

COLLIMAR SECTION FROM
PALEN DRY LAKE NO. 1

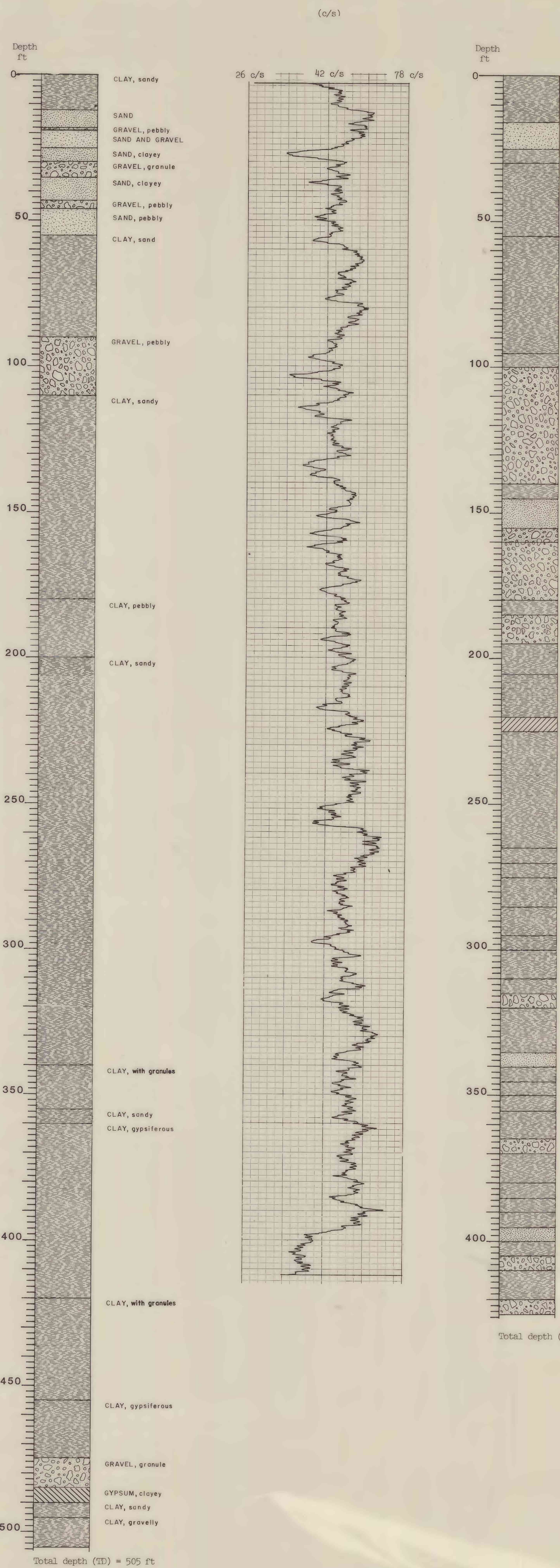
GAMMA-RAY LOG FROM
PALEN DRY LAKE NO. 2

COLLIMAR SECTION FROM
PALEN DRY LAKE NO. 2

LITHOLOGIC LOG FROM PALEN DRY LAKE TEST WELL NO. 1

LITHOLOGIC LOG FROM PALEN DRY LAKE TEST WELL NO. 2

INTRODUCTION

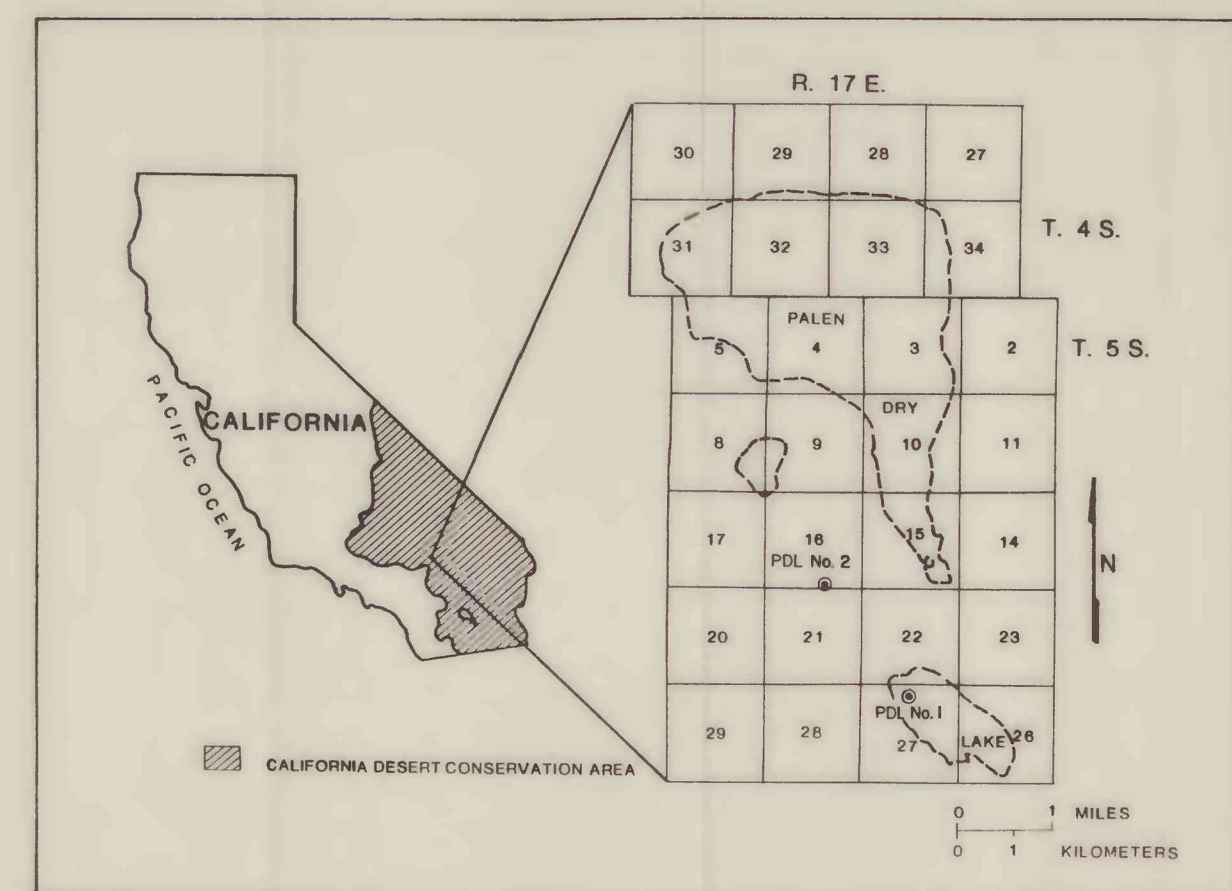


Total depth (TD) = 425 ft

Total depth (TD) = 505 ft

Depth (feet)	Description
0 - 10	Clay, sandy, moderate-brown (5M 4/4, damp), calcareous, 45 percent; 45 percent subrounded to subangular, medium to very coarse quartz and gypsum sand; less than 1 percent very fine mafic grains
10 - 12	Clay, sandy, light-brown (5M 5/6, damp), similar to 0-10 ft except color
12 - 18	Sand, light-brown (5M 5/6, damp), subrounded, iron-stained quartz grains, 1 percent fine mafic sand
18 - 19	Gravel, pebbly, subangular to rounded clasts, abundant metavolcanic clasts
19 - 25	Sand and pebbly gravel, fine to medium sand with subordinate to subrounded granules; pebbles include clasts of granite, quartzite and siltite, predominantly of subangular to subangular; interbedded pale-yellowish-brown (10M 6/6, damp) clay in gravel
25 - 30	Sand, clayey, fine sand; pale-yellowish-brown (10M 6/6, damp); calcareous clay matrix decreasing toward bottom of this interval
30 - 35	Gravel, granule, light-brown (5M 5/6, wet), abundant granules; medium to coarse sand
35 - 43	Sand, clayey, pale-yellowish-brown (10M 6/6, wet), fine to coarse, subrounded; calcareous clay matrix; occasional granules
43 - 46	Gravel, pebbly, light-brown (5M 5/6, wet), subangular to angular pebbles as large as 20 m consisting predominantly of granitic and metamorphic detritus with abundant quartz; minor sand
46 - 55	Sand, pebbly, light-brown (5M 5/6, wet), predominantly fine sand with 10 percent medium to coarse sand; 3 percent pebbles; calcareous clay matrix
55 - 60	Clay, sandy, light-brown (5M 5/6, damp), moderate plasticity, calcareous, 30 percent; 45 percent fine sand, 4 percent granules; 1 percent pebbles. Unit contains interbedded gypsum crystals in sandy clay matrix between 55-60 ft
