

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT**

PART-I

**GEOTECHNICAL
INVESTIGATION
REPORT
VOLUME II - APPENDICES**

PREPARED BY



**Converse Ward Davis Dixon
Earth Sciences Associates
Geo/Resource Consultants
General Geotechnical Consultant**

November, 1981



RTD



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APPENDIX A
FIELD EXPLORATION PROGRAM

Appendix A: Field Exploration Program

A.1 SUMMARY

Forty-one geologic borings were drilled at designated locations along the 18-mile alignment (see Drawings 1 and 3, Volume 1). In addition 20 borings, 100 feet deep, were drilled for down-hole placement of geophysical cross-hole geophones at ten station locations. The geologic borings varied from 100 to 400 feet deep, with most being approximately 200 feet in depth, for a total of 8,491 feet of drilling.

Drilling and coring of the 61 borings took place between December 1, 1980, and March 17, 1981. Although three additional borings were added to the program (including a 400-foot continuous hard rock NX core hole) with no schedule extensions, the program was successfully completed 14 days ahead of schedule. Sample and core recovery from the 41 geologic borings was very good. Sample recovery from the Converse ring Split Spoon and Pitcher Barrel samplers collectively averaged 78%. A total of 1,649.6 feet of NX coring was performed in nine borings using wire line and conventional 10-foot Christensen double tube core barrels, and core recovery averaged 92%.

Included in this Appendix are the following:

- Original Field Boring Logs (420 sheets),
- Symbols Used on the Boring Logs for the Sampling and Drilling Mode,
- Colored Photographs (Figures A-1 through A-38),
- Summary of Boring Data (Table A-1),
- Correlation of Soil Data Obtained in the Field (Table A-2),
- Definition of Engineering Geology Terms used in the Boring Logs (Table A-3)
- Water Pressure Test Summary (Table A-2),
- Groundwater Monitoring Summary (Table A-3).

A.2 ROTARY WASH AND WIRE LINE CORING

A.2.1 Technical Staff

Members of three team firms participated in the drilling exploration program from conception to completion. CWDD/ESA/GRC personnel who worked on this project include:

Howard A. Spellman - Project Manager, CWDD
Richard C. Harding - Assistant Project Manager, ESA
Tim J. Manzagol - Field Exploration Manager, ESA
John D. Gallinatti - Field Geologist, ESA
Daniel R. Gillette - Field Geologist, CWDD
Elizabeth L. Schoeberlein - Field Geologist, GRC
Steven Slaff - Field Geologist/Permitting, GRC
Stephen M. Testa - Field Geologist, CWDD
John A. Campbell - Permitting/Site Service, CWDD.

The field geologist continuously supervised each boring during the drilling and sampling operation. The geologist was also responsible for preparing a detailed lithologic log of the rotary wash cuttings and for sample/core identification, labeling and storage of all samples. At the ten station locations where two additional 100-foot-deep borings were drilled (15 and 30 feet respectively from the sampled geologic borings), the site geologist also prepared lithologic logs from the wash cuttings for these two additional geophysical cross-hole geophone holes. These logs have not been included in the appendix; however, they are available upon written request from the Converse Ward Davis Dixon office in Pasadena, California.

The field geologist supervised all water pressure tests; noted all meter readings; and was responsible for the timely and proper installation of the piezometer pipe, gravel pack and bentonite seals.

A.2.2 Drilling Contractors and Equipment

Pitcher Drilling Company of East Palo Alto, California, supplied three Falling 1500 rotary wash rigs, each operated by a two-man crew. For the hard rock reaches of the alignments, near the flanks and the interior of the Santa Monica Mountains, a CME-55 wireline core rig owned and operated by P.C. Exploration, Roseville, California, was used. Although Pitcher Drilling Company was hired specifically to drill and sample the alluvium and soft formation reaches of the alignment, they did a minor amount of NX coring in Borings 34 and 35 using a conventional 10-foot Christensen double tube core barrel.

P.C. Exploration was contracted to diamond-core the hard rock formation; however, near ground surface in the Santa Monica Mountains, where poor rock quality did not permit successful core recovery, they successfully sampled using a Pitcher Barrel sampler.

A.3 SOIL, SOFT GROUND AND HARD ROCK LOGGING AND SAMPLING

Three types of rotary drill/sampling procedures were completed over the 18-mile-long subway route. They were completed at the following locations:

- soft ground tunnel reaches,
- station locations,
- hard rock tunnel reaches.

A detailed description of each drilling and sampling procedure follows:

• Soft Ground Tunnel Reaches

Twenty-five of the 41 borings drilled were located along the soft ground tunnel reaches of the route. As specified in the CWDD/ESA/GRC proposal, these borings were sampled in overburden every 10 feet, using a standard split spoon driven with a standard 30-inch-stroke, 140-pound hammer.

At each 20-foot interval, prior to sampling with the split spoon, an undisturbed Converse ring sample was obtained using a down-hole 450-pound slip-jar hammer. At these 20-foot intervals, the Converse sample was immediately followed with the standard split spoon sample.

Where the soft Puente/Fernando Formations were encountered, the borings were either sampled with a Pitcher-Barrel or cored continuously to total depth. The choice of using the Pitcher Barrel or NX core barrel was made by the driller and the site geologist depending upon ground conditions encountered.

Where continuous Pitcher Barrel sampling was performed in the softer Puente/Fernando Formations, all samples were extruded in the field, cleaned, logged and boxed - except for every sixth tube which was capped, taped, labeled, transported and stored vertically for undisturbed sample testing in the laboratory. This sampling procedure was modified at the discretion of the geologist when borehole conditions were poor.

The most common cause for altering the sampling interval was when gravels were encountered at the desired sampling depth. Standard penetration blow count information can often be misleading in this type of formation, and it is difficult to recover an undisturbed sample. Therefore, borings were advanced until drill response and cuttings suggested a change in formation.

The sampling program was also modified when dense formations of young and old alluvium were encountered and the Converse sampler would not penetrate. The Pitcher Barrel sampler, superior in this type of soil, was substituted for the Converse sampler in order to obtain better undisturbed samples.

• Station Locations

One boring was located at each of the 16 proposed station locations where a more intensive sampling program was performed. The standard penetration test (SPT) interval (using a conventional split spoon sampler) was decreased to every 5 feet and performed through the entire depth of the boring or until continuous bedrock sampling began. Similar to the tunnel location program, an undisturbed Converse ring sample was taken at 20-foot intervals, followed by the split spoon. When the soft Puente/Fernando Formations were encountered, the borings were either sampled with a Pitcher-Barrel or cored continuously to the desired total depth. This sampling was procedure modified when bore hole conditions, similar to those described above, were poor.

At 10 of the 16 station locations, geophysical downhole and crosshole surveys were performed. This procedure involved drilling two additional borings in line with, and spaced 15 and 30 feet from, the geologic boring. It was not possible to complete these borings as groundwater observation wells because the 4 7/8-inch in diameter geology hole was reamed to 7 inches, and 100 feet of 4-inch PVC casing grouted in place. However, special attention was given during the actual drilling operation to observe fugitive groundwater conditions. Drilling fluid levels were usually noted each morning prior to rig start-up, and the moisture content

of samples was noted. Where scheduling permitted (as in the case of station locations 7, 15, 18, 24, 28 and 34), the borings were left open over the four to five-day drilling break, and water levels were checked prior to commencement of the new work shift.

Since the two additional geophone holes also had to be cased and grouted, it was not possible to complete these as groundwater monitoring wells. However, it would be possible to return to these sites at a future date and perforate the plastic casing using a wire-line perforation gun to transform the holes into monitoring wells.

° Hard Rock Tunnel Reaches

Along the Reach through the Santa Monica Mountains (Borings 29 through 35), harder, more resistant, bedrock of the Topanga Formation was encountered. Overburden and weathered bedrock were typically thin in all borings, except in Boring 35 where alluvium was over 120 feet thick.

The previously described sampling procedures were followed in the overburden portion of the borings. However, since the CME-55 core rig was not set up to sample with the Converse sampler all undisturbed samples were obtained with a Pitcher Barrel sampler.

When the harder more resistant bedrock was encountered, continuous NX coring was carried out. All core was logged in detail by the site geologist, labeled, and boxed. This core is stored at Converse Ward Davis Dixon's office in Pasadena, California.

With the exception of Boring 34, a cross-hole location, all hard rock boring locations were completed as groundwater observation wells with 2-inch perforated plastic ABS casing.

A-4 LITHOLOGIC LOG

A.4.1 Field Classification of Soils

All soil types were classified in the field by the site geologist using the "Unified Soil Classification System". Based on the characteristics of the soil, this system indicates the behavior of the soil as an engineering construction material.* Although particle size distribution estimates were based on volume rather than weight, the field estimates should fall within an acceptable range of accuracy.

Table A-2 shows the correlation of standard penetration information and the physical description of the consistency of clays (hand-specimen) and the compactness of sands used by the field geologists for describing the materials encountered.

*For a more complete discussion of the Unified Soil Classification System, refer to Corps of Engineers, Technical Memorandum No. 3-357, March 1953, or Department of the Interior, Bureau of Reclamation, Earth Manual, 1963.

The following symbols were used to indicate the type of sample and the drilling mode:

<u>Log Symbol</u>	<u>Sample Type</u>	<u>Type of Sampler</u>
<u>B</u>	<u>Bag</u>	<u>-</u>
<u>J</u>	<u>Jar</u>	<u>Split spoon</u>
<u>C</u>	<u>Can</u>	<u>Converse ring</u>
<u>S</u>	<u>Shelby Tube</u>	<u>Pitcher barrel</u>
<u>Box</u>	<u>Box</u>	<u>Pitcher barrel, core barrel</u>

<u>Log Symbol</u>	<u>Drilling Mode</u>
<u>AD</u>	<u>Auger drill</u>
<u>RD</u>	<u>Rotary drill</u>
<u>PB</u>	<u>Pitcher barrel sampling</u>
<u>SS</u>	<u>Split spoon</u>
<u>DR</u>	<u>Converse drive sample</u>
<u>C</u>	<u>Coring</u>

A.4.2 Field Description of the Formations.

The description of the formations is subdivided in two parts: lithology and physical condition. The lithologic description consists of:

- ° rock name;
- ° color of the wet core (from GSA rock color chart);
- ° mineralogy, textural and structural features; and
- ° any other distinctive features which aid in correlating or interpreting the geology.

The physical condition describes the physical characteristics of the rock which are important for engineering design consideration. The form for the description is as follows:

Physical condition: _____ fractured, minimum _____, maximum _____, mostly _____; _____ hardness, strength; _____ weathered.

Definitions of engineering geology terms used on the boring logs are given on Table A-3. One or more of the physical characteristics may change with the depth of the hole. After the rock was described in general, only those characteristics that changed and the appropriate depth interval were noted.

A-5 WATER PRESSURE TESTING

Water pressure tests were performed in 16 of the 41 geology borings. The test data obtained in the Santa Monica Mountains Reach of the alignment are more reliable than those obtained in the Puente and Fernando Formations. Harder rock of the Topanga Formation (Santa Monica Reach) allowed better seating of the packers; hence, higher pressure tests and more accurate meter readings were obtained.

Similar results were obtained using both pneumatic and push packers in the Puente and Fernando Formations. Because of the more massive and clayey nature of the Fernando Formation, slightly better data were gathered. The fine sand interbeds of the Puente Formation tended to wash out around the packers at pressures between 20 to 40 psi. However, enough reliable data were obtained to demonstrate that both the Puente and Fernando Formations are very tight and, in almost all cases, would take less than 1 gpm over a 20-foot test interval at 40 psi.

It is anticipated that the greatest water inflow from these two soft claystone/siltstone formations will occur along fault planes and along the hard-cemented concretionary bedding planes encountered in a number of the borings. Flows from these zones are anticipated to be on the order of 10 gpm. Marginal success was achieved when attempts were made to double pack across some hard-cemented zones. Packer leakage during these selective tests allowed only estimates of actual water loss to the formation. The tests did suggest water losses in the range of 2 to 5 gpm at 20 to 40 psi.

The Topanga sandstones, conglomerates and basalts had very little to no water take. Exceptions were the upper portion of Boring 30 which averaged 28 gpm in a 60-foot test interval at 100 psi and Boring 31 which averaged 26 gpm in a 150-foot test interval at 60 psi. Both borings are adjacent to the Hollywood Bowl Station and are located in the Hollywood fault zone.

Table A-4 summarizes, by boring and associated depth intervals, all field pressure tests performed.

A-6 GROUNDWATER MONITORING

A total of 6,047 linear feet of 2-inch plastic ABS pipe was installed in 31 of the 41 geology borings. In addition, 905.5 feet of 1 inch PVC plastic pipe was installed in 11 of 31 borings to monitor perched water levels. Table A-5 summarizes (a) data obtained from the geology borings which were completed as groundwater observation wells and (b) the most current water level readings obtained prior to publication of the draft report.

A.6.1 Piezometer Installations

Where possible, 2-inch ABS pipe was installed to the total depth in 31 of the 41 borings for permanent ground water monitoring. The remaining 10 geology

borings were cross-hole Station sites which required grouting in 100 feet of 4-inch diameter PVC casing. During the drilling of these 10 geology borings, groundwater monitoring was performed prior to grouting and casing. Drilling fluid levels were noted most mornings prior to drilling start-up, and most of the holes were left open during the four to five-day breaks. Upon return from the breaks, the geologist would note the fluid level in the boring. This "fugitive" information also appears in Table A-5.

Prior to installation of the piezometer pipe, the boring was flushed clean of drilling muds by lowering a weighted 2-inch diameter hose to the bottom of the boring. Fresh water was drawn from either nearby metered fire hydrants or from water transported and pumped by the drilling equipment. The plastic pipe was perforated with approximately 1/8 inch wide by 1 inch long sawed vertical slots spaced 6 to 8 inches apart. The perforated portions of the pipe were wrapped with fibrous nylon cloth to minimize sand flow with time into the piezometer.

After installation of the piezometer pipe, the annulus of the boring around the pipe was backfilled with a coarse sand/pea gravel aggregate. When double piezometers were installed in a boring, the two piezometers were separated vertically by a 3 to 5-foot seal placed below the upper piezometer and above the highest perforation of the lower piezometer where an impermeable silt or clay unit was encountered. The seal consisted of manufactured, compressed bentonite balls. For unknown reasons, several of these bentonite ball seals proved ineffective; hence, only the upper perched water levels in these borings could be monitored. Although double piezometer installations were not specified in the original RFP, the CWDD team conducted an experiment at select locations along the proposed alignment in an attempt to monitor geologic conditions which suggested multiple water levels. For future double piezometers another type of seal should be used.

A 1 to 5-foot thick surface bentonite seal was placed on all monitoring holes to prevent surface water from artificially recharging the gravel-packed hole or contaminating local ground water. After the piezometers were installed, the borings were flushed using air lift provided by a trailer-mounted air compressor. Each boring was covered with a standard 7-inch diameter steel water meter cap held at surface grade by a grouted in-place 3 to 4-foot long, 5-inch diameter plastic sleeve.

A.7 CORE PHOTOGRAPHY

Photographs were taken of all extruded Pitcher Barrel samples of the Puente and Fernando Formations and NX core from the Santa Monica Mountain Reach including a small amount recovered from the Fernando Formation claystone at Boring 7. All photos, as presented on Figures A-1 through A-38, were taken by CWDD staff in a temporary studio at CWDD's Pasadena office. To facilitate identification, large labels bear the number of each boring as well as the top and bottom depth intervals for each box.

TABLE A-1 Summary of Boring Data

Hole No.	Depth of Geology Boring		Feet In Soil	Feet In Rock	Station* Depth (ft)	Tunnel* Depth (ft)	Sampling/Corr. Recovery				Down Hole	Cross Hole	Piezometer Installed Depth (ft)	Water Pressure Test Intervals (ft)	Natural Gas	Amount of Casings Installed (ft)				Hole Completion Casings and Grouted	Piezometer			
	SS	SR					RI	TK	4 in.	3 in.						2 in.	1 in.							
1	150	149.1	29.2	119.9	-	125	05/78	1/67	40/89	0/-	no	no	yes	0-149.1	90-110	Trace	-	-	149.0	-	-	-	-	Single
2	100	103.0	12.0	88.0	-	105	02/83	0/-	30/97	0/-	no	no	yes	0-103	Not performed	Yes	-	-	103.0	-	-	-	-	Single
3	150	150.6	88.0	61.6	-	100	09/67	4/65	18/83	0/-	no	no	yes	0-150.6	Not performed	Trace	-	-	150.6	-	-	-	-	Single
4	150	150.0	101.5	48.5	-	80	07/51	1/30	17/96	0/-	no	no	yes	0-150	Not performed	Trace	-	-	150.0	-	-	-	-	Single
5	150	150.0	84.2	65.8	55	-	05/22	1/00	26/78	0/-	yes	yes	no	-	Not performed	No	100	200	-	-	-	-	-	-
6	150	150.2	79.0	71.2	-	50	08/54	2/77	26/84	0/-	no	no	yes	0-150	Not performed	Trace	-	-	150.0	-	-	-	-	Single
7	150	200.5	18.0	182.5	75	-	10/97	3/85	36/89	9/89	yes	yes	no	-	80-105	No	100	200	-	-	-	-	-	-
8	200	202.1	121.5	80.6	75	-	20/69	6/61	21/73	0/-	yes	no	yes	0-202.1	Not performed	Trace	-	-	202.1	-	-	-	-	Single
9	200	200.0	54.8	145.2	80	-	08/65	5/33	52/98	0/-	yes	no	yes	0-60-0-200	62-82 82-102	No	-	-	200.0	60	-	-	-	Double
10	200	202.0	22.5	179.5	-	165	05/88	2/00	62/72	0/-	no	no	yes	0-12 0-200	Not performed	Trace	-	-	200.0	42	-	-	-	Double
11	200	201.1	20.0	180.2	60	-	04/100	1/100	63/92	0/-	yes	yes	no	-	63-83 35-55 55-75	Yes	100	200	-	-	-	-	-	-
12	200	200.1	32.0	168.1	-	95	03/62	1/80	60/95	0/-	no	no	yes	0-200	Not performed	Trace	-	-	200	-	-	-	-	Single
13	200	200.0	33.0	167.0	60	-	05/86	1/00	66/92	0/-	yes	yes	no	-	51-71 111-131	No	100	200	-	-	-	-	-	-
14	200	199.6	30.0	169.6	60	-	05/69	2/50	60/92	0/-	yes	no	yes	0-30 0-200	100-120	No	-	-	200.0	30	-	-	-	Double
15	200	200.0	90.0	110.0	65	-	16/83	4/89	44/34	0/-	yes	yes	no	-	72-92 95-115 100-120	Trace	100	200	-	-	-	-	-	-
16	200	199.2	85.0	114.2	70	-	02/100	0/-	60/36	0/-	no	no	yes	0-80 0-200	Not performed	No	-	-	200	80	-	-	-	Double
17	200	200.9	38.0	162.9	-	145	04/97	02/100	58/88	0/-	no	no	yes	0-200	Not performed	No	-	-	200.0	-	-	-	-	Single
18	200	200.6	84.9	115.8	80	-	12/96	05/100	42/62	0/-	yes	yes	no	-	†	Trace	100	200	-	-	-	-	-	-
19	200	209.0	66.0	143.0	-	155	08/87	04/59	50/82	0/-	no	no	yes	0-200	Not performed	Yes	-	-	200.0	-	-	-	-	Single
20	200	192.5	109.7	82.3	90	-	13/68	02/79	43/82	0/-	yes	yes	no	-	80-100 100-120 120-140	Trace	100	200	-	-	-	-	-	-

* Proposal.

** Actual.

† Two geophone holes.

TABLE A-1 Summary of Boring Data (continued)

Hole No.	Depth of Geology Boring		Feet In Soil	Feet In Rock	Station ^a Depth (ft)	Tunnel ^a Depth (ft)	Sampling/Corre Recovery				Down Hole	Cross Hole	Piezometer Installed Depth (ft)	Water Pressure Test Depth Intervals (ft)	Natural Gas	Amount of Casings Installed (ft)				Hole Casing and Grouted	Completion Piezometer		
	1	2					SS	DR	PJ	DR						4 in.	3 in.	2 in.	1 in.				
21	200	200.0	147.5	52.5	-	160	11/95	04/88	30/89	0/-	no	no	yes	0-110 0-200	Not performed	Yes	-	-	200.0	110	-	-	Double
22	200	200.3	140.0	60.0	-	155	14/84	04/95	23/74	0/-	no	no	yes	0-129 0-200	Not performed	Yes	-	-	200.0	129	-	-	Double
23	200	200.7	122.0	78.7	89	-	19/91	10/190	25/89	0/-	yes	no	yes	0-200	Not performed	Yes	-	-	200.0	-	-	-	Single
23A	200	217.5	198.2	19.3	-	-	19/95	09/91	01/100	0/-	yes	no	yes	0-217.5	Not performed	Trace	-	-	217.5	-	-	-	Single
24	200	202.5	202.5	0.0	60	-	39/85	10/79	0/-	0/-	yes	yes	no	-	Not performed	No	100	200	-	-	-	-	-
25	200	202.5	202.5	0.0	-	150	20/85	10/87	0/-	0/-	no	no	yes	0-200	Not performed	No	-	-	200	-	-	-	Single
26	200	209.5	198.0	11.5	-	130	19/76	07/91	04/84	0/-	no	no	yes	0-56 0-200	Not performed	No	-	-	200.0	86	-	-	Double
27	200	201.0	201.0	0.0	-	125	18/90	03/100	08/80	0/-	no	no	yes	0-200	Not performed	No	-	-	200.0	-	-	-	Single
28	200	202.0	202.0	0.0	75	-	39/64	10/85	0/-	0/-	yes	yes	no	-	Not performed	No	100	200	-	-	-	-	-
28A	200	217.5	61.6	155.9	-	-	00/	0/-	6/90	0/-	no	no	yes	0-40 0-219.5	Not performed	No	-	-	217.5	40	-	-	Double
29	200	209.8	20.5	189.3	-	155	04/77	00/00	4/41	37/96	yes	no	yes	0-18.5 0-203.5	110-130 130-150	No	-	-	203.5	38.5	-	-	Double
30	250	251.0	45.0	206.0	-	130	04/87	00/00	0/-	65/94	no	no	yes	0-125	70-130 130-251	No	-	-	175	-	-	-	Single
31	300	300.0	0.6	299.4	80	-	03/62	00/00	0/-	95/91	yes	no	yes	0-180	51-138 138-300	No	-	-	180	-	-	-	Single
32	400	398.6	4.5	394.1	-	275	00/	00/00	4/92	88/95	no	no	yes	0-398.6	320-340 340-360	No	-	-	398.6	-	-	-	Single
32A	400	391.7	17.0	374.9	-	360	00/	00/00	0/-	92/95	no	no	yes	0-391.7	278-391	No	-	-	391.7	-	-	-	Single
33	220	220.8	38.0	182.8	-	145	03/	00/00	3/82	46/82	no	no	yes	0-40 0-110	120-140 140-160	No	-	-	160	40	-	-	Double
34	200	200.0	50.5	149.5	70	-	17/88	05/83	37/93	4/100	yes	yes	no	-	Not performed	No	100	200	-	-	-	-	-
35	200	198.0	120.5	77.5	-	125	12/82	06/95	7/80	15/82	no	no	yes	0-25 0-135	169-191 159-181	No	-	-	-	250	-	-	Double
36	200	206.7	206.7	0.0	-	125	18/	09/00	06/66	0/-	no	no	yes	0-201	Not performed	No	-	-	201	-	-	-	Single
37	200	202.0	202.0	0.0	-	120	20/63	10/78	0/-	0/-	no	no	yes	0-200	Not performed	No	-	-	200	-	-	-	Single
38	200	201.3	201.3	0.0	-	85	21/67	05/65	07/68	0/-	yes	no	yes	0-200	Not performed	No	-	-	200	-	-	-	Single

^a Proposal.

^{aa} Actual.

† Two geophone holes.

‡ Performed but no date given.

TABLE A-2 Correlation of N-Values and Consistency/Compactness of Soil Obtained In the Field

N-Values (blows/foot)	Hand-Specimen (clay only)	Consistency (clay or silt)	Compactness (sand only)	N-Values (blows/foot)
0 - 2	Will squeeze between fingers when hand is closed	Very soft	Very loose	0 - 4
2 - 4	Easily molded by fingers	Soft	Loose	4 - 10
4 - 8	Molded by strong pressure of fingers	Firm	---	---
8 - 16	Dented by strong pressure of fingers	Stiff	Medium dense	10 - 30
16 - 32	Dented only slightly by finger pressure	Very stiff	Dense	30 - 50
32+	Dented only slightly by pencil point	Hard	Very dense	50+

TABLE A-3 Bedrock Description Terms

PHYSICAL CONDITION*	SIZE RANGE	REMARKS
Crushed	-5 microns to 0.1 ft	Contains clay
Intensely Fractured	0.05 ft to 0.1 ft	Contains no clay
Closely Fractured	0.1 ft to 0.5 ft	
Moderately Fractured	0.5 ft to 1.0 ft	
Little Fractured	1.0 ft to 3.0 ft	
Massive	4.0 ft and larger	

HARDNESS**

Soft	- Reserved for plastic material
Friable	- Easily crumbled or reduced to powder by fingers
Low Hardness	- Can be gouged deeply or carved with pocket knife
Moderately Hard	- Can be readily scratched by a knife blade; scratch leaves heavy trace of dust
Hard	- Can be scratched with difficulty; scratch produces little powder & is often faintly visible
Very Hard	- Cannot be scratched with knife blade

STRENGTH

Plastic	- Easily deformed by finger pressure
Friable	- Crumbles when rubbed with fingers
Weak	- Unfractured outcrop would crumble under light hammer blows
Moderately Strong	- Outcrop would withstand a few firm hammer blows before breaking
Strong	- Outcrop would withstand a few heavy ringing hammer blows but would yield, with difficulty, only dust & small fragments
Very Strong	- Outcrops would resist heavy ringing hammer blows & will yield with difficulty, only dust & small fragments

WEATHERING	DECOMPOSITION	DISCOLORATION	FRACTURE CONDITION
Deep	- Moderate to complete alteration of minerals, feldspars altered to clay, etc.	Deep & thorough	All fractures extensively coated with oxides, carbonates, or clay
Moderate	- Slight alteration of minerals, cleavage surfaces lusterless & stained	Moderate or localized & intense	Thin coatings or stains
Little	- No megascopic alteration in minerals	Slight & intermittent & localized	Few stains on fracture surfaces
Fresh	- Unaltered, cleavage surface glistening	None	

*Joints and fractures are considered the same for physical description, and both are referred to as "fractures"; however, mechanical breaks caused by drilling operation were not included.

**Scale for rock hardness differs from scale for soil hardness.

TABLE A-4 Water Pressure Test

Boring No.	Depth of Section Tested (ft)		Pressure (psi)	Duration of Test (min)	Average Flow (gpm)	Remarks	
	Top	Bottom					
1	90.0	110.0	10			Packers would not seat	
	107.0	127.0	10			Packers would not seat	
	110.0	130.0	10			Packers would not seat	
	116.0	136.0	20			Packers would not seat	
7	80.0	105.0	10	5	0		
	80.0	105.0	20	5	0		
	80.0	105.0	40	5	0		
	80.0	105.0	60	5	0		
9	82.0	102.0	20	4	0		
	82.0	102.0	40	5	0.1		
	82.0	102.0	60	-	-	Packer seals would not hold	
	62.0	82.0	20	5	0		
	62.0	82.0	40	5	0.1		
	62.0	82.0	60	5	0		
	11	63.0	83.0	20	5	1.0	Natural artesian flow made packer leakage estimates difficult
		63.0	83.0	40	5	1.0	
63.0		83.0	60	5	1.6		
63.0		83.0	80	5	1.6		
55.0		75.0	20	5	0.6		
55.0		75.0	40	5	0.7		
55.0		75.0	60	5	0.9		
55.0		75.0	80	5	0.8		
35.0		55.0	20	5	0.8		
35.0		55.0	40	5	0.9		
35.0		55.0	60	5	1.3		
35.0		55.0	80	5	1.6		
13	111.0	131.0	20	5	0		
	111.0	131.0	40	3	0.7	Packer's seals let loose	
	51.0	71.0	40	5	0		
	51.0	71.0	60	5	0		
	51.0	71.0	80	-	-	Packer seals would not hold	
14	100.0	120.0	20	3	0.1	Leaking 1/4 gal/min	
	100.0	120.0	40	-	-	Packer seals would not hold	
	55.0	75.0	20	-	-	Packer seals would not hold	
	45.0	65.0	20	-	-	Packer seals would not hold	
	70.0	90.0	20	-	-	Packer seals would not hold	
	15	100.0	120.0	20	-	-	Packer seals would not hold
95.5		115.5	20	5	0	Formation held water at 20 psi	
95.5		115.5	40	-	-	Packer seals would not hold	
71.0		91.0	40	5	0		
71.0		91.0	60	5	0		
18	100.0	121.3	20	-	-	Packer seals would not hold	
	110.0	131.3	20	5	=1		
	115.0	136.3	20	0.33	27.6		
20	120.0	140.0	20	5	0		
	120.0	140.0	40	5	0		
	120.0	140.0	60	-	-	Hole washed our around packer	
	100.0	120.0	20	5	0		
	100.0	120.0	40	5	0		
	100.0	120.0	60	5	0		
	100.0	120.0	80	-	-	Test aborted; too much fluctuation	
	80.0	100.0	10	-	-	Test aborted; packer let loose at 435, 500 & 650 psi	

TABLE A-4 Water Pressure Test (continued)

Boring No.	Depth of Section Tested (ft)		Pressure (psi)	Duration of Test (min)	Average Flow (gpm)	Remarks
	Top	Bottom				
29	110.0	130.0	30	5	0	
	110.0	130.0	50	5	0	
	110.0	130.0	80	5	0.2	
	130.0	150.0	30	5	0	
	130.0	150.0	50	5	0	
	130.0	150.0	80	5	0	
	130.0	150.0	100	5	0	
30	70.0	130.0	20	5	0	
	70.0	130.0	40	5	0	Formation fractured
	70.0	130.0	60	3	0.9	
	70.0	130.0	100	5	28	Possibly hydro-fractured formation at 100 psi
	130.0	251.0	20	5	0.2	
	130.0	251.0	40	5	0.1	
	130.0	251.0	60	3	0	
31	138.0	300.0	20	5	17.2	Fractured rock
	138.0	300.0	40	5	20.4	
	138.0	300.0	60	5	29.0	
	51.0	138.0	20	5	1.8	
	51.0	138.0	40	5	11.6	
	51.0	138.0	60	5	22.6	
	32	340.0	360.0	10	5	0
340.0		360.0	50	5	0	
340.0		360.0	100	5	0.1	
340.0		360.0	140	2	0	
320.0		340.0	10	5	0	
320.0		340.0	50	5	0	
320.0		340.0	100	5	0.2	
32A	278.0	390.0	25	3	0	
	278.0	390.0	60	4	0	
	278.0	391.0	100	3.5	0.1	Due to rod leakage
33	140.0	160.0	10	5	0	
	140.0	160.0	20	5	0	
	140.0	160.0	40	5	0	
	140.0	160.0	60	5	0	
	140.0	160.0	100	5	0.6	
	120.0	140.0	10	5	0	
	120.0	140.0	20	5	0	
	120.0	140.0	40	5	0	
	120.0	140.0	60	5	0	
	120.0	140.0	100	5	1.6	
	35	169.0	191.0	0	-	-
159.0		181.0	0	-	-	Packer would not seat

TABLE A-5 Groundwater Monitoring Summary

Hole No.	Pipe Diameter (in.)	Pipe Depth (ft)	Date Depth Measured	Depth to Water (ft)	Depth to Water (ft) 06/17/81	Date of Water Quality Sample	Remarks
1	2	149.1	03-10-81	26.0	24.5	02-19-81	Perched water
2	2	100.0	03-10-81	13.5	13.5	02-19-81	Pipe has filled with a heavy oil/tar crude
3	2	150.6	03-10-81	33.1	33.0	02-19-81	
4	2	150.0	03-10-81	30.0	29.7	02-19-81	
5	crosshole	-	01-04-81	25.0	-----	*	Boring grouted; data obtained during drilling
6	2	150.0	03-17-81	19.5	21.0	02-20-81	
7	crosshole	-	12-18-81	12.0	-----	*	Boring grouted; data obtained during drilling
8	2	202.1	03-07-81	105.7	112.5	*	
9	2	200.0	03-07-81	53.0	53.5	02-23-81	Bentonite separating plug ineffective
9	1	60.0	03-07-81	51.5	52.5	*	
10	2	200.0	03-22-81	27.1	25.1	*	Bentonite separating plug ineffective; reads perched water
10	1	42.0	03-22-81	22.7	22.9	02-23-81	Reads perched water
11	crosshole	-	-----	-----	-----	01-31-81	Artesian
12	2	200.0	03-22-81	14.5	16.1	02-18-81	Reads perched water
13	crosshole	-	01-30-81	16.5	-----	*	Boring grouted; data obtained during drilling
14	2	200.0	03-22-81	24.7	24.5	02-18-81	Bentonite separating plug ineffective
14	1	30.0	03-22-81	21.7	25.0	*	Reads perched water
15	crosshole	-	01-27-81	15.0	-----	*	Boring grouted; data obtained during drilling
16	2	200.0	03-29-81	35.2	-----	02-18-81	Bentonite separating plug ineffective; reads perched water
16	1	80.0	03-29-81	35.2	-----	02-18-81	
17	2	200.0	03-29-81	24.9	-----	02-18-81	Reads perched water
18	crosshole	-	01-26-81	15.0	-----	*	Boring grouted; data obtained during drilling
19	2	200.0	03-29-81	12.6	-----	02-20-81	Hole filled with a heavy tar/oil crude
20	crosshole	-	01-14-81	18.0	-----	*	Boring grouted; data obtained during drilling
21	2	200.0	03-25-81	109.5	109.3	01-07-81	Deep aquifer
21	3/4	110.0	03-25-81	16.5	14.0	01-07-81	Perched water

* Not sampled

TABLE A-5 Groundwater Monitoring Summary (continued)

Hole No.	Pipe Diameter (in.)	Pipe Depth (ft)	Date Depth Measured	Depth to Water (ft)	Depth to Water (ft) 06/17/81	Date of Water Quality Sample	Remarks
22	2	200.0	-----	-----	36.5	02-16-81	Oil/tar seepage into pipe; accuracy of water level uncertain
22	3/4	129.0	03-25-81	15.6	17.5	02-16-81	Reads perched water
23	2	200.0	03-25-81	7.3	-----	02-13-81	Perched water
23A	2	217.5	03-25-81	21.2	-----	02-20-81	Reads perched water
24	crosshole	-	-----	-----	-----	-----	Boring grouted; data obtained during drilling
25	2	200.0	03-24-81	108.0	-----	02-13-81	-----
26	2	200.0	03-24-81	24.5	25.5	02-12-81	Pipe broken during installation; both piezometers reading perched water
26	1	86.0	03-24-81	24.5	25.5	02-12-81	-----
27	2	200.0	03-24-81	29.8	30.5	02-13-81	Possibly reading perched water; existence of lower aquifer uncertain
28	crosshole	-	01-12-81	75.0	-----	*	Boring grouted; data obtained during drilling
28A	2	217.5	03-23-81	53.2	-----	*	-----
28A	1	40.0	03-23-81	-----	-----	*	Dry
29	2	203.5	03-23-81	73.2	-----	*	-----
29	1	38.5	03-23-81	-----	-----	*	Dry
30	2	175.0	03-20-81	22.2	20.5	*	Possibly perched water?
31	2	180.0	03-20-81	28.5	-----	03-02-81	Possibly perched water?
32	2	398.6	03-20-81	56.9	56.5	02-24-81	-----
32A	2	391.7	03-17-81	9.5	-----	*	Reads perched water on top of bedrock
33	2	160.0	03-17-81	22.8	-----	02-11-81	Reads perched water; bentonite separating plug ineffective
33	1	40.0	12-04-80	21.5	-----	02-12-81	-----
34	crosshole	-----	04-02-81	19.0	-----	*	Boring grouted; data obtained during drilling
35	1 (west)	175.0	-----	93.0	93.5	02-12-81	-----
35	1 (east)	75.0	03-16-81	-----	-----	*	Dry
36	2	201.0	03-09-81	110.3	118.8	02-10-81	-----
37	2	200.0	03-09-81	121.5	123.5	02-10-81	-----
38	2	200.0	03-09-81	137.2	139.5	02-25-81	-----

* Not sampled




THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 10-11 Feb. 81 HOLE NO. 1
 LOCATION 10000 S. ... GROUND ELEV. 317
 DRILLING CONTRACTOR J.N. ... Co. LOGGED BY ... DEPTH TO GROUND WATER 22.0
 TYPE OF RIG ... HOLE DIAMETER 4.5 HAMMER WEIGHT AND FALL 140 lbs. 20 ft
 SURFACE CONDITIONS ... TOTAL DEPTH 149.1 NO. CORE BOXES 1

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0' - 0.4' asphalt			C			
		0.4' - 1.0' bedrock			AB			
1.0		1.0' - 5.6' <u>SILTY CLAY:</u> medium brown (5YR 5/2); 25% low plasticity silt; 5% fine sand; 69% clay is subrounded.			RD			
2.0								
4.0		color change to medium brown (10YR 5/3).						
5.6	ALL	5.6' - 7.2' <u>SANDY SILT:</u> moderate yellowish brown (10YR 5/3); 30% low plasticity silt; 5% fine sand; 65% medium stiff sand is subrounded.						Drilling with ...
7.2								
9.2	SM	9.2' - 15.4' <u>SILTY SAND:</u> light olive brown (5Y 5/6); 80% medium to coarse sand; 20% low plasticity silt; dry to moist medium dense sand is subrounded; sand is derived from ... micritic ... gravel (<5%), iron staining.	J-1	24	SS			rig chattering.
10.0				15				1.0/1.5 recovery.
12.0		gravel content increasing.		10	RD			rig chattering.
14.0	SW	12.4' - 16.6' <u>GRAVELLY SAND:</u> light olive brown (5Y 5/6); 50% coarse sand; 20% gravel; 10% low plasticity silt; 10% clay; sand is subrounded; gravel is mostly rounded; sand is derived from ... micritic ...						drill rate = 75%/minute.
16.0								
16.6	SW	16.6' - 27.2' <u>SANDY GRAVEL:</u> medium olive (10YR 5/3); 40% coarse sand; 10% moderate yellowish brown (5YR 5/6) and moderate yellowish brown (10YR 5/3); 20% gravel; 40% silt; 10% low plasticity silt; 20% fine sand; 10% gravel is rounded; sand is subangular to subrounded.						rig chattering.
18.0								1140.
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
20.0	GW	16.6'-29.2' <u>SANDY GRAVEL:</u> (continues).	C-1		DR			0.6/0.9 recovery. coverly bent sampler head. DR blowcount: 51, 100.	
			J-2	30	SS			0.3/0.6 recovery.	
22.0						RD			
24.0									
26.0									
28.0									
29.2'		<u>29.2' - 50.7' PUENTE FORMATION</u>						13:00.	
		<u>CLAYSTONE:</u>							
30.0	Y 37	banded; grayish olive green (SG 3/2) grayish green (SG 5/2); olive gray (SG 3/2); greenish gray (SG 6/1); 79% high plasticity fines; 2% fine sand. very stiff; dry to moist. sand is subangular; laminated to finely bedded; interbedded greenish gray (SG 6/1) siltstone.	J-3	21	SS			1.5/1.5 recovery.	
				43					
				50		RD			
32.0									
34.0									
36.0									
38.0									
40.0									
42.0									
44.0	42 Y	beds slightly folded.	S-1		PS	1		2.6/2.8 recovery. drill rate = .5/minute.	
								13:45.	
			box #1			2		1.9/2.7 recovery.	
								SHEET 2 OF 8	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0		59.2'-58.7' <u>PUNTE FM.</u> <u>CLAYSTONE</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described).	box #1		PB	2		1.9/2.7 recovery.
46.0		uncemented fine sand lenses and laminae [grayish brown (SYR 3/2)] comprise approximately 10% of formation.				3		1.3/2.8 recovery. drill rate = .3/minute.
48.0		tar in more permeable beds. pronounced odor.				4		2.7/2.7 recovery. petroleum sample 49.5-51.3
50.0						5		2.4/2.8 recovery. disturbed sample. Pitner barrel damaged (gravel fell in from above).
52.0						6		2.7/2.7 recovery. tar floating on mud tank.
54.0		tar in up to 50% of beds of formation.	box #2			7		1.9/2.8 recovery. not kept in tube because severely disturbed.
56.0						8		0.6/2.7 recovery. sample not kept in tube because of poor recovery.
58.7-61.3'		<u>SILTSTONE:</u> light bluish gray (SB 7/1); quartz, mica, feldspar, equigranular, well-cemented; moderately hard; weak; slightly weathered; contains fatty laminae; apparently a well-cemented zone of the claystone (concretion).				9		2.8/2.8 recovery. 16:00. drill rate = .25/minute.
61.3-149.1		<u>CLAYSTONE:</u> (continues as described above). sulfurous-organic odor.	5-2			10		1.75/2.7 recovery.
64.0						11		2.8/2.8 recovery.
66.0		small fault with .125" displacement. dies out after 5" oriented vertically.	box #2					
65.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		61.5-149.1' <u>PUENTE FM</u> <u>CLAYSTONE:</u> (continues)	box #2		PB	11		2.8/2.8 recovery.
70.0	42 ✓	<u>PHYSICAL CONDITION:</u> (continues as previously described). beds 0.2"-1.0" thick.				12		2.7/2.7 recovery.
72.0			box #3					
74.0	45 ✓ 38 ✓	strong tar odor persists. beds 0.2"-1.1" thick.				13		17:00 10 Feb. 1981 1.8/2.8 recovery. 11 Feb. 81 07:10 0% combustible gas. water table at 17.3'. thinning down drilling fluid.
76.0		sand lenses (fine, uncemented, subrounded sand in pockets comprising 5-10% of formation.				14		2.7/2.7 recovery. drill rate = 2.5 ft./minute.
78.0		sulfurous-organic odor.	S-3			15		2.8/2.8 recovery. drilling with 250 p.s.i. hydraulic draw-down. 08:20.
80.0								
82.0		sand beds and lenses comprise 10% of formation.	box #3			16		2.7/2.7 recovery. drill rate = 1.75 ft./minute.
84.0								
86.0	45 ✓	tar, tar odor. core breaks easily along sandy bedding planes.	box #4			17		2.8/2.8 recovery.
88.0	45 ✓	bedding less distinct and distorted, possibly pre-consolidation disturbance.				18		2.7/2.7 recovery. tar floating on mud tank. 09:30.
90.0	45 ✓					19		2.8/2.8 recovery. drill rate = 1 ft./minute.
92.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		613'-149.1' <u>PUNTE FM.</u> <u>CLAYSTONE</u> : (continues) <u>PHYSICAL CONDITION</u> : (continues as previously described)	box #4		PB	19		2.8/2.8 recovery.
94.0			box #5			20		2.7/2.7 recovery. sample disturbed. filter barrel damaged by concretion at end of run.
96.0	41 Y	94.7'-97.8' concretions; well-sorted siltstone and sandstone. see description for interval from 58.7-61.3'	S-4			21		1.7/1.7 recovery. rig chattering. run disturbed. filter barrel damaged by concretion at end of run.
98.0				S-5		FD	22	
100.0			S-5		PB	23		2.3/2.8 recovery.
102.0		uncemented, fine sand beds up to 2.5" thick. 40% of sample is sand.	box #5			24		11:40. 2.4/2.7 recovery.
104.0	38 Y						25	
106.0	40 Y	sand beds comprise approximately 30% of sample.				26		2.4/2.7 recovery. samples expand when left inside pitcher tubes making extrusion very difficult.
108.0	40 Y			box #6			27	
110.0		sand beds comprise approximately 20% of sample.				28		drill rate = 2 ft./minute. 2.7/2.7 recovery.
112.0	41 Y							
114.0								
116.0	40 Y							

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	37	61.3-149.1 <u>PUENTE FM.</u> <u>CLAYSTONE</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described)	S-6		PB	29		2.5/2.8 recovery. sample disturbed. pitcher barrel was improperly placed. tar present in the hole.
118.0								
120.0	39		box #6			30		2.7/2.7 recovery. sample disturbed. pitcher barrel was improperly placed. tar present in hole. 13:20.
122.0		core breaks easily along sandy bedding planes.	box #7			31		2.5/2.8 recovery.
124.0	40	tar still prevalent.						
126.0	42	sand and silt beds comprise ~ 50% of sample.				32		2.7/2.7 recovery. drilling with 200p.s.i. hydraulic draw-down.
128.0	42	tar less frequently occurring; still odorous.				33		2.8/2.8 recovery. drill rate = 1.8'/minute.
130.0	41					34		2.7/2.7 recovery. 14:15
132.0			box #8					
134.0	40		S-7			35		2.8/2.8 recovery.
136.0	39		box #8			36		0.4/2.7 recovery. pitcher tube wedged in barrel.
138.0	40					37		2.8/2.8 recovery. 15:15.
140.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0	40 ✓	61.3'-149.1' <u>PUENTE FM. CLAYSTONE:</u> (continues). <u>PHYSICAL CONDITION:</u> (continues as previously described)	box #8		PB	37		2.9/2.9 recovery.
142.0						38		2.7/2.7 recovery.
144.0						39		2.3/2.8 recovery.
146.0						40		2.8/2.8 recovery. petroleum sample: interval 143.0-148.9'
148.0			box #9 5-8					
150.0		B.H. 149.1' Terminated hole.						16:30 11 Feb. '81 Ran electric logs from 16:45-18:30 08:00 12 Feb '81 water table at 22.9' 0% combustible gas 12:30 Set 2" diameter p.v.c. casing from ground surface to 149.1', per- forated densely from 10.0'-50.0' (for gas analysis) and sparsely from 114.1'-149.1' (for deep groundwater). GAS ANALYSIS BY RYLAND- CUMMINGS WAS PERFORMED. GAS WAS DETECTED w/ THE CHROMATOGRAPH. Water sampled 2/19/81
152.0								



SUMMARY BORING NO. 1

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 10-11 Feb. '81.

OVERBURDEN DEPTH (FT.) 0.0' TO 29.2'.

BEDROCK DEPTH (FT.) 29.2' TO 149.1' (T.D.).

WATER PRESS. TEST YES; INTERVAL(S) 90' TO 110', 116' TO 136'.

GROUND WATER DEPTH (FT.) 22.9' DATE 12 Feb.; 17.8' DATE 11 Feb.

(TRACE)
 GAS YES; DEPTH FIRST NOTICED , DATE .

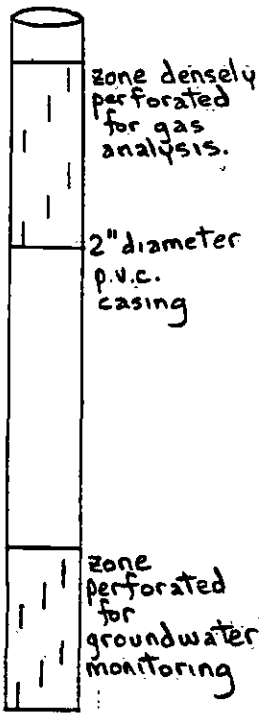
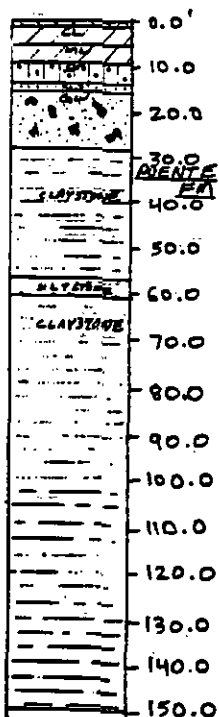
E-LOG YES.

DOWN-HOLE SURVEY NO.

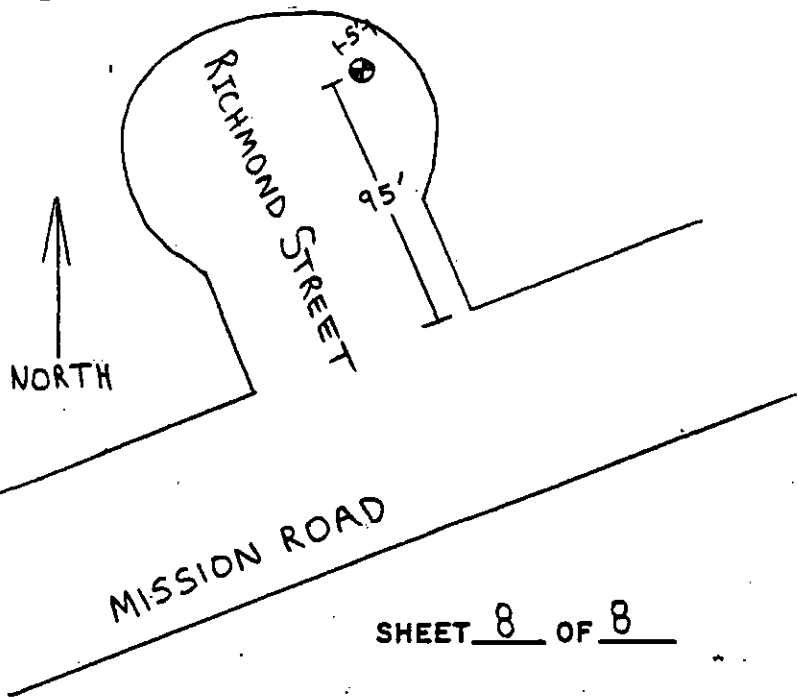
CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" TO ; 3" TO ; 2" 0.0' TO 149.1'.

GROUND ELEVATION REF. 317'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 2/13/81 - 2/15/81 HOLE NO. 2
 LOCATION Mission St. south of Mecca GROUND ELEV. 280'
 DRILLING CONTRACTOR Pitchee LOGGED BY Gallinetti DEPTH TO GROUND WATER none
 TYPE OF RIG Falling HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs., 30 in.
 SURFACE CONDITIONS Sidewalk TOTAL DEPTH 100.0 NO. CORE BOXES 7

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0-0.5 <u>CEMENT</u>			RD			Begin drilling
1	SP	0.5-12.0 <u>SAND</u> : moderate brown (5YR 4/4); ~5% low plasticity fines; ~80% fine grained sand; ~15% medium to coarse grained; scattered gravel and cobbles; loose; dry.						4:00 2/13/81 Auger to 7'; set 7' of 5" surface casing; stop for 2/13/81.
2								2/14/81 - mix mud & begin rotary drilling
4								
6								[P.P.] stands for pocket penetrometer: data obtained from field - extruded PB samples
8		8' = some large (3'-5") cobbles of granitic material.			RD			
10				20	SS RD			0.0/0.3 recovery - hit a rock after 0.3'; stopped sample.
12		<u>RUENTE FORMATION</u>						
12		12.0-38.6 <u>CLAYSTONE</u> : dk. moderate brown (5YR 3/4); 100% moderate plasticity fines; stiff; damp; oily; some thin sand layers are oil saturated; [P.P. > 5]; no fractures	S-1	23 38 48	SS			15/1.5 recovery
14								16' - begin continuous Fisher Barrel sampling (8:30)
16			S-1		RD	1		2.6/2.8 recovery & undisturbed sample
18								
20			BOX 1			2		

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (1')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20		12.0 - 38.6 CLAYSTONE (cont.)	Box 1		PB	2		2.8/2.8 recovery
22		22' - some SILET layers ~10-20% and occasional thin sand layers				3		2.8/2.8 recovery
24		24' - Disrupted bedding				4		2.8/2.8 recovery
26						5		2.5/2.8 recovery best tube - can't be extracted
28			S-2			6		2.4/2.8 recovery
30			Box 1 (cont.)			7		2.8/2.8 recovery *undisturbed sample
32		31'-33' highly disrupted bedding, seems to be small "faults" with minor displacements as well as abrupt attitude changes. POSSIBLY DISTINCT X-BEDDING.	Box 2			8		2.5/2.8 recovery increase in amount of oil - covering top of mud tool Petroleum sample 37.6-38.2
34			S-3			9		2.7/2.8 recovery GAS - bubbling up
36		37'-38.6' Fractured material w/ abundant oil; this was probably source of gas also	Box 2 (cont.)			10		2.8/2.8 recovery
38		38.6-100.0 SILTSTONE: dk yellowish brown (10 YR 4/2); 100% low plasticity fines; bedding is faint but constant; stiff; no fractures; can be crumpled w/ a knife with slight difficulty; friable; p.p. 75; oil; noticeable by smell and in fractures and sand lenses.						
40								
42								
44								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
44		<p>39.6-100.0 SILTSTONE: (cont.)</p> <p>PHYSICAL CONDITION: Fractures are rare and very thin, oil filled; can be gouged w/ a knife with difficulty; friable; [p.p. >5]</p> <p>amount of petroleum visible and petroleum odor decreasing (tighter formation)</p> <p>no bedding</p>	Box 3		PB	11		2.6/2.8 recovery	
46						12		2.6/2.8 recovery	
48									
50				5-4			13		2.4/2.8 recovery * undisturbed sample
52									
54				Box 3 (cont.)			14		2.9/2.8 recovery
56							15		2.8/2.8 recovery
58				Box 4			16		2.7/2.8 recovery
60									
62							17		2.8/2.8 recovery
64									
66							18		2.8/2.8 recovery
68				5-5			19		2.4/2.8 recovery * undisturbed sample

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68		38.6 - 100.0 <u>SILTSTONE</u> : (cont.)	S-5		PB	19		
70		Physical condition: no fractures. can be gouged w/ knife with difficulty; damp; oil dispersed throughout; [P.P. > 5]	Box 5			20		2.7/2.8 recovery
72						21		2.6/2.8 recovery
74						22		2.3/2.8 recovery
76						23		2.8/2.8 recovery
78						24		2.8/2.8 recovery
80			Box 6			24		2.8/2.8 recovery
82						25		2.8/2.8 recovery
84			S-6			25		2.8/2.8 recovery * undisturbed sample
86			Box 6 (cont.)			26		2.8/2.8 recovery
88		faint bedding				27		2.8/2.8 recovery
90						28		
92			Box 7			28		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92		38.6 - 100.0 <u>SILTSTONE</u> (cont.)	Box 7		PB	28		2.8/2.8 recovery
94		PHYSICAL CONDITION: no fractures; can be gouged w/ a knife with difficulty; friable; [p.p. > 5].				29		2.8/2.8 recovery
96		faint bedding				30		2.8/2.8 recovery # undisturbed sample
98			S-7					
100	B.H.	100.0 - Bottom of Hole						100' - Terminate Hole; stop circulation 1500' 2/14/81. ESH runs e-logs; Cummings runs gas analysis. 2/15/81 - flush out hole; install 100' of 2" PVC piezometer w/ cloth covered perforations from 60' to 95'. Gravel pack to surface; clean-up site and move off hole - noon 2/15/81, water sampled 2/19/81



SUMMARY BORING NO. 2

PROJECT 80-1280-22 STATION HOLE 110 DATE DRILLED 2/13/81 - 2/15/81

OVERBURDEN DEPTH (FT.) 0' TO 12'.

BEDROCK DEPTH (FT.) 12' TO 100' (T.D.).

WATER PRESS. TEST 110; INTERVAL(S) _____ TO _____, _____ TO _____.

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.

GAS yes; DEPTH FIRST NOTICED 37', DATE 2/14/81

E-LOG yes.

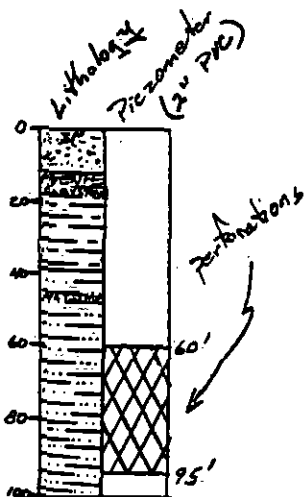
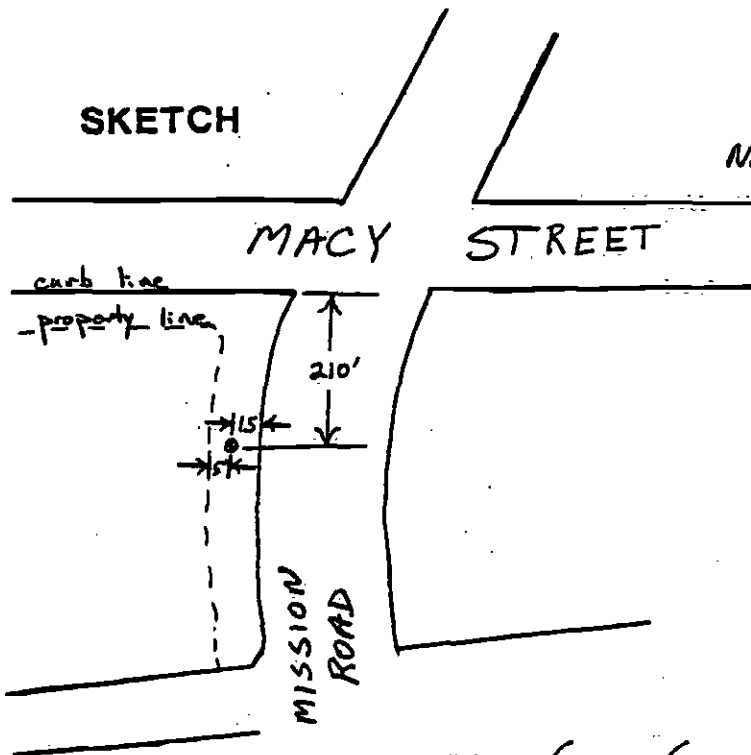
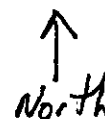
DOWN-HOLE SURVEY no.

CROSS-HOLE SURVEY no.

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 100'.

GROUND ELEVATION REF. 280'

SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 3-9 Feb. 1981 HOLE NO. 3
LOCATION east end of Commercial St on west bank of L.A. River GROUND ELEV. 281'
DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY S. Staff DEPTH TO GROUND WATER 31.8'
TYPE OF RIG Faling 1500 HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs 30 inches
SURFACE CONDITIONS brick and mortar TOTAL DEPTH 150.6' NO. CORE BOXES 4

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0' - 0.3' brick and mortar						10:30 3 Feb '81 began drilling.
	SM	0.3' - 0.8' cobblestone pavement			AD			0.0' - 0.8' drilled with "garbage barrel" (cylindrical bit).
2.0		0.8' - 5.5' FILL - SILTY SAND: dark yellowish brown (10YR 4/2); 60% sand, 35% low plasticity fines, 5% gravel; moist, medium dense; sand is subangular, gravel is well rounded brick, metamorphic rocks, and quartz.			RD			0.8' - 3.5' drilled with 6" flight auger. Set 6" steel surface casing to 3.5' with 1.5' stick-up.
4.0								3.5' - 10.0' drilled with new 4 7/8" tri-cone tooth bit. Mixed 2 sacks bentonite.
6.0	SP	5.5' - 22.3' GRAVELLY SAND: Mottled; yellowish gray (5Y 8/1), moderate reddish orange (10R 6/6), grayish black (N 2); 85% coarse sand, 15% gravel; saturated; medium dense.						Drilling with 230 p.s.i. hydraulic draw-down.
8.0								rig chattering.
10.0				17	SS			0.0/1.5 recovery. no sample.
				17				
				18				
12.0					RD			rig chattering. Mixed 2 more sacks bentonite. Mud is very thick.
14.0								
16.0								rig chattering.
18.0								
20.0								11:45

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	SP	5.5'-22.3' GRAVELLY SAND: (continues)	C-1		DR			DR blowcount: 58, 100. .75/1.0 recovery 350 lb slip jars; 24" drop used for drive samples. 1.5/1.5 recovery
22.0			J-1	29 36 51	SS			
24.0	SP SM	22.3'-38.6' SILTY SAND: light olive gray (SY 5/2); 90% fine sand, 10% low plasticity fines; moist; dense; sand is subangular.			RD			rig chattering
26.0								
28.0								
30.0			J-2	23 33 40	SS			12:30 10/15 recovery
32.0					RD			12:45
34.0		occasional cobbles						smoother drilling
36.0								drill rate = 1.25'/minute
38.0								
40.0	SP SM	38.6'-88.8' SILTY SAND: medium dark gray (N4); 90% fine to medium grained sand, 10% moderate plasticity fines; moist; very dense; subrounded, medium grained sand; some rounded granitic rock-derived metamorphic cobbles. gravel lens.	C-2		DR			13:00 DR blowcount: 100. .5/1.5 recovery then refusal intense rig chattering refusal-no sample 0.0/1.5 recovery
42.0					SS			
44.0					RD			intense rig chattering (metamorphic cobbles and boulders) drill rate = .1'/minute

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SP	38.6'-88.8' <u>SILTY SAND:</u> (continues)			RD			drilling with 100 p.s.i. hydraulic draw-down
46.0								
48.0								14:25
50.0			J-3	38 37 33	SS			1.3/1.5 recovery metamorphic boulder at 44.2' caused problems running back into hole after taking J-3 sample.
52.0		gravel lens			RD			
54.0		gravel lens						rig chattering.
56.0								
58.0		gravel content increases to 10% of formation ↓						
60.0			C-3		DR			DR blowcount: 8, 33. 0.3/1.0 recovery.
60.0			J-4	32 50	SS			0.5/1.0' recovery. 16:10
62.0					RD			
64.0								
66.0								
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SP	38.6'-88.8' <u>SILTY SAND:</u> (continues)			RD			
70.0		gravel content increases to 20% of formation	J-5	42	SS			14:40 .75/.75 recovery refusal at 70.75'
72.0					RD			
74.0								
76.0								
78.0								
80.0			J-6	50	SS			17:00 3 February 1981 07:45 4 February 1981 .25/.25 recovery. DR blowcount: 100 .2/.3 recovery.
82.0		gravel lens			RD			cleaned out hole before sampling. Obstruction at 44.2' gone now. refusal on both samples. rig chattering violently drilling with 150 p.s.i. hydraulic drawdown. mixed Isack bentonite.
84.0								
86.0		gravel lens						rig chattering.
88.0								08:30
90.0		88.8-150.6' <u>PUENTE FORMATION</u> <u>CLAYSTONE:</u> grayish olive green (SGY 3/2); 98% high plasticity fines, 2% fine sand; very stiff, moist; sticky; sand is subangular; sulfurous-organic odor; micaceous; poorly developed fissility.	J-7	26 30 48	SS			1.5/.5 recovery. unconfined strength > 4.5 tons/ft?
92.0					RD			SHEET <u>4</u> OF <u>8</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (s)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		88.8' - 150.6' PUENTE FM CLAYSTONE: (continues)			RD			
94.0		PHYSICAL CONDITION: massive; soft to friable hardness; soft to friable strength; fresh.						
96.0								
98.0								
100.0			box #1		PB	1	1	0.4/2.8 recovery metamorphic cobble from higher in hole blocked pitcher barrel and distorted sample.
102.0								
104.0			S-1			2		2.5/2.7 recovery. unconfined strength > 4.5 tons/ft ²
106.0		no longer any odor banded with grayish olive green (SGY 3/2) layers ~ 1/4" thick alternating with greenish black (SGY 2/1) layers ~ 1/8" thick				3		10:00 2.8/2.8 recovery adding water drill rate = 1.4'/minute
108.0	6 12					4		1.9/2.7 recovery.
110.0		massive structure						
112.0						5		2.8/2.8 recovery. 11:20
114.0								
116.0			box #2			6		2.7/2.7 recovery.

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		88.8'-150.6' <u>PUNTE FM</u> <u>CLAYSTONE:</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described).	box #2		PB	6		2.7/2.7 recovery.
118.0				7			2.7/2.8 recovery. 11:45	
120.0				8			2.7/2.7 recovery. sample was extruded (rather than saved as undisturbed) because Pitcher barrel was damaged by cobble from higher in hole. Hole caved in or bridged at 100' while running back in to collect PB-9. 4 February 1981.	
122.0					RD		9 February 1981. Groundwater deeper than 40'. Hole caved in from 123.8'. Drilled out with 50-200 psi hydraulic draw-down 10:45-10:20. Mixed 3 sacks bentonite, small amount synthetic polymer. Cave-in ended at bedrock. Small bridge at 100.3'. Mixed 4 more sack bentonite. Drilled to 123.0'. 11:30	
124.0			S-2		PB	9		2.8/2.8 recovery-run #9.
126.0	✓a1	moderately well-developed fissility. Cleavage planes are dark greenish gray (5G 4/1) to greenish gray (5G 6/1).	box #2			10		2.2/2.7 recovery-run #10. drilling with 250 p.s.i. hydraulic draw-down.
128.0	✓c0	yellowish gray (5Y 8/1) silt blebs .1-.3" long comprise 1-2% of sample.	box #3			11		2.3/2.8 recovery. metamorphic cobbles falling in from up the hole are cutting down recovery and disturbing some samples.
130.0						12		2.7/2.7 recovery. disturbed by bent Pitcher barrel.
132.0	✓14	poorly-developed bedding.				13		2.8/2.8 recovery. disturbed by bent Pitcher barrel. drill rate = .33'/minute.
134.0						14		2.3/2.7 recovery.
136.0	✓b					15		13:30 2.3/2.8 recovery.
138.0			box #4					
140.0			S-3					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
140.0		88.8-150.6' <u>PUENTE FM.</u> <u>CLAYSTONE:</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described)	S-3		PB	15		2.3/2.8 recovery	
142.0			S-4			16		2.5/2.7 recovery drill rate = 124/5 minutes	
144.0							17		0.3/2.8 recovery
146.0							18		2.8/2.8 recovery
148.0									
150.0								14:45 9 Feb. '81	
152.0		B.H. Terminated hole. 150.6'						Ran electric logs 15:00 - 17:00. Set 150' of 2" diameter p.v.c. casing perforated from 105'-150'. 07:15 10 Feb 1981 0% combustible gas groundwater at 31.8' below surface. water sampled 2/19/81	



SUMMARY BORING NO. 3

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 3-9 Feb 1981.

OVERBURDEN DEPTH (FT.) 0.8' TO 88.8'

BEDROCK DEPTH (FT.) 88.8' TO 150.6' (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) TO , TO .

GROUND WATER DEPTH (FT.) 31.8' DATE 10 Feb '81; DATE .

GAS TRACE; DEPTH FIRST NOTICED , DATE .

E-LOG YES.

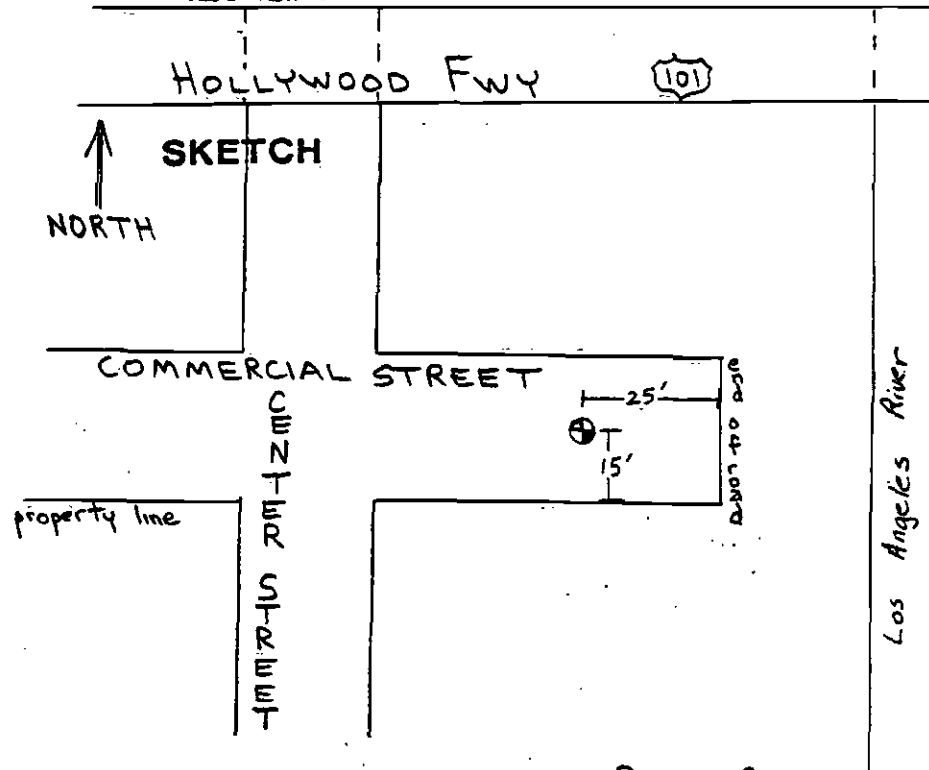
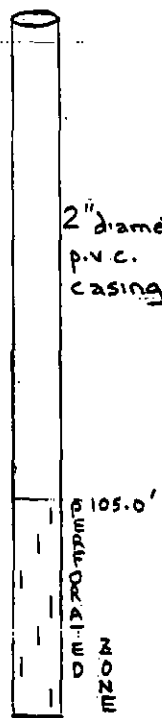
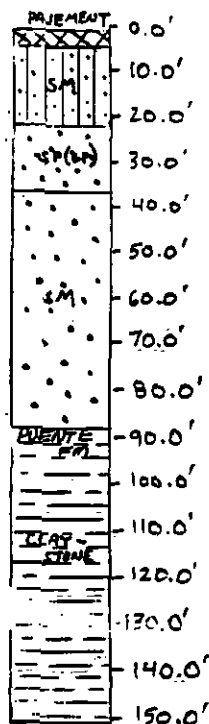
DOWN-HOLE SURVEY NO.

CROSS-HOLE SURVEY NO.

perforated from:
 105.0' - 150.6'

PVC CASING (I.D.): 4" TO ; 3" TO ; 2" 0.0' TO 150.6'

GROUND ELEVATION REF. 281'



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 4

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SCPTD DATE DRILLED 2-9-81 HOLE NO. 4
 LOCATION 210 E. OF PARKER ST. + CENTER ST. INTERSECT. ON S. SIDE OF PARKER ST. GROUND ELEV. 2.79'
 DRILLING CONTRACTOR Pitche Drilling Co. LOGGED BY Stephen M. Teske DEPTH TO GROUND WATER _____
 TYPE OF RIG Eding 1500 HOLE DIAMETER _____ HAMMER WEIGHT AND FALL 140lb. - 30in.
 SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 150.0' NO. CORE BOXES 5

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
0.0 - 2.0		1.0-0.2 CONCRETE; 0.2-14.0 FILL; Primarily crushed asphalt and brick.			RD			Started drilling at 8:45, cloudy day, light drizzle; augered down to 10.0'.	
2.0 - 4.0									
4.0 - 6.0									
6.0 - 8.0									
8.0 - 10.0					RD				
10.0 - 12.0									
12.0 - 14.0									
14.0 - 16.0	SP	14.0-21.0 GRAVELLY SAND: olive black (SP21), non-plastic fines (<5%); fine to medium sand (80%); gravel (15%) up to 2.0mm, in max. dia.; wet; very dense, poorly graded; odorous (oil); dilatancy quick; toughness none.	3-1	19	SS				SPT at 15.0'; 10/1.5 recovery.
16.0 - 18.0				30					
18.0 - 20.0				50					
20.0 - 21.0					RD				

SHEET 1 OF 8

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	SD	14.0-21.0 GRAVELLY SAND; (CONTINUED)		50	DR			(CONTINUED)
				50 1/2	SS			concrete sample at 20.0, no recovery;
	GP	21.0-31.5 SANDY GRAVEL:			RD			SPT at 20.5, no recovery.
22.0		numerous cobbles and boulders.						moderate to heavy rod chatter (episodic) from 21.0 to 30.0.
24.0								
26.0								
28.0								
30.0				50 1/2	SS			SPT at 30.0, no recovery.
					RD			causing is preventing advancement of hole;
32.0		gravels range up to 6.0 diam. in max. dia., consist primarily of granitics and metamorphic, subangular to sub-rounded; poorly graded.	J-2					added two sacks of bentonite; cuttings sampled at 32.0.
34.0								
36.0								
38.0								
40.0				50 1/2	SS			SPT at 40.0, no recovery; much difficulty getting back into hole.
					RD			
42.0								
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	GP	2.0-INS SANDY GRAVEL (CONTINUED) numerous cobbles and boulders.			RD			(CONTINUED)
46.0								moderate to heavy rig shaking continues.
48.0								
50.0								due to heavy rig shaking, no SPT was taken at 50.0'
52.0								
54.0								
56.0								
58.0								
60.0		continued; numerous cobbles and boulders.			RD			SPT at 60.0', no recovery.
62.0								stopped drilling at a depth of 70.0'
64.0								2-10-81 Resumed drilling at 7:00 AM, clear day.
66.0								
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	GP	210-10.5 SANDY GRAVEL (CONTINUED) primarily cobbles and boulders.			RD			(CONTINUED) moderate to heavy rip shaking continues
70.0				50/2	SS			SPT at 70.0, no recovery; much difficulty getting back into hole.
72.0								
74.0								
76.0								
78.0								
80.0		continued; primarily cobbles and boulders.		20/4	SS RD			SPT at 80.0, no recovery.
82.0								
84.0								
86.0								
88.0								
90.0								
92.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	SP	21.0-101.5 SANDY GRAVEL (CONTINUED)			RD			(CONTINUED)
94.0		fine to coarse sand with numerous cobbles and boulders.						moderate to heavy rig shaking to 101.5'
96.0								
98.0								
100.0								
102.8		<u>RIENTE FORMATION</u> 101.5-150.0 CLAYSTONE: primary olive gray (5Y3/2) micaceous claystone (90%), very fine sand (10%); compositional banding apparent.			RB			gas check 0.0% LEL; no gas encountered; continuous pitcher barrel sampling from 102.5; had to ream hole out to 7.0" with tri-cone bit from 12:45 to 1:20 AM in order to pitcher barrel; pitcher barrel samples are at 2.8' intervals.
104.0		<u>PHYSICAL CONDITIONS:</u> massive, soft to friable hardness; plastic to weak strength; fresh; tends to fracture along bedding planes. continued.				1	2.8 2.8	
106.0			Box #1			2	2.8 2.8	
108.0	80 70	from 107.8, very thin to medium compositional banding; contacts sharp and parallel; hairline fractures at 108.4 dipping 80° to core axis with an oriented strike 70° to bedding.				3	2.8 2.8	200 psi. pocket penetrometer 24.5 kg/cm ²
110.0								
112.0	70 4	primarily claystone exhibiting compositional banding; at 112.1 clay filled fracture with undeterminable offset.				4	2.8 2.8	200 psi.
114.0	80 70	continued; very thin to medium compositional banding evident in claystone (depositional features); from 113.7 alternating claystone and very thin grayish brown (5YR 3/2) fine sandstone laminae	Box #2			5	2.8 2.8	200 psi.
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		101.5-150.0 CLAYSTONE: (CONTINUED)	Box # 2		PB	5	2.9 2.6	(CONTINUED) 200 psi.
118.0		PHYSICAL CONDITION: (CONT.) massive; soft to friable hardness; plastic to weak strength; fresh; tends to fracture along S-1 bedding planes, notably sandstone laminae. primarily claystone with wavy parallel alternating very thin to thin fine sandstone (5%) laminae.				6	2.8 2.8	200 psi.
120.0		119.3 to 119.9 intensely fractured (orientation undeterminable).	Box # 2			7		200 psi.
122.0	70	continued; compositional banding apparent in claystone.				8	2.4 2.0	200 psi.
124.0							2.6 2.8	Stopped drilling at a depth of 124.9' at 5:00.
126.0	70	continued; primarily claystone (80-85%), fine sandstone (10-15%).	Box # 3			9	2.8 2.8	2-11-81 Resumed drilling at 7:00 AM, clear day.
128.0	70	continued.				10		200 psi.
130.0							2.8 2.8	
132.0		continued; compositional banding apparent in claystone (bluish green clay).	Box # 4			11	2.8 2.6	200 psi. pocket penetrometer 74.5 kg/cm ²
134.0						12		200 psi.
136.0		continued.		S-2			2.5 2.8	
138.0			Box # 4			13	2.8 2.8	200 psi.
140.0		continued.				14	2.8 2.8	200 psi.

5:00
7:00

7:20

8:10
8:15

8:42
9:03

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	OPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0		141.5 - 150.0 CLAYSTONE (CONTINUED) 140.7 - 141.7 well cemented very fine greenish gray (5G61) sandstone.	Box # 4		PB	14	2.5 2.5	(CONTINUED)
142.0		PHYSICAL CONDITION: contains as previously described.				15		200 psi. pocket penetrometer > 4.5 kg/cm ²
144.0	10:20	144.5 to 145.3 grayish brown (5YR3/2) fine to medium sand, partially saturated with oil.	Box # 5			16	1.9 2.8	200 psi. petroleum sample 145-146
146.0		from 145.3 primarily mottled claystone (70%); oil saturated fine to medium sand (30%).				17	2.7 2.7	Terminated hole at a depth of 150.0' at 11:20 AM; E-log conducted from 11:30 to 2:00 PM.
148.0			S-3					
150.0	B.H.	TERMINATE HOLE 150'						Installed 150.0' / 2" PVC piezometer (PVC slotted from 110.0' to 145') and back filled hole with pea gravel. 5' BEATSITE PLUG AT SURFACE. WATER SAMPLED 2/19/81

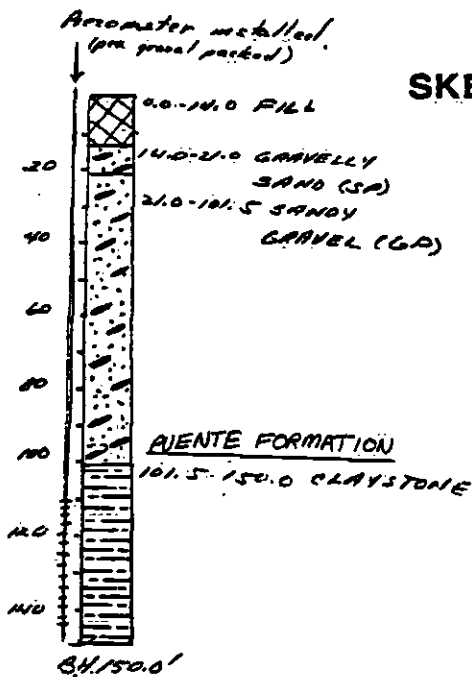
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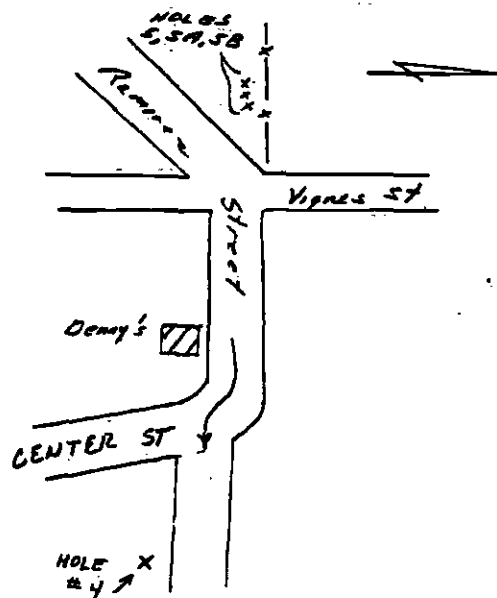


SUMMARY BORING NO. 4

PROJECT SCATD STATION HOLE NO DATE DRILLED 2-9-81/2-11-81
 OVERBURDEN DEPTH (FT.) 0.0 TO 101.5
 BEDROCK DEPTH (FT.) 101.5 TO 150.0 (T.D.)
 WATER PRESS. TEST NO; INTERVAL(S) — TO —, — TO —
 GROUND WATER DEPTH (FT.) — DATE —; — DATE —
 GAS TRACE; DEPTH FIRST NOTICED —, DATE —
 E-LOG YES
 DOWN-HOLE SURVEY NO
 CROSS-HOLE SURVEY NO
 PVC CASING (I.D.): 4" — TO —; 3" — TO —; 2" 0.0 TO 150.0
 GROUND ELEVATION REF. 279'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SCATD DATE DRILLED 12/20 - 24/90 HOLE NO. 5
LOCATION at intersection of Vigano & Ramirez St, Los Angeles GROUND ELEV. 280
DRILLING CONTRACTOR Pitkin Drilling Co. LOGGED BY Stephen M. Fasta DEPTH TO GROUND WATER _____
TYPE OF RIG Fauling 1500 HOLE DIAMETER 6 7/8, 9 7/8 HAMMER WEIGHT AND FALL 140lb - 30in
SURFACE CONDITIONS asphalt roadway TOTAL DEPTH 150.0' NO. CORE BOXES 5

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0 - 0.3 ASPHALT			RD			Started drilling at 9:20 AM, cloudy day.
0.3	GP	0.3 - 52.0 SANDY GRAVEL; non-plastic fines (25%); medium- to coarse sand (40%); gravel (55%); gravel primarily composed of gravities ranging up to 6" in max dia.; poorly graded.						moderate to heavy rig chatter from 3.0'; averaging 300 psi; did not begin sampling schedule until 52.0' due to the cobbly and gravelly nature of the material.
2.0								
4.0								
6.0								
8.0								
10.0								
12.0								
14.0								
16.0								
18.0								
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (#)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	GP	0.3-52.0 SANDY GRAVEL (CONTINUED)			RD			(CONTINUED) moderate to heavy 17 khaton from 3.0' averaging 300 psi
22.0								
24.0								
26.0								
28.0								
30.0								
32.0								
34.0								
36.0								
38.0								
40.0								
42.0								
44.0								

PROJECT

SCATA

DATE DRILLED


1-2-80

HOLE NO.

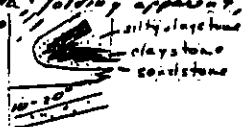
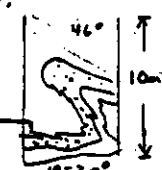
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DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	GP	0.3-52.0 SANDY GRAVEL: (CONTINUED)				RD		(CONTINUED) heavy rig shaking to 52.0; averaging 300 psi
46.0								
48.0								
50.0								
52.0	SP	52.0-55.0 GRAVELLY SAND: medium dark gray (N4), plastic fines (45%); medium to coarse sand (75%); gravel up to 1/2 inch in max. dia. (20%), primarily granitic; toughness none; dilatancy none; odor apparent (similar to that of a cesspool).	J-1	47 50/10	SS RD			SPT at 52.0; 3/15 recovery
54.0								easy drilling from 53.0 to 55.0; heavy rig shaking from 55.0 to 60.0
56.0	GP	55.0-64.2 SANDY GRAVEL:						
58.0								
60.0		cuttings primarily gravel of granitic composition.		40 50/10	SS RD			SPT at 60.0; no recovery. heavy rig shaking from 60.6 to 66.0
62.0								
64.0								
66.0		medium dark gray (N4) very fine-grained sand; moist	J-2	B 20 50/10	SS RD			SPT at 66.0; 3/15 recovery
68.0								

SHEET 3 OF 8

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		55.0-84.2 SANDY GRAVEL: (CONTINUED)			RD			(CONTINUED)
70.0				50	DR			Converse sampler at 70.0; no recovery; clutch disengaged.
72.0					RD			moderate to heavy rig shaking from 70.6 to 84.2.
74.0								
76.0								
78.0		cuttings primarily gravel of granitic composition						heavy rig shaking at 75.0; cuttings obtained.
80.0								heavy rig shaking at 80.0.
82.0								
84.0								easy drilling from 84.2; claystone cuttings, and in tip of bit
86.0		<u>PUENTE FORMATION</u> 84.2-150.0 <u>CLAYSTONE</u> : Wavy, parallel bedding; primarily olive gray (5-7.5/2) claystone (50%) with alternating very thin to thin laminae of dusky yellowish brown (10YR 2/2) siltier claystone (30%) and light gray (N7) friable sandstone (20%); micaceous; claystone fossiliferous (61%); opposite dip orientation apparent in PB-1.			PB	1	10/10	2-3-81 Resumed drilling at 85.0; clear day; about 10.0' of casing, cleaned out hole with pitcher barrel; pitcher barrel from 85.0-86.0, 86.0 to 88.5.
88.0			Box # 1		PB	2	15/25	
90.0		 <u>PHYSICAL CONDITION:</u> soft to friable hardness; plastic to friable strength; fresh; tends to fracture along bedding planes, notably friable sandstone beds and laminae.			PB	3	14/25	pitcher barrel from 88.5 to 91.0; 91.0 to 93.5
92.0		sandstone blobs apparent.			PB	4	22/25	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	52° Y	872-1500 CLAYSTONE; CONTINUED <u>PHYSICAL CONDITIONS:</u> (continues to be the same as previous description) folding of laminae apparent at 92.5'			PB	4	2.2 2.5	(CONTINUED) pocket penetrometer 24.5 21.31
94.0		primarily claystone from 92.5 to 100.4, some faintly discernible very thin discontinuous sandstone laminae.	Box #1		PB	5	1.9 2.5	pitcher barrel from 92.5 to 96.5; 100 psi.
96.0	40° Y	thin sandstone laminae at 96.6, 97.1,			PB	6	2.18 2.5	pitcher barrel from 96.2-98.5; 100 psi
98.0	20-30° Y				PB	7	1.7 2.5	pitcher barrel from 98.5 to 101; 100 psi. pocket penetrometer 24.5 21.31
100.0	51° Y	alternating very thin to medium laminae of claystone, sandstone and silty claystone; some laminae truncated, x-bedding (upright).	Box #2		PB	8	1.9 2.5	pitcher barrel from 101 to 103.5; 100 psi.
102.0	46° Y	repeating sequence of very thin to thin sandstone, claystone and silty claystone; organics (trace 0.1%).			PB	9	1.5 2.5	pitcher barrel from 103.5 to 106; 100 psi
106.0	43° Y	primarily claystone; wavy discontinuous sandstone, dark green wavy stringers (up to 2cm) from 108.5; preferred orientation dipping about 43°			PB	10	2.5 2.5	pitcher barrel from 106 to 108.5; 100 psi. pocket penetrometer 24.5 21.31
108.0	43° Y	primarily claystone, siltier claystone rounded concretions apparent, randomly distributed from 108.5-112.5			PB	11	2.5 2.5	pitcher barrel from 108.5 to 111.0; 100 psi
110.0			Box #3		PB	12	1.9 2.5	pitcher barrel from 111.0 to 113.5; 100 psi. gas check; no gas encountered 0.0% in.
112.0		primarily claystone with occasional discontinuous wavy sandstone up to 4cm in max. thickness from 111.0-116.0; variable bedding 5-40°			PB	13	2.5 2.5	pitcher barrel from 113.5 to 116.0; 100 psi.
114.0		sandstone laminae occasionally discontinuous						
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MORE	RUN NO.	CORE REC. %	REMARKS
116.0	44° Y	64.2-150.0 <u>CLAYSTONE</u> : (CONTINUED) Primarily claystone with alternating wavy, parallel very thin to medium laminae of sandstone, either claystone with minor siltstone; micaceous, fossiliferous (c. 1%) claystone.						(CONTINUED) pitcher barrel from 116 to 118.5; 100psi.
118.0		<u>PHYSICAL CONDITION</u> (continues as previously described) occasional discontinuous, non-parallel laminae, folding apparent, dip 49°.	Box #3			14	2.5 / 2.5	
120.0	44° Y					15	1.7 / 2.5	pitcher barrel from 118.5 to 121; 100psi.
122.0		bedding planes sharp, dip of bedding planes variable (10-46°), folding apparent.				16	2.5 / 2.5	pitcher barrel from 121 to 123.5; 100psi.
124.0	46° Y					17		pitcher barrel from 123.5 to 126; 100psi.
126.0		folding apparent from 125-126.0.				18	1.5 / 2.5	
128.0	46° Y	sharp contacts between alternating laminae; cross-bedding evident (sequence is upright)	Box #4			19	1.7 / 2.5	pitcher barrel from 126 to 128.5; 100psi.
130.0	46° Y	wavy parallel alternating laminae of sandstone, claystone & silty claystone; dark yellowish brown (10YR 4/2) siltstone (1.0mm) at 129.6; graded bedding apparent in very fine- to fine-grained sandstone laminae at 129.7-130.0				20	1.8 / 2.5	pitcher barrel from 128.5 to 131; 100psi. pocket penetrometer 74.5 2/9/81
132.0		alternating laminae of sandstone, claystone, silty claystone and siltstone; clay filled fractures & karren fractures with offsets apparent at 132.0; prominent fracture plane dips 47°				21	1.3 / 2.5	pitcher barrel from 131 to 133.5; 200psi.
134.0	46° Y	some folding evident in sandstone laminae at 134.5 sandstone				22	1.4 / 2.0	pitcher barrel from 133.5 to 136.3; 200psi.
136.0	42° Y	cross-bedding apparent (sequence as upright)				23	1.1 / 2.0	pitcher barrel from 136.3 to 139; 200psi; 137.0 to 141.8; 200psi.
138.0		<u>PHYSICAL CONDITION</u> : soft to friable hardness; plastic to friable strength; fresh; tendency to fracture along bedding planes, notably friable sandstone laminae.	Box #5			22	2.2 / 2.7	
140.0						23	1.1 / 2.0	

PROJECT

SCRTD

DATE DRILLED

1-3-81

HOLE NO.

5

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		81.2-150.0 CLAYSTONE (CONTINUED) Wavy, parallel wavy thin to medium alternating laminae of claystone, subordinate sandstones and siltier claystone, and minor siltstones; variable thickness of laminae; cross-bedding apparent (sequence is upright).			FD	23	1.9 2.8	(CONTINUED) pitcher barrel from 141.8 to 144.5; 200 psi.
142		primary claystone to 142.3; very fine grained sandstone from 142.3-142.8, 143.1-145.3.			PB	24	1.9 2.8	
144		alternating wavy parallel laminae; sandstone from 144.5-147.3, 145.1-145.6, 145.9-146.2.	Box # 5		PB	25	1.9 2.8	pitcher barrel from 144.5 to 147.3; 200 psi.
146		PHYSICAL CONDITION: soft to fine to medium; plastic to friable, strong, fresh; cracks to fracture along bedding planes, notably sandstone laminae.			PB	26	1.9 2.8	pitcher barrel from 147.3 to 150.0; 200 psi.
148		primarily claystone from 147.3 with fine to coarse grained sandstone at 147.3-147.6, 148.0-148.4, 148.6-148.9 and 149.1-149.3.			PB	26	2.0 2.7	Terminated hole at 150.0', 12-3-81.
150	B.H.							12-4-81 Installed 100.0' of 4" PVC and grouted. Pushed 3.0' length of 6" I.D. PVC & below asphalt surface; steel H ₂ O cover was then set flush with concrete surface.

5:30
7:06

SHEET 2 OF 8



SUMMARY BORING NO. 5

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 1-2-81/1-4-81

OVERBURDEN DEPTH (FT.) 0.0' TO 84.2'

BEDROCK DEPTH (FT.) 84.2' TO 150.0' (T.D.)

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____

GAS NO; DEPTH FIRST NOTICED _____, DATE _____

E-LOG YES

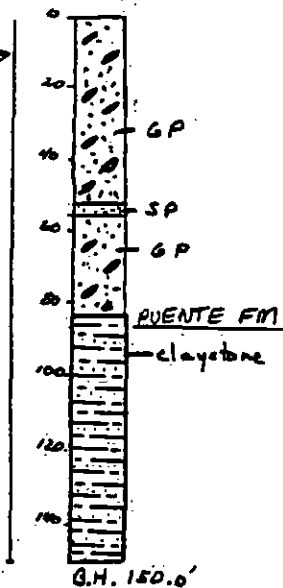
DOWN-HOLE SURVEY YES

CROSS-HOLE SURVEY YES

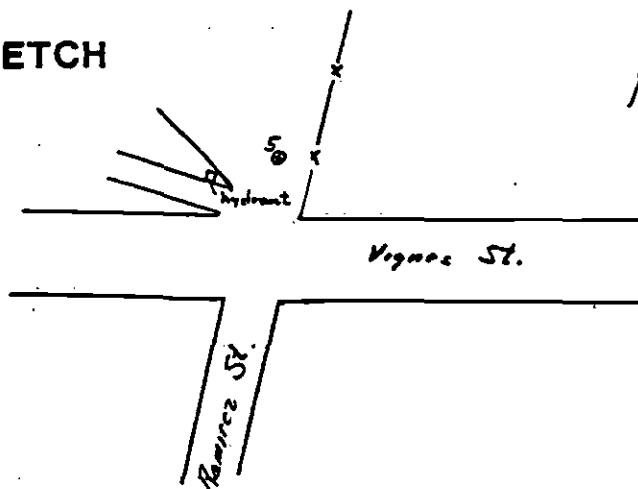
PVC CASING (I.D.): 4" 0.0' TO 100.0'; 3" _____ TO _____; 2" _____ TO _____

GROUND ELEVATION REF. 280'

150' of 4" PVC →
grouted



SKETCH



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 6

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1220-22 DATE DRILLED 2/3/81-2/10/81 HOLE NO. 6
 LOCATION Macy St. east of Alameda ST. GROUND ELEV. 281'
 DRILLING CONTRACTOR Pitchev LOGGED BY Gallinotti DEPTH TO GROUND WATER ~20'
 TYPE OF RIG Failing HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs. 30 inches
 SURFACE CONDITIONS Sidewalk TOTAL DEPTH 150.2' NO. CORE BOXES 5

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0 - 0.5 CEMENT			AD			Begin drilling at 3:30 2/3/81. Auger to 10', set 13' of 5" surface casing; set mud tub, mix mud; begin rotary drilling.
1	SP	0.5 - 23.5 GRAVELLY SAND: light olive gray (SFS/2); ~85-90% fine grained sand; 10-15% rounded to sub-rounded gravels, mostly 1/2" but up to 4-5" cobbles; loose; damp to dry.						[p.p.] stands for pocket penetrometer; data obtained from field-extruded PB samples
2								
4								
6								
8								
10								
12			J-1	29 24 17	SS			1.5/1.5 recovery
14					RD			11.5' - stop drilling 2/3/81. Begin 2/4/81.
16								* Top of water table between 10' and 20'
18								
20								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	SP	0.5-23.5 GRAVELLY SAND (cont.)	S-1		PB			take undisturbed PB rather than DR sample because stuff barrel for DR sampler has been lost.
22		sample: base sand w/ subangular to sub-rounded gravel; mostly 1/4" to 1/2"; water saturated.		10	SS			1.7/2.5 recovery
24	SM	23.5-38.0 SILTY SAND with GRAVELLY layers: medium bluish gray (SB5/1); ~20% low plasticity fines; ~80% very fine to fine sand; occasional gravelly layers contain ~20% sub-angular to sub-rounded 1/4" to 1" gravels; clasts are predominantly granitic or high-grade metamorphic quartzite, gneiss; medium dense; moist to wet; <u>not</u> saturated.	S-2	17				1.5/1.5 recovery
26				26	RD			<u>water saturated</u>
28								
30			S-3	16	SS			1.0/1.5 recovery
32				17				material is <u>not</u> saturated.
34				11	RD			
36		granitic gravels (medium grained, Biotite - thornblende Granodiorite)						35' - begin rig chatter.
38	SP	38.0-79.0 SAND w/ GRAVELLY layers: medium bluish gray (SB5/1); ~80% fine grained sand; ~20% medium to coarse sand; some gravelly layers w/ 10-20% subangular to subrounded quartzite gravels; medium dense to loose; wet.	S-2		PB			1.4/2.5 recovery
40								tube bent on bottom; sample <u>might</u> be disturbed.
42			S-4	24	SS			0.8/0.8 recovery
44				50	RD			SHEET 2 OF 8

PROJECT 80-1290-22

DATE DRILLED 2/3/81

HOLE NO. 6

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	SP	38.0 - 79.0 SAND with GRAVELLY layers; (cont.)			RD			
46								
48								
50			I-5	50	SS			0.0/0.4 recovery
52					RD			50.4' - stop drilling 9:30 2/4/81. Drillers need to take drum off rig, and see out of mud.
54								50.4' - Gas Test 2/4/81 - No combustibles; 20% O ₂
56								Begin drilling 10:30 2/9/81 - hole filled in to 30" with sluff.
58								
60					DR			No Recovery - loose gravelly sand - no binder to hold it together.
62			I-6	11	SS			DR → 37 blows
				45				0.0/1.0 recovery
				50				0.8/1.3 recovery
64					RD			
66								
68								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPY (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68	SP	38.0 - 79.0 SAND w/ GRAVELLY SAND (layers: cont.)			RD			
70				38	RD			0.0/0.2 recovery - Gravel stuff
72								
74								
76								
78								
79.0		<u>PUEENTE FORMATION</u>						
79.0 - 94.0		<u>SILTY SANDSTONE</u> w/ SILT layers: ~80% SILTY SAND and ~20% SILT layers 0.2' to 0.5' thick; SILTY SAND is medium gray (NS); ~20% low plasticity fines; ~80% poorly graded fine sand; loose; moist; SILT is dark yellowish brown (10 YR 4/2); 100% low plasticity fines; stiff; damp.	C-1					
80				50	RD			DR → 39 Blows 0.1/0.4 recovery
82			BOX 1			1		0.9/0.4 recovery Go down & clean out hole; begin continuous Pitman Barreling.
84		PHYSICAL CONDITION: massive, friable, fresh.						1.7/2.8 recovery bent tube
86		SILTY SAND: P.P. > 5 SILT : P.P. > 5				2		1.7/2.8 recovery bent tube
88						3		1.7/2.6 recovery bent tube
90						4		2.7/2.8 recovery bent tube
92		P.P. = 2.0 (SAND)						SHEET 4 OF 8

NO RECOVERY on 1st DR; go down w/ bit & clean hole, make another drop, since only DR 0.4' because hole started caving in.

DR → 39 Blows
0.1/0.4 recovery
0.9/0.4 recovery
Go down & clean out hole; begin continuous Pitman Barreling.
1.7/2.8 recovery bent tube
1.7/2.8 recovery bent tube
1.7/2.6 recovery bent tube
2.7/2.8 recovery bent tube

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92		79.0 - 94.0 SILTY SANDSTONE w/ SILT lenses (cont.)	BOX 1		PB	4		
94		94.0 - 121.0 SILT-STONE: Dk. yellowish brown (10 YR 5/4) and light brownish gray (5 YR 5/1); 100% low plasticity fines; massive to thinly bedded; stiff; moist; easily carved with a knife; no fractures.	S-3			5		2 1/2 recovery bent tube can't be extruded
96			S-4			6		2 1/2 recovery bent tube can't be extruded
98					RD			Rotary bit no try to clean out hole.
100			BOX 1 (cont.)		PB	7		2 3/2 recovery bent tube
102		101.0' - 101.5' CLAYEY [P.P. > 5]	BOX 2					"undisturbed sample"
104			S-5			8		2 8/2 recovery bent tube; hole is clean (no stuff on top) - gravel must be within the material
106		106' - 120' Thinly bedded (0.1' - 0.2' thick) w/ claystone and SAND layers.	BOX 2 (cont.)			9		2 9/2 recovery
108								
110		109.4' bedding inversion, could be that core got rotated, but that doesn't seem to be the case. [P.P. = 4.5]				10		108.4' STOP DRILLING 2/9/81 BEGIN DRILLING 2/10/81 2 9/2 recovery
112						11		2 8/2 recovery bent tube
114		dep. slump features locally [P.P. = 2.5]	BOX 3			12		2 8/2 recovery bent tube
116		115.4 bedding disruption						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		94.0 - 121.0 SILTSTONE: (cont)	BOX 3		PB	12		
118		118 - 0.2' thin laminae surface.				13		2.8/2.8 recovery best tube
120						14		2.7/2.8 recovery best tube
122		121.0 - 134.0 SILTSTONE & SANDSTONE ~60% SILT layers and ~40% SAND layers, layers are ~1' thick; SILT is dark yellowish brown (10YR 4/2); 100% low plasticity fines; massive (no bedding); stiff; damp; easily carved with a knife; SAND is medium gray (N5); 100% poorly graded fine sand; loose; friable; wet to saturated; no bedding.	5-6 BOX 3 (cont)			15		2.9/2.8 recovery * undisturbed sample
124			BOX 4			16		2.5/2.8 recovery best tube
126						17		1.7/2.8 recovery best tube
128						18		2.7/2.8 recovery best tube
130						19		2.7/2.8 recovery best tube
132						20		2.7/2.8 recovery
134		134.0 - 150.4 SILTY SANDSTONE medium gray (N5); ~20% low plasticity fines; ~80% very poorly sorted fine grained sand; dense; wet; friable; faint bedding - rare. [P.P. = 4.25]				21		
136		136.4 - SILT layer ~0.2' thick	BOX 5					
138		138.6 - SILT layer ~ 0.5' thick						
140			5-7					

PROJECT 80-1280-22

DATE DRILLED 2/10/81

HOLE NO. 6

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		134.0 - 150.2 SILTY SANDSTONE (cont.)	S-7		PB	21		1 1/2' recovery K undisturbed sample
142		143' - SILT layer no. 2' thick	Box 5 (cont.)			22		2 7/8' recovery best tube
144						23		1 5/8' recovery mangled tube - can't be extended
146		[P.P. = 5]	S-8					
148			Box 5 (cont.)				24	
150	B.H.	150.2' Bottom of Hole						150.2 Terminate Hole stop circulation at 11:30 2/10/81. Run c-logs (EST). Instal 250' of 2" PVC piezometer w/ cloth covered perforations from 110' to 145'; gravel pack to surface; clean-up site. Move off site 7:00 2/11/81 water sampled 2/20/81

SHEET 7 OF 8



SUMMARY BORING NO. 6

PROJECT 80-1290-22 STATION HOLE NO DATE DRILLED 2/3/81 - 2/10/81

OVERBURDEN DEPTH (FT.) 0 TO 79'

BEDROCK DEPTH (FT.) 79' TO 150.2' (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.

GAS TRACE; DEPTH FIRST NOTICED _____, DATE _____.

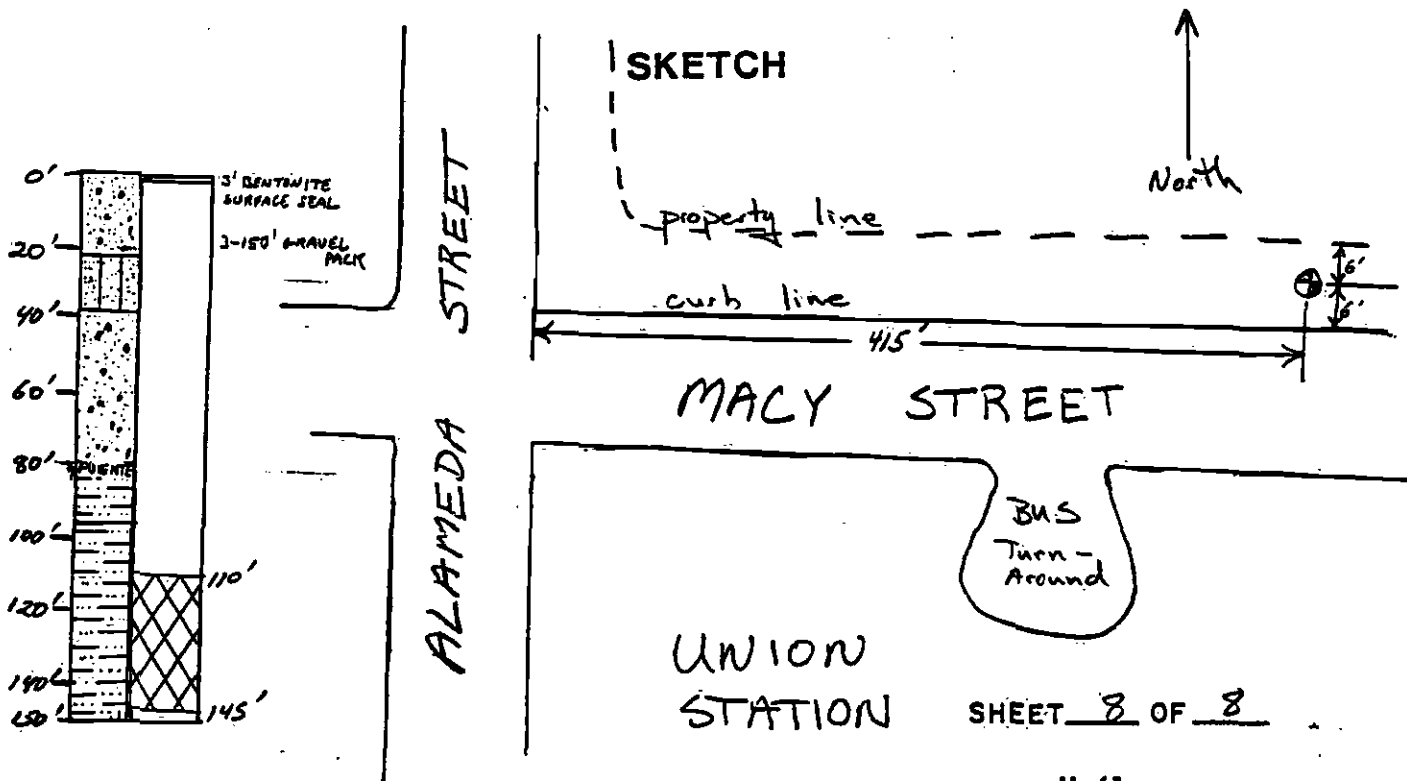
E-LOG YES.

DOWN-HOLE SURVEY NO.

CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 200'.

GROUND ELEVATION REF. 281'



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 7

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SCATD DATE DRILLED 12-17-80/12-21-80 HOLE NO. 7
 LOCATION on First Street near Spring Street intersection GROUND ELEV. 291'
 DRILLING CONTRACTOR Pitler Drilling Co. LOGGED BY Stephen M. Testa DEPTH TO GROUND WATER ~12'
 TYPE OF RIG Eilm. 1500 HOLE DIAMETER 4 1/8" HAMMER WEIGHT AND FALL 140lb - 30in.
 SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 200.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0-0.3 CONCRETE; 0.3-11.5 FILL; crushed brick			RD			Drilling started at 7:15; clear day.
2.0								
4.0								
6.0								
8.0								
10.0								
12.0	GP	11.5-18.0' SANDY GRAVEL: non-plastic fines (c.5%); medium to coarse sand (20%); gravel up to 1.5" in max. dia. (75%); primarily granitics; poorly graded. <i>note: sandy gravel from 11.5 to 18.0 may be full material as well; origin questionable</i>						drillers drove in 14.0' 9:30 casing; drilling with benzotris water; moderate rod chatter;
14.0								down time from 10:25 to 10:25 11:45 due to empty water tank;
16.0		gravel up to 1.5" in max. dia; primarily granitics	J-1	50	SS		5.5	11:45 spt at 16.0'; refusal at 16.5'
18.0		FERNANDO FORMATION 18.0-200 CLAYSTONE; see sheet 2;			RD			rod chatter ceased at 18.0'
20.0								


SHEET 1 OF 9

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0		180-2000 CLAYSTONE (CONTINUED); olive gray (54312); plastic fines (90%); very fine sand (210%); dilatancy none; medium toughness; medium plasticity; micaceous, hard, moist;		21	DR		1.0	(CONTINUED)
			C-1	42			1.5	converse sample from 20.0 to 21.5'; SPT
				49			1.1	from 21.5 to 23.0';
22.0				52	SS		1.5	ball on rig came off;
			J-2	64			1.5	SPT AT 21.5'
		PHYSICAL CONDITION: little fractured to massive; sift to friable hardness; soft to friable strength; fresh;			RD			drillers had to ream hole larger for 20' to 24.3 to prevent caving; 23516 hammer used for converse sampler
24.0		continued;						
				17	SS		1.5	SPT AT 25.0'
26.0				26			1.5	pocket penetrometer
			J-3	27			1.5	74.5 2/9/81
					RD			
28.0								
30.0		continued; sandy clay randomly distributed blebs apparent, greenish gray (56461), plastic fines (80%), very fine sand (20%); hairline shear planes also apparent;		15	SS		1.5	SPT AT 30.0'
			J-4	24			1.5	
				46	RD		1.5	
32.0								
34.0		continued;						
				15	SS		1.5	SPT AT 35.0'
36.0			J-5	30			1.5	pocket penetrometer
				31			1.5	74.5 2/7/81
					RD			
38.0								
40.0				22	DR		1.0	converse sample
			C-2	60			1.0	from 40.0 to 41.0
				21	SS		1.5	
42.0		continued; desiccated carbonate (<1%);	J-6	41			1.5	
				47			1.5	
					RD			
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	CL	18.0-200 CLAYSTONE (CONTINUED) olive gray (5% sil); plastic fines (90%); very fine sand (<10%); dilatancy zone; medium toughness; medium plasticity; micaeous; hard; moist. <u>PHYSICAL CONDITIONS.</u> little fractured to massive; soft to friable hardness; soft to friable strength; fresh;			RD			(CONTINUED) 99.5 reading - 0% LBL. 4:30
46.0			J-7	21 37 50	SS RD			SPT at 45.0 Halted drilling 5:00 AM at 46.5'
48.0								12-18-80 Resumed drilling at 7:42 AM, clear day.
50.0		continued;	J-8	24 21 27	SS RD			SPT at 50.0' pocket penetrometer 74.5 2/9/81
52.0								
54.0		continued;						
56.0			J-9	20 20 25	SS RD			SPT at 55.0'
58.0								
60.0		continued; sandier (10-15%) lense 5cm. in thickness dipping 35° relative to core axis; fossiliferous (<1%); bivalve plus invertebrate tests due to their small size, probably forams in part.	C-3	27 45 50	DR SS			converse sample from 60.0 to 61.2'; SPT from 61.2' to 62.7'
62.0			J-10	16 22 43	SS RD			pocket penetrometer 74.5 2/9/81
64.0		continued;						
66.0			Box 2		RS			pitcher sample from 65.0 to 67.5; 67.5 to 70.0
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		18.0-200 (CLAYSTONE) (CONTINUED) olive gray (S 72/2), plastic (95%), very fine sand (< 10%), micaceous, hard, moist; fossiliferous (2.1%), organics (2.1%).			PB	2	2.5 2.5	(CONTINUED) pitcher sample from 67.5 to 70.0
70.0		PHYSICAL CONDITIONS: little fractured to massive; soft to fracture hardness; soft to friable strength; fresh			C	3	240%	NX core without casing; pump pressure 20, 80 psi; drill bit feel material not good for coring; pitcher used; more appropriate
72.0	50° 70°	50.0° hairline joints at 71.0, 71.2 and 71.8'; fossiliferous (2.1%), random distributed	Box 2			4	51%	retrieved only 9" of core; second attempt after drilling an additional 6" resulted in full recovery
74.0						5	100.0%	
76.0	70°	70° hairline joints at 75.2 and 79.0'; carbonate filled voids (1.0 cm in max. dia.) and trace unidentifiable organics evident (2.1%);				6	100.0%	
78.0	70°					7	100.0%	
80.0								
82.0		faintly discernible lensoidal compositional banding (barclay?) dipping 5-10° relative to core axis; trace organics (2.1%)	Box 3					
84.0		continued;						
86.0								
88.0								
90.0		continued;						
92.0								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	BPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
94.0		18.0-20.0 CLAYSTONE: (CONTINUED) olive gray (54.2%); plastic fines (90%), very fine sand (2.10%), hard; micr.; micaceous; fossiliferous (2.1%), organics (2.1%)	Boy #3		C	7		(CONTINUED) Drilling halted at 5:00 PM at 95.5'
96.0		<u>PHYSICAL CONDITION</u> moderate to closely fractured, soft to friable hardness; soft to friable strength; fresh				8	40%	12-17-80 Resumed drilling at 7:00 AM, clear day
98.0							30%	
100.0		moderately fractured from 100.5 to 105.5; closely fractured zone from 101.0 to 102.0; up to 3cm. clay zone along fracture plane;	Boy #4			9	40%	<u>note:</u> moderate to closely fractured zones at 100.5 and 110.5, respect- ively may be a result of air curing and not inherent structural features
102.0								
104.0								
106.0		continued;				10	45%	no drilling time for 5' interval about 30 minutes
108.0								
110.0		closely fractured from 110.5 to 112.2'				11	50%	gas check, pressure test and holding test taken and completed
112.0			Boy #5				100%	Reamed hole out for pitcher barrel Halted drilling at 4:25 PM.
114.0		70° fracture at 115.2'						
116.0			Boy #1		PS	12	25%	12-20-80 Resumed drilling at 7:00 AM; clear day; Pitcher sample from 115.0 to 117.5; 117.5 to 120.0
118.0		continued,			PS	13	28%	SHEET 5 OF 9

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (BT)	DRILL HOSE	RUN NO.	CORE REC. %	REMARKS
118.0		100-100.0 CRYSTONEX (CONTINUED)			PB			(CONTINUED)
120.0		sandier blobs up to 3cm. in max. dia. randomly distributed	Box # 1		PB	13		
122.0					PB	14		pitcher sample from 120-122.5, 150psi; sampling & drilling time for 2.5' pitcher interval about 20 minutes;
124.0		<u>PHYSICAL CONDITION:</u> massive; soft to friable hardness; soft to firm strength; fresh			PB	15		pitcher sample from 122.5 to 125.0, 150psi.
126.0		continued;	Box # 6		PB	16		pitcher sample from 125-127.5, 150psi
128.0	50°	discontinuous 2cm. thick laminae of grayish olive (10Y4/2) clayey sandstone at 50° to core axis;			PB	17		pitcher sample from 127.5-130, 150psi
130.0	45°	bedding discernable by grayish olive 2cm. thick clayey sandstone laminae. compositional banding dipping in opposite direction at 40°. bedding apparent at 132.6 and 133.2			PB	18		pitcher sample from 130-132.5, 150psi; pitcher barrel broke down at 12:40, resumed drilling at 1:15
132.0					PB	19		pitcher sample from 132.5-135, 150psi
134.0	50°				PB	20		pitcher sample from 135-137.5, 150psi
136.0			Box # 7		PB	21		pitcher sample from 137.5-140.0, 150psi
138.0	53°	some bedding apparent			PB	22		pitcher sample from 140-142.5, 150psi
140.0	53°				PB	22		
142.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
142.0	55°	18.0-200.0 CLAYSTONE (CONTINUED) olive gray (SV 22); plastic fac. (30%); very fine sand (2.10%); hard; moist; micaceous; fossiliferous (0.2%); opercula (0.1%)	B04 #7		PB	22	2.1 2.5	(CONTINUED) pitcher sample from 142.5-145.0, 150 psi
144.0	53°	<u>CRITICAL CONDITION:</u> massive; soft to firm to hardness; soft to friable strength; fresh;				23	2.5 2.5	
146.0					PB	24		pitcher sample from 145.0-147.5, 100 psi; slightly harder resistance to drilling
148.0		continued; no bedding apparent;			PB	25	1.7 2.5	pitcher sample from 147.5-150.0, 150 psi
150.0	50°	bedding subtle;	B04 #8		PB	26	2.2 2.5	pitcher sample from 150.0-152.5, 150 psi
152.0	52°				PB	27	2.5 2.5	pitcher sample from 152.5-155.0, 150 psi
154.0		Sem. thick wavy sandstone laminae 1.5-3.5; continued; no bedding apparent;			PB	28		pitcher sample from 155.0-157.5, 150 psi Drilling halted at 5:42 AM at 157.5'
156.0		continued;			PB	29	1.7 2.5	12-20-80 Resumed drilling at 7:29 AM at 157.5'; clear day pitcher sample from 157.5-160.0, 150 psi
158.0	50°				PB	30	2.2 2.5	pitcher sample from 160.0-162.5, 150 psi
160.0		continued;	B04 #9		PB	31	2.5 2.5	pitcher sample from 162.5-165.0, 150 psi
162.0	58°	continued; no bedding apparent			PB	32		pitcher sample from 165.0-167.5, 150 psi
164.0								
166.0	54°	Sem. thick wavy, lenticular sandstone lens at 165.0;						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT. (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
166.0		18.0-200.0 <u>SANDSTONE</u> : (CONTINUED) olive gray (54212); plastic fines (90%); very fine sand (2.10%); hard; moist; micaceous; fossiliferous (2.1%); organics (2.0%)	Box # 7		PB	32	24/25	(CONTINUED)
168.0	50° Y	2 cm. thick wavy sandstone lense at 168.5			PB	33	24/25	pitcher sample from 167.5-170.0; 150psi
170.0		sandstone beds up to 5cm. thick at 170.3, 171.0 and 172.0; olive black (54211) subrounded silt concretions randomly distributed from 170-175; sandstone at 173.4, 174.2 and 174.6, 5.0 to 25.0 cm in thickness	Box # 10		PB	34	25/25	pitcher sample from 170.0-172.5; 150psi
172.0		continued;			PB	35	25/25	pitcher sample from 172.5 to 175.0; 150 psi
174.0	52° 160 Y	<u>PHYSICAL CONDITION:</u> massive; soft to friable hardness; soft to friable strength; fresh;			PB	36	18/25	pitcher sample from 175.0-177.5; 150psi
176.0		very thin lamina at 179.9			PB	37	22/25	pitcher sample from 177.5-180.0; 150psi
180.0	52° Y	sandstone lamina at 180.6, 181.2 (4mm) and 181.5			PB	38	15/25	pitcher sample from 180.0-182.5; 150psi
182.0		7cm. sandstone laminae at 182.9	Box # 11		PB	39	24/25	pitcher sample from 182.5-185.0; 150psi
184.0		25cm. sandstone laminae at 186.3			PB	40	23/25	pitcher sample from 185.0-187.5; 150psi
186.0	63° Y	wavy discontinuous sandstone lamina at 188.0, 188.5 and 189.0;			PB	41	22/25	pitcher sample from 187.5-190.0; 150psi
190.0	78° Y							

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	DPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
190	70 Y	18.0-200.0 CLAYSTONE (CONTINUED) sandstone lamina at 190.5, 190.8, 191.4, 191.6, & 192.3; up to lam. in max. thickness.			PB	42	25 25	(CONTINUED) pitcher barrel from 190.0-192.5; 150 psl.
192		wavy very fine to medium sandstone lamina at 192.8, 193.5 and 193.9; very thin lamina at 194.1; randomly distributed silt concretions apparent.			PB	43	23 25	pitcher barrel from 192.5-195.0; 150 psl.
194	30 Y				PB	44	17 25	pitcher barrel from 195.0-197.5; 150 psl.
196		wavy sandstone lamina at 195.7 and 196.4.			PB	45	25 25	pitcher barrel from 197.5-200.0; 150 psl.
198		wavy sandstone lamina at 199.5 and 200.0; silt concretions some appearing stretched parallel to bedding (probably due to compaction)						Terminated hole at 200.0', 12-21-80
200	55 Y							12-22-80 Installed 200.0' of 4" PVC and grouted; pushed 3.0' length of 6" I.D. PVC to below sidewalk surface; steel H ₂ O cover was then set flush with concrete surface. Ran H ₂ O pressure test setting packers at 80.0-105.0'; tight formation; no water loss.
	B.H.							

3:15



SUMMARY BORING NO. 7

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 12-17-80/12-21-80

OVERBURDEN DEPTH (FT.) 0.0 TO 18.0'

BEDROCK DEPTH (FT.) 18.0 TO 200.5' (T.D.).

WATER PRESS. TEST YES; INTERVAL(S) 80.0 TO 105.0; _____ TO _____.

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.

GAS NO; DEPTH FIRST NOTICED _____, DATE _____.

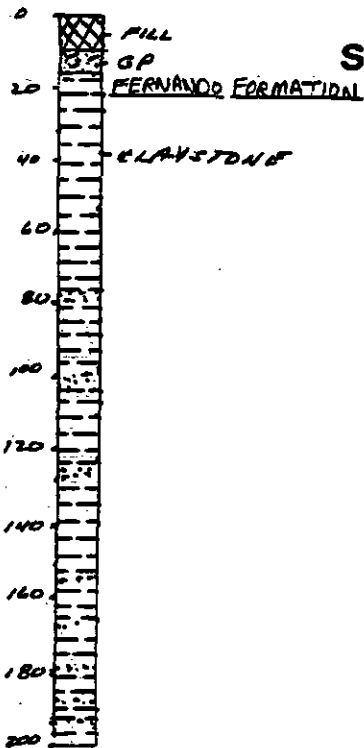
E-LOG YES

DOWN-HOLE SURVEY YES

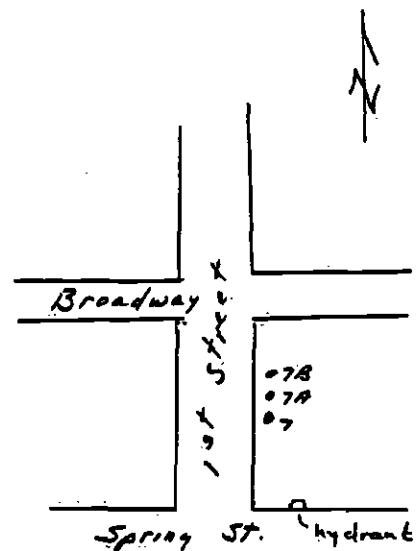
CROSS-HOLE SURVEY YES

PVC CASING (I.D.): 4" 0.0 TO 100.0'; 3" _____ TO _____; 2" _____ TO _____.

GROUND ELEVATION REF. 291'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 16-18 Feb. 81 HOLE NO. 8
 LOCATION southeast side of Broadway southwest of 5th St. GROUND ELEV. 264'
 DRILLING CONTRACTOR J.N. Pitcher Co LOGGED BY S. Staff DEPTH TO GROUND WATER _____
 TYPE OF RIG Fahog 1500 HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs. 30 inches
 SURFACE CONDITIONS concrete gutter TOTAL DEPTH 202.1' NO. CORE BOXES 6

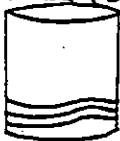
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0'		0.0-0.8' concrete			C			07:00 16 Feb. 1980
0.8'	ML	0.8'-8.0' SANDY SILT: FILL: olive gray (5Y 3/2); 50% low plasticity fines; 35% fine sand; 15% gravel and boulders; moist; loose; sand is subangular to subrounded; gravel is rounded granitic rock 2.4' - color change to: light olive gray (5Y 5/2)			RD			0.0'-5.5' drilled with "garbage barrel" (8" cylindrical bit) diameter 5.5'-8.0' drilled with 4 7/8" tooth rock bit. Put 1 sack of bentonite in top 5' of hole to stop caving. Mixed 1/2 sack bentonite in drilling fluid. Drilled through 2" steel pipe (empty) at 2.0'. Did not set surface casing.
8.0'	SW	8.0'-74.2' GRAVELLY SAND: mottled: medium gray (N-5); very light gray (N-8); dusky yellow (5Y 6/4); 60% fine to coarse sand; 30% gravel; 10% medium plasticity fines; moist; medium dense to very dense; sand is angular to subrounded; most of material is derived from granitic rocks.			RD			mixed 1/2 sack bentonite. rig chattering.
10.0'	T 21			29				09:00. 2/2 recovery.
12.0'								drilling with 230psi hydraulic draw-down. rig chattering. drill rate = .7'/minute.
16.0'	T 12		J-2	27	SS			0.6/1.0 recovery.
18.0'				52	RD			drill rate = .8'/minute. 09:40.
20.0'								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	CORE REC. %	REMARKS
20.0	SW 16	8.0' - 74.2' GRAVELLY SAND: (continues) occasional interbedded clayey silt beds (dark yellowish orange [over 6/6] up to .1' thick.	J-3	26	SS		0.0/0.2 recovery.
				23			0.8/1.2 recovery.
				50		RD	
22.0							10:10.
24.0							
26.0	5		J-4	20	SS		0.4/0.7 recovery.
					50		
28.0					RD		rig chattering. drilling with 200 p.s.i. hydraulic draw-down.
30.0	6	very dense.	J-5	50	SS		10:35.
						50	
32.0					RD		rig chattering.
34.0							
36.0			J-6	50	SS		0.1/0.4 recovery.
					RD		
38.0							
40.0			J-7	33	SS		DR blow count: 50. 0.0/0.2 recovery. saved material in bit. 0.6/0.9 recovery.
				50			
					RD		11:50.
42.0							
44.0							

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SW	8.0 - 74.2' GRAVELLY SAND: (continues)			RD			
			lost	50	SS			0.0/25 recovery.
46.0					RD			
48.0	ML	46.5 - 48.2 SANDY SILT: light olive brown (5Y 5/6); 90% medium plasticity fines; 10% fine sand; saturated; presumably very stiff; sand is subangular to subrounded.						12:45.
	SW							
50.0								hole is not losing or making water.
52.0		material is very much like decomposed granite. Shows iron staining.						.2/.2 recovery.
54.0					RD			
56.0								drilling with 200 psi. hydraulic draw-down.
58.0								drill rate = .5'/minute
60.0								rig chattering. 13:45.
			J-9	50	SS			.15/.25 recovery. Did not bother to try to collect Converse sample due here. Too gravelly.
62.0					RD			
64.0								rig chattering.
			J-10	50	SS			.2/.3 recovery.
66.0					RD			
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SW	8.0 - 74.2' <u>GRAVELLY SAND:</u> (continues)			RD			rig chattering.
70.0			J-11	50	SS			2/2 recovery.
					RD			drilling fluid is thick.
72.0								15:20.
	ML	72.4 - 74.2' <u>SANDY SILT:</u> light olive brown (5Y 5/6); 80% medium plasticity fines; 20% fine sand; saturated; presumably very stiff; sand is subangular.						drill rate = .7'/minute.
74.0	SM	74.2 - 77.8 <u>SILTY SAND:</u> moderate yellowish brown (10YR 5/4); 80% fine sand; 20% low plasticity fines; moist; very dense; iron stained; abundant mica.	J-12	50	SS			3/4 recovery.
76.0					RD			
78.0	SP SM	77.8 - 86.2 <u>SILTY SAND:</u> pale olive (10Y 6/2); 90% fine sand; 10% low plasticity fines; moist; very dense; sand grains subrounded to rounded; minor mica; quartz-rich.						
80.0					VR RD			DR blowcount: 50. 2/2 recovery.
82.0								16:25.
84.0		color change to grayish green (10GY 5/2); mica slightly more abundant.						25/25 recovery.
			J-13	50	SS			17:00 16 Feb '81
86.0	ML	86.2 - 93.2 <u>SANDY SILT:</u> Mottled; light olive brown (5Y 5/6); and light brown (5YR 5/6); 90% low plasticity fines; 10% fine sand; moist; very dense; micaceous; sand is subrounded to rounded; iron staining.			RD			07:00 17 Feb '81 Water table at 27.2'. Added no chemicals to drilling fluid. drill rate = 2'/minute. hole remained completely open over night. drilling with 220 p.s.i. hydraulic draw-down.
88.0								
90.0			C-3T		DR			DR blowcounts: 75. 25/5 recovery.
			J-14	65	SS			5/5 recovery.
92.0					RD			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CODE REC. %	REMARKS
92.0	ML	86.2-93.2 SANDY SILT: (CONTINUES)			RD			
94.0	SM	93.2-96.0 SILTY SAND: Mottled; pale olive (10Y 6/2); light brown (5YR 5/6); 60% fine sand; 40% low plasticity fines; moist; very dense; micaceous; sand is subrounded; lenses; weakly cemented.	J-15	60	SS			drill rate = 1.25'/minute. 2/.5 recovery.
96.0	ML	96.0-108.8 SANDY SILT: grayish green (5G 5/2); 90% low plasticity fines; 10% fine sand; moist; very dense; micaceous; sand is subrounded; homogeneous; weakly cemented.			RD			
98.0								08:05.
100.0			C-4		DR			DR blowcount: 74. 2/.4 recovery.
			J-16	40 50	SS			8/.8 recovery.
102.0		grading clayier, up to 95% fines.			RD			
104.0								
106.0			J-17	30	SS			.25/.25 recovery. 08:50.
					RD			drill rate = 1.3'/minute.
108.0								
110.0	SP SM	108.8'-121.5 SILTY SAND: grayish green (5G 5/2); 90% fine to medium sand; 10% medium plasticity fines; moist; very dense; sand is subrounded; uncemented.	J-18	50	SS			rig chattering. 0.2/0.2 recovery.
112.0		grading coarser. sand is coarse.			RD			drilling with 200 p.s.i. hydraulic draw-down.
114.0				50	SS			09:30.
116.0					RD			0.0/0.1 recovery. rig chatter.

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	SP SM	108.8-121.5 <u>SILTY SAND:</u> (continues)			RD			rig chattering. thinning down drilling fluid.
118.0								drill rate = .5'/minute.
120.0								10:50. skipped split spoon since very dense, coarse sand cannot be recovered.
122.0		<u>FERNANDO FORMATION</u> 121.5-202.1 <u>SILTSTONE:</u> dusky yellow green (SGY 5/2); 98% high plasticity fines; 2% fine sand. moist; very stiff; sand is subangular, uncemented; micaceous.						there is still no casing whatsoever in the hole.
124.0		<u>PHYSICAL CONDITION:</u> massive; soft to friable hardness; soft to friable strength; fresh.	C-5 T		DR			DR blowcount: 60, 20. 0.7/0.7 recovery.
126.0		massive structure. color change to grayish olive green (SGY 3/2) - dark greenish gray (SGY 4/1).	box #1		RD			11:30. encountered minor cave-in at 27' while running in hole for first pitched tube
128.0					PB	1		2.8/2.8 recovery.
130.0	5	3 .25" thick claystone beds 1.0" apart; greenish black (SG 2/1). Bedding planes are gently folded.				2		2.0/2.7 recovery. drill rate = .7'/minute.
132.0						3		2.8/2.8 recovery. drilling with 250 p.s.i. hydraulic draw-down.
134.0						4		2.7/2.7 recovery.
136.0			box #2			5		2.5/2.8 recovery. drill rate = .6'/minute.
138.0	7					6		15:00. 2.7/2.7 recovery.
140.0			S-1					SHEET <u>6</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
140.0	8 11	21.5' - 202.1 SILTSTONE: (continues) PHYSICAL CONDITION: (continues as previously described). lensoidal. beds distinguished by slight color and hardness variations. Beds 1/8" thick, with interbedded claystone.	S-1		PB	6		2.7/2.7 recovery.	
142.0			box #2			7		0.0/2.8 recovery. cup leather inside pitcher barrel wore out causing tube to rotate in barrel, drilling fluid to enter tube and sample to be lost.	
144.0						8		2.7/2.7 recovery.	
146.0						9		0.0/2.8 recovery. this sample was lost for the same reason as run #7 above.	
148.0						10		0.0/2.7 recovery. after replacing cup leather, still no recovery.	
150.0						11		0.0/0.7	
152.0						RD		06:00 18 Feb '81 water table at 54.3'. Cleaned sluffed gravel out with 47/8" drag bit from 153.2' - 155.30'. Added no chemicals to drilling fluid. 0% combustible gas.	
156.0			S-2			PB	12		2.7/2.7 recovery. drill rate = .5/minute. drilling with 270 p.s.i. hydraulic draw-down. no casing in hole.
158.0			box #2				13		0.0/2.8 recovery. Driller believes one large rock (granitic) which caused problems before and was pushed aside by drag bit fell back to bottom and blocked pitcher tube. Went back in with drag bit. Pushed cobble aside again. 09:30.
162.0						RD			Added no chemicals to drilling fluid.
164.0						PB	14		1.6/2.8 recovery.

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MORE	RUN NO.	CORE REC. %	REMARKS
164.0		121.5-202.1 SILTSTONE: (continues) PHYSICAL CONDITION: (continues as previously described).	box #2		PB	14		11:30.
166.0		yellowish gray (5Y 7/2) silt lens.				15		2.7/2.7 recovery. drill rate = .6/minute.
168.0	7 1/5	thinly bedded; beds 1/8-3/8" thick; mostly 1/4" thick; differentiated by slight color and hardness changes.	box #3			16		2.8/2.8 recovery. drilling with 100 p.s.i. hydraulic draw-down. Pitcher tube damaged.
170.0		yellowish gray (5Y 7/2) silt lens. (1" x 1/2" x 1/2").				17		2.6/2.7 recovery.
172.0		yellowish gray (5Y 7/2) silt lens.				18		2.8/2.8 recovery. 12:30.
174.0	3	bedding less distinct. pre-consolidation disturbance (slumping?) beds .1-.3" thick, average .2" thick.	S-3			19		2.7/2.7 recovery.
176.0		tiny streaks and lenses of white, chalky material (gypsum?).				20		2.7/2.8 recovery.
178.0	2	thin, rhythmic beds .1-.2" thick, average .15" thick.	box #3			21		2.7/2.7 recovery. drill rate = .7/minute. 13:30.
180.0		Yellowish gray (5Y 7/2) silty claystone lens 2" x 2 1/2" x 1"; also smaller lenses.	box #4			22		2.8/2.8 recovery.
182.0		Thicker beds: 3"-1' thick, average 8".						
184.0	3	contorted bedding; beds 1/5-3" thick; average 1" thick.						
186.0		calcareous shells broken in pieces .2" long.						
188.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0	5	121.5 - 202.1 <u>SILTSTONE</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described). contorted and offset beds 1/4" - 2" thick; average 1" thick.	box #4		PB	22		2.8/2.8 recovery.
190.0			box #5			23		2.7/2.7 recovery. 14:30.
192.0	7	as above, highly contorted; calcareous shells, minor sandy silt lenses; small amount of tar in greenish black (5G 2/1) silt beds.	S-4			24		1.9/2.8 recovery. poor recovery may be due to concretionary zone. rig chattering slightly. drill rate = .25'/minute
194.0			box #5		25		2.7/2.7 recovery. drilling with 150 psi. hydraulic draw-down. floating on mud tank.	
196.0	6					26		2.8/2.8 recovery. 15:30. drill rate = .45'/minute.
198.0					27		2.8/2.8 recovery.	
200.0	7							
202.0		B.H. = 202.1' Terminated hole.	box #6					15:55 18 Feb '81 Ran electric logs from 17:00 - 19:00 18 Feb '81 Ran down-hole seismic survey from 19:00 - 21:00 19 Feb '81 Set 2" diameter p.v.c. casing from 0.0 - 202.1' perforated from 80-120' and 162-197'. Water table at 64.5'. 0% combustible gas.



SUMMARY BORING NO. 8

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 16-18 Feb. '81

OVERBURDEN DEPTH (FT.) 0.0 TO 121.5

BEDROCK DEPTH (FT.) 121.5 TO 202.1 (T.D.)

WATER PRESS. TEST NO; INTERVAL(S) — TO —, — TO —

GROUND WATER DEPTH (FT.) 64.5 DATE 19 Feb.; 54.3 DATE 18 Feb.

GAS trace; DEPTH FIRST NOTICED —, DATE —

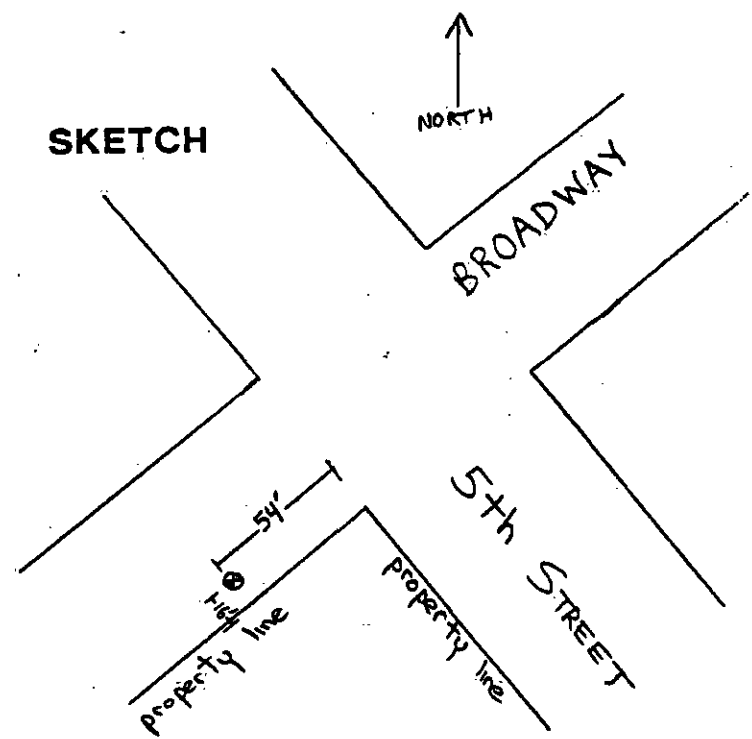
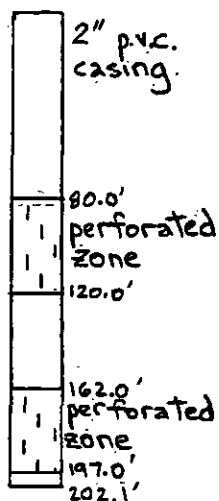
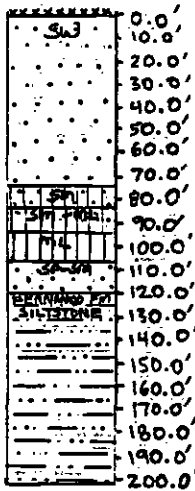
E-LOG YES

DOWN-HOLE SURVEY YES

CROSS-HOLE SURVEY No

PVC CASING (I.D.): 4" — TO —; 3" — TO —; 2" 0.0 TO 202.1

GROUND ELEVATION REF. 264'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SCRTD DATE DRILLED 2-12-81/2-14/81 HOLE NO. 9
LOCATION 7th Street near Flower Street GROUND ELEV. 267'
DRILLING CONTRACTOR Peter Doherty Co. LOGGED BY Stephen M. Testa DEPTH TO GROUND WATER _____
TYPE OF RIG Falmes 1500 HOLE DIAMETER 5" HAMMER WEIGHT AND FALL 140lb - 30in
SURFACE CONDITIONS concrete slab sidewalk TOTAL DEPTH 200.0' NO. CORE BOXES 14

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	CL	0.0-0.2 CONCRETE; 0.2-9.0 SANDY CLAY; moderate brown (SVR 314); plastic fines (80%); very fine sand (20%); moist; slow dilatancy; medium toughness.			AD			Arrived on site at 5:00 AM to setup; started drilling at 7:30; clear day; augered down to 10.0'; 8.5' of casing installed.
2.0								
4.0								hit old clay pipe sewer conduit at 4.0'
6.0								
8.0								
10.0	SM	9.0-14.0 SILTY SAND; moderate brown (SVR 314); non-plastic fines (15%); very fine sand (85%); moist; medium dense; slow to quick dilatancy; slight toughness.	J-1	5 6 9	SS RD			SPT at 10.0'; 4/1.5 recovery.
12.0								
14.0	GP	14.0-29.0 SANDY GRAVEL; medium; non-plastic fines (25%); fine to coarse sand (25%); gravel (60%) up to 1/2" in max. dia.; moist; very dense; dilatancy none; toughness none.	J-2	32 50	SS RD			minor re-orientation at 14.0'; SPT at 15.0'; 5/1.0 recovery.
16.0								
18.0								
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL HOSE	RUN NO.	CORE REC. %	REMARKS
20.0	GP	14.0-29.0 SANDY GRAVEL (CONTINUED)		25	DR			(CONTINUED)
				50				continue sample at 20.0', no recovery;
		numerous cobbles and boulders.		SPT	SS			SPT at 21.0' no recovery; moderate to heavy rod chatter to 22.5'; trouble getting back into hole due to cave in.
22.0					RD			
24.0								
26.0								
28.0		clayey gravel (cuttings) moderate yellow brown (10YR 5/1)						moderate to heavy rod chatter at 27.0'; occasional rock from 27.0';
30.0	ML	29.0-34.0 SANDY SILT; dark yellowish brown (10YR 4/2); silt (80%); very fine sand (20%); micaceous; mottled; iron stain stratification; moist; dense; dilatancy slow to quick; slight toughness.	J-3	9	SS			SPT at 30.0', 10/1.5 recovery.
				19				
				21				
32.0					RD			
34.0		color change at 34.0'						
36.0		34.0-38.0 STRATIFIED SAND AND SILTY CLAY; 35.0-35.3 SAND; greenish gray (5G 6/1); non-plastic fines (65%); fine to coarse sand (95%); moist; grades to light olive brown (10Y 4/2) SILTY CLAY; plastic fines (85%); non-plastic fines (15%); moist; dense; micaceous; grades to grayish olive (10Y 4/2) in color; at 36.0 greenish gray (5G 6/1) SAND similar to that at 36.0'	J-4	10	SS			SPT at 35.0', 1.2/1.5 recovery.
				14				
				20				
38.0	SP				RD			
40.0		38.0-44.5 SAND; dusky yellow (5Y 6/4); non-plastic fines (65%); fine to medium sand (95%); organics (4%); stratified (iron stained); moist; very dense; dilatancy quick; toughness none.	J-5	50	DR			continue sample at 40.0', no recovery; SPT at 40.5', 1.0/1.5 recovery.
				18	SS			
				23				
42.0				50				
					RD			
44.0								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SP	38.0-44.5 SAND: (CONTINUED)			RD			(CONTINUED)
46.0	SP	44.5-50.0 GRAVELLY SAND: greenish gray (56611); very dense.	J-6	16	SS			SPT AT 45.0', 10/1.3 recovery.
48.0		gravelly (fine)		25				
50.0		<u>FERNANDO FORMATION</u> 50.0-53.0 SILTSTONE:	J-7	19	SS			SPT AT 50.0', 1.5/1.5 recovery
52.0		ducky yellow (54614), non-plastic fines (90%); very fine sand (10%); moist; very dense; mottled due to variable iron staining.		23				
54.0		53.0-54.8 SANDY CLAYSTONE: ducky yellow (54614) mottled; moist; very dense; gravelly at 54.5.		30	AD			
56.0		54.8-200.0 CLAYSTONE: olive gray (54312) micaceous claystone; subtle compositional banding reflecting slight silt-clay variances during deposition; fossiliferous (bivalves, snails, etc) randomly distributed.	E-1	54	DR			concrete sample at 54.0', 10/1.0 recovery; minor rod chatter at 54.5; smooth drilling at 54.8.
58.0				50	RD			
60.0		continued.			PB	1		started continuous pitcher barrel sampling from 57.5'
62.0		<u>PHYSICAL CONDITION:</u> massive; soft handness; plastic strength; fresh; 2.5" of core tends to bend when held at both ends (doesn't fall apart)	Box # 1			2		200 psi.
64.0		continued.				3		pocket penetrometer > 4.5 kg. 1cm ² gas check - 0.0% LEL.
66.0		continued.				4		200 psi.
68.0			Box # 2			5		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	OPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		54.8-200.0 (CLAYSTONE) (CONTINUED) olive gray (5Y3/2) micaceous clay-stone; subtle compositional banding reflecting slight silt-clay increase during deposition apparent; fossiliferous (bivalves, snails, etc.) randomly distributed.	Box #2		PB	5	2.5 2.5	(CONTINUED) very monotonous unit.
70.0								200 psi.
72.0		PHYSICAL CONDITION: (CONT.) massive; soft to low hardness; plastic to weak strength; fresh,	5-1			6	2.5 2.5	200 psi.
74.0		continued.	Box #2			7	2.5 2.5	200 psi.
76.0						8	2.5 2.5	
78.0		continued; very well cemented fine sandstone from 78.0 to 78.9.				9	2.5 2.5	250 psi.
80.0		continued.	Box #3			10	1.3 2.5	Stopped drilling at a depth of 81.0' at 4:30 PM
82.0		yellowish gray (5Y7/2) silt blubs noted at 82.0'				11	2.5 2.5	2-13-81 Resumed drilling at 6:30 AM; clear day.
84.0						12	2.5 2.5	200 psi.
86.0		continued.	5-2			13	2.5 2.5	200 psi.
88.0			Box #3			14	2.5 2.5	packet penetrometer > 4.5 kg/cm ² .
90.0		continued.				15	2.5 2.5	200 psi.
92.0			Box #4					SHEET 4 OF 10

#130
6:30

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		548-200.0 CLAYSTONE; (CONTINUED)			FB	15	2.15	(CONTINUED)
94.0		dark gray (5Y3/2) micaceous clay-stone; subtle compositional banding reflecting slight silt-clay variance during deposition apparent; fossiliferous (bivalves, snails, etc.) randomly distributed.				16	2.15	200 psi
96.0		<u>PHYSICAL CONDITION: (CON'T)</u> massive; soft to low hardness; plastic to weak strength; fresh.	Box # 1			17	2.15	200 psi averaging 3 runs/hour
98.0						18	2.15	200 psi
100.0		continued.	6-3			19	2.15	200 psi
102.0		continued.				20	2.15	200 psi
104.0		continued.	Box # 5			21	2.15	200 psi
106.0		continued.				22	2.15	200 psi
108.0		continued.				23	2.15	200 psi
110.0		continued.				24	2.15	200 psi
112.0			Box # 6					
114.0			5-4					
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT 16'	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		54.8-200.0 <u>CLAYSTONE</u> ; (CONTINUED) olive gray (5Y3/2) micaceous claystone; subtle compositional banding reflecting silt-clay variance during deposition apparent; fossiliferous (bivalves, snails, etc.) randomly distributed.			AS			(CONTINUED)
118.0						25	25	200 psl. average 3 runs/hour.
120.0		<u>PHYSICAL CONDITION</u> : (LOW T) massive; soft to low hardness; plastic to weak strength; fresh.				26	25	200 psl.
122.0		continued.				27	25	200 psl.
124.0			Box #7			28	25	200 psl. pocket penetrometer 74.5 kg/cm ² .
126.0		continued.				29	25	200 psl.
128.0						30	25	200 psl.
130.0		continued.				31	25	200 psl.
132.0		wood fragments (2.1%) evident at 132.5'				32	25	200 psl.
134.0		wood fragments (2.1%) at 135.7'.	Box #8			33	25	200 psl.
136.0		continued.				34	25	200 psl.
138.0		continued.						200 psl.
140.0			Box #9					200 psl.

PROJECT

SCPTD

DATE DRILLED 2-13-81 / 2-14-81

HOLE NO.

9

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0		54.8-200.0 CLAYSTONE; (CONTINUED)			PR	34	2.5 2.5	(CONTINUED)
142.0		shiny gray (54312) micaceous clay-stone; subtle compositional banding reflecting silt-clay variances during deposition apparent; fossiliferous (bivalves, snails, etc.) randomly distributed.	B07 #9			35	2.5 2.5	200 psi.
144.0		PHYSICAL CONDITION: (CONT.) massive; soft to low hardness; plastic to weak strength; fresh.	S-6			36	2.5 2.5	200 psi.
146.0		continued.				37	2.5 2.5	200 psi. pocket penetrometer 74.5 kg/cm ² .
148.0		continued; wood fragments evident.	B07 #9			38	2.5 2.5	200 psi.
150.0		continued.				39	2.5 2.5	200 psi.
152.0		continued.	B07 #10			40	2.5 2.5	200 psi.
156.0		grayish yellow (54810) silt slabs apparent; compositional banding.				41	2.5 2.5	200 psi.
158.0		continued.	S-7			42	2.5 2.5	200 psi.; gas check 0.0% LEL (no gas encountered)
160.0		continued.				43	2.5 2.5	200 psi. Stopped drilling at a depth of 163.5' at 4:30 PM
162.0		163.5-164.5 VOLCANIC TUFF: dark grayish gray (56411); very fine grained; wet.	B07 #11			44	2.5 2.5	Resumed drilling at 6:30; clear day.
164.0								SHEET 7 OF 10

1:30

2:30

4:30

6:30

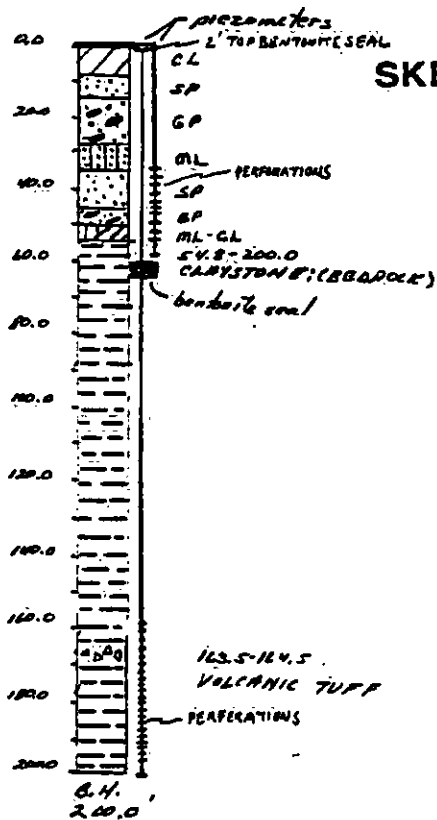
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0	A B	54.8-200.0 CLAYSTONE: (CONTINUED) olive gray (5Y3/2) micaceous clay-stone; subtle compositional banding reflecting silt-clay variance during deposition apparent; fossiliferous (bivalves, snails, etc.) randomly distributed.			AB			(CONTINUED)
166.0						44	2.5 2.5	200 psi averaging 3 runs/low.
168.0		PHYSICAL CONDITION: (CONT) massive; soft to low hardness; plastic to weak strength; fresh.				45	2.5 2.5	200 psi
170.0						46	2.5 2.5	200 psi
172.0		continued; grayish yellow (5Y8/4) siltstone lamina (17 cm. thick) at 171.2' and 173.3'				47	2.5 2.5	200 psi
174.0						48	2.5 2.5	200 psi
176.0		continued.				49	2.5 2.5	200 psi
178.0		continued.				50	2.5 2.5	200 psi
180.0		continued.				51	1.3 2.5	200 psi
182.0						52	2.5 2.5	200 psi
184.0						53	2.5 2.8	200 psi
186.0		continued.						
188.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0		54.8-200.0 CLAYSTONE: (continued as previously described)	Box #13		PB	53	28	(CONTINUED)
190.0		PHYSICAL CONDITION: (continued as previously described).				54	28	200 psi.
192.0		continued.				55	28	200 psi.
194.0		continued.	Box #14			56	28	200 psi.
196.0		continued.				57	28	200 psi.
198.0								Terminated hole at a depth of 200.0' at 11:50 A.M.
200.0	AH.							<p>2-15-81</p> <p>Conducted water pressure test at depth intervals 60.0' to 80.0' and 80.0' to 100.0' from 6:30 AM to 11:30 AM. Installed double piezometers: 200.0' - of 2" PVC slotted from 140.0' to 195.0'; 60.0' - of 1" PVC slotted from 45.0' to 55.0'; bentonite seal from 62.0' to 65.0'; hole back-filled with pea gravel. Water sampled 2/23/81</p>

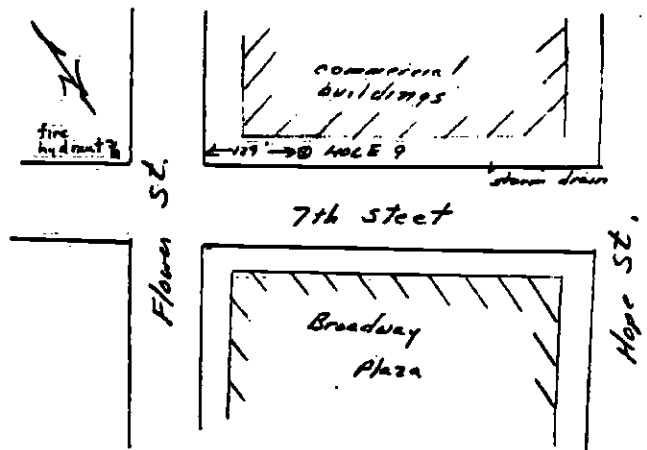


SUMMARY BORING NO. 9

PROJECT SCPTD STATION HOLE _____ DATE DRILLED 7-12-81/2-14-81
 OVERBURDEN DEPTH (FT.) 0.0' TO 54.8'
 BEDROCK DEPTH (FT.) 54.8' TO 200.0' (T.D.)
 WATER PRESS. TEST YES; INTERVAL(S) 62.0' TO 82.0', 82.0' TO 102.0'
 GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____
 GAS NO; DEPTH FIRST NOTICED _____, DATE _____
 E-LOG YES
 DOWN-HOLE SURVEY YES
 CROSS-HOLE SURVEY NO
 PVC CASING (I.D.): 4" _____ TO _____; ^{1"} 0.0 TO 60.0'; 2" 0.0' TO 200.0'
 GROUND ELEVATION REF. 267'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/31/81-2/3/81 HOLE NO. 10
 LOCATION Wilshire Blvd. at Valencia St GROUND ELEV. 320'
 DRILLING CONTRACTOR Pitcher LOGGED BY Gallinatti DEPTH TO GROUND WATER ~20'
 TYPE OF RIG Feeling HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs; 30 inches
 SURFACE CONDITIONS Sidewalk, business area TOTAL DEPTH 202.0 NO. CORE BOXES 8

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
0		0.0-0.5 CEMENT			AD			Begin drilling 9:00 1/31/81. Auger to 2.5' set new tub & begin rotary drill log. set 4' & 5" casing 1.5/1.5 recovery material at 20' is saturated. ~20' - water table (18'-22.5' perched water table - "underground stream")	
1	CL	0.5-12.0 SANDY CLAY: moderate brown (SYR 4/4); ~85% moderate plasticity fines; ~15% fine to medium grained sand; soft; disp. GRADING SANDIER (-70% fines, ~30% sand)			RD				
2									
4									
6									
8									
10					9	SS			
				3-1	20				
					22				
12	SP		12.0-18.0 SAND: moderate brown (SYR 4/4); 100% fine to medium grained sand; loose.			RD			
14									
16									
18	SP	18.0-22.5 LOBBLED SAND: moderate brown (SYR 4/4); 80-85% fine to medium sand; 15-20% gravel and cobbles; up to 3"; loose; water saturated.							
20									

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	SP	18.0 - 22.5 <u>GRAVELLY SAND</u> : fine			DR			DR ⇒ 53 blows No RECOVERY - just loose cobbles / gravel - fell out of sampler 2.5/0.75 recovery
22		<u>WEATHERED FERNANDO FORMATION</u> 22.5 - 38.0 <u>CLAYSTONE</u> : pale yellowish brown (10YR 6/2); 100% moderate to high plasticity fines; soft; damp	I-2	29 30	SS RD			DR sample taken w/ 325 lbs. down-hole jars, 5" tube + 1" rings. (GRAVEL probably causing high blow counts material is <u>not</u> dense.
24								
26								
28								
30					DR			30'-31' - Two DR runs, but just filled w/ cobble stuff
32		some oxide staining	S-1		PB			DR ⇒ 45 Blows NO RECOVERY ⇒ gravel stuff DR ⇒ 53 Blows NO RECOVERY ⇒ gravel stuff 2.0/2.5 recovery - some stuff on top.
34			I-3	7 12 25	SS RD			1.5/1.5 recovery
36								
38		<u>FERNANDO FORMATION</u> 38.0 - 40.0 <u>CLAYSTONE</u> : greyish brown (5YR 3/2); 100% moderate to high plasticity fines; stiff to very stiff; damp; no bedding						11:30 1/31/81 40' - Begin continuous sampling w/ Pitcher Barrel
40		<u>PHYSICAL CONDITIONS</u> : massive, low hardness, friable, fresh.	BOX 1		PB	1		2.7/2.8 recovery
42		40.7 step (70°) fracture filled with light colored material - thin.				2		
44								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44		380-2020 CLAYSTONE: (cont)	BOX 1			2		2.8/2.8 recovery
46		PHYSICAL CONDITIONS massive, low hardness, friable, fresh.				3		2.8/2.8 recovery
48						4		2.8/2.8 recovery
50		no bedding	S-2			5		2.7/2.4 recovery
52			BOX 1 (cont)			6		2.7/2.5 recovery
54			BOX 2			7		2.5/2.5 recovery material is expanding out of tube.
56						8		2.7/2.5 recovery
58						9		4.7/2.5 recovery
60		distinct smell of methane when clay is cut or broken: "swamp gas" sulphur?	S-3			10		2.4/2.5 recovery
62			BOX 2 (cont)			11		4.7/2.5 recovery
64								
66			BOX 3					
68								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
69		36.0 - 202.0 <u>CLAYSTONE:</u> (cont.)	BOX 3		PB	11		
70		PHYSICAL CONDITIONS: massive, low hardness, friable, fresh.	S-4			12		2.0/2.5 recovery tube is badly bent, couldn't be extruded. Not an undisturbed sample
72		No Bedding	S-5			13		2.5/2.5 recovery tube bent - can't be extruded
74		Clay still has pungent odor (sulphur/methane?)	S-6			14		2.5/2.5 recovery * undisturbed sample
76			BOX 3 (cont.)			15		1.7/2.5 recovery
78						16		2.5/2.8 recovery
80						17		1.6/2.8 recovery
82						18		2.6/2.8 recovery
84			BOX 4			19		2.9/2.8 recovery tube is bent, can't be extruded.
86			S-7			20		1.4/2.8 recovery
88			BOX 4 (cont.)					
90								
92								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92		38.0-2020 CLAYSTONE: (cont)			PB	20		
94		PHYSICAL CONDITION: massive, low hardness, friable, fresh	5-8			21		2.8/2.8 recovery undisturbed sample
96		NO BEDDING				22		0.0/2.8 recovery NO RECOVERY poor recovery due mainly to bad hole conditions - crooked hole causing tubes to get caught in bit & chanced up.
98		ODOR: (sulphur/mercaptan?)				23		0.0/2.8 recovery NO RECOVERY all samples are coming up bent w/ poor recovery. try going down w/ bit but does not help.
100						24		1.0/2.8 recovery NO RECOVERY
102						25		104.2' - stop drilling 1/31/81 - start drilling 2/1/81.
104		104.2' GAS TEST - No Combustibles 20% O ₂				25		0.0/2.8 recovery bent tube NO RECOVERY
106						26		0.0/2.8 recovery NO RECOVERY bent tube still having problems w/ collapse in the bottom of the hole
108						27		0.0/2.0 recovery bent tube NO RECOVERY
110						28		rig moved; delay while Drillers recenter rig. NO RECOVERY - CLAY in the tube, but tube is totally mangled; broken into 3 pieces / unrecoverable
112						29		
114						29		1.2/2.5 recovery
116			Box 4 (cont)					SHEET 5 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		38.0 - 202.0 <u>CLAYSTONE</u> : (cont.)			PB	29		Bit on Pitcher Barrel Cracked; replace bit, clean out hole, continue samplings w/ new bit
118		PHYSICAL CONDITION: MASSIVE, low hardness, friable, fresh	Box 4 (lead)		RD PB	30		
120		No Bedding				31		1.9/2.5 recovery
122		ODOR: (Sulphur/mercuric?)				32		2.5/2.5 recovery
124			S-9			33		2.3/2.5 recovery
126			Box 5			34		2.6/2.5 recovery (expanded out of tube)
128		~127-130 CLAY MATERIAL IS <u>EXPANSIVE</u>				35		2.7/2.5 recovery
130		130-134 scattered small shell fragments.				36		2.0/2.5 recovery
132						37		0.0/2.5 recovery No RECOVERY due to collapsed tube (to much pump pressure)
134						38		2.5/2.5 recovery
136						39		
138			S-10					
140								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		38.0 - 202.0 <u>CLAYSTONE</u> : (cont.)	BOX 5 (cont.)		PB	39		2.4/2.5
142		PHYSICAL CONDITION: massive, low hardness, friable, fresh.	BOX 6			40		5/2.5 recovery collapsed tube
144		No Bedding				41		1.9/2.5 recovery
146		ODOR: (Sulphur/Methane?)				42		2.0/2.5 recovery
148						43		2.2/2.5 recovery
150						44		2.5/2.5 recovery & undisturbed sample
152			S-11			45		2.5/2.5 recovery bent tube, could not be extruded. - <u>not undisturbed</u>
154						46		0.0/2.5 recovery NO RECOVERY - tube collapsed
156			S-12			47		160' - stop drilling for 2/1/41 - Bear drilling rig - go down w/ bit and clean out hole; continue sampling.
158						48		0.0/2.5 recovery <u>NO RECOVERY</u>
160								S-13: Bent tube, couldn't be extruded; <u>not an</u>
162			S-13					SHEET <u>7</u> OF <u>10</u>

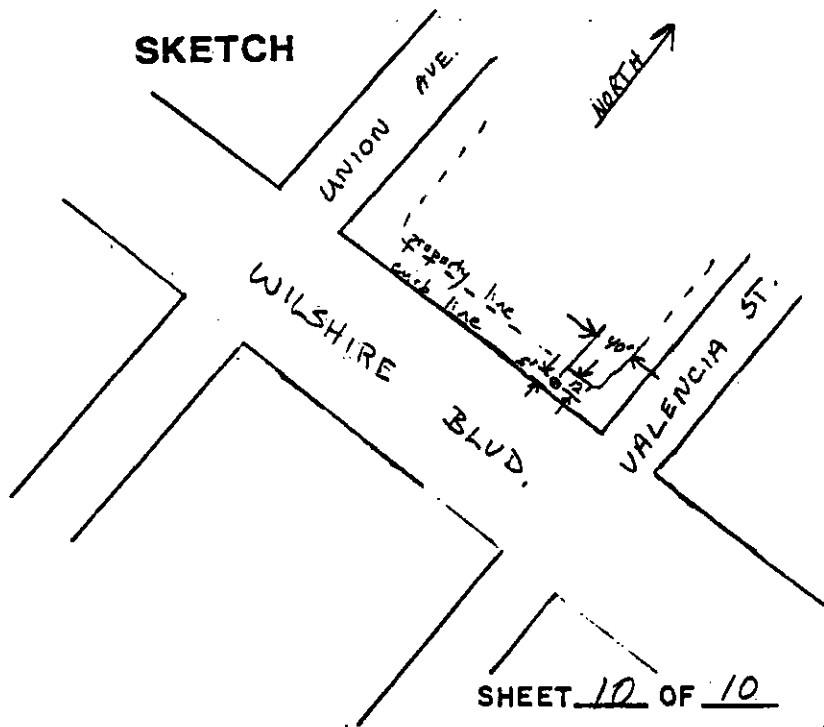
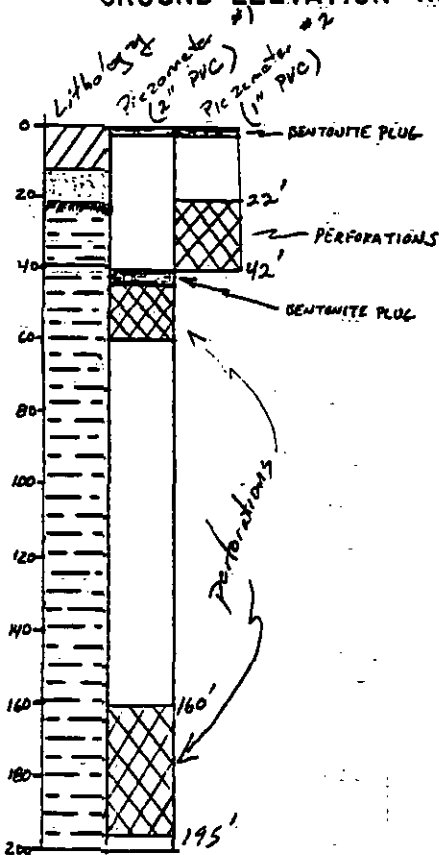
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		35.0 - 202.0 <u>CLAYSTONE</u> : (cont)	S-13		PB	48		2.5/2.8 recovery (NOT an undisturbed sample)
166		PHYSICAL CONDITIONS: massive, low hardness, friable, fresh	Box 6 (cont.)			49		2.4/2.8 recovery
168		166-168 <u>FRT CLAY</u> No more sulphur/methane(?) odor.	Box 7			50		2.5/2.8 recovery * undisturbed sample
170			S-14			51		2.1/2.8 recovery
172	(5m)	171.9 - 172.4 <u>SILTY SAND</u> lumpy; ~20% low plasticity fines; ~80% very fine sand; small shell fragments	Box 7 (cont.)			52		1.8/2.8 recovery
174						53		2.7/2.8 recovery
176		No Odor.				54		2.9/2.8 recovery Bent tube - can't be extended; Not an undisturbed sample
178						55		2.7/2.8 recovery
180		scattered small shell fragments	S-15			56		2.4/2.8 recovery * undisturbed sample
182			Box 7 (cont.)					
184			Box 8					
186			S-16					
188								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		38.0 - 202.0 <u>CLAYSTONE: (cont.)</u>	BOX 8 (cont.)		PB	57		2.8/2.8 recovery
190								
192			S-17			58		2.8/2.8 recovery Entered tube - can't be extruded - <u>NOT</u> an undisturbed sample
194			BOX 8 (cont.)			59		2.7/2.8 recovery
196								
198			S-18			60		2.8/2.8 recovery
200								
202	B.H.	202.0 Bottom of hole water sampled 1" 2/23/81				61		0.0/2.8 recovery NO RECOVERY - Mangled tube
								202.0' - Terminate Hole; stop circulation at 12:45; last sample out of hole at 1:00; ESA runs c-log; flush hole, install two permeameters; 2" PVC from 0' to 200' w/ cloth covered perforations from 45' to 60' and 160' to 195'; 1" PVC from 0' to 42' w/ perforations from 22' to 42'; Bentonite Plug from 42' to 47'; Clean-up site. move off site 9:00 2/3/81 SHEET <u>9</u> OF <u>10</u>



SUMMARY BORING NO. 10

PROJECT 30-1280-10 STATION HOLE 10 DATE DRILLED 1/31/81 - 2/3/81
 OVERBURDEN DEPTH (FT.) 0' TO 22.5'
 BEDROCK DEPTH (FT.) 22.5' TO 202' (T.D.).
 WATER PRESS. TEST 10; INTERVAL(S) _____ TO _____, _____ TO _____.
 GROUND WATER DEPTH (FT.) ~20' DATE 1/31/81; _____ DATE _____.
 GAS TRACE; DEPTH FIRST NOTICED _____, DATE _____.
 E-LOG yes.
 DOWN-HOLE SURVEY NO.
 CROSS-HOLE SURVEY NO.
 PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 200'.
 GROUND ELEVATION REF. 320'



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 11

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 29-31 Jan '81 HOLE NO. 11
LOCATION South side Wilshire Bl. just east of Alvarado St. GROUND ELEV. 271'
DRILLING CONTRACTOR J.N. Pletcher Co. LOGGED BY S. Slaff DEPTH TO GROUND WATER 29'
TYPE OF RIG Feeling 1500 HOLE DIAMETER 4 3/8" HAMMER WEIGHT AND FALL 140 lbs 30 inches
SURFACE CONDITIONS asphalt over concrete TOTAL DEPTH 201.1' NO. CORE BOXES

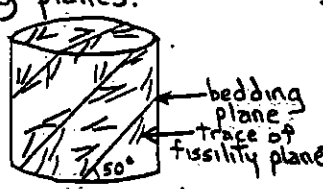
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0'-0.1' ASPHALT			AD			Began drilling 10:00
		0.1'-0.9' CONCRETE						Drilled 0.0'-0.9' with "garbage barrel" (cylindrical bit).
	ML	0.9'-20.9' CLAYEY SILT: Mottled: light olive brown (5Y 5/6) and light olive (10Y 5/4); 98% moderate plasticity fines; 2% fine sand; medium stiff; dry; sand is subangular.			RD			Drilled 0.9'-3.0' with 6" flight auger. Set 6" steel surface casing to 3.0' with 2" stick-up.
2.0								Drilled 3.0'-5.0' with 4 3/8" drag bit.
4.0								
		As above, mottled with dusky yellow (5Y 6/4) and moderate brown (5YR 4/4); 98% low plasticity fines; 2% fine sand; micaceous; spongy.		6	SS			1.5/1.5 recovery
6.0			J-1	9				
				12	RD			
8.0								
			J-2	7	SS			1.5/1.5 recovery
10.0				12				
				22	RD			
12.0								
	CL 45	14.5'-16.1' SILTY CLAY: grayish olive green (5GY 3/2); 98% low plasticity fines; 2% fine sand; stiff; dry to moist.		10	SS			1.5/1.5 recovery
16.0	ML	As above, becoming banded; stiff, moist, weakly foliated.	J-3	14				
				21	RD			
18.0								
			C-1	14	DR			Drive sample using modified California sampler and 325 lb. down-hole jabs.
20.0				34				1.0/1.0 recovery

SHEET 1 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	ML	0.9' - 20.9' <u>CLAYEY SILT</u> (continues)		14	SS			1.5/1.5 recovery
		20.9' - 201.1' <u>PUEBLO FORMATION:</u>	J-4	26				13:30
22.0		<u>SILTSTONE:</u> grayish olive green fines; 5% very fine sand; no dilatancy; medium plasticity; hard; dry; micaceous; glauconitic(?). <u>PHYSICAL CONDITION:</u> massive; soft to friable (hardness); soft to friable (strength); fresh.		38	RD			drill rate = .8 min/ft.
24.0								
26.0		As above; small amount of clay cement; sulfurous- organic odor.	S-1		PB	1		2.6/2.8 recovery
28.0	51		box #1			2		1.8/2.8 recovery drilling with 230 p.s.i. hydraulic draw-down. standard penetration > 4.5 tons/ft ²
30.0		Grading from thickly to thinly bedded.				3		2.8/2.8 recovery
32.0	55					4		2.7/2.8 recovery drill rate = .8 min/ft. 14:30
34.0		Organic-sulfurous odor decreasing.				5		2.8/2.8 recovery
36.0						6		2.4/2.8 recovery
38.0		Grading from dry to moist.	box #2			7		2.0/2.8 recovery
40.0	52							
42.0			S-2					
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0		20.9'-201.1' SILTSTONE: (continues)	S-2		PB	7		2.0/2.8 recovery
		PHYSICAL CONDITION: (continues as previously described).	box #2			8		2.8/2.8 recovery
46.0								
48.0	58	SILTSTONE contains interbedded uncemented sandstone. Sandstone beds are greenish gray (5GY 6/1), .25-1.5" thick, comprise 5-20% of siltstone unit.				9		2.1/2.8 recovery
50.0			box #3			10		2.8/2.8 recovery
52.0								
54.0	58	Some siltstone beds are dusky yellow (5Y 6/4), comprise 1-5% of siltstone unit.				11		2.8/2.8 recovery
56.0						12		2.8/2.8 recovery
58.0		Samples break easily along bedding planes; most easily along sandstone bedding planes.						
		No sulfurous-organic odor.	S-3			13		2.6/2.8 recovery
60.0								
62.0	50		box #4			14		2.2/2.8 recovery Did not add any chemicals to drilling fluid all day.
64.0								64.2' end of 29 Jan. '81
						15		groundwater at 6.1' at 07:00 30 Jan. '81. 2.8/2.8 recovery
66.0								drilling with 200 p.s.i. hydraulic draw-down.
68.0						16		2.8/2.8 recovery SHEET 3 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	58 Y	20.9' - 201.1' <u>SILTSTONE:</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described). Scattered coarse sand-sized grains of organic matter, apparently wood.	box #4		PB	16		2.8/2.8 recovery
70.0			box #5			17		2.7/2.8 recovery
72.0						18		2.7/2.8 recovery
74.0						19		2.8/2.8 recovery
76.0						20		2.8/2.8 recovery
78.0	47 Y		S-4			21		2.8/2.8 recovery
80.0			box #5			22		2.8/2.8 recovery
82.0			box #6			23		2.8/2.8 recovery
84.0						24		2.8/2.8 recovery
86.0				S-5			25	
88.0	53 Y					26		
90.0			S-6			27		2.7/2.8 recovery
92.0								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	51 Y	20.9' - 201.1' SILTSTONE: (continues). PHYSICAL CONDITION: (continues as previously described).	S-6 box #6		PB	24		2.7/2.8 recovery
94.0						25		2.3/2.8 recovery
96.0	49 Y	Grading from thinly bedded to massive; decreasing proportion of sandstone beds.	box #7			26		2.8/2.8 recovery
98.0						27		2.7/2.8 recovery drill rate = .6'/minute
100.0	49 Y	Sandstone beds < 5% of siltstone unit.				28		2.6/2.8 recovery
102.0						29		1.8/2.8 recovery easy drilling
104.0	50 Y	Siltstone has very slight fissility (probably due to sub-parallel orientation of mica grains). Bedding is indistinct at this depth, but fissility seems to be along planes 10-30° to bedding planes.	S-7			30		2.8/2.8 recovery
106.0						31		2.0/2.8 recovery 11:00 drill rate = .9ft/minute
108.0	50 Y		box #8			32		2.8/2.8 recovery
110.0						33		2.8/2.8 recovery
112.0								
114.0								
116.0								SHEET 5 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (S)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		20.9' - 201.1' <u>SILTSTONE:</u> (continues). <u>PHYSICAL CONDITION:</u> (continues as previously described).	box #8		PB	33		2.8/2.8 recovery
118.0			box #9			34		2.4/2.8 recovery
120.0	48 Y					35		2.3/2.8 recovery
122.0		Bedding more distinct.	S-8			36		2.7/2.8 recovery
124.0						37		1.9/2.8 recovery
126.0	51 Y		box #9			38		2.6/2.8 recovery
128.0		Sandstone beds are thicker than above - up to 2.5" thick.				39		2.7/2.8 recovery
130.0						40		2.1/2.8 recovery
132.0	53 Y	Siltstone is quartz-rich and contains mafic minerals. Probably a near-shore deposit derived from metamorphic and igneous rocks.	box #10			41		2.4/2.8 recovery
134.0								2.8/2.8 recovery
136.0								
138.0	49 Y							
140.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (CT)	DRILL MODE	RUN. NO.	CORE REC. %	REMARKS	
140.0		20.9-201.1' SILTSTONE: (continues). PHYSICAL CONDITION: (continues as previously described).	S-9		PB	42		2.8/2.8 recovery	
142.0	49		box #10			43		2.7/2.8 recovery	
144.0			box #11						
146.0		147.1-147.6 SANDSTONE: dark greenish gray (SG 4/1); 90% fine sand; 10% medium plasticity fines; no dilatancy; medium plasticity; very dense; moist; micaceous (sericite or muscovite); sand is rounded; quartz- rich; uncemented; friable.				44		1.9/2.8 recovery	
148.0	51					45		1.9/2.8 recovery	
150.0									
152.0							46		2.5/2.8 recovery 14:20 2% combustible gas
154.0			Siltstone is massive, unfractured.	box #12			47		2.7/2.8 recovery
156.0			S-10						
158.0						48		2.7/2.8 recovery	
160.0			box #12			49		2.8/2.8 recovery	
162.0	47								
164.0						50		2.8/2.8 recovery	

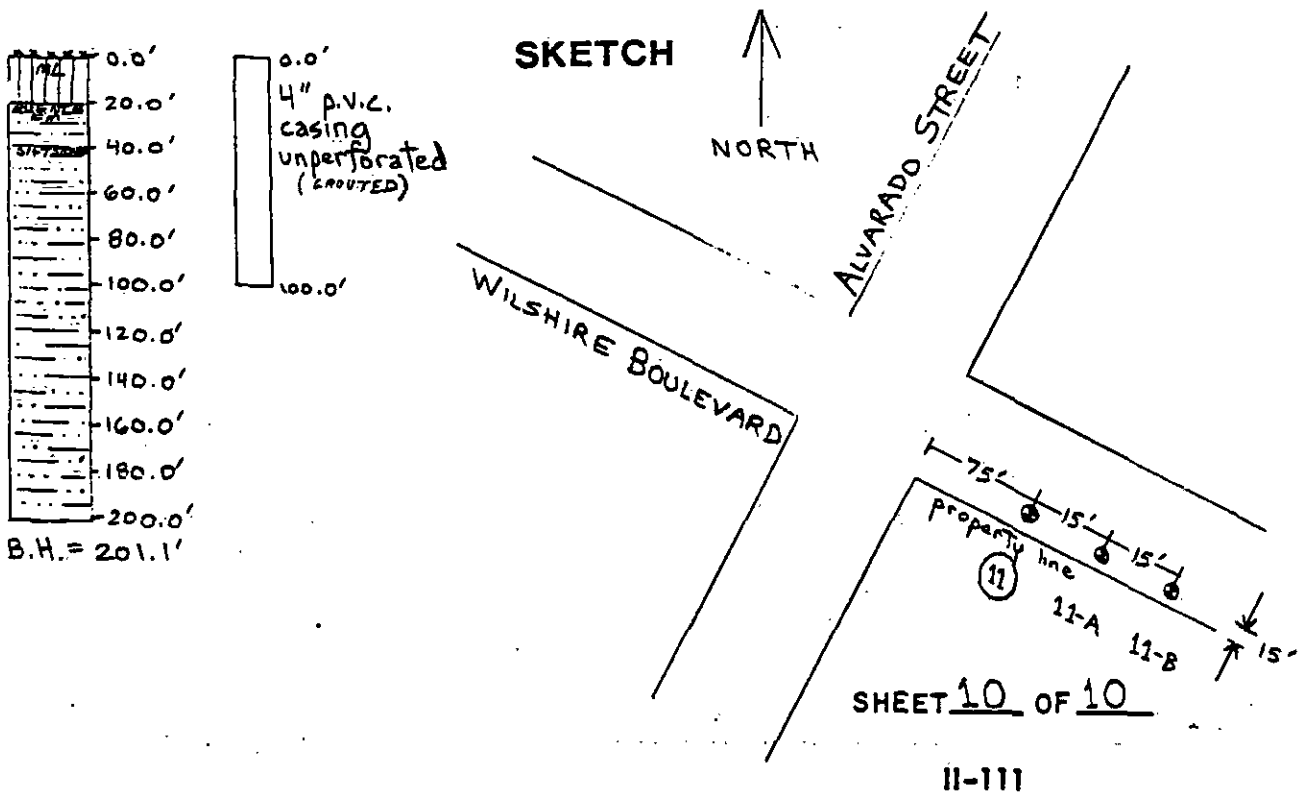
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS			
164.0	51 y	20.9'-201.1' SILTSTONE: (continues). PHYSICAL CONDITION: (continues as previously described).	box #13		PB	50		2.8/2.8 recovery			
166.0						51		2.8/2.8 recovery			
168.0						52		2.8/2.8 recovery			
170.0						53		2.1/2.8 recovery			
172.0						54		2.7/2.8 recovery			
174.0	52 y					55		2.6/2.8 recovery			
176.0											
178.0											
180.0	53 y	sandstone beds interbedded in siltstone are greenish gray (SGY 6/1); 75% fine sand, 25% moderate plasticity fines; very dense, moist, mucaceous; uncemented, beds are .25"-.75" thick; comprise ~5% of sample.	box #14			56		end of day 30/1/81 2.6/2.8 recovery 31/1/81 07:00 Artesian water flow from hole at .25gal/min with 3' hydrolic head. Temperature = 81°F Small gas bubbles (.2" diameter) rising constantly. Large gas bubbles (2" diameter) rise 6 times/minute. 3-4% combustible gas background with kicks up to 12%.			
182.0						57		2.7/2.8 recovery drilling with 200 p.s.i. hydraulic draw-down.			
184.0						58		2.8/2.8 recovery			
186.0						59		2.8/2.8 recovery			
188.0	52 y		box #15					SHEET 8 OF 10			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0	48 50 50	20.9' - 201.1' SILTSTONE: (continues) PHYSICAL CONDITION: (continues as previously described)	S-12		PB	59		2.8/2.8 recovery 08:55
190.0			box #15			60		2.6/2.8 recovery gas pocket; large bubbles and tar in drilling fluid.
192.0						61		2.8/2.8 recovery standard penetration > 4.5 tons/sq. ft.
194.0						62		2.8/2.8 recovery
196.0						63		10:15 15% combustible gas. 2.5/2.5 recovery
198.0					box 16 S-13			
200.0								
202.0		B.H. 201.1' Terminated hole.						10:30 31 January 1981 Reamed hole, ran electric logs. 13:15 - artesian water flow rate = 1 gal/6 minutes with 3' hydraulic head. 13:30 - artesian flow rate = 1 gal/4.5 min. with 3' head. Conducted down-hole seismic testing. 16:30 - artesian flow rate = 1 gal/2 min. with 3' head. 1 gal/1.3 min. with 2' head. 17:00 - artesian flow rate = 1 gal/min with .5' head. 07:00 1 February 1981 artesian flow rate = 1 gal/1.3 min with .5' head. Collected water sample for analysis. 06:45 2 February 1981 artesian flow rate = 1 gal./1.3 min. Gas bubbles still rising through water. Conducted gas analysis with chromatograph. 09:15 After bailing hole down to 50.0' determined artesian aquifer is at 29.0' Water sampled 2/7/81



SUMMARY BORING NO. 11

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 29-31 Jan. 1981.
OVERBURDEN DEPTH (FT.) 0.9' TO 20.9'.
BEDROCK DEPTH (FT.) 20.9' TO 201.1' (T.D.). 55' - 75',
WATER PRESS. TEST YES; INTERVAL(S) 63' TO 83', 35' TO 55'.
GROUND WATER DEPTH (FT.) 29' DATE 2 Feb '81; artesian DATE 31/1/81.
GAS YES; DEPTH FIRST NOTICED 153.0', DATE 30 Jan '81.
E-LOG YES.
DOWN-HOLE SURVEY YES.
CROSS-HOLE SURVEY YES.
PVC CASING (I.D.): 4" 0.0' TO 100'; 3" _____ TO _____; 2" _____ TO _____.
GROUND ELEVATION REF. 271'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 2/11/81-2/13/81 HOLE NO. 12
LOCATION Wilshire Blvd. west of Hoover St. GROUND ELEV. 245'
DRILLING CONTRACTOR Pitchee LOGGED BY Gallinatti DEPTH TO GROUND WATER none
TYPE OF RIG Friling HOLE DIAMETER 4 3/8" HAMMER WEIGHT AND FALL 140 lbs. 30"
SURFACE CONDITIONS slightly wet to moist TOTAL DEPTH 200.1 NO. CORE BOXES 14

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0-1.0 CEMENT			AD			Begin drilling 9:00
1	CL	1.0-8.0 GRAVELLY CLAY: light brown (5YR 5/6); ~80% moderate plasticity fines; ~20% fine sand to 1/4" gravel; medium stiff; damp.						2/11/81. Auger to 6; set 7' of 5" surface casing and
2								more casing
4								[P.P.] stands for pocket penetrometer: data obtained from field-extruded PB samples
6					RD			
8	CL	8.0-10.0 CLAY: medium dark gray (N4); ~95% moderate plasticity fines; ~5% fine grained sand; firm; damp.						
10	CL	10.0-32.0 SANDY CLAY: Light brown (5YR 5/6); ~80% fines - moderate plasticity; ~20% fine grained sand; soft; damp.	I-1	3 5 8	SS			1 3/5 recovery
12					RD			
14								
16								
18								
20								

increase in SAND content





~30-40% fine to coarse sand; material is soft & mottled, could be fill

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	LL	10.0-32.0 SANDY CLAY (LAD)	C-1		DR			DR ⇒ 12 c'ws 0.8/1.0 recovery
22				2	SS			0.0/1.5 recovery
24				3	RD			DS sample taken w/ modified in terms sample size, SS 5% down-hole tests: C-1 taken w/ 5" tube plus 1" core.
26								
28								
30				6	SS			1.5/1.5 recovery
32			I-2	10				
32		<u>PUEENTE FORMATION:</u>		12	RD			
32		32.0-77.8 SILT and CLAYSTONE						
34		thinly bedded (0.05' to 0.2' thick); ~ 50% SILT layers and 50% laminated CLAYSTONE layers:	BOX 1		PB 1			34'-Beam continuous Pitcher 2nd sampling 11:30 2/11/81
36		SILT is brownish gray (5YR 4/1); 100% low plasticity fines; stiff; damp; easily curved with knife (P.P. = 3.5); CLAYSTONE dk. yellowish brown (10YR 4/4); 100% moderate plasticity fines; hard; curved with difficulty with knife (P.P. > 5); damp to dry. Occasional thin SAND laminations.						2.2/2.8 recovery
38								2.7/2.8 recovery
40								2.8/2.8 recovery
42								2.7/2.8 recovery
44								

Decrease in SAND content

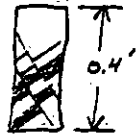

35' - 90° turn in strike of bedding;
no apparent fracture,
& dip remains constant


32' - 50' ~~sample~~ swell
when material is cut
w/ knife or broken


DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (15')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44		32.0-77.8 SILT and CLAYSTONE (cont.)	BOX 2		PB	4		
46		44' - disrupted bedding 0.4' 	S-1			5		2.8/2.8 recovery
48		[P.P. > 5]	BOX 2 (cont.)			6		2.7/2.8 recovery
50		50' - disrupted bedding 0.4'  no fractures				7		2.8/2.8 recovery
52		53' - disrupted bedding 0.4'  no fractures				8		2.9/2.8 recovery
56			BOX 3			9		2.7/2.8 recovery
58						10		2.7/2.8 recovery
62		61.6' - Disrupted bedding 0.4'  crushed cemented material	S-2			11		1.6/2.8 recovery
64			BOX 3 (cont.)			12		2.9/2.8 recovery
68						13		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68		32.0-77.8 SILT and CLAYSTONE (cont.)	30X 2		PB	13		2.8/2.8 recovery
70		[P.P. > 5]	30X 4			14		2.8/2.8 recovery
72						15		2.8/2.8 recovery
74						16		2.0/2.0 recovery
76			S-3			16		2.0/2.0 recovery
78		77.8-81.5 SILTSTONE: very hard, cemented siltstone; barely scratches w/ knife.			RD			cemented zone - rotary drill thru it
80		81.5-200.1 SILTSTONE/some thin (0.05') CLAYSTONE interbeds:			PB	17		2.8/2.8 recovery
82		same as 32.0-77.8 except claystone makes up only ~20% of the rock; thin SPND lamirations make up ~5% of the rock.	S-4			18		2.7/2.8 recovery
84			30X 4 (cont.)			18		2.7/2.8 recovery
86		[P.P. > 5]				19		2.8/2.8 recovery
88		80'-90' sulphur smelt when material is cut or broken	30X 5			19		2.8/2.8 recovery
90						20		2.7/2.8 recovery
92								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
92		<p>21.5 - 200.1 SPT w/ 21.5 - 175.0 cont.</p> <p>THIS CASE CONTAINS NO fractures; can be gouged w/ a knife; friable; [P.P. > 5].</p>	Box 5		PB	21		2.3/2.3 recovery	
94						22		2.8/2.8 recovery	
96				Box 6			23		2.8/2.8 recovery
98				5-5			24		2.8/2.8 recovery
100				Box 6 (cont.)			25		2.8/2.5 recovery
102							26		2.6/2.3 recovery
104							27		2.9/2.3 recovery
106				Box 7			28		2.8/2.8 recovery
108							29		
110				5-6					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		81.5 - 200.1 SILT w/ CLAYSTONE:	S-6		PB	29		2.8/2.8 recovery * undisturbed sample
118		PHYSICAL CONDITIONS: no fractures; can be gouged w/ a knife; friable to moderately strong; [p.p. > 5]	S-7			30		2.8/2.8 recovery Best core - can't be extracted
120	40		Box 7 (cont.)			31		120.2 - stop 2/11/81 SPT 2.2/2.2 1.5/2.8 recovery
122						32		2.7/2.8 recovery
124	40		Box 8			33		2.7/2.8 recovery
126						34		2.9/2.8 recovery
128						35		2.8/2.8 recovery
130	40	130.2' - 131.0' - some "micro-faults" with small but distinct offset of 2-3 mm; "faults" dipping ~60°				36		2.8/2.8 recovery * undisturbed sample
132		132.1' - disrupted bedding				37		2.8/2.8 recovery
134			S-8			38		
136	40		Box 9			39		2.8/2.8 recovery
138						40		
140								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		81.5 - 200.1 SILT w/ CLAYSTONE (cont.)	BOX 9		PB	38		2.8/2.8 recovery
142		PHYSICAL CONDITION: no fractures; friable to moderately strong; can be gouged w/ a knife with some difficulty; [pp > 5]				39		2.7/2.8 recovery
144								
146		145.5 - small "microstauks" with 5mm displacement dipping ~ 60°	BOX 10			40		2.9/2.8 recovery
148			S-9			41		2.8/2.8 recovery <u>Bent tube - can't be extended</u>
150			BOX 10 (cont.)			42		2.9/2.8 recovery
152		152.2 - disrupted bedding				43		2.8/2.4 recovery
154						44		1.9/2.2 recovery * undisturbed sample
156			S-10			45		2.3/2.5 recovery
158			BOX 10 (cont.)			46		2.6/2.7 recovery
160		160'-161' burrowing/slumping ?? caused many irregularities in the bedding.	BOX 11					
162								
164								

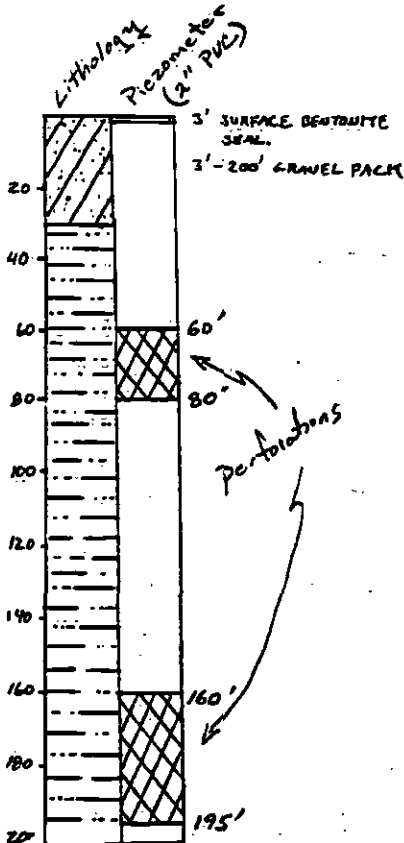
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		81.5-200.1 SILT w/ CLAYSTONE: (cont.)	S-11		PB	47		0.8/1.0 recovery WON'T EXTRUDE - too tight.
166			Box II (cont.)			48		
168		167.2' Disturbed bedding 				49		2.9/2.8 recovery POSSIBLY BAD TUBE OR EXPANSIVE MATERIAL
170						50		2.5/2.5 recovery
172			S-12			51		2.0/2.0 recovery
174			Box II (cont.)			52		2.2/2.7 recovery
176			Box 12			53		2.9/2.8 recovery
178						54		2.8/2.8 recovery
180						55		2.9/2.8 recovery
182								
184								
186			Box 13			56		2.7/2.7 recovery * undisturbed sample
188			S-13					SHEET 8 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		81.5-200.1 Silt w/ CLAYSTONE:	SS-13		PB	56		
190		physical condition: no fractures, gouged w/ drill with a bentonite; [p.p. > 5]	BOX 13 (cord)			57		2.4/2.8 recovery
192						58		2.8/2.8 recovery
194						59		2.0/2.8 recovery
196		196' - zone of broken/baked material (no. 4' x 1.5')				60		2.7/2.8 recovery
198			BOX 14					
200	B.H.	200.1 Bottom of Hole						2/12/81 Terminate Hole at 200.1'; stop circulation at 4:30, last sample out of hole at 4:45. 2/13/81 - EBA c-log hole. Install piezometer (2" PVC) with cloth-covered perforations from 60' to 80' and from 160' to 195'. gravel packed to surface. Clean-up and move off. off site 3:00 2/13/81. water sampled 2/18/81

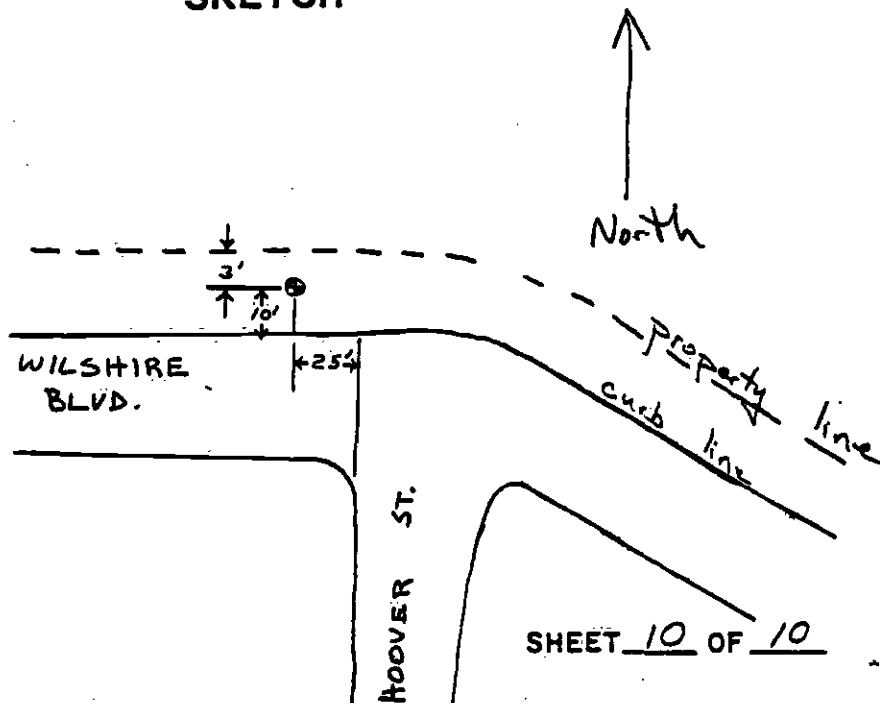


SUMMARY BORING NO. 2

PROJECT 80-1280-22 STATION HOLE 110 DATE DRILLED 2/11/91 - 2/13/91
 OVERBURDEN DEPTH (FT.) 0' TO 32'.
 BEDROCK DEPTH (FT.) 32' TO 200.1' (T.D.).
 WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.
 GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.
 GAS TRACE (H₂S) DEPTH FIRST NOTICED _____, DATE _____.
 E-LOG YES.
 DOWN-HOLE SURVEY NO.
 CROSS-HOLE SURVEY NO.
 PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 200'.
 GROUND ELEVATION REF. 245'



SKETCH



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 13

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.


