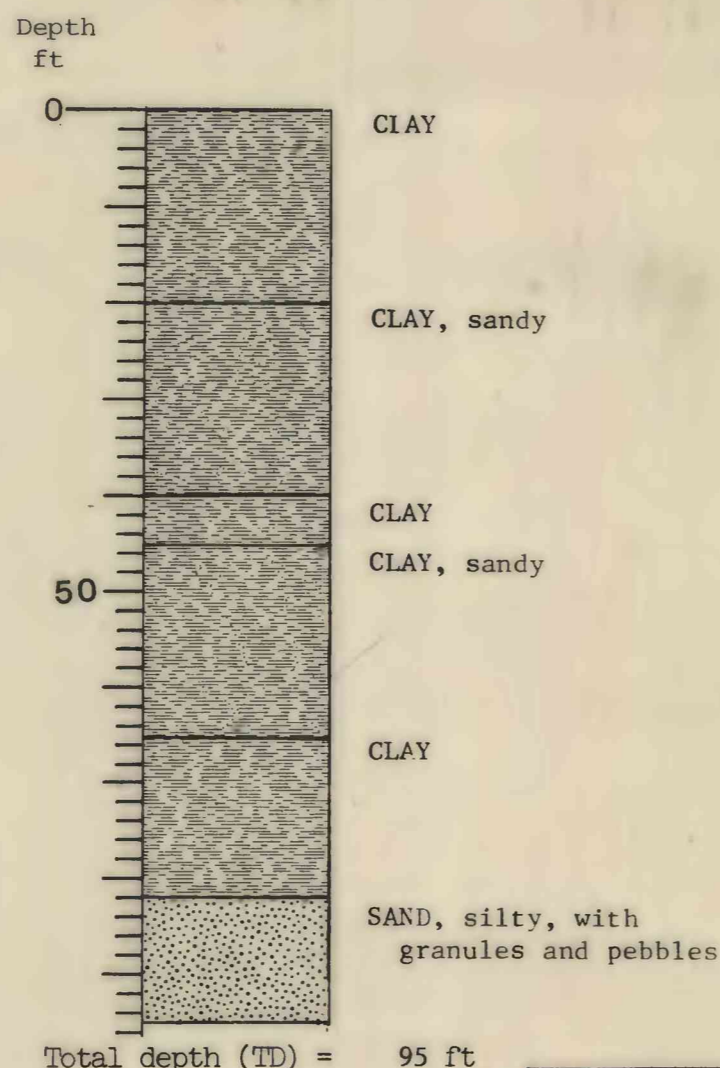
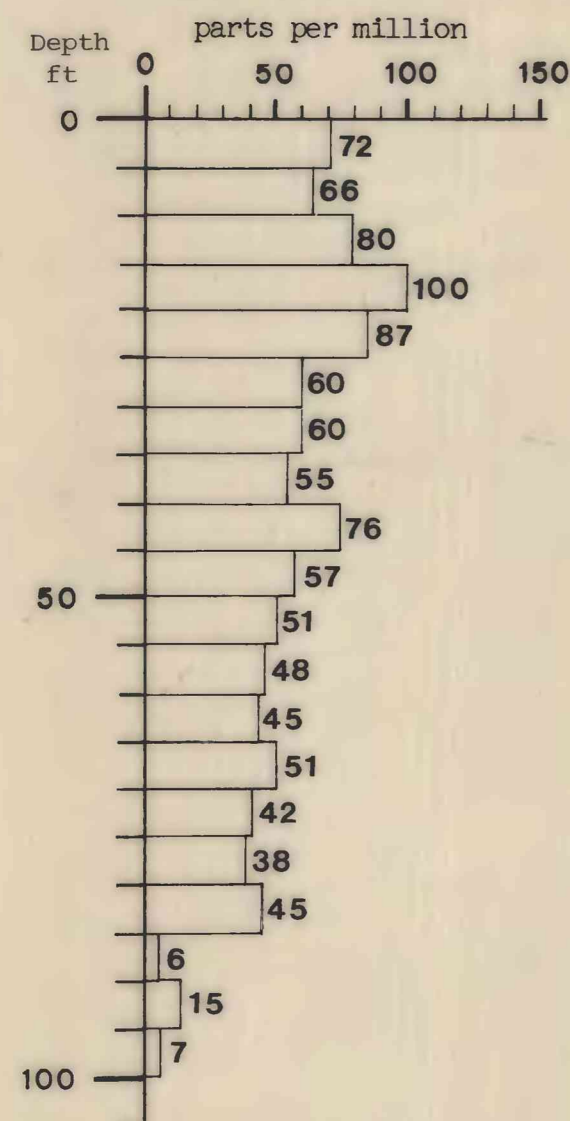


LITHIUM LOG  
( J. D. Vine, 1978, written commun.)