60 - 80	Clay, sandy, similar to 55-60 ft except clay content decreasing to 40 percent; 45 percent fine sand; 15 percent granules
80 - 90	Clay, sandy, similar to 55-60 ft except clay content increasing to 40 percent; 40 percent medium sand; 20 percent angular to subrounded pebbles as large as 20 m
90 - 110	Gravel, pebbly, 40 percent; 40 percent medium to coarse sand; 20 percent calcareous clay matrix
110 - 115	Clay, sandy, same as 80-90 ft
115 - 125	Clay, sandy, light-brown (5M 5/6, wet), calcareous, 45 percent; 30 percent medium sand; 15 percent granules; 40 percent pebbles
125 - 160	Clay, sandy, light-brown (5M 5/6, wet), calcareous, 45 percent; 30 percent medium sand; 15 percent granules; 40 percent pebbles
160 - 180	Clay, sandy, light-brown (5M 5/6, wet), calcareous, 45 percent; 30 percent medium sand; 15 percent granules; 40 percent pebbles
180 - 185	Clay, pebbly, light-brown (5M 5/6, wet), calcareous, 50 percent; contains gypsum crystals as large as 75 m; 20 percent medium sand; 30 percent pebbles
185 - 200	Clay, pebbly, light-brown (5M 5/6, wet), calcareous, 40 percent; 20 percent medium sand; 20 percent pebbles consisting of granitic and metamorphic detritus. Gypsum crystals as large as 75 m between 185-200 ft
200 - 205	Clay, sandy, light-brown (5M 5/6, wet), calcareous, 70 percent; 20 percent medium sand; less than 1 percent pebbles
205 - 215	Clay, sandy, similar to 200-205 ft except no pebbles present
215 - 235	Clay, sandy, mottled pale-olive (10M 6/6, wet) and light-brown (5M 5/6, wet) calcareous, 45 percent; 30 percent very coarse sand; 20 percent medium sand; 10 percent granules; gypsum crystals present
235 - 240	Clay, sandy, mottled yellowish-brown (5M 7/7, wet) and moderate-yellowish-brown (10M 6/6, wet), calcareous; similar to 215-235 ft except color
240 - 260	Clay, sandy, mottled yellowish-brown (5M 7/7, wet) and red (10M 6/6, wet) calcareous clay, 40 percent; 30 percent medium sand; 15 percent very coarse sand; 10 percent granules; 5 percent pebbles as large as 20 m; abundant gypsum crystals in 250-260 ft interval
