 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	1,000 feet
Top of Mahogany zone . . . . .	1,195 feet
Bottom of Mahogany zone. . . . .	1,410 feet
Top of high-resistivity zone . . . . .	1,710 feet

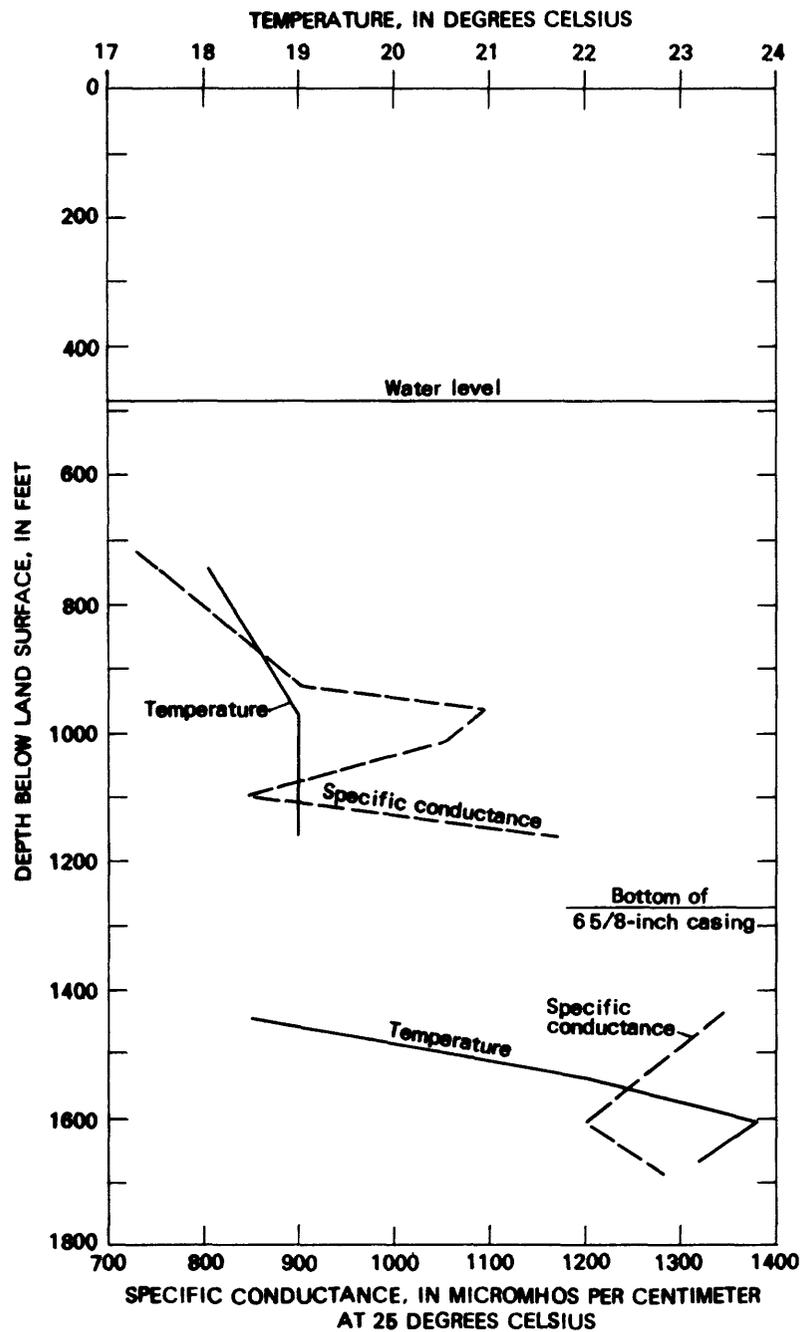


Figure 50.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-11B.

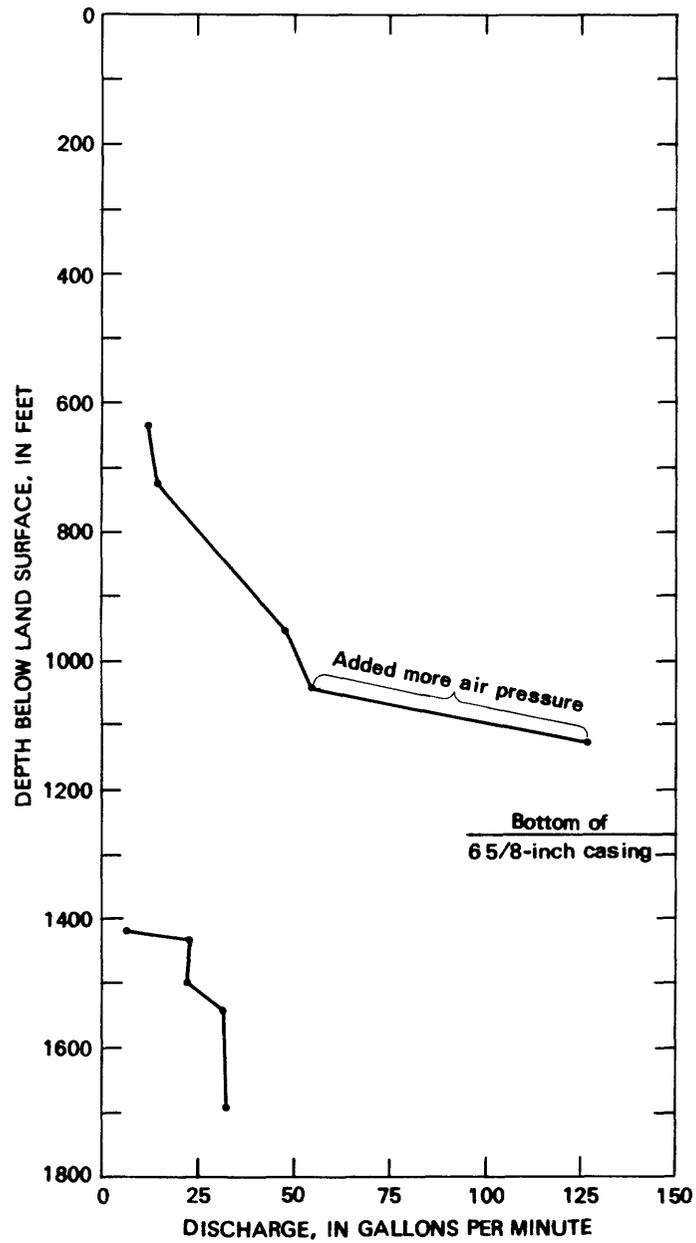


Figure 51.--Water discharged during the drilling of test hole TH75-11B.

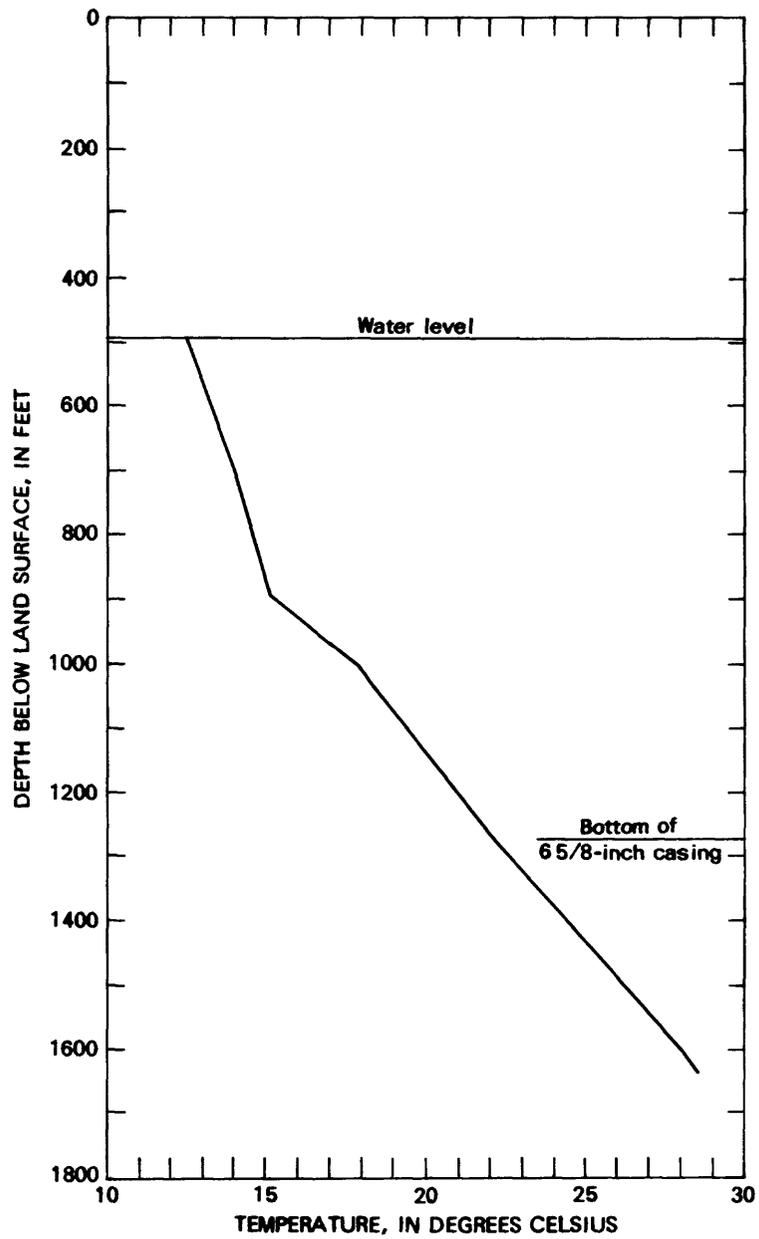


Figure 52.--Fluid temperature in test hole TH75-11B, June 17, 1976.

Table 21.--Chemical analyses of water samples from test hole TH75-11B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
JUL. 1975	0247	125	1282	14	40	180	10	5.0	5.9	320	0.4
01....	0010	1273	1715	16	30	20	90	4.2	5.2	550	120
12....											
DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
JUL. 1975	0653	0	536	130	20	14	0.2	0.02	0.13	0.40	834
01....	1130	0	927	6.5	200	18	.4	.06	.00	.00	1480
12....											
DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
JUL. 1975	1280	8.0	19.0	40	0	330	1	40	1	1000	0
01....	2200	7.0	24.0	0	600	500	2	210	0	620	20
12....											

Test Hole TH75-13A

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 2 S., R. 98 W.  
lat 39°51'36" N., long 108°21'00" W.