PROJECT SCATD 60-1280-22 DATE DRILLED 130-8/2-81 HOLE NO. 13
 LOCATION intersection of Wilshire Blvd. and New Hampshire Ave GROUND ELEV. 249'
 DRILLING CONTRACTOR Pitkin Drilling Co. LOGGED BY Stephen M. Testa DEPTH TO GROUND WATER 16.5'
 TYPE OF RIG Fuller 1500 HOLE DIAMETER 5" HAMMER WEIGHT AND FALL 140lb - 30in
 SURFACE CONDITIONS asphalt TOTAL DEPTH 200.0' NO. CORE BOXES 15

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	CK	0.0-0.2 ASPHALT; 0.2-3.0 SANDY CLAY; light olive brown (5Y5/16); plastic fines (65%); fine sand (35%); moist; mottled; dilatancy none; medium toughness.			AD			Started drilling at 9:30; clear day; augered down to 6.5'
3.0								
4.0	SP	3.0-20.0 SAND; olive gray (5Y3/2); non-plastic fines (210%); fine to medium sand (90%); moist; quick dilatancy; toughness none.						
6.0		at 5.0: moderate yellowish brown (10YR 5/4); fine to coarse; gravel (5-10%) up to 3/4" max. dia., dry.			RD			dove 8.5' 1/2" casing.
8.0								
10.0		moderate yellowish brown (10YR 5/4); non-plastic fines (210%); fine to coarse sand (90%); no gravel; moist; very dense.	J-1	20 30 34	CS			SPT at 10.0'; 15/1.5 recovery
12.0					RD			
14.0		gravelly from 13.0 to 13.5'						moderate rock chatter from 13.0 to 13.5'
16.0		dark yellow (5Y 6/4); non- plastic fines (2.5%); fine to coarse sand (95%); gravel up to 1/4" max. dia. (2-3%); mottled; stratified; moist; very dense.	J-2	22 50	SS			SPT at 15.0'; 10/1.0 recovery; groundwater level at 16.0' (2-2-81)
18.0					RD			
20.0								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	S07	200-305 SILTY SAND: dusky yellow (5Y6/4); non-plastic fines (85%); very fine to fine sand (70%); organics (1-3%) randomly distributed; mottled; stratified; iron staining ubiquitous; moist; very dense; slow to quick dilatancy; slight toughness.	J-3	21 24 32 45 50	SS DR RD			(CONTINUED) SAT at 20.0'; 1.5/1.5 recovery; converse sample at 21.5'
22.0								anon rod chatter from 22.5 to 25.0.
24.0								
26.0		continued; dark yellowish brown (10YR 4/2) and dark yellowish orange (10YR 6/6); mottled; moist; very dense;	J-4	19 33 31	SS RD			SAT at 25.0'; 1.0/1.5 recovery.
28.0								
30.0		<u>WEATHERED PUENTE FORMATION</u> 30.5-33.0 CLAYSTONE: dark yellowish brown (10YR 4/2); plastic fines (90%); very fine sand (<100µ); mottled; moist; medium dense; iron stained laminae dipping 45° to core axis.		12 8 21	SS RD			SAT at 30.0'; 1.0/1.5 recovery.
32.0		<u>PUENTE FORMATION</u> 33.0-200.0 CLAYSTONE: Wavy, parallel, alternating very thin to medium laminae of primary olive gray (5Y3/2), brownish black (5YR 2/1) and grayish brown (5YR 3/2) claystone; subordinate light olive gray (5Y 4/2) friable fine grained sandstone; and dark yellowish brown (10YR 4/2) siltstone; also evident is gypsum (CaSO ₄ ·2H ₂ O) laminae up to 7 cm. in thickness (notably at 34.2, 36.5, 36.8, 38.0, 38.6, 38.8, and 40.9); micaceous; moist.						subtle change in drilling resistance at 33.0'
34.0								
36.0	40 Y				PB			220 psi.
38.0	35-40 Y		Boy			1	2.5 2.5	250 psi.
40.0	20-30 Y	<u>PHYSICAL CONDITION:</u> massive; soft to low hardness; plastic to weak strength; fresh; tends to fracture along bedding planes, notably sandstone laminae.				2	2.5 2.5	250 psi.
42.0						3	2.5 2.5	250 psi.
44.0	20-30 Y	grayish orange (10YR 7/4) very fine grained laminae notably at 43.0 and 42.7 (volcanic ash?)				4	2.5 2.5	250 psi.

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0		330-200.0 CLAYSTONES (CONTINUED) wavy, parallel, alternating very thin to medium lamina of claystone, siltstone and sandstone to 46.4.	Box # 1		PB	4	2.2 2.5	(CONTINUED) 250 psi.
46.0						5		
48.0	30-40 Y	brownish black (5YR 2/1) claystone from 46.4 to 47.0; micaceous: 47.5 to 50.0 primarily olive gray (5Y 2/2) micaceous claystone with wavy discontinuous very thin to thin fine sandstone laminae.	Box # 2			6	2.0 2.0	200 psi.
50.0		<u>PHYSICAL CONDITION:</u> massive, soft to low hardness, plastic to weak strength, fresh; tends to fracture along bedding planes, notably sandstone laminae.				7	2.2 2.5	200 psi.
52.0	30-40 Y	continued.	S-1			8	2.5 2.5	200 psi.
54.0		continued.	Box # 2			9	2.1 2.5	200 psi.
56.0						10	2.1 2.5	200 psi.
58.0	20-30 Y	continued; primarily claystone (75%) with discontinuous sandstone lamina (25%).				11	2.1 2.5	200 psi.
60.0	15-20 Y	continued.	Box # 3			12	2.1 2.5	
62.0		wavy, parallel, alternating very thin to medium lamina of claystone (20%), fine sandstone (20%) and siltstone (10%).				13	2.1 2.5	
64.0						14	2.1 2.5	
66.0			S-2					
68.0			Box # 3					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (1')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		33.0-200.0 CLAYSTONE (CONTINUED) wavy, parallel, alternating very thin to medium laminae of micaceous claystone (70%), fine sandstone (20%) and siltstone (10%). <u>PHYSICAL CONDITION:</u> continued as previously described.	Box #3		PB	14	2.5 2.5	(CONTINUED)
70.0	30-35 Y					15	2.5 2.5	250psi
72.0		primarily olive gray (5Y3/2) claystone (80%) with wavy discontinuous very thin to thin fine sandstone laminae. continued.	Box #4			16	2.1 2.1	200psi
74.0	30-40 Y				17	2.2 2.2	200psi	
76.0		continued; claystone (75%) fine sandstone (25%).	Box #5			18	2.3 2.5	200psi
78.0	30-40 Y				19	2.5 2.5	200psi	
80.0		continued.	S-3			20	1.7 2.5	200psi
82.0					21	2.5 2.5	200psi	
84.0		continued.	Box #5			22	2.1 2.5	200psi
86.0					23	2.5 2.5	200psi	
88.0		continued.	Box #6					
90.0	30-35 Y							
92.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BIT (in)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		33.0-200.0 CLAYSTONE (CONTINUED)			PB	23		(CONTINUED) 200 psi
94.0		from 72.5 primarily olive gray (5-12) micaceous claystone (75-80.0%) with very, coarsely discontinuous very thin to medium fine sandstone lamina (25-20%)	Box #6			24		stopped drilling at a depth of 95.0' at 5:00 PM
96.0		PHYSICAL CONDITIONS! massive, soft to low hardness; plastic to weak strength; fresh; tends to fracture along bedding planes, notably along sandstone lamina;	S-4			25		1-31-81 Resumed drilling at 7:00 at a depth of 95.0' clear day.
98.0	20-30 Y	continued; bivalves at 98.2 (i.e. by 3.0mm).	Box #6			26		200 psi
100.0	30-35 X	continued.				27		200 psi
102.0		alternating very thin to medium lamina of claystone (80%), fine sandstone (10%) and siltstone (10%).	Box #7			28		250 psi
104.0		continued, folding apparent.				29		250 psi
106.0	0-20 Y					30		350 psi
108.0			S-5			31		225 psi, due to refusal at 111.0'; put on tri-cone bit and rotary drilled to 112.5'
110.0		well cemented fine grained sandstone at 110.5	S-6		RD			
112.0		continued.			PB	32		225 psi
114.0	30° Y		Box #7			33		225 psi
116.0		continued.	Box #8					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		23.0-200.0 CLAYSTONE: (CONTINUED)			FB			(CONTINUED)
118.0	50 Y	navy, parallel; alternating very thin to medium lamina of micaceous claystone with subordinate fine sandstone and siltstone.				33	1.6 2.5	250 psi; averaging about 7.5 to 10.0 per hour.
120.0		continued to 121.5, then primarily olive gray (5Y2/2) micaceous claystone with very thin to medium lamina of fine sandstone.	Box # 8			34	1.9 2.5	250 psi.
122.0		PHYSICAL CONDITION: (CONTINUED) massive; soft to low hardness; plastic to weak strength; fresh; tends to fracture along bedding planes, notably along sandstone laminae.				35	2.1 2.5	200 psi.
124.0		continued: claystone (75%), fine sandstone (25%).		5-7		36	2.5 2.5	200 psi.
126.0	25-30 Y		Box # 8			37	2.1 2.5	200 psi.
128.0		continued.				38	2.3 2.5	200 psi.
130.0		continued; bivalves at 131.3.				39	2.3 2.5	200 psi.
132.0	40 Y	alternating claystone (60%), fine sandstone (35%) and siltstone (5%).	Box # 9			40	2.3 2.5	250 psi.
134.0		continued; claystone (70%), fine sandstone (30%).				41	1.6 2.5	200 psi.
136.0	30 Y					42	1.6 2.5	200 psi.
138.0			5-B					
140.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL HOZE	RUN NO.	CORE REC. %	REMARKS
140.0		33.0-200.0 CLAYSTONE (CONTINUED)			PB			(CONTINUED)
	30° Y	primarily olive gray (54 1/2%) micaceous claystone (55%) with very thin to medium fine sandstone (45%) lamina.				43	2.5 2.5	200 psi.
142.0								
	30° Y	continued; claystone (70%); fine sandstone (30%).				44	2.5 2.5	200 psi.; gas check 0.0% LEL (no gas encountered)
144.0			Box # 10					
	20-40 Y	continued; some compositional banding apparent in claystone.				45	2.5 2.5	200 psi.
146.0								
		from 147.5 alternating lamina of claystone, sandstone and siltstone.				46	2.5 2.5	250 psi.
148.0								
	40 Y	continued.	Box # 11			47	2.5 2.5	250 psi.
150.0		<u>PHYSICAL CONDITION:</u> continued, same as previously described.						
152.0								
						48	2.5 2.5	250 psi.
154.0		continued.	S-9					
	40 Y					49	2.5 2.5	250 psi.
156.0								
		at 157.5 primarily olive gray (51 3/4%) micaceous claystone (75-80%) with wavy fine sandstone laminae (20-25%).	Box # 11			50	2.5 2.5	200 psi.
158.0								
						51	2.5 2.5	200 psi.
160.0								
	35 Y	continued.	Box # 12			52	2.5 2.5	200 psi.
162.0								
164.0								

PROJECT

SCRTD

DATE DRILLED 1-31-81 / 2-1-81

HOLE NO. 13

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CONS. REC. %	REMARKS
164.0		33.0-200.0 CLAYSTONE: (CONTINUED)			PB			(CONTINUED)
		165 to 167.5 alternating very thin to medium lamina of claystone (70%), fine sandstone (20%) and siltstone (10%)	Box # 12			52	21.5 21.5	250 psi.
166.0	30-40 Y					53	21.5 21.5	
168.0		PHYSICAL CONDITION: massive; soft to low hardness; plastic to weak strength; fresh; tends to fracture along bedding planes, notably along sandstone lamina.	5-10			54	21.5 21.5	250 psi.
170.0	20-40 Y	continued.						250 psi.
172.0			Box # 12			55	21.5 21.5	
174.0	20-25 Y	at 172.5 primarily micaceous claystone (70-80%) with wavy discontinuous fine sandstone (20-30%)				56	21.5 21.5	engine malfunction resulting in down time of 1.0 hour, resumed drilling at 3:30.
176.0	10-25 Y	continued.	Box # 13			57	21.5 21.5	
178.0		continued.						
180.0	20-25 Y					58	21.5 21.5	stopped drilling at 180.0'
182.0	20-20 Y	at 180.0 alternating very thin to medium lamina of claystone (70%), fine sand- stone (25%) and siltstone (5%).				59	21.5 21.5	2-1-81 Resumed drilling at 7:00 AM from 180.0'; clear day.
184.0			5-11			60	21.5 21.5	250 psi.
186.0	15-50 Y	continued; alternating claystone (50%), fine sandstone (30%) and siltstone (20%).	Box # 14			61	21.5 21.5	250 psi.
188.0						62	21.5 21.5	

SHEET 8 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUS NO.	CORE REC. %	REMARKS
188.0		<p>33.0-200.0 CLAYSTONE (CONTINUED) wavy, parallel, alternating very thin to medium lamina of micaceous claystone (50%), fine sandstone (30%) and siltstone (20%).</p> <p><u>PHYSICAL CONDITION:</u> continued, same as previously described.</p> <p>continued; 45° hairline fracture showing 4.0cm offset at 192.5; irregular disharmonic folding also apparent.</p> <p>continued; irregular folding apparent.</p>			PB			(CONTINUED)
190.0	45.50					62	1.3 2.5	250 psi
192.0				Box #14		63	1.1 2.5	250 psi
194.0	45					64	2.5 2.5	250 psi
196.0				Box #15		65	2.5 2.5	250 psi
198.0				S-12		66	2.5 2.5	250 psi
200.0	B.H.							<p>Terminated hole at 200.0' at 11:30.</p> <p>2-2-81 Conducted water pressure test from 7:00 to 9:20 AM; reamed hole out from 5.0" to 7.0"; installed 100.0' of 4" PVC and grouted.</p>



SUMMARY BORING NO. 13

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 1-30-81/2-1-81

OVERBURDEN DEPTH (FT.) 0.0 TO 33.0

BEDROCK DEPTH (FT.) 33.0 TO 200.0 (T.D.)

WATER PRESS. TEST YES; INTERVAL(S) 57.0 TO 71.0, 111.0 TO 131.0

GROUND WATER DEPTH (FT.) 16.5' DATE 2/2/81; - DATE -

GAS NO; DEPTH FIRST NOTICED -, DATE -

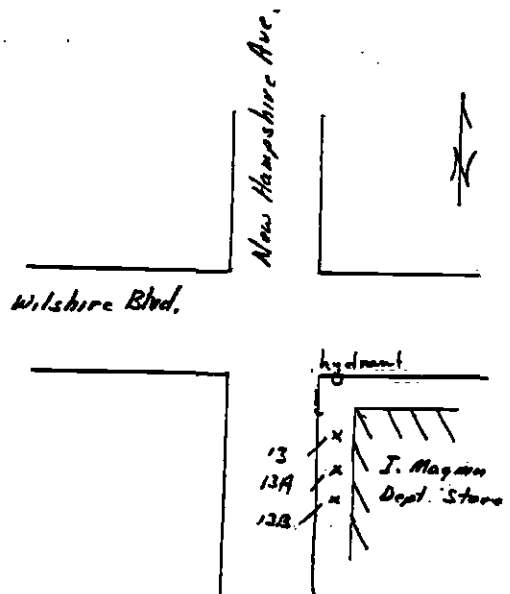
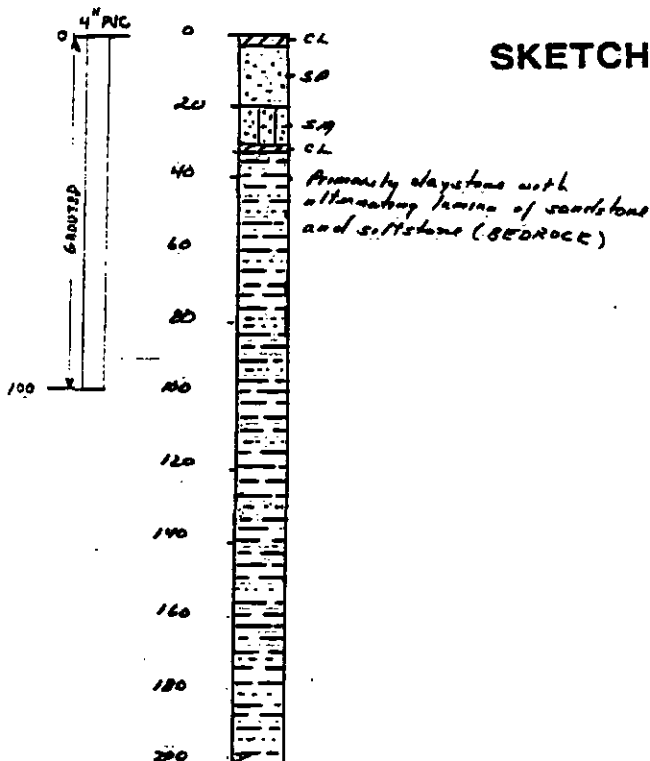
E-LOG YES

DOWN-HOLE SURVEY YES

CROSS-HOLE SURVEY YES

PVC CASING (I.D.): 4" 0.0 TO 100.0; 3" - TO -; 2" - TO -

GROUND ELEVATION REF. 2.49'



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 14

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/27-30/81 HOLE NO. 14
LOCATION South of A. J. Miller on Blvd. at Alameda GROUND ELEV. 215'
DRILLING CONTRACTOR Pitchee LOGGED BY Ballmann DEPTH TO GROUND WATER ✓
TYPE OF RIG Falling HOLE DIAMETER 4 3/4" HAMMER WEIGHT AND FALL 140 lb. 50"
SURFACE CONDITIONS Asphalt - side of street TOTAL DEPTH 199.5 NO. CORE BOXES 14

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0 - 1.0 <u>CEMENT</u>			AD			Begin drilling 2:00 1/27/81
1	CL	1.0 - 17.0 <u>SAUIDY CLAY</u> : Dark yellowish brown (10 YR 4/2); ~80% moisture to high plastic fines; ~20% fine to medium grained sand; damp; soft.						Auger down to 8' 5' at 5" stroke
2								(eventually put down at 23' at 23:00)
4								
6								
8		8.0 Color change to olive gray (5Y 3/2).			RD			
10			I-1	2 3 4	SS			1.3/1.5 recovery
12					RD			
14								
16			I-2	7 12 15	SS			1.3/1.5 recovery
18	SM	17.0 - 21.5 <u>SILTY SAND</u> : light brown (5YR 6/4); ~15% low plasticity fines; ~70% fine grained sand; ~15% medium grained sand; loose; moist to wet.			RD			
20								

SHEET 1 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	SM	17.0 - 21.5 <u>SILTY SAND</u> (cont.) <u>WEATHERED PUENTE FORMATION</u>			DR			DR ⇒ 28 blows <u>NO RECOVERY</u>
22		21.5 - 30.0 <u>CLAYEY SILTSTONE</u> : light brown (5YR 6/4); 100% low moderate plasticity fines; sat to firm; moist.	I-3	13 13 13	SS RD			0/1.5 recovery
24					RD			use 1" rings; Drive thru w/ down bit; 28 blows; DR 5 rec.
26		sample: many oxide stained fracture surfaces	C-1		DR			DR ⇒ 32 blows 10/1.0 recovery
28				6 7 11	SS			15/1.5 recovery
30		<u>PUENTE FORMATION?</u> 30.0 - 37.3 <u>SILTSTONE w/ CLAY</u> interbeds: CLAY interbeds make up ~30%; SILT is pale brown (5YR 5/2); 100% low plasticity fines; CLAY is dk moderate brown (5YR 3/4); 100% moderate plasticity fines; stiff; damp.	I-5	40 55	SS RD			07/1.0 recovery
32		PHYSICAL CONDITION: massive; low hardness; friable; fresh.	BOX		PB	1		1.6/2.6 recovery
34						2		2.6/2.8 recovery
36						3		2.8/2.8 recovery pocket penetrometer 21.5 2/2/81
38		37.3 - 60.8 <u>SILTSTONE</u> : dark to brown (10YR 4/2); 100% low plasticity fines; damp; stiff				4		2.9/2.9 recovery
40		PHYSICAL COND = low; massive; low hardness, friable, fresh.				5		
42								
44			S-1					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44		37.3 - 50.8 SILTSTONE (cont.)	S-1		PB	5		2.8 / 2.8 recovery
46			Box 2			6		2.5 / 2.8 recovery
48						7		2.6 / 2.8 recovery packet penetrometer 74.5 = 1/81
50								
52		51' - 60' interbeds of CLAY (~15%) and SILTSTONE (~5%)				8		2.8 / 2.8 recovery
54						9		2.7 / 2.8 recovery
56			Box 3					
58			S-2			10		- stop to add 15 more feet of 5" surface casing. 2.8 / 2.8 recovery best time requires pipe cutters.
60		60.8 - 64.0 SILTSTONE: creamish brown (5YR 3/2); hard; compact; fine.	S-3			11		10/10 recovery 60' - hard compact drilling thru it - ~10:30 drill thru bottom at 64'.
62		PHYSICAL CONDITIONS: massive, hard; strong; little weathered.			RD			
64		64.0 - 166.0 SILTSTONE: dk. yellowish brown (10YR 4/2); 100% fine plasticity fines; stiff; damp.	Box 3 (cont.)		PB	12		2.7 / 2.8 recovery
66		PHYSICAL CONDITIONS: massive, low hardness, friable, fresh.						
68								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CONS REC. %	REMARKS
67		57.0 - 16.0 SILTSTONE: (cont.)	Box 3		PB	13		1.5/2.8 recovery
70						14		2.3/2.8 recovery
72		71.0 - 4.0 (0.1') SILTY SPILL						
74			Box 4			15		2.7/2.8 recovery pocket penetrometer 74.5 2/9/81
76		PHYSICAL CONDITIONS: massive, low hardness, friable, fresh.				16		2.9/2.8 recovery
78						17		2.8/2.8 recovery
80			S-4					
82		82.0 - 88.0 CLAY intervals (0.05' to 0.2' thick) make up ~ 25% of volume	Box 4			18		2.7/2.8 recovery
84						19		2.7/2.8 recovery pocket penetrometer 74.5 2/9/81
86			Box 5			20		2.8/2.8 recovery
88						21		2.8/2.8 recovery
90								
92								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92		64.0 - 103.0 <u>SILTSTONE: (cont)</u>	Box 5		PB	21		
						22		2.7/2.8 recovery
94		PHYSICAL CONDITION: medium low cohesiveness, friable, fresh.						pocket penetrometer 24.5 2/9/81
96			S-5			23		2.8/2.8 recovery
98			Box 5			24		2.8/2.8 recovery
100			Box 6					
102						25		2.9/2.8 recovery
104		103.0 - 113.0 CLAY interbedded (0.05' to 0.2' thick) make up ~25% of material				26		pocket penetrometer 24.5 2/9/81 2.8/2.8 recovery
106								
108			Box 7			27		2.7/2.8 recovery
110						28		2/2 recovery (hard cement zone)
						29		2.2/2.8 recovery
112								
114			S-6			30		2.8/2.8 recovery
116			Box 7			31		

PROJECT 90-1290-22

DATE DRILLED 1/28/81

HOLE NO. 141

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (10')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		54.0 - 166.0 SILTSTONE: (cont.) PHYSICAL CONDITIONS: massive, low hardness, friable, fresh.	BOX 7			31		2.5/2.8 recovered 2.8/2.8 recovered
118						32		2.7/2.8 recovered
120								
122			BOX 8			33		1.9/2.8 recovered
124						34		2.7/2.8 recovered
126						35		126.8 - stop drilling 1/28.2 1/29/81 RAINING - (all day!) 2.8/2.8 recovered pocket penetrometer 74.5 2/9/81
128						36		2.8/2.8 recovered
130			S-7					
132			BOX 8 (cont.)			37		2.5/2.8 recovered
134								
136			BOX 9			38		2.5/2.8 recovered
138						39		2.9/2.8 recovered
140								

SHEET 6 OF 10

PROJECT 80-1070-22

DATE DRILLED 1/29/81

HOLE NO. 14

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		140.0 - SILTSTONE: (cont)	Box 9		PE	39		packet penetrometer 24.5 2/9/81
142		parting with 140.0 - 141.0 fine sand, trace, shell.				40		
144		144.0 - 144.5 sandstone fine sand, trace, shell. (0.05 to 0.1 ft. -)	Box 10			41		
146						42		2.5/2.5 recording
148			S-8					
150		gradational increase in competency of the SILT; sandstone it is contained in SILTSTONE but contact is arbitrary	Box 10			43		2.5/2.5 recording
152								
154		increase in competency of the sandstone 2.05 to 0.2 ~75% SILT layers - 0.15 sandstone - 0.15 SILT layers	Box 11			44		2.5/2.5 recording packet penetrometer 24.5 2/9/81
156						45		2.0/2.0 recording
158						46		2.5/2.5 recording
160								
162						47		2.5/2.5 recording
164			S-9			48		

SHEET 7 OF 10

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		164.0 - 166.0 <u>SILTSTONE</u> (cont.) - definite contact between				48		24.5 2/9/31 POSSIBLE CONTACT BETWEEN PUENTE AND THE FERNANDEZ FORMATIONS
166		166.0 - 199.6 <u>SILTSTONE</u> : dark fine grained (10YR 4/2); 100% silty; occasional thin (0.05' to 0.1') CLAY layers ~ 10-25% CONSTITUTION MASSIVE; irregularly bedded; streaky	Box 11			49		27/2.8
170						50		21/2.8
172			Box 12			51		1.5/2.8
174						52		2.6/2.8
176						53		pocket penetrometer 24.5 - 1/9/31
178						54		2.3/2.8
180			S-10			55		1.5/2.8 resistivity
182			Box 12			56		2.9/2.8
184		184.0 - 199.6 <u>CLAYSTONE</u> layers make up 10-25% of material	Box 13					
186						56		2.6/2.8 resistivity
188								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		166.0 - 199.6 <u>SILTSTONE (cont.)</u>	BOX 13		PB	57		
						58		<p>2.0 / 2.5 recovery</p>
			BOX 14			59		<p>3.1 / 2.8 recovery</p>
			S-11			60		<p>2.8 / 2.9 recovery</p>
	B.H.	199.6 Bottom of Hole						<p>199.6 Terminate No/0 - stop circulation 4:00 1/28/81. ESA was 2-logs. Some fold logs down - in seismic. 1/30/81 - Run water pressure tests. Motand was to set for the packers to seat properly. The only successful test was from 100' to 120' at 20 psi. The formation took no water. Piezometers installed: 2" PVC from 0' to 700' with cloth covered perforations from 160' to 195'. 1" PVC from 0' to 30' with perforations from 15' to 25'. Gravel packed w/ Bentonite plug from 27' to 33'. surface cap. Clean-up site. Move off site 1/31/81. JDB.</p>
		199.6' - GAS TEST - No Combustibles 20% O ₂ water sampled 2° 2/18/81						



SUMMARY BORING NO. 14

PROJECT 40-1280-22 STATION HOLE yes DATE DRILLED 1/27-30/81

OVERBURDEN DEPTH (FT.) 0' TO 30'

BEDROCK DEPTH (FT.) 30' TO 199.6' (T.D.)

WATER PRESS. TEST yes; INTERVAL(S) 100' TO 120', _____ TO _____

GROUND WATER DEPTH (FT.) none DATE _____; _____ DATE _____

GAS no; DEPTH FIRST NOTICED _____, DATE _____

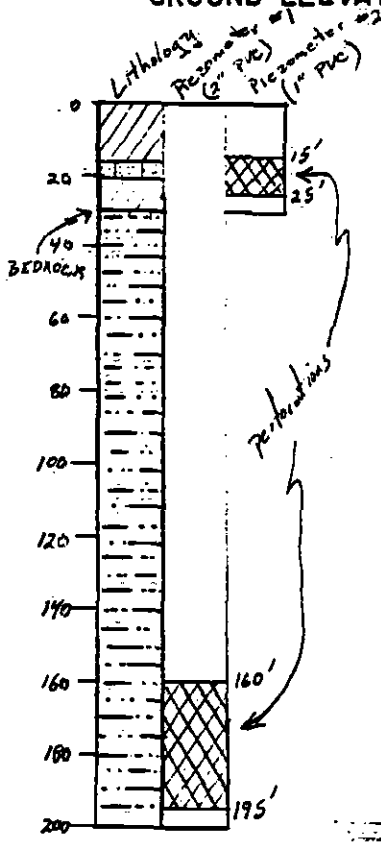
E-LOG yes

DOWN-HOLE SURVEY yes

CROSS-HOLE SURVEY no

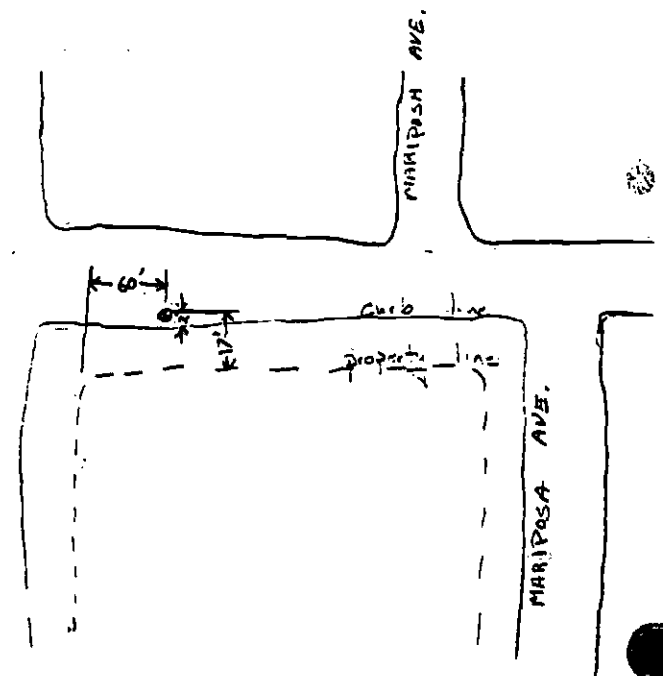
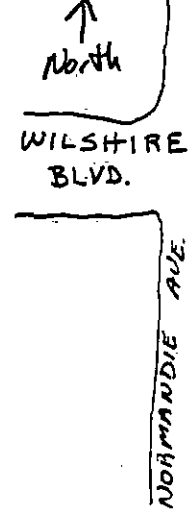
PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 200'

GROUND ELEVATION REF. 215'



Bentonite Plug
27' to 33'

SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
 CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SEPTO DATE DRILLED 1-26-81/1-28-81 HOLE NO. 15
 LOCATION at intersection of Wilshire Blvd. and Oxford GROUND ELEV. 200
 DRILLING CONTRACTOR Reber Drilling Co. LOGGED BY Stephen M. Testa DEPTH TO GROUND WATER _____
 TYPE OF RIG Fulling 1500 HOLE DIAMETER 5.0" HAMMER WEIGHT AND FALL 140 lb - 30 in.
 SURFACE CONDITIONS asphalt TOTAL DEPTH 200.0 NO. CORE BOXES 12

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0 - 0.2		ASPHALT			RD			Started drilling at 11:00 AM, clear day; augered down to 6.0'; 6.5' of 5" casing;
0.2 - 7.0	CL	SANDY CLAY: dark yellowish brown (10YR 4/2); mottled; plastic fines (70%); medium to coarse sand (30%); moist; slow dilatancy; medium toughness.						
7.0 - 10.0					RD			
10.0 - 12.0								
10.0			T-1	0	SS			SPT at 10.0'; 11/1.5 recovery pocket penetrometer 3.5 (broke apart) 2/9/81
				15				
				21				
12.0 - 15.0					RD			
15.0 - 15.5	SP	TAR SAND: black (N1); fine to medium subangular to subrounded sand.	T-2	7	SS			SPT at 15.0'; 1.5/1.5 recovery
15.5 - 16.5	CL	SANDY CLAY: dark yellowish brown (10YR 4/2); plastic fines (85%); fine to medium sand (15%); mottled; moist; stiff; slow dilatancy; medium toughness.		8				
				21				
16.0 - 20.0								
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN. NO.	CORE REC. %	REMARKS
20.0	CL	20.0-21.3 SANDY CLAY: dark greenish gray (56441); plastic fines (80%); fine sand (20%); mottled; moist; hard.		25	DR			(CONTINUED) converse sample at 20.0'; 1.5/1.5 recovery. pocket penetrometer 3.75 (broke apart) 2/9/81
22.0	SP		J-3	26 27 3	SS			SPT at 21.5'; 4/1.5 recovery.
24.0		21.3-28.0 SAND: dark greenish gray (56441); plastic fines (5%); very fine to medium sand (90%); gravel up to 1/4" (5%); moist; medium dense; dilatancy quick; toughness none; poorly graded.		4 7	AD			
26.0		25.0-26.0 continued; moist; dense.	J-4	6 23 24	SS RD			SPT at 25.0'; 1.0/1.5 recovery.
28.0	CL							
30.0	SP	28.0-30.8 SANDY CLAY: greenish black (56421); plastic fines (75%); fine sand (25%); moist;	J-5	6 11 17	SS			SPT at 30.0'; 1.5/1.5 recovery. pocket penetrometer 3.5 (broke apart) 2/9/81
32.0		30.8-31.5 SAND: greenish black (56421); plastic fines (5%); fine to coarse sand (90-95%); gravel up to 1/4" (2%); moist; medium dense; dilatancy quick; toughness none; poorly graded.			RD			
34.0								
36.0		dark greenish gray (56441); plastic fines (100%); fine to coarse sand (90%); moist; very dense.	J-6	25 33 25	SS RD			SPT at 35.0'; 1.5/1.5 recovery.
38.0								
40.0		continued; moist; very dense.						
42.0	CL	42.0-53.0 CLAY: greenish black (56211); plastic fines (95%); very fine to fine sand (2.5%); moist; very stiff; dilatancy none; high toughness.	J-7	15 16 21	SS RD			SPT at 41.5'; 1.5/1.5 recovery. pocket penetrometer 74.5 2/9/81
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	CL	42.0-53.0 <u>CLAY</u> : (CONTINUED)			RD			(CONTINUED)
				12	SS			
46.0		greenish black (5G211); plastic fines (95%); very fine to fine sand (2.5%); moist; very stiff; dilatancy none; high toughness.	J-8	15				SPT at 45.0'; 1.5/1.5 recovery.
				21	RD			
48.0								
50.0	CL	49.0-53.0 <u>SANDY CLAY</u> : dark greenish gray (5G411); plastic fines (60%); very fine to fine sand (35%); gravel up to 1/4" (5%); moist; very stiff; slow dilatancy; medium toughness.	J-9	16	SS			SPT at 50.0'; 1.5/1.5 recovery.
				26	RD			pocket penetrometer 74.5 2/9/81
52.0								
54.0	SC	53.0-58.0 <u>CLAYEY SAND</u> : dark greenish gray (5G411); plastic fines (25%); fine to coarse sand (75%); moist; very dense; grades coarser with depth; slow dilatancy; slight toughness.	J-10	16	SS			SPT at 55.0'; 1.5/1.5 recovery.
56.0				21	RD			
58.0	CL							
60.0		58.0-64.0 <u>SANDY CLAY</u> : dark greenish gray (5G411); plastic fines (65%); fine to coarse sand (35%); moist; very stiff; finely stratified; slow dilatancy; medium toughness.	C-3	30	DR			converse sample from 60.0 to 61.0'; 1.0/1.0 recovery.
				62	SS			SPT at 61.0'; 1.5/1.5 recovery.
62.0			J-11	13				pocket penetrometer 4.5 (broke apart) 2/9/81
				22	RD			
64.0								
66.0	SC-CL	64.0-67.5 <u>SANDY CLAY AND CLAYEY SAND</u> : stratified very thin to medium lamina of dark greenish gray (5G411) sandy clay and clayey sand; moist; sandy clay: plastic fines (80%); fine to coarse sand (20%); clayey sand: plastic fines (20%); fine to coarse sand (20%).	J-12	11	SS			SPT at 65.0'; 1.0/1.5 recovery.
				21				pocket penetrometer 74.5 2/9/81
				25	RD			
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SC-CL	67.0-67.5 SANDY CLAY AND CLAYEY SAND: (CONTINUED)			RD			(CONTINUED)
70.0	SP	69.5-90.0 SAND: dark greenish gray (5G1411); plastic fines (6.5%); fine sand (9.5%); very moist; very dense; quick dilatancy; toughness none.	J-13	22 30 32	SS RD			SPT at 70.0; 1.5/1.5 recovery.
72.0								
74.0		continued; very fine to fine sand.						
76.0			J-14	15 10 21	SS RD			SPT at 75.0; 1.0/1.5 recovery.
78.0								
80.0		continued.		50 50	DR SS RD			converse sample at 80.0; no recovery. SPT at 80.5; 1/1.5 recovery.
82.0								Halted drilling at 81.0, 5:00 1-27-81 7:00 Resumed drilling at 7:00 A.M., cloudy day.
84.0		continued.						
86.0				50/1.5	SS RD			SPT at 80.5; 1/1.4 recovery.
88.0		shell fragments from cuttings (bivalve plus others).						minor rod chatter from 80.6; considerable rod chatter from 88.0 to 88.5; minor from 88.5 to 90.0; continuous pickup barrel sampling from 90.0'
90.0	SP	<u>PUENTE FORMATION?</u> 90.0-200.0 CLAYSTONE: wavy, parallel, very thin to medium lamina; primarily olive gray (5Y3/2) claystone; fine grained subordinate light gray (N7) sandstone laminae; micaceous; fossiliferous (1-2%).	Box #1		PB			
92.0							11 2.5	SHEET 4 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL HOOD	RUN NO.	CORE REC. %	REMARKS
92.0		90.0-200.0 CLAYSTONE;			PB	1		(CONTINUED) 200 psl.
94.0	5-30 Y	92.5-94.3: wavy, parallel, alternating very thin to medium laminae of olive gray (5Y3/2) claystone, light gray (N7) sandstone, and dark yellowish brown (10YR 2/2) siltstone (occasionally well cemented).				2	1.6 21.5	200 psl.
96.0	0-15 Y	95.0-97.3: primarily claystone (70%), sandstone (20%), siltstone (10%); siltstone contact usually sharp; claystone and sandstone sharp to gradational.	Boy #1			3	2.3 2.5	200 psl.
98.0	0-10 Y	97.5-100.0: primarily claystone (90%); fine sandstone (10%)				4	2.5 2.5	200 psl.
100.0	0-10 Y	PHYSICAL CONDITION: massive, soft to friable hardness; plastic to weak strength; fresh; claystone (85%); fine sandstone (15%).				5	1.4 21.5	200 psl.
102.0		claystone (85%); fine sandstone (15%); no discernible bedding apparent.				6	2.1 21.5	200 psl.
104.0		continued.				7	2.3 21.5	200 psl. pocket penetrometer 74.5 2/9/81
106.0		PHYSICAL CONDITION: continued; tends to fracture along bedding planes, notably sandstone.	Boy #2			8	2.2 21.5	200 psl.
108.0	10-15 Y	continued, some lenticular discontinuous fine sandstone evident.				9	2.2 21.5	250 psl.
110.0		wavy, parallel, alternating very thin to medium laminae of claystone, sandstone and siltstone.				10	2.2 21.5	250 psl.
112.0	45° 5-15 Y	continued; siltstone is fossiliferous (4%), at 112.5 3mm. offset along a 45° hairline fracture.	Boy #3			11	2.0 21.5	250 psl.
114.0								
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS			
116.0	10-15 Y	70.0 - 200.0 CLAYSTONE (CONTINUED) wavy, parallel, alternating very thin to medium lamina of primary claystone and subordinate fine sandstone and siltstone; 60° hairline fracture showing 1mm offset at 116.0; cross-bedding evident in sandstone lamina (sequence is upright); mottled from 116.8-117.0. primarily claystone (80%) with fine sandstone lamina (20%) from 117.5.	Boz # 3		PB	11	2.5 2.5	(CONTINUED) pocket penetrometer 74.5 2/19/81 200 psi; gas check 0.0% LEL, 11:02 AM.			
118.0						12	2.5 2.5	200 psi.			
120.0						13	2.5 2.5	200 psi.			
122.0	0-10 Y					continued; claystone (65%); fine sandstone (35%).			14	2.5 2.5	250 psi.
124.0	20-30 Y					alternating claystone, sandstone and siltstone from 125.0; cross-bedding apparent.	Boz # 4		15	2.5 2.5	250 psi, pocket penetrometer 74.5 2/19/81
126.0		continued.			16	2.5 2.5	200 psi.				
128.0		primarily claystone (80%); fine sandstone (20%).			17	2.5 2.5	pocket penetrometer 74.5 2/19/81 200 psi.				
130.0		continued.			18	2.5 2.5	200 psi.				
132.0		<u>PHYSICAL CONDITION:</u> massive; soft to friable hardness; plastic to weak strength; fresh; tends to fracture along bedding planes, notably sandstone.			19	2.5 2.5	200 psi.				
134.0		wavy, parallel, alternating very thin to medium lamina of claystone, subordinate sandstone and siltstone from 125.7.	Boz # 5		20	2.5 2.5					
136.0		continued.									
138.0	15-20 Y										
140.0											

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL LOG	RUN NO.	CORE REC. %	REMARKS
140.0		90-200.0 CLAYSTONE (CONTINUED)			PB			(CONTINUED)
142.0	60' / 10-15'	PHYSICAL CONDITION: MASSIVE, soft to friable hardness; plastic to weak strength; fresh; tends to fracture along bedding planes clay filled 60' fracture at 142.0; primarily claystone (75%) with very thin to medium fine sandstone lamina (25%).	Boy #6			21	21.5	250 psi.
144.0	570	continued.				22	21.5	200 psi.
146.0	10-15'					23	21.5	200 psi. pocket penetrometer 24.5 2/9/81
148.0		continued; claystone (60%), fine sandstone (40%).				24	21.5	200 psi.
150.0	0-15'	wavy, parallel, alternating very thin lamina of clay- stone, siltstone and fine sandstone.				25	21.5	250 psi.
152.0		continued.	Boy #7			26	21.5	250 psi. pocket penetrometer 24.5 2/9/81
154.0						27	21.5	250 psi.
156.0		continued, en-echelon hairline fractures evident (vertical, parallel to core axis), up to 7mm. off set.				28	21.5	250 psi.
158.0		continued. claystone sandstone				29	21.5	200 psi.
160.0		primarily claystone (70%), fine sandstone (30%).				30	21.5	200 psi.
162.0		continued.	Boy #8					
164.0								



DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		90.0-200.0 CLAYSTONE (CONTINUED)			PS	30	21.5 21.5	(CONTINUED) 200 psi.
166.0		PHYSICAL CONDITION: massive; with friable hard- ness, plastic to weak strength; fresh; tends to fracture along bedding planes, notably sand- stone.	Bo7 #8			31	21.5 21.5	pocket penetrometer 74.5 2/19/81
168.0	10-15 Y	primarily claystone to 169.0, then wavy, parallel, alternating clay- stone with subordinate sandstone and siltstone; sharp contacts.				32	21.5 21.5	250 psi.
170.0		claystone (80%); fine sand- stone (20%).				33	21.5 21.5	200 psi.
172.0	15-25 Y	alternating very thin to medium lamina of claystone, fine sandstone, and siltstone; sharp contacts.	Bo7 #9			34	21.5 21.5	pocket penetrometer 74.5 2/19/81 250 psi.
174.0	15-25 Y	continued.				34	21.5 21.5	stopped drilling at 500 at a depth of 175.0'
176.0						35	21.5 21.5	1-28-81 Resumed drilling at 7:00 AM; cloudy day, light rain.
178.0	25 Y	primarily claystone (75%), fine sandstone laminae (25%).				36	21.5 21.5	250 psi.
180.0	20 Y	continued; bivalves at 181.3.				37	21.5 21.5	250 psi.
182.0		continued, fossiliferous.	Bo7 #10			37	21.5 21.5	pocket penetrometer 74.5 2/19/81
184.0		continued.				38	21.5 21.5	
186.0						39	21.5 21.5	
188.0	15-20 Y	continued.	Bo7 #11			40	21.5 21.5	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0		90.0-200.0 CLAYSTONE (CONTINUED) <u>PHYSICAL CONDITION:</u> continued as previously described.			PB	40		(CONTINUED)
190.0		primary dove gray (S1312) claystone (80%); wavy discontinuous very thin to medium fine sandstone (20%).				41		200 psl.
192.0		continued.	Box # 11					pocket penetrometer 74.5 2/14/81 200 psl.
194.0		continued.				42		200 psl.
196.0						43		
198.0		continued.	Box # 12			44		200 psl. gas check 0.0% LEL, 11:50. pocket penetrometer 74.5 2/19/81 Terminated hole at 11:45 at a depth of 200.0'
200.0	BH							1-29-81 (heavy rain) water pressure test taken at the following intervals 100-120, 95-115, 72-92 (10:00 to 11:00 AM); reamed hole to 7" then installed 100.0' of 4" PVC and grouted. 4:45 7:00



SUMMARY BORING NO. 15

PROJECT SCATD STATION HOLE YES DATE DRILLED 1-26-01/1-28-01

OVERBURDEN DEPTH (FT.) 0 TO 90

BEDROCK DEPTH (FT.) 90 TO 200 (T.D.)

WATER PRESS. TEST YES; INTERVAL(S) 72 TO 92, 95 TO 115
100 TO 120

GROUND WATER DEPTH (FT.) - DATE -; - DATE -

GAS TRACE; DEPTH FIRST NOTICED -, DATE -

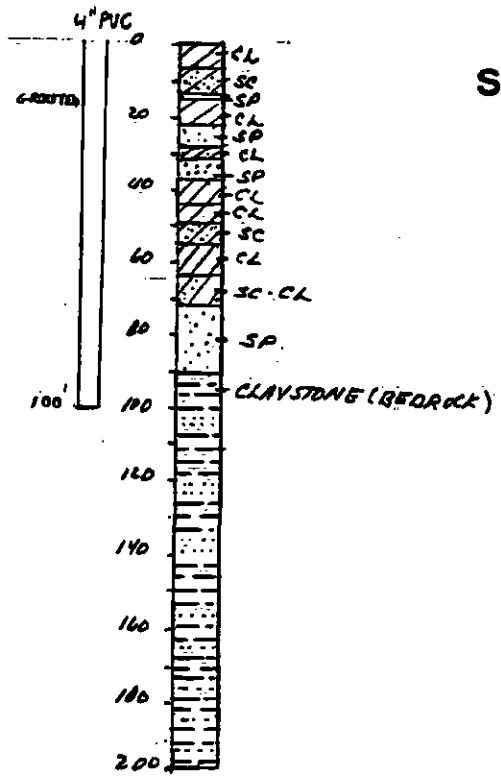
E-LOG YES

DOWN-HOLE SURVEY YES

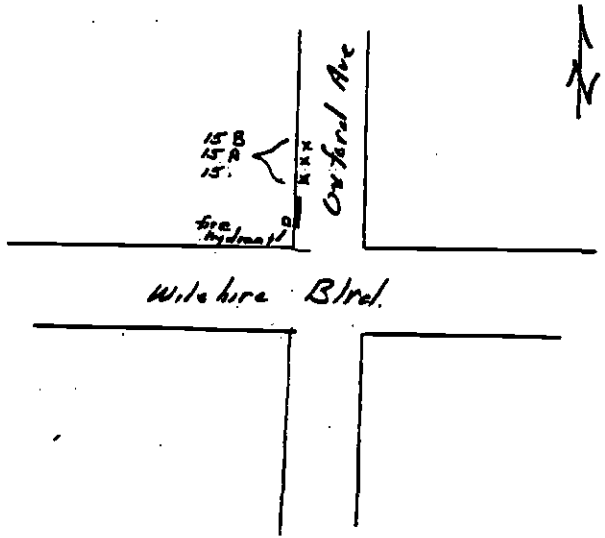
CROSS-HOLE SURVEY YES

PVC CASING (I.D.): 4" 0.0 TO 100.0; 3" 0.0 TO 100.0; 2" 0.0 TO 100.0

GROUND ELEVATION REF. 200'



SKETCH



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 16

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 90-1330-02 DATE DRILLED 1/20-27/81 HOLE NO. 16
 LOCATION Wilshire Blvd. between Irving and Broadway GROUND ELEV. 211'
 DRILLING CONTRACTOR Parker LOGGED BY Carl Smith DEPTH TO GROUND WATER 65'
 TYPE OF RIG Failing HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs - 20"
 SURFACE CONDITIONS Side walk TOTAL DEPTH 199.2 NO. CORE BOXES 13

DEPTH	CLASS.	FIELD DESCRIPTION.	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0-0.5 <u>CEMENT</u>			AD			
1	SM	0.5-9.0 <u>SILTY SPUD</u> : light olive brown (5Y 5/6); ~15-20% low plasticity fines; 90-85% poorly sorted fine sand; sub angular; loose; damp.						Some debris noted 1/20/81
2								
4								install 5' of 5" surface casing
6					RD			
9								
10	CL	9.0-12.0 <u>SANDY CLAY</u> : moderate yellowish brown (10YR 5/4); ~85% moderate plasticity fines; ~15% angular fine to medium grained sand; very stiff; damp.	J-1	22/50	SS			0.9/0.9 recovery
12	CH	12.0-20.0 <u>CLAY</u> : Dusky yellow (5Y 6/4); 100% moderate to high plasticity fines; firm; damp.			RD			install 5' more of surface casing
14								
16			J-2	8/11/21	SS			1.5/1.5 recovery
18			S-1		FB	1		16.5' - Begin continuous Pitcher Bailing 12:30
20			Box 1			2		2.5/12.8 recovery

SHEET 1 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	SM	20.0-29.5 <u>SILTY SAND</u> : pale yellowish brown (10 YR 6/2); 15% low plasticity fines; ~45% medium grained sand; loose to medium dense moist.	Box 1		PB	2		2.9/2.9 recovery
22						3		2.7/2.8 recovery
24						4		2.0/2.8 recovery
26						5		2.1/2.8 recovery pocket penetrometer 1.5-3.25 2/9/81 2.5 - Distinct color change.
28	SM	28.5-32.0 <u>SILTY SAND</u> : medium blueish gray (5B 5/1); 15% low plasticity fines; ~45% fine grained sand; loose; moist to wet.	Box 2			6		2.7/2.8 recovery
30						7		pocket penetrometer 1.0 2/9/81
32	CL	32.0-45.4 <u>CLAY</u> : Dark greenish gray (5G 4/1); 100% moderate plasticity fines; stiff; damp.	S-2			7		2.8/2.8 recovery
34						8		2.7/2.8 recovery
36						9		2.8/2.8 recovery
38						10		2.8/2.8 recovery pocket penetrometer 54.5 2/9/81
40		37.2-37.8 <u>CLAYEY SAND</u> (~30% fines, ~70% medium grained sand)	Box 2 (lost)					
42		39.0-42.0 Some clots of cemented material	Box 3					
44								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	CL	32.0 - 45.4 <u>CLAY</u> : (cont.)	BOX 3		PB	10		
45.4		45.4 - 51.0 <u>SILTY SAND</u> : dark greenish gray (SG 4/1); ~15% low plasticity fines; ~25% v. poorly graded fine to very fine sand; med. dense to loose; moist.				11		2 3/2.8 recovery
46	SM					12		2 1/2.8 pocket penetrometer 2.25 2/9/81
49						13		2 3/2.8 recovery
50						14		2 5/2.8 recovery
50	CL (SC)	51.0 - 56.2 <u>CLAY and CLAYEY SAND</u> : dark greenish gray (SG 4/1); CLAY layers are 100% moderate plasticity fines; <u>CLAYEY SAND</u> layers are ~30% moderate plasticity fines, 70% medium to coarse sand; CLAY areas ~75% CLAYEY SAND layers ~25%.	BOX 3 (cont.)			15		2 1/2.8 recovery
56	CL	56.2 - 60.0 <u>CLAY</u> : dark greenish gray (SG 4/1); 95-100% moderate plasticity fines; 0-5% medium sized medium sand; stiff; moist.	BOX 4			16		1.7/2.8 recovery
58						17		1.3/2.8 recovery
60	SM	60.0 - 85.0 <u>SILTY SAND</u> : dark greenish gray (SG 4/1); ~15% low plasticity fines; ~35% fine grained sand; loose; wet to saturated;				18		pocket penetrometer 3.5 2/9/81
62						19		65' - Water Table saturates sands
64								2.6/2.8 recovery
66								
68								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68					PB	19		No RECOVERY - submerged
70			S-4			20		1.5/2.8 recovery
72								
74			S-5			21		.9/2.8 recovery
76		75'-77' medium to coarse grained sand	Box 4 (cont.)			22		1.8/2.8 recovery
78								
80						23		No RECOVERY - submerged
82		81.0'-85.0' GRAVELLY SAND: probably local conglomerate.			RD			11.3' - slip distance 1/22/81 begin drilling 1/21/81 rotary drill through sand & gravel
84		<u>FERNANDO FORMATION</u>						
86		85.0 - 96.4 SILTSTONE: moderate brown (5YR 5/4); 100% low plasticity fines; stiff, damp. PHYSICAL CONDITION: massive, low hardness, friable, fresh.	Box 4 (cont.)		PB	24		1.1/2.8 recovery
88								
90			Box 5			25		2.4/2.8 recovery
92		91.0-96.4 some thin SANDY SILT lenses.				26		SHEET <u>4</u> OF <u>10</u>

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	40	85.0 - 96.4 SILTSTONE: (cont.)	Box 5		PB	26		2.5/2.9 recovery
94						27	2.5/2.8 recovery pocket penetrometer 24.5 2/9/81	
96	30	96.4 - 105.0 SILTSTONE w/ interbedded CLAY and SILTY SAND: ~60% SILT layers, ~20% SILTY SAND layers, ~20% SILTY SAND layers; SILT is dk. moderate brown (5YR 3/4); 100% low plasticity fines; CLAY is grayish brown (5YR 3/2); 100% moderate plasticity fines; thin bedded; SILTY SAND is light brown (5B 6/1); ~20% low plasticity fines; ~20% coarse fine to fine sand; damp.	Box 6			28		2.8/2.9 recovery
98						29	2.8/2.8 recovery	
100						30	2.7/2.8 recovery	
102						31	2.7/2.7 recovery	
104	35	105.0 - 135.0 SILTSTONE: dk. moderate brown (5YR 3/4); 100% low plasticity fines; damp. PHYSICAL CONDITION: massive, low hardness, friable, fresh.	Box 6 (cont.)			30		2.7/2.7 recovery
106						32	pocket penetrometer 24.5 2/9/81 2.9/2.8 recovery	
108						33	2.8/2.8 recovery	
110	35	111.0 - 114.0 Some SILTY SAND layers and CLAY layers (0.05' - 0.1' thick)	Box 7			32		2.8/2.8 recovery
112						34	2.8/2.8 recovery	
114								
116								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		105.0 - 135.0 SILTSTONE: (cont)	BOX 7		PB	34		
			S-7			35		2.3/2.8 recovery
118								
120	(SM)	120.1' - 120.3' SILTY SAND: light brown (5YR 6/4); ~30% low plasticity fines; ~70% v. fine to fine sand.	BOX 7 (cont)			36		packet penetrometer 24.5 2/19/81 2.4/2.7 recovery
122						37		2.4/2.8 recovery
124		123 - 135' occasional thin (0.05' - 0.1') SILTY AND SAND.	BOX 8			38		2.9/3.5 recovery
126						39		
128			S-8			40		2.0/2.8 - Bottom of tube is bent, requires pipe cutter before recovery.
130			BOX 8 (cont)					
132		GRADING MODE COMPETENT						1.5/2.5 recovery ran into cemented material ADJ → 35' → not firm red material
134			S-9		PB	41		2.2/2.3 recovery 134' - GAS TEST 12 1.5
136		135.0 - 169.5 SILTSTONE; same as above, except gradually more competent.	BOX 8 (cont)			42		2.6/2.7 recovery packet penetrometer 24.5 2/19/81
138		PHYSICAL CONDITION: massive, low hardness, friable, fresh.				43		2.0/2.1 recovery
140			BOX 9					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (6')	DRILL MODE	SUN NO.	CORE REC. %	REMARKS
140		135.0 - 169.5 SILTSTONE (2-2)	Box 9		PB	47		20/20 recovery
142		~10% SILTY SAND				45		13/20 recovery
144						46		20/20 recovery pocket penetrometer 24.5 2/9/81
146			S-10			47		25/25 recovery
148		PHYSICAL CONDITION: massive, low hardness, friable to weak, fresh.				48		22/28 recovery
150		49.7 - Volcanic Ash layer - 0.02' thick	Box 10			49		19/20 recovery
152						50		28/28 recovery
154		157.2' - 0.2' layer of SANDY SILT				51		27/28 recovery pocket penetrometer 24.5 2/9/81
160						52		23/28 recovery
162			S-11			53		22/22 recovery 164' - stop 1/21/81 - begin 1/26/81 - clean out hole to 164' -
164								SHEET 7 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		135.0 - 169.5 <u>SILTSTONE</u> (cont.)	BOX 10 BOX 11		PB	54		2.7/2.8 recovery pocket penetrometer 74.5 2/9/81
166						55		2.1/2.8 recovery
168						56		2.8/2.8 recovery
170	X 40	169.5 - 189.0 <u>SILTSTONE</u> with interbedded <u>CLAYSTONE</u> and <u>SILTY SAND</u> : -60% SILTSTONE, -20% claystone, -20% SILTY SAND; typical 0.05' to 0.2' thick; SILTSTONE same as above; CLAYSTONE is grayish brown (5YR 3/2), 100% moderate plasticity fines. SILTY SAND is light bluish gray (5B 7/1); -20% low plasticity fines, -80% very fine grained sand.				57		2.3/2.8 recovery
172						58		2.2/2.2 recovery Top of core bent during extrusion - requires ppt filters for extrusion
174	X 45	PHYSICAL CONDITION: massive, low hardness, friable, fresh.	BOX 12			59		2.8/2.8 recovery
176			S-12			60		2.8/2.8 recovery pocket penetrometer 74.5 2/9/81
178			S-13			61		2.4/2.8 recovery
180		180 - 181.5 <u>SILTSTONE</u> (w/out any interbeds)	BOX 12 (cont.)			62		2.3/2.8 recovery
182								
184	X 70 X 50							
186								
188								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		189.5 - 189.0 SILTSTONE with interbedded CLAYSTONE and SILTY SAND (cont.)	BOX 12		RB	62		
190		189.0 - 199.2 SILTSTONE: dark moderate coarse (5 YR 2/4); 100% low plasticity fines; damp. PHYSICAL CONDITIONS: massive; low hardness; friable; fresh.	BOX 13			63		1.9/2.2 recovery
192						64		2.8/2.8 recovery
194			S-14			65		1.2/2.8 recovery
196		196' - 199' some sandy and CLAYEY interbeds	BOX 13 (cont.)			66		2.8/2.8 recovery pocket penetrometer 74.5 2/17/81
198	B.H.	199.2' Bottom of Hole						
200								199.2' Terminate Hole: 4:00 1/26/81 run electric logs 1/26/81. 1/27/81 - install piezometers; 2" PVC from 200' to surface w/ cloth covered perforations from 160' to 195'; gravel pack to 87'. Bentonite Plug from 75' to 87'; 1" PVC piezometer from 50' to surface w/ perforations from 40' to 75'. Gravel pack to 5'. Bentonite surface plug & surface cap. Clean-up site and move off 12:00 1/27/81. water sampled 2:41 2/18/81



SUMMARY BORING NO. 16

PROJECT 80-1280-22 STATION HOLE no DATE DRILLED 1/23/81 = 1/27/81

OVERBURDEN DEPTH (FT.) 0' TO 85'

BEDROCK DEPTH (FT.) 85' TO 199.2 (T.D.)

WATER PRESS. TEST no; INTERVAL(S) TO , TO

GROUND WATER DEPTH (FT.) 65' DATE 1/21/80; DATE

GAS no; DEPTH FIRST NOTICED , DATE

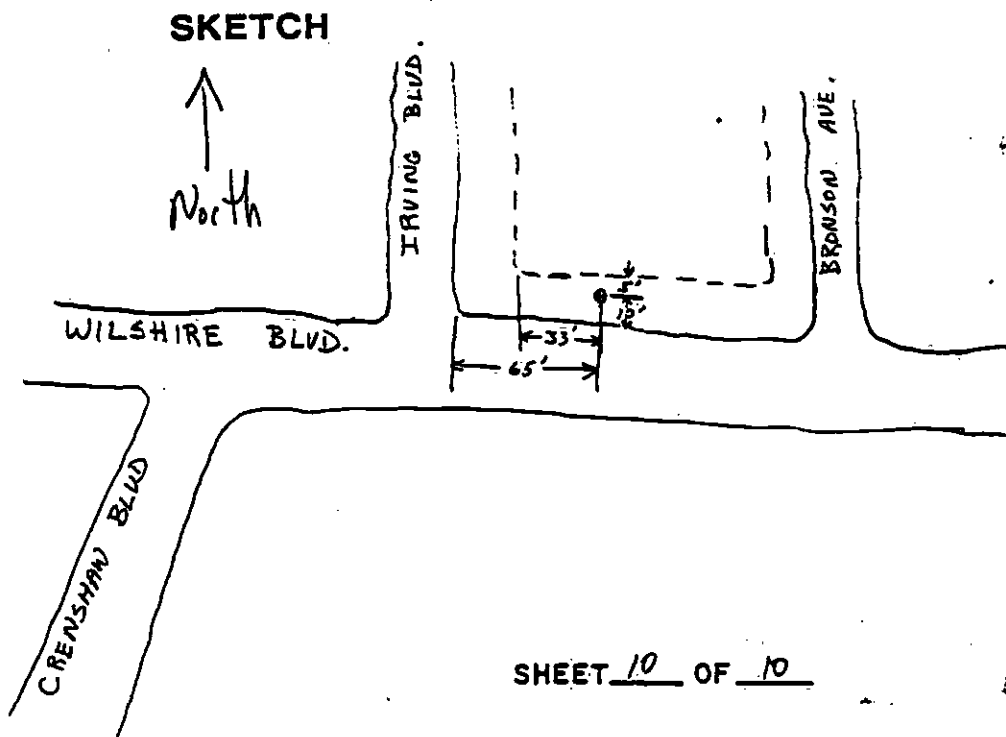
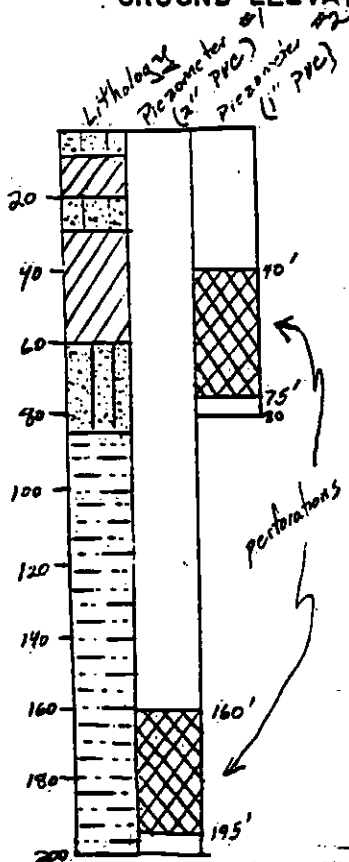
E-LOG yes

DOWN-HOLE SURVEY no

CROSS-HOLE SURVEY no

PVC CASING (I.D.): 4" TO ; 3" TO ; 2" 0' TO 200'

GROUND ELEVATION REF. 211'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/17-20/81 HOLE NO. 17
LOCATION Wilshire Blvd. (north side) at Mainfield Road GROUND ELEV. 196'
DRILLING CONTRACTOR Pitcher LOGGED BY Gallinetti DEPTH TO GROUND WATER
TYPE OF RIG Fairline HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs. 30 inches
SURFACE CONDITIONS Dirt covered vacant lot TOTAL DEPTH 200.9 NO. CORE BOXES 13

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
0	SM	0-4.5 <u>SILTY SAND</u> : Dusty yellow (5Y 6/4); ~30% low plasticity fines; ~70% fine grained sand; loose; dry.			AD			Begin drilling 1:00 1/17/81; auger to 3', begin rotary drilling	
1					RD				
2	CL	4.5-15.0 <u>SANDY CLAY</u> : moderate blue-green (5BG 4/6); ~70% moderate plasticity fines; ~30% angular fine grained sand; stiff; moist.							
4									
6									
8									
10	SP	15.0-20.0 <u>SAND</u> : moderate yellowish brown (10YR 5/4); ~80% fine sand; ~20% medium to coarse sand; scattered gravel; medium dense to loose.	S-1					1 2/3 recovery	
12									8 SS
14									12 17
16					RD				
18									
20									

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL HOOD	RUN NO.	CORE REC. %	REMARKS
44	ML	38.0-49.5 <u>CLAYEY SILT: (cont.)</u>	Box 1		PB	1		1.9/2.5 recovery
						2		1.9/2.5 recovery
46								
48						3		2.5/2.5 recovery
50	SP	49.5-64.0 <u>SAND</u> ; grayish blue-green (5BG5/2); ~5% low plasticity fines; ~95% v. poorly graded fine sand; loose; moist. PHYSICAL CONDITION: massive, no fractures, friable, fresh. probably very near shore marine sands (Beach sands).				4		0.0/2.5 recovery NO RECOVERY - probably loose sand
52						5		1.7/2.5 recovery
54								
56		55.1 medium to coarse sand (0.1' thick)				6		pocket penetrometer 0.5 2/9/81 1.5/2.5 recovery
58		56.3 medium to coarse sand (0.1' thick)	Box 2			7		2.5/2.5 recovery
60						8		pocket penetrometer 2.5 2/9/81 60' stop drilling 1/17/81 begin drilling 1/18/81. 60' GAS TEST - <u>NO GAS</u>
62						9		1.1/2.8 recovery 1.9/2.8 recovery
64		<u>FERNANDO FORMATION</u>	S-1					
66		64.0-74.0 <u>CLAYSTONE</u> : dk yellowish brown (10YR 4/2); 100% moderate plasticity fines; stiff to very stiff; damp to moist. PHYSICAL CONDITION: massive, fractures are rare, low hardness, friable, fresh.	Box 2 (cont)			10		1.9/2.8 recovery
68								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	ML	38.0-49.5 <u>CLAYEY SILT?</u> (cont.)	Box 1		PB	1	1.9/2.5	recovery
						2	1.9/2.5	recovery
46								
						3	2.5/2.5	recovery
48								
		horizontal contact						
50	SP	49.5-64.0 <u>SAND</u> ; grayish blue-green (SBGS 1/2); ~5% low plasticity fines; ~95% v. poorly graded fine sand; loose; moist. PHYSICAL CONDITION: massive, no fractures, friable, fresh. probably very near shore marine sands (Beach sands).				4	0.0/2.5	recovery NO RECOVERY - probably loose sand
52						5	1.7/2.5	recovery
54								
		vertical contact						
56		55.1 medium to coarse sand (0.1' thick)				6	1.5/2.5	recovery pocket penetrometer 0.5 2/19/81
58		56.3 medium to coarse sand (0.1' thick)	Box 2			7	2.5/2.5	recovery
60								
						8		pocket penetrometer 2.5 2/19/81 60' stop drilling 1/17/81 begin drilling 1/18/81. 60' GAS TEST - NO GAS
62								
						9	1.1/2.8	recovery
64		<u>FERNANDO FORMATION</u>	S-1					
		64.0-74.0 <u>CLAYSTONE</u> : dk. yellowish brown (10YR 4/2); 100% moderate plasticity fines; stiff to very stiff; damp to moist.						
66		PHYSICAL CONDITION: massive; fractures are rare, low hardness, friable, fresh.	Box 2 (cont.)			10	1.9/2.8	recovery
68								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (lb)	DRILL HOSE	RUN NO.	CORE REC. %	REMARKS
68		64.0 - 74.0 <u>CLAYSTONE</u> : (cont.)	Box 2		PB	10		
		68.9 FRACTURE; approx. horizontal; ~ 0.1' thick zone of disrupted material				11		2.1/2.8 recovery
70								
						12		2.2/2.8 recovery
72			Box 3					
		74.0 - 79.1 <u>CLAYSTONE</u> interbedded SAND: thinly laminar (0.1' to 0.2' thick); CLAY is dark yellowish brown (10R 4/6); 100% moderate plasticity fines; some layers high plasticity; SAND is light bluish gray (5B 6/1); 100% v. fine sand; moderate plasticity; CLAY layers - 75%; high plasticity CLAY ~ 20%; SAND layers - 5%. PHYSICAL CONDITION: massive, low hardness, friable, fresh.				13		1.9/2.8 recovery
74								
						14		1.9/2.4 recovery; stopped cutting after 2.4 because cemented zone wouldn't cut.
76								
						15		RUN 15: no recovery, bent tube, cemented zone is too hard to cut; rotary drill through it
78		79.1 - 80.5 <u>CLAYSTONE</u> : olive gray (5Y 4/1); hard cemented claystone. PHYSICAL CONDITION: massive; Hard, moderately strong, fresh.	Box 3 (cont.)		RD			
80		80.5 - 107.2 <u>CLAYSTONE</u> : mod. brown (5YR 3/4); 100% moderate to high plasticity fines; stiff; damp. PHYSICAL CONDITIONS: massive, fractures are rare, low hardness, friable, fresh.			PB	16		2.2/2.8 recovery
82								
						17		2.3/2.8 recovery
84			S-2					
								pocket penetrometer 74.5 2/9/81
86			Box 3 (cont.)			18		2.0/2.9 recovery
88								
						19		1.7/2.8 recovery
90			Box 4					
92								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	OPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92		80.5 - 107.2 CLAYSTONE: (cont.)	Box 4		PB	20		2.0/2.8 recovery
94		93.0 - some thin (0.1'-0.2' thick) layers of SANDY CLAY (~20-30% fine sand)				21		2.3/2.8 recovery
96								pocket penetrometer 74.5 2/9/81
98						22		2.1/2.8 recovery
100			5-3			23		2.8/2.8 recovery
102								
104			Box 4 (cont.) Box 5			24		1.7/2.8 recovery
106						25		2.3/2.8 recovery
108		107.2 - 111.0 CLAYSTONE interbedded SANDY CLAY & thin layered (0.05' to 0.2' thick) CLAY, some layers are high plasticity (100% fines), some low plasticity (100% fines), and some are SANDY CLAY (~20% fines, ~20% fine sand); color varies: moderate brown (SYR 3/4); dark yellowish brown (10YR 4/2); and light brown (SYR 5/6); total volume is ~50% high plasticity layers, ~40% low plasticity layers, ~10% SANDY CLAY layers.				26		2.7/2.8 recovery
110								pocket penetrometer 74.5 2/9/81
112		PHYSICAL CONDITION: massive, low hardness, friable, fresh.				27		2.9/2.8 recovery
114		111.0 - 120.0 CLAYSTONE: dk. moderate brown (SYR 3/4); 100% moderate plasticity fines; v. stiff; damp.	Box 6			28		2.4/2.8 recovery
116								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MOSE	RUN NO.	CORE REC. %	REMARKS
116		111.0-120.0 <u>CLAYSTONE</u> : (cont.) PHYSICAL CONDITION: massive, low hardness, friable, fresh	BOX 6		PB	28		
118		GRADING SILTIER ↓				29		2.8/2.8 recovery
120		120.0-124.0 <u>SILTSTONE</u> : moderate yellowish brown (10YR 5/2); 100% low plasticity fines; bedding observable ~ 0.2' thick; stiff; damp.				30		2.5/2.8 recovery
122		PHYSICAL CONDITION: massive, low hardness, friable, fresh.	5-4			31		2.3/2.3 recovery
124		124.0-131.0 <u>CLAYSTONE</u> : dk. reddish brown (5YR 2/4); 100% moderate plasticity fines; stiff to hard; damp.	BOX 6 (cont)			32		2.9/2.8 recovery
126		PHYSICAL CONDITION: massive, low hardness to moderate hardness, friable to weak, fresh.	BOX 7			33		2.3/2.8 recovery
128		127.8-129.3 interval of more consolidated <u>CLAYSTONE</u>						
130		gradational contact						
132		131.0-138.0 <u>SILTSTONE</u> : gray olive (10Y 4/2); 100% low plasticity fines; stiff to very stiff; damp.				34		2.9/2.8 recovery
134		PHYSICAL CONDITION: massive, low hardness, friable, fresh.				35		2.3/2.9 recovery
136			5-5			36		2.8/2.8 recovery
138		138.0-158.1 <u>CLAYSTONE</u> : dk. moderate brown (5YR 3/4); 100% moderate plasticity fines; very stiff; moist.						
140		PHYSICAL CONDITION: massive, low hardness; friable; fresh.	BOX 8			37		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
140		138.0-158.1 <u>CLAYSTONE: (cont)</u>	Box 8		PB	37		2.8/2.8 recovery	
142						38		2.8/2.8 recovery	
144								pocket penetrometer 24.5 2/9/81	
146						39		2.8/2.8 recovery	
148						40		2.8/2.8 recovery	
150				Box 9			41		2.8/2.8 recovery
152								pocket penetrometer 24.5 2/9/81	
154				S-6			42		2.8/2.8 recovery
156							43		2.8/2.8 recovery pocket pen. 24.5 2/9/81
158			158.1-164.8 <u>CLAY & SILTSTONE:</u> interbedded 0.05' to 0.2' thick layers of CLAY (~60%) and SILT (~40%); CLAY is dark moderate brown (5YR 3/4), 100% moderate plasticity fines; SILT is grayish olive (10Y 4/2); 100% low plasticity fines; stiff to hard; damp. PHYSICAL CONDITION: massive, low hardness, friable, fresh.	Box 9 (cont)					
160							44		158.9' - stop drilling 1/19/81 - begin drilling ~10:00 1/19/81.
162									2.8/2.8 recovery
164				Box 10			45		2.8/2.8 recovery
									SHEET 7 OF 40

PROJECT 80-1280-22DATE DRILLED 1/18/81HOLE NO. 17

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	NUM NO.	CORE REC. %	REMARKS
164		159.1-164.8 CLAY and SILTSTONE: (cont.)	BOX 10		TB	45		
		164.8-200.9 CLAYSTONE: dark moderate brown (5YR 3/4); 100% moderate plasticity fines; damp.				46		2 1/2" recovery
166		PHYSICAL CONDITIONS: massive, low hardness, friable; fresh.				47		2 1/2" recovery
168								
170			S-7			48		2 1/2" recovery
172								
174			BOX 10 (cont.)			49		2 1/2" recovery
176			BOX 11			50		2 1/2" recovery
178						51		2 1/2" recovery
180								
182						52		2 1/2" recovery
								2 1/2" recovery
184			BOX 12			53		2 1/2" recovery
186		184.9-185.1 SAND layer. light bluish gray (5B 7/1); 100% v. fine sand.						
188			S-8			54		

SHEET 8 OF 10

11-769

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	CL	164.8 - 200.9 CLAYSTONE (cont.) PHYSICAL CONDITION: massive, low hardness, friable, fresh.	S-8		PB	54		2.8/2.8 recovery
190			Box 12 (cont.)			55		2.9/2.8 recovery pocket penetrometer 74.5 2/9/81
192						56		2.8/2.8 recovery
194						57		2.9/2.9 recovery
196		196-198 some thin (0.18'-0.2') layers of SANDY CLAY	Box 13					
198						58		2.9/2.8 recovery
200			S-9					
	B.H.	200.9 Bottom of Hole						200.9' - Terminate Hole. Stop circulation - 2230 1/19/81. Run electric logs. 1/20/81 - install piezometer (2" PVC). Down to 200'. with cloth-covered perforations from 50' to 70' and from 180' to 195'. Gravel pack in surface, surface Bentonite 7 mg. Move of A site 11:00 1/20/81. water sampled 2/18/81



SUMMARY BORING NO. 17

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 1/17 - 1/20/81

OVERBURDEN DEPTH (FT.) 0' TO 38'

BEDROCK DEPTH (FT.) 38' TO 200.9' (T.D.)

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____

GAS NO; DEPTH FIRST NOTICED _____, DATE _____

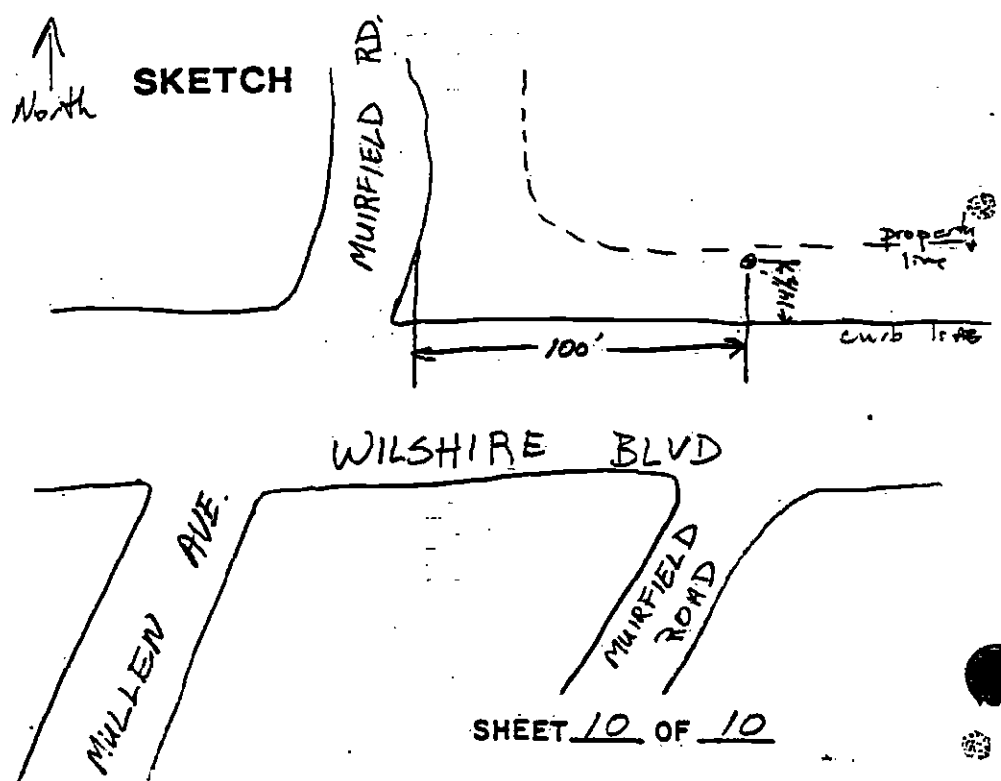
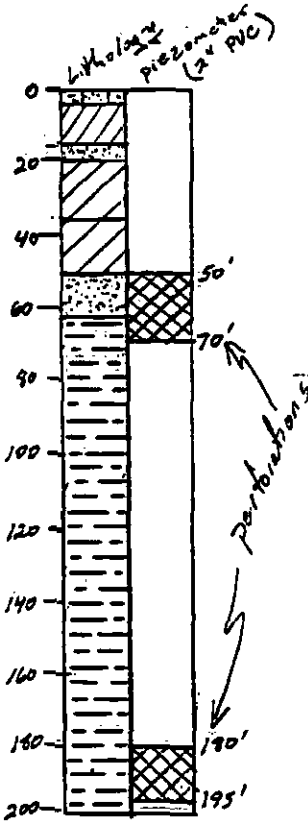
E-LOG YES

DOWN-HOLE SURVEY NO

CROSS-HOLE SURVEY NO

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 200' *cloth covered*

GROUND ELEVATION REF. Sidewalk 196'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/19-2/22 HOLE NO. 18
 LOCATION Wilshire @ La Brea GROUND ELEV. 194'
 DRILLING CONTRACTOR J.N. Pitcher Co LOGGED BY Schoeberlein DEPTH TO GROUND WATER 15'
 TYPE OF RIG Frilling 1500 HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lb 30/0
 SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 200.6 NO. CORE BOXES 6

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	CL	3" concrete			AO			Auger to 3' set casing to 4', 1' stick-up.
2.0		0.2 - 4.5 <u>SILTY CLAY</u> : olive black (5Y 2/1); 89% high plastic fines, 2% sand; moist; medium stiff.			RO			
4.0								
6.0	CL	4.5 - 11.0 <u>SANDY CLAY</u> : moderate yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2); 60-70% moderately plastic clay; 30-40% very fine grained sand; moist, very stiff.	5-1	5 6 9	SS RO			1.3/1.6 recovery
8.0								
10.0		grading sandier						
12.0	SC	11.0 - 15.0 <u>CLAYEY SAND</u> : pale yellowish brown (10YR 6/2). 10-20% fines; 80-90% fine to medium grained angular sand with minor gravels; moist; medium dense.	5-2	5 10 12	SS RO			1.2/1.5 recovery
14.0								
16.0	CL	15.0 - 17.5 <u>SANDY CLAY</u> : pale yellowish green (10GY 3/2) mottled with light greenish grey (5GY 8/1) - 80% moderately plastic clay; 40% fine to medium grained sand; moist; stiff.	5-3	4 6 8	SS RO			1.5/1.5 recovery
18.0								
20.0			c-1		OR			c-1 disturbed 8/5, 11/5 100% recovery SHEET 1 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	CL	15.0-37.5 SANDY CLAY: (cont.)	J-4	9	SS			1.5/1.5 recovery
				12				
				15				
22.0					RD			
24.0		color change to dusky yellow (5Y6/4) mottled with pale greenish yellow (10Y6/2)						
			J-5	5	SS			1.5/1.5 recovery
26.0				10				
				17				
					RD			
28.0								
30.0	CL	medium bluish gray sandy clay lense (ES S/1)	J-6	10	SS			1.5/1.5 recovery
				17				
				17				
32.0	CL				RD			
34.0	SP	sand lense medium grained grading sandier						
	CL							
36.0		60% clay, 40% sand	J-7	11	SS			1.5/1.5 recovery
				11				
				16				
					RD			
38.0	SC	37.5-44.0 CLAYEY SAND: dusky yellow (5Y6/4); ~40% clay, ~60% fine to medium grained subangular sand; interbedded with sandy clay; moist; dense to very dense.	C-2		RD			16/1.5, 18/1.5 1.0/1.0 recovery
40.0			J-8	17	SS			1.5/1.5 recovery
				24				
				30				
42.0					RD			
44.0		clay increase						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL LOG	RUN NO.	CORE REC. %	REMARKS
44.0	CL	44.0-43.5 <u>SILTY CLAY</u> : dark greenish grey (5G 4/1); 98% moderately plastic fines; 2% sand; occasional concretions; moist; very stiff.	J-9		RO			1.5/1.5 recovery 1/17/81 1/20/81 water at 15' in a.m.
46.0				8	CS			
				20				
48.0	ML	48.5-55.4 <u>CLAYEY SILT</u> : dark greenish grey (5G 4/1); 100% low plastic fines; moist; v. stiff. grading siltier	J-10		RO			1.5/1.5 recovery
50.0				18	SS			
				20				
52.0	SP	55.4-84.8 <u>SAND</u> : greyish green (10 G 4/2); 3-4% silt; 96-97% very fine to fine-grained angular to subangular sand; moist to saturated; dense; sulfur odor; occasional gravel; saturated	Box 1		PB 1			dense continuous pitcher samples 2.2/2.5 recovery 2.0/2.5 recovery pocket penetrometer 8.5 2/9/81 terminate continuous little consolidated sand
56.0								
58.0					2			
60.0	OR		C-3		RO			32/5, 44/5 10/11.0 recovery 15/5, 50/4
62.0								
64.0								
66.0	SS		J-11	12				SHEET <u>3</u> OF <u>10</u>
				50				
68.0	AD							

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SP	55.4 - 84.8 SAND: (cont.)			RO			
		gravel and coarse sand lense						
70.0				28	SS			1.3 / 1.5 recovery
			J-12	33				
				45				
72.0					RO			
		gravel content increases to 10-15% subround medium gravels to 3/4" diameter						
74.0								checked gas: 21% O ₂ 0% combustibles
76.0			6-1		PB	3		1.5 / 2.4 recovery
		liquifiable						chatter
78.0			Box 1 (cont.)			4		1.7 / 2.6 recovery
80.0		coarse sand lense				5		1.4 / 2.5 recovery
82.0	SP							
		shells and angular to round sand and gravel				6		intense rig chatter
84.0		FERNANDO FORMATION						0 / 2.6 recovery tube torn up, pocket penetrometer 7.0 (broke apart) 2/19/81
		84.8 - 200.6 SILTY CLAYSTONE: dirty grey (s & 3/2), 100% moderately plastic fines, moist; many interbedded zones of banded colors little compositional change, dips 10-30°				7		0.3 / 2.5 recovery
86.0		Physical Condition: moderately fractured to massive, most fractures mechanically induced; friable to low hardness; friable to weak strength; little weathered.				8		0 / 2.5 recovery
88.0								
90.0					RO			added polydrill drilled out to get gravel out of hole
92.0			Box 1 (cont.)		PB	9		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (CT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		84.8-200.6 SILTY CLAYSTONE (cont.) Physical Condition: as previously described	Box 1 (cont.)		PB	9		1.8 / 2.5 recovery pushing rock ahead samples disturbed
94.0						10		1.5 / 2.5 recovery
96.0					RO			sample disturbed extruded drilled out to try to get rock out
98.0								
100.0			Box 2		PB	11		2.5 / 2.5 recovery pocket penetrometer 3.0 2/9/81 picked up rock in tube
102.0			S-2			12		2.1 / 2.5 recovery
104.0		silt lense; dry interbedded lenses of varying silt-clay content ratios	Box 2 (cont.)			13		1.8 / 2.5 recovery
106.0						14		chatter
108.0		6" cemented lense						1.3 / 2.8 recovery
110.0						15		1.5 / 2.8 recovery
112.0						16		1.2 / 2.8 recovery
114.0								pocket penetrometer 74.6 2/9/81 took spacer out of pitcher barrel, pushing w/ 350 psi prior to spacer removal and 200 psi following.
116.0			S-3			17		

PROJECT 80-1280-22

DATE DRILLED 1/19-27/81

HOLE NO. 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CONC. REC. %	REMARKS
116.0		64.8-200.6 SILTY CLAYSTONE: (cont.) Physical Condition: as previously described	S-3		PB	17		1.8/2.8 recovery
118.0			Box 2 (cont.)			18		chatter 2.4/2.8 recovery
120.0			Box 3			19		1.9/2.8 recovery
122.0						20		1.5/2.8 recovery
124.0						21		1.4/2.8 recovery
126.0						22		20 minutes rest in hole
130.0			S-4					2.8/2.8 recovery pocket penetrometer 74.5 2/9/81
132.0			Box 3 (cont.)			23		30/1000's call in tube 2.3/2.8 recovery
134.0						24		1.2/2.8 recovery
136.0						25		1/20/80 1/2/80 water at 15' in a.m.
138.0		bedding dips 20° from horizontal						2.8/2.8 recovery
140.0						26		SHEET 6 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MOOD	RUN NO.	CORE REC. %	REMARKS
140.0		84.8-200.6 <u>SILTY CLAYSTONE</u> (cont.) Physical Condition: as previously described.	Box 3 (cont.)		PB	26		1.5/2.8 recovery
142.0		142-150 interbedded silty clay with silt and very fine sand 30° dip of bedding, beds	Box 4			27		60/1000's roll in
144.0		1/8" to 1/2" mostly 1/2" thick; color olive grey (S14) w/ dusky yellow green (S14 5/2) interbeds 144.0 - white ash, 1" thick 10° dip				28		2.8/2.8 recovery pocket penetrometer 74.5 2/9/81
146.0			S-5					30/1000's 2.1/2.8 recovery
148.0			Box 4 (cont.)			29		60/1000's 2.8/2.8 recovery
150.0						30		60/1000's
152.0								2.3/2.8 recovery
154.0						31		30/1000's 1.7/2.8 recovery
156.0		minor chass bedding present						
158.0						32		1.7/2.8 recovery
160.0		160' very fine grained sand lense 1 1/2" thick light bluish grey (S85/1)	Box 5			33		pocket penetrometer 74.5 2/9/81 1.5/2.8 recovery
162.0						34		2.0/2.8 recovery
164.0			S-6					

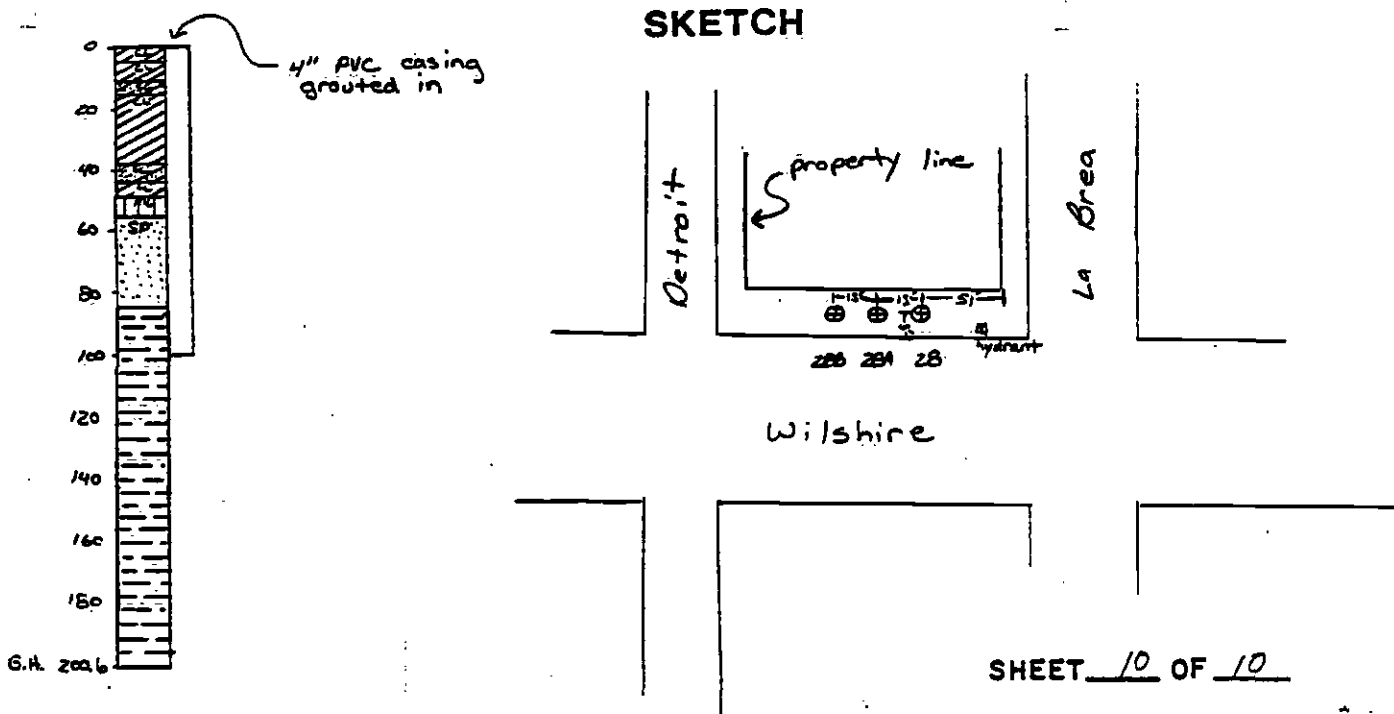
DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPY (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		34.8 - 200.6 <u>SILTY CLAYSTONE</u> (cont) Physical Condition: as previously described.	5-6		PB	34		
166.0		166.0 silty sand, lt. bluish grey; very fine grained; 2" thick	Box 5			35		2.2/2.8 recovery
168.0						36		gas: 0% combustibles 21% O ₂ pocket penetrometer 74.5 1.4/2.8 recovery
170.0						37		1.3/2.8 recovery
172.0		170.8 - 1/2" sand lense as at 166.0 171.2 - 1/2" sand lense as at 166.0				38		pocket penetrometer 74.5 2.4/2.8 recovery
174.0		174.4 1/2" sand lense as at 166.0 bedding dip change to 10°, most fractures along non cohesive sand and silt beds mechanical breaks dominantly.				39		1.7/2.2 recovery
176.0		177.5 clay lense, 3" thick, soft.				40		intense chatter
178.0		178.0 - 179.2 well cemented silt stone lense, closely fractured				41		0.2/2.8 recovery drilling smoothed out
180.0						42		2.9/2.8 recovery
182.0			5-7			43		2.2/2.8 recovery
184.0			Box 6			44		1.9/2.8 recovery
186.0						45		
188.0		187.0 - 1/2" sand lense as at 166.0				46		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0		84.8-200.6 SILTY CLAYSTONE = (cont) Physical Condition: as previously described	Box 6 (cont)		FB	43		
190.0		190' 1/2" sand lense				44		1.1 / 2.8 recovery pocket penetrometer > 4.5
192.0						45		1.6 / 2.8 recovery
194.0						46		1.0 / 2.8 recovery
196.0						47		rock pushing ahead poor sample
198.0								0 / 2.8 recovery
200.0								
202.0		B.H. 200.6 - Terminated hole at 2:30 1/21/81, E-logged 1/21/81, down hole geophysics 1/21/81, water level noted on sheet 1 following stabilization for 4 days prior to pressure test. Water pressure test attempted 1/26/81 problems with minor pocket leakage and problems seating lower packer. Water loss was probably in fractured cemented zone at 178' hole reamed 1/27/81 to 6" 4" casing installed to 100'.						
204.0								
206.0								
208.0								
210.0								
212.0								



SUMMARY BORING NO. 18

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 1/19-27/81.
 OVERBURDEN DEPTH (FT.) 0 TO _____.
 BEDROCK DEPTH (FT.) 84.8 TO 200.6 (T.D.).
 WATER PRESS. TEST YES; INTERVAL(S) _____ TO _____, _____ TO _____.
 GROUND WATER DEPTH (FT.) 15' DATE 1/21/81; _____ DATE _____.
 GAS ^(TRACE) NO; DEPTH FIRST NOTICED _____, DATE _____.
 E-LOG YES . 1/21/81
 DOWN-HOLE SURVEY YES 1/21/81.
 CROSS-HOLE SURVEY YES.
 PVC CASING (I.D.): 4" 0 TO 100'; 3" _____ TO _____; 2" _____ TO _____.
 GROUND ELEVATION REF. 194'



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 19

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 30-1280-22 DATE DRILLED 1/12-15/81 HOLE NO. 19
 LOCATION North side of Wilshire St. Curson (Hancock Park) GROUND ELEV. 186'
 DRILLING CONTRACTOR Pitcher LOGGED BY Gallinetti DEPTH TO GROUND WATER
 TYPE OF RIG Failog HOLE DIAMETER 4 1/8" HAMMER WEIGHT AND FALL 140 lbs., 30 inches
 SURFACE CONDITIONS sidewalk TOTAL DEPTH 209.0 NO. CORE BOXES 8

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0-0.5 CEMENT			AD			Begin drilling 1:30 1/12/81
1	CL	0.5-9.0 SANDY CLAY: greenish black (SG 2/1); ~85% moderate plasticity fines; ~15% fine grained sand; soft; damp.						
2								material does not seem oily, but oil film appears on mud tub.
4					RD			
6		5.0-8.0 charcoal wood chips						
8								
10	CL	9.0-14.0 OIL CLAY: Greenish Black (SG 2/1); 100% moderate plasticity fines; petroleum throughout material; oily smell; firm; damp.		4 6 12	SS			1.5/ 1.5 recovery pocket penetrometer 1.5 2/19/81
12					RD			
14	SP	14.0-23.0 TAR SAND: Black (N2); minor fines (hard to discern through tar); 100% fine grained sand; saturated w/ oil; medium dense.						
16								
18								
20								

SHEET 1 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	SP	14.0-23.0 <u>TAR SAND</u> : (cont.)	C-1		DR			DR ⇒ 45 blows
		sample ~20% fines	J-2	15	SS			0.8/1.0 recovery petroleum sample * sampler lost in the hole - retrieved w/ the pitcher barrel
22				26				1.5/1.5 recovery
				37				
24	CL	23.0-24.5 <u>CLAY</u> : Dk. greenish gray (56 4/1); 100% moderate plasticity fines; firm to stiff; no petroleum.			RD			Drive sample taken w/ down-hole jars 325 lbs.; 5" tube plus 1" rings.
26	SM	24.5-34.0 <u>SILTY TAR SAND</u> : Greenish Black (56 2/1); ~20% low plasticity fines; ~80% fine sand; saturated w/ petroleum; medium dense.						22.5' GAS TEST: O ₂ - 16% Combustibles: off the scale (reads over 100%)
30			J-3	7	SS			1.5/1.5 recovery pocket penetrometer 2.5 2/9/81
				13				
				23				
32					RD			
34	SP	34.0-66.0 <u>GASEOUS TAR SAND</u> : Black (N1); 100% fine sand; saturated w/ petroleum; loose to med. dense; material is very porous, seems to be aerated - spongy, gas makes up a significant amount of the volume.						42' - stop 5:00 1/12/81 begin 7:00 1/13/81
36								used 1" rings rather than 5" tube
38								DR ⇒ 80 blows
40			C-2		DR			0.8/1.0 recovery * rings disturbed when moving from sampler
			J-4	7	SS			1.0/1.0 recovery petroleum sample 40'-42'
				5				
42					RD			
44								SHEET 2 OF 10

PROJECT 80-1289-22

DATE DRILLED 1/13/81

HOLE NO. 19

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (16')	DRILL HOSE	SPUR NO.	CORE REC. %	REMARKS
44	SP	34.0-66.0 <u>TAR SAND</u> : (cont.)			RD			42' - GAS TEST: combustibles - off the scale (over 100%)
46								
48								
50			I-5	12 50	SS			.5/.9 recovery
52					RD			
54								
56								
58								gas bubbling up out of hole.
60			C-3		DR			used 5" tube plus rings DR ⇒ 100 Blows
62			I-6	10 39 50	SS			.7/.9 recovery petroleum sample 60-62' 1.4/.4 recovery
64					RD			
66		<u>FERNANDO FORMATION</u> 66.0-69.0 <u>CLAYSTONE</u> : grayish olive (10Y 4/2); v. well cemented; hard; thin laminations; physical condition unknown.						(no samples of CLAYSTONE)
68								SHEET 3 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (FT)	DRILL MODE	NUM NO.	CORE REC. %	REMARKS
64		66.0-69.0 <u>CLAYSTONE</u> (cont.)			RD			
70		69.0-78.0 <u>OIL CLAYSTONE</u> : moderate brown (SYR 9/4); 100% moderate to low plasticity fines; oil smell w/ a few oil seams visible; stiff; damp. PHYSICAL CONDITION: little fractured to massive, low hardness to friable, fresh.	J-7	10	SS			1.0/ 1.5 recovery pocket penetrometer 74.5 2/9/81
				25				
					36			
72					RD			
74								
76								
76								
76								
80		78.0-108.0 <u>OILY SILTY SANDSTONE</u> : moderate brown (SYR 9/4); ~30% low plasticity fines; ~70% poorly sorted very fine sand; oil smell; dense; damp. PHYSICAL CONDITION: little fractured to massive, low hardness to friable, fresh.	J-8	15	SS	DR		use 1" rings DR => 27 blows NO RECOVERY - sample fell out of surface pocket penetrometer 74.5 2/9/81 1.0/ 1.5 recovery
				25				
					45			
82					RD			
84								
86								
88								
90						PB 1		90' - Begin continuous filter logging 10:00 first PB was empty, try to clean hole w/ bit, but continue to have problems
92			S-1			2		90' - Abundant gas. bubbling SHEET 4 OF 10

GRADING
SILTIER
↓

90' - Begin continuous
filter logging 10:00 1/13/81
first PB was empty,
try to clean hole w/
bit, but continue to
have problems
90' - Abundant gas. bubbling

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT ('s)	DRILL MUD	RHS NO.	CORE REC. %	REMARKS
92		78.0-108.0 OILY SILTY SANDSTONE (cont.)	S-1		PB	2		1.7/2.5 recovery Bottom of tube severely twisted and bent, will require pipe cutter to extract
94		PHYSICAL CONDITIONS: little to moderately fractured, minimum 0.5', maximum 5.0', usually ~3.0', low hardness, friable, fresh.	Box 1			3		.4/1.0 recovery
96				4		.4/1.5 recovery		
98				5		.5/2.5 recovery		
100				6		.6/2.5 recovery pocket penetrometer >4.5 2/9/81		
102				7		0.0/2.5 recovery		
104		occasional bedding, indistinct.				8		104' - stop drilling 1/13/81 - begin 1/14/81 install 73' of 5" casing to stop hole from casing in. Pump now working properly (flushed w/ fresh water). Resume drilling 4:00 1/14/81. Tube on run 8 is bent w/ large (3" cobble) in tube, 1/15 recovery. Run 9 is only able to clear out sluff - no footage
106				9				
108				10				
110		GRADATIONAL CONTACT 109.0-145.0 OILY SILTSTONE: moderate brown (SYR 3/4); 100% no plasticity fines; oily; stiff; damp.	S-2			11		106' - stop drilling 1/14/81 - begin drilling 1/15/81.
112		PHYSICAL CONDITIONS: little fractured to massive, minimum 1.0', maximum 5.0', usually 3.0', low hardness, friable, fresh.	Box 1 (cont.)			12		.9/2.5 recovery
114						13		1.9/2.5 recovery pocket penetrometer >4.5 2/9/81
116								SHEET <u>5</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL ROPE	RUN NO.	CORE REC. %	REMARKS
116		108.0 - 145.0 OILY SILTSTONE: (cont.)	Box 1		PB	13		
118		118.0 - 126.0 Some very fine grained sand (~20%)				14		2 3/2.5 recovery
120		no bedding	Box 2			15		2 1/2.5 recovery pocket penetrometer >4.5 2/9/81
122		physical condition: little fracturing mostly 2'-3' spacing, low hardness, friable, fresh.	5-3			16		1.8/2.5 recovery
124			Box 2 (cont.)			17		2.4/2.5 recovery
126		127.5 - 132.0 slightly more plastic (CLAYEY SILT)				18		2.3/2.5 recovery
128		GAS in formation				19		2.3/2.5 recovery
130						20		1.5/2.5 recovery pocket penetrometer >4.5 2/9/81
132		132.0 - 137.0 ~30% fine sand; occasional thin (0.1') SAND lens.				21		1.9/2.5 recovery
134			Box 3			22		1.9/2.5 recovery
136						23		
138								
140								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MCODE	RUN NO.	CORE REC. %	REMARKS
140		108.0-145.0 OILY SILTSTONE: (cont.)	Box 3		PB	23		2.3/2.5 recovery Top 1' of run 23 was fractured during extrusion
142	55	140.0-145.0 occasional thin (0.2') SAND lens. this is the only bedding visible.	3-4			24		2.5/2.5 recovery pocket penetrometer 24.5 2/9/81
144	50	145.0-209.0 OILY CLAYEY SILTSTONE Drk. muckate brown (SPT 3/4); 100% low plasticity fines; stiff to very stiff; damp to dry. Physical condition: little fractured to massive, low hardness, friable, fresh.	Box 3 (cont.)			25		2.4/2.5 recovery
146						26		2.5/2.5 recovery sample from run 26 fractured during extrusion
148						27		2.2/2.5 recovery
150						28		2.5/2.5 recovery
152			Box 4			29		2.3/2.5 recovery
154	50	155.2 - thin (0.1') SAND lens dipping 30°				30		2.5/2.5 recovery pocket penetrometer 74.5 2/9/81
156						31		2.5/2.5 recovery
158						32		2.4/2.5 recovery
160			5-5					
162	50	162.2 - Thin (0.1') SAND lens 163.5 - Thin (0.1') SAND lens dipping 50°	Box 4 (cont.)					
164								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		145.0-209.0 OILY CLAYEY SILTSTONE (cont.)	BOX 4		PB	33		2.5/2.5 recovery
166		PHYSICAL CONDITION: little fractured, to massive, mostly -30' low hardness, friable, fresh	BOX 5			34		2.4/2.5 recovery
168						35		2.3/2.5 recovery
170						36		2.3/2.5 recovery
172			172.5' - thin (0.1') SAND lens dipping 40°				37	
174						38		2.5/2.5 recovery
176						39		179' - stop drilling 1/15/81 begin drilling 1/16/81
178		177.5-179.0 SANDY SILT (~20% fine sand)	Box 6			40		2.5/2.5 recovery
180			5-6			41		2.5/2.5 recovery
182			Box 6 (cont.)			42		2.2/2.5 recovery
184		184.9' SAND lens (0.1' thick)						2.5/2.5 recovery
186								
188		189.3' SAND lens						2.5/2.5 recovery

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6')	DRILL CODE	RUN NO.	CORE REC. %	REMARKS
188	ML	145.0-209.0 OILY CLAYEY SLTSTONE (cont.)	Box 6		PB	42		
190		PHYSICAL CONDITION: little fractured to massive, 2' to 10' spacing, low hardness, friable, fresh.				43		24/25 recovery
192			Box 7			44		24/25 recovery pocket penetrometer 74.5 2/9/81
194						45		24/25 recovery
196						46		24/25 recovery
198		GRADING CLAYEYER!				47		25/25 recovery
200			S-7			48		25/25 recovery
202			Box 7 (cont.)			49		24/25 recovery pocket penetrometer 74.5 2/9/81
204						50		25/25 recovery
206			Box 8					
208	B.H.	209.0 Bottom of Hole						209' Terminate Hole
210		Piezometer installed to 210' w/ cloth covered perforations from 40' to 80' and 170' to 200'. (40' to 50' was unclotted). Gravel peck to 42'. 25' Bentonite plug 37' to 42' and grout from 37' up to surface						stop circulation 11:00 1/16/81 run c-logs, install piezometer, & grout surface SHEET 9 OF 10



SUMMARY BORING NO. 19

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 1/12 - 1/17/81

OVERBURDEN DEPTH (FT.) 0 TO 66.

BEDROCK DEPTH (FT.) 66 TO 209 (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.

GAS yes; DEPTH FIRST NOTICED 22', DATE 1/12/81

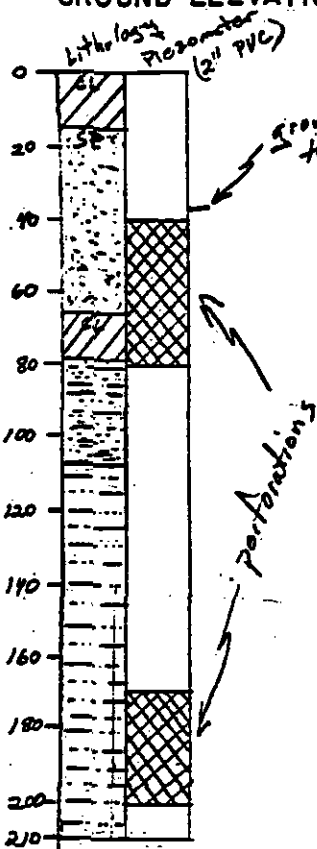
E-LOG yes.

DOWN-HOLE SURVEY NO.

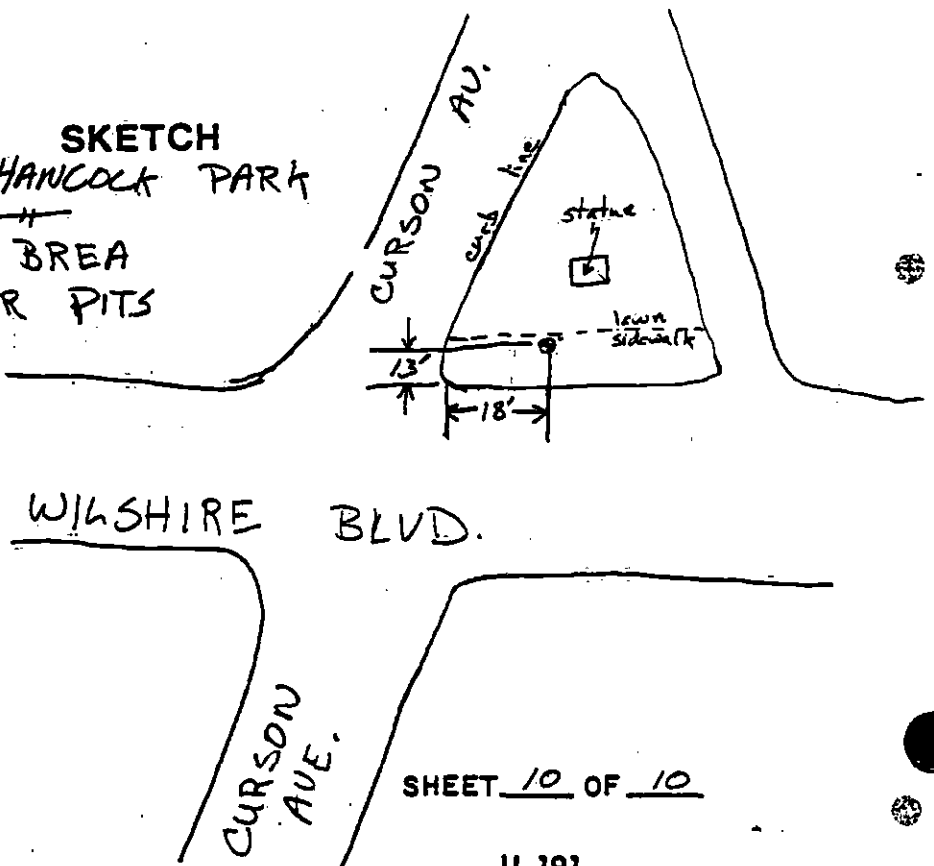
CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 209'.

GROUND ELEVATION REF. 186'



SKETCH
HANCOCK PARK
LA BREA
TAR PITS





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SCPTD 80-1280-22 DATE DRILLED 1-12-81 / 1-15-81 HOLE NO. 20
LOCATION intersection of Wilshire Blvd. and Fairfax Avenue GROUND ELEV. 164'
DRILLING CONTRACTOR Pitkin Drilling Co. LOGGED BY Stephen M. Testa DEPTH TO GROUND WATER _____
TYPE OF RIG Fairly 1500 HOLE DIAMETER _____ HAMMER WEIGHT AND FALL 140lb - 30in.
SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 200.0 NO. CORE BOXES _____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (15')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0-0.3 CONCRETE;			RD			Started drilling 1 st cloudy, light drizzle 1-13-81 Started drilling at 10:25, clear day
0.3	SM	0.3-14.0 SILTY SAND (FILL) grayish brown (5YR 3/2), non-plastic fines (20%), fine to coarse sand (80%); moist; dilatancy slow; toughness slight.						
2.0								
4.0								
6.0								
8.0								
10.0								
10.0			J-1	11	SS			SPT at 10.0', 9/11.5 recovery
				8				
				22				
12.0		moderate brown (5YR 4/4); non-plastic fines (42%); very fine to fine sand (60%); gravel (1-2%); tan (1-2%); micaceous; moist; medium dense; dilatancy slow; toughness slight.			RD			
14.0	CL	14.0-17.0 SANDY CLAY: light olive gray (5Y 3/2); plastic fines (60%); very fine to fine sand (40%); tan (1-2%); mottled; moist; stiff; dilatancy slow to none; medium to high toughness.						
16.0			J-2	7	SS			SPT at 15.0', 13.5 recovery pocket penetrometer 2.75 (broke apart) 2/9/81
				6				
				9				
18.0					RD			
20.0	SC							

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	SC	19.0-23.0 CLAYEY SAND: olive gray (5441); plastic fines (30%); fine to coarse sand (70%); tar (1-2%); at 21.5 medium dark gray (M4); moist; hard; dilatancy slow to quick; medium to slight toughness; dark greenish gray (5641) clay laminae 1mm thick at 22.0'	C-1	27 40 50 15 20 32	DR SS RD			(CONTINUED) concrete sample at 20.0'; 45/11.5 recovery; SPT at 21.5; 9/11.5 recovery
22.0			J-3					
24.0	CK							
26.0		23.0-41.4 SANDY CLAY: shale black (5421); plastic fines (80%); very fine sand (20%); moist; hard; dilatancy none; toughness high; faint odor of tar.						SPT at 25.0, 2/1.5 recovery
28.0								
30.0		dusky yellowish brown (10V R 2.2); plastic fines (50%); fine sand (40%); micaceous; moist; hard; strong tar odor.	J-5	23 22 37	SS			SPT at 30.0' 1.5/1.5 recovery pocket penetrometer 74.5 2/9/81
32.0		gravelly;			RD			mild rod chatter from 32.5 to 34.5'
34.0								
36.0		very dense;		41 50	SS RD			SPT at 35.0'; no recovery
38.0								
40.0		mottled; sandier from 40.9 to 41.4 (gradational); 2mm. thick dark green (5641) laminae at 40.7'.			PB			pitcher bowl from 40 to 42.5'; 42.5 to 45.0'; 200 psi. pocket penetrometer 74.5 2/9/81
42.0		primarily olive gray (5421/2) from 42.5 to 43.4; mottled.	Box #1			1	1.5 2.5	
44.0	SP	43.4-107.7 OIL SAND: grayish black (M2); fine to medium oil sand; subangular to subrounded quartz grains apparent; poorly graded.			PB	2	2.5 2.5	petroleum sample obtained at 42.5' (sample # M2-1).

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SP 10- Y	42.5-107.7 OIL SANDS (CONTINUED)			FB	2	5 1/4	(CONTINUED)
46.0		fine-to-medium oil sand; faintly discernable bedding apparent by compositional banding and variable grain size; gravelly (20%) up to 4mm in max. dia. average; Som.	Boy #1		FB	3	5 1/2	pitaker basal from 45.0 to 47.5'; 200 p.s.l.
48.0					RD			pocket penetrometer 3.5 2/9/81
50.0		fine-to-medium oil sand; very dense.	J-6	30	SS			SPT at 50.0; 45/1.5 recovery
52.0				34				
54.0		gravelly from 52.0 to 54.0		58	RD			rod chatter from 52.0-52.4; 52.9-53.5; variable to 54.0
56.0		fine-grained oil sand, very dense; gravelly from 55.5 to 56.0.	J-7	26	SS			pocket penetrometer 3.0 2/9/81; SPT at 55.0; 1.9/1.0 recovery
58.0				50	RD			rod chatter from 55.5 to 56.0
60.0		fine grained oil sand, start to 60.9 gravelly (<15%) up to 1mm. in max. dia.	J-8	57 1/2	RR			pocket penetrometer 2.5 2/9/81
62.0				59 1/2	SS			ADVERSE sample from 60.0 to 60.5; 100% recovery; SPT from 60.5 to 60.9; .4/1.4 recovery
64.0					RD			1-14-81 Resumed drilling at 7:00 AM; clear day.
66.0		fine grained oil sand; very dense.	J-9	40	SS			SPT at 65.0; .5/1.8 recovery
68.0					RD			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SP	<u>VL. S-107) OIL SAND: (CONTINUED)</u>			RD			(CONTINUED)
70.0	SP-30 Y	fine to coarse oil sand (85%); gravel up to 6cm max. dia. (± 5%); black-green clay seams /mm. thick at 70.3;	J-10	32 50	SS RD			SPT at 70.0'; 9/1.0 recovery
72.0								
74.0								
76.0		grayish black (N2), fine to medium oil sand (90%); gravel up to 3cm max. dia. (1-2%); very dense.	J-11	50 55	RD RD			SPT at 75.0'; 3/1.3 recovery
78.0								
80.0	SP-15 Y	fine to medium oil sand; sand (80%); gravel (20%); medium to coarse sand from 80.8 to 81.0; gravel up to 1mm max. dia.	Box #1		RB	4		pitcher barrel from 80.0 to 82.5; 200 psi; petroleum sample obtained at 80.0' (MS-2)
82.0					RD			
84.0								
86.0		very dense.		50 55	SS RD			petroleum sample 85' SPT at 85.0' NO recovery pocket penetrometer 2.75 2/9/81
88.0								
90.0		very fine to fine oil sand (85%); gravel (± 5%); very dense; micaceous.	J-17	30 50	SS RD			SPT at 90.0'; 10/1.0 recovery pocket penetrometer 74.5 2/9/81
92.6								SHEET 4 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MOOD	RUN NO.	CONG. REC. %	REMARKS
92.0	SP	93.4-101.7 SAND (CONTINUED)			RD			(CONTINUED) rod chatter from 93.0 to 95.0
94.0		93.0-96.4 sandy gravel; olive gray (5Y3/2); medium to coarse sand (40%); gravel up to 10mm in max. dia. (60%); saturated with oil						
96.0		sharp contact at 96.0; 96.0-96.4 dusky yellowish green (10GY 3/2) clayey sand; plastic fines (22%); non-plastic fines (25%); very fine to fine sand (80%); micaceous; dry; clay content increases with depth; at 98.6 gravel content increases with depth; at 99.0 medium to coarse sand (40%); gravel (60%); randomly distributed silt blebs	Box #1		PB	5	14 2.5	pitcher barrel from 95 to 97.5, 200 psi.
98.0		100-100.7 olive gray (5Y3/2) claystone; 100.7-102.0 discontinuous blue-green clay lamina (30%); medium to coarse oil sand (55%); gravel (15%)				6	22 2.5	pitcher barrel from 97.5 to 100.0, 200 psi. pocket penetrometer 74.5 2/9/81
100.0						7		pitcher barrel from 100.0 to 102.5; 102.5 to 103.0, 200 psi.
102.0					RD	8	14 2.5	heavy rod chatter from 103.0 to 104.5
104.0		wavy, parallel, primarily fine oil saturated sand with very thin to thin clay lamina from 103 to 103.7; siltstone clast 15 cm. in dia. at 103.6	Box #2		PB	9	22 2.5	pitcher barrel from 105 to 107.5, 200 psi. wood fragments obtained from 105 and 106.0'
106.0	0-10					10	22 2.5	pitcher barrel from 107.5 to 110.0, 200 psi.
108.0		107.5 to 109.5, very fine to fine oil saturated sand; 109.5 to 110.0, olive gray (5GY 4/1) claystone; at 109.7 oil saturated sand with claystone contact wavy but sharp				11	20 2.5	pitcher barrel from 110.0 to 112.5, 200 psi.
110.0	10-15	<u>FERNANDO FORMATION</u> 109.7-112.5 CLAYSTONE; wavy, faintly discernable bedding; olive gray (5Y3/2) micaceous claystone (60%); dusky yellowish brown (10YR 2/2) siltier claystone (40%); very thin to medium lamina; occasionally mottled in appearance				12	21 2.5	pitcher barrel from 112.5 to 115.0; 115.0 to 117.5, 200 psi.
112.0		<u>PHYSICAL CONDITION:</u> massive; soft to friable hardness; soft to friable strength; fresh; tends to fracture along bedding planes.	Box #3			13	21 2.5	pocket penetrometer 74.5 2/9/81
114.0								
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		117-122.5 CLAYSTONE (CONTINUED)	Boy #3		PB	13	115	(CONTINUED)
118.0		wavy, parallel; very thin to medium lamina of olive gray (5YR 2/2) claystone and either dusky yellowish brown (10YR 2/2) claystone; micaceous fossils, forams.				14		pitcher barrel from 117.5 to 120.0, 200 psi.
120.0	15-20	PHYSICAL CONDITION: massive, soft to friable hardness; soft to friable strength; fresh; tends to fracture along bedding planes.	S-1			15	22 25	stopped drilling at a depth of 120.0 Resumed drilling at 7:00 AM; clear day; pitcher barrel from 120.0 to 122.5, 200 psi.
122.0		122.1 to 121.5, 123.2 to 123.5: well cemented greenish gray (5Y 6/1) very fine grained sandstone with a heavy concentration of shells including bivalves, snails & turritella tests				16	10 10	pitcher barrel from 122.5 to 123.5; refusal at 123.5.
124.0			Boy #3		RD			gas check at 123.5; 0.0%
126.0	12-20				PB	17	25 25	pitcher barrel from 125.0 to 127.5, 200 psi.
128.0	5-10	very thin to medium lamina of claystone (50%) and either claystone (50%)				18	13 25	pitcher barrel from 127.5 to 130.0, 200 psi.
130.0			Boy #4			19		pitcher barrel from 130 to 132.5, 200 psi. pocket penetrometer >4.5 2/9/81
132.0		very thin to medium lamina of claystone (80%) and either claystone (20%).	S-2			20		pitcher barrel from 132.5 to 135.0, 200 psi.
134.0	0-20					21	19 25	pitcher barrel from 135 to 137.5, 200 psi.
136.0	0-5	wavy, parallel very thin to medium lamina.	Boy #4			22	17 25	pitcher barrel from 137.5 to 140.0, 200 psi.
138.0		very thin to medium lamina of claystone (40%) and either claystone (60%).						
140.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL HOOD	RUN NO.	CORE REC. %	REMARKS
140.0		109.7-142.5 CLAYSTONE (CONTINUED) wavy, parallel; very thin to medium laminae of olive gray (5Y 3/2) claystone and siltier dusty yellowish brown (10YR 2/2) claystone; micaceous; fossiliferous. PHYSICAL CONDITION: (CONTINUED) massive; soft to friable hardness; soft to friable strength; fresh; tends to fracture along bedding planes.	Boy #4		23	23		(CONTINUED)
142.0	15-20 Y							pitcher barrel from 142.5 to 145.0, 200 psi.
144.0		140.0-145 primarily dusty yellowish brown (10YR 2/2) siltier claystone (70%); olive gray (5Y 3/2) claystone (30%)	Boy #5					pitcher barrel from 145 to 147.5, 200 psi.
146.0			S-3					
148.0	40 Y	148.5 bluish green clay lens 1mm thick; small tests randomly distributed occasionally occurring in groups.						pitcher barrel from 147.5 to 150.0, 200 psi. pocket penetrometer 74.5 2/9/81
150.0								pitcher barrel from 150 to 152.5, 200 psi.
152.0	40-15 Y	continued.	Boy #5					pitcher barrel from 152.5 to 155, 200 psi.
154.0								
156.0		dusty yellowish brown (10YR 2/2) silty claystone (70%); bluish green discontinuous clay laminae up to 1mm in thickness (30%), punch and swell laminae;						pitcher barrel from 155 to 157.5, 200 psi. pocket penetrometer 74.5 2/9/81
158.0	5-15 Y		Boy #6					pitcher barrel from 157.5 to 160, 200 psi.; gas check 0.0%.
160.0			S-4					pitcher barrel from 160 to 162.5, 162.5 to 165.0, 200 psi.
162.0								
164.0		continued; bluish green clay laminae up to 1mm in thickness at 163.3.	Boy #6					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	OPT (67)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		167.7-192.5 CLAYSTONE (CONTINUED) wavy, parallel very thin to medium lamina of dove gray (5Y3/2) claystone and dusky yellowish brown (10YR 2/2) silty claystone; micaceous; fossiliferous (primarily snail's foot);			PB	32	2.5 2.5	(CONTINUED) pitcher barrel from 165.0 to 167.5; 200 psi.
166.0		166.0 to 169.5 faintly discernable bluish green laminae apparent	Box #6			33	2.5 2.5	pitcher barrel from 167.5 to 170.0; 200 psi.
168.0		PHYSICAL CONDITION: (CONTINUED) massive; soft to friable hardness; soft to friable strength; fresh; tends to fracture along bedding planes.				34	2.5 2.5	pitcher barrel from 170 to 172.5; 200 psi.
170.0		continued.				35	2.5 2.5	pitcher barrel from 172.5 to 175.0; 200 psi.
172.0		lamina more prevalent from 172.0 to 179.3. 174.0 to 174.5 mottled spotty depositional texture evident.	Box #7			36	2.5 2.5	pitcher barrel from 175 to 177.5; 200 psi.
174.0						37	2.5 2.5	pitcher barrel from 177.5 to 180.0; 200 psi; gas check 0.0%.
176.0		mottled spotty depositional texture evident.	S-5			38	2.5 2.5	pitcher barrel from 180.0 to 182.5; 200 psi.
178.0		primarily silty claystone; lamina more prevalent; 180.2 to 180.6 mottled spotty depositional texture evident; very thin bluish green lamina at 181.2.	Box #7			39	2.5 2.5	pitcher barrel from 182.5 to 185.0; 200 psi.
180.0		continued.				40	2.5 2.5	pitcher barrel from 185.0 to 187.5; 187.5 to 190.0; 200 psi.
182.0		continued.				41	2.5 2.5	
184.0		lensoidal discontinuous silt and fine grain sand lamina.	Box #8			42	2.5 2.5	
186.0		continued.						
188.0								

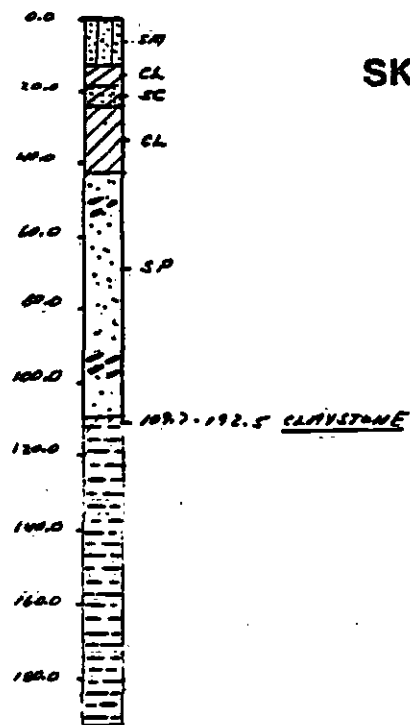
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0		107.7-92.5 CLAYSTONE (CONTINUED)			PB			(CONTINUED)
		<u>PHYSICAL CONDITION:</u> continued as previously described.	Boys #8			42	2.2 2.5	<p>pocket penetrometer 34.9 2/9/81</p> <p>pitcher haul from 190-192.5; 200 p.s.l.; gas check 0.0%</p>
190.0						43	2.5 2.5	<p>terminated hole at 192.5 on 1-15-81</p>
192.0			S-6					<p>1-17-81</p> <p>Ran H₂O water pressure test at intervals 80-100, 100-120 and 120-140; installed 100.0' of 4" PVC and grouted hole.</p>
	BH							

5:00

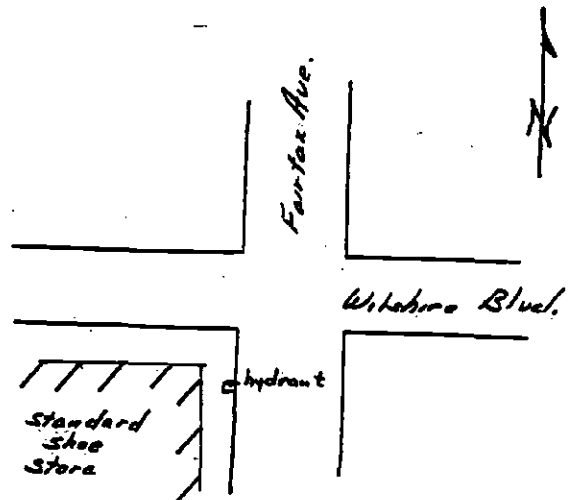


SUMMARY BORING NO. 20

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 1-12-81/1-15-81.
 OVERBURDEN DEPTH (FT.) _____ TO _____.
 BEDROCK DEPTH (FT.) _____ TO 200.0 (T.D.).
 WATER PRESS. TEST YES; INTERVAL(S) 20.0 TO 100.0, 100.0 TO 120.0,
120.0 TO 140.0.
 GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.
 GAS TRACE; DEPTH FIRST NOTICED _____, DATE _____.
 E-LOG YES.
 DOWN-HOLE SURVEY YES.
 CROSS-HOLE SURVEY YES.
 PVC CASING (I.D.): 4" 0.0' TO 100.0'; 3" _____ TO _____; 2" _____ TO _____.
 GROUND ELEVATION REF. 164'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/18-23/80 HOLE NO. 21
LOCATION Maryland at Crescent Heights Blvd. GROUND ELEV. 159'
DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY LS DEPTH TO GROUND WATER _____
TYPE OF RIG Enlira 1500 HOLE DIAMETER 4 7/8 HAMMER WEIGHT AND FALL 140 lb / 30 in drop
SURFACE CONDITIONS asphalt street TOTAL DEPTH 200' NO. CORE BOXES 5

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	XX	2" asphalt 6" baserock			AO			12' Surface casing
2.0	CL	0.5' - 4.5' <u>SANDY CLAY</u> : dark yellowish brown (10YR 4/2); 95% plastic fines; 5% fine grained sand; dry to moist						
4.0	SP	4.5 - 6.0 <u>SAND</u> : greyish green (10G 4/2); 3% fines; 97% fine sand, dry.						
6.0	CL	6.0 - 8.5 <u>SANDY CLAY</u> : greyish green (10G 4/2) color grading to light olive grey (5Y 5/2) grading sandy.						
8.0	SC	8.5 - 14.0 <u>CLAYEY SAND</u> : light olive grey (5Y 5/2); dense to very dense, dry to moist; interbedded with sandy clay; gradation J-1		12 19 28	SS			12/3/80 12/19/80 1.5/1.5 recovery
12.0					RO			4 7/8" tricone mixed drill-trol (polymer) mud
14.0	CL	14.0 - 17.0 <u>SILTY CLAY</u> : pale yellowish brown (10YR 6/2); 100% moderately plastic fines; soft to medium stiff.						
16.0								
18.0	CL	17.0 - 18.8 <u>SILTY CLAY</u> : greyish blue green (5BG 5/2); 100% moderately plastic fines.						
18.0	SP	16.8 - 27.5 <u>SAND</u> : greyish blue green (5BG 5/2); 3% fines, 97% v. fine grained.	S-1					1.6/2.0 recovery
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (ft)	DRIILL HOSE	NUM NO.	CORE REC. %	REMARKS
20.0	SP	18.8 - 27.5 SAND : (cont.) sand, dense, moist; contains minor metallic luster grains.	J-2	13	SS			1.5/1.5 recovery
	15							
	25							
22.0					RO			change to 4 3/8" side discharge drag bit
24.0								
26.0								
28.0	CL	27.5 - 37.5 SILTY CLAY : medium bluish grey (SB S/1) 100% medium plasticity fines; v. stiff to hard; moist.						
30.0			J-3	8	SS			1.5/1.5 recovery
				14				
				20				
32.0					RO			
34.0								
36.0		grading sandy						
38.0	SC	37.5' - 55.0' CLAYEY SAND : medium bluish grey (SB S/1); medium dense to dense; moist, interbedded w/ sandy clay; contains minor gravel to 1/2"; contacts gradational						
40.0			C-1		DR			10/5 12/5 1.0/1.0 recovery
				16	SS			
			J-4	18				1.5/1.5 recovery
				25				
42.0					RO			
44.0		clay content increase						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN. NO.	CORE REC. %	REMARKS	
44.0	SC	37.5' - 55.0' CLAYEY SAND : (cont.)			RO				
46.0									
48.0									
50.0									
			J-5	10 16 21	SS			1.5/1.5 recovery	
52.0					RO				
54.0		more clay sandier							
56.0	SP	55.0' - 64.0' SAND : medium bluish grey (S B S/1), 23.4% 98% + fine grained sand, u. dense, moist							
58.0									
60.0									
62.0									
			C-2		OR			24/5 26/5 .8/1.0 recovery	
60.0			J-6	23 32 36	SS			1.1/1.5 recovery	
62.0		clayey sand lense			RO				
64.0	CL	64.0 - 69.4 SILTY CLAY : medium bluish grey (SB S/1); 100% medium plasticity fines;							
66.0									
68.0									
				soft					

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		64.0-69.4 <u>SILTY CLAY</u> : (cont.) stiff			RD			
70.0	SC	69.4-74.4 <u>CLAYEY SAND</u> : greenish grey (5G 6/1); 15% fines; 85% very fine grained sand; v. dense, moist.	J-7	16 25 34	SS			1.5/1.5 recovery
72.0					RD			
74.0	SP	74.4-83.0 <u>SAND</u> : greenish grey (5G 6/1); 98% very fine sand slight gravel 6"						minor chatter
76.0		slight gravel						minor chatter
78.0								
80.0			C-3		DR			55/5 50/4 .2/1.0 recovery
			J-8	44 50	SS RD			44/5 50/25 .75/.75 recovery
82.0								
84.0	SW	83.0-85.5 <u>GRAVELLY SAND</u> : olive black (5Y 2/1); gravel to 1/2" basalt, quartz and shale.						rig chattering
86.0	SP	85.5-98.3 <u>SAND</u> : olive black (5Y 2/1); 5% fines, 95% v. fine grained sand dense; moist gravelly lense.						
88.0								
90.0		sulfur odor, saturated	J-9	40 36 44	SS			1.2/1.5 recovery
92.0					RD			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL LOGS	RUN NO.	LOG REC. %	REMARKS
92.0	SP	95.5 - 98.3' <u>SAND</u> : (cont)			RD			
94.0								
96.0								
98.0								
98.0	SC	96.3-109.0 <u>CLAYEY SAND</u> : mottled greenish grey (SGY 4/1) and dark greenish grey (SGY 4/1) 40% clay 50% very fine grained angular sand; stiff to very stiff; moist; strong sulfur odor in sample	J-4		OR			19/5 13/5 9/10 recovery sample from middle
100.0			J-10	3 14 20	SS			14/15 recovery
102.0					RD			
104.0								
106.0								
108.0								
109.0	SW	109.0 - 116.0 <u>TAR SAND</u> : olive black (SYZ/1); medium grained sand w/ petroleum binder; very dense; intermittent gravel and coarse sand or silt lenses	J-11	52 58	SS			10/10 recovery 12/18/80 12/20/80 4.0 at 13' and hole bridged at 80' overnight mixed bentonite oil breaker down polymer
112.0		coarser			RD			
114.0								
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	SM	116.0 - 125 SILTY SAND: greenish grey (5.6/1) mottled with dark greenish grey; 15% silt; 85% very fine grained sand; v. dense, moist; contains petroleum stringers.			RO			
118.0								
120.0			S-2		PB	2		1.2/1.2 recovery 500 psi down pressure refusal
122.0			Box 1			3		1.2/1.2 recovery/ pocket penetrometer 2.75 (broke apart) 2/9/81
						4		1.2/1.2 recovery
124.0		grading coarser -- gravelly lense				5		1.2/2.5 recovery
126.0	ML-SM	125 - 131.0 SANDY SILT: medium grey (NS); 50% silt 50% very fine grained sand; dense; dry to moist.			RO			washed out finer material at bottom of sample interval
			S-3		PB	6		washed out 1.4/2.4 recovery 600 psi.
128.0		- gravel lense 2"						
130.0			Box 2 (cont.)		PB	7		1.2/1.2 recovery
						8		1.2/1.2 recovery
132.0	SP-SW	131.0 - 136.0 TAR SAND: olive black (5.2/1); 98% medium grained sand; 2% coarse sand and fine gravel, oil rich. 132.6 increased gravel to 2"			RO	9		petroleum sample 131.3-131.8 1.3/1.3 recovery pocket penetrometer 1.5 2/9/81
134.0								rig chatter 250 psi downpressure
136.0	SP	136.0 - 147.5 SAND: greenish grey (5.6/1); 99% medium grained sand; dense; moist; contains minor gravel to 1/2" well rounded.						
138.0			Box 3 (cont.)		PB	10		1.0/1.0 recovery pocket penetrometer 0.8 2/9/81
		138.7 gravel lense				11		1.0/1.0 recovery
140.0			S-4					SHEET 6 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0	SP	136.0 - 147.5 SAND: (cont)			AC			
142.0		142.7-143 gravel lense						
144.0								
146.0		146-147.5 gravel lense						
148.0	ML	<u>FERNANDO FORMATION</u> 147.5-200.0 SILTSTONE: med. bluish grey (S @ S/I) : 100% non plastic silt; dense; dry to moist; occasional cemented siltstone lenses. Physical condition: massive; friable hardness and strength; little weathered to fresh	5-5		PB	12		2.4/3.0 recovery ran 2 beyond tube capacity
150.0								
152.0		151.8 - 152 cemented lense	Box 1 (cont.)			13		rig chattering 1.6/2.0 recovery pocket penetrometer 24.5 2/19/81
154.0		153.5 cemented				14		rig chatter entire run 1.5/1.7 recovery
154.0		154.5 cemented	Box 2					
156.0		155.5 cemented			RD			rotary drilling undertaken due to INTERMITTANT CEMENTED (0.1-0.5') CONCRETIONS (WITHIN THE SOFTER SILT) BLOCKING THE PITCHER BARREL TUBES.
158.0								
160.0								
162.0			5-6		PB	15		1.7/2.5 recovery
164.0			Box 2 (cont.)			16		pocket penetrometer 24.5 2/19/81 2.3/2.5 recovery

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0	ML	147.5 - 200.0 SILTSTONE (cont.) physical condition as previously described	Box 2 (cont.)		RB	16		12/21/80 gas detector indicated 19% O ₂ & <0% combustible both set alarm off. water at 15' am, advanced hole 1/2' to insure clean hole
166.0		slight plasticity 3" zone	Box 2 (cont.)		RB	17		2.7/2.5 recovery
168.0						18		2.1/2.5 recovery 200-275 psi down pressure in sampling slit
170.0						19		2.5/2.5 recovery
172.0			5-7					
174.0			Box 2 (cont.)			20		2.5/2.5 recovery pocket penetrometer 24.5 2/1/81
176.0						21		2.5/2.5 recovery
178.0			Box 3			22		1.9/2.5 recovery
180.0		179-179.5 contains shell fragments				23		2.2/2.7 recovery
182.0			5-8					
184.0		183.3 1" clay lense	Box 3 (cont.)			24		2.5/2.8 recovery pocket penetrometer 24.5 2/9/81
186.0		contains shells, minor sticks				25		2.6/2.7 recovery
188.0								SHEET 8 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BPT (C)	DRILL LOG	RUN NO.	CORE REC. %	REMARKS
188.0	ML	147.5 - 200' SILTSTONE (cont.) physical condition as previously described.	5-9 Box 3 (cont.)			26		
190.0						27		1.8/2.8 recovery 300 p.s.i. down pressure
192.0		3" shells				28		2.8/2.8 recovery
194.0		6" contains shells shells				29		2.5/2.8 recovery
196.0						30		2.8/2.8 recovery
198.0			5-10					
200.0		B.H. 200.0' terminated. set 2" ABS to 203' w/ slots at 120'-150' and 180-195' gravel pack to 120'. bentonite seal at 110'-120' 3/4" pic 0 to 110 w/ slots at 15'-40' and 105'- 70'; GRAVEL PACK 110 TO 8'. BENTONITE SEAL 8' TO SURFACE. E-LOGGED HOLE 12/22/80 PRIOR TO PIEZO. INSTALLATION.						Rylard + Cummins removed sample 131.3- 131.8 for analysis purposes hole bailed to 25' water at 19' after 10 min, hole caving during bailing operations water sampled 3/4" x 2" 1/7/81

SUMMARY BORING NO. 21

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 12/18-22/80

OVERBURDEN DEPTH (FT.) 0 TO 147.5'

BEDROCK DEPTH (FT.) 147.5' TO 200' (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.

GROUND WATER DEPTH (FT.) 19' DATE 12/21/80; _____ DATE _____.

GAS YES; DEPTH FIRST NOTICED 90', DATE 12/19/80.

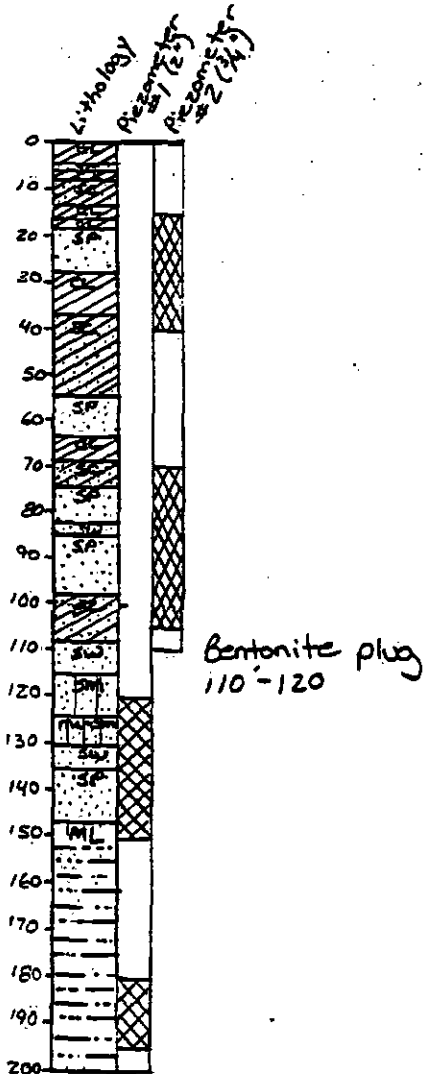
E-LOG YES.

DOWN-HOLE SURVEY NO.

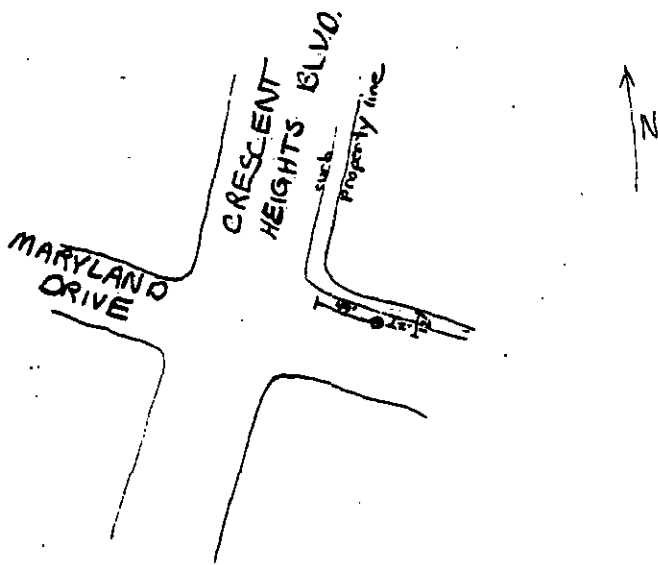
CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 200'.

GROUND ELEVATION REF. 159



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/19/80 HOLE NO. 22
LOCATION Blackburn Dr. off of Crescent Heights GROUND ELEV. 162
DRILLING CONTRACTOR Pitchee LOGGED BY Gallinetti DEPTH TO GROUND WATER _____
TYPE OF RIG Falling HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs, 30 inches
SURFACE CONDITIONS paved street TOTAL DEPTH 200.3 NO. CORE BOXES 3

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0-1.0 Asphalt			AD			Begin drilling at 8:00 12/18/80. Cut down through asphalt. Auger slowly to 4' set down 5 1/2' of 5" casing (pushed). mix mud and begin rotary drilling.
2	ML	10-7.5 CLAYEY SILT: olive gray (5Y 5/2); 100% low to moderate plasticity fines; damp to dry; soft.						
4					RD			
6								
8	SW	7.5-12.0 GRAVELLY SAND: pale yellowish brown (10YR 6/6); 10-20% fine grained sand; ~50% medium grained sand; ~20% coarse sand; 10-20% sub-rounded gravels; sand is angular and predominately of a granitic source; loose.						10/1.5 recovery
10		sample: no gravel	5-1	15	SS			
12				16				
14	ML	12.0-15.0 SANDY SILT: moderate yellowish brown (10YR 5/4); ~80% low plasticity fines; ~20% fine sand; soft.						Drill rate = 8 min / 65 feet
16	CL	15.0-18.0 SANDY CLAY: medium dark gray (N4); ~80% moderate plasticity fines; ~20% fine sand; stiff to very stiff; dry to damp.						
18								
20								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT ('6)	DRILL BLOCK	RUN NO.	CORE REC. %	REMARKS
20	CL	15.0 - 45.0 SANDY CLAY: (cont.)	C-1		DR			DR ⇒ 34 blows 10/1.0 recovery
22		sample: ~20-30% fine sand	J-2	6	SS			1.5/1.5 recovery
				7				
				8				
24					RD		21' - stop to put in more casing to prevent hole caving in. Casing down to 12'	
26		Thin gravelly lens at 26' and 28' (less than 1" thick)						Drill rate: 5 min/7.5 feet
28		SAND fraction coarsening						
30		sample: half of sample was 50% sand, 50% clay, half of sample was 95% clay, 5% sand	J-3	11	SS			1.5/1.5 recovery
				15				
				37				
32					RD			
34		variable sand content 0 to 60% predominately: 70-80% fines, 20-30% fine sand						Drill rate: 5 min/8.5 feet
36		occasional thin gravel pockets (0.2' to 0.6')						only 5 rings recovered because large cobble changed the 6" ring
38								DR ⇒ 71 blows 9/1.0 recovery 1.5/1.5 recovery
40			C-2		DR			
42			J-4	7	SS			
				11				
				21				
44					RD			

PROJECT 80-1280-22

DATE DRILLED 12/19/80

HOLE NO. 22

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	CL	15.0-45.0 SANDY CLAY (cont.)			RD			Drill rate: 5 min / 7.5 feet
46	SL	45.0-70.5 CLAYEY SAND: dark medium grain (AV4); ~30% medium plasticity fines; ~70% fine to medium grained sand; dense; damp.						
50			J-5	7 12 17	SS			15/1.5 recovery $\frac{1}{4}$
52					RD			Drill rate 4 min / 8.5 feet
54								
56								DR \Rightarrow 50 blows 19/1.0 recovery $\frac{1}{4}$
58								
60			L-3		DR			.8/1.5 recovery $\frac{1}{4}$
62			J-6	11 17 29	SS			
64					RD			
66								Drill rate = 7 min / 7.5 feet.
68								

SHEET 3 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	NUM. IN.	CORE REC. %	REMARKS
68	SC	45.0-70.5 <u>CLAYEY SAND:</u> (conf)			RD			
70				17	SS			.8/1.5 recovery
70.5	SC	70.5-77.0 <u>CLAYEY SAND:</u> Brownish-Black (SYR 2/1); ~20% moderate plasticity fines; ~80% fine to medium sand; streaky petroleum substance throughout sand.	J-7	29				70.5 - first sign of petroleum
72				55	RD			
74								Drill rate = 6 min / 9.5 feet
76								
77.0	CL	77.0-88.5 <u>GRAVELLY CLAY:</u> mottled dark yellowish brown (10YR 4/2) and medium gray (N5); ~90% moderate plasticity fines; ~10% scattered rounded gravel 1" to 2"; very stiff; petroleum throughout.						
78								
80			C-4		DR			DR ⇒ 100 blows .8/9 recovery
82			J-8	20	SS			
				29				1.0/1.5 recovery
				55	RD			
84								
86								
88.5	SP	88.5-139.0 <u>TAR SAND:</u> Black (N1); 100% fine to medium grained sand; saturated with oil (petroleum); medium dense to dense.						90' - explosimeter doesn't register
90			J-9	29	SS			1.0/1.0 recovery
				50				
					RD			
92								

PROJECT 80-1280-22

DATE DRILLED 12/19/80

HOLE NO. 22

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	SP	88.5-139.0 <u>TAR SAND: (lead)</u>			RD			
94								
96								
98								
100		97.5-100.0 <u>CEMENTED SAND: medium gray (NS); hard cemented sandstone layer (concretion).</u>	S-1		PB			switch from Drive sampling to Pitcher Barrel sampling to improve recovery 1.5/2.5 recovery
102			I-10	25 50	SS RD			7/9 recovery
104								Drill Rate: 7 min / 6.4 feet
106								
108								
110			I-11	21 50	SS RD			1.0/1.0 recovery
112								Drill Rate: 8 min / 9.0 feet
114		occasional cemented sand layers ~0.5' thick						
116								SHEET <u>5</u> OF <u>70</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116	SP	88.5-134.0 <u>TAR SAND: (cont.)</u>			RD			
118								
120		~ 10% scattered rounded gravels 1/4" to 2", mostly 1/2"	S-2		PB			1.8/2.5 recovery
122			S-2	11/50	SS			7/8 recovery
124					RD			
126								
128								
130			J-3	21/50	SS			10/1.0 recovery
132					RD			131' stop drilling for 12/18/80 (5:00) resume drilling at 7:00 (12/19/80).
134								Drill Rate: 17 min / 9 feet
136								
138								
140		<u>FERNANDO FORMATION</u> 139.0-200.3 <u>SILTSTONE: grayish green (106 1/2)</u> ; 100% low plasticity fines; dense; d cm.						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		139.0-200.3 <u>SILTSTONE</u> : (cont.) Physical condition: massive, friable strength and hardness, little weathered to fresh	S-3		PB			2.0/2.5 recovery
142				19	SS			1.0/1.0 recovery
144			S-14	50	RD			Drill rate: 10 min / 6.5 feet
146								
148								
150			Box 1		PB	1		150'-beam continuous sampling (8:30) pocket penetrometer 24.5 2/9/81
152								1.7/2.5 recovery
154						2		2.4/2.5 recovery
156			S-4			3		2.0/2.5 recovery
158			Box 1 (cont.)			4		1.7/2.5 recovery
160						5		2.1/2.5 recovery
162								
164			S-5			6		2.0/2.5 recovery

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		139.0 - 20.3 SILTSTONE: (cont) physical condition as previously described	S-5		PB	6		pocket penetrometer 74.5 2/9/81
166			Box 2 (cont)			7		1.9/2.5 recovery
168						8		1.7/2.5 recovery
170						9		1.7/2.5 recovery
172			S-6					
174			Box 2			10		1.9/2.5 recovery
176						11		2.0/2.5 recovery
178		occasional thin (0.1') clayey layers				12		2.8/2.4 recovery
180		180.4' - organics						
182		181' - 0.2' thick layer of shell fragments				13		1.6/2.5 recovery pocket penetrometer 74.5 2/9/81
184		183.8 - shell fragments				14		1.7/2.5 recovery
186								
188			S-7			15		1.6/2.5 recovery

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		139.0 - 200.3 SILTSTONE: (cont) physical condition: as previously described 188.8 - wood fragments	Box (cont) Box 3		PB	16		20/2.5 recovery
190						17		17/2.5 recovery
192		192.0 - trace fossils (worm holes) & wood chips				18		17/2.5 recovery
194		193.4 wood fragments 194.5 trace fossils (worm holes)				19		1.9/2.5 recovery pocket penetrometer 24.5 2/9/81
196						20		2.1/2.5 recovery
198		199.0 shell fragments	5-8					
200	B.H.	200.3 Bottom of hole						200.3 Terminate Hole 4:00 12/20/80
202		12/21/80 - Bailed hole to 50'. stopped bailing because gravel was getting in bailer, didn't want to lose the hole. Hole quickly recharged to 30'. Bailed to 50' again. Surface packing installed and gas samples taken at upper 50'. May attempt gas sampling again once piezometer is in hole 2" piezometer installed from 185' to surface with perforations at 165' to 180' and 125' to 145'. Hole bridged at 135' before gravel could be installed. Bentonite plug from 125' to 125'. 3/4" piezometer installed from 130' to surface. perforations from 20' to 125' and from 30' to 50' Rig left at site over bank.						ESA runs e-logs 5:00 - 8:00 12/20/80; Byland & Cummings run Gas analysis on hole 12/21/80 flush hole and install perforated piezometer 12/21/80 * two piezometers installed: #1 perforated below tar sands (2"); #2 perforated above tar sands (1"). water sampled 3/4" x 2" 2/16/81



SUMMARY BORING NO. 22

PROJECT 80-1260-22 STATION HOLE no DATE DRILLED 12/19/80

OVERBURDEN DEPTH (FT.) 0' TO 140'

BEDROCK DEPTH (FT.) 140' TO 200' (T.D.)