260 - 265	Clay, sandy, mottled moderate-yellowish-brown (10M 5/4, wet) and pale-olive (5M 6/6, wet), calcareous; similar to 260-265 ft except color
265 - 270	Clay, sandy, moderate-yellowish-brown (10M 5/4, wet) calcareous clay; similar to 260-265 ft except color
270 - 275	Clay, sandy, mottled light-olive-gray (5M 5/2, wet) and light-brown (5M 5/6, wet), calcareous; similar to 260-265 ft except color
275 - 290	Clay, sandy, light-brown (5M 5/6, wet), calcareous; similar to 260-265 ft except color
290 - 295	Clay, sandy, mottled light-olive-gray (5M 5/2, wet) and light-brown (5M 5/6, wet), calcareous; abundant gypsum crystals in clay; similar to 260-265 ft except color
295 - 300	Clay, sandy, light-brown (5M 5/6, damp), calcareous, 60 percent; 10 percent medium sand; 10 percent very coarse sand; 20 percent granules; abundant gypsum crystals
300 - 310	Clay, sandy, similar to 295-300 ft except decrease in clay and addition of 10 percent pebbles
310 - 320	Clay, sandy, similar to 295-300 ft except decrease in clay and addition of 10 percent pebbles as large as 20 m
320 - 335	Clay, sandy, moderate-brown (5M 4/4, wet), moderate plasticity, calcareous, 50-60 percent; 30 percent fine sand; 10 percent medium sand; 20 percent granules; abundant gypsum crystals
335 - 340	Clay, sandy, mottled light-brown (5M 5/6, wet) and light-olive-gray (5M 5/2, wet), calcareous, 70 percent; 20 percent medium sand; 10 percent angular to subangular granules; abundant gypsum crystals as large as 30 m
340 - 355	Clay, with granules, light-brown (5M 5/6, wet), calcareous, 70 percent; 20 percent granules; 10 percent medium sand; abundant gypsum crystals
355 - 360	Clay, sandy, mottled moderate-brown (5M 4/4, wet) and light-brown (5M 5/6, wet), calcareous, 45 percent; 20 percent granules; 15 percent very fine sand; abundant gypsum crystals
360 - 365	Clay, gypsiferous, light-brown (5M 5/6, damp), calcareous, 45 percent; 10 percent gypsum crystals as large as 10-20 m
365 - 380	Clay, sandy, light-brown (5M 5/6, damp), moderate plasticity, calcareous, 70-80 percent; 5 percent very coarse sand; 5 percent granules; 20-30 percent gypsum crystals as large as 30-40 m