Altitude of land surface: 6,390 feet above mean sea level

Drilled: December 1975

Total depth: 640 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 198 feet

Depth to static water level: 57.31 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . .510 feet  
Top of Mahogany zone . . . . . .660 feet  
Bottom of Mahogany zone. . . . . .830 feet  
Top of high-resistivity zone . . . . . .1,500 feet

Table 22.--*Transmissivity and related data from test hole TH75-13A*

Test date-----	January 13, 1976
Hydrologic unit tested-----	Upper aquifer
Transmissivity, in feet squared per day-----	540
Storage coefficient-----	1.6×10 <sup>-4</sup>
Depth to static water level, in feet-----	60
Depth to top of interval open to well, in feet-----	198
Depth to bottom of interval open to well, in feet-----	640
Average discharge during testing, in gallons per minute-----	531

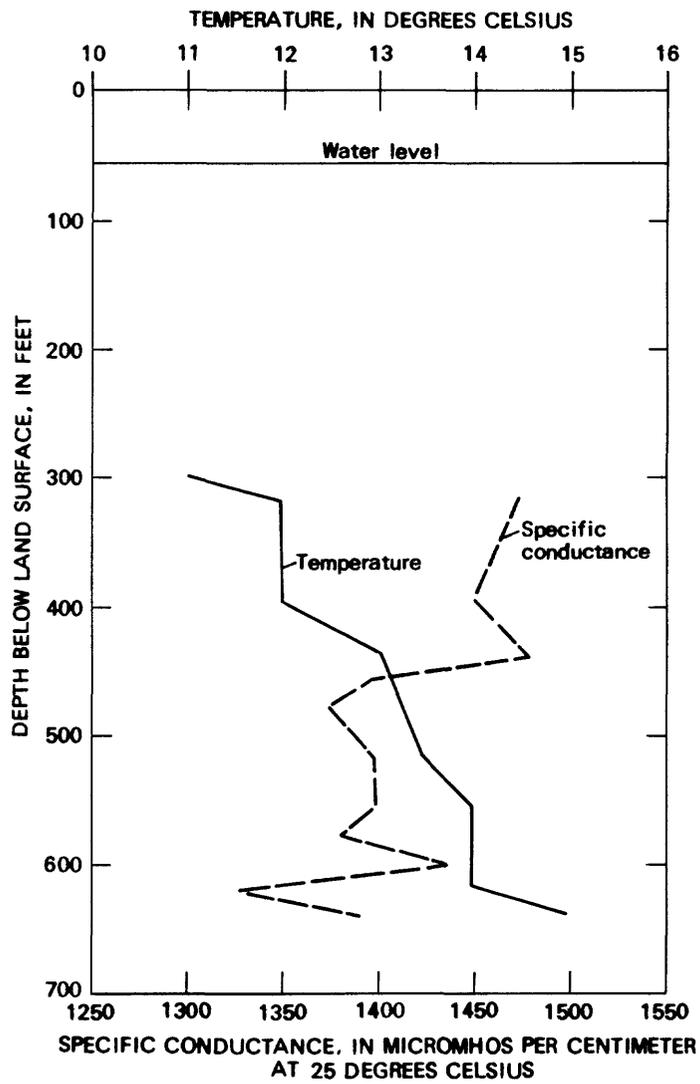


Figure 53.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-13A.

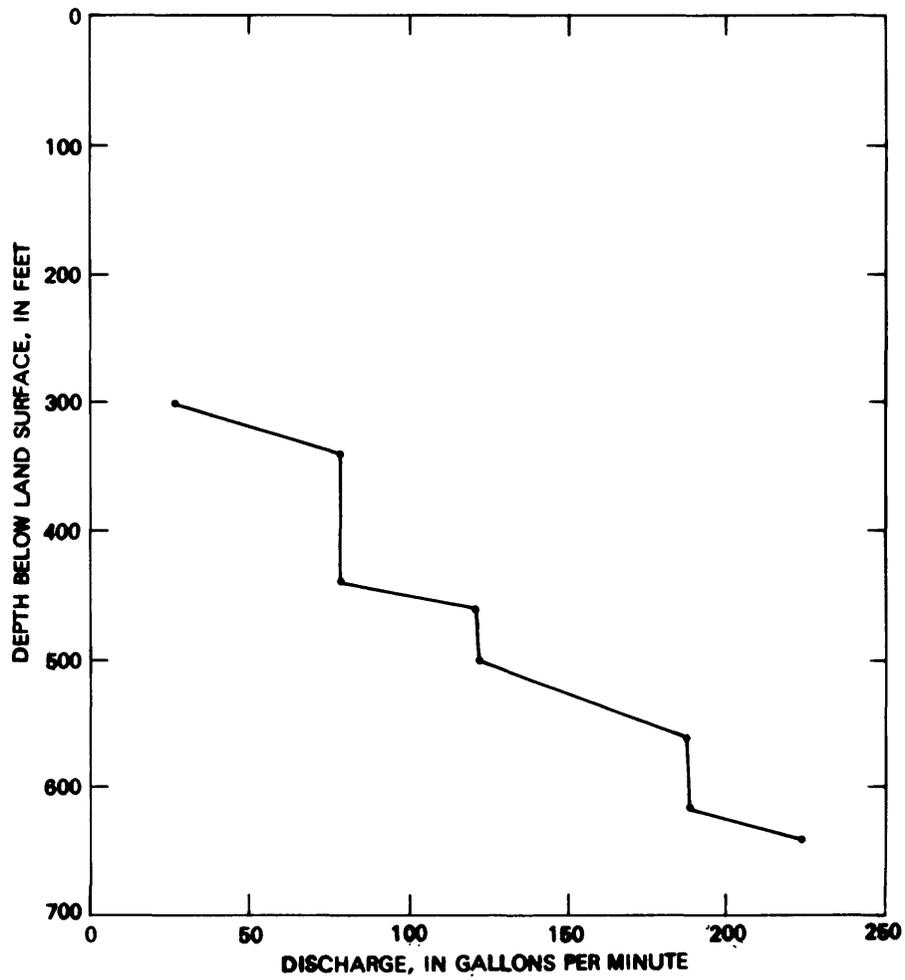


Figure 54.--Water discharged during the drilling of test hole TH75-13A.

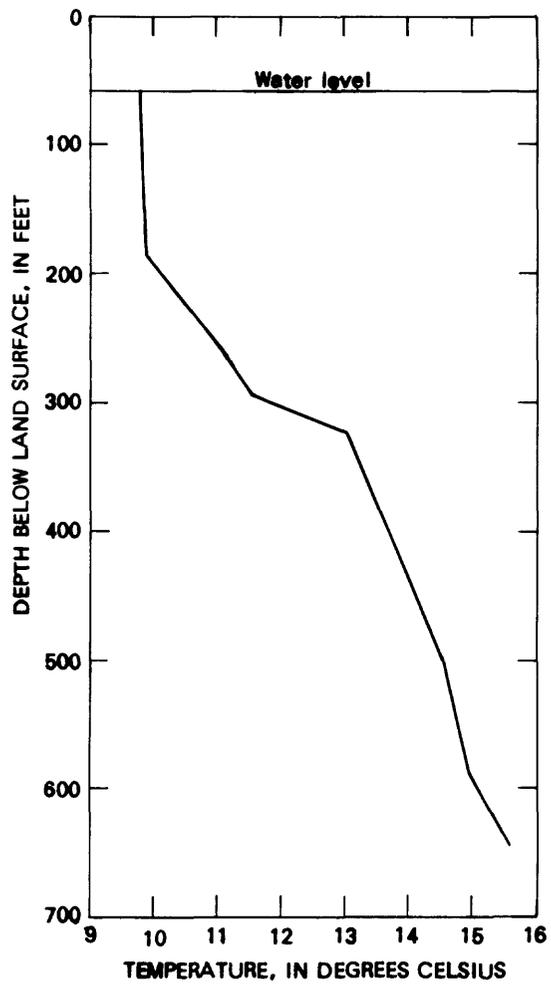


Figure 55.--Fluid temperature in test hole TH75-13A, August 18, 1976.

Table 23.--Chemical analyses of water samples from test hole TH25-13A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
DEC. 1975										
12...	1500	198	320	36	0	0	30	56	64	210
13...	0500	198	640	28	0	40	0	28	60	230

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUD-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
DEC. 1975									
12...	0.6	584	0	479	380	7.2	0.3	0.1	0.03
13...	.4	565	0	463	320	6.9	1.5	.1	.01

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED SOLIOS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS) (MG/L)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
DEC. 1975									
12...	0.04	0.12	1050	1475	8.3	12.0	1	100	100
13...	.02	.06	961	1400	8.3	15.0	2	100	140

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC. 1975									
12...	0	1	0	70	0.0	2	0	7900	0
13...	0	0	0	70	.0	1	0	7400	0

Test Hole TH75-13B

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 2 S., R. 98 W.  
lat 39°51'36" N., long 108°21'00" W.

Altitude of land surface: 6,390 feet above mean sea level

Drilled: January 1976

Total depth: 1,080 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 168 feet  
6 5/8-inch steel pipe cemented to a depth of 768 feet

Depth to static water level: 69.59 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 510 feet  
Top of Mahogany zone . . . . . 660 feet  
Bottom of Mahogany zone. . . . . 830 feet  
Top of high-resistivity zone . . . . . 1,500 feet