WATER PRESS. TEST no; INTERVAL(S) _____ TO _____, _____ TO _____

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____

GAS YES; DEPTH FIRST NOTICED _____, DATE _____

E-LOG YES

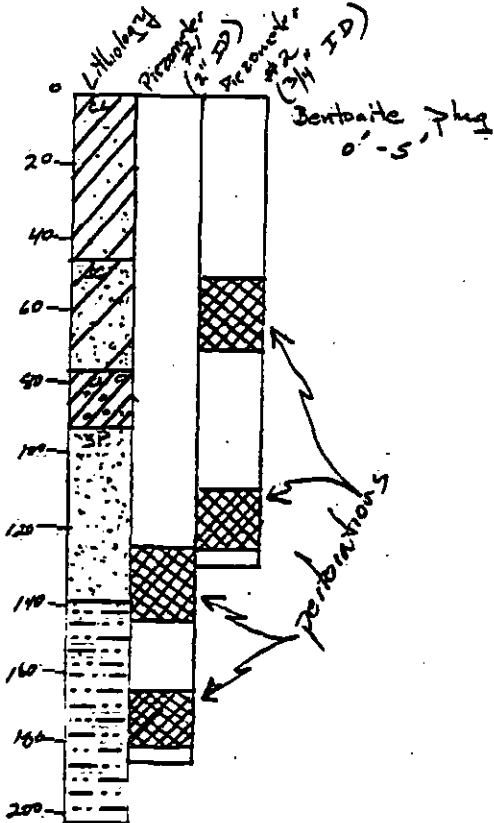
DOWN-HOLE SURVEY no

CROSS-HOLE SURVEY no

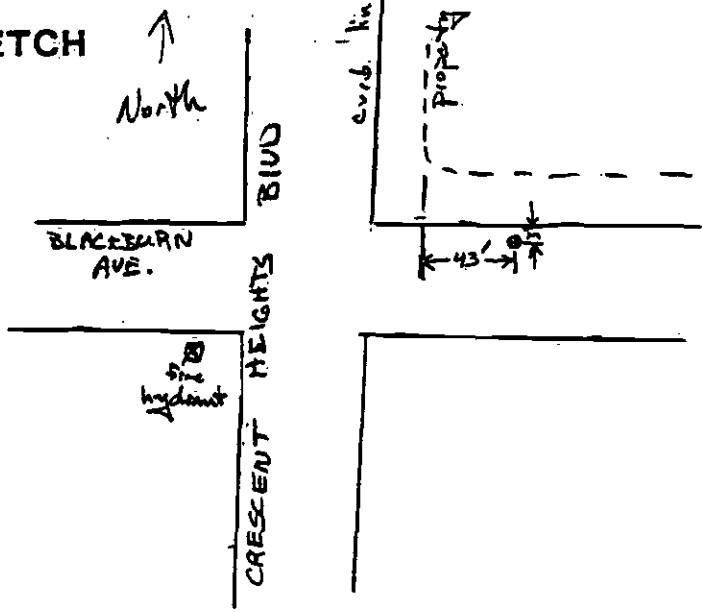
PVC 1" 1' to 130'

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 1' TO 201'

GROUND ELEVATION REF. 162



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
 CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 20-1280-22 DATE DRILLED 12/31/80-1/4/81 HOLE NO. 23
 LOCATION Fairfax at Beverly Blvd. GROUND ELEV. 188'
 DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY Schocherlein DEPTH TO GROUND WATER 7.5'
 TYPE OF RIG Feiling 1580 HOLE DIAMETER 4 7/8 HAMMER WEIGHT AND FALL 140 lb / 30 in
 SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 200.7' NO. CORE BOXES 4

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0-0.5 concrete						complications with CBS studios and setting up, misunderstanding regarding property boundaries. Augered to 10' to assure utilities clearance
	CL	0.5-1.5 CLAY: grayish black (N2); 96% hi plastic clay, 4% fine grained sand, moist.			AD			
2.0	CL	1.5-3.5 SANDY CLAY: brownish black (SYR 2/1); 85% clay; 15% sand; moist.						
4.0	CL	3.5-6.2 SILTY CLAY: medium bluish grey (SBS/1) 98% medium plastic fines; stiff; moist.						
				4	SS			1.5/1.5 recovery
6.0			J-1	5				
	SC/CL	6.2-12.0 CLAYEY SAND: light greenish grey (SG 3/1) 50% clay, 50% sand.		12	AO			
8.0								water at 9.5'
10.0					OR			7.5', 7.5'
								1.0/1.0 recovery
					RO			2/2/80 12/80 set up tub, drilling w/ 4 7/8" drag bit 11.5' surface casing
12.0	CL	12.0-14.0 CLAY: greenish grey (SG 6/1); 100% hi plastic clay; stiff.						
14.0	ML	14.0-19.0 CLAYEY SILT: dark greenish grey (SG 4/1); 99% low plastic fines; medium dense; dry to moist.						
				6	SS			1.5/1.5 recovery
16.0			J-2	9				
				15				
					AO			
18.0								
20.0	CL	19.0-23.5 SANDY CLAY: dark greenish grey (SG 4/1) 70% clay, 40% silt to						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	OPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	CL	19.0 - 23.0 <u>SANDY CLAY</u> : (cont.) medium grained sand w/ occasional gravel to 3/4". stiff to medium dense, clay to moist.	C-2		OR			5/.5', 14/.5' 0.2/1.0 recovery
22.0					RD			
24.0	SC	23.5 - 33.0 <u>CLAYEY SAND</u> : dark greenish grey (5G4/1). 20% fines, 80% fine grained sand; dense; moist, contains gravel to 1/2".						
26.0			J-3	11	SS			1.0/1.5 recovery
				16				
				25				
28.0					RD			
30.0		sulfur odor						
			C-3		OR			20/.5', 22/.5' 0.7/.5' recovery
32.0	CL	33.0 - 44.0 <u>SILTY CLAY</u> : dark greenish grey (5G4/1). lots low plastic fines; stiff moist.			RD			
34.0								
36.0			J-4	9	SS			1.5/.5 recovery
				16				
				23				
38.0					RD			
40.0								
			C-4		OR			17/.5' 37/.5'
42.0					RD			
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SC	44.0 - 51.0 CLAYEY SAND: dark greenish grey (SG 4/1); 30% clay, 70% sand interbedded with sandy clay; medium dense; moist to wet.			RO			
46.0			J-5	11 14 17	SS			1.5/1.5 recovery
			grading to sandy chy			RO		
48.0								
50.0								
52.0	CL	51.0 - 64.0 SANDY CLAY: dark greenish grey (SG 4/1); 70% clay, 30% sand interbedded with clayey sand; medium dense, moist.			RO			
54.0						OR		10/1.5, 14/1.5 recovery
56.0				J-5		OR		10/1.5 15/1.5 1.0/1.0 recovery
58.0					RO			
60.0								
62.0								
64.0	CL	64.0 - 88.0 SANDY CLAY: greenish black (SG 2/1); 90% low plastic fines, 10% fine grained sand, very dense, dry to moist, contains minor petroleum.			SS			
66.0				J-6	6 8 25	SS		1.1/1.5 recovery
68.0				J-7	33 49 43	OR SS RO		21/1.5, 34/1.5 0.9/1.0 recovery gas test 9:30 am 21% C, 0% comb. 1.1/1.5 recovery

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CONC. REC. %	REMARKS
68.0	CL	64.0 - 88.0 SANDY CLAY (cont)			RO			
70.0		vertical petroleum stringers	J-8	17 35 40	SS			1.5/1.5 recovery
72.0					RO			
74.0								
76.0			J-9	51 46 53	SS			1.5/1.5 recovery
78.0					RO			minor chatter
80.0		6" petroleum rich lense, sand increase	J-10	26 45 46	SS			1.5/1.5 recovery
82.0					RO			
84.0			C-8		OR			29/1.5, 50/45 0.8/0.95 recovery
86.0			J-11	30 56	SS			1.0/1.0 recovery gas detector indicates 21% O ₂ and 0% comb.
88.0	SP	88.0 - 115.0 TAR SAND: black (W1) 99% fine to medium grained angular sand; v. dense; petroleum binder.						
90.0			J-12	37 70	SS			0.9/1.0 recovery petroleum sample J-12
92.0					RO			

PROJECT 80-1280-22

DATE DRILLED 12/31/80 - 1/4/81

HOLE NO. 23

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (#)	DRILL ROD NO.	RUN NO.	LOG REC. %	REMARKS
92.0	SP	88.0 - 115.0 TAR SAND (cont.)			RD			
94.0								
96.0			J-13	57	SS			0.5/0.5' recovery petroleum sample J-13
					RD			
98.0	GP SP	6" of gravel						chatter
100.0			J-14	55	SS			10.5' recovery
102.0	GP SP	6" gravel very fine grained						chatter
104.0			C-9		DR			50/5, 50/4 0.3/0.9 recovery
			J-15	84	SS			0.5/0.5 recovery
106.0								
108.0								
110.0			J-16	52	SS			52/5, 50/2 0.7/0.7 recovery
				50	RD			gas = 6% combustibles 21% O ₂ 3:00 pm chatter
112.0	GP SP	112.5 gravel 6"						
114.0		114.5 gravel 6"						chatter
		WEATHERED FERNANDO FORMATION						
		115 - 122.0 SILTY CLAYSTONE						
	CL	greenish black (SG 2/1) 100% low plastic fines;	J-17	28	SS			28/5, 29/5, 30/4
116.0				39				SHEET <u>5</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MOODE	RUN NO.	CORE REC. %	REMARKS
116.0	CL	115.0-122.0 SILTY CLAY (cont.) dry to moist, very stiff; contains stringers of petroleum rich silt & fine sand.	J-7	50	SS RD			1.4/1.4 recovery possible weathered bedrock
118.0								
120.0	SP CL	tar sand lense	J-18	58	SS RD			0.5/0.5 recovery
122.0		FERNANDO FORMATION 122.0-140.2 CLAYEY SILTSTONE: olive black (S&Z/i) to dark greenish grey (S&Y4/i); poorly cemented; contains stringers of very fine grained tar sand and interbeds of tar sand. Physical Condition: closely fractured, mostly 0.1-0.3; soft to friable hardness; plastic to friable strength moderate to little weathered.						
124.0			C-10		OR			31/0.5, 4/0.5 1.0/1.6 recovery
126.0			J-19	49 50	SS RD			28/0.5, 49/0.5, 50/0.3' 1.3/1.3 recovery
128.0								
130.0		well cemented						gas: 6% combustible 21% O ₂ 5:30 p.m. 1/3/81
132.0		softer (less cement)						gas: >100% combustible 18% O ₂ 6:30 a.m. bubbling visible foam 1' from ground surface. changed to 4 3/8" tricone to drill out well cemented area 200 p.s.i. down from
134.0			Bar 1		PB 1	1		1.6/2.8 recovery
136.0		tar sand	S-1		PB 2	2		damaged tube going in hole thru highly cemented area 2.2/2.2 recovery
138.0		siltstone	Cor 1 (cont.)		PB 3	3		gas: >100% comb., 18% O ₂ 9:00am 2.2/2.7 recovery
140.0								SHEET 6 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (1')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0		140.2-200.7 <u>TAR SAND</u> : black (N1); 20-50% petroleum 50-70% fine grained sand; occasional minor gravel, swelling medium dense to dense, contains siltstone interbeds; becoming more dense and finer grained with depth. Siltstone interbeds as described in 122.0-140.2 interval.	Box 1 (cont.)		PB PB	3 4		packet penetrometer 0.5 2/9/81 2.6/2.8 recovery
142.0					PB	5		143.1 sample removed for petroleum testing
144.0		144.6 well cemented siltstone concretions						1.5/2.7 recovery
146.0					PB	6		2.1/2.2 recovery
148.0		147.2-147.4 siltstone lense, moderately to well cemented 148 - concretions			PB	7		2.5/2.8 recovery
150.0			Box 2					
152.0		interbedded siltstone	S-2		PB	8		slow extruding, sample expanding in tube max. expansion 2-3" 2.7/2.8 recovery
154.0		153.9 siltstone lense 2" thick 154.6 siltstone, right angle fracturing, slicken sides on most fracture surfaces	Box 2 (cont.)		PB	9		packet penetrometer 74.5 2/9/81 2.4/2.8 recovery
156.0		156.2 tar sand 156.9 cemented zone 1" thick			PB	10		2.7/2.7 recovery
158.0		158 tar sand 158.5 clayey siltstone			PB	11		2.5/2.8 recovery 0.8' extruded, rest in tube, refusal to extrude.
160.0		tar sand			PB	12		1.2/2.7 recovery
162.0		siltstone						
164.0								SHEET <u>7</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT 16'	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		140.2-200.7 TAR SAND (cont.) siltstone interbed	Box 2 (cont.)		PB	12		
					PB	13		packet penetrometer 4.5 2/9/81 2.8/2.8 recovery
166.0		tar sand						
168.0			S-3		PB	14		2.8/2.8 recovery
170.0		siltstone	Box 2 (cont.)		PB	15		2.8/2.8 recovery
172.0		thin interbeds	Box 3					sample expanding in tube & bubbling Ryland & Cummings gas testing
174.0		siltstone w/ tar sand stringers			PB	16		1/3/81 1/4/81 Don start drilling after flushing hole and cleaning up. packet penetrometer 4.0 2/9/81 2.8/2.8 recovery
176.0		176-179.5 possible fault gouge moderately cemented, intensely fractured, dominantly tar in sample			PB	17		strong sulfur odor losing circulation 1.7/2.7 recovery
178.0		tar sand, loose, coarse sand and fine gravel						
180.0		blue green clay lense 2" no tar very fine grained tar sand			PB	18		2.8/2.8 recovery
182.0		siltstone						pure tar coming up on collars
184.0		tar sand	S-4		PB	19		1.9/2.8 recovery
186.0			Box 3 (cont.)		PB	20		packet penetrometer 2.75 2/9/81 2.7/2.8 recovery
188.0			Box 4		PB	21		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0		140.2 - 200.7 TAR SAND: (cont.)	Box 4 (cont.)		PB	21		2.5/2.7 recovery
190.0		3" gravelly tan and coarse sand			PB	22		2.8/2.8 recovery
192.0		occasional coarse sand and fine gravel			PB	23		2.7/2.8 recovery
194.0								pocket penetrometer 2.75 2/9/81
196.0					PB	24		2.8/2.8 recovery
198.0					PB	25		2.7/2.7 recovery
200.0			S-5					
202.0		B.H. 200.7 Terminate hole 1:30 p.m. 1/4/81; downhole geophysical survey (Bruce Auld) completed 1/4/81; E-log (ESA) completed 1/4/81; site cleaned and piezometer set to 200' for gas monitoring. Moved off site 1/4/81. Water sampled 2/13/81.						
204.0								
206.0								
208.0								
210.0								
212.0								



SUMMARY BORING NO. 23

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 12/31/80-1/4/81

OVERBURDEN DEPTH (FT.) 0 TO 122.

BEDROCK DEPTH (FT.) 122 TO 200.7 (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.

GROUND WATER DEPTH (FT.) 9.5' DATE 12/31/80; _____ DATE _____.

GAS YES; DEPTH FIRST NOTICED 30', DATE 1/2/81.

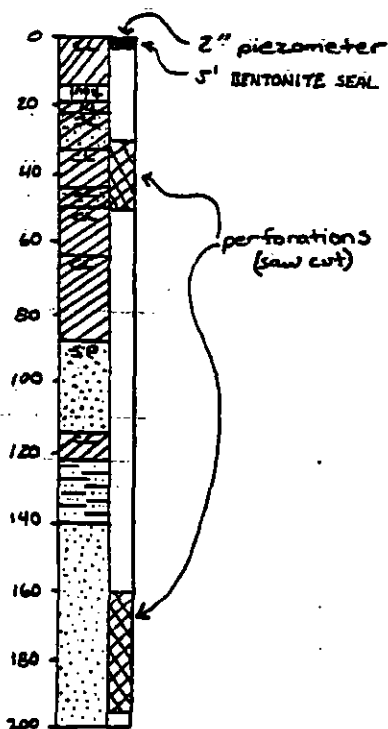
E-LOG YES . 1/4/81

DOWN-HOLE SURVEY YES 1/4/81.

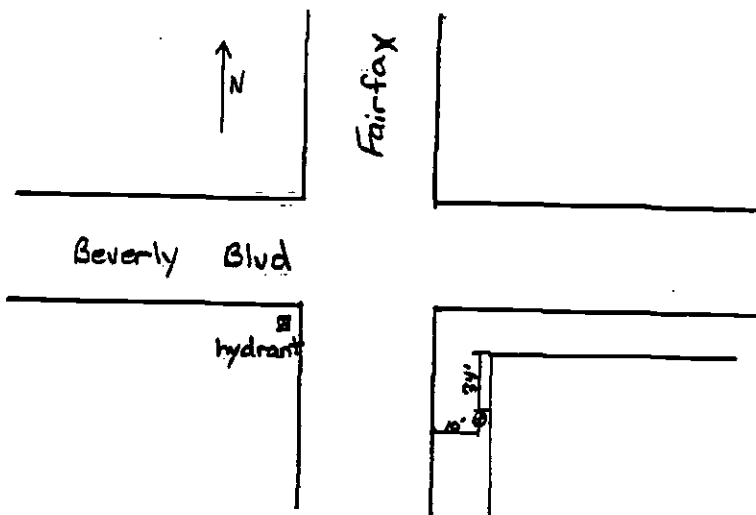
CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0 TO 200.

GROUND ELEVATION REF. 188'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12-15 Feb '81 HOLE NO. 23-A
LOCATION South side Rosewood Ave. west of Orange Grove Ave GROUND ELEV. 214'
DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY S. Staff DEPTH TO GROUND WATER 19.7'
TYPE OF RIG Fairlim 1500 HOLE DIAMETER 4 5/8" HAMMER WEIGHT AND FALL 140 lbs 30 inches
SURFACE CONDITIONS concrete TOTAL DEPTH 217.5' NO. CORE BOXES 1

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0' - 0.8' concrete			C			15:45 12 February 1981.
0.8	CL	0.8' - 6.8' SILTY CLAY: dark yellowish brown (10YR 4/2); 90% medium plasticity fines; 10% fine to medium sand; moist; medium stiff; sand is subangular.			AD			0.0' - 0.8' drilled with "garbage barrel" (cylindrical bit) 0.8' - 4.5' drilled with 6" diameter flight auger. Set 6" steel surface casing to 4.5' with 2.0' stick-up. 4.5' - 10.0' drilled with 4 5/8" drag bit. Mixed 1/2 sack bentonite.
2.0								
4.0					RD			
6.0								easy drilling. drill rate = 3.5 ft/minute
6.8	SM	6.8' - 11.2' SILTY SAND: moderate yellowish brown (10YR 5/4); 70% medium to fine sand; 30% low plasticity fines; saturated; loose; sand is subangular to subrounded; sand is 70% quartz, 20% feldspar, 5% mica, 5% rock fragments and other constituents, some grains are iron-stained.						
10.0			J-1	18	SS			1.5/1.5 recovery.
				13				
				15				
11.2	CL	11.2' - 14.8' SILTY CLAY: dark yellowish brown (10YR 4/2); 90% low plasticity fines; 10% fine to medium sand; wet; medium stiff; sand is subangular.			RD			2.75 tons/ft ² Standard penetration.
12.0								
14.0								16:30.
14.8	SM	14.8' - 16.6' SILTY SAND: moderate yellowish brown (10YR 5/4); 70% medium to fine sand; 30% low plasticity fines; saturated; loose; sand is subangular.						drilling with no hydraulic draw-down; merely the weight of the drill pipe.
16.0								
16.6	CL	16.6' - 62.9 SANDY CLAY: dusky yellow (5Y 6/4); 88% low plasticity fines; 10% fine to coarse sand; 2% gravel; soft; moist. Sand is subangular; gravel is sub- rounded.						drill rate = 2.8'/minute.
18.0								
20.0			C-1		DR			DR blowcount: 2, 3. 0.8/1.0 1 recovery.

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (5')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	CL	16.6-62.9 SANDY CLAY: (continues) PHYSICAL CONDITION: (continues as previously described)	J-2	8	SS			15/1.5 recovery standard penetration: 1.3 tons/ft. ² 17:00
				19				
				19				
22.0					RD			07:00 12 Feb. 1981. 13 Feb. 1981. water table at 13.6' 0% combustible gas. No chemicals added to drilling fluid.
24.0								smooth drilling.
26.0		grading sandier						drill rate = 2.5'/minute.
28.0								
30.0			J-3	9	SS			1.2/1.5 recovery standard penetration: 1.5 tons/ft. ²
				10				
				11				
32.0		sand content reaching 20%			RD			
34.0								
36.0		decreasing sand content						drill rate = 2.25'/minute.
38.0								
40.0		mottled: moderate brown (5YR 4/4) dark yellowish brown (10YR 4/2); dusky yellow (5Y 6/4).	G-2		DR			DR blowcount: 8, 10. 1.0/1.0 recovery.
			J-4	10	SS			1.5/1.5 recovery. standard penetration: 2.2 tons/ft. ²
				20				
				23				
42.0		color change to light olive brown (5Y 5/6)			RD			08:25.
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	CL	16.6'-62.9' <u>SANDY CLAY</u> (continues).			RD			rig chattering slightly.
46.0								drill rate = 2.0/minute.
48.0								
50.0								
52.0								
54.0								
56.0								
58.0								
60.0								
62.0								
64.0	CL	62.9-133.9' <u>SILTY CLAY</u> : dusky green (SG 3/2); 95% moderate plasticity fines; 5% fine sand; moist hard; sand is mostly subangular quartz.			RD			rig chattering.
66.0								
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL HOSE	RUN NO.	CORE REC. %	REMARKS
68.0	CL	62.9-133.9' SILTY CLAY: (continues).			RD			11:15
70.0			J-7	19 30 27	SS			1.5/1.5 recovery. standard penetration: 1.8 tons/ft ²
72.0					RD			
74.0								
76.0								
78.0								
80.0			C-4		DR			13:30. 1.0/1.0 recovery. DR blowcount: 10, 14.
82.0			J-8	15 25 27	SS			1.4/1.5 recovery. standard penetration: 1.7 tons/ft ²
84.0					RD			drill rate = 1.25' / minute.
86.0								
88.0								
90.0			J-9	29 33 32	SS			1.5/1.5 recovery. standard penetration: 1.5 tons/ft ²
92.0					RD			SHEET <u>4</u> OF <u>11</u>

decrease in sand content to 2%.

increasing sand content to 10%.

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	CL	62.9-133.9' SILTY CLAY: (continues).			RD			
94.0								
96.0								14:20.
98.0								
100.0			G-5 T		DR			.8/1.0 recovery. DR blowcount: 24, 34.
			J-10	15 35 29	SS			.8/1.5 recovery. standard penetration: 2.7 tons/ft ²
102.0					RD			
104.0		probable thin silty sand bed. (minor gravel).						rig chattering.
106.0								
108.0		probable thin silty sand bed. (minor gravel).						rig chattering.
110.0			J-11	23 29 51	SS			1.5/1.5 recovery. standard penetration: 1.0 tons/ft ²
112.0					RD			
114.0		probable thin silty sand bed. (minor gravel).						15:40. rig chattering.
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	CL	62.9'-133.9' SILTY CLAY: (continues).			RD			
118.0								
120.0			C-6		DR			DR blowcount: 23, 77. 1.0/1.0 recovery.
122.0			J-11 A	28 50	SS RD			.75/.75 recovery. standard penetration: 1.5 tons/ft ²
124.0		probable silty sand bed ~.5' thick.						rig chattering.
126.0								16:40.
128.0								
130.0	SM	130.1 - 130.8 SILTY SAND: grayish green (5G 5/2); 80% fine sand; 20% medium plasticity fines; saturated; very dense; sand is rounded; sulfurous-organic odor; <1% shale; quartzite, other meta- morphitic rock gravel; gravel is subangular.	J-12	64	SS RD			.5/.5 recovery. refusal. 13 Feb '81 07:15 14 Feb '81 water table at 21.3' 0% combustible gas. Did not add any chemicals to drilling fluid.
132.0								
134.0	SM	133.9-139.8 SILTY SAND: dusky blue green (5BG 3/2) and medium dark gray (N4); 60% fine sand; 40% medium plasticity fines; wet; very dense; sand is subangular to subrounded, fine to very fine; sulfurous-organic odor.						drill rate = 1.3 ft/ minute.
136.0								Note: hole deviates slightly from vertical at silty sand bed from 133.9' - 134.5'. Deviation impeded free fall of jars during collection of C-7. Blowcount may not reflect true sample density. DR blowcount: 100. .5/.5 recovery.
138.0		fines decreasing to 20% of formation.						SS .25/.25 recovery.
140.0		139.8 - 143.8' SANDY GRAVEL: (see next page)	C-7		DR			
			J-13	50	SS			SHEET <u>6</u> OF <u>11</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0	GM (GW)	139.8-143.8' SANDY GRAVEL: mottled - dark gray (N3); medium light gray (N6); 50% fine gravel; 30% coarse sand; 20% medium plasticity fines; saturated, very dense; most grains granitic or metamorphic rock-derived; grains are very fine grained; moderately hard; moderately strong; fresh; subrounded to subangular; contains quartz, plagioclase feldspar, quartz-filled fractures.			RD			switched from 4 7/8" drag bit to 4 7/8" tooth rock bit at 139.8'. rig chattering. drill rate = .14"/minute. drilling with 250 p.s.i. hydraulic draw-down.
142.0								
144.0	SM	143.8-147.5' SILTY SAND: medium dark gray (N4); 80% fine to very fine sand; 20% medium plasticity fines; wet; very dense; sulfur-organic odor.						
146.0								
148.0	GM (GW)	147.5-152.4' SANDY GRAVEL: see 139.8-143.8' description above.						10:30.
150.0								skipped SS sample due to hardness of formation.
152.0	SM	152.4-217.5' SILTY SAND: dark greenish gray (5GY 4/1); 90% fine sand; 10% medium plasticity fines; moist; very dense; sand is subangular to subrounded; sulfur-organic odor; OCCASIONAL INTERBEDS OF FINE SANDY SILT.						drilling with 175 p.s.i. hydraulic draw-down. drill rate = .15"/minute.
154.0								
156.0								11:30.
158.0								
160.0			C-8 J-14	50	DR SS RD			DR blowcount: 100. .5/.5 recovery. .4/.4 recovery. Standard penetration: 0 tons/ft ²
162.0								
164.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0	SM	152.4' - 217.5' SILTY SAND: (continues)			RD			drill rate = .75'/minute.
166.0								
168.0								
170.0			C-15	50	SS RD			.3/.3 recovery. standard penetration: 2.3 tons/ft ² 12:30.
172.0								
174.0								drill rate = 1'/minute. drilling with 175 ps i: hydraulic draw-down.
176.0								
178.0								
180.0			C-9	50	DR SS RD			DR blowcounts: 67. 0.3/0.3 recovery. .25/.25 recovery. standard penetration: 0.3 tons/ft ² drill rate = 1'/minute.
182.0								
184.0								rig chattering. drill rate = .1'/minute.
186.0		gravel zone						
188.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0	SM	152.4'-217.5' SILTY SAND: (continues)			RD			
190.0					RD			0.0/0.1 recovery. silty sand is very dense, making split spoon sampling difficult.
192.0								
194.0								15:00.
196.0								drill rate = .4'/minute.
198.0		<u>POSSIBLY FERNAUDO FORMATION?</u> 198.2-199.2' CLAYSTONE: banded; dark greenish gray (SG4 4/1); siltstone laminate light gray (N 7); 98% low plasticity fines; 2% fine sand; very stiff, moist; laminated to finely bedded; siltstone beds comprise 10% of formation; unfractured, fresh.	J-17	100	SS			thinning down drilling fluid before sampling. Attempted to drive Converse sampler at 199.0'. Slip jars hung up on wall at gravel zone and did not function. No sample. 5.5 recovery. Standard penetration: 3.4 tons/ft ² Flushed out hole, ran electric logs from 18:30-20:30 14/2/81
200.0		PHYSICAL CONDITION: massive; soft to friable hardness; soft to friable strength; fresh.			RD			07:30 15 February 1981 0% combustible gas. Water table at 19.7'. Ran down-hole seismic survey from 08:15-10:00.
202.0								13:50. drilling with 200p.s.i. hydraulic draw-down.
204.0		subangular, medium-grained sand in cuttings. (see sample G-1). (presumably sluff).						drill rate = .75'/minute. drilling with clear water. rig chattering.
206.0		probably claystone and siltstone beds are interbedded throughout the interval 185.8'-217.5'.						
208.0								
210.0								drill rate = .8'/minute.
212.0								SHEET <u>9</u> OF <u>11</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212.0		152.4'-217.5' <u>SILTY SAND:</u> (continues)			RD			
214.0								15:00.
216.0		interbedded claystone 215.0'-25.2' (see 198.2'-199.2' description)			PB	1		25/2.5 recovery. drill rate = 1'/minute.
216.0		interbedded claystone 216.0'-217.2' (see description above)						15:40 15 Feb '81.
218.0		B.H. 217.5' Terminated hole.						Set 2" diameter ABS casing from 0.0' - 217.5', perforated from 110' - 212.5', and 15.0' - 50.0' for gas analysis. Water sampled 2/20/81
220.0								
222.0								
224.0								



SUMMARY BORING NO. 23-A

PROJECT 80-1280-2-2 STATION HOLE NO DATE DRILLED 12-15 Feb. 1981.

OVERBURDEN DEPTH (FT.) 0.0' TO 198.2.

BEDROCK DEPTH (FT.) 198.2 TO 217.5 (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) — TO —, — TO —.

GROUND WATER DEPTH (FT.) 19.7' DATE 13 Feb.; 21.3' DATE 14 Feb.

GAS TRACE; DEPTH FIRST NOTICED —, DATE —.

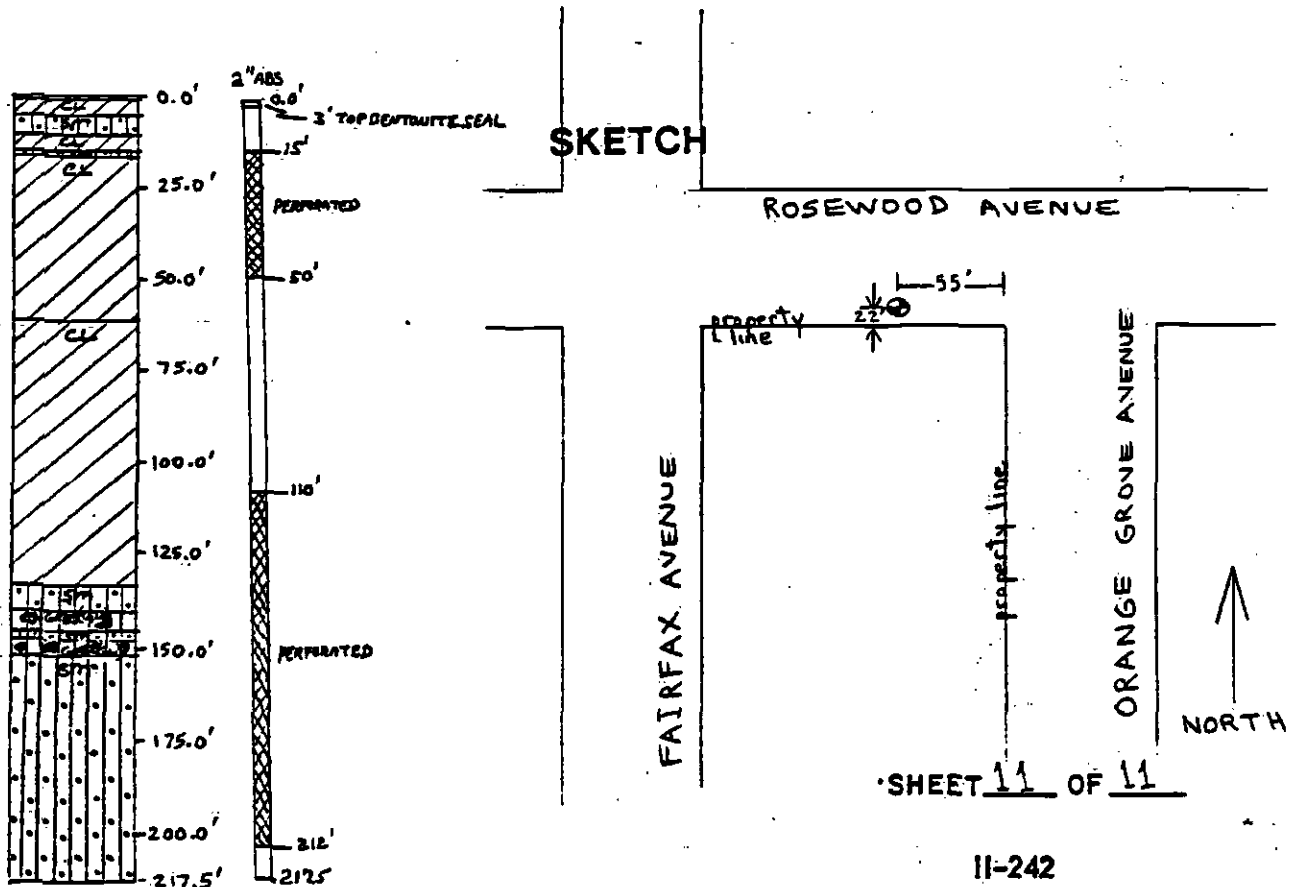
E-LOG YES. Trace RSP 2/29/81

DOWN-HOLE SURVEY YES.

CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" — TO —; 3" — TO —; 2" 0.0' TO 217.5'.

GROUND ELEVATION REF. 214'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/2/81 HOLE NO. 24
LOCATION Fairfax south of Santa Monica Blvd. GROUND ELEV. 285'
DRILLING CONTRACTOR Pitchee LOGGED BY Gallinatti DEPTH TO GROUND WATER —
TYPE OF RIG Failing HOLE DIAMETER 4 1/8" HAMMER WEIGHT AND FALL 140 lbs. 30 in.
SURFACE CONDITIONS Sidewalk TOTAL DEPTH 202.5 NO. CORE BOXES —

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0-1.0 <u>CEMENT</u>			AD			Begin drilling at 8:15.; drill thru cement, auger to 5'; set 5' 5" surface casing and begin core drilling.
1	CL	1.0-8.0 <u>CLAY</u> ; reddish brown (10R 4/4); ~95% moderate plasticity fines; ~5% fine grained sand; soft; damp.						
2								
4								
6					RD			
8	ML	8.0-17.0 <u>SANDY SILT</u> : moderate brown (5YR 4/4); 80-85% low plasticity fines; 10-15% fine grained sand; 5% angular medium to coarse sand; soft; damp.						07/1.5 recovered pocket penetrometer 2.0 (brake point) 2/4/81
10			I-1	4	SS			
				4				
				5				
12					RD			
14								
16								10/1.5 recovery
			I-2	3	SS			
				4				
18	ML/SM	17.0-21.0 <u>SANDY SILT - SILTY SAND</u> ; moderate brown (5YR 4/4); ~50% low plasticity fines; ~35% fine sand; ~15% medium to coarse angular sand; silt to firm; damp.						
						AD		
20								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	DRUM NO.	CORE REC. %	REMARKS
20	ML/SM	17.0-24.0 SANDY SILT - SILTY SAND: (cont.)	C-1		DR			DR ⇒ 26 blows .7/1.0 recovery
22		gradational contact ↓	J-3	6 8 15	SS RD			1.3/1.5 recovery
24	CL	24.0-37.0 SANDY CLAY: moderate brown (5YR 4/4); ~80% moderate plasticity fines; ~20% fine to medium sand; occasional scattered fine gravel; firm; damp.	J-4	6 10 15	SS RD			Drive sample w/ modified California sampler; down-hole jets = 325 lbs. pocket penetrometer 2.75 (broke apart) 1.5/1.5 ^{2/9/81} recovery
26								
28								
30		gradational increase in SAND content ↓	J-5	4 5 9	SS RD			1.5/1.5 recovery
32								
34		~60% fines; ~30% fine sand; ~10% med. to coarse sand.						
36			J-6	6 10 14	SS RD			1.5/1.5 recovery
38	SM	37.0-44.0 SILTY SAND: light moderate brown (5YR 5/4); ~15% low plasticity fines; ~70% fine grained sand; ~15% medium to coarse sand (angular); occasional scattered sub-angular gravel up to 2"; medium dense; damp.	L-2		DR			DR ⇒ 66 blows .6/1.0 recovery
40			J-7	10 11 12	SS RD			1.1/1.5 recovery
42								
44								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (ft)	DRILL MODE	RUSH NO.	CORE REC. %	REMARKS	
44	CL	44.0 - 52.0 <u>SANDY CLAY</u> : moderate brown (SYR 4/4); ~85% moderate plasticity fines; ~15% fine to medium sand; firm; damp.			RD			1.5/1.5 recovery pocket penetrometer 2.5 (broke apart) 2/9/81 Gas Test: 0% combustibles 20% Oxygen	
46			J-8	6 8 15	SS				
48						RD			
50				J-9	4 5 8	SS			1.5/1.5 recovery
52	SC	52.0 - 64.0 <u>CLAYEY SAND</u> : light moderate brown (SYR 5/4), ~25% moderate plasticity fines; 65-70% fine grained sand; 5-10% medium to coarse sand; medium dense; damp.			RD			1.5/1.5 recovery	
54									
56				J-10	8 9 13	SS			
58						RD			
60		sample: ~20% fines; ~80% very fine to fine grained sand.			DR			DR ⇒ 24 blows .6/1.0 recovery 0.0/1.5 recovery 10 recovery *64' - possible "older Alluvium" contact (stiffer & darker) 1.5/1.5 recovery pocket penetrometer 2.75 2/9/81	
62			C-3	7 10 12	SS				
64						RD			
66	CL		64.0 - 72.0 <u>SANDY CLAY</u> : dk. moderate brown (SYR 3/4); ~85% moderate plasticity fines; ~15% fine grained sand; stiff; damp.	J-11	8 9 19	SS			
68					RD				

increase in SAND content

up to 40% fine sand

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRIILL MODE	RUN NO.	CORE REC. %	REMARKS
68	CL	64.0 - 72.0 SANDY CLAY: (cont.)			RD			
70				13	SS			1.5/1.5 recovery pocket penetrometer 3.75 2/9/81
			I-12	39				
				55				
72	SC	72.0 - 84.0 CLAYEY SAND: moderate brown (5YR 4/4); ~35% moderate plasticity fines; ~55% fine sand; ~10% medium to coarse sand; medium dense; damp.			RD			
74				9	SS			1.0/1.5 recovery
			I-13	18				
				20				
76					RD			
78								
80					DR			DR ⇒ 55 blows 4/1.0 recovery
82				13	SS			1.5/1.5 recovery
			I-14	18				
				50				
84	SP	84.0 - 88.0 SAND: moderate brown (5YR 4/4); ~5% fines; ~75% fine sand; ~20% medium to coarse sand; loose; wet to saturated.			RD			84' - partially saturated w/ water
86				21	SS			1.5/1.5 recovery
			I-15	19				
				17				
88	ML	88.0 - 93.0 CLAYEY SILT: moderate brown (5YR 4/4); 100% low to moderate plasticity fines; firm; damp.			RD			
90				5	SS			1.9/1.5 recovery
			I-16	6				
				14				
92					RD			

Decrease in
CLAY
content

(~15% fines; ~85% sand)

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6")	DRILL MOOD	RUN NO.	CORE REC. %	REMARKS
92	ML	89.0 - 93.0 <u>CLAYEY SILT</u> (L.S.)			RD			
94	SM	93.0 - 108.0 <u>SILTY SAND</u> : moderate brown (5YR 4/4); ~15% low plasticity fines; ~70% fine sand; ~15% medium to coarse sand; medium dense; damp.	J-17	19 37 41	SS RD			1.5/1.5 recovery
96								
98								GAS TEST: 0% combustibles 20% Oxygen
100			C-5		DR			DR → 65 blows 0.8/1.0 recovery
102			J-18	25 20 20	SS RD			1.0/1.5 recovery
104								
106			J-19	23 36 50	SS RD			0.8/1.4 recovery
108	CL	108.0 - 124.0 <u>SANDY CLAY</u> : dk. moderate brown (5YR 3/4); ~85% moderate plasticity fines; ~10% fine sand; ~5% medium grained sand; stiff; damp.	J-20	15 19 28	SS RD			106.4' - stop drilling 4:45 1/2/81 Begin drilling 7:00 1/3/81
110								1.9/1.5 recovery pocket penetrometer 3.25 (broke apart) 2/7/81
112								
114								
116			J-21	19 27	SS			1.5/1.5 recovery

Decrease in
SILT
content

Increase in
SAND
content

(~5-10% fines; 90-95% sand)

15-40% fine to med. sand

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116	CL	108.0-124.0 SANDY CLAY: (col.)	J-21	37	SS RD			
118								
120			C-6		DR			DR ⇒ 60 Blows 1.0/1.0 recovery
122			J-22	17 25 40	SS RD			1.5/1.5 recovery
124	SC	124.0-128.0 CLAYEY SAND: moderate brown (SYR 4/4); 20-20% moderate plasticity fines; ~60-70% fine grained sand; ~20% medium grained sand; occasional scattered gravel; medium dense to dense; damp.	J-23	25 41 41	SS RD			1.5/1.5 recovery
126								
128	CL	128.0-138.0 SANDY CLAY: dk. moderate brown (SYR 3/4); ~80% moderate plasticity fines; ~10% fine grained sand; ~10% medium grained sand; stiff to very stiff; damp.	J-24	13 17 23	SS RD			.5/1.5 recovery
130								
132								
134								
136			J-25	17 25 40	SS RD			1.5/1.5 recovery pocket penetrometer 3.5 (broke point) 2/9/51
138	SC	138.0-149.0 CLAYEY SAND: dk. moderate brown (SYR 3/4); 30-40% moderate plasticity fines; 60-70% very fine to fine sand; dense; damp.						
140								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (10')	DRILL MODE	BLW NO.	CORE REC. %	REMARKS
140	SC	138.0 - 141.0 CLAYEY SAND: (cont)	C-7		DR			DR → 100 Blows 1.0/1.0 recovery
142		↓ coarsening ↓	J-26	19 26 36	SS RD			1.5/1.5 recovery pocket penetrometer 2.75 2/9/81
144								
146			sample: interbedded 20% fines, 80% very fine to fine sand; and 20% fines, 30% fine sand, 50% medium grained sand; interbedded on scale of 0.2'; coarser material is looser.	J-27	17 32 50	SS RD		
148								
150	ML	149.0 - 152.0 SANDY SILT: dark moderate brown (5YR 3/4); ~70% low plasticity fines; ~30% fine grained sand; some clayey layers and occasional medium to coarse sand; stiff; damp.	J-28	16 22 32	SS RD			1.5/1.5 recovery
152	SC	152.0 - 178.0 CLAYEY SAND: dk. moderate brown (5YR 3/4); ~15% moderate plasticity fines; ~60% fine grained sand; ~25% angular medium grained sand; medium dense; damp.	J-29	31 50	SS RD			1.0/1.0 recovery pocket penetrometer 1.5 (broke apart) 2/9/81
154								
156								
158								
160			C-8		DR			DR → 93 Blows .9/1.0 recovery
162			J-30	24 26 35	SS RD			1.0/1.5 recovery
164								

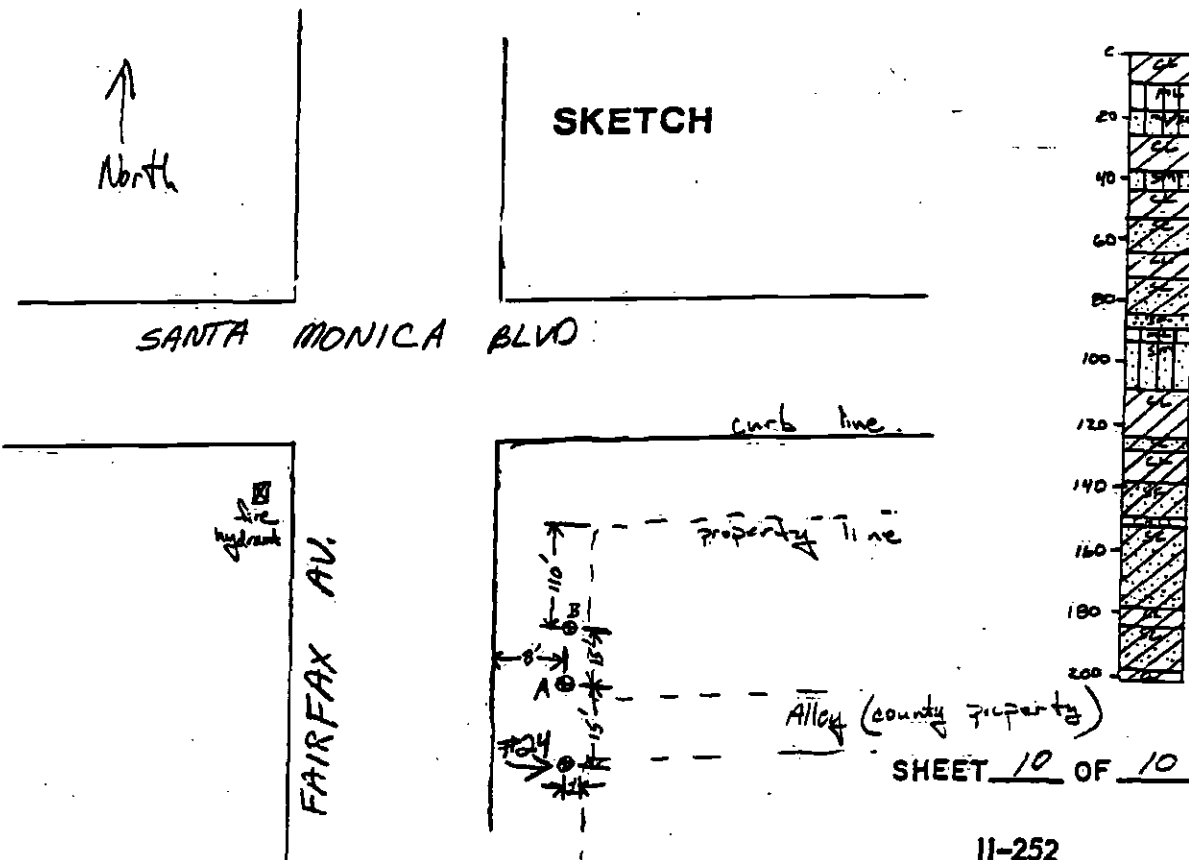
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	LOG NO.	CORE REC. %	REMARKS
164	SC	152.0-178.0 CLAYEY SAND: (62%)			RD			<p>NO RECOVERY</p> <p>0.9/1.5 recovery</p> <p>166.5' stop drilling at 4:45 1/3/81.</p> <p>Begin drilling 7:00 1/4/81.</p> <p>5/8 recovery</p> <p>9/9 recovery</p> <p>DR → 100 Blows</p> <p>28/0.9 recovery</p> <p>1.5/1.5 recovery</p> <p>1.5/1.5 recovery</p> <p>packet penetrometer 2.75 2/9/81</p>
166				23	SS			
				28				
				34				
168					RD			
170				32	SS			
			I-31	38				
					RD			
172								
174								
176				39	SS			
			I-32	50				
					RD			
178	CL	178.0-184.0 SANDY CLAY: dk moderate brown (5YR 3/4); ~85% moderate plasticity fines; ~15% fine grained sand; stiff; damp.			DR			
180			C-9	19	SS			
				27				
			I-33	50				
					RD			
184	SC	184.0-198.0 CLAYEY SAND: moderate brown (5YR 4/4); 30-50% moderate plasticity fines; 50-80% fine grained sand; occasional medium grained sand; dense; damp.						
186				21	SS			
			I-34	26				
				41				
					RD			
188								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	SC	184.0 - 198.0 CLAYEY SAND: (cont)			RD			
190			I-35	20 33 50	SS RD			1.3/1.3 recovery pocket penetrometer 2.5 (broke apart) 2/9/81
192								
194								193.5' - intense rig Chatter
196				24 20 39	SS RD			0.0/1.5 recovery <u>NO RECOVERY</u>
198	CL	198.0 - 202.5 SANDY CLAY: dk. moderate brown (5YR 5/4); ~80% moderate plasticity fines. ~20% fine grained sand; stiff; damp.						
200			C-10		DR			DR => 100 Blows 1.0/1.0 recovery
202	B.H.	202.5 - Bottom of Hole	I-36	19 31 40	SS			1.5/1.5 recovery
204								202.5' - Terminate Hole 2:30 1/4/81. 1/4/81 - ESA runs electric logs and Bruce Auld does down-hole seismic work. 1/5/81 ream hole to 7" down to 100'; install 4" casing to 100' and grout it in. cap it and move over to 24a.



SUMMARY BORING NO. 24

PROJECT 80-1280-22 STATION HOLE yes DATE DRILLED 1/2/81 - 1/4/81
 OVERBURDEN DEPTH (FT.) 0 TO 202.5.
 BEDROCK DEPTH (FT.) — TO — (T.D.).
 WATER PRESS. TEST no; INTERVAL(S) — TO —, — TO —.
 GROUND WATER DEPTH (FT.) — DATE —; — DATE —.
 GAS no; DEPTH FIRST NOTICED —, DATE —.
 E-LOG yes.
 DOWN-HOLE SURVEY yes.
 CROSS-HOLE SURVEY yes.
 PVC CASING (I.D.): 4" 0' TO 100'; 3" — TO —; 2" — TO —.
 GROUND ELEVATION REF. 285'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/29-31/80 HOLE NO. 25
LOCATION Sierra Bonita and Fountain GROUND ELEV. 323
DRILLING CONTRACTOR Pitcher LOGGED BY Gallinatti DEPTH TO GROUND WATER _____
TYPE OF RIG Falling HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs. 30 inches
SURFACE CONDITIONS Sidewalk TOTAL DEPTH 202.5 NO. CORE BOXES _____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		00-1.0 CEMENT (sidewalk)			AD			Begin drilling 9:15 12/29/80
1	SM	10-15.0 SILTY SAND: yellowish moderate brown (SYR 4/6); 10-20% low plasticity fines; 60% fine sand; 20% med to coarse sand; 0-10% rounded gravel; loose; damp to moist; sand is angular.			RD			Auger to 4', set 4' of casing, begin rotary wash drilling
2								
4								
6								
9								
10		increase in silt content; decrease in coarse SAND and gravel	I-1	2	SS			1 1/5 recovery
				4				
				3				
12					RD			
14								Drill rate = 8 min / 8.5 feet
16	CL	15.0-26.0 SANDY CLAY: yellowish moderate brown (SYR 4/6); ~90% moderate plasticity fines. ~10% fine to medium grained angular sand; firm; moist.						
18								
20								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	CL	15.0 - 21.0 SANDY CLAY (cont)	C-1		DR			DR ⇒ 11 blows 8/1.0 recovery
22			S-2	4	SS			↑ 1.2/1.5 recovery
				6				
				7				
24					RD			
26	SM	26.0 - 49.0 SILTY SAND: yellowish moderate brown (SYR 4/6); ~10% low plasticity fines; ~90% very fine to fine grained sand; medium dense; moist.						Drive sample using modified California sampler and down- hole jaws (325 lbs.)
30			S-3	4	SS			1.1/1.5 recovery
				6				
				10				
32					RD			
34								Drill rate = 8 min / 8.5 feet
36		36.0 - 49.0 Increase in grain size to ~10% fines; ~70% fine sand; ~20% medium to coarse sand.						
38								
40			C-2		DR			DR ⇒ 28 blows 0.9/1.0 recovery
42			S-4	9	SS			1.2/1.5 recovery
				16				
				17				
44					RD			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	SM	26.0-47.0 <u>SILTY SAND</u> : (cont.)			RD			
46								
46								
50	ML	47.0-52.0 <u>SANDY SILT</u> : yellowish moderate brown (5YR 4/6); ~70% low plasticity fines; ~20% fine sand; ~10% medium to coarse sand; occasional scattered pea gravel; firm to stiff; damp.	J-5	7 10 16	SS RD			1.5/1.5 recovery pocket penetrometer 2.0 (broke apart) 2/9/81
52	SM	52.0-58.0 <u>SILTY SAND</u> : yellowish moderate brown (5YR 4/6); ~10% low plasticity fines; ~65% fine sand; ~25% medium to coarse sand; medium dense; damp.						decrease in drill rate
54								Drill rate =
56								18 min / 8.5 feet
58	ML	58.0-97.0 <u>SANDY SILT</u> : moderate brown (5YR 4/4); ~70% low plasticity fines; ~20% fine sand; ~10% angular medium to coarse grained sand; stiff; damp.	C-3	7 13 21	DR SS RD			DR → 69 blows 1.0/1.0 recovery 1.5/1.5 recovery
60								
62								
64								
66								2:30 rig stops morning (out of gas) 3:00 continue drilling
68								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68	ML	58.0-97.0 SANDY SILT: (cont.)			RD			3:00 County inspector tells us to be off Fountain Ave. by 4:00 requires moving water truck and drill pipe
70		gradational increase in grain size of the sand; sand is now predominately medium to coarse ↓	I-7	18	SS			1.3/1.5 recovery
	17							
	13							
72					RD			
74								
76								losing circulation to sands
78								* <u>Fluid loss</u> continues throughout the rest of the drilling
80			C-4		DR			DR = 49 blows 1.0/1.0 recovery
82			I-8	17	SS			1.5/1.5 recovery
				29				
				35				
84					RD			82.5' - stop drilling at 4:30 - clean up site - leave site 5:00 12/29/80.
86								12/30/80 - gas test 7:00 am. 20% O ₂ O ₂ combustible
88								Begin drilling 8:30
90		sample: ~80% low plasticity fines; ~20% fine to med. sand on med sand (~80%) layer ~0.1' thick.	I-9	19	SS			1.4/1.5 recovery pocket penetrometer 1.0 (broke apart) 2/9/81
				17				
				18				
92					AD			SHEET 4 OF 10

PROJECT 80-1280-22

DATE DRILLED 12/30/80

HOLE NO. 25

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	OPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	ML	58.0-97.0 SANDY SILT: (Loam)			RD			Drill Rate = 18 min. / 8.5 feet
94								
96								
98	SM	97.0-135.0 SILTY SAND: moderate brown (5YR 4/4); ~30% low plasticity fines; ~50% fine grained sand; ~20% medium to coarse sand; dense; damp.						DR ⇒ 54 blows 09/10 recovery 1.2/1.5 recovery
100			C-5		DR			
102			S-10	19 37 40	SS			
104					RD			
106								Drill rate = 14 min / 7.5 feet
108								
110								1.5/1.5 recovery
112			S-11	19 13 21	SS			
114					RD			
116								Drill Rate = 19 min / 8.5 feet

SHEET 5 OF 10

PROJECT 90-1280-22

DATE DRILLED 12/30/80

HOLE NO. 25

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL LOGS	RUN NO.	CORE REC. %	REMARKS
116	SM	97.0-135.0 <u>SILTY SAND</u> (cont.)			RD			
118								
120			C-6		DR			DR ⇒ 85 blows 10/1.0 recovery
122				26	SS			00/1.5 recovery
				20				
				26				* NO recovery on split-spoon sample
124					RD			
126								Drill rate: 23 min / 7.5 feet
128								
130			X-2	23	SS			12/1.5 recovery
				46				
				38				
132					RD			
134								
136	ML	135.0-144.0 <u>SILT</u> : dark moderate brown (5YR 3/4); ~95% low plasticity fines; ~5% fine to medium angular sand; stiff to very stiff; damp.						
138								
140								

SHEET 6 OF 10

PROJECT 80-1280-22DATE DRILLED 12/30/80HOLE NO. 25

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140	ML	135.0-144.0 <u>SILT</u> : (cont.)	C-7		DR			DR → 94 blows 1.0/1.0 recovery
				15	SS			
142			J-13	25				1.4/1.5 recovery
				29				
					RD			
144	SM	144.0-157.0 <u>SILTY SAND</u> : moderate brown (5YR 4/4); ~25% low plasticity fines; ~50% fine grained sand; ~25% medium to coarse sand; dense; damp.						
146								
148								
150			J-14	29	SS			1.5/1.5 recovery pocket penetrometer 4.5 (broke apart) 2/9/81
				40				
				37				
152					RD			
154								
156								
158	ML	157.0-173.0 <u>SANDY SILT</u> : moderate brown (5YR 4/4); ~75% low plasticity fines; ~20% fine sand; ~5% coarse medium to coarse sand; stiff; damp.						
160			C-8		DR			DR → 97 blows 1.0/1.0 recovery
				17	SS			
162			J-15	35				1.5/1.5 recovery
				40				
					RD			
164								

SHEET 7 OF 10

PROJECT 80-1280-22

DATE DRILLED 12/30/90

HOLE NO. 25

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLES	SPT (blows)	DRILL LOGS	NUM. NO.	CORE REC. %	REMARKS
164	ML	157.0 - 173.0 SANDY SILT: (cont.)			RD			
166								
168								
170			T-16	37 50	SS			1.0/1.0 recovery
172					RD			170' - stop drilling ~4:30 12/30/90 - Begin drilling 7:30 12/31/90
174	SM	173.0 - 202.5 SILTY SAND: moderate brown (SYR 9/4); ~15% low plasticity fines; ~75% fine grained sand; ~10% medium to coarse sand; dense; damp.						
176								
178								
180			C-9		DR			DR ⇒ 100 blows/9 feet 7/9 recovery
182			T-17	34 41 46	SS			Recovery 5/9
184					RD			
186								
188								

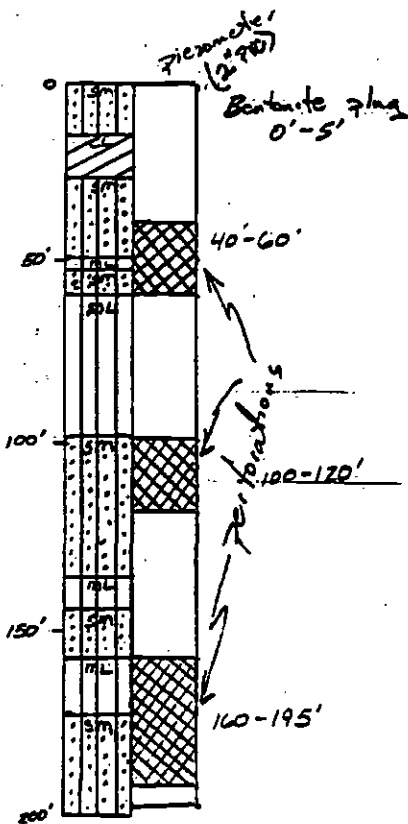
SHEET 8 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	SM	173.0 - 202.5 SILTY SAND (cont.)			RD			
190				26	SS			15/15 recovery
			I-18	30				
				55				
192					RD			
194								
196								
198								
200			C-10		DR			DR ⇒ 96 blows 16/10 recovery pocket penetrometer 3.5 (broke apart) 2/1/81 1/15 recovery
				26	SS			
			I-19	33				
202	B.H.	202.5 Bottom of Hole		55				202.5' - Terminate hole 11:30 12/31/80. Run electric logs (ESA) install 2" PVC piezometer to 200' with perforations from 40' to 60'; 100' to 120', and 160' to 195'. Backfill with pea gravel; clean up site and move off 12/31/80. water sampled 2/13/81

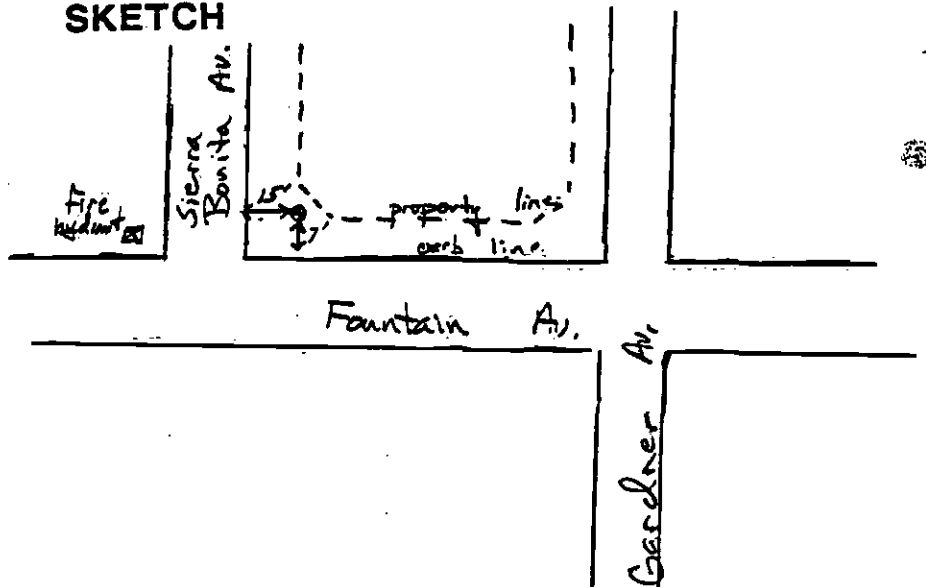


SUMMARY BORING NO. 25

PROJECT 80-1280-22 STATION HOLE 110 DATE DRILLED 12/21/81 - 12/30/81
OVERBURDEN DEPTH (FT.) 0 TO 202.5
BEDROCK DEPTH (FT.) — TO — (T.D.).
WATER PRESS. TEST NO; INTERVAL(S) — TO —, — TO —.
GROUND WATER DEPTH (FT.) — DATE —; — DATE —.
GAS NO; DEPTH FIRST NOTICED —, DATE —.
E-LOG yes.
DOWN-HOLE SURVEY NO.
CROSS-HOLE SURVEY NO.
PVC CASING (I.D.): 4" — TO —; 3" — TO —; 2" 0' TO 200'.
GROUND ELEVATION REF. 323



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/29-31/80 HOLE NO. 26
LOCATION Sycamore + Fountain GROUND ELEV. 316'
DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY Schoeberlein DEPTH TO GROUND WATER _____
TYPE OF RIG _____ HOLE DIAMETER _____ HAMMER WEIGHT AND FALL _____
SURFACE CONDITIONS asphalt TOTAL DEPTH 209.5 NO. CORE BOXES _____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	AC	1" asphalt			AD			hole moved 1' E due to proximity of overhead wires
1.0	CL	1.0' - 7.0' <u>SILTY CLAY</u> : olive black (SY 2/1), 98% hi plastic fines; stiff; moist.						
2.0								
4.0								
6.0		grading sandy minor color change to greyish brown (SY 2/1) less stiff						
7.0	CL	7.0' - 36.0' <u>SANDY CLAY</u> : moderate brown (SYR 3.5/4) 85% clay, 15% medium to fine grained sand; stiff; dry.						
8.0								
10.0			J-1	9 10 11	SS			1.3/1.5 recovery
12.0					RD			casing bottom set 11.5' drilling w/ 478 drag bit
14.0		13-14' sand lense SP						
16.0		15-16' clay lense sild content decrease						
18.0								
20.0			C-1		DR			20/5' 31/5' 28/10 recovery SHEET <u>7</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MOOD	RUIS NO.	CORE REC. %	REMARKS
20.0	CL	7.0 - 36.0 SANDY CLAY:(cont)	J-2	26	SS			0.7/1.5 recovery
				28				
				31				
22.0					RD			
24.0								
26.0								
28.0								
30.0			J-3	14	SS			0.9/1.5 recovery
				13				
				10				
32.0					RD			losing circulation, mixed in 1/2 bag bentonite
34.0								
36.0	SC	35' gravel lense 1' thick to .5' diameter 36.0 - 48.0 CLAYEY SAND: moderate brown (SYR 1/4); 20% mod. plastic fines, 80% fine to medium, grained sand; dense, saturated.						
38.0								
40.0			C-2		DR			9/1.5; 12/1.5 1.0/1.0 recovery
				25	SS			0/1.5 recovery
				19				
				25				saturated samples
42.0					RD			
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	Sample	SPT (bl)	DRILL MODE	Run No.	CORE REC. %	REMARKS
44.0	SC	36.0 - 48.0' CLAYEY SAND (cont.)			RO			
46.0								
48.0	CL	48.0-66 SANDY CLAY: moderate brown (SPR 4/4); 75% clay; 25% fine to medium grained sand; moist dense.						
50.0			J-4	11 14 21	SS			1.5/1.5 recovery
52.0					RO			
54.0		53.5' gravel lense						chatter
56.0								
58.0								
60.0			C-3		DR			11/.5', 17/.5' 1.0/1.0 recovery
62.0			J-5	22 29 48	SS			1.1/1.5 recovery
64.0					RO			
66.0	GP	66-68 gravel						
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SL	68.0-71.0 CLAYEY SAND: moderate brown (SYR 4/4) 25% clay; 75% sand; dense moist; 69-69.5 gravel lense			RO			
70.0				29	SS			1:3/1.5 recovery
72.0	CL		71.0-114.0 SANDY CLAY: moderate brown (SYR 4/4), 65% moderately plastic fines, 35% very fine grained sand; moist; very stiff grading to sandy clay in places.	J-6	21			
74.0				18				rig trouble fuel blockage 2:30 - 3:00.
76.0						RO		
78.0		sand decrease plasticity increase						
80.0			C-4		OR			17/5', 26/5' 0.7/1.0 recovery drive rock ahead 0/1.5 recovery
82.0				21	SS			
				17				
				23				
84.0					RO			
86.0								
88.0								
90.0								
			5-7	11	SS			1.5/1.5 recovery
				14				
				19				
92.0					RO			

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPY (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	CL	71.0 - 114.0 SANDY CLAY: (cont.)			RD			
94.0								
96.0								
98.0	GC	98' 3" gravel lense						chatter
		clayey sand interbed	J-8		CR			21/.5', 25/.5'
100.0				14	SS			0.9/.0 recovery
				19				1.5/.5 recovery
				22				
102.0	CL				RD			
104.0								
106.0								
108.0	SP	108-110 sand lense						
110.0	CL	Sand	J-9	25	SS			1.5/.5 recovery
		clayey sand		21				12/27/80
				21				12/30/80
112.0					RD			water at 20' in a.m.
114.0	CL	114.0 - 164.0 SILTY CLAY: moderate reddish brown (2.5 YR 4/6) 95% moderately plastic fines, 5% medium grained sand in inter beds.						
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CONG. REC. %	REMARKS	
116.0	CL	114.0 - 164.0 SILTY CLAY: (cont) dense, moist, interbeds of sand, sandy clay and clayey sand.			RO				
118.0									
120.0					C-6		OR		17/5 25/5 1.0/1.0 recovery
						17	SS		
					J-10	21			
						42			
122.0							RO		
124.0									
126.0									
128.0									
130.0				7	SS				
			J-11	9					
				30					
132.0					RO				
134.0	GP	134 thin gravel lense						minor chatter	
136.0	CL								
138.0	CL-SL	samples: clayey sand to sandy clay, dense moist variable throughout	S-1		PB	1		changed to pitcher barrel to ease the sampling process	
140.0			J-12	36	SS			1.2 - 2000s. 1st. 5' 3500s. 1.8/2.0 recovery SHEET 6 OF 10	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL MUD	RUB NO.	CORE REC. %	REMARKS
140.0	CL	114.0-164.0 SILTY CLAY : (cont) increase in sand	J-12	31 38	SS RD			1.1/1.5 recovery
142.0								
144.0								
146.0								
148.0								
150.0			J-13	15 20 33	SS RD			1.5/1.5 recovery
152.0								
154.0								
156.0	GF CL	155 thin gravel lense ~.5'						chatter
158.0			S-2		PB	2		400psi down pressure 1.7/2.0 recovery
160.0	SC	clayey sand lense Very dense, occasional gravels to .75'	J-14	37 50	SS RD			35/.5', 50/.4' 28/0.9 recovery
162.0								
164.0								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUSH NO.	CORE REC. %	REMARKS
164.0	ML	164.0 - 173.0 SANDY SILT: moderate brown (5YR 4/4); 90% non-plastic fines; 10% fine to medium sand with occasional gravels; v. dense; moist; gradational contact.			RD			
166.0								
168.0								
170.0			J-16	17 26 32	SS			1.5/1.5 recovery
172.0					RD			
174.0	SC	173.0 - 190.0 CLAYEY SAND: mod. brown (5YR 4/4) - well graded in places; moist/v. dense. 174 thin gravel lense 175 thin gravel lense						rig chatter
176.0								
178.0			S-3		PB	3		1.8/2.5 recovery
180.0			J-16	24 53	SS			24/.5; 53/.5 1.0/1.0 recovery
182.0		clay decrease			RD			
184.0								
186.0								
188.0	GC	187 thin gravel lense						chatter drill rate slowed

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (1')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0	SC	173.0 - 190.0 <u>CLAYEY SAND:</u> (cont)			RO			drill rate increase
190.0	SW	190.0 - 198.0 <u>SAND:</u> grey & white; contains gravel to 1/2", v. dense; gravels and coarse sand subround to round, medium sand subangular to angular.		85	SS RO			85/5' 0.0/0.5 recovery
192.0								
194.0								
196.0								
198.0	ML	<u>FERNANDO FORMATION</u> 198.0 - 209.5 <u>SILTSTONE:</u> dusky yellow (SY 6/4); 100% low plasticity fines; v. dense; moist.	C-7		DR RO			198.0' POSSIBLE BEDROCK CONTACT. RD 10' AND SAMPLE TO CONFIRM. 64/5 100/45 99/95 recovery drilling to 210 then PB possible bedrock
200.0								
202.0								
204.0		204.0 color change to dusky green SG 3/2						minor chatter
206.0								
208.0			S-4		PB	4		1.8/2.0 recovery
210.0		B.H. 209.5 terminated hole, water sampled 2/12/81						
212.0								



SUMMARY BORING NO. 26

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 12/29-31/80

OVERBURDEN DEPTH (FT.) 0 TO 198

BEDROCK DEPTH (FT.) 198 TO 209.5 (T.D.)

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____

GROUND WATER DEPTH (FT.) 20 DATE 12/30/80; _____ DATE _____

GAS NO; DEPTH FIRST NOTICED _____, DATE _____

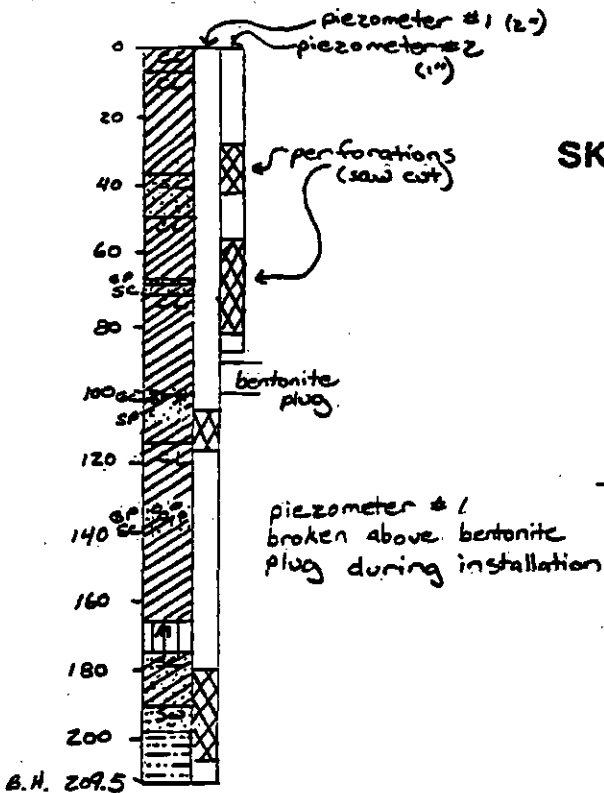
E-LOG YES (12/30/80)

DOWN-HOLE SURVEY NO

CROSS-HOLE SURVEY NO

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0 TO 200 damaged

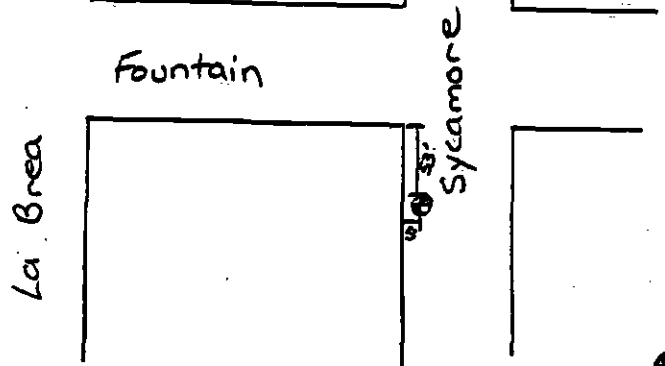
GROUND ELEVATION REF. 312'



SKETCH



Fountain





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/15-18/80 HOLE NO. 27
LOCATION Seward ~ 100' N. of Fountain GROUND ELEV. 322
DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY LS DEPTH TO GROUND WATER _____
TYPE OF RIG Falling 1500 HOLE DIAMETER 4 7/8 HAMMER WEIGHT AND FALL 140 lb / 30 in. drop
SURFACE CONDITIONS asphalt TOTAL DEPTH 201.0 NO. CORE BOXES 0

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	CL	0.0 - 19.0 SILTY CLAY: greyish brown (5YR 3/2), 98% fines, 2% sand; moist; interbedded with silt, clay, sand and gravel interbeds from 1/2" to 8" average thickness			AO			auger down to 10' to clear utilities drove SPT then set casing
2.0								
4.0		3.6-4.5 clayey sand						
6.0		4.5-11.0 silty clay; dark yellowish brown (10 YR 4/2), 98% fines moist						
8.0								
10.0		increasing silt and sand with depth						
12.0		11.0-11.5 clayey sand lense	J-1	4 5 4	SS			1.2/1.5 recovery pocket penetrometer 3.0 (broke apart) 2/9/81
14.0		small amount of gravel and coarse sand			RO			13' of casing stabilizer
16.0		16 sandy clay						minor chatter
18.0		18 clayey silt						
20.0	SC	19.0 - 26.0 CLAYEY SAND: moderate yellowish brown (10 YR 5/4), 15% fines, 85% fine						minor chatter SHEET <u>1</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPR (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	SC	19.0 - 26.0 CLAYEY SAND: (cont) grained sand, occasional coarse sand, medium dense, moist to wet, slight mica.			PB			2.0/2.0 recovery PB cut at 250 p.s.i.
22.0			J-2	5	SS			1.2/1.5 recovery
				4				
				7				
24.0	CL	24.0-26.0 silty clay, dark greyish black			RO			
26.0	SP	26.0 - 40.2 SAND: moderate yellowish brown (10YR 5/4); 95% medium sand, 5% coarse sand and gravel;						
28.0								
30.0			J-3	8	SS			1.2/1.5 recovery
				18				
				25				
32.0		31.0-32.0 coarse sand & gravel lense ~1' thick						
34.0		silty sand interbedded with fine sand lenses ~1/2" thick						
36.0								
38.0		38-38.5 coarser sand, no fines, minor fine gravel.						
40.0	SW	40.2 - 53.0 GRAVELLY SAND: moderate yellowish brown (10YR 5/4); WELL GRADED FINE TO COARSE SAND.	PB-2		PB	2		1.7/1.7 recovery PB cut at 250 p.s.i.
42.0			J-4	25	SS			1.2/1.5 recovery
				32				
				33				
46.0					RO			

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
46.0	SW	40.2 - 53.0 GRAVELLY SAND: (cont.)			RD			
48.0		48.5-49.5 silty sand, less gravel						
50.0			J-5	45 14 12	SS			0.2/1.5 recovery
52.0					RD			chatter
54.0	SM	53.0 - 70.0 SILTY SAND: moderate yellowish brown (10PR 5/4); 30% silt, 70% fine grained sand, sub angular grains, occasional coarse sand or gravel lenses; medium dense, moist.						
56.0		57' silty clay 6" thick						
58.0			PB-3		PB	3		checked for gas no register on explosimeter
60.0								2.3/2.5 recovery PB cut at 250 p.s.i. extruded, partially disturbed due to deformed tube
62.0			J-6	9 10 13	SS			1.5/1.5 recovery
64.0					RD			
66.0								
68.0		68.5 thin clay lense						
70.0								

PROJECT 80-1280-22DATE DRILLED 12/15-18/80HOLE NO. 27

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DRY (16)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
70.0	CL	70.0-120.0 <u>SANDY CLAY</u> : moderate yellowish brown (10 YR 5/4); 85% fines, 15% sand; very stiff to hard; moist, interbedded with clayey sand.	J-7	12	RD			1.5/1.5 recovery
				17	SS			
				20	RD			
72.0								
74.0								
76.0								
78.0			PB-4		PB	4		2.75/2.75 recovery PB cut at 200 p.s.i.
80.0								
82.0			J-8	11	SS			1.5/1.5 recovery
				17				
				20	RD			
84.0								change to 4 7/8" drag bit
86.0		sand lense						
88.0		sand lense						
90.0			J-9	12	SS			1.5/1.5 recovery
				20				
				23	RD			
92.0		93'-96' occasional sand lenses (thin)						occasional chatter
94.0								SHEET <u>4</u> OF <u>10</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS				
94.0	CL	70.0 - 120.0 SANDY CLAYS cont.			RD							
96.0												
98.0					PB-5				PB	5	2.75/2.75 recovery	
100.0					J-10				12	SS		1.5/1.5 recovery sample contained voids probably due to rock obstruction
102.0									16			
									24			
104.0										RD		
106.0												
108.0												
110.0					J-11				12	SS		1.5/1.5 recovery
112.0									18			
									24			
114.0										RD		end of day 12/17/80 water at 25' in a.m.
116.0									clayey sand lense			
118.0												

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	BLW NO.	CORE REC. %	REMARKS
118.0	CL	70.0 - 120.0 SANDY CLAY: (cont)			RD			24" stroke on 350 lb. slip jars
					DR			12/.5' 18/.5'
120.0	SP	120.0 - 137.0 SAND: moderate brown (SYR 4/4); 2% fines, 98% medium grained sand; moist; dense; interbedded w/ clays and gravels.	C-1	J-12 48 50	SS			1.0/1.0 recovery
122.0		122-123 coarse sand lense			RD			1.0/1.0 recovery
124.0								
126.0		126.5 stiff silty clay						
128.0								
130.0								
132.0		131 - 3" thick sandy clay lense	J-13	14 22 44	SS			1.5/1.5 recovery
134.0					RD			
136.0								
138.0	CL	137.0 - 175.0 SANDY CLAY: moderate brown (SYR 4/4); 70% fines, 30% sand; K stiff; moist; interbeds of sand and gravel						
140.0			C-2		DR			12/.5, 30/.5 blows
					SS			1.0/1.0 recovery
			J-14	14 19 30	SS			1.5/1.5 recovery
142.0					RD			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
142.0	CL	137.0-175.0 SANDY CLAY: (cont)			RD			
	SW	143-145 coarse sand and gravel						
144.0								
146.0	CL							
148.0		hard						
150.0			S-15	21 23 25	SS			1.5/1.5 recovery
152.0					RD			
154.0								
156.0								
158.0					PB			attempted PB, tube dented, washed out 2.5' NO RECOVERY
160.0		thin coarse sand lense						
162.0					RD			fished out rock (basalt) 3" diameter w/ PB washed out 2.5'
164.0			PB-6		PB	6		2.5/2.5 recovery
166.0			J-16	20	SS			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
166.0	CL	137.0 - 175.0 SANDY CLAY: (cont.)	J-16	28 37	SS			1.5/1.5 recovery
168.0								
170.0								
172.0								
174.0								
176.0	SC	175.0 - 201.0 CLAYEY SAND: moderate brown (SYR 4/4); 2.5% fines; 75% fine to medium sand w/ occasional gravels; very dense; moist; some gravel friable.						rig chatter
178.0								
180.0			PB-7		PB	7		1.0/2.0 recovery tube turned on barrel
182.0			J-17	40 62	SS			1.0/1.0 recovery
184.0		clay decrease			RD			change to 4 7/8" tricone
186.0								
188.0								
190.0								

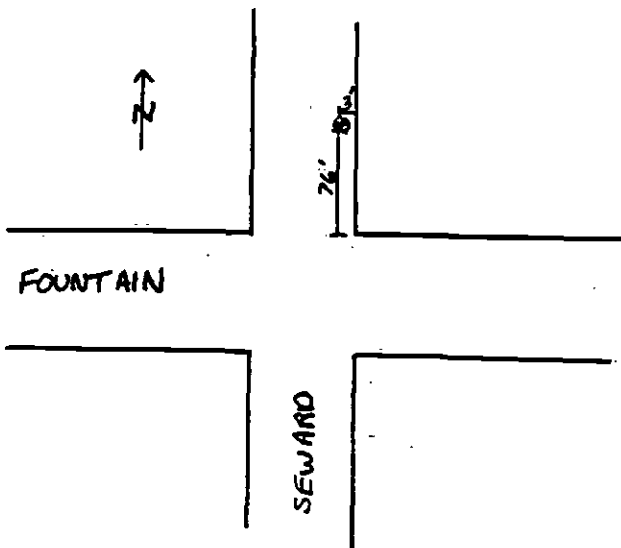
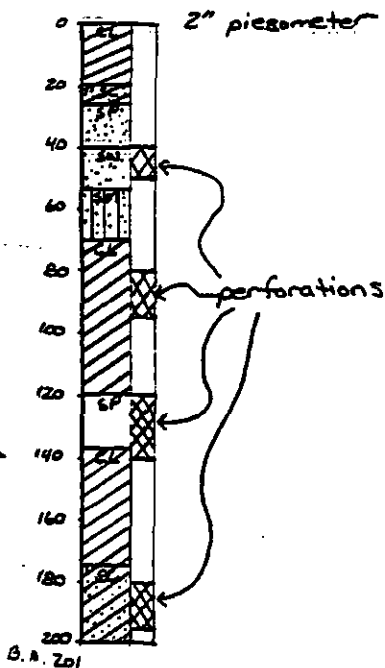
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (F)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
190.0	SC	175-201.0 CLAYEY SAND (cont.)	5-18	50	SS			1.0/1.0 recovery end of day 12/17/80 12/18/80
192.0				55				
194.0		193-195 less fines						
196.0								
198.0		198-200 sand						
200.0		200.0-201.0 sand	c-3		DR			63/5 100/5 1.0/1.0 recovery
202.0		B.H. 201.0 terminated hole water sampled 2/13/81						
204.0								
206.0								
208.0								
210.0								
212.0								
214.0								



SUMMARY BORING NO. 27

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 12/15-18/80.
 OVERBURDEN DEPTH (FT.) 0 TO 201.
 BEDROCK DEPTH (FT.) NA TO (T.D.).
 WATER PRESS. TEST NO; INTERVAL(S) TO , TO .
 GROUND WATER DEPTH (FT.) DATE ; DATE .
 GAS NO; DEPTH FIRST NOTICED , DATE .
 E-LOG YES . 12/18/80
 DOWN-HOLE SURVEY NO.
 CROSS-HOLE SURVEY NO.
 PVC CASING (I.D.): 4" TO ; 3" TO ; 2" 0 TO 200.
 GROUND ELEVATION REF. 322

SKETCH



SHEET 10 OF 10



THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/5-81 HOLE NO. 28
LOCATION Cahuenga at Hollywood Blvd. GROUND ELEV. 385'
DRILLING CONTRACTOR J.A. Pitzer Co. LOGGED BY Schoeberlein DEPTH TO GROUND WATER
TYPE OF RIG Feiling 1502 HOLE DIAMETER 4 7/8 HAMMER WEIGHT AND FALL 140 lb. 13 inch
SURFACE CONDITIONS asphalt street TOTAL DEPTH 202 NO. CORE BOXES 0

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0 - 1.2 asphalt			AO			start hole 2:45 p.m. Auger to 10' to set casing and insure utilities security
2.0	SC	1.2 - 9.0 <u>CLAYEY SAND</u> : dark yellowish brown (10YR 4/2) 10% clay, 90% fine to medium subangular sand; dry to moist, loose; contains minor gravels to 1/2", subround.						
4.0								
6.0		grading clayier	J-1	2	SS			1.5/1.5 recovery
6.0				1				
6.0				2				
8.0					AO			
10.0	CL	9.0 - 14.0 <u>SANDY CLAY</u> : dark yellowish brown (10YR 4/2); 70-85% moderately plastic clay, 15-35% medium to fine grained subangular sand; moist; stiff.						
10.0			J-2	5	SS			1.3/1.5 recovery
10.0				5				
10.0				5				
12.0					RO			set casing, mud tub and prepared to Rotary wash, 4 7/8" drag bit, surface casing to 11"
14.0		grading sandier						
14.0	SC	14.0 - 19.0 <u>CLAYEY SAND</u> : moderate yellowish brown (10 YR 5/4) 5-10% clay, 90-95% fine grained sand; moist; loose.						
16.0			J-3	3	SS			1.2/1.5 recovery
16.0				3				
16.0				3				
18.0		grading clayier						
18.0					RO			
20.0	CL	19.0 - 21.0 <u>SANDY CLAY</u> : mod. yellowish brown (10YR 5/4) 90-95% clay, 5-10% very fine grained						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	CL	19.0-21.0 SANDY CLAY: (cont.) sand; wet; soft.	C-1		DR			2/.5 2/.5 1.0/1.0 recovery
22.0	SC	21.0-23.0 CLAYEY SAND: moderate yellowish brown (10YR 5/4); 15-20% clay; 80-85% very fine grained sand; wet; loose.	J-4	5	SS			1.3/1.5 recovery
				3				
				6				
24.0	GP	23.0-24.0 GRAVEL: subangular to subround to 2" diameter.			RD			rig chatter
26.0	SP	24.0-31.0 SAND: moderate yellowish brown (10YR 5/4); 98% subangular sand; saturated dense, occasional gravels.	J-5	10	SS			0.7/1.5 recovery
				15				
				16				
30.0					RD			mixed mud
				6				
				20				
32.0	SC	31.0-54.8 CLAYEY SAND: moderate yellowish brown (10YR 5/4); 15-20% clay, 80-85% very fine grained subangular sand; medium dense; wet; occasional subround to round gravels to 1/2".		24	RD			0.1/.5 recovery rock stuck in shoe
36.0				9	SS			falling in, mudding up 0.7/1.5 recovery
				11				
				12				
38.0					RD			1.5/0 1.6/81 water at 15' in o.m.
40.0			C-2		DR			35 lb hammer 18" stroke 17/.5 13/.5 0.7/1.0 recovery
				17				
				19				
42.0				20	SS			0/1.5 recovery
44.0					RD			

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MOOD	RUN NO.	CORE REC. %	REMARKS
44.0	SC	31.0 - 54.8 <u>CLAYEY SAND</u> : (cont.)			RO			
46.0			J-7	8 11 11	SS RO			1.1/1.5 recovery
48.0								
50.0		interbedded sand						
52.0			J-8	9 13 13	SS RO			1.0/1.5 recovery
54.0								
56.0	CL	54.5 thin gravel 54.8 - 59.8 <u>SANDY CLAY</u> : moderate brown (5 YR 3/4); 95% hi plastic clay; 5% very fine grained sand; moist; stiff.	J-9	5 8 8	SS RO			1.1/1.5 recovery
58.0								
60.0	SC	59.8 - 64.7 <u>CLAYEY SAND</u> : moderate yellowish brown (10 YR 5/4) 10-20% clay; 80-90% fine grained sand; occasional gravel; moist; dense; inter- beds of sandy clay and sand.	C-3 J-10	11 17 17	OR SS RO			6/1.5, 12/1.5 0.7/1.0 recovery 1.1/1.5 recovery
62.0								
64.0		clay decrease						
66.0	SP	64.7 - 96.5 <u>SAND</u> : moderate yellowish brown (10 YR 5/4). ~97% subangular medium grained sand; moist; dense; occasional gravels.	J-11	20 18 20	SS RO			1.1/1.5 recovery
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SP	64.7-96.5 SAND : (cont.)			RD			
70.0				29	SS			1.1/1.5 recovery
			J-12	36				
				34				
72.0	GW	71.5-23.5 gravel lens			RD			chatter
74.0	SP							
76.0				30	SS			0.5/1.5 recovery
			J-13	44				
				42				
78.0					RD			
80.0	SP	color change to moderate brown (5 YR 4/4) clay increase	C-4		DR			15/1.5, 23/1.5 0.7/1.0 recovery
				37	SS			1.0/1.5 recovery
			J-14	35				
				40				
82.0		cobbles			RD			changed to 4 7/8" tricone, rig chatter @ 81.5', cemented sand stone in shoe of bit
84.0								rig chatter
86.0		weakly cemented very dense	J-15	50	SS			50/25 0.23/0.25 recovery 200 p.s.i. down
		increased cementation			RD			
88.0								
90.0		color change to moderate yellowish brown (10 YR 5/4)			RD			50/.2 0.242 recovery
92.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	SP	64.7 - 96.5 SAND: (cont.)			RO			
	CL	93-94 sandy clay lense ~70% clay, 30% fine to medium grained sand gravels						
94.0	GW							
			J-17	50	SS			50/3 0.3/0.3 recovery intense chatter
96.0					RO			
	CL	96.5-109.5 SANDY CLAY: moderate brown (SYR 4/4); ~70% mod. plastic clay; 30% medium to coarse sand; moist; v. stiff						
98.0						OR		
			CS					
100.0				9	SS			0/1.5 recovery
				11				
				16				
102.0					RO			return to 4 7/8" drag bit intermittent chatter
104.0								
				18	SS			0.6/1.5 recovery
106.0			J-18	18				
				23				
					RO			
108.0								
	GW	109.0 - 113.5 SAND + GRAVEL: moderate brown (SYR 4/4); interbedded sand contains ~3% clay 97% medium grained sand w/ occasional gravel, gravel well graded with 90% sand, angular to sub angular, gravel lense						rig chatter
110.0	SP				50	SS		
	GW		J-19	56				
112.0					RO			
	CL	113.5 - 118.0 SANDY CLAY: moderate brown (SYR 4/4); interbedded w/ clayey sand; 40-80% clay, 20-60% fine to medium grained sand; moist to wet; dense						
114.0					18	SS		
			J-20	28				
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	CL	113.5 - 118.0 SANDY CLAY: (cont)	J-20	28	SS			1.1 / 1.5 recovery
118.0	CL	118.0 - 125.0 CLAYEY SAND: moderate yellowish brown (10 YR 5/4); 40-60% clay, 40-60% sand; moist; very dense; interbedded with sandy clayey gravels to 1"			RD			
120.0			C-6		DR			42 / 5 51 / 5 1.0 / 1.0 recovery
122.0			J-21	22 34 50	SS			22 / 5 34 / 5 50 / 3 1.2 / 1.3 recovery
124.0	SW	clay decrease ↓ gravel			RO			chatter
126.0	SP	125.0 - 134.0 GRAVELLY SAND: moderate yellowish brown (10 YR 5/4); ~2% clay, 85% fine to medium grained angular sand, 10-15% fine to medium gravels, angular to subround; moist to wet; very dense.	J-22	62 51	SS			1.0 / 1.0 recovery 62 / 5 51 / 5
128.0					RO			
130.0			J-23	56	SS			chatter decrease 56 / 5 0.4 / 0.5 recovery
132.0					RO			minor chatter
134.0	SC	134.0 - 136.0 CLAYEY SAND: moderate brown (5 YR 3/4); 35-40% clay, 60-65% fine grained sand w/ occasional gravel; moist to wet; very dense.	J-24	24 45 59	SS			1.3 / 1.5 recovery
136.0		clay increase ↓			RO			
138.0					SS			
140.0			C-7					25 / 5 20 / 5 1.0 / 1.0 recovery

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0	SC	134.0 - 156.0 CLAYEY SAND : (cont.) gravelly	J-25	41 50	SS RD			41/1.5 50/1.3 0.8/0.8 recovery rig chatter
142.0								drill smoothed out
144.0								
146.0			J-26	28 48 60	SS RD			1.3/1.5 recovery 11/2/81 11/7/81
148.0								
150.0			J-27	43 50	SS RD			43/1.5 50/2.5 0.75/0.75 recovery
152.0		clay decrease						
154.0			J-28	50	SS RD			50/1.3 0.3/0.3 recovery
156.0	SP	156.0 - 178.6 SAND : moderate yellowish brown (10 YR 5/4). 98% medium grained angular to subangular sand. contains gravel to 1" diameter. moist very dense; gradational contact.						
158.0					CR			65/1.5 68/1.5 1.0/1.0 recovery
160.0			C-3	50	SS RD			50/0.25 0/0.25 recovery intense chatter
162.0								
164.0								

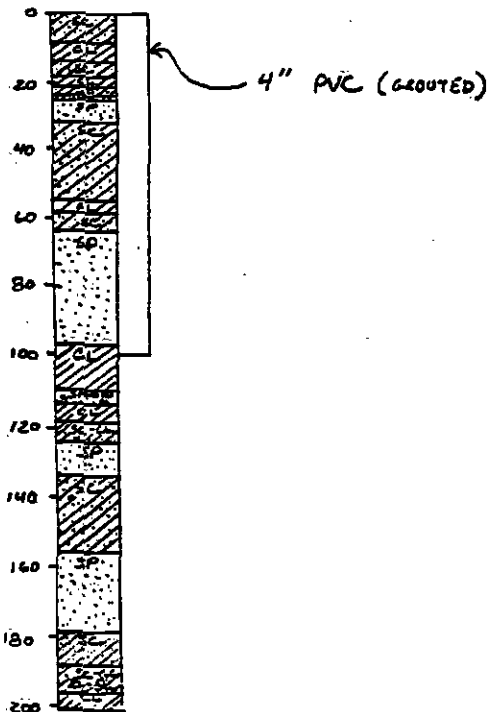
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL LOGS	RUN NO.	CORE REC. %	REMARKS
164.0	SP	156.0 - 178.0 SAND: (cont.)			RO			
				50	SS			50/3
					RO			0/0.3 recovery
166.0								
	CL	167-168.5 silty sand						
168.0								
	SP							
170.0		interbedded with very fine grained sand and no gravel	J-29	39	SS			1.4/1.5 recovery
				46				
				36				
172.0					RO			
174.0		gradual clay increase to clayey sand w/ occasional lenses of sand						
				28	SS			0/1.5 recovery
				34				
176.0				42				
					RO			
178.0								
	SC	178.6 - 188.2 CLAYEY SAND: moderate yellowish brown (10YR 5/4); 5-10% clay; 90-95% fine to medium grained sand; moist; very dense.	C-9		OK			42/1.5, 50/1.5
180.0			J-30	71	SS			1.0/1.0 recovery used catcher in SPT
				41				71/1.5, 41/1.5, 50/1.3
				50				1.0/1.3 recovery
182.0		occasional gravel			RO			
								chatter
184.0								
186.0		gravels 2" thick		67	SS			used catcher in SPT
					RO			0/0.5 recovery
188.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0	SC	178.6 - 188.4. <u>CLAYEY SAND:</u> (cont.)			RO			intense chatter
188.4	SC-GR	188.4 - 196.0 <u>CLAYEY SAND & GRAVEL:</u> moderate yellowish brown (10 YR 5/4); 5-15% clay; 60% medium to coarse angular sand; 25-35% fine to medium sub angular to subround gravel; moist; dense.			RO			0/0.25 recovery 50/0.25 rods bouncing when driving SPT intense chatter
190.0				50	SS			
192.0					RO			
194.0								
196.0	CL	196.0 - 202.0 <u>SANDY CLAY:</u> moderate yellowish brown (10 YR 5/4); 70-80% clay; 20-30% fine grained sand; moist, v. stiff.						50/1 0.1/0.1 recovery
198.0								
200.0					OR			70/1.5 0/0.5 recovery
202.0				58	SS			1.5/1.5 recovery
202.0			5-32	51				
202.0				36				
204.0		B.H. 202.0 - Terminated hole; 2:30 1/7/81; Down hole geophysical survey (Bruce Auld) 3:00-6:30pm 1/7/81; E-logs (ESA) 6:30-10:00 pm 1/7/81; water at 75' 1/12/81 cased (4" PVC) and grouted to 100' 1/12/81,						
206.0								
208.0								
210.0								
212.0								

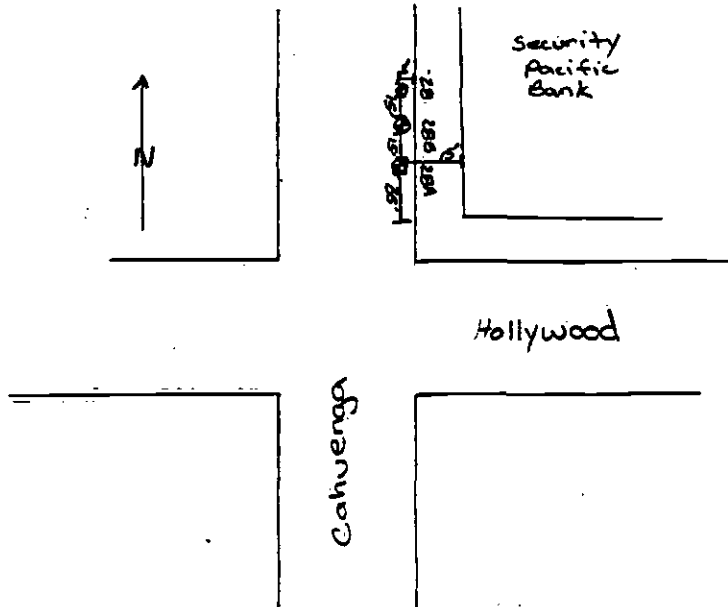


SUMMARY BORING NO. 28

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 1/5-7/81.
OVERBURDEN DEPTH (FT.) 0 TO 202.
BEDROCK DEPTH (FT.) NA TO (T.D.).
WATER PRESS. TEST NO; INTERVAL(S) TO , TO .
GROUND WATER DEPTH (FT.) 75 DATE 1/12/81; DATE .
GAS NO; DEPTH FIRST NOTICED , DATE .
E-LOG YES . 1/7/81
DOWN-HOLE SURVEY YES 1/7/81.
CROSS-HOLE SURVEY NO.
PVC CASING (I.D.): 4" 0 TO 200'; 3" TO ; 2" TO .
GROUND ELEVATION REF: 385'



SKETCH



SHEET 10 OF 10

**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 28-A

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.


PROJECT 80-1280-22 DATE DRILLED 24-25 Feb. '81 HOLE NO. 28-A
LOCATION West side Calhoun Blvd. between Yucca and Franklin GROUND ELEV. 410'
DRILLING CONTRACTOR J.N. Pitcher Co. LOGGED BY S. Staff DEPTH TO GROUND WATER 18.3'
TYPE OF RIG Falling 500 HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs - 30 inches
SURFACE CONDITIONS asphalt over concrete TOTAL DEPTH 217.5' NO. CORE BOXES 2

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0-0.1' ASPHALT 0.1'-1.3' CONCRETE			AD			07:15 24 February 1981 Drilled 0.0' - 1.8' with "garbage barrel" (cylindrical bit: 8" diameter), drilled 1.8' - 7.0' with flight auger: 6" diameter. Set 6" diameter steel surface casing from 0.0' - 7.0' with 1.5' stick-up.
2.0	ML	1.3'-6.6' SANDY SILT: moderate yellowish brown (10YR 5/4); 75% low plasticity fines; 25% fine sand; moist; soft; sand is subangular to subrounded.						
4.0								
6.0								
8.0					RD			Mixed 1 sack bentonite in drilling fluid. Drilled 7.0' - 69.0' with 4 7/8" tri-cone bit.
10.0	SP ML	9.0'-9.8' GRAVELLY SAND: moderate yellowish brown (10YR 5/4); 85% coarse to medium sand; 15% gravel; SUB-ROUNDED; medium dense; sand and gravel are angular to rounded; mostly sub- rounded; quartz-rich.						rig chattering. Drill rate = .3/minute.
12.0								Drilling with no hydraulic draw-down.
14.0	SP ML	13.0'-13.6' GRAVELLY SAND: see description above (9.0'-9.8').						rig chattering.
16.0	SP ML	15.4'-16.2' GRAVELLY SAND: (see description above). Gravel content increases to 25% of formation.						rig chattering.
18.0								Drill rate = 2'/minute.
20.0								08:30. SHEET 1 OF 11

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	ML	1.3-61.6' SANDY SILT; (continues)			RD			
22.0		sandy silt grading sandier and coarser; 35% medium to coarse sand.						drilling with 40 p.s.i. hydraulic draw-down.
24.0	SP	24.0-25.4' GRAVELLY SAND; (see description above; 9.0'-9.8'). Lens is made up of grains derived from many types of rock. (mottled).						rig chattering.
26.0	ML							
28.0								drill rate = .75'/minute.
30.0								09:40.
32.0		sandy silt grading siltier: 20% fine sand; 10% medium to coarse sand.						mixed 1/2 sack bentonite with drilling fluid.
34.0								
36.0								drill rate = 1.1'/minute.
38.0								drilling with 40 p.s.i. hydraulic draw-down.
40.0								10:00.
42.0								drill rate = 1.5'/minute.
44.0								SHEET 2 OF 11

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	ML	1.3-61.6' SANDY SILT: (continues) color slightly darker. grading sandier: 20% medium to coarse sand; 20% fine sand.			RD			drilling with 50 p.s.i. hydraulic draw-down.
46.0								drill rate = .75"/minute.
48.0		color change to light olive brown (54 5/6).						formation keeps drilling fluid viscous.
50.0								10:25.
52.0								drilling with 70 p.s.i. hydraulic draw-down.
54.0								
55.0-55.8	SP	GRAVELLY SAND: (see description above: 9.0'-9.8').						rig chattering.
56.0	ML							
58.0								drill rate = 1/minute.
60.0								thinning down drilling fluid with water.
60.6-61.6	SP	GRAVELLY SAND: (see description above: 9.0'-9.8'). Probable occasional boulders and cobbles.						rig chattering.
62.0								
64.0		WEATHERED TORANGA FORMATION top of weathered bedrock as indicated by resistivity log. color is between moderate yellowish brown (10YR 5/4) and grayish orange (10YR 7/4).						drilling with 200 p.s.i. hydraulic draw-down.
66.0		61.6-69.0 SANDY SILTSTONE: color change to dark yellowish orange (10YR 6/6).						
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	ML	66.6'-69.0' SANDY SILTSTONE: (cont.)			RD			12:00
70.0	CL (SM)	69.0-109.0' SILTY CLAYSTONE Mottled: very pale orange (10YR 8/2); light olive gray (5Y 5/2); medium gray (N 5); and dusky brown (5YR 2/2); 95% medium plasticity fines; 5% fine sand; moist; very stiff; sand is subangular; irregular bedding; beds .25"-1.0" thick, average .25" thick. Silty clay is interbedded with beds and lenses of SILTY SAND: dark yellowish orange (10YR 6/6); 85% fine sand; 15% medium plasticity fines; moist; very dense; sand is subrounded; beds and lenses .5"-1.5" thick, average .75" thick. Silty sand comprises approximately 15% of the whole formation. This material may be weathered "bedrock" since there appears to be some relict bedding dipping from 49° to nearly vertically.	box #1		PB	1		2.7/2.7 recovery. drill rate = .75'/minute standard penetration: 4.3 tons/foot?
72.0					RD			
74.0								
76.0								drilling with 40 p.s.i. hydraulic draw-down.
78.0								12:30.
80.0								
82.0		color change to a shade between dusky yellow (5Y 6/4) and light olive gray (5Y 5/2).						smooth drilling.
84.0								
86.0								drilling with 120 p.s.i. hydraulic draw-down. drill rate = .5'/minute.
88.0		silty sand comprises less than 10% of the formation.						formation clay is thickening drilling fluid.
90.0								
92.0		grading sandier; silty sand comprises 30% of formation.						thinning down drilling fluid with water. 13:15.

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	CL (SM)	69.0-109.0' <u>SILTY CLAYSTONE:</u> (continues)			RD			
94.0								
96.0		grading sandier. silty sand comprises 40% of formation.						
98.0								
100.0		minor dark gray (N3) silty clay in cuttings; 98% high plasticity fines; 2% fine sand; moist; very stiff.						drilling with 120 p.s.i. hydraulic draw-down. 13:50
102.0		 contorted bedding; minor off-sets; frequent color changes; possibly soft sediment deformation. This may be the top of the fresh, unweathered "bedrock." Silty clay shows slickensides.	Box #1		PB 2		1.6/2.5 recovery. cobble dented tube and cut recovery. drill rate = .15"/minute. standard penetration: >4.5 tons/foot ²	
104.0					RD			
106.0								drill rate = .4"/minute.
108.0								
110.0		109.0-217.5 <u>TOPANGA FORMATION CLAYSTONE:</u> olive black (5Y 2/1); 98% medium plasticity fines; 2% fine sand; moist; hard; sparsely micaceous (biotite); interbedded <u>SILTSTONE:</u> light gray (N7); 85% medium plasticity fines; 15% fine sand; moist; hard; sand is subrounded; uncemented; beds, 1-1.5" thick; average .2" thick. Bedding distorted: folded, off-set, interrupted by lenses; bedding nearly vertical; incipient fractures; approximately 20% of formation is siltstone and sandstone. <u>SANDSTONE:</u> light gray (N7); 60% fine sand; 40% medium plasticity fines; moist; hard; sand is subrounded; uncemented; micaceous.	Box #1		PB 3			rig chattering. 14:30. 2.5/2.5 recovery. standard penetration = >4.5 tons/foot ²
112.0					RD			
114.0								drilling with 220 p.s.i. hydraulic draw-down. drill rate = .2"/minute. softer, easier drilling.
116.0								SHEET <u>5</u> OF <u>11</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		109.0-217.5' CLAYSTONE: (continues).			RD			
118.0		PHYSICAL CONDITION: massive; friable to low hardness; friable to weak strength; fresh; closely fractured; fractures healed.						rig chattering.
120.0								
122.0								17:00 24 Feb. 1981 07:00 25 Feb. 1981 0% combustible gas. water table 19.3' below ground surface.
124.0								07:35.
126.0								drill rate = .34'/minute. drilling with 170 p.s.i. hydraulic draw-down.
128.0								
130.0								
132.0		silty sand and/or silty clay contains tan.						drill rate = .45'/minute. drilling with 170 p.s.i. hydraulic draw-down.
134.0								formation is thickening drilling fluid.
136.0								
138.0								drill rate = .34'/minute. 08:35.
140.0								SHEET <u>6</u> OF <u>11</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0		109.0-217.5' <u>CLAYSTONE:</u> (continues). <u>PHYSICAL CONDITION:</u> (continues as previously described).			RD			thinning down drilling fluid with water.
142.0								rig began chattering.
144.0								rig stopped chattering.
146.0								drilling with 170 p.s.i. hydraulic draw-down.
148.0								09:35.
150.0								rig began chattering.
152.0								rig stopped chattering.
154.0	79	near-vertical bedding extremely contorted, folded, off-set; siltstone and sandstone comprise approximately 40% of formation.	Box #1		PB	4		2.5/2.5 recovery. drill rate = .16'/minute. drilling with 100 p.s.i. hydraulic draw-down.
156.0					RD			11:30.
158.0								
160.0								drilling with 170 p.s.i. hydraulic draw-down.
162.0								
164.0								

PROJECT 80-1280-22

DATE DRILLED 25 Feb. 1981

HOLE NO. 28-A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		109.0-217.5 CLAYSTONE: (continues). PHYSICAL CONDITION: (continues as previously described).			RD			
166.0								rig chattering.
168.0								12:30.
170.0								thinning down drilling fluid with water.
172.0								
174.0								drill rate = .3"/minute. drilling with 180 p.s.i. hydraulic draw-down. 13:35.
176.0								
178.0								
180.0								
182.0								drill rate = .25"/minute. drilling with 200 p.s.i. hydraulic draw-down. 14:50.
184.0								
186.0								
188.0								1.5/1.5 recovery. then refusal.


Bgr

PB 5

SHEET 8 OF 11

11-290

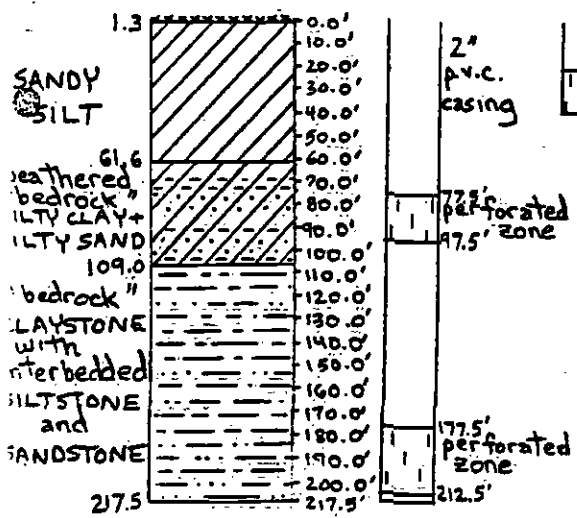
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CONS. REC. %	REMARKS
188.0		188.0-189.5 <u>SILTSTONE</u> : as described above, but better cemented (concretionary); low to moderate hardness; weak strength.	box #2		PB	5		1.5/1.5 recovery. then refusal.
190.0		109.0-217.5' <u>CLAYSTONE</u> : (continues). <u>PHYSICAL CONDITION</u> : (continues as previously described).			RD			drilling with 300 ps.i. hydraulic draw-down.
192.0								thinning down drilling fluid with water.
194.0								drilling with 200 ps.i. hydraulic draw-down.
196.0								16:00.
198.0								drill rate = .35'/minute.
200.0								
202.0								easier drilling. drill rate = .4'/minute.
204.0								
206.0								
208.0								drill rate = .3'/minute. drilling with 200 ps.i. hydraulic draw-down.
210.0								
212.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212.0		109.0-217.5' <u>CLAYSTONE:</u> (continues) <u>PHYSICAL CONDITION:</u> (continues as previously described). off-set and distorted beds; fairly well-cemented; 60% of formation is sandy siltstone; light gray N7; 70% low plasticity fines; 30% fine sand; moderately hard; weak; sand is subangular. 40% of formation is silty claystone; grayish olive (10Y 4/2); 95% low plasticity fines; 5% fine sand; low hardness; weak strength; thinly bedded; beds .05- .2" thick.			RD			
214.0								
216.0	71 84		BOX 2		PB	6		2.0/2.5 recovery. drill rate = .4/minute. drilling with 200 p.s.i. hydraulic draw-down. 17:40 25 Feb. '81 07:00 26 Feb. '81 0% combustible gas. water table 24.2 below ground surface. 08:30-11:30 ran electric logs. 11:30-14:00 installed 2" diameter p.v.c. casing from 0.0'-217.5' perforated from 77.5'- 97.5' and 177.5'-212.5'. set bentonite plug from 51.7-54.0'. installed 1" diameter p.v.c. casing from 0.0'-40.0'. perforated from 20.0- 40.0'.
218.0		B.H. 217.5' Terminated hole.						
220.0								

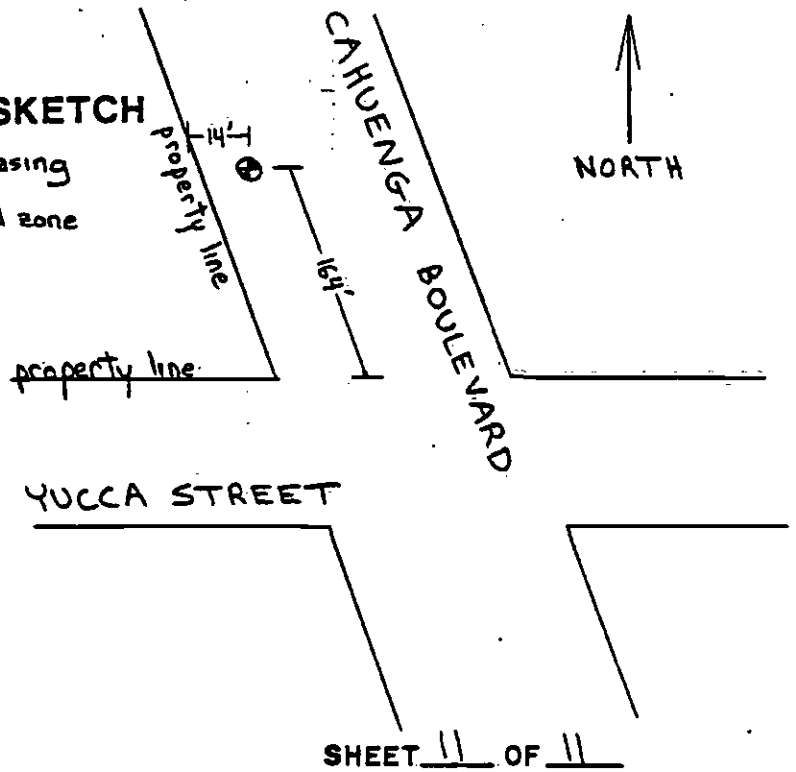


SUMMARY BORING NO. 28-A

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 24-25 Feb. '81
 OVERBURDEN DEPTH (FT.) 0.0 TO 61.6.
 BEDROCK DEPTH (FT.) 61.6 TO 217.5 (T.D.).
 WATER PRESS. TEST NO; INTERVAL(S) TO , TO .
 GROUND WATER DEPTH (FT.) 18.3 DATE 25 Feb.; 24.2 DATE 26 Feb.
 GAS NO; DEPTH FIRST NOTICED , DATE .
 E-LOG YES.
 DOWN-HOLE SURVEY NO.
 CROSS-HOLE SURVEY NO.
 PVC CASING (I.D.): 4" TO ; 3" TO ; 2" 0.0' TO 217.5'.
 GROUND ELEVATION REF. 414'



SKETCH



SHEET 11 OF 11



THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED Jan 19-23, 1981 HOLE NO. 29
LOCATION 43 1/2 DIX/CAHUENGA Int., 15 1/2 CAHUENGA JUST N/2 FRANKLIN AV GROUND ELEV. 417'
DRILLING CONTRACTOR P.C. Exploration LOGGED BY DAN Gillette DEPTH TO GROUND WATER 10'
TYPE OF RIG Mobile 8-40 HOLE DIAMETER 3" 6" HAMMER WEIGHT AND FALL 140 lbs 15-18"
SURFACE CONDITIONS W/2 CAHUENGA on SIDEWALK TOTAL DEPTH 209.8' NO. CORE BOXES 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	TIME DATE
0	Af	0.0-0.4 Concrete, Artificial Fill, Concrete			C			Sidewalk and Traffic Island	1-19-8
1	SM	0.4-20.5 ALLUVIUM			RD			Poured over concrete street	8 ⁰⁰
2		0.4-16.5 SILTY SAND; Mod. brn. (SYR 4/4); 10-15% non plastic fines; 85-90% F. + Med SAND; 0-5% 3/4" Gravel; lenses (1 1/2") of silty clay; Moist; M. Dense.						Core 8" hole w/ CASBIOE Tipped coring tool	9 ⁰⁰
3								TRI CONE - 0.4 → 47.0	10 ⁰⁰
4								4 3/8" DIA. BIT.	
5									
6									
8									
10			J-1	6	SS			std pen = 10.0-11.5	11 ⁰⁰
12				10				1.9/1.5 recovery	11 ⁰⁶
14		14.5-15.0 gravel		10	RD				
16								CHATTER	
18	GP	16.5-20.5 GRAVEL and COBBLES H. brn (SYR 5/6) and brownish gray (SYR 4/1); 5-10% non-plastic fines; 20% M+C SAND; 60% S. Ang. gravel; 5% < COB- Bles and Boulders(?); Moist; Dense.						CHATTER	
20					PB	1		Recover = 1 19.0-22.0	12 ⁰⁰

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	GP	0.4-20.5 ALLUVIUM (cont) WEATHERED TOPANGA FORMATION			PB	1		Pitcher #1 19.0-22.0 trouble w/ sample - use 1000 psi down press No Recovery
2		20.5-36.0 SANDY CLAYSTONE: light brn (5YR 5/6); 90% plastic fines; 10% fine sand; mottled (gray blebs and streaks)	J-2	5 8 10	SS			std pen #2 22.0-23.5 9/1.5 recovery
4		MOIST; firm PHYSICAL CONDITION: MASSIVE OR LITTLE FRACTURED- (INDISTINCT DUE TO WEATHERING); soft to friable hardness; friable strength; deep weathered			RD			
6								
8								
30		29.0-29.6 - cobbles or boulders			PB	2		Pitcher barrel #2 29.0-32.0 RASHED COBBLE thru clay No recovery
2			J-3	7 10 13	SS			std pen #3 32.0-33.5 1.2/1.5 recovery
4					RD			
6		TOPANGA FORMATION 36.0-42.0 SANDY CLAYSTONE AND SILTSTONE: mod yel brn (10YR 5/4) and mod gray (N5); predom sandy cist beds (1/4" - 1/2") w/ siltst inter beds 38.2-39.8 - FRACTURE ZONE Chaotic bedding no preferred stress direction						36.0 - first appearance of bedding
8								
40		PHYSICAL CONDITION: close to mod. fract.; friable to low hardness; weak to mod. strength; deep to mod. weathering	Box 1		PB	3		Pitcher Barrel #3 40.0-42.0 2.0/2.0 recovery
2		42.0-45.0 SILTY CLAYSTONE: light brn. (5YR 5/6); 100% plastic fines	J-4	11 30 45	SS			std pen #4 42.0 -> 43.5 1.5/1.5 recovery As at 42.0 - penetrometer 3.5 (6 rows apart) 2/9/81
44		PHYSICAL CONDITION: massive or little fract.; soft; plastic; mod weathered.	Box 1		PB	4		SHEET OF 10

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44		42.0-45.0 SILTY CLAYSTONE			PB			Pitcher Barrel #4
		45.0-209.8 SANDSTONE	Box 1			4		43.5 → 45.6 2 1/2 / 2.1 recovery
6		Mod yel. brn (10YR 5/4) and med light gray (N6); mod yel brn beds 1-2' in thickness; w/ med light gray clayey ss interbeds (1/8 to 1/4"); contains organic (dk brn) dots; lightly cemented; Fe oxide stains on fracture surfaces 47-49'			RD			change mud - set up to core - clean out hole to 47'
8	T ₆₀		Box 2		C	5		RUN 5 47.0-48.1 1 1/2 / 1.1 recovery
50	T ₆₀					6		RUN 6 48.1-53.0
2		PHYSICAL CONDITION: mod. fract.; low hardness; weak strength; mod to little weathered.						4.9 / 4.9 recovery
4								RUN 7 53.0 → 58.0
6		50.0-209.8 Sandstone color is med light gray (N6) and grayish black (N2); occurs as sandstone beds (N6) 1/2" to 3" in thickness w/ grayish black siltstone and claystone interbeds (1/16 to 1/8").				7		2.8 / 5.0 recovery
8	T ₆₀							RUN 8 58.0-61.0
60	T ₁₅	56.9-57.4 - fracture zone intensely fractured	Box 3			8		2.4 / 3.0 recovery
2	T ₁₅	60.0-68.0 - 40% claystone beds						RUN 9 61.0 → 66.0
4						9		
6		65.0-65.2 - well cemented sandstone med light gray (N6) v. hard						4.2 / 5.0 recovery
		66.0 - cemented						RUN 10 66.0 → 71.0
68	T ₁₀					10		4.0 / 5.0 recovery

PROJECT 80-1280-22

DATE DRILLED 1/19-23/81

HOLE NO. 29

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68	T ₁₀ L ₅	45.0-209.8 SANDSTONE: (cont) (AS AT 45.0)	Box 3		C	10		RUN 10 66.0 → 71.0
70								70.2-70.5 cemented AS AT 65.0
2	T ₁₀					11		RUN 11 71.0 → 75.5
4								4 5/4.5 recovery
6	T ₁₀					12		RUN 12 75.5-80.5
8								5 0/5.0 recovery
80	T ₁₀		Box 5			13		RUN 13 80.5-85.5
2								4 9/5.0 recovery
4	T ₁₀					14		RUN 14 85.5-90.5
6								4 8/5.0 recovery
8	T ₁₀					15		RUN 15 90.5 → 95.5
90								SHEET 4 OF 10
92								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92		45.0-209.8 SANDSTONE (cont)	Box 6		C	15		RUN 15 90.5-95.5
4		92.0-92.5 cemented ss. 93-95 - lenticular shaped sandstone inclusions - 30% - 1/4" x 1/2"						50/5.0 recovery 347
6		PHYSICAL CONDITION: CONTINUES AS PREVIOUSLY DESCRIBED						RUN 16 95.5-100.5 405
8						16		
100		99.0 cemented ss (as at 65.0) - contact at 40"	Box 7					50/5.0 recovery 455 1-26-8
2		102-104 SLUR ZONE - 1/4" offset				17		RUN 17 100.5-104.0 1-21-8 715
4								3.5/3.5 recovery 745
6		105 HAIRLINE FRACTURES - no offset						RUN 18 104.0-109.0 750
8		106.8-108.6 - SLUR ZONE 1" offsets - En Eclelon pattern	Box 8			18		50/5.0 recovery 820
110								RUN 19 109.0-113.8 840
2		111.6 SLUR ZONE 1/4" offset				19		9 ⁰⁰ AM - TIM M. - O ₂ - 21% COMBUSTIBLES - 0%
4		113.0-118.0 BRECCIATED SANDSTONE APPEARS AS 1/4" SQUARE frag- ments IN CLAYSTONE - chaotic bedding						4.8/4.8 recovery 925
116						20		RUN 20 113.8-118.8 930

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		45.0-209.8 SANDSTONE (CONT)			C			RUN 20 113.8-118.8
8		118.0 - 1/2" offset	Box 9			20		50/50 recovery
120		119.0-119.2 Cemented Sandstone (AS AT 65.0) 119.2 CALCITE IN JOINT 119.3 FAULT - 1/4" WIDE clay filled				21		RUN 21 118.8-122.0 24/32 recovery
2		120.5 calcite in joint 120-124 SLATE - appears as v. hard version of cist interbeds				22		RUN 22 122.0-124.0 20/20 recovery
4		123.5-132.2 medium light gray (L6) w/ slate (L6) interbeds (1-3"); sandstone matrix composed of sand 75% and 25% clay; fragments in ss were 1/8 - 1/2" siltst., ss, and cist.				23		RUN 23 124.0-128.5 4.5/4.5 recovery
8		126.0 - Calcite filled joints 1/8 - 1/16"	Box 10			24		RUN 24 128.5-131.5 30/30 recovery
130		PHYSICAL CONDITION: closely fractured - intense (125-126'); mod hard to hard; mod. strong; little weathered				25		RUN 25 131.5-136.5 change water
2		130.0 - vertical calcite filled joints				26		RUN 26 136.5-141.5 50/50 recovery
4		132.2 - 209.8 SANDSTONE AS AT 50.0' eg (gray + blk laminated s.s)				26		50/50 recovery
6		135.0 clay filled Slane Zone						
8		138.0 Brecciated ss; 1/4" offset in cist.	Box 11					
140								SHEET 6 OF 10

PROJECT 80-1280-22

DATE DRILLED 1/19-23/81

HOLE NO. 29

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		45.0-209.8 SANDSTONE (CONT) 140.0- offset of UNKNOWN AMOUNT	Box 11		C	26		RUN 26 136.5-141.5 50/50 recovery
2								
4						27		RUN 27 141.5-145.5
6								40/40 recovery
8		146.0-149.8 FRACTURE ZONE Multiple offsets 1/8" - 1/2"	Box 12			28		RUN 28 145.5-150.5
150		PHYSICAL CONDITION (146-151) Intensely fractured; Friable; Weak; little weathered.						47/50 recovery
2						29		RUN 29 150.5-154.0
4			Box 13					35/35 recovery
6								RUN 30 154.0-159.0
8		157.0-160.0 FRACTURE ZONE offsets 1/4" - 1" - En Echelon				30		50/50 recovery
160								RUN 31 159.0-164.0
2						31		50/50 recovery
164		164.0 - offsets UNDETER. AMOUNT						SHEET 7 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		450-209.8 SANDSTONE: (cont)	Box 14		C			RUN 32 164.0-169.0
6		164.5-175.0 SLIAR ZONE no predominate direction of principal stress; offsets in laminated ss 1/4" → 3/4" often in En Echelon manner				32		50/5.0 recovery
8		BRICCIATED SS IN UST 164, 168						10 ⁰⁰
170		169-176.5 cist very deformed chaotic foliations - no preferred direction						RUN 33 169.0-174.0
2		PHYSICAL CONDITION (165-175) Intensely fractured; low to mod hardness, mod to weak strength; little to fresh weathering.				33		50/5.0 recovery
4			Box 15					RUN 34 174.0-178.3
6		175 offset magnitude undetermined				34		10 ⁴⁵
8								43/4.3 recovery
180						35		RUN 35 178.3-179.8
2								1.5/1.5 recovery
4			Box 16					RUN 36 179.8-184.8
6		182.0-209.8 SLIAR ZONE contains brecciation and 1/4-3/4" offsets as at 164.0				36		50/5.0 recovery
188						37		RUN 37 184.8-189.8
								12 ¹⁰ 12 ¹⁵

PROJECT 80 1280 22

DATE DRILLED 1/19-23/81

HOLE NO. 29

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	[Diagrammatic symbols]	45.0-209.8 SANDSTONE: (cont)	Box 16		C	37		Run 37 184.8-189.8 50/50 recovery
190		182-209.8 shale zone (cont)						
2	[Diagrammatic symbols]	188 - 1/8" offsets 189 - 1" offset						
4		192 - Multiple offsets MAGNITUDE UNKNOWN	Box 17			38		50/50 recovery
6	[Diagrammatic symbols]	195-196 - Multiple offsets En Echelon PATTERN						
8						39		50/50 recovery
200	[Diagrammatic symbols]	<u>PHYSICAL CONDITION (182-209)</u> Closely to intensely fractured; Low hardness; AND strong; Little to fresh weathering						
2			Box 18			40		Run 40 199.8-204.8 50/50 recovery
4	[Diagrammatic symbols]							
6						41		Run 41 204.8-209.8 50/50 recovery
8	[Diagrammatic symbols]	208.0 cemented SS						
210		TOTAL Depth 209.8 Water sampled 2/25/81						

SHEET 9 OF 10



SUMMARY BORING NO. 29

PROJECT 80-1280-22 STATION HOLE No DATE DRILLED Jan 19-22, 1981

OVERBURDEN DEPTH (FT.) 0.0 TO 20.5

BEDROCK DEPTH (FT.) 20.5 TO 209.8 (T.D.)

WATER PRESS. TEST Yes; INTERVAL(S) 110 TO 130, 130 TO 150

GROUND WATER DEPTH (FT.) 10' DATE 1-20-81; DATE _____

GAS No; DEPTH FIRST NOTICED _____, DATE _____

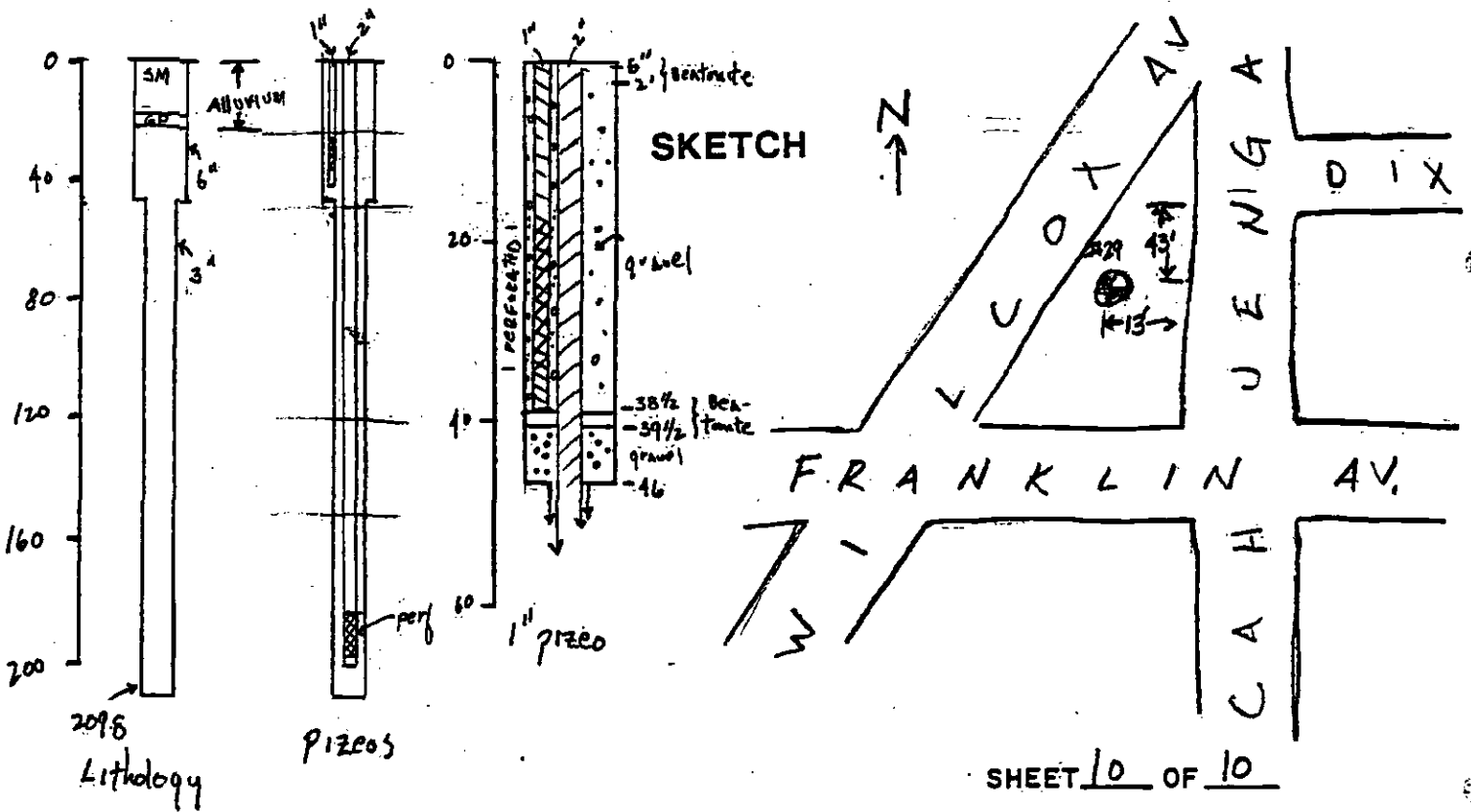
E-LOG 1-22-81

DOWN-HOLE SURVEY 1-22-81

CROSS-HOLE SURVEY No

PVC CASING (I.D.): 4" 1 1/2 TO _____; 3" No TO _____; 2" 0.0 TO 203.5

GROUND ELEVATION REF. 417' 1" 0.0 TO 33.5





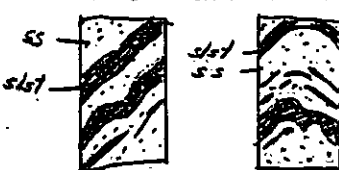
THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.


PROJECT SCATD (80-1280-22) DATE DRILLED 2-26-81/3-3-81 HOLE NO. 30
LOCATION Calnege Blvd 76.0' north of Ada Street GROUND ELEV. 476'
DRILLING CONTRACTOR PC Exploration LOGGED BY Stephen M. Festa DEPTH TO GROUND WATER _____
TYPE OF RIG B-40 HOLE DIAMETER NX HAMMER WEIGHT AND FALL 140 lb. - 30 in.
SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 251.0 NO. CORE BOXES 20

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0	SC	0.0-2.0 CONCRETE; 0.2-16.0 CLAYEY SAND; grayish brown (5YR 3/2); plastic flow (25%); very fine to fine sand (75%); moist; dilatancy low; medium toughness.			RD			Started drilling at 2:00 PM; clear day.
2.0								
4.0								
6.0								
8.0								
10.0		continued; moist; medium dense.		3	SS			SPT at 10.0; 1.0/1.5 recovery
			J-1	4				
				5				
12.0					RD			
14.0								
16.0								
18.0								
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	SC	16.0-29.0 <u>CLAYEY SAND:</u> dark yellowish brown (10YR 4/2); plastic fine s (20%); vary fine to fine sand (95%); gravel (2.5%) up to 4mm in max. dia; moist; medium dense; dilatancy slow; medium toughness.	3-2	4	RD			(CONTINUED SPT at 20.0; 1.2/1.5 recovery.
22.0				7				
24.0				9				
26.0								
28.0								minor rod chatter 27.0 to 29.0' (cobbles).
30.0	SP (SC) (CL)	<u>WEATHERED TOPANGA FORMATION</u> 29.0-45.0 <u>STRATIFIED SAND, SILTY SAND AND SANDY CLAY;</u> stratified very thin to thin laminae of dark yellowish orange (10YR 6/6) and dusky yellowish brown (10YR 2/2) very fine to fine sand and silty sand; and pale yellowish brown (10YR 6/2) sandy clay; mottled; moist; dense;	3-3	16	RD			SPT at 30.0; 1.5/1.5 recovery. Stopped drilling at 4:50 AM. 2-27-81 Resumed drilling at 7:00 AM from 31.5'
32.0				17				
34.0				27				
36.0								minor rod chatter from 35.0-40.0 (gravelly)
38.0								
40.0	25 70	coarsened; moist; very dense; dip of laminae increases with depth.	3-4	12	RD			SPT at 40.0; 1.5/1.5 recovery.
42.0				27				
44.0				36				

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	NUM NO.	CORE REC. %	REMARKS
44.0		29.0-45.0 SAND, SILTY SAND AND SANDY CLAY: (CONTINUED) <u>JOPANGA FORMATION</u>			RD			(CONTINUED) former drilling resisted from 45.0'
46.0								
48.0								installed 50.0' of 4" casing to a depth of 49.0'
50.0	LD Y	<u>450-1558 INTERBEDDED SANDSTONE AND SILTSTONE.</u> wavy, parallel, alternating very thin to medium lamina of light olive gray (5Y 5/2) siltstone and very fine to fine dark yellowish orange (10YR 6/6) sandstone; moist; weathered.			C			continuous air casing from 50.0'
52.0						1	5/16	
54.0	SD Y	<u>PHYSICAL CONDITION:</u> massive; friable to low hardness; friable to weak strength; moderately weathered; tends to fracture along bedding planes.				2	3/5 4/9	350 - 400 psi.
56.0								
58.0	30 Y	wavy, parallel, alternating very thin to medium lamina of brownish black (5YR 2/1) siltstone and yellowish gray (5Y 7/2) fine moderately weathered sandstone grading to fresh medium light gray (N6) sandstone; hairline fractures apparent (offset undeterminable).				3	1/2 2/4	
60.0	10 Y							
62.0	25 Y							
64.0	60 Y	primarily sandstone to 62.8 then primarily siltstone; to 70.3'				4	1/8 2/4	
66.0	16 Y					5	5/16	
68.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	40 Y	UNDIFFERENTIATED INTERBEDDED SANDSTONE AND SILTSTONE: (CON'T)			C			(CONTINUED)
70.0		very parallel alternating very thin to medium laminae of light olive gray (S451) siltstone and fine to coarse medium light gray (N6) sandstone.	Box #2			6	24 24	
72.0	50 Y	PHYSICAL CONDITION: little fractured, hardness moderate to hard; low to moderate strength; fresh; tends to fracture along bedding planes and fractures. 70.3-71.1 well cemented fine to medium sandstone; hard.				7	15 15	oil film on drilling water.
74.0	40 Y	primarily sandstone (80%); siltstone (20%); cross-bedding apparent (sequence is upright).	Box #3			B	15 15	400 psi.
76.0								
78.0	80 Y	siltstone (70%); sandstone (30%); coarse grained at 77.7.				9	18 18	
80.0	50 Y	sandstone (50%); siltstone (50%); channeling patterns evident; calcite filled irregular venalet at 79.6.						
82.0						10	3.7 3.7	
84.0	50 Y	continued.						400 psi.
86.0			Box #4			11	47 47	packet penetrometer 74.5 kg/cm ²
88.0	40 Y	continued; fine to medium sandstone 87.7 to 89.7, 90.3 to 90.9 from 90.9 alternating sandstone and siltstone.						
90.0						12	47 47	
92.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	Bo 40 Y	45.0-155.8 <u>INTERBEDDED SANDSTONE AND SILTSTONE (CON 7)</u>	Bo 25		C	12	40 40	(CONTINUED)
94.0						13	40 40	
96.0		fine to medium sandstone 92.4 to 93.8, alternating sandstone and siltstone from 93.8.	Bo 25					
98.0	40 Y	continued. PHYSICAL CONDITION: little fractured; hardness moderate to hard; low to moderate strength; fresh; tends to fracture along bedding planes and fractures.				14	40 40	Stopped drilling at 5:00 AM on 2/28/81
100.0								
102.0		continued; discontinuous silt lamina.				15	20 20	2-28-81 Resumed drilling at 7:00 AM; heavy continuous rain.
104.0	40 Y	sandstone (50%), siltstone (50%) at 104.5  discontinuous silt lamina	Bo 26					
106.0						16	40 40	
108.0								
110.0	40 Y	from 110.3 to 118.0; primarily greenish gray (5G 6/1) fine to medium well cemented sand- stone; siltstone (c. 5%)				17	50 50	
112.0								
114.0	40 Y		Bo 27			18	10 10	
116.0	40 Y	114.5 to 115.3 coarse sandstone; well cemented; moderately hard.				19	10 10	using circulation water; oil film on drilling water.
						20	30 30	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	70	US.G-155B INTERBEDDED SANDSTONE AND SILTSTONE (CON'T)			C			(CONTINUED)
118.0	40	116.7 to 116.9 alternating very thin laminae of siltstone and sandstone; hairline fracture showing 2.0cm. offset.	Box #7			20	3.0 3.0	400 psi
120.0	70	from 118.0 very parallel alternating, very thin to medium laminae of greenish gray (566/1) sandstone (50%) and siltstone; hairline fractures apparent.				21		
122.0	35						4.0 5.0	
124.0	20	continued; calcite filled fractures at 123.5 <u>PHYSICAL CONDITION:</u> little fractured; hardness moderate to hard; low to moderate strength; fresh.				22	1.5 2.5	
126.0	40	continued; siltstone (70%); fine to medium sandstone (30%)	Box #8			23	2.5 2.5	
128.0	40	continued; hairline fractures showing up to 3mm. offset.				24	2.5 2.5	400 psi pocket penetrometer 74.5 kg/cm ²
130.0	40							
132.0	50	continued; 131.5 to 132 coarse grained well cemented greenish gray (566/1) sandstone.				25		
134.0	40	continued; closely fractured.				26	2.0 2.5	
136.0	20-30	continued.	Box #9			27	1.5 2.0	400 psi
138.0	40	continued; primarily sandstone 137.0 to 137.5; little fractured.				28	3.0 3.0	
140.0							5.0 5.0	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL M.D.C.E.	RUN NO.	CORE REC. %	REMARKS
140.0		142.0-159.0 INTERBEDDED SANDSTONE AND SILTSTONE; (CON'T)			C			(CONTINUED)
142.0		wavy, parallel, alternating very thin to medium lamina of greenish gray (56611) fine to coarse sandstone and brownish black (54221) siltstone.	Box # 9			28	15 50	
144.0	40 70 1	<u>PHYSICAL CONDITION:</u> moderately to closely fractured; moderately to low hardness; moderately strong strength; fresh.	Box # 10					400 psi.
146.0						29	15 50	After completion of R29, pulled rods to changed bit Stopped drilling at 148.0 at 4:20 PM.
148.0		continued; fine to medium sandstone 148.5 to 152.8.						5:10 7:00
150.0	40 70 1					30	18 48	3-2-81 Resumed drilling from 148.0 at 7:00 AM; heavy continuous rain until 11:00 AM.
152.0	40	continued; low hardness from 151.0'; closely fractured;						400 psi
154.0	70					31	15 50	
156.0	40 70 1	155.8 to 156.4 clay shear zone	Box # 11					shear zone begins at 155.8
158.0	40 70 1	157.2 to 157.9 fine to medium well cemented sandstone, moderately hard.				32	20 20	
160.0	70	159.8 - 162.6 CLAY GOUGE: dark greenish gray (56411); clay (80%); various rock and mineral fragments (20%).						
162.0		162.6 - 171.3 VOLCANIC BRUCCIA: dark greenish gray (56491); angular to subangular fine grained vesicular basalt fragments in a dark greenish	Box # 12			33	15 50	
164.0						34	30 30	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		162.6-171.3 <u>VOLCANIC BRECCIA</u> : (cont'd) gray (5641) clay matrix; basalt fragments range up to 5cm in max. dia. increasing up to 8cm. in max. dia. from 1630'; basalt fragments (65%), clay matrix (35%).			C	34	36	(CONTINUED)
166.0						35	26	
168.0		continued; 168.5 to 170.0 closely to internally fractured; slickenside surfaces 80° from horizontal; basalt fragments 2.3cm. in max. dia.	Box #12			36	5.5	
170.0							5.5	
172.0		171.3-172.6 <u>METASANDSTONE</u> : greenish black (56421); medium to coarse hard fossiliferous (?) metasandstone				37	17	
174.0		173.0-174.9 <u>VOLCANIC BRECCIA</u> : dark greenish gray (5841) angular to subrounded fine grained vesicular basalt in a dark greenish gray (5641) clay matrix (similar to above 162.6 to 171.3); internally to closely fractured.				38	17	
176.0		174.9-183.5 <u>METASANDSTONE</u> : light gray (47) fine to coarse grained; fossiliferous (?); hard; closely to internally fractured; numerous hairline fractures	Box #13			39	3.1	
178.0								losing circulation water.
180.0						40	4.6	
182.0		continued; thin coal seam to 1/4" within metasandstone						
184.0		183.5-251 <u>BASALT</u> : greenish black (56421); many slickensided surfaces; fine to very fine matrix containing plagioclase laths.				41	2.5	
186.0		<u>PHYSICAL CONDITION</u> : crushed to closely fractured mostly crushed; moderately hard; weak to moderately strong; moderately weathered.				42	1.7	Stopped drilling at 4:50 at a depth of 180.0'
188.0								SHEET 8 OF 12

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (10')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0	30	183.5-251 <u>BASALT</u> : greenish black (SAY 2/1); numerous slickensided fractures some fractures calcified filled to 1/8"	Box 14		C	43	33 23	3/31/81 began drilling 7 am. L. Schöcherlein taking over for 2. tests as logging geologist minor circulation loss all day
190.0		190-191.6 physical condition: little fractured, 1.4' moderately hard to hard; moderately strong; fresh				44	12 17	
192.0		191.6 6" shear zone				45		
194.0	40	increased size of phenocryst groundmass containing plagioclase laths to 1/4"	Box 15			47		
196.0		40° fracture set				47		
198.0		197 6" dark reddish brown (10R 3/4) hydrothermal alteration zone, top of flow				46		
200.0						47		
202.0		203-215 intensely to closely fractured, clay coating fracture surfaces numerous slickensides, dominant fractures 30°	Box 16			47	15 15	
204.0	10					48	24 25	10:08
206.0		205-208 vesiculated, filled with quartz, red brown, altered, top of flow				49	15 26	10:30 blocked
208.0		208.5-212 crushed to intensely fractured				50	15 19	blocking oil on tub possible shale
210.0						51	22 23	sheared material clay matrix washing out leaving gravel sized fragments
212.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (10')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212.0		<u>BASALT</u> (cont.)	Box 16			51	12:25	
		212-214 vesicles filled with silica				52	12:35	
214.0			Box 17				2.7 3.0	
		215-226 closely to moderately fractured w/ fault gouge and intensely fractured zones to 6"				53		mixed 1 bag Quik Thik
216.0							22.2 24	
218.0		217.8 - 3" seam of fault gouge with basalt fragments to 1/2"				54	23 25	
		219 & 219.5 1/2" seam of fault gouge						
220.0						55	19 15	2:10
222.0		222 - 223 fault gouge w/ small sized basalt fragments						
		224-225 gouge and intensely fractured				56	29 2.0	
224.0			Box 18			57	29 3.0	
226.0		226 - 1" gouge zone 226-232 Physical Conditions: moderately fractured min. 1/4" max 1.5" mostly 1.0"; hard; strong; fresh 10° fracture calcite coated						
228.0		30° & 60° fracture sets most fractures rehealed w/ calcite, fracture more readily along old fracture surfaces, some slickensides minor fracture offsets 230.5 and smaller fractures abut against larger;				58	39 2.5	
230.0		232 - 233.5 crushed to closely fractured				59	2.0 3.0	4:17 4:26
232.0						60	3.0 3.8	4:40
234.0			Box 19					
236.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6")	DRILL HOOD	RUN NO.	CORE REC. %	REMARKS
236.0		<u>BASALT</u> : (cont.)	Box 19			60		
238.0		Physical condition: moderately fractured. 3 to 1.5 mostly .8"; hard, strong; fresh				61	11/12	
240.0		239.8 - 240.6 intensely fractured				62	25/26	
242.0						63	6.05	
244.0			Box 20			64	6.20	
246.0	85°							
248.0								
250.0	85°	dominant fracture set 50° dip most healed w silica surfaces maximally smooth & undulating						
252.0		B.H. 251.0' terminated 7:45 3/3/81; 3/4/81 E-log 8:30am 3/4/81 water pressure test 1 pm.						problems at 152' getting E-log tool down hole cleared out hole 2 times before completing E-logs
254.0								
256.0								
258.0								
260.0								



SUMMARY BORING NO. 30

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 2/26/81-3/4/81

OVERBURDEN DEPTH (FT.) 0 TO 45

BEDROCK DEPTH (FT.) 45 TO 251 (T.D.)

WATER PRESS. TEST yes; INTERVAL(S) 70 TO 130, 130 TO 251

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____

GAS NO; DEPTH FIRST NOTICED _____, DATE _____

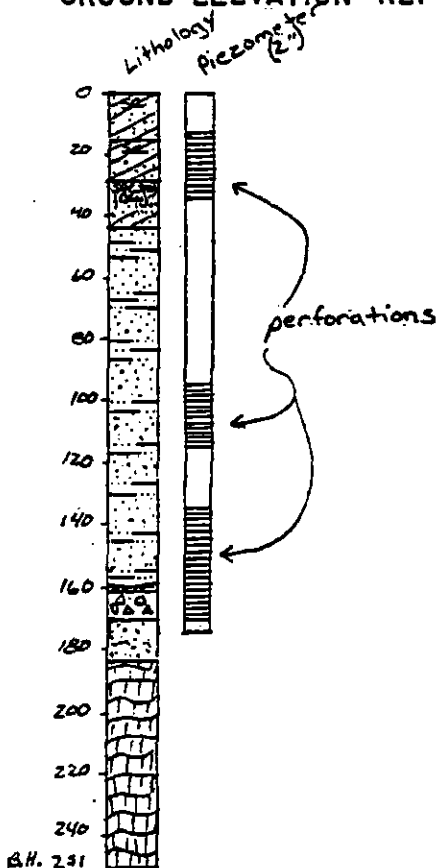
E-LOG YES 3/4/81

DOWN-HOLE SURVEY NO

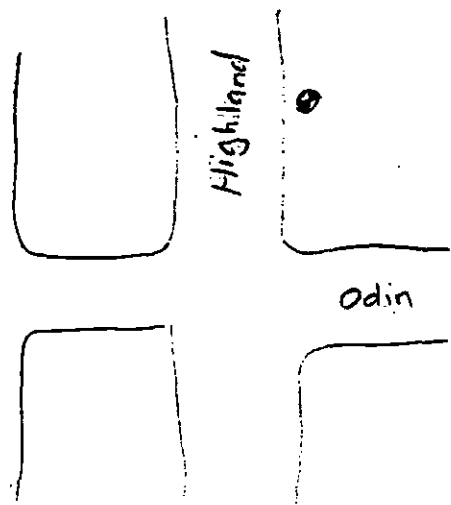
CROSS-HOLE SURVEY NO

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0' TO 175'

GROUND ELEVATION REF. 476'



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 2/12-24/81 HOLE NO. 31
LOCATION Chunee at Hollywood Bowl Entrance GROUND ELEV. 482'
DRILLING CONTRACTOR P.C. Exploration LOGGED BY Schoeberlein/Teate DEPTH TO GROUND WATER _____
TYPE OF RIG Mobile B-40 HOLE DIAMETER 3" HAMMER WEIGHT AND FALL 14016 - 30"
SURFACE CONDITIONS concrete sidewalk TOTAL DEPTH 300.0 NO. CORE BOXES 27

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0-0.2 <u>CONCRETE</u> ; 0.0-0.6 <u>SAND BASE</u> ; 0.6-85.4 <u>BASALT</u> ; moderate yellowish brown (10YR5/4) to moderate olive brown (5Y4/4);			RD			void under concrete 2"; drilling with 43/4" triangles; mixed mud 1 bag.
2.0								
4.0		<u>PHYSICAL CONDITION:</u> crushed; friable hardness; friable strength; deeply weathered.						
6.0			J-1	65	SS			14016 hammer on A-rad; 65/1.3; 0.3/0.3 recovery
8.0					RD			4 min/ft drilling rate
10.0								chatter 6 min/ft.
12.0		moderate olive brown (5Y4/4); fine grained; vesicular with vesicles up to 3mm in max. dia. commonly filled with ochronite and zeolites.	Box #1		C	1	0 1.0	begin coring with face discharge diamond bit
14.0		<u>PHYSICAL CONDITION:</u> intensely to closely fractured, ranging .02 to .12 averaging .05; fracture planes common- ly coated with Fe oxides, clay (up to 3mm) and occasional calcite; moderately hard; moderately strong; deep to moderate weathering.				2	0 1.0	pipe out of pump broke down 10 min.
16.0						3	0 1.0	losing circulation; no cuttings going into formation; reaming with 43/4" triangles to 20'; mixed mud 2 bags; attempt to get below fractured weathered suspected basalt.
18.0					RD			rig drilling smoother
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0		<u>06-85.4 BASALT (CONTINUED)</u> moderate olive brown (5Y4/4); fine grained, vesicular with vesicles up to 3mm. in max. dia. and commonly filled with chlorite and zeolites	Boy #1		C			(CONTINUED)
22.0		<u>PHYSICAL CONDITION:</u> intensely to closely fractured; fracture planes occasionally filled with calcite (numerous hairline fractures); moderately hard; moderately strong; deeply weathered.			RD			reamed and continued drilling with 4 3/4" tremore bit, rock too weathered and fractured to core; mixed / bag mud
24.0								75.4; 0.1% recovery
26.0		26.5-26.8 hard lens		3-2	75	55		
28.0					RD			
30.0		29.0-29.5 hard						
32.0				1-1	30	30		50.1; 0.1% recovery
34.0					RD			2-13-81
36.0		olive grey (5Y3/2) and light olive brown (5Y5/6) to brownish black (5YR2/1); aphanitic; inclusions of dusky green trachite material and coarse-grained more weathered material to 1".	Boy #1		C			5-8 min/ft drilling rate
38.0		quartz and Mn, Fe oxide coating on fractures; 3 dominant fracture orientations						
40.0		40.4-45.0 dark yellowish brown (10YR4/2) trach volcanic glass fragments in altered olive grey (5Y3/2) ground mass 41.5-42.0 intensely fractured, clay border						
42.0								
44.0			Boy #2					


DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MOOSE	RUN NO.	CORE REC. %	REMARKS
44.0		0.6-045 BASALT: (cont) PHYSICAL CONDITION: as above	Box 2		C	8	93/97	
46.0	75-88	semi vesiculated w/ zeolites; most fractures healed w/ CaCO ₃ ; inclusions of coarser grained material in aphanitic matrix to 2"				9	15/28	10:50
48.0	75-88	45.0-46.0 fracture set 75-88 dip, silica filled rock less weathered with depth				10	39/30	11:15 - 11:15 Remaining to case upper fractured zone to 49'
50.0		50-70° fractures slickensided green basalt inclusions increasing in frequency; grayish blue green (S BG 5/2); rock becoming more competent; most fractures healed; silica cement;				11	17/41	1:50
52.0	75-88	PHYSICAL CONDITION: closely to moderately fractured; moderately hard to hard; strong; little weathered	Box 3			12	25/37	2:10
54.0		54.5 basalt xenoliths evident				?		3:30
56.0		56-84.5 BASALT: grayish blue green (S BG 5/2); as above				13		
58.0	75-88	PHYSICAL CONDITION: closely to moderately fractured; mod. hard to hard; strong; moderately weathered				14	50/50	
60.0						15		3:40 measured rods bottom of run 13 of 28'
62.0		basalt xenoliths apparent				14	27/22	
64.0	75-88		Box 4			15		4:10
66.0	50°	64-65' extremely weathered zone, upper contact w/ overlying basalt 15° crushed to intensely fractured						
68.0		65'-85.4 Breccia well cemented; 20°-160° dips on fracture sets, Calc. filling to 1/16 inch.						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	RPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0		56-65.4 <u>BASALT</u> : (CONTINUED) fine grained vesicular basalt w/ basalt xenoliths (fine grained non vesicular) numerous hairline fractures	Box 4 (cont.)		C	16	4.6 4.6	
70.0								
72.0								
74.0		74'-75' intensely to closely fractured zone < .1 to .5	Box 5			17	4.8 4.8	2:30 formation taking a lot of water
76.0		calcite-filled fractures						
78.0						18	4.1 4.8	9:10
80.0								
82.0		81-82.5 intensely to closely fractured zone pyrite < 1%				19 20	10.2 10.2	10:00 10:20 ground core
84.0		conformable contact	Box 6				4.9 4.9	drilling slower
86.0		85.4 - 91 <u>SILTSTONE</u> : greyish black (N2) minor pyrite, sandstone inclusions to 3/4". well cemented; fractures all healed with calcite filling; alternating wavy parallel very thin to medium very fine grained siltstone and sandstone Physical Condition: little fractured to massive; hard; strong; fresh						oil in return water becoming gray in color petroleum sample 87-89 drill rate increasing
88.0						21	4.7 4.7	11:02
90.0		conformable contact apparent soft sediment deformation with secondary fracturing and subsequent rehealing inclusions to 2"						
92.0		91-102.7 <u>SANDSTONE BRECCIA</u> :						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		91 - 102.7 SANDSTONE BRECCIA: olive grey (5Y 3/2) to medium dark grey (N4) in a very fine grained matrix greyish black (N2); inclusions of sandstone and fine grained porphyry to 6" diameter; slightly metamorphosed. Physical Condition: moderately to little fractured; hard; strong; fresh.	Box 6 (cont)		C	22	4.5	11:55
94.0			Box 7			23	1.9	
96.0						24	4.9	2:05
100.0		slickensides present in filling on fracture surface						
102.0		30° depositional contact, sharp and irregular				25	4.9	2:10
104.0		102.7 - 109 CONGLOMERATE: medium grey (N5); -30% quartz sand - 15% calciferous sand as matrix w/ 20% siltstone sandstone and various gravels well cemented, graded, subround volcanic 30% and granitic 40% grains up to 1.5" in diameter. Physical Condition: closely to little fractured; mostly .5'; hard; strong; fresh.	Box 8					
106.0								
108.0		conformable contact				26	4.7	2:17
110.0		109 - 114.5 SANDSTONE BRECCIA: as above in 91 - 102.7 70°-75° fractures slickensided. Physical Condition: closely fractured mostly .1'; hard; moderately strong; little weathered to fresh.						minor rig chatter
112.0			Box 9			27	2.4	3:00
114.0		113.7 - 114.7 deeply weathered 113.7 - 114.4 shear zone						
116.0		114.5 - 121.4 INTERBEDDED SANDSTONE & SILTSTONE: dark grey (N3) to greyish black (N2) (cont. next page)				28		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DRILL LOG	DRILL LOG	NUM NO.	CORE REC. %	REMARKS
116.0		114.5-121.4 INTERBEDDED SANDSTONE & SILTSTONE: well cemented by silica; partially metamorphosed, bedding dips 60°; fracturing has 3 sets 70°, 20° and 90°, 20° fractures filled with calcite and clay, 70° fracture open and clay coated, 90° fracture undulatory surface calcite filled; contains some inclusions of angular to subrounded sandstone.	Box 9 (cont.)		C	28	2.9 2.9	
118.0		Physical Condition: moderately fractured; very hard; strong; fresh.				29	1.0 1.0	2/14/81 2/15/81 water @ 35' in a.m.
120.0		120.8 - 121.4 shear zone crushed				30	2.8 2.8	8:45
122.0		121.4-141.6 METASANDSTONE: medium grey (NS); coarse grained sand -50% qtz, 40% feldspar -10% mafic; quartz cement in fractures; pyrite present. 70-80° preferred orientation of elongated minerals.	Box 10			31	1.2 1.2	core barrel blocking
124.0		Physical Condition: closely to moderately fractured; v. hard; strong; fresh.				32	2.9 2.9	9:55
126.0		microcline apparent 3-4mm maximum				33	1.3 1.3	10:15
128.0		128.5 .3' coarser grained zone				34	2.9 2.9	10:30 blocked
130.0		131.6 metaconglomerate .5' wavy lined	Box 11			35	4.5 4.5	11:00
132.0		weakly schistose due to larger grain size up to 4" in diameter				36	11:50 11:00	core good
134.0		135.0 grain size decrease						
136.0		139-141 brecciated, closely fractured, numerous hairline silica filled fractures						
138.0								
140.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0		137.4-141.6 METASANDSTONE (CONT'D)	Box #11		C	36	2.4 4.4	(CONTINUED)
142.0		141.6-154.2 INTERBEDDED SAND- STONE AND SILTSTONE: medium gray (NS) to grayish black (N2) fine grained sand, partially metamorphosed; fractures open and calcite filled.				37	1.0 2.0	losing water circulation
144.0		PHYSICAL CONDITION: intensely to moderately fractured (mostly .05-.30'); hard to very hard; strong; fresh.	Box #12			38	4.6 7.8	
146.0		from 144.0 intensely fractured, many open fractures; calcite crystals on open fracture surfaces.						
148.0	1/20							
150.0	20	149-150.7 little fractured; fine grained				39	3.8 2.8	
152.0	30	shale with medium to fine horizontal movement				40	1.2 1.4	surfacing in hole, added scrap to drill water 2:25
154.0	30	151.2-190.8 BISILT: olive black (SV211); fine to medium grained; mineral constituents in- clude plagioclase, subordinate pyro- xene, minor opaques and trace pyrite. closely to intensely fractured with secondary mineralization along fracture planes (primarily chlorite commonly showing chlorite sur- faces and minor calcite (CaCO ₃); fracture planes straight to irregu- lar.	Box #13			41	1.8 2.2	2-16-81 resumed drilling at 152.6; clean day; Stephen M. Fitch replaced Lisa Schreiber as geologist and logger. 7:15
156.0	30	156.4 1cm. thick pyrite segregation.				42		
158.0	40	PHYSICAL CONDITION: closely to intensely fractured, moderately hard, moderately strong, fresh.				43	2.4 2.8	considerable circulation loss 9:16
160.0	50					44	1.4 3.1	
162.0	60	60° fracture planes most prominent; some hairline fractures apparent.	Box #14			45	1.2 2.0	
164.0						46	1.7 1.7	
						47	1.5 1.9	

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (G)	DRILL HOSE	NUM NO.	CORE REC. %	REMARKS
164.0		151.2-190.8 BASALT (CONTINUED) olive black (S1211); fine to medium grained; closely to intensely fractured with secondary mineralization along fracture planes (primarily chlorite commonly showing slicken-sicle surfaces and minor calcite (CaCO ₃); fracture planes straight to irregular; numerous hairline fractures.			C	47		(continued)
166.0	80 30					48	.2 1.0	considerable water loss.
168.0	20 40	some fine grained composition at banding apparent at 168.5.	Box #14			49	1.0 1.0	
170.0	30 5	PHYSICAL CONDITION: (CON'T) closely to intensely fractured; moderately hard; moderately strong; fresh.				50	1.8 1.2	
172.0	0 30 50					51	2.0 2.2	
174.0		 40° prominent fracture plane with ubiquitous hairline fractures.	Box #15			52	1.8 1.0	
176.0	40 40 100	continued.				53	1.0 1.4	
178.0						54	1.7 3.0	Stopped drilling at a depth of 175.6.
180.0	40 20					55	7 1.0	2-17-81 Resumed drilling at 7:42, clear day; having some difficulty reaching bottom of hole due to cave-in.
182.0		continued.				56	1.0 1.0	
184.0						57	1.8 2.4	900 psi.
186.0	40 40		Box #16			58	1.7 1.6	
188.0						59	1.4 1.6	considerable water loss
						60	1.5 2.2	
						61	2.5 2.8	
						62		

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MUD LOG	RUN NO.	CORE REC. %	REMARKS
188.0		151.2-190.8 <u>BASALT</u> (CONTINUED) olive black (SV21), fine to medium grained; closely to intensely fractured with secondary mineralization along fracture planes (primarily chlorite, commonly showing sphaerulite surfaces and minor calcite (CaCO ₃); numerous hairline fractures.			C			(CONTINUED)
190.0						62	15.15	some loss of circulation water
192.0	50 Y	190.8-220.7 <u>SILTSTONE AND SANDSTONE INTERBEDS</u> Primarily olive black (SV21) very thin to medium parallel laminae siltstone with subordinate very fine to fine well cemented bluish gray (SB51) sandstone; hairline anastomosing fractures apparent; silica filled and hairline fractures ubiquitous.	Boy #16			63	11.5	oil film in drilling water
194.0	60 Y					64	2.0 2.0	packet penetrometer 74.5 kg/cm ²
196.0	70 Y					65	1.7 1.2	700 psi
198.0	50 Y	primarily brownish black (SVR21) micaceous siltstone (80%); very fine to fine light bluish gray (SB71) sandstone (20%); subtle depositional features evident	Boy #17			66		
200.0	60 Y							Stopped drilling at a depth of 202.4'
202.0	70 Y	continued; very thin to medium wavy laminae; pyrite (trace);						2-18-81 Resumed drilling at 200 AM, clear day.
204.0	60 Y	<u>PHYSICAL CONDITION:</u> moderately fractured, moderately hard; weak to moderately strong; fresh; fracture along bedding planes and healed fractures.				67	1/2 1/2	700 psi
206.0	10 Y					68	1.7 1.0	
208.0	70 Y	primarily siltstone (70%), subordinate fine sandstone (30%)	Boy #18			69		
210.0								
212.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212.0	70	190.8-210.7 SILTSTONE AND SAND- STONE INTERBEDS (CONT)	Box #18		C	69		(CONTINUED)
	70	Wavy alternating very thin to medium lamina of primarily brownish black (5YR2/1) micaceous siltstone and subordinate light bluish gray (5B7/1) very fine to fine sandstone; numerous silica filled and hairline fractures.				70		700 psi
214.0	70					71		oil film in drilling water
216.0			Box #19					
218.0	70	continued; <u>PHYSICAL CONDITION:</u> moderately fractured; moderately hard; weak to moderately strong; fresh; tends to fracture along bedding planes and healed fractures.				72		700 psi. pocket penetrometer 74.5 kg/cm ²
220.0								
222.0	70	continued.				73		700 psi
224.0			Box #20					
226.0	70	continued; fossiliferous siltstone.				74		Stopped drilling at 2:15 to clean up site before break. 2-23-81 Resumed drilling 700 AIR, clean clay; took 1.0 hour to get back to bottom of hole due to casing.
228.0								
230.0	70					75		
232.0	70	continued; subtle compositional banding reflecting silt-sand variance apparent; fossiliferous.				76		700 psi oil film in drilling water.
234.0			Box #21					
236.0								

9:40
10:00

11:15

12:21

1:35
8:25
9:30

10:44

PROJECT

SCRP

DATE DRILLED 2-23-81/2-24-81

HOLE NO.

31

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
236.0		190.8-240.7 SILTSTONE AND SANDSTONE INTERBEDS: (CONT)			C			(CONTINUED)
238.0	50 10 5	many alternating very thin to medium lamina of primarily brownish black (54R21) micaceous siltstone with trace pyrite and subordinate light bluish gray (5B71) very fine to fine sandstone; numerous silica filled and irregular hairline fractures.	Box #21			76	16 50	700 psi.
240.0		<u>PHYSICAL CONDITION:</u> moderately fractured; moderately hard; weak to moderately strong; trash; tends to fracture along bedding planes and local fractures.				77	3.5 3.5	oil film in drilling water.
242.0	50 75	contained; fossiliferous; moderate yellowish brown (54Y14) siltstone blob at 237.5.				78	1.5 1.6	700 psi.
244.0	50 10		Box #22			79		
246.0	50	continued.					3.2 4.8	
248.0	50					80	2.5 2.8	700 psi. pocket penetrometer >4.5 kg/cm ²
250.0	50 10					81	2.4 2.4	
252.0	80	continued.				82		700 psi.
254.0			Box #23				4.7 4.7	
256.0		gravel sandier from 256.9						Stopped drilling at 257.3 at 4:45.
258.0	40 70					83	4.8 4.8	2-24-81 Resumed drilling at 7:00; clear day.
260.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
260.0	70	190.8-260.7 <u>SILTSTONE AND SANDSTONE INTERBEDS (CON'T)</u>			C			(CONTINUED)
262.0	50	260.7-262.1 <u>SANDSTONE!</u> medium gray (NS); fine to coarse, well cemented; quartz rich; no apparent schistosity; lower contact 50°.				83	4.8 4.8	
264.0	50	262.1-265.1 <u>CONGLOMERATE!</u> greenish gray (5B61); coarse (up to 10mm. in max. dia.); subangular to subrounded; intensely fractured (clay filled); clasts includes quartz, microcline, numerous calcareous; grades to coarse sandstone with depth; no apparent schistosity.	Box #24			84	1.0 1.0	
266.0	100	265.1-300.0 <u>BASALT!</u> dark greenish gray (5B41); fine grained; vesicular (vesicles up to 1cm. in max. dia. commonly filled with chlorite and occasionally zoilites (?); moderately to closely fractured; fracture planes commonly filled with chlorite showing slickenside surfaces at 20° to core axis; numerous hairline and silica filled fractures also apparent; upper contact is conformable.				85	4.5 4.5	loss of circulation water
268.0	20							900 psi
270.0	10					86	4.8 4.8	
272.0	20	at 272.4 <u>alve black (5Y211)</u> fine to medium grained; vesicles less oblique; very similar to basalt from 151.2 to 190.8.	Box #25					packet penetrometer 74.5 kg/cm ²
274.0	50					87	4.8 4.8	
276.0								gas detector 0.0% LEL, no gas encountered.
278.0	60	continued						900 psi
280.0	10					88	4.8 4.8	loss of circulation water
282.0	50	continued.	Box #26					
284.0	10					89	4.7 4.7	

PROJECT

SCRTD

DATE DRILLED

2-24-81

HOLE NO.

31

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
284.0		265.1-300.0 BASALT (CONTINUED)			C			(CONTINUED)
286.0		olive black (54211), fine to medium grained, moderately to closely fractured; fractures planes commonly filled with chlorite showing slicken side surfaces; numerous hairline and silica filled fractures also apparent.	Box #26			89	47 47	
288.0	30 1/2					90	47	
290.0						91	21	
292.0	40 5/8		Box #27			92	51.5	loss of circulation water
294.0		continued; chlorite filled vesicles ubiquitous from 293.0.				93	51.5	
296.0		continued.				94	31.4	
298.0						95	8.0 48	no recovery, mismatch of sample tube, tried to recover core from 296.0 to 300.0 but was unsuccessful.
300.0	6.4							Terminated hole at 300.0 2-24-81.
								2-25-81 water pressure test was conducted at intervals 51.0 to 138.0, and 138.0 to 300.0' at 20, 40 and 60 psi.
								2-27-81 performed down hole geophysics;
								2-28-81 perimeter installation; installed 180.0' of 2" PVC perforating pipe at the following intervals: 80.0 to 100.0' & 155.0 & 175.0'; backfilled hole with pea gravel. water sampled 3/2/81

SHEET 13 OF 14



SUMMARY BORING NO. 31

PROJECT 80-1280-22 STATION HOLE _____ DATE DRILLED 2/12-24/81

OVERBURDEN DEPTH (FT.) 0.0' TO 0.6'

BEDROCK DEPTH (FT.) 0.6 TO 300.0 (T.D.)