380 - 395	Clay, gypsiferous, mottled light-brown (5M 5/6, damp) and light-olive-gray (5M 5/2, damp), calcareous, 75 percent; 20 percent gypsum crystals as large as 5-6 percent granules
395 - 400	Clay, gypsiferous, moderate-yellowish-brown (10M 5/4, damp), calcareous, 55 percent; 20 percent gypsum crystals; 15 percent very coarse sand
400 - 405	Clay, gypsiferous, similar to 395-400 ft except 10 percent clay; 30 percent gypsum crystals
405 - 410	Clay, gypsiferous, moderate-yellowish-brown (10M 5/4, damp), calcareous, 70 percent; 15 percent gypsum crystals; 15 percent very coarse sand
410 - 420	Clay, gypsiferous, light-brown (5M 6/4, damp), calcareous, 75 percent; 20 percent gypsum crystals as large as 20 m
420 - 440	Clay, with granules, light-brown (5M 6/4, damp), calcareous, 60 percent; 20 percent granules; 15 percent coarse sand; 5 percent very coarse sand
440 - 455	Clay, with granules, mottled light-brown (5M 5/4, damp) and light-olive-gray (5M 5/2, damp), calcareous, 60-70 percent; 15 percent granules; 10 percent pebbles with 20 m medium diameter; gypsum crystals as large as 60 m
455 - 470	Clay, gypsiferous, light-brown (5M 5/6, damp), calcareous, 45 percent; 40 percent gypsum crystals as large as 60 m; 10 percent granules; 5 percent very coarse sand
470 - 475	Clay, gypsiferous, light-brown (5M 5/6, damp), calcareous, 50 percent; 30-40 percent gypsum crystals; 10-20 percent fine sand
475 - 485	Gravel, granule, 50 percent granules; 10 percent very coarse sand; 40 percent light-brown (5M 5/6, damp) calcareous clay matrix
485 - 490	Gypsum, clayey, predominantly gypsum with 20-30 percent light-brown (5M 5/6, damp) calcareous clay; minor interbedded sandstone
490 - 495	Clay, sandy, light-brown (5M 5/6, damp), calcareous, 50 percent; 20 percent very coarse sand; 20 percent granules; 10 percent pebbles as large as 20 m
495 - 505	Clay, gravelly, light-brown (5M 5/6, damp), calcareous, 50 percent; 20 percent pebbles as large as 30 m; 10 percent very coarse sand; gypsum crystals in clay