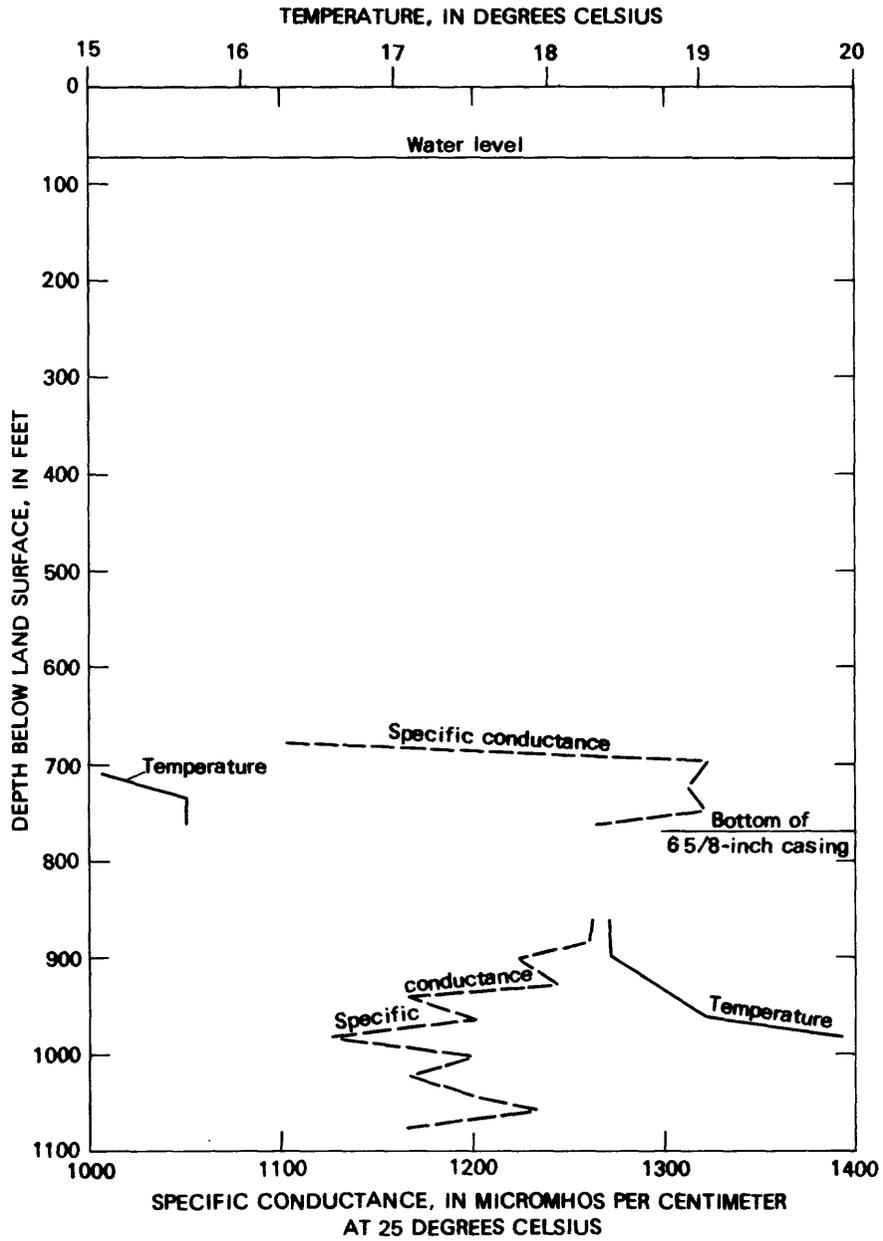


Figure 56.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-13B.

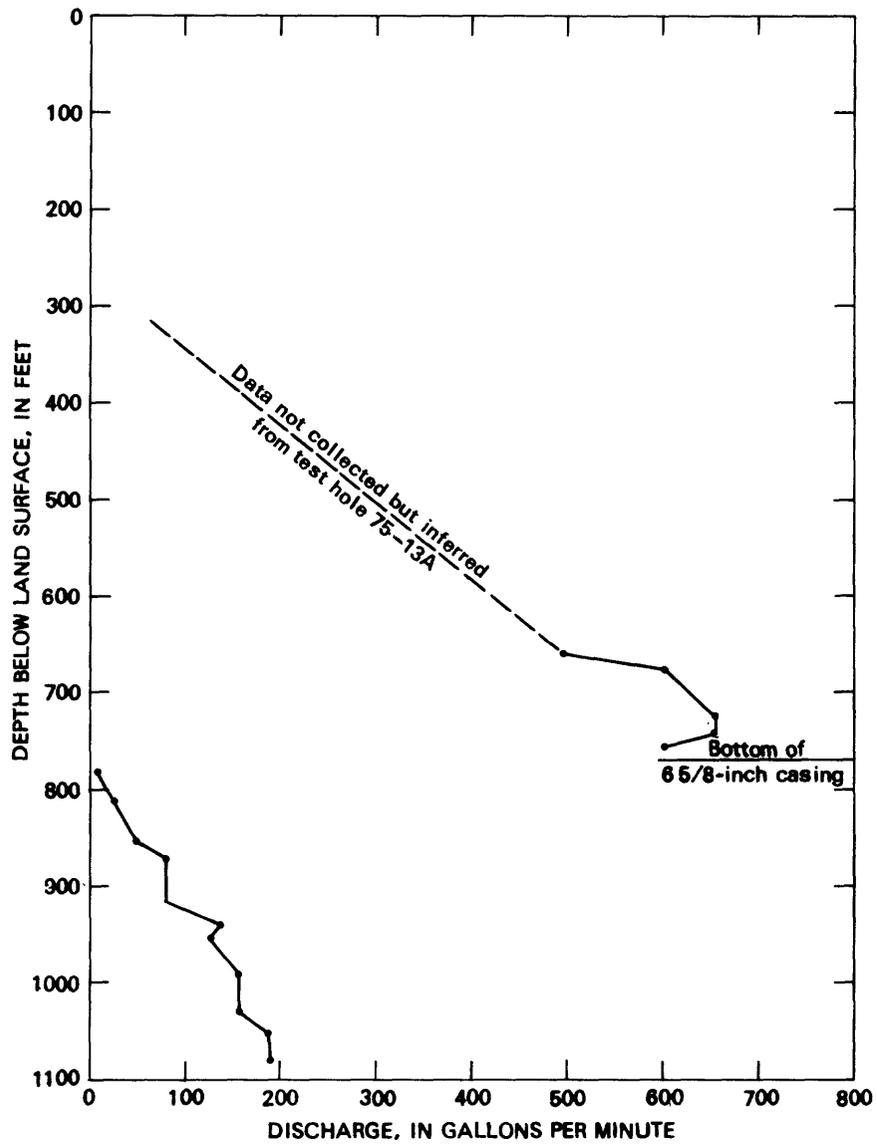


Figure 57.--Water discharged during the drilling of test hole TH75-13B.

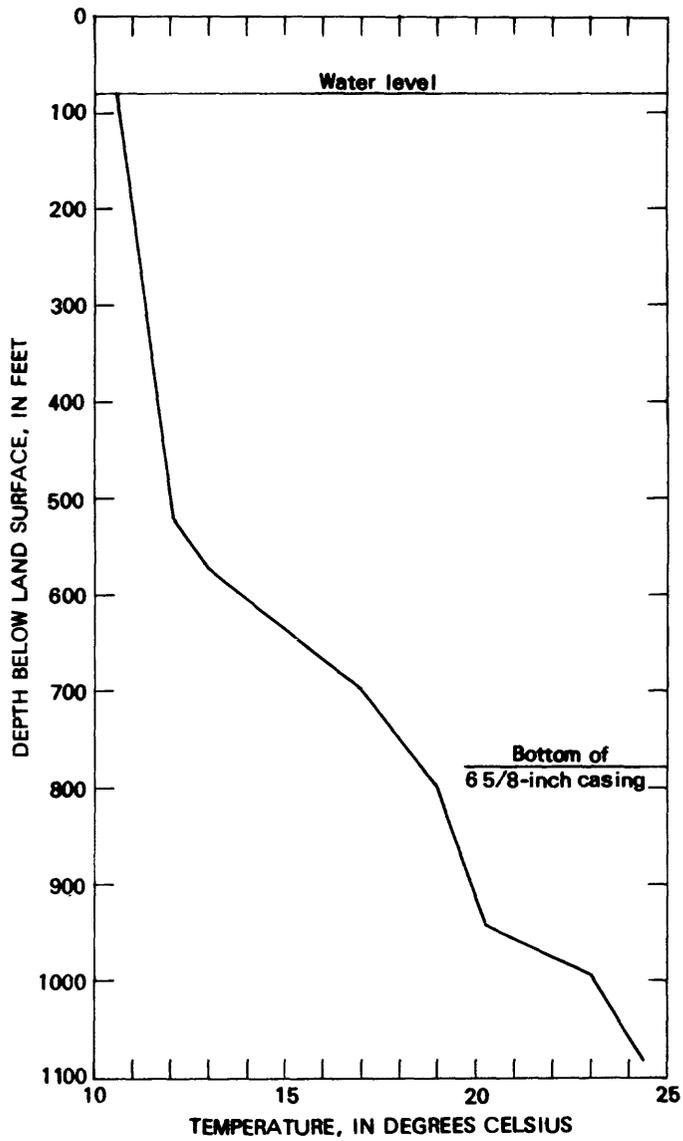


Figure 58.--Fluid temperature in test hole TH75-13B, August 18, 1976.

Table 24.--Chemical analysis of water sample from test hole TH75-13B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
JAN. 1976										
16...	2245	768	1080	13	10	940	90	7.3	14	310
DATE		DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
JAN. 1976										
16...		1.1	661	82	679	50	12	5.0	0.1	0.06
DATE		DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	SPECIFIC CONDUCTANCE (MICROMHOS) (UNITS)	PH	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
JAN. 1976										
16...		0.04	0.12	825	1160	8.7	19.5	0	1200	290
DATE		DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYBDENUM (MO) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN. 1976										
16...		0	0	3	200	0.2	1	0	1600	10

Test Hole TH75-15A

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 30, T. 3 S., R. 97 W.  
lat 39°45'40" N., long 108°19'12" W.

