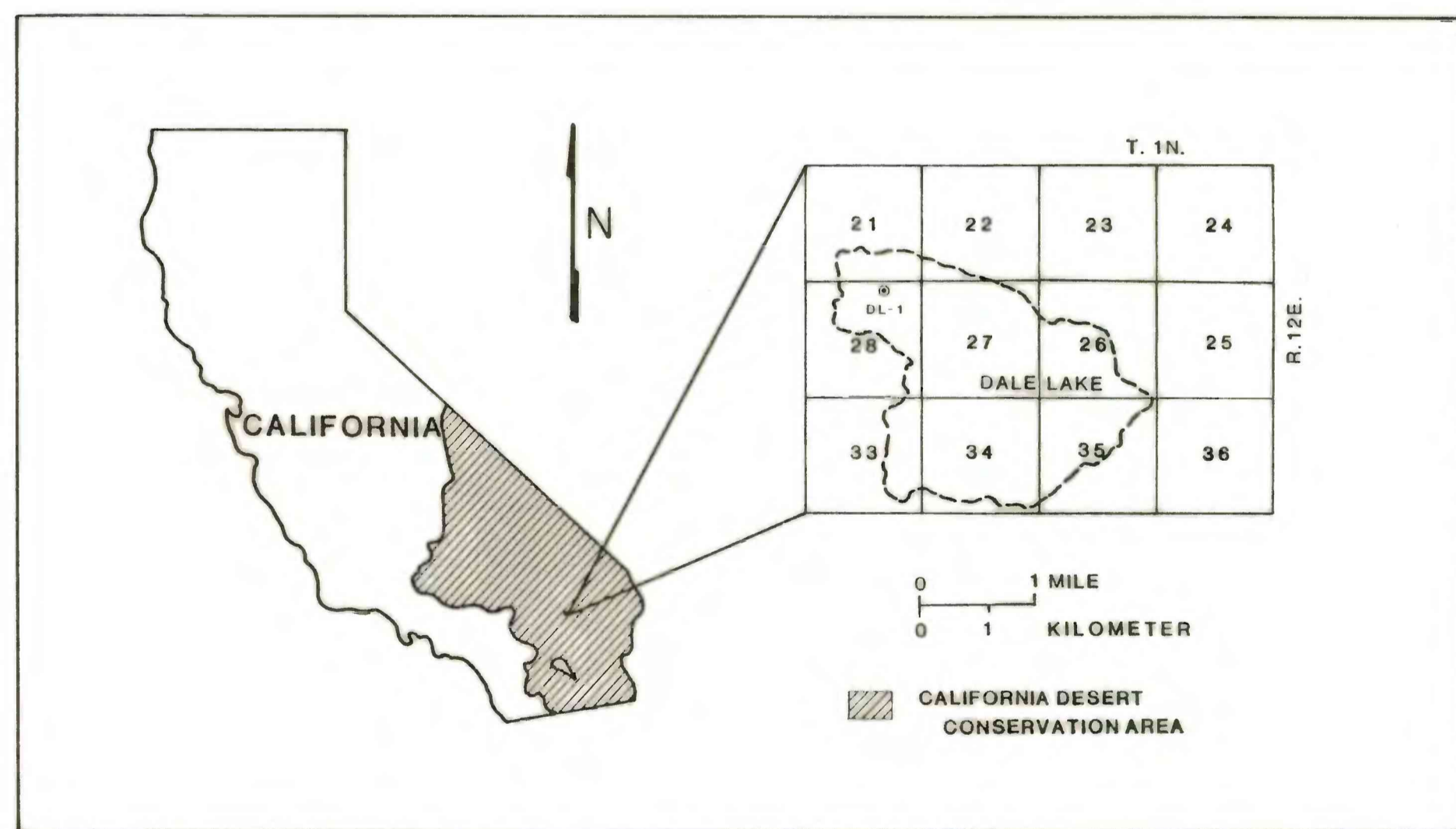
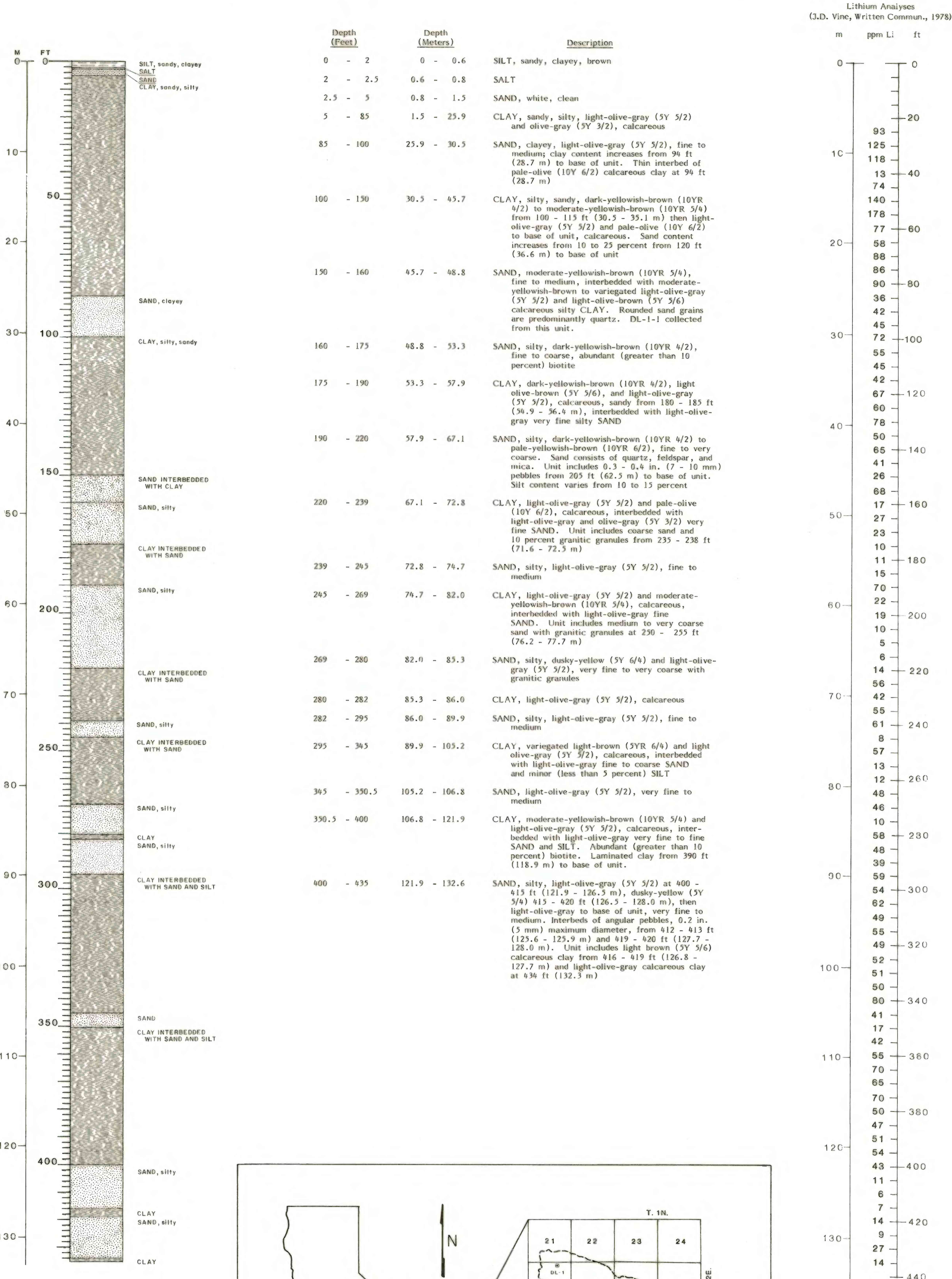
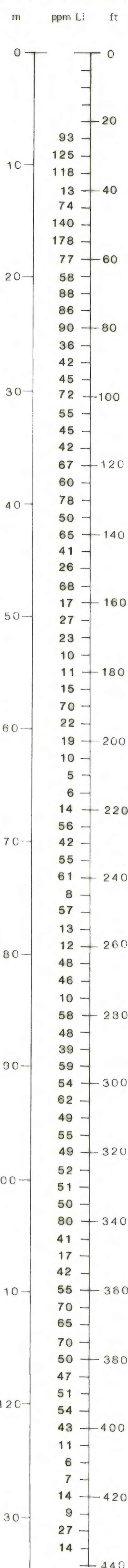