Depth (feet)	Description
0 - 10	Clay, silty, moderate-brown (5M 4/4, damp), 10-20 percent; calcareous; trace of sand
10 - 16	Clay, silty, light-brown (5M 5/6, damp), calcareous; 1-2 percent granules; trace of pebbles
16 - 20	Sand, dark-yellowish-brown (10M 6/6, wet), calcareous, 40 percent; 40 percent granules; calcareous; minor amounts of calcareous clay; 35 percent mafic grains
20 - 25	Sand, similar to 16-20 ft interval except increasing clay content
25 - 30	Clay, sandy, moderate-brown (5M 4/4, wet); occasional granules
30 - 35	Clay and sand, interbedded; light-brown (5M 5/6, wet) calcareous clay
35 - 55	Clay and sand, interbedded; pale-yellowish-brown (10M 6/6, wet) clay; similar to 30-35 ft interval except color
55 - 70	Clay, sandy, moderate-brown (5M 4/4, wet), calcareous; medium sand
70 - 95	Clay, sandy, moderate-brown (5M 4/4, wet), similar to 55-70 ft interval except scattered granules and pebbles
95 - 100	Clay and sand, interbedded; mottled pale-yellowish-brown (10M 6/6, wet) and dark-yellowish-brown (10M 6/6, wet) calcareous clay; interbedded fine sand; occasional pebbles
100 - 110	Gravel, granule, very light gray (10-8), subangular to subrounded granules, well sorted; primarily granitic detritus
110 - 125	Gravel, granule, very light gray (10-8), similar to 100-110 ft interval except better sorted with less pebbles
125 - 130	Gravel, granule, very light gray (10-8), similar to 100-110 ft interval except better sorted with less pebbles
130 - 135	Gravel, granule, very light gray (10-8), similar to 125-130 ft interval except clay lenses decreasing to 30 percent
135 - 140	Gravel, granule, very light gray (10-8), similar to 125-130 ft interval except clay lenses decreasing to 10-15 percent
140 - 145	Clay, pale-yellowish-brown (10M 6/6, damp), calcareous, 40 percent; 40 percent granules; very coarse sand and granule gravel
145 - 150	Sand, very light gray (10-8, damp), 50 percent very coarse sand; 10 percent moderate-yellowish-brown (10M 5/4, damp) clay interbeds
150 - 155	Sand, very light gray (10-8, damp), similar to 145-150 ft interval except clay becoming mottled moderate-yellowish-brown (10M 5/4, damp) and pale-olive (10M 6/6, damp) and increasing to 40 percent
155 - 160	Gravel, pebbly, very light gray (10-8, damp); includes 20 percent mottled clay in 150-160 ft interval
160 - 165	Gravel, granule, very light gray (10-8); 10-15 percent moderate-yellowish-brown (10M 5/4, damp) clay
165 - 170	Gravel, granule, very light gray (10-8, damp), similar to 160-165 ft interval except moderate-brown (5M 4/4, damp) clay increasing to 10-20 percent
170 - 175	Gravel, granule, very light gray (10-8, damp); 10-15 percent moderate-yellowish-brown (10M 5/4, damp) clay
175 - 180	Gravel, granule, very light gray (10-8, damp) abundant very coarse sand; clay decreasing to 5-10 percent
180 - 185	Clay, with granules, light-brown (5M 5/6, damp), 75 percent; 25 percent granules
185 - 190	Gravel, granule, very light gray (10-8, damp); 10 percent mottled clay (5M 5/4, damp) moderate-yellowish-brown (10M 5/4, damp) clay
190 - 195	Gravel, granule, very light gray (10-8, damp), similar to 185-190 ft interval except gravel decreasing to 20 percent; clay increasing to 50 percent
195 - 200	Clay, with granules, mottled moderate-yellowish-brown (10M 5/4, damp) to light-brown (5M 5/6, damp) clay; 65 percent; 35 percent granules
200 - 205	Clay, with granules, mottled olive (5M 4/1, damp) and moderate-yellowish-brown (10M 5/4, damp) clay; 70 percent; granules about 30 percent
205 - 220	Clay, moderate, light-brown (5M 5/6, damp) to moderate-yellowish-brown (10M 5/4, damp); 75 percent; 10-20 percent granule gravel; 5 percent silt
220 - 225	No sample recovered: Lithology interpreted same as 205-220 ft