Altitude of land surface: 6,805 feet above mean sea level

Drilled: June 1975

Total depth: 670 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 155 feet

Depth to static water level: 45.85 feet, September 24, 1976

Geologic data:

Surface geologic unit. . . . .	Uinta Formation
Green River Formation:	
Top of Parachute Creek Member. . . . .	.330 feet
Top of Mahogany zone . . . . .	.670 feet
Bottom of Mahogany zone. . . . .	.850 feet
Top of Garden Gulch Member . . . . .	.1,795 feet

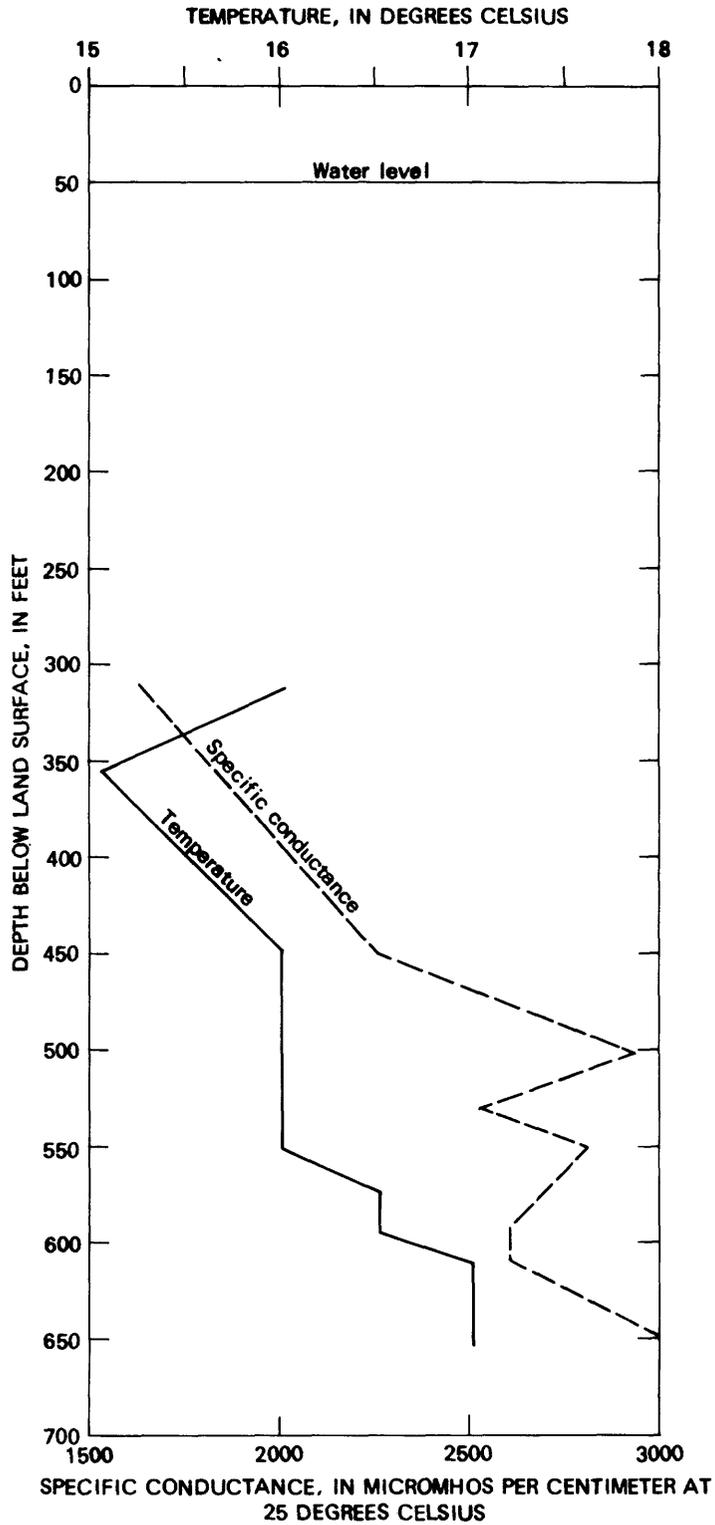


Figure 59.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-15A.

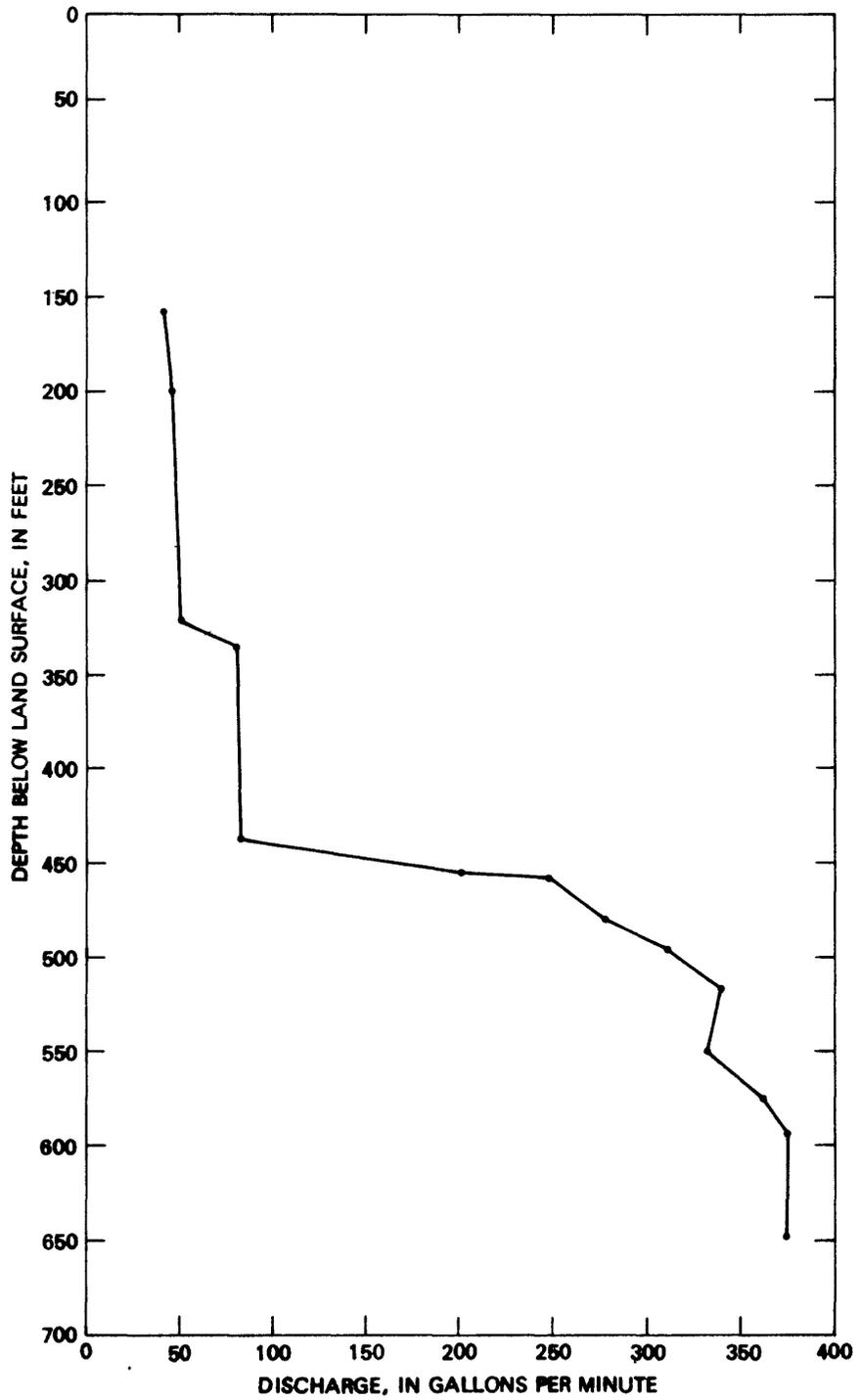


Figure 60.--Water discharged during the drilling of test hole TH75-15A.

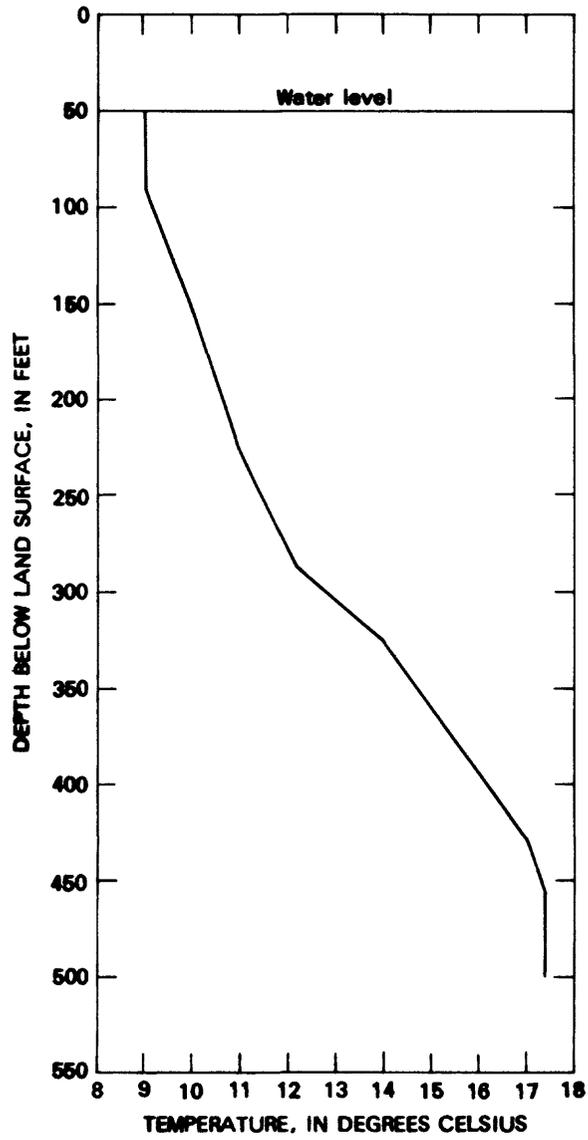


Figure 61.--Fluid temperature in test hole TH75-15A, August 18, 1976.

Table 25.--Chemical analyses of water samples from test hole TH75-15A

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED ALUMINUM (AL) (MG/L)	DIS-SOLVED IRON (FE) (MG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
JUN. 1975	1330	155	314	<10	20	80	32	87	310	1.1
05...	1700	155	655	<10	110	30	13	23	860	2.1
12...										
DATE	TIME	CARBONATE (CO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
JUN. 1975	780	--	640	72	2.2	0.4	0.01	0.00	0.00	1160
05...	1930	0	1580	260	15	.9	.01	.02	.06	2200
12...										
DATE	TIME	PH	TEMPERATURE (DEG C)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED NIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUN. 1975	1620	8.0	16.0	100	1200	1	520	0	14000	10
05...	3000	7.9	17.0	600	8200	2	1000	0	4300	0
12...										

Test Hole TH75-15B

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 30, T. 3 S., R. 97 W.  
lat 39°45'40" N., long 108°19'12" W.