WATER PRESS. TEST YES; INTERVAL(S) 51.0' TO 138.0', 138.0' TO 300.0'

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____

GAS NO; DEPTH FIRST NOTICED _____, DATE _____

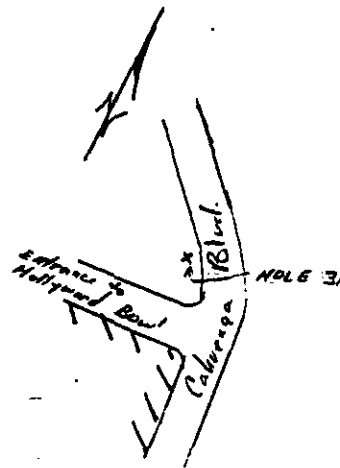
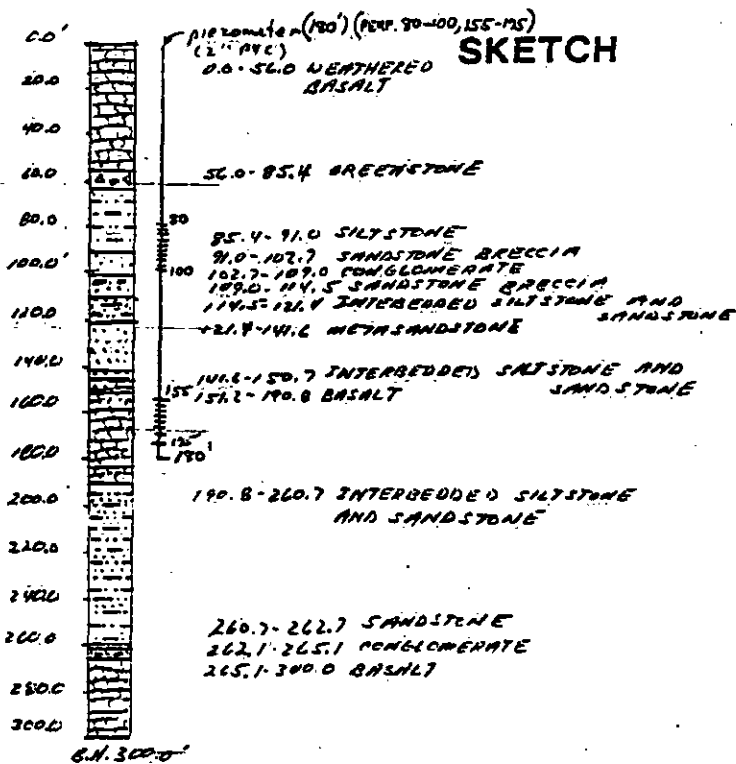
E-LOG YES

DOWN-HOLE SURVEY YES

CROSS-HOLE SURVEY NO

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0.0' TO 180'

GROUND ELEVATION REF. 4.82'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 2/2-10/81 HOLE NO. 32
LOCATION On the Sac. w. end of Hillpark DRIVE GROUND ELEV. 770
DRILLING CONTRACTOR PL EXPLOSION LOGGED BY DAN Gillette DEPTH TO GROUND WATER 8'
TYPE OF RIG 8-40 HOLE DIAMETER NX-1/3 HAMMER WEIGHT AND FALL NOT USED
SURFACE CONDITIONS A.C. Pavement TOTAL DEPTH 398.6 NO. CORE BOXES 41

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0		0.0-0.2 ASPHALT, 0.2 → 0.4 BASE			C			CORE THRU STREET
1		0.4-4.5 ARTIFICIAL FILL SILTY SAND			RD			TRI CONE 0.2 → 8.5
2	AF	MOD. yellow. brown (SYR 3/4); 40% non plastic fines; 60% f. and med SAND; M. DEN.						NOTE: M.B. DENOTED AT RIGHT MARGIN OF CLASS. COLUMN REFERS TO LOCATIONS OF MECHANICAL BREAKS IN THE CORE.
3								
4		4.5-398.6 TOPANGA FORMATION						
5		4.5-7.0 Very WEATHERED BASALT:						
6		dusky yellowish brown (10YR 2/2); 75% plastic fines; CUTTINGS SHOW 25% granular weathered BASALT rock of Ang C. SAND SIZE.						
8		7.0-18.0 BASALT						
10		dusky brown (SYR 2/2) AND brownish black (SYR 2/1); vesicular (20%); contains pyroxene (amphibole?) and Feldspar crystals - sl. weath- ered, .5 to 1 mm. Anisodal and occ subhedral; EXTENSIVE Fe OXIDE STAINING; Clay deposits IN FRACTURES; occ. 6" layers of clay (w/ w/ basalt?)	Box 1		C	1		RUN 1 8.5-12.0 3.0/3.5 recovery
12		PHYSICAL CONDITION (7.0-18.0)						
14		close to intensely fractured; soft to friable w/ HARD layers; FRIABLE STRENGTH; MOD. to deep weathered.				2		RUN 2 12.0-14.5 1.5/2.5 recovery
16		15.0-18.0 Clay - v. soft				3		RUN 3 14.5-17.0 2.3/2.5 recovery
18		18.0 - CaCO ₃ on joint				4		RUN 4 17.0-18.0 0.0/1.0 rec. ATTEMPT TO plug casing hole casing
20		18.0-398.0 Very WEATHERED BASALT AS AT 4.5'; 80% plastic fines; appears AS A C. SAND w/ clay matrix	Box 2		PB	5		Pitcher Bagger = 1 18.0 → 20.0 1.8/2.0 recovery SHEET 1 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20		4.5-398.6 <u>BASALT</u> (cont) 180-38.0 <u>VERY WEATHERED BASALT</u>	Box 2 (cont)		PB	6		Pitcher Barrel #2 20.0 → 23.0
2		22.0 - joint w/ extensive Fe oxide staining						2.5/3.0 recovery
4		23.0 slickensides - minor undetermined movement 24-26 fracture zone clay filled (from weather)				6A		Pitcher Barrel #3 23.0 → 26.0
6		26.0-28.0 <u>BASALT Flow</u>						3.0/3.0 recovery
8		olive black (5Y 2/1) ves- icular (30%) - 10% vesicles at 27.5; contains chlorite (?) infilling some vesicles, zeolites, opal, calc ₃ and quartz;			RD			26.0 → 28.0 Not possible to rock core due to intensity to crushed fracturing - occ. v. hard Basalt makes P.3 tips bend + tear
30		<u>PHYSICAL CONDITION (18-38)</u> closely to mod fract.; friable to low hardness; weak strength; deep to mod. weathered	Box 2a		PB	6B		Pitcher Barrel #4 30.0 - 31.0 10/11.0 recovery
2		<u>PHYSICAL CONDITION (26-28)</u> mod fract.; hard to v. hard; strong to v strong; fresh.			RD			RUN 6A + 6B ARE LABELED WITH SUBSCRIPTS OF LATE IF ORIGINALLY BEING OVERLOOKED IN THE RUN NO. SEQUENCE. tjm
1								
6								
8								
40		38.0-400.0 <u>BASALT</u> dark greenish gray (5G 4/1); vesicular, 5 to 1.5 mm, (2-15%) occ porphyritic (subhedral); brecciated into 1/2 → 2" blocks; Fe oxide stains on fractures + joints to 43'; Mineralogy - (field estimate) 50-60% Ca Feldspar (Bytownite or Anorthoclase); 20-30% Augite 10-30% accessory minerals - (Chlorite, Zeolite-Naturalite)	Box 1		C	7		38.0 - driller decides rock is hard enough to core - clean out hole place casing to 40.0
2								Run 7 40-43.0 NOTE: BOX 2 IS 3" DIA. PB SAMPLES FROM UPPER PORTION OF HOLE BOX 2 IS ALSO 3" DIA. PB SAMPLE
44			Box 3			8		Run 8 3.0/3.0 recovery

1/24-29/81

PROJECT 50-1380-22

DATE DRILLED 2/2-10/81

HOLE NO. 32

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (lb)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	A	4.5-398.6 <u>BASALT</u> (cont.) Thompsonite (from Hoots 1930); Quartz-opal; Olivine; Epidote; Sphere, Phreatic; Vesicular basalt occurs massive and brecciated; Zeolites, opal and chlorite(?) filling all vesicles; chlorite(?) is dusty blue green (SBG 3/2) and yellowish green (10GY 4/4) and appears as material between brecciated basalt as if it was injected. - does not appear to be alteration product - but does appear to have been deposited hydrothermally.	BOX 3 (CONT)		C			Run 8 43.0-47.7
6	A					8		47/4.7 recovery
6	A					9		Run 9 47.7-49.7
50	A		BOX 4			10		20/2.0 recovery
2	A					10		Run 10 49.7-53.0 lost 1/2 TANK (700gal) H ₂ O
2	A					10		2.5/3.5 recovery
4	A	47.0-49.0 CaCO ₃ in joints - 1/2" < 49.7-50.2 shear zone - horiz- ontal slickensides 52.0 - slickensides - Two no directions of movement. at 35° to each other 56-58 - solid basalt - aphanitic 58-58.4 - vein filled w/ chlorite(?) PHYSICAL CONDITION (38-68) mod. fract.; Low hardness; mod. strength; little weathered				11		Run 11 53.0-58.0
6	A					11		50/5.0 recovery
8	A					12		Run 12 58.0-62.0
60	A	58.4-75.0 <u>BASALT</u> as at 38.0', vesicles filled w/ blue-gray chlorite(?); basalt matrix - 85% aphanitic feldspar + augite, 15% sub hedral + anhedral feldspar augite, olivine, phenocrysts 58.5-60.0 - 40% phenocrysts 59.5-60.0 - sheared 60-64 fractures 2-4" apart 65.0 - CaCO ₃ in fracture	BOX 5			12		40/4.0 recovery
2	A					13	1	Run 13 62.0-63.0 5/1.0 recovery
4	A					14		Run 14 63.0-68.0
6	A					14		5/5.0 recovery

SHEET 3 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68		4.5-398.6 <u>BASALT</u> (CONT) 68.0-68.5 - OFFSET - 1/16" clay	Box 5 (cont)		C	15		RUN 15 68.0 → 73.0
70		69-71 intense fracturing	Box 6			15		
2		71.5-72.5 white mineral filling fractures - (1/16")				15		5.0/5.0 recovery
4		72.5 - Vein Rock contact				16		RUN 16 73.0-78.0
6		74.5-80.5 - <u>CHLORITE(?)</u> Veins mineralogy as described at 38.0'; crisscross core; contains moderate gel. byn (10 YR 5/4) altered BASALT inclusions. Ranging in size from 1/8" to 3/4", sometimes 1 or 3" - angular highly mineralized, compose 25 to 40% of vein in fill.	Box 7			16		5.0/5.0 recovery
2		MS 76-77, 81-83 - Country rock BASALT exhibits Baked Zone of Contact Actinophilism				17		RUN 17 78.0-83.0 79.5 - lost 1700 gals (1400 gals)
4		<u>PHYSICAL CONDITION</u> MOD fract.; MOD HARD TO HARD; MOD STRONG TO STRONG; little weathered				17		5.0/5.0 recovery
6		83.0-84.0 <u>Fracture Zone</u> - crushed to intense				18		RUN 18 83.0-86.0
8		86.5-103.8 <u>BRACCIATED BASALT</u> Country rock basalt broken into 1/2 to 1" angular blocks separated by 1/16 - 1/8" chlorite(?) infillings				18		2.8/3.0 recovery
90		90.0 - <u>SLAR Zone</u> - slickensides 2 directions of movement	Box 8			19		RUN 19 86.0-89.2
92		92.0 - Thin (1/32") CaCO ₃ joint				19		3.1/3.2 recovery
						20		RUN 20 89.2-91.2 4.9/5.0 recovery
								SHEET 4 OF 18

11/24-29/81

PROJECT 80-1280-22

DATE DRILLED 2/27/81

HOLE NO. 32

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (15')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	A	45-398.6 <u>BASALT</u> (cont)	BOX 8 (CONT)		C	20		RUN 20 89.2-94.2
4								4.9/5.0 recovery
6		95-97.0 - En Eclon joint 95-97.0 - En Eclon joint PATTERN - white MIN- COAL on surfaces				21		RUN 21 94.2-99.2
8		97.5-98.5 SLEAZE ZONE intensely fractured horizontal slickensides	BOX 9					5.0/5.0 recovery
100		99.0-104.0 - 40 to 50% Zeolites + opal ORBICULAR phenocrysts.				22		RUN 22 99.2-104.2
2								
4		104 - CHLORITE Vein CONTAINS ALTERED BASALT IN- CLUSIONS AS AT 74.5'						5.0/5.0 recovery
6								
8		107-110.5 - CHLORITE Vein AS AT 74.5'	BOX 10			23		5.0/5.0 recovery
110		110 - 18' CONTACT 111-112 Baked ZONE						RUN 24 109.2-114.2
2						24		
4		112.8 - CHLORITE Vein						5.0/5.0 recovery
116		114.4-124.0 BRECCIATED BASALT				25		RUN 25 114.2-119.2
								SHEET 5 OF 18

PROJECT 30-1280-22

DATE DRILLED 2/2-10/81

HOLE NO. 32

1/24-29/81

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116	T	45-398.6 <u>BASALT</u> (cont)	Box 11		C	25		RUN 25 114.2-119.2
8	A	118.0 - Hackly surface - white mineral coating						5.0/5.0 recovery
120	A	120-124 - Criss Cross w/ chlorite veins (as at 74.5)				26		RUN 26 119.2-124.0
2	A	PHYSICAL CONDITION MOO TO CLOSE fract; MOO. HARD; MOO STRENGTH; little to FROSH COLOR - vesicular brecciated Basalt - olive gray (5Y 4/1); chlorite (?) - (5G 3/2)						3.8/4.8 recovery
4	A	123.5 - contact metamorphic zone 124-125 chlorite vein 65° contact				27		RUN 27 124.0-126.8
6	A	125 - cooling aureole						2.8/2.8 recovery
8	A	126 - SLUR Zone - slicks on Hackly surface - poss clay gauge - washed out	Box 12					RUN 28 126.8-131.8
130	A	126.2 greenish blk (5GY 2/1) mineral on fault surface - 1/2 in thick - HARD				28		lost 1 Tank H ₂ O
2	A	129 joint covered w/ white silicate mineral						5.0/5.0 recovery
4	A	130.2 - 131.6 - chlorite vein contains 20-40% altered basalt inclusions				29		RUN 29 131.8-135.3
6	A	132 - OFFSET - 3/8" wide filled w/ grayish green (10GY, 5/2) mineral - poss serpentine + Epidote - hard						3.5/3.5 recovery
8	A	136.5 - Calc ₃ on joint (1/16")	Box 13			30		RUN 30 135.3-137.4
140	A	137.8-138.4 - FRACTURE ZONE - INTENSE -						3.1/3.1 recovery
	A	139.8-140.0 FRACTURE ZONE				31		RUN 31 137.4-140.3
								2.9/2.9 recovery

SHEET 6 OF 18

PROJECT

80-1280-22

DATE DRILLED

1/24-29/31
2/27/81

HOLE NO.

32

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BAT (BT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		45-398.6 <u>RASALT</u> (cont) 140.0 CaCO ₃ on 1/8" joint 141.0-141.2 CHLORITE VEIN AS AT 74.5'	BOX 13 (cont)		C	32		RUN 32 140.3-142.6
2		142 - FRACTURE ZONE - CRUSHED 4" WIDE						2.3/2.3 recovery
4		144.5 - Hackly SURFACES COATED w/ white mineral	BOX 14			33		RUN 33 142.6-147.6
6		147-147.5 - 20% Zeolites						50/50 recovery
8		148.0 - 149 - OFFSET - HORIZ. slickensides on joint plane 149-150 CHLORITE Dike w/ altered BASALT inclusions				34		RUN 34 147.6-152.6
150		<u>PHYSICAL CONDITION</u> little fractured; HARD; MOD STRONG to STRONG; FRESH						50/50 recovery
		<u>LITHOLOGY</u> VESICULAR BRECCIATED BASALT AND CHLORITE(?) VEINS w/ inclusions of altered BRECCIATED BASALT.						
4		154 CHLORITE VEIN - (AS ABOVE)	BOX 15			35		RUN 35 152.6-157.6
6		156 CHLORITE VEIN (AS ABOVE)						49/50 recovery
8		158.0 SLURRY ZONE - 1" wide white nonplastic gouge						RUN 36 157.6-162.6
160		159.5-161.2 CHLORITE VEINS CRISS CROSS (AS ABOVE)				36		
2		163-163.4 Intense FRACTURING						50/50 recovery
164		164 - JOINT Hackly SURF.	BOX 16			37		RUN 37

10⁰⁰
10¹⁷
11⁰⁵
1-24-81
2-2-81
7⁵⁵
9³⁰
9⁵⁵
10⁵⁵
11⁰⁰
12³⁰
12⁵⁰
15⁵⁵
2⁰⁰

1/24-29/81

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164		4.5-398.6 BASALT (cont)	Box 16		C			RUN 37 162.6-167.6
		165.0 - CHLORITE Vein				37		
6		166.2-166.4 - 1/2" white, hard zeolites - 1" cavity filled w/ zeolites and chlorite flecks						48/5.0 recovery
8		166.6-166.8 - CHLORITE Vein						3 ⁰⁰
		168.0 - SACAR ZONE - 1" wide filled w/ quartz (SGY 21) mineral (chlorite - Epidote?)						RUN 38 167.6-172.6
		169.2-171.4 - CHLORITE Vein						3 ¹⁰
170						38		
2		172.0-172.6 SACAR ZONE - white + AZURE blue gouge - elongated vesicles						5.0/5.0 recovery
		175.0-176.0 CHLORITE Vein	Box 17					4 ²⁰
4								RUN 39 172.6-177.6
						39		4 ³⁰
6								5.0/5.0 recovery
		177.0-180.2 - CHLORITE Vein						5 ¹⁰
8								RUN 40 177.6-182.4
								2-2-B
180						40		2-3-B
2		182-182.4 - CHLORITE Vein	Box 18					7 ⁰⁰
								48/4.8 recovery
4		184.0-186.2 - CHLORITE Vein						RUN 41 182.4-186.0
						41		1/2 TANK H ₂ O loss
6		185.9 CaCO ₃ on joint						3.6/3.6 recovery
								10 ⁰⁰
188						42		RUN 42 186-190
								10 ¹⁰
								SHEET 8 OF 18

1/24-29/81

PROJECT 80-1280-22

DATE DRILLED 2/2-10/81

HOLE NO. 32

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT 10'	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	A	4.5-398.6 BASALT (CONT)	BOX 18 (CONT)		C	42		RUN 42 186.0-190.0
190	A	190.0- fault - 1/2" wide, filled w/ grayish mineral (log 5/2) Calc. flaky in ill-direction + MAGNITUDE UNDETER.				43		4.4/4.0 recovery RUN 43 190.0-194.0
2	A	192.0-194.0 CHLORITE Vein (AS AT 74.5')	BOX 19			43		4.0/4.0 recovery
4	A	PHYSICAL CONDITION LITTLE FRACTURED; HARD; V. STRONG; FRESH.				44		RUN 44 194.0-198.5
6	A	COLOR - CHLORITE(?) - dark Bl. gray BASALT - med Lt gray (NS) and med gray (NS)				44		4.5/4.5 recovery
8	A	195.0-197.0 FRACTURE ZONE intensely fractured, hackly surface - trace of white mineral (QUARTZ) COATING				45		RUN 45 198.5-203.2
200	A	200.0-OFFSET - slickensides Direction inferred - amount unknown - minor magnitude	BOX 20			45		4.7/4.7 recovery
2	A	201.4-202.2 CHLORITE Vein 10° contact				46		RUN 46 203.2-207.9
4	A	202.8-203.4 CHLORITE Vein				46		CODE COMMING OUT IN 2 to 4' lengths
6	A	204.2 - 20° contact				46		4.7/4.7 recovery
8	A	207 CHLORITE Vein				47		RUN 47 207.9-212.8
210	A	208.8- QUARTZ (?) on joint	BOX 21			47		4.9/4.9 recovery
212	A							SHEET 9 OF 18

1/24-29/81

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212		4.5-398.6 <u>BASALT (CONT)</u>	BOX 21 (CONT)		C	47		
4						48		RUN 48 212.8-217.6 CORE coming out in 1-4' pieces
6		216.5 - Contact meta aureole 216.6 - 221.0 <u>Chloerite Vein</u>				48		4.8/4.8 recovery
8		218 - 2" Basalt angular frags w/ contact meta aureoles 218.8 - Quartz on joint sur.	BOX 22			49		RUN 49 217.6-222.5
220						49		
2		221.8-226.0 <u>Chloerite Vein</u>				49		4.9/4.9 recovery
4		224-226, 30 to 50% altered Basalt inclusions				50		
6						50		4.9/4.9 recovery
8		227.0 - Contact meta aureole 227.2 - 228.8 <u>Chloerite Vein</u>	BOX 23			51		RUN 51 227.4-232.4
230		229.2-229.6 <u>Chloerite Vein</u>				51		
2		229-50° contact 230.0-236.0 - <u>Chloerite Vein</u> - contains quartz stringers (1/8"); and 20-40% altered brecciated basalt.				52		RUN 52 232.4-237.2
4						52		4.8/4.8 recovery
236								SHEET 10 OF 10

PROJECT 80-1280-22

DATE DRILLED 1/24-29/81
2/2-10/81

HOLE NO. 32

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
236		4.5-398.6 BASALT (CONT)	Box 24		C	52		
8		237.0-239.0 FRACTURE ZONE 1/8" joints filled w/ CaCO ₃ fluffy-XTALS growing in void of joint						Run 53 237.2-241.8
240		239.6- chlorite vein (as at 74.5')				53		
2		241- CaCO ₃ on surface						4 6/4.6 recovery
4						54		Run 54 241.8-242.7 .9/1.9 recovery
4		244.0 OFFSET - 1/8" - filled w/ grayish green mineral (is GY 5/2) - epidote - hard "leached"						Run 55 242.7-247.6
6		PHYSICAL CONDITION LITTLE FRACTURED; HARD; STRONG; FRESH. LITHOLOGY BRECCIATED (1-3" angular) Vesicular BASALT (as at 380') and chlorite veins (as at 74.5') - chlorite has intruded, brecciated, + altered basalt.	Box 25			55		4.9/4.9 recovery
8		249.5-251 Slime Zone CaCO ₃ in joints - flaky - to 4%				56		Run 56 247.6-251.6
250								4.0/4.0 recovery
2		252 joint w/ hackly surface				57		Run 57 251.6-252.6 .9/1.0 recovery
4		253.0-255.6 - OFFSET; MAGNITUDE UNKNOWN						Run 58 252.6-257.5
6		255.6-257 - FRACTURE ZONE joints (1/4") filled w/ CaCO ₃	Box 26			58		lost 1 Tank H ₂ O 4.9/4.9 recovery
8						59		Run 59 257.5-262.4
260								SHEET 11 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
260	A	4.5-398.6 BASALT (cont)	Box 26 (cont)		C	59		RUN 59 257.5-262.4
2	B	260.2 - 1/8" wide - Qtz infill				59		4.7/4.9 recovery
4	B	262.9-314.5 Chlorite Vein (AS AT 74.5') CONTAINS UP TO 45% ARTESIAN BASALT (golden color)	Box 27			60		RUN 60 262.4-267.3
6	B					60		4.8/4.9 recovery
8	B	267.5 - QUARTZ infill				61		RUN 61 267.3-272.1
270	B					61		4.8/4.8 recovery
2	B	271.0-271.4 OFFSET - Magnetite - 1-2 mm UNDET. - 1-2" wide; 1 mm pyrite - 1-2" wide; QUARTZ infill in vugs (Euhedral - 2mm - 5mm - green Epidote (?) - Chlorite -	Box 28			62		RUN 62 272.1-277.0
4	B	274.0 - OFFSET - 1/2" wide Lt green mineral				62		4.9/4.9 recovery
6	B					62		5.1/5.1 recovery
8	B					63		RUN 63 277.0-282.1
280	B					63		5.1/5.1 recovery
2	B	282.5 - Hackly Sulf/AIE on joint	Box 29			64		RUN 64 282.1-286.3
284	B					64		SHEET 12 OF 18

PROJECT 80-1280-22

1/24-26/81

DATE DRILLED 2/2-10/81

HOLE NO. 32

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
284		45-3986 <u>BASALT</u> (cont)	Box 29 (cont)		C			RUN 64 282.1-286.3
6		285.8-286.2; OFFSETS- 2 directions of slickensides at 35° to each other				64		4.2/4.2 recovery
8		<u>LITHOLOGY</u>				65		RUN 65 286.3-291.1
290		Chlorite (?) [100 cleavage, H=4] injected into country rock Basalt - resulting in Brecciation and alteration of Basalt. - late tectonic movement has fractured jointed + faulted chlorite + Basalt	Box 30					4.8/4.8 recovery
2						66		RUN 66 291.1-293.5
4								2.4/2.4 recovery
6						67		RUN 67 293.5-298.3
8		296.0-296.5 - Brecciated Basalt - 1-4" angular blocks - DE Brn + BK						4.8/4.8 recovery
300		<u>PHYSICAL CONDITION</u>	Box 31			68		RUN 68 298.3-303.3
2		little to massive; HARD; MOD strong; FRESH. Color Chlorite (?) - dusky bl grn (5 BG 3/2)						5.0/5.0 recovery
4		Basalt - v. altered - light brown (SYR 5/6)						RUN 69 303.3-308.1
6						69		4.8/4.8 recovery
308								SHEET 13 OF 18

PROJECT 80-1280-22

DATE DRILLED 2/2-10/81

HOLE NO. 32

1124-29/81

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DRILL	DRILL	CORE	REMARKS
			BOX	MODE	NO.	REC. %	
			(CONT)				
308		45-398.6 BASALT (cont)	BOX 31 (CONT)	C			RUN 70 308.1-313.0
310			BOX 32				
2					70		4.9/4.9 recovery
4		314.5-318.8 Brecciated Basalt			71		RUN 71 313.0-317.9
6							
8		317.8 CaCO ₃ on joint (1/2") 318-joint hackly Sur.					4.4/4.9 recovery
320		318.8-355.0 CHLORITE VEIN	BOX 33		72		RUN 72 317.9-322.7
2		322.2-324.6 SHEARED ZONE - slicken slips + intensely fractured					4.8/4.8 recovery
4		324.8-325.3 joint filled w/ CaCO ₃ - 3MM WIDE.			73		RUN 73 322.7-324.0 -change bit + water 11°-12° 1.3/1.3 recovery
6							
8		328.5 - OFFSET - 1/2-3/4"			74		RUN 74 324.0-329.5
330							4.9/4.9 recovery
332			BOX 34		75		RUN 75 328.5-334.3
							SHEET 14 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
332		45-398.6 <u>BASALT</u> (cont)	Box 34 (cont)		C	75		RUN 75 329.5-333.3 4.8/4.8 recovery
4		333.5 - Fault - Quartz infill Slickensides						2 ³⁵ 2 ⁴⁰
6		336.0 - 340.0 SHEAR Zone 335.7 - (Fault) well devel. Slickensides				76		4.6/4.9 recovery
8		338 - veat joint Qtz xtals infill.						2-7.8 2-9.8
340		339 - OFFSET green MILKY (Epidote) - 1/4" wide	Box 35			77		RUN 77 338.2-343.2 Rig repair 8-9 4.9/5.0 recovery
2								10 ¹⁰
4		345 Qtz on joint <u>PHYSICAL CONDITION</u> (as at 301')				78		RUN 78 343.2-348.1 4.9/4.9 recovery
6								10 ¹⁵
8								10 ⁵⁵
350			Box 36			79		RUN 79 348.1-352.9 4.4/4.8 recovery
2		351 - CaCO ₃ xtals on joint						11 ⁵⁵
4						80		RUN 80 352.9-354.7 1.8/1.8 recovery
356		355 - 357 Brecciated Basalt				81		RUN 81 354.7-359.5 SHEET 15 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (5')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
356		4.5-398.6 <u>BASALT (CONT)</u>	BOX 36 (CONT)		C			RUN 81 354.7-359.5
8	MS	357-362 <u>CHLORITE VEIN</u>				81		4.6/4.8 recovery
	MS	357-357.8-30% <u>Zeolites</u>	BOX 37					
360	MS							RUN 82 359.5-364.5
2	MS	362-364 <u>BRECCIATED BASALT</u>				82		
4	MS	364- <u>CaCO₃ on joint</u>						4.9/5.0 recovery
6	MS	366-368- <u>SHEAR ZONE</u> well developed slickensides						
8	MS	368.2- <u>HACKLY SUR</u>	BOX 38					4.8/4.9 recovery
	MS	<u>PHYSICAL CONDITION</u>						
370	MS	MOD fract; MOD HARD; strong; little to FRESH weathering.						RUN 84 369.4-374.3
	MS	<u>LITHOLOGY</u>						
2	MS	<u>BRECCIATED BASALT (50-70%)</u> <u>ALTERED BASALT + CHLORITE (30-50%)</u>				84		
4	MS	374 <u>CaCO₃ on joint</u>						4.9/4.9 recovery
6	MS							
8	MS	376-380- <u>FRACTURE ZONE</u> close to intensely fract; CaCO ₃ on joints	BOX 39					4.6/4.9 recovery
380	MS	379 <u>HACKLY SUR.</u>						

1/24-29/81

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BIT (in)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
380	A	4.5-398.6 <u>BASALT</u> (cont)	Box 39 (cont)		C	86		RUN 86 379.2-382.7
2	A					86		3.5/3.5 recovery
4	A	383-385 SHEAR ZONE Horn gauge; well level slicks.				87		RUN 87 382.7-384.0
6	A					87		2.3/2.3 recovery
8	A					88		RUN 88 384.0-388.8
10	A		Box 40			88		4.8/4.8 recovery
12	A	389.5 CaCO ₃ joint				89		RUN 89 388.8-393.7
14	A	389-392 - FRACTURE ZONE				89		4.7/4.7 recovery
16	A					89		
18	A					90		RUN 90 393.7-398.6
20	A	395.0-398.6 - SHALE: Olive Black (SY 211); -100% CLAY & SILT MATRIX; VERY HARD & DENSE; LOW GRADE METAMORPHISM. PHYSICAL CONDITION Little fractured; HARD to V HARD; V. STRONG; FRESH	Box 41			90		4.9/4.9 recovery
TOTAL DEPTH 398.6								
400		SET 397' ABS 2" CASING 1' Bentonite seal AT SURFACE Place water meter cap over hole-						water sampled 2/24/81



SUMMARY BORING NO. 32

1/24-26/81

PROJECT 80-1280-22 STATION HOLE No DATE DRILLED 2/2-10/81

OVERBURDEN DEPTH (FT.) 0.0 TO 4.5

BEDROCK DEPTH (FT.) 4.5 TO 398.6 (T.D.).

WATER PRESS. TEST Yes; INTERVAL(S) 320 TO 340, 340 TO 360.

GROUND WATER DEPTH (FT.) 668 DATE 2/3; 665 DATE 2/8.

GAS No; DEPTH FIRST NOTICED _____, DATE _____.

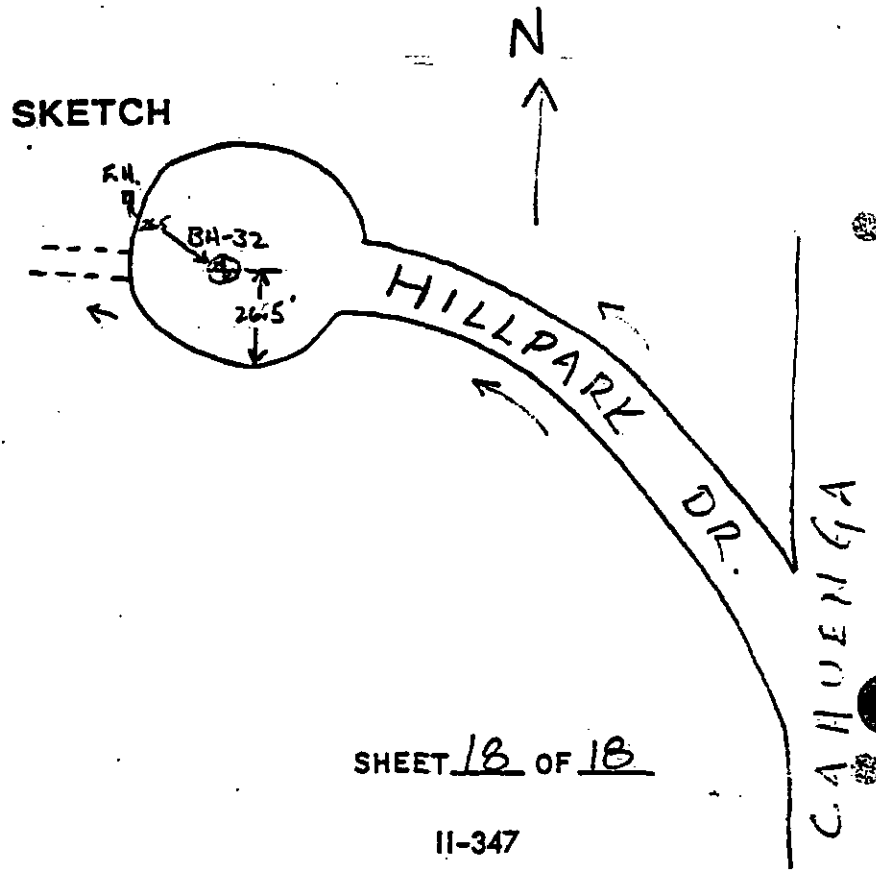
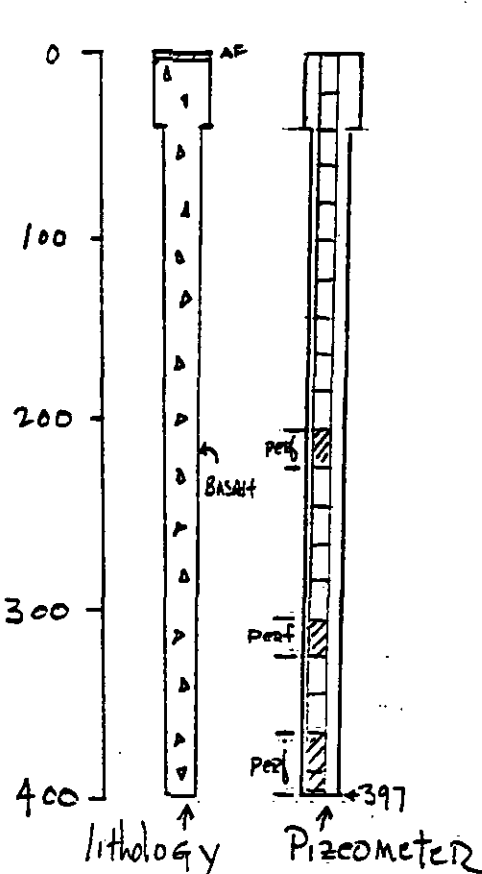
E-LOG 2-10-81.

DOWN-HOLE SURVEY No.

CROSS-HOLE SURVEY No.

ABS
~~PPC~~ CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 0 TO 393.6.

GROUND ELEVATION REF. 770, U.S.G.s Topo Sheet "Hollywood - 1966"





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
 CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 3/9/78 HOLE NO. 32-A
 LOCATION 155' 4/0 OAKSHIRE DR / PASSMORE DR INT / ON OAKSHIRE GROUND ELEV. 770'
 DRILLING CONTRACTOR P.C. EXPLOIATION LOGGED BY DAN Gillette DEPTH TO GROUND WATER 30'
 TYPE OF RIG Mobile B-40 HOLE DIAMETER NX (2.3") HAMMER WEIGHT AND FALL NA
 SURFACE CONDITIONS Concrete Oakshire Street SURF TOTAL DEPTH 391.7 NO. CORE BOXES 39

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
1	Af	00-0.8 CONCRETE (OAKSHIRE)			C			9 1/2" CORE thru street Rotary Drill at 1.2'
2		0.8-1.2 BASE - sand and gravel			RD			
4		1.2-14.0 SANDY CLAY: light brown (5YR 5/4); 60% plastic fines; f. SAND; sl Mo (est); M. Den (est).						
6								
8	CL							
10								
12								Rig Chatter
14		13.0-14.0 Sand and Gravel						
16	SC	14.0-17.0 CLAYEY SAND: mod Brn. (5YR 3/4) and Mod yel Brn (10YR 5/4); 40% plastic fines; med-coarse SAND; sl Mo (est); M Den (est). 16.0-17.0 SAND + Gravel						Rig Chatter
18		17.0-24.0 WEATHERED SANDSTONE brown to gray (5YR 4/1) and light brown (5YR 5/6); 30-40% plastic fines (w/ & w/); cuttings show blebs of clay, c sand + gravel chips.						
20								SHEET <u>1</u> OF <u>18</u>

DEPTH	CLASS:	FIELD DESCRIPTION	SAMPLE	SP (6)	DRILL MODE	RUN NO.	CORE REC. (%)	REMARKS
20		17.0-24.0 WEATHERED SANDSTONE (cont)			RD			Big Chatler 24- At 24.0' decide that H. box cuttings are bedrock and that 0-17 is alluvium; 17-24 is weathered bedr.
2		20.5-21.0 Smt + Gravel PHYSICAL CONDITION: (est) Closely fract. (due to wx); Soft to friable; FRIABLE; MOD TO DEEP WEATHERED						
4		24.0-235.0 SANDSTONE MED. to dk gray (NA); 80% Ft MED SAND; MATRIX CONTAINS SI PLASTIC Siltst AND Clst; CONTAINS CONGLOMERATIC ZONES (1-6") of C. SAND; CONTAINS BLK Siltst frags; light CaCO ₃ cementation.						
6		PHYSICAL CONDITION						
8		PHYSICAL CONDITION						SET 5" CASING TO 30' FLUSH TANK - START LOGGING 29.8'
30		MASSIVE; soft to friable; FRIABLE; Little weathered (NO STAINING)	Box 1		C	1		RUN 1 29.8-32.5 200
2		PHYSICAL APPEARANCE						27/27 recovery 230
4		gray SANDSTONE - contains C SAND lenses and layers (cemented) 6"-2' in thickness COARSE layers are gradational w/ MED + F SAND forming MAJORITY of UNIT - also CONTAINS blk and gray Siltst and Clst layers - [laminated - thin (1/16" + 1/8")] - also contains angular clasts of laminated Siltst + Clst randomly oriented in gray ss MATRIX - contains load CASTS, flame structures				2		RUN 2 32.5-37.3 235
6								4.8/4.8 recovery 250
8								RUN 3 37.3-42.2 255
40		39.5-40 - laminated Siltst Clst + SS.	Box 2			3		Driller comment - "water course" - lost H ₂ O when core pull
2		42.0 - slickensides on Joint plane						4.9/4.9 recovery 315
44						4		RUN 4 42.2-47.3 320
								SHEET 2 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44		24.0-235.0 SANDSTONE (COCK)			C			RUN 4 42.2-47.3
6	A ₇₀	46.0-46.2 SLANE ZONE GRAY SAND - SLICKENSIDES				4		46.0 slight H ₂ O loss 48/5.1 recovery
8	B ₆₀	48.0 laminated siltst	BOX 3					RUN 5 47.3-52.2
50	A ₇₀ B ₆₅	50.0-51.0 - offsets - hackly sur; slickensid ES-65°				5		48/49 recovery
2		52.0-54.0 laminated siltst, clst, ss.				6		RUN 6 52.2-54.2
4		54.0-65.5 ss - prob. A single bed good CORE recovery				6		1.8/2.0 recovery
6		<u>PHYSICAL CONDITION</u> CLOSELY FRACTURED; low HARD NESS; weak STRENGTH; Little WEATHERED				7		RUN 7 54.2-56.5 2.2/2.3 recovery
8			BOX 4			8		RUN 8 56.5-61.2
60	B ₆₀	60.5 - slickensides on JOINT						4.7/4.7 recovery
2								RUN 9 61.2-66.0
4		64-65 SS (gl)				9		4.8/4.8 recovery
6		65.5-68 - laminated	BOX 5			10		RUN 10 66.0-71.0
68								SHEET 3 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68	f70	24.0-235.0 SANDSTONE (cont)	Box 5 (cont)		C			RUN 10 66.0-71.0
70	f61	70.0-77 FRACTURE ZONE 70.3- slickensides on fracture				10		5.0/5.0 recovery
2	f60	73. SLIP ZONE - 1/8" gauge						RUN 11 71.0-76.0
4	f65					11		change drill water
6	f60	76 SLIP ZONE - 1/8" off sets	Box 6					5.0/5.0 recovery
8	f70	78-80- ss cgl - CaCO ₃ cement				12		RUN 12 76.0-81.0
80	f75							4.7/5.0 recovery
2	f85	81-82 laminated clst, sstst 82 CaCO ₃ on joint						RUN 13 81.0-86.0
4	f85	PHYSICAL CONDITION: closely fractured; low to MOD hardness; weak to MOD strength; little weathered				13		4.8/5.0 recovery
6	f60		Box 7					RUN 14 86.0-91.0
8	f85					14		
90	f70	89- oil BLESS						4.9/5.0 recovery
92	f60	90-91- ss cgl - CaCO ₃ cement and on joints				15		SHEET 4 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (10')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	SS	240-235.0 SANDSTONE (cont)	Box 7		C			RUN 15 910-960
4	SS	940-950 laminated siltst				15		
6	SS	PHYSICAL CONDITION VARIABLE properties w/ Rx Type	Box 8					4.9/5.0 recovery
8	SS	1. S.S. - MOD fract; MOD HARD; Strong to v. strong; Fresh						110
100	SS	2 SS. Cg - MOD to little fract; MOD HARD (cem); strong little wx				16		RUN 16 96.0-101.0
2	SS	3 Clst / siltst - clstey to MOD fract; LOW HARD; WEAK strength; little wx						4.8/5.0 recovery
4	SS	101.0-104.0 FRACTURE ZONE						130
6	SS							RUN 17 101.0-106.0
8	SS	103.5 - slickensides on joint	Box 9			17		140
10	SS							4.9/5.0 recovery
110	SS	106.0-109.0 FRACTURE ZONE						155
112	SS							RUN 18 106.0-111.0
114	SS					18		200
116	SS							4.7/5.0 recovery
118	SS	111.0-113.0 FRACTURE ZONE						250
120	SS							RUN 19 111.0-116.0
122	SS		Box 10			19		255
124	SS							4.9/5.0 recovery
126	SS	115.8 - hackly sur. Calc ₃ 1/4"						SHEET 5 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		24.0-235.0 SANDSTONE (cont)	BOX 10		C			RUN 20 116.0-119.5
8		116.0-117.0 - laminated clst + sltst.				20		2.7/3.5 recovery
120		120.0-125.0 laminated clst + sltst				21		RUN 21 119.5-122.0 1.5/2.5 recovery
2						22		RUN 22 122.0-127.1
4						22		4.9/5.1 recovery
6		126.0 - intersection joints w/ slicks	BOX 11					
8		127-127.5 laminated clst + sltst.						RUN 23 127.1-132.2
130		129-133 FRACTURE zone offsets 1/4 to 1/8"				23		3.0/5.1 recovery
2		132-134 Multiple shear planes						RUN 24 132.2-137.3
4		134-55 / clst-sltst contact	BOX 12			24		4.9/5.1 recovery
6								RUN 25 137.3-142.3
8						25		
140		139-140 Sandstone Cgl.						

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140		240-2350 SANDSTONE (CONT)	BOX 12		C	25		RUN 25 137.3-142.3
2		141-143 SS Cgl.						4.9/5.0 recovery
4		143-147 laminated siltst, clst, SS - exhibit multiple offsets	BOX 13			26		RUN 26 142.3-147.3
6								5.0/5.0 recovery
8						27		RUN 27 147.3-152.3
150		PHYSICAL CONDITION (150) MASSIVE; MODERATELY HARD; STRONG FRESH						4.9/5.0 recovery
2		PHYSICAL APPEARANCE (150) LT gray (N6) + MED gray (N7) MED + fine grained sandstone; MOD well cemented.	BOX 14			28		RUN 28 152.3-157.1
4		1550-1570 - laminated SS, CLST, SILTST						4.8/4.8 recovery
6						29		RUN 29 157.1-161.7
8								4.6/4.6 recovery
160		161.0 - slickensides on joint surface				30		RUN 30 161.7-162.7
2			BOX 15					1.0/1.0 recovery
164						31		RUN 31 162.7-167.5

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BIT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164	SS	24.0-235.0 SANDSTONE (cont)	BOX 15		C			RUN 31 162.7-167.5
6	SS	166.2-172.0 ORG SANDSTONE BED				31		48/48 recovery
8	SS	166.5 - slickensides on joint surface						RUN 32 167.5-172.4
170	SS	PHYSICAL CONDITION MASSIVE; MOD HARD; V. STRONG FRESH.				32		48/49 recovery
2	SS	170-171 - organic chips - Li Caeson						
4	SS	173.0-179.0 FRACTURE ZONE APPEARS AS OFFSETS IN SANDSTONE BEDS - MAGNETIC AND TEND UNDETERMINED	BOX 16			33		RUN 33 172.4-177.3
6	SS	175.8 - horiz slicks on concave sur.						4.8/4.9 recovery
8	SS	178 - slickensides on joint sur (lucky)						RUN 34 177.3-182.2
180	SS					34		
2	SS	181.0-182.5 - laminated ss. clst, sltst. - depositional offsets	BOX 17					4.7/4.9 recovery
4	SS					35		RUN 35 182.2-186.6
6	SS	185 - horiz slicks on joint sur						4.4/4.4 recovery
188	SS	186.0-187.0 - SANDSTONE CALCIUMATE				36		RUN 37 186.6-187.5
	SS	187.0-188.5 - laminated ss. clst, sltst				37		9/9 rec SHEET 8 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (5')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		24.0-235.0 SANDSTONE (CONT)	BOX 17		C	37		RUN 37 187.5-190.5
190		187.5-188.8- multiple depositional offsets (1/4")	BOX 18					30/3.0 recovery
2						38		RUN 38 190.5-192.5 20/2.0 recovery
4		193.0-196.0 FRACTURE ZONE 193-CaCO ₃ on 1/8" jct 194 slice ensues 195 CaCO ₃ on 1/8-1/4"				39		RUN 39 192.5-195.7 32/3.2 recovery
6								RUN 40 195.7-200.7
8			BOX 19			40		5.0/5.0 recovery
200		209 Silt						
202		PHYSICAL CONDITION Little fractured; moderately hard; strong; little weathered				41		RUN 41 200.7-202.5 1.8/1.8 recovery
4						42		RUN 42 202.5-207.5 4.9/5.0 recovery
6								
8		207.8-210. Laminated cist, ss, siltst	BOX 20					RUN 43 207.5-213.3
210						43		4.8/4.8 recovery
212								SHEET 9 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212		24.0-235.0 SANDSTONE (CONT)	BOX 20		C	44		RUN 44 212.3-217.2
4						44		
6		216-221 FRACTURE ZONE 216.2 - slickensides						4.9/4.9 recovery
8		218 - depositional offsets - 1/4"	BOX 21			45		RUN 45 217.2-219.3 2.1/2.1 recovery
220		221.0-228.0 LAMINATED SS, CLST, SILTST; exhibits depositional offsets				46		RUN 46 219.3-222.5 3.0/3.0 recovery
2		<u>PHYSICAL CONDITIONS</u> Little fractured; Low to mod strength; strong; fresh				47		RUN 47 222.5-225.3 Change Bit 2.8/2.8 recovery
4			BOX 22			48		RUN 48 225.3-227.5 2.2/2.2 recovery
6								
8								
230		230.0-233.0 FRACTURE ZONE 232 2 directions of fault (slicks) - 1/4" gauge 232.5 calc on joint				49		RUN 49 227.5-232.4 4.9/4.9 recovery
2								
4		235.0-239.5 SANDSTONE CONG- LOMERATE w/ INTERBEDDED SANDSTONES	BOX 23			50		RUN 50 232.4-235.7 3.3/3.3 recovery
236						51		SHEET 10 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
236		2350-2595 SANDSTONE CONG- LUMERATE + SANDSTONE (CON'T) 237 CaCO ₃ STRENGTHS	Box 23		C			RUN 51 235.7-240.6
8		2380-742 FRACTURE ZONE				51		4.8/4.9 recovery
240		238-hackly joints 238.5-hackly slicks on joint 239.5-stained on joints-veet slicks				52		RUN 52 240.6-242.5 1.9/1.9 recovery
2		PHYSICAL CONDITION (235) MASSIVE, MOD HARD, STRONG Little to Fresh weather	Box 24			53		RUN 53 242.5-247.5
4		PHYSICAL APPEARANCE Lt gray sandstone and sandstone conglomerate interbedded. Cg clasts. Sand range from 10-30% composed of volcanics in gravel and cobble size - contains PYRITE				54		RUN 54 247.5-252.4
6		249-258 FRACTURE ZONE 249-252 intensely fract				55		RUN 55 252.4-256.4
8		252 veet slicks on joint				56		RUN 56 256.4-257.5 1.1/1.1 recovery trouble w/ wire line
250		253-255 slicks on joints	Box 25			57		RUN 57 257.5-261.5
2		259-slicks on joint						3.9/4.0 recovery
4		259.5-261 laminated list and ss						SHEET 11 OF 18

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
260		261-292 SANDSTONE! SAME AS 241-235	BOX 25		C	57		RUN 57 257.5-261.5
2		261.5-263 FRACTURE ZONE	BOX 26			58		RUN 58 261.5-262.5 1.0/1.0 recovery
4		265 sticks on joint				59		RUN 59 262.5-267.4
6		266-268 FRACTURE ZONE 267- tectonic off set 268- sticks on joint						4.6/4.9 recovery
8		268-271 SHEAR ZONE intensely fractured; low recovery; mine gauge, no water loss - plunge appears to be approx 20°				60		RUN 60 267.4-270.5 1.9/3.1 recovery
270		271 - loose sticks on joint	BOX 27			61		RUN 61 270.5-272.5 1.9/2.0
2						62		RUN 62 272.5-275.3 2.8/2.8 recovery
4		275-277 laminated clst, ss, siltst.				63		RUN 63 275.3-277.5 1.9/2.2 recovery
6		276- Flare structure						RUN 64 277.5-282.4
8		279-281 Laminated clst, ss, siltst.				64		4.5/4.9 recovery
280		<u>PHYSICAL CONDITION</u> closely fractured; low to mod hardness; weak to mod strength; little weathered	BOX 28			65		RUN 65 282.4-286.0
2		281 - CaCO ₃ on bedding planes						SHEET 12 OF 18
284								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT 15'	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
284		2610-292.0 SANDSTONE (cont)	Box 28		C	65		RUN 65 282.4-286.0
6		<u>PHYSICAL APPEARANCE</u> gray fine + medium grained sandstone w/ ool. congl-meratic lenses and layers						1.2/3.6 recovery
8						66		RUN 66 286.0-290.3 lost CORE - driller claims mismatch - then ground up CORE 289.5-290.0
290								1.7/4.3 Broken chain down 45-50'
2		2920-377.0 SANDSTONE CONGLOMERATE				67		RUN 67 290.3-292.5 2.2/2.2
4		Light gray (N7) (matrix); w/ variable colors in clasts. Matrix - poorly sorted sands. Clasts - 40-80% - Round and sub rounded clear gravel and cobbles. (majority 1-2")	Box 29					RUN 68 292.5-297.5
6		clasts composed of quartzite, ex, quartzite, volcanics.				68		5.0/5.0 recovery
8		contains Bin shells (1/4) and moderate to heavy Calc. cementation						RUN 69 297.5-302.5
300		<u>PHYSICAL CONDITION</u> Little fractured; mod hard; Mod strong; Little weathered.				69		
302								5.0/5.0 recovery
4								RUN 70 302.5-307.4
6			Box 30			70		4.9/4.9 recovery
308								SHEET 13 OF 18

PROJECT 80-1280-22

DATE DRILLED 3/9-17/81

HOLE NO. 32-A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
308		292.0-317.0 SANDSTONE CONGLOMERATE (cont)	Box 30		C	71		RUN 71 307.4-311.5
310						71		4.0/4.1 recovery
2		Note: core breakage and structural elements difficult to determine in Cgl.	Box 31			72		RUN 72 311.5-312.5 .8/1.0 recovery
4				73		RUN 73 312.5-317.4		
6						73		4.8/4.9 recovery
8						74		RUN 74 317.4-322.5
320						74		4.8/4.9 recovery
2						75		RUN 75 322.5-327.4
4			Box 32			75		4.2/4.9 recovery
6						76		RUN 76 327.4-329.0 1.6/1.6 recovery
8		PHYSICAL CONDITION Little to massive; MOD HARD (MATRIX); MOD strong to strong; Little to fresh weathering.				77		RUN 77 329.0-331.5 2.5/2.5 recovery
330						78		SHEET 14 OF 18
332								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
332		2920-377.0 SANDSTONE CONGLOMERATE (cont)	Box 32		C			RUN 76 331.5-332.5 1.0/1.0 recovery
4			Box 33			79		RUN 79 332.5-337.4 12-9 ⁰⁰ INSTALL NEW BIT
6								4.9/4.9 recovery
8		PHYSICAL APPEARANCE Light gray (N7) and Dusky green (5G 3/2) and DK greenish gray (5G 4/1) well rounded, poorly sorted Sandstone Conglomerate; contains 20-40% cobbles; 10% boulders				80		RUN 80 337.4-342.4
340								5.0/5.0 recovery
2			Box 34			81		RUN 81 342.4-346.9
4		- MATRIX IS SILTY MED SAND ABOUT 60% of TOT RX - PYRITE CUBES 1MM						4.5/4.5 recovery
6						82		RUN 82 346.9-347.5 6/6 recovery
8		346- MATRIX begins to show micritic texture (flowing) (overturn)						RUN 83 347.5-352.5
350						83		5.0/5.0 recovery
2			Box 35			8A		RUN 84 352.5-357.4
4		353 - slicks on joint						4.9/4.9 recovery
356								SHEET 15 OF 18

PROJECT 80-1280-22

DATE DRILLED 3/9-17/81

HOLE NO. 32-A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
356		292.0-377.0 SANDSTONE CONGLOMERATE (mod)	BOX 35		C	84		
8								12 ³⁵
						85		12 ⁴⁵
360			BOX 36					1 ⁰⁰ 2 ⁰⁰
2								1 ⁰⁰ 2 ⁰⁰ 100-200 down REPAIR SLEAVED Bolts on MAIN DRIVE
								2 ⁴⁰
4		364 SLURRY ZONE Slicks and gauge				86		2 ⁵⁵
6								3 ²⁵ 3 ¹⁰
8		PHYSICAL CONDITION Little to MASSIVE; MOD Hard; weak to MOD Strong; Little to Fresh weathered	BOX 37			87		3 ³⁵ 3 ⁴⁵
370						88		A ⁰⁰
2								4 ³⁰
4								A ³⁵
6		376 HORIZ Slicks on Joint				89		A ³⁵
8		377.0-380.0 CLAYSTONE AND SANDSTONE						5 ⁰⁰ 5 ¹⁰
380		IMMINATED - 1/8-1/16" med gray (NSI) and blk (SI) - gray SS PARTING - 1/4-1/2" - AS ABOVE 378.5 Slicks on joint	BOX 38			90		5 ⁰⁰ 5 ¹⁰

SHEET 16 OF 18

PROJECT 80-1280-22

DATE DRILLED 3/9-17/81

HOLE NO. 32-A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
380		380-391.7 SANDSTONE	Box 38		C	90		RUN 90 377.3-382.2
2		-AS AT 24.0'- 381.5 hoarz slick on vert joint						4.9/4.9 recovery
4						91		RUN 91 382.2-387.1
6		385 - Hoarz Slicks						4.8/4.9 recovery
8			Box 39			92		RUN 92 387.1-391.7
390								4.6/4.6 recovery
		TOTAL Depth 391.7'						E-LOGGED HOLE 3/17/81 H ₂ O PRESSURE TESTED INTERVAL 278-391 - NO TAKE, RAN 391' OF 2" ABS CASING, PERFORATED AT 110-120, 220-240, 370-391' TOP SURFACE BENTONITE SEAL, CAPPED AT PAVEMENT GRADE W/ STANDARD STEEL H ₂ O METER CAP.

SHEET 17 OF 18



SUMMARY BORING NO. 32-A

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 3/9-17/81

OVERBURDEN DEPTH (FT.) 0.0 TO 17.0

BEDROCK DEPTH (FT.) 17.0 TO 391.7 (T.D.)

WATER PRESS. TEST YES; INTERVAL(S) 278 TO 391, TO _____

GROUND WATER DEPTH (FT.) 9.5' DATE 3/20/81; DATE _____

GAS No; DEPTH FIRST NOTICED _____, DATE _____

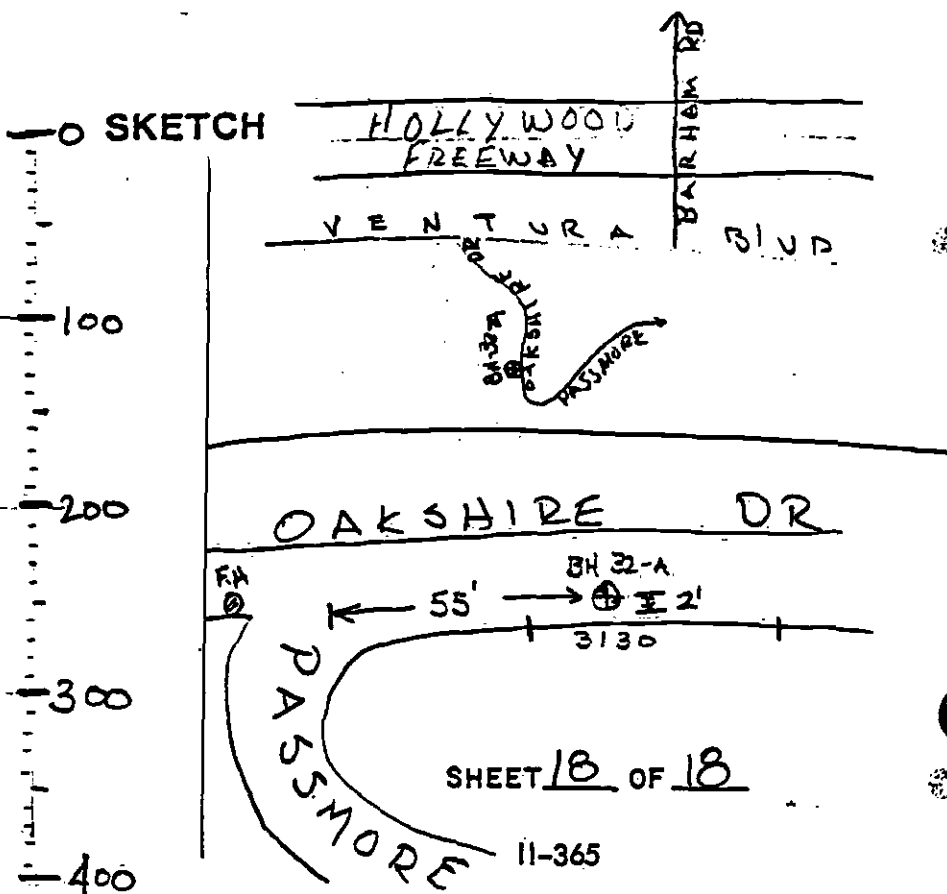
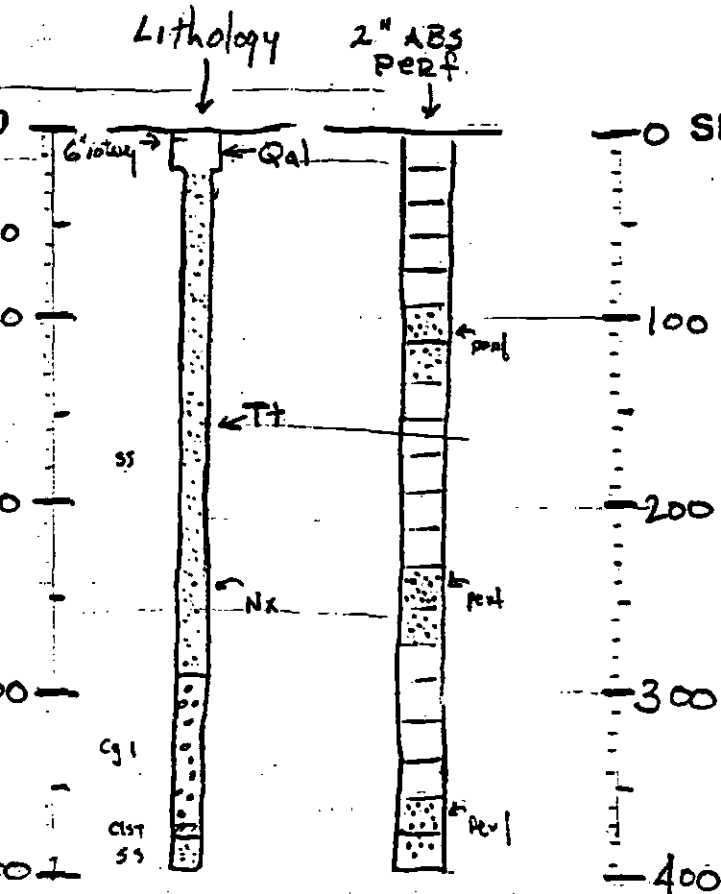
E-LOG 3/17/81

DOWN-HOLE SURVEY No

CROSS-HOLE SURVEY No

PVC CASING (I.D.): 4" TO _____; 3" TO _____; ^{ABS} 2" 0.0 TO 391.7

GROUND ELEVATION REF. 770' Burbank, Calif U.S.G.S 7 1/2 MIN QUAD 1966





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

JAN 6, 78.

PROJECT 80-1280-22 DATE DRILLED 9.10.12, 1981 HOLE NO. 33
LOCATION 15' NW/0 CAHUENGA BVD / FREDONIA, CO INT. NE SIDE GROUND ELEV. 620'
DRILLING CONTRACTOR P.C. EXPLOSION LOGGED BY Paul G. ... DEPTH TO GROUND WATER 50.0'
TYPE OF RIG Mobile 340 HOLE DIAMETER 5" HAMMER WEIGHT AND FALL 140 lbs, 12-15"
SURFACE CONDITIONS SIDEWALK TOTAL DEPTH 22.0 NO. CORE BOXES 16

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bls)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0-0.4		CONCRETE			RD			SIDEWALK
0.4-38.0	CL	ALLUVIUM						Trouble Drilling thru SIDEWALK -
0.4-4.8		SANDY CLAY: dark yel. brn. (10YR 4/2); 95% PLASTIC FINES: 5-10% M SAND; Sl porous; MOIST; SOFT.						PIECE of WOOD AT 1.5'
4.8-17.0	SM	SILTY SAND: mod. brn. (5YR 3/4); 15-20% non PLASTIC FINES: 80-85% f. SAND; Sl. porous; CON- TAINS trace of dk brn BASALT c. SAND; Sl. moist; M. Den.						NOTE: M.D. WRITTEN IN THE CLASS. DENOTES MECHANICAL BREAKS FOUND IN THE CORE AND ARE NOT NATURAL IN- SITU BREAKS
15.5-16.5		85% M+C SAND		3 5 5	SS B			same class 10.0-11.5
17.0-38.0	CL	SANDY CLAY: light brown (5YR 5/6); 80% PLASTIC FINES; 20% f. SAND; MOIST; FIRM						soil by "MORE DENSE"

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	CL	0.4-38.0 <u>ALLUVIUM</u> 17.0-38.0 <u>SANDY CLAY (cont.)</u>	S-1		PB	1	2.5/3.0	ZUN 1 - Pitcher Barrel 20.0 - 23.0 Recovery 2.5/3.0
22								
24			J-2	1 1 2	SS			DRIVE SS-2 23.0-24.5
26		25.0-28.0 - 10-15% M SAND			RD			
28		VARIABLE SAND CONTENT MIXED w/ CLAY (85-90%)						
30		30.0-33.0 10-15% C. SAND		1/2 1/2 1	SS			DRIVE SS-3 30.0-31.5 No Recovery
32					RD			
34								
36		36.0-38.0 - M+C SAND						
38	CL	38.0-2208 <u>TOPANGA FORMATION</u> 38.0-500 <u>SANDSTONE</u> : dark yell. orange (10YR 6/6); 20% non plastic fines; 15% Fines 1/4 to 1/2" - S. Angular; 65% M SAND; Sl. Moist; no strati- fication.	S-2		PB	2	1.0/1.2	ZUN 2 - Pitcher Barrel 40.0-41.2, use 1000 psi down press. Recovery 1.0/1.2
40								
42		<u>PHYSICAL CONDITIONAL</u> : 38- 50' FRACT: MASSIVE; HARD; Friable to Low strength; weak & friable weather; GOOD			RD			No S.P.T too dense
44								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (FT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
38.0-40.0		38.0-22.0 <u>TOPANGA FORMATION</u>			RO			38.0-40.0 SANDSTONE (cont)
40.0-47.0		47.0-48.0 <u>CLAYSTONE</u> dark gray (N2)						
50.0-55.0		50.0-55.0 <u>SANDSTONE CONGLOMERATE</u> Med light gray (N6); 80% f.a.d. sand; 20% siltstone; contains 1/4 to 1/2" siltst. frags.	S-3		PB	3	1.5/1.5	RUN 5 49.0-50.5 1000 PSI DOWNPRESS recovery 1.5/1.5
55.0-57.0		<u>PHYSICAL CONDITION</u> little fractured, low hardness mod. strong strength, mod. weathered	BOX 1		C	A	1.7/2.5	RUN 4 50.5-53.0 S-3 INDICATED BEDROCK START CORING AT 50.5 recovery 1.7/2.5
55.0-57.0		55.0 Fe oxide stain on fractures						RUN 5 53.0-58.0 9 ⁰⁰ -11 ⁰⁰ set up to core
55.0-57.0		55.0-57.0 <u>CLAYSTONE</u> med light gray (N6); 10% plastic fines; massive						recovery 1.6/5.0
57.0-77.0		57.0-77.0 <u>SANDSTONE CONGLOM.</u> AS AT 55.0; cemented; contains angular clasts of claystone, siltstone and sandstone in a sandstone matrix; No apparent bedding planes						RUN 6 58.0-61.5
61.5-66.5						6	1.6/3.5	recovery 1.6/3.5
66.5-71.5						7		RUN 7 61.5-66.5
66.5-71.5						8		recovery 1.4/5.0
66.5-71.5						8		RUN 8 66.5-71.5

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68		38.0-220B <u>TOPANGA FORMATION</u>	BOX 1		C			204 5 425-725
70		57.0-77.0 <u>SANDSTONE CGL.</u> 69.0-71.5 sandstone and silty sandstone lenses intermixed; no apparent bedding planes - appears like a turbidite deposit.				8	20/30	lost 1/2 tank mud (approx. 100 gal.) recovery 2.0/5.0
72						9	23/25	RUN 9 71.5-73.0 recovery 23/25
74		<u>PHYSICAL CONDITION</u> closely to mod. fractured; low to friable hardness; friable to weak strength; mod. to little weathered.	BOX 2			10	27/40	RUN 10 74.0-78.0 recovery 2.7/4.0
76						11	1.4/2.0	RUN 11 78.0-80.0 organic coating in mud recovery 1.4/2.0
78		77.0-84.0 <u>SANDY CLAYSTONE:</u> 80% plastic fines; 20% s. sand; appears intermixed with fine sand stringers and stringers vertical polished surfaces in claystone.				12	23/30	RUN 12 80.0-83.0 recovery 23/30
80						13	3.1/5.0	RUN 13 83.0-86.0 recovery 3.1/5.0
82						14	2.0/2.5	RUN 14 86.0-90.5 recovery 2.0/2.5
84		84.0-90.0 <u>QUARTZITE:</u> med light gray (N6); HARD				15		RUN 15 90.5-93.0
86		85.0-86.0 - clay zone; 1/8" wide slickensides, calcite infilling						
88			BOX 3					
90		89.0-90.0 <u>SANDSTONE:</u> lgt gray (N6); c. sand matrix; contains silt & frags						
92		90.0-93.0 <u>QUARTZITE</u> as at 84.0, with calcite stringers						

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (15')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		82.0-220.8 <u>TOPANGA FORMATION</u>	Box 3		C	15	22/25	RUN 15 92.0-93.0 recovery 22/25
92.0		92.0-93.0 Shear zone; clay filled				16	1/7	RUN 16 92.0-93.0 recovery 1/7
94		93.0-95.0 <u>SANDSTONE CONGLOMERATE:</u>				17	43/43	RUN 17 93.0-95.0 lost 1/2 tank mud recovery 43/43
96		95.0-98.0 <u>CLAYSTONE</u> grayish black (N2); MASSIVE; INTER-MIXED WITH FINE SANDSTONE ORGANIC				18	18/25	RUN 18 95.0-98.0 recovery 18/25
98		97.0 vertical slickensides				19	8/25	RUN 19 98.0-100.0 recovery 8/25
100		98.0-100.0 <u>SANDSTONE:</u> light gray (N6); M + C. SAND MATRIX; FRIABLE; little weathered	Box 4			20	19/25	RUN 20 98.0-100.0 recovery 19/25
102		100.0-103.0 <u>CLAYSTONE:</u> grayish black (N2); HORIZONTAL SLICKENSIDES (102.7)				21	5/10	RUN 21 100.0-103.0 lost spring change bit recovery 5/10
104		103.0-104.5 <u>SANDSTONE CONGLOMERATE:</u> (AS AT 57.0)				22	10/15	RUN 22 103.0-104.5 recovery 10/15
106		104.5-106.5 <u>CLAYSTONE</u> (AS AT 57.0)				23	20/30	RUN 23 104.5-106.5 recovery 20/30
108		106.5-110.0 <u>SANDSTONE CONGLOMERATE:</u> (AS AT 57.0)				24	3.4/10	RUN 24 106.5-110.0 change bit - to diamond recovery 3.4/10
110		110.0-112.0 <u>CLAYSTONE:</u> (AS AT 95.0)				25		RUN 25 110.0-112.0 SHEET 5 OF 4
112		112.0-113.5 <u>QUARTZITE:</u> HARD; little weathered; sugary texture						
114		113.5-121.0 <u>CLAYSTONE:</u> (AS AT 95.0)	Box 5					
116		115.0 - horizontal slickensides						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT 16'	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116		38.0-220.8 TDPANGA FORMATION			C			RUN 25 115-116
118		113.5-121.0 <u>CLAYSTONE</u> : (cont.) 116.0-117.0 vertical joints calcite filled	BOX 5			25	2.9/3.0	recovery 2.8/3.0
120		117.0-118.0 <u>BASALT</u> : brownish black (5YR 2/1); HARD; contains subhedral feldspar x-tals 1/16" - 1/2"						RUN 26 118.0-123.0
122		119.0-120.9 <u>BASALT</u>				26	4.0/5.0	recovery 4.0/5.0
124		121.0-128.5 <u>SANDSTONE CONGLOMERATE</u> : (as at 57.0')						RUN 27 123.0-126.0
126		124.5-125.0 <u>BASALT</u> (as at 117.0)				27	2.7/3.0	recovery 2.7/3.0
128		127.0 slickensides on joint	BOX 6					RUN 28 126.0-129.0
130		128.5-220.8 <u>SANDSTONE</u> : predominantly medium gray (N5) sandstone laminated with thin grayish black (N2) claystone and siltstone inter beds. ss beds 1/4" - 2", clay + silt beds 1/16" - 1/8"; well bedded.				28	2.8/3.0	recovery 2.8/3.0
132		<u>PHYSICAL CONDITION</u> moderately fractured; mod to hard, hardless; weak strength little to fresh weathering.						RUN 29 129.0-132.0
134						29	2.6/3.0	recovery 2.6/3.0
136								RUN 30 132.0-137.0
138						30	4.0/5.0	recovery 4.0/5.0
140			BOX 7					RUN 31 137.0-141.0
142						31	5.0/4.0	recovery 5.0/4.0

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (16')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
138		38.0-220.8 TOPANGA FORMATION	Box 7		C	31	5.0/4.0	RUN 31 137.0-141 recovery 5.0/4.0
142		128.5-220.8 SANDSTONE (cont.) (AS AT 128.5)				32	3.0/5.0	RUN 32 141.0-144.0 recovery 3.0/3.0
144		144.0-148.0 Slur Zone	Box 8			33	3.5/3.5	RUN 33 144.0-147.5 recovery 3.5/3.5
146		148.0 Clay in Slur Zone - approx 1/8" wide				34	4.5/5.0	RUN 34 147.5-152.5 recovery 4.5/5.0
150		151-151.5 Slur Zone				35	3.3/3.3	RUN 35 152.5-155.5 recovery 3.3/3.3
154			Box 9			36	5.0/5.0	RUN 36 155.8-160.8 recovery 5.0/5.0
156						37	4.7/5.0	RUN 37 160.8-165.8 recovery 4.7/5.0
158		158.5 - Slur Zone	Box 10					

SHEET 7 OF 11

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164	SS	380-220.8 TOPANGA FORMATION 128.5-220.8 SANDSTONE	Box 10		C	37		RUN 37 160.8-165.8 recovery $\frac{4.7}{5.0}$
166		164-164.5 - displaced beds (1/8") - no slickensides 166.5 - displaced beds (1/8")						845 851
168		168-168.5 QUARTZITE: (AS AT 12.0)				38		
170	SS		Box 11					recovery $\frac{5.0}{5.0}$ 927 935
172	M.B.	- 171.5 displaced beds (1/4")						
174	M.B.	173.5 CLAYSTONE: (AS AT 95.0) 173.5-174.5 convoluted bedding				39		recovery $\frac{4.6}{5.0}$ 1000 1012
176								
178	SS	178.5-179.1 - horiz. fractures.				40		
180	SS	179.0-180.0 1/4" offset	Box 12					recovery $\frac{4.9}{5.0}$ 1032 1045
182	M.B.							
184	M.B.					41		
186	SS	185.7 1/8" offset						recovery $\frac{4.9}{5.0}$ 1120 1135
188						42		RUN 42 185.8-190.8 recovery $\frac{5.0}{5.0}$ SHEET <u>2</u> OF <u>11</u>

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	M.B.	38.0-220.8 TOPANGA FORMATION	Box 12		C			RUN 42 185.3-190.8
190	M.B.	128.5-220.8 SANDSTONE: (AS AT 128.5) 184.5-190.5 SLIP ZONE beds d/set 1"	Box 13			42		recovery 5.0/5.0
192	M.B.					43		RUN 43 190.8-195.8
194	M.B.	194.0-195.0 CLAYSTONE: (AS AT 95.0)						recovery 4.8/5.0
196	M.B.	196.0-197.0 SET of ENCHELON FRACTURES each 1/2" d/set	Box 14			44		RUN 44 195.3-200.8
198	M.B.							recovery 4.9/5.0
200	M.B.					45		RUN 45 200.3-205.3
202	M.B.	PHYSICAL CONDITION MOD. FRACT; HARD TO MOD HARD; weak strength; little to FRESH weathering						recovery 5.0/5.0
204	M.B.					46		RUN 46 205.3-210.8
206	M.B.		Box 15					MOD pump down
208	M.B.					47		recovery 5.0/5.0
210	M.B.							RUN 47 210.8-215.8
212	M.B.							SHEET 9 OF 11

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
212	M.B. / 55	39.0-220.8 <u>STOPANGA FORMATION</u> 128.5-220.8 <u>SANDSTONE</u> (AS AT 128.5)	Box 15		C	47		RUN 47 210.8-215.8
214			Box 16			47		recovery 50/50
216	M.B.					48		RUN 48 215.8-217.6 - hole sande'd in recovery 18/18
218	M.B.					49		RUN 49 217.6-220.8
220	B.H.	TOTAL Depth 220.8 Water AT 50.0'						recovery 3.2/3.2
								SET 2" ABS CASING TO 160' WOULD NOT ADVANCE IN SMALL NX HOLE. SET 1" PVC CASING TO 40' INSTALL BENTONITE SEAL AT: 0.0 → 2.0' 40.0 → 42.0' PLACE PER GRAVEL 2.0 → 40.0' Cap hole 1-13-81



SUMMARY BORING NO. 33

PROJECT 80-1280-22 STATION HOLE No DATE DRILLED 1/6, 7, 8, 9, 10, 12/81

OVERBURDEN DEPTH (FT.) 0.0 TO 38.0.

BEDROCK DEPTH (FT.) 38.0 TO 226.8 (T.D.).

WATER PRESS. TEST yes; INTERVAL(S) 120 TO 140, 140 TO 160.

GROUND WATER DEPTH (FT.) 50.0 DATE _____; _____ DATE _____.

GAS No; DEPTH FIRST NOTICED _____; DATE _____.

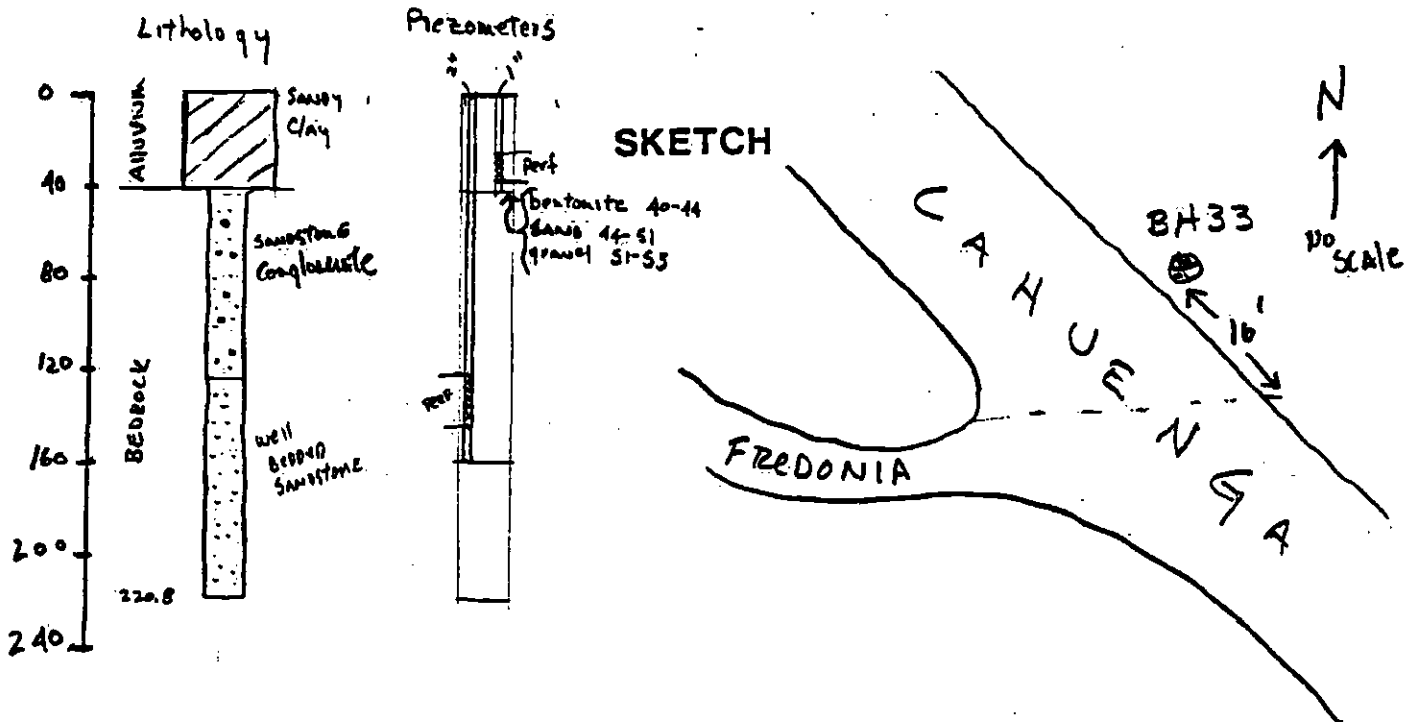
E-LOG yes.

DOWN-HOLE SURVEY No.

CROSS-HOLE SURVEY No.

PVC CASING (I.D.): 4" No TO _____; 3" No TO _____; 2" 0.00 TO 160.0.

GROUND ELEVATION REF. 620' ABS
1" 0.00 TO 40.0





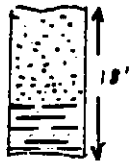
THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT SCATD DATE DRILLED 12-2-80/12-8-80 HOLE NO. 34
LOCATION 1000 Bluffs Drive near Averta Drive intersection GROUND ELEV. 574
DRILLING CONTRACTOR Pitler Drilling Co. LOGGED BY Stephen M. Testa DEPTH TO GROUND WATER 14.8'
TYPE OF RIG Elmer 1500 HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lb. - 30 in.
SURFACE CONDITIONS residential roadway TOTAL DEPTH 200.5' NO. CORE BOXES 9

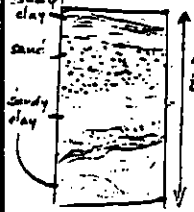
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0.0 - 0.5' CONCRETE:			AD			12-2-80 Drilling commenced at 7:55 AM, clear day. Hole drilled with water.
0.5	ML	0.5 - 34.0' SANDY SILT: dark yellow brown (10YR 4/2); approx. 85% non-plastic fines; 10- 15% very fine- to fine-grained sand; moist; dilatancy slow; toughness none.			AD			
2.0								
4.0								
6.0								
8.0								
10.0		yellow brown (5YR 3/2); soft, moist.	J-1	3 4 5	SS		12 18	SPT at 10.0'
12.0					AD			
14.0								
16.0		dark yellow brown (10YR 4/2); very fine- to fine-grained; dense; moist; little gravel up to 1/4" in max. dim.	J-2	5 10 15	SS		14 18	SPT at 15.0' packet penetrometer 2.0 2/9/81
18.0					AD			
20.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	ML	0.5-34.0 SANDY SILT (CONTINUED)		8	DR			(CONTINUED)
			C-1	11			18/18	CWDD at 20.0' with 240 lb hammer
22.0		stiff.		10				
			J-3	6	SS			SPT at 21.5'; drilling halted at 1:00 PM at 23.0'
				7			18/18	
				8				
24.0					RD			12-4-80 Resumed drilling at 7:00 AM, moderate to heavy rain. Hole drilled with bentonitic drilling fluid.
26.0		dusky brown (5YR 2/2); non-plastic fines (75%); very fine- to fine-grained sand (25%); little gravel up to 1/4" in max. dia.; soft; fine roots.	J-4	3	SS		18/18	SPT at 25.0'
				4				
				5				
28.0					RD			
30.0								
		dark yellow brown (10YR 4/2); sandier (35-40%); gravel (2.5%) but up to 1.5" in max. dia.; stiff; fine roots.	C-2	15	DR		18/18	CWDD at 30.0'
				17				
				22				
32.0		stiff; no gravel nor fine roots	J-5	6	SS		18/18	SPT at 31.5'
				7				
				13				
34.0					RD			
	SM	34.5-38.5 SILTY SAND: dark yellowish brown (10YR 6/2); silt (15-20%); very fine- to fine-grained sand (80%); dense.	J-6	10	SS		15/18	SPT at 35.0'
36.0				15				
				25				
					RD			
38.0								
40.0	SP	38.5-44.0 GRAVELLY SAND: pale yellow brown (10YR 6/2); non-plastic fines (25%); medium- to coarse-grained sand (80%); gravel (15%); poorly graded; gravel up to 1.5" in max. dia., averaging 1/4"; very dense.	J-7	21	SS		12/18	SPT at 40.0'
				41				
				24				
42.0					RD			rod chatter at 44.0'
44.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (BT)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	GP	30.5-44.0 GRAVELLY SAND; (CON'T) 44.0-50.5 GRAVEL; poorly graded; subangular to sub-rounded up to 1.5" in max. dia.; primarily quartz; however, granite, diorite and micaeics also present.			RD			(CONTINUED)
46.0			J-8	LB	SS		74.5	SPT at 45.0'
48.0				76.5	RD			considerable rod chatter from 48.0-50.0'; hard drilling resistance at 49.0'; added mud to prevent caving.
50.0		<u>TOPANGA FORMATION</u> 50.5-200.5' <u>INTERBEDDED SHALE AND SANDSTONE'S</u>	C-3	2	OR		74.8	CORD at 50.0'; bunch rod drop from 50.2 to 50.5'; hit boulder at 51.0';
52.0		navy non-parallel medium-to very thin lamina of primarily olive gray (5Y4/1) very fine-to fine-grained sandy clay and subordinate dark greenish gray (5G4/1) fine-to medium grained sand with lesser very thin lamina of siltstone; sandy clay shale lamina consist of 90% plastic fines, 10% sand, 1-2% randomly distributed unidentifiable organics; sand contains 45% fines, lenses range up to 5cm. generally; depositional features apparent (bedding, gradad bedding, cross bedding); hard;	J-9	30	SS		18	18 SPT at 51.0'
54.0				42				replaced bit with a new one.
56.0			J-10	39	SS		18	SPT at 55.0'
58.0		<u>PHYSICAL CONDITIONS:</u> little fractured; low hardness; friable to weak strength; fresh. at 55.0 olive black (5YR 2/1); hard.		60	RD		18	18 pocket penetrometer 74.5 2/9/81
60.0		dark greenish-gray (5G4/1); sandier; fine-to medium-grained (25-30%) from 60.0 to 61.0' followed by 6" olive gray (5Y4/1) sandy clay as at 50.5'; hard; bedding 10-15°	J-11	75	SS		18	SPT at 60.0'
62.0				50	RD		18	18 pocket penetrometer 4.0 (broke apart) 2/9/81
64.0								
66.0		olive gray (5Y4/1); plastic fines (2-10%), fine to medium-grained sand (75-90%); organics (1-2%); sandier with depth; hard.	J-12	85	SS		15	SPT at 65.0'
68.0				80.5	RD		15	15 pocket penetrometer 74.5 2/9/81




DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	Boulding 0-15"	50.5-200.5' <u>INTERBEDDED SHALE AND SANDSTONE (CONT)</u> physical conditions similar to that previously described under main heading.			RD			(CONTINUED)
70.0		alternating wavy non-parallel medium- to very thin shale and sandstone lamina.	PB-1		PB	1	2.5 2.5	pitcher sample from 70.0 to 72.5'; 150psi pocket penetrometer 74.5 2/9/81
72.0		olive gray (5YR 4/1); fine- to medium-grained sand; fines 45%.			RD			rod chatter from 72.0 to 75.0'
74.0								
76.0		dusty brown (5YR 4/2); sandy clay; plastic fines (90%), sand 40%; very thin- to thin lamina of dark greenish gray (5G 4/1) sand with 45% plastic fines from 75.0 to 76.0'; hard.	J-13	54	SS		15/10	SPT at 75.0'
78.0					RD			
80.0								
82.0	60°	dusty yellowish brown (10YR 7/2); hairline carbonate-filled fracture at 60° to core axis	J-14	62	SS		8/12	SPT at 80.0'
84.0					RD			
86.0	Boulding 15-20"		J-15	71	SS		11/12	
88.0		navy non-parallel medium- to very thin lamina; 3.0" dark greenish gray (5G 4/1); fine grained sand from 85.0 to 85.3; dusty brown (5YR 2/2) sandy clay from 85.3 to 85.8; sand 45%; dark greenish gray sand from 85.8 to 85.9'; hard.			RD			
90.0								
92.0			PB-2		PB	2	2.5 2.5	pitcher sample from 90.0 to 92.5'; 250psi pocket penetrometer 74.5 2/9/81

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0		<u>SD-S-200.5' INTERBEDDED SHALE AND SANDSTONE: (CONT)</u>	PB-2		PB	2		(CONTINUED)
94.0		<u>PHYSICAL CONDITION (CONT)</u> little fractured; friable to low hardness; friable to weak strength; fresh.			RD			
96.0		olive black (5 1/2), very fine- to fine-grained sand (95%), plastic fines (2.5%); sandy clay lense lamina 3mm. thick at 95.2'; plastic fines (90%), sand (10%); sand is friable	J-16	100/15	SS		5/10	pocket penetrometer 54.5 2/19/81 SPT at 95.0' Ended drilling at 95.5' at 5:00 PM 12-5-80 Drillers arrived at 7:00 AM, cloudy day. Resumed drilling at 7:15 AM.
98.0					RD			
100.0								
102.0		well cemented medium- to fine-grained sandstone from 101.0 to 101.4'	PB-3		PB	3	14/25	pitcher sample from 100-102.5' 200psi pocket penetrometer 54.5 2/19/81
104.0					RD			
106.0		wavy non-parallel medium- to very thin laminae of olive black (5 1/2) sandy clay and greenish gray (5 G 4/1) friable fine- to medium-grained sand; depositional features showing bedding @ 15-20° dip; channeling, graded bedding. Bottom 6" predominately sandy clay; hard.	J-17A J-17B	53 ES	SS		15/115	SPT at 105.0' pocket penetrometer 74.5 2/19/81
108.0					RD			
110.0								
112.0		 has a fracture approx. at 110.4'; 3mm. offset.	PB-4		PB	4	25/25	continuous pitcher sampling from 110.0'; 200psi pocket penetrometer 74.5 2/19/81
114.0		dusky yellowish brown (10YR 2/1) sandy clay; very fine grained sand (5%); has a fracture showing 3/4" offset at 113.4'	PB-5		PB	5	20/25	pitcher sample from 112.5 to 115.0', 200psi
116.0			PB-6		PB	6	25/25	pitcher sample from 115.0 to 117.5', 200psi

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0		50.5-200.5 INTERBEDDED SHALE AND SANDSTONE (CON'T)	PB-6		PB	6	2.5 / 2.5	(CONTINUED) pocket penetrometer 74.5 2/9/81
118.0		bedding 15-20° 117.5 to 118.4 thin to very thin alternating shale and sandstone lamina, from 119.0 olive black (S42/1) shale	PB-7		PB	7	11.8 / 2.5	pitcher sample from 117.5 to 120.0; 200psi
120.0			PB-8		PB	8	2.5 / 2.5	pitcher sample from 120.0 to 122.5; 200psi
122.0		moderate to well cemented sandstone from 121.4 to 122.4'	PB-9		PB	9	2.2 / 2.5	pitcher sample from 122.5 to 125.0; 200psi
124.0		PHYSICAL CONDITION (CON'T) little fractured primarily along bedding planes; low hardness; friable to weak strength; fresh	PB-10		PB	10	11.5 / 4.5	variable resistance, hard-soft-hard from 126-126.5'; 250psi refusal at 126.5'; drilled to 128.0'
126.0			PB-11		PB	11	2.0 / 2.5	pitcher sample from 128.0 to 130.5; 200psi
128.0		medium to very thin lamina of alternating shale and subordinate sandstone.	PB-12		PB	12	2.5 / 2.5	pitcher sample from 130.5 to 133.0, 200psi drilling halted at 500 at 133.0
130.0			PB-13		PB	13	1.5 / 2.5	12-6-80 Resumed drilling at 725, clear day. Pitcher sample from 133.0 to 133.5; rod chatter. Cored to 135.0; well cemented sandstone from 133.5 to 134.5.
132.0		well cemented sandstone from 131.0 to 132.0, 133.2 to 133.5'	PB-14		PB	14	2.5 / 2.5	pitcher sample from 135.0 to 137.5; 250psi
134.0			PB-15		PB	15	12.2 / 2.5	pitcher sample from 137.5 to 137.9'
136.0		shale from 137.0 to 137.5	PB-16		PB	16	2.1 / 2.1	pitcher sample from 137.9 to 140.0'
138.0								
140.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS	
140.0		<u>SD-5-2005 INTERBEDDED SHALE AND SANDSTONE (CONT)</u> alternating medium to very thin lamina of shale and subordinate sandstone.	PB-17		PB	17	25 25	(CONTINUED) pitcher sample from 140.0 to 142.5, 200psi	
142.0		shale from 142.0 to 145.0	PB-18		PB	18	25 25	pitcher sample from 142.5 to 145.0, 200psi; minor rod chatter from 143.5 to 145.0;	
144.0			PB-19		PB	19	15 15	pitcher sample from 145.0 to 146.5, 250psi; refusal penetrometer pocket 24.5 2/9/81	
146.0			PB-20		RD	20	20	pitcher sample from 146.5 to 146.6; cored to 147.5; moderate rod chatter; resumed	
148.0			PB-21				25 25	pitcher sampling at 147.5 to 150.0, 150psi	
150.0			PB-22				8 8	pitcher sample from 150.0 to 150.8; refusal, cored to 152.0; moderate rod chatter 150.8 to 151.8; pitcher sample from 152.0 to 154.5, 200psi	
152.0			PB-23				25 25	pitcher sample from 152.0 to 154.5, 200psi; refusal penetrometer 24.5 2/9/81	
154.0								hit well cemented sandstone at 154.5; drilled to 155.5; pitcher sample from 155.5 to 158.0, 200psi.	
156.0			<u>PHYSICAL CONDITION (CONT)</u> fractured little; low hardness; friable to weak strength; fresh	PB-24		PB	24	25 25	pitcher sample from 158.0 to 160.5; hit well cemented sandstone at 160.4; moderate rod chatter.
158.0			shale from 158.2 to 158.8, 159.2 to 160.6	PB-25		PB	25	25 25	pitcher sample from 160.5 to 163.0, 250psi.
160.0			irregular hairline fracture shows 1" offset	PB-26		PB	26	25 25	pitcher sample from 163.0 to 165.5, 250psi
162.0				PB-27		PB	27	20 25	

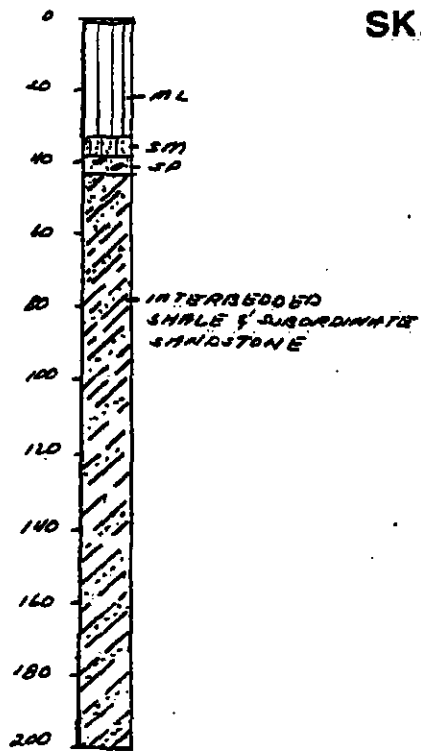
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT ('6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		<u>50.5-200.5 INTERBEDDED SHALE AND SANDSTONE (CONT)</u>	PB-27		PB		2.5 2.5	(CONTINUED)
166.0		alternating medium to very thin lamina of shale and subordinate sandstone with lesser very thin siltstone lamina.	PB-28		PB		2.5 2.5	pitcher sample from 165.5 to 168.0, 200psi, moderate rod chatter from 167.0 to 168.0 pocket penetrometer 94.5 219181
168.0		sandstone from 167.0 to 168.0, 169.5 to 170.0	PB-29		PB	29	2.5 2.5	pitcher sample from 168.0 to 170.5, 200psi; bit well cemented sandstone from 170.0 to 170.5 - considerable rod chatter; sandstone unit extends to a depth of 170.7
170.0		<u>PHYSICAL CONDITION:</u> little fractured along bedding planes; friable to low hardness; friable to weak strength; Treesh.	PB-30		RD			
172.0			PB-31		PB	30	2.5 2.5	pitcher sample from 172.0 to 172.2, refusal
174.0		sandstone from 174.0 to 174.4; coarse- to medium-grained.	PB-32		PB	31	1.8 1.0	12-7-80 Resumed drilling at 7:00 PM, clear day.
176.0		slate from 175.6 to 177.0	PB-33		PB	32	1.9 1.0	pitcher sample from 173.5 to 174.5 moderate rod chatter 174.0 to 174.5 175.5 250psi, moderate rod chatter
178.0			PB-34		AD	33	1.5 1.5	pitcher sample from 175.5 to 177.0 considerable rod chatter at 177.0, 200psi; pitcher tube stuck in barrel, excessive hammering
180.0		well cemented sandstone from 180.6 to 181.2	PB-35		PB	34	2.5 2.5	7 sample tube was required to free the tube; pitcher sample from 178.0 to 180.5, 200psi
182.0			PB-36		PB	35	1.6 1.6	pitcher sample from 180.5 to 181.0, refusal at 181.0 (well cemented sandstone); sandstone to 181.2; brake wash off pitcher bit
184.0		184.0-200.0 alternating shale, sandstone and subordinate siltstone moderate brown (SYR 314); sandstone, olive gray (SY 312) fine to medium grained very thin to thick parallel continuous laminae, bedding 18-20° dip to core axis; shale; dusky yellowish brown (10YR 2/2) to olive black (5Y 2/1) vary thin to medium parallel continuous laminae, fractures at 186° dip 50° carbonaceous & clay filled; fine, sub-parallel laminae dip set	PB-37		AD	36	1.4 1.4	pitcher sample from 181.5 to 182.0, refusal (well cemented sandstone); well cemented sandstone from 181.5 to 182.4 and 183.0 to 183.2
186.0			Box #1		C	37	4.8 5.0	pitcher sample from 184.0 to 184.2, refusal Core from 184.0 with new diamond bit, circulating clean water, standard 1X core barrel
188.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188		<u>50.5-200.5 INTERBEDDED SHALE AND SANDSTONE (CONTINUED)</u> very thin shale lamina from 188.0 to 188.7;			C	1	100%	(CONTINUED) cored from 189.0 to 193.4'
190		<u>PHYSICAL CONDITION:</u> fractured little; friable to low hardness; friable to weak strength; fresh.	Boys #8			2	100%	
192		189.0 to 190.8 dusky brown (SXR4); slightly wavy generally parallel very thin shale lamina; depositional features apparent (graded bedding, channeling, X-bedding)					100%	
194		194.6 to 197.6 dark greenish gray (S6411); fine- to coarse-grained sandstone	Boys #9			3	100%	cored from 193.4 to 198.5'
196		 depositional channeling features at 197.9' very thin shale lamina from 198.0 to 198.5'; very thin fine-grained sandstone from 198.5 to 199.7; irregular basinal joint from 199.0 to 200.0, no dip?					100%	stopped drilling at 5 ⁰⁰ at 198.5'
198							100%	12-8-80 Resumed drilling at 7 ⁰⁰ AM. Clear day; cored from 198.5 to 200.0; terminated hole at 200.0' at 9:30 AM
200	BH						100%	Installed 100.0' of 4" PVC and grouted; annulus 3.0' of 6" ID PVC 1/2 below sidewalk surface, steel H ₂ O cover was then set flush with concrete surface.

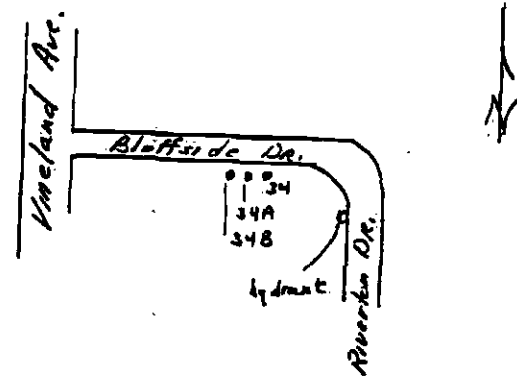


SUMMARY BORING NO. 34

PROJECT 80-1280-22 STATION HOLE YES DATE DRILLED 12-2-80/12-8-80
 OVERBURDEN DEPTH (FT.) 0.0' TO 50.5'.
 BEDROCK DEPTH (FT.) 50.5' TO 200.0' (T.D.).
 WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.
 GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.
 GAS NO; DEPTH FIRST NOTICED _____, DATE _____.
 E-LOG YES.
 DOWN-HOLE SURVEY YES.
 CROSS-HOLE SURVEY YES.
 PVC CASING (I.D.): 4" 0.0 TO 100.0; 3" _____ TO _____; 2" _____ TO _____.
 GROUND ELEVATION REF. 574



SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 1/14-18/81 HOLE NO. 35
 LOCATION Vineland @ Aqua Vista GROUND ELEV. 581
 DRILLING CONTRACTOR J. N. Pitcher Co. LOGGED BY Schoeberlein DEPTH TO GROUND WATER _____
 TYPE OF RIG Feiling 1500 HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lb. 30 in.
 SURFACE CONDITIONS asphalt street TOTAL DEPTH 198.0 ND. CORE BOXES 6

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILLS MODE	RUN NO.	CORE REC. %	REMARKS
0.0	AC	0.0-0.7 ASPHALT			AO			Auger to 3.5' slowly checking for utilities
0.7	SM	0.7-5.0 SILTY SAND: dark yellowish brown (10 YR 4/2); 20-30% lo plasticity silt, 70-80% very fine to fine grained subangular to subround sand; dry; fill.						
2.0								
4.0					RO			set casing to 5' set up tub, mixed mud, drilling
5.0	NL	5.0-16 CLAYEY SILT: grayish brown (5YR 3/2); 100% lo plastic fines; moist; medium dense; less clay with depth.						
6.0								
10.0				4 5 7	SS			1/3/1.5 recovery
12.0			J-1		RO			
14.0								
16.0	SP	16-26 SAND: pale yellowish brown (10 YR 6/2); 98% very fine grained subangular sand; moist; dense.						
18.0								
20.0			S-1		OR			11/1.5 16/1.5 disturbed 10/1.5 recovery SHEET 1 OF 10

PROJECT 80-1280-22

DATE DRILLED 1/14-18/81

HOLE NO. 35

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	SP	16-26 SAND: (cont)	J-2	13	SS			1.1/1.5 recovery
				13				
				25				
22.0					RO			
24.0								
26.0	CL	26-36 SILTY CLAY: moderate brown (5 YR 4/4); 100% medium plastic fines; moist; medium stiff to stiff.						
28.0								
30.0			J-3	4	SS			1.5/1.5 recovery
				4				
				6				
32.0					RO			1/14/81 1/15/81
34.0								
36.0	SP	36-77 SAND: moderate, yellowish brown (10 YR 5/4) and dark yellowish brown (10 YR 6/4) mottled (Fe staining); 99% medium to coarse angular sand; occasional gravel; moist; very dense; granitic source.						
38.0								
40.0			C-2		OR			30/0, 43/5 1.0/1.0 recovery
			J-4	40	SS			
				55				
42.0					RC			
44.0								

SHEET 2 OF 10

PROJECT 80-1280-22

DATE DRILLED 1/14-18 1961

HOLE NO. 55

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SP	36-77 SAND: (cont.)			RO			
46.0		contains gravel and cobbles						
48.0								
50.0		decrease in gravel, dominantly coarse sand	5	52	SS			35/5, 60/5 25/25 recovery
52.0					RO			
54.0								
56.0								
58.0								
60.0			6-3		OK			35/5 35/5 0.8/1.0 recovery
62.0				40	SS			40/5 60/25 0.4/0.75 recovery
64.0				50	RO			
66.0								
68.0								

PROJECT 30-1280-22

DATE DRILLED 1/14 - 18/51

HOLE NO. 35

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	SP	36-77 SAND: (cont)			RO			
70.0			J-6	24	SS			1.1/1.5 recovery
				49				
		minor gravel at bottom of sample		39				
72.0					RO			
74.0								
76.0		75-75.5 gravel lens						intense chatter 6"
78.0	SP/CL	77-78.8 INTERBEDDED SAND & CLAY: mottled brown & grey; 30% clay lenses; ~70% medium graded sand; moist; dense.						
80.0	CL	79.3-84 SILTY CLAY: light olive grey (5Y 5/2); 100% red. plastic fines; moist; very stiff.	C-4	13	SE			17/1.5, 17/1.5 28/1.0 recovery
			J-7	15				
				17				
82.0					RO			
84.0	SP	84-99.6 SAND: pale yellowish brown (10YR 6/2). 98% very fine to fine graded angular sand; moist to wet; very dense.						
86.0								
88.0								
90.0			J-8	39	SS			1.0/1.0 recovery
				64				
92.0					RO			

SHEET 4 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	SP	84-99.6 SAND: (cont.) gravel lens 6" grain size increase			RD			intense chatter 6"
94.0	SP							
96.0		grain size decrease						
98.0								
100.0	CL	WEATHERED TOPANGA FORMATION 99.6-117.5 SANDY CLAY: dark yellowish brown (10YR 4/2); ~75% mod. plastic clay, 5% fine to medium grained angular sand, occasional gravel moist, very stiff; interbedded with clayey sand, sand and silty clay.	C-5	8 13 20	DR SS RD			9/1.5, 16/1.5 1.0/1.0 recovery 1.5/1.5 recovery
102.0			J-9					
104.0								
106.0								
108.0								
110.0		sample: thinly interbedded sands and clays of varying grain size and consistency	J-10	13 10 15	SS RD			1.5/1.5 recovery
112.0								
114.0								
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (C)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	CL	99.6-117.5 SANDY CLAY (cont)			RO			
118.0	SW	117.5-120.5 SAND: medium bluish grey (SB S/1); 98% well graded sand, occasional gravel lenses; wet to saturated, dense; clayey sand at top of interval.	C-6		OR			no chatter 62/1.5 81/5 1.0/1.0 recovery
120.0		TOPANGA FORMATION 120.5-198.0 CLAYEY SILTSTONE:		28	CS			1.3/1.5 recovery
122.0		color from medium light grey (NG) to moderate brown (S YR 4/4), silt with minor clay and fine sand lenses; occasional well cemented layers; thinly laminated.	J-11	31				
124.0		Physical condition: closely to moderately fractured, easily mechanically broken; friable to low hardness; friable to weak strength; little weathered.		39	RO			
126.0								
128.0								
130.0			Box #1		PG	1		pitcher barrel taken to examine potential bedrock, begin continuous pitcher sampling 2.2/2.5 recovery samples cored w/ 300 p.s.i. down
132.0						2		2.0/2.5 recovery
134.0								
136.0			S-1			3		2.4/2.5 recovery
138.0								
140.0			Box I (cont.)			4		2.0/2.75 recovery
140.0		fracture sets merge from 20-30° from horizontal along bedding planes and 50-55° fracture						

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0		120.5-198.0 (cont.) CLAYEY SILTSTONE: Physical condition: as previously described	5-2		PB	4		1.5/1.5 recovery problems extruding, won't push out
142.0			Box 1 (cont.)			5		
144.0						6		1.4/2.75 recovery
146.0		145-145.6 well cemented	Box 2			7		11:51/81 in a.m. went in w/ Pitcher barrel to clean out hole to bottom of run NX w/ diamond bit - coring only with weight of rods, down pressure jacks up pump pressure
148.0					C	8		5.1/5.1 recovery increased fracturing in cored runs compare to pitcher barrel samples, primarily mechanical due to different methods
150.0		150.1-152.1 intensely fractured				9		10:05 2.0/2.5 recovery core mixed up due to shooting out of barrel
152.0		152.0-152.6 clay lense soft and plastic 153.6 thin fine grained sand lense dip of laminations = 30° from horizontal, fractures along bedding, additional fractures 90° from horiz.				10		10:40 3.7/4.9 recovery
154.0								
156.0		157 - fine grained sand lense 157-157.5 intensely fractured						
158.0		158.7 soft clay zone 6"	Box 3			11		12:00 12:20 0.5' recovered from previous run has been noted 1.8/1.8 recovery 2:48
160.0		sandy clay lenses increasing in size and frequency				12		1:25 change to Turcon carbide bit, no notable increase in drilling speed 4.1/4.2 recovery
162.0								
164.0						13		1:58 2:20

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	DPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164.0		120.5-198 <u>CLAYEY SILTSTONE</u> (cont.) <u>PHYSICAL CONDITION: AS PREVIOUSLY DESCRIBED</u>	Box 3 (cont.)		C	13		
166.0		fracturing becoming horizontal along bedding planes						4.0/5.1 recovery
168.0		168.6 2" well cemented sand stone lense	Box 4					6' lost out bottom of core barrel 3:25
170.0		168.7-169.0 sand lense no cementation, very fine grained				14		
172.0		171-173.8 increased cementation sand content increase						4.5/5.2 recovery
174.0		173.8-174.5 sand lense soft uncemented, pale blue				15		4:00 4:25
176.0		174.5-177.3 moderately cemented siltstone of low hardness occasional pinch zones, easily mechanically fractured, moderately fractured as undisturbed						5.0/5.2 recovery
178.0		177.8 2" sand lense uncemented, pale blue						
180.0		178.5 4" sand lense, pale blue	Box 5					
182.0		178.7 clay lense, soft, uncemented, dusky yellow brown (OVR 2/2)				16		5:25 1/16/81 5:30 1/17/81 1.1/2.0 recovery
184.0		183 - 4" sand lense						
186.0		183.8 2" sand lense				17		5:30 using N rod to get collar out of hole and thinned fluid, drilling faster core ground at top of run 3.6/4.7 recovery
188.0		minor clay zones with swelling bedding present						
190.0		185 - 2" sand lense				18		10:05
192.0		clay lense 3"						1.6/1.8 recovery
194.0						19		core barrel clogged up between inner and outer

PROJECT 80-1280-22

DATE DRILLED 1/14-18/81

HOLE NO. 35

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188.0		120.5 - 198.0 CLAYEY SILTSTONE (cont)				19		Diamond bit - back on
190.0		189 thin beds poorly to moderately cemented sandstone and siltstone 1/4" thick, dip 40°				20		0.5 / 1.5 recovery change bit back to carbide
192.0		191.5 siltstone, fewer, thicker interbeds to 2"						4.2 / 5.0 recovery
194.0		sandy clay lense, soft				21		4:05 1/13/81 E-loaded hole 1/17/80 0.8 / 2.5 recovery
196.0			Box 6			22		8:40 blocked 7:25 12.0 recovery
198.0		G.H. 198.0 - Terminated hole 2' early due to problems with blocking while coring, enough information received hole is logged to 193.5' 1/17/81 water pressure test 1/18/81 attempted, packers would not seat. Dropped 180' of 2" PVC during installation, fishing attempt unsuccessful, broke and dropped again in hole, installed 1" to 175' inside lower section of 2". Attempted to run 2nd 1" to isolate perched aquifer, problems installing effective bentonite seal due to presence of 2" in hole. water sample 2/12/81						8:55 blocked
200.0								
202.0								
204.0								
206.0								
208.0								
210.0								
212.0								

SHEET 6 OF 10



SUMMARY BORING NO. 35

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 1/14-18/81

OVERBURDEN DEPTH (FT.) 0 TO 120.5

BEDROCK DEPTH (FT.) 120.5 TO 198.0 (T.D.)

WATER PRESS. TEST YES; INTERVAL(S) 169 TO 191, 159 TO 181

GROUND WATER DEPTH (FT.) 60' DATE 1/19/81; DATE _____

GAS NO; DEPTH FIRST NOTICED _____, DATE _____

E-LOG YES . 1/17/81

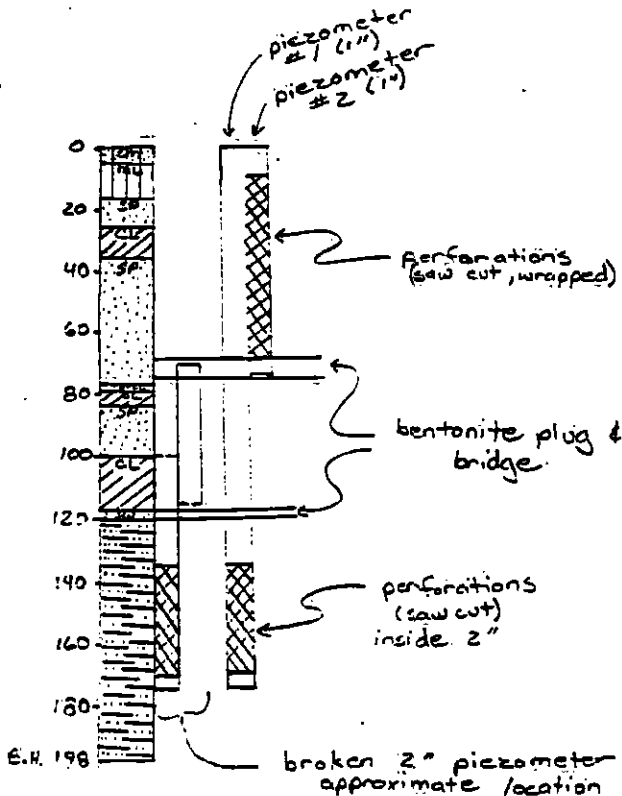
DOWN-HOLE SURVEY NO

CROSS-HOLE SURVEY NO

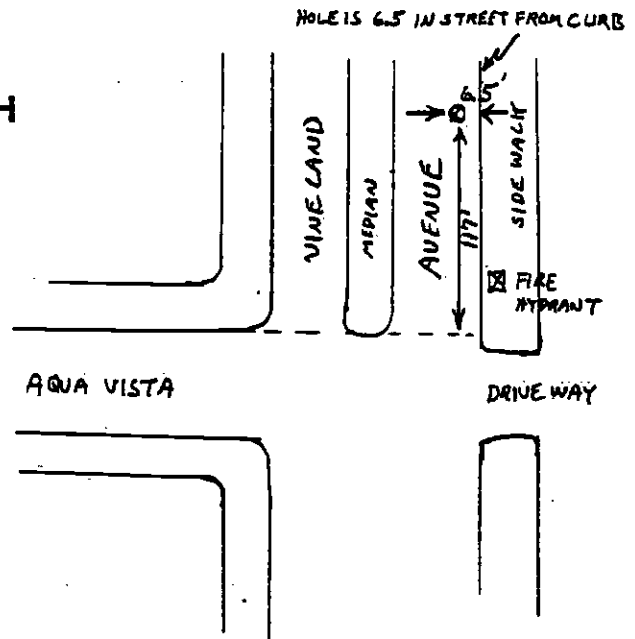
1" : 0 TO 175'
 1" : 0 TO 75'

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" _____ TO _____

GROUND ELEVATION REF. 581



SKETCH



**ConverseWardDavisDixon
Earth Sciences Associates
Geo/Resource Consultants**



Boring Log 36

THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY OFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/5-7/80 HOLE NO. 36
 LOCATION 45' E of Vineland E curb, 7' N of Bloomfield N curb GROUND ELEV. 589'
 DRILLING CONTRACTOR T.M. Pitzer Co. LOGGED BY Don Gillette DEPTH TO GROUND WATER 68.3'
 TYPE OF RIG Soilmaster HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lbs - 30" drop
 SURFACE CONDITIONS sidewalk - residential TOTAL DEPTH 206.7' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0.0		0. - 0.4 <u>CONCRETE:</u>			C			TRICONE thru concrete
0.4	SM	0.4 - 4.0 <u>SILTY SAND; GRAYS + BROWNS; ~15% FINES; ~85% MED. SAND; TRACE COARSE SAND; MOD. DENSE; SLIGHTLY MOIST.</u>			AD			8-10.2' HOLE CASED (DRIVEN) 5" I.D.
4.0	SP	4.0 - 13.0 <u>SAND; GRAY; ~100% MED. SAND; TRACE COARSE SAND; TRACE 1/2" GRAVEL; ~2% MOD. DENSE; SLIGHTLY MOIST.</u>						(REMOVED CASING + MIXED MUD 1:45 - 2:30)
10.2			T-1	5	SS			10.2 - SET CASING + MUD 1:45 - 2:30
12.0				6				
13.0	ML	13.0 - 28.0 <u>SANDY SILT; DRK. BROWN; ~60% SILT; ~40% FINE SAND; MICACEOUS; FIRM; MOIST.</u>						NO DOWN PRESSURE
16.0	ML	~15-16 SILT,						
16.0	ML	16-18 SANDY SILT.						
18.0	ML	18-19 SILT						
20.0	ML							

SHEET 1 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20.0	ML	13.0-28.0 SANDY SILT (cont.)	C-1		RD DR			DR → 22 blows/1.0'
22.0	ML	22-23 silt	J-2	5	SS			pocket penetrometer 2.5 2/9/81
				8				
	ML	23-24 sandy silt			RD			
24.0	ML	24-25 silt						
	ML							
26.0		26-28 sand increase						
28.0	CL	28.0-34.0 SILTY SANDY CLAY; dark brown; 55% fines; 45% sand; firm; moist						
30.0			J-3	2	SS			
				4				
				6				
32.0					RD			
34.0	SC	34.0-39.0 CLAYEY SAND; dark brown, 35% fines; 65% sand; dense						
36.0								
38.0								
40.0	SP-GP	39.0-48.5 SAND AND GRAVEL; reddish brown; very dense; moist; gravel subround to 3" diameter, sand medium to coarse grained	C-2		DR			chatter
	GP							DR → refusal at .8' 100 blows/.8'
				50	SS			no SPT recovery, refusal at .5" penetration
42.0	SP-GP	40-42 Gravel, 10% sand, 90% gravel, to 3"			RD			
44.0								

PROJECT 80-1280-22

DATE DRILLED 12/5-7/80

HOLE NO. 36

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (G)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44.0	SP	39.0-48.5 SAND AND GRAVEL: (cont)			RO			rig chattering
46.0	SP-60	44-45 sand, lt. brown; very dense, medium to coarse grained						
48.0								48.5' clay driller notes
50.0	SM	48.5-56.5 SILTY SAND: brown; 40% silt, 60% sand micaceous; dense; moist			OR			OR ⇒ 49 blows/1.0' lost sample, no check ball 12/5/80
52.0					OR			OR ⇒ 82 blows/1.0'
54.0			J-4	10 15 29	SS			low blows possibly due to loss of OR sample
56.0								chatter
58.0	SP-60	56.5-65.5 SAND AND GRAVEL: grey, 50% medium to coarse sand, 50% 1/2" to 1" gravel, very dense, moist						
60.0					OR			OR ⇒ 100 blows/.1' no recovery
62.0					SS RO			SS ⇒ no recovery
64.0	ML	63-65.5 Sandy silt and gravel, dark brown, gravel to 1/2" diameter						
66.0	CL	65.5-68.0 CLAY; dark brown						
68.0								

SHEET 3 OF 20

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68.0	ML	68.0-78.5 <u>SANDY SILT</u> ; grey and reddish brown, 75-85% silt thin laminations, 15-25% fine sand, stiff, moist			RO			
70.0			C-3	11	SS			OR ⇒ 85 blows/1.0'
72.0	ML		72-73 clayey silt, grey	J-5	45			
	ML			49				
74.0	ML				RD			
76.0	ML	75-76 clayey silt, grey						
78.0	SW	78.5-129.0 <u>SAND</u> : grey to reddish grey, 97% fine to medium grained sand, 3% gravel to 1/2" diameter						change driller
80.0			J-6	26	SS			SS ⇒ 26/5, 42/5, 23/3
					42			
82.0	CL	82-82.6 clay, dark brown			RD			
	SW							
84.0		sand grading coarser						
86.0								
88.0	CL	87-87.5 clay, dark brown						
	SW							
90.0					OK			OR ⇒ 100 blows/1.0'
92.0	CL	91-92 sandy clay, dark brown	C-4	12	SS			
			J-7	22				

PROJECT 80-1280-22

DATE DRILLED 12/5-7/80

HOLE NO. 36

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92.0	SW	78.5-129.0 SAND: (cont.)	J-7	22	SS RD			
94.0								
96.0	GP SW	95-96 Gravel						chatter
98.0								
100.0	GP SW	99.5-100 gravel to 1"	J-8	50	SS RD			chatter SS ⇒ 50 blows / .75'
102.0		thin interbeds of brown sandy silt and sandy clay approx. 1/2" thick						
104.0								
106.0								
108.0								
110.0			J-9	48 50	DR SS RD			DR ⇒ 100 blows / .3' no recovery SS ⇒ 48 / .5', 50 / .3'
112.0		silt interbeds and cobbles						
114.0								
116.0								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116.0	SW	78.5-129.0 SAND: (cont.)			RD			
118.0								
120.0				28	SS			SS ⇒ 28/5, 46/5, 50/4
		trace gravel to 1", moist	J-10	46				
				50				
122.0					RD			
124.0								
126.0								
128.0								
130.0	ML	129.0-138.4 SANDY SILT: grey, stiff, moist, laminated black organic silt, grey fine sand	C-5		DR			100 blows/.9'
132.0		contains claystone interbeds			RD			
134.0								
136.0			PB-1		PB	1		2.5'/2.5' recovery pitcher barrels taken to determine if formation was weathered bedrock
138.0	SP-6P	137.5-138.4 sand and gravel			PB			1.5'/2.5' recovery
	SC	138.4-144.0 CLAYEY SAND: H. brown; 25-35% clay, 65-75% medium to coarse sand, dense, moist	PB-2			2		
140.0								

PROJECT 80-1280-22

DATE DRILLED 12/5-7/80

HOLE NO. 36

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140.0	SC	138.4-144 <u>CLAYEY SAND</u> : (cont)	PB3		PB	3		1.4/2.5 recovery
142.0		142 10-15% clay, 85-90% coarse sand			RO			sand and gravel encountered indicating dense clayey sand above chatter
144.0	SP-GR	144.0-156.0 <u>SAND AND GRAVEL</u> grey, 75-80% medium to coarse sand, 20-25% gravel to 3"						500 psi down pressure
146.0								
148.0								
150.0			J-11	43 50	SS			SS ⇒ 43/.5', 50/.4'
152.0					RO			
154.0								
156.0	SM-ML	156.0-167.0 <u>SILTY SAND</u> ; # brown, 50% silt, 50% fine sand, very stiff, moist						variable down pressure, 500psi for sand
158.0								
160.0			J-12	21 34 50	SS			SS ⇒ 21/.5', 34/.5', 50/.3' pocket penetrometer 2.25 (broke apart) 2/9/81
162.0			PB4		PB	4		1.2/1.5' recovery
164.0								

SHEET 7 OF 10

PROJECT 80-1280-22DATE DRILLED 12/5-7/80HOLE NO. 36

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPY (6")	DRILL WIDE	RUN NO.	CORE REC. %	REMARKS
164.0	SM	156.0-167.0 <u>SILTY SAND:</u> (cont)			RO			
166.0								chatter
168.0	SW	167.0-193.5 <u>SAND:</u> grey, 95% medium to coarse grained sand, 5% gravel to 1", very dense, moist						
170.0			J-13	50	SS RO			SS → 50/.25'
172.0								
174.0	CL	173-175 clay, dark brown						
176.0	SW							
178.0		177 gravel lense						chatter
180.0					PB			1.3/2.5 recovery
182.0			PB-5			5		
184.0			J-14	50	SS RO			SS → 50/.3'
186.0		186.5 gravel lense						chatter
188.0								

SHEET 2 OF 10

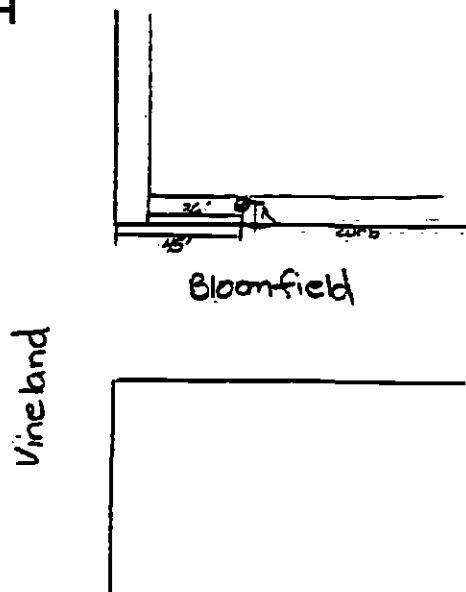
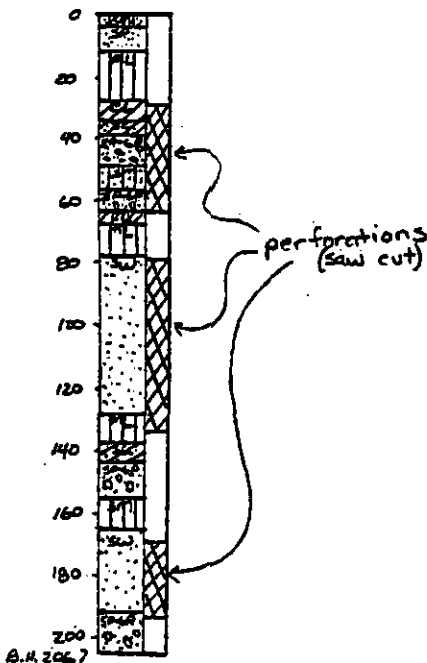
DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (BT)	DRILL MODE	RUB NO.	CORE REC. %	REMARKS
188.0	SW	167.0-193.5 SAND; (cont.)			RO			
190.0			J-15	50	SS RO			SS → 50/3'
192.0								
194.0	SP=GP	193.5-208.6 SAND AND GRAVEL; grey, trace fines, 60-70% medium grained sand, 30-40% gravel to 3"; very dense, moist						chatter 300psi down pressure
196.0								chatter
198.0								chatter
200.0								
202.0								
204.0								
206.0			086		PB	6		141.5' recovery
208.0		B.H. 206.7' Hole terminated installed 20' 2" schedule 40 PVC, perforations at 21'-61', 81'-141', 180'-195'. water sampled 2/10/81						SS → 50/2
210.0								
212.0								



SUMMARY BORING NO. 36

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 12/5-7/80.
 OVERBURDEN DEPTH (FT.) 0 TO 206.7.
 BEDROCK DEPTH (FT.) NA TO (T.D.).
 WATER PRESS. TEST NO; INTERVAL(S) TO , TO .
 GROUND WATER DEPTH (FT.) DATE ; DATE .
 GAS NO; DEPTH FIRST NOTICED , DATE .
 E-LOG YES . 12/7/80
 DOWN-HOLE SURVEY NO.
 CROSS-HOLE SURVEY NO.
 PVC CASING (I.D.): 4" TO ; 3" TO ; 2" 0 TO 201.
 GROUND ELEVATION REF. 589'

SKETCH





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/8-10/80 HOLE NO. 37
LOCATION Huson St. (between Lancaster & U. road) GROUND ELEV. 604'
DRILLING CONTRACTOR Pitchee LOGGED BY J.D. Gallinatti DEPTH TO GROUND WATER 124.2'
TYPE OF RIG Failing HOLE DIAMETER 4 3/8" HAMMER WEIGHT AND FALL 140 lbs ; 30 in. fall
SURFACE CONDITIONS Sidewalks - side street TOTAL DEPTH 202' NO. CORE BOXES N/A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN. NO.	CORE REC. %	REMARKS
0.0	SM	0.0 - 20.5 SILTY SAND: dark yellowish brown (MAYR 4/2). ~40% low plasticity fines; ~60% very fine grained sand; moist to damp; loose; SM.			AD			Drilling started at 2:30 12/8/80
2.0								
4.0								
6.0								
8.0								
10.0				5	SS			SPT at 10.0'
			1/4	5				
				6				1.0/1.5 recovery pocket penetrometer 1.5 (broke apart) 2/9/81
12.0					AD			
14								
		↓ GRADING SANDIER						
16								
18								
20								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
20	SM	0.0-20.5 SILTY SAND : (cont.)	C-1		DR			Blows = 26 for DR
20.5	SP	20.5-23.5 SAND : very fine orange (10YR 8/2); 100% very fine sand to fine sand; loose; SP.		12	SS			(140 lbs. hammer - 30 in. dia) 3/10 recovery on DR no recovery on SS
22				22				
				30				
					RD			* Drive samples taken using above ground hammer
24	SM/ML	23.5-25.0 SILTY SAND-SANDY : SILT; moderate brown (5YR 4/4); ~50% low plasticity fines; ~45% fine sand; ~5% scattered angular gravel, mostly granitic; SM/ML.						
26								
28								
	SP	29.0-30.5 GRAVELLY SAND						
30								
	ML	30.5-33.5 GRAVELLY SILT : dk. moderate brown (5YR 3/4); ~70% low plasticity fines; ~30% fine sand; soft to firm; ML.	J-2	5	SS			
				8				
				11				4/1.5 recovery pocket penetrometer 74.5 2/9/81
32					RD			
34	SP/ML	33.5-54.0 GRAVELLY SAND : light yellowish brown (10YR 6/4); ~50% fine grained sand; ~40% medium & coarse sand; ~10% gravel, mostly 1/2" up to 1"; clasts are sub-angular and predominately granitic w/ some graywacke; base; SP/ML.						
36								
38								
40			C-2		DR			DR => 114 blows .5/1.0 recovery
			I-3	15	SS			SS => 15/5, 50/25 .5/1.75 recovery
42				20				
					RD			chatter, from 42' to 45'
44		42.0-45.0 = increased gravel content (20-30%)						

PROJECT 80-1250-22

DATE DRILLED 12/8/80

HOLE NO. 37

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
44	SP/SW	33.5 - 54.0 GRAVELLY SAND: (6')			RD			
46								
48								
50			S-4	41 50	SS RD			chatter from 49' to 50'
52								SS ⇒ 41/5 41/4 .4/9 recovery
54	SP	54.0 - 74.0 SAND: very light brown (5YR 6/4); 100% fine grained sand; moist to dry; medium dense; SP.						50.9' - stop drilling for 12/8 (4:30) continue drilling 7:00 on 12/9
56								
58								
60			C-3		DR			DR ⇒ 68 blows 10/1.0 recovery
62		sample: some light brown (5YR 5/6) staining	S-5	18 32 36	SS RD			SS ⇒ 10/1.5 recovery
64								
66								slow drilling (dense sand)
68								

SHEET 3 OF 10

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
68	SP	54.0-74.0 SAND: (cont.)			RD			
70		sample: poorly graded fine sand (100% sand)	T-6	50	SS RD			SS ⇒ 50/4 4/4 recovery * although very high blow count, sample did not appear more than medium dense.
72								
74	CL/CH	74.0-78.0 SANDY CLAY: light brown (5YR 5/6); ~80% moderate plasticity fines; ~20% fine grained sand; firm to stiff; CL/CH.						
76								Drill rate = 10 min/10 ft.
78	SP	78.0-83.0 SAND: pale yellowish brown (10YR 6/2); 100% fine grained sand; dense; damp; SP.						
80		brown from sand: → coarse sand + gravel wet, dense. SP	C-4		DR			DR ⇒ 105 blows 6/1.0 recovery
82			T-7	50	SS RD			SS ⇒ 50/5 5/5 recovery
84	ML	83.0-85.0 SANDY SILT: moderate brown (5YR 4/4); ~80% low plasticity fines; ~20% fine sand; firm; ML.						
86	SP	85.0-108.0 SAND: moderate yellowish brown (10YR 5/4); ~90% fine grained sand; ~10% medium to coarse grained subangular sand; dense; damp; SP.						
88		88.0-94.0 occasional thin SANDY SILT layers 0.5'-1.0' thick.						
90			T-8	50	SS RD			SS ⇒ 50/3 3/3 recovery pocket penetrometer 0.75 (broke apart) 2/9/81 SHEET 4 OF 10
92								

PROJECT 80-1280-22

DATE DRILLED 12/9/80

HOLE NO. 37

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	SP	85.0 - 108.0 SAND: (cont.)			RD			
94								
96								
98								
100		sample: SAND: ~90% fine sand; ~10% medium sand.	C-5		DR			DR → 100 blows / 6'
			S-9	50	SS			10/6 recovery
					RD			SS → 50/5
								4/1.5 recovery
102								
104		103.0 - 108.0 some vegetation fragments: thin & fibrous.						
106								
108	CL	108.0 - 115.0 SANDY CLAY: moderate brown (5YR 4/4); ~90% moderate to high plasticity clay; ~10% very fine sand; stiff; damp; CH.						
110			S-10	24	SS			1.5/1.5 recovery
				32				
				40				
112					RD			
		↓ gradational contact						
114		115.0 - 131.0 SAND: light yellowish brown (10YR 6/4); ~90% fine grained sand; ~10% medium & coarse sand; dense; damp; SP.						
116	SP							

SHEET 5 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116	SP	115-131 SAND: (cont.)			RD			
118								
120			C-6		DR			DR ⇒ 100 blows/.4 ft.
			J-11	50	SS			.4/.4 recovery
122					RD			SS ⇒ 50/.5
								.4/.5 recovery
124								
126								
128								
130	SP	129.0-131.0 GRAVELLY SAND: ~80% sand; ~20% subrounded gravel sp to 2";	J-12	50	SS			SS ⇒ 50/.3
					RD			.1/.3 recovery
132	ML	sample: contains disseminated pyrite (& chalcopyrite?)						* sample J-12 should be carefully examined for ore minerals in the fines fraction.
134		131.0-137.0 SANDY SILT: moderate brown (5YR 4/4); ~25% low plasticity fines; ~25% fine grained sand; occasional gravelly lenses; stiff; ML.						
136		↓ gradational contact						
138	SP	137.0-159.0 SAND: light yellowish brown (10YR 6/4); ~97% fine grained sand; ~3% medium and coarse sand; dense; SP.						
140								

PROJECT 80-1280-22DATE DRILLED 12/9HOLE NO. 37

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
140	SP	137.0 - 159.0 SAND: (cont.)	C-7		DR			DR ⇒ 100 blows / .5 ft.
		sample: abundant disseminated pyrite	J-13	48	SS			.5/.5 recovery
142				50	RD			SS ⇒ .5/1.0 recovery
144								
146								
148								
150			J-14	50	SS			SS ⇒ .5/.5 recovery
					RD			
152								
154								
156								
158								
160	ML	159.0 - 160.5 SANDY SILT: Dusky yellowish brown (10YR 2/2); ~75% low plasticity fines; ~25% fine grained subangular sand; very stiff; ML.	C-8		DA			DR ⇒ 100 blows / 9'
	SP		J-15	24	SS			.9/.9 recovery
162		160.5 - 172.0 SAND: light yellowish brown (10YR 6/4); ~90% very fine to fine grained sand; ~10% medium to coarse sand; dense; SP.		50	RD			SS ⇒ .2/.9 recovery
164								

SHEET 7 OF 10

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164	SP	160.5 - 172.0 SAND: (cont.) 164.0 - occasional SILT lenses			RD			
166								
168								
170		sample: very fine grained SAND w/ abundant mica; 0.5' layer of SILT; some MND.	J-16	28 38 30	SS RD			SS ⇒ 12/1.3 recovery ↘
172	CL	172.0 - 177.0 SANDY CLAY: light brown (5YR 5/6); ~80% low to moderate plasticity fines; ~20% fine sand; CL.						
174								
176								
178	SP	177.0 - 188.1 SAND: light yellowish brown (10YR 6/4); ~80% fine sand; ~20% medium to coarse sand; dense to very dense; SP.						
180			C-9 J-17	18 50	DR SS			12/10/80 DR ⇒ 100 blows/5' 4/5 recovery SS ⇒ 18/5, 50/3 .6/8 recovery
182								180' - stop drilling for 12/9/80 (5:00 PM) start drilling in am. on 12/10/80 Lisa Schuberlein replaces John Gallianthi
184								
186								
188		188' thin clay/cravel lense						rig chattering SHEET 8 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS				
188.0	SM	188.1-196.0 <u>SILTY SAND:</u> moderate olive brown ~15% silt, 85% very fine sand, very dense, moist; SM										
190.0									J-18	50	SS	SPT 9/5 51.5 recovery pocket penetrometer 74.5 kg/cm ² 2/9/81
192.0												
194.0												
196.0	SP	196.0-201.5' <u>SAND:</u> yellowish grey (547/2); 45% fms, fine grained; angular to subangular grains, contains pyrite, medium dense, wet. SP										
198.0												
200.0											DR	DR 100/4; 0/1 recovery SS 111/5 recovery
202.0									J-19	15	SS	Terminated to 6' at 202' 12-10-80
								12:00				
								water sampled 2/10/81				



SUMMARY BORING NO. 37

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 12/10/80

OVERBURDEN DEPTH (FT.) 0 TO 202.0'

BEDROCK DEPTH (FT.) --- TO --- (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) --- TO ---, --- TO ---

GROUND WATER DEPTH (FT.) 124.2 DATE 12/15/80; --- DATE ---

GAS NO; DEPTH FIRST NOTICED ---; DATE ---

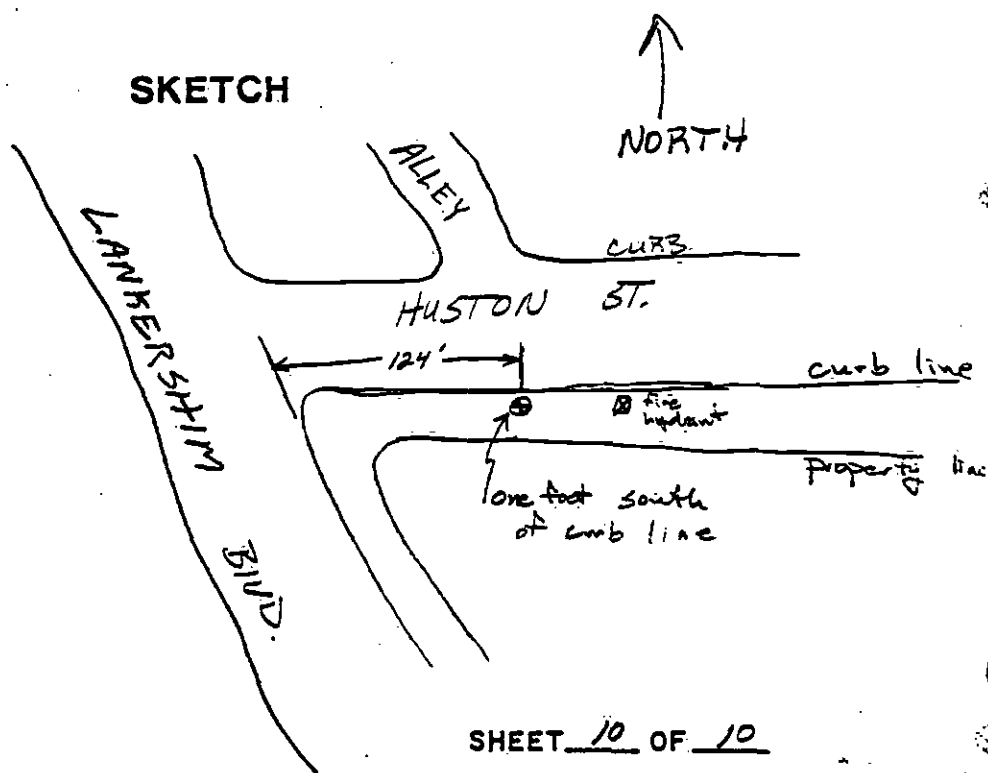
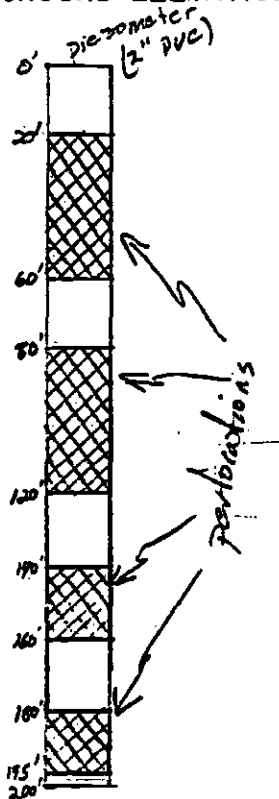
E-LOG yes

DOWN-HOLE SURVEY NO

CROSS-HOLE SURVEY NO

PVC CASING (I.D.): 4" --- TO ---; 3" --- TO ---; 2" 0' TO 200'

GROUND ELEVATION REF. 604'





THIS LOG IS APPLICABLE ONLY AT THIS LOCATION AND TIME.
CONDITIONS MAY DIFFER AT OTHER LOCATIONS OR TIME.

PROJECT 80-1280-22 DATE DRILLED 12/15/80 HOLE NO. 38
LOCATION Fair Ave. off of Chandler Blvd. between RR tracks and a floor GROUND ELEV. 630
DRILLING CONTRACTOR Pitdcor LOGGED BY Gallinatti DEPTH TO GROUND WATER N/A
TYPE OF RIG Fairing HOLE DIAMETER 4 7/8" HAMMER WEIGHT AND FALL 140 lbs, 30 in.
SURFACE CONDITIONS asphalt, side of road TOTAL DEPTH 201.3 NO. CORE BOXES none

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (bl)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
0	SM	0-2.0 <u>SILTY SAND</u> ; moderate olive brown (5Y 4/4); ~15% low plasticity fines; ~65% fine grained sand; ~15% medium grained sand; ~5% coarse grained sand; damp; loose.			AD			Begin drilling at 1000 12/15/80.
2	SP	2.0-34.0 <u>SAND</u> ; pale grayish olive (10Y 5/2); 90% very fine to fine grained sand; ~10% medium grained sand; loose; dry.						Auger to 10' then set 10' of 5" surface casing. Mix mud, sample, and begin rotary drilling. Drill w/ 4 7/8" RTC bit.
4								
6								
8								
10		sample: <u>SAND</u> ; occasional gravel (2 1" gravels in 1' of sample); one 0.1' layer of very fine sand was moist.	S-1	7 13 12	SS RD			10/15 recovery
12								
14		12'-13' gravelly lens						
16		slight increase in medium & coarse sand content to ~20%.						
18								
20								

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL MODE	RUSH NO.	CORE REC. %	REMARKS
20	SP	2.0' - 34.0' SAND: (cont.)	C-2		DR			Drive samples taken with down-hole jars - 18 inch drop 325 lbs.
22			J-2	17	SS			
				24				
				38				
24					RD			DR ⇒ 66 blows 0.9/1.0 recovery
26								RD ⇒ 1.1/
28								
30		29.5 - 31.0 Gravelly lens						
		sample: SAND: ~65% fine sand; ~35% medium & coarse sand; wet.		29	SS			SS - no recovery due to gravel blocking split - spoon
					RD			
32			J-3	22	SS			1.2/1.5 recovery
				22				
				50				
34	SM	34.0' - 36.0' SILTY SAND: moderate brown (SYR 4/4); ~20% low plasticity fines; ~80% fine grained sand.						
36	SP	36.0' - 49.0' GRAVELLY SAND: Light brown (SYR 6/4); ~50-70% fine sand; 30-40% medium and coarse sand; 10% gravel, concentrated in layers, sub-rounded, up to 1/2" moist; medium dense.						
38								Drive sample partially disturbed while removing from sampler
40			C-2		DR			
				30	SS			DR ⇒ 69 blows 0.6/1.0 recovery
42			J-4	29				SS ⇒ 1.2/1.5 recovery
				50				
					RD			
44								

PROJECT 80-1280-22

DATE DRILLED 12/15/80

HOLE NO. 38

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL ROPE	RUN NO.	CORE REC. %	REMARKS
44	SP	36.0' - 49.0' GRAVELLY SAND (cont)			RD			
46								
48								
50	SW	49.0' - 85.0' SANDY GRAVEL - GRAVELLY SAND: Light brown (SPT 6/4)(?); ~50% fine to coarse sand; ~50% rounded to sub-rounded 1/4" to 3" gravel; medium dense to dense; clasts are mostly granitic. interlayered SAND layers 0.5' to 2' thick		50	SS			0.3 recovery no recovery - probably were sitting on a gravel COBBLE.
52					RD			
54								rig chatter
56								
58								
60			C-3		DR			small recovery due to large gravel in sample DR ⇒ 100 blows/.6 ft.
62				50	SS			.4/.6 recovery
64					RD			SS ⇒ 0.0/.5 recovery no recovery due to gravel jammed in spt. + - spoon
66								stop drilling at 5:00 12/15/80. begin drilling at 7:00 12/16/80
68								

SHEET 3 OF 10

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6')	DRILL HOSE	RUN NO.	CORE REC. %	REMARKS
68	SW	49.0 - 55.0 <u>SANDY GRAVEL - GRAVELLY SAND - (cont.)</u>			RD			
70	SM	70.5 - 72.0 <u>SILTY SAND: dk yellowish brown (10YR 4/2); ~15% low plasticity fines; ~85% very fine to fine sand; moist to wet; medium dense.</u>	J-5	23 31 20	SS			0.9/1.2 recovery pocket penetrometer 0.5 (broke apart) 2/19/81
72	SW-SW (S)				RD			
74		↓ large cobbles present						
76								
78								
80			G-4		DR			DR → 11.5 blows / 3' .1/.3 recovery
82			J-6	30	SS RD			PB → 0.9/1.7 recovery no recovery due to large gravels and cobbles - tube bent
84								SS → 0.1/0.3 recovery
86	CL	85.0 - 88.0 <u>SANDY CLAY: (moderate brown 5YR 4/4); ~80% moderate plasticity fines; ~20% fine grained sand; medium dense.</u>						
88	SW	88.0 - 91.5 <u>GRAVELLY SAND: pale yellowish brown (10YR 6/2); ~20% fine grained sand; ~70% medium grained sand; ~10% coarse sand and gravel; sand is all angular, gravel is sub-angular; medium dense. material seems to be of granitic source.</u>	J-7	30	SS RD			.1/.3 recovery
90								
92								

PROJECT 80-1280-22

DATE DRILLED 12/16/80

HOLE NO. 38

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPY (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
92	SW	88.0 - 97.5 GRAVELLY SAND: (cont.)			RD			
94								
96								
98	ML	97.5 - 99.0 SANDY SILT: moderate brown (5YR 4/4); ~80% low plasticity fines; ~20% fine grained sand; medium dense.						poor recovery due to gravel
100	SP (P)	99.0 - 103.0 SAND with interbedded SANDY GRAVEL: moderate yellowish brown (10YR 5/4); ~10% fine sand; ~80% medium sand; ~10% coarse sand; interbedded with ~30% sand; ~70% gravel.	C-5 T-8	50	DR SS RD			DR ⇒ 100 blows/.5' SS ⇒ 3/.5 recovery SS ⇒ 7.3 recovery
102								
104	SM (ML)	103.0 - 102.0 SILTY SAND and CLAYEY SILT: moderate brown (5YR 4/4); SILTY SAND is ~30% low plasticity fines; ~70% very fine to fine sand; dense to med. dense; CLAYEY SILT is ~100% low to moderate plasticity fines; stiff; two lithologies are interbedded.	S-1 T-9	27 50	PB SS RD			1.3/2.0 recovery 0.8/0.8 recovery
106								
108								
110								
112	SW	112.0 - 110.5 GRAVELLY SAND: light brown (5YR 6/4); ~10% low plasticity fines; ~40% fine sand; ~40% medium grained angular sand; ~10% sub-rounded gravel; dense; some SILT lenses.						
114								
116								

PROJECT 80-1250-22DATE DRILLED 12/16/80HOLE NO. 38

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
116	SW	112.0 - 140.5 <u>GRAVELLY SAND</u> (ind)			BD			
118			S-2		PB			1.2/2.0 recovery bottom 0.9' fell out of tube while still in the hole
120		sample: <u>SAND</u> : ~70% fine sand; ~30% medium sand	S-10	50	SS AD			1/3 recovery
122		↓ decrease in gravels						
124	ML	124.0 - 125.0 <u>SANDY SILT</u> ; ~80% fines; ~20% fine sand.						
126	SW	↓ ~30% fine sand; ~70% med. sand.						
128								
130				50	SS AD			0.0/3 recovery 1/10 recovery ↓ stop to reseal hole at surface
132								
134								
136								
138								
140								

SHEET 6 OF 10

DEPTH	CLASS	FIELD DESCRIPTION	SAMPLE	BT (ft)	DRILL MODE	SUN NO.	CORE REC. %	REMARKS
140	SW SM	112.0-140.5 GRAVELLY SAND: (cont.)			RD			
142		140.5-168.0 SILTY SAND: moderate brown (5YR 4/4); ~20% low plasticity fines; ~80% very fine to fine graded sand; dense; wet; fine grained pyrite common.	S-3		PB			2 1/2 recovery
144			S-11	50	SS RD			2/3 recovery
146								
148								
150								
152			S-12	50	SS RD			4/4 recovery
154								
156								
158								
160			S-4		PB			19/25 recovery
162			S-13	50	SS RD			3/4 recovery
164								

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
164	SM	140.5 - 168.0 <u>SILTY SAND: (cord.)</u>			RD			163' - stop at 5:00 for 12/16/80 begin drilling 7:30 12/17/80
166								
168	CL	168.0 - 173.0 <u>SILTY CLAY: light olive brown (5Y 5/6); 100% moderate plasticity fines; stiff; damp; MnO staining.</u>						
170			J-14	21 48 50	SS			1.1/1.3 recovery
172					RD			
174	SM	173.0 - 187.0 <u>SILTY SAND: yellowish moderate brown (7.5 YR 4/6); ~20% low plasticity fines; ~80% very fine to fine grained sand; dense; moist; abundant fine grained pyrite.</u>						
176								
178								
180			S-5		PB			1.3/1.5 recovery
182			S-15	50	SS RD			1/3 recovery
184								
186								
188	SP	187.0 - 201.3 <u>SAND: moderate yellowish brown (10YR 5/4); ~20% fine grained sand; ~40% medium grained sand; dense; moist; some pyrite and mica.</u>						

increase in grain size ↓ gradational contact

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (blows)	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
188	SP	187.0 - 201.3 SAND = (cont.)			RD			
190			5-16	50	SS RD			.2/3 recovery pocket penetrometer 0.5 (broke apart) 2/9/81
192								
194		194'-200' some interbedded SILTY SAND lenses						
196								
198								
200			5-6		PB			1.0/1.0 recovery
201	B.H.	201.3 Bottom of hole	5-12	50	SS			2/3 recovery
202								201.3 - Terminate Hole
204		penetrometer: from 200' to surface, perforated from 180' to 195', from 120' to 140', and 60' to 100' moved off hole 12/18/80						Finish drilling at 11:45 (12/17/80). e-log until 3:00 Down-hole survey on morning of 12/18/80. Flush-out hole and install perforated casing. water sampled 2/25/81

SUMMARY BORING NO. 38

PROJECT 80-1280-22 STATION HOLE NO DATE DRILLED 12/15/80.

OVERBURDEN DEPTH (FT.) 0' TO 201'.

BEDROCK DEPTH (FT.) _____ TO _____ (T.D.).

WATER PRESS. TEST NO; INTERVAL(S) _____ TO _____, _____ TO _____.

GROUND WATER DEPTH (FT.) _____ DATE _____; _____ DATE _____.

GAS NO; DEPTH FIRST NOTICED _____, DATE _____.

E-LOG yes.

DOWN-HOLE SURVEY yes.

CROSS-HOLE SURVEY NO.

PVC CASING (I.D.): 4" _____ TO _____; 3" _____ TO _____; 2" 1' TO 200'.

GROUND ELEVATION REF. G.L. = 630' (TORO)

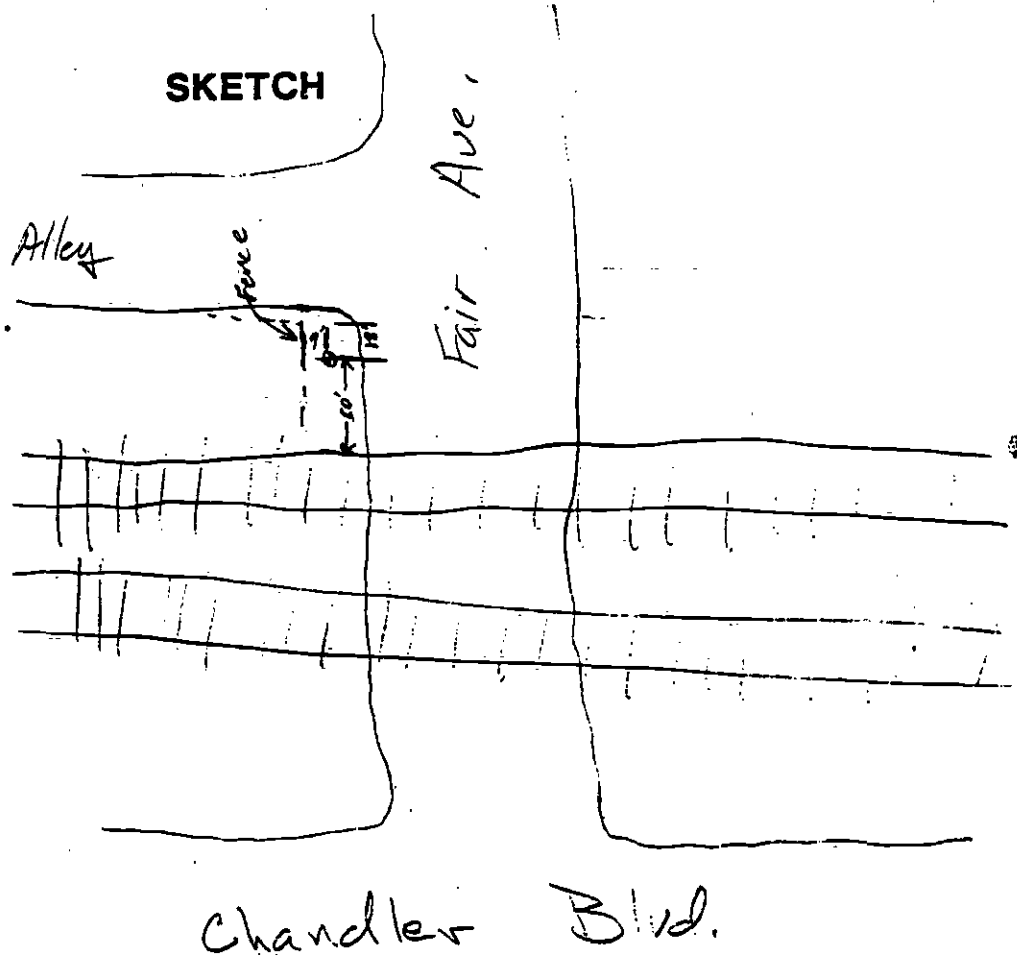
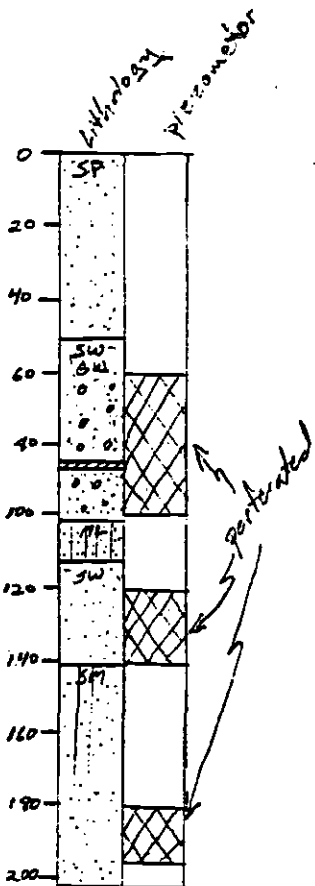




PHOTO - CORE BORING No. 1 42.8 to 149.1 Feet

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Project No
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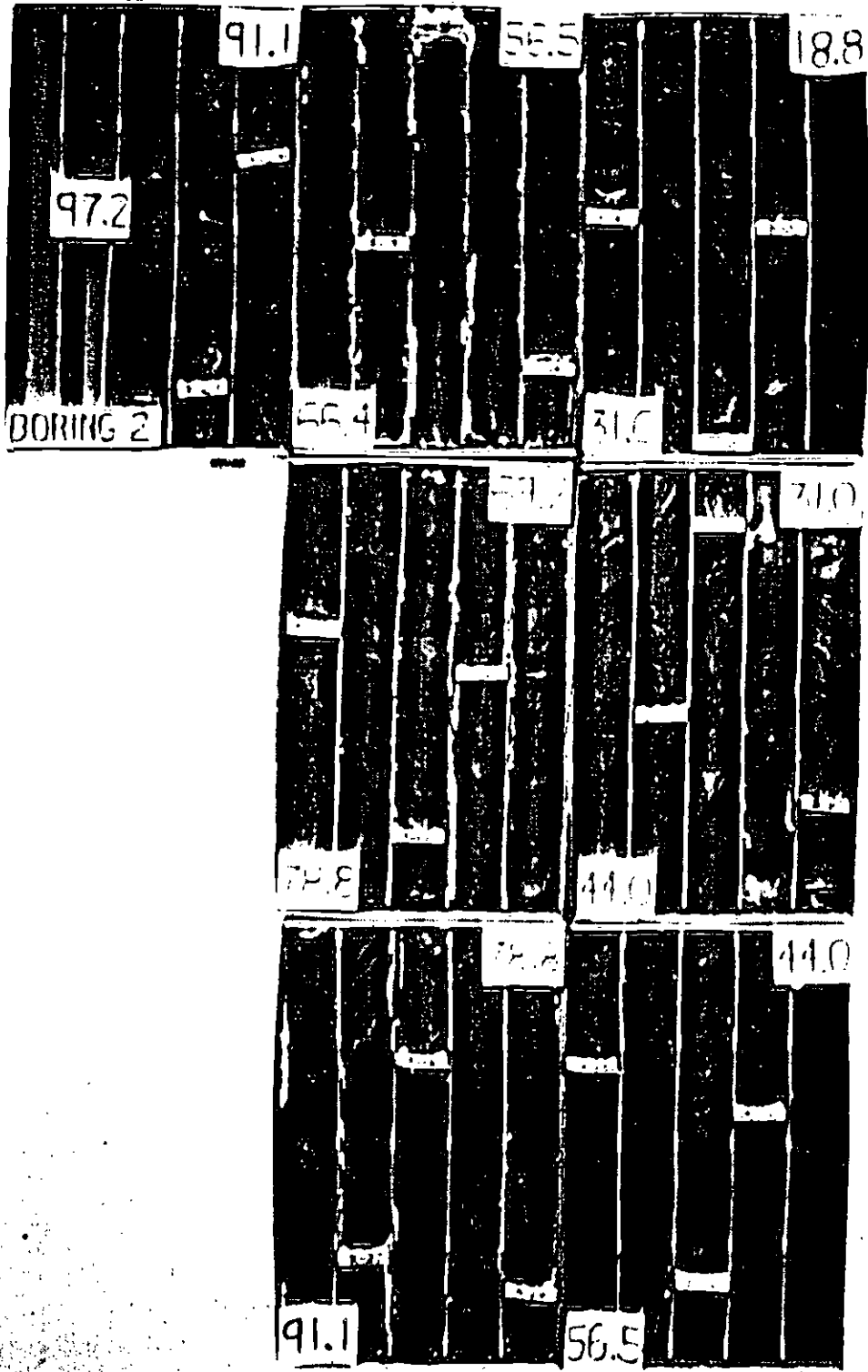


PHOTO - CORE BORING No. 2 18.8 to 97.2 Feet

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Figure No
 A-2

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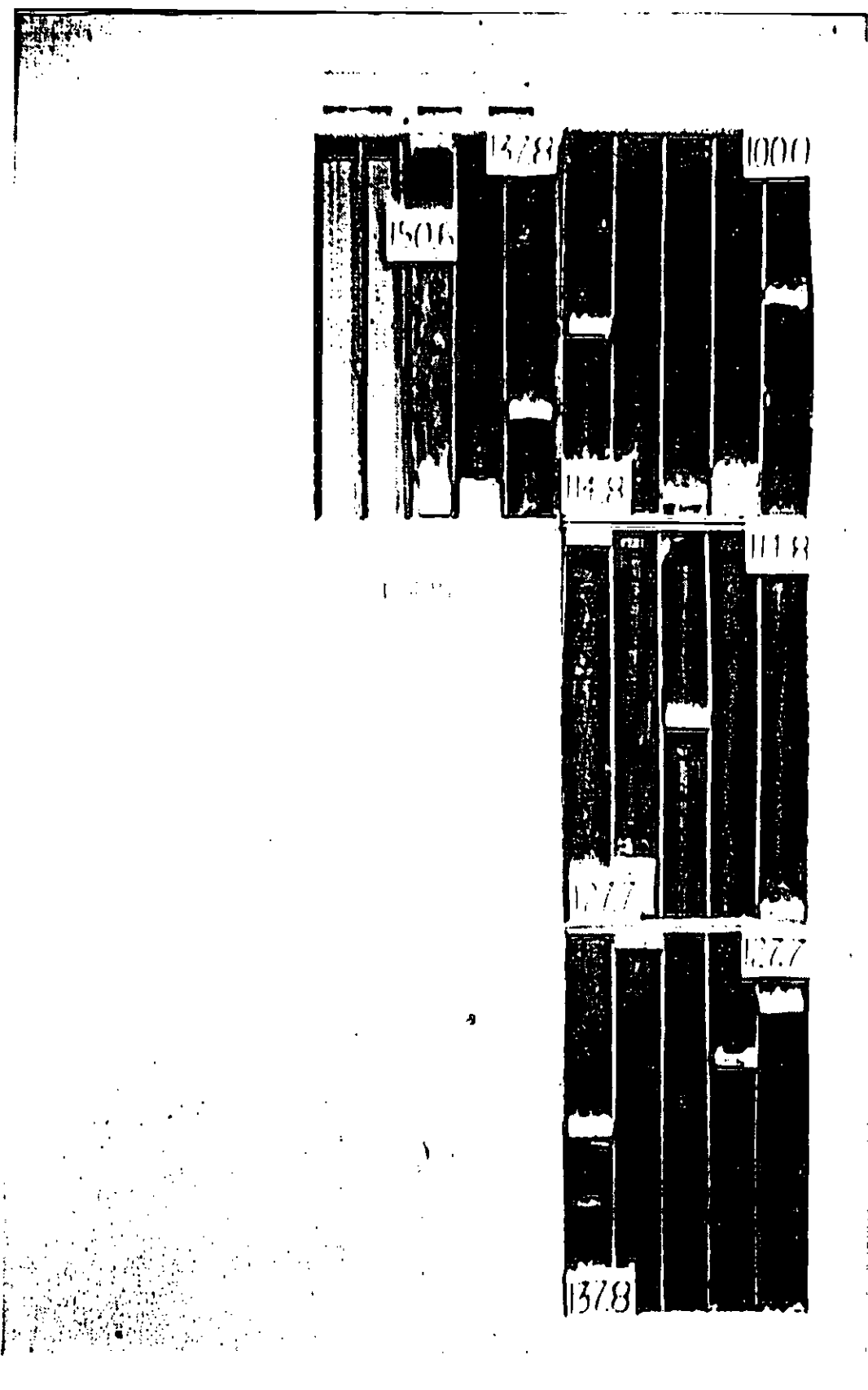


PHOTO - CORE BORING No. 3 100.0 to 150.6 Feet

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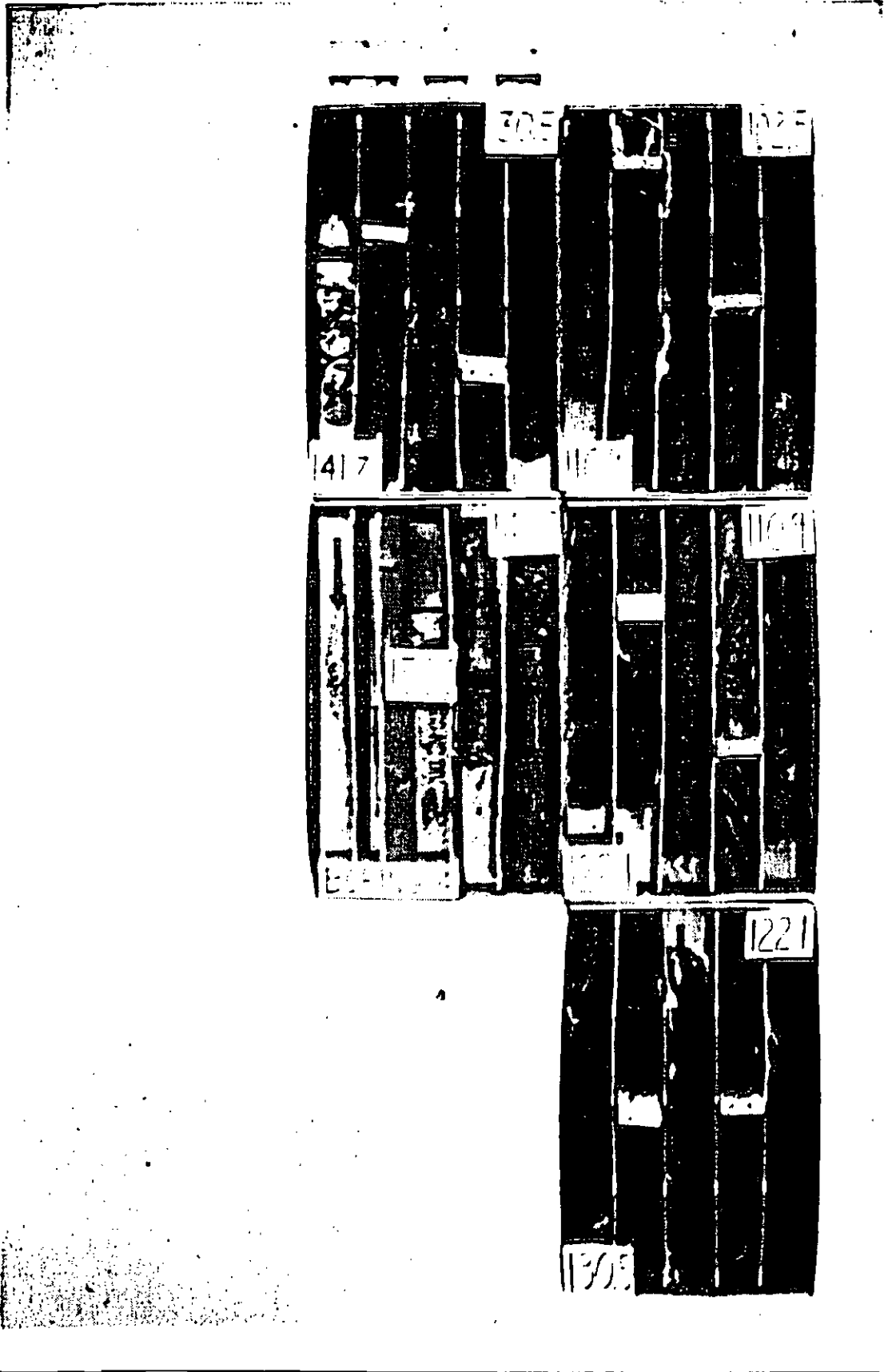


PHOTO - CORE BORING No. 4 102.5 to 150.0 FEET

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Figure No
A-4

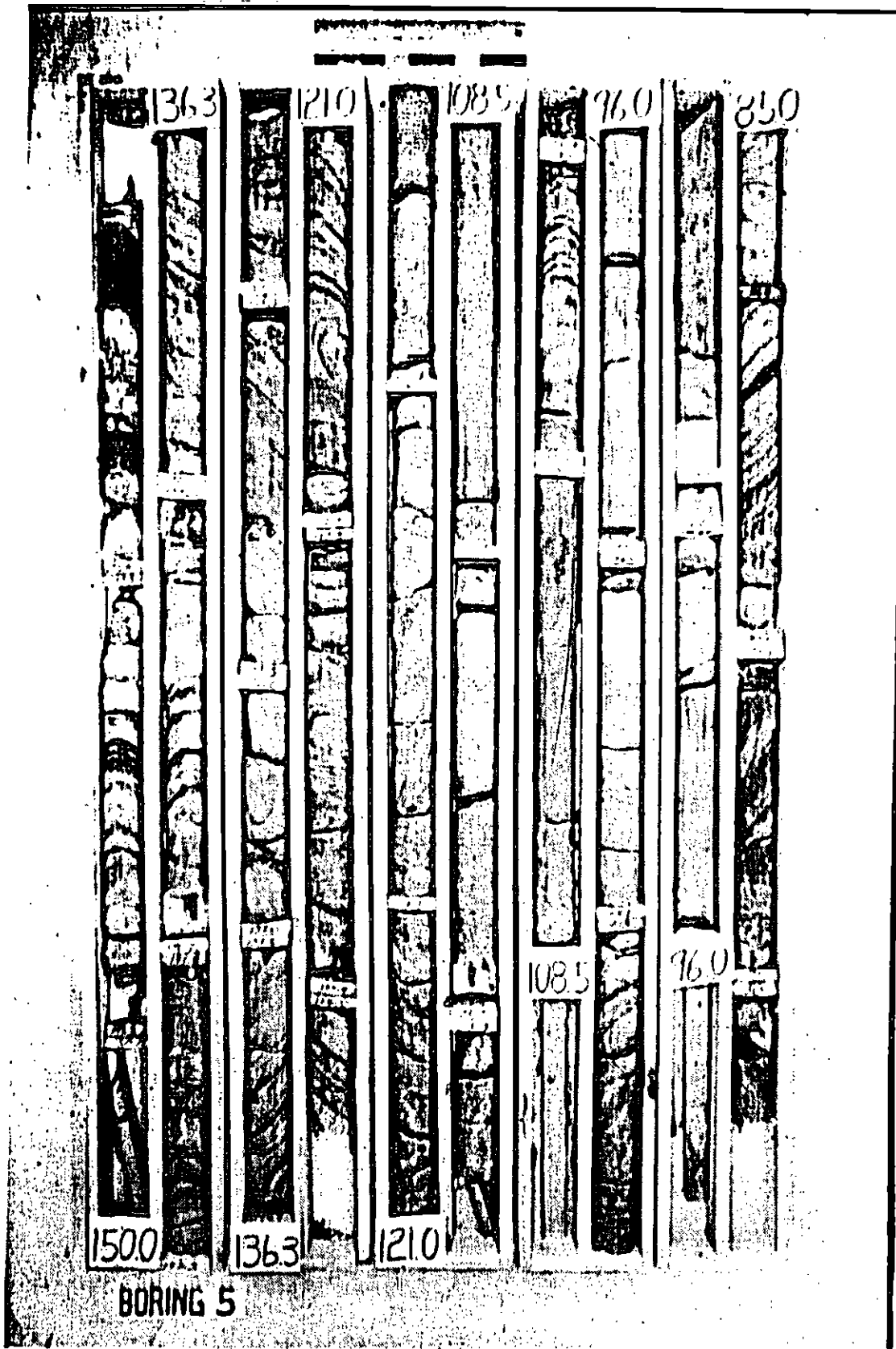


PHOTO - CORE BORING No. 5 85.0 to 150.0 FEET

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Figure No.
A-5



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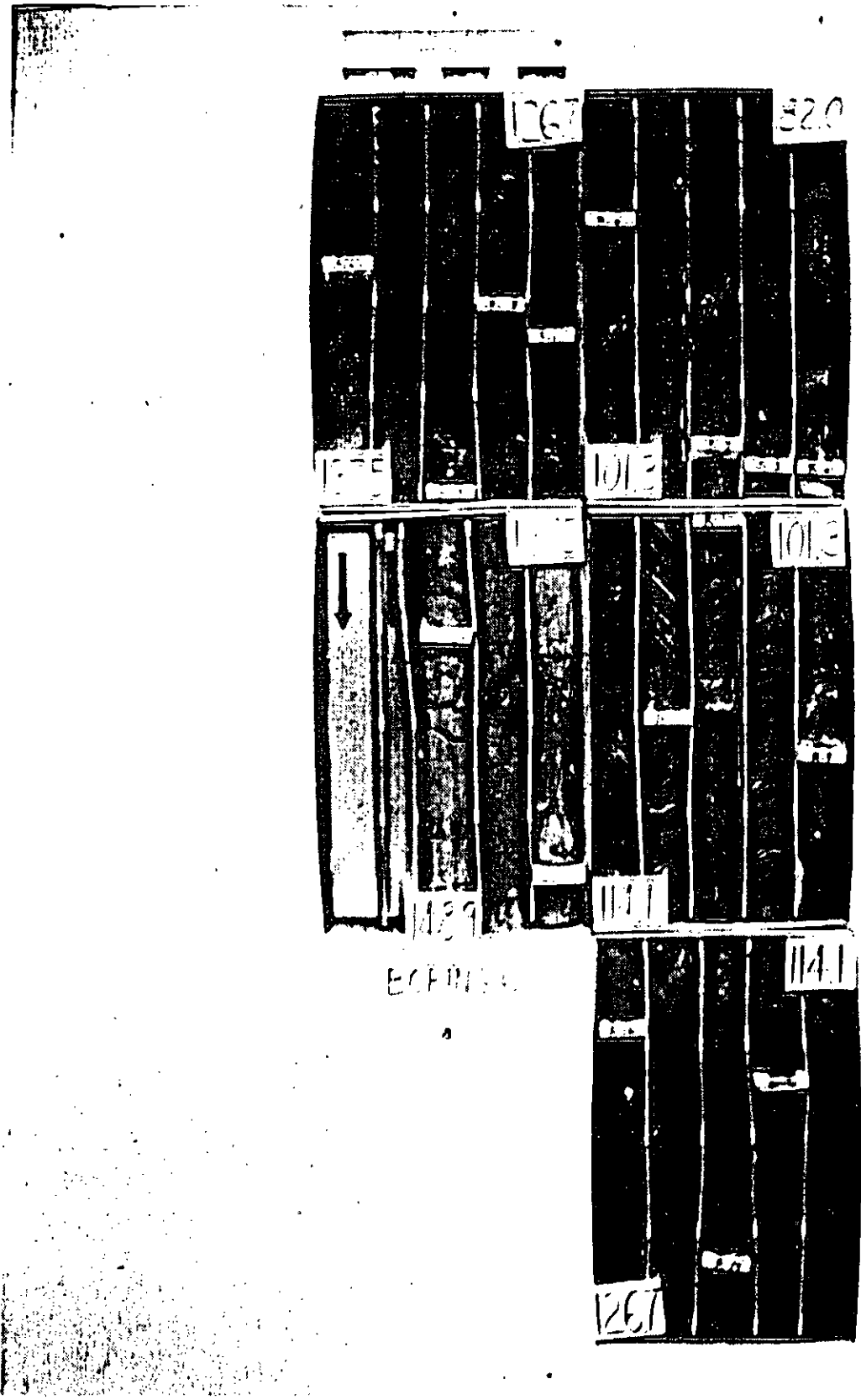


PHOTO - CORE BORING No. 6 82.0 to 148.9 FEET

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Figure No



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A-6

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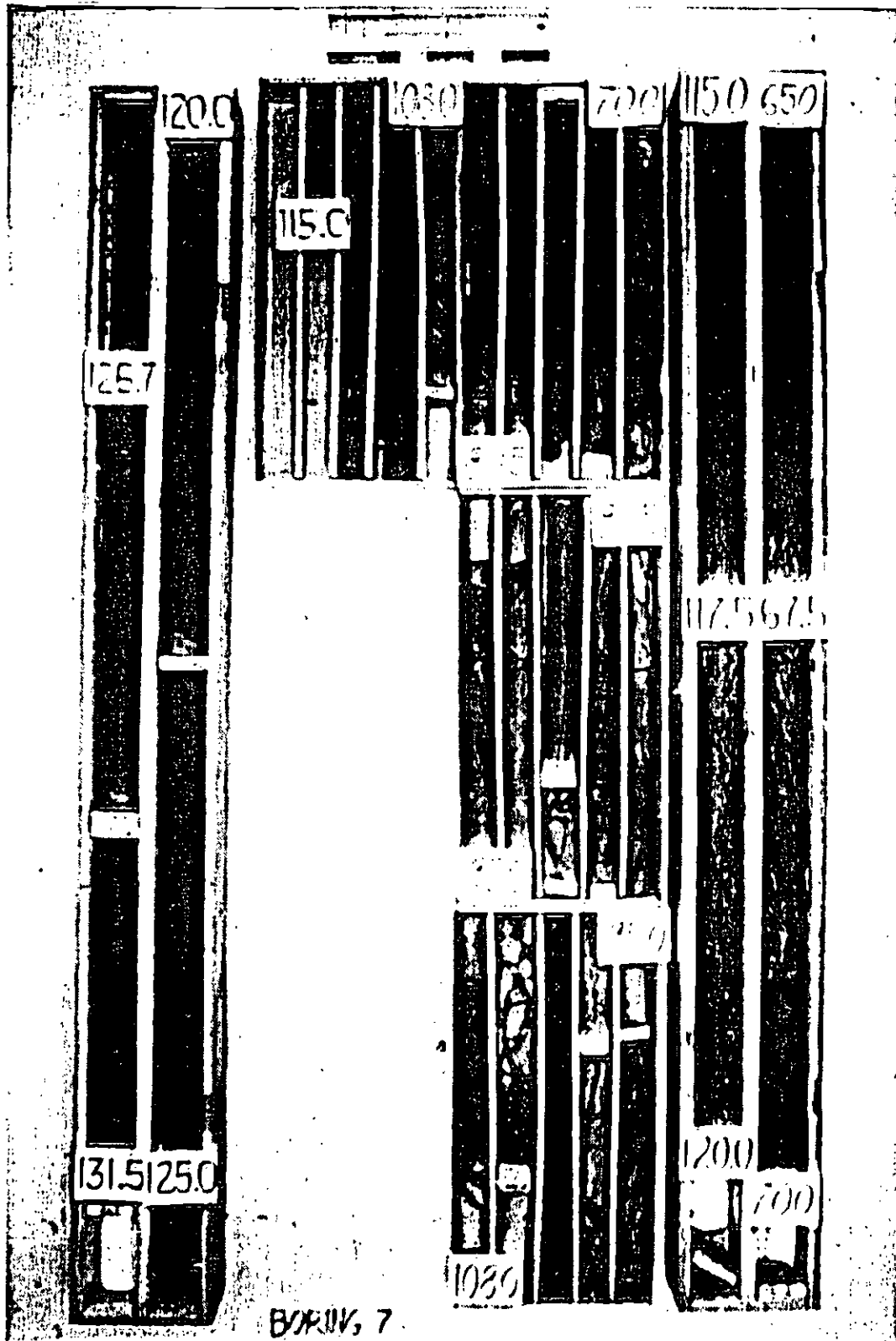


PHOTO - CORE BORING No. 7 65.0 to 131.5 FEET

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Figure No.
A-7



PHOTO - CORE BORING No. 8 125.0 to 202.1 FEET

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Figure No

A-8



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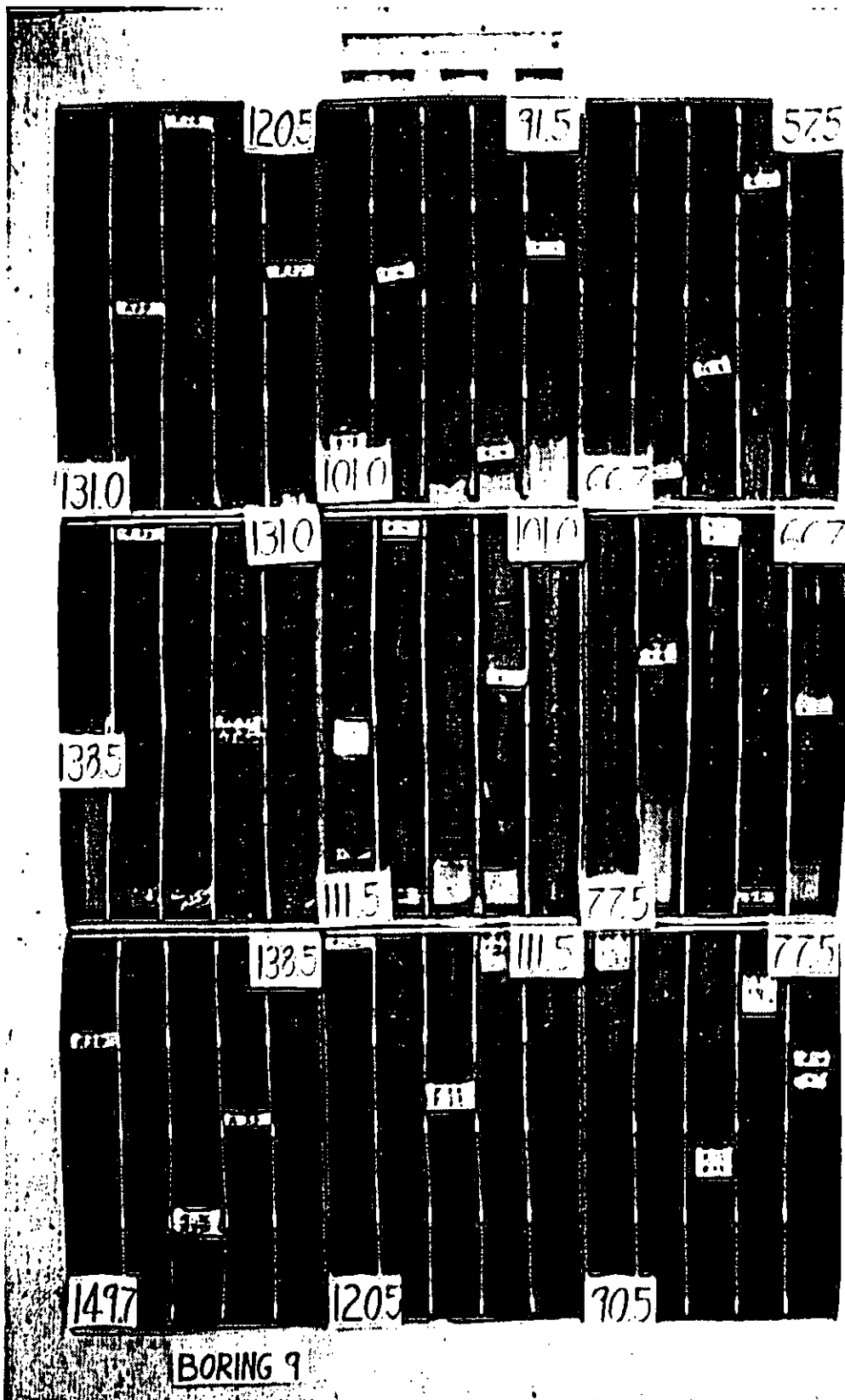


PHOTO - CORE BORING No. 9 57.5 to 149.7 FEET

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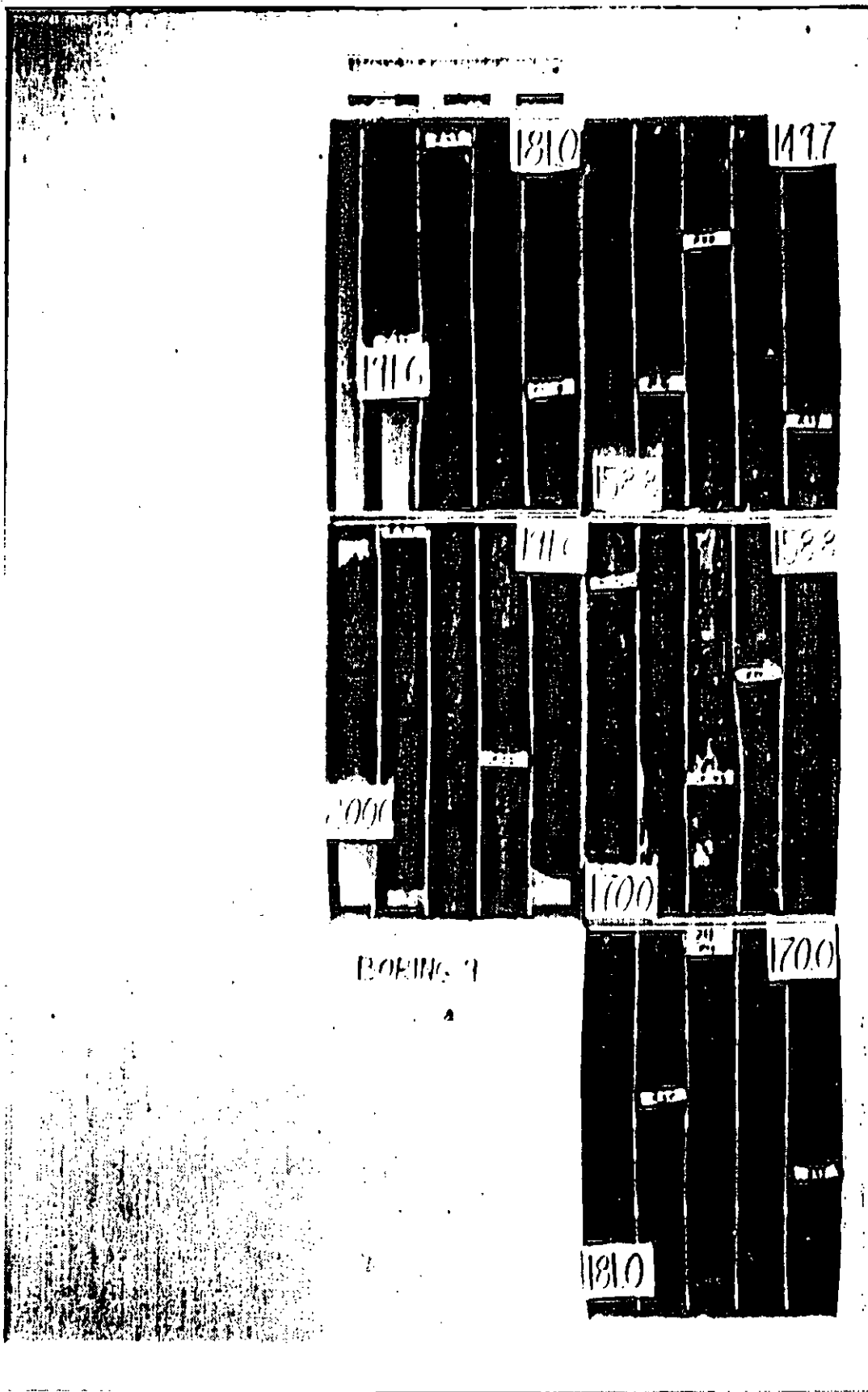


PHOTO - CORE BORING No. 9 149.7 to 200.0 FEET

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Figure No.
A-91

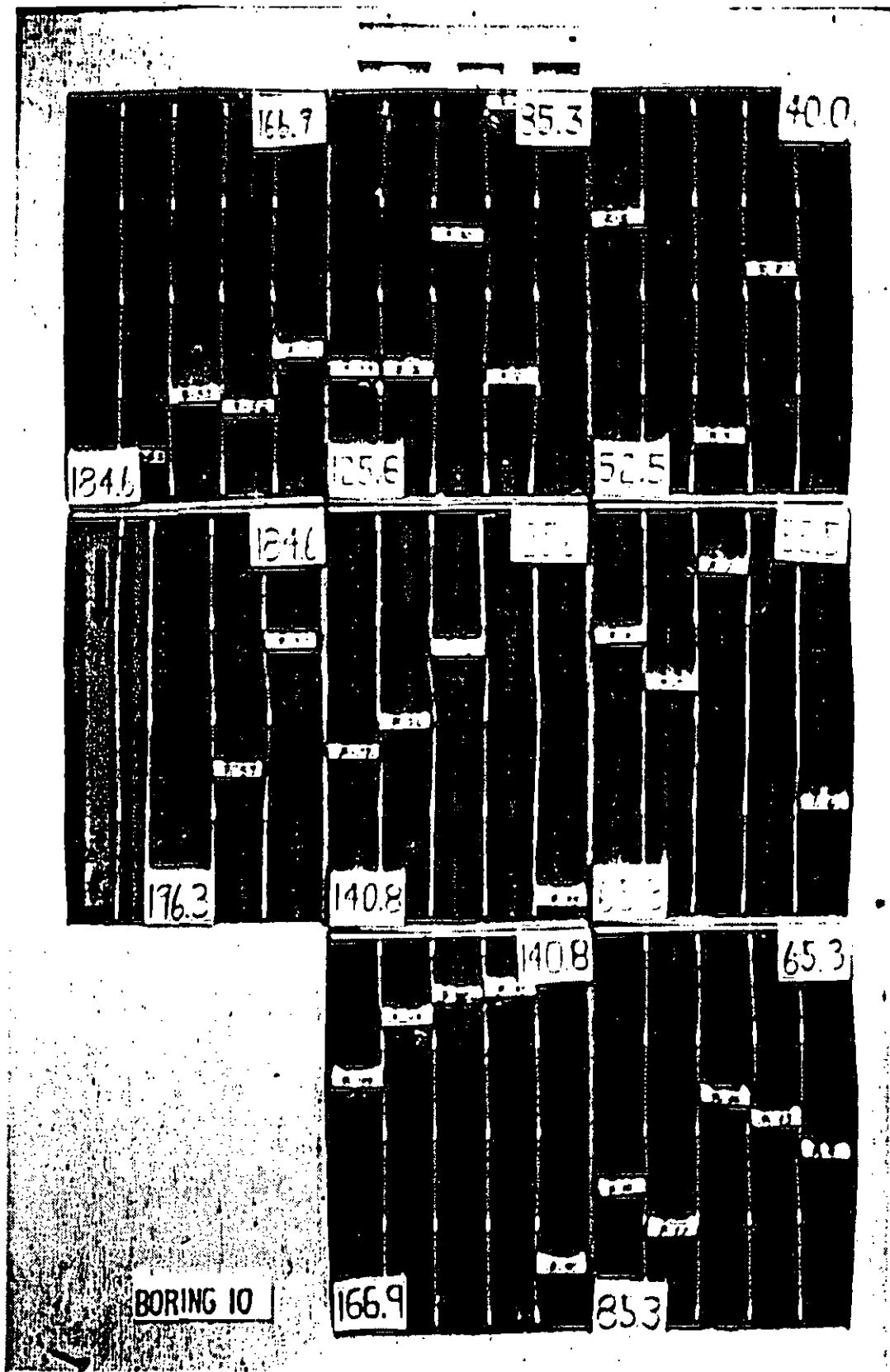


PHOTO - CORE BORING No. 10 40.0 to 196.3 FEET

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Figure No

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PHOTO - CORE BORING No. 11 27.8 to 131.4 FEET

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Figure No
A-11a

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PHOTO - CORE BORING No. 11 131.4 to 201.1 FEET

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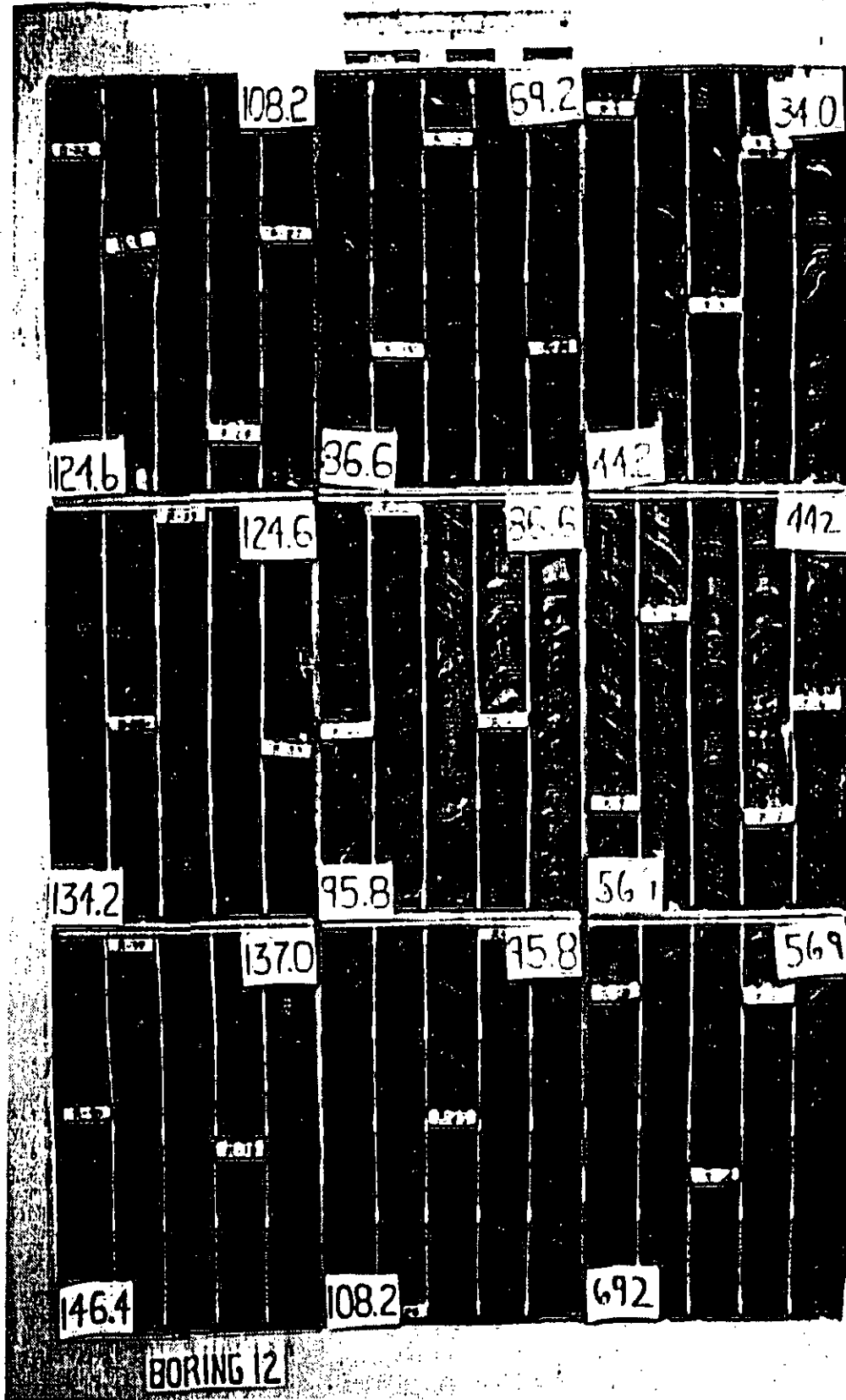


PHOTO - CORE BORING No. 12 34.0 to 146.4 FEET

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Figure No.
A-12a



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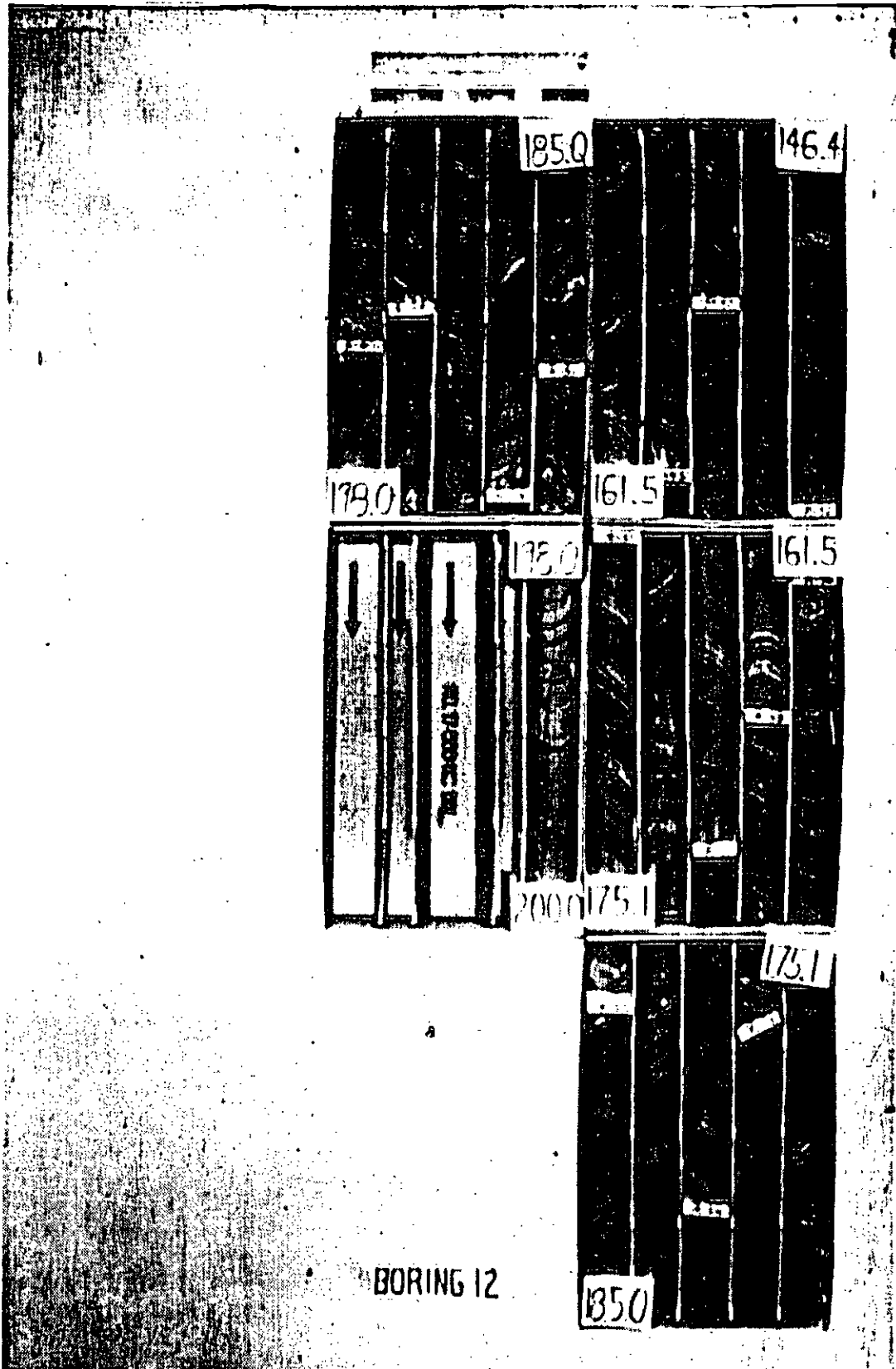


PHOTO - CORE BORING No. 12 146.4 to 200.0 FEET

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Figure No.