COLUMNAR SECTION

LITHOLOGIC LOG

INTRODUCTION



Depth (feet)	DESCRIPTION
0-20	Clay, moderate-brown (5YR 4/4), calcareous. Unit contains scattered gypsum crystals as much as 20 mm across at 6 ft
20-25	Clay, pale-brown (5YR 5/2), calcareous, with less than 1 percent coarse sand
25-40	Clay, pale-yellowish-brown (10YR 6/2) calcareous, silty, with less than 1 percent sand
40-45	Clay, variegated, pale-yellowish-brown, (10YR 6/2), pale-olive (10Y 6/2), and moderate-brown (5Y 4/4), calcareous
45-55	Clay, variegated, pale-olive (10Y 6/2) and pale-yellowish-brown (10YR 6/2), calcareous with as much as 50 percent coarse sand which decreases to 35 percent below 50 ft
55-65	Clay, pale-olive (10Y 6/2) to grayish-olive (10Y 4/2), calcareous, with minor, varying amounts of coarse sand
65-70	Clay, variegated, olive-gray (5Y 3/2), grayish-olive (10Y 4/2), and pale-olive (10Y 6/2), calcareous
70-75	Clay, variegated, grayish-olive (10Y 4/2), and pale-olive (10Y 6/2)
75-82	Clay, variegated, grayish-olive (10Y 4/2) and grayish-olive-green (5Y 3/2), calcareous
82-95	Sand, very coarse, and granules with scattered pebbles in a silt matrix. Pebbles are mainly dark, volcanic rock fragments as much as 20 mm across. Unit composed of 95 percent sand and granules and 5 percent matrix. Matrix increases to 10 percent below 85 ft. Unit contains a bed of fine to medium sand in a silty matrix at 88 ft

Total depth 95 ft. Hole abandoned due to artesian flow

**DISCUSSION**

The Federal Land Policy and Management Act of 1976 (Public Law 94-579) directed the Secretary of the Interior to prepare and implement by September 1980 a comprehensive long-range plan for the management, use, development, and protection of public lands within the California Desert Conservation Area (CDA). The responsibility to prepare this plan was assigned to the Bureau of Land Management's (BLM) California Desert Planning Staff. The BLM was directed to evaluate mineral as well as botanical, wildlife, cultural, and recreation resource data for effective multiple-use land planning. In turn, the BLM requested assistance from the U.S. Geological Survey (USGS) in defining the mineral resources.

In 1978 the USGS drilled 56 shallow test wells to depths of 50-600 ft to provide BLM with the requested mineral resource data. The lithologic and water quality data obtained from one of these test wells drilled on Troy Dry Lake, Calif., are presented in this report.