Altitude of land surface: 6,805 feet above mean sea level

Drilled: June 1975

Total depth: 1,040 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 137 feet  
6 5/8-inch steel pipe cemented to a depth of 740 feet

Depth to static water level: 29.30 feet, September 24, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . .330 feet  
Top of Mahogany zone . . . . .670 feet  
Bottom of Mahogany zone. . . . .850 feet  
Top of Garden Gulch Member . . . . .1,795 feet

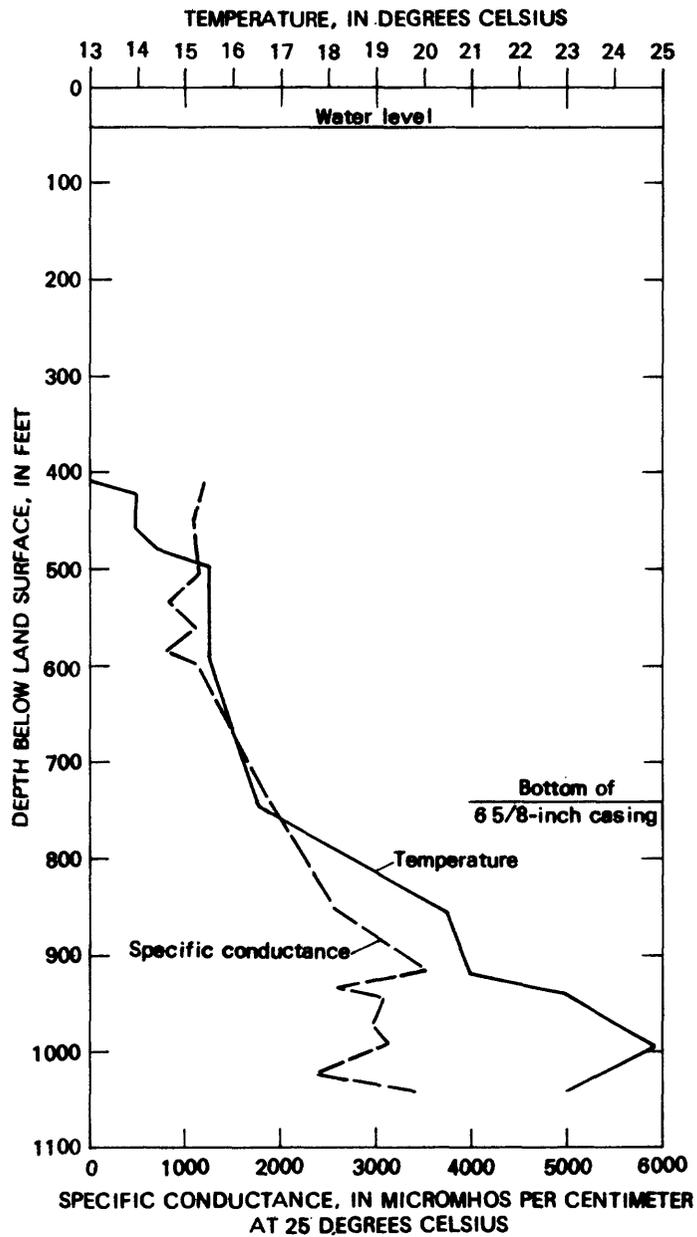


Figure 62.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-15B.

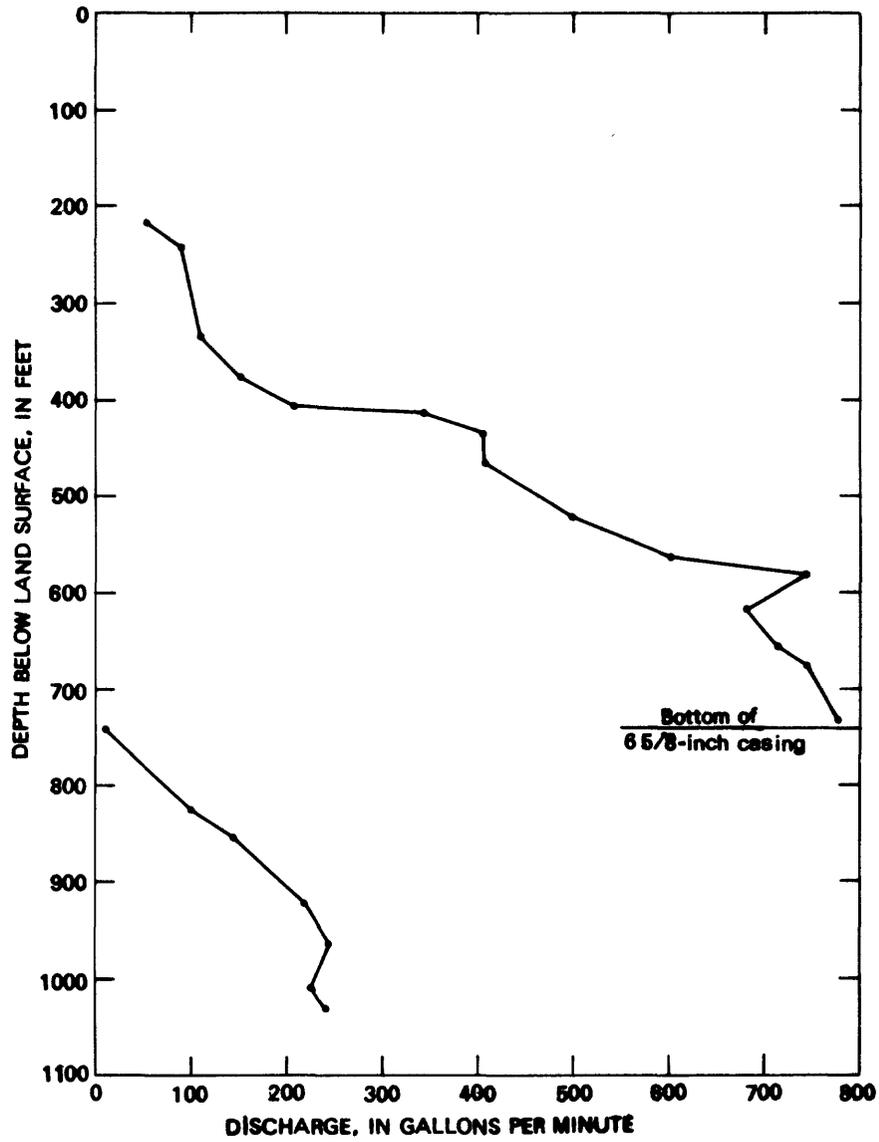


Figure 63.--Water discharged during the drilling of test hole TH75-15B.

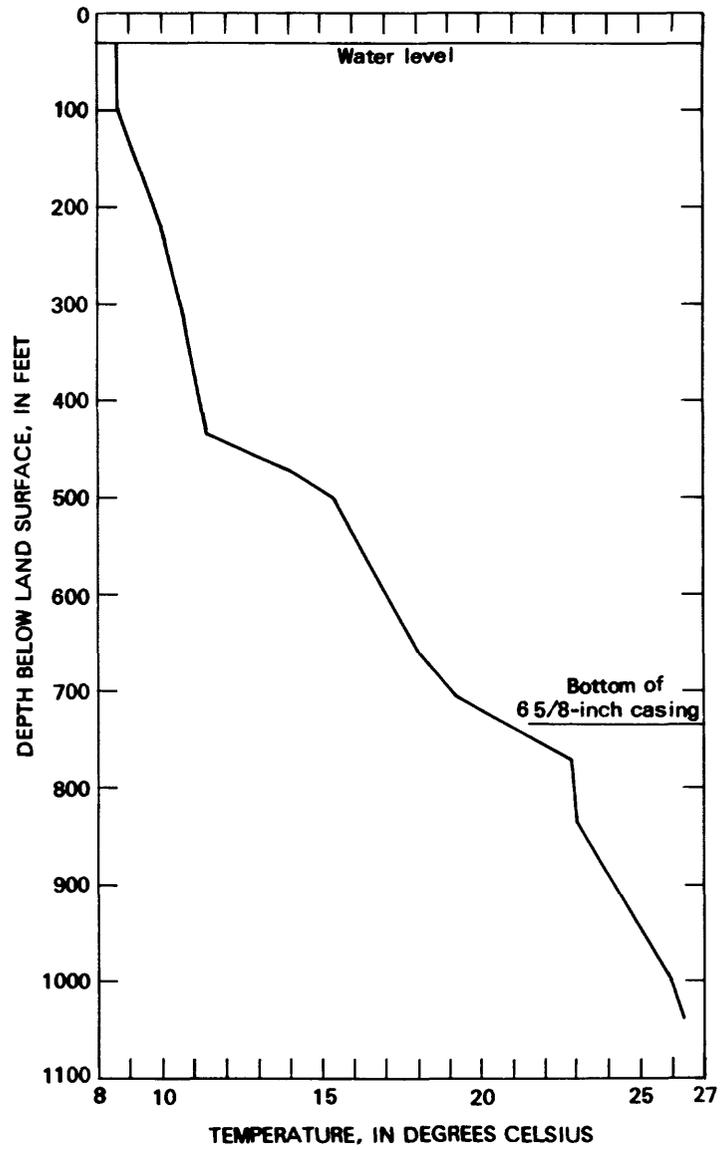


Figure 64.--Fluid temperature in test hole TH75-15B, August 21, 1976.

Table 26.--Chemical analysis of water sample from test hole TH75-15B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUMINUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)
JUN. 1975	1200	740	1040	8.6	0	0	10	7.7	5.7	890	13
23...											
		CARBONATE (CO3) (MG/L)	ALKALINITY AS CaCO3 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED ORTHOPHOSPHORUS (P) (MG/L)	DIS-SOLVED ORTHOPHOSPHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
JUN. 1975	1980	0	1620	8.4	230	16	0.8	0.08	0.00	0.00	2170
23...											
		PH (UNITS)	TEMPERATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED STRONTIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JUN. 1975	3600	8.3	23.0	3	1700	9000	0	1600	0	2400	10
23...											
		SPECIFIC CONDUCTANCE (MICROHMS)									

Test Hole TH75-17B

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 36, T. 1 N., R. 97 W.  
 lat 40°00'45" N., long 108°13'14" W.