A-12b



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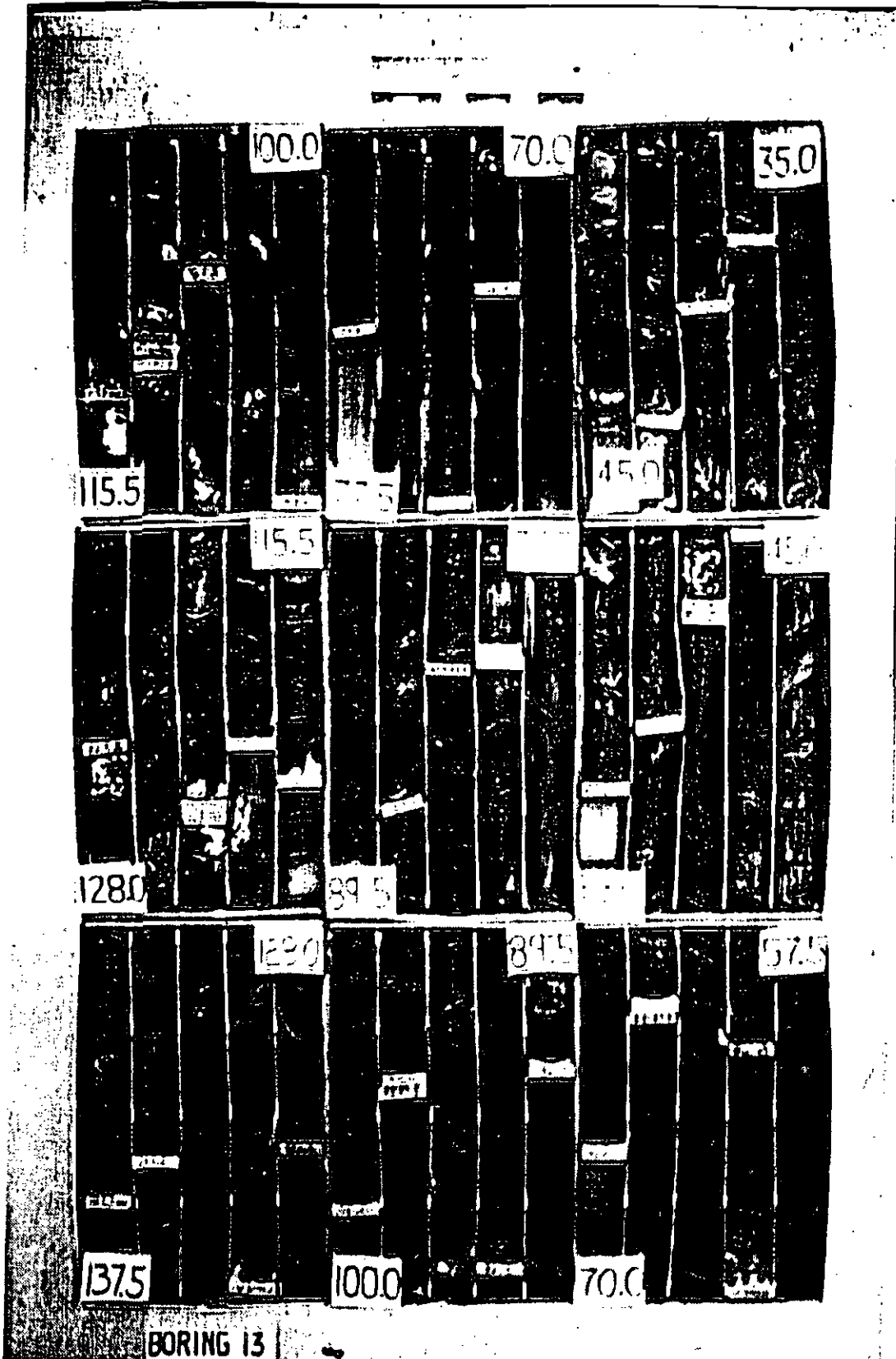


PHOTO - CORE BORING No. 13 35.0 to 137.5 FEET

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Figure No.

A-13a



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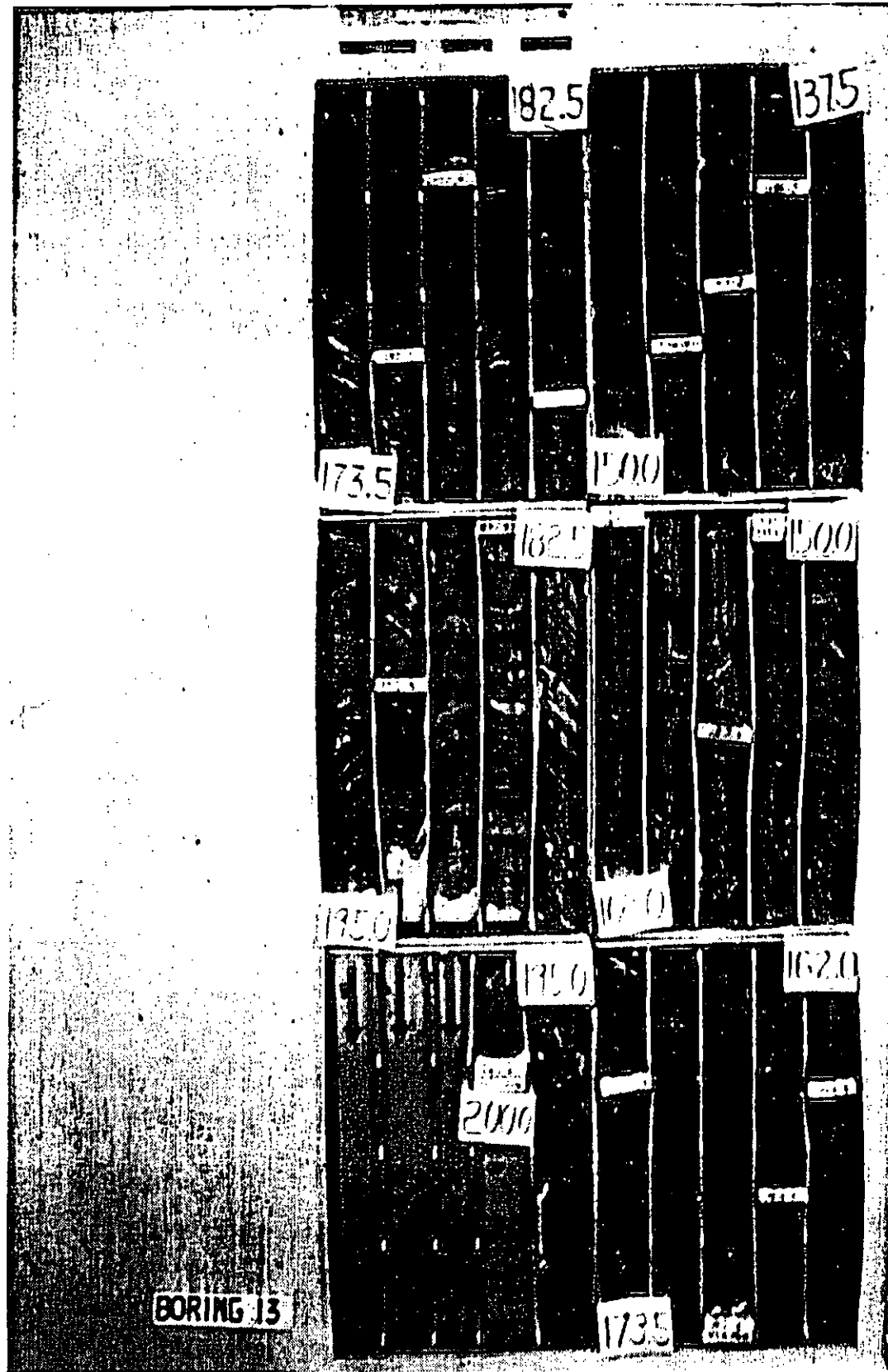


PHOTO - CORE BORING No. 13 137.5 to 200.0 FEET

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Figure No.

A-13b



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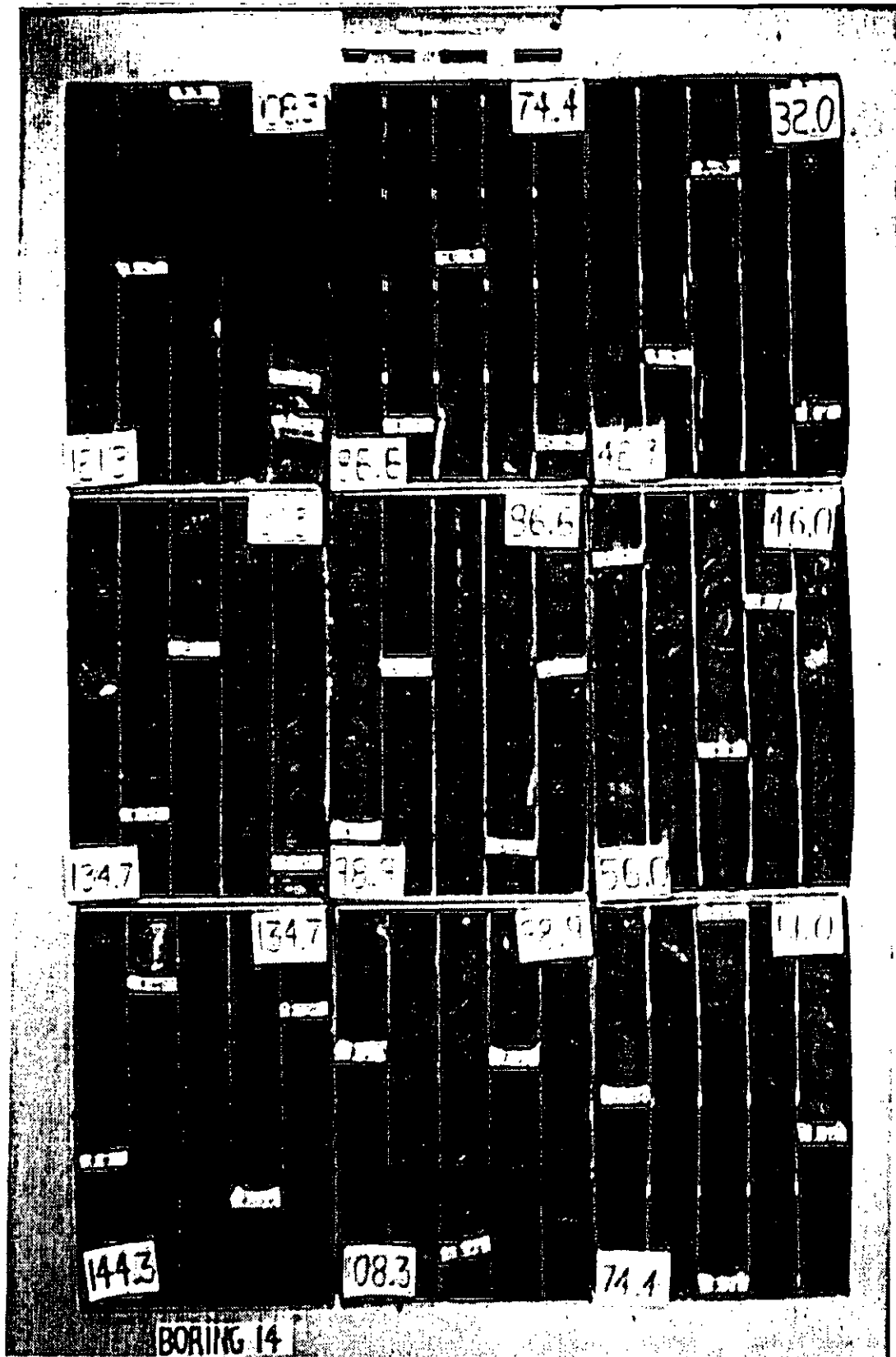


PHOTO - CORE BORING No. 14 32.0 to 144.3 FEET

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Figure No.
A-14a

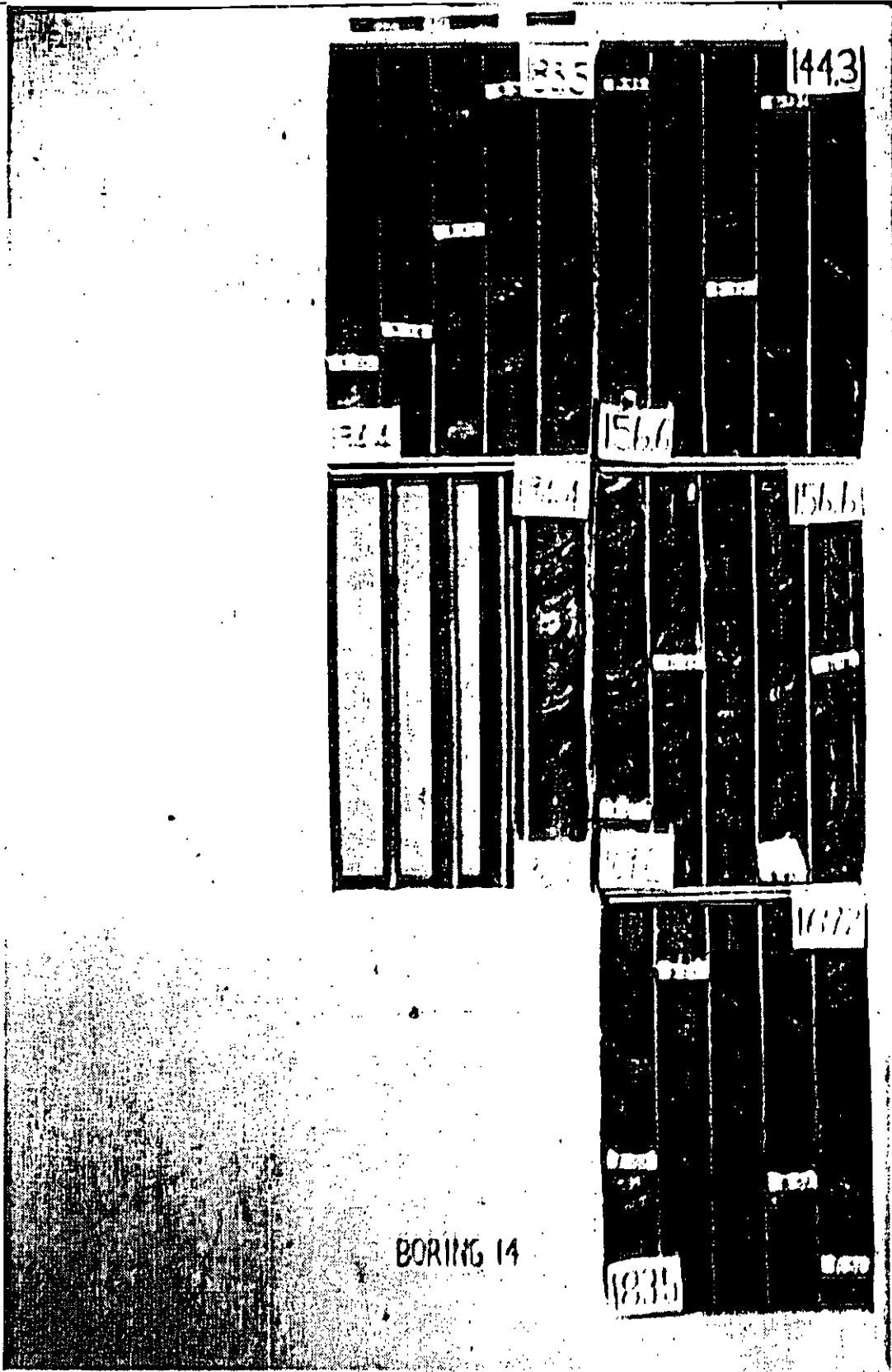


PHOTO - CORE BORING No. 14 144.3 to 194.4 FEET

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Figure No.
A-14b

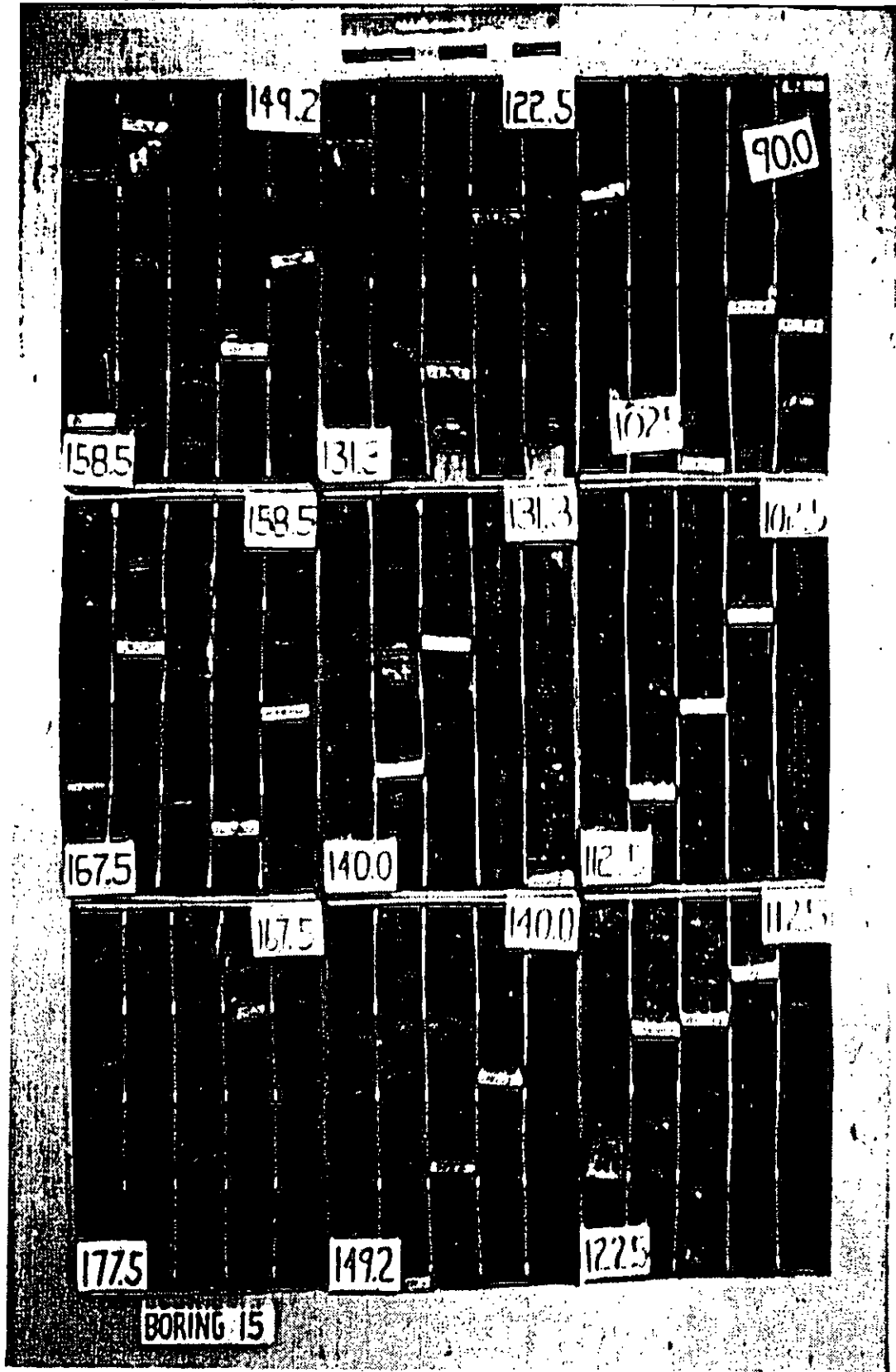


PHOTO - CORE BORING No. 15 90.0 to 177.5 FEET

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Figure No.
A-15a

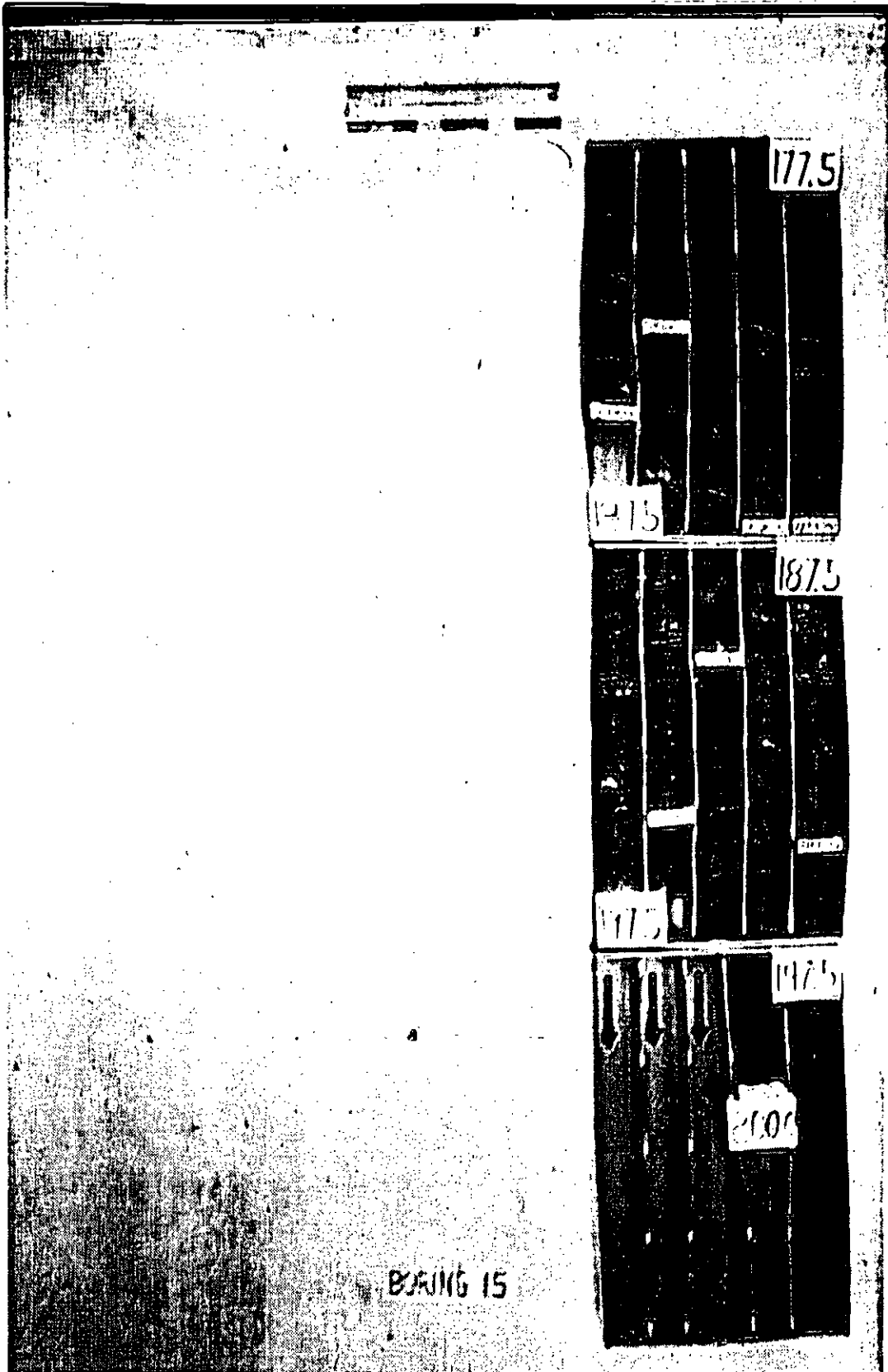


PHOTO - CORE BORING No. 15 177.5 to 200.0 FEET

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Figure No.
A-15b

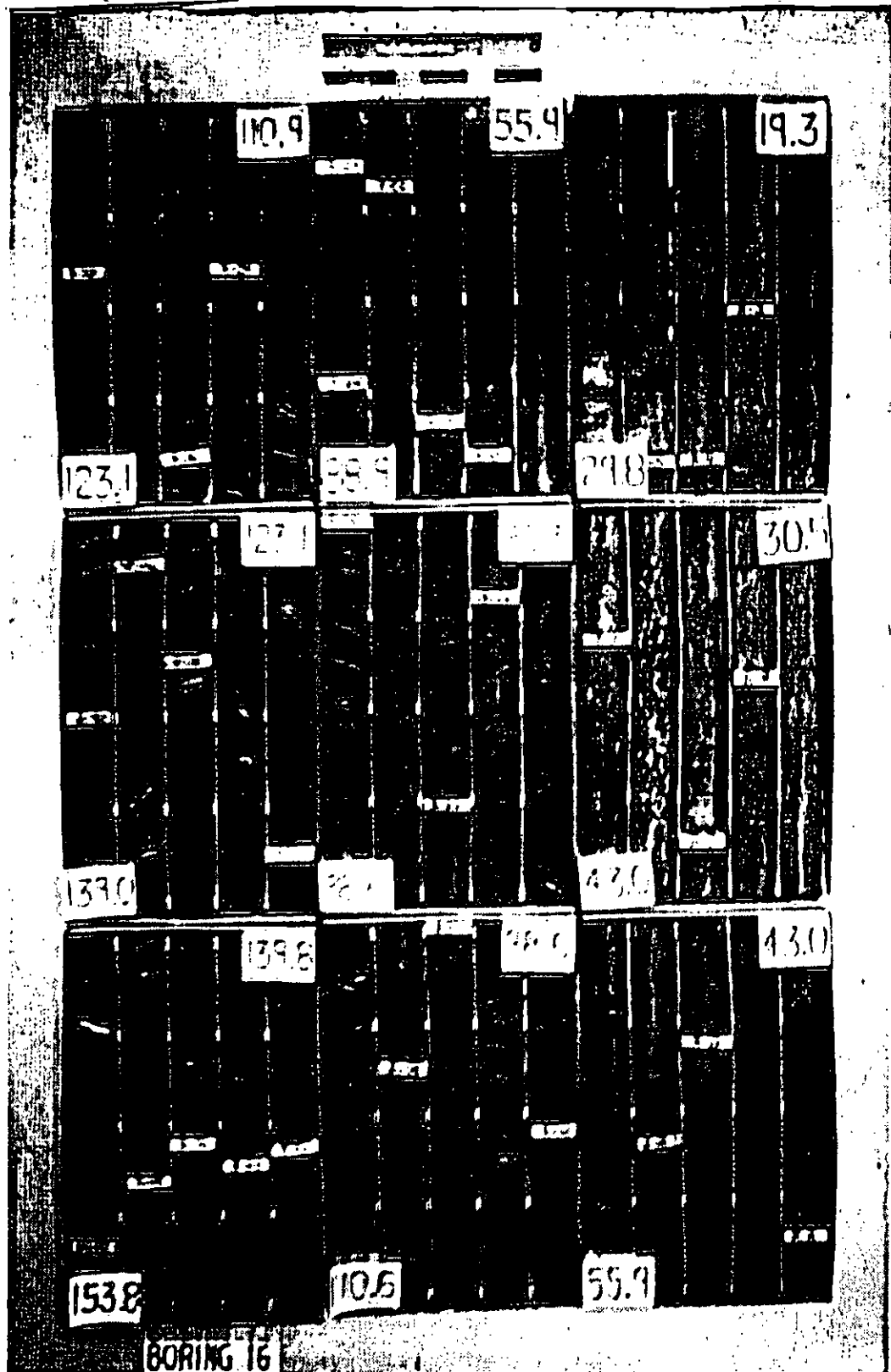


PHOTO - CORE BORING No. 16 19.3 to 153.8 FEET

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Figure No.
A-16a

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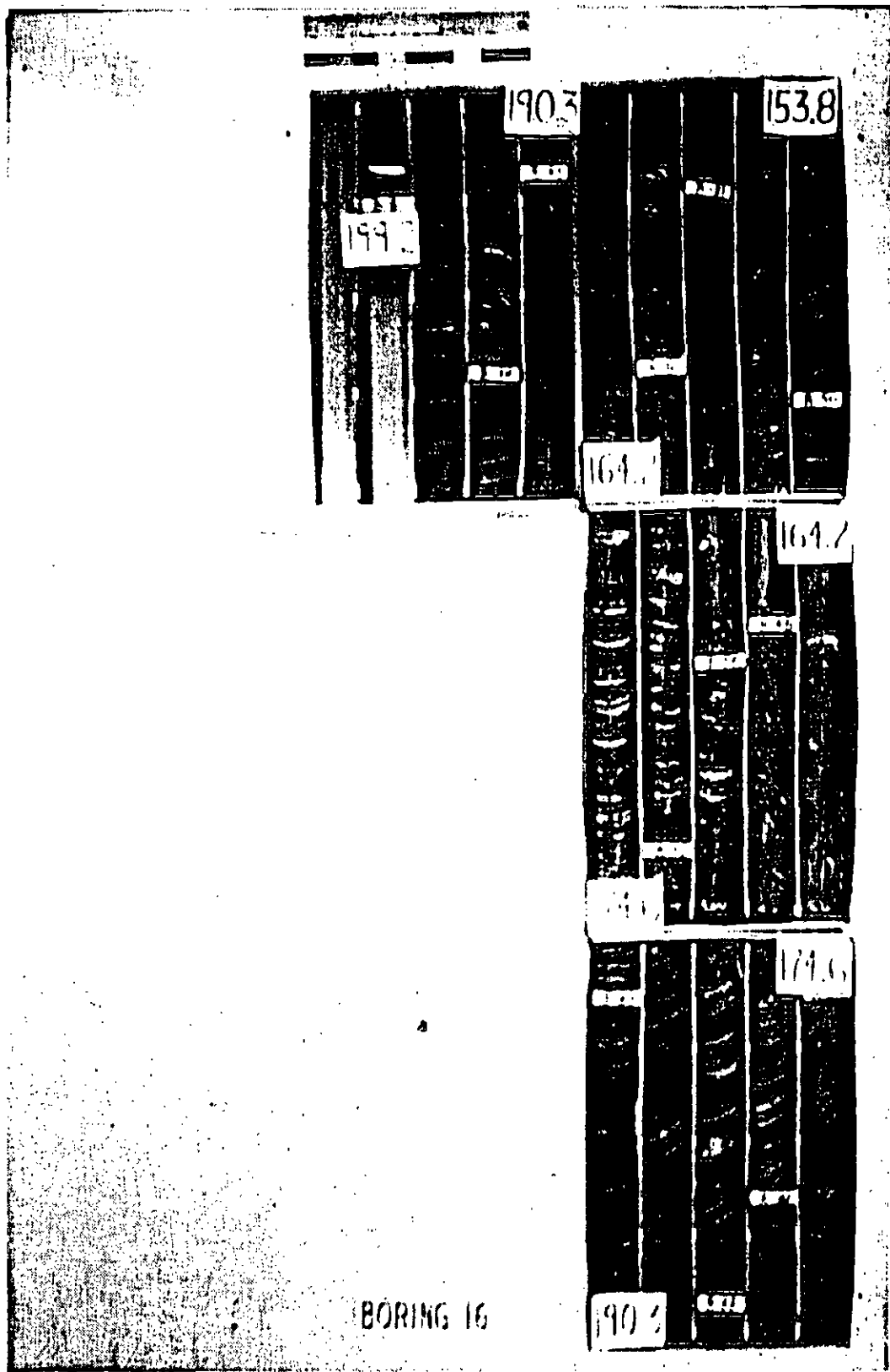


PHOTO - CORE BORING No. 16 153.8 to 199.2 FEET

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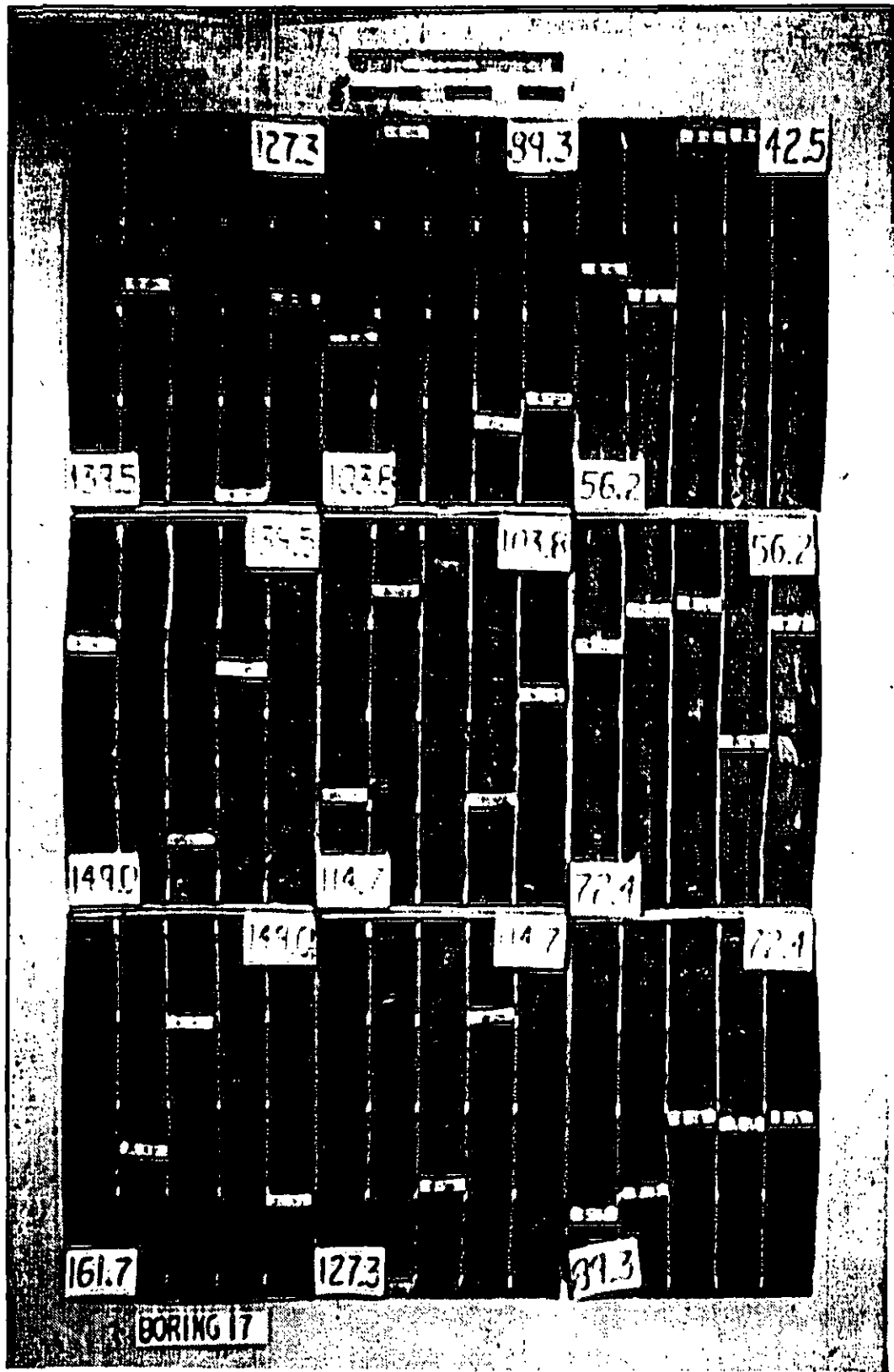


PHOTO - CORE BORING No. 17 42.5 to 161.7 FEET

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Figure No.
A-17a



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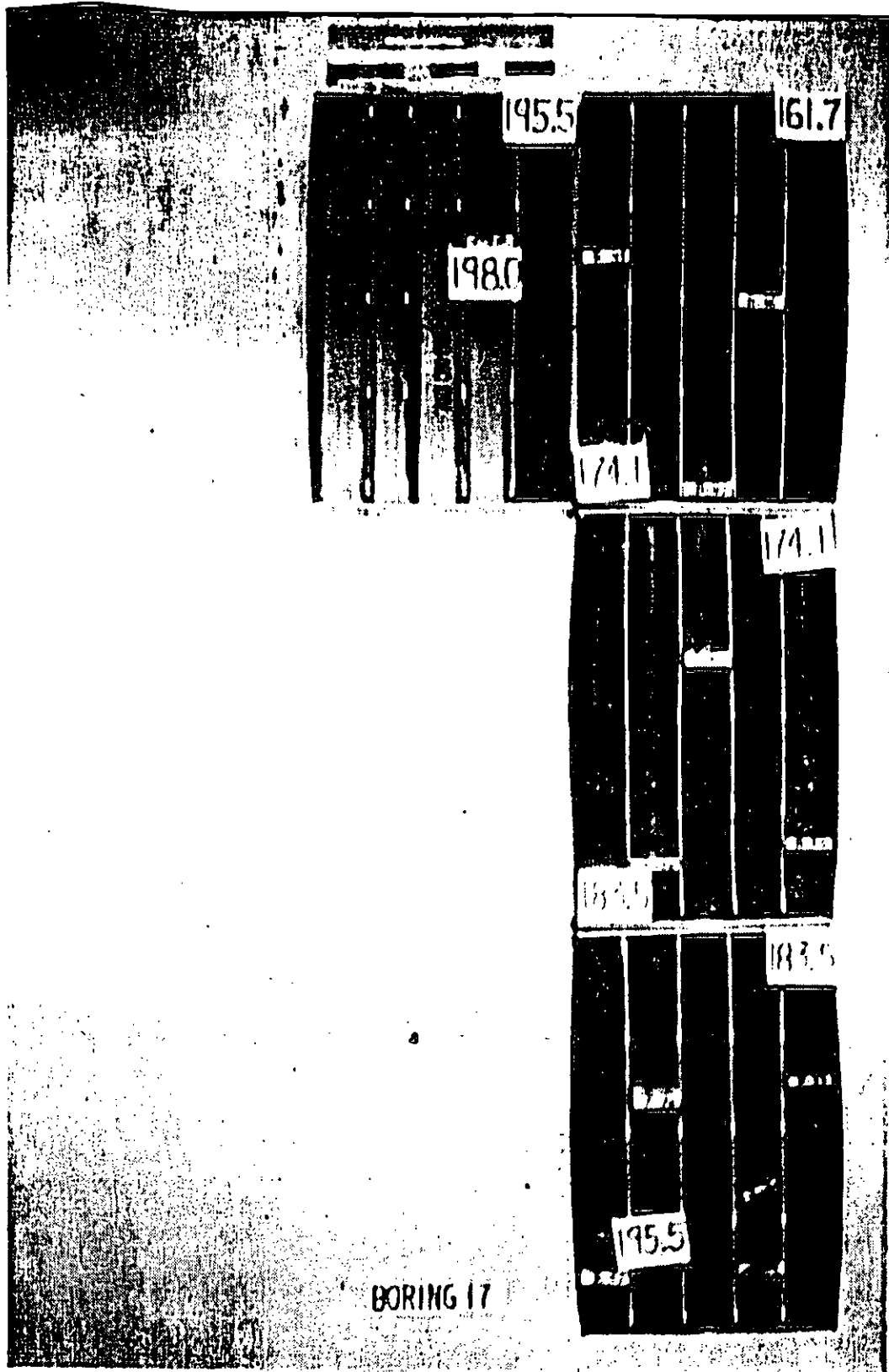


PHOTO - CORE BORING No. 17 161.7 to 198.0 FEET

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Figure No.

A-17b



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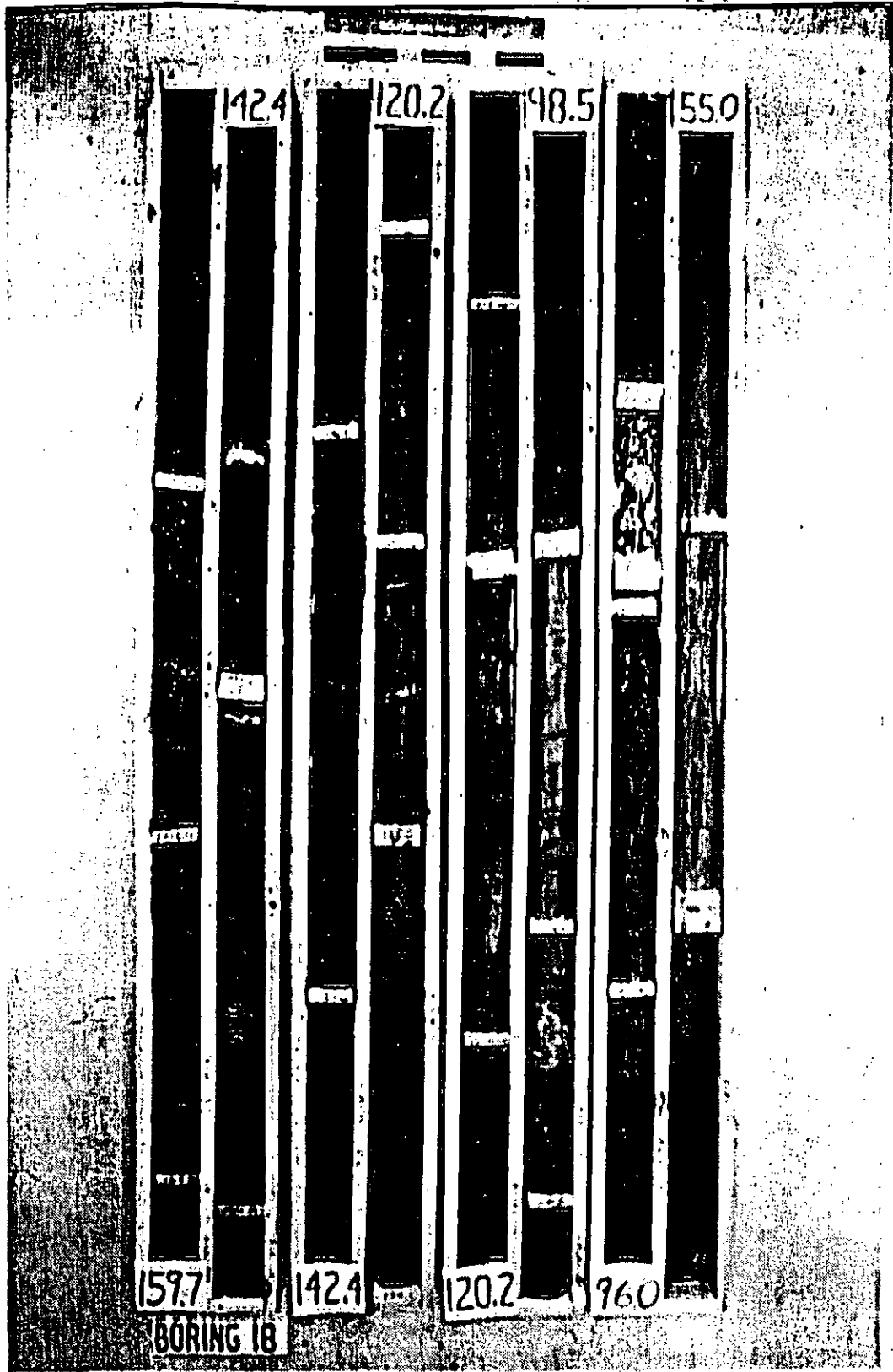


PHOTO - CORE BORING No. 18 55.0 to 159.7 FEET

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Figure No.
A-18a



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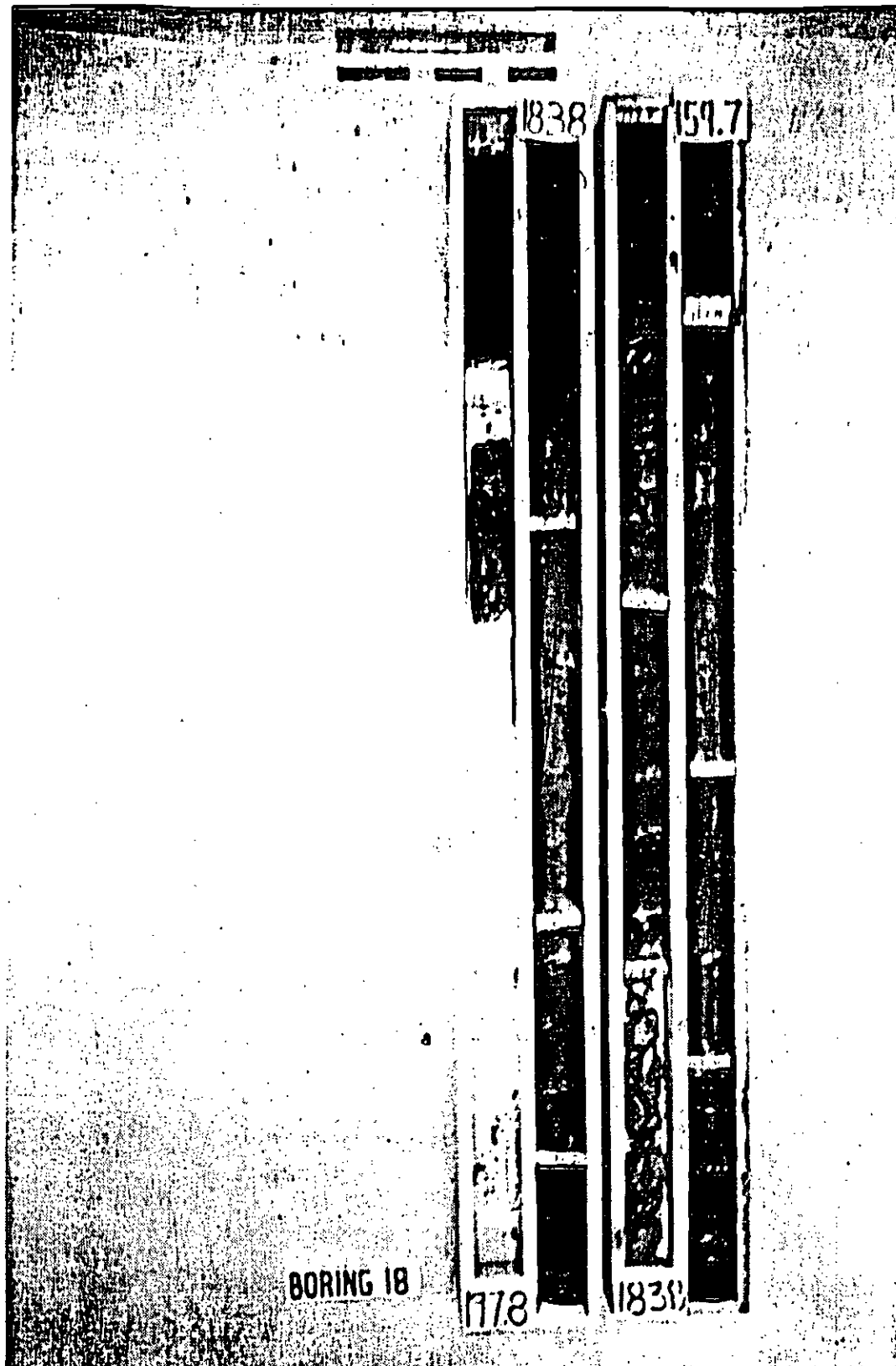


PHOTO - CORE BORING No. 18 159.7 to 197.8 FEET

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Figure No.

A-18b



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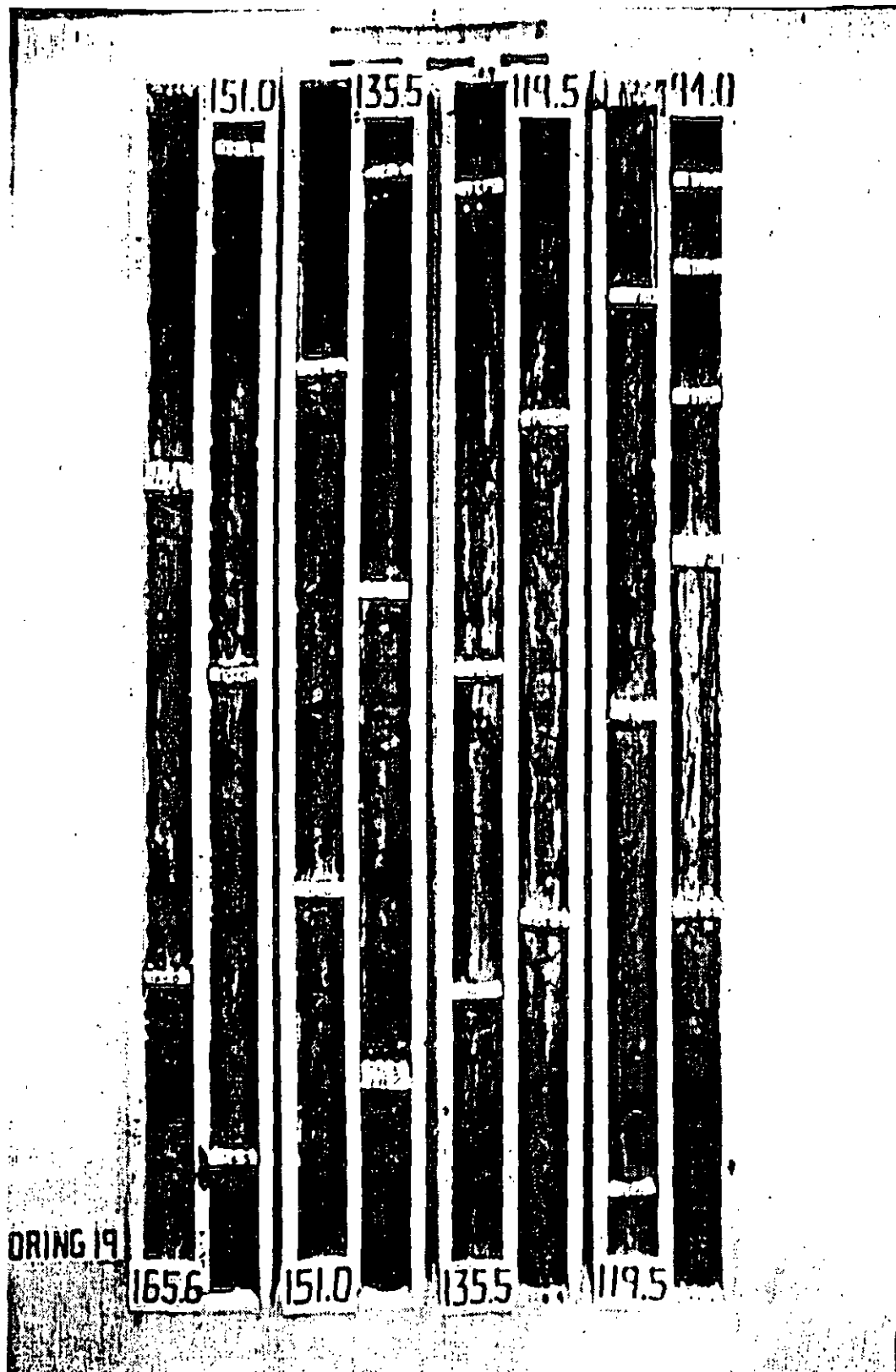


PHOTO - CORE BORING No. 19 94.0 to 165.6 FEET

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Figure No.
A-19a

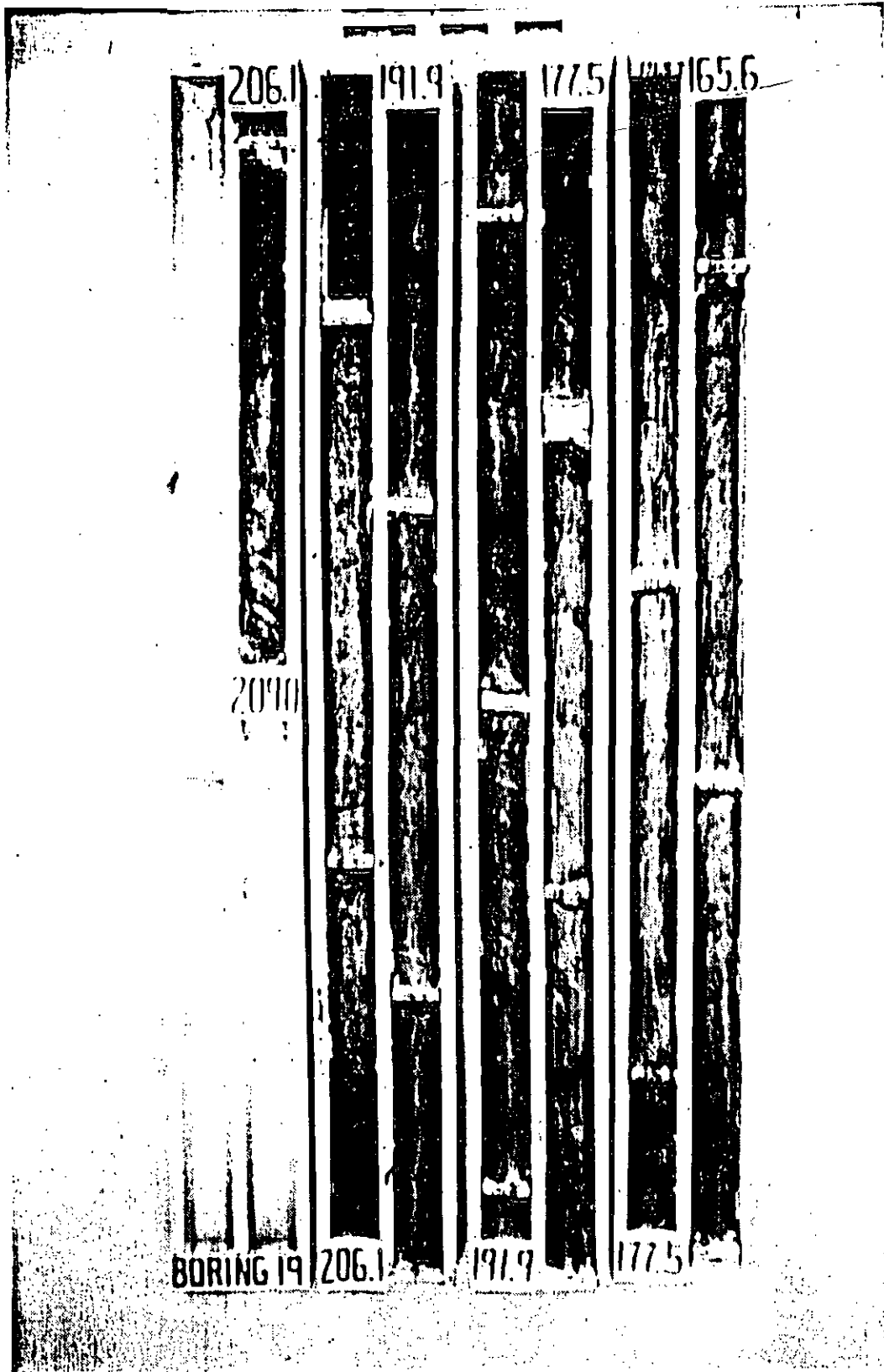


PHOTO - CORE BORING No. 19 165.6 to 209.0 FEET

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Project No.

80-1280

Figure No.

A-19b

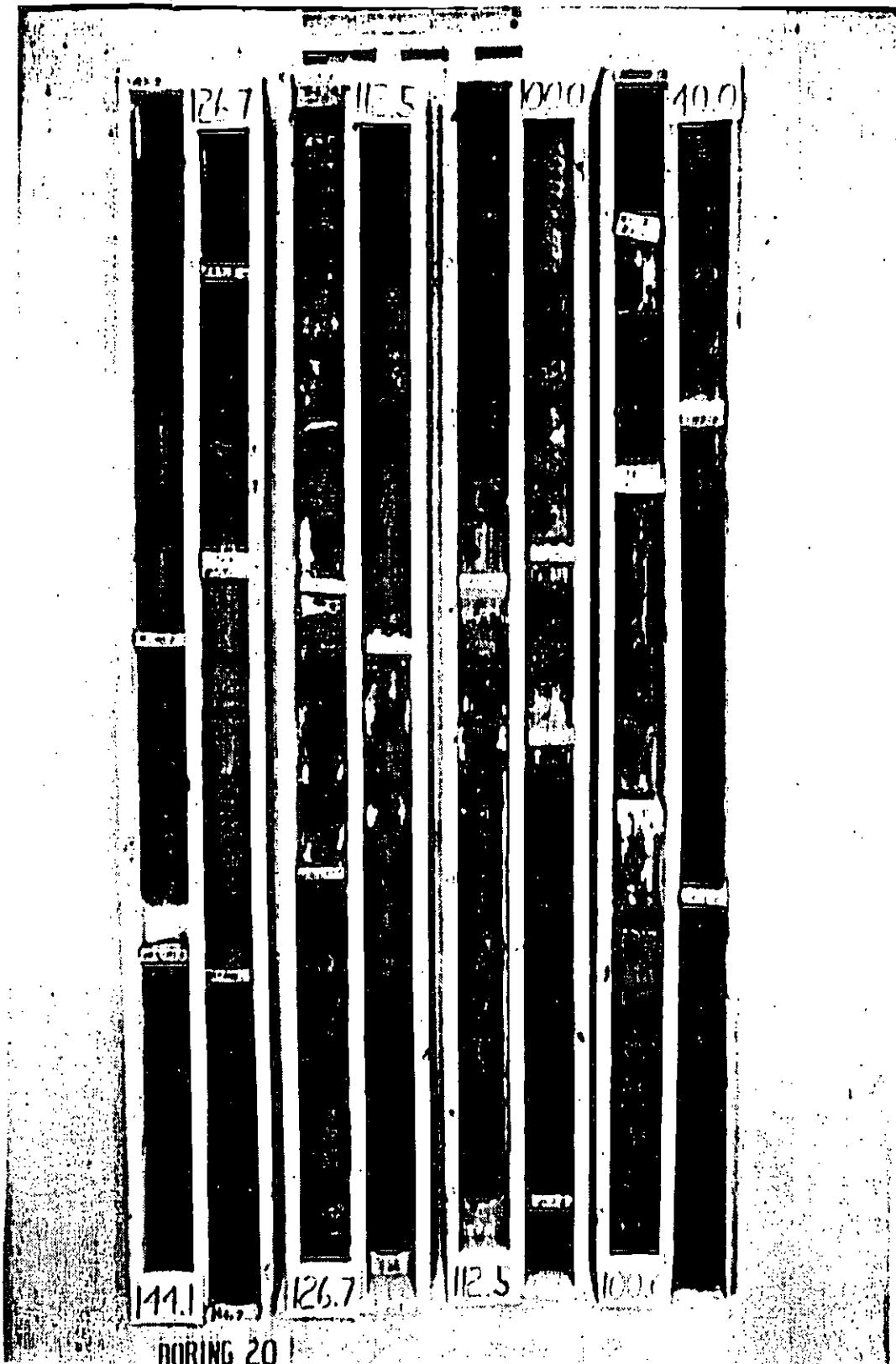


PHOTO - CORE BORING No. 20 40.0 to 144.1 FEET

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Figure No.

A-20a



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PHOTO - CORE BORING No. 20 144.1 to 190.0 FEET

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Project No.
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Figure No.
A-20b

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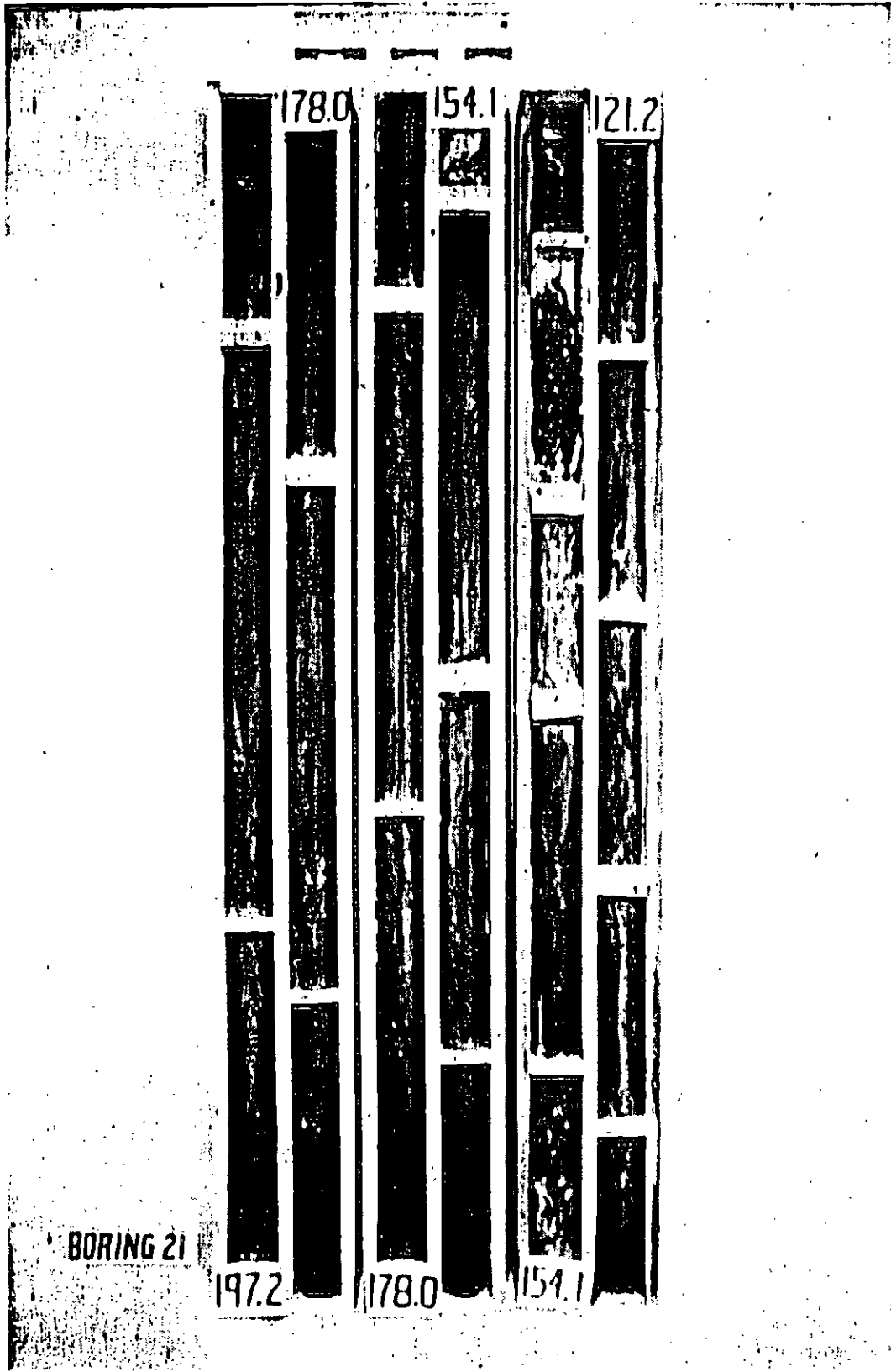


PHOTO - CORE BORING No. 21 121.2 to 197.2 FEET

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METRO RAIL PROJECT

Project No.
80-1280

Figure No.
A-21



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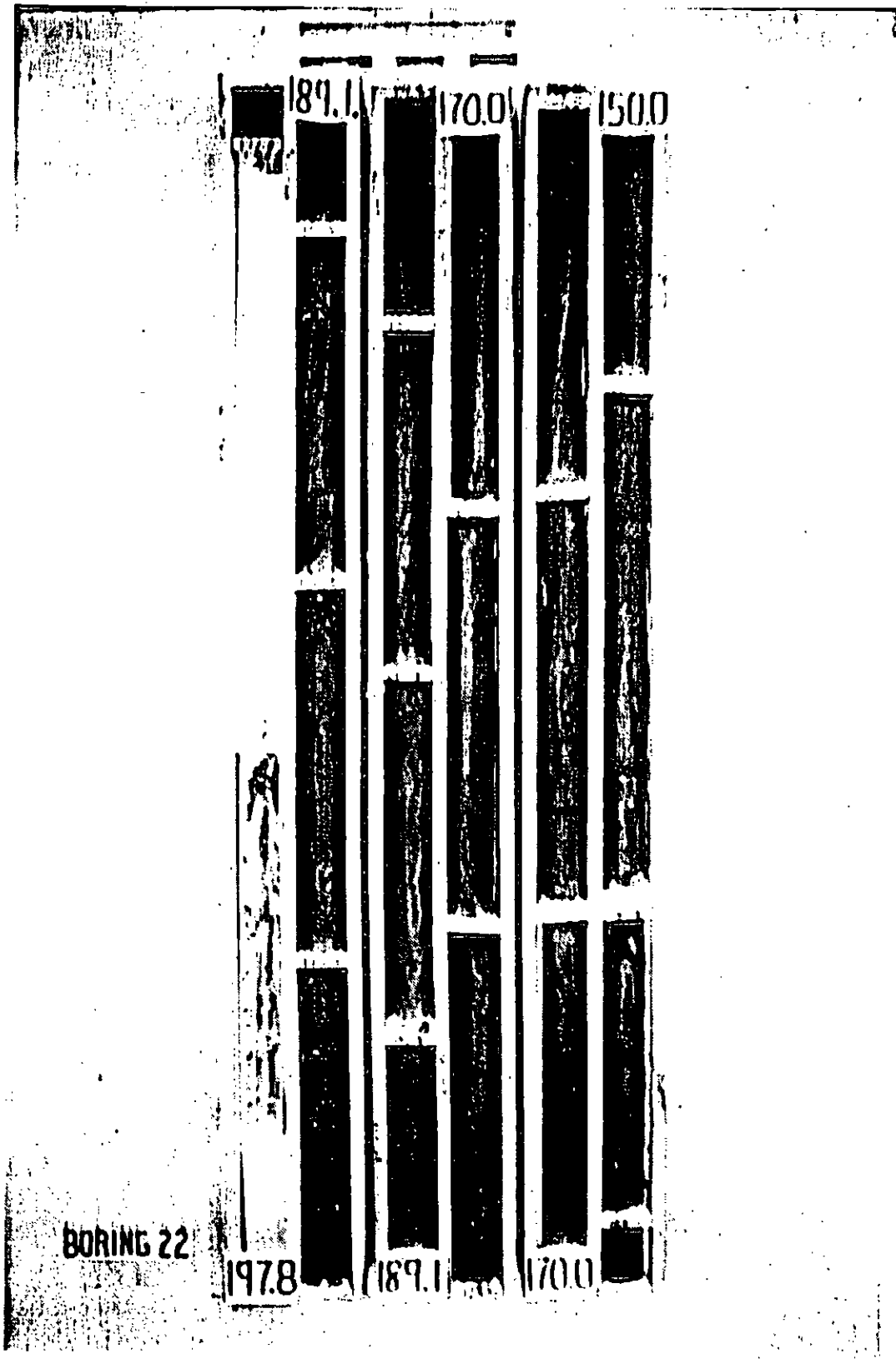


PHOTO - CORE BORING No. 22 150.0 to 197.8 FEET

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Project No.
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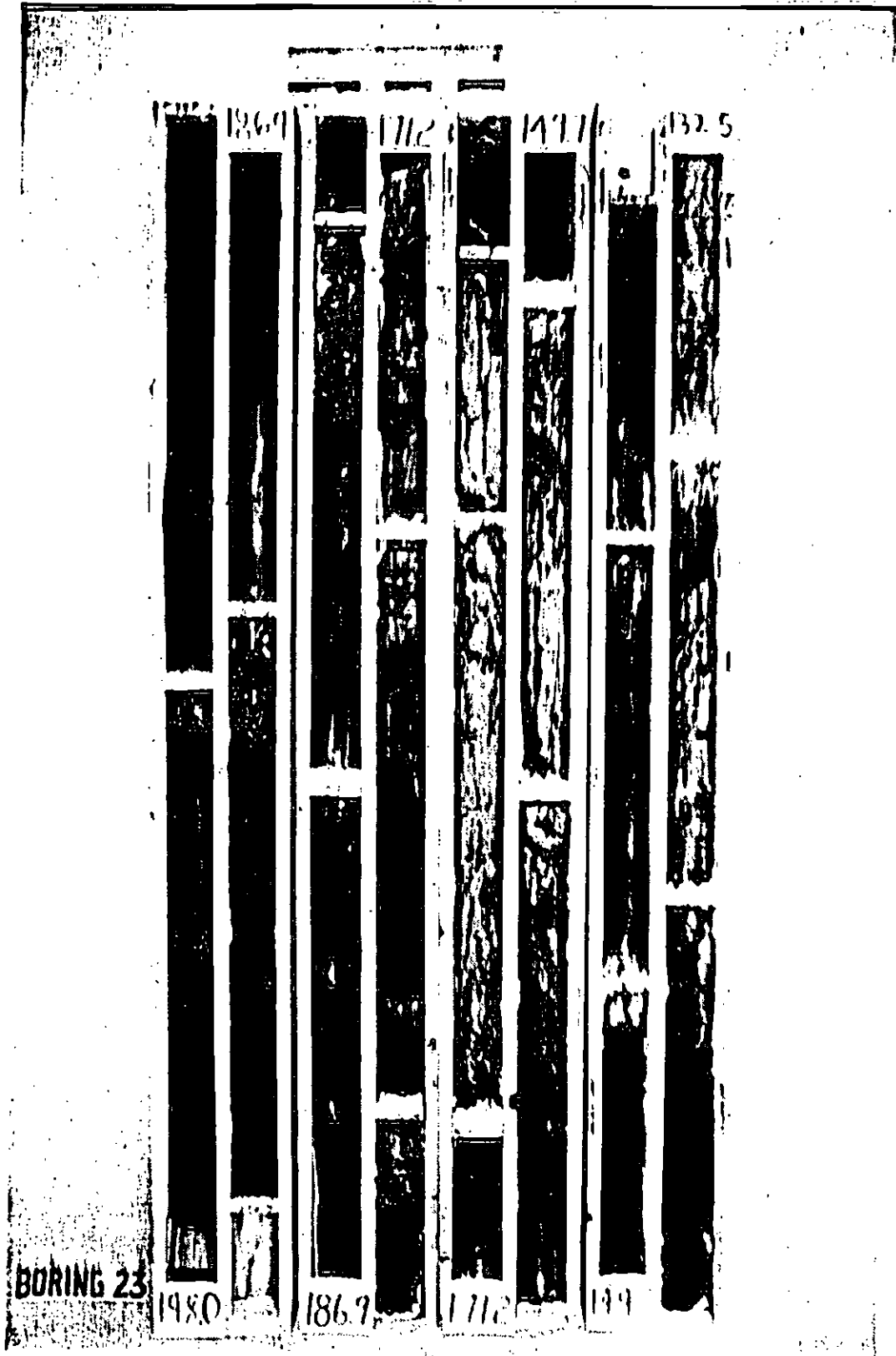


PHOTO - CORE BORING No. 23 132.5 to 198.0 FEET

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METRO RAIL PROJECT

Project No.
80-1280

Figure No.
A-23



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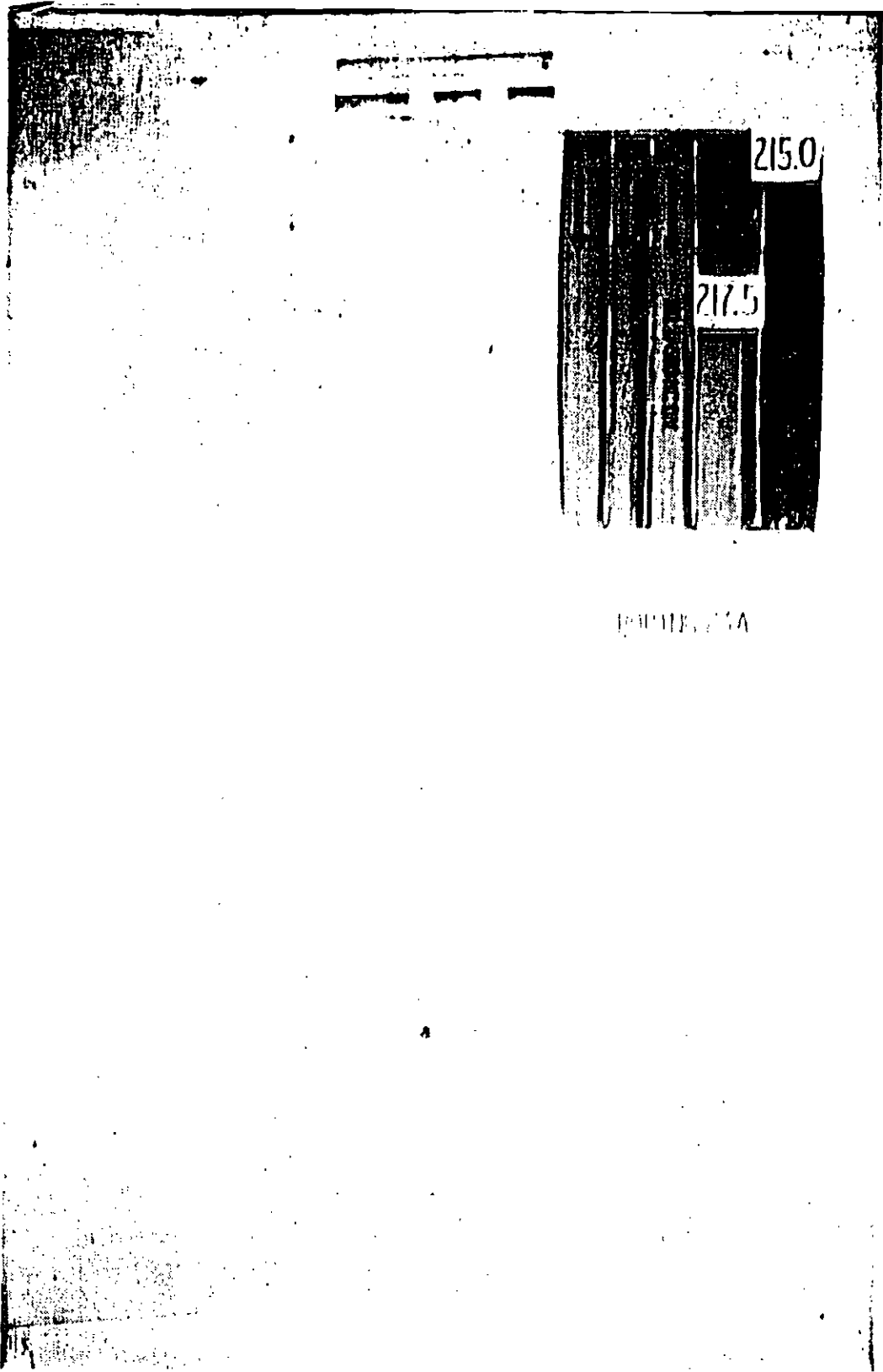


PHOTO 23A

PHOTO - CORE BORING No. 23A 215.0 to 217.5 FEET

Southern California Rapid Transit District
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Project No.
80-1280

Figure No.
A-24



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11-461

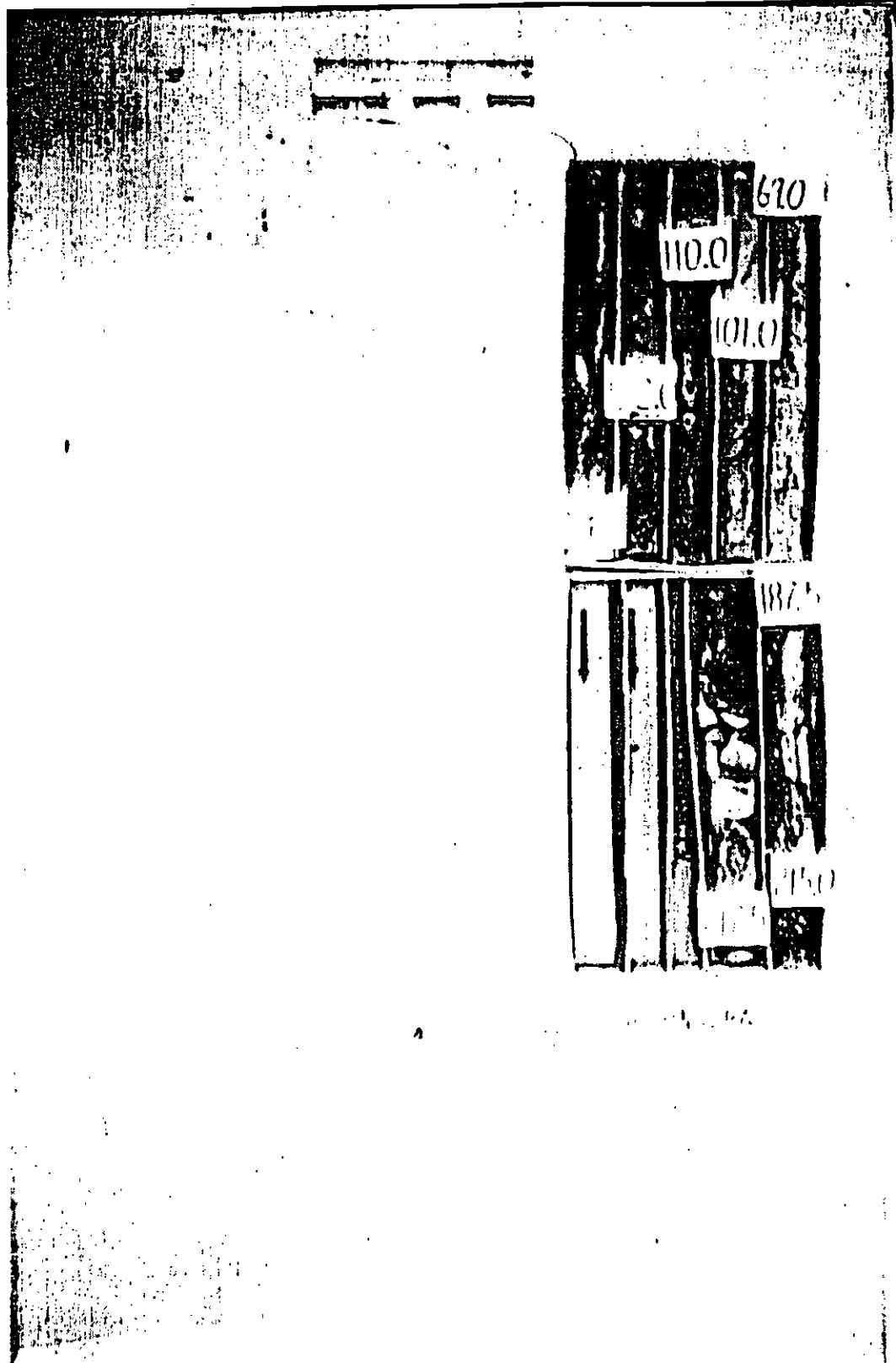


PHOTO - CORE BORING No. 28A 69.0 to 217.5 FEET

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Project No.

80-1280

Figure No.

A-25



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11-462

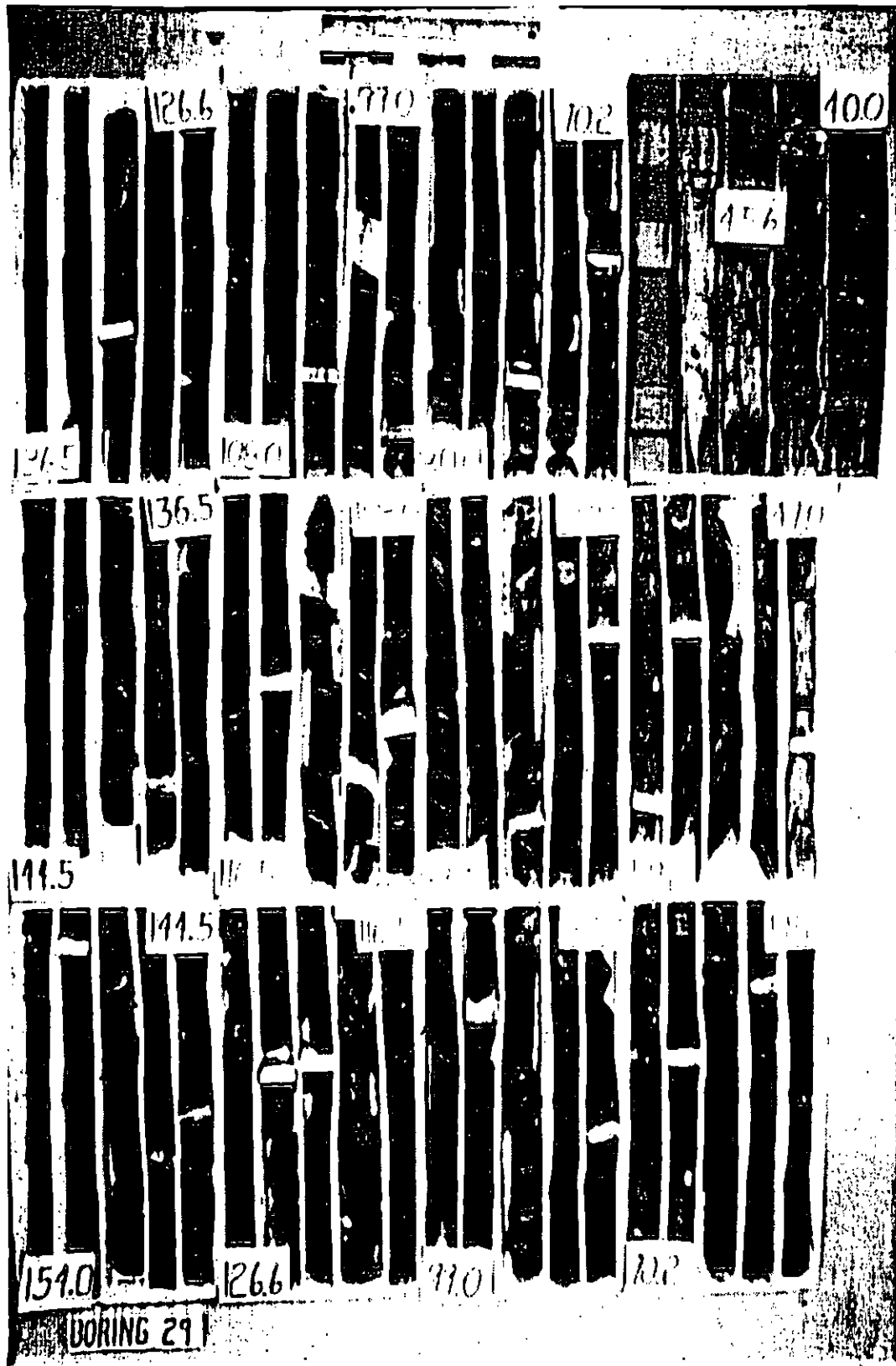


PHOTO - CORE BORING No. 29 40.0 to 154.0 FEET

Southern California Rapid Transit District
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Project No.

80-1280

Figure No.

A-26a

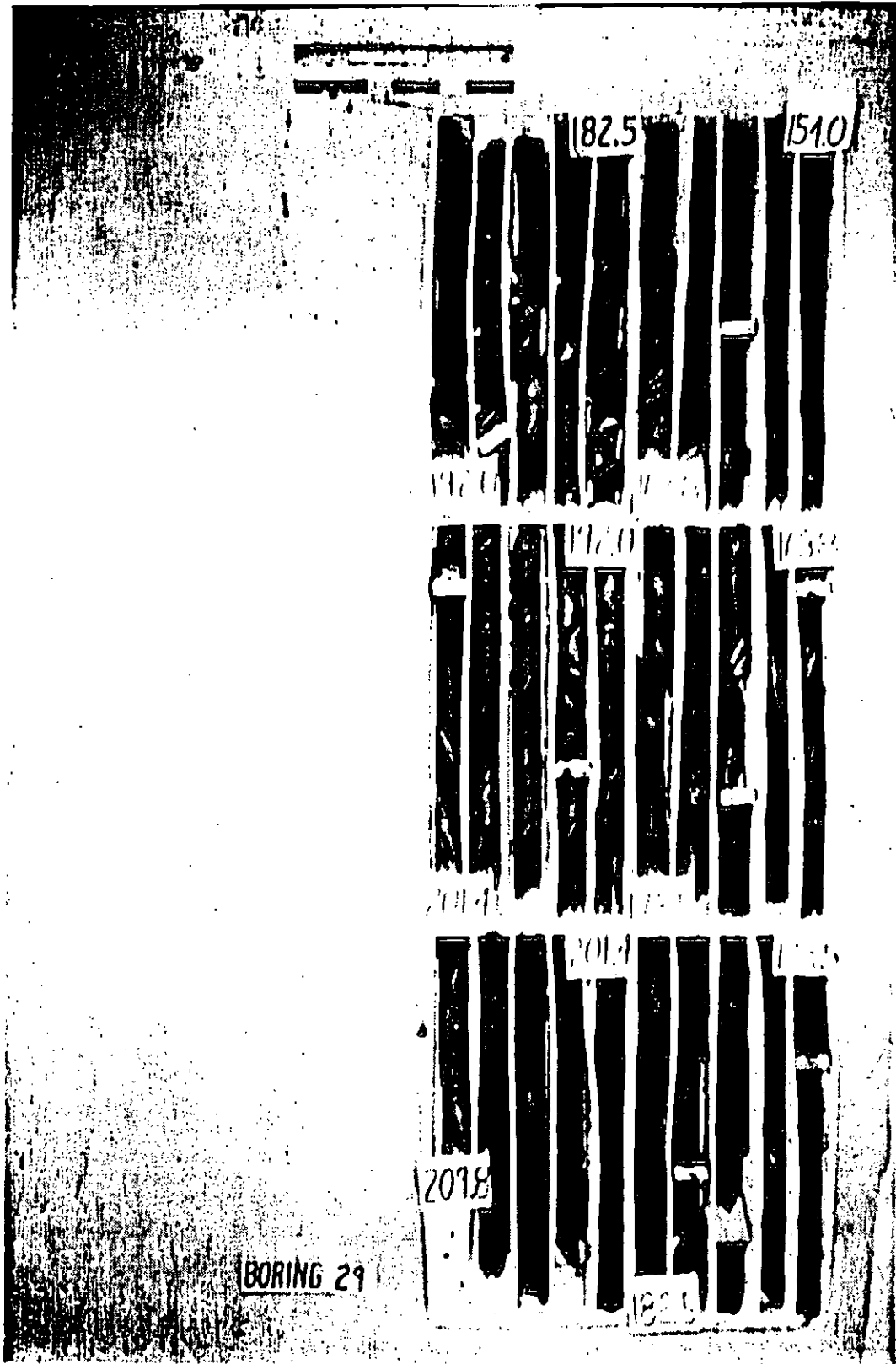


PHOTO - CORE BORING No. 29 154.0 to 209.8 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-26b



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11-464

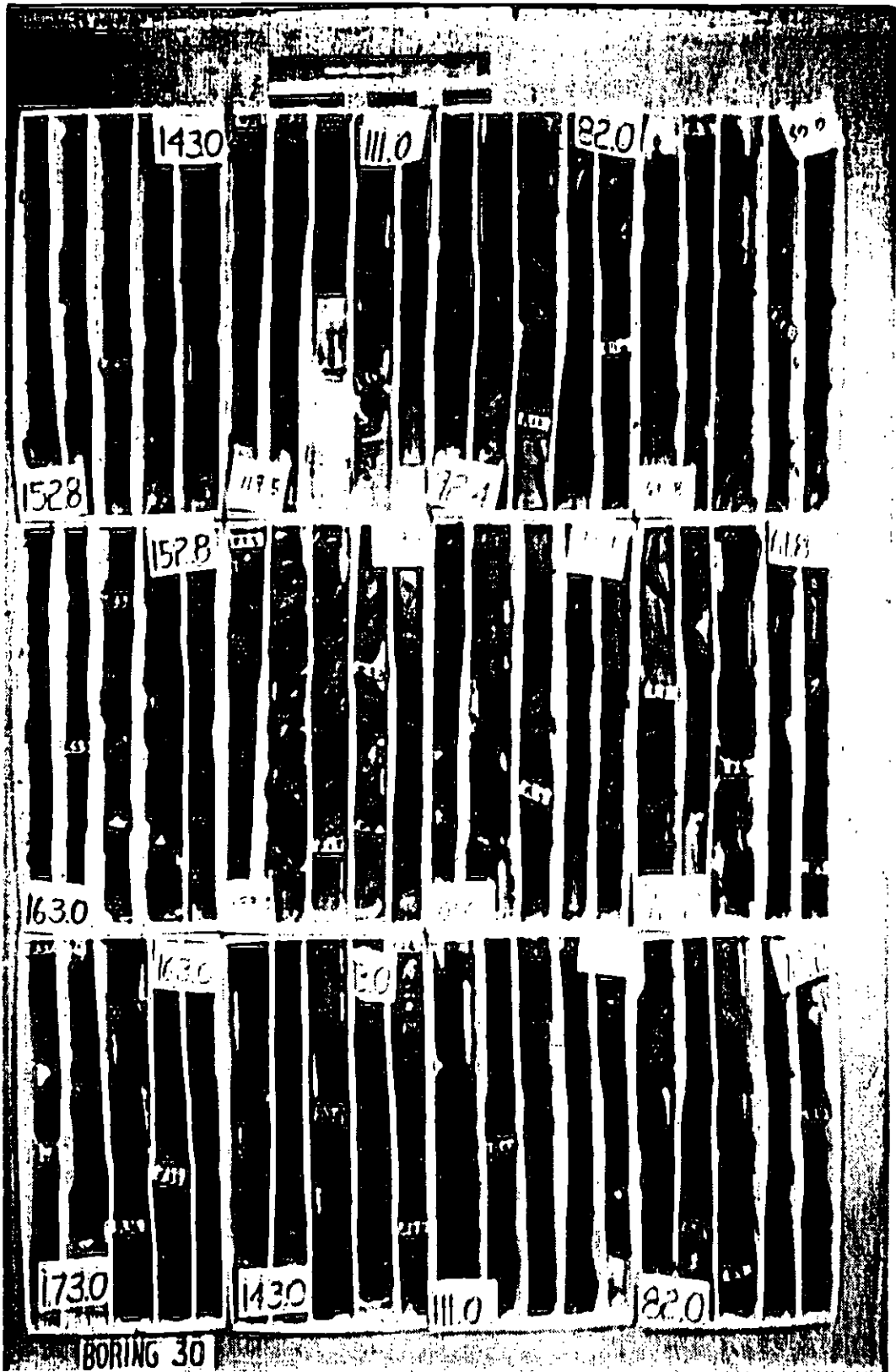


PHOTO - CORE BORING No. 30 50.0 to 173.0 FEET

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METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-27a



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11-465

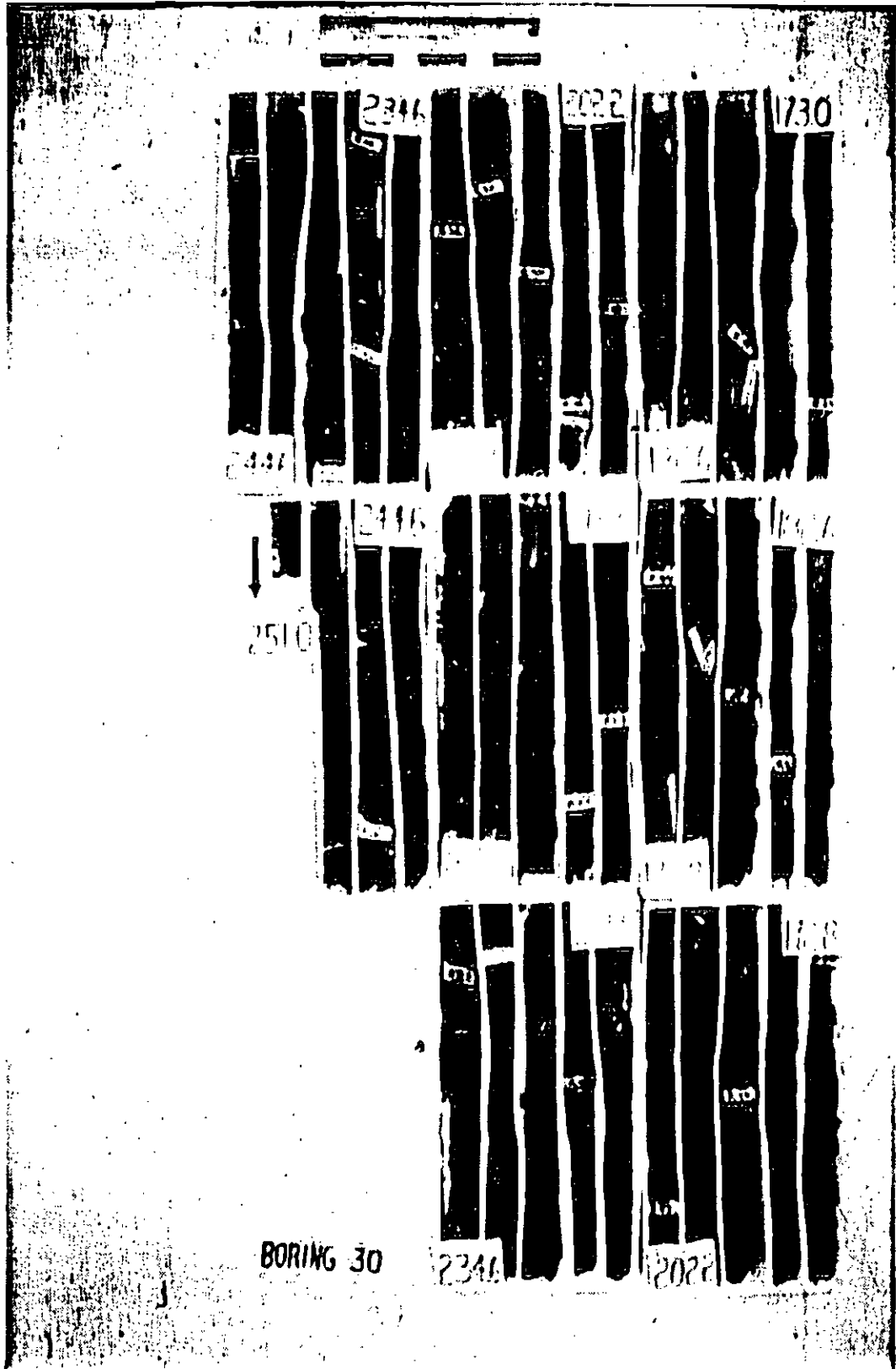


PHOTO - CORE BORING No. 30 173.0 to 234.6 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-27b



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Geotechnical Consultants

11-466

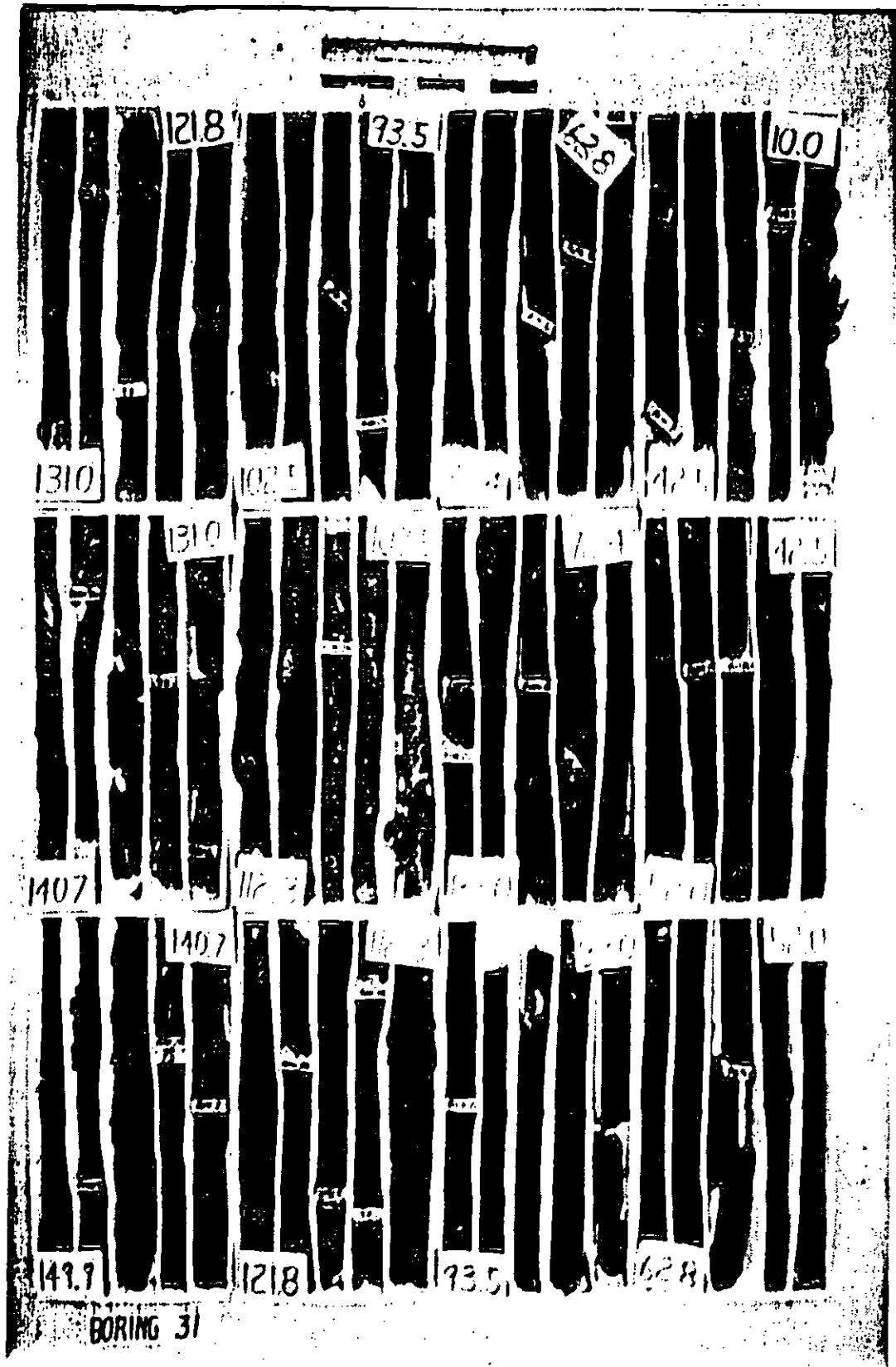


PHOTO - CORE BORING No. 31 10.0 to 149.9 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.
80-1280

Figure No.
A-28a

Approved for publication by _____

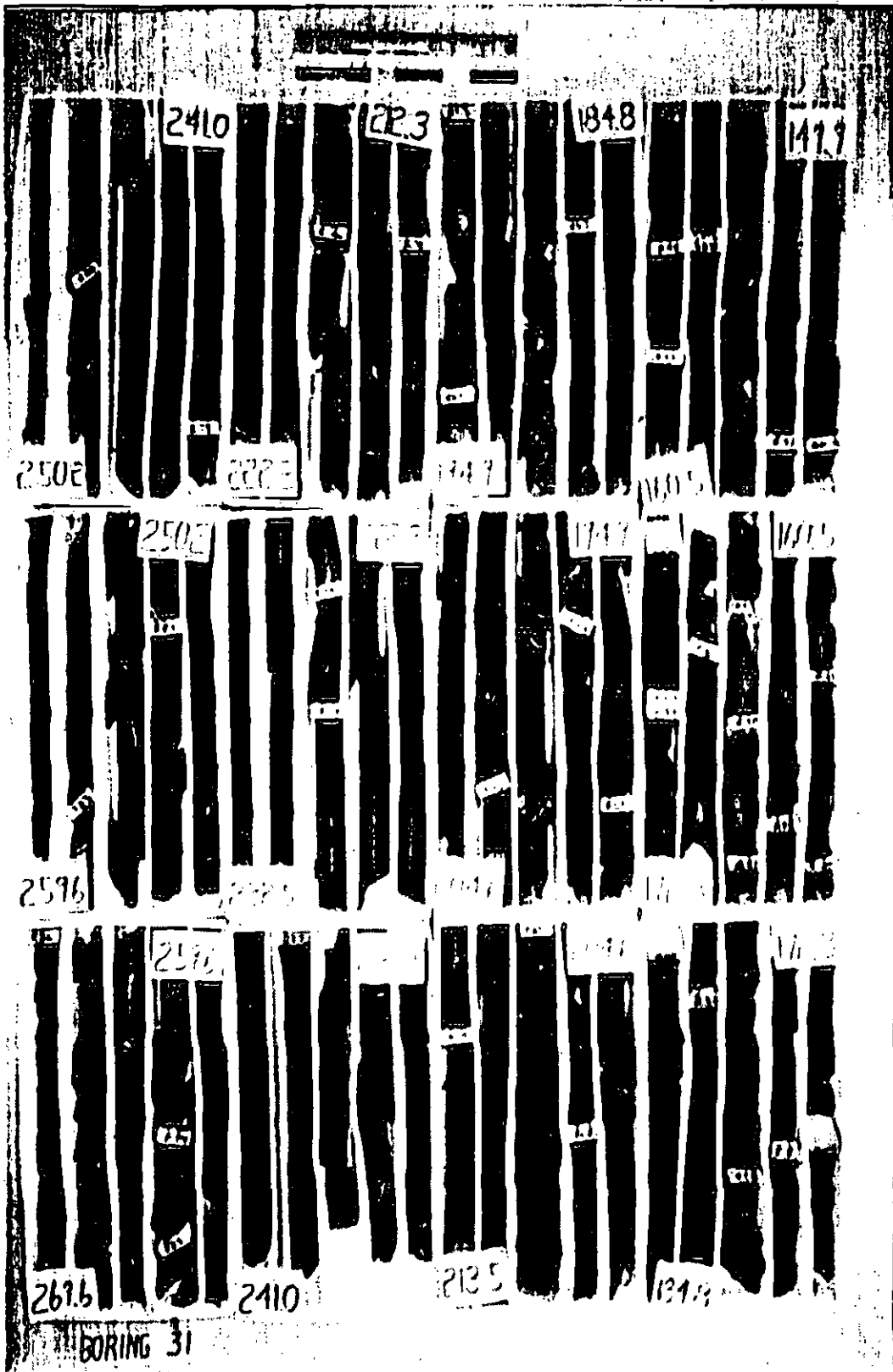


PHOTO - CORE BORING No. 31 149.9 to 269.6 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-28b

Approved for publication by

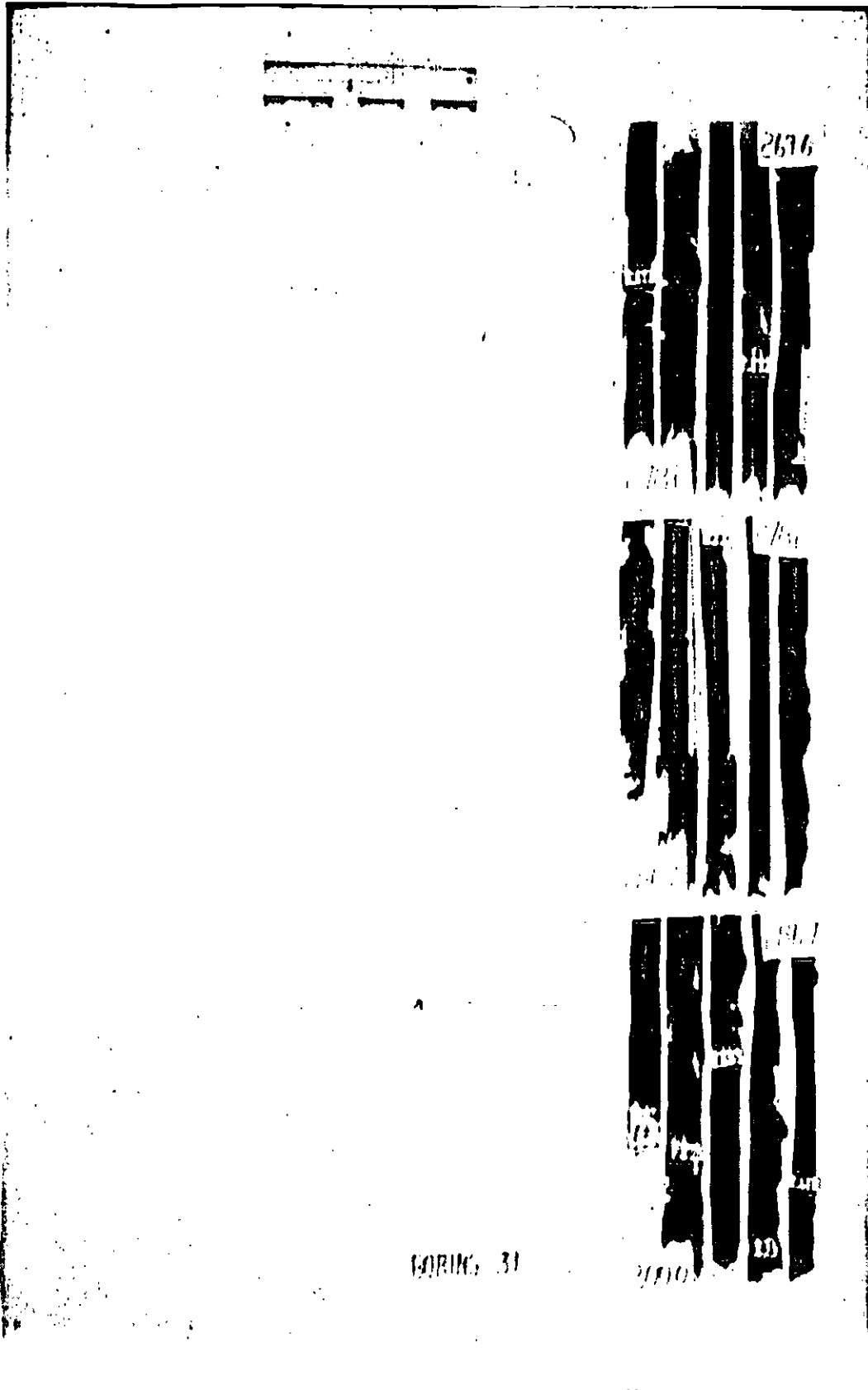


PHOTO - CORE BORING No. 31 269.6 to 300.0 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-28c



CWDD/ESA/GRC

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11-469

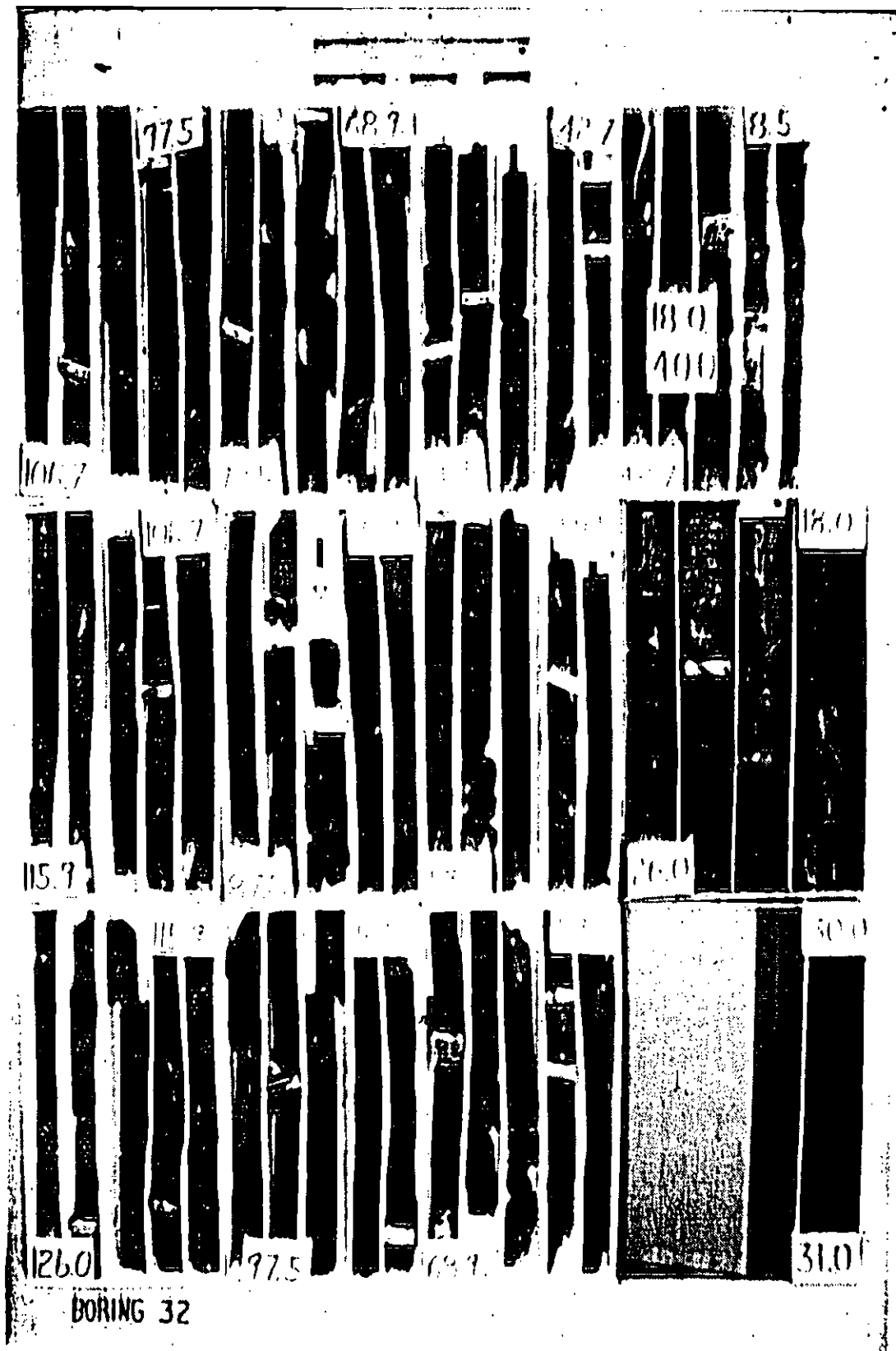


PHOTO - CORE BORING No. 32 8.5 to 126.0 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-29a



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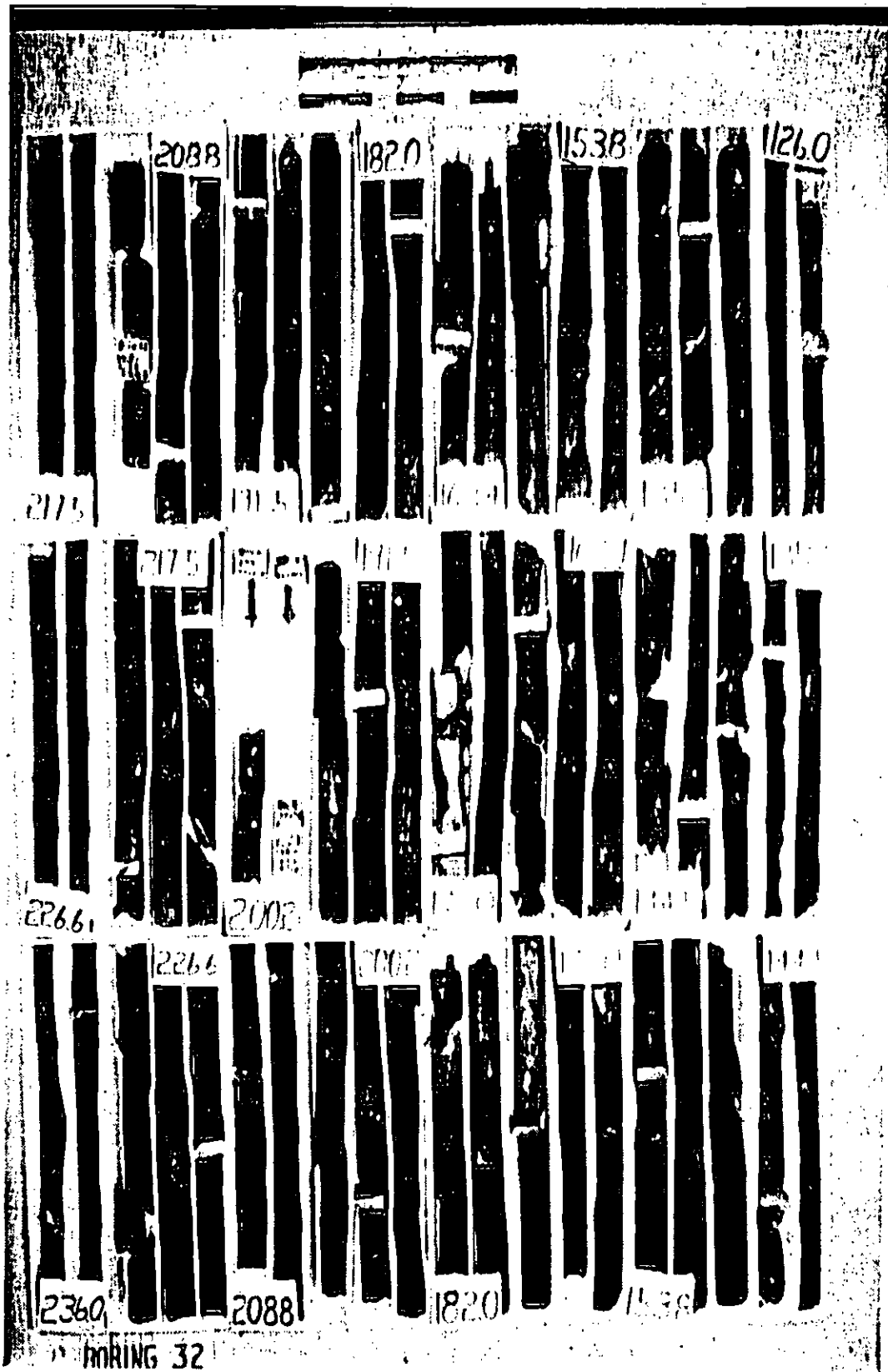


PHOTO - CORE BORING No. 32 126.0 to 236.0 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-29b



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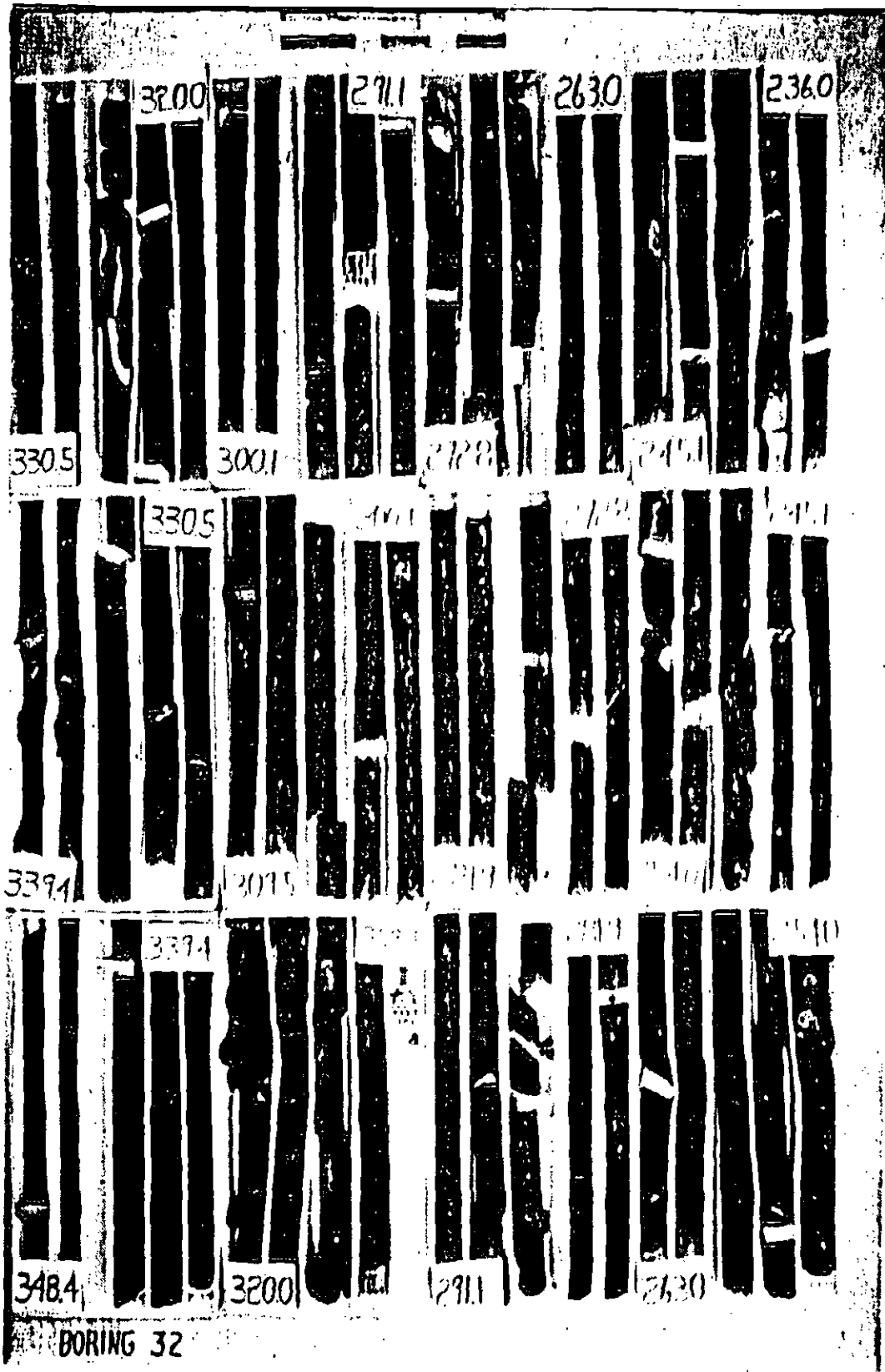


PHOTO - CORE BORING No. 32 236.0 to 348.4 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-29c

Approved for publication by



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Geotechnical Consultants

11-472

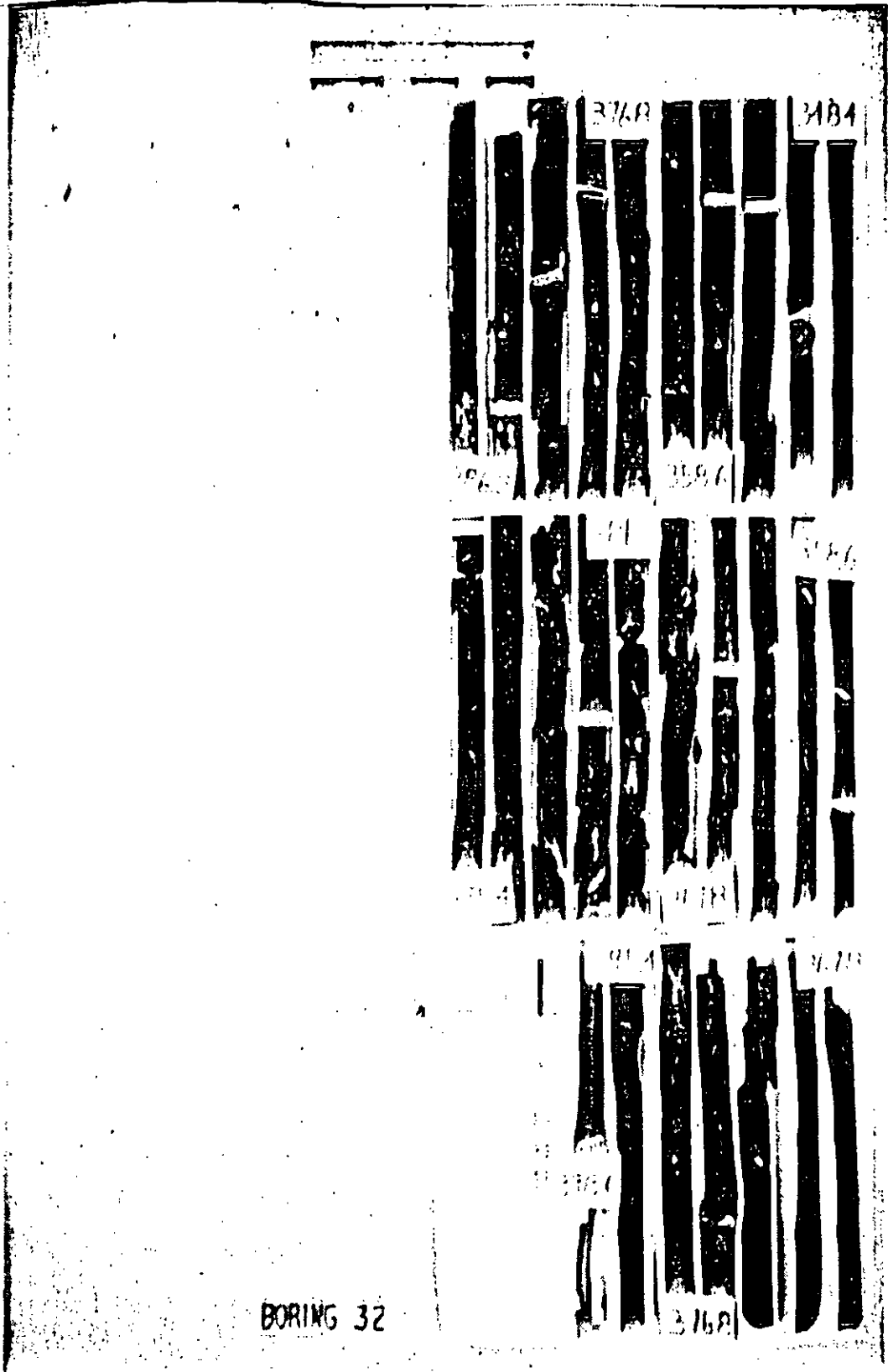


PHOTO - CORE BORING No. 32 348.4 to 395.4 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.
80-1280

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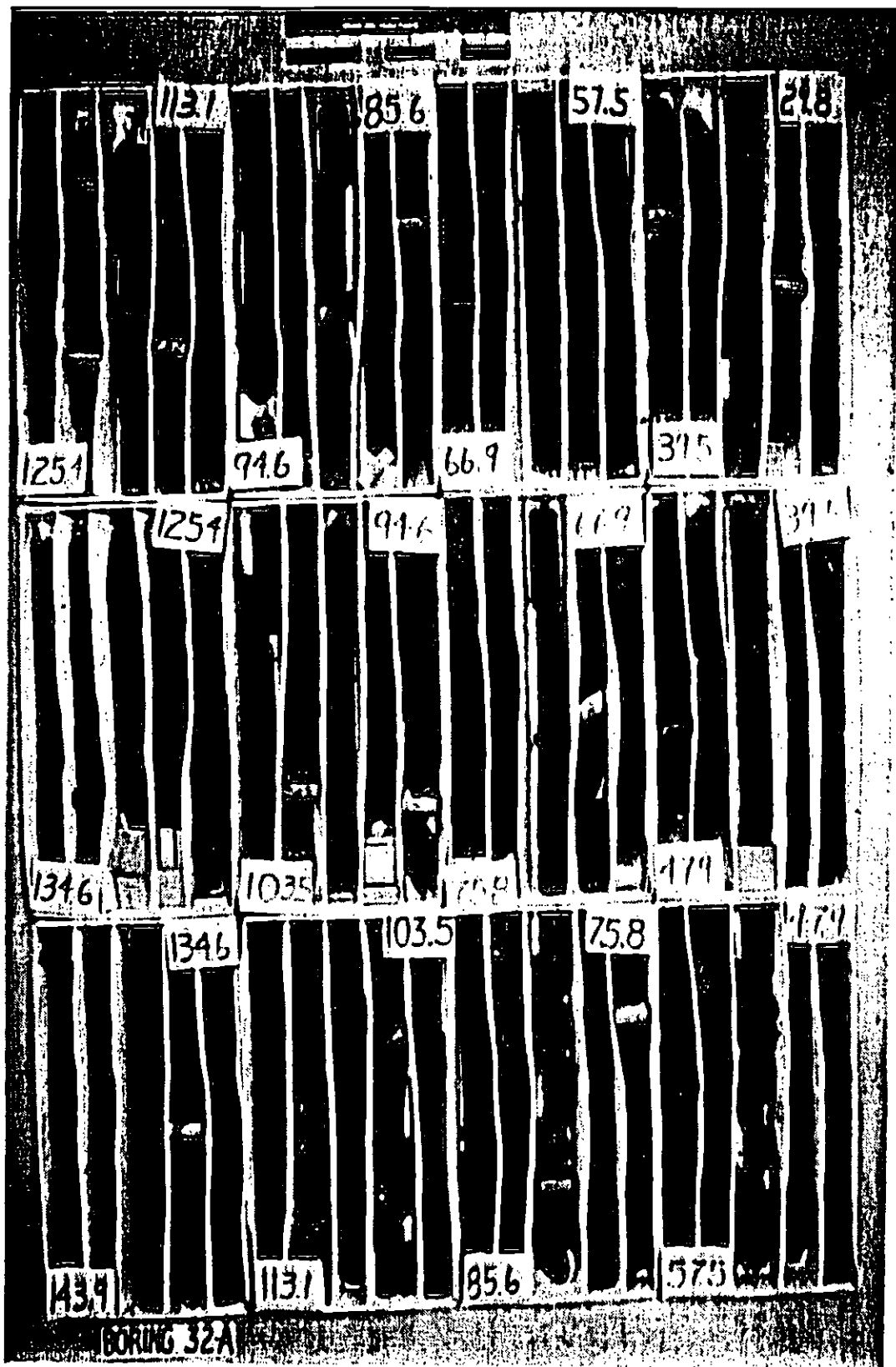


PHOTO - CORE BORING No. 32A 29.8 to 143.9 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-30a



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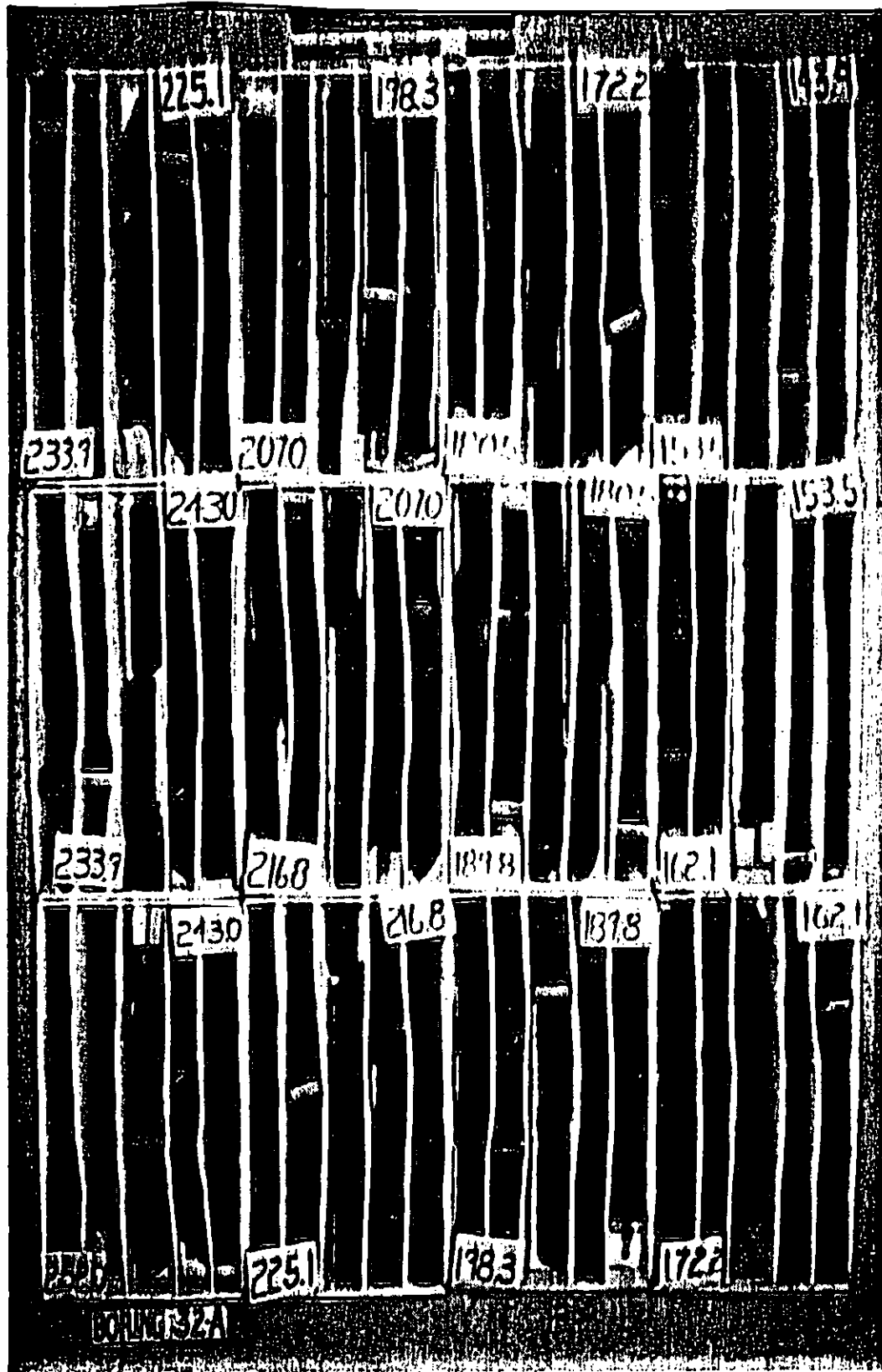


PHOTO - CORE BORING No. 32A. 143.9 to 252.0 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-30b

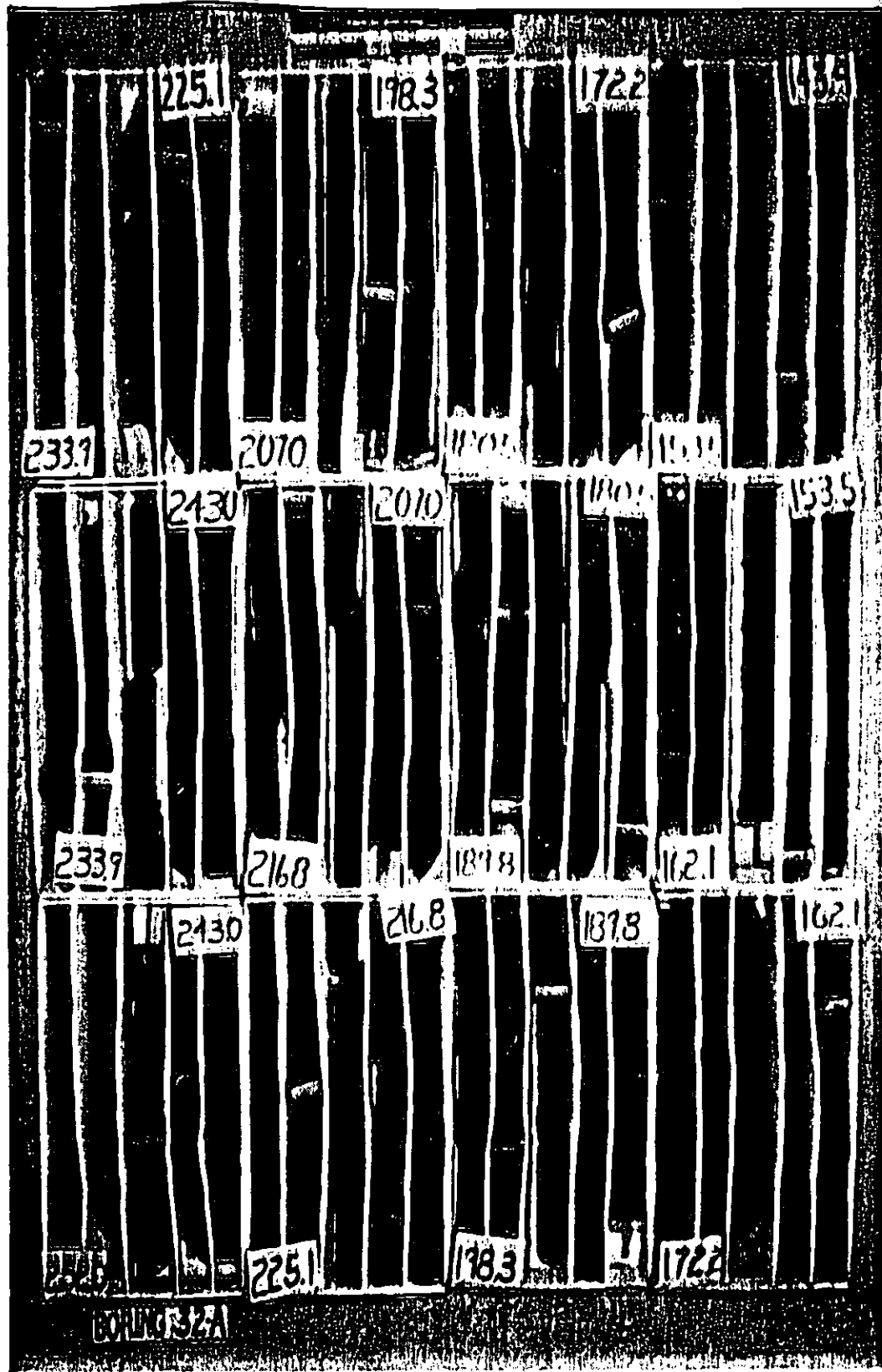


PHOTO - CORE BORING No. 32A 143.9 to 252.0 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-30b



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11-475

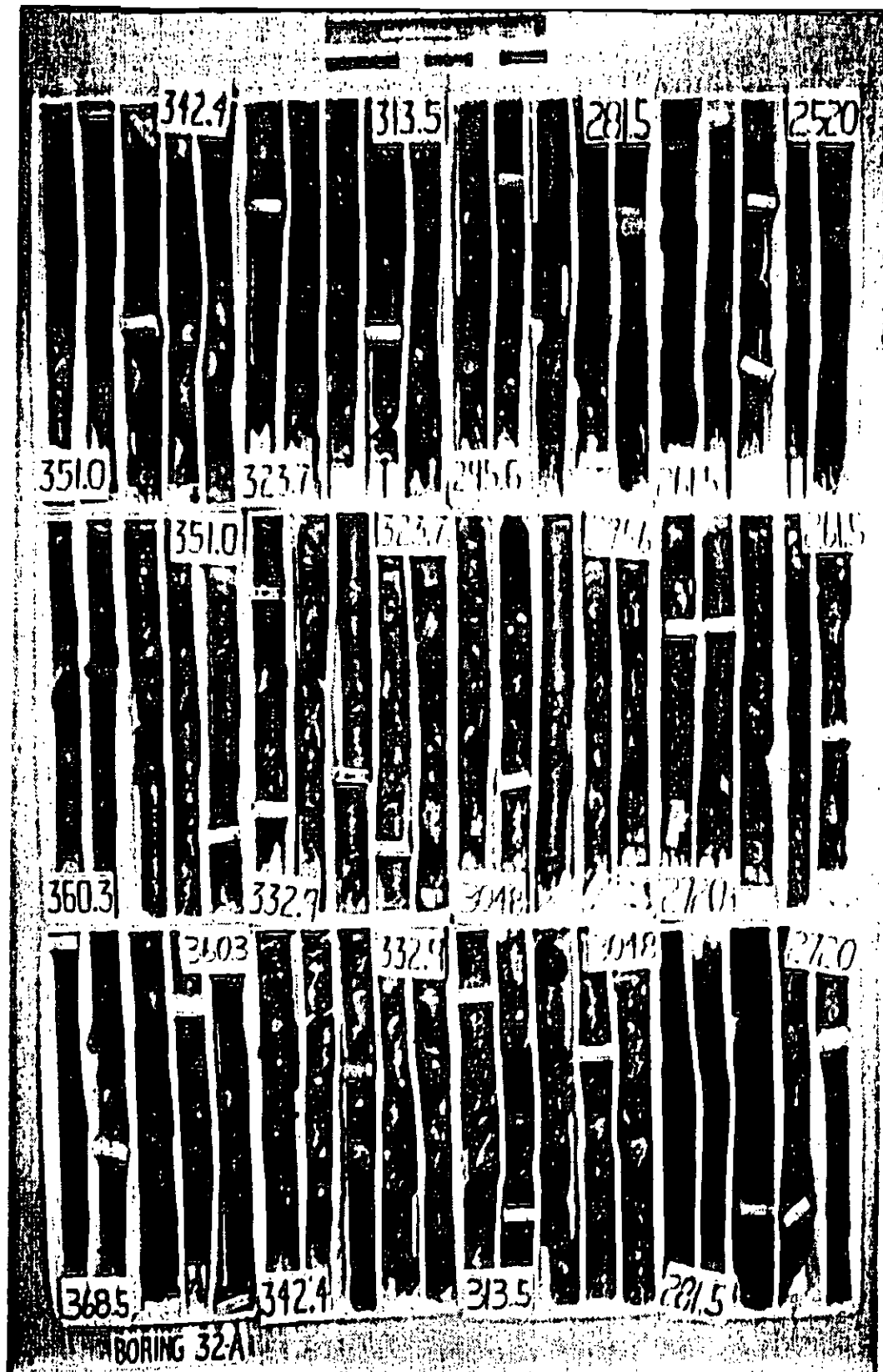


PHOTO - CORE BORING No. 32A 252.0 to 368.5 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-30c



CWDD/ESA/GRC

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11-476

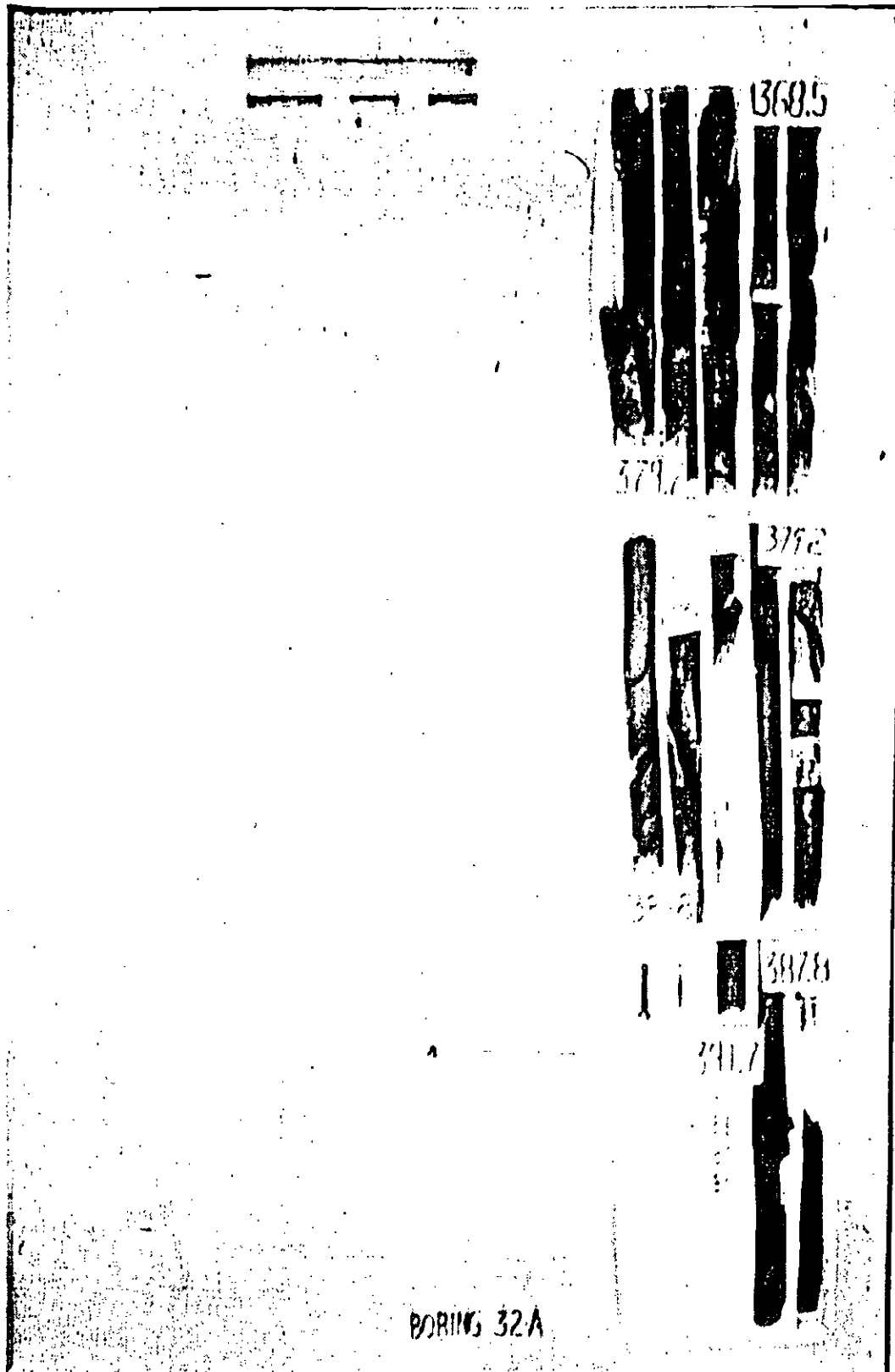


PHOTO - CORE BORING No. 32A 368.5 to 391.7 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-30d

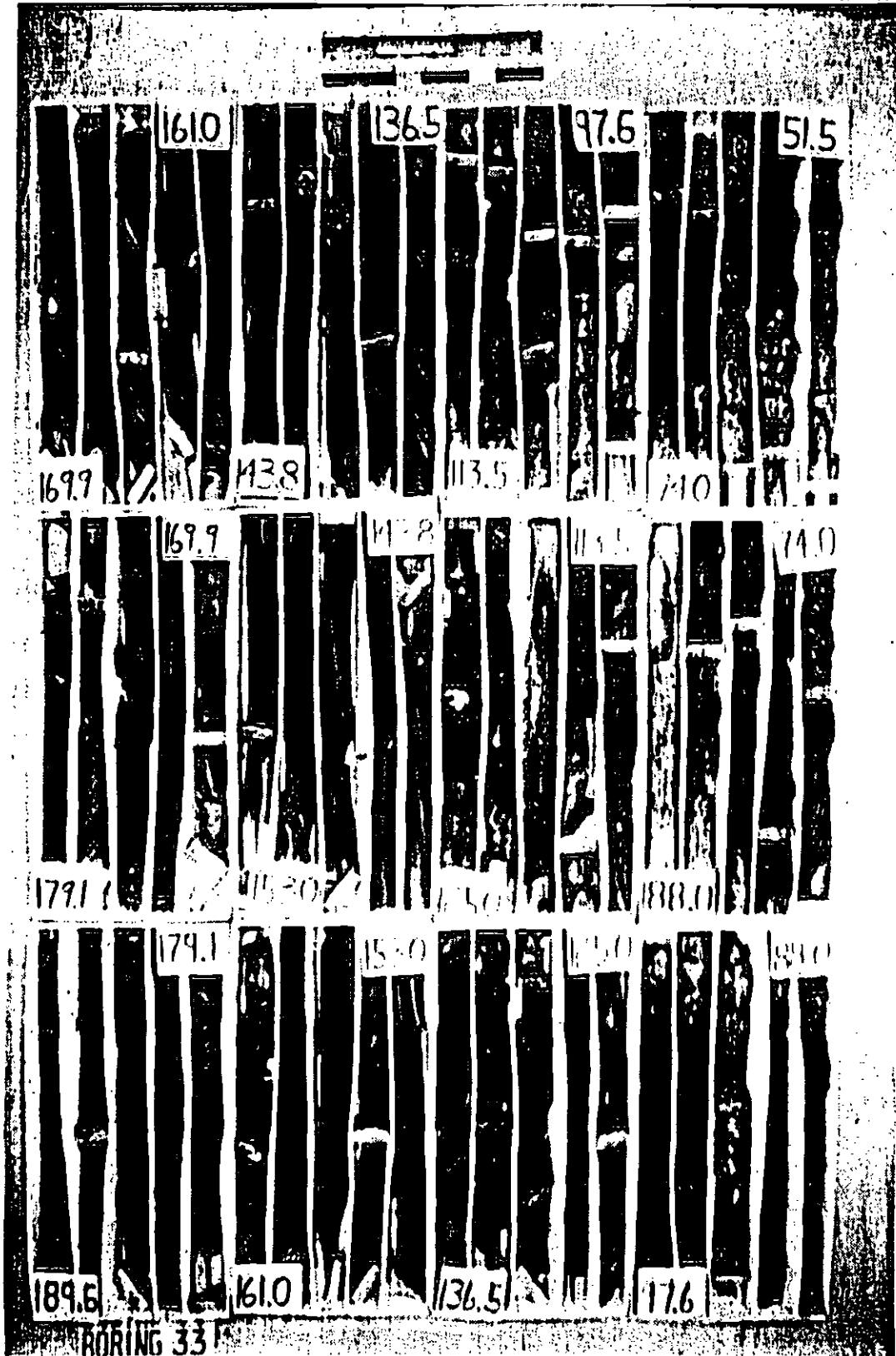


PHOTO - CORE BORING No. 33 51.5 to 189.6 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-31a



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11-478

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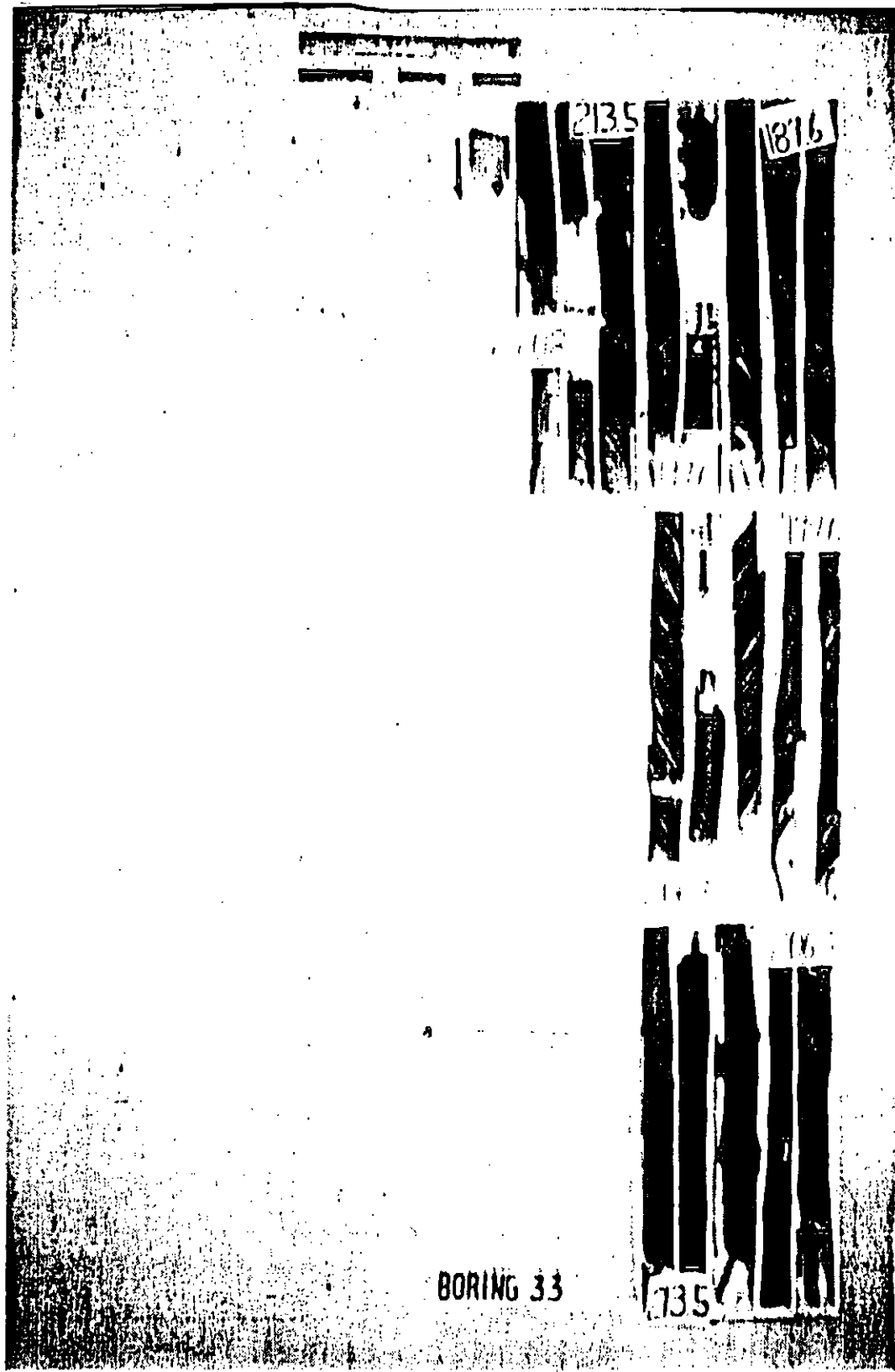


PHOTO - CORE BORING No. 33 189.6 to 220.8 FEET

Southern California Rapid Transit District
METRO RAIL PROJECT

Project No.

80-1280

Figure No.

A-31b



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11-479

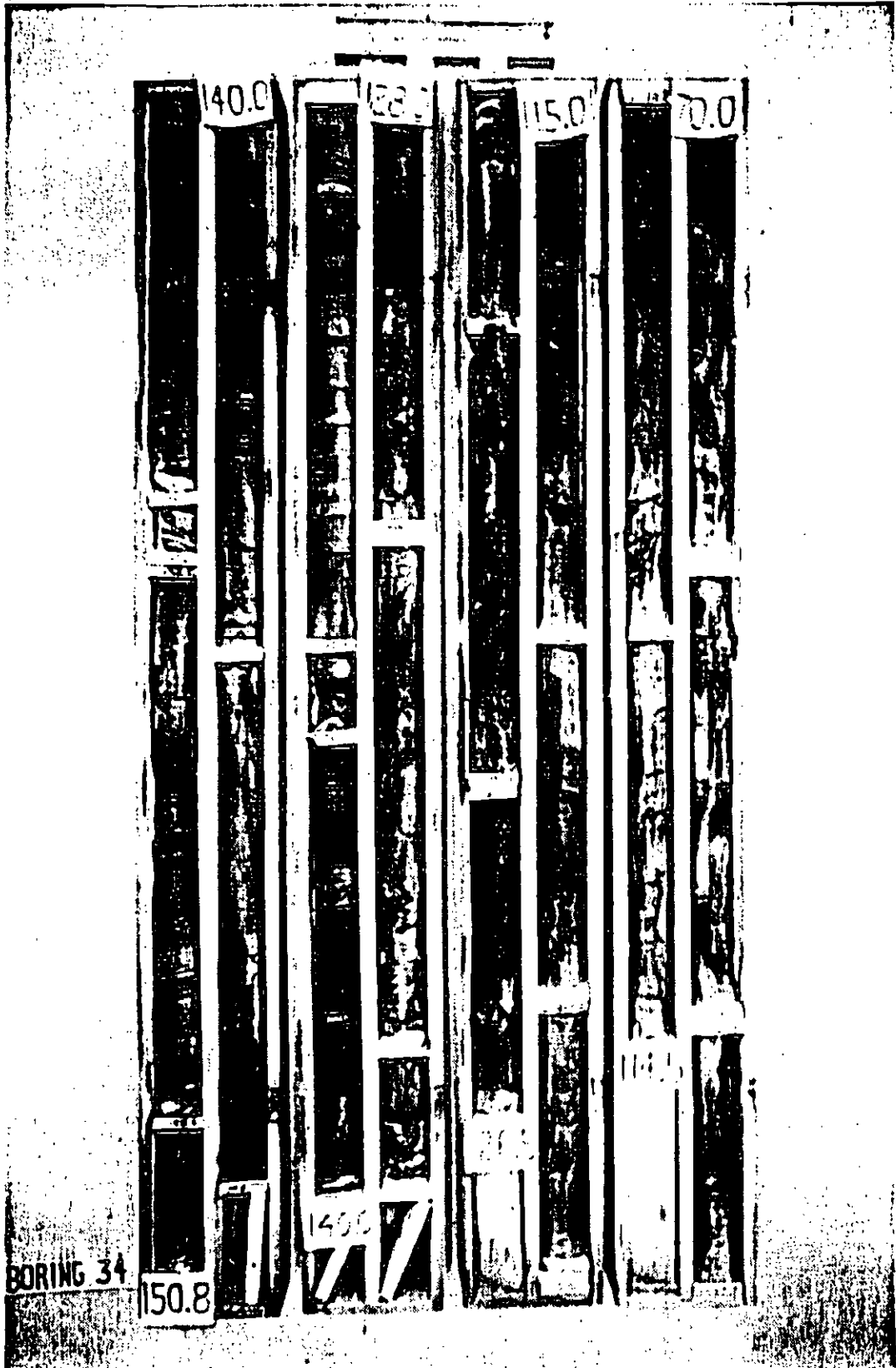


PHOTO - CORE BORING No. 34 70.0 to 150.8 FEET

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PHOTO - CORE BORING No. 34 152.0 to 200.0 FEET

Southern California Rapid Transit District
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Project No.

80-1280

Figure No.

A-32b



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11-481

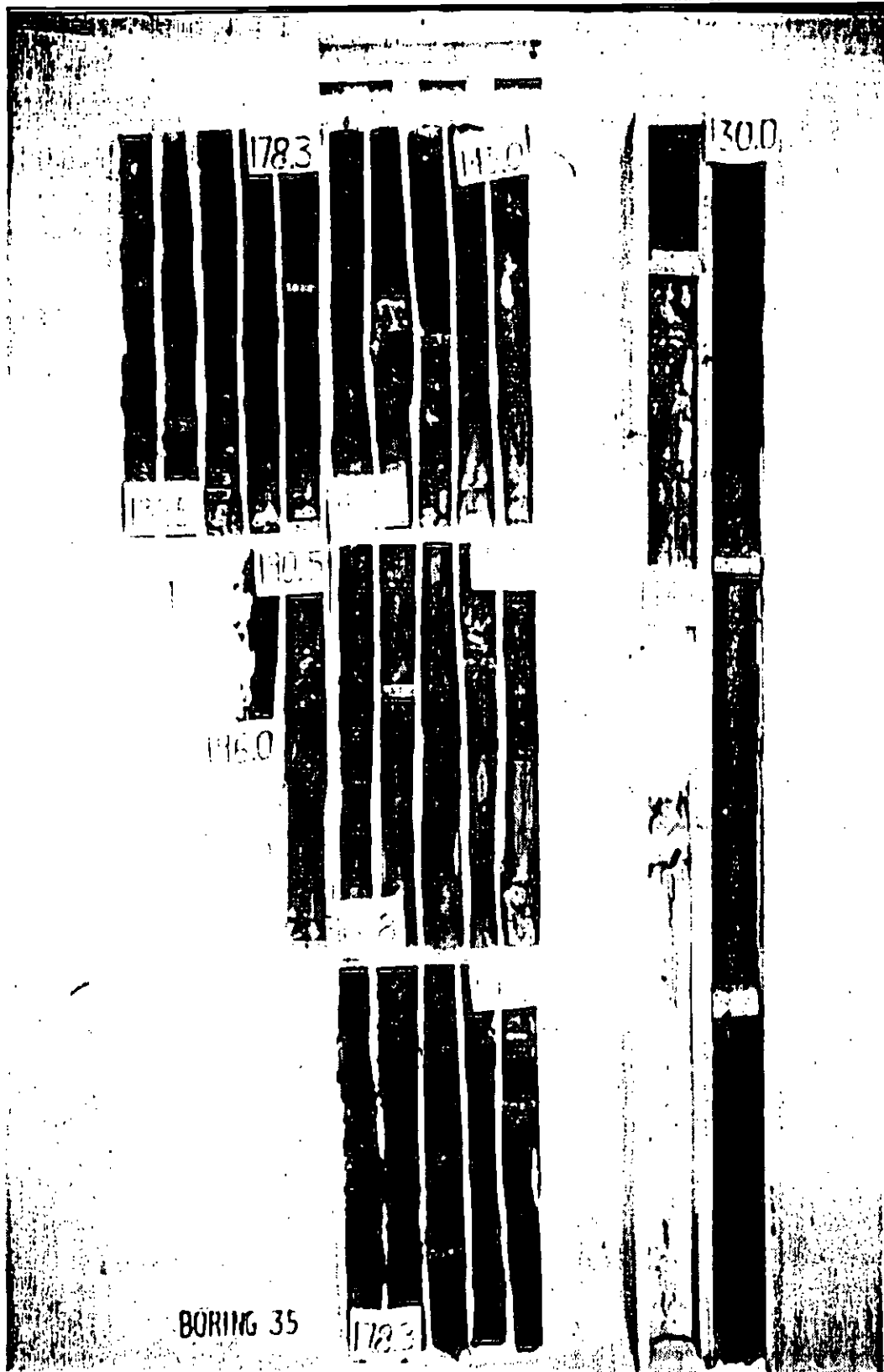


PHOTO - CORE BORING No. 35 130.0 to 196.0 FEET

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Project No.

80-1280

Figure No.

A-33



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11-482

APPENDIX B
E-LOGGING

Appendix B: E-Logging

B.1 SUMMARY

All 41 geologic sample borings were electric-logged by Converse Team Member, ESA. A full suite consisting of spontaneous potential resistivity, natural gamma, casing collar locator, caliper, neutron and density logs was performed in each boring, for a total 41,693 feet of log.