LITHOLOGIC LOGS FROM DALE DRY LAKE TEST WELL NO. 1



TEST WELL LOCATION
DL-1 Latitude: 34°08' 56"
Longitude: 115°03' 32"
NW 1/4 Sec 28, T. 1 N., R. 12 E.
San Bernardino Meridian

Lithium Analyses
J.D. Vine, Written Commun., 1978



INTRODUCTION

Lithologic and water quality data from Dale Dry Lake, California were obtained in April, 1978. These data provide leasable mineral resource input to the Bureau of Land Management's comprehensive long-range plan, authorized by the Federal Land Policy and Management Act of October 21, 1976 (Public Law 94-579), for the management, use, development, and protection of public lands within the California Desert Conservation Area (index map).

DRILLING AND LITHOLOGIC LOGGING TECHNIQUES

The test well was completed by the reverse circulation drilling technique. Drilling fluids, either air or water or both, are pumped down the outer annulus of dual-wall drill pipe to an open-throat button bit. The drilling fluids and cuttings then are forced up the inner annulus of the drill pipe to the surface. This technique assures recovery of uncontaminated sediment and water samples. In situ ground water is used as a drilling fluid as much as possible; otherwise a fine mist of imported fresh water and air is used.

Lithologic characteristics of the samples of the drill cuttings are described in the field. Field descriptions are later supplemented by laboratory examination. The rock color chart (Goddard and others, 1948) is used to color classify damp to wet samples. Sediment names are described by Wentworth (1922). Percentage of lithologic constituents listed in the lithologic description are approximate. "No Recovery" is used where samples are not collected.

The drill cuttings and water samples are analyzed for Lithium (Li) by the U.S. Geological Survey's Lithium Resource Appraisal Group in Denver, Colorado. The lower economic limit for lithium extraction is currently 1,000 ppm Li in sediments and 30 - 100 ppm Li in groundwater.

WATER QUALITY

Water samples are collected at the first aquifer with significant flow and at total depth (T.D.) by stopping drill rotation and pumping air through the drill string. The aquifer is allowed to flow for several minutes before a water sample is collected. The water temperature, pH, and specific gravity of raw and filtered untreated samples are measured in the field.

ACKNOWLEDGMENTS

G. Thomas Server provided laboratory lithologic descriptions.

REFERENCES

- Goddard, E.N., chm, and others, 1949, Rock-color chart: National Research Council; reprinted by Geological Society of America, 1951, 1963, 1970, 6 p.
Wentworth, C.K., 1922, A scale of grade and class terms for clastic sediments: *Journal of Geology*, v. 30, p. 377 - 392.

WATER QUALITY DATA FROM DALE DRY LAKE TEST WELL NO. 1 (Analyses by U.S. Geological Survey, Water Resource Division, Denver Colorado)

Test Well number	Date of collection	Depth of water sample (ft)	Water temperature (°C)	pH lab	pH field	Specific gravity	Specific conductance (microhms/cm at 25°C)	Percent sodium	SAR* (sodium absorption rate)		
DL-1-1	4/29/78	155	21.8	8.0	8.2	1.025	45,000	99	364		
Results in mg/L											
Test Well number	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Phosphorus (P)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Total Nitrate (NO ₂ +NO ₃)	Iodide (I)
DL-1-1	10.0±0.4*	44	32	13,000	42	0.01	5,800	16,000	8.1	0.05	0.50
Results in mg/L											
Test Well number	Bicarbonate (HCO ₃)	Manganese (Mn)	Iron (Fe)	Boron (B)	Lithium (Li)	Strontium (Sr)	Uranium (U)	Solids, residue on evaporation at 180°C (TDS)	Total Alkalinity Carbonate (CaCO ₃)	Total hardness	Percent Difference
DL-1-1	134	0.170	0.770	14.000	0.130	2.900	0.011	32,100	110	250	-0.29

* SAR Water Classification
10 Excellent
10-18 Good
18-26 Fair
26 Poor
Determined on 1:200 dilution.
Calculated.

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

BY
J. P. CALZIA