225 - 245	Clay, micaceous; light-brown (5M 5/6, damp) to moderate-yellowish-brown (10M 5/4, damp); same as 205-220 ft
245 - 265	Clay, micaceous, moderate-yellowish-brown (10M 5/4, damp); same as 205-220 ft
265 - 270	Clay, with granules, moderate-yellowish-brown (10M 5/4, damp), 50 percent clay; 30 percent granule gravel; 20 percent medium to coarse sand
270 - 275	Clay, with pebbles, moderate-brown (5M 4/4, damp), clay contains about 5 percent black organic detritus; 10 percent granules; 5 percent pebbles
275 - 285	Clay, with granules, moderate-yellowish-brown (10M 5/4, damp), 50 percent; 30 percent granules; 15 percent medium sand
285 - 295	Clay, with very fine interbedded sand, light-brown (5M 5/6, damp) clay, 55 percent; 15 percent sand
295 - 300	Clay, light-brown (5M 5/6, damp), interbedded with light-olive-gray (5M 5/2, damp) calcareous clay
300 - 305	Clay, sandy, light-brown (5M 5/6, damp), calcareous; 10 percent medium sand; 10 percent granules
305 - 310	Clay, sandy, moderate-yellowish-brown (10M 5/4, damp), calcareous; 10 percent fine sand; 10 percent granules
310 - 315	Clay, silty, moderate-yellowish-brown (10M 5/4, damp), calcareous; 5 percent granules
315 - 320	Gravel, granule, 90 percent granules; mottled moderate-yellowish-brown (10M 5/4, damp) and light-olive-gray (5M 5/2, damp) clay matrix
320 - 325	Clay, sandy, light-brown (5M 5/6, damp), calcareous; very fine to coarse sand
325 - 335	Clay, sandy, similar to 320-325 ft except addition of 15 percent granules
335 - 340	Sand, clayey, medium to coarse sand, 95 percent; 5 percent granules; 2 percent light-brown (5M 5/6, damp) clay matrix
340 - 345	Clay, sandy, moderate-yellowish-brown (10M 5/4, damp), calcareous; 5 percent granules
345 - 350	Clay, with granules, moderate-yellowish-brown (10M 5/4, damp), calcareous; 5 percent granules
350 - 355	Clay, sandy, light-brown (5M 5/6, damp), calcareous; abundant very fine silt; 5-10 percent sand; less than 3 percent granules
355 - 360	Clay, with granules, moderate-brown (5M 4/4, damp), calcareous; 20-30 percent granules; 1-5 percent sand
360 - 365	Clay, with granules, dark-yellowish-brown (10M 4/2, damp), calcareous; 10-20 percent sand; 5 percent granules
365 - 370	Gravel, granule, 55 percent granules; 30 percent sand; 10-15 percent dark-yellowish-brown (10M 4/2, damp) calcareous clay
370 - 375	Clay, with granules, moderate-yellowish-brown (10M 5/4, damp), calcareous; 15-20 percent granules; 15 percent fine sand
375 - 380	Clay, with granules, similar to 370-375 ft except granules increasing to 25 percent; medium to coarse sand increasing to 20 percent
380 - 385	Clay, sandy, moderate-yellowish-brown (10M 5/4, damp), calcareous; 10-15 percent fine to medium sand; 5-10 percent granules
385 - 390	Clay, with granules, moderate-brown (5M 4/4, damp), calcareous; 5 percent granules; 1-5 percent medium sand
390 - 395	Clay, sandy, moderate-brown (5M 4/4, damp), calcareous; 10 percent medium to coarse sand; very light gray (10-8), very coarse; 10 percent moderate-brown (5M 4/4, damp) calcareous clay matrix
400 - 405	Clay, with granules, moderate-brown (5M 4/4, damp), calcareous; 20 percent quartzite granules
405 - 410	Gravel, granule, light-gray (10-8), quartzite; 5 percent dark-yellowish-brown (10M 4/2, damp) calcareous clay
410 - 420	Clay, with granules, moderate-brown (5M 4/4, damp), calcareous; 20 percent granules; 10 percent medium sand; occasional gypsum crystals in clay
420 - 425	Gravel, sandy, light-gray (10-8); 10 percent medium sand; 5 percent moderate-brown (5M 4/4, damp) calcareous clay



CONVERSION FACTORS

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

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

GEOPHYSICAL AND LITHOLOGIC DATA FROM TEST WELLS ON PALEN DRY LAKE, RIVERSIDE COUNTY, CALIFORNIA