Data interpreted from these logs were used extensively during the field exploration program to:

- provide depth to bedrock information and facilitate decisions regarding completion of holes;
- determine ground water levels, perforation intervals for installation of piezometers and location of bentonite seals when double piezometers were installed;
- provide approximate borehole volumes for grout and gravel packing;
- determine location of rugose hole conditions for better placement of push and pneumatic packers; and
- avoid borehole washout zones during down-hole geophysical surveys, thereby optimizing compressional and shear wave velocity information and minimizing damage to geophone bladders caused by overexpansion in washout areas.

When the various field and laboratory data were being compiled and synthesized in the office, the logs were used frequently to:

- facilitate interpretation of surface geophysics;
- verify ground water depths;
- check the field geologists' lithologic log unit picks;
- prepare the final geologic profiles for this report; and
- determine depth intervals for petroliferous deposits where sampling was not performed.

A complete set (172 pages) of reduced E-logs for all 41 geologic sample borings follows this appendix.

B.2 EQUIPMENT

A Model 3200 Gearhart Owen skid-mounted down-hole logging unit, transported in a modified 3/4 ton Ford truck, was used for all logging. All down-hole sondes were slim line (1 5/8-to 1 11/16-inch diameter) Gearhart Owen tools. The radioactive source, used for the neutron device, was a Gulf Nuclear 3-curie AmBe; for the density tool, a 125-millicurie Cs source was used.

B.3 LOGGING AND QUALITY ASSURANCE

Both operator error and equipment malfunction can occur while obtaining geophysical data from electric-logs. The most common causes of errors are:

- selection of ground surface geophysical sonde and cable datums;
- slippage of cable on sheave (most commonly caused by impedance of sonde by borehole obstruction);
- backlash in the strip-chart paper drive linkage;
- false tool response due to borehole rugosity; and
- variance in drilling mud formation invasion and chemical differences in the drilling muds used for the various holes.

The following precautions were observed to assure top performance and accurate results:

- To maintain continuity and uniformity in all boreholes, the drillers were requested to use the same or similar mud for advancement of all borings. Except for several locations in the downtown Los Angeles River Reaches, where coarse gravels were encountered, simple bentonitic drilling fluids provided adequate control of water loss and borehole stabilization. In the NX core holes of the Santa Monica Mountains Reach, a "Quick Thick" polymer was used which had little effect on tool response.
- All logging was performed by two experienced geologists familiar with the Gearhart Owen unit. They verified the accuracy of the depth and checked odometer readings at the beginning and end of each probe. Depth accuracy for all logs is plus or minus one foot. Prior to its use, each tool was calibrated at the well site in accordance with the manufacturer's specifications.
- A minimum of two 100-foot duplicate runs for all logs was produced in each of the 41 borings to verify electronic function and accuracy of the log depth. Copies of these Quality Assurance runs are available upon written request.

B.4 INTERPRETATION AND LIMITATIONS

Each tool functioned satisfactorily during each suite of well logs run in the 41 borings and produced usable interpretive data. Although the casing collar locator (CCL) was not requested in the original RFP, the log was run to complete the suite. The results of this log were useful in locating disconnected surface casing in Borings 33 and 35. The CCL also shows why S.P.-RES. logs were not run to the surface in some borings, such as Boring 19, where significant amounts of steel casing were installed to control caving. S.P.-RES. tools are not capable of logging through steel or plastic casing.

The natural fresh water environment of the San Fernando Valley, Santa Monica Mountains and the Central Los Angeles Basin area, along with the fresh water drilling muds allowed for high quality spontaneous potential and resistivity logs. The resistivity logs, specifically, responded distinctly to the high resistivity tar sands, pervious sands and gravels, and the hard cemented zones within the Puente and Fernando Formations. Very distinctive low resistivities with a sharp signature change can be seen consistently within the high resistivity alluvial overburden which lies unconformable on the Pliocene/Miocene siltstone and claystones. Typical flattened and smoothed SP curves from the effects of gas can be seen in Borings 2, 19 and 23 and help to verify the existence of quantities of gas in these borings.

The resistivity tool used for this project was a point resistivity type. It is a shallow to medium reading tool, depending on the borehole diameter, and is designed specifically for high resolution in thin bed formations. Consequently, it is an excellent tool for lithologic correlations. However, because of deep-drill fluid penetration (large flush zones) in the coarse-grained alluvium, values for R_T may be inaccurate. Resistivity values for this tool in alluvium should be considered qualitative and not quantitative. High resistivity kicks in the alluvium, below known groundwater levels, are areas high permeability can be expected. However, high resistivities are also indicative of petroleum-saturated formations.

Resistivity interpretations are more complex in the Santa Monica Mountains Reach because of different physical properties of the rock. Regardless of water content, resistivity readings will likely be high if the rock is a massive, dense material. When referring only to a resistivity log, an accurate determination of water content in hard bedrock is difficult. Intensity of fracturing and their inter-relationships make water content estimates speculative.

Because a high percentage of mica and potassic feldspars exists in the sands of the Los Angeles Basin alluvium, natural gamma ray logs tend to be "muddied." Separation of natural gamma counts between clayey material and sands is reduced, making lithologic correlations more difficult. For lithologic unit identification, the point resistivity proved superior to the natural gamma tool in this natural geologic condition. However, the natural gamma log did produce excellent logs in the Topanga siltstone, shales and basalts. Separation was further enhanced because the igneous rocks were andesitic and doleritic; i.e., contained very small amounts of potassic feldspars. The natural gamma also very clearly identified ash beds within the alluvium and soft formation sediments. Identification of these ashes may prove useful for age-dating if fault activity studies are performed at a later date.

One major value of the caliper log is to identify weak, fractured rock zones and loose, unconsolidated sediments. Such areas can be detected by noting depth intervals where the borehole has become larger than the drill bit size used. It should be noted that washout zones and potential running sand areas

are easier to identify in deep borings where groundwater levels are high. In these situations, when the drill pipe is removed from the hole, the pipe volume is large and displaces enough drilling fluid so that the elevation of the remaining fluid in the hole is lower than the surrounding groundwater. Therefore, saturated unconsolidated sands have a greater chance of caving off the borehole walls or possible "running in." Washout areas occurring only near the top of the hole may be deceptive because other weak saturated sands may exist at greater depths. If the material is weak, it will be washed out to some extent no matter where it is encountered in the boring. It should be noted that increased hole rugosity will also occur in borings where extensive sampling has been undertaken, or where a driller is advancing a boring using excessive pump pressure and drill fluid volumes.

Regulations of the State of California Department of Health, Radiologic Section, prohibit the use of radioactive well logging tools in an open hole if groundwater contains less than 2,000 ppm total dissolved solids. Consequently, the borings had to be cased before the radioactive, density and neutron tools could be activated. Performance of the density tool was hindered by this requirement because it is an eccentric mechanism which must be pushed against the borehole wall to achieve optimum results. It also is more shallow-reading tool than the neutron.

Because hole completion had been consistent and laboratory tests had produced a large volume of bulk density data, the density tool was put into operation to determine if an empirical gamma ray count versus density could produce meaningful results (see Figure B-1). The actual density values calculated from results of laboratory tests performed on undisturbed samples for both alluvium and the Pliocene-Miocene soft formation bedrock were plotted together versus gamma ray counts for a given sample depth. Although bulk densities for these samples varied between 110-135 pounds per cubic foot, separation of lithologies along the x-axis (gamma ray counts) did not occur. The majority of samples fell within a narrow 175 count span regardless of bulk density or lithology. This count range probably represents an empirical bulk density for the ABS pipe and gravel pack and masked the actual formation densities that surrounded the borehole.

Data obtained from this field experiment are of limited value because the tool operated in an unfavorable environment; i.e., through casing in a gravel-packed boring. Interpolation of these data to unsampled portions of the borings is not recommended.

The density tool was not operated in the 10 cross-hole Station locations because of poorer borehole environment; i.e., larger reamed diameter of the borings; thicker larger diameter PVC casing; and the greater density of the grout versus gravel pack.

The neutron tool was also run through the plastic ABS pipe. The plastic pipe has a large percentage of hydrogen, which absorbs the high velocity neutrons emitted by the AmBe source. Data obtained from these borings should be considered empirical rather than quantitative.

Various types of neutron detector tools are available. The type and source-to-detector spacing used with the Gearhart Owen surface equipment result in high counting rates when the hydrogen concentration is low, and vice versa. The theory is identical to that used in density logging. With high hydrogen concentrations, the neutrons are thermalized and captured close to the source and a few, relatively speaking, reach the detector. With low hydrogen concentrations, the neutrons must go further to be thermalized because there are fewer hydrogen atoms to slow their progress, and more neutrons reach the detector. Generally, the higher the neutron count, the lower the hydrogen count; i.e., less volume of water versus matrix material in pore spaces. Care should be exercised by noting shale content of the formation of interest to avoid confusing total porosities and water content with effective porosity.

The small diameter boring, thin-walled ABS casing and the ability of the neutron tool to read an approximate 16-inch diameter span created favorable conditions for obtaining more meaningful data than that gathered from the density tool. Figure B-2 shows counts versus laboratory water content. Only samples which were analyzed for water content and were located below the piezometric surface (that existed within the borehole when the neutron log was run; see Table A-5) were plotted. The water-filled gravel pack acts as a neutron absorber and, therefore, affects the neutron count returning to the tool detector. A separate graph could be produced plotting water content versus lithology types for samples located above the borehole piezometric surface. Such a graph was not produced because limited lab data did not allow for a meaningful statistical analysis.

Figure B-2 can be summarized in terms of log interpretation as follows:

- log counts in the 200's indicate saturated silts or clays;
- neutron log counts in the mid 300's to low 400's indicate saturated sands;
- log counts in the low 300's is a "grey zone" represented by mixed lithologies of sandy clays and silts.

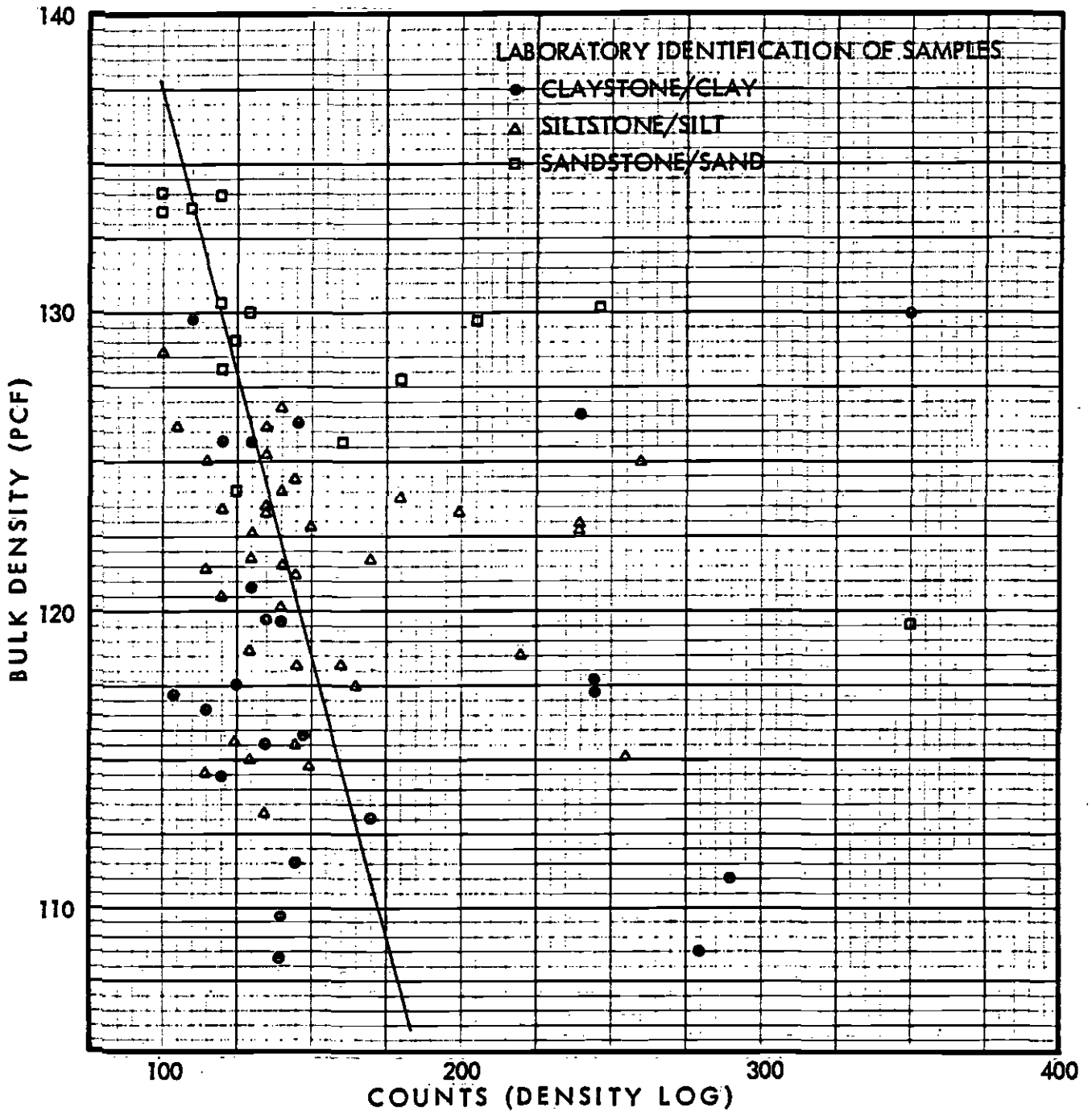
Although not graphically represented, neutron data obtained above the borehole piezometric surface (although limited) can be summarized as follows:

- counts of 600 and above are typically unsaturated soils;
- clays range between 600 to 1,000 counts;
- silts and sands range between 900 to 1,200 counts;
- course sands and gravels are 1,100 counts and greater.

The accuracy of the neutron tool's prediction of formation water content was good. A least square regression analysis was performed. The resulting regression line (see Figure B-2) showed that, as expected, the neutron counts were inversely proportional to the water content. The corresponding standard error of estimate of y on x was 5%. For example, for a neutron count taken from a specific depth of interest and projected to the regression line, the corresponding moisture content would probably be within +5% of laboratory test results.

These data referenced to the bulk density values compared with results from grain-size analysis can provide rough estimates of effective porosities.

The neutron logs also show very definite inflections when the probe passes out of the groundwater level in the piezometers. Consequently, groundwater levels in stabilized wells can be read accurately. It might also be noted that the neutron log clearly depicts the hard cemented zones and ash beds within the Puente and Fernando Formations with large deflections to the right. The density log does not have a large deflection for the cemented zones; however, it locates the ash beds very clearly with large deflections to the right.

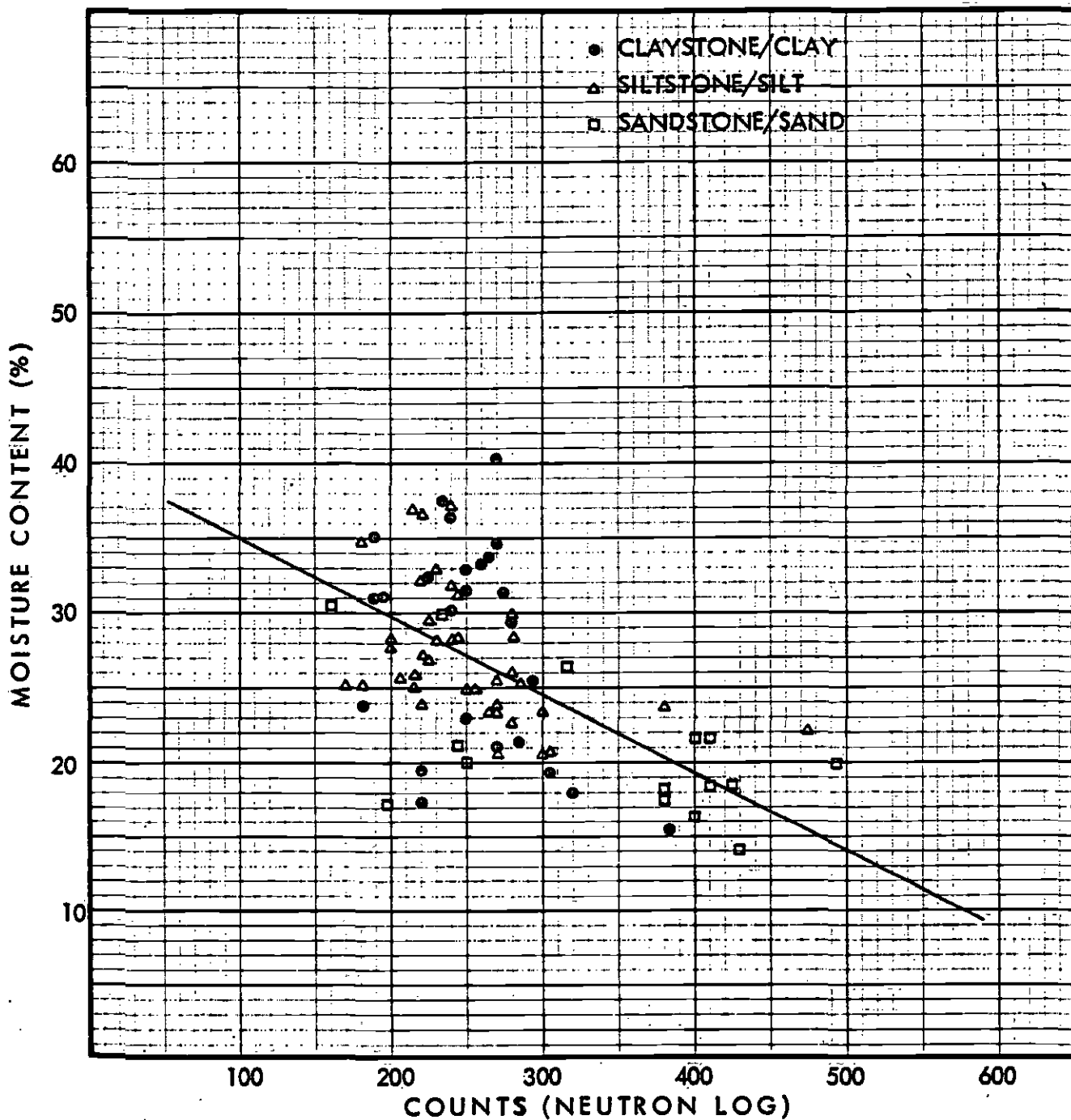


LABORATORY IDENTIFICATION OF SAMPLES

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Figure No.
B-1



NOTE: 1. All samples plotted are below borehole piezometric surfaces
 2. Moisture content values plotted on the Y-axis are laboratory test data

LABORATORY IDENTIFICATION OF SAMPLES

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 80-1280

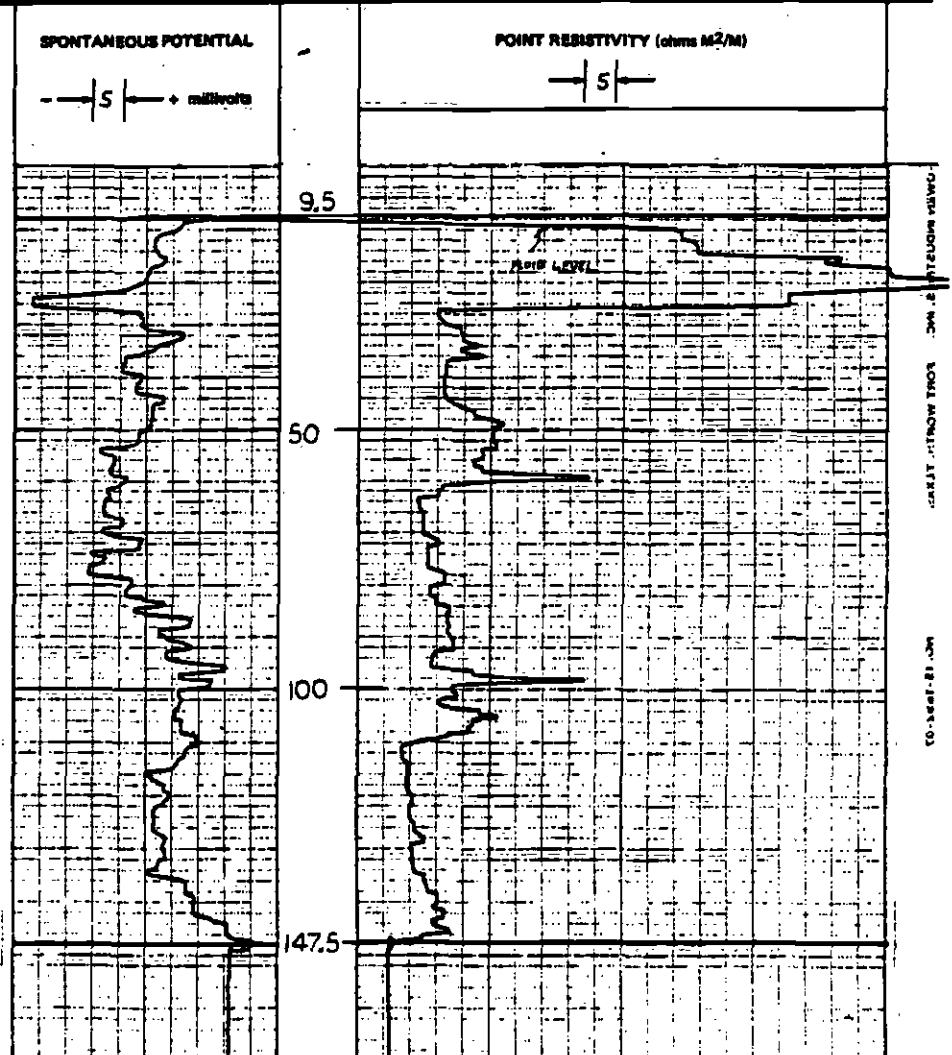


Converse Ward Davis Dixon
Earth Sciences Associates
Geo/Resource Consultants

SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/10/81				
PROJ. NO. 2191-25	Run No. 1				
WELL: 1	Depth-Offset 150.0'				
FIELD:	Depth-Logger 150.0'				
COUNTY: LOS ANGELES	Dist. Log Interval 147.5'				
STATE: CALIFORNIA	Top Log Interval 9.5'				
Other Service: NATURAL GAMMA, CCL, CALIPER	Casing-Offset 3" @ 3'	0	0		
DENSITY, NEUTRON	Casing-Logger 5" @ 3'				
	Bit Size 4 7/8"				
	Typ. Fluid in Hole BENTONITE				
	Dist. Visc.				
	pH Field Log 9	ml	ml	ml	ml
	Source of Sample Mud Tub				
	Run @ Mass. Temp. 10 @ 72 °F	0	0	0	0
	Run @ Mass. Temp. 10 @ 72 °F	0	0	0	0
	Run @ Mass. Temp. 10 @ 72 °F	0	0	0	0
	Source Rod Run				
	Run @ BMT	0	0	0	0
	Circulation Stopped 1600				
	Logger on Bottom 1645				
	Max. Res. Temp.	0	0	0	0
	Recorded By HANZAGOL				

Remarks: LINE SPEED 36 FT/MIN



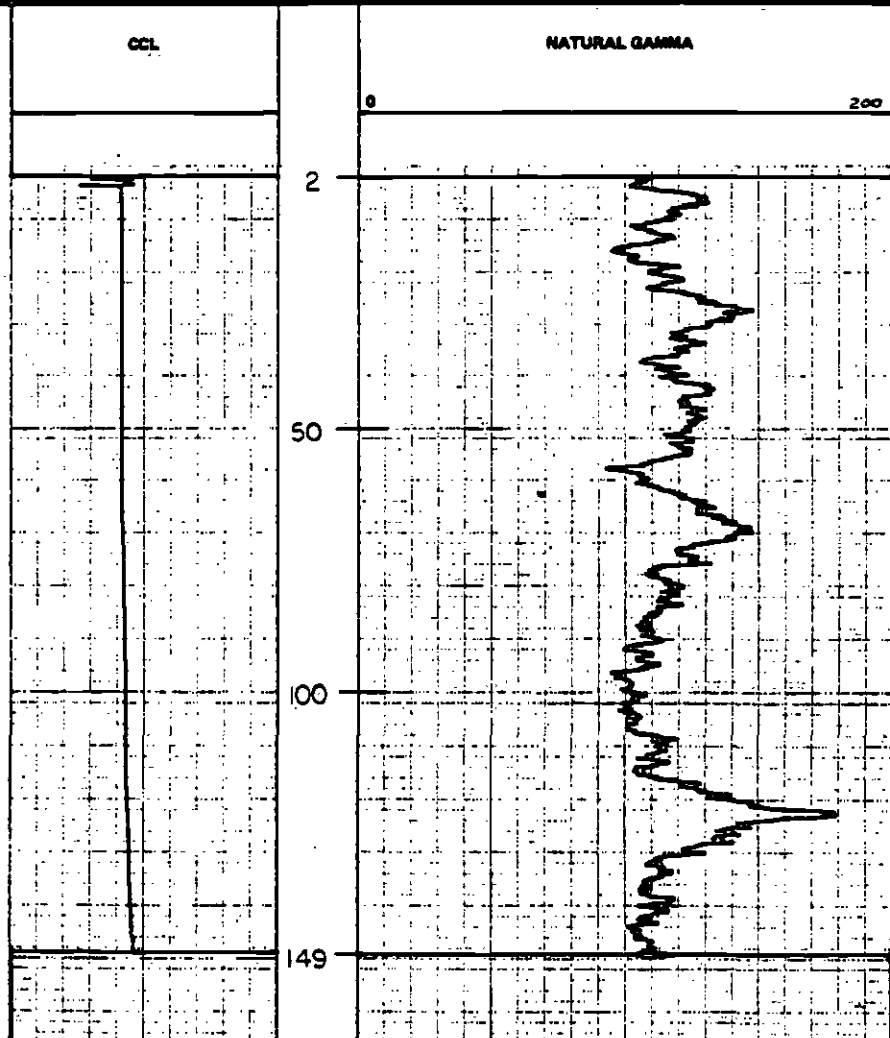


Converse Ward Davis Dixon
Earth Sciences Associates
Geo/Resource Consultants

**CCL-GAMMA RAY
LOG**

CLIENT: SCRTD	Date: 2/11/81				
PROJ. NO.: 2191-25	Run No.: 1				
WELL: 1	Depth-Driller: 150.0'				
FIELD:	Depth-Logger: 150.0'				
COUNTY: LOS ANGELES	Sta. Log Interval: 149.0'				
STATE: CALIFORNIA	Test Log Interval: 2.0'				
Other Services: SP-RES, CALIPAR, DENSITY, NEUTRON	Casing-Driller: 5" @ 3'				
	Casing-Logger: 5" @ 3'				
	Bit Size: 4 3/8"				
	Type Fluid in Hole: BENTONITE				
	Chem. Visc.:				
	pH Field Log: 9 ml				
	Source of Sample: mud Tub				
LOCATION: RICHMOND STREET OFF MELBOY STREET	Run @ Meas. Temp.: 10 @ 72 °F				
	Run @ Meas. Temp.: 10 @ 72 °F				
	Run @ Meas. Temp.: 10 @ 72 °F				
Section:	Source: Run / Run:				
Permanent Datum: G.L.	Run @ BHT:				
Log Measured From: G.L.	Chromium Standard: 1600				
Drilling Measured From: G.L.	Logger on Bottom: 1705				
	Max. Run. Temp.:				
	Recorded By: MHN2066				

Remarks: LINE SPEED 20 FT/MIN



24437 H14C/W TRC-1 3M 52474600 HOMO-TEAR-130
 MPT-1125-CO

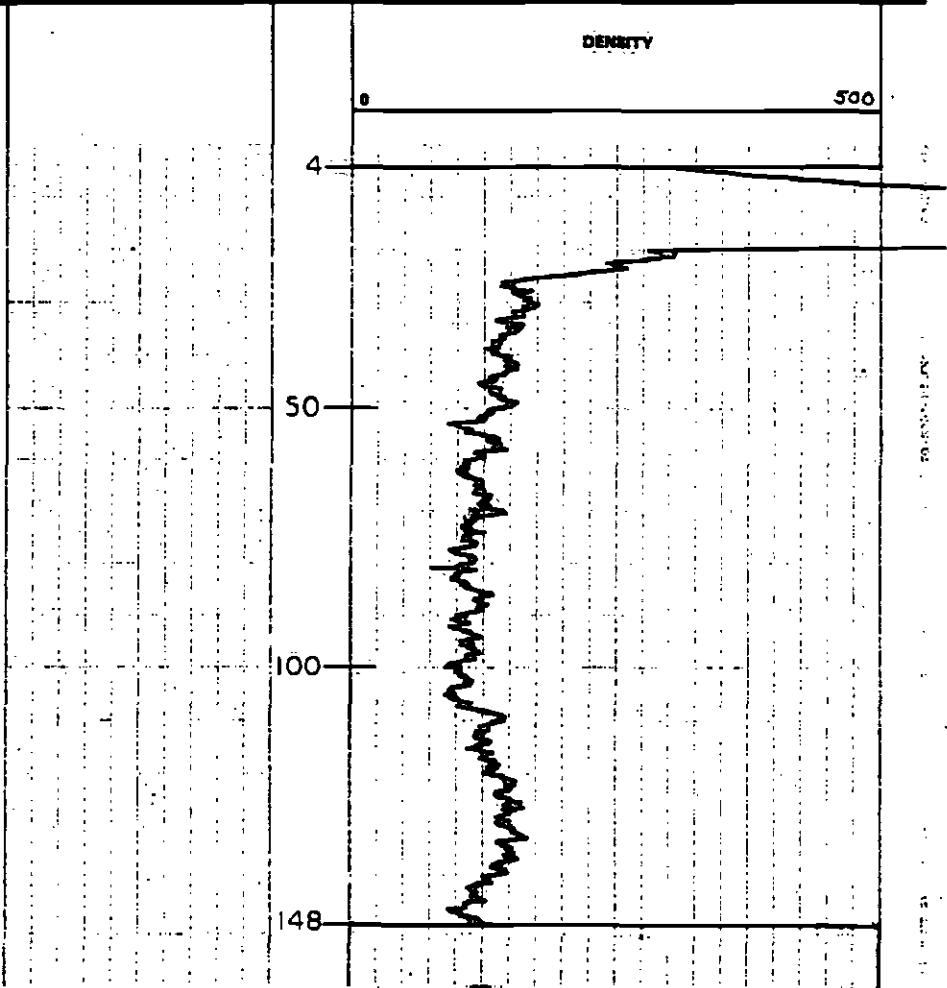


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DENSITY LOG

CLIENT: <i>SCRTO</i>		Date	<i>3/10/81</i>	
PROJ. NO. <i>2191-25</i>		Run No.	<i>710</i>	
WELL: <i>1</i>		Depth-Driller	<i>150'</i>	
FIELD:		Depth-Logger	<i>148'</i>	
COUNTY: <i>LOS ANGELES</i>		Den. Log Interval	<i>4</i>	
STATE: <i>CALIFORNIA</i>		Top Log Interval	<i>2" ABS @ 150'</i>	
Other Services: <i>GAMMA, S.P., RES., CALIF.</i>		Casing-Driller	<i>2" ABS @ 150'</i>	
<i>NEUTRON</i>		Casing-Logger	<i>2" ABS @ 150'</i>	
<i>RICHMOND ST. OFF MISSION STREET</i>		BR Size		
Section		Type Fluid in Hole	<i>FRESH H₂O</i>	
Township		Den.	Vis.	
Range		pH	Fluid Loss	ml
Permeant Element: <i>G.L.</i>		Source of Sample	<i>NOUE</i>	
Log Measured From: <i>G.L.</i>		Run @ Meas. Temp.	°F	°F
Drilling Measured From: <i>G.L.</i>		Run @ Meas. Temp.	°F	°F
ELEVATION		Run @ Meas. Temp.	°F	°F
<i>G.L. 317</i>		Source: Rwd / Rms		
<i>D.F.</i>		Run @ GHT	°F	°F
<i>K.B.</i>		Checked/Stopped	<i>3/11/81</i>	
		Logger on Bottom	<i>3/10/81</i>	
		Max. Res. Temp.	°F	°F
		Recorded By	<i>MANZAGAL</i>	

Remarks: *BORING IS GRAVEL PACKED AROUND THE 2" ABS CASING*



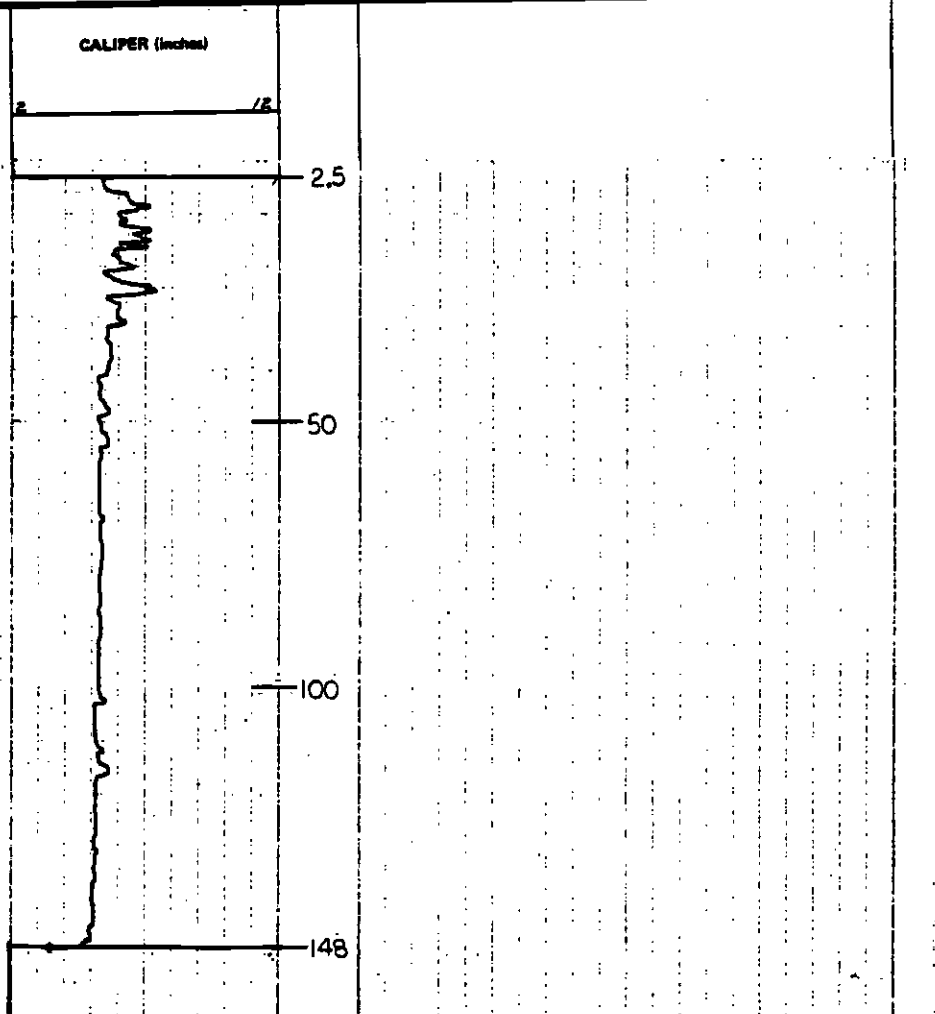


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CALIPER LOG

CLIENT: SCRTD	Date: 2/10/91			
PROJ. NO. 2191-25	Run No. 1			
WELL: 1	Depth-Driller 150.0'			
FIELD:	Depth-Logger 150.0'			
COUNTY: LOS ANGELES	Str. Log Interval 149.0'			
STATE: CALIFORNIA	Top Log Interval 2.5			
Other Service: NATURAL GAMMA, CCL, SP-RES.	Casing-Driller 5" @ 3'			
DENSITY NEUTRON	Casing-Logger 5" @ 3'			
RICHMOND STREET OFF MISSION	Bit Size 4 7/8"			
STREET	Type Fluid in Hole BENTONITE			
Section Township Range	Dens. Visc.			
Permanent Datum G.L.	pH Field Log 9	ml	ml	ml
Log Measured From G.L.	Source of Sample Mud Tub			
Drilling Measured From G.L.	Run @ Meas. Temp. 10 @ 72 °F			
	Run @ Meas. Temp. 10 @ 72 °F			
	Run @ Meas. Temp. 10 @ 72 °F			
	Sensor: Run Rate			
	Run @ BHT			
	Circulation Stopped	1600		
	Logger on Bottom	1300		
	Max. Run Temp.			
	Recorded By	MAN ZAGOL		

Remarks: LINE SPEED 20 FT/MIN



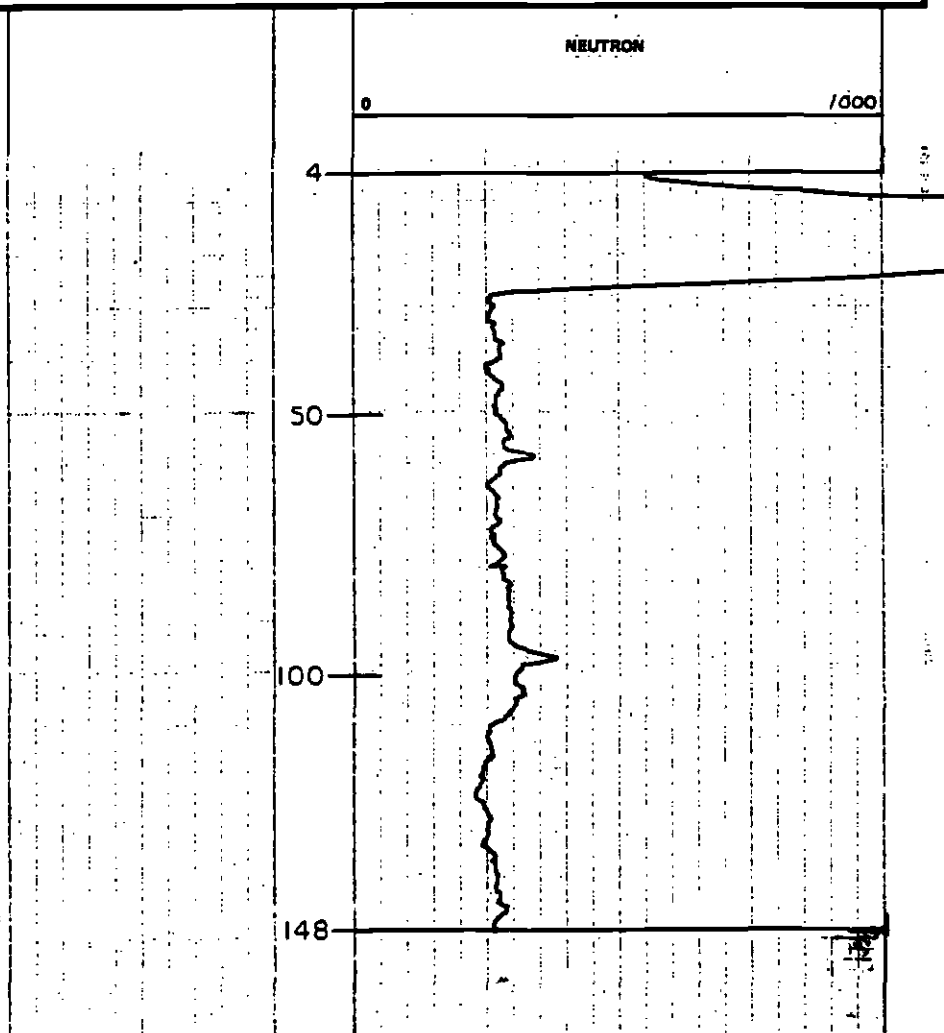


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NEUTRON LOG

CLIENT: SCRTP	Date	3/10/81	
PROJ. NO. 291-25	Run No.	Two	
WELL: 1	Depth-Driller	150'	
FIELD:	Depth-Logger	150'	
COUNTY: LOS ANGELES	Stn. Log Interval	4'	
STATE: CALIFORNIA	Top Log Interval	4'	
Other Services: GAMMA CCL, SP, RES.	Casing-Driller	2" ABS @ 150'	
CALIPER DENSITY	Casing-Logger	2" ABS @ 150'	
LOCATION: RICHMOND ST. OFF. MISSION STREET	Bit Size	4 7/8"	
	Type Fluid in Hole	FRESH H ₂ O	
	Dens. Visc.		
	pH Field Loss	ml ml ml	
	Source of Sample	NONE	
	Run @ Meas. Temp.	• °F • °F • °F • °F	
	Run @ Meas. Temp.	• °F • °F • °F • °F	
	Run @ Meas. Temp.	• °F • °F • °F • °F	
	Source: Run/Time		
	Run @ BHT	• °F • °F • °F • °F	
Section	Towable	Range	
Permanent Datum: G.L.	G.L. 317		
Log Measured From: G.L.	D.P.		
Drilling Measured From: G.L.	N.B.		
	Max. Run. Temp.	• °F • °F • °F • °F	
	Recorded By	HANEAGOL	

Remarks: **DRILL IS GRAVEL PACKED AROUND THE 2" ABS CASING**



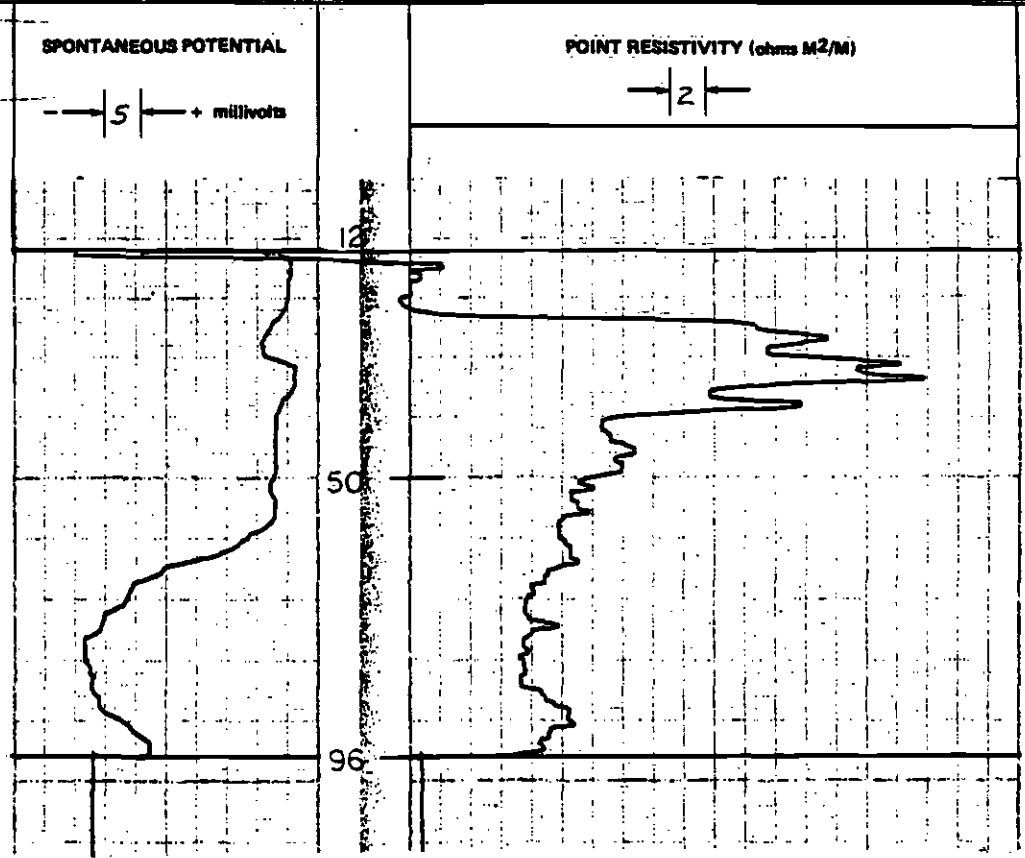


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SP-RESISTIVITY LOG

CLIENT: SCRTD		Date	2/14/81		
PROJ. NO. 2191-25		Run No.	1		
WELL: 2		Depth-Driller	100		
FIELD:		Depth-Logger	97		
COUNTY: LOS ANGELES		Dist. Log Interval	96		
STATE: CALIFORNIA		Top Log Interval	12		
Other Services: NATURAL GAMMA, CCL,		Casing-Driller	5" @ 7'	•	•
CALIPER, NEUTRON		Casing-Logger	5" @ 9'		
LOCATION: MISSION STREET SOUTH OF		Bit Size	4 7/8"		
MACY STREET		Type Fluid in Hole	BENTONITE		
Section	Township	Range	Dens.	Vis.	
Permanent Datum: G.L.		G.L. 280	pH	Field Loss	ml ml ml
Log Measured From G.L.		D.F.	Source of Sample		
Drilling Measured From G.L.		K.B.	Rin @ Mass. Temp.	•	•
			Rinf @ Mass. Temp.	•	•
			Rms @ Mass. Temp.	•	•
			Source: Rinf	Rms	
			Rin @ BHT	•	•
			Circulation Stopped	1300	
			Logger on Bottom	1625	
			Max. Rec. Temp.	•	•
			Recorded By	MANZAGOL	

Remarks: LINE SPEED 35 FT/MIN



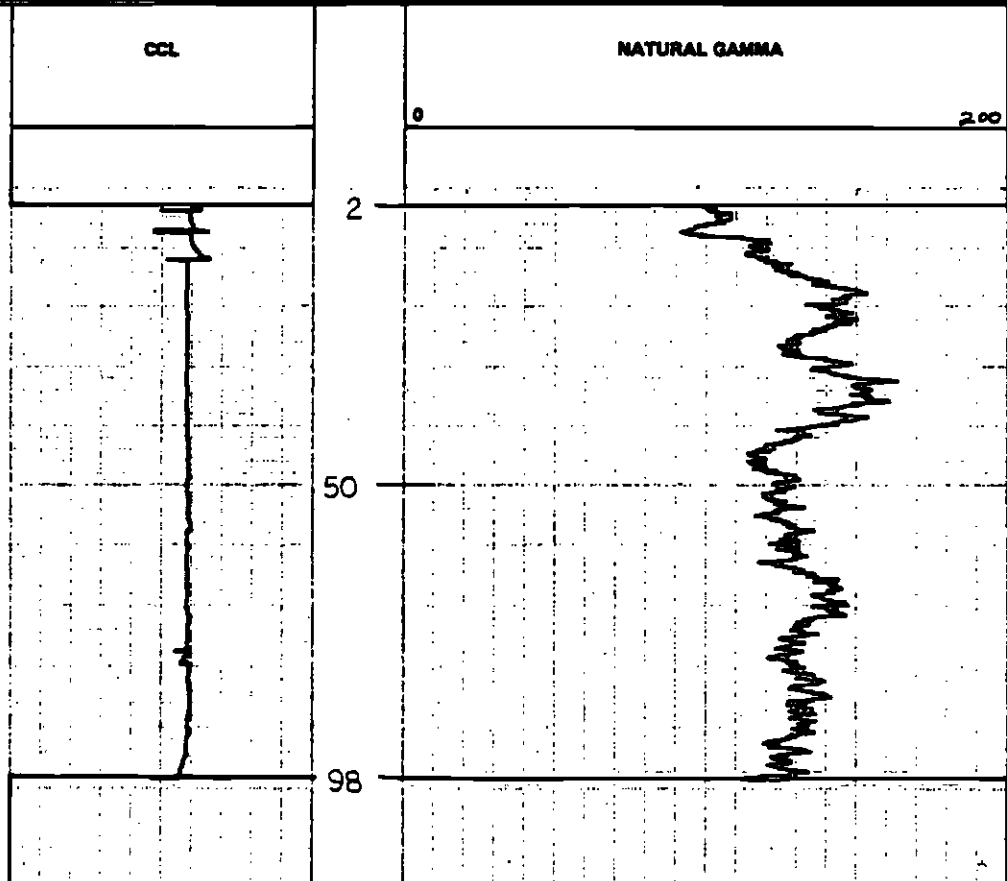


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/14/81			
PROJ. NO. 2191-25	Run No. 1			
WELL: 2	Depth-Driller 100			
FIELD:	Depth-Logger 99			
COUNTY: LOS ANGELES	Bot. Log Interval 98			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: SP-RES, CALIPER, NEUTRON	Casing-Driller 5" @ 7'			
	Casing-Logger 5" @ 9'			
	Bit Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Dens. Visc.			
	pH Field Log			
	Source of Sample			
LOCATION MISSION STREET SOUTH OF	Rm @ Meas. Temp.			
MACY STREET	Rmf @ Meas. Temp.			
	Rms @ Meas. Temp.			
	Source: Rmf Rms			
Section Township Range	Rm @ BHT			
Permeant Depth: G.L.	Circulation Stopped	1300		
Log Measured From: G.L.	Logger on Bottom	1525		
Drilling Measured From: G.L.	Max. Rec. Temp.			
	ELEVATION G.L. 280			
	D.F.			
	K.B.			
	Recorded By: MANZAGOL			

Remarks: LINE SPEED 15 FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED



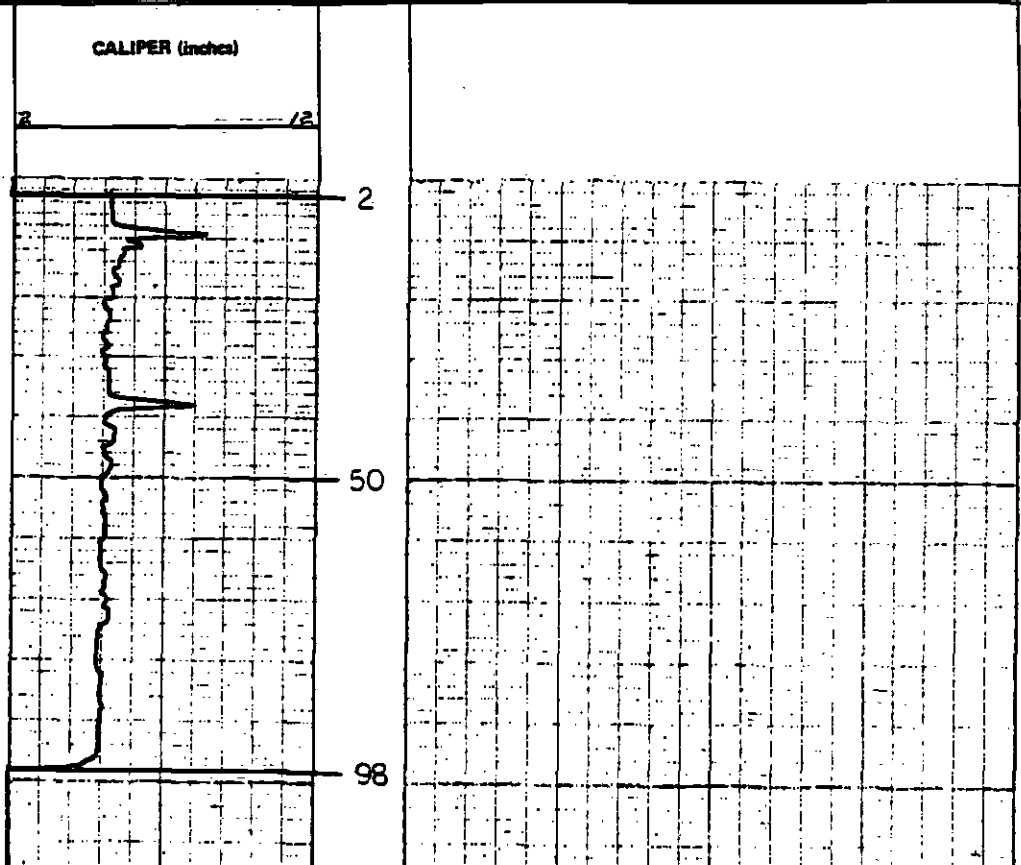


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CALIPER LOG

CLIENT: SCRTD	Date: 2/14/91		
PROJ. NO. 2191-25	Run No. 1		
WELL: 2	Depth-Driller 100		
FIELD:	Depth-Logger 100		
COUNTY: LOS ANGELES	Stm. Log Interval 99		
STATE: CALIFORNIA	Top Log Interval 2		
Other Services: NATURAL GAMMA, CCL, SP-RBS, NEUTRON	Casing-Driller 5" @ 7'		
	Casing-Logger 5" @ 9'		
	Bit Size 4 7/8"		
	Type Fluid in Hole BENTONITE		
	Dens. Visc.		
	pH Fluid Loss	ml	ml
	Source of Sample		
LOCATION: MISSION STREET SOUTH OF MAGY STREET	Rm @ Mean Temp.	°F	°F
	Rmf @ Mean Temp.	°F	°F
	Rms @ Mean Temp.	°F	°F
	Source: Rmf Rms		
Section Township Range	Rm @ BHT	°F	°F
Permanent Datum: G.L.	Circulation Stopped	1300	
Log Measured From G.L.	Logger on Bottom	1450	
Drilling Measured From G.L.	Max. Res. Temp.	°F	°F
	Recorded By: MANZAGOL		

Remarks: **LINE SPEED 20 FT/MIN**



103-INTRO-1204 11-1-81-3001 KAWD-THA-CASB

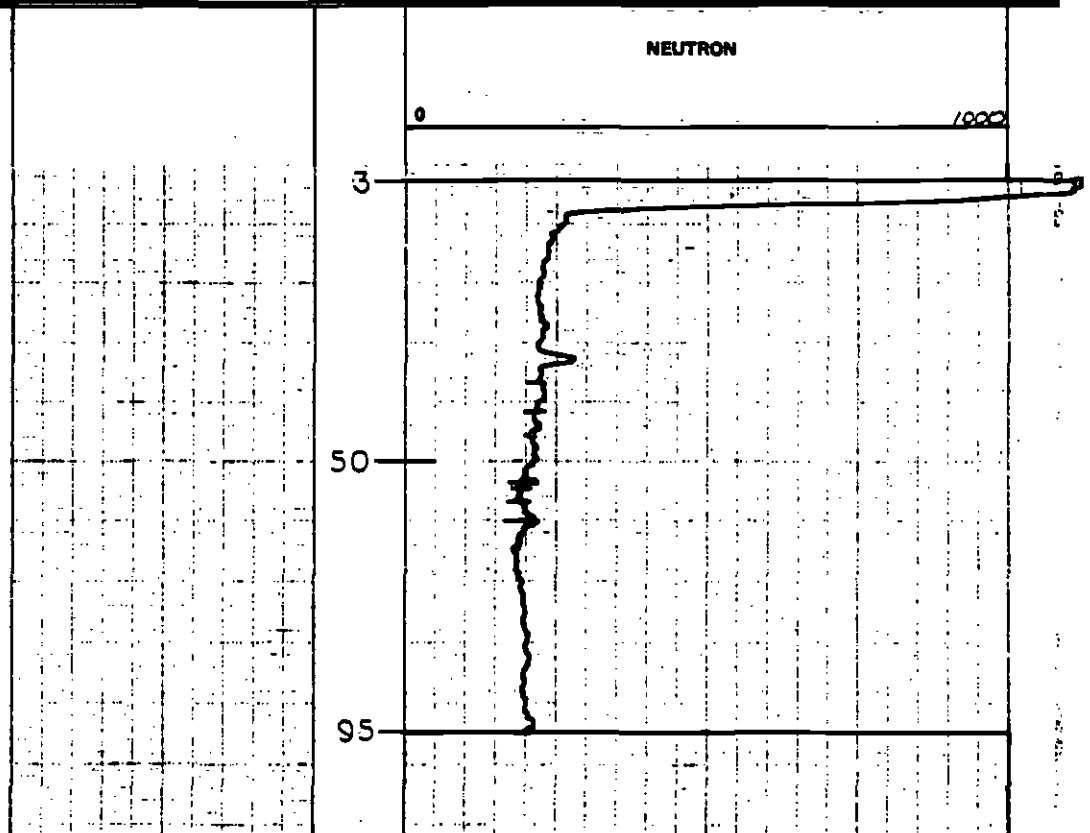


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NEUTRON LOG

CLIENT: SCRTD		Date	3/10/81	
PROJ. NO. 2191-25		Run No.	720	
WELL: 2		Depth-Driller	100	
FIELD:		Depth-Logger	96	
COUNTY: LOS ANGELES		Stm. Log Interval	95	
STATE: CALIFORNIA		Tap Log Interval	5	
Other Services: S.P.-RES., CALIPER, GAMMA, CCL		Casing-Driller	2" ABS @ 100'	
LOCATION: MISSION ST. SOUTH OF HALY STREET ~ 150'		Casing-Logger	2" ABS @ 100'	
Section		Township	Range	
Permanent Datum: G.L.		ELEVATION	G.L. 2.80	
Log Measured From: G.L.		ELEVATION	D.F.	
Drilling Measured From: G.L.		ELEVATION	K.S.	
Type Fluid in Hole		FRESH H ₂ O		
pH		Field Log	mi	
Source of Sample		NONE		
Run @ Mass. Temp.		°F		
Run @ Mass. Temp.		°F		
Run @ Mass. Temp.		°F		
Source: Run		Run		
Run @ BHT		°F		
Circulation Stopped		2/14/81		
Logger on Bottom		3/10/81		
Max. Res. Temp.		°F		
Recorded By		MARRAGOL		

Remarks: LINE SPEED 10 F/Min DORING FILLED WITH THICK OIL BETWEEN 40-70'
HALE GRAVEL PACKED, UNABLE TO RUN DENSITY TOOL DOWN HOLE BECAUSE OF THE
THICK GRADE OIL, WATER LEVEL AT 13.5 FT. IN CASING.



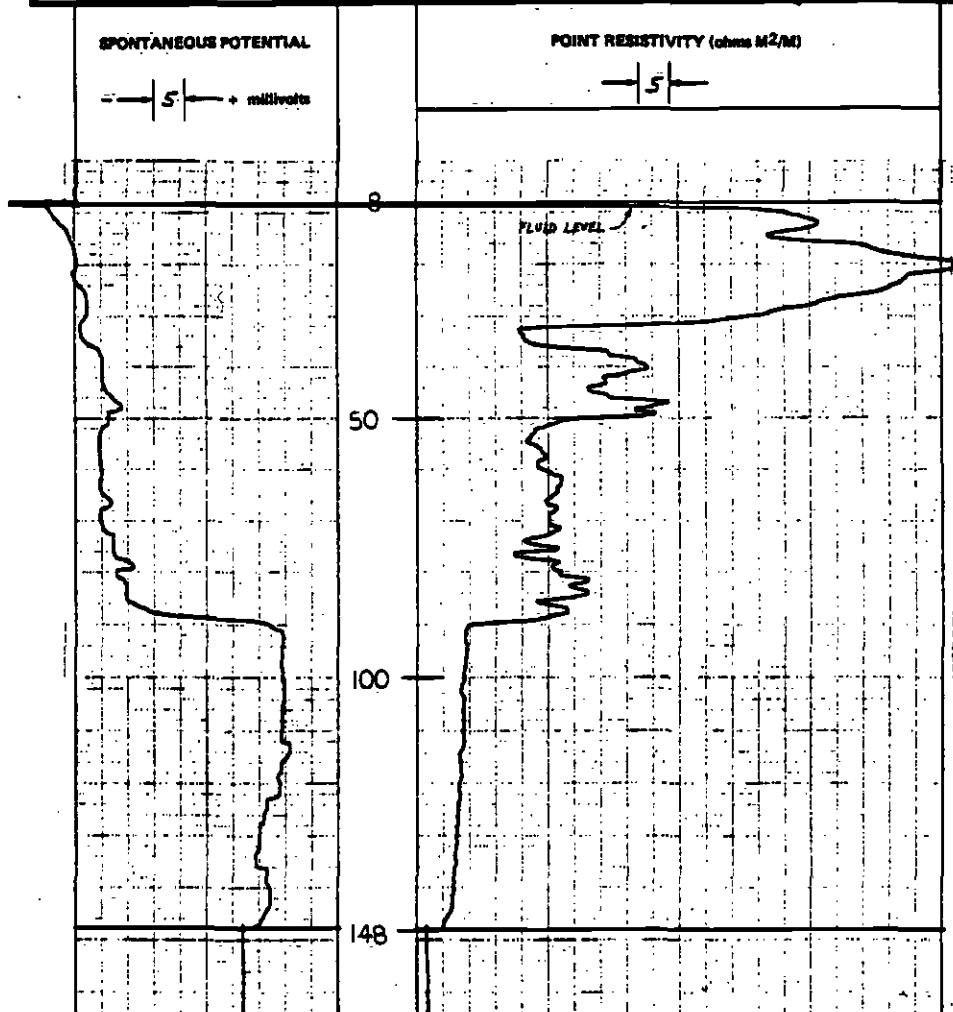


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/7/91			
PROJ. NO. 2191-25	Run No. 1			
WELL: 3	Depth-Driller 150			
FIELD:	Depth-Logger 149			
COUNTY: LOS ANGELES	Size Log Interval 148			
STATE: CALIFORNIA	Top Log Interval 9			
Other Services: NATURAL GAMMA, C.C.L., CALIPER, DENSITY, NEUTRON	Casing-Driller 5' @ 4'			
	Casing-Logger 5' @ 4'			
	Bit Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Dist. Visc.			
	gpi Field Loss 9 ml			
	Source of Sample Mud Tub			
LOCATION: COMMERCIAL STREET AT DEAD END INTO L.A. RIVER	Run @ Min. Temp. 6.8 @ 70 °F			
	Run @ Min. Temp. 6.9 @ 70 °F			
	Run @ Min. Temp. 6.0 @ 70 °F			
	Source: Run @ Run			
	Run @ BIT			
Section Township Range	Corection Stopped 1730			
Permit Date: G.L.	Logger on Bottom 1550			
Log Measured From G.L.	Max. Run Temp. °F			
Drilling Measured From G.L.	Recorded By: MANZAGOL			

Remarks: LINE SPEED 35 FT/MIN



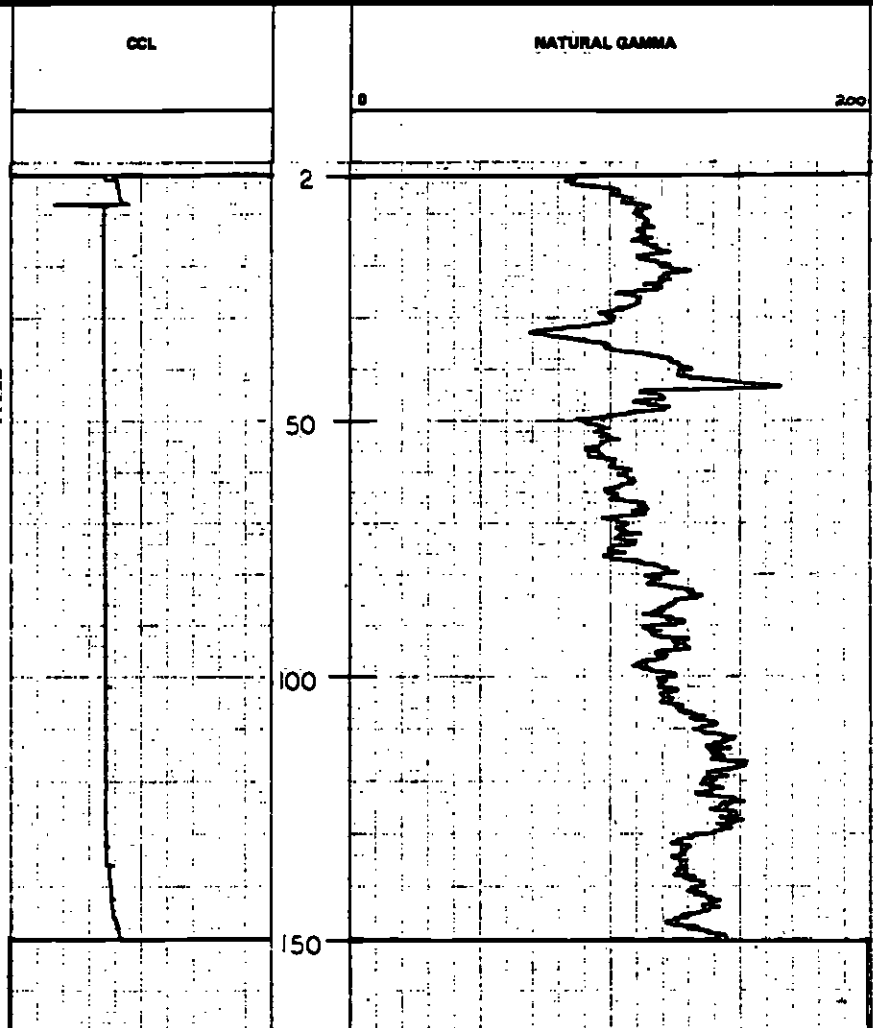


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/1/91			
PROJ. NO. 2191-25	Run No. 1			
WELL: 3	Depth-Driller 150			
FIELD:	Depth-Logger 151			
COUNTY: LOS ANGELES	Blm. Log Interval 150			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: SP-RES, CALIPER, DENSITY, NEUTRON	Casing-Driller 5' 4"			
NEUTRON	Casing-Logger 5' 4"			
COMMERCIAL STREET AT DEAD	Bit Size 4 3/4"			
END INTO L.A. RIVER	Type Fluid in Hole XENTONITE			
	Conn. Visc.			
	pH Field Log 9			
	Source of Sample Mud Tub			
	Run @ Mean Temp. 6.8 @ 70 °F			
	Run @ Mean Temp. 6.9 @ 70 °F			
	Run @ Mean Temp. 6.0 @ 70 °F			
	Run @ SHT			
	Circulation Stopped 1430			
	Logger on Bottom 1500			
	Max. Res. Temp.			
	Recorded By MANZAGOL			

Remarks: LINE SPEED 20 FT/MIN



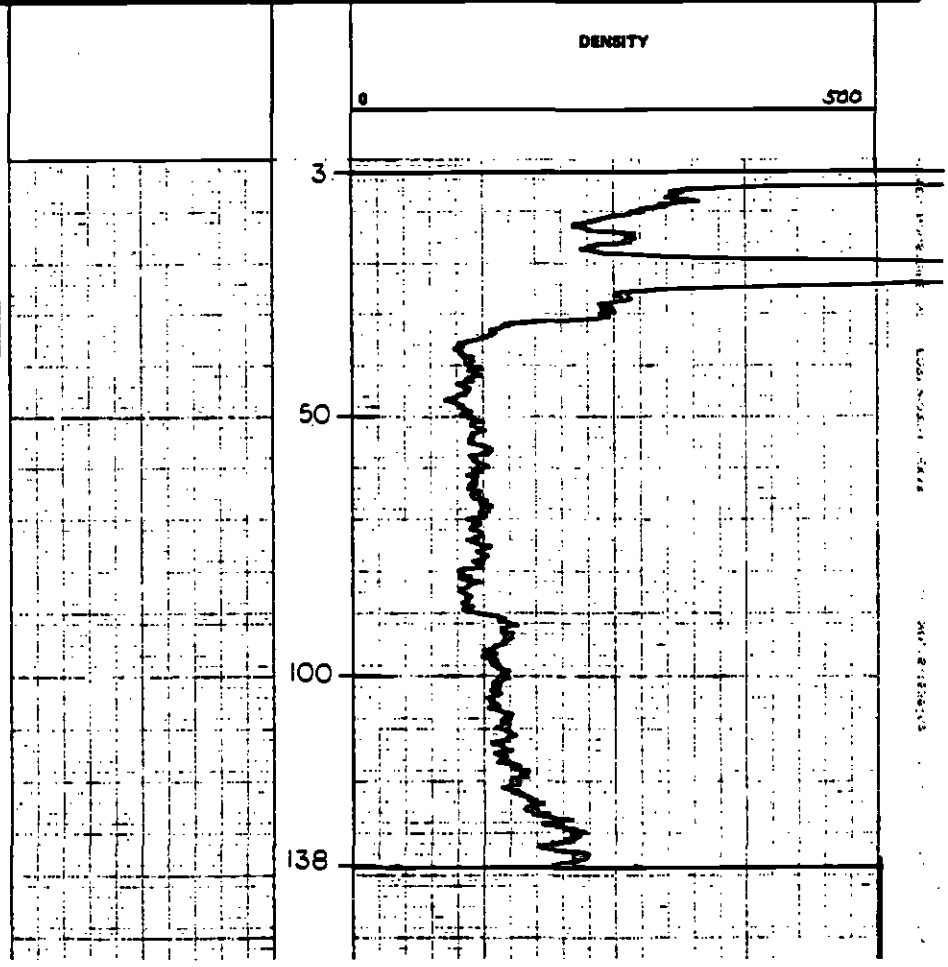


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DENSITY LOG

CLIENT: SCRTD	Date: 3/10/81
PROJ. NO. 2191-25	Run No. TWO
WELL: 3	Depth-Driller 150'
FIELD:	Depth-Logger 139'
COUNTY: LOS ANGELES	Stem Log Interval 138'
STATE: CALIFORNIA	Top Log Interval 3
Other Services: S.P., RES., GAMMA, C.C.L., CALIPER, NEUTRON	Casing-Driller 2" ABS @ 150'
	Casing-Logger 2" ABS @ 150'
	Bit Size 4 3/8"
	Type Fluid in Hole FRESH H ₂ O
	Dens. Vis.
	pH Field Log
	Source of Sample NONE
	Run @ Min. Temp.
	Run @ Max. Temp.
	Run @ Min. Temp.
	Run @ Max. Temp.
	Reason: Run / Run
	Run @ BWT
	Circulation Stopped 2/2/81
	Logger on Bottom 3/10/81
	Max. Res. Temp.
	Recorded By MANBAGOL
Location: COMMERCIAL ST. AT DEAD END INTO L.A. RIVER	
Section Township Range	
Permanent Datum: G.L. ELEVATION G.L. 281	
Log Measured From: G.L. D.P.	
Drilling Measured From: G.L. K.B.	

Remarks: LINE SPEED 15 FT/MIN. HOLE IS GRAVEL PACKED. WATER LEVEL IN CASING 33'
HOLE OBSTRUCTED AT 139 FT.



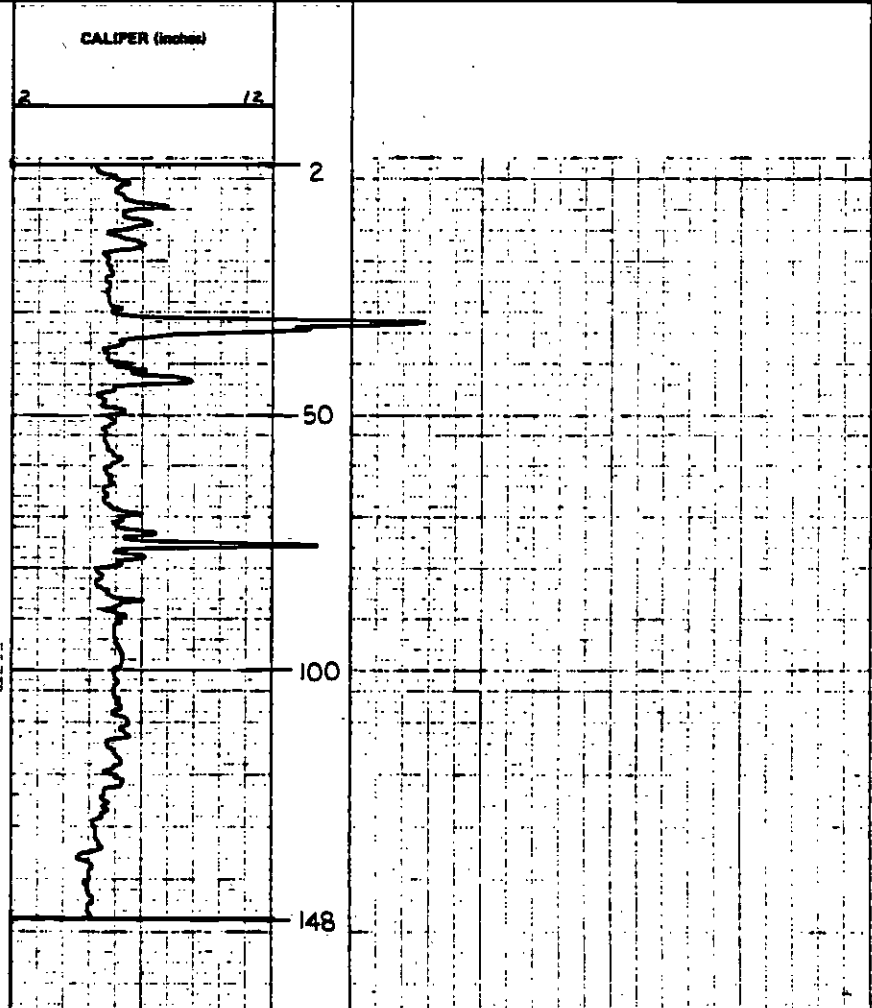


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CALIPER LOG

CLIENT: SCRTD	Date: 2/9/91			
PROJ. NO. 2191-25	Ram No. 11			
WELL: 3	Depth-Driller 150			
FIELD:	Depth-Logger 150			
COUNTY: LOS ANGELES	Stm. Log Interval 148			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: NATURAL GAMMA, CCL, SP-RES, DENSITY, NEUTRON	Casing-Driller 5" @ 4'			
LOCATION: COMMERCIAL STREET AT DEAD END INTO L.A. RIVER	Casing-Logger 5" @ 4'			
	Bit Size 4 7/8"			
	Type Fluid in Hole RENTONITE			
	Dens. Visc.			
	g/gl. Fluid Loss			
	g/gl. Field Loss			
	Source of Sample Mud Tub			
	Rm @ Max. Temp. 6.8 @ 70 °F			
	Rwd @ Max. Temp. 6.9 @ 70 °F			
	Rms @ Max. Temp. 6.0 @ 70 °F			
	Source: Rwd / Rms			
	Rm @ BHT			
	Chlorination Stopped 1430			
	Logger on Bottom 1615			
	Max. Res. Temp.			
	Recorded By MANZAGOL			

Remarks: **LINE SPEED 20 FT/MIN**



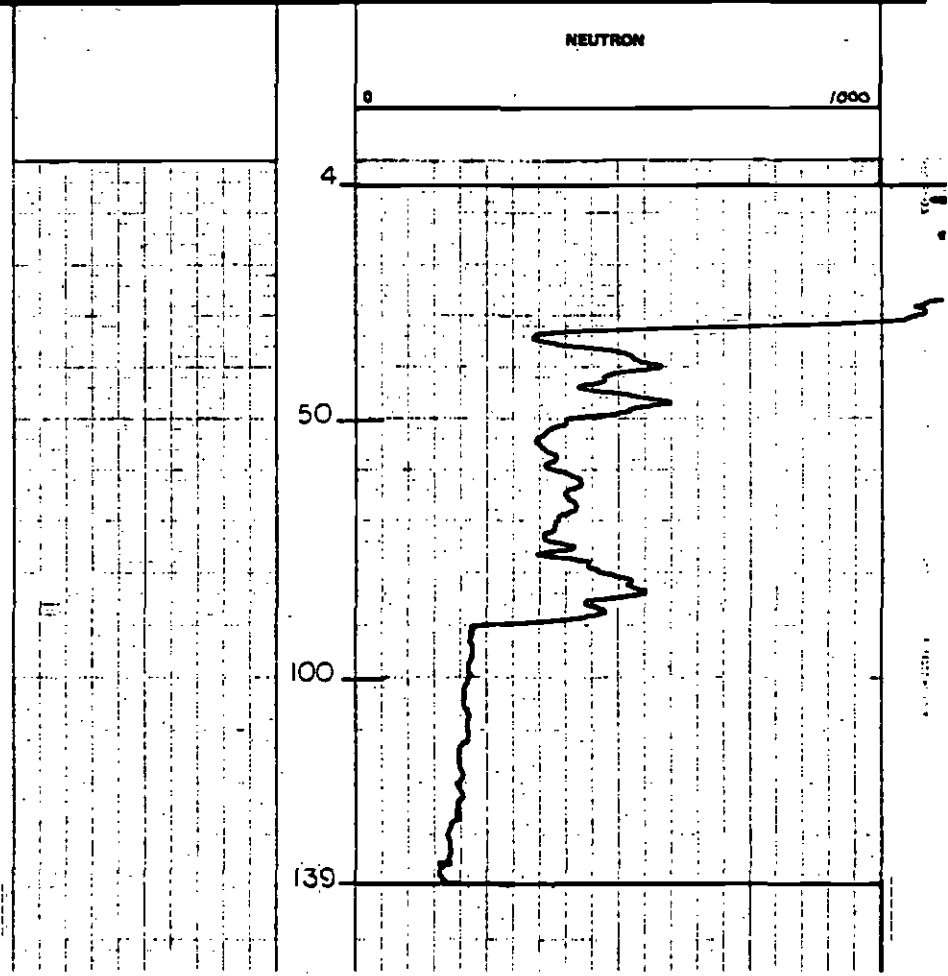


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NEUTRON LOG

CLIENT: SCRTD	Date: 3/10/81
PROJ. NO.: 2191-25	Run No.: TWO
WELL: 3	Depth-Driller: 150
FIELD:	Depth-Logger: 140
COUNTY: LOS ANGELES	Bot. Log Interval: 139
STATE: CALIFORNIA	Top Log Interval: 4
Other Services: S.P. RES, CALPER, GAMMA, CCL,	Casing-Driller: 2" ABS @ 150'
DENSITY	Casing-Logger: 2" ABS @ 150'
LOCATION: COMMERCIAL STREET AT DEAD END WTS	Bit Size: 4 3/4"
L.A. RIVER	Type Fluid in Hole: FRESH H ₂ O
Section:	Temp.: <input type="checkbox"/> Vis.: <input type="checkbox"/>
Township:	pH: <input type="checkbox"/> Field Log: <input type="checkbox"/> ml <input type="checkbox"/> ml <input type="checkbox"/>
Range:	Source of Sample: NONE
Permanent Datum: G.L.	Run @ Min. Temp.: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Log Measured From: G.L.	Run @ Max. Temp.: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Drilling Measured From: G.L.	Run @ Min. Temp.: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
ELEVATION: G.L. 281	Source: Run / Run: <input type="checkbox"/> <input type="checkbox"/>
D.F.:	Run @ DWT: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
K.B.:	Circulation Stopped: 2/1/81
	Logger on Bottom: 3/10/81
	Max. Run. Temp.: <input type="checkbox"/> <input type="checkbox"/>
	Recorded By: MANEAL

Remarks: LINE SPEED 15"/MIN., HOLE GRAVEL PACKED, WATER LEVEL IN CASING 33'
HOLE OBSTRUCTED AT 140 FT.



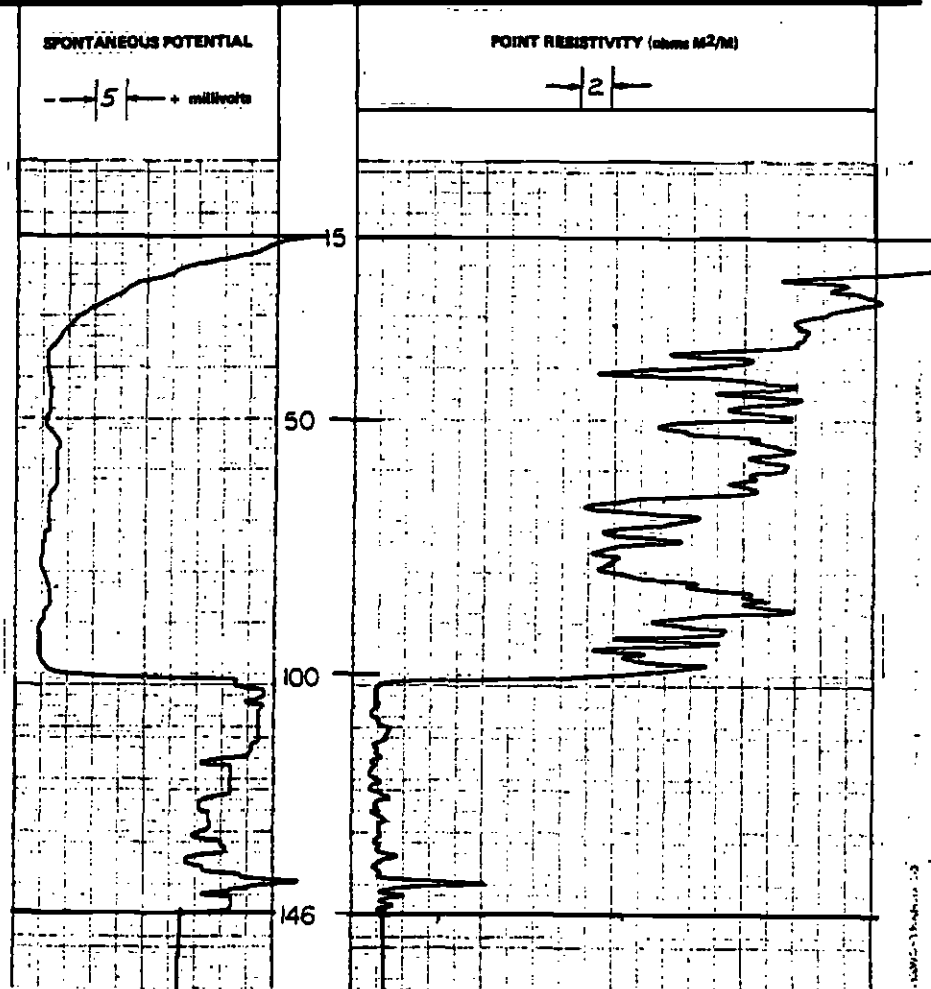


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/11/81				
PROJ. NO.: 2191-25	Run No.: 1				
WELL: 4	Depth-Driller: 150				
FIELD:	Depth-Logger: 147				
COUNTY: LOS ANGELES	Iron Log Interval: 116				
STATE: CALIFORNIA	Top Log Interval: 15				
Other Services: NATURAL GAMMA, CCL, CALIPER, DENSITY, NEUTRON	Casing-Driller: 5" @ 4'				
	Casing-Logger: 5" @ 4'				
	Bit Size: 4 3/4"				
	Type Fluid in Hole: BENTONITE				
	Dens.:	Vis.:			
	pH:	Field Log:			
	Source of Sample				
	Run @ Min. Temp.:				
	Run @ Min. Temp.:				
	Run @ Min. Temp.:				
	Source: Run / Run				
	Run @ GHT:				
	Circulation Stopped:	1030			
	Logger on Bottom:	1330			
	Max. Res. Temp.:				
	Recorded By:	MANZABOL			
Section:	Township:	Range:			
Permanent Datum: G.L.	ELEVATION: G.L. 279				
Log Measured From: G.L.	ELEVATION: G.P.				
Drilling Measured From: G.L.	ELEVATION: K.B.				

Remarks: LINE SPEED 35 FT/MIN



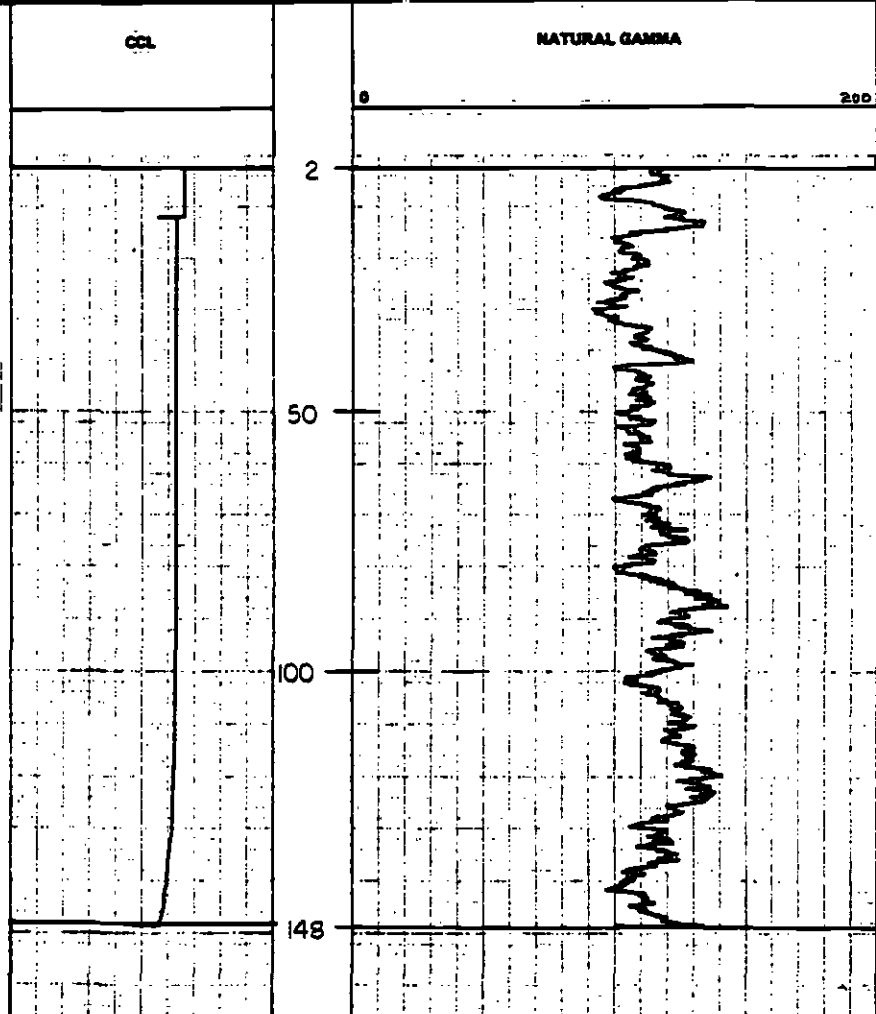


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD.	Date: 2/11/91			
PROJ. NO. 2191-25	Run No. 1			
WELL: 4	Depth-Driller 150			
FIELD:	Depth-Logger 149			
COUNTY: LOS ANGELES	Stm. Log Interval 148			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: SP-RES, CALIPER, DENSITY, NEUTRON	Casing-Driller 5" x 4'			
LOCATION: RAMIREZ STREET ~200' EAST OF CENTER STREET	Casing-Logger 5" x 4'			
	BH Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Dens. Vis.			
	pH Field Log			
	Source of Sample			
	Run @ Meas. Temp.			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Source: Run Rate			
	Run @ BHT			
	Circulation Stopped 1030			
	Logger on Surface 1305			
	Max. Run Temp.			
	Recorded By MANZAAGL			
Permanent Datum: G.L.	ELEVATION G.L. 279			
Log Measured From: G.L.	D.P.			
Drilling Measured From: G.L.	K.L.			

Remarks: LINE SPEED 20 FT/MIN; CCL READS 3' HIGHER THAN DEPTH INDICATED



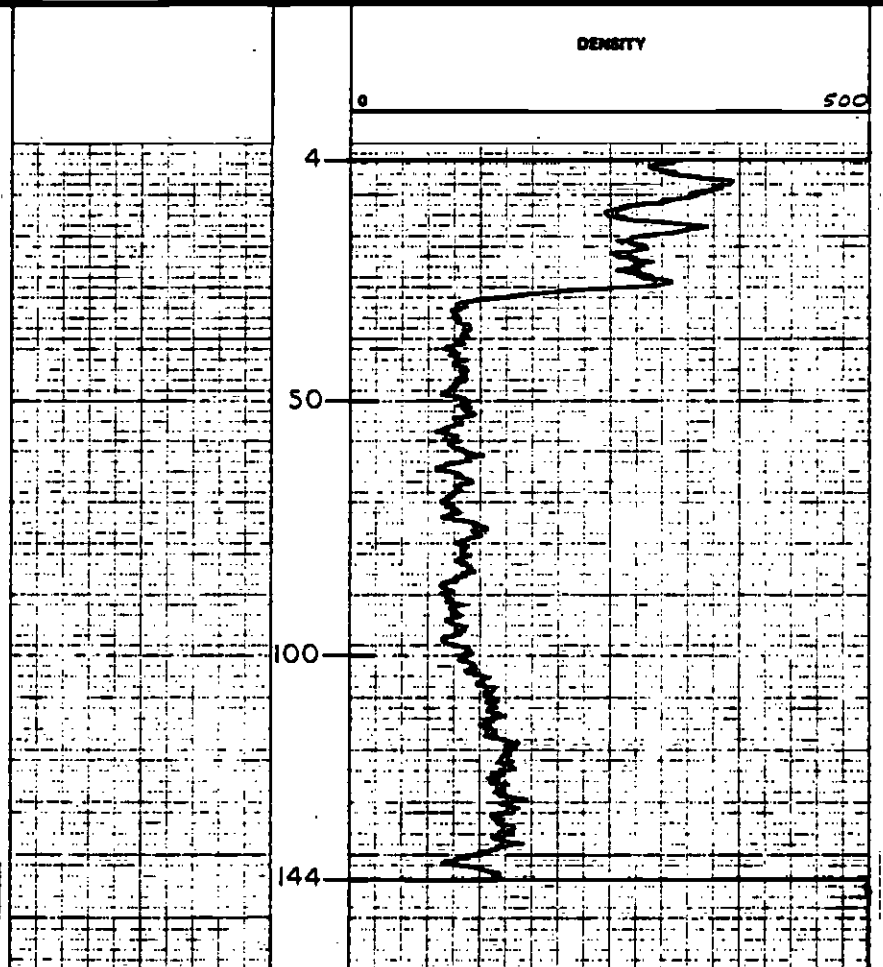


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DENSITY LOG

CLIENT: SCRTD	Date	3/12/81		
PROJ. NO. 2M1-25	Run No.	720		
WELL: 4	Depth-Orbiter	150		
	Depth-Logger	145		
FIELD:	Stm. Log Interval	144		
	Top Log Interval	4		
COUNTY: LOS ANGELES	Casing-Orbiter	2" ABS @ 150'		
STATE: CALIFORNIA	Casing-Logger	2" ABS @ 150'		
	Bit Size	4 7/8"		
Other Services: S.P., RES, CALIFER, GAMMA,	Type Fluid in Hole	FRESH H₂O		
METHOD	Dens.	Vis.		
	pH	Field Log	ml	ml
LOCATION: RAMIREZ STREET ~200' EAST OF CENTER STREET	Source of Sample	NONE		
	Run @ Min. Temp.	°F	°F	°F
	Run @ Max. Temp.	°F	°F	°F
	Run @ Min. Temp.	°F	°F	°F
	Run @ Max. Temp.	°F	°F	°F
Section	Township	Range	Sec	Range
Permeant Details: G.L.	ELEVATION	GL 279	Circulation Stopped	2/12/81
Log Measured From: G.L.		D.F.	Logger on Bottom	3/12/81
Drilling Measured From: G.L.		K.R.	Max. Res. Temp.	°F
			Recorded By	MWLABOL

Remarks: **LINE SPEED 15^FMM., HOLE IS GRAVEL PACKED, WATER LEVEL IN HOLE 30'**



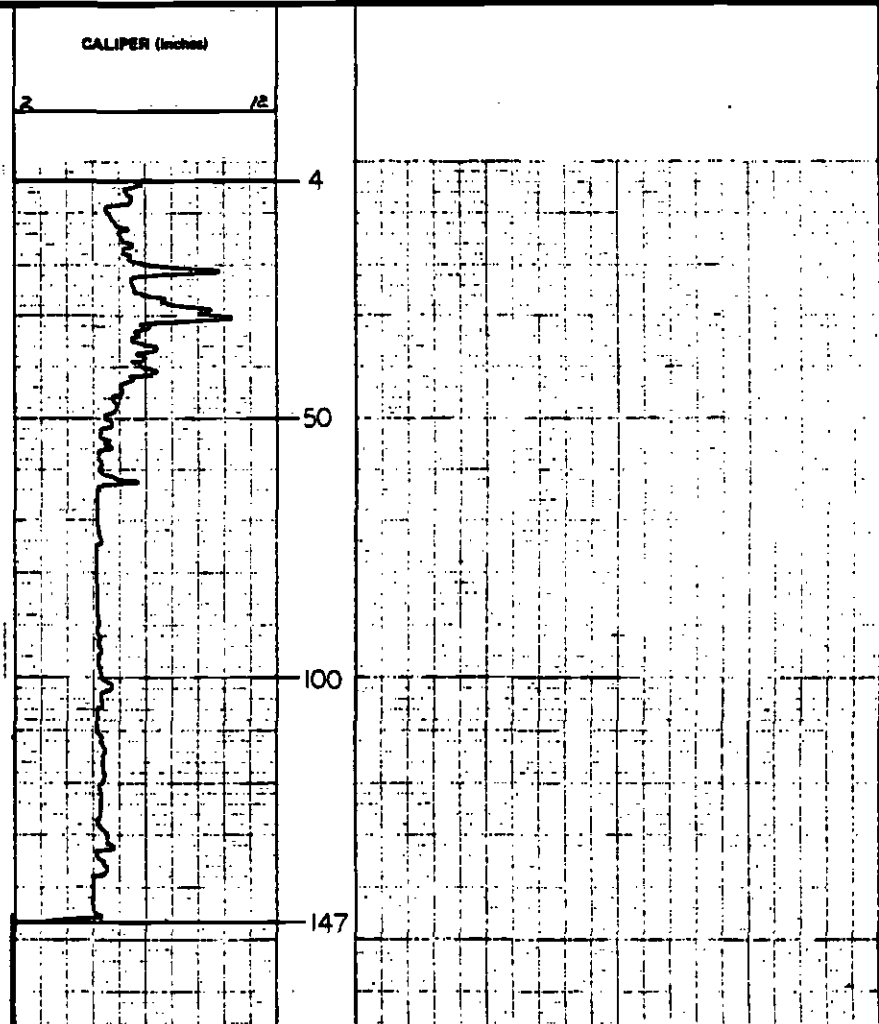


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CALIPER LOG

CLIENT: SCRTD	Date: 2/4/81		
PROJ. NO. 2191-25	Run No. 1		
WELL: 4	Depth-Driller 150		
FIELD:	Depth-Logger 149		
COUNTY: LOS ANGELES	Stm. Log Interval 147		
STATE: CALIFORNIA	Top Log Interval 4		
Other Services: NATURAL GAMMA, CAL.	Casing-Driller 5" o.d.		
SP-RAS, DENSITY, NEUTRON	Casing-Logger 5" o.d.		
LOCATION: RAMIREZ STREET - 200' EAST OF CENTER STREET	Bit Size 4 7/8"		
Section Township Range	Type Fluid in Hole BENTONITE		
Permanent Datum: G.L.	Dist. Vis.		
Log Measured From: G.L.	pH Field Log		
Drilling Measured From: G.L.	Source of Sample		
	Rm @ Mast. Temp.		
	Rmf @ Mast. Temp.		
	Rms @ Mast. Temp.		
	Source: Rmf Rate		
	Rm @ BHT		
	Circulation Stopped	1030	
	Logger on Bottom	1230	
	Max. Res. Temp.		
	Recorded By	MANZASOL	

Remarks: LINE SPEED 20 FT/MIN



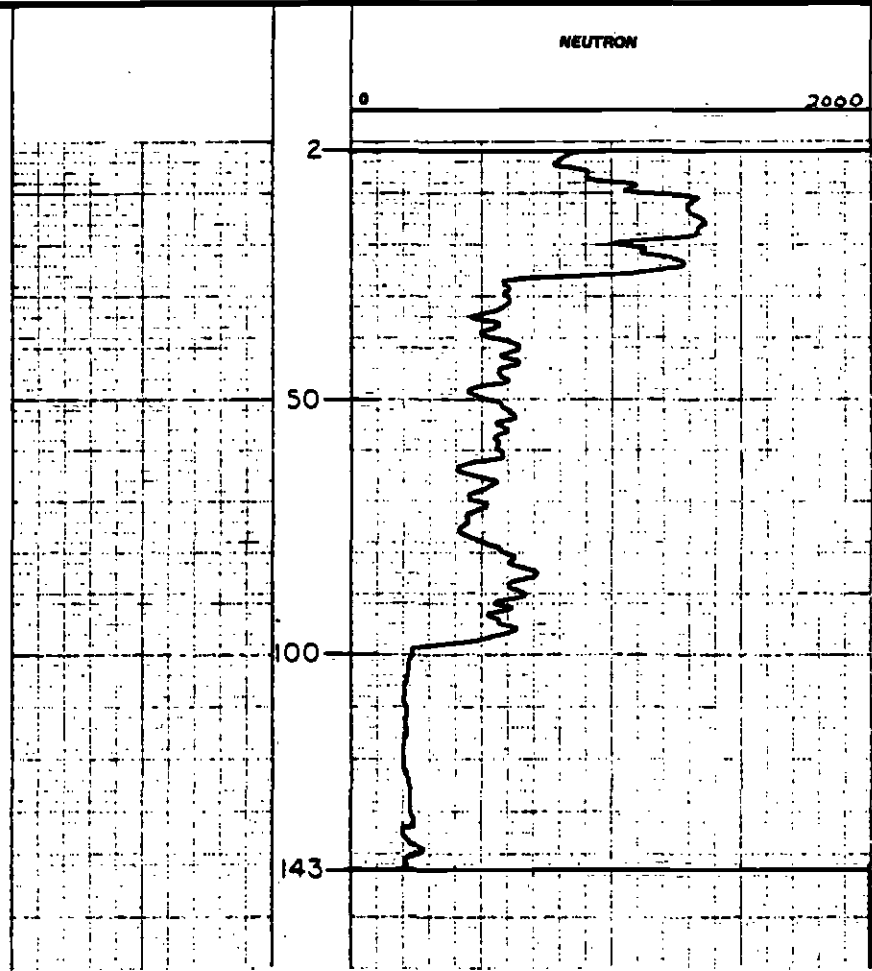


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NEUTRON LOG

CLIENT: <i>SCRTD</i>	Date	<i>7/10/81</i>	
PROJ. NO. <i>2191-25</i>	Run No.	<i>TWO</i>	
WELL: <i>4</i>	Depth-Order	<i>150</i>	
FIELD:	Depth-Logger	<i>144</i>	
COUNTY: <i>LOS ANGELES</i>	Shot Log Interval	<i>140</i>	
STATE: <i>CALIFORNIA</i>	Top Log Interval	<i>2</i>	
Other Services: <i>S.P., RES., GAMMA, CALIPER</i>	Casing-Driller	<input checked="" type="checkbox"/>	<i>2" ABS @ 150'</i>
DENSITY	Casing-Logger	<input checked="" type="checkbox"/>	<i>2" ABS 150'</i>
LOCATION: <i>RANIKER STREET - 200' EAST OF CENTER STREET</i>	Bit Size	<i>4 1/2"</i>	
Section	Type Fluid in Hole	<i>FRESH H₂O</i>	
Yearable	Down	Van	
Range	PH	Fluid Loss	ml
Permeability Domain: <i>G.L.</i>	Source of Sample	<i>WAVE</i>	
Log Measured From: <i>G.L.</i>	Run @ Max. Temp.	<input checked="" type="checkbox"/>	<i>0</i>
Drilling Measured From: <i>G.L.</i>	Run @ Max. Temp.	<input checked="" type="checkbox"/>	<i>0</i>
ELEVATION	Run @ Max. Temp.	<input checked="" type="checkbox"/>	<i>0</i>
<i>279</i>	Source: Rad		
<i>D.F.</i>	Run @ BHT	<input checked="" type="checkbox"/>	<i>0</i>
<i>K.S.</i>	Run @ BHT	<input checked="" type="checkbox"/>	<i>0</i>
	Circulation Stopped		<i>3/11/81</i>
	Logger on Bottom		<i>3/10/81</i>
	Max. Res. Temp.	<input checked="" type="checkbox"/>	<i>0</i>
	Recorded By	<i>MANAGER</i>	

Remarks: *LINE SPEED 1577 MIN., HOLE IS GRAVEL PACKED, WATER LEVEL IN HOLE 30'*



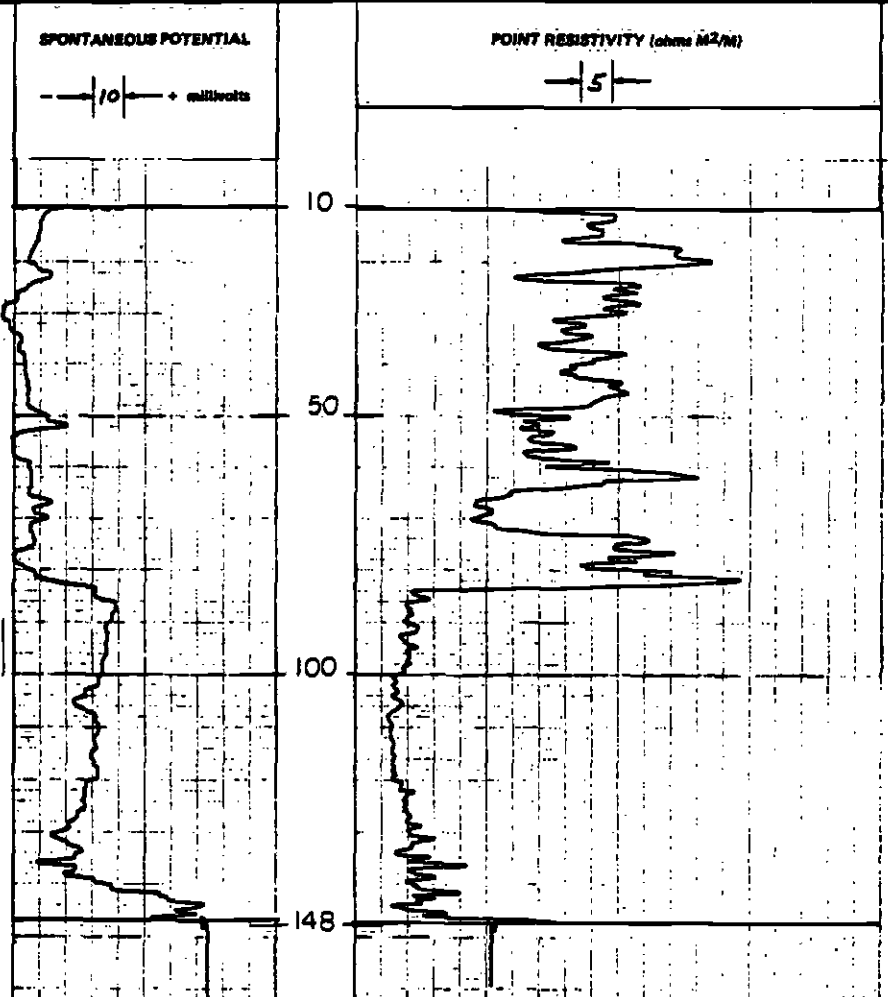


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SP-RESISTIVITY LOG

CLIENT: SCRTD		Date	1/4/81	
PROJ. NO. 2191-25		Run No.	ONE	
WELL: 5		Depth-Oriller	150	
FIELD:		Depth-Logger	149	
COUNTY: LOS ANGELES		Bot. Log Interval	148	
STATE: CALIFORNIA		Top Log Interval	10	
Other Services: LAMMA, CLL, CALIPER, NEUTRAN		Casing-Oriller	— 0	
LOCATION: INTERSECTION OF VIGNES AND RAMIREZ STREETS		Casing-Logger	—	
ELEVATION:		Bit Size	6 7/8 TO 52. 4 1/2" TO 507 TO 49	
Snapshots		Type Fluid in Hole	BENTONITE	
Permanent Datum: 6.L.		Down	Up	
Log Measured From: 6.L.		pH	Field Loss	B ml ml ml
Drilling Measured From: 6.L.		Source of Sample	MUD TUB	
ELEVATION: GL 280		Res @ Meas. Temp.	10 @ 65 °F	
ELEVATION: D.P.		Res @ Meas. Temp.	10 @ 65 °F	
ELEVATION: K.B.		Res @ Meas. Temp.	9.9 @ 63 °F	
		Spacer: Resol Rate		
		Res @ BMT		
		Conduction Stopper	200	
		Logger on Bottom	1100	
		Max. Res. Temp.	°F °F °F	
		Recorded by	MAUBALOL	

Remarks: **LINE SPEED 35"/MIN.**



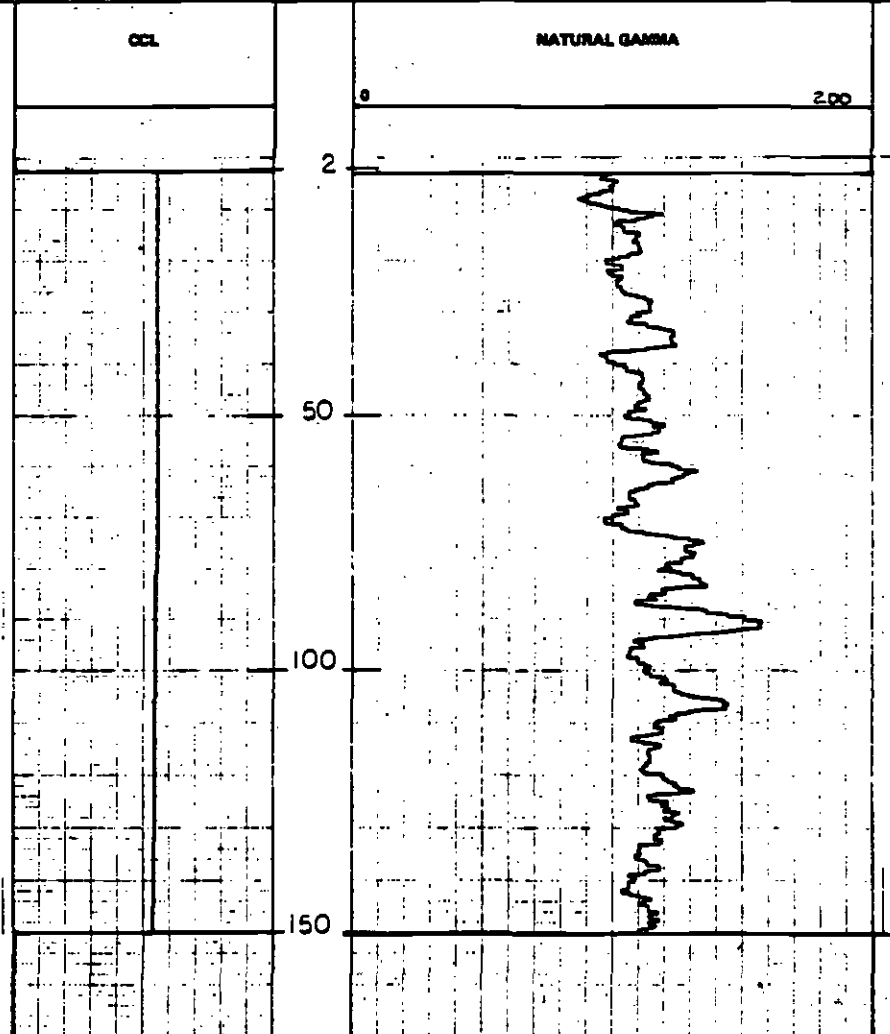


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/4/81			
PROJ. NO. 2191-25	Run No. ONE			
WELL: 5	Depth-Driller 150			
FIELD:	Depth-Logger 151			
COUNTY: LOS ANGELES	Des. Log Interval 150			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: S.P., RES., CALPER,	Casing-Driller ---	0	0	0
NEUTRON	Casing-Logger ---			
INTERSECTION OF VILLES AND RAPIER STREETS	Bit Size 4 1/4 TO 5 1/2	5 1/2	ON 4 1/4"	
	Type Fluid in Hole BENTONITE			
	Dens. Visc.			
	pH Field Log 8	ml	ml	ml
	Source of Sample MUD TUB			
	Run @ Meas. Temp. 10 @ 65°F	0	0	0
	Reel @ Meas. Temp. 10 @ 65°F	0	0	0
	Run @ Meas. Temp. 9.9 @ 65°F	0	0	0
	Source: Reel / Run			
	Run @ 80°F	0	0	0
	Circulation Stopper 200			
	Logger on Bottom 750			
	Max. Res. Temp. 0	0	0	0
	Recorded By MANRAGOL			

Remarks: LINE SPEED 20 FT/MIN.



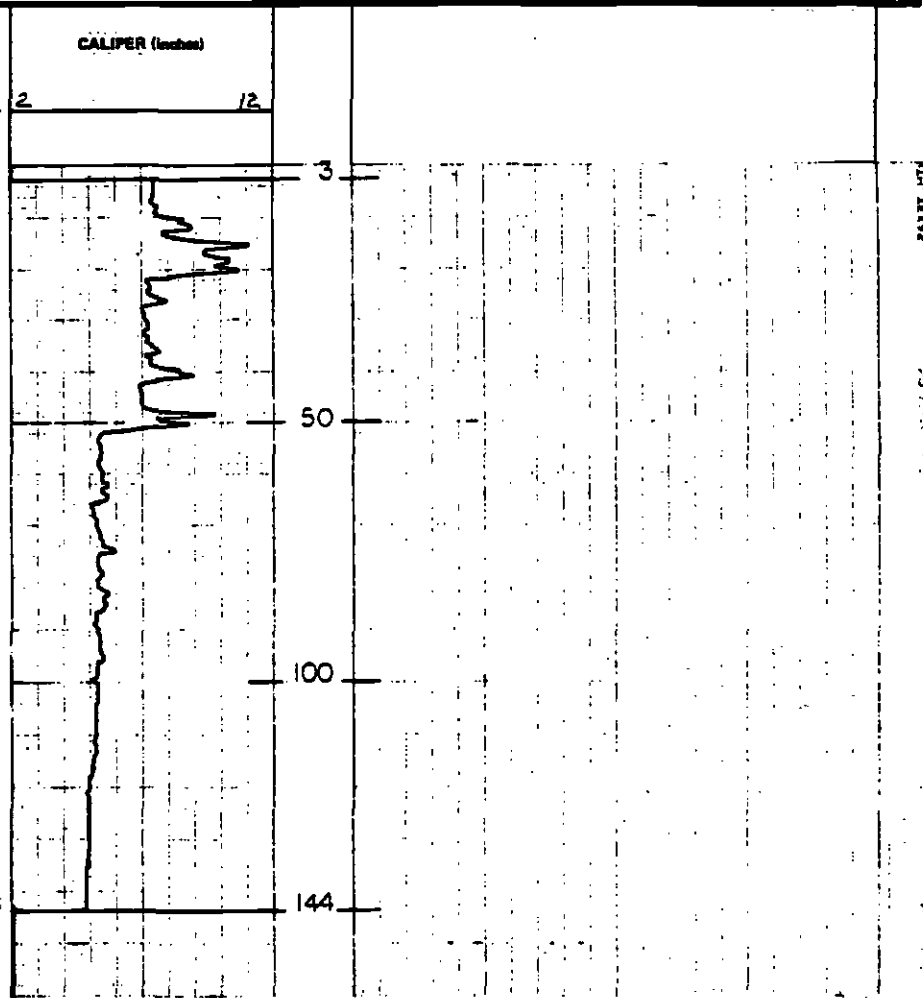


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CALIPER LOG

CLIENT: SCRTD	Date: 1/4/91		
PROJ. NO.: 2191-25	Run No.: ONE		
WELL: 5	Depth-Driller: 150		
FIELD:	Depth-Logger: 146		
COUNTY: LOS ANGELES	Stm. Log Interval: 144		
STATE: CALIFORNIA	Top Log Interval: 3		
Other Services: S.P., RES., GAMMA, CCL,	Casing-Driller: —	•	•
NEUTRON	Casing-Logger: —	•	•
LOCATION: INTERSECTION OF VIGNES AND RAMIREZ STREETS	Bit Size: 6 7/8" TO 52' 4 7/8" TO BOTTOM		
Section	Township	Range	
Permanent Datum: G.L.			
Log Measured From: G.L.			
Drilling Measured From: G.L.			
	ELEVATION		
	G.L. 280		
	D.P.		
	K.S.		
	Types Fluid in Hole: BENTONITE		
	Temp. Vis.		
	pH. Field Log: 8	ml	ml
	Source of Sample: MUD TUB		
	Run @ Max. Temp. 10 @ 65 °F	•	°F
	Run @ Max. Temp. 10 @ 65 °F	•	°F
	Run @ Max. Temp. 9.9 @ 65 °F	•	°F
	Run @ BMT	•	°F
	Circulation Stopped	800	
	Logger on Bottom:	1130	
	Max. Rec. Temp.	°F	°F
	Recorded By: MAURACOL		

Remarks: **"1/2" UP HOLE DRIFT FROM CALIPER TOOL, LINE SPEED 20 FPM.**



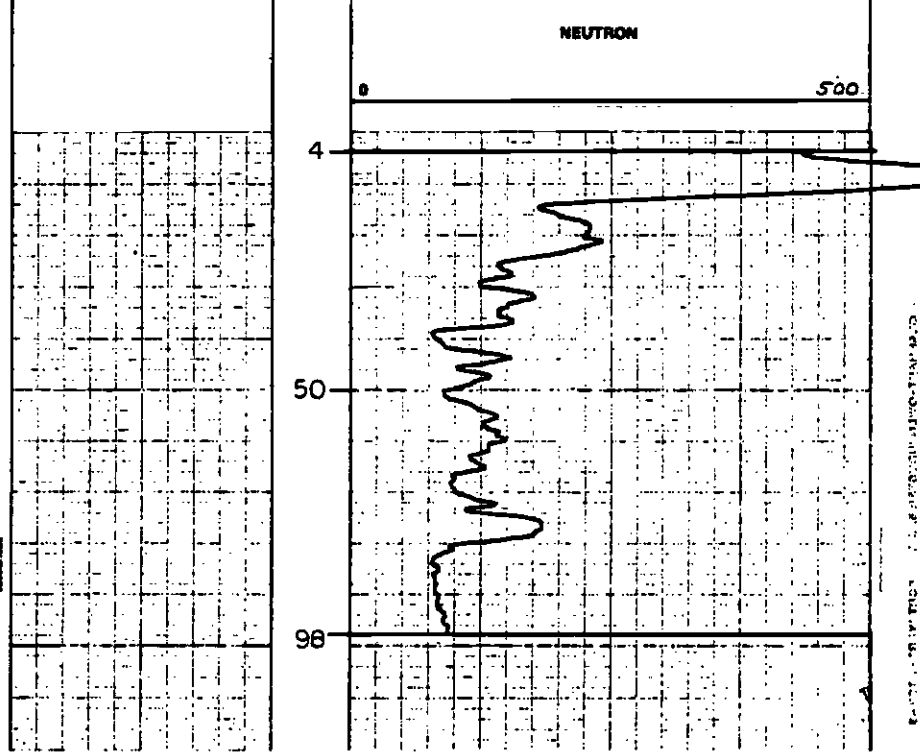


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NEUTRON LOG

CLIENT: SCRTD	Date	3/10/81
PROJ. NO. 2191-25	Run No.	TWO
WELL: S (PHONE HOLE A)	Depth-Driller	100
FIELD:	Depth-Logger	99
COUNTY: LOS ANGELES	Dist. Log Interval	.98
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES., GAMMA, CALIPER	Casing-Driller	3" P.C. @ 100'
	Casing-Logger	3" P.C. @ 100'
	Bit Size	4 1/4"
	Type Fluid in Hole	FRESH WATER
	Dens. Vis.	
	pH - Field Log	ml ml ml
	Source of Sample	NONE
	Run @ Min. Temp.	°F °F °F °F
	Run @ Max. Temp.	°F °F °F °F
	Run @ Min. Temp.	°F °F °F °F
	Severe: Run Run	
	Run @ BHT	°F °F °F °F
	Chatterbox Stopped	3/10/81
	Logger on Bottom	3/10/81
	Min. Res. Temp.	°F °F °F °F
	Recorded By	MAWRAGOL

Remarks: PHONE HOLE A WAS LOGGED, 3" P.C. GRouted IN PLACE, CASING FILLED WITH WATER TO SURFACE, LOG SPEED 15"/MIN.



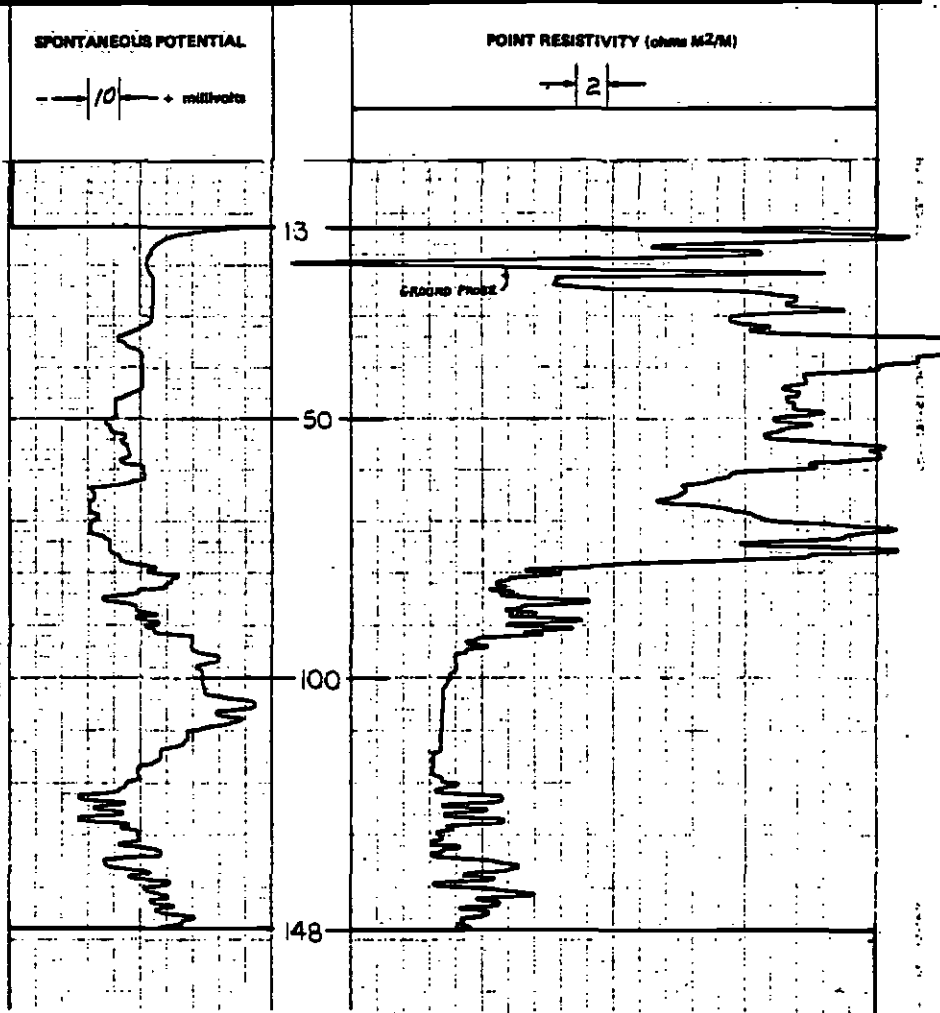


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/14/81			
PROJ. NO. 2191-25	Rim No. 1			
WELL: 6	Depth-Driller 150.2			
FIELD:	Depth-Logger 149.0			
COUNTY: LOS ANGELES	Stem Log Interval 148.0			
STATE: CALIFORNIA	Top Log Interval 13.0			
Other Services: NATURAL GAMMA CCL, CALIPER, DENSITY, NEUTRON	Casing-Driller 5" @ 13'			
LOCATION: RACY STREET EAST OF ALAMEDA STREET	Casing-Logger 5" @ 13'			
Section Township Range	Bit Size 4 7/8"			
Permanent Datum: G.L.	Type Fluid in Hole BENTONITE			
Log Measured From: G.L.	Dem. Vis.			
Drilling Measured From: G.L.	pH. Fluid Loss			
	Source of Sample MUD TUR			
	Rm @ Mem. Temp.			
	Rmf @ Mem. Temp.			
	Rms @ Mem. Temp.			
	Source: Rmf Rms			
	Rm @ DWT			
	Circulation Stopped			
	Logger on Bottom			
	Max. Res. Temp.			
	Recorded By GALLINATTI			

Remarks: LINE SPEED 30 FT/MIN



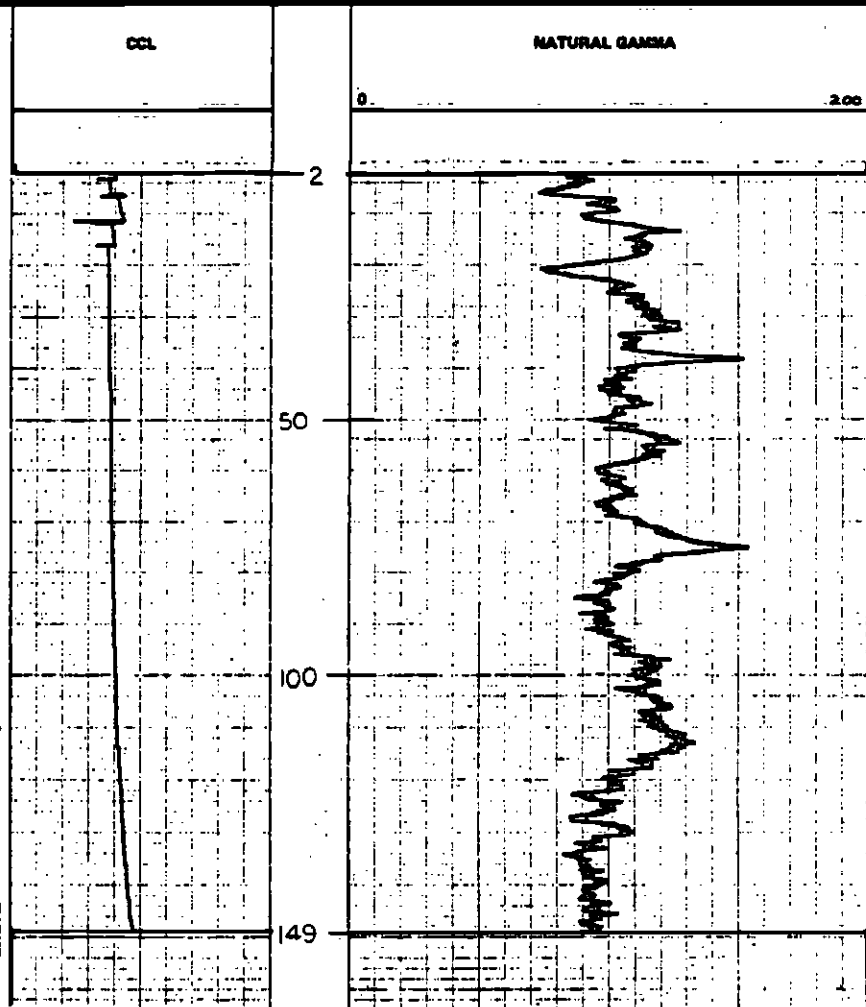


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/10/81			
PROJ. NO. 2191-25	Run No. 1			
WELL: 6	Depth-Oriller 150.2			
FIELD:	Depth-Logger 150.0			
COUNTY: LOS ANGELES	Stem Log Interval 149.0			
STATE: CALIFORNIA	Top Log Interval 2.0			
Other Services: SP-RES, CALIPER, DENSITY, NEUTRON	Casing-Oriller 5" @ 13'			
	Casing-Logger 5" @ 13'			
	Bit Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Date	Vis.		
	pH	Fluid Loss	ml	ml
	Source of Sample	AUD TUS		
LOCATION: MAGY STREET EAST OF ALAMEDA STREET	Run @ Mass. Temp.			
	Run @ Mass. Temp.			
	Run @ Mass. Temp.			
	Source: Rod Rate			
	Run @ BMT			
Permeant Contact: G.L.	Circulation Stopped	11:30		
Log Measured From: G.L.	Logger on Bottom	1:30		
Drilling Measured From: G.L.	Max. Res. Temp.			
	Recorded By: GALLINATI			

Remarks: LINE SPEED 15 FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED



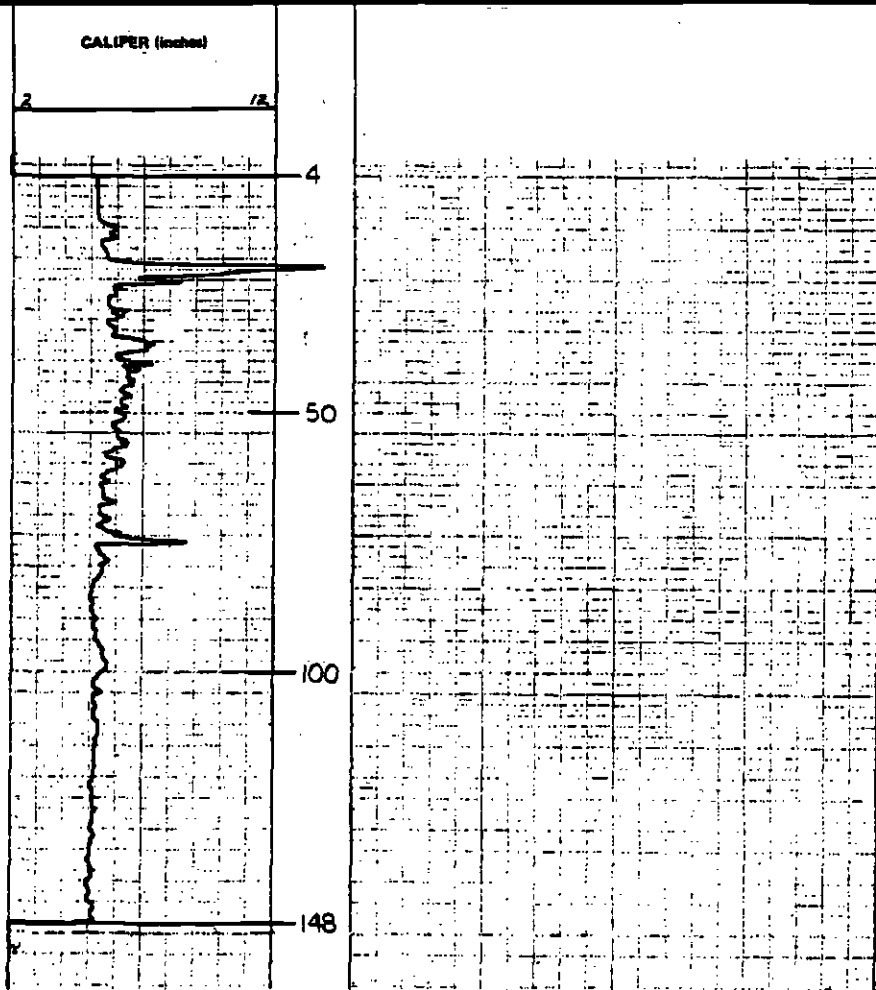


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CALIPER LOG

CLIENT: SCRTD	Date: 2/10/91			
PROJ. NO. 2191-25	Run No. 150.2			
WELL: 6	Depth-Driller 150.2			
FIELD:	Depth-Logger 148.2			
COUNTY: LOS ANGELES	Blk. Log Interval 148.2			
STATE: CALIFORNIA	Top Log Interval 4.0			
Other Services: NATURAL GAMMA, CCL, SP-RES DENSITY, NEUTRON	Casing-Driller 5" @ 13'			
LOCATION: MACY STREET EAST OF ALAMADA STREET	Casing-Logger 5" @ 13'			
	Bit Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Dist. Vis.			
	pH Field Log	ml	ml	ml
	Source of Sample	AUD TUB		
	Run @ Max. Temp.			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Run @ Min. Temp.			
	Run @ BHT			
	Run @ BHT			
Permanent Datum: G.L. 281	Circulation Started: 1130			
Log Measured From: G.L. D.F.	Logger on Bottom: 1230			
Drilling Measured From: G.L. K.S.	Max. Rec. Temp. 98			
	Recorded By: GALLINATTI			

Remarks: LINE SPEED 20 FT/MIN



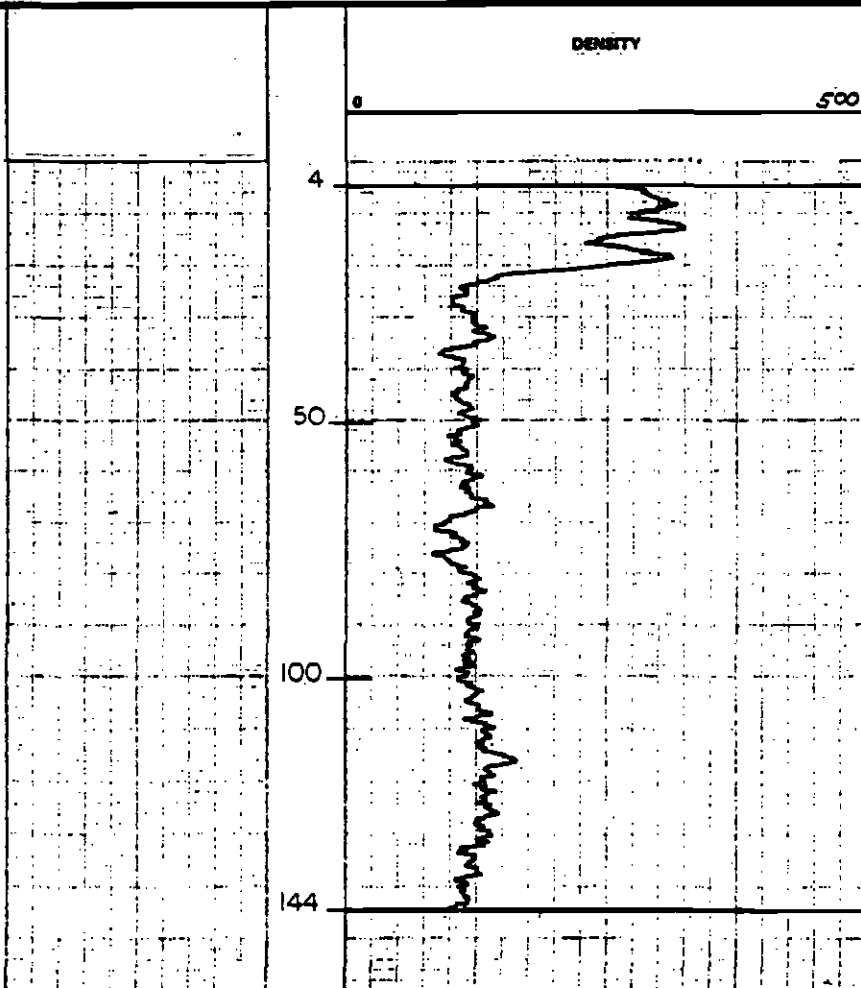


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DENSITY LOG

CLIENT: SCRTD	Date	3/7/81
PROJ. NO. 2191-25	Run No.	700
WELL: 6	Depth-Driller	150.0
FIELD:	Depth-Logger	145.0
COUNTY: LOS ANGELES	Sum. Log Interval	145.0
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES., CALIPER, GAMMA, GCL, NEUTRON	Casing-Driller	2" ADS @ 150'
LOCATION: ACRY. ST. EAST OF ALAMEDA ST.	Casing-Logger	2" ADS @ 150'
	Bit Size	4 7/8"
	Type Fluid in Hole	FRESH H ₂ O
	Down	Up
	pH	Field Log
	Source of Sample	NONE
	Run @ Min. Temp.	
	Run @ Max. Temp.	
	Run @ Min. Temp.	
	Run @ Max. Temp.	
	Run @ GWT	
	Circulation Stopped	2/12/81
	Logger on Bottom	3/7/81
	Max. Run. Temp.	
	Recorded By	MANEAGOL

Remarks: LINE SPEED 15 FT/MIN... HOLE IS GRAVEL PACKED. WATER LEVEL IN CASING AT 19.5 FT, HOLE OBSTRUCTED AT 145.0 FT.



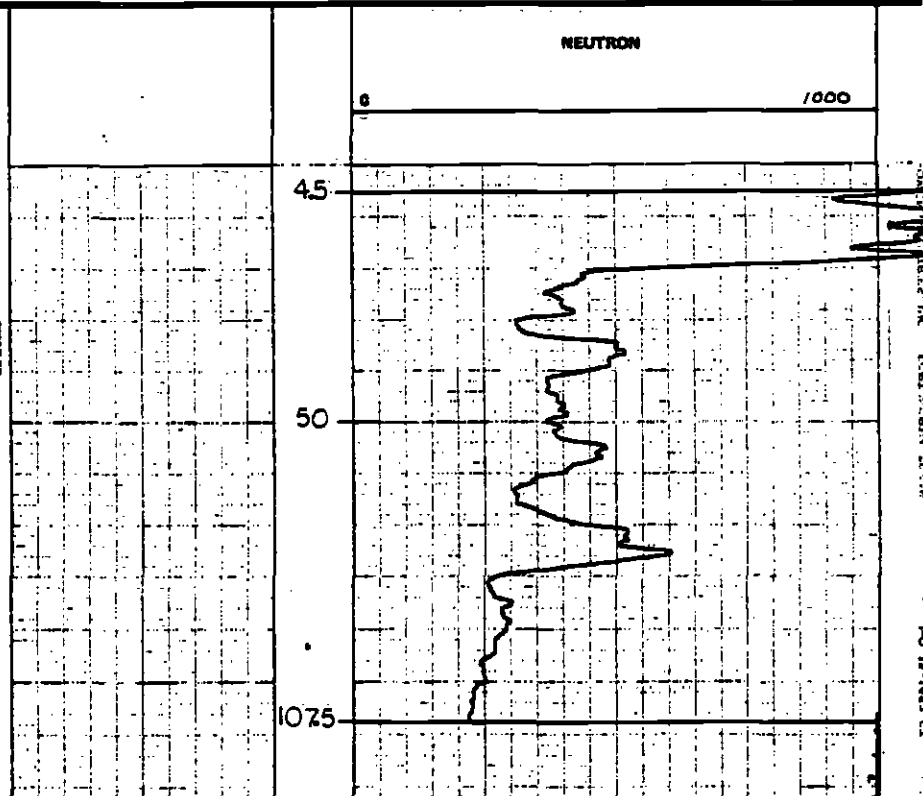


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NEUTRON LOG

CLIENT: SCR TD	Date	3/7/81	
PROJ. NO. 2191-25	Run No.	TWD	
WELL: 6	Depth-Offset	150.2	
FIELD:	Depth-Logger	100.5	
COUNTY: LOS ANGELES	Botm. Log Interval	107.5	
STATE: CALIFORNIA	Top Log Interval	4.5	
Other Services: S.P., RES., CALIPER, GAMMA, CCL, DENSITY	Casing-Offset	2" ABS @ 150'	
LOCATION: MAGT ST. EAST OF ALAMEDA ST.	Casing-Logger	2" ABS 150'	
	Bit Size	4 7/8"	
	Type Fluid in Hole	FRESH H₂O	
	Dem. Vis.		
	pH Field Log		
	Source of Sample	NONE	
	Run @ Minn. Temp.		
	Run @ Max. Temp.		
	Run @ Minn. Temp.		
	Run @ Max. Temp.		
	Resist. Read / Rate		
	Run @ BHT		
Permanent Downer: G.L.	Chatterton Stopper	2/10/81	
Log Measured From: G.L.	Logger on Section	3/7/81	
Drilling Measured From: G.L.	Max. Res. Temp.		
	Recorded By	MANEALOL	

Remarks: **LINE SPEED IS 7"/MIN., HOLE IS GRAVEL PACKED, WATER LEVEL IN CASING AT 19.5 FT. HOLE OBSTRUCTED AT 106.5 FT.**



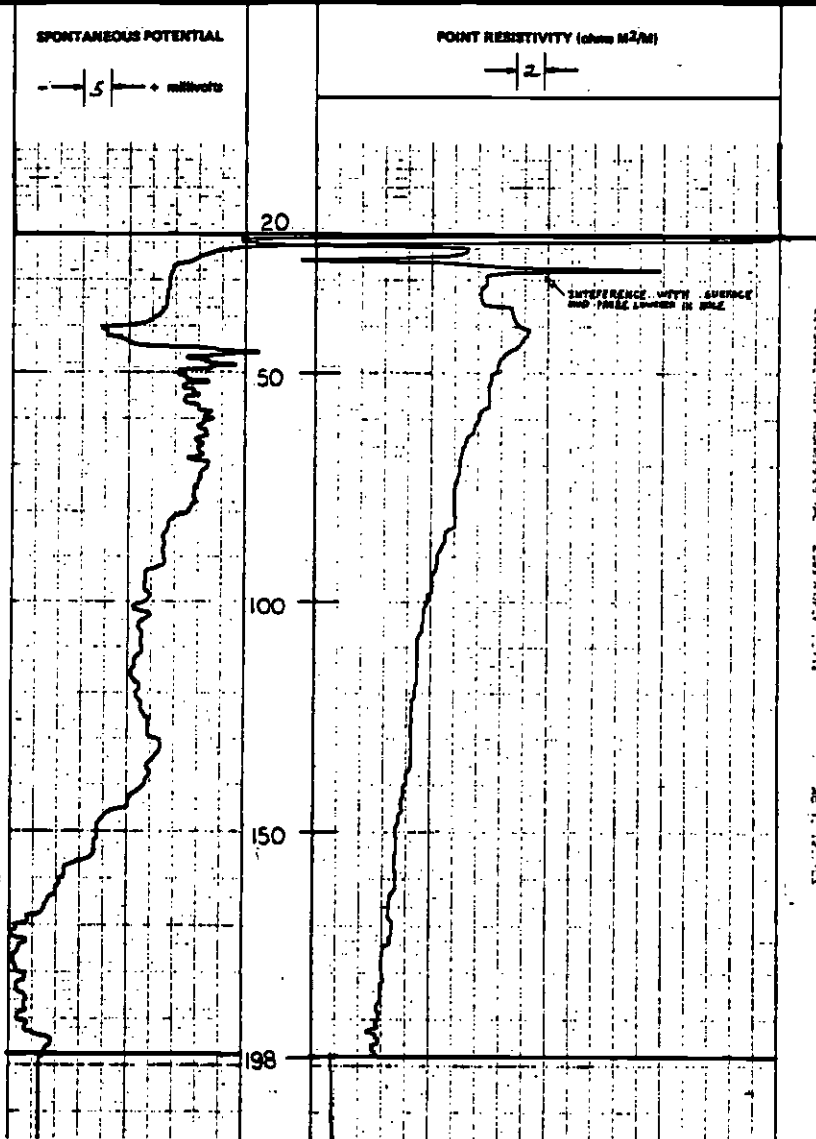


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 12/12/00		
PROJ. NO. 2191-25	Run No. 1		
WELL: 7	Depth-Offset: 200		
FIELD:	Depth-Logger: 199		
COUNTY: Los Angeles	Base Log Interval: 1.9%		
STATE: California	Top Log Interval: 2.1		
Other Services: Natural Gamma, Caliper, Neutron	Casing-Offset: 5' @ 24"		
	Casing-Logger: 5' @ 22"		
	Bit Size: 4 1/2"		
	Type Fluid in Hole: Barite		
	Down: Visc.		
	pH: Field Log: 8	ml	ml
	Source of Sample: Mud Tub		
	Run @ Min. Temp: 2.4 @ 63°F	0	0
	Run @ Min. Temp: 6.1 @ 63°F	0	0
	Run @ Min. Temp: 8.5 @ 63°F	0	0
	Source: Mud Base		
	Run @ BHT: 0	0	0
	Correction Applied: 1300		
	Logger on Surface: 1500		
	Min. Run Temp: 0	0	0
	Recorded By: HANZAGOL		
Permanence Datum: G.L.	G.L. 29'		
Log Measured From: G.L.	G.P.		
Drilling Measured From: G.L.	M.S.		

Remarks: Line Speed = 30 ft/rev



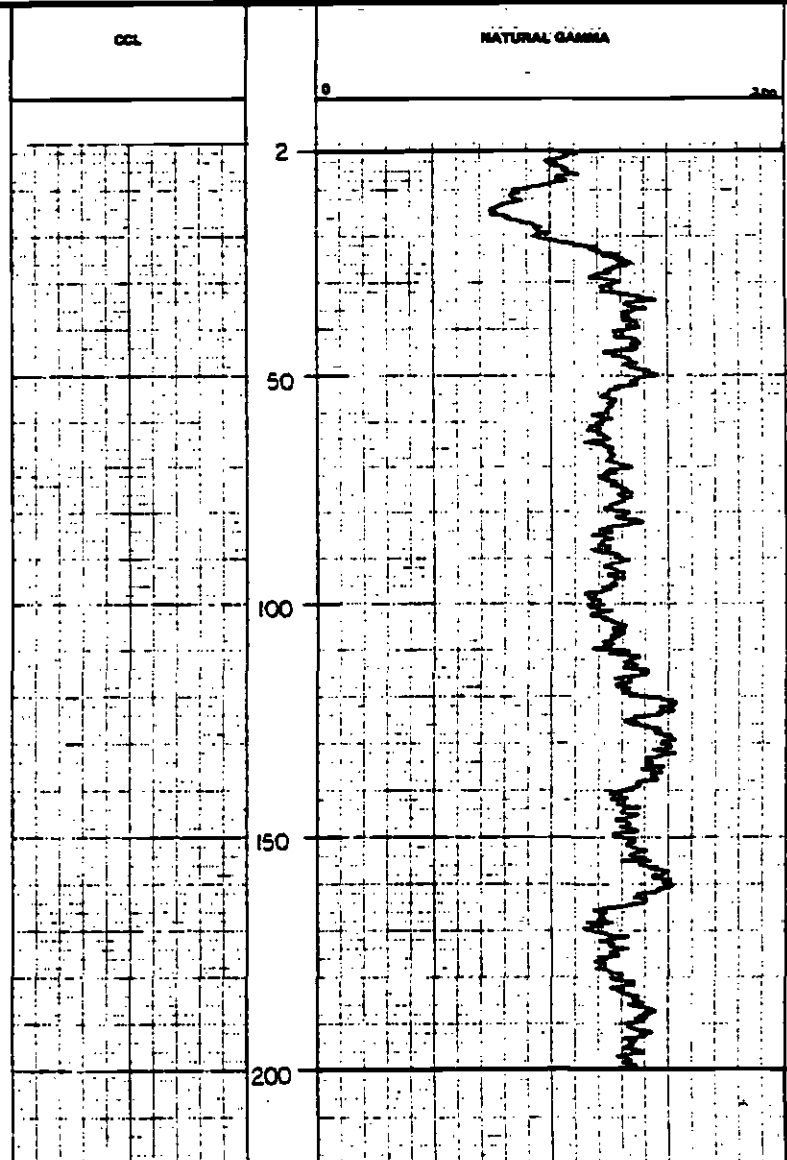


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CCL-GAMMA RAY
LOG

CLIENT: SCRFD	Date: 12/11/90		
PROJ. NO. 2491-25	Run No. 7		
WELL: 7	Depth-Offset 300		
FIELD:	Depth-Logger 201		
COUNTY: Los Angeles	Run Log Interval 300		
STATE: California	Top Log Interval 2		
Other Services: SP-Res, Caliper, Neutron	Caliper-Offset 5" @ 24		
	Caliper-Logger 5" @ 23		
	Bit Size 4 1/2"		
	Type Fluid in Hole Reaction		
	Temp. Vis.		
	pH Field Log. 8	mi	mi
	Source of Sample Hand Tube		
	Run @ Mass. Temp. 24 @ 63 °F		
	Run @ Mass. Temp. 6.1 @ 63 °F		
	Run @ Mass. Temp. 8.5 @ 63 °F		
	Source Run / Rate		
	Run @ BKT		
	Circulation Stopped 1300		
	Logger on Bottom 1400		
	Max. Run. Temp.		
	Recorded By: MYR/2206L		

Remarks: **Line Speed = 20 fpm**



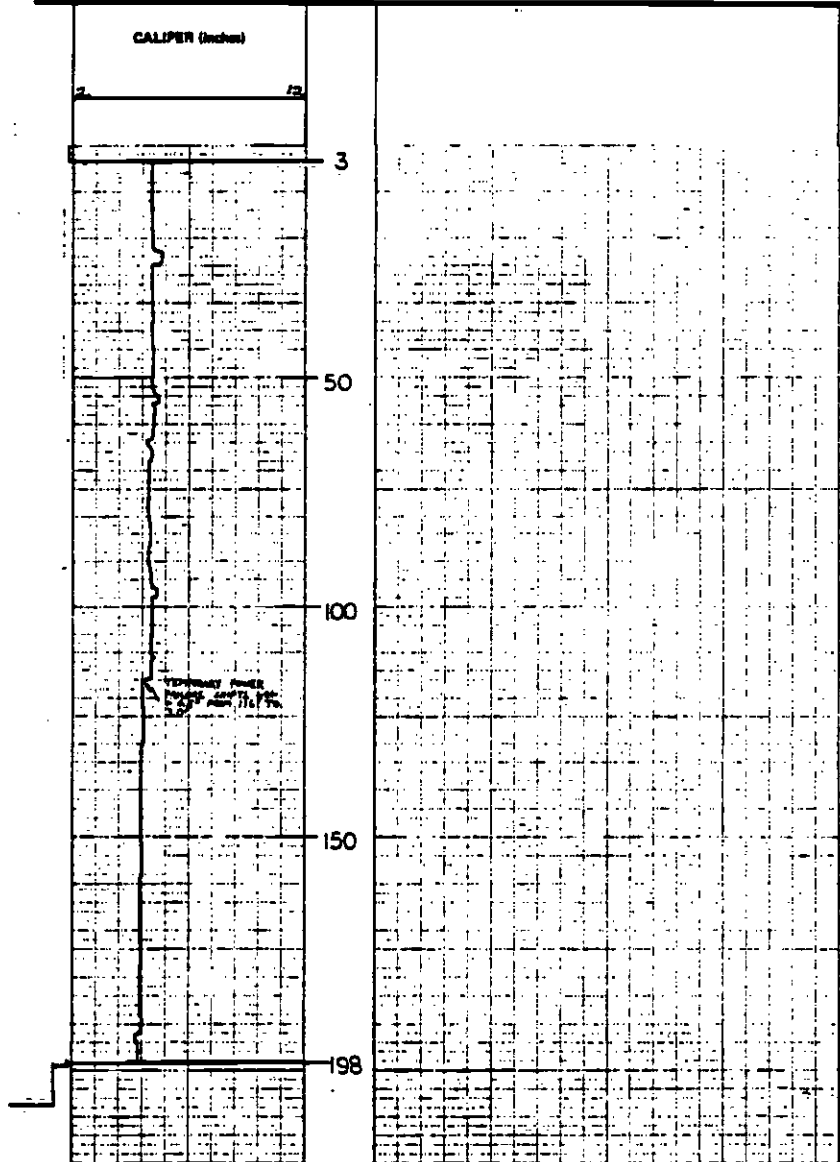


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CALIPER LOG

CLIENT: SCRTD	Date: 12/19/90			
PROJ. NO.: 2191-25	Run No.: 1			
WELL: 7	Depth-Driller: 200			
FIELD:	Depth-Logger: 200			
COUNTY: Los Angeles	Run Log Interval: 179			
STATE: California	Top Log Interval: 3			
Other Services: Natural Gamma SP-Res, Neutron	Chisel-Driller: 5" @ 24			
	Chisel-Logger: 5" @ 23			
	Bit Size: 7 7/8"			
	Type Fluid to Hole: Mud			
	Temp. Via:			
	pH Field Log: R of			
	Source of Sample: Mud/Tub			
	Run @ Min. Temp.: 2.4 @ 63 °F			
	Run @ Min. Temp.: 4.1 @ 63 °F			
	Run @ Min. Temp.: 8.5 @ 63 °F			
	Sealer: Rod / Run			
	Run @ GWT: 0 °F			
	Completion Strapped: 100			
	Logger on Bottom: 120			
	Max. Rec. Temp.: °F			
	Recorded By: MANNING			

Remarks: Line Speed = 20 fpm



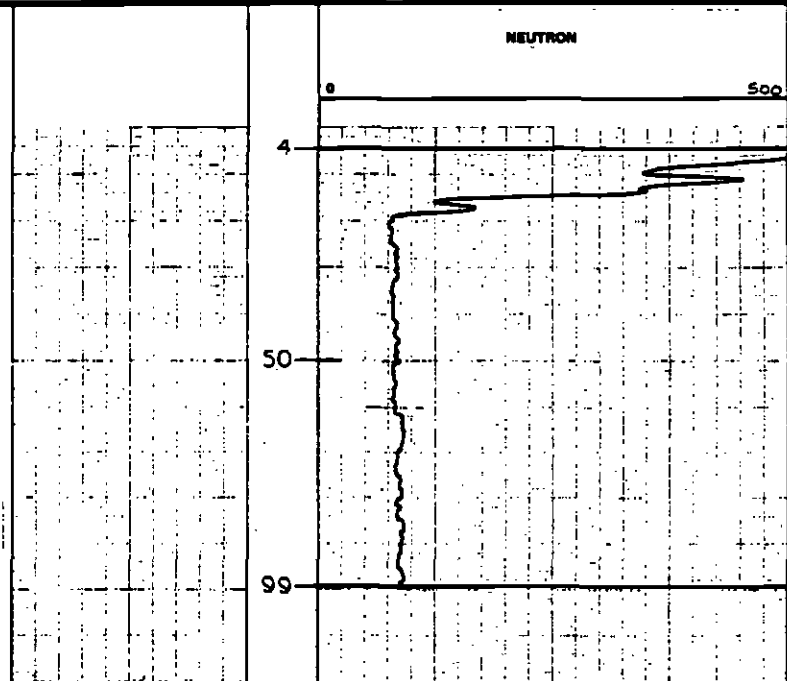


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NEUTRON LOG

CLIENT: SCATD	Date	3/7/81
PROJ. NO. 2191-25	Rate No.	TWO
WELL: 7 (PHONE HOLE A)	Depth-Offset	100
FIELD:	Depth-Logger	100
COUNTY: LOS ANGELES	Time Log Interval	99
STATE: CALIFORNIA	Type Log Interval	4
Other Services: SP-RGS NATURAL GAMMA	Casing-Offset	0
CCL CALIPER	Casing-Logger	3 PVC @ 100'
1ST STREET BETWEEN BROADWAY AND SPRING (CITY HALL)	Bit Size	4 1/2"
	Type Fluid in Hole	FRESH WATER
	Core	Yes
	pH	Field Log
	Source of Sample	NONE
	Run @ Min. Temp.	0 °F
	Run @ Max. Temp.	0 °F
	Run @ Min. Temp.	0 °F
	Run @ Max. Temp.	0 °F
	Sealer Fluid	None
	Run @ BHT	0 °F
	Circulation Started	12/19/80
	Logger on Bottom	3/7/81
	Min. Run Temp.	0 °F
	Measured By	MANZAGOL
Permeability Datum	G.L.	EL. 291
Log Measured From	G.L.	D.F.
Depth Measured From	G.L.	K.B.

Remarks: PHONE HOLE A WAS LOGGED, 3" PVC GRADED IN PLACE. WATER LEVEL IN CASING TO SURFACE, LINE SPEED IS FT/MIN.



PLotted by: M. J. ...

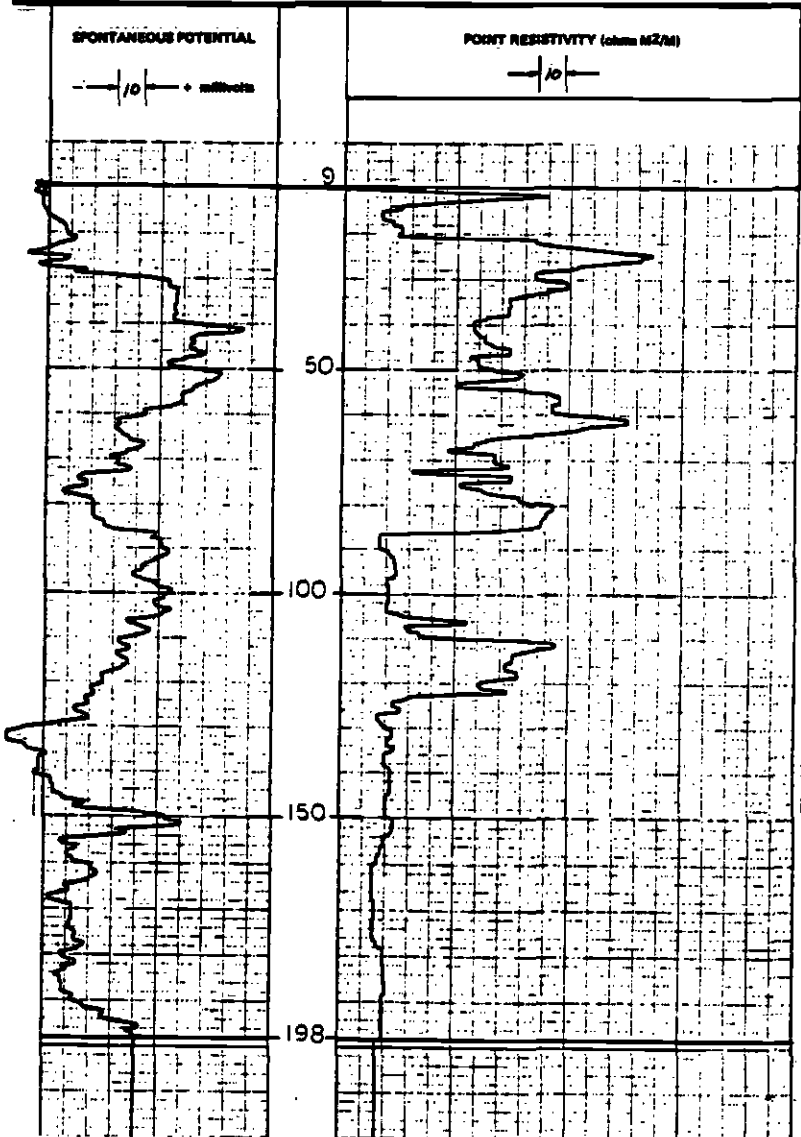


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/19/91				
PROJ. NO. 2191-25	Run No. 1				
WELL: 8	Depth-Offset 202				
FIELD:	Depth-Logger 198				
COUNTY: LOS ANGELES	Span Log Interval 198				
STATE: CALIFORNIA	Top Log Interval 2				
Other Services: NATURAL GAMMA, CALIPER	Casing-Offset NA				
	Casing-Logger NA				
	Bit Size 4 1/2"				
	Type Fluid in Hole SEPTON FTE				
	Dist. W. Fluid Loss 9				
	Source of Sample Road Tub				
LOCATION: BROADWAY STREET AT 5 TH STREET	Run @ Min. Temp. 100.0 @ 78 °F				
	Span @ Min. Temp. 100.0 @ 78 °F				
	Span @ Min. Temp. 5.2 @ 78 °F				
	Resistor Read Rate				
	Run @ 50V				
	Circulation Observed 1500				
	Length on Bottom 1830				
	Min. Res. Temp.				
	Recorded By WEN 2460L				

Remarks: LINE SPEED 35 FT/MIN ; NO CASING IN HOLE



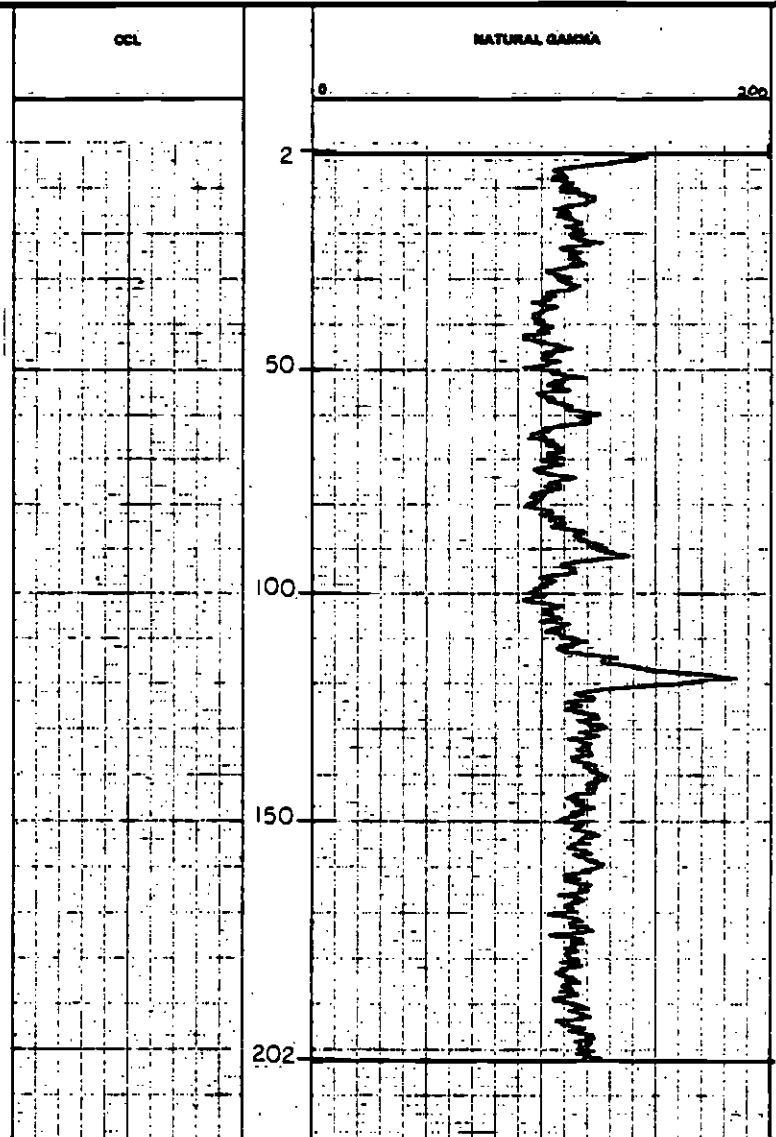


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/14/79				
PROJ. NO. 2191-25	Run No. 1				
WELL: 8	Depth-Offset 202				
FIELD:	Depth-Logger 203				
COUNTY: LDS ANGELES	Dist. Log Interval 202				
STATE: CALIFORNIA	Top Log Interval 2				
Other Services: SP-RES, CALIPER	Casing-Offset NA				
	Casing-Logger NA				
	Dr. Size 4 1/2				
	Type Fluid in Hole SEXTANTITE				
	Chem. Visc.				
	pH Field Log 9	ml		ml	
	Number of Samples Mud Tub				
LOCATION: BROADWAY STREET AT 5th STREET	Run @ Min. Temp. 10.0 @ 78	°F			
	Run @ Min. Temp. 10.0 @ 78	°F			
	Run @ Min. Temp. 5.2 @ 78	°F			
	Summer. Surf. Size				
Run @ 5MT					
Permeant Depth G.L.	E.L. ZLN				
Log Measured From G.L.	D.F.				
Drilling Measured From G.L.	S.S.				
	Chatterbox Depth 1600				
	Logger on Screen 1735				
	Min. Res. Temp.				
	Recorded By GALLINATTI				

Remarks: **LINE SPEED 20 FT/MIN ; NO CASING IN HOLE**



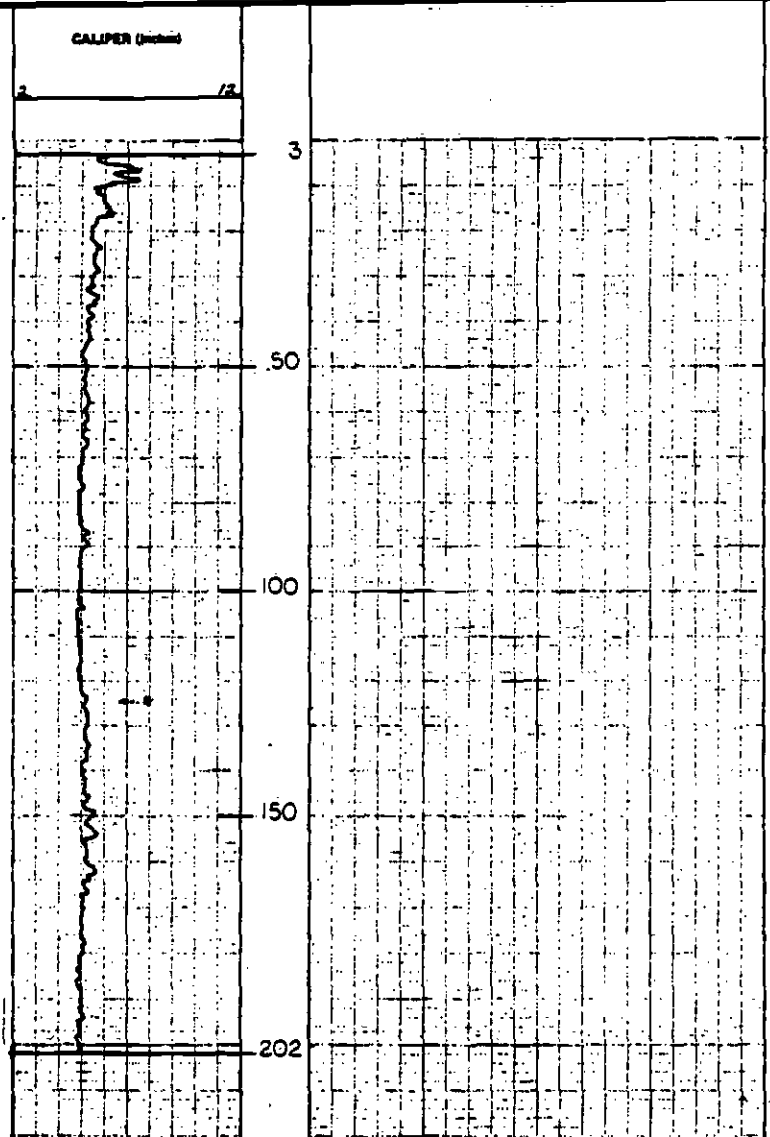


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CALIPER LOG

CLIENT: SCRTD	Date: 2/15/81		
PROJ. NO. 2191-2.5	Run No. 1		
WELL: 8	Depth-Other 202		
FIELD:	Depth-Loggs 202		
COUNTY: LOS ANGELES	Struc. Log Interval S		
STATE: CALIFORNIA	Casing-Other NA		
Other Service: NATURAL GAS, SP-RES	Casing-Loggs NA		
	Str. Size 4 1/2"		
	Type Fluid in Hole BENTONITE		
	Dist.		
	Field Loggs 9		
	Source of Sample Mid Tib		
	Run @ Min. Temp. 10.0 @ 78 °F		
	Run @ Min. Temp. 10.0 @ 78 °F		
	Run @ Min. Temp. 5.2 @ 78 °F		
	Recess. Rod / Size		
	Run @ BPT		
	Classification Observed 1600		
	Loggs on Record 1705		
	Max. Peak Temp.		
	Recorded by GALLINATI		
Permeant Column G.L.	G.L. 264		
Log Measured From G.L.	D.F.		
Drilling Measured From G.L.	E.S.		

Remarks: **LINE SPEED 20 FT/MIN ; NO CASING IN HOLE**



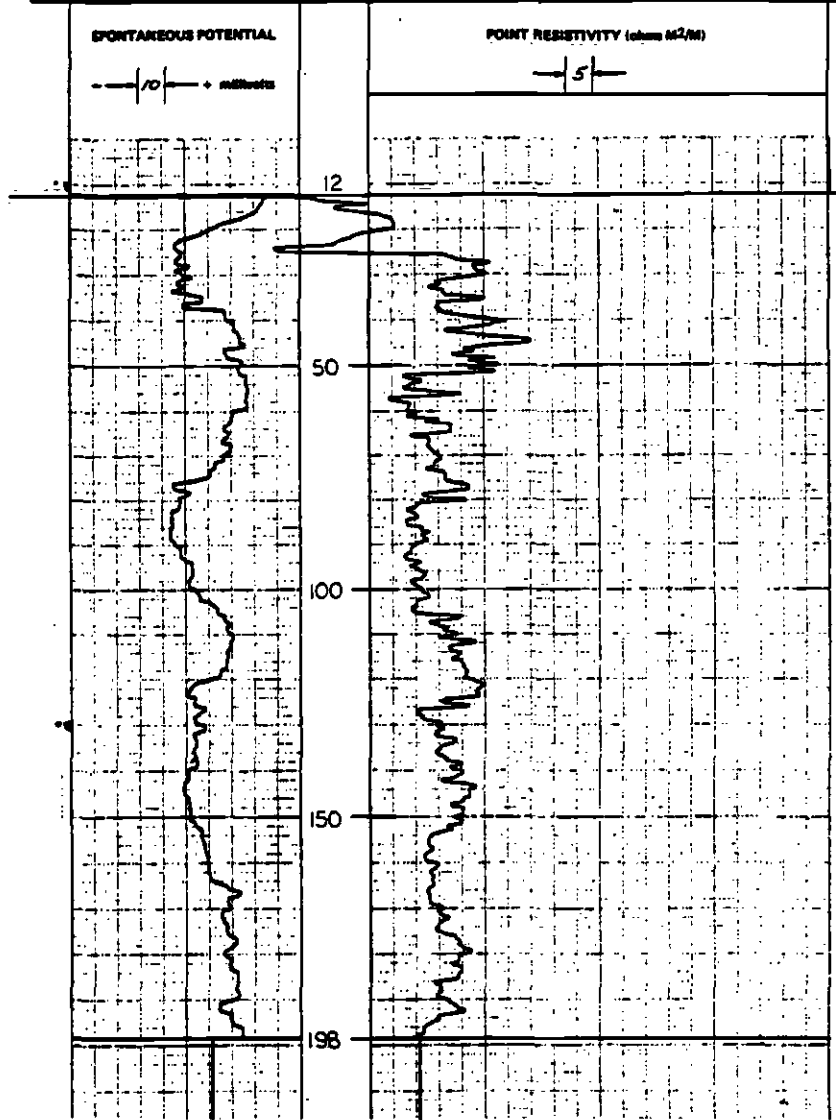


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/14/81				
PROJ. NO. 2191-25	Run No. 1				
WELL: 9	Depth-Offset 200				
FIELD:	Depth-Logger 199				
COUNTY: LOS ANGELES	Stem Log Interval 192				
STATE: CALIFORNIA	Top Log Interval 12				
	Logging-Offset 5' @ 9'				
	Logging-Logger 5' @ 9'				
	SP Stem 4 1/2'				
	Type Fluid in Hole BENTONITE				
Other Services: NATURAL GAMMA, CCL,	Dens. Vis.				
CALIPER, DENSITY, NEUTRON	pH Fluid Loss				
72 STREET BETWEEN FLOWER	Source of Sample Mud Tub				
STREET AND HOPE STREET	Run @ Min. Temp. 80 @ 82 °F				
	Run @ Max. Temp. 85 @ 82 °F				
	Run @ Min. Temp. 90 @ 82 °F				
	Summer Run Time				
Section Township Range	Run @ BHT				
Permitted Owner: G.L.	Corrosion Inhibitor 1130				
Log Measured From: G.L.	Logger on Bottom 1300				
Drilling Measured From: G.L.	Max. Res. Temp.				
	Recorded By: FRANZAGOL				

Remarks: LINE SPEED 35 FT/MIN



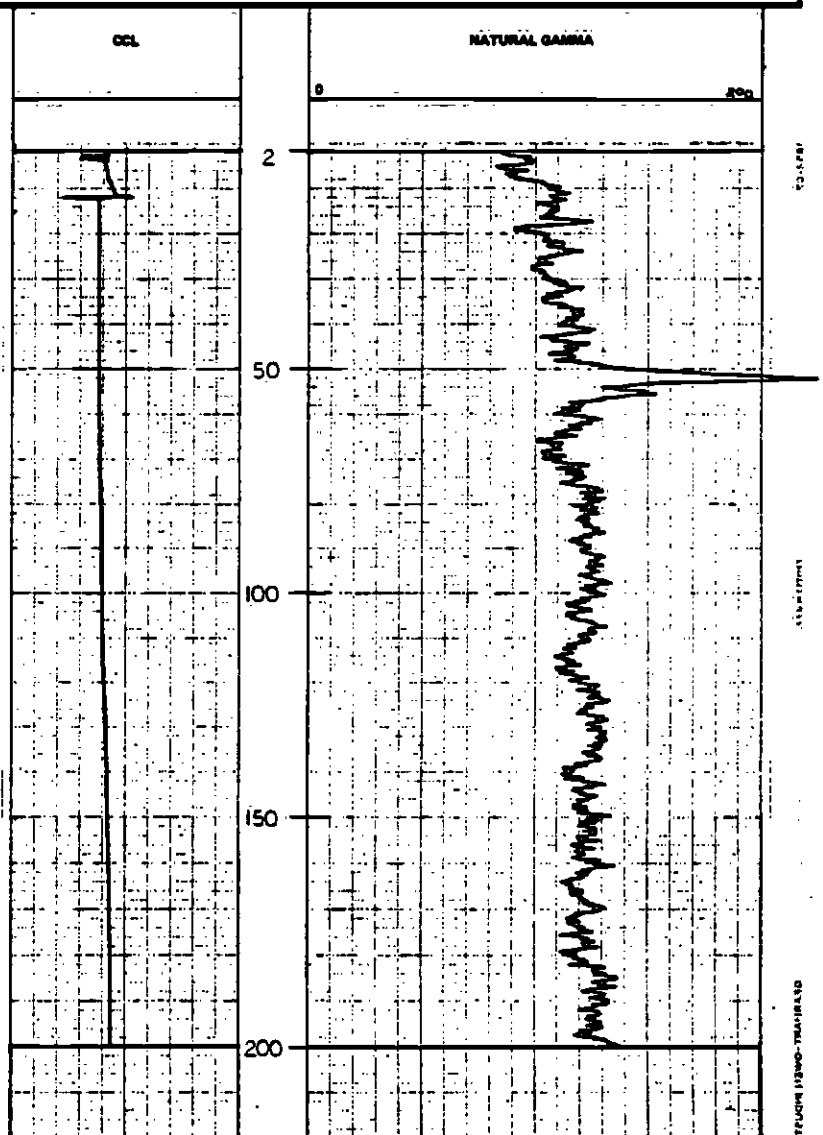


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/17/91			
PROJ. NO. 2191-25	Run No.			
WELL: 9	Depth-Offset: 200			
FIELD:	Depth-Logger: 201			
COUNTY: LOS ANGELES	Shm. Log Interval: 200			
STATE: CALIFORNIA	Top Log Interval: 2			
Other Services: SD-RS, CALIPER, DENSITY,	Casing-Offset: 5" @ 8'			
NEUTRON	Casing-Logger: 5" @ 8'			
73 STREET BETWEEN FLOWER	Bit Size: 7 7/8"			
STREET AND HOPE STREET	Type Fluid in Hole: BENTONITE			
	Dens. Min:			
	pH / Fluid Loss: 0			
	Source of Sample: MUD TUB			
	Run @ Min. Temp.: 9.0 @ 82°F			
	Run @ Max. Temp.: 8.5 @ 82°F			
	Run @ Min. Temp.: 9.0 @ 82°F			
	Shower / Cool / Free:			
	Run @ 80°F:			
	Countdown Stopped: 1130			
	Logger on Bottom: 1200			
	Min. Res. Temp.:			
Position Depth: G.L.	Range:			
Log Interval From: G.L.	Count: 267			
Depth Measured From: G.L.	D.F.:			
	Recorded By: MANZAGOL			

Remarks: **LINE SPEED IS FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED**



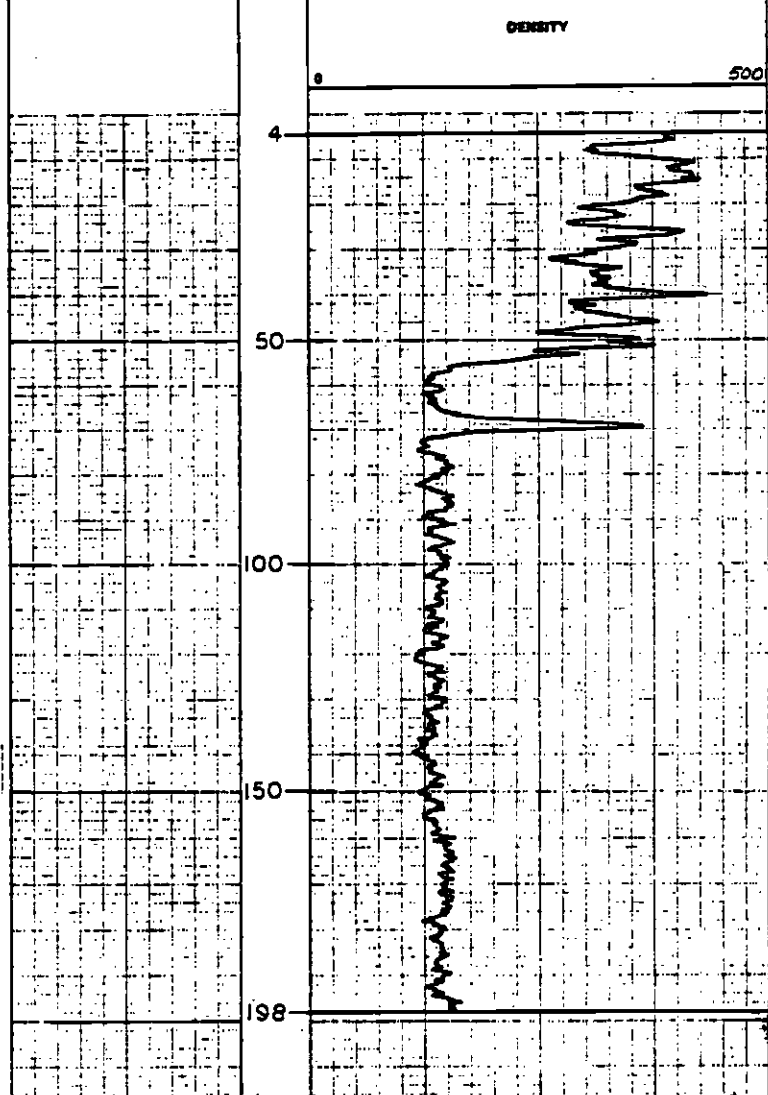


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DENSITY LOG

CLIENT: SCRTD	Date	3/7/91
PROJ. NO. 2191-25	Run No.	TWQ
WELL: 9	Depth-Offset	200
FIELD:	Depth-Logger	197
COUNTY: LOS ANGELES	Stem Log Interval	4
STATE: CALIFORNIA	Top Log Interval	2' 00" @ 200'
Other Services: SP-RES, NATURAL GAMMA, CCL, CALIPER, NEUTRON	Casing-Logger	2' 00" @ 200'
7th STREET BETWEEN FLOWER STREET AND HOPE STREET	Bit Size	4 7/8"
Location	Type Fluid in Hole	FRESH WATER
Section Township Range	Dens. Visc. pH Field Log	
Permeability Domain: G.L.	Source of Sample	NONE
Log Measured From: G.L.	Run @ Min. Temp.	
Drilling Measured From: G.L.	Run @ Max. Temp.	
	Run @ Min. Temp.	
	Run @ Max. Temp.	
	Source: Run? Stem	
	Run @ BHT	
	Circulation Stoppage	2/14/91
	Logger on Bottom	3/7/91
	Min. Res. Temp.	
	Recorded By	MANZAGO

Remarks: LINE SPEED 18 FT/MIN, 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 60 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT 61 TO 64 FT, WATER LEVEL AT 53 FT IN CASING.