Altitude of land surface: 6,100 feet above mean sea level

Drilled: May 1975

Total depth: 2,400 feet

Casing: 9 5/8-inch steel pipe cemented to a depth of 110 feet  
 6 5/8-inch steel pipe cemented to a depth of 893 feet

Depth to static water level: 41.25 feet, September 20, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
 Green River Formation:  
 Top of Parachute Creek Member. . . . . 570 feet  
 Top of Mahogany zone . . . . . 775 feet  
 Bottom of Mahogany zone. . . . . 1,000 feet  
 Top of Garden Gulch Member . . . . . 2,060 feet

Table 27.--*Transmissivity and related data from test hole TH75-17B*

Test date-----	May 12, 1975
Hydrologic unit tested-----	Upper aquifer
Transmissivity, in feet squared per day-----	1,600
Depth to static water level, in feet-----	120
Depth to top of interval open to well, in feet-----	110
Depth to bottom of interval open to well, in feet-----	893
Average discharge during testing, in gallons per minute-----	719

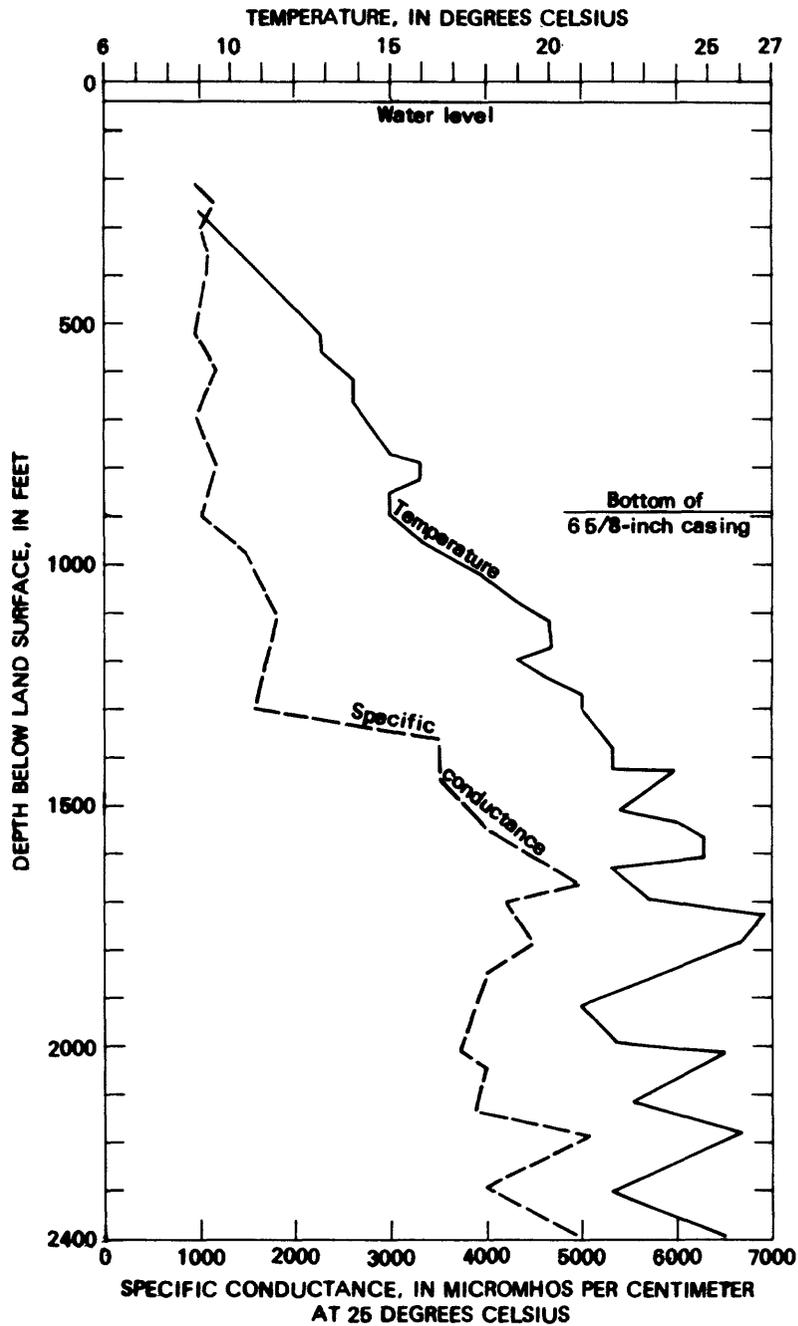


Figure 65.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-17B.

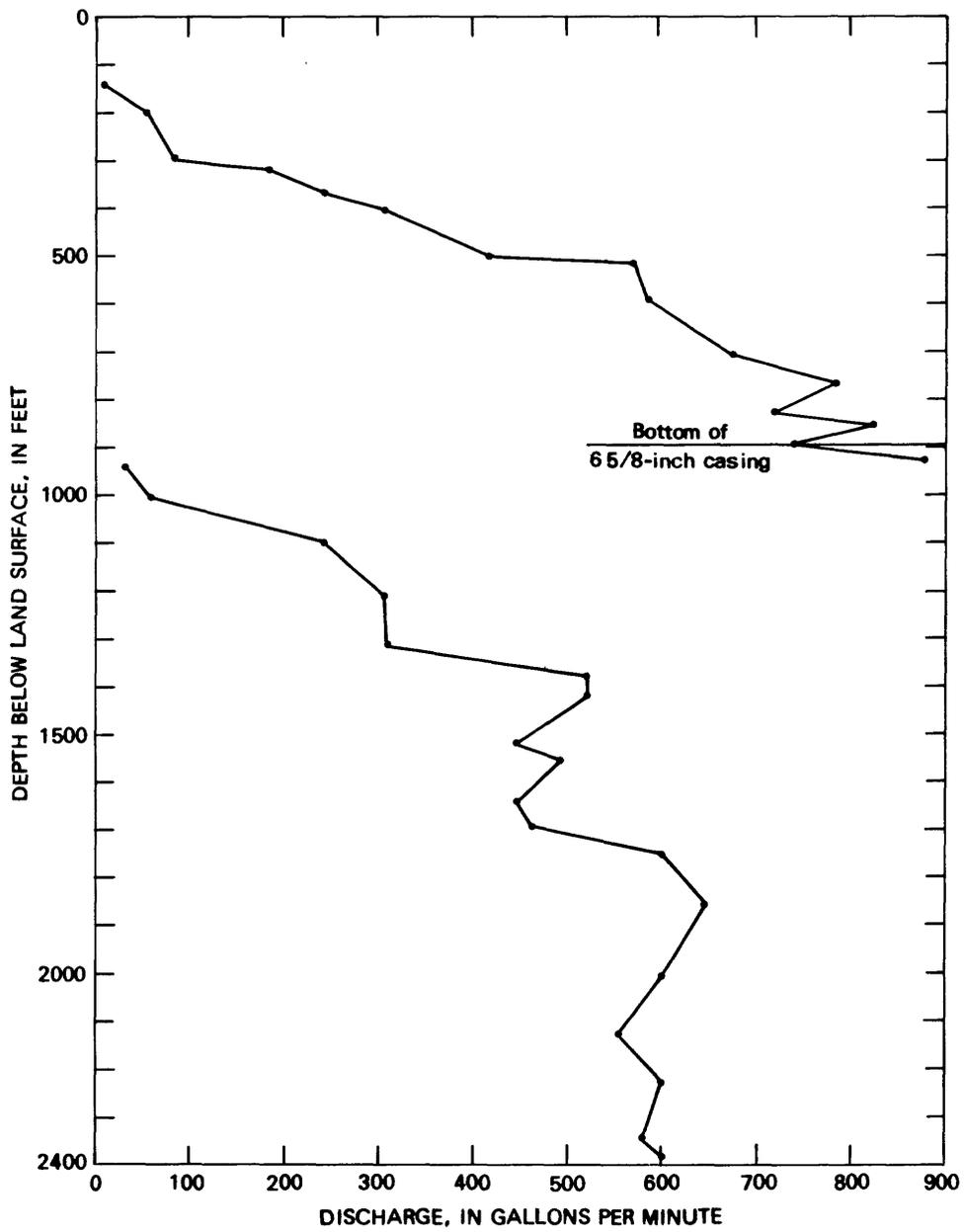


Figure 66.--Water discharged during the drilling of test hole TH75-17B.

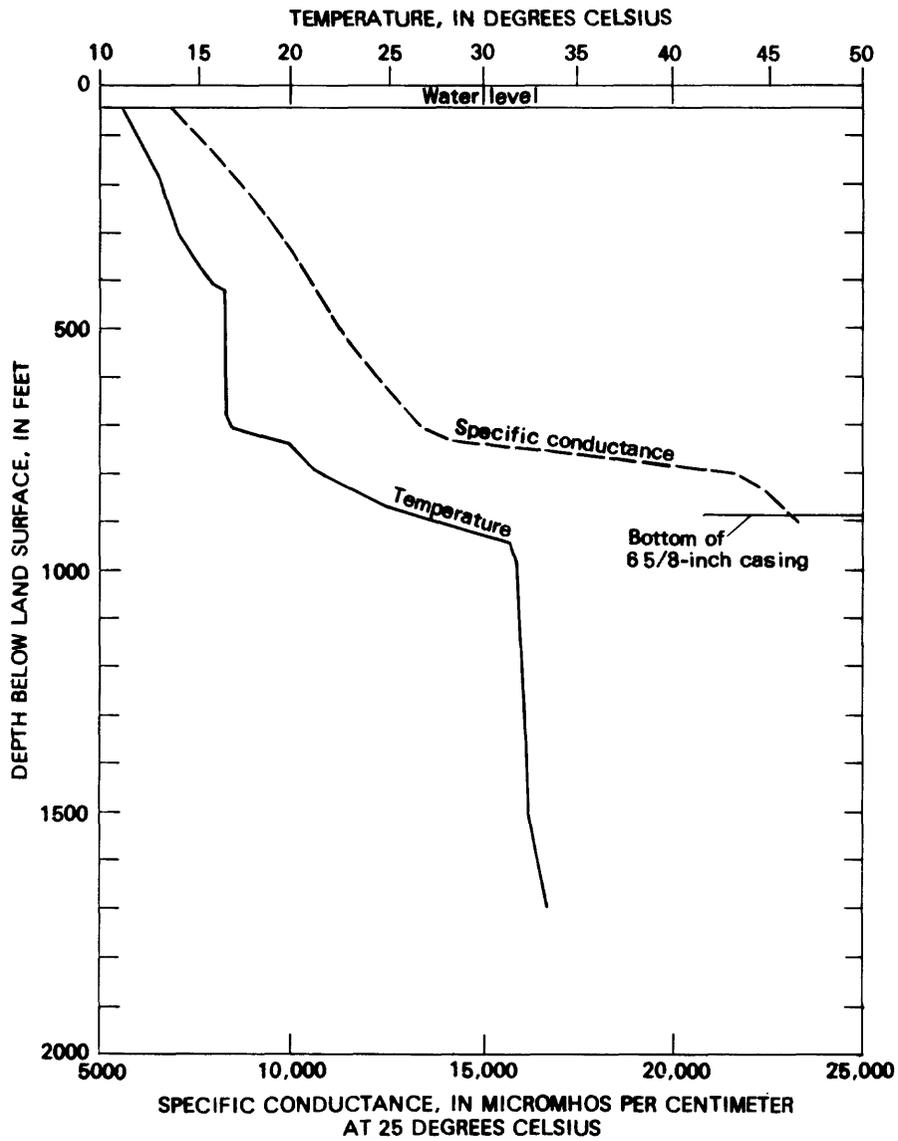


Figure 67.--Fluid temperature and specific conductance in test hole TH75-17B, October 28, 1975.