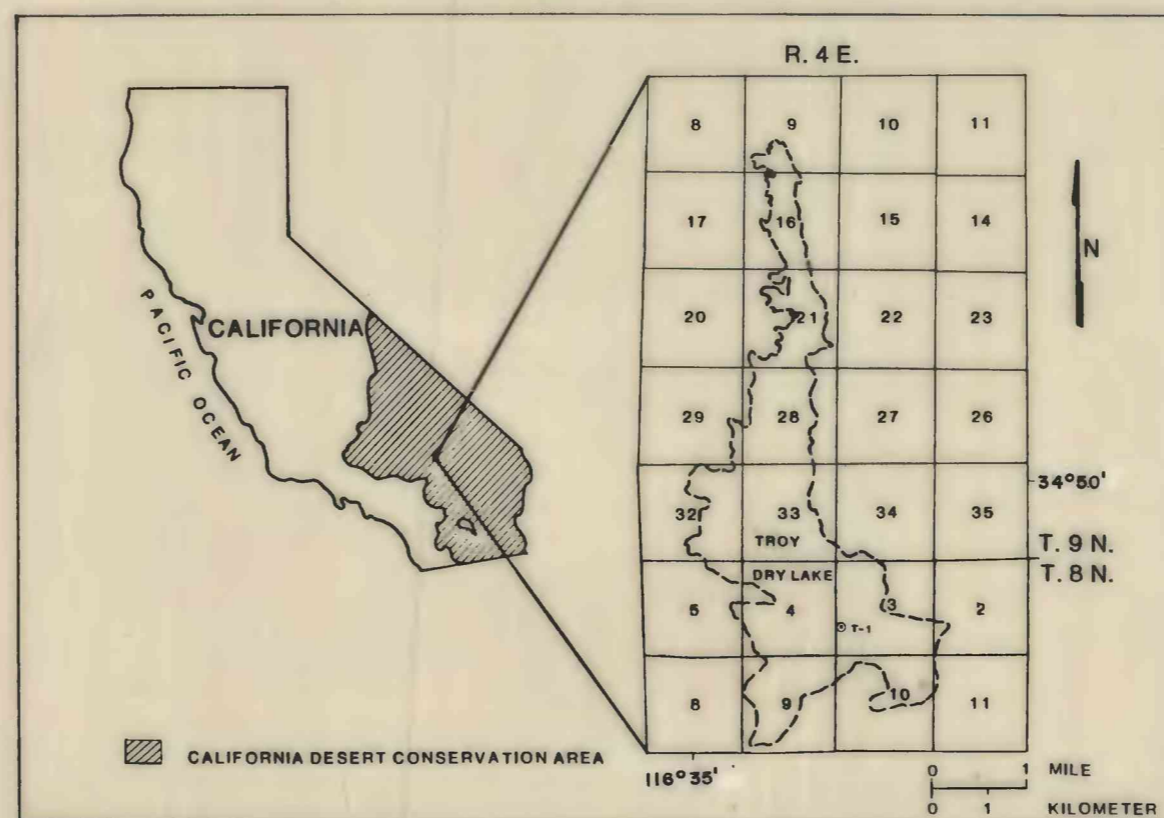
**LOCATION AND DRILLING METHODS**

Test well T-1 was drilled in SWNW1/4 sec. 3, T. 8 N., R. 4 E., SEW, California (lat. 34°48'39" N., long. 116°33'18" W.) on Troy Dry Lake (see index map). This test well was completed in June 1978 to a total depth of 95 ft by a contracted, track mounted, reverse circulation drill rig. Drilling fluids, a mixture of air and water, were pumped down the outer annulus of dual-wall drill pipe to an open face insert bit. Drilling fluids mixed with sediment cuttings were forced up the inner annulus of the drill pipe to the surface where samples were collected. This drilling technique ensured recovery of uncontaminated sediment or ground-water samples because the return cuttings or ground water were not in contact with the bore wall. In situ ground water was used as a drilling fluid where possible; otherwise, a fine mist of imported freshwater and air was used.

A continuous lithologic log was completed during drilling. Sediment samples were collected at 5-ft intervals and were described in the field. Field lithologic descriptions were supplemented by microscopic study when the samples were returned to the laboratory. Sediment names used in this report are those defined by Folk (1968). The rock-color chart (Goddard and others, 1948) was used to color classify damp to wet samples. Lithologic percentages are approximate.

Drill cuttings were analyzed for lithium (Li) by the U.S.G.S., in Denver, Colo. Lithium analyses are included in this report to complete the mineral resource appraisal on Troy Dry Lake.

**INDEX MAP**



**CONVERSION FACTORS**

Multiply English unit	By	To obtain metric units
Inches (in.)	2.540	Centimeters (cm)
Feet (ft)	0.305	Meters (m)

**WATER QUALITY**

A ground-water sample was collected at the first aquifer having measurable flow into the borehole by stopping drill rotation and pumping air through the drill string. The aquifer was allowed to flow for several minutes to remove drilling fluids and cuttings from the drill string before a ground-water sample was collected. Temperature and pH of the raw, untreated sample and specific gravity of the filtered sample were measured in the field. Chemical analyses of the filtered sample collected from test well T-1 are listed in the chemical analyses table.

**ACKNOWLEDGMENTS**

G. Thomas Server supplemented field lithologic descriptions by laboratory study of sediment cuttings under binocular microscope.

**REFERENCES**

- Folk, R. L., 1968, Petrology of sedimentary rocks: Austin, University of Texas, 170 p.
- Goddard, E. N., chm., and others, 1948, Rock-color chart: National Research Council; reprinted by Geological Society of America, 1951, 1963, 1970, 6 p.

This report has not been edited for conformity with U.S. Geological Survey editorial standards

Chemical analyses of ground water from test well T-1, Troy Dry Lake, California  
[Analyses by U.S. Geological Survey, Denver, Colo.]

Test well-sample No.	Date sample collected	Sample depth (ft)	Specific conductance (microhm/cm at 25°C)	pH		Temperature, water (°C)	Specific gravity	Hardness, total	mg/l																			
				Field	Lab				Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> ) <sup>+</sup>	Alkalinity, total (CaCO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Iodide (I)	Silica (SiO <sub>2</sub> )	Solids, residue on evaporation at 180°C	Nitrite plus nitrate (N)	Phosphorus (P)	Boron (B)	Iron (Fe)	Lithium (Li)	Manganese (Mn)	Strontium (Sr)	Uranium (U)
T-1-1	6/23/78	75	41,000	7.5	7.8	21.8	1.025	4,300	140	950	10,000	43	329	270	1,100	16,000	4.4	0.35	4.0±0.4†	25,400	5.4	0.00	22,000	70	420	140	5,000	32

‡ Calculated.  
† Determined on 1:200 dilution.

LITHOLOGIC AND WATER-QUALITY DATA FROM TROY DRY LAKE,  
SAN BERNARDINO COUNTY, CALIFORNIA

By

Roger D. Dockter

1980