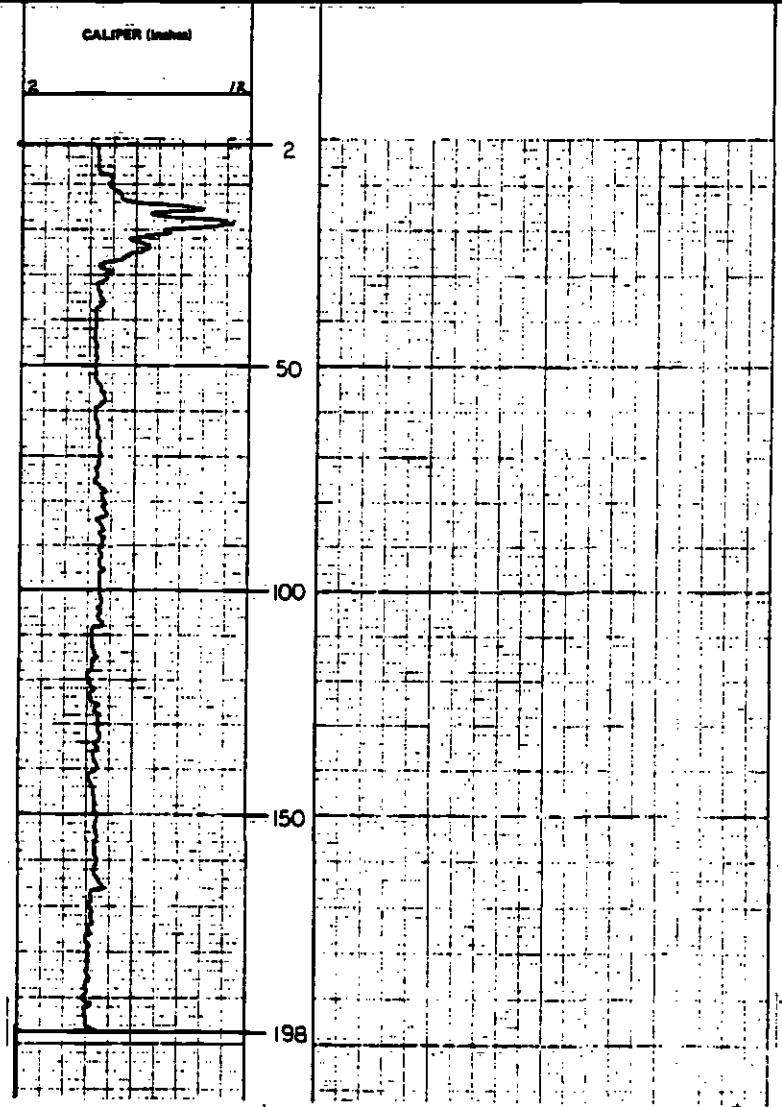


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CALIPER LOG

CLIENT: SCRTD	Date: 2/17/81		
PROJ. NO. 2191-25	Run No. 1		
WELL: 9	Depth-Orbit 200		
FIELD:	Depth-Logger 200		
COUNTY: LOS ANGELES	Min. Log Interval 178		
STATE: CALIFORNIA	Top Log Interval 2		
Other Services: NATURAL GAMMA, CCL,	Coring-Orbit 5" @ 9'		
SP-RES. DENSITY NEUTRON	Coring-Logger 5" @ 9'		
7th STREET BETWEEN HOWAR	Bit Size 7 7/8"		
STREET AND HOPE STREET	Type Fluid in Hole BENTONITE		
	Drain. Visc.		
	psi Field Log		
	Stems of Sample Mud Tub		
	Run @ Min. Temp. 9.0 @ 82 °F		
	Surf @ Min. Temp. 8.8 @ 82 °F		
	Min. @ Min. Temp. 9.0 @ 82 °F		
	Source Surf / Run		
	Run @ BHT		
Permanent Datum G.L.	G.L. 267		
Log Measured From G.L.	D.F.		
Drilling Measured From G.L.	K.B.		
	Check-out Stopped 1130		
	Logger on Station 1330		
	Min. Run Temp. °F		
	Recorded By FINZAGOL		

Rotator LINE SPEED 20 FT/MIN



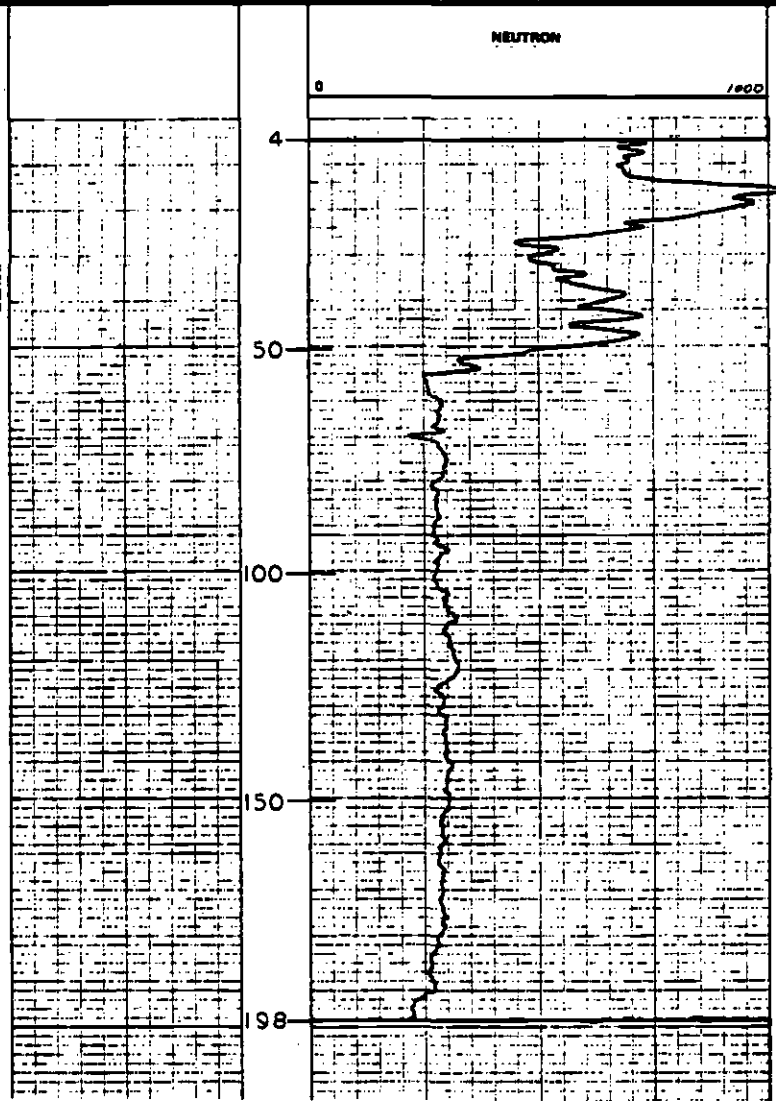


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NEUTRON LOG

CLIENT: SCAFD	Date	5/7/81	
PROJ. NO. 2191-25	Run No.	TWO	
WELL: 9	Depth-Driller	200	
FIELD:	Depth-Logger	199	
COUNTY: LOS ANGELES	Dist. Log Interval	198	
STATE: CALIFORNIA	Top Log Interval	4	
Other Services: SP-RES, NATURAL GAMMA, CCL, CALIBER, DENSITY	Casing-Driller	0	2" ABS @ 200'
	Casing-Logger	0	2" ABS @ 200'
	SH Size	4 1/2"	
	Type Fluid in Hole	FRESH WATER	
	Dist. Win.		
	psi	Fluid Loss	ml
	Source of Sample	NONE	
7th STREET BETWEEN FLOWER STREET AND HOPE STREET	Run @ Mass. Temp.	0	0
	Run @ Mass. Temp.	0	0
	Run @ Mass. Temp.	0	0
	Shower: Roof		
	Run @ SHY	0	0
Permeability Datum: G.L.	GL 267	Circulation Stopped	2/14/81
Log Started From: G.L.	D.S.	Logger on Bottom	3/7/81
Drilling Method From: G.L.	K.B.	Max. Res. Temp.	0
		Recorded By	MANZAGOL

Remarks: **LINE SPEED IS 15 FT/MIN, 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 60 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT 61 TO 64 FT, WATER LEVEL AT 53 FT. IN CASING.**



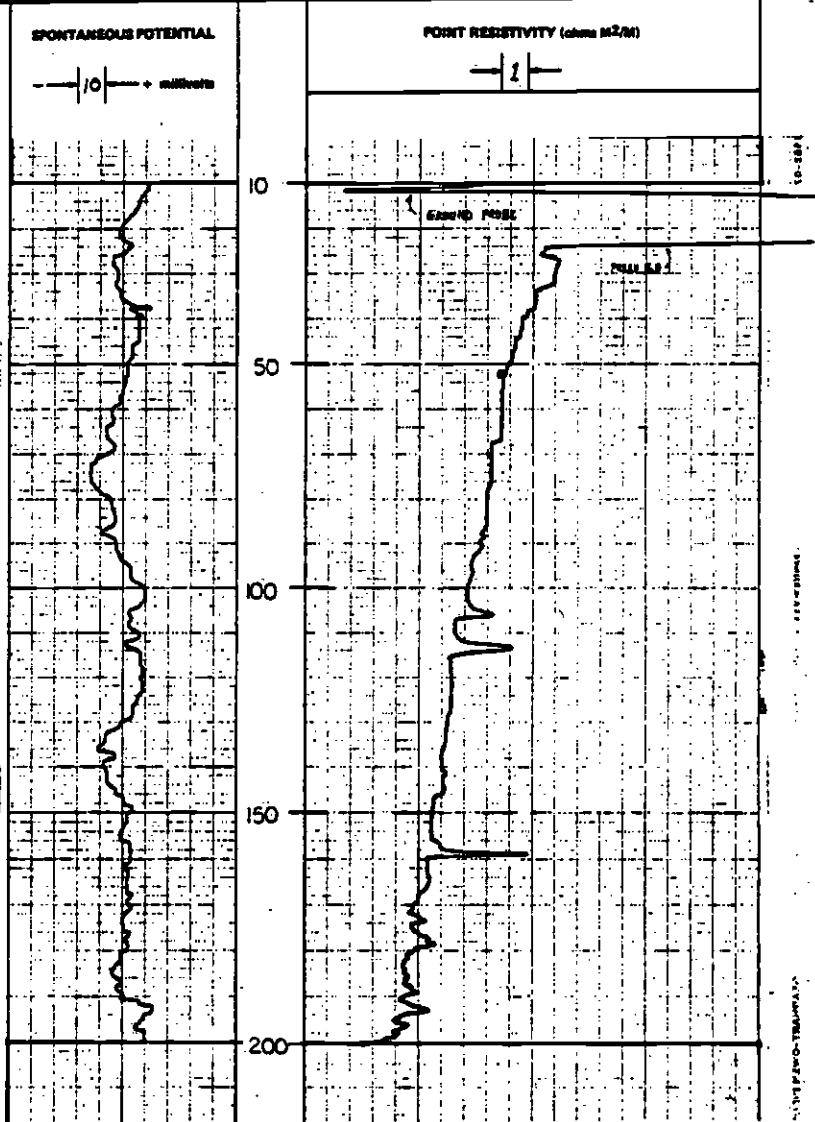


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SP-RESISTIVITY LOG

CLIENT:	SCRTD	Date:	2/2/81		
PROJ. NO.:	2191-25	Ran. No.:	1		
WELL:	10	Depth-Offset:	262		
FIELD:		Depth-Logger:	261		
COUNTY:	LOS ANGELES	Ran. Log Interval:	200		
STATE:	CALIFORNIA	Top Log Interval:	20		
Other Services:	NATURAL GAS, G.A., C.C.	Condy-Offset:	5" @ 4"		
DENSITY:	NEUTRON	Condy-Logger:	5" @ 4"		
		R/L Size:	1 3/4"		
		Type Fluid in Hole:	NEUTRON		
		Temp.:		Min.	
		pH:		Field Log.	
		Source of Sample:			
WRE-SHIRE BLVD NORTHWEST - 9P		Ran. @ Min. Temp.:		°	°
VALENCIA ST		Reel @ Min. Temp.:		°	°
		Ran. @ Min. Temp.:		°	°
		Reel @ Min. Temp.:		°	°
		Ran. @ 80°F:		°	°
		Reel @ 80°F:		°	°
Penetration Datum:	G.L.	Chart/Line Skipped:	1845		
Log Started From:	G.L.	Logger on Bottom:	11:20		
Charting Interval From:	G.L.	Max. Res. Temp.:		°	°
		Recorded By:	G.H.A. (10/11/81)		

Remarks:	LINE SPEED 30 FT/MIN



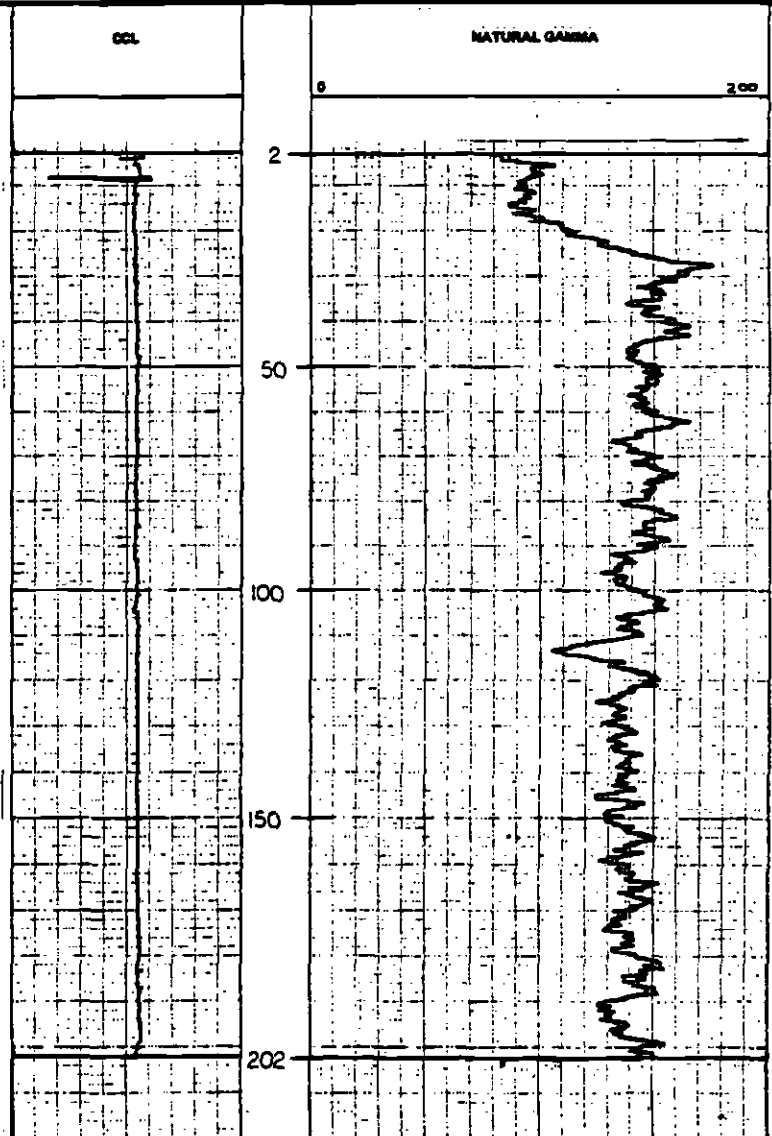


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD.	Date: 2/2/81			
PROJ. NO. 2191-25	Run No. 1			
WELL: 10	Depth-Driller 202			
FIELD:	Depth-Logger 202			
COUNTY: LOS ANGELES	Min. Log Interval 200			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: SP-RES, CALIPR, DENSITY, NEUTRON	Casing-Driller 5' @ 4'			
	Casing-Logger 5' @ 4'			
	Bit Size 4 1/2"			
	Type Fluid in Hole BENTONITE			
	Core, Visc.			
	pH Field Log			
	Counts of Sample			
ADDRESS: HILBRIE BLVD NORTHWEST OF VALENCIA ST	Run @ Min. Temp. 0 °F			
	Run @ Min. Temp. 0 °F			
	Run @ Min. Temp. 0 °F			
	Summer Run / Run			
	Run @ 200'			
	Completion Success 1295			
	Log on Screen 1800			
	Max. Res. Temp. 0 °F			
	Recorded By GALLINATI			

Remarks: LINE SPEED 20 FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED



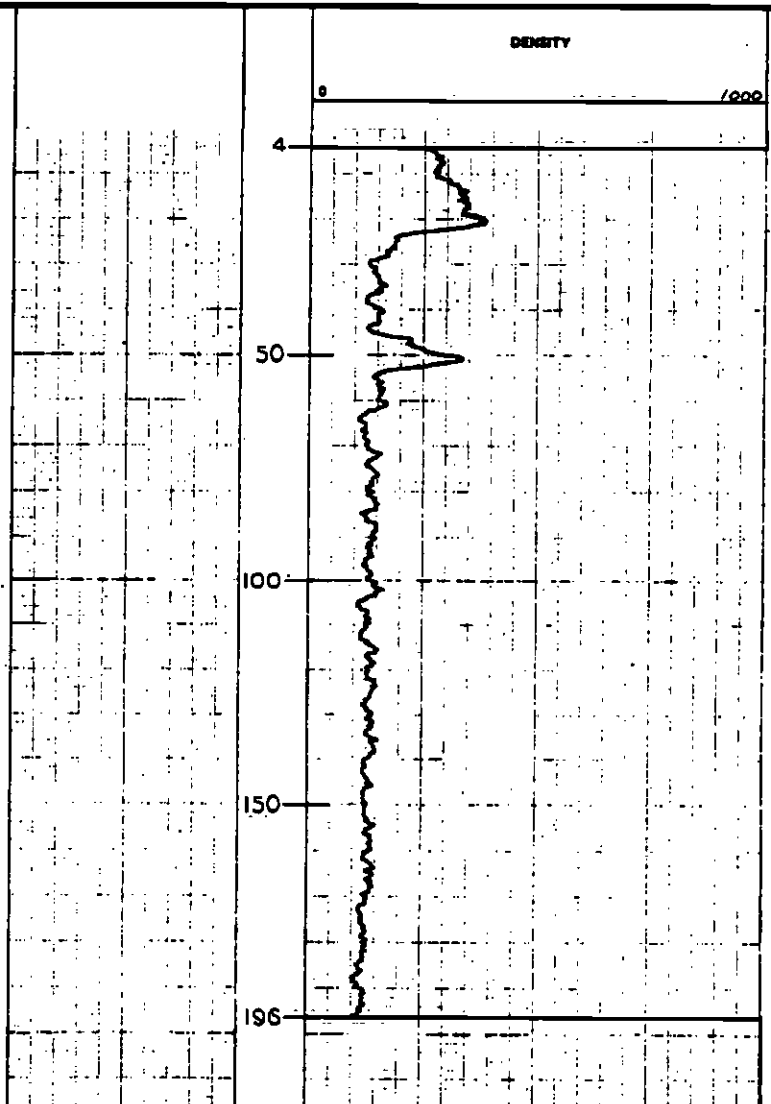


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DENSITY LOG

CLIENT: SCATD	Date: 3/22/81		
PROJ. NO. 2191-25	Run No. TWO		
WELL: 10	Depth-Driller 202		
FIELD:	Depth-Logger 197		
COUNTY: LOS ANGELES	Run Log Interval 196		
STATE: CALIFORNIA	Top Log Interval 4		
Other Services: SP-RES, NATURAL GAMMA	Coring-Other 2" ASSQ200'		
CAL CALIPER DENSITY	Coring-Logger 2" ASSQ200'		
WILSHIRE BLVD NORTHWEST OF VALENCIA STREET	GR Size 4 3/8"		
	Type Fluid in Hole FRESH WATER		
	Dens. Vis.		
	PH Field Loss		
	Source of Sample	NONE	
	Run @ Max. Temp.		
	Start @ Max. Temp.		
	Run @ Max. Temp.		
	Source: Road / River		
	Run @ 50°F		
Permeation Datum: G.L.	Condition Stopped 2/2/81		
Log Measured From: G.L.	Logger on Bottom 3/22/81		
Drilling Measured From: G.L.	Max. Rec. Temp.		
	Recorded By: MANZAGOL		

Remarks: LINE SPEED 15 FT/MIN, 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 42 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT 39 TO 44 FT



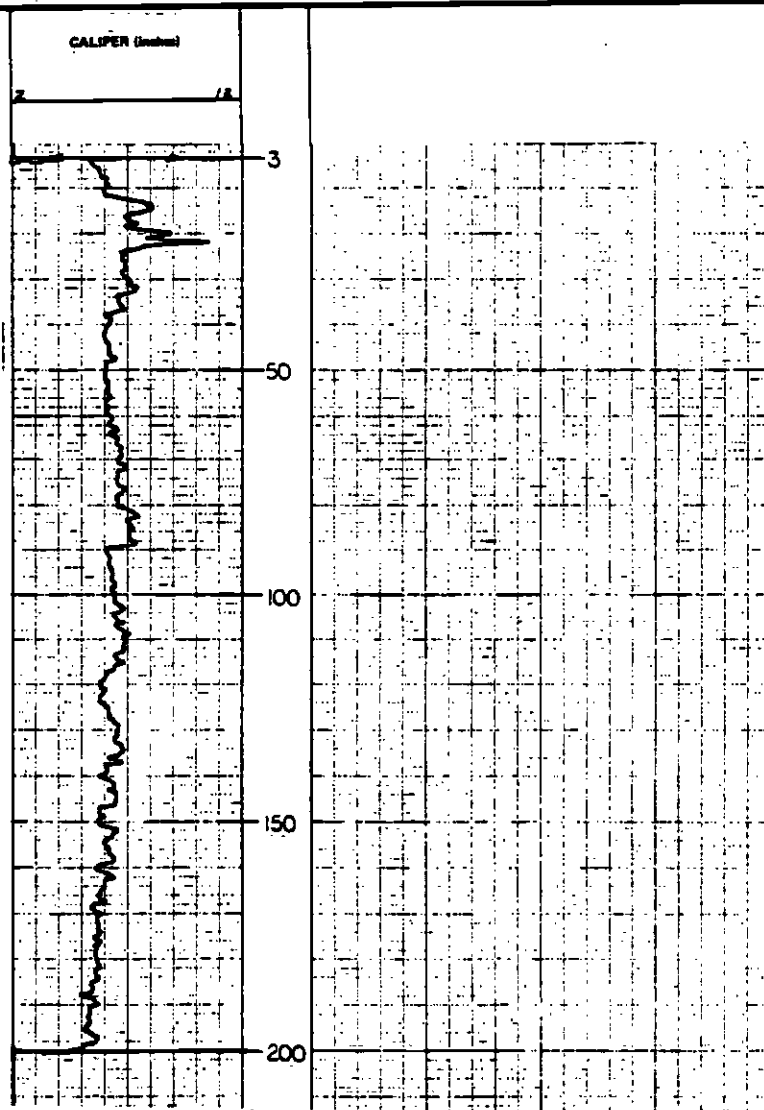


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CALIPER LOG

CLIENT: SCRTD	Date: 2/8/81			
PROJ. NO. 2191-25	Run No. 1			
WELL: 10	Depth-Offset 202			
FIELD:	Depth-Logger 202			
COUNTY: LOS ANGELES	Dist. Log Interval 200			
STATE: CALIFORNIA	Top Log Interval 3			
Other Services: NATURAL GAMMA, CELL, SP-RSS	Coding-Offset 5' @ 7'			
	Coding-Logger 5' @ 7'			
	Bit Size 7 7/8"			
	Type Fluid in Hole SEXTONITE			
	Dist. Via			
	pt	Fluid Loss	at	at
DENSITY - NEUTRON	Source of Sample			
WILKINS BLVD NORTHWEST OF VALENCIA ST	Run @ Max. Temp.			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Run @ Min. Temp.			
Section Township Range	Sanctus Reef / Run			
	Run @ BHT			
Permeant Column G.L.	Circulation Stoppage	1245		
Log Measured From G.L.	Logger on Bottom	1330		
Drilling Measured From G.L.	Max. Rec. Temp.			
	Recorded By: GALLINATTI			

Remarks: **LINE SPEED 20 FT/MIN**



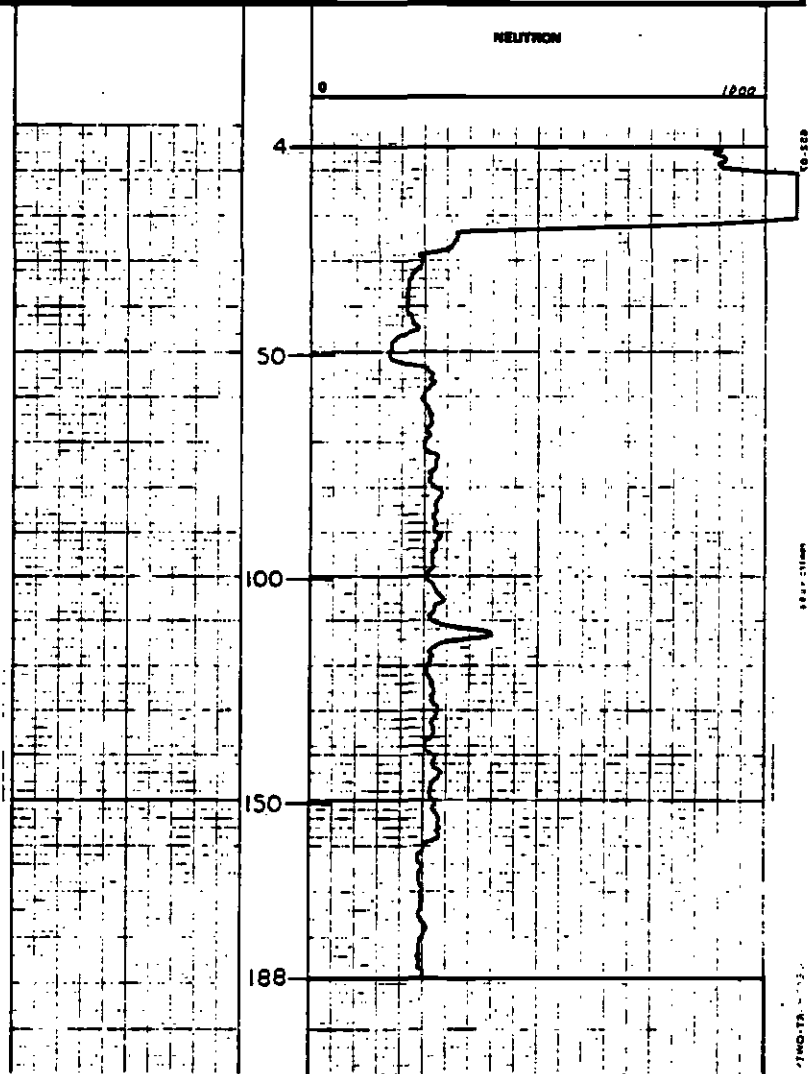


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NEUTRON LOG

CLIENT: 64RTD	Date: 3/27/81
PROJ. NO. 2191-25	Run No. TW9
WELL: 10	Depth-Counter 202
FIELD:	Depth-Logger 179
COUNTY: LOS ANGELES	Obs. Log Interval 12
STATE: CALIFORNIA	Top Log Interval 4
Other Services: SP. RES. NATURAL GAMMA	Counting-Counter 2 ARSO 200'
C.C. CALIBER: DENSITY	Counting-Logger 2 ARSO 200'
WILSHIRE BLVD NORTHWEST OF VALENCIA STREET	Bit Size 4 1/2"
	Type Fluid in Hole FRESH WATER
	Chem. Visc.
	pH Field Log
	Source of Sample NONE
	Run @ Min. Temp. 0 °F
	Run @ Max. Temp. 0 °F
	Run @ Min. Temp. 0 °F
	Run @ Max. Temp. 0 °F
	Source (Ref) Rate
	Run @ 2077
Permeability G.L.	Checkoff Counter 2/2/81
Log Measured From G.L.	Logger on Bottom 3/22/81
Drilling Measured From G.L.	Max. Res. Temp. °F
	Recorded By MRNZAOL

Remarks: LINE SPEED 15 FT/MIN. HOLE OBSTRUCTED AT 189 FT.
1" PVC ALSO PLACED IN HOLE FROM G.L. TO 42 FT. BENTONITE
PUG BETWEEN PIEZOMETERS AT 39 TO 44 FT.



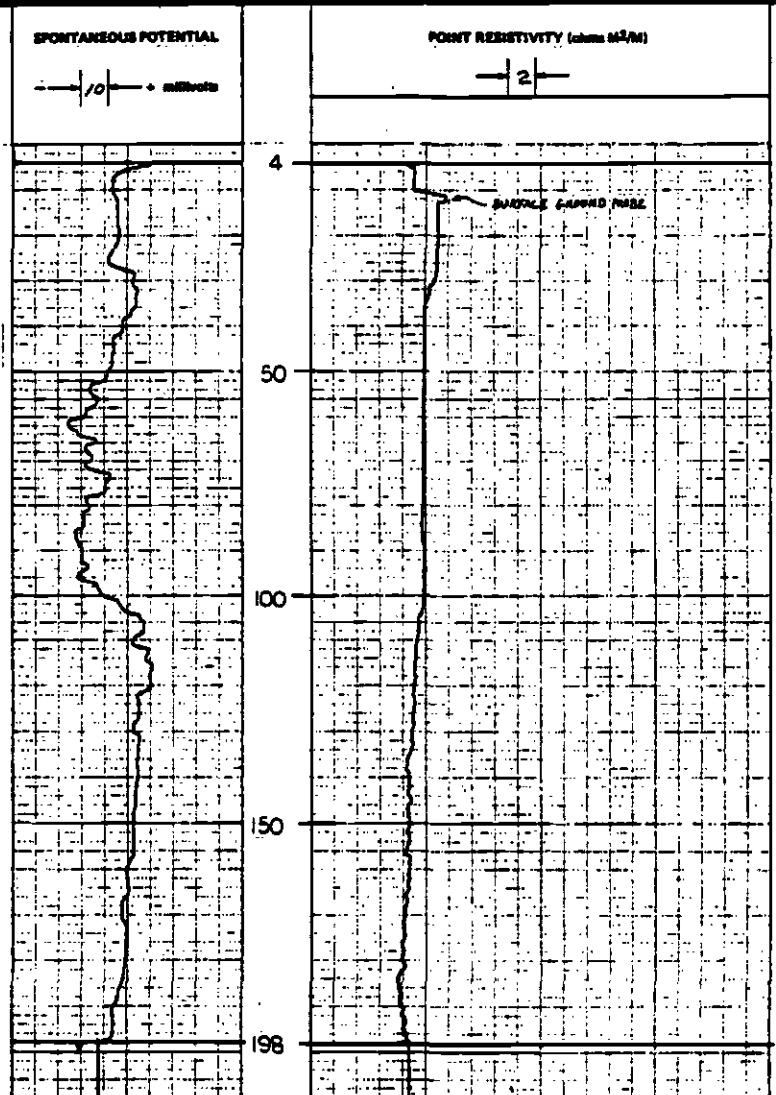


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 1/31/91		
PROJ. NO. 2191-25	Run No. 1		
WELL: 11	Depth-Order 201.1		
FIELD:	Depth-Logger 199.0		
COUNTY: LOS ANGELES	Base Log Interval 178.0		
STATE: CALIFORNIA	Top Log Interval 7.0		
Other Services: NATURAL GAMMA, CCL, CALIPER, NEUTRON	Contig-Order 5' @ 3'		
WILSHIRE BLVD SOUTHEAST OF ALVARADO STREET	Contig-Logger 5' @ 3'		
	Bit Size 7/8"		
	Type Fluid in Hole: NEUTRONITE		
	Dens. Visc.		
	pH Fluid Loss ml		
	Source of Sample: AWD-TUB		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Spont. Read. Rate		
	Run @ 50T		
Permeability Device: G.L.	SL 271	Completion Record: 1000	
Log Interval From: G.L.	D.P.	Loggs on Station: 1145	
Drilling Mechanical From: G.L.	K.A.	Max. Res. Temp.	
		Recorded By: MANTAGOL	

Remarks: LINE SPEED 35 FT/MIN. RESISIAN WELL - 16PM FLOW, NATURAL GAS BUBBLING OUT OF WELL HEAD.



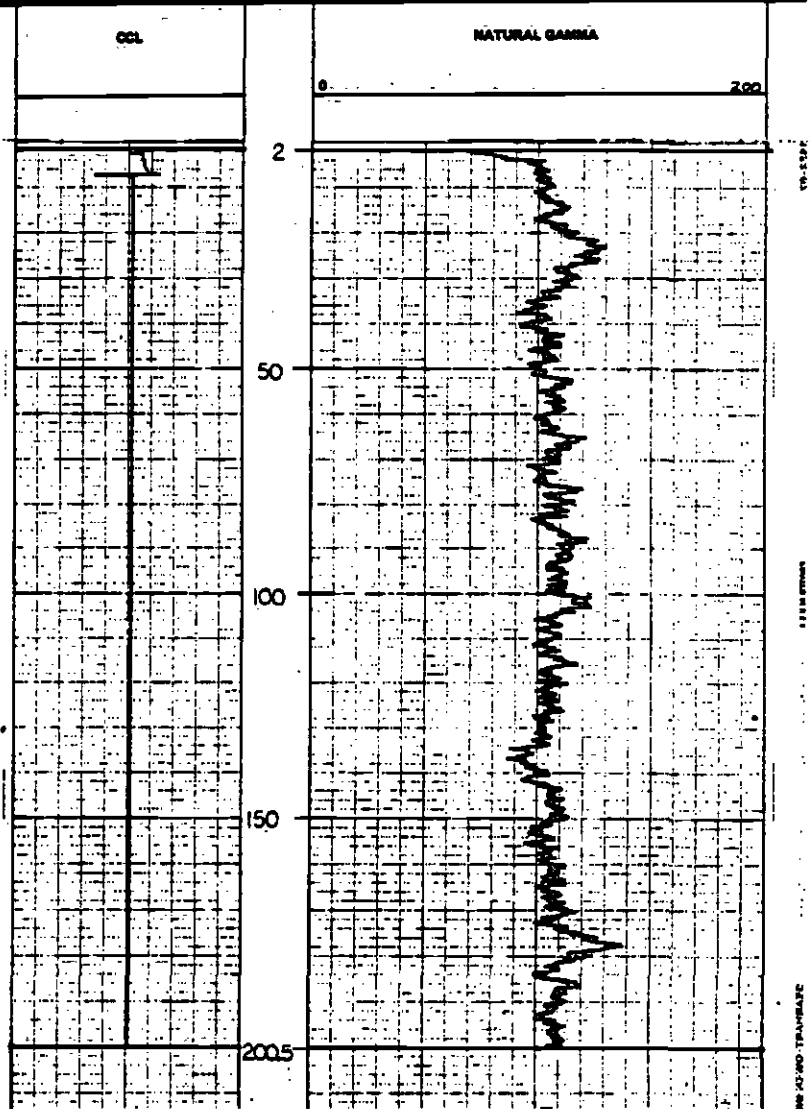


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/21/91			
PROJ. NO. 2191-25	Run No. 1			
WELL: 11	Depth-Offset 201.1			
FIELD:	Depth-Logger 201.5			
COUNTY: LOS ANGELES	Min. Log Interval 200.5			
STATE: CALIFORNIA	Top Log Interval 5.0			
Other Services: SP-RES, CALIPER, NEUTRON	Casing-Offset 5" @ 3'			
	Casing-Logger 5" @ 3'			
	Bit Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Chem. Visc.			
	pH Field Log			
	Source of Sample CUP TUB			
WEAVER BLVD SOUTHEAST OF	Run @ Min. Temp.			
ALVARADO STREET	Run @ Min. Temp.			
	Run @ Min. Temp.			
	Run @ Min. Temp.			
	Source (Std) Rate			
	Run @ 80%			
	Checklist Checked 1000			
	Logger on Screen 1100			
	Min. Res. Temp.			
	Checked By MRZAGOL			

Remarks: LINE SPEED 20 FT/MIN, CCL READS 3.0' HIGHER THAN DEPTH INDICATED



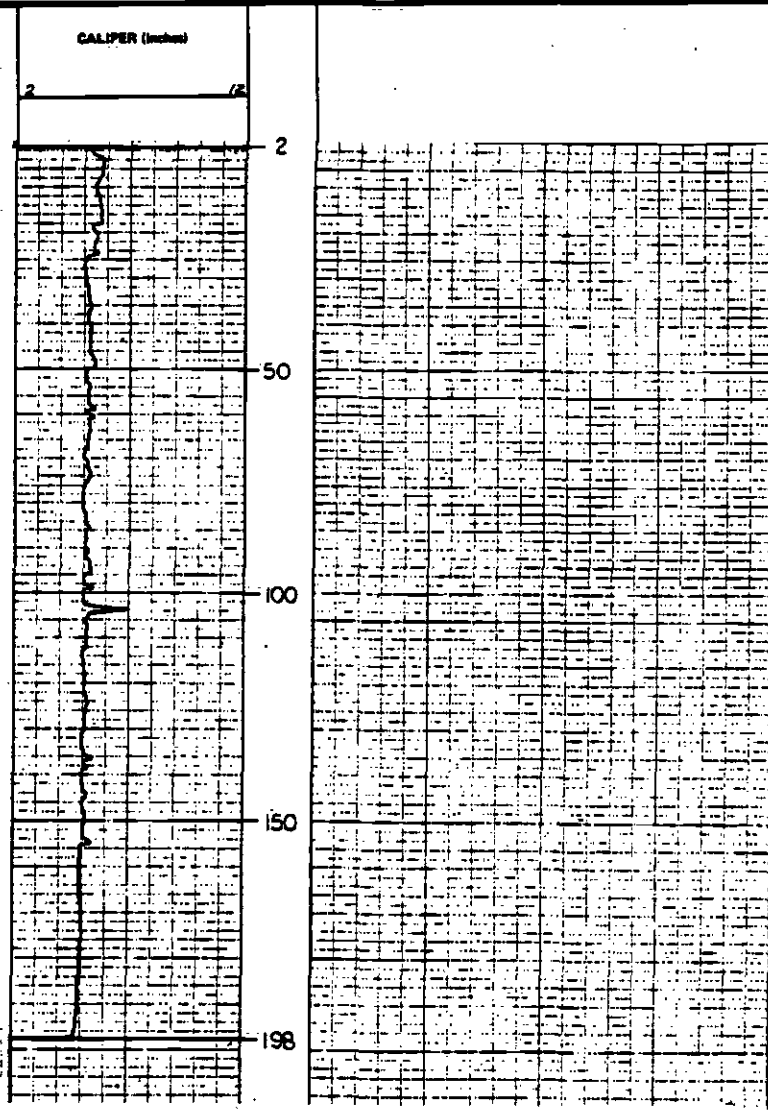


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CALIPER LOG

CLIENT: SCRTD	Date: 7/31/91			
PROJ. NO. 2191-25	Run No. 7			
WELL: 11	Depth-Offset 201.1			
FIELD:	Depth-Logger 298.0			
COUNTY: LOS ANGELES	Min. Log Interval 175.0			
STATE: CALIFORNIA	Top Log Interval 2.0			
Other Services: NATURAL GAMMA, CCL	Caliper-Offset 5" @ 3'			
SP-RES. NEUTRON	Caliper-Logger 5" @ 3'			
WILSHIRE BLVD SOUTH EAST OF ALVARADO STREET	Bit Size 4 1/4"			
	Type Fluid in Hole BENTONITE			
	Conn. Vln.			
	psi Fluid Loss			
	Seams of Bentonite	FEED THE		
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Reamer - Run / Rate			
	Run @ BHT			
	Circulation Stopped	1000		
	Logger on Bottom	1220		
	Min. Run Temp.			
	Recepted By	MANEAGAL		
Permeability	GL 271			
Log Measured From	G.L.	D.P.		
Drilling Measured From	G.L.	K.B.		

Reamer LINE SPEED 20 FT/MIN



50-2291-21-01

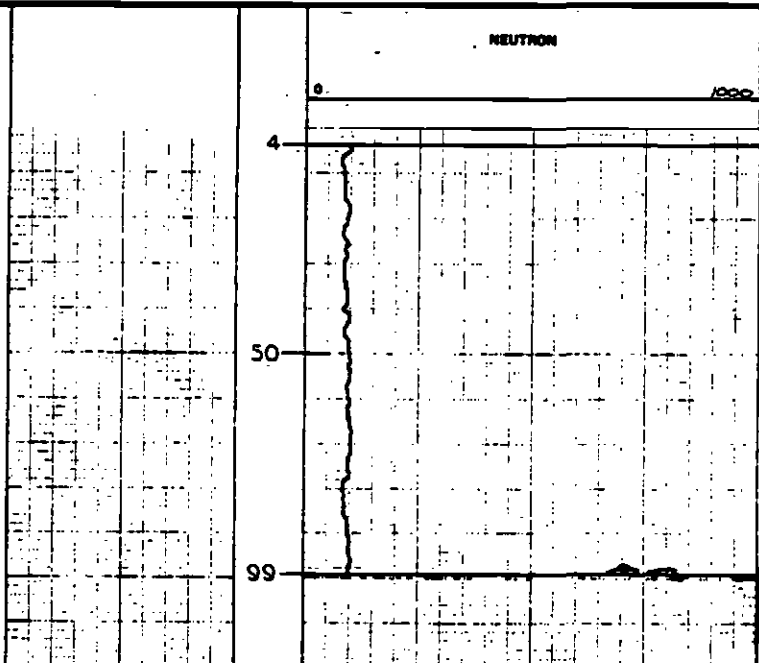


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NEUTRON LOG

CLIENT: SCPTD	Date	3/22/81	
PROJ. NO. 2191-25	Run No.	TW10	
WELL: 11 (PHONE HOLE A)	Depth-Offset	100'	
FIELD:	Depth-Logger	100'	
COUNTY: LOS ANGELES	Stem Log Interval	49'	
STATE: CALIFORNIA	Top Log Interval	4'	
Other Services: SP-RES, NATURAL GAMMA	Casing-Offset	0	3" PVC @ 100'
COL. CALIF. WILSHIRE BLVD SOUTHWEST 1E	Casing-Logger	0	3" PVC @ 100'
ALVARADO STREET	Bit Size	4 1/8"	
	Type Fluid in Hole	FRESH WATER	
	Dens. Visc.		
	pH Fluid Loss	ml	ml
	Source of Sample	NONE	
	Run @ Min. Temp.	0	49
	Run @ Max. Temp.	0	49
	Run @ Min. Temp.	0	49
	Run @ Max. Temp.	0	49
	Summer Prod / Run		
	Run @ 200'	0	49
	Run @ 500'	0	49
	Run @ 1000'	0	49
Permeameter Datum: G.L.	SL 271	Circulation Started	1/31/81
Log Measured From: G.L.	S.F.	Logger on Site	3/22/81
Drilling Measured From: G.L.	K.B.	Max. Res. Temp.	49
		Recorded By	MRAJZAGOL

Remarks: **LINE SPEED 15 FT/MIN, PHONE HOLE A WAS LOGGED, 3" PVC GROUTED IN PLACE, WATER LEVEL IN CASING TO SURFACE.**



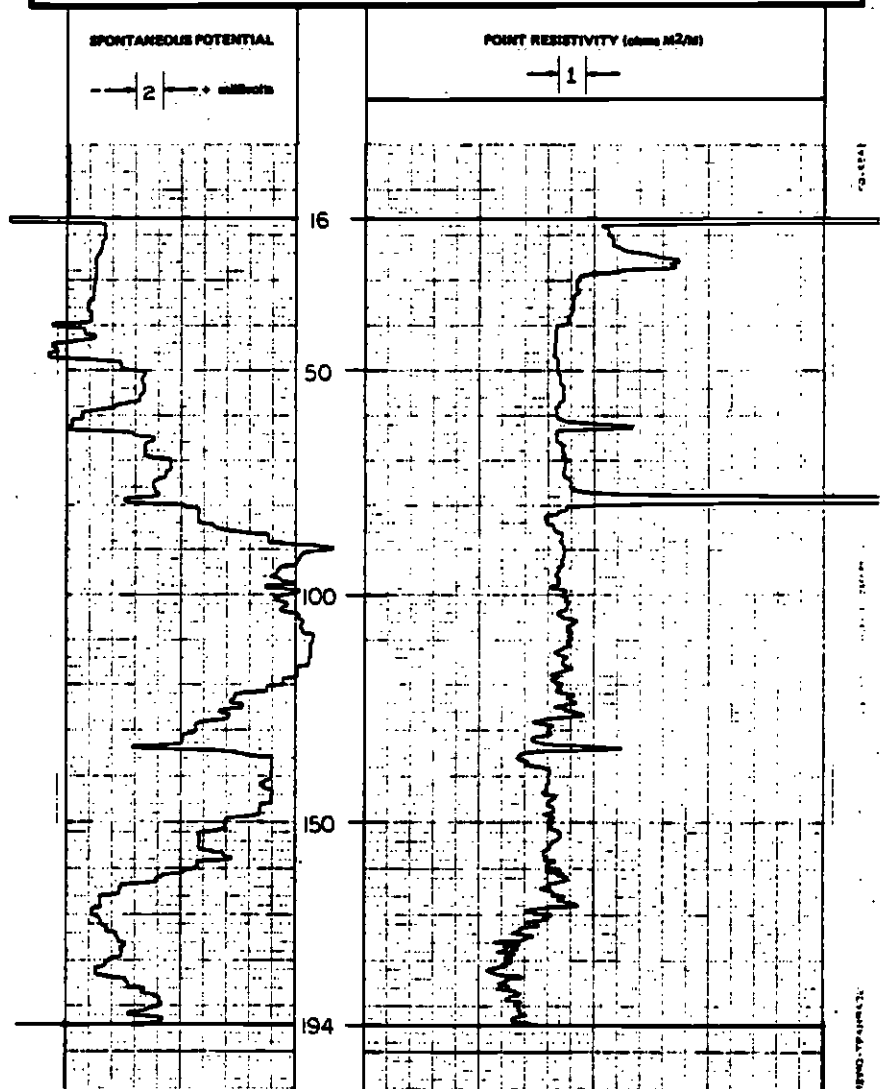


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/13/91			
PROJ. NO. 291-25	Run No. 1			
WELL: 12	Depth-Offset 200.1			
FIELD:	Depth-Logger 192.0			
COUNTY: LOS ANGELES	Stem, L&I Interval 194.0			
STATE: CALIFORNIA	Top Log Interval 16.0			
Other Services: NATURAL GAMMA, CCL, CALIPER, DENSITY, NEUTRON	Casing-Offset 5' @ 7'			
WILSHIRE BLVD AT INTERSECTION WITH HOOVER STREET	Casing-Logger 5' @ 7'			
	Bit Size 4 7/8"			
	Type Fluid to Mud BENTONITE			
	Dens. Visc.			
	pH Fluid Loss			
	Sections of Sample			
	Run @ Min. Temp.			
	Run @ Min. Temp.			
	Run @ Min. Temp.			
	Source: Roof Rise			
	Run @ BHT			
	Circulation Pressure 0.330			
	Logger on Bottom 0200			
	Min. Run. Temp.			
	Recorded by GANUNAT7			

Remarks: LINE SPEED 30 FT/MIN



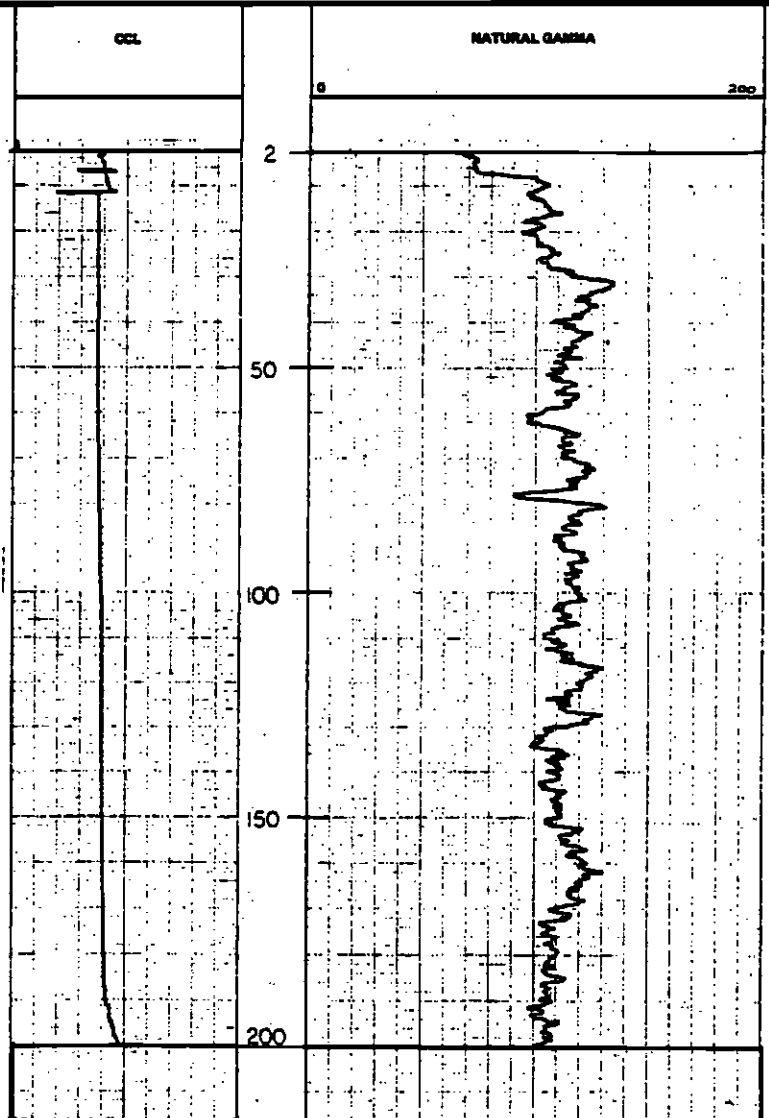


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**CCL-GAMMA RAY
LOG**

CLIENT: SCRTD	Date: 2/13/91			
PROJ. NO. 2191-25	Run No. 1			
WELL: 12	Depth-Order 200.1			
FIELD:	Depth-Logger 201.0			
COUNTY: LOS ANGELES	Stem Log Interval 200.0			
STATE: CALIFORNIA	Top Log Interval 2.0			
Other Services: SP-RES, CALIPER, DENSITY, NEUTRON	Casing-Order 5' 0.7'			
	Casing-Logger 5' 0.7'			
	Bit Size 4 7/8"			
	Type Fluid in Hole BENTONITE			
	Temp. Vis.			
	pH Fluid Loss	ml	ml	ml
	Number of Samples			
	Run @ Min. Temp.	0	0	0
	Run @ Min. Temp.	0	0	0
	Run @ Min. Temp.	0	0	0
	Source: Refl. Rate			
	Run @ SHY	0	0	0
	Checked on Surface 0830			
	Logged on Bottom 0845			
	Max. Res. Temp.			
	Recorded By GALLINATI			
Permeability Device G.L.	ELEVATION G.L. 245			
Log Measured From G.L.	S.P.			
Drilling Measured From G.L.	S.S.			

Remarks: LINE SPEED 20 FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED



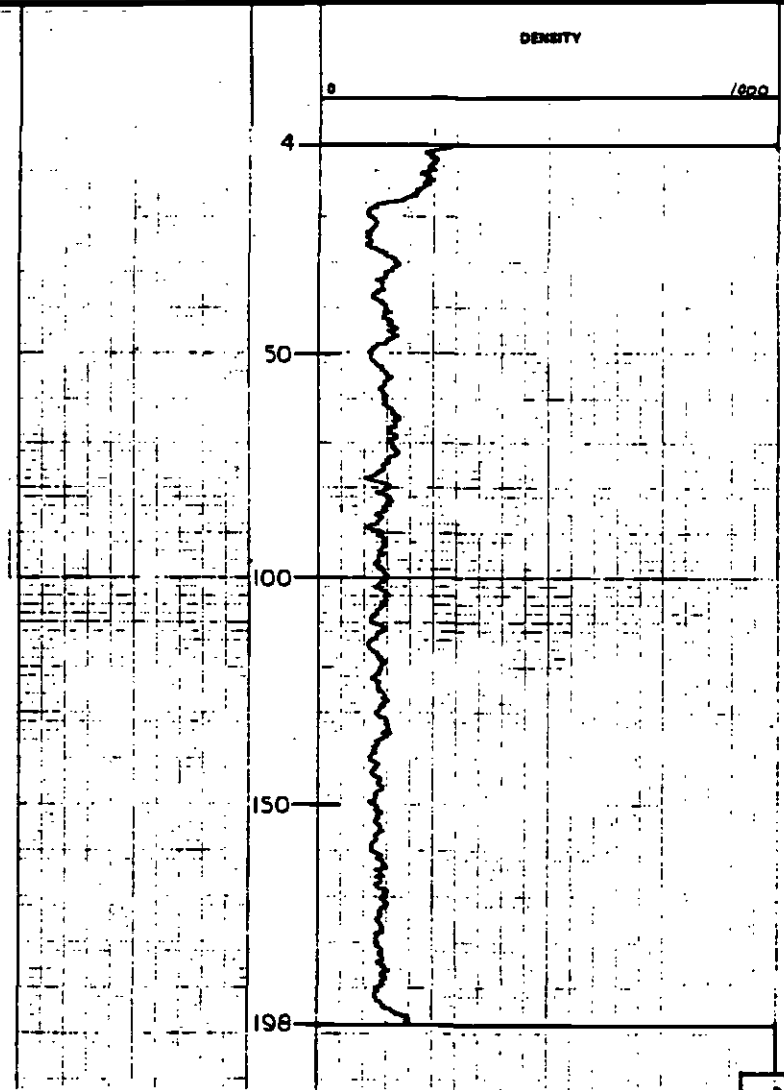


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DENSITY LOG

CLIENT: SCR7D	Date	3/22/81	
PROJ. NO. 2191-25	Well No.	TW0	
WELL: 12	Depth-Driller	200	
FIELD:	Depth-Logger	199	
COUNTY: LOS ANGELES	Stem Log Interval	199	
STATE: CALIFORNIA	Top Log Interval	4	
Other Services: SP-RES COL NATURAL GAMMA	Casing-Driller	2" ABS 230'	
CALIPER NEUTRON	Casing-Logger	2" ABS 200'	
WILSHIRE BLVD AT INTERSECTION WITH HAVER STREET.	Bit Size	4 1/8"	
Location: Section Township Range	Type Fluid in Hole	FRESH WATER	
Permanence Datum G.L.	Date	Vis.	
Log Measured From G.L.	pH	Field Log	nd
Drilling Method From G.L.	Amount of Sample	MINUTE	
	Run @ Min. Temp.	•	•
	Run @ Max. Temp.	•	•
	Run @ Min. Temp.	•	•
	Run @ Max. Temp.	•	•
	Amount Read / Rate	•	•
	Run @ BMT	•	•
	Circulation Stopped	2/13/81	
	Logger on Bottom	3/22/81	
	Min. Run Temp.	•	•
	Recorded By	MMZRCOL	

Revised: **LINE SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 14.5 FT.**



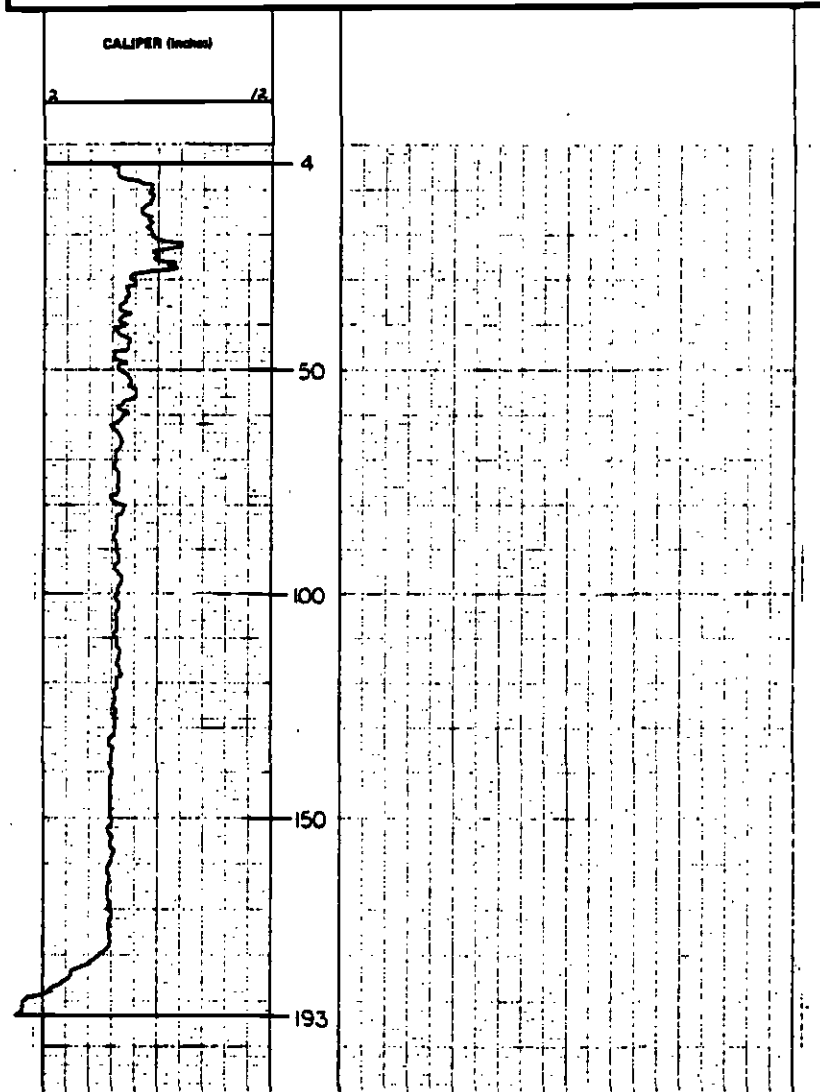


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CALIPER LOG

CLIENT: SCRTD	Date: 2/10/91	Run No. 1			
PROJ. NO. 2191-25	Depth-Offset 200.1	Depth-Logger 195.0			
WELL: 12	Shin. Log Interval 195.0	Top Log Interval 4.0			
FIELD:	Coring-Offset 5' 8 7/8"	Coring-Logger 5' 8 7/8"			
COUNTY: LOS ANGELES	Bit Size 4 7/8"	Type Fluid in Hole BENTONITE			
STATE: CALIFORNIA	Other Services: NATURAL GAMMA, CCL, SP-RES, DENSITY, NEUTRON	Down. Visc.			
Other Services: NATURAL GAMMA, CCL, SP-RES, DENSITY, NEUTRON	WASHING BLVD AT INTERSECTION WITH HOOVER STREET	pH Field Log			
Section	Turntable	Range	Run @ Mean Temp.		
Permanent Datum: G.L.	BL 245		Run @ Mean Temp.		
Log Measured From: G.L.	D.P.		Run @ Mean Temp.		
Drilling Measured From: G.L.	K.S.		Run @ Mean Temp.		
			Run @ BHT		
			Characterization Standard	2/10/91	1000
			Logger on Bottom	2/10/91	0100
			Max. Run Temp.		
			Measured By	GALLINATI	

Remarks: LINE SPEED 20 FT/MIN; CALIPER RUN AFTER HOLE SAT
UNCIRCULATED OVERNIGHT; HOLE CIRCULATED TO CLEAR SLOUGH
OFF BOTTOM BEFORE OTHER TOOLS WERE RUN



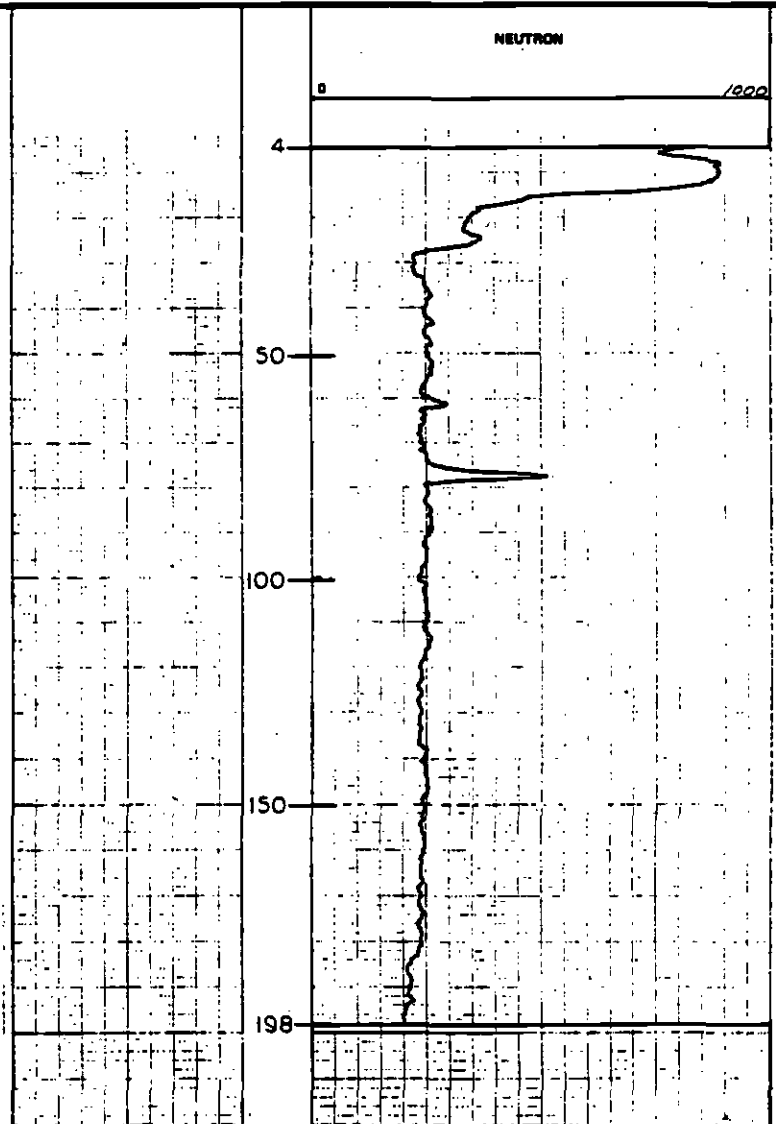


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NEUTRON LOG

CLIENT: SECFD	Date	3/22/81
PROJ. NO. 2191-25	Well No.	7W8
WELL: 12	Depth-Offset	200.1
FIELD:	Depth-Logger	199
COUNTY: LOS ANGELES	Max. Log Interval	197
STATE: CALIFORNIA	Top Log Interval	4
Other Services: SP-RGS, CCL, NATURAL-GAMMA, CALIPER, DENSITY	Casing-Offset	2' ABS @ 200'
	Casing-Logger	2' ABS @ 200'
	Bit Size	4 7/8"
	Type Fluid in Hole	FRESH WATER
	Temp.	Vis.
	pH	Fluid Loss
	Source of Sample	NONE
WILSHIRE BLVD AT INTERSECTION WITH MOVER STREET	Min @ Max. Temp.	0 °F @ 0 °F
	Min @ Max. Temp.	0 °F @ 0 °F
	Min @ Max. Temp.	0 °F @ 0 °F
Section	Township	Range
Permeant District	BL 245	Completion Stopped
Log Measured From	D.F.	Logger on Bottom
Drilling Measured From	E.B.	Max. Min. Temp.
		Recorded By
		MANZAGOL

Remarks: **LINE SPEED IS 15 FT/MIN, WATER LEVEL IN CASING AT 14.5 FT.**



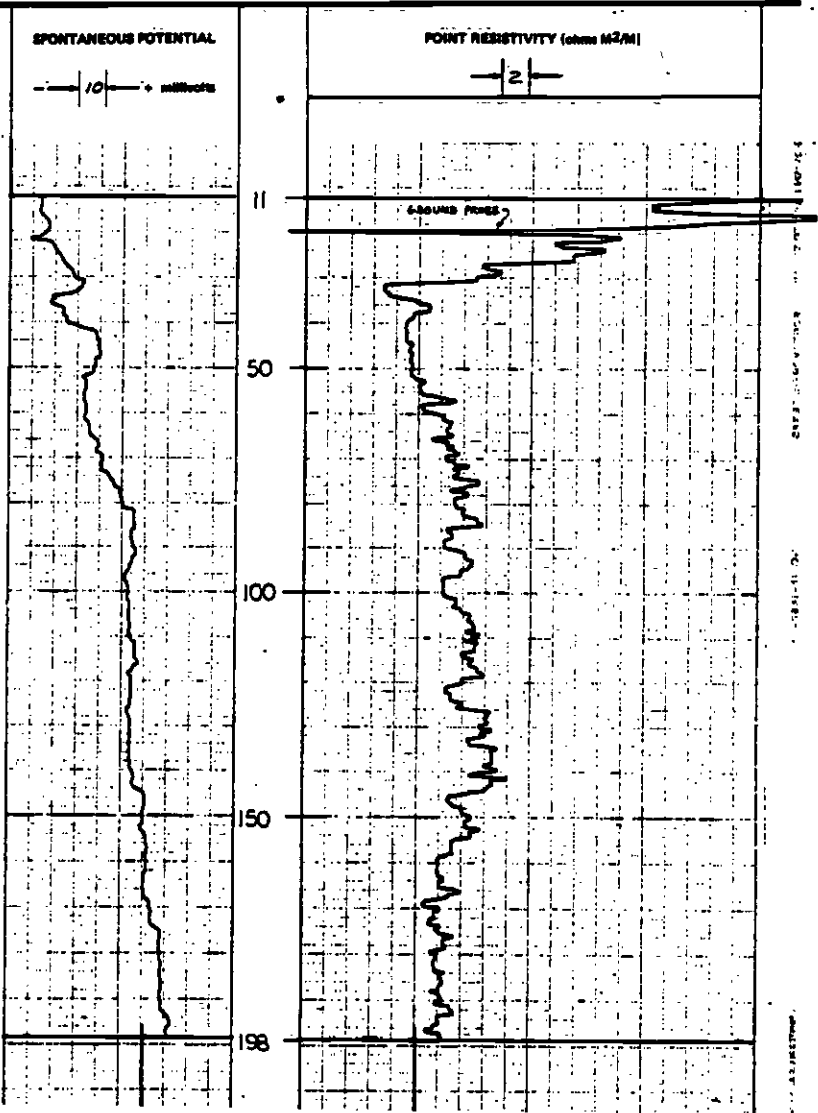


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/1/91				
PROJ. NO. 2191-25	Run No. 1				
WELL: 13	Depth-Driller 200				
FIELD:	Depth-Logger 199				
COUNTY: LOS ANGELES	Shot Log Interval 178				
STATE: CALIFORNIA	Top Log Interval 11				
Other Services: NATURAL GAMMA, CCL, CALIPER, NEUTRON	Casing-Driller 6" @ 7'				
	Casing-Logger 6" @ 7'				
	Bit Size 4 7/8"				
	Type Fluid in Hole BENTONITE				
	Dens. Win.				
	pph Fluid Loss				
	Source of Sample RUD TUB				
	Run @ Min. Temp.				
	Run @ Max. Temp.				
	Run @ Min. Temp.				
	Run @ Max. Temp.				
	Source: Run Run				
	Run @ BMT				
	Circulation Observed 1/30				
	Leaky on Bottom 1/3/95				
	Min. Res. Temp.				
	Recorded By MANZAGOL				

Remarks: LINE SPEED 35 FT/MIN



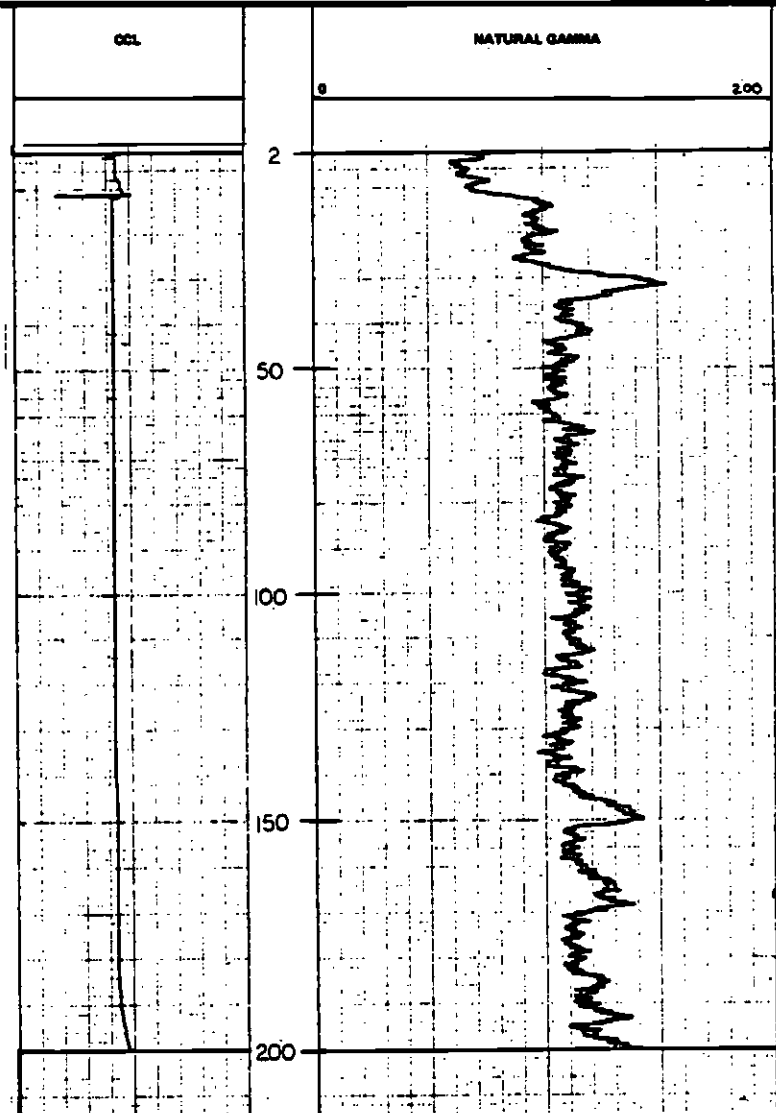


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/1/81			
PROJ. NO. 2191-25	Run No. 1			
WELL: 13	Depth-Driller 200			
FIELD:	Depth-Logger 201			
COUNTY: LOS ANGELES	Stem Log Interval 200			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: SP-RBS, CALIPER, NEUTRON	Casing-Driller 5" @ 7'			
	Casing-Logger 5" @ 7'			
	Bit Size 4 1/2"			
	Type Fluid in Hole: SEAWATER			
	Dist. Vis.			
	SP Fluid Loss			
	Source of Sample	AUD TOP		
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Run @ Int.			
	Completion Stopped	1130		
	Logger on Bottom	1300		
	Max. Run. Temp.			
	Recorded By	HANZAGAL		

Remarks: LINE SPEED 20 FT/MIN. CCL READS 20' UNDER TRUE DEPTH INDICATED



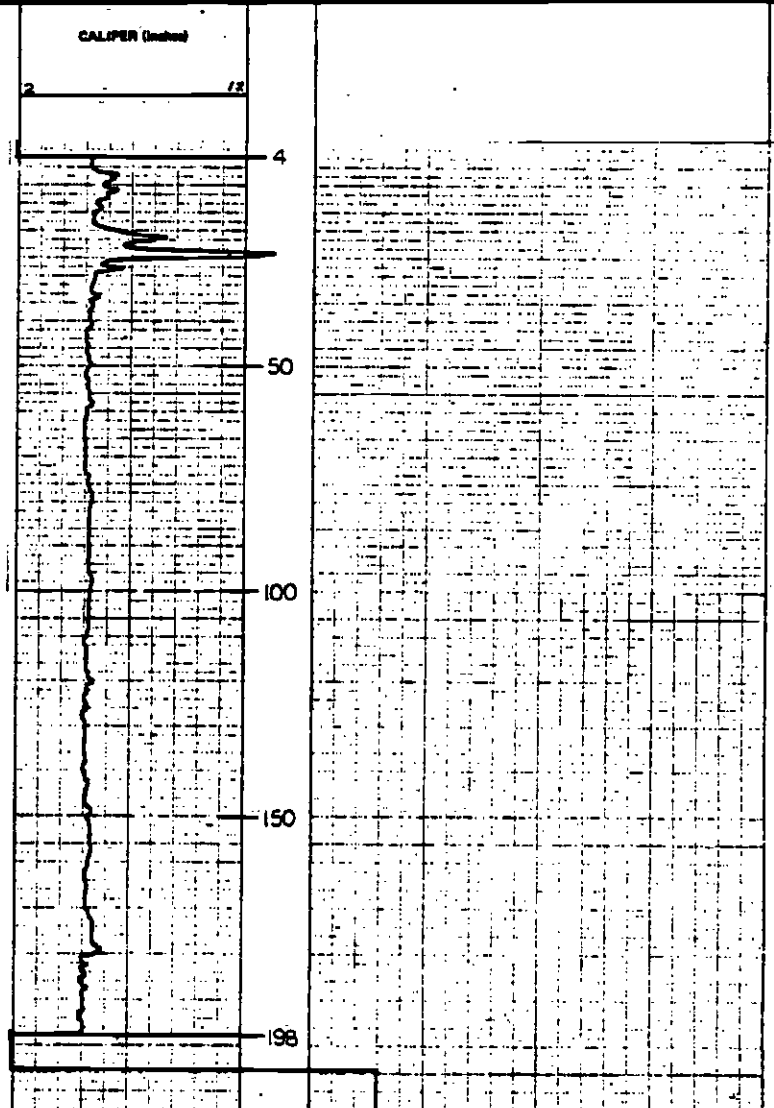


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CALIPER LOG

CLIENT: SCRTD	Date: 2/4/81			
PROJ. NO. 2191-25	Well No. 200			
WELL: 13	Depth-Order 200			
FIELD:	Stem Log Interval 178			
COUNTY: LOS ANGELES	Top Log Interval 4			
STATE: CALIFORNIA	Casing-Order 5' 0 7'			
Other Services: NATURAL GAMMA, CCL.	Casing-Log 5' 0 7'			
SR-RES, NEUTRON	Bit Size 7 7/8"			
NEW HAMPSHIRE AVENUE SOUTH	Type Field to Note: BENTONITE			
OF WILSHIRE BLVD	Date: Vln.			
	psi Field Log	ml	ml	ml
	Source of Sample: RWB TUB			
	Run @ Min. Temp.	0	0	0
	Run @ Max. Temp.	0	0	0
	Run @ Min. Temp.	0	0	0
	Run @ Max. Temp.	0	0	0
	Source: Rod / Run			
	Run @ BHT	0	0	0
Section Township Range	Chlorination Strength: 1/10			
Permeability Constant: 0.1	Loggs on Screen: 12/15			
Log Observed From: 0.1	Max. Res. Temp.			
Drilling Observed From: 0.1	Recorded By: MHWZACOL			

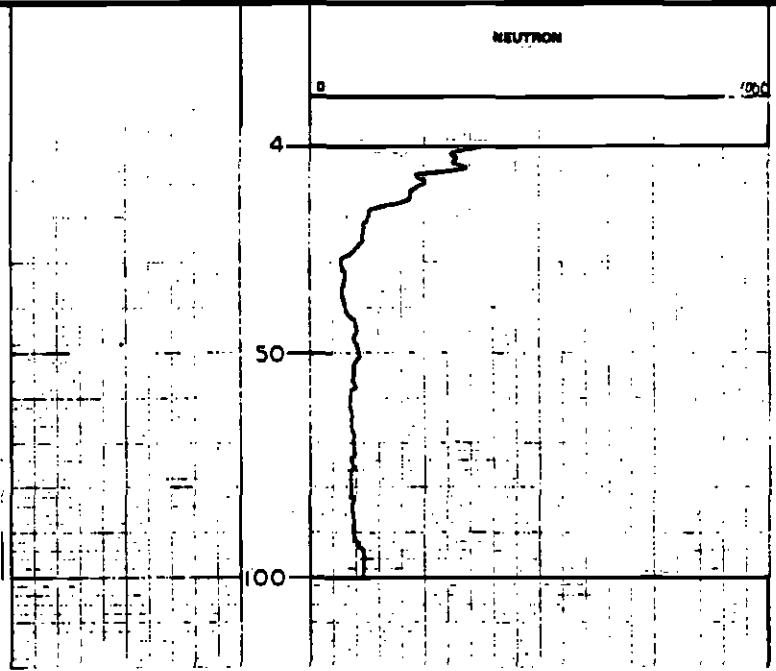
Remarks: LINE SPEED 20 FT/MIN





CLIENT: SCRFD	Date: 3/22/81
PROJ. NO.: 2191-25	Run No.: TWO
WELL: 15 (PHONE HOLE A)	Depth-Driller: 180
FIELD:	Depth-Logger: 181
COUNTY: LOS ANGELES	Str. Log Interval: 180
STATE: CALIFORNIA	Top Log Interval: 4
Other Services: SP-RES, NATURAL GAMMA, CCL, CALIPER	Casing-Driller: 3" PVC @ 100'
NEW HAMPSHIRE AVENUE SOUTH OF WILSHIRE BLVD	Casing-Logger: 3" PVC @ 100'
Section:	SP Log: 4 1/2"
Township:	Type Fluid in Hole: FRESH WATER
Range:	Dens.:
BL 249	Vis.:
D.P.	pH:
G.L.	Field Log:
	Scale of Graph: NONE
	Run @ Min. Temp.: 0 0 0 0 0 0 0
	Run @ Max. Temp.: 0 0 0 0 0 0 0
	Run @ Min. Temp.: 0 0 0 0 0 0 0
	Run @ Max. Temp.: 0 0 0 0 0 0 0
	Run @ Min. Temp.: 0 0 0 0 0 0 0
	Run @ Max. Temp.: 0 0 0 0 0 0 0
Measurement Details: G.L.	Classification Stopped: 2/1/81
Log Measured From: G.L.	Logger on Bottom: 3/22/81
Drilling Measured From: G.L.	Min. Run. Temp.: 0 0 0 0 0 0 0
	Recorded By: MANZAGOL

PHONE HOLE A WAS LOGGED, 3" PVC GROUTED IN PLACE
WATER LEVEL IN CASING TO SURFACE LINE SPEED IS 15 FT/MIN



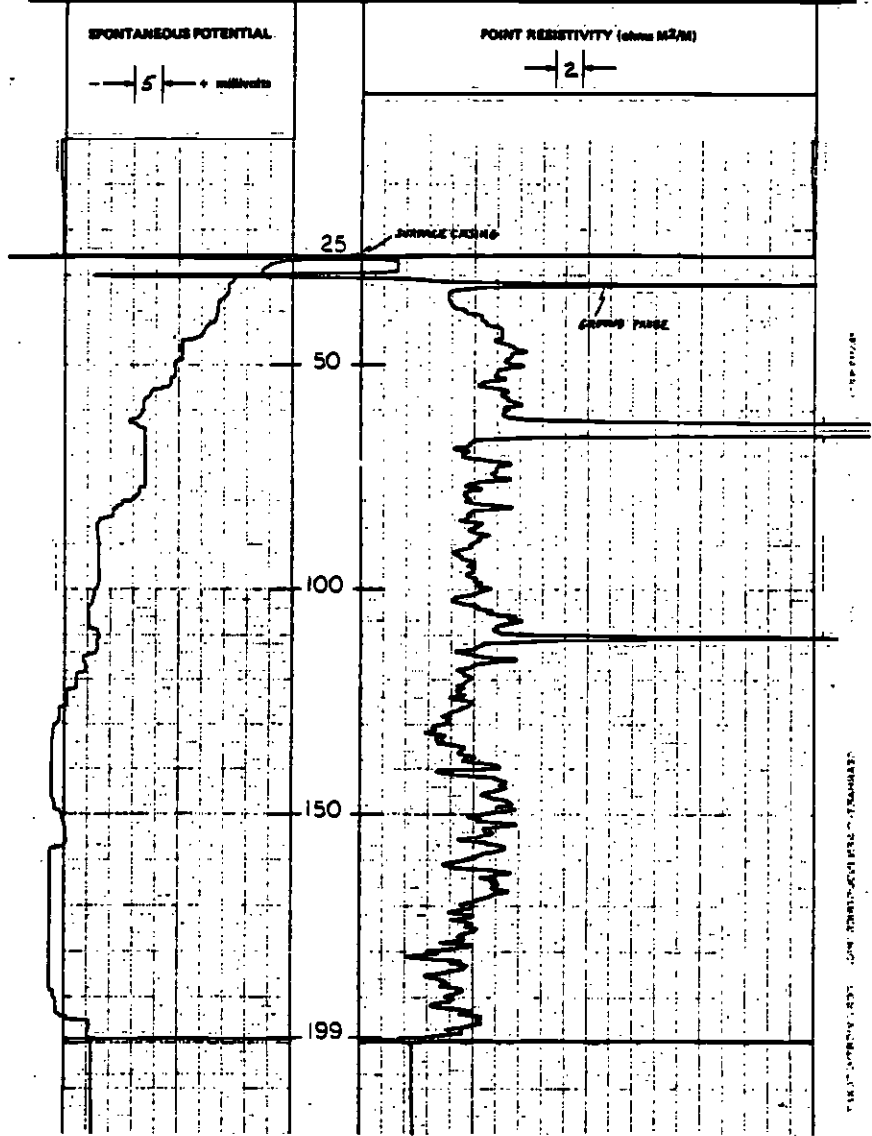


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 1/29/81			
PROJ. NO. 2191-22	Core No. 04E			
WELL: 14	Depth-Offset 199.6			
FIELD:	Depth-Logger 200.0			
COUNTY: LOS ANGELES	Stem Log Interval 199.0			
STATE: CALIFORNIA	Top Log Interval 2.0			
Other Services: GAMMA, CCL, CALIPER, NEUTRON, DENSITY	Core-Offset 5' @ 25'			
	Core-Logger 5' @ 25'			
	Bit Size 7 7/8"			
	Type Fluid in Hole BENZONATE			
	Core, Visc.			
	PH Fluid Loss 7'	all		all
	Source of Sample AND TUB			
	Run @ Max. Temp. 10' @ 60 °F			
	Run @ Min. Temp. 10' @ 60 °F			
	Run @ Max. Temp. 9' @ 60 °F			
	Run @ Min. Temp. 9' @ 60 °F			
	Interval: Prod / Ann			
	Run @ 50FT			
Permanent Datum: G.L.	G.L. 215	Continuation Stopper	1600	
Log Measured From: G.L.	D.F.	Logger on Surface	1980	
Drilling Method/Tool: G.L.	K.B.	Max. Res. Temp.		
		Recorded By	GALIMATTI	

Remarks: LINE SPEED 30 FT/MIN



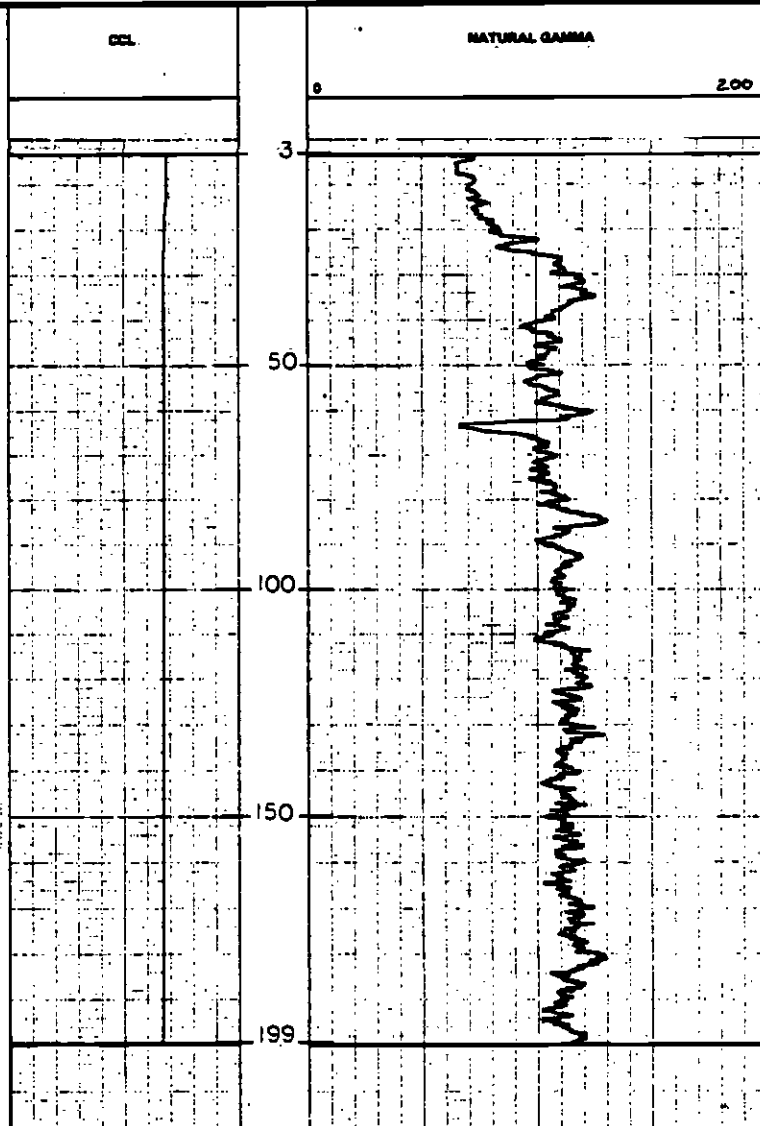


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/29/71			
PROJ. NO. 2191-22	Run No. ONE			
WELL: 14	Depth-Orbit 199.6			
FIELD:	Depth-Logger 200.0			
COUNTY: LOS ANGELES	Sen. Log Interval 199.0			
STATE: CALIFORNIA	Top Log Interval 2.0			
Other Services: S.P. RES. CALVER, MERTON	Casing-Orbit 5" @ 25'			
DEASITY	Casing-Logger 5" @ 25'			
60' EAST OF ARMANDIE AND WILSHIRE INTERSECTION, ON S. SIDE OF WILSHIRE	Bit Size 4 3/4"			
	Type Fluid in Hole DRYPANITE			
	Dens. Visc.			
	pH Field Log 7	ml	ml	ml
	Amount of Sample AWD TUG			
	Run @ Min. Temp. 10.0 @ 60 °F			
	Run @ Min. Temp. 1.0 @ 60 °F			
	Run @ Min. Temp. 9.0 @ 60 °F			
	Run @ Min. Temp.			
	Run @ 50T			
	Circulation Stopped 1600			
	Logger on Bottom 1845			
	Max. Res. Temp.			
	Recorded By GALLIAGUCCI			

Remarks: LINE SPEED 20 FPM



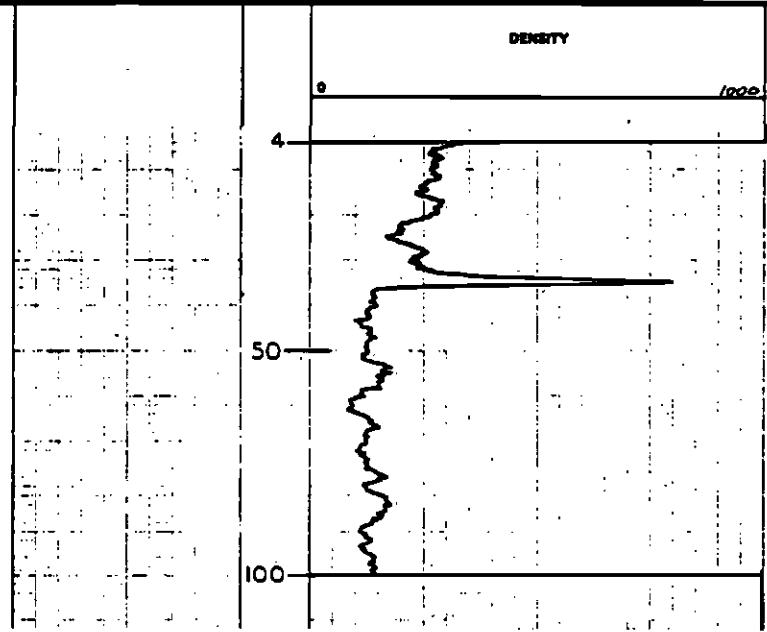


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DENSITY LOG

CLIENT: SCRTD	Date	3/22/81
PROJ. NO. 2191-25	Run No.	TWD
WELL: IV	Depth-Offset	199.6
FIELD:	Depth-Logger	101.0
COUNTY: LOS ANGELES	Shot Log Interval	100.0
STATE: CALIFORNIA	Top Log Interval	4.0
Other Services: SP - RES, NATURAL GAMMA	Casing-Offset	2" ABS @ 200'
CCL, CALIPER, NEUTRON	Casing-Logger	2" ABS @ 200'
60' EAST OF NORMANDIE AND WILSHIRE INTERSECTION, ON SOUTH SIDE OF WILSHIRE	SH Dia	4 1/2"
Location Township Range	Type Fluid in Hole	FRESH WATER
Perviousness Datum: G.L.	Down	Vis.
Log Measured From: G.L.	pH	Field Log
Drilling Measured From: G.L.	Gamma of Sample	NONE
	Res @ Min. Temp.	
	Res @ Max. Temp.	
	Res @ Min. Temp.	
	Res @ Max. Temp.	
	Gamma Res / Rate	
	Res @ SHY	
	Chromatins Suspended	
	Logger on Bottom	
	Max. Res. Temp.	
	Recorded By	MANZAGOL

Remarks: HOLE OBSTRUCTED AT 101 FT. LINE SPEED IS FT./MIN. 1" PVC ALSO PLACED IN HOLE FROM -G.L. TO 30 FT. BENTONITE PLUG BETWEEN PIEZOMETERS AT 27 TO 33 FT. WATER LEVEL IN CASING AT 24.7 FT.



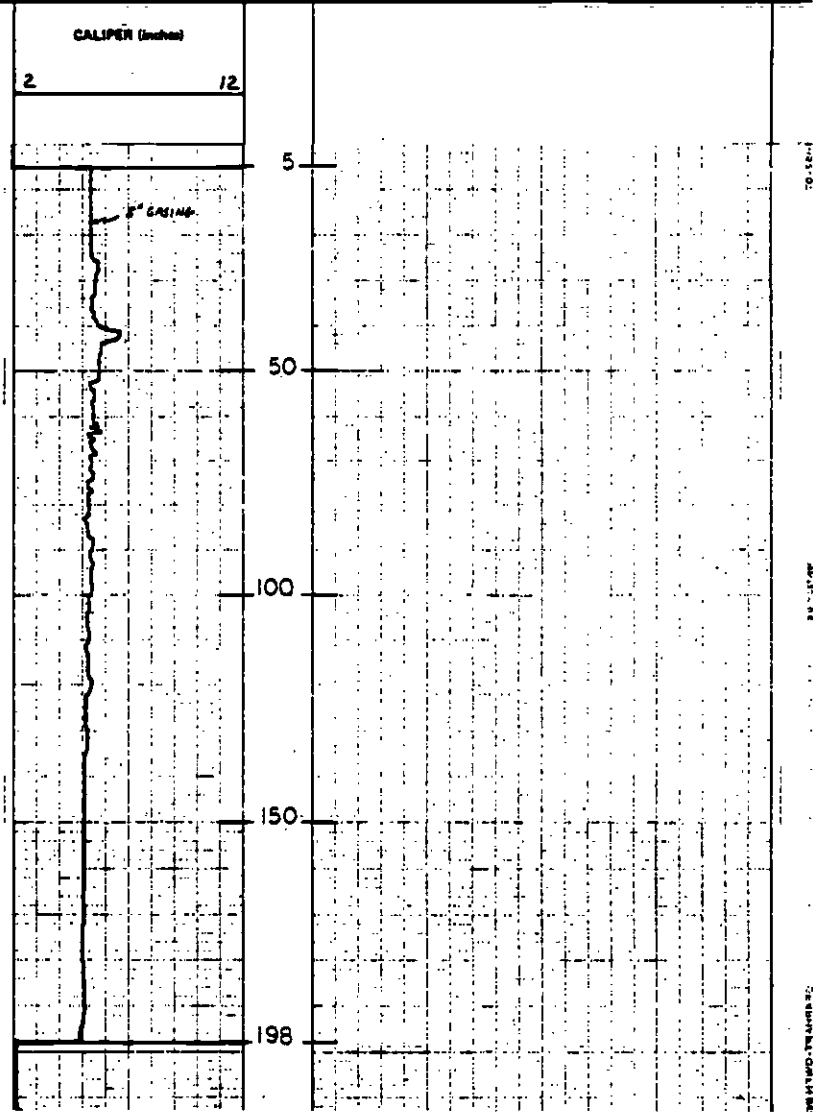


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CALIPER LOG

CLIENT: SCRTD	Date: 1/29/81			
PROJ. NO. 2191-22	Run No. ONE			
WELL: 14	Depth-Offset: 192.6			
FIELD:	Depth-Logger: 2000			
COUNTY: LOS ANGELES	Min. Log Interval: 198.0			
STATE: CALIFORNIA	Top Log Interval: 5			
Other Services: S.P. RES. GAMMA, C.C.L.	Casing-Offset: 5' @ 25'			
	Casing-Logger: 5' @ 25'			
	Bit Size: 4 7/8"			
	Type Fluid in Hole: BENTONITE			
	Flow: Vis:			
	pH: Field Log: 7	ml	ml	ml
	Source of Sample: AND TUB			
NEUTRAL DENSITY	Run @ Min. Temp. 10' @ 60"			
60' EAST OF HERMANDE AND WILSHIRE	Run @ Min. Temp. 10' @ 60"			
INTERSECTION ON THE S. SIDE OF	Run @ Min. Temp. 9.0' @ 60"			
WILSHIRE	Run @ Min. Temp. 9.0' @ 60"			
Section: Township: Range:	Run @ INT: 0' @ 7"			
Permeability Datum: G.L.	G.L. 215			
Log Measured From: G.L.	D.F.			
Drilling Measured From: G.L.	K.B.			
	Core/Section Started: 1600			
	Logger on Section: 1700			
	Min. Run. Temp. 7"			
	Recorded By: GALLIATTI			

Remarks: LINE SPEED 20 FT/MIN.



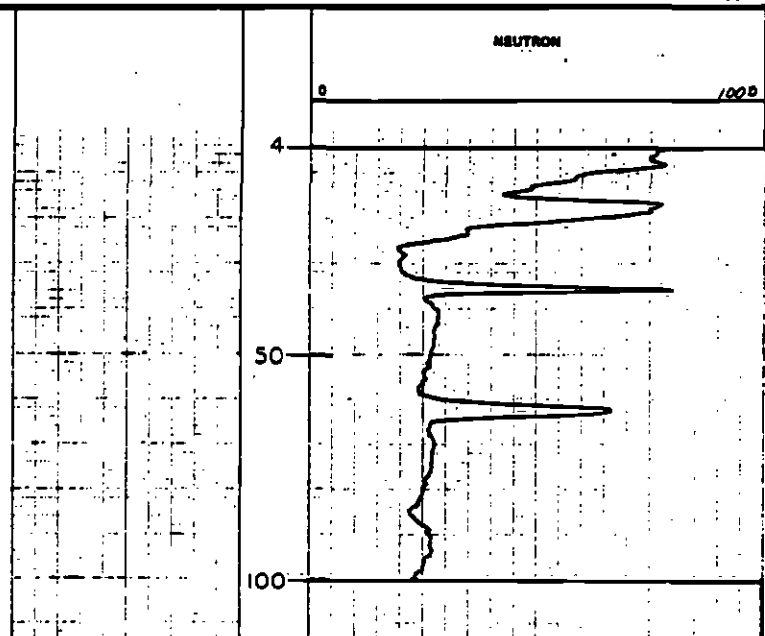


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NEUTRON LOG

CLIENT: SCRTD	Date: 3/22/81
PROJ. NO. 2191-25	Run No. 799
WELL: 14	Depth-Offset 199.6
FIELD:	Depth-Logger 101.0
COUNTY: LOS ANGELES	Blk. Log Interval 100.0
STATE: CALIFORNIA	Top Log Interval 4.0
Other Services: SP-RES, NATURAL, GAMMA CCL, CALIPER, DENSITY	Casing-Offset 2" ABS 200
60' EAST OF NORMANDIE AND WILSHIRE INTERSECTION, ON SOUTH SIDE OF WILSHIRE.	Casing-Logger 2" ABS 200
	Bit Size 4 1/8"
	Type Fluid in Hole FRESH WATER
	Cor. Wts.
	OH - Fluid Loss
	Scale of Sample NONE
	Req. @ Min. Temp. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Req. @ Max. Temp. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Req. @ Min. Temp. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Req. @ Max. Temp. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Sensor Req. / Area <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Req. @ ENT <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Chronotherm Started
	Logger on Bottom
	Max. Res. Temp. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Recorded by MANZAGOL
Permeability Control G.L.	ELEVATION GL 215
Log Measured From G.L.	S.P.
Offset Measured From G.L.	S.B.

Remarks: HOLE OBSTRUCTED AT 101 FT. LINE SPEED 15 FT/MIN. 1" PVC ALSO
PLACED IN HOLE FROM G.L. TO 90 FT. BENTONITE PLUG BETWEEN
PIEZOMETERS AT 27 TO 33 FT. WATER LEVEL IN CASING
AT 24.7 FT.



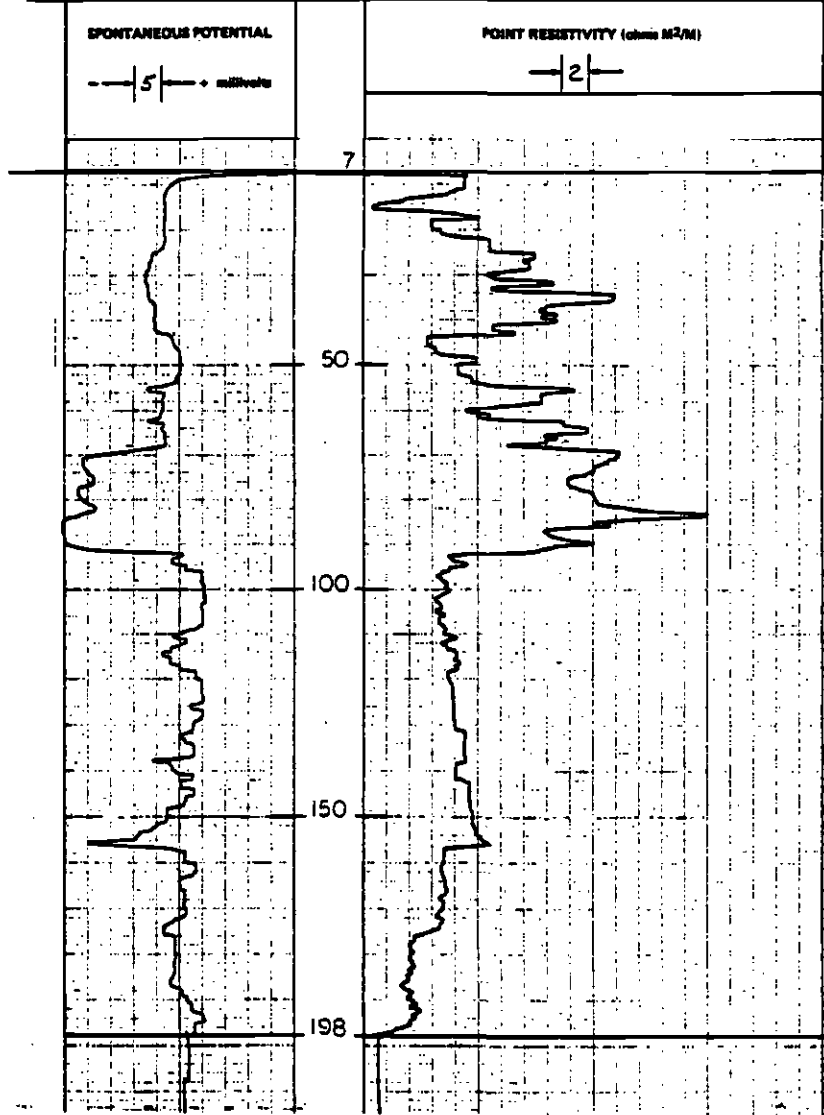


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SP-RESISTIVITY LOG

CLIENT: SCATD	Date: 1/27/81		
PROJ. NO. 2191-22	Run No. 83E		
WELL: 15	Depth-Offset 2.0		
FIELD:	Depth-Logger 199		
COUNTY: LOS ANGELES	Stem Log Interval 198		
STATE: CALIFORNIA	Top Log Interval 7		
Other Services: GAMMA, CCL, CALIPER, NEUTRON	Casing-Offset 5" @ 6'		
	Casing-Logger 5" @ 7'		
	Bit Size 4 7/8"		
	Type Fluid in Hole SEAWATER		
	Temp. Visc.		
	psi Fluid Loss 9	ml	ml
	Source of Sample MUD TUB		
	Run @ Meas. Temp. 9.5 @ 74 °F		
	Run @ Meas. Temp. 9.5 @ 74 °F		
	Run @ Meas. Temp. 9.5 @ 74 °F		
	Seismic Refl / Res		
	Run @ SHY		
Section	Township	Range	
Permanent Datum G.L.	QL 200		
Log Measured From G.L.	D.F.		
Drilling Measured From G.L.	K.B.		
	Chronometer Stoppage 11:00		
	Logger on Station 142.0		
	Meas. Res. Temp.		
	Recorded By MANUEL		

Remarks **LINE SPEED 25' / MIN.**



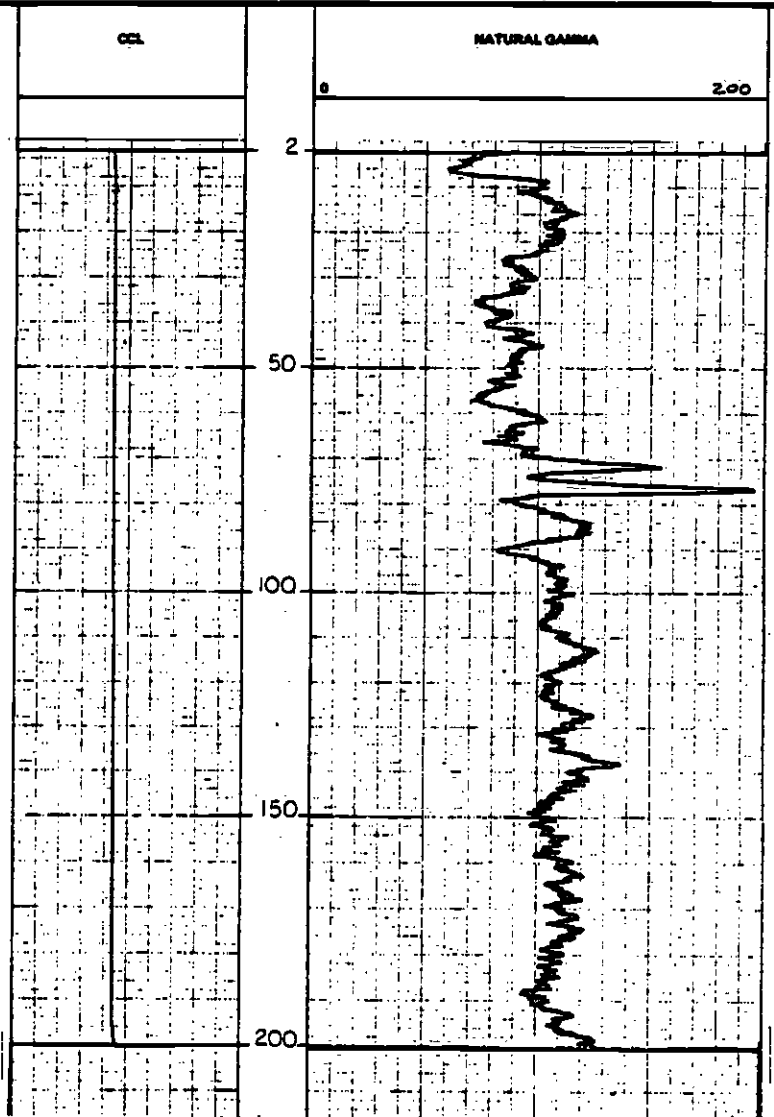


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CCL-GAMMA RAY LOG

CLIENT: SCRTD	Date: 1/27/81			
PROJ. NO. 2191-22	Run No. 42E			
WELL: 15	Depth-Offset 3.0			
	Depth-Logger 387			
	Stem Log Interval 2.00			
FIELD:	Top Log Interval 2			
COUNTY: LOS ANGELES	Contig-Offset 5" @ 6'			
STATE: CALIFORNIA	Contig-Logger 5" @ 6'			
	Bit Size 4 7/8			
Other Services: CALIPER, SP. RES., NEUTRON	Type Fluid in Hole SEAWATER			
	Temp. Vis.			
	pH Fluid Loss			
	Reason of Stop			
LOCATION: SW CORNER OF OXFORD AND WALSHIRE	Run @ Min. Temp. 9.5 @ 74 °F			
ON OXFORD	Run @ Min. Temp. 9.5 @ 74 °F			
	Run @ Min. Temp. 9.5 @ 74 °F			
	Run @ Min. Temp. 9.5 @ 74 °F			
Section	Township	Range		
Permeability Contact G.L.	G.L. 200			
Log Measured From G.L.	S.F.			
Depth Measured From G.L.	S.F.			
	Chlorination Stopped 11:00			
	Logger on Bottom 1335'			
	Max. Run Temp. °F			
	Recorded By MAULASH			

Remarks: **LINE SPEED 20 FPM, CCL READS 3.0 HIGHER THAN DEPTH INDICATED.**



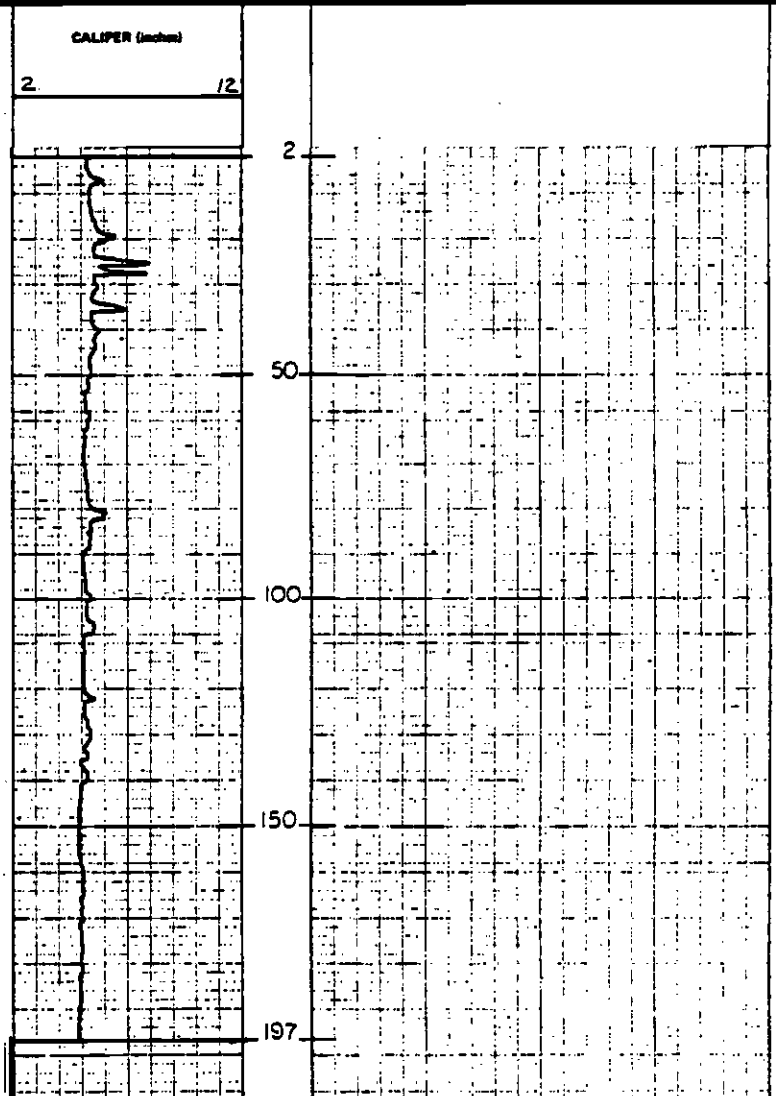


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CALIPER LOG

CLIENT: SCR7D	Date: 1/27/81		
PROJ. NO. 2191-22	Run No. ONE		
WELL: 15	Depth-Driller 300		
FIELD:	Depth-Logger 197		
COUNTY: LOS ANGELES	Max. Log Interval 197		
STATE: CALIFORNIA	Top Log Interval 0		
Other Services: CAMA, CCL, S.P., RES.	Caliper-Driller 5' @ 6'		
	Caliper-Logger 5' @ 6'		
	Bit Size 4 3/4"		
	Type Fluid in Hole DRY DRILL		
	Down. Visc.		
	pH Fluid Loss 9	ml	ml
	NEUTRON		
	Source of Sample FWP TUB		
	Run @ Max. Temp. 9.5 @ 74 °F		
	Run @ Min. Temp. 9.5 @ 74 °F		
	Run @ Max. Temp. 8.5 @ 74 °F		
	Seismic Read. Time		
	Run @ SHY		
	Circulation Stopped 1100		
	Logger on Bottom 1300		
	Max. Run Temp. °F		
	Recorded By PAWELASL		

Remarks: **LINE SPEED 207 fpm**



GENERAL CALIPER LOGS INC. 1504 N. WILSON AVE. LOS ANGELES, CALIF. 90017-1805

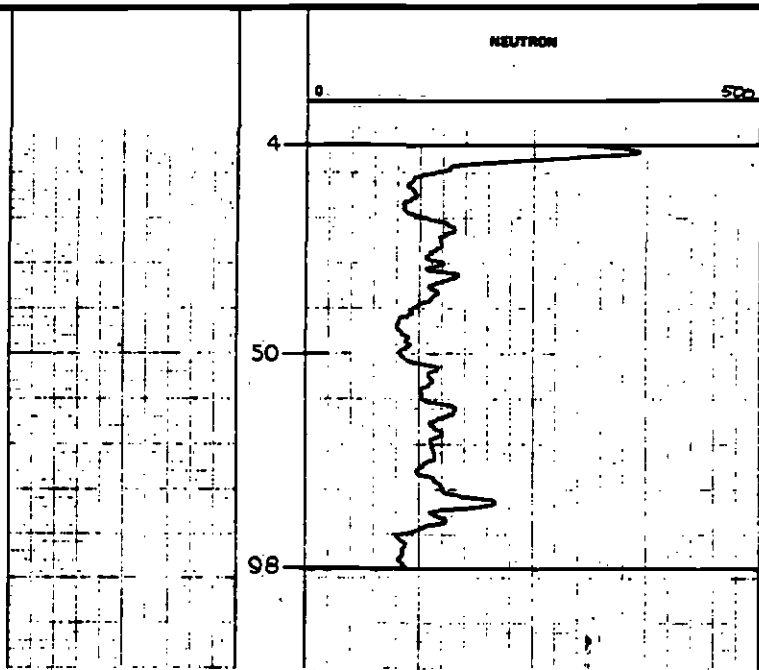


**Converse Ward Davis Dixon
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Geo/Resource Consultants**

NEUTRON LOG

CLIENT: SCRTD	Date	3/22/81
PROJ. NO.: 2191-15	Run No.	TWO
WELL: 15 (PHONE HOLE A)	Depth-Offset	100
FIELD:	Depth-Logger	99
COUNTY: LOS ANGELES	Shot Log Interval	17
STATE: CALIFORNIA	Top Log Interval	4
Other Services: CP-RES, NATURAL GAMMA, CAL, CALIFER.	Casing-Offset	0 3" PVC @ 100'
LOC: NW CORNER OF OXFORD AND WILSHIRE ON OXFORD	Casing-Logger	3" PVC @ 100'
Section	Bit Size	4 1/8"
Township	Type Fluid in Hole	FRESH WATER
Range	Dens.	Vis.
Permanent Datum: G.L.	pH	Fluid Loss
Log Measured From: G.L.	Source of Sample	
Drilling Measured From: G.L.	Run @ Miss. Temp.	
	Run @ Miss. Temp.	
	Run @ Miss. Temp.	
	Run @ Real Rate	
	Run @ BHT	
ELEVATION: 84.200	Checked	1/27/81
	Logged	3/22/81
	Max. Run Temp.	
	Recorded by	MANZAGOL

Remarks: PHONE HOLE A WAS LOGGED, 3" PVC GROUTED IN PLACE, WATER LEVEL IN CASING TO SURFACE, LINE SPEED IS FT/MIN.



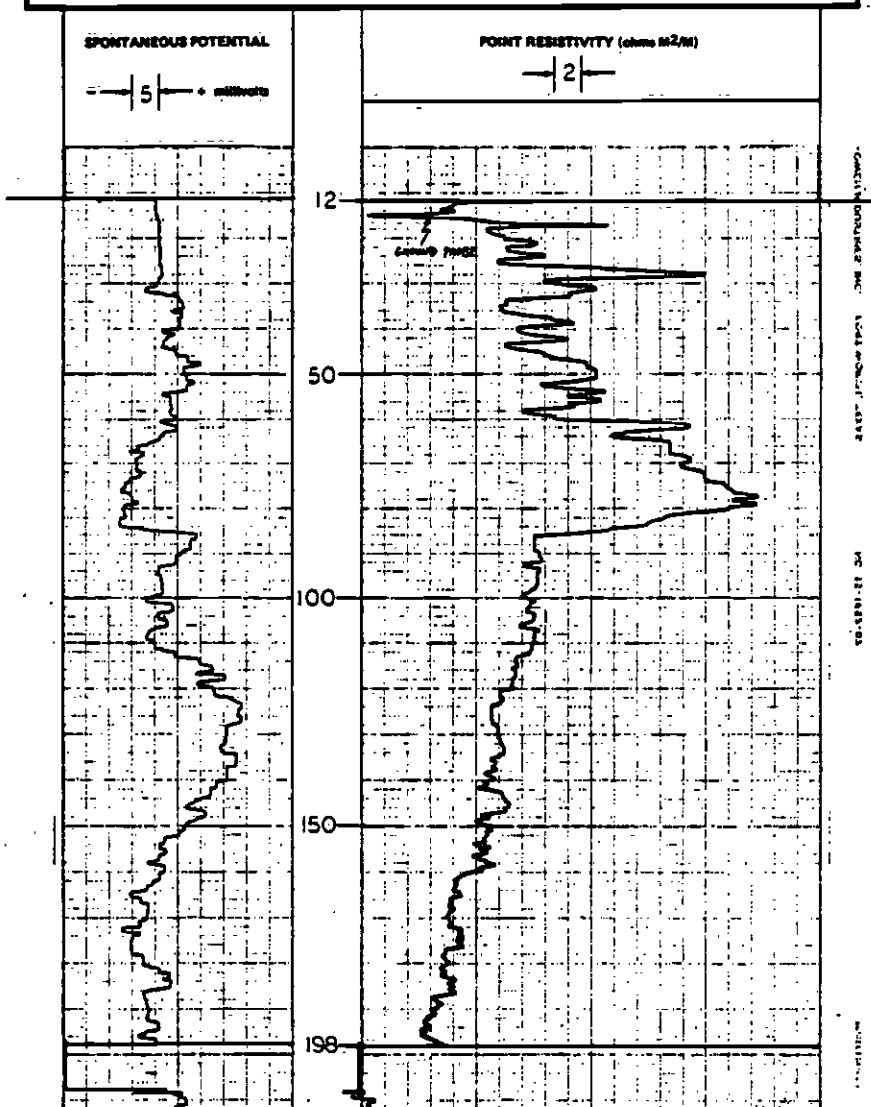


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SP-RESISTIVITY LOG

CLIENT: SCATO	Date: 1/26/81			
PROJ. NO. 2191-22	Run No. one			
WELL: 16	Depth-Offset: 1942			
FIELD:	Depth-Logger: 199			
COUNTY: Los Angeles	Run Log Interval: 198			
STATE: California	Top Log Interval: 18			
Other Services: Gamma, C.C.L. Calveer, Neutron, Density	Casing-Offset: 5" @ 11'			
	Casing-Logger: 5" @ 10'			
	Bit Size: 4 1/2"			
	Type Fluid in Hole: Bentonite			
	Conn. Vis.			
	psi	Fluid Loss	ft	in
	Source of Sample: Mud Tub			
LOCATION: East of Irving Blvd. and Wilshire Blvd. intersection, N. side of Wilshire.	Run @ Mass. Temp. 5.8 @ 75°F			
	Run @ Mass. Temp. 4.5 @ 75°F			
	Run @ Mass. Temp. 5.5 @ 75°F			
Section: Younghi Range	Source: Run / Run			
	Run @ BMT			
Permeameter Output: G.L.	Circulation Diagram: 1600			
Log Measured From: G.L.	Logger on Bottom: 1730			
Drilling Measured From: G.L.	Run. Res. Temp.			
	Recorded By: G. Linth			

Remarks: Line Speed 30 FT/MIN



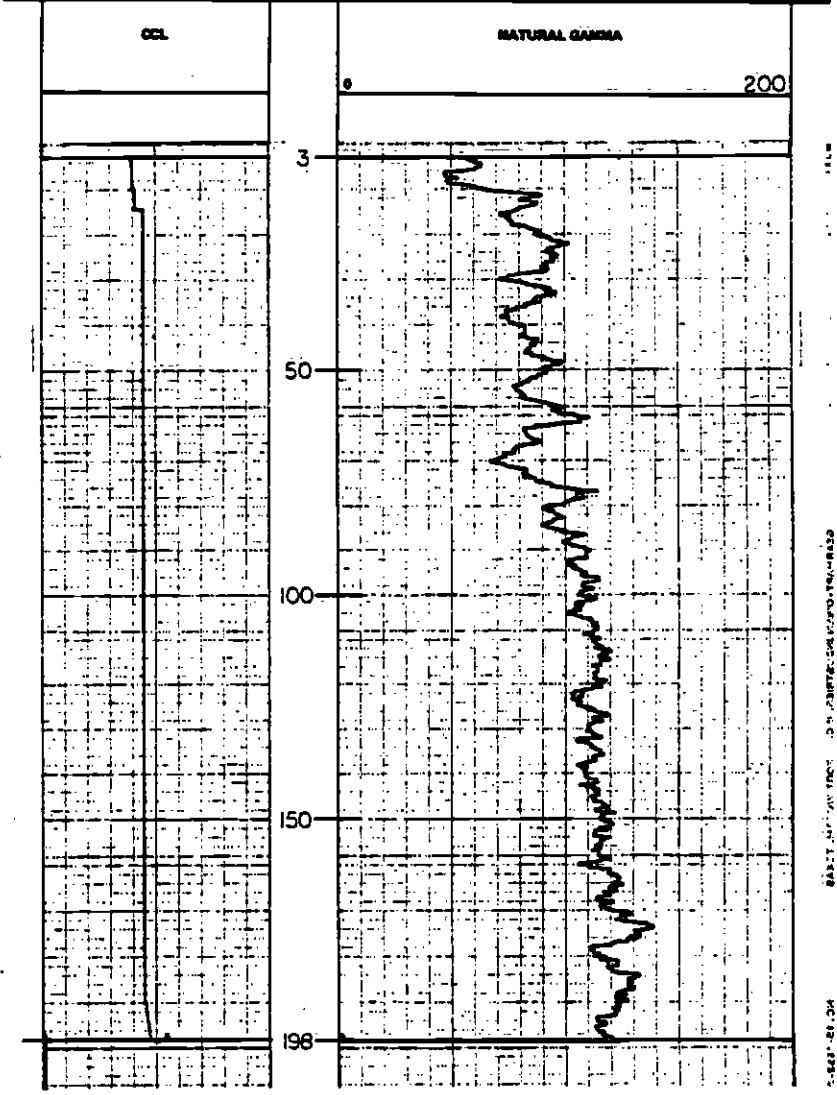


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CCL-GAMMA RAY LOG

CLIENT: SCATO	Date: 1/26/81			
PROJ. NO. 2191-22	Run No. 2012			
WELL: 16	Depth-Offset 199.2			
FIELD:	Depth-Logger 199			
COUNTY: Los Angeles	Min. Log Interval 198			
STATE: California	Top Log Interval 3			
Other Services: S.A. Res. Caliper, Neutron Density	Casing-Offset 5' 0 1/2"			
	Casing-Logger 5' 0 1/2"			
	Bit Size 4 7/8"			
	Type Fluid in Hole Bentonite			
	Dens. Win.			
	pH Fluid Loss 0 ml			
	Screen of Sample Fluid Tub			
	Run @ Min. Temp. 5.8 @ 75 °F			
	Run @ Min. Temp. 4.5 @ 75 °F			
	Run @ Min. Temp. 5.8 @ 75 °F			
	Screened Mud / Rate			
	Run @ 800'			
	Chatterbox Observed 1600'			
	Logger on Bottom 1845'			
	Min. Res. Temp.			
	Recorded By Gallinat			
Permeameter Details: Core G.L. 211				
Log Observed From: Core G.L.				
Logging Observed From: G.L.				

Remarks: Line Speed 20 FT/MIN, CCL READS 30' HIGHER THAN INDICATED



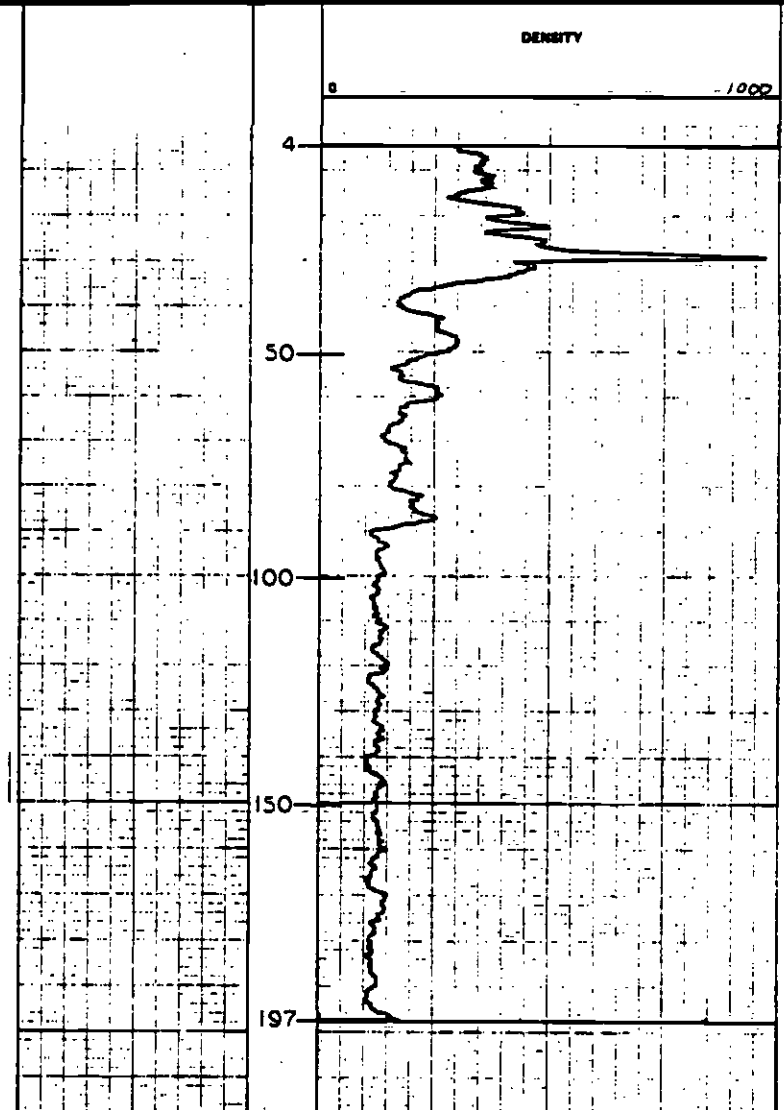


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DENSITY LOG

CLIENT: SCRTD	Date	3/29/91
PROJ. NO. 2191-25	Run No.	TWO
WELL: 16	Depth-Offset	199.2'
FIELD:	Depth-Logger	198
COUNTY: LOS ANGELES	Stm. Log Interval	197
STATE: CALIFORNIA	Top Log Interval	4
Other Services: SP, RES, NATURAL GAMMA, CCL, CALIPER, NEUTRON	Casing-Offset	2" ABOVE 200'
EAST OF IRVING BLVD AND WILSHIRE BLVD INTERSECTION, NORTH SIDE OF WILSHIRE.	Casing-Logger	2" ABOVE 200'
	Bit Size	4 1/2"
	Type Fluid in Hole	FRESH WATER
	Dens. Vis.	
	gal. Fluid Loss	
	State of Sample	NONE
	Run @ Mass. Temp.	
	Start @ Mass. Temp.	
	Rate @ Mass. Temp.	
	Source Prod. Rate	
	Run @ BHT	
Permanent Datum: G.L.	GL 211	1/26/91
Log Measured From: G.L.	BP.	3/29/91
Drilling Measured From: G.L.	K.S.	
	Recorded By	MANZAGOL

Remarks: LINE SPEED IS FT/MIN, WATER LEVEL AT 35.2 FT IN CASING, 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 80 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT 75 TO 80 FT.



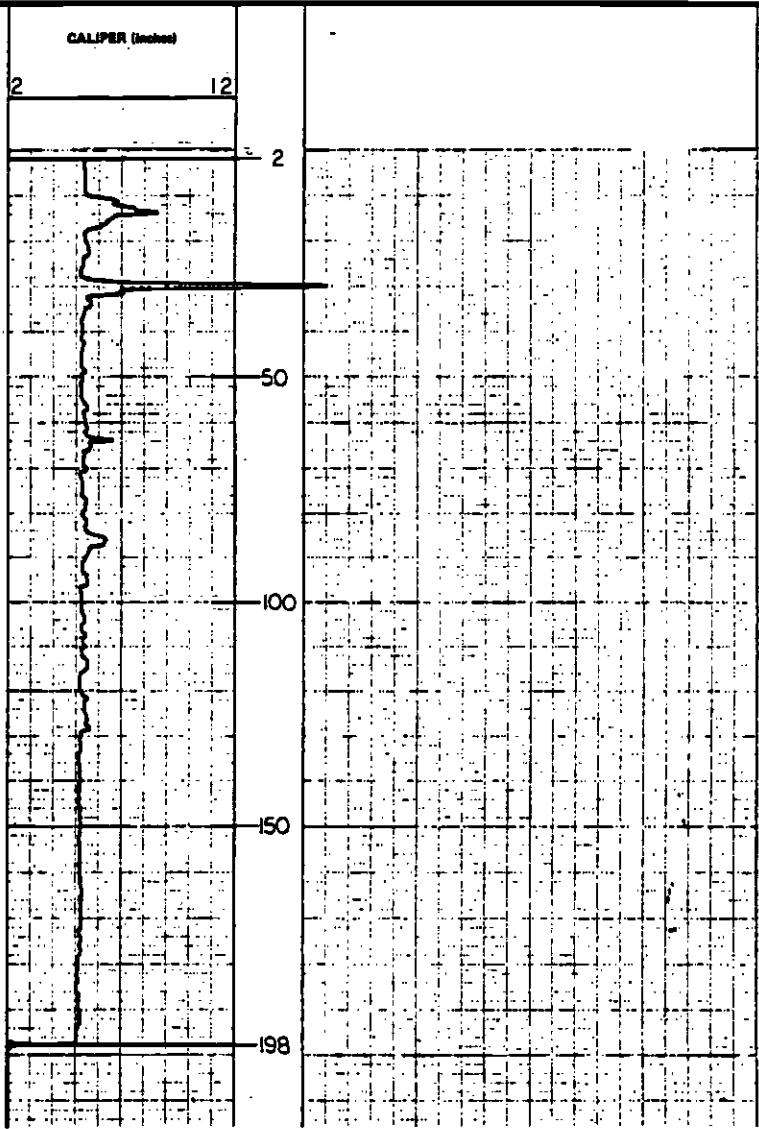


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CALIPER LOG

CLIENT: SCATO	Date: 1/26/81
PROJ. NO. 2191-22	Run No. 005
WELL: 16	Depth-Order 199.2
FIELD:	Depth-Logger 100
COUNTY: Los Angeles	Stem Log Interval 1.0
STATE: California	Tap Log Interval 2'
Other Services: Gamma, C.C., S.P., A.S.	Caliper-Order 5" @ 11'
Neutron Density	Caliper-Logger 5" @ 10'
East of Tring Blvd. and	Bit Size 4 7/8"
Wilshire Blvd intersection, N.	Type Fluid in Hole Bentonite
Side of Wilshire	Down. Visc. 0
Section	SPR Field Log 0
Turnable	Recovery of Samples 77% Tub
Range	Run @ Min. Temp. 5.8 @ 75 °F
Permeable Datum: G.L.	Run @ Max. Temp. 4.5 @ 75 °F
Log Measured From: G.L.	Run @ Min. Temp. 5.5 @ 75 °F
Drilling Measured From: G.L.	Recovery: Run / Stop
	Run @ BHT 0
	Check-out Stopped 16:00
	Logged up to 16:30
	Min. Run Temp. 0
	Recorded By: G.H. [Signature]

Remarks: Line Speed 20 FT/MIN.



CALIPER LOG
 1-26-81
 G.H. [Signature]

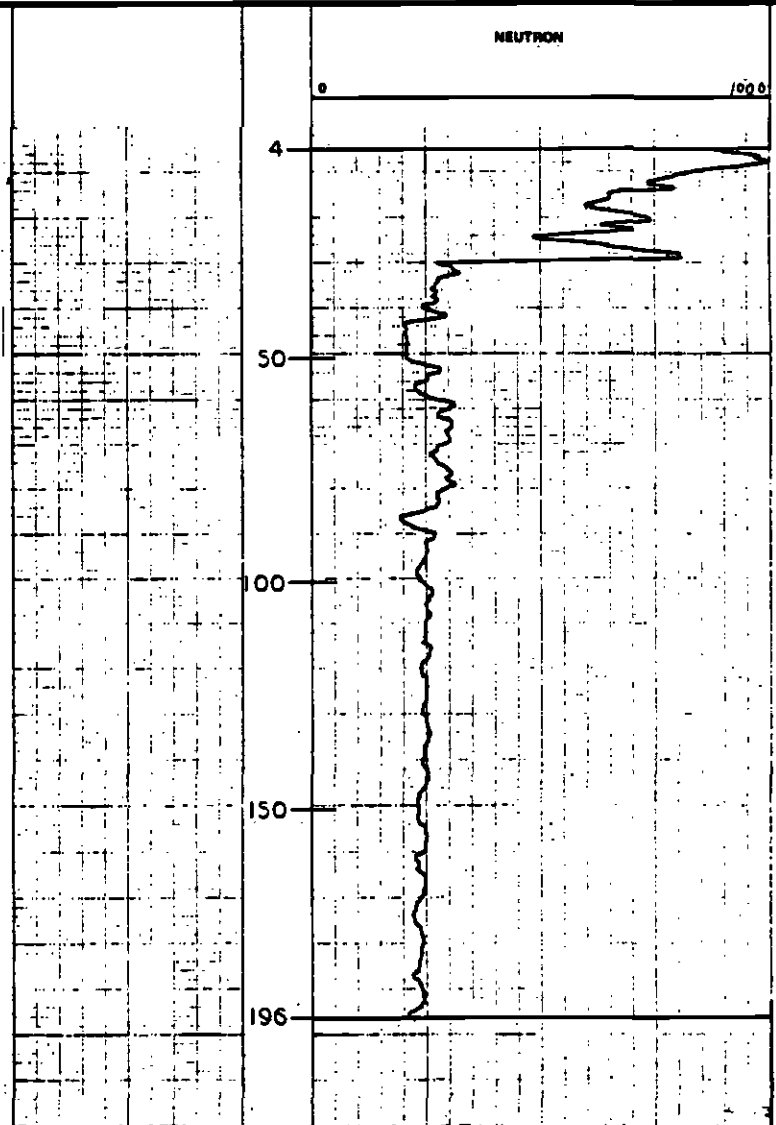


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NEUTRON LOG

CLIENT: SCRFD	Date	3/29/81
PROJ. NO. 2191-25	Run No.	TWO
WELL: 16	Depth-Driller	199.2
FIELD:	Depth-Logger	197
COUNTY: LOS ANGELES	Stem Log Interval	194
STATE: CALIFORNIA	Top Log Interval	4
Other Services: GP RES, NATURAL GAMMA, CCL CALIPER, DENSITY	Casing-Driller	ZAES 220'
	Casing-Logger	ZAES 220'
	Stm Size	4 1/2"
	Type Fluid in Hole	FRESH WATER
	Dens. Visc.	
	pH Fluid Loss	
	Source of Records	NONE
	Run @ Min. Temp.	
	Run @ Min. Temp.	
	Run @ Min. Temp.	
	Source Run / Run	
	Run @ GWT	
	Chronometer Checked	3/26/81
	Logger on Bottom	3/29/81
	Min. Run Temp.	
	Recorded By	MANZA GOL

Remarks: **LINE SPEED 16 FT/MIN, WATER LEVEL AT 32.5 FT IN CASING, 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 80 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT 75 TO 80 FT.**



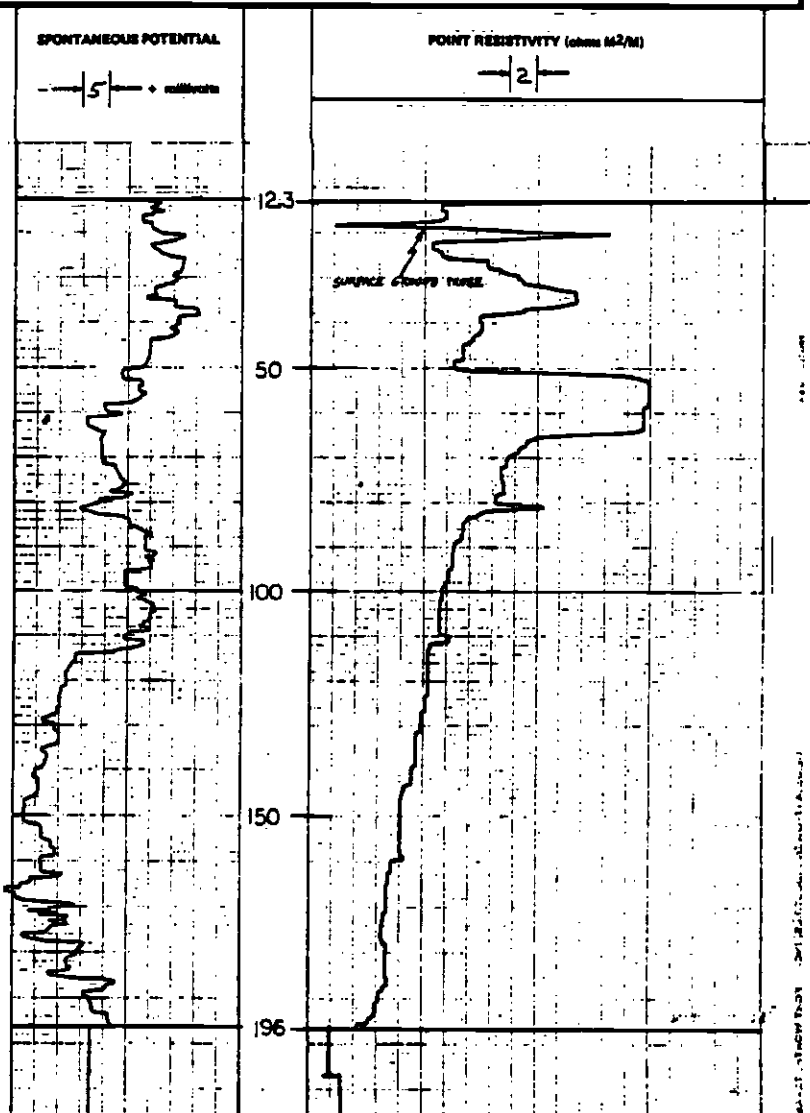


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SP-RESISTIVITY LOG

CLIENT: SCRTP	Date: 11/19/81	Run No. 048		
PROJ. NO. 2191-22	Depth-Cable 201	Depth-Logger 177		
WELL: 17	Bot. Log Interval 176	Top Log Interval 123		
FIELD:	Casing-Depth 5' @ 3'	Casing-Logger		
COUNTY: LOS ANGELES	Bot. Elev. 435'	Type Fluid in Hole SEAWATER		
STATE: CALIFORNIA	Down	Up		
Other Services: LAMAR, CCL, CALIFER	pH	Fluid Loss		
NEUTRON DENSITY	Source of Sample MUD TUB	Run @ Min. Temp. 6.5 @ 58 °F		
100' INT. OF MUIRFIELD M. AND	Run @ Min. Temp. 6.5 @ 58 °F	Run @ Min. Temp. 6.0 @ 58 °F		
WILSHIRE INTERSECTION, N. SIDE OF	Down @ Bot. Rate	Run @ BWT.		
WILSHIRE	Station	Township	Range	
Permeam Depth: 6L	S.L. 196	Completion Stopped 1430		
Log Measured From 6L	D.P.	Logger on Bottom 1820		
Drilling Measured From 6L	K.S.	Max. Res. Temp.		
		Recorded By: MADRAGE		

Remarks: **LINE SPEED 35 F/HR**



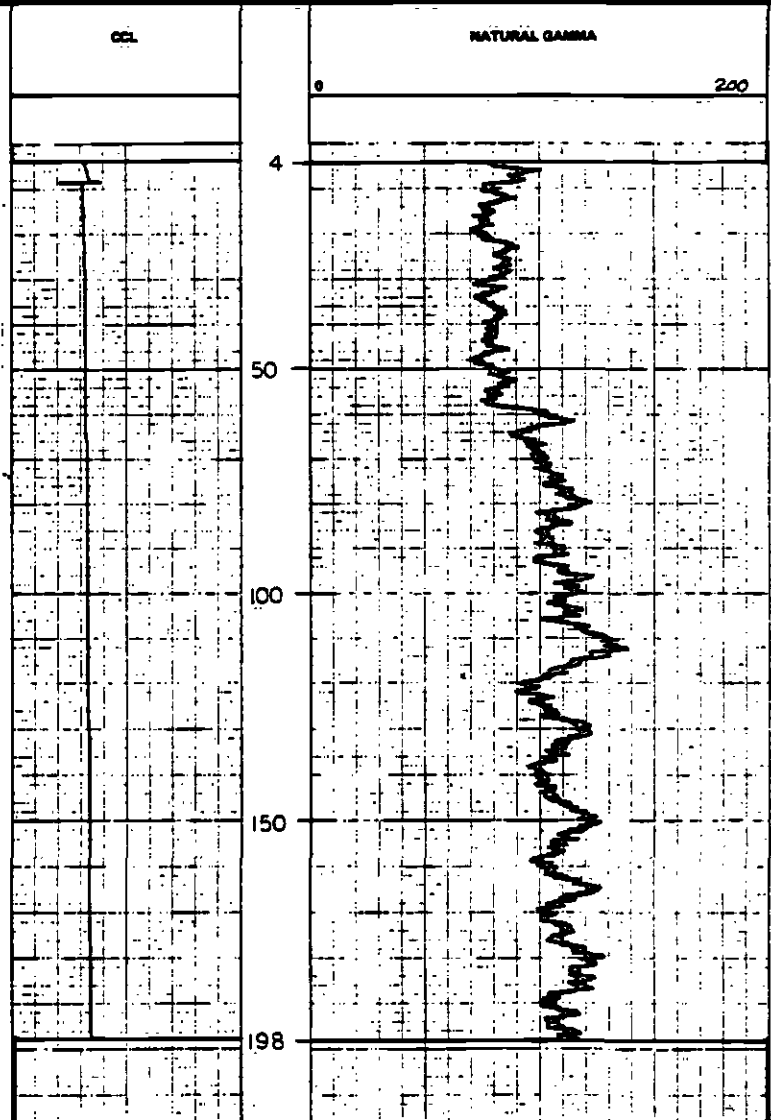


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/17/81	Run No. GNE			
PROJ. NO. 2191-22	Depth-Offset: 281	Depth-Logger: 199			
WELL: 17	Min. Log Interval: 178	Top Log Interval: 4			
FIELD:	Casing-Offset: 5' 0.5"	Casing-Logger: 5' 0.5"			
COUNTY: LOS ANGELES	Bit Size: 4 7/8"	Type Fluid in Hole: BENTONITE			
STATE: CALIFORNIA	Down: Visc.	Down: pH	Field Loss	ml	ml
Other Services: S.P., RES., CALIFER.	Scale of Sample: MUD TUB	Run @ Min. Temp. 8.5 @ 58 °F			
NEUTRON DENSITY	Run @ Min. Temp. 8.5 @ 58 °F	Run @ Min. Temp. 8.0 @ 58 °F			
100' EAST OF MUIRFIELD RA. AND WILSHIRE INTERSECTION, N. SIDE OF WILSHIRE	Run @ Min. Temp. 8.0 @ 58 °F	Run @ Min. Temp. 8.0 @ 58 °F			
Section	Thickness	Range	Run @ Min. Temp.		
Permeant Column: G.L.	R.L. 196		Checkouts Skipped: 1438		
Log Measured From: G.L.	D.P.		Logger on Bottom: 1600		
Drilling Measured From: G.L.	N.S.		Max. Run Temp. °F		
			Recorded By: GALLIATTI		

Rotation: LINE SPEED 20 FT/MIN.



10-5581-21-01
 BAKER, HENRY 1981
 C.W. 82-87-004 P.001-TR-04-83

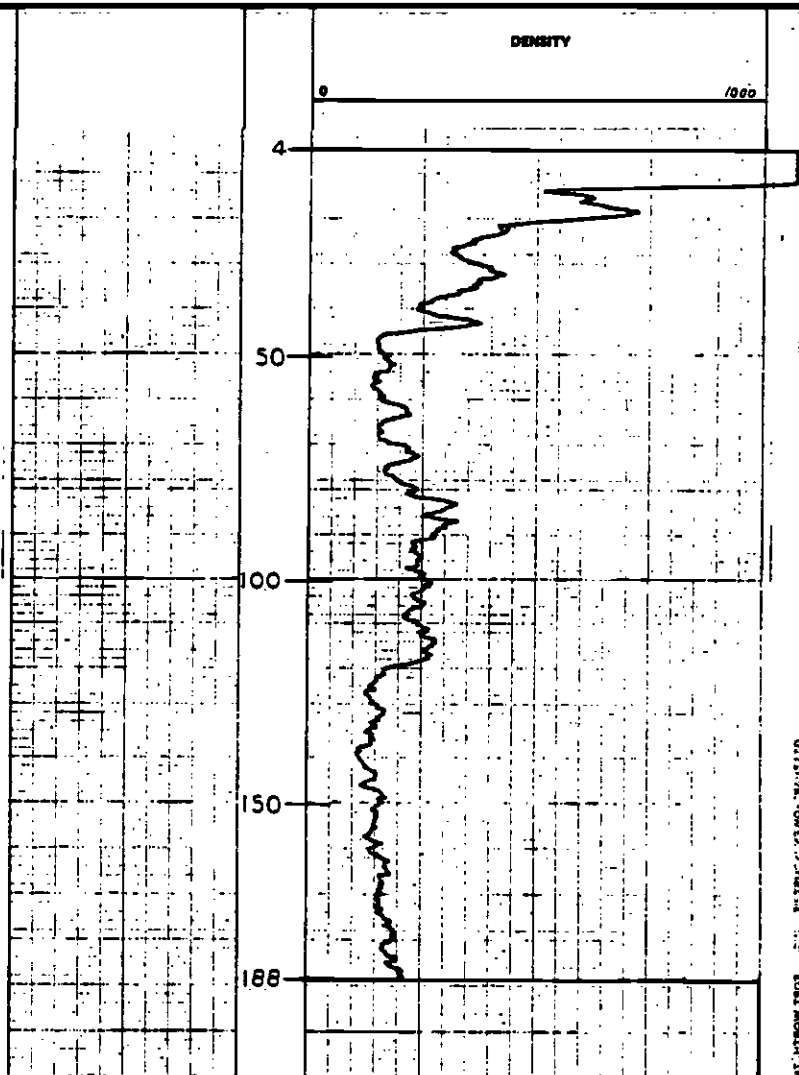


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DENSITY LOG

CLIENT: SCATD	Date	3/29/81							
PROJ. NO. 219125	Run No.	7560							
WELL: 17	Depth-Offset	201							
FIELD:	Depth-Logger	179							
COUNTY: LOS ANGELES	Min. Log Interval	1.00							
STATE: CALIFORNIA	Top Log Interval	4							
Other Services: SP RES. NATURAL GAMMA	Casing-Offset	2' ABSO 200'							
CGL CALIFORNEAN NEUTRON	Casing-Logger	2' ABSO 200'							
100' EAST OF MURFIELD RD AND WILSHIRE BLVD INTERSECTION N. SIDE OF WILSHIRE.	Bit Size	4 1/2"							
Station	Toolface	Range	True Fluid in Hole						
Formation Density	G.L.	W.L.	Q.S.	Q.S.					
Log Measured From	G.L.	W.L.	Q.S.	Q.S.					
Drilling Measured From	G.L.	W.L.	Q.S.	Q.S.					
			Dens.	Vis.					
			pH	Field Loss	ad	ad	ad		
			Source of Sample						
			Run @ Min. Temp.	0	0	0	0	0	0
			Run @ Max. Temp.	0	0	0	0	0	0
			Run @ Min. Temp.	0	0	0	0	0	0
			Run @ Max. Temp.	0	0	0	0	0	0
			Temperature	0	0	0	0	0	0
			Run @ BHT	0	0	0	0	0	0
			Corrections						
			Log on Bottom						
			Max. Res. Temp.						
			Recorded By						

Minimum LINE SPEED IS FT/MIN, WATER LEVEL IN CASING AT 24.9 FT,
HOLE OBSTRUCTED AT 189 FT.



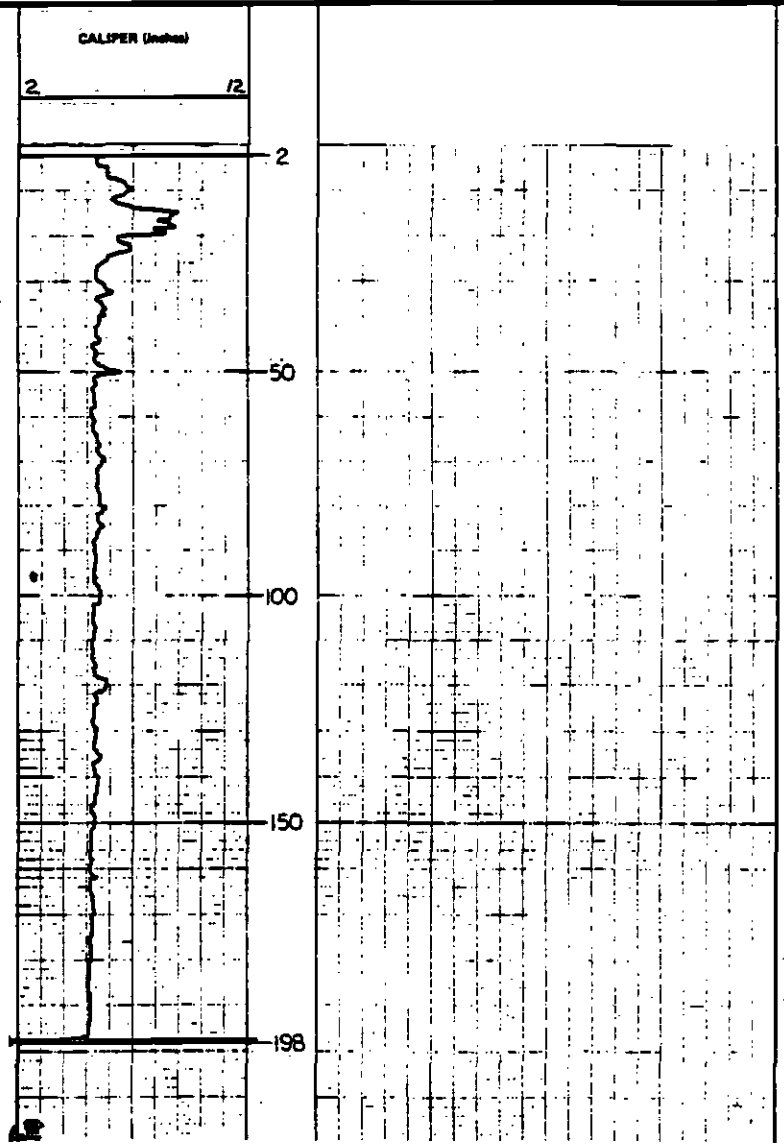


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CALIPER LOG

CLIENT: SLRTD	Date: 1/19/81								
PROJ. NO. 2191-22	Run No. 042								
WELL: 19	Depth-Offset 201								
FIELD:	Depth-Logger 700								
COUNTY: LOS ANGELES	Run Log Interval 198								
STATE: CALIFORNIA	Top Log Interval 2								
Other Services: LAMPA, CCL, S.P., RES	Casing-Offset 5" @ 5'								
NEUTRON, DENSITY	Casing-Logger 5" @ 5'								
100' EAST OF FAIRFIELD RD. AND	GR Size #4								
WILSHIRE INTERSECTION, N. SIDE OF	Type Fluid in Hole DEIONIZED								
WILSHIRE									
Station	Township	Range	Sec	Field Log	PH	Vis.	ml	ml	ml
				Source of Sample	MUD TOR				
				Run @ Min. Temp.	6.6 @ 58 °F				
				Run @ Max. Temp.	8.6 @ 58 °F				
				Run @ Mean Temp.	8.0 @ 58 °F				
				Run @ SAT	0 °F				
				Chromatic Stripped	1450				
				Logger on Bottom	1815				
				Min. Run Temp.					
				Recorded By	GALLINATI				
Formused Datum	G.L.	ELEVATION	G.L. - 196						
Log Measured From	G.L.	D.F.							
Cutting Measured From	G.L.	H.B.							

Remarks: **LAME SPEED 20.74 MIN**



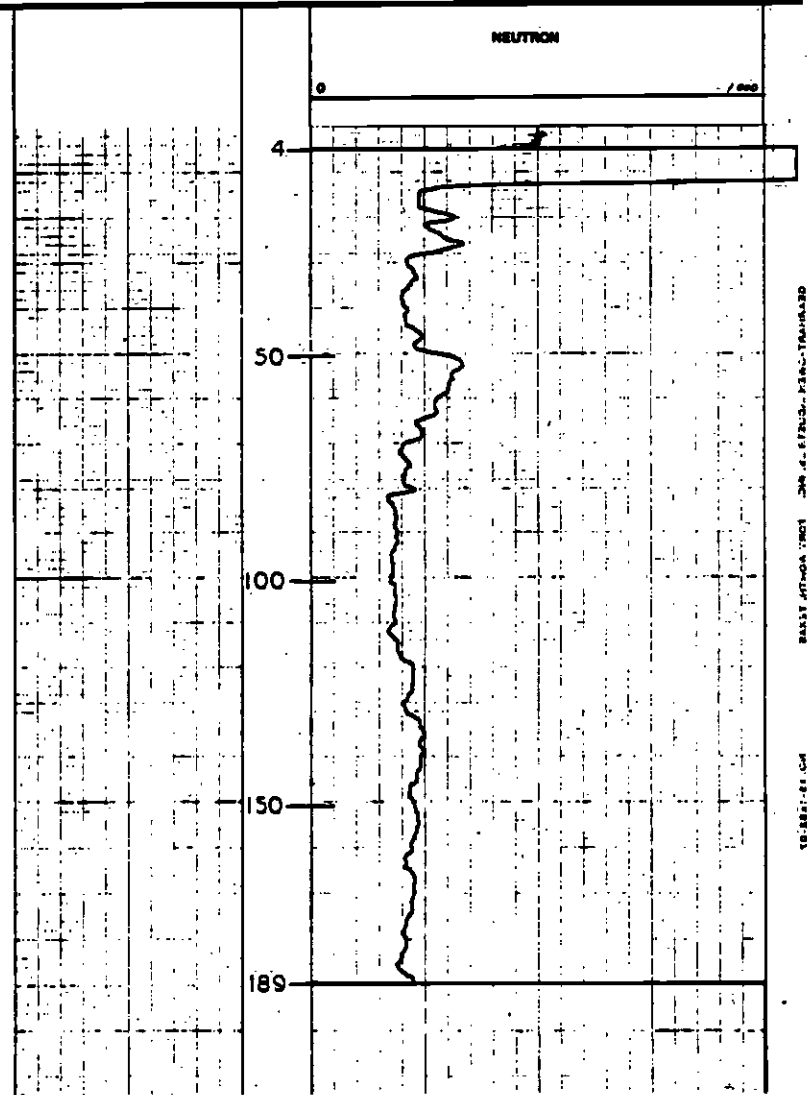


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NEUTRON LOG

CLIENT: SCRTP	Date	3/29/81		
PROJ. NO. 271-25	Well No.	TWO		
WELL: 17	Depth-Offset	201		
FIELD:	Depth-Logger	190		
COUNTY: LOS ANGELES	Dev. Log Interval	189		
STATE: CALIFORNIA	Top Log Interval	4		
Other Services SP, RES, NATURAL GAMMA, CAL CALIPER, DENSITY	Casing-Offset	2' ABOVE 200'		
	Casing-Logger	2' ABOVE 200'		
	Bit Size	4 1/2"		
	Type Fluid in Hole	FRESH WATER		
	Chem. Visc.			
	pH Fluid Loss			
	Source of Sample	NONE		
	Res @ Min. Temp.			
	Res @ Max. Temp.			
	Res @ Min. Temp.			
	Res @ Max. Temp.			
	Res @ Min. Temp.			
	Res @ Max. Temp.			
	Res @ Min. Temp.			
	Res @ Max. Temp.			
	Res @ Min. Temp.			
	Res @ Max. Temp.			
Permeability Depth	GL	GL	196	1/19/81
Log Measured From	GL	D.P.		3/29/81
Drilling Measured From	GL	R.S.		MANJASOL

Remarks: **LINE SPEED IS FT/MIN, WATER LEVEL IN CASING AT 24.9 FT, HOLE OBSTRUCTED AT 190 FT.**



BASIC APPROX. T.M.C.T. DR. 4. - F.P.H.D. - PERC. - T.M.H. 189-81-01-01

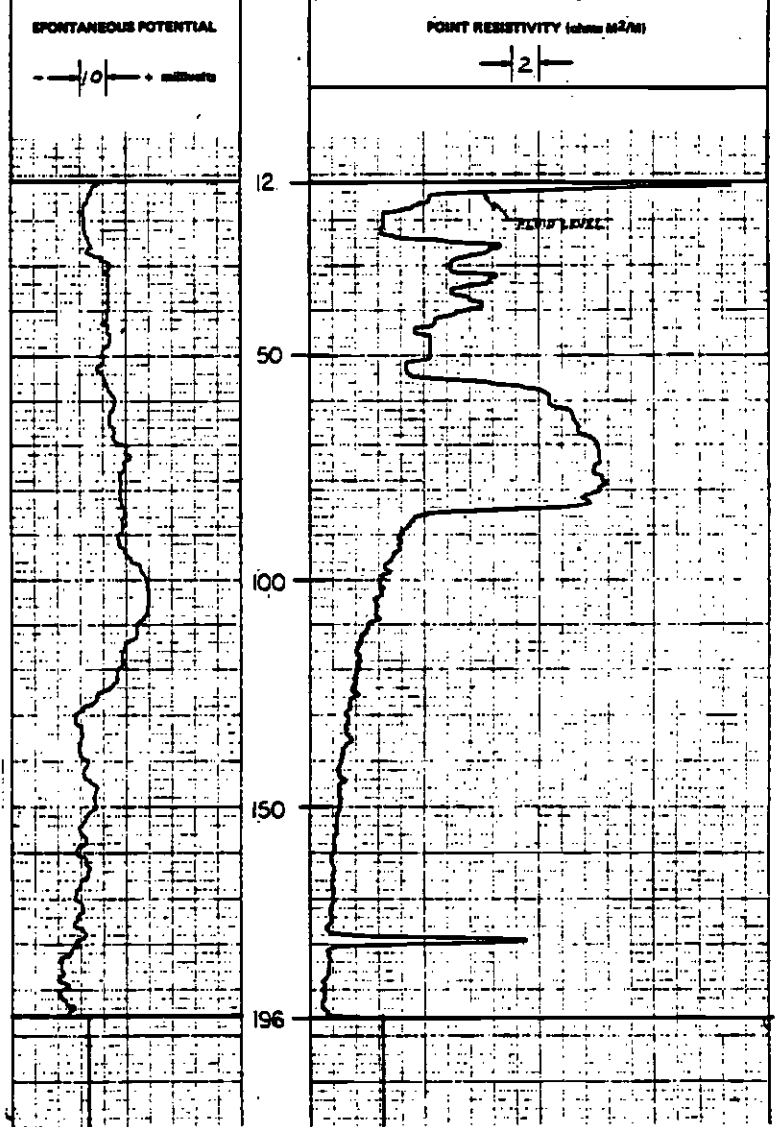


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 1/21/71				
PROJ. NO.: 2191-22	Run No.: ONE				
WELL: 18	Depth-Offset: 201				
	Depth-Logger: 197				
	Min. Log Interval: 176				
FIELD:	Top Log Interval: 12				
COUNTY: LOS ANGELES	Offset-Offset: 4' @ 5"				
	Offset-Logger:				
STATE: CALIFORNIA	Site Size: 4 1/4'				
	Type Fluid to Hole: SEAWATER				
Other Services: LAMMA, CCL, CALIFEE, NEUTRON	Down:	Up:			
	PHI - Fluid Loss: 8 ml				
	Sumner of Borate: AND TUB				
NEW CORNER OF WILSHIRE AND LA BREA AVE. ON WILSHIRE	Res @ Min. Temp.: 2.2 @ 71 °F				
	Res @ Min. Temp.: 4.5 @ 71 °F				
	Res @ Min. Temp.: 6.5 @ 71 °F				
Location:	Sumner: Resist	Rate:			
Township:	Res @ 50FT:				
Range:	Classification Observed: 1400				
Permanent Contact: G.L.	Log on Bottom: 1555				
Log Measured From: G.L.	Min. Res. Temp.:				
Drilling Measured From: G.L.	Recorded By: MANBAGL				

Remarks: LINE SPEED 25 FT/MIN.



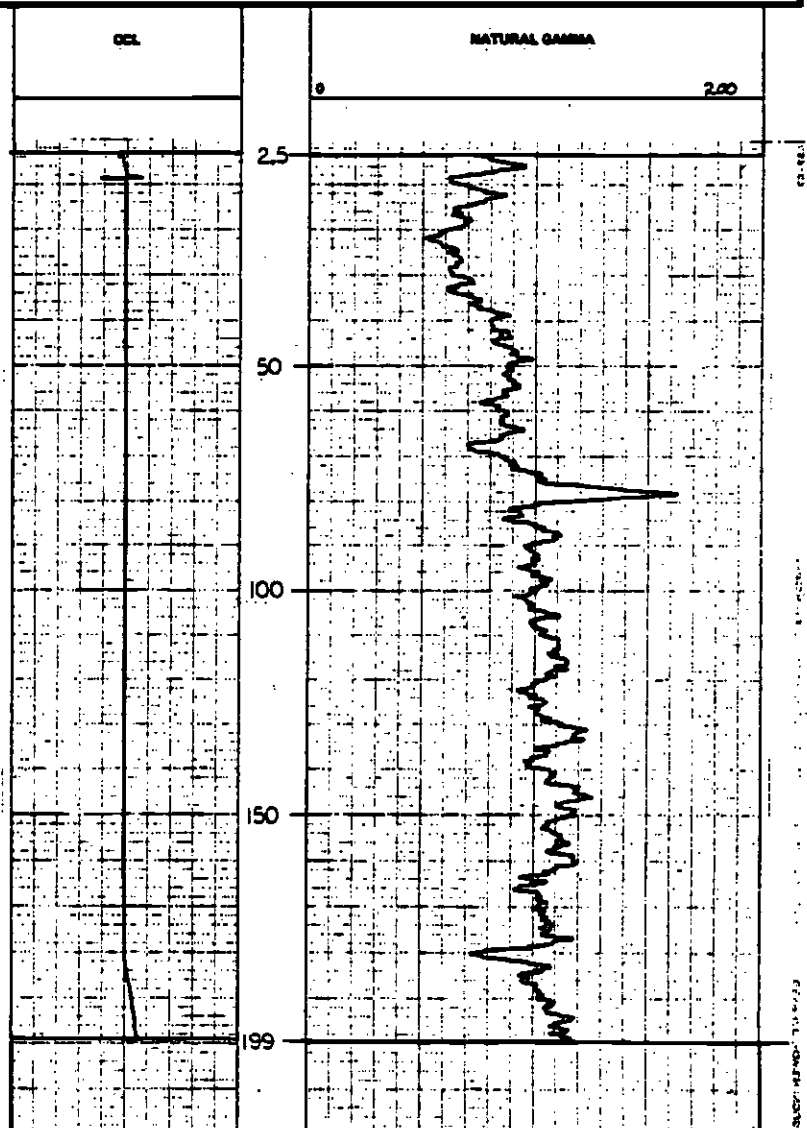


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CCL-GAMMA RAY
LOG

CLIENT: SCRTO	Date: 1/21/81		
PROJ. NO. 2191-22	Run No. 046		
WELL: 18	Depth-Counter 201		
FIELD:	Depth-Logger 200		
COUNTY: LOS ANGELES	Dist. Log Interval 1.5		
STATE: CALIFORNIA	Outcrop-Counter 4' @ 5"		
Other Services: S.P., RES., CALIFOR.	Outcrop-Logger 5' @ 5"		
ALBERTA	Min. Site 47%		
NW CORNER OF WILSHIRE AND LA BREA AVE., ON WILSHIRE	Type Field in Use NONWHITE		
	Dist. Min.		
	Dist. Max.		
	Dist. Min. Log		
	Dist. Max. Log		
	Source of Sample ADD TUB		
	Run @ Min. Temp. 5.9 @ 71 °F		
	Run @ Max. Temp. 4.5 @ 71 °F		
	Run @ Min. Temp. 6.8 @ 71 °F		
	Run @ Max. Temp.		
	Run @ 50FT		
	Countdown Stopped 1430		
	Logger on Bottom 1530		
	Max. Run Temp.		
	Recorded By MANABOL		
Permeability 6.L	Q.L. 194		
Log Measured From 6.L	D.P.		
Drilling Measured From 6.L	N.B.		

Remarks: **LINE SPEED 20 FT/MIN. CCL READS MINUS 3.0' FROM DEPTH INDICATED**



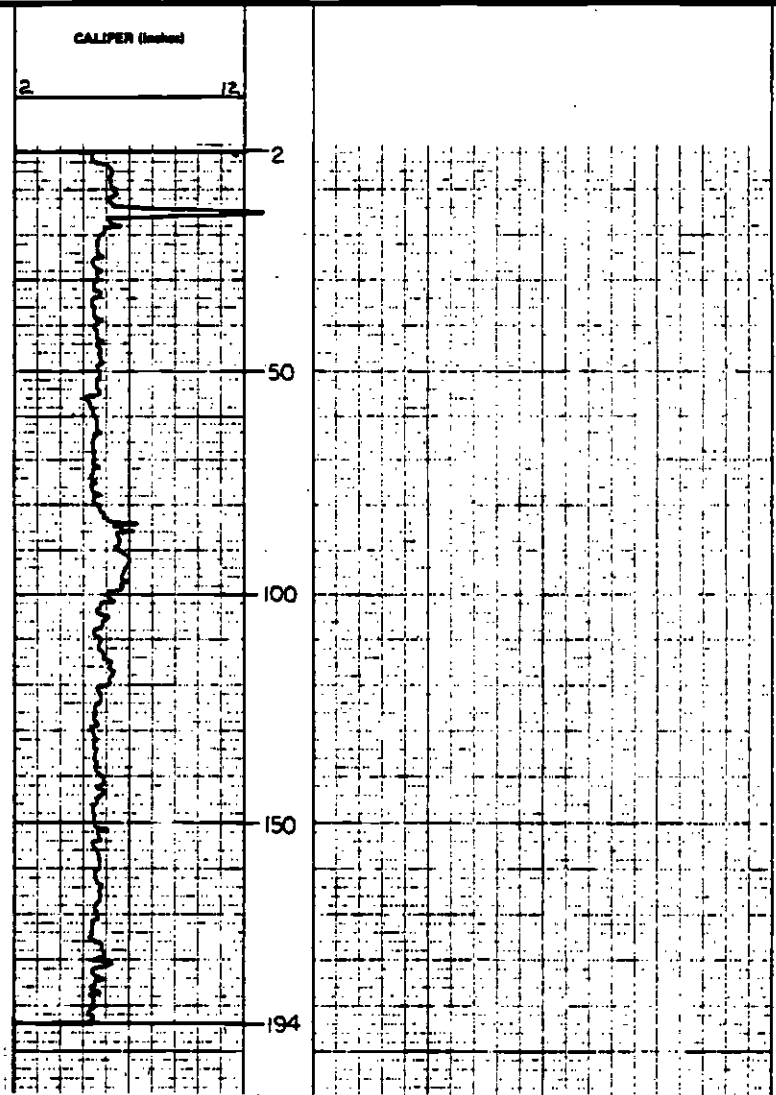


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CALIPER LOG

CLIENT: SCRTO	Date: 12/1/81				
PROJ. NO. 2191-22	Well No. ONE				
WELL: 18	Depth-Oriller 2.01				
FIELD:	Depth-Laggar 196				
COUNTY: LOS ANGELES	Dist. Log Interval 194				
STATE: CALIFORNIA	Top Log Interval 2				
Other Services: S.P., RES., LOGGING, C.C., NEUTRON	Depth-Oriller 41' 0.5"				
NEW CORNER OF WILSHIRE AND LA BRYA AVE ON WILSHIRE	Control-Laggar 41' 5"				
	Dist. Log 475'				
	Type Fluid in Hole SEALED				
	Dist. Log	Vis.			
	pH	Fluid Loss	at	at	at
	Source of Sample	AND TMS			
	Run @ Min. Temp.	5.9 @ 71 °F			
	Read @ Min. Temp.	4.5 @ 71 °F			
	Temp @ Min. Temp.	6.8 @ 71 °F			
	Min. Res. Temp.				
	Run @ BMT				
	Circulation Stoppage	1400			
	Laggar on Bottom	1500			
	Min. Res. Temp.				
	Recorded By	LAURIE GIL			
Location	Township	Range			
Permeation Datum G.L.	Dist. Log 194				
Log Measured From G.L.	D.P.				
Drilling Measured From G.L.	R.L.				