Table 28.--Chemical analyses of water samples from test hole TH75-17B

[Data by U.S. Geological Survey; FT, foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTER-VAL (FT)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTAS-SIUM (K) (MG/L)
MAY 1975	2340	110	490	10	24	20	10	23	22	200	1.3
08...	1315	110	919	<10	21	210	5	15	20	230	.8
12...	1245	919	1295	10	22	60	10	14	23	400	.9
16...	1416	919	2400	20	17	90	10	13	16	990	3.2

DATE	TIME	BICAR-BONATE (HCO3) (MG/L)	ALKA-LINITY AS CAC03 (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED NITRATE (N) (MG/L)	DIS-SOLVED NITRITE PLUS PHOS-PHATE (P04) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (P04) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)
MAY 1975	08...	638	523	17	3.8	0.1	0.00	0.12	643
12...	12...	665	545	19	5.5	.1	.01	.09	679
16...	16...	1070	878	33	10	.3	.01	.12	1080
26...	26...	2400	1970	170	17	.6	.00	.18	2480

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MH05) (DEG C)	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAY 1975	08...	1020	13.0	10	700	360	3	40	0	1600	8
12...	12...	1100	16.0	34	700	500	1	60	0	1600	10
16...	16...	1600	21.0	3	500	780	1	70	0	1500	0
26...	26...	3800	22.5	32	2300	4300	10	440	1	1200	30

Test Hole Th75-18A

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 15, T. 2 S., R. 97 W.  
 lat 39°52'55" N., long 108°15'42" W.

Altitude of land surface: 6,740 feet above mean sea level

Drilled: September 1975

Total depth: 810 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 108 feet

Depth to static water level: 424.0 feet, September 27, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
 Green River Formation:  
 Top of Parachute Creek Member. . . . . .620 feet  
 Top of Mahogany zone . . . . . .875 feet  
 Bottom of Mahogany zone. . . . . .1,070 feet  
 Top of high-resistivity zone . . . . . .1,660 feet  
 Top of Garden Gulch Member . . . . . .2,055 feet

Table 29.--*Transmissivity and related data from test hole TH75-18A*

Test date-----	September 10, 1975
Hydrologic unit tested-----	Upper aquifer
Transmissivity, in feet squared per day-----	250
Storage coefficient-----	1×10 <sup>-4</sup>
Depth to static water level, in feet-----	432
Depth to top of interval open to well, in feet-----	108
Depth to bottom of interval open to well, in feet-----	810
Average discharge during testing, in gallons per minute-----	132

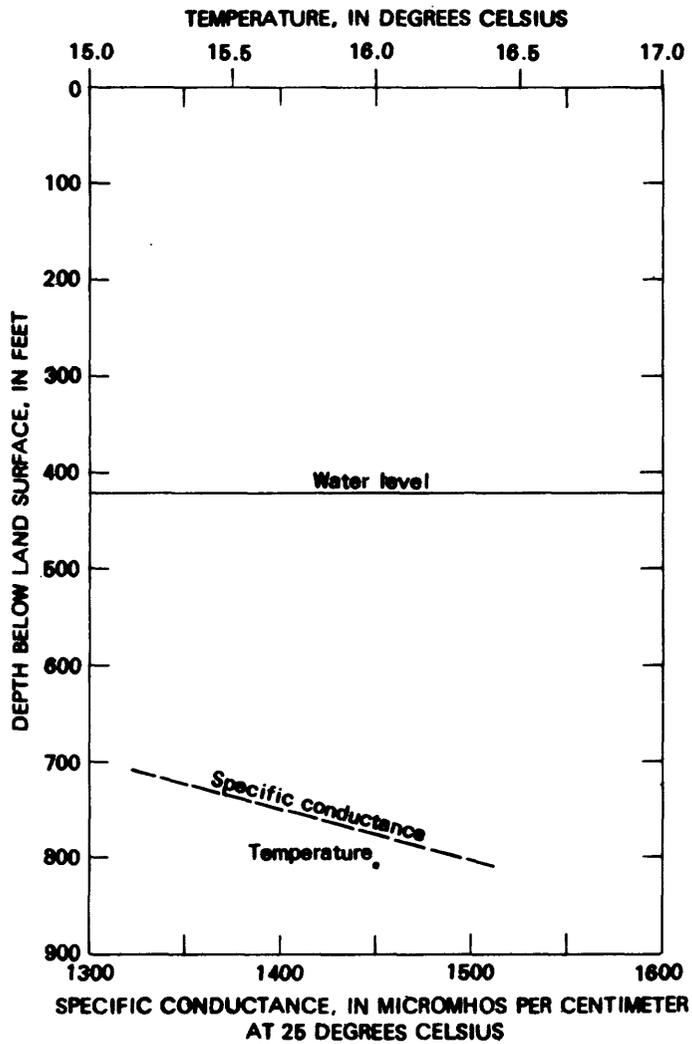


Figure 68.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-18A.

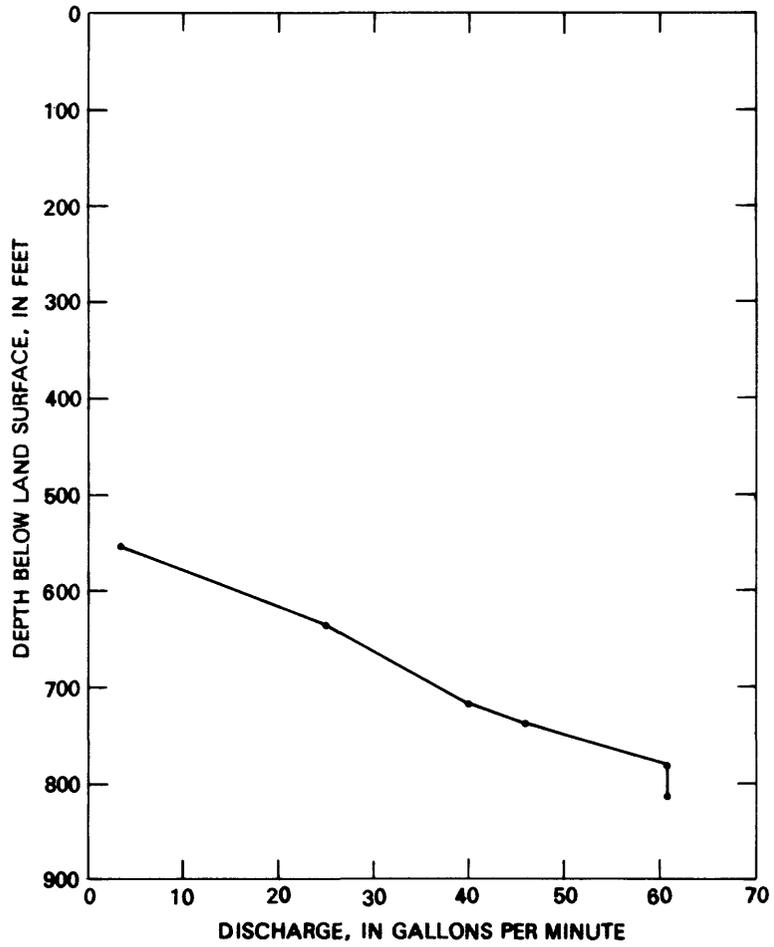


Figure 69.--Water discharged during the drilling of test hole TH75-18A.

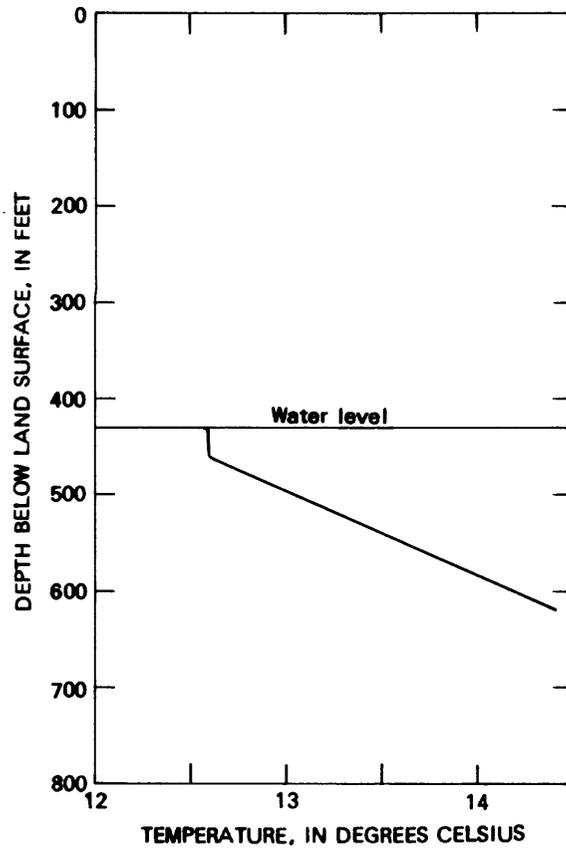


Figure 70.--Fluid temperature in test hole TH75-18A, August 24, 1976.

Table 30.--Chemical analysis of water sample from test hole TH75-18A

[Data by U.S. Geological Survey; FT. foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTER- VAL (FT)	DEPTH TO BOT- TOM OF SAMPLE INTER- VAL (FT)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED ALUM- INUM (AL) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
SEP. 1975 09...	1000	108	810	24	0	2400	100	24	60	230
DATE	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	ALKA- LITY AS CACO3 (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	
SEP. 1975 09...	0.6	620	0	509	230	17	3.1	0.1	0.01	
DATE	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHATE (PO4) (MG/L)	DIS- SOLVED SOLIOS (SUM OF CONSTI- TUENTS) (MG/L)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (UNITS)	PH	TEMPER- ATURE (DEG C)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	
SEP. 1975 09...	0.01	0.03	901	1510	8.9	16.0	5	<200	170	
DATE	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	DIS- SOLVED MERCURY (MG) (UG/L)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED STRON- TIUM (SH) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	
SEP. 1975 09...	0	1	0	30	0.0	0	0	3800	0	

Test Hole TH75-18B

Location: SW¼NE¼NE¼ sec. 15, T. 2 S., R. 97 W.  
lat 39°52'55" N., long 108°15'42" W.

Altitude of land surface: 6,740 feet above mean sea level

Drilled: September 1975

Total depth: 1,375 feet

Casing: 8 5/8-inch steel pipe cemented to a depth of 131 feet  
6 5/8-inch steel pipe cemented to a depth of 972 feet

Depth to static water level: 498.9 feet, September 27, 1976

Geologic data:

Surface geologic unit. . . . . Uinta Formation  
Green River Formation:  
Top of Parachute Creek Member. . . . . 620 feet  
Top of Mahogany zone . . . . . 875 feet  
Bottom of Mahogany zone. . . . . 1,070 feet  
Top of high-resistivity zone . . . . . 1,660 feet  
Top of Garden Gulch Member . . . . . 2,055 feet

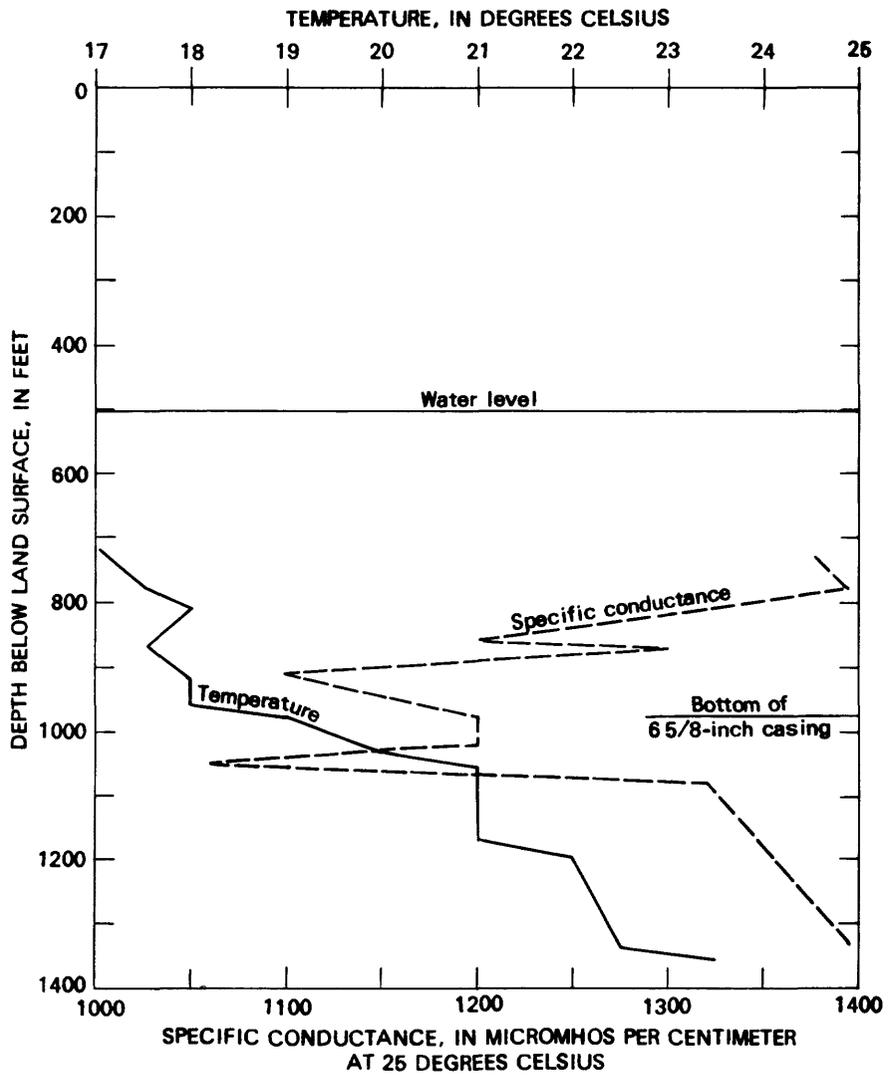


Figure 71.--Temperature and specific conductance of water discharged during the drilling of test hole TH75-18B.

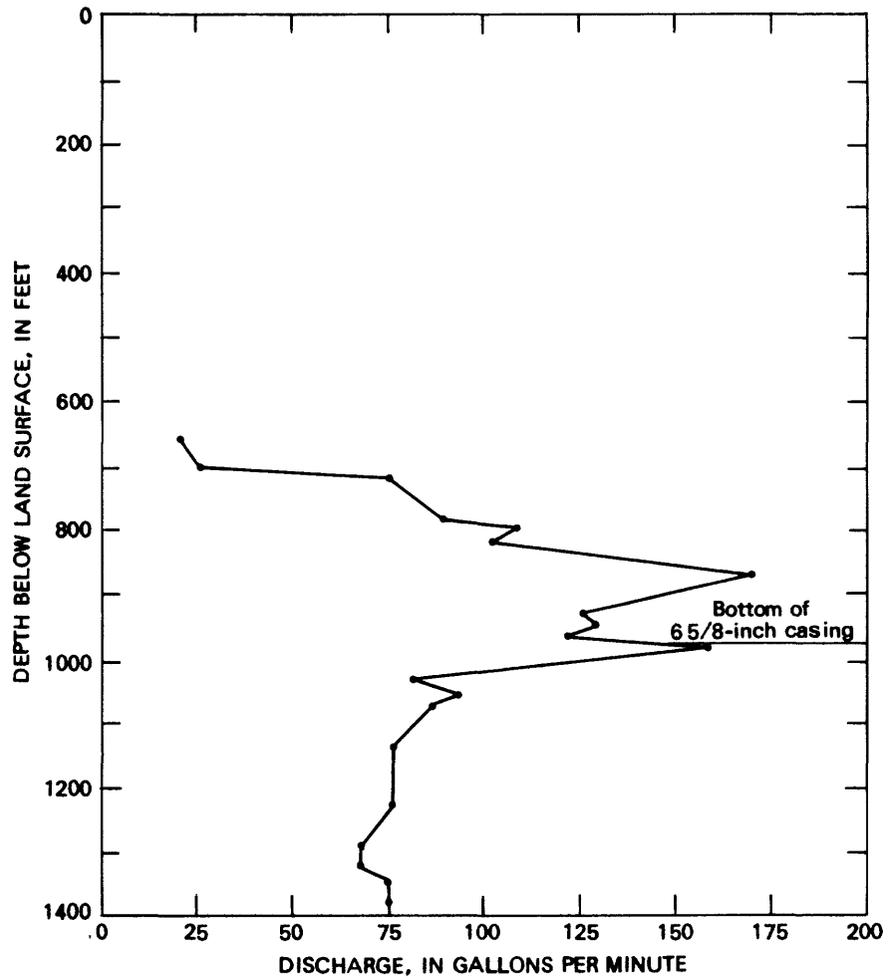


Figure 72.--Water discharged during the drilling of test hole TH75-18B.

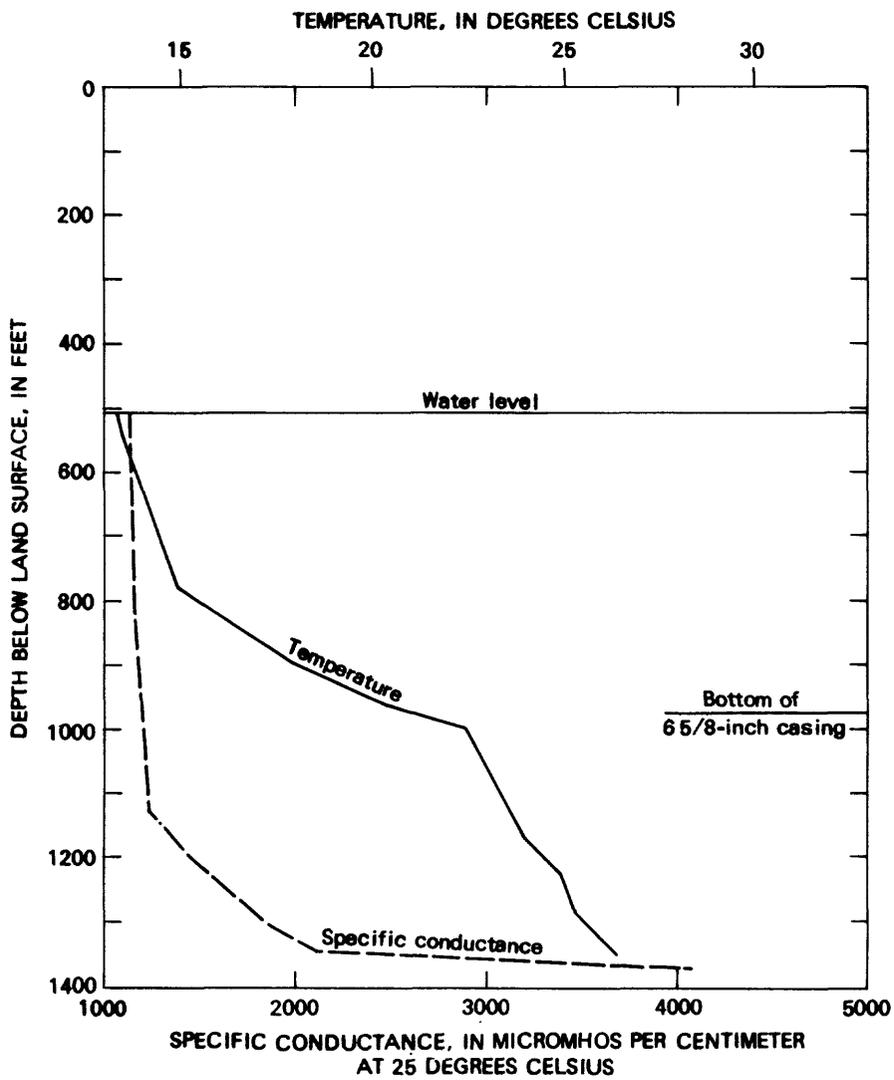


Figure 73.--Fluid temperature and specific conductance in test hole TH75-18B, August 24, 1976.

Table 31.--Chemical analysis of water sample from test hole TH75-18B

[Data by U.S. Geological Survey; FT., foot; MG/L, milligram per liter; UG/L, microgram per liter; DEG C, degrees Celsius]

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	DEPTH TO BOT-TOM OF SAMPLE INTERVAL (FT)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED ALUM-INUM (AL) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
SEP. 1975 12...	2145	972	1075	14	10	1400	40	5.5	12	260

DATE	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (CO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CAC03 (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	BROMIDE (BR) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)
SEP. 1975 12...	1.9	641	16	552	70	10	5.9	0.1	.05

DATE	DIS-SOLVED ORTHO-PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO-PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CON-STI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED BORON (B) (UG/L)
SEP. 1975 12...	0.01	0.03	715	1125	8.9	21.0	95	<200	190

DATE	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED LITHIUM (LI) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED MOLYB-DENUM (MO) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED STRON-TIUM (SR) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
SEP. 1975 12...	0	0	0	30	0.0	2	0	1400	10