Remarks: **LINE SPEED 2.0 FPM**



REVISIONS: 01/24/82, 02/14/82, 03/14/82, 04/14/82, 05/14/82, 06/14/82, 07/14/82, 08/14/82, 09/14/82, 10/14/82, 11/14/82, 12/14/82

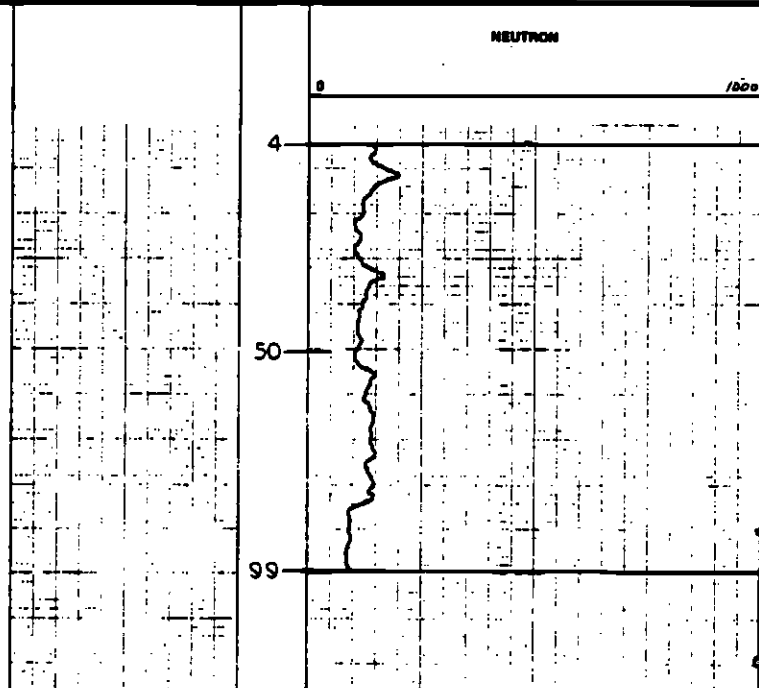


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NEUTRON LOG

CLIENT: <i>SCATD</i>	Date	<i>3/29/81</i>	
PROJ. NO. <i>2191-25</i>	Run No.	<i>TWO</i>	
WELL: <i>18 (PHONE HOLE-A)</i>	Depth-Offset	<i>100</i>	
	Depth-Logger	<i>100</i>	
FIELD:	Bot. Log Interval	<i>99</i>	
	Top Log Interval	<i>4</i>	
COUNTY: <i>LOS ANGELES</i>	Casing-Offset	<i>3" PVC @ 100'</i>	
	Casing-Logger	<i>3" PVC @ 100'</i>	
STATE: <i>CALIFORNIA</i>	SR No.	<i>47A</i>	
	Type Fluid In Hole	<i>FRESH WATER</i>	
Other Services: <i>SP, RES, NATURAL GAMMA</i>	Class.	Vis.	
	PH	Field Log	ml
<i>CCL CALIPER</i>	Source of Sample		
<i>NW CORNER OF WILSHIRE AND LA BREA AVE. ON WILSHIRE.</i>	Run @ Min. Temp.	<input type="checkbox"/>	<input type="checkbox"/>
	Run @ Max. Temp.	<input type="checkbox"/>	<input type="checkbox"/>
	Run @ Min. Temp.	<input type="checkbox"/>	<input type="checkbox"/>
	Run @ Max. Temp.	<input type="checkbox"/>	<input type="checkbox"/>
Surfaces	Surf	Rate	
	Run @ SURF	<input type="checkbox"/>	<input type="checkbox"/>
Permeability	<i>G.L.</i>	<i>EL 194</i>	Completion Stopper
Log Measured From	<i>G.L.</i>	<i>D.P.</i>	Logger on Screen
Drilling Measured From	<i>G.L.</i>	<i>R.B.</i>	Max. Res. Temp.
			Recorded By
			<i>MANZAGOL</i>

*Because PHONE HOLE A WAS LOGGED 3" PVC GROTTED IN PLACE,
LINE SPEED IS FT/MIN, WATER LEVEL IN CASING AT SURFACE.*



OMEGA NO. 7-1081-1000 5001 ALUMINUM LETTER
 M. J. 12-1981-01

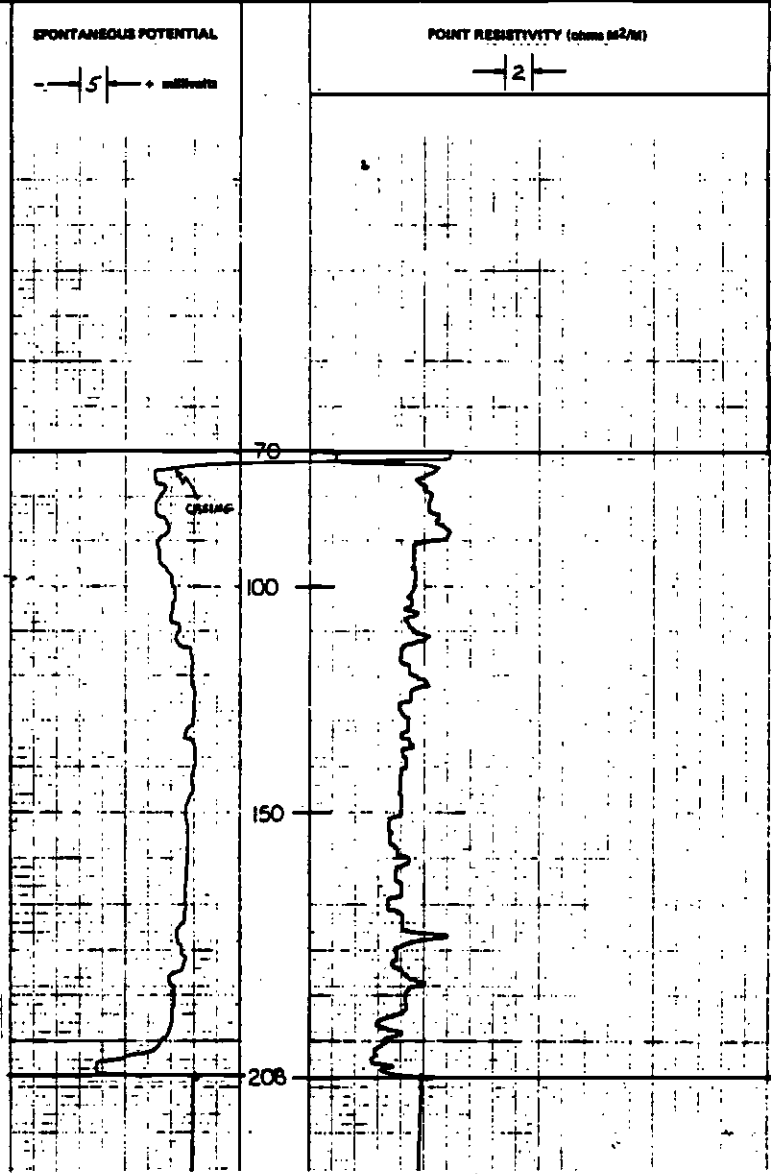


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SP-RESISTIVITY LOG

CLIENT: <i>SCRIP</i>	Date: <i>11/14/81</i>	
PROJ. NO. <i>2191-22</i>	Run No. <i>626</i>	
WELL: <i>19</i>	Depth-Offset <i>209</i>	
FIELD:	Depth-Logger <i>209</i>	
COUNTY: <i>LOS ANGELES</i>	Min. Log Interval <i>209</i>	
STATE: <i>CALIFORNIA</i>	Top Log Interval <i>90</i>	
Other Services: <i>SARMA, C.C., CALPER</i>	Casing-Offset <i>5' @ 73'</i>	
	Casing-Logger <i>5' @ 73'</i>	
	Bit Size <i>4 1/2"</i>	
	Type Fluid in Hole <i>SEAWATER</i>	
	Temp. - Vm.	
	off - Fluid Loss <i>R</i>	
	Source of Sample <i>AND TUR</i>	
LOCATION: <i>EAST SIDE OF CURSAN AND WILSHIRE AVE. INTERSECTIONS</i>	Run @ Min. Temp. <i>2.5 @ 68 °F</i>	
	Run @ Min. Temp. <i>2.5 @ 68 °F</i>	
	Run @ Min. Temp. <i>2.5 @ 68 °F</i>	
	Source: Surf / Rose	
	Run @ SURF <i>0 °F</i>	
	Corrosion Stopper <i>1180</i>	
	Logger on Bottom <i>1215</i>	
	Min. Res. Temp. <i>°F</i>	
	Recorded By <i>MAWAL60L</i>	
Station	Township	Range
Permanent Datum <i>G.L.</i>	<i>G.L. 186</i>	
Log Measured From <i>G.L.</i>	<i>D.F.</i>	
Drilling Measured From <i>G.L.</i>	<i>R.B.</i>	

Remarks: *LINE SPEED 35 FPM*



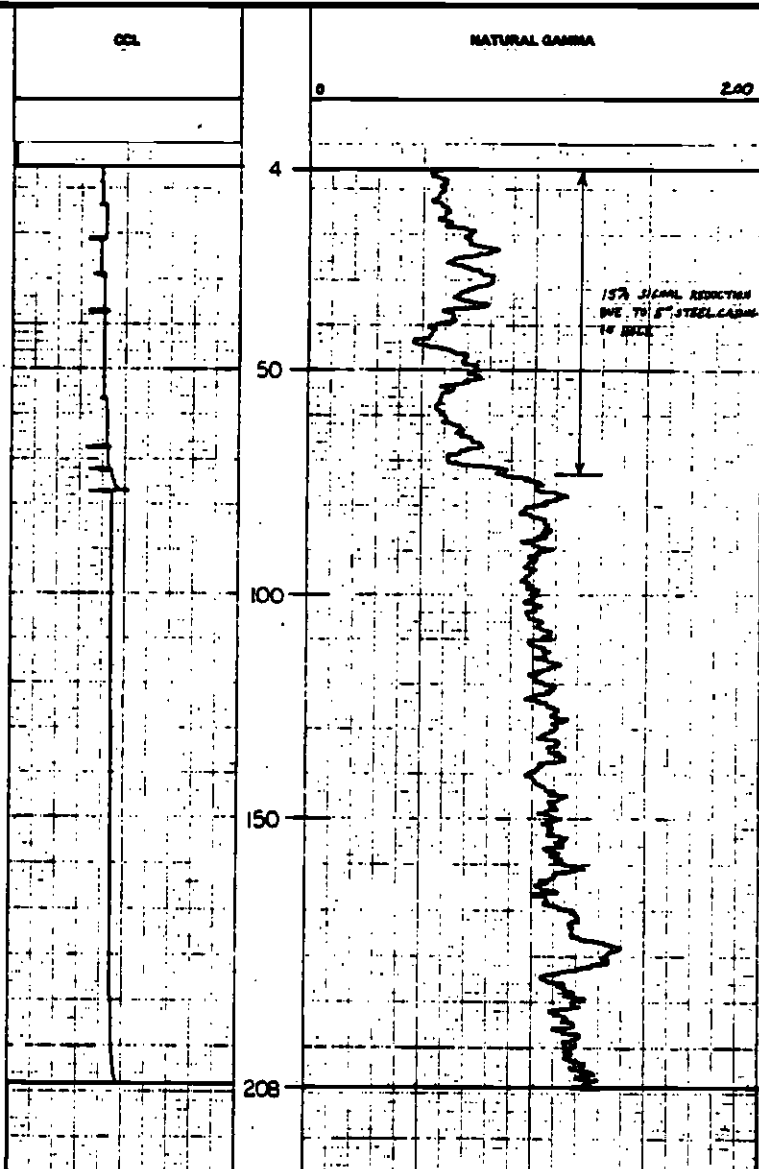


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/16/81			
PROJ. NO. 2191-22	Well No. 42L			
WELL: 19	Depth-Driller 207			
FIELD:	Depth-Logger 207			
COUNTY: LOS ANGELES	Strat. Log Interval 208			
STATE: CALIFORNIA	Top Log Interval 4			
Other Services: S.P., RES., CALIPER	Depth-Driller 5" @ 25'			
	Depth-Logger 5" @ 24'			
	Bit Size 4 1/2"			
	Type Fluid in Hole SEALED			
	Con. Visc.			
	gal Fluid Loss			
	Number of Samples			
	Run @ Min. Temp. 2.5 @ 68°F			
	Run @ Max. Temp. 2.5 @ 68°F			
	Run @ Min. Temp. 2.5 @ 68°F			
	Run @ Max. Temp. 2.5 @ 68°F			
	Source: Surf / Res			
	Run @ GMT			
	Completion Depth 1100			
	Logset on Bottom 1400			
	Max. Res. Temp.			
	Recorded By LAUBACH			

Remarks: **LINE SPEED 20 FPM, CCL READS MINES 30' DEPTH INDICATED**



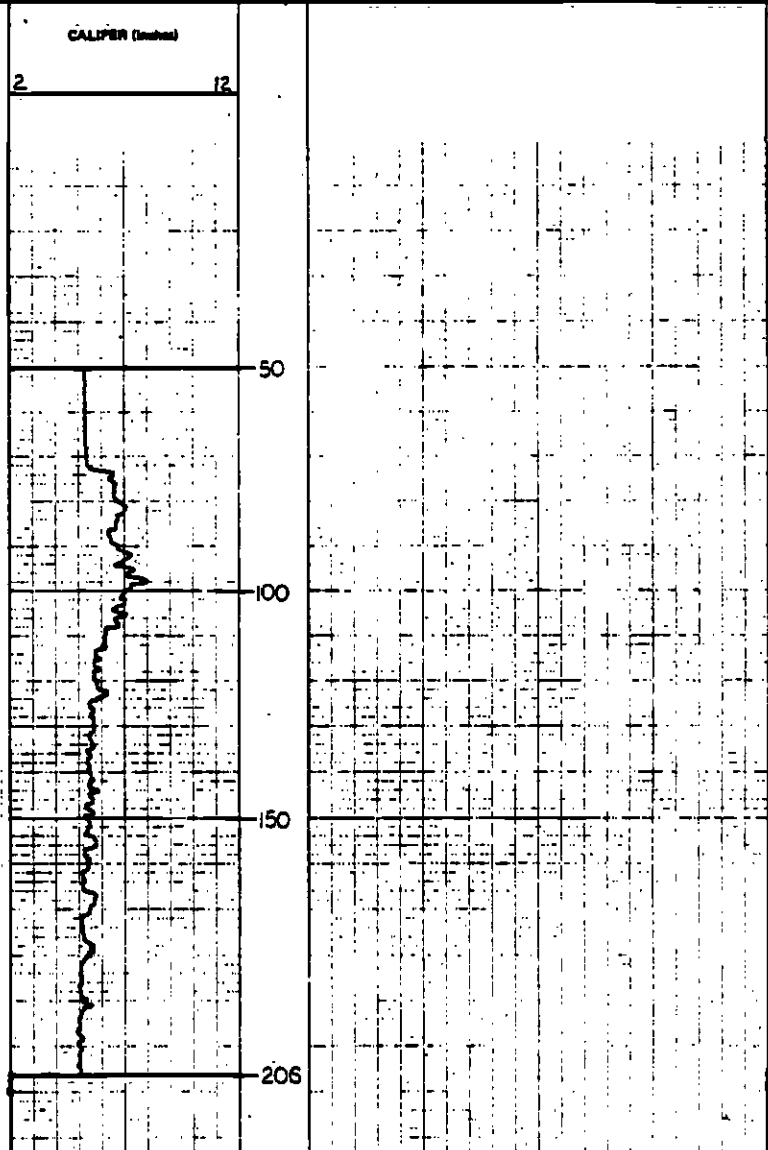


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CALIPER LOG

CLIENT: SCRTD	Date: 11/18/81						
PROJ. NO. 2191-22	Run No. 046						
WELL: 19	Depth-Oriller 207						
FIELD:	Depth-Logger 208						
COUNTY: LOS ANGELES	Min. Log Interval 206						
STATE: CALIFORNIA	Top Log Interval 50						
Other Services: SP, RES, GAMMA, CCL	Caliper-Oriller 5" @ 73'	0	0	0			
	Caliper-Logger 5" @ 73'						
	Bit Size 4 1/2"						
	Type Fluid in Hole SEAWATER						
	Conn. Visc.						
	SPH Fluid Loss 0	0	0	0			
	Bottom of Sample MUD TOP						
CORRECTION EAST SIDE OF CURMAN AND WILSHIRE AVE. INTERSECTIONS	Run @ Min. Temp. 2.5 @ 68 °F	0	0	0			
	Run @ Min. Temp. 2.5 @ 68 °F	0	0	0			
	Run @ Min. Temp. 2.5 @ 68 °F	0	0	0			
	Run @ Min. Temp. 2.5 @ 68 °F	0	0	0			
Section	Turntable	Range	Run @ BHT	0	0	0	0
Penetration Details: G.L.	G.L. 186		Chisel/Bit Stopped	1166			
Log Measured From: G.L.	D.P.		Logger on Bottom	1330			
Drilling Measured From: G.L.	H.B.		Max. Pen. Temp.		0	0	0
			Recorded By	GALLIATTI			

Remarks: LINE SPEED 20 FPM



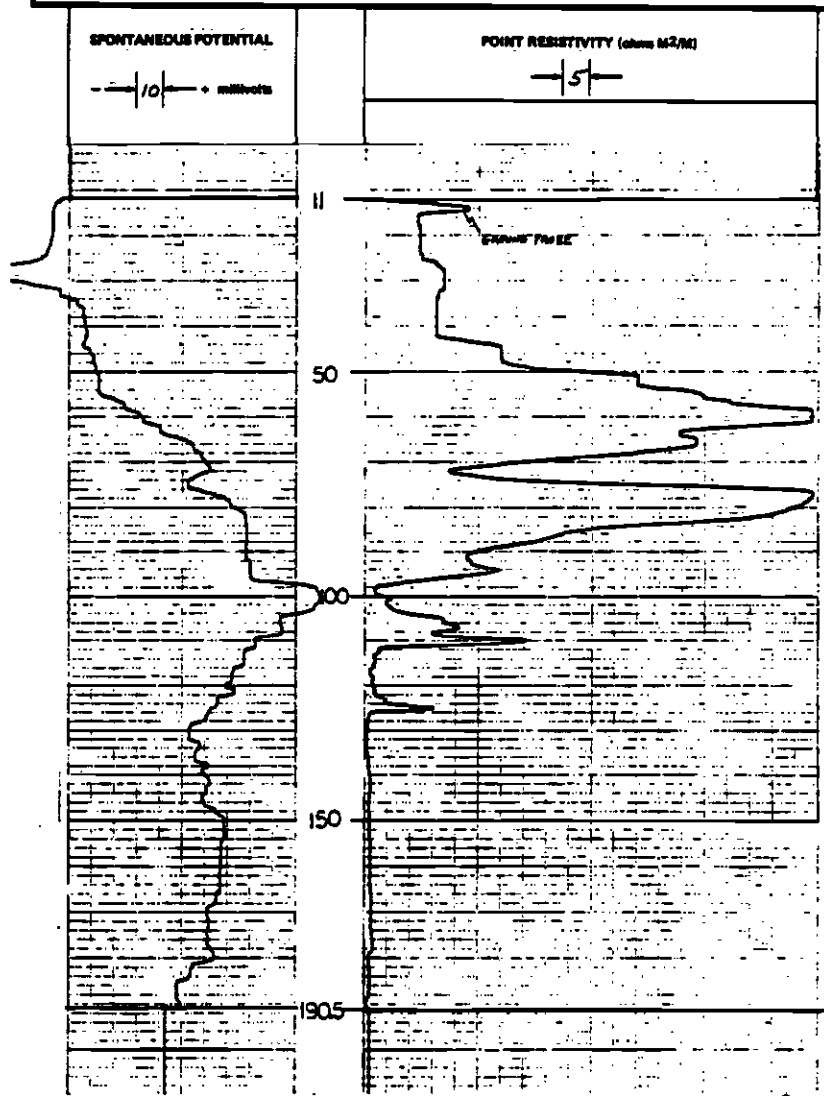


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 11/13/81	Run No. ONE			
PROJ. NO. Z191-ZZ	Depth-Start: 192	Depth-Log: 192.5			
WELL: Z0	Bot. Log Interval: 190.5	Top Log Interval: 11			
FIELD:	Casing-Outer: 5" @ 11'	Casing-Log: 5" @ 11'			
COUNTY: Los Angeles	Bit Size: 4 1/2"	Type Fluid in Hole: Bentonite			
STATE: California	Other Services: Gamma, GCL, Calpac, Neutron	Down. Visc.:			
	Location: 75' west of E. Buena Vista Ave. and Wilshire Blvd. intersection, S. side of Wilshire.	Run @ Min. Temp.: 4.5 @ 6.5 °F			
		Run @ Max. Temp.: 5.5 @ 6.5 °F			
		Run @ Min. Temp.: 2.9 @ 6.5 °F			
		Run @ Max. Temp.:			
		Run @ 50°F:			
		Run @ 1700			
		Log on Bottom: 20/5			
		Run, Res. Temp.:			
		Checked By: Ranjo			

Remarks: LINE SPRED 35' / 100'



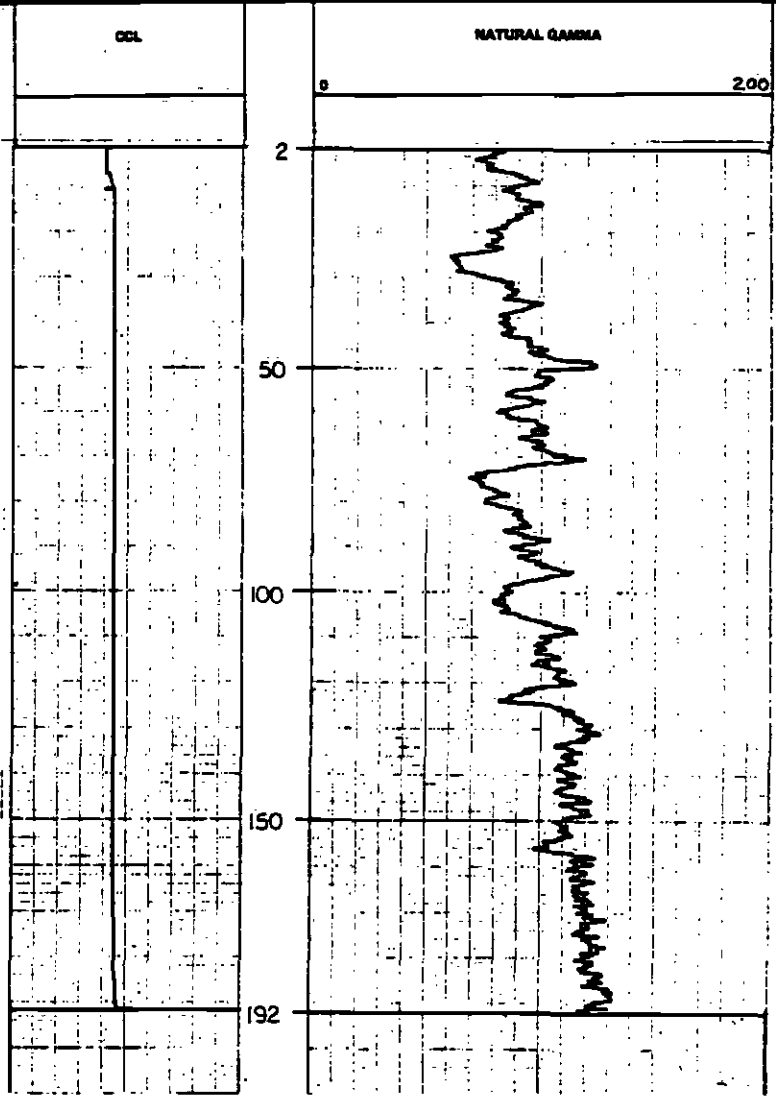


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CCL-GAMMA RAY
LOG

CLIENT: SCARD	Date: 11/8/81	Run No. 202			
PROJ. NO. 2191-22	Depth-Offset: 172	Depth-Logger: 172			
WELL: 20	Stem Log Interval: 1.92	Top Log Interval: 2			
FIELD:	Casing-Offset: 3' @ 11'	Casing-Logger: 5' @ 11'			
COUNTY: Los Angeles	Stem Log Interval: 1.92	Stem Log Interval: 1.92			
STATE: California	Type Fluid in Hole: Con. brine	Type Fluid in Hole: Con. brine			
Other Services: S.P. Res. Caliper	Date: 11/8/81	Time: 11:00			
Neutron	psi: 8	psi: 8			
75' west of Fairfax Ave. and Winshire Blvd. intersection, S. side of Winshire	Source of Sample: Mud Tub	Run @ Min. Temp.: 2.9 @ 63°F			
	Run @ Min. Temp.: 2.4 @ 63°F	Run @ Min. Temp.: 2.4 @ 63°F			
	Run @ Min. Temp.: 2.9 @ 63°F	Run @ Min. Temp.: 2.9 @ 63°F			
Surface	Surface Foot	Surface Foot			
Permeability	Permeability	Permeability			
Pressure Datum: G.L.	Pressure Datum: G.L. 164	Pressure Datum: G.L. 164			
Log Interval From: G.L.	Log Interval From: G.L.	Log Interval From: G.L.			
Drilling Measured From: G.L.	Drilling Measured From: G.L.	Drilling Measured From: G.L.			
	Completion Stage: 1700	Completion Stage: 1700			
	Logger on Bottom: 1830	Logger on Bottom: 1830			
	Stem Res. Temp.: 7.9 @ 63°F	Stem Res. Temp.: 7.9 @ 63°F			
	Recorded By: Ronza Gel	Recorded By: Ronza Gel			

Remarks: LINE SPEED 20 FPM.



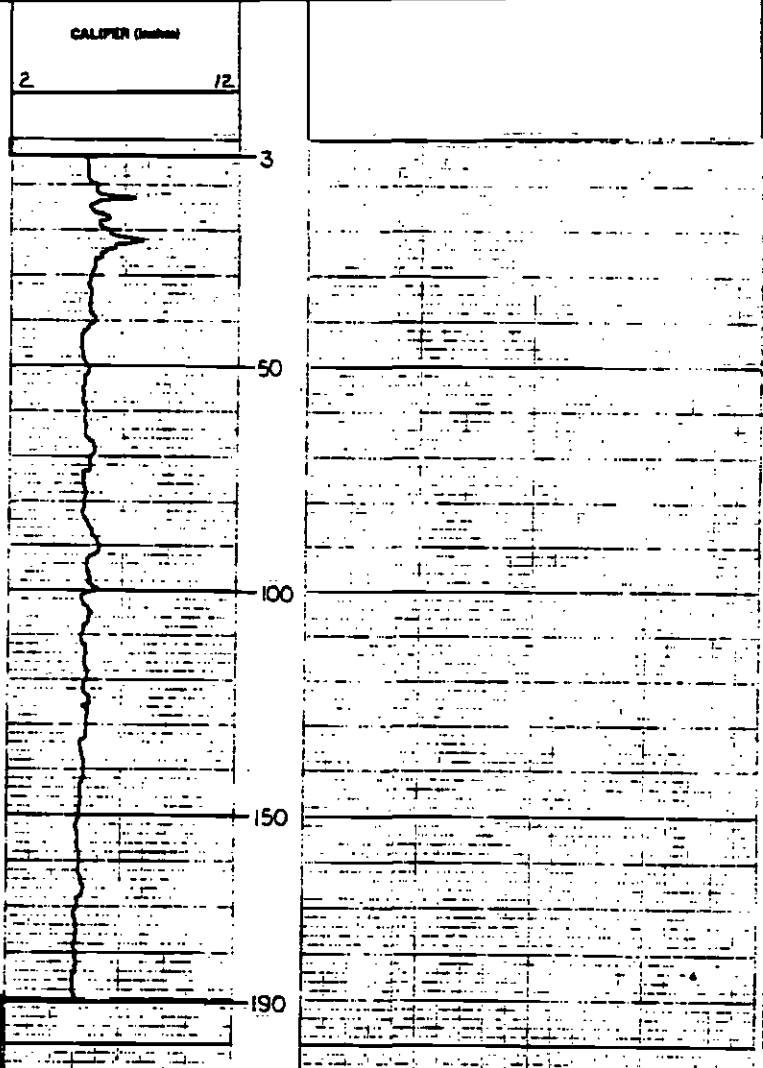


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CALIPER LOG

CLIENT: SCATO	Date: 1/18/81			
PROJ. NO. 2191-22	Plan No. 205			
WELL: 20	Depth-Outer 192			
FIELD:	Depth-Logger 192			
COUNTY: Los Angeles	Strat. Log Interval 190			
STATE: California	Top Log Interval 2			
Other Services: SO, Res., CCL, Gamma, Neutron	Coring-Outer 5" @ 11'			
	Coring-Logger 5" @ 11'			
	Bit Size 4 7/8"			
	Type Fluid in Hole Bentonite			
	Dens. Visc.			
	pH Field Loss 0	ml	ml	ml
	Source of Sample Mod. Tib			
	Run @ Min. Temp. 4.7 @ 65°F			
	Run @ Min. Temp. 3.5 @ 63°F			
	Run @ Min. Temp. 7.9 @ 63°F			
	Source: Prod / Res			
	Run @ 200T			
	Classification Reported 1700			
	Length of Section 1900			
	Max. Min. Temp.			
	Recorded By Mergel			
Permeant Outer 0.4	GL 164			
Log Interval Feet 0.4	DF			
Drilling Interval Feet 0.4	LB			

Remarks: LINE SPEED 20.7/min.



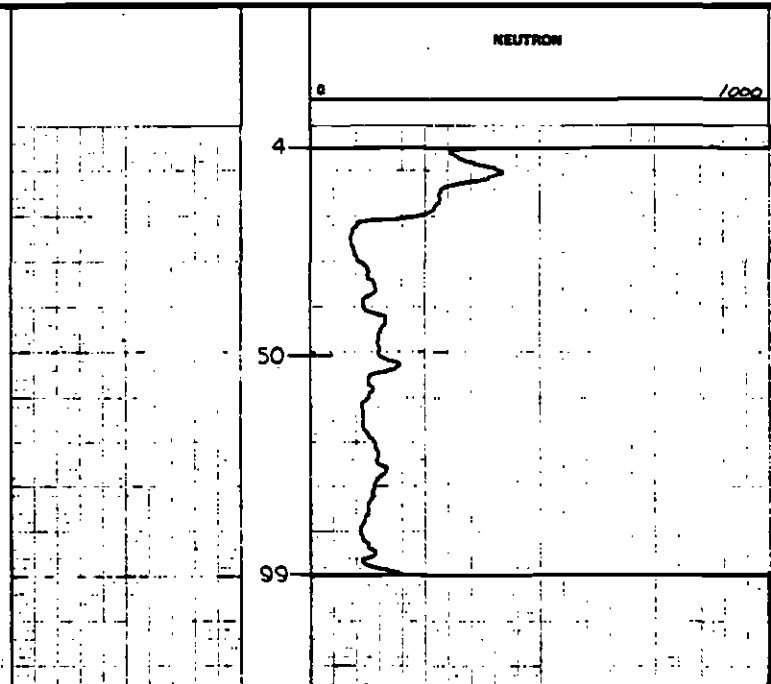


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NEUTRON LOG

CLIENT: SCRTD	Date	3/25/81
PROJ. NO. 2191-25	Run In.	TWD
WELL: 20 (PHONE HOLE A)	Depth-Offset	100
FIELD:	Depth-Logger	100
COUNTY: LOS ANGELES	Shm. Log Interval	00
STATE: CALIFORNIA	Top Log Interval	4
Other Services: SP, RES NATURAL GAMMA	Casing-Offset	0
CCL CALIPER	Casing-Logger	0
75' WEST OF FAIRBANK AVE AND WILSHIRE BLVD INTERSECTION, S. SIDE OF WILSHIRE	Bit Size	3" PVC @ 100'
	Type Fluid in Hole	4 7/8"
	Type Fluid in Hole	FRESH WATER
	Dens. Min.	
	Max.	
	Field Log	
	Reason of Straggle	NONE
	Run @ Min. Temp.	0 °F
	Run @ Max. Temp.	0 °F
	Run @ Min. Temp.	0 °F
	Run @ Max. Temp.	0 °F
	Source Used	None
	Run @ BHT	0 °F
Permittee District: G.L.	BL 164	1/15/81
Log Measured From: G.L.	D.F.	3/25/81
Drilling Measured From: G.L.	K.A.	MANZAGOL

Remarks: **PHONE HOLE A WAS LOGGED. 3" PVC GROUDED IN PLACE. WATER LEVEL IN CASING AT SURFACE. LINE SPEED 15 FT/MIN.**



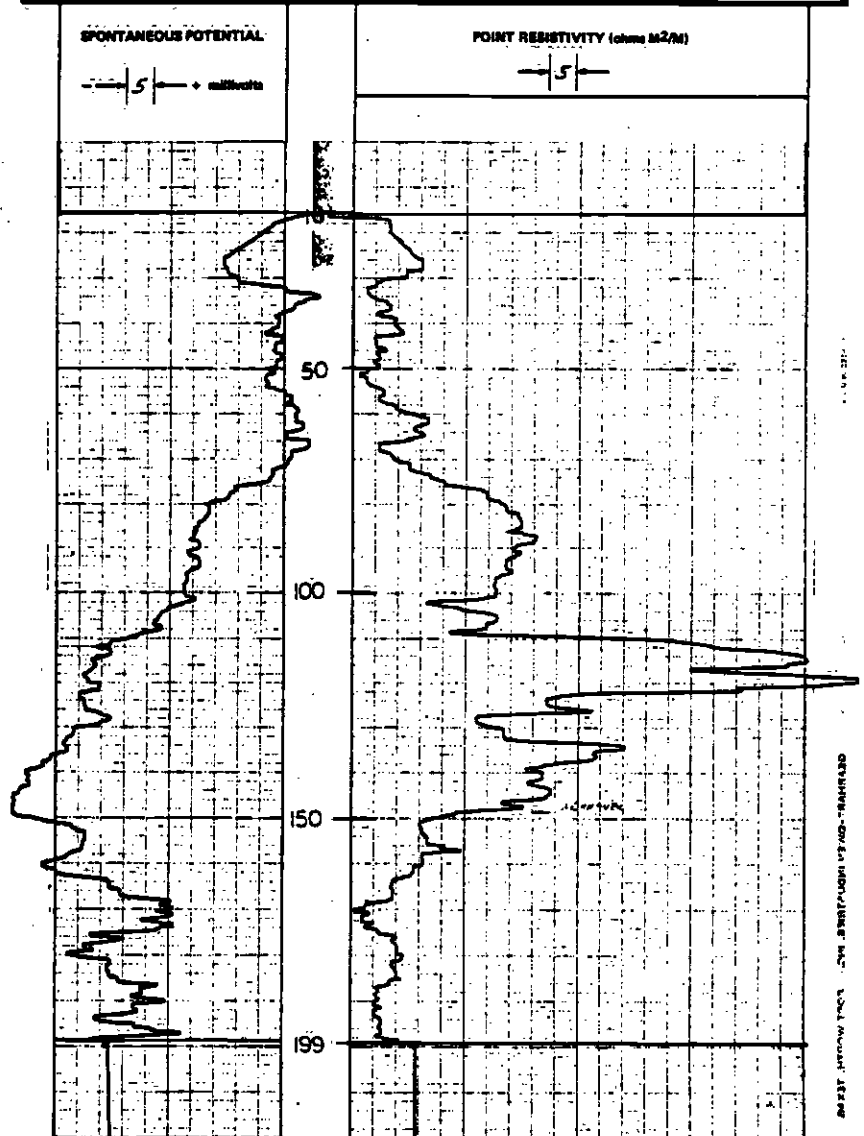


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 12/03/90	Run No. 1
PROJ. NO. 2191-25	Depth-Oriller 200	Depth-Logger 200
WELL: 21	Stem Log Interval 199	Top Log Interval 16
FIELD:	Casing-Oriller 5' @ 16'	Casing-Logger 5' @ 16'
COUNTY: Los Angeles	Bit Size 4 3/4"	Type Fluid in Hole: Tapwater
STATE: California	Down. Visc. 9	ml
Other Services: Natural Gas, Calgep	ml	ml
Geology: Douglas Newton	ml	ml
Mayland Av. off of Crescent	ml	ml
Highgate Blvd.	ml	ml
Section	Yards	Range
Permeated Down: G.L.	G.L. 159	Circulation Stopped 930
Log Measured From: G.L.	D.F.	Logger on Bottom 930
Drilling Measured From: G.L.	K.B.	Max. Res. Temp. 93
		Recorded By: GALLINOTTI

Remarks: Line Speed = 30 FT/min



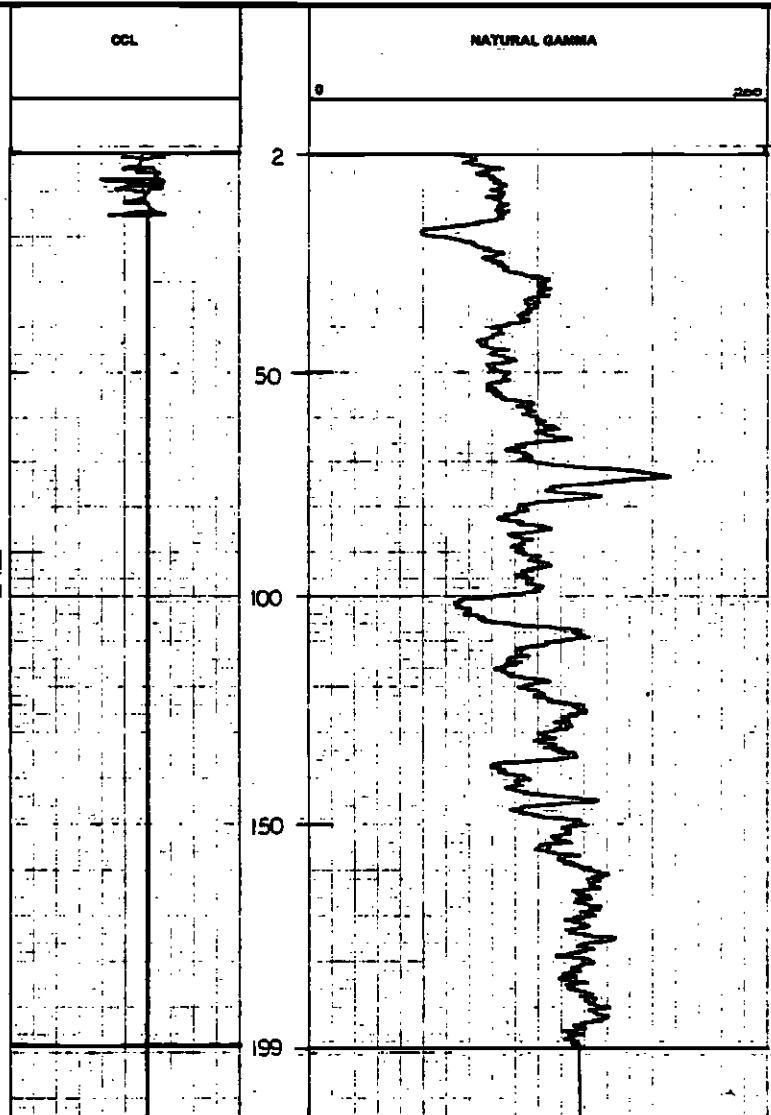


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 12/22/90
PROJ. NO.: 291-25	Shot No. 1
WELL: 21	Depth-Orbit: 200
FIELD:	Depth-Logger: 200
COUNTY: Los Angeles	Shot Log Interval: 199
STATE: California	Top Log Interval: 2
Other Services: SP-Res, Caliper, Density, Neutron	Caliper-Orbit: 5' @ 16'
	Caliper-Logger: 5' @ 16'
	Shot Size: 7 7/8"
	Type Fluid in Hole: Random
	Dens. Visc. Field Log
	Source of Sample: Mud Tank
Location: Maryland Av. at Crescent	Run @ Min. Temp.: 8.5 @ 67 °F
Highgate Blvd.	Run @ Min. Temp.: 8.3 @ 67 °F
	Run @ Min. Temp.: 6.0 @ 67 °F
	Source: Run Rate
	Run @ 80V: 0 - 0 - 0 - 0
	Chromatol Shipped: 930
	Logger on Bottom: 1030
	Max. Rec. Temp.: 0 - 0 - 0 - 0
	Recorded By: G. ALBERTI

Remarks: Line Speed = 20 fpm



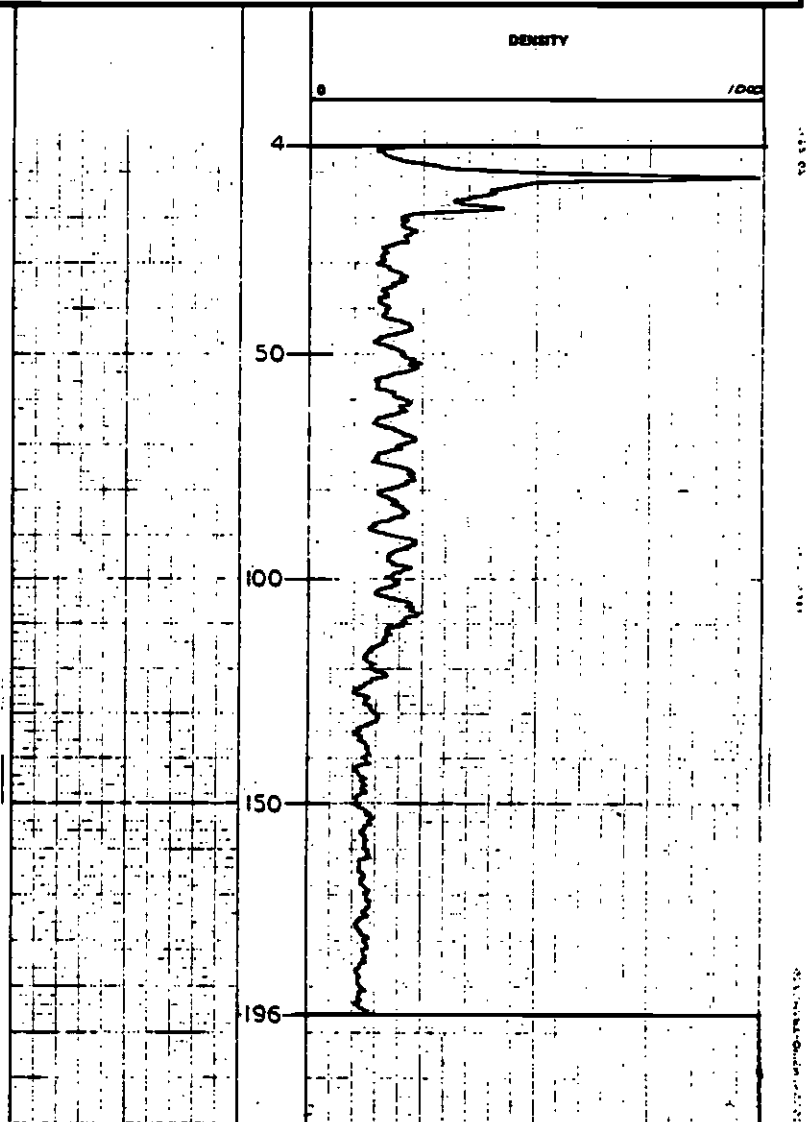


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DENSITY LOG

CLIENT: SCR7D	Date	5/25/81	
PROJ. No. 2191-25	Run No.	YWO	
WELL: 21	Depth-Offset	200	
FIELD:	Depth-Logger	197	
COUNTY: LOS ANGELES	Dist. Log Interval	196	
STATE: CALIFORNIA	Top Log Interval	4	
Other Services: SP RES, NATURAL GAMMA, OCL CALIPER, NEUTRON	Casing-Offset	2" MSB 200'	
MARYLAND AVE OFF OF CRESCENT HEIGHTS BLVD.	Casing-Logger	2" MSB 200'	
	OH Size	4 1/8	
	Type Fluid in Hole	FRESH WATER	
	Dist. Vis.		
	psi Fluid Loss	ml	ml
	Source of Sample	NONE	
	Run @ Stn. Temp.	°C	°F
	Read @ Stn. Temp.	°C	°F
	Run @ Max. Temp.	°C	°F
	Source: Surf / Bore		
	Run @ BHT	°C	°F
Permeameter Output: G.L.	Circulation Stop/Start	12/22/80	
Log Measured From: G.L.	Logger on Bottom	5/25/81	
Drilling Observed From: G.L.	Max. Run. Temp.	°C	°F
	Recorded by	MANZAGOL	

Remarks: LINE SPEED 16 FT/MIN, 3/4" PVC ALSO PLACED IN HOLE FROM G.L. TO 110 FT, BENTONITE PLUG BETWEEN PIEZOMETERS FROM 110 TO 120 FT, WATER LEVEL IN CASING AT 109.5 FT.



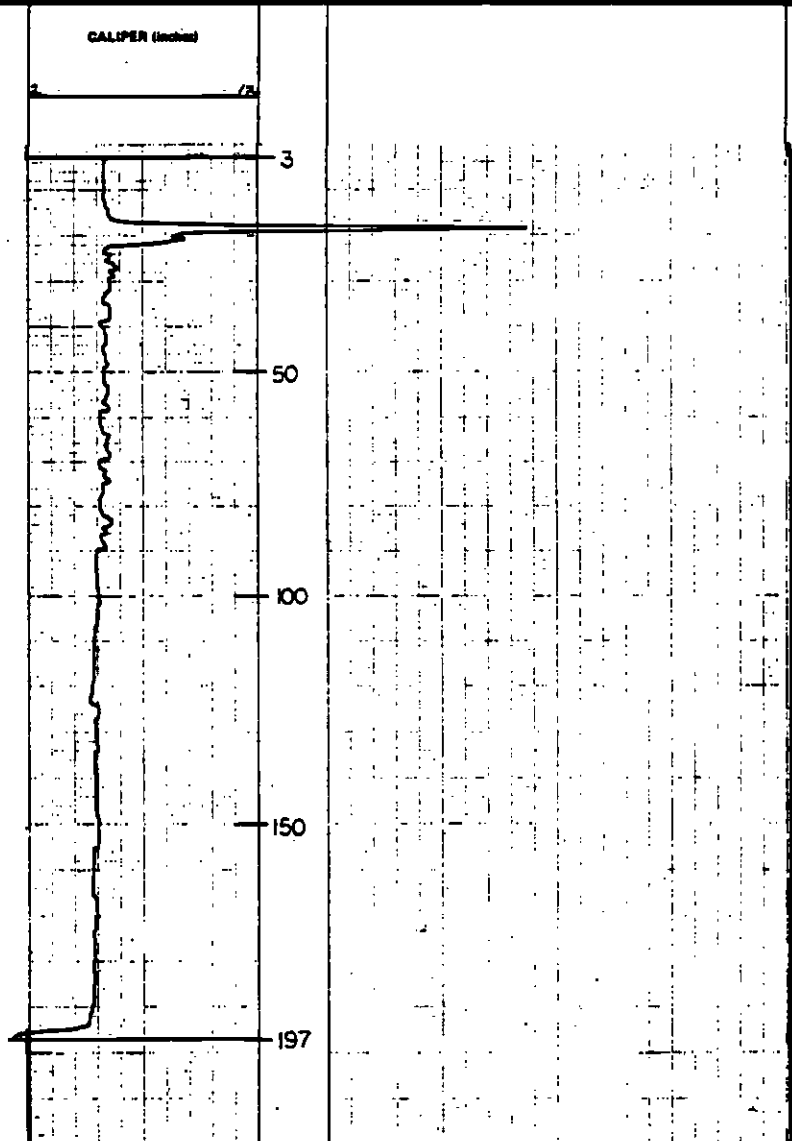


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CALIPER LOG

CLIENT: SCRTD	Date: 12/22/80	Run No.:			
PROJ. NO. 2191-25	Depth-Driller: 197	Depth-Logger: 197			
WELL: 21	Ben. Log Interval: 197	Top Log Interval: 5			
FIELD:	Casing-Driller: 5" @ 16'	Casing-Logger: 5" @ 16'			
COUNTY: Los Angeles	Dr. Size: 7 7/8"	Type Field in State: Pasadena			
STATE: California	Other Services: Michael Gammis, SP-Res.	Drone: Visc.			
Geology: Neutron	Drone: pH	Field Log: 9	all	all	all
Location: Maryland Av. off of Crescent	Source of Sample: Mud Tub	Run @ Min. Temp.:	8.5 @ 67 °F		
Analysis: Blud.	Run @ Min. Temp.:	Run @ Min. Temp.:	8.5 @ 67 °F		
	Run @ Min. Temp.:	Run @ Min. Temp.:	6.0 @ 67 °F		
Station:	Source: Rod / Rise	Run @ BWT:			
Permanent Datum: G.L.	Circulation Stopped: 930	Logger on Bottom: 1100			
Log Started From: G.L.	Max. Res. Temp.:	Recorded By: GALLAGHER			
Drilling Started From: G.L.					

Remarks: Line Speed = 20 FT/min



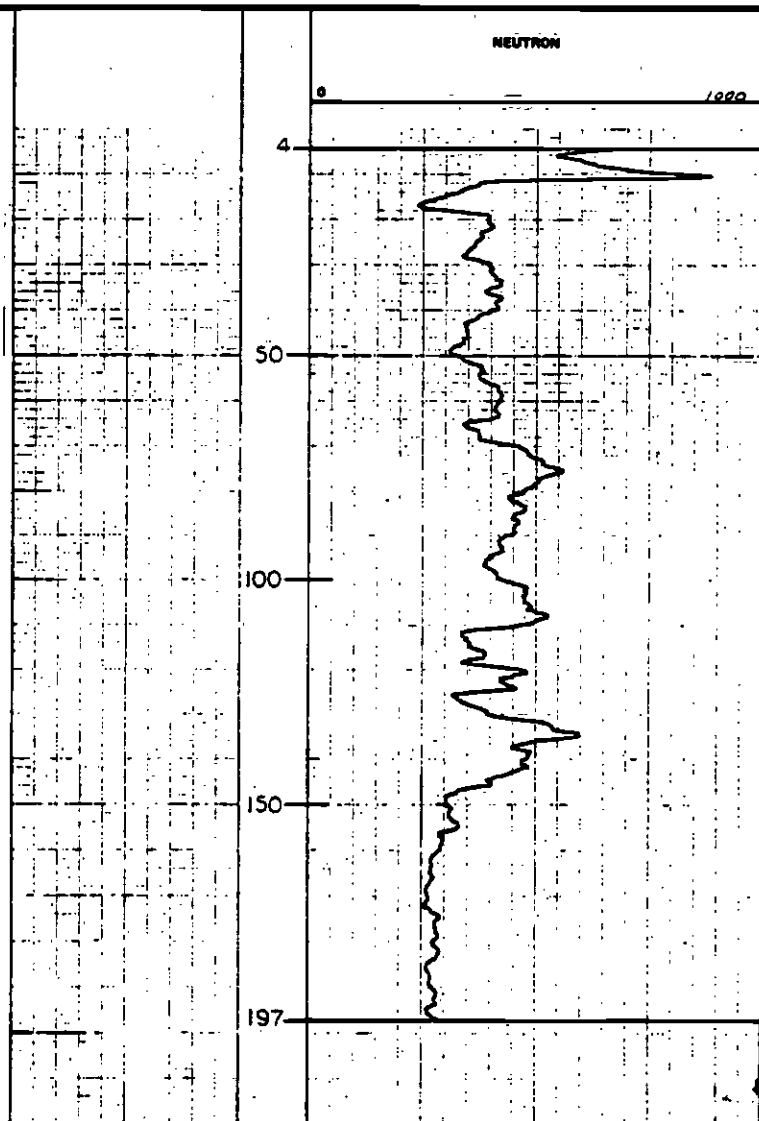


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NEUTRON LOG

CLIENT: <u>9CRTD</u>	Date	<u>3/25/81</u>
PROJ. NO. <u>L191-25</u>	Ran Sta.	<u>TVB</u>
WELL: <u>21</u>	Depth-Oriller	<u>200</u>
FIELD:	Depth-Layer	<u>198</u>
COUNTY: <u>LOS ANGELES</u>	Min. Log Interval	<u>1.97</u>
STATE: <u>CALIFORNIA</u>	Top Log Interval	<u>4</u>
Other Services: <u>SP RES NATURAL GAMMA, CCL, CALIPER, DENSITY</u>	Casing-Oriller	<u>2" ABS @ 200</u>
<u>MARYLAND AVE. OFF OF CRESCENT HEIGHTS BLVD.</u>	Casing-Layer	<u>2" ABS @ 200</u>
	SW Size	<u>4 7/8</u>
	Type Fluid in Hole	<u>FRESH WATER</u>
	Day	Min.
	pH	Fluid Loss
	Source of Sample	<u>NONE</u>
	Ran @ Min. Temp.	
	Ran @ Max. Temp.	
	Ran @ Min. Temp.	
	Summer / Ran	
	Ran @ 50°F	
	Check-out Stopped	<u>12/22/80</u>
	Logger on Surface	<u>3/25/81</u>
	Min. Res. Temp.	
	Recorded By	<u>MANZAGOL</u>
Permanant Cement	<u>G.L.</u>	<u>G.L. 159</u>
Log Measured From	<u>G.L.</u>	<u>D.F.</u>
Drilling Measured From	<u>G.L.</u>	<u>K.B.</u>

Remarks: LINE SPEED IS FT/MIN, 3/4" PVC ALSO PLACED IN HOLE FROM
G.L. TO 110 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT
110 TO 120 FT, WATER LEVEL IN CASING AT 109.5 FT.



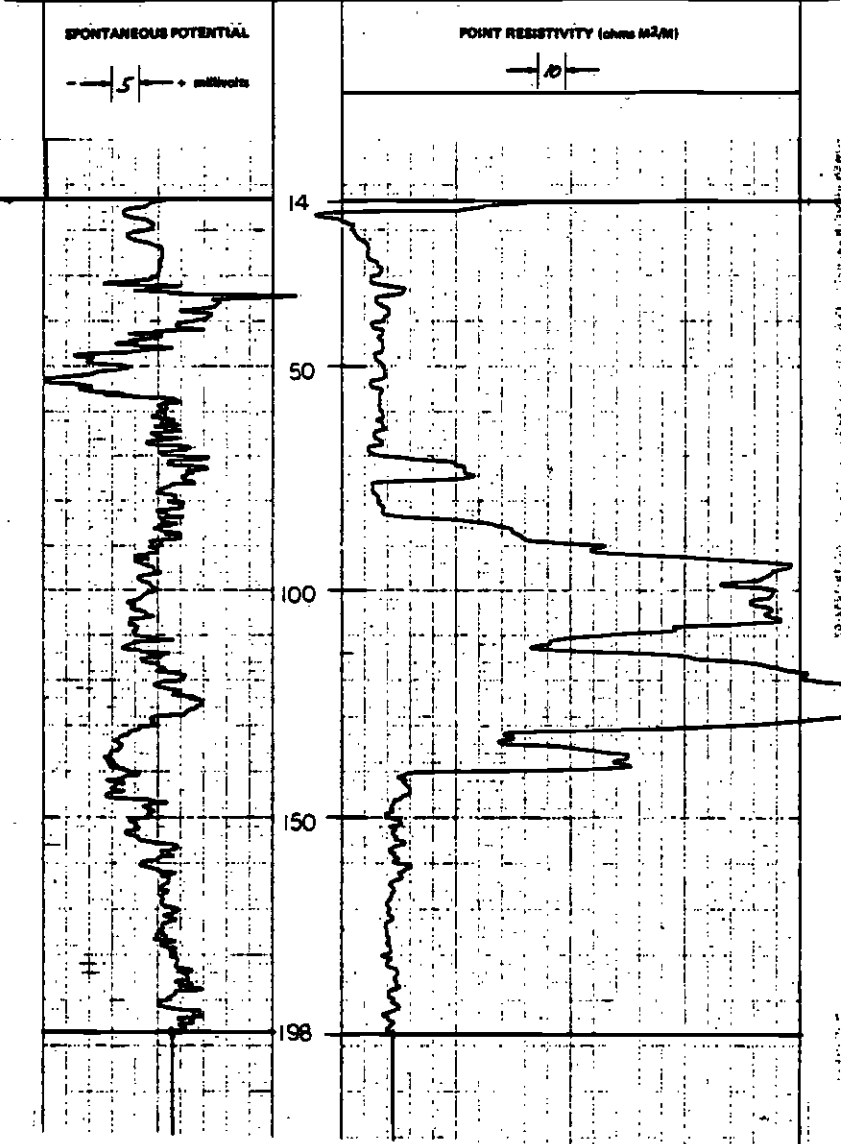


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SPERESISTIVITY LOG

CLIENT: SCRTD	Date: 12/20/80				
PROJ. NO. 2191-25	Run No. 1				
WELL: 22	Depth-Offset -200				
FIELD:	Depth-Logger 173				
COUNTY: Los Angeles	Run Log Interval 173				
STATE: California	Top Log Interval 17				
Other Services: Natural Gamma, Caliper, Density, Neutron	Casing-Offset 5' @ 16				
	Casing-Logger 5' @ 16				
	Log Size 1 7/8"				
	Type Fluid in Hole: Residual				
	Chem. Visc.				
	pH Fluid Loss 8 ml				
	Source of Sample Mid Tub				
LOCATION: Blackhawk Dr. off of Concord	Run @ Min. Temp. 10 @ 71 °F				
Residual Fluid	Run @ Min. Temp. 2.9 @ 71 °F				
	Run @ Min. Temp. 2.9 @ 71 °F				
	Residual Fluid				
Section Township Range	Run @ BMT				
Permeability Datum G.L.	Conduction Potential				
Log Measured From G.L.	Logger on Bottom				
Drilling Measured From G.L.	Min. Res. Temp.				
	Recorded By G. GILBERT				

Remarks: Line Speed = 30 FT/min



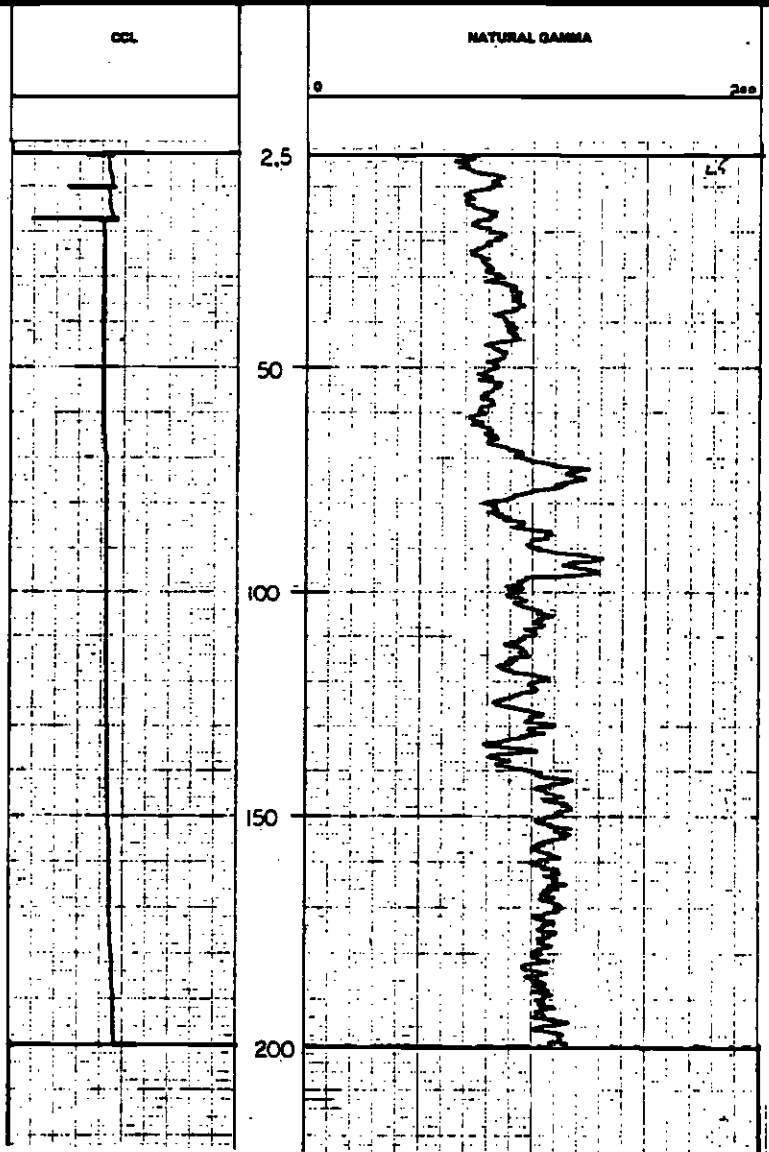


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 12/22/90		
PROJ. NO. 2191-25	Run No. 1		
WELL: 22	Depth-Offset 200		
FIELD:	Depth-Logger 2.01		
COUNTY: Los Angeles	Shm. Log Interval 2.00		
STATE: California	Top Log Interval 2.5		
Other Services: SP-Res, Caliper, Density, Neutron	Coring-Offset 5" @ 16'		
	Coring-Logger 5" @ 16'		
	Shm. Lim 4 1/2"		
	Type Fluid in Hole Drilling Fluid		
	Chem. Visc.		
	pH		
	Fluid Loss		
	Series of Sample Red Tub		
	Run @ Mass. Temp. 10 @ 71 °F		
	Run @ Mass. Temp. 9.9 @ 71 °F		
	Run @ Mass. Temp. 9.9 @ 71 °F		
	Seams: Start / Rate		
	Run @ SMT		
	Chatterbox Stopper 1600		
	Logger on Bottom 1700		
	Max. Res. Temp.		
	Recorded By G.A. HART		
Permeation Device G.L.	Log Interval G.L. 16'		
Log Interval From G.L.	D.P.		
Drilling Interval From G.L.	G.L.		

Remarks: **Line Speed = 20 ft/min. CCL READS ABOUT 3.0' FROM DEPTH INDICATED**



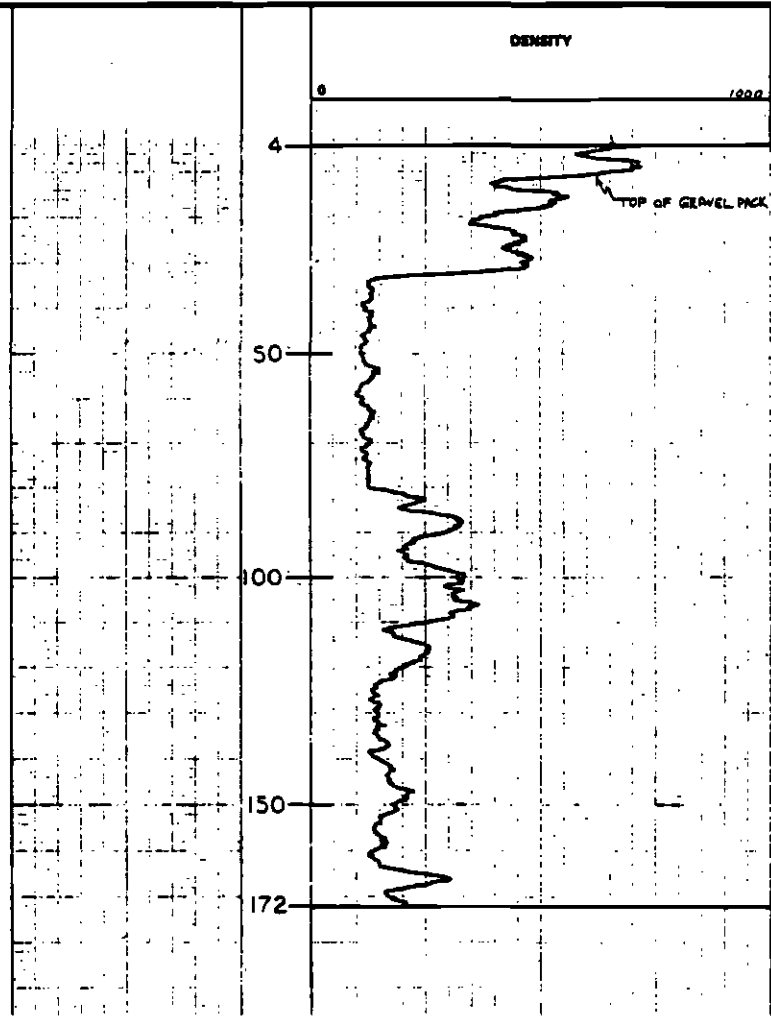


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DENSITY LOG

CLIENT: SCRTD	Date	3/25/81	
PROJ. NO. ZMI-25	Run No.	TWO	
WELL: 22	Depth-Offset	200	
FIELD:	Depth-Logger	173	
COUNTY: LOS ANGELES	Dist. Log Interval	172	
STATE: CALIFORNIA	Top Log Interval	4	
Other Services: SP, RES, NATURAL GAMMA, CCL, CALIPER, NEUTRON	Casing-Offset	2" ABS @ 200'	
BLACKBURN DR OFF OF CRESCENT HEIGHTS BLVD.	Casing-Logger	2" ABS @ 200'	
	Bit Size	4 7/8"	
	Type Fluid in Hole	FRESH WATER	
	Dist. Vols.		
	pH		
	Fluoride		
	Source of Sample		NONE
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Source: Surf / Bore		
	Run @ BRT		
	Calculation Checked	12/20/81	
	Logger on Station	3/25/81	
	Min. Run Temp.		
	Recorded By	MANZAGAL	
Section	Township	Range	
Pointment Details	G.L.	ELEVATION	GL 162
Log Measured From	G.L.	D.F.	
Drilling Measured From	G.L.	R.S.	

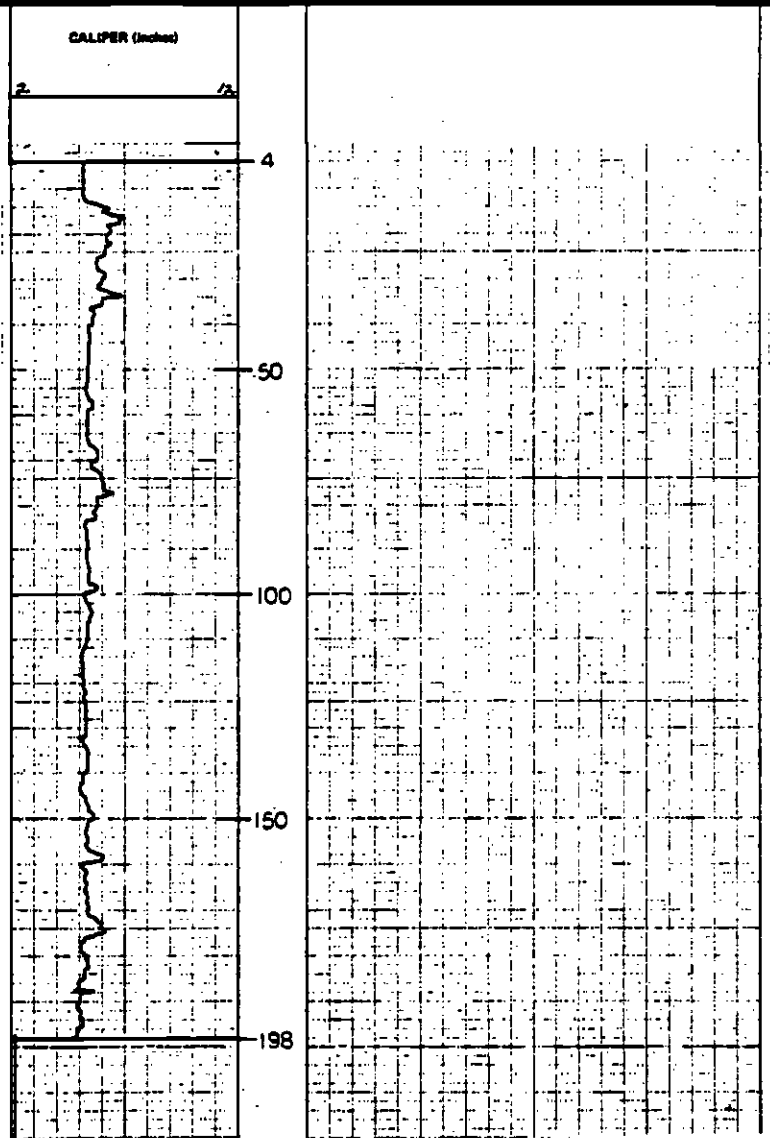
Remarks: TAR IN HOLE AT 173 FT, LINE SPEED 15 FT/MIN, 3/4" PVC ALSO PLACED IN HOLE FROM G.L. TO 129 FT, BENTONITE PLAGS BETWEEN PIEZOMETERS AT UNKNOWN DEPTH, WATER LEVEL IN CASING AT UNKNOWN DEPTH.





CLIENT: SCRTD	Date: 12/22/70		
PROJ. NO. 2191-25	Rim Dia. 1		
WELL: 22	Depth-Offset 200		
FIELD:	Depth-Logger 200		
COUNTY: Los Angeles	Rim Log Interval 150		
STATE: California	Top Log Interval 7		
Other Services: Natural Gamma, SP-Res.	Caliper-Offset 5' @ 16'		
Drilling Method: Hand	Caliper-Logger 5' @ 13'		
	Bit Size 4 1/2"		
	Type Fluid in Hole Testosterone		
	Dist. Vin.		
	PH Field Loss 0	oil	oil
	Service of Sample Mud Tub		
	Rim @ Min. Temp. 10 @ 71 °F		
	Rim @ Max. Temp. 9.9 @ 71 °F		
	Rim @ Min. Temp. 9.9 @ 71 °F		
	Rim @ Max. Temp. 9.9 @ 71 °F		
	Rim @ Min. Temp.		
	Rim @ Max. Temp.		
	Circulation Stopped 1600		
	Logger on Bottom 1730		
	Max. Rec. Temp.		
	Recorded By GALLIOTTI, MARCELO		

Remarks: Line Speed = 20 ft/min



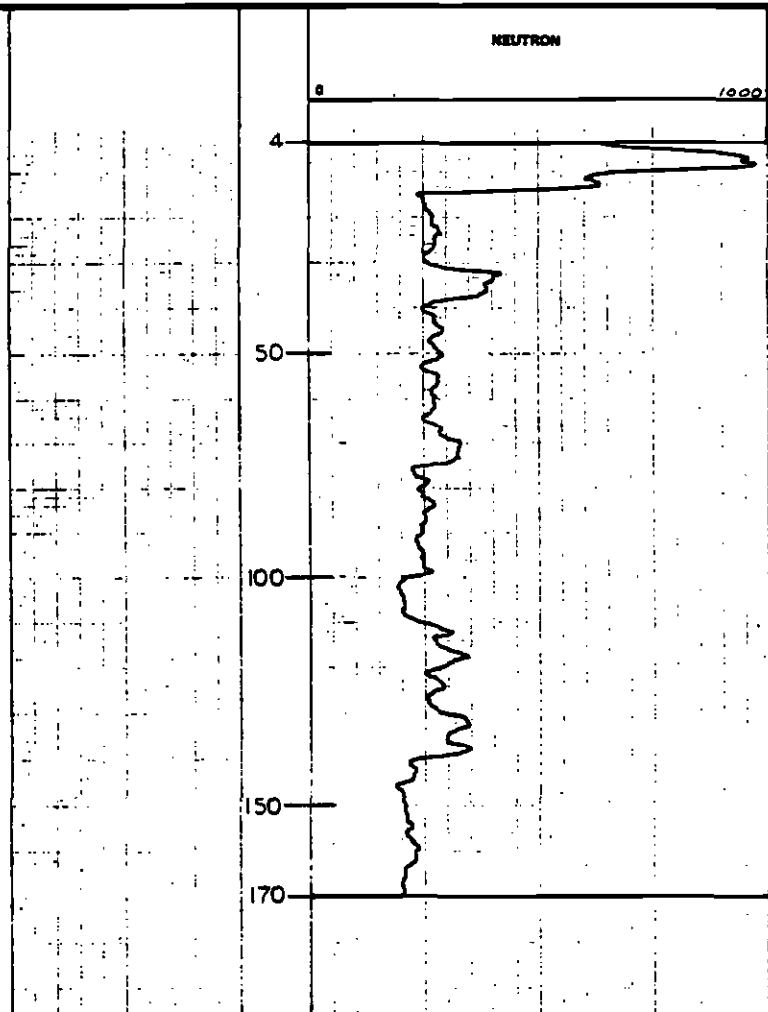


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NEUTRON LOG

CLIENT: SCRIP	Date	3/25/81
PROJ. NO. 2191-25	Run No.	TWR
WELL: 22	Depth-Order	200
FIELD:	Depth-Logger	171
COUNTY: LOS ANGELES	Min. Log Interval	170
STATE: CALIFORNIA	Top Log Interval	4
Other Services: SP, RES, NATURAL GAMMA,	Casing-Order	2" ARSO 200
C.C.L. CALIPER, DENSITY	Casing-Logger	2" ARSO 200
BLACKBURN DR. OFF OF CRESCENT	Bit Size	4 7/8"
HEIGHTS BLVD.	Type Fluid in Hole	FRESH WATER
	Temp. Visc.	
	API Field Log	
	Source of Sample	NONE
	Run @ Min. Temp.	
	Run @ Max. Temp.	
	Run @ Min. Temp.	
	Run @ Max. Temp.	
	Source: Real Rate	
	Run @ BHT	
	Completion Stopped	12/20/80
	Logger on Bottom	3/25/81
	Max. Run. Temp.	
	Powered By	MANZAGO
Section	Township	Range
Permanent Datum	G.L.	BL 162
Log Measured From	G.L.	D.P.
Drilling Measured From	G.L.	R.L.

Remarks: TWR IN HOLE AT 171 FT. LINE SPEED 15 FT/MIN, 3/4" PVC ALSO PLACED IN HOLE FROM G.L. TO 129 FT. BENTONITE PLUG BETWEEN PIEZOMETERS AT UNKNOWN DEPTH. WATER LEVEL IN CASING AT 15.6 FT.



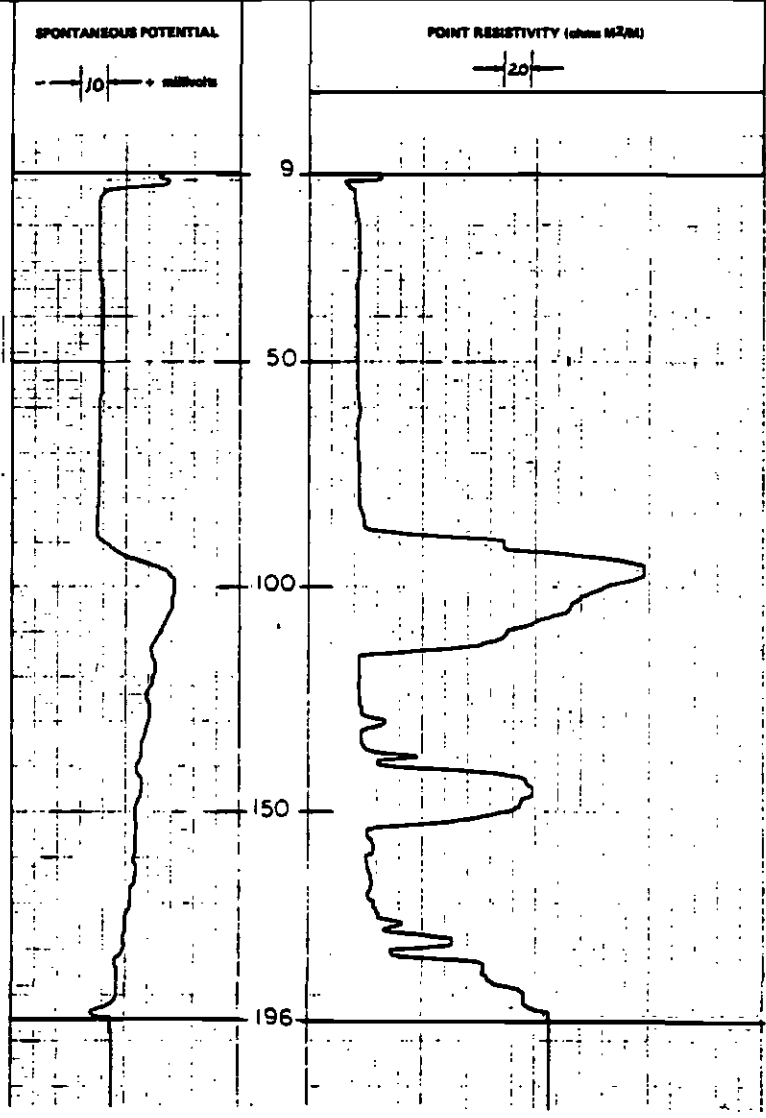


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 11/18/81			
PROJ. NO. 2191-25	Run No. ONE			
WELL: 23	Depth-Offset: 208.7			
FIELD:	Depth-Logger: M7			
COUNTY: LOS ANGELES	Dist. Log Interval: 196			
STATE: CALIFORNIA	Top Log Interval: 9			
Other Services: GAMMA, CCL, CALPER,	Casing-Offset: 5" @ 115'			
NEUTRAL DENSITY	Casing-Logger: 5" @ 115'			
~ 75' SOUTH AND ON THE EAST SIDE ~	Bit Size: 4 1/2"			
OF BEVERLY AND FAIRFAX INTERSECTION	Type Fluid in Hole: BENTONITE			
	Down. Vols.			
	off Field Loss	B	ml	ml
	Storage of Samples: AND TWO			
	Run @ Mean. Temp.	9.9 @ 74°F		
	Run @ Mean. Temp.	9.8 @ 74°F		
	Run @ Mean. Temp.	9.0 @ 74°F		
	Run @ 8MT			
	Chlorination Started	1300		
	Logger on Station	20 16		
	Min. Res. Temp.			
	Recorded By	MANUACOL		

Remarks: LINE SPEED 35 FT/MIN. NATURAL GAS BLENDING OUT HOLE WHILE LOGGING



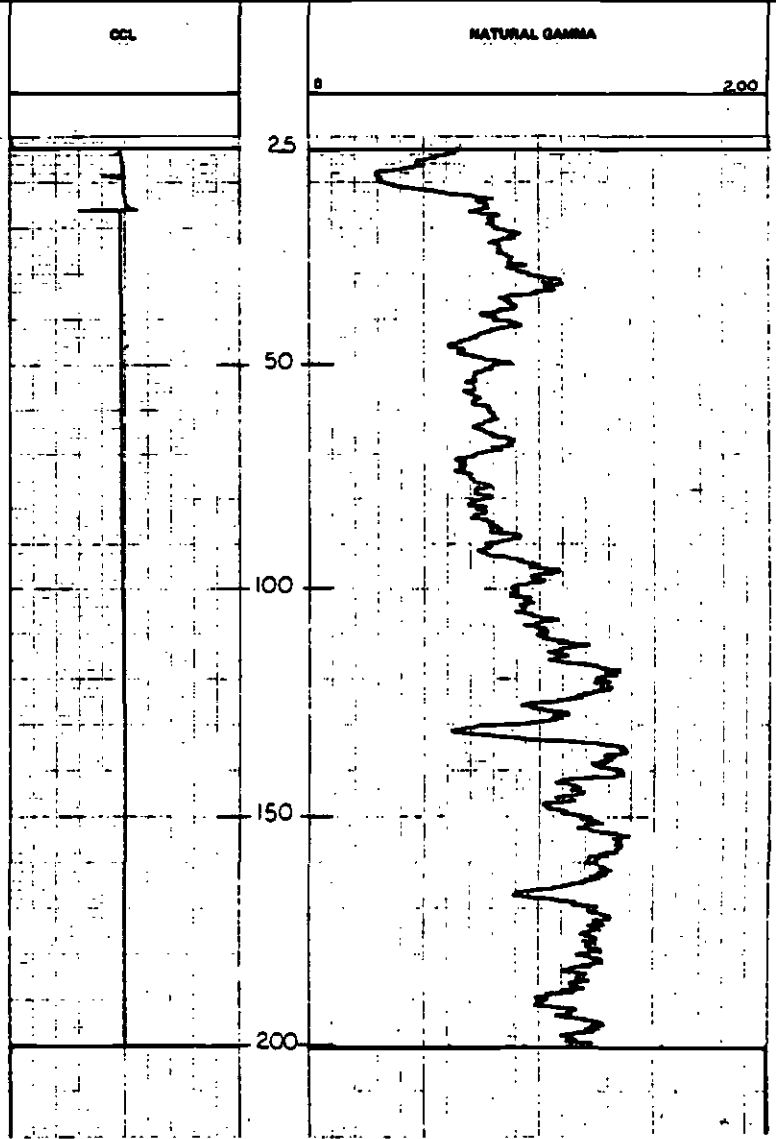


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/4/91				
PROJ. NO. 2191-25	Run No. DNE				
WELL: 23	Depth-Offset 200.7				
FIELD:	Depth-Logger 201.0				
COUNTY: LOS ANGELES	Gen. Log Interval 200.0				
STATE: CALIFORNIA	Top Log Interval 2.5				
Other Services: S.P., RES., CALIPR, NEUTRON, DENSITY	Depth-Offset 5' @ 11.5'				
	Depth-Logger 5' @ 12.5'				
	Bit Size 4 1/4"				
	Type Fluid in Hole BENTONITE				
	Temp. Visc.				
	pH Fluid Loss 0 ml				
	Source of Sample MUD TUB				
	Run @ Min. Temp. 2.2 @ 74 °F				
	Run @ Min. Temp. 2.8 @ 74 °F				
	Run @ Min. Temp. 3.0 @ 74 °F				
	Source: Surf / Rose				
	Run @ BWT				
	Correction Applied 1300				
	Logger on Bottom 1950				
	Min. Res. Temp.				
	Recorded By MARALDI				

Remarks: CCL READS 3' HIGHER THAN INDICATED, LINE SPEED 20"/MIN.



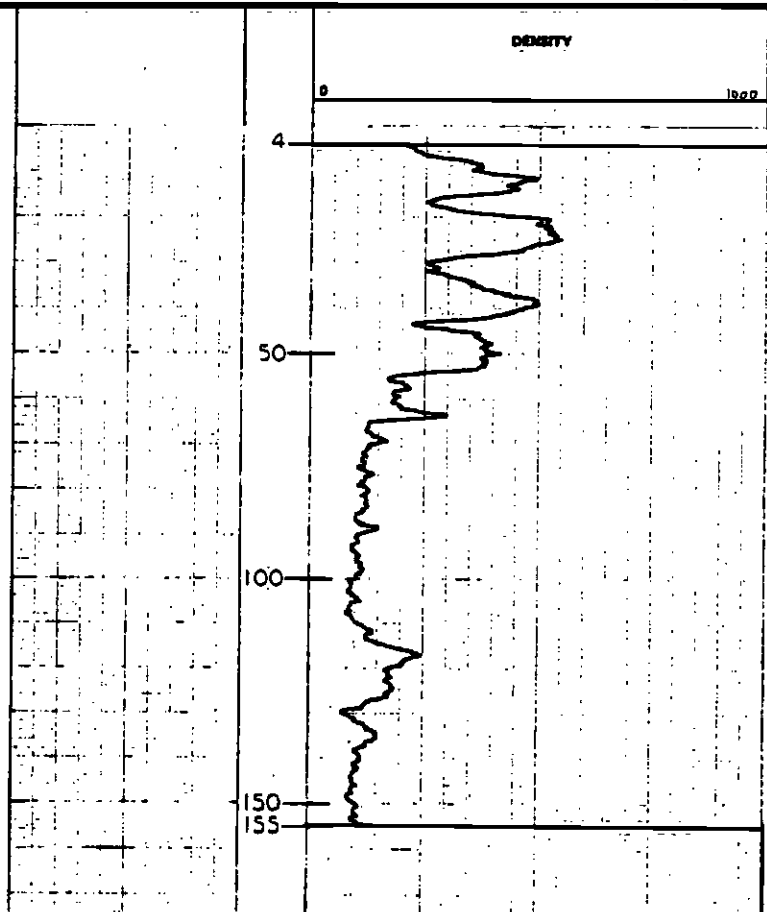


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DENSITY LOG

CLIENT: SCRIP	Date	3/25/81	
PROJ. NO. 2191-25	Run No.	219	
WELL: 25	Depth-Driller	200.7	
FIELD:	Depth-Logger	156	
COUNTY: LOS ANGELES	Sec. Log Interval	155	
STATE: CALIFORNIA	Top Log Interval	4	
Other Services: S.P. RES., NATURAL GAMMA, CCL, CALIPER, NEUTRON	Casing-Driller	2" ABS 200'	
	Casing-Logger	2" ABS 200'	
	Bit Size	4 7/8"	
	Type Fluid in Hole	FRESH WATER	
	Chem. - Visc.		
	pH	Field Log	all
	Number of Samples	NONE	
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Summer / Fall / Rain		
	Run @ DWT		
	Completion Pressure	14/81	
	Log on Bottom	325/81	
	Min. Run. Temp.		
	Recorded By	MANZAGOL	
Permanent Datum: G.L.	ELEVATION	G.L. 187	
Log Measured From: G.L.	ELEVATION	D.F.	
Drilling Measured From: G.L.	ELEVATION	K.B.	

Remarks: **LINE SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 7.3 FT TBR IN HOLE AT 156 FT.**



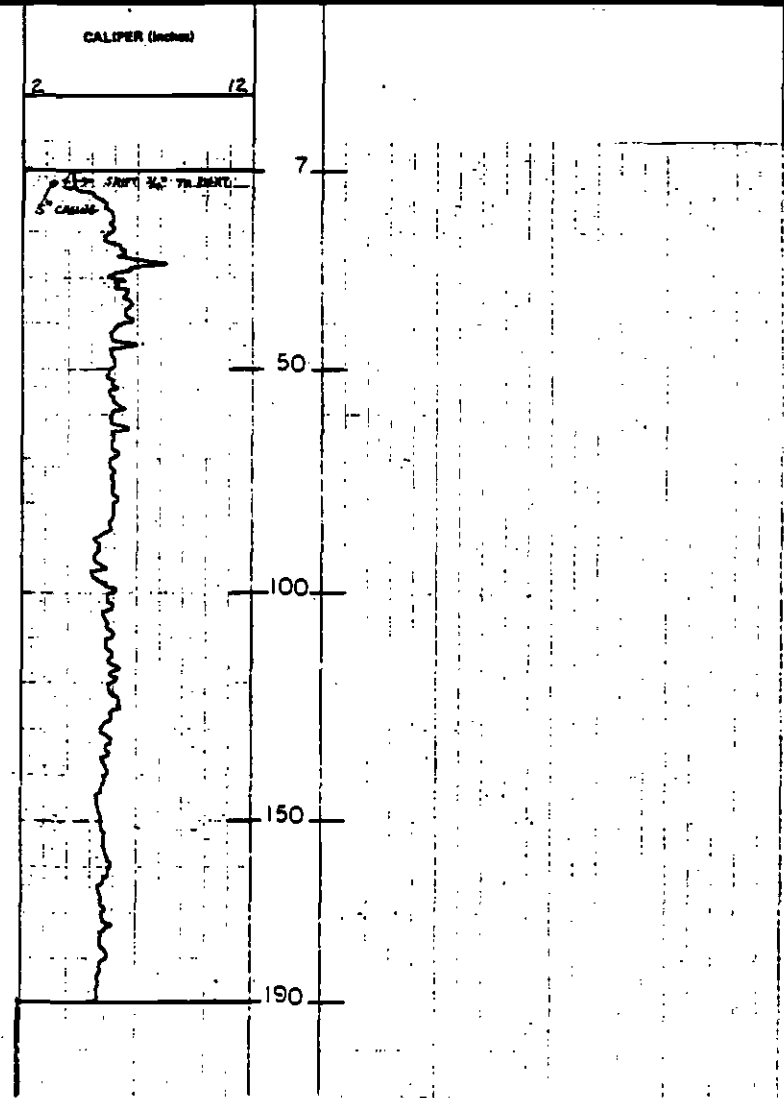


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CALIPER LOG

CLIENT: SCRTD	Date: 1/4/81		
PROJ. NO. 2191-25	Run In. ONE		
WELL: 23	Depth-Offset 200.7		
FIELD:	Depth-Logger 192		
COUNTY: LOS ANGELES	Str. Log Interval 190		
STATE: CALIFORNIA	Top Log Interval 7		
Other Services: GAMMA, CCL, S.P., RES.	Casing-Outside 5" @ 11.5'		
NEUTRON DENSITY	Casing-Logger 5" @ 11.5'		
~ 70' SOUTH ON THE EAST SIDE OF	Bit Size 4 7/8"		
PARROL AND BEVERLY STREET	Type Fluid In Hole DENMITE		
INTERSECTION	Conn. Visc.		
	gH Fluid Loss 8		
	Source of Sample MUD TR		
	Run @ Meas. Temp. 9.9 @ 74 °F		
	Run @ Meas. Temp. 9.8 @ 74 °F		
	Run @ Meas. Temp. 9.8 @ 74 °F		
	Source: Surf / Pipe		
	Run @ BHT 0 °F		
	Circulation Stopped 1300		
	Length on Bottom 2130		
	Max. Ann. Temp. °F		
	Recorded By MAURICE		
Section	Touchdown	Range	
Permittent Datum G.L.	G.L. 188		
Log Measuring From G.L.	D.P.		
Dubbing Measured From G.L.	R.S.		

Remarks: TOP OF LOG READS HOLE DIA. 3/4" TO SMALL, LINE SPEED 2.0 F/PM



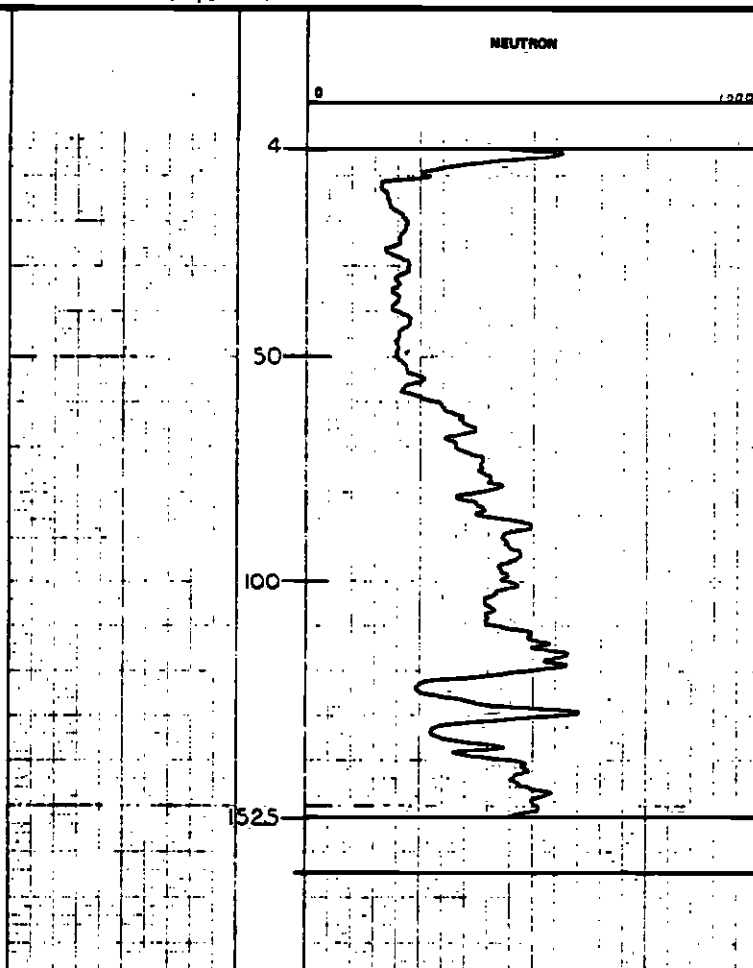


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NEUTRON LOG

CLIENT: SCRTD	Date	3/25/81
PROJ. NO. 2191-25	Well No.	TM20
WELL: 25	Depth-Offset	200.7
FIELD:	Depth-Logger	153.5
COUNTY: LOS ANGELES	Dist. Log Interval	152.5
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES, NATURAL GAMMA	Casing-Offset	2" ABSQ 200'
CCL, CALIPER, DENSITY	Casing-Logger	2" ABSQ 200'
~75' SOUTH AND ON THE EAST SIDE OF BEVERLY AND FAIRFAX INTERSECTION.	Bit Size	4 7/8"
	Type Fluid in Hole	FRESH WATER
	Down	Yes
	Up	Yes
	Field Log	Yes
	Records of Sample	None
	Run @ Max. Temp.	Yes
	Run @ Min. Temp.	Yes
	Run @ Max. Yield	Yes
	Run @ Min. Yield	Yes
	Recorder Read	Yes
	Run @ 50Y	Yes
	Recorder Stopped	1/4/81
	Logger on Bottom	3/25/81
	Max. Run. Temp.	Yes
	Recorded By	MANZAGOL

Remarks: LINE SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 7.3 FT,
TOP IN. HOLE AT 153.5 FT.



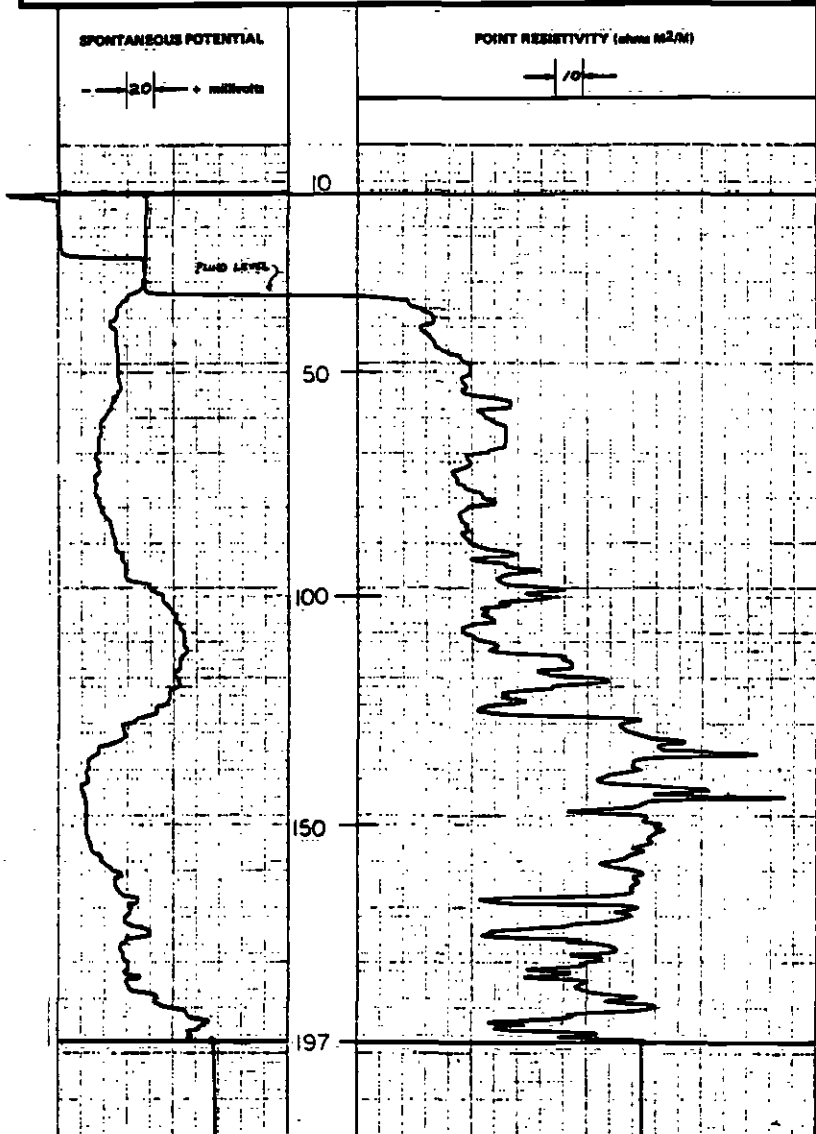


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/17/91		
PROJ. NO.: 2191-25	Run In:		
WELL: 23A	Depth-Outer: 200		
FIELD:	Depth-Logger: 197		
COUNTY: LOS ANGELES	Top Log Interval: 10		
STATE: CALIFORNIA	Casing-Outer: 5" x 5"		
Other Services: NATURAL GAMMA, CCL, CALIPER DENSITY, NEUTRON	Casing-Logger: 5" x 5"		
	Bit Size: 4 1/2"		
	Type Fluid in Hole: BENTONITE		
	Temp.:		
	pH:		
	Field Log: 8.5		
	Source of Sample: MID TOB		
	Run @ Mass. Temp.:		
	Run @ Mass. Temp.:		
	Run @ Mass. Temp.:		
	Run @ Mass. Temp.:		
	Run @ BPT:		
	Chlorination Success: 1700		
	Logger on Bottom: 1875		
	Min. Res. Temp.:		
	Recorded By: RANAGOL		

Remarks: LINE SPEED 35 FT/MIN. TWO FRESH H₂O DRILLING FLUID IN HOLE.



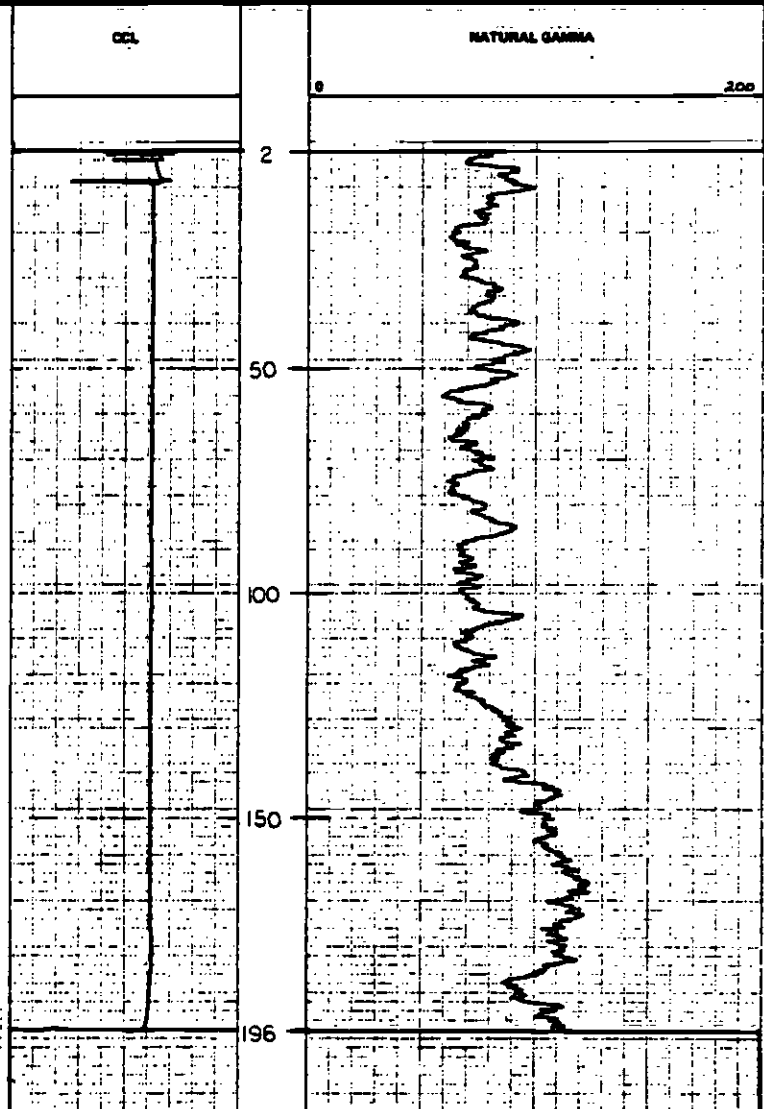


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD.	Date: 2/14/81		
PROJ. NO. 2191-25	Run No. 1		
WELL: 23A	Depth-Orbit 200		
FIELD:	Depth-Logger 199		
COUNTY: LOS ANGELES	Min. Log Interval 1/2		
STATE: CALIFORNIA	Top Log Interval 2		
Other Services: SP-RES, CALIPER, DENSITY, NEUTRON	Casing-Orbit 5" @ 5'		
	Casing-Logger 5" @ 5'		
	Site Size 4 3/4'		
	Type Fluid in Hole BENTONITE		
	Dist. Visc.		
	pH Field Log 8.5	ml	ml
	Number of Samples Mud Tub		
	Run @ Min. Temp. 10" @ 80 °F		
	Run @ Min. Temp. 10" @ 80 °F		
	Run @ Min. Temp. 4.8 @ 80 °F		
	Source: Roof / Hole		
	Run @ BHT		
	Countdown Stopped 1700		
	Logger on Bottom 1870		
	Min. Run Temp.		
	Recorded By: HANZAGOL		

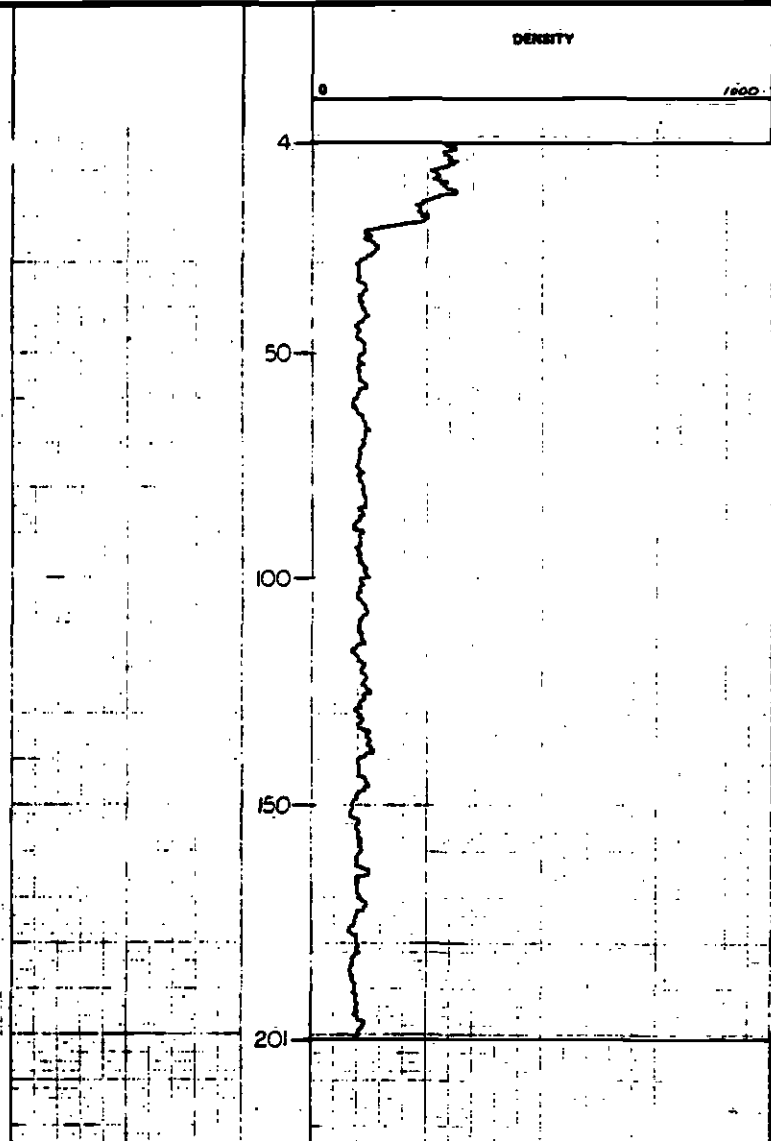
Remarks: LINE SPEED 15 FT/MIN ; CCL READS 3' DEEPER THAN
DEPTH INDICATED





CLIENT: SCRTD	Date	3/25/71
PROJ. NO. 2191-25	Run No.	TW8
WELL: 33A	Depth-Offset	217.5
FIELD:	Depth-Logger	202
COUNTY: LOS ANGELES	Run Log Interval	201
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P. RES. NATURAL GAMMA G.L. CALIPER, NEUTRON	Casing-Offset	2" ABS @ 217.5
	Casing-Logger	2" ABS @ 217.5
	Bit Size	4 7/8"
	Type Fluid in Hole	FRESH WATER
	Dens. Visc.	
	pH Field Log	oil oil oil
	Source of Sample	WELL
	Run @ Meas. Temp.	oil oil oil oil
	Well @ Meas. Temp.	oil oil oil oil
	Run @ Meas. Temp.	oil oil oil oil
	Strat. Ref. Name	
	Run @ BWT	oil oil oil oil
	Chloride Above Logger on Bottom	2/14/71
	Meas. Run. Temp.	oil oil oil
	Recorded By	MANZAGOL

Remarks: LINE SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 21.2 FT,
HOLE OBSTRUCTED AT 202 FT.



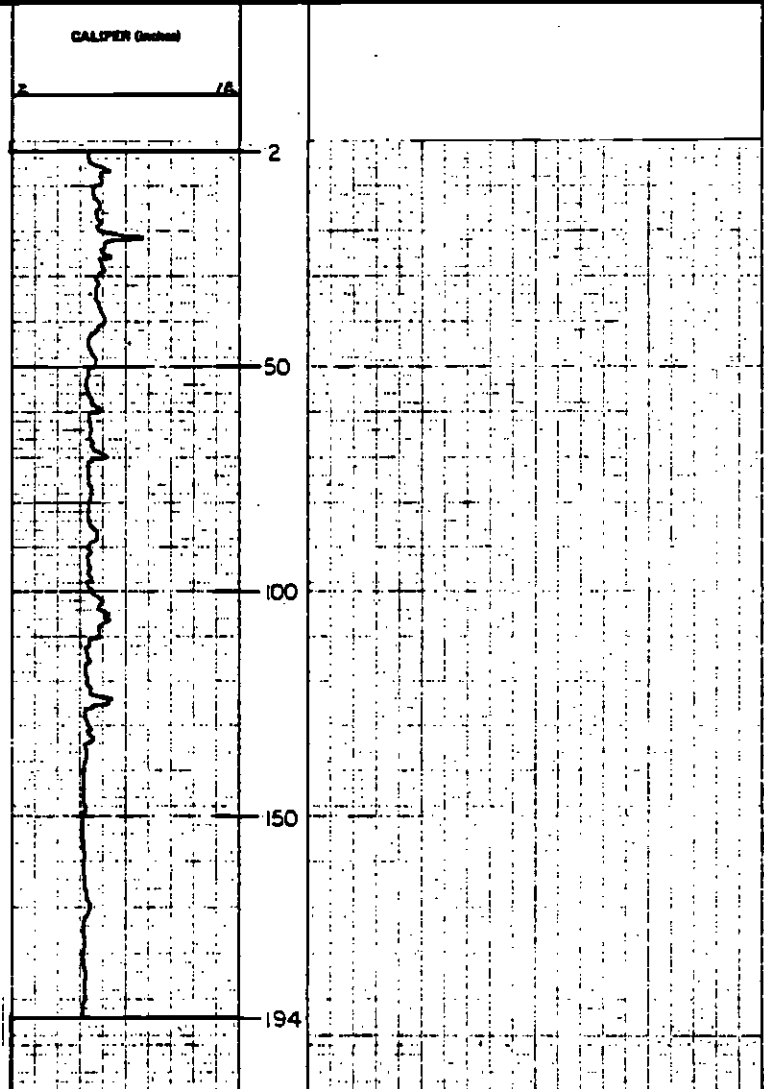


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CALIPER LOG

CLIENT: SCRTD	Date: 2/17/91		
PROJ. NO. 2191-25	Run No. 1		
WELL: 23A	Depth-Order 200		
FIELD:	Depth-Logger 176		
COUNTY: LOS ANGELES	Min. Log Interval 177		
STATE: CALIFORNIA	Top Log Interval 2		
Other Services: NATURAL GAS/VA C.C.L.	Casing-Order 5" x 5'		
SP-RBS DENSITY-NBUTRON	Casing-Logger 5" x 5'		
SOUTH SIDE OF ROSWELL STREET	Bit Size 4 1/2"		
100' EAST OF PHOENIX AVENUE	Type Fluid in Hole BENTONITE		
	Date. Vis.		
	spH Field Log	8.5	
	Source of Sample Red Tub		
	Run @ Min. Temp. 10" @ 80 °F		
	Run @ Min. Temp. 10" @ 80 °F		
	Run @ Min. Temp. 4.5" @ 80 °F		
	Run @ Min. Temp.		
	Run @ BWT.		
	Checklist Observed 1780		
	Logger on Screen 1780		
	Min. Run Temp.		
	Recorded By PHENAGDL		
Permeability Order G.L.	G.L. 214		
Log Measured From G.L.	D.P.		
Drilling Measured From G.L.	K.S.		

Remarks: **LINE SPEED 20 FT/MIN**



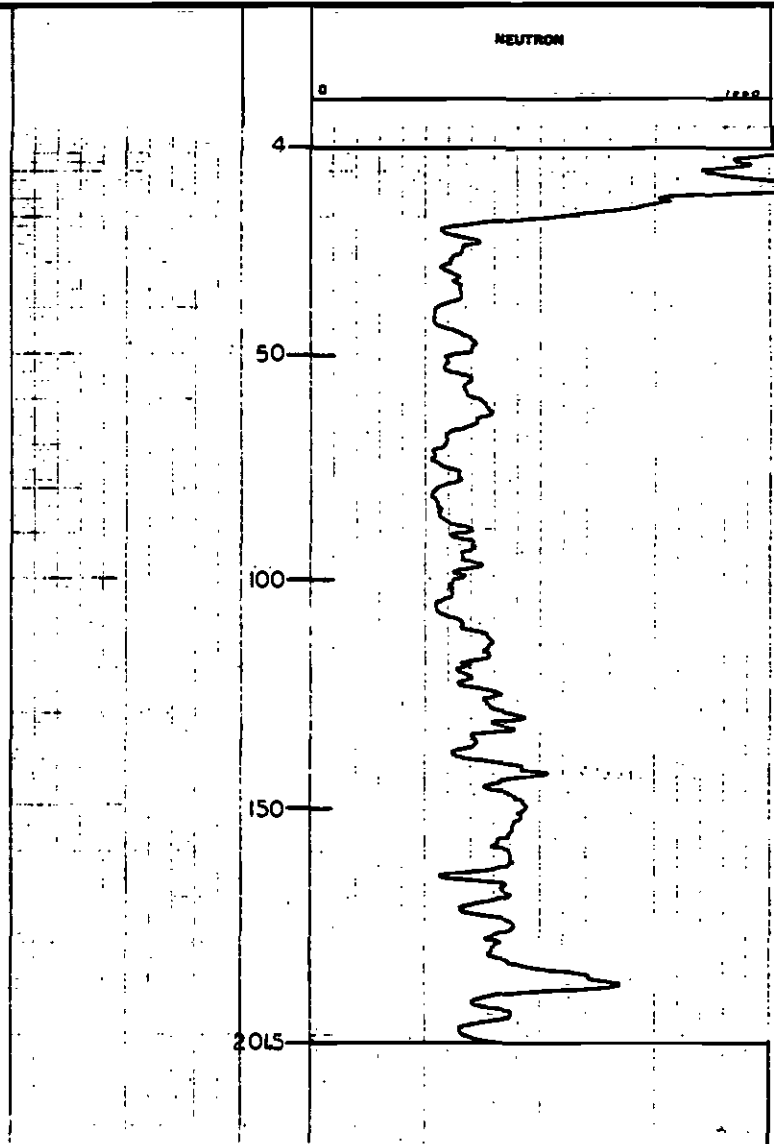


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NEUTRON LOG

CLIENT: 4CLTD	Date: 3/25/81
PROJ. NO. 2191-25	Ram No. TW6
WELL: 25A	Depth-Driller 217.5
FIELD:	Depth-Logger 202.5
COUNTY: LOS ANGELES	Shm. Log Interval 201.5
STATE: CALIFORNIA	Top Log Interval 4
Other Services: S.P. RES. NATURAL GAMMA DCL, CALIPER, DENSITY	Depth-Driller 2" ASSE 217.5
SAITH SIDE OF ROSEWOOD STREET ~100' EAST OF FAIRFAX AVENUE.	Depth-Logger 2" ASSE 217.5
Section Township Range	SH Size 4 7/8
Permeameter Datum: G.L.	Type Fluid in Hole FRESH WATER
Log Measured From: G.L.	Chem. Visc. pH Field Loss
Drilling Measured From: G.L.	Source of Sample NONE
	Ram @ Min. Temp. 0 0 0 0 0 0
	Ram @ Max. Temp. 0 0 0 0 0 0
	Ram @ Min. Temp. 0 0 0 0 0 0
	Ram @ Max. Temp. 0 0 0 0 0 0
	Ram @ SHT 0 0 0 0 0 0
	Circulation Stopped 2/14/81
	Logger on Bottom 3/25/81
	Max. Ram. Temp. 0 0 0 0 0 0
	Recorded By MFR NZ PGSL

Remarks: LINE SPEED IS FT/MIN. WATER LEVEL IN CASING AT 21.2 FT,
HOLE OBSTRUCTED AT 202.5 FT.



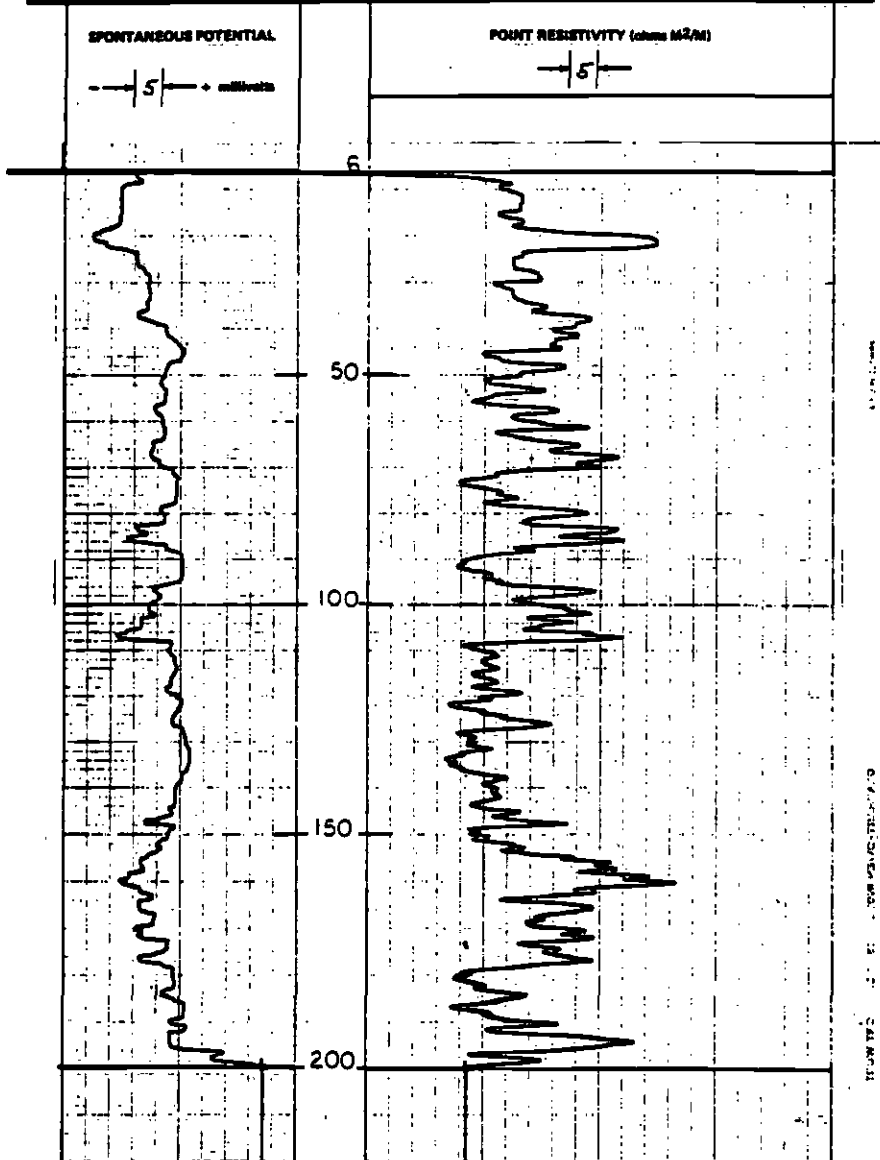


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 11/11/11			
PROJ. NO. 2191-25	Run No. ONE			
WELL: 24	Depth-Driller: 2.00			
FIELD:	Depth-Logger: 2.01			
COUNTY: LOS ANGELES	Dist. Log Interval: 2.00			
STATE: CALIFORNIA	Top Log Interval: 6			
Other Services: GAMMA, ECL, CALPIER	Coring-Driller: 2" @ 5'			
NEUTRON	Coring-Logger: 2" @ 5'			
	Bit Size: 4 1/2			
	Type Fluid in Hole: RESTRAINED			
	Dist. Win.			
	psi Fluid Loss: 9	at	at	at
	Source of Sample: MUD TUB			
	Run @ Min. Temp: 100 @ 66 °F			
	Run @ Min. Temp: 100 @ 66 °F			
	Run @ Min. Temp: 100 @ 66 °F			
	Source: Roof / Base			
	Run @ 800'			
	Completion Interval: 1330			
	Logger at Bottom: 1230			
	Min. Res. Temp.:			
	Recorded By: CALLIMATTI			
Section	Township	Range		
Permittent Datum: G.L.	ELEVATION G.L. 285			
Log Measured From: G.L.	D.F.			
Drilling Measured From: G.L.	N.S.			

Remarks: LINE SPEED 35' / MIN.



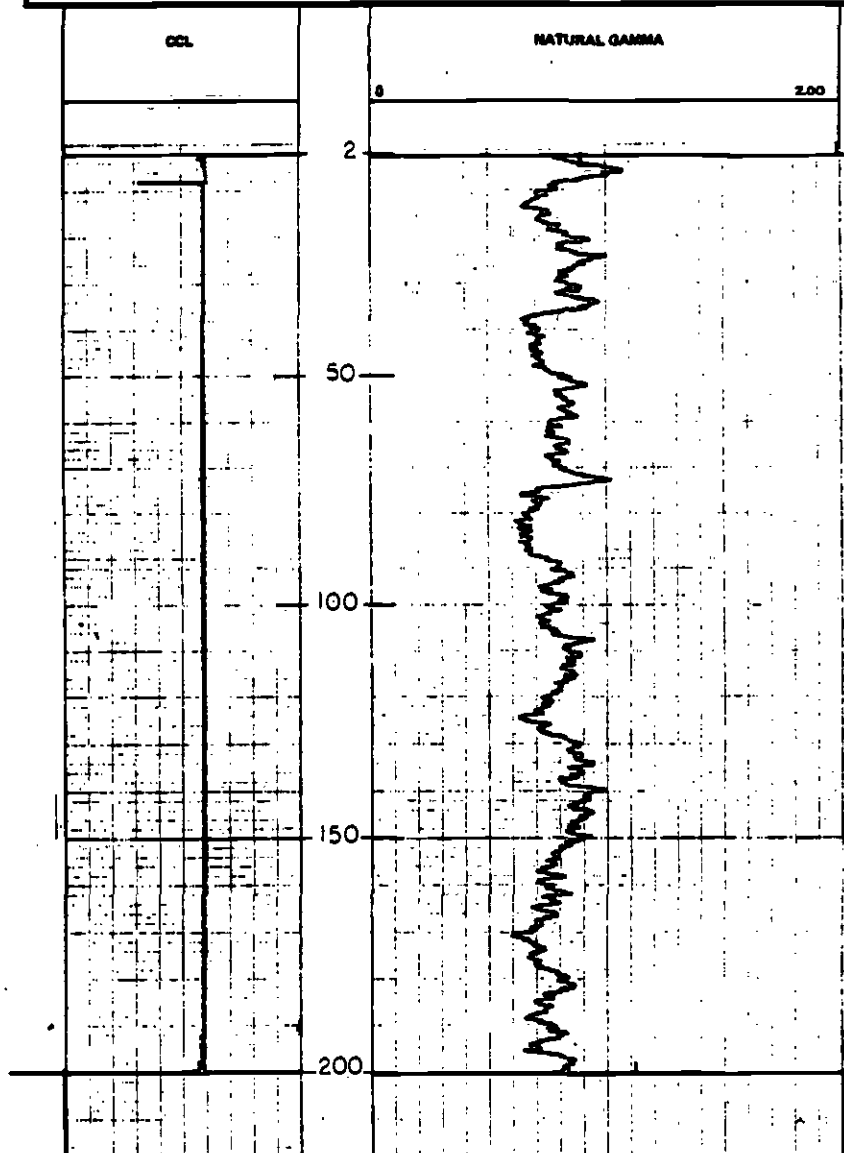


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/4/81			
PROJ. NO. 2191-25	Run No. ONE			
WELL: 24	Depth-Driller 200			
FIELD:	Depth-Logger 281			
COUNTY: LOS ANGELES	Run Log Interval 200			
STATE: CALIFORNIA	Top Log Interval 2			
Other Services: S.P., RES., LALIPER HENTON	Casing-Driller 5" @ 5'			
	Casing-Logger 5" @ 5'			
	Well Size 4 1/2"			
	Type Fluid to Hole DEIONIZED			
	Dist. - Yds.			
	psi	Field Log		
	Source of Sample	740 TUR		
	Run @ Min. Temp.	100 @ 66°F		
	Run @ Min. Temp.	100 @ 66°F		
	Run @ Min. Temp.	100 @ 66°F		
	Source: Run	Run		
	Run @ GWT			
	Penetration Stopped	1330		
	Logger on Bottom	1600		
	Max. Run Temp.			
	Recorded By	GALLIATHI		

Remarks: LINE SPEED 20 FT/MIN. CCL READS 3' HIGHER THAN DEPTH INDICATED



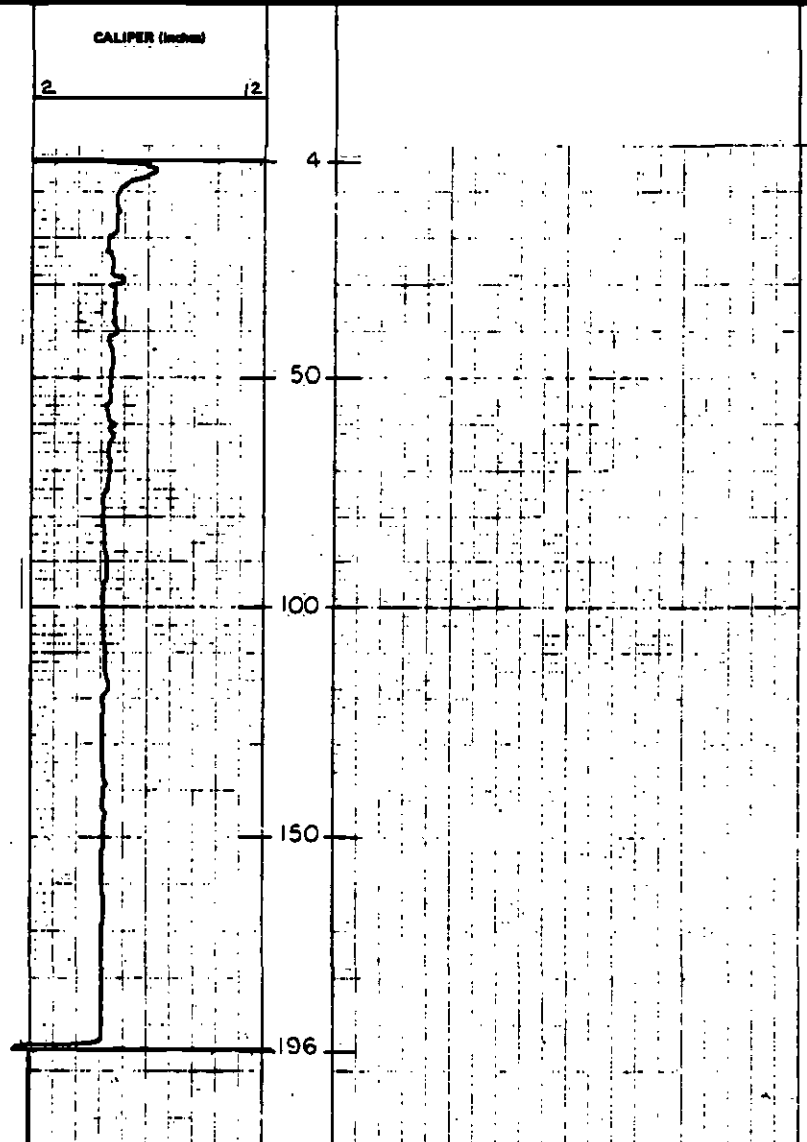


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CALIPER LOG

CLIENT: SCRTD	Date: 1/4/81			
PROJ. NO. 2191-25	Run No.: 4NE			
WELL: 24	Depth-Orifer: 200			
FIELD:	Depth-Logger: 198			
COUNTY: LOS ANGELES	Run Log Interval: 196			
STATE: CALIFORNIA	Top Log Interval: 4			
Other Services: J.R. RES., LAMMA, C.C.	Casing-Orifer: 6" 0.5'			
NEUTRAN	Casing-Logger: 5" 0.5'			
190' SOUTH (ON THE EAST SIDE) OF SANTA ANITA AND YANITA BLVD. INTERSECTION	Bit Size: 4 3/8"			
Section: _____ Township: _____ Range: _____	Type Fluid in Hole: SEAWATER			
Permeant Density: G.L.	Dens. _____ Visc. _____			
Log Measured From: G.L.	pH _____ Fluid Loss: 9 ml			
Drilling Measured From: G.L.	Source of Sample: PROP. TOP			
	Run @ Min. Temp.: 10 = 0.66 °F			
	Run @ Max. Temp.: 10 = 0.66 °F			
	Run @ Min. Temp.: 10 = 0.66 °F			
	Run @ Max. Temp.: 10 = 0.66 °F			
	Min. Run Temp.: _____ °F			
	Max. Run Temp.: _____ °F			
	Recorded By: L.L. HARTY			

Remarks: **LINE SPEED 2.0 F/Min.**



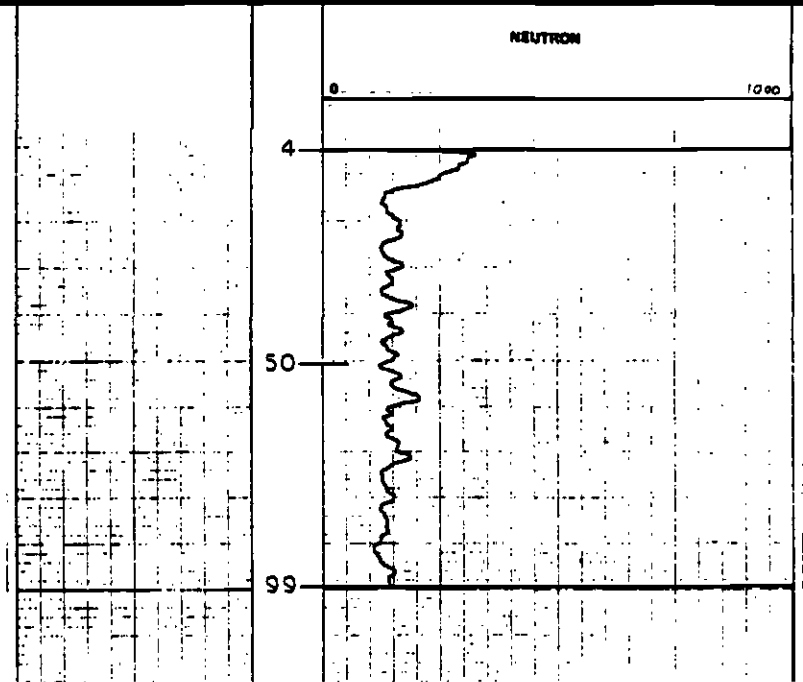


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NEUTRON LOG

CLIENT: SCATP	Date	3/24/81
PROJ. NO. 2191-25	Run No.	TWO
WELL: 24 (PHONE HOLE A)	Depth-Offset	100
FIELD:	Depth-Logger	100
COUNTY: LOS ANGELES	Stem Log Interval	99
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES, NATURAL GAMMA	Casing-Offset	3" PVC @ 100
CCL	Casing-Logger	3" PVC @ 100
100' SOUTH (ON THE EAST SIDE) OF SANTA MONICA AND FAIRFAX AVENUE INTERSECTION	Bit Size	4 1/8"
Section	Type Fluid in Hole	FRESH WATER
Particulars Contain: G.L.	Temp.	
Log Measured From: G.L.	pH	
Drilling Measured From: G.L.	Field Log	
	Source of Sample	NONE
	Run @ Meas. Temp.	
	Run @ Meas. Temp.	
	Run @ Meas. Temp.	
	Source: Steel / Core	
	Run @ 80FT	
	Circulation Stopped	1/4/81
	Logger on Bottom	3/20/81
	Max. Res. Temp.	
	Recorded By	MBANZAGOL

Remarks: PHONE HOLE A WAS LOGGED, 3" PVC GRADED IN PLACE, WATER LEVEL IN CASING TO SURFACE, LINE SPEED 15 FT/MIN.



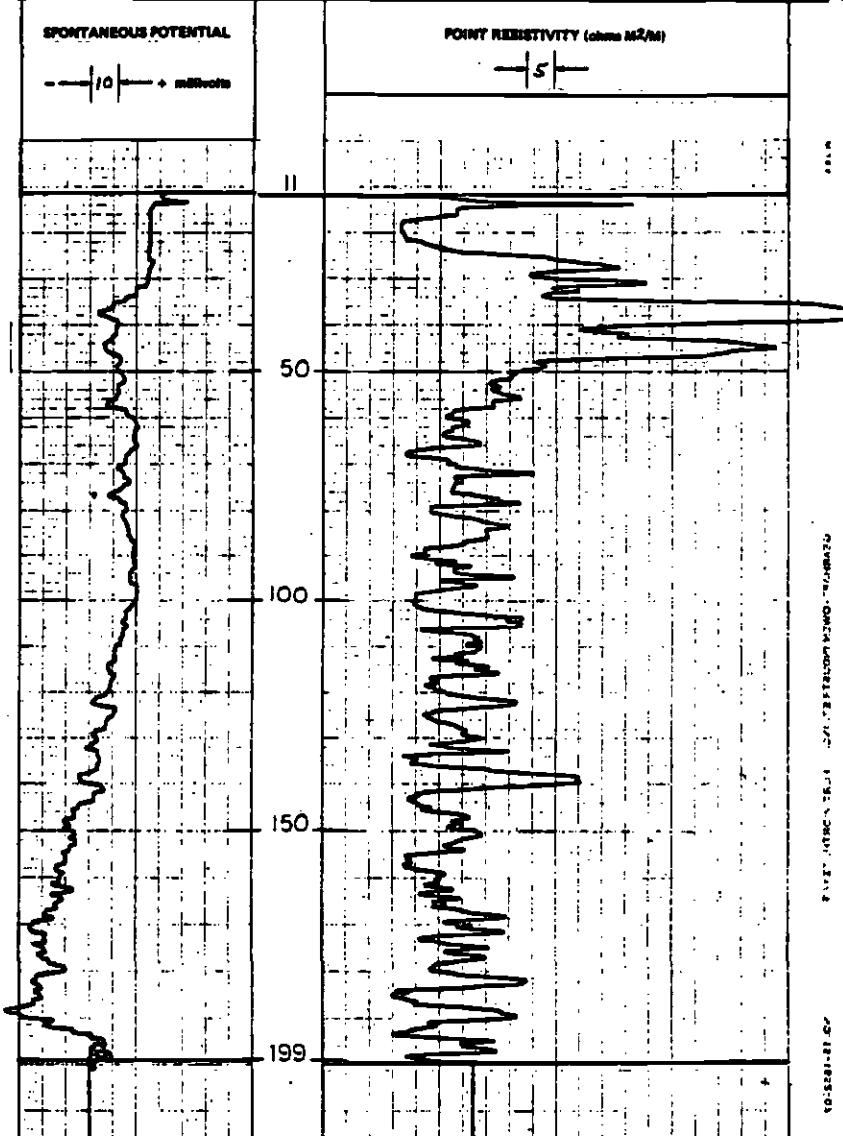


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date	12/3/80		
PROJ. NO. 2191-25	Run No.	04E		
WELL: 25	Depth-Driller	282.5		
FIELD:	Depth-Logger	200		
COUNTY: LOS ANGELES	Run Log Interval	199		
STATE: CALIFORNIA	Top Log Interval	11		
Other Services: NAT. GAMMA, CALIPER.	Casing-Driller	5" @ 4'		
NEUTRAL DENSITY	Casing-Logger	4"		
	Bit Size	4 3/8"		
	Type Fluid in Hole	SEALED WATER		
	Dens.	Vis.		
	pH	Field Log	R	ml
	Source of Sample	PHD TUB		
LOCATION: NE CORNER OF FOUNTAIN AVE. AND SIERRA BONITA AVE.	Run @ Min. Temp.	10 @ 63 °F		
	Run @ Min. Temp.	10 @ 63 °F		
	Run @ Min. Temp.	10 @ 63 °F		
	Run @ Min. Temp.	10 @ 63 °F		
Section	Township	Range	Run @ SMT	
Permitted District: G.L. (USE ONLY)	GL 523		Calibration Checked	1100
Log Measured From: G.L.	D.F.		Logger on Bottom	1300
Drilling Measured From: G.L.	K.B.		Min. Res. Temp.	°F
			Recorded By	CALINATTI

Remarks: LINE SPEED 30 F/min.



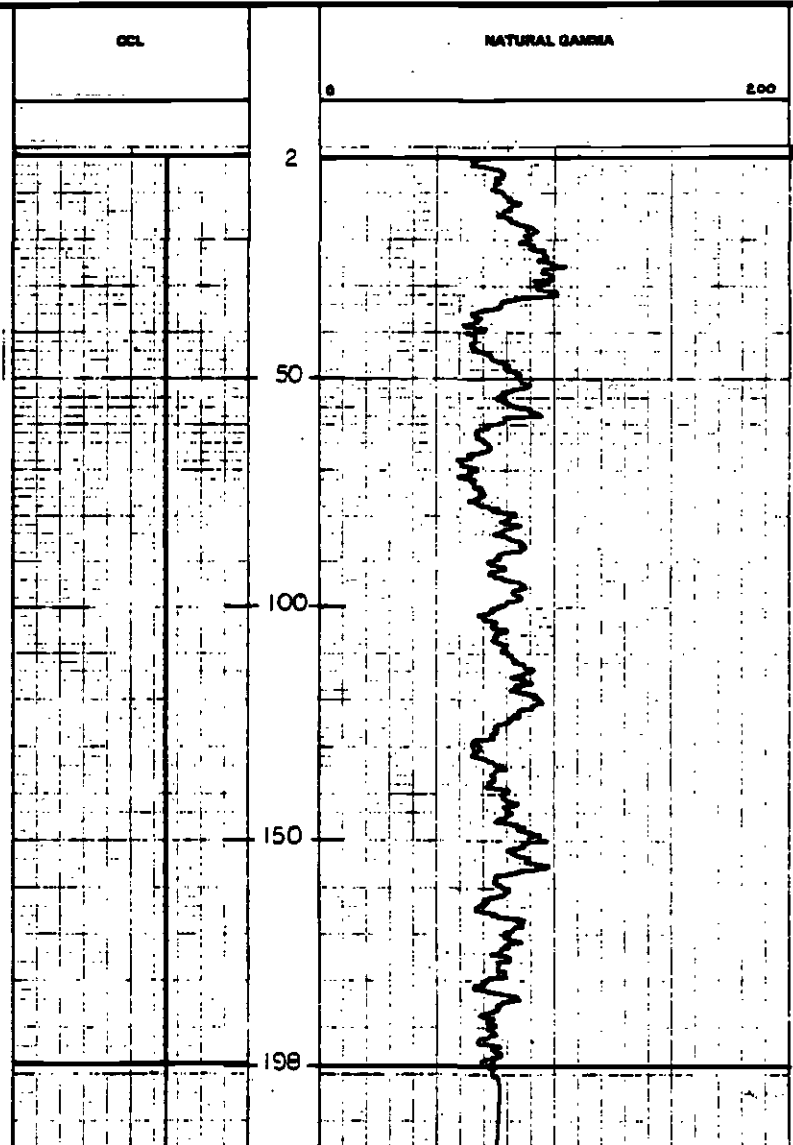


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 12/31/80	Run No. 61E		
PROJ. NO. 2171-25	Depth-Driller LOGS	Depth-Logger 177		
WELL: 25	Dist. Log Interval 178	Top Log Interval 2.0		
FIELD:	Coring-Driller 5" @ 4'	Coring-Logger 4'		
COUNTY: LOS ANGELES	Bit Size 4 7/8"	Type Fluid in Hole SEAWATER		
STATE: CALIFORNIA	Dist. Vin.	Dist. Mud Loss		
Other Services: S.P., RES., CALIF.,	Range of Sample 700-715	Run @ Min. Temp. 10° @ 6.5'		
NEUTRON DENSITY	Run @ Max. Temp. 10° @ 6.5'	Run @ Min. Temp. 10° @ 6.5'		
MR. CORNER OF FOUNTAIN AVE. AND	Run @ Min. Temp. 10° @ 6.5'	Run @ Min. Temp. 10° @ 6.5'		
SIEGA RANITA AVE.	Run @ Min. Temp. 10° @ 6.5'	Run @ Min. Temp. 10° @ 6.5'		
Section	Township	Range		
Permanent Datum G.L. (SEA LEVEL)	G.L. 32.3	Log @ Bottom 13.40		
Log Measured From G.L.	D.F.	Min. Res. Temp.		
Drilling Measured From G.L.	K.B.	Recorded By GALLAGHER		

Remarks: **CCL WAS NOT RUN, LINE SPEED 20 FT/MIN.**



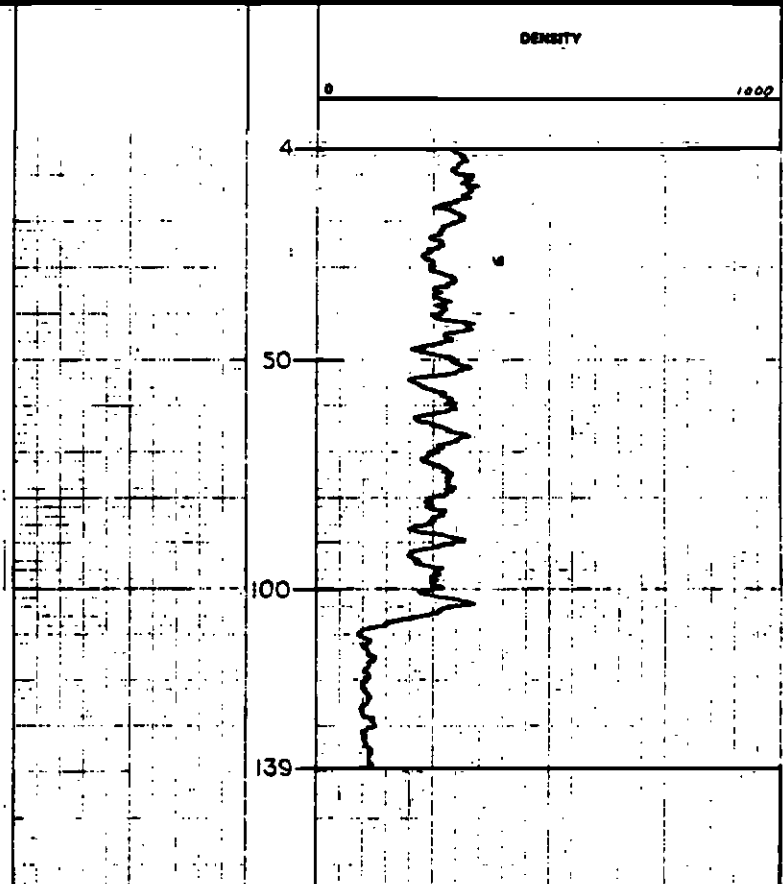


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DENSITY LOG

CLIENT: SCRTD	Date	3/24/81
PROJ. NO. 211-25	Site No.	TWP
WELL: 25	Depth-Offset	202.5
FIELD:	Depth-Logger	140
COUNTY: LOS ANGELES	Base Log Interval	139
STATE: CALIFORNIA	Top Log Interval	4
Other Services: SP, RES, NATURAL GAMMA, CCL, CALIPER, NEUTRON	Casing-Offset	0
NE CORNER OF FOUNTAIN AVE	Casing-Logger	2' ABSO 200'
DND SIERRA BONITA AVE.	Bit Size	4 1/8"
Section	Township	Range
Permeability	Core	Flow
Log Measured From	Log	Log
Drilling Interval From	Log	Log
	Recorded By	MBJZAGD

Remarks: LOG SPEED 16 FT/MIN, WATER LEVEL IN CASING AT 106 FT, HOLE OBSTRUCTED AT 140 FT.



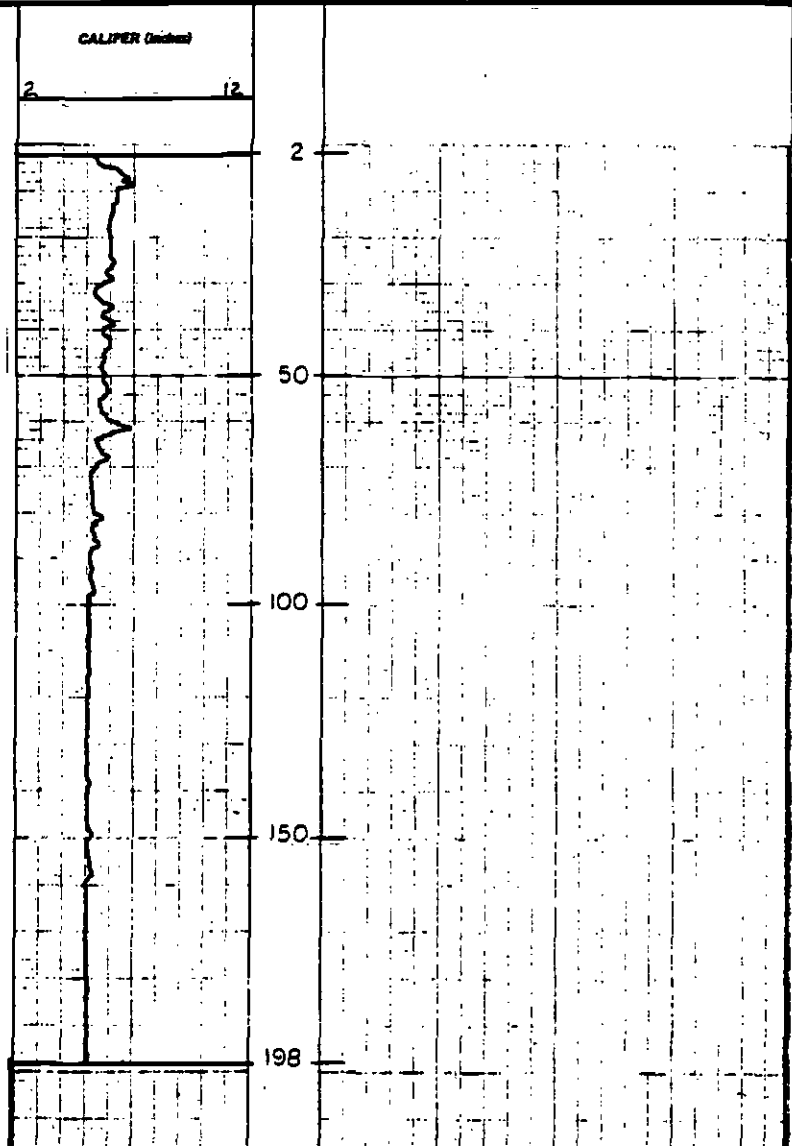


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CALIPER LOG

CLIENT: SCR7D	Date: 12/31/80		
PROJ. NO. 2191-25	Run No. 04E		
WELL: 25	Depth-Offset 202.5'		
FIELD:	Depth-Lag 100'		
COUNTY: LOS ANGELES	* Stem. Log Interval 178'		
STATE: CALIFORNIA	* Top Log Interval 2'		
Other Services: NAT. GAMMA, S.P., RES.	Coring-Offset 5' @ 4'	•	•
NEUTRON DENSITY	Coring-Lag 4'		
NE CORNER OF MOUNTAIN AVE. AND SIERRA RAMITA AVE.	Bit Size 4.75"		
	Type Fluid in Hole SEALED		
	Dist. Visc.		
	* psi * Fluid Loss	•	•
	Number of Samples AND TUB		
	Run @ Max. Temp. 10" @ 63 °F	•	•
	Run @ Min. Temp. 10" @ 63 °F	•	•
	Run @ Max. Temp. 10" @ 63 °F	•	•
	Run @ Min. Temp. 10" @ 63 °F	•	•
	Summ. Run / Rise		
	Run @ BHT	•	•
	Circulation Stopped		
	Logger on Bottom		
	Max. Rec. Temp.		
	Recorded By FALLINATTI		

Remarks: LIVE SPEED 20 FT/MIN.



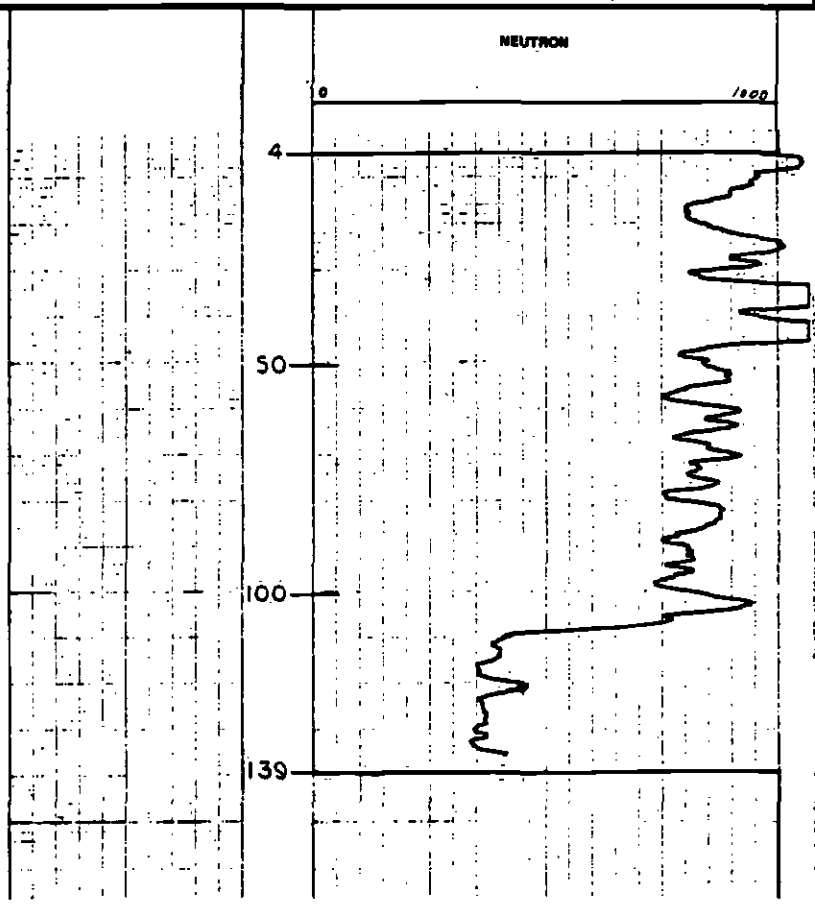


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NEUTRON LOG

CLIENT: SCRTP	Date	3/24/81		
PROJ. NO. 241-25	Run No.	TW0		
WELL: 25	Depth-Driller	2025		
FIELD:	Depth-Logger	140		
COUNTY: LOS ANGELES	Min. Log Interval	139		
STATE: CALIFORNIA	Top Log Interval	4		
Other Services: SP, RES, NATURAL GAMMA	Casing-Driller	<input type="checkbox"/>	2" ABS @ 200'	<input type="checkbox"/>
CCL CALIPER DENSITY	Casing-Logger	<input type="checkbox"/>	2" ABS @ 200'	<input type="checkbox"/>
NE CORNER OF FOUNTAIN AVE	Bit Size	4 7/8"		
AND SANTA ANITA AVE.	Type Fluid in Hole	FRESH WATER		
	Dens.	Vis.	spH	Field Log
	g/cc	cp	nd	nd
	Source of Sample			
	Run @ Min. Temp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Run @ Min. Temp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Run @ Min. Temp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Source: Surf / Run	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Run @ BHT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Circulation Stopped	12/31/80		
	Logger on Bottom	3/24/81		
	Min. Run Temp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Recorded By	MANZAGO		
Permanent Datum: GL (SIDEWALK)	ELEVATION	GL 323		
Log Measured From: GL	D.F.			
Drilling Measured From: GL	K.S.			

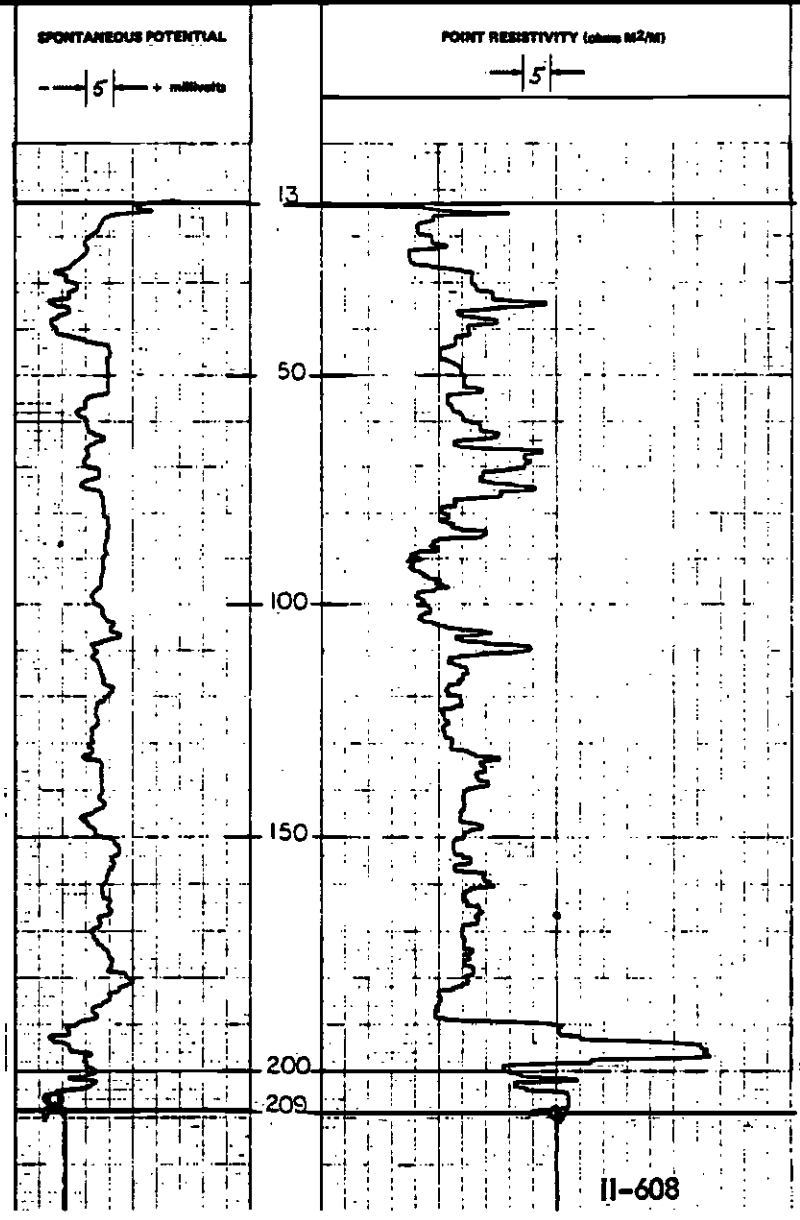
Remarks: **LINE SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 108 FT, HOLE OBSTRUCTED AT 140 FT.**





CLIENT: SCRTD		Date: 12/28/90		
PROJ. NO. 2191-25		Run No. ONE		
WELL: 26		Depth-Offset 287.5		
FIELD:		Depth-Logger 210		
COUNTY: LOS ANGELES		Shm. Log Interval 207		
STATE: CALIFORNIA		Top Log Interval 13		
Other Services: GAMMA, CALIPER, NEUTRON		Caliper-Offset 5" @ 11.5"		
DEENSITY		Caliper-Logger //		
53' SOUTH OF FOUNTAIN AVE AND STAMBORE INTERSECTION, ON STAMBORE		Bit Size 4 7/8"		
Location: Township Range:		Type Fluid in Hole DENTRINITE		
Permeability Control G.L. (MOVEMENT) G.L. 312		Dens. Vis.		
Log Measured From G.L. D.P.		pH Field Log		
Drilling Measured From G.L. S.B.		Sum of Sample AND TUB		
		Run @ Max. Temp. 10" @ 67%		
		Reel @ Max. Temp. 10" @ 67%		
		Run @ Max. Temp. 10" @ 67%		
		Conductor Steel Pipe		
		Run @ SST		
		Conductor Strapped		
		Logger on Bottom		
		Max. Run. Temp.		
		Recorded By MAURAGOL		

Remarks: LINE SPEED 40 FPM.



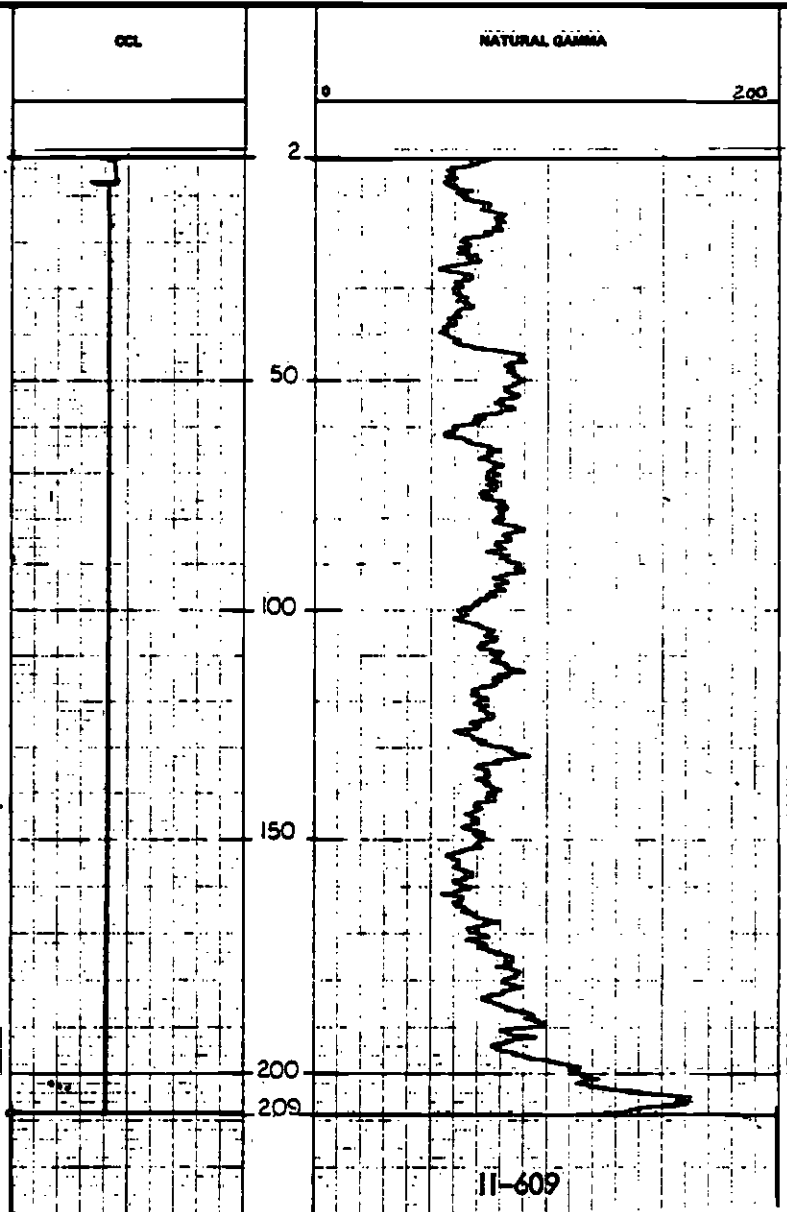


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 12/30/90	Run No. 016			
PROJ. NO. 2191-25	Depth-Offset 289.5	Depth-Logger 218			
WELL: 26	Stem Log Interval 269	Top Log Interval 8			
FIELD:	Coring-Offset 5' @ 11.5'	Coring-Logger 10			
COUNTY: LOS ANGELES	Bit Size 4 7/8"	Type Fluid in Hole SEAWATER			
STATE: CALIFORNIA	Down. Visc.	gH - Fluid Loss 8 ml			
Other Services: S.P.-RES, CALIPER,	Source of Sample MUD TUB	Run @ Min. Temp. 10 @ 67 °F			
NEUTRON DENSITY	Run @ Min. Temp. 10 @ 67 °F	Run @ Min. Temp. 10 @ 67 °F			
LOCATION: 5' SOUTH OF MOUNTAIN AVE. AND SYCAMORE INTERSECTION, AN SYCAMORE	Source Run / Run	Run @ 8MT			
Station	Township	Range			
Formation Details: G.L. (PAVEMENT)	G.L. 3/2	Completion Stopped 1600			
Log Measured From: G.L.	D.P.	Logger on Bottom 1720			
Logging Measured From: G.L.	K.S.	Max. Run Temp. °F			
		Recorded By: J.A.M.B.A.G.A.L.			

Remarks: LINE SPEED 20.7"/MIN. CCL READS 3 FEET DEEPER THAN INDICATED



11-609

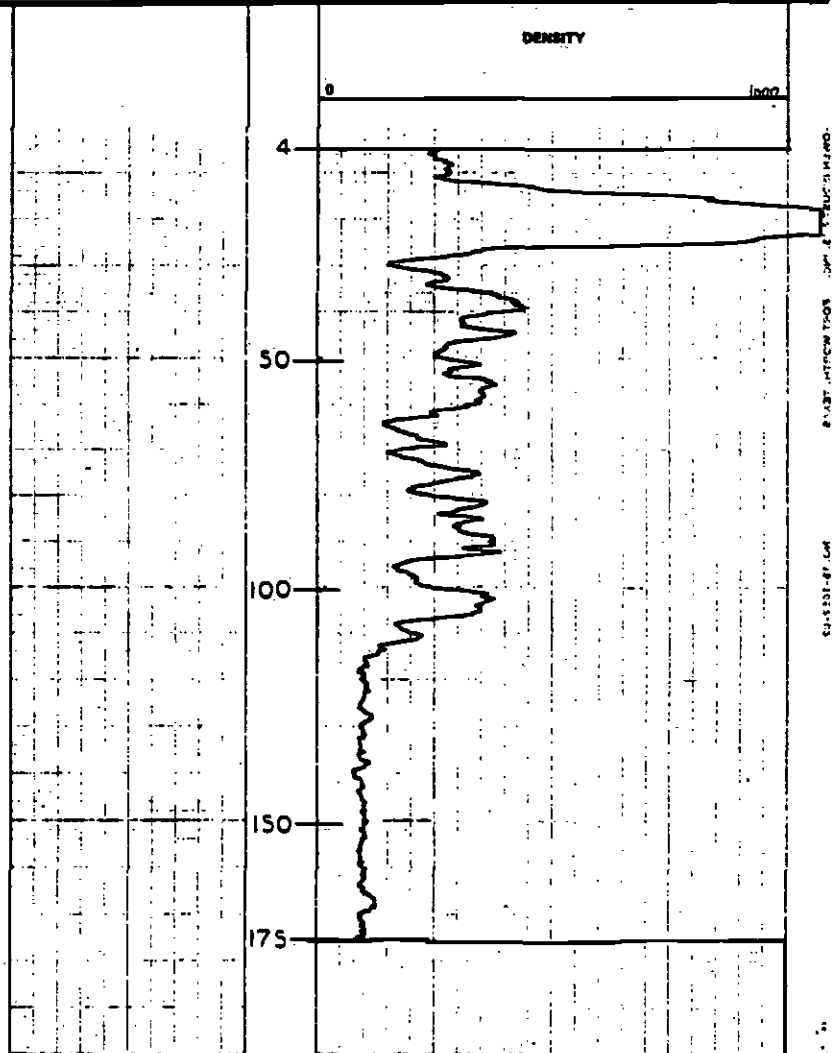


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DENSITY LOG

CLIENT: SCRTD	Date: 3/24/81						
PROJ. NO. 211-25	Run No. TWA						
WELL: 26	Depth-Driller: 209.5						
FIELD:	Depth-Logger: 176						
COUNTY: LOS ANGELES	Stm. Log Interval: 175-						
STATE: CALIFORNIA	Top Log Interval: 4						
	Casing-Driller: 2" ABS 200' (BROKEN)						
	Casing-Logger: 2" ABS 200' (BROKEN)						
	Bit Size: 4 7/8"						
	Type Fluid in Hole: FRESH WATER						
Other Services: SP-RES, NATURAL GAMMA, CCL CALIPER, NEUTRON							
155' SOUTH OF FOUNTAIN AVE. AND SYCAMORE INTERSECTION ON SYCAMORE							
Section	Traverse	Range	Run @ MFT	Run @ Min. Temp.	Run @ Max. Temp.	Run @ Min. Temp.	Run @ Max. Temp.
Permanent Datum: G.L. (PAVEMENT)	AL 312						
Log Measured From: G.L.	D.P.			12/30/80	3/24/81		
Drilling Measured From: G.L.	K.S.						
							MANZAGOL

Remarks: CASING BROKEN DURING INSTALLATION, HOLE OBSTRUCTED AT 176 FT., LINE SPEED IS FT/MIN, WATER LEVEL IN CASING AT 24.5 FT., 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 86 FT., BENTONITE PLUG BETWEEN PIEZOMETERS AT 81 TO 86 FT.



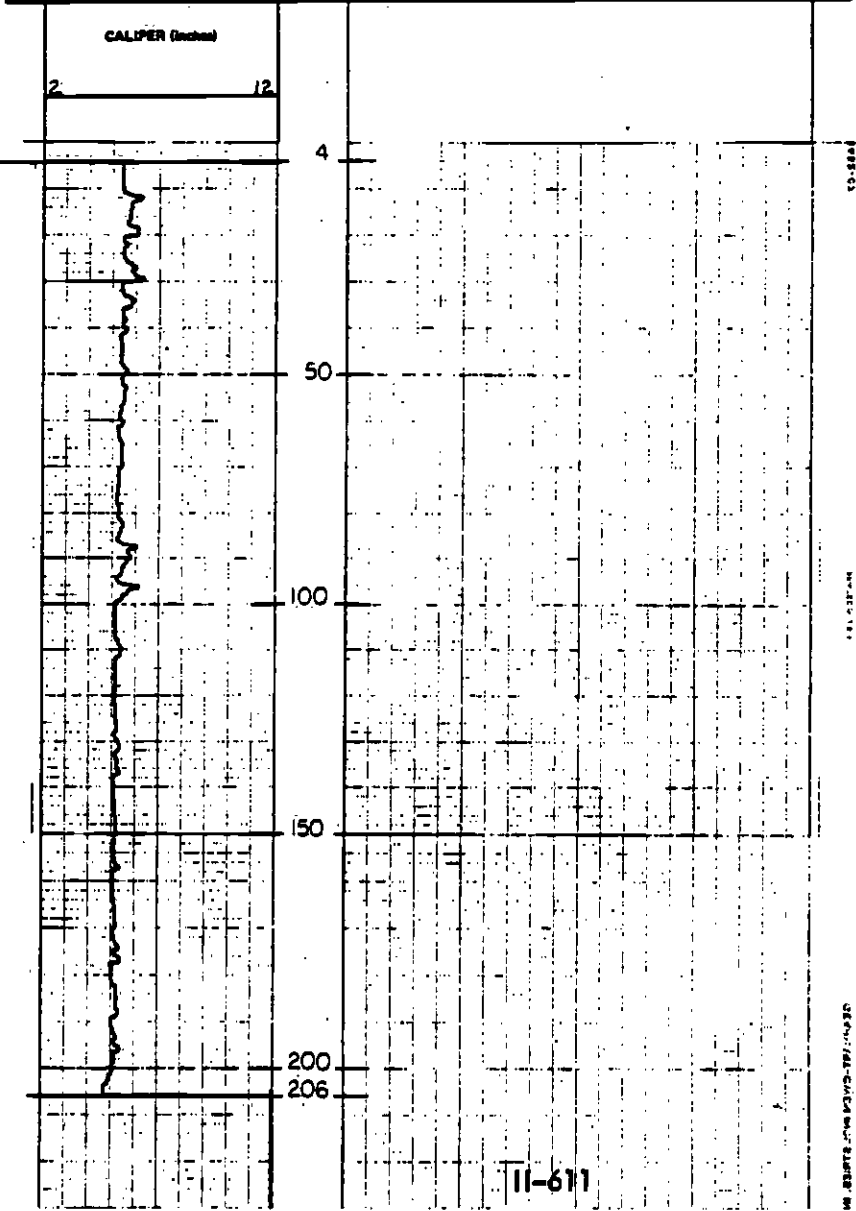


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CALIPER LOG

CLIENT: SCRTD	Date: 12/16/20			
PROJ. NO. 2191-25	Run No. ONE			
WELL: 26	Depth-Driller: 2095			
FIELD:	Depth-Logger: 201			
COUNTY: LOS ANGELES	Min. Log Interval: 200			
STATE: CALIFORNIA	Top Log Interval: 4			
Other Services: S.P.-RES., GAMMA,	Casing-Driller: 5" @ 115'	0	0	
NEUTRON DENSITY	Casing-Logger: 11			
57' SOUTH OF EQUATION AVE AND SYCAMORE INTERSECTION IN SYCAMORE	Bit Size: 4 1/2"			
	Type Fluid in Hole: BENTONITE			
	Chem. Visc.			
	pH Field Log	0	ml	ml
	Source of Sample: MUD TOP			
	Run @ Min. Temp. 10 @ 67 °F	0	°F	°F
	Run @ Min. Temp. 10 @ 67 °F	0	°F	°F
	Run @ Min. Temp. 10 @ 67 °F	0	°F	°F
	Source: Run / Run			
	Run @ BMT	0	°F	°F
	Chatterton Depth: 1600			
Permeant Column: G.L. (PNEUMAT)	QL 3/2			
Log Measured From: G.L.	D.F.			
Drilling Measured From: G.L.	R.R.			
	Logger on Bottom: 1745			
	Min. Run Temp. °F	°F	°F	°F
	Recorded By: NAME-GL			

Remarks: TOP 100' OF LOG HAS A 1/2" DRIFT TO THE RIGHT, LINE SPEED 20 FPM.



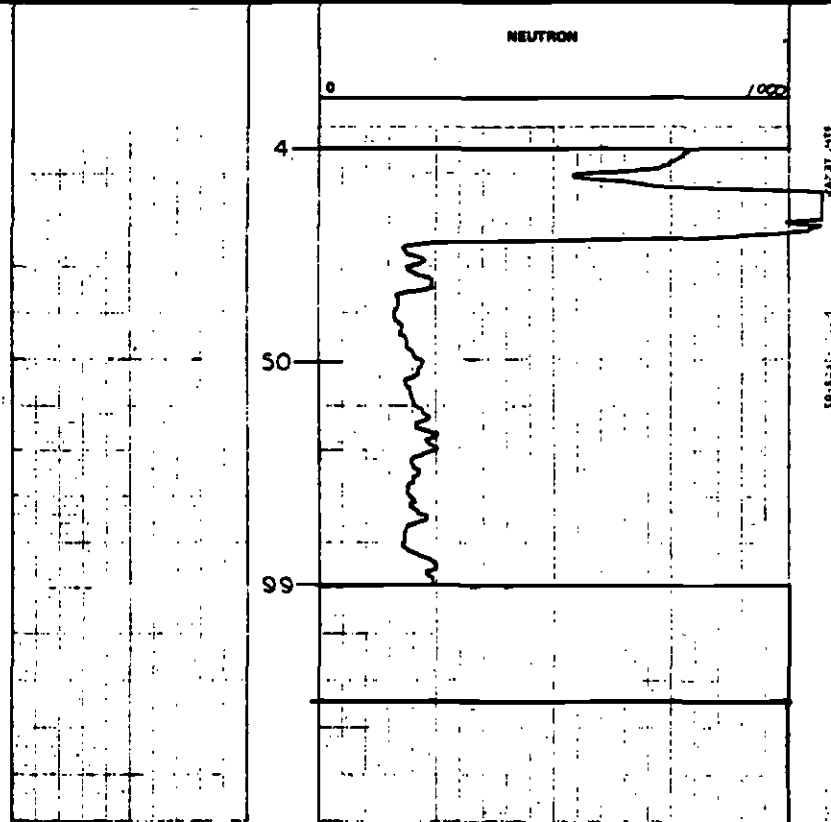


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NEUTRON LOG

CLIENT: SCATD	Date	3/24/81
PROJ. NO. 241-25	Run No.	TWO
WELL: 26	Depth-Offset	209.5
FIELD:	Depth-Logger	100
COUNTY: LOS ANGELES	Stem Log Interval	99
STATE: CALIFORNIA	Top Log Interval	4
Other Services: SP-RES, NATURAL GAMMA	Coring-Offset	0
CCL CALIBER, DENSITY	Coring-Logger	2" ABS @ 200' (Brown)
83' SOUTH OF MOUNTAIN AVE. AND SYCAMORE INTERSECTION, ON SYCAMORE	Bit Size	4 1/2"
Section Township Range	Type Fluid in Hole	FRESH WATER
Permeant Column: G.L. (DAVE MANN)	Date	3/24/81
Log Measured From: G.L.	Run	12/30/80
Drilling Measured From: G.L.	Logger on Bottom	3/24/81
	Max. Run Time	
	Recorded By	MANZAGO

Remarks: CASING BROKEN DURING INSTALLATION. HOLE OBSTRUCTED AT 100 FT. LINE SPEED IS FT/MIN. WATER LEVEL IN CASING AT 24.5 FT. 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 86 FT. BENTONITE PLUG BETWEEN PIEZOMETERS AT 81 TO 86 FT.



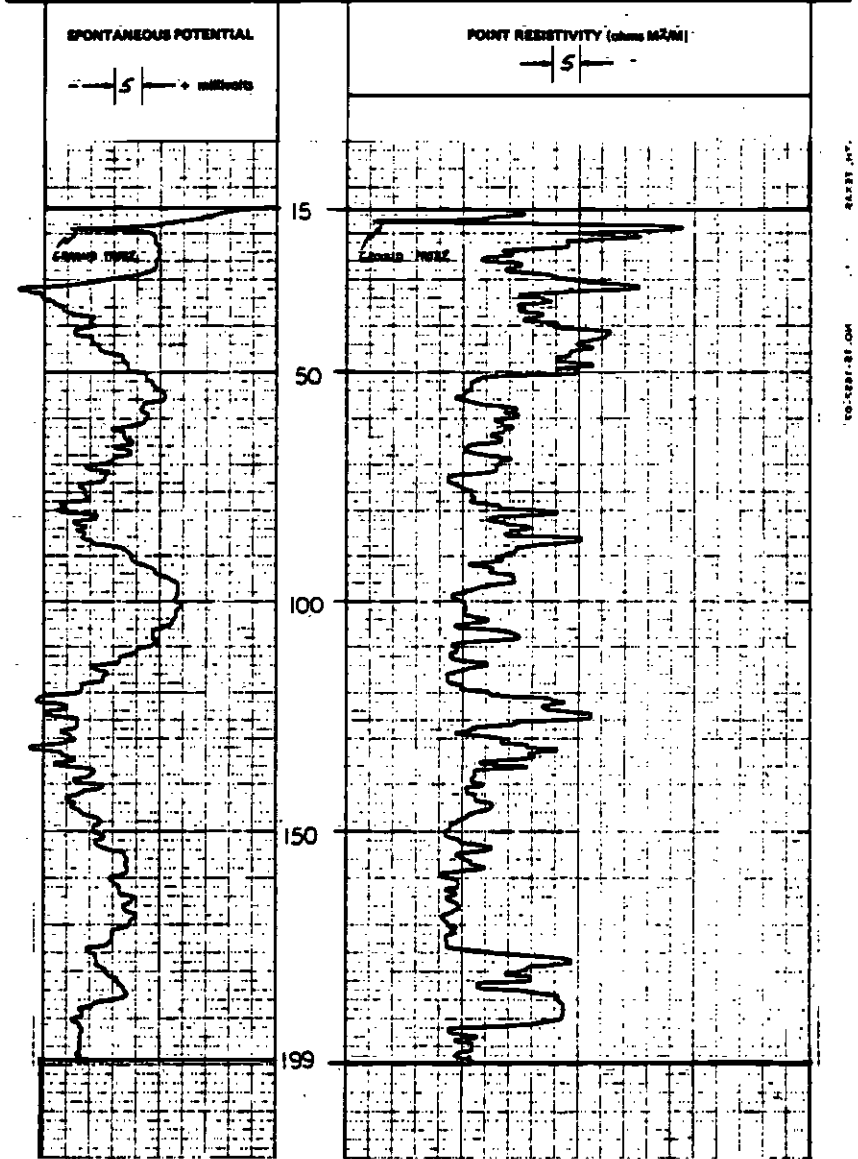


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SP-RESISTIVITY LOG

CLIENT: <u>SCRD</u>	Date: <u>12/10/90</u>
PROJ. NO. <u>2191-25</u>	Run No. <u>1</u>
WELL: <u>27</u>	Depth-Offset <u>201</u>
FIELD:	Depth-Logger <u>200</u>
COUNTY: <u>Los Angeles</u>	Run Log Interval <u>179</u>
STATE: <u>California</u>	Top Log Interval <u>13</u>
Other Services: <u>Natural Gamma, Caliper, Density, Neutron</u>	Casing-Offset <u>5" @ 16'</u>
	Casing-Logger <u>3" @ 16'</u>
	Bit Size <u>7 1/2"</u>
	Type Fluid in Hole <u>Brine/NaCl</u>
	Conn. Vols.
	SP Field Log <u>2</u> ml
	Scale of Graph <u>1000 Ohm Tub</u>
	Run @ Min. Temp. <u>10.0 @ 69.0°</u>
	Run @ Max. Temp. <u>10.0 @ 69.0°</u>
	Run @ Min. Temp. <u>9.9 @ 69.0°</u>
	Run @ Max. Temp. <u>9.9 @ 69.0°</u>
	Access: Rod / Size
	Run @ BHT <u>0.0°</u>
	Corrosion Suscept. <u>800</u>
	Logger on Screen <u>1000</u>
	Max. Run. Temp. <u>0°</u>
	Recorded By <u>MANZAROL</u>

Remarks: Line Speed = 30 FT/min



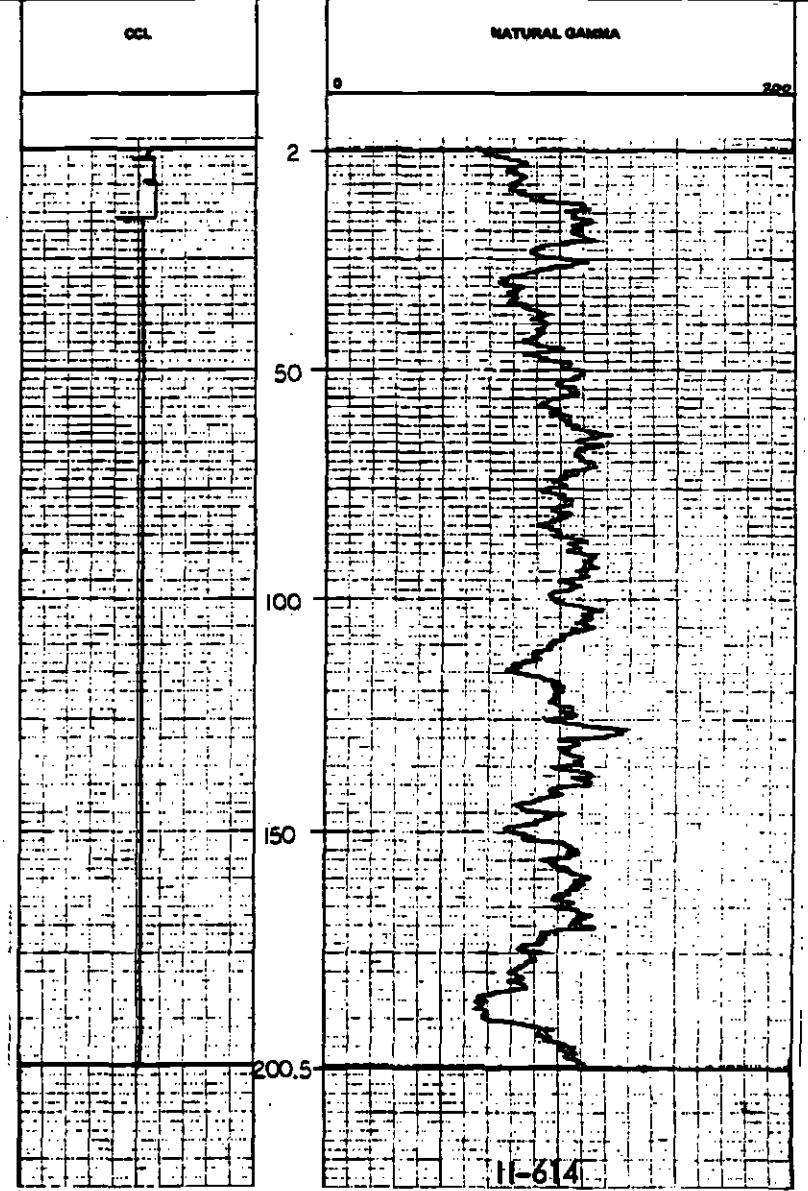


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CCL-GAMMA-RAY
LOG

CLIENT: SCRTD	Date: 12/18/92			
PROJ. NO. 2191-25	Run No. 1			
WELL: 27	Depth-Offset 20'			
FIELD:	Depth-Logger 20'			
COUNTY: Los Angeles	Min. Log Interval 200'			
STATE: California	Top Log Interval 2'			
Other Services: SP-Res, Calpac,	Cashy-Offset 5' @ 16'			
Density Neutron	Cashy-Logger 5' @ 14'			
SEWARD 100' N OF FOUNTAIN	Min. Log 4 3/4'			
	Type Fluid in Well	Brackish		
	Temp. Min.			
	pH Field Log	0	10	15
	Source of Sample	Prod Tub		
	Run @ Min. Temp.	100 @ 68 °F		
	Run @ Min. Temp.	100 @ 68 °F		
	Run @ Min. Temp.	9.7 @ 68 °F		
	Source: Rod Size			
	Run @ BWT			
	Completion Shipped	200		
	Logger on Surface	330		
	Min. Run Temp.			
	Recorded By	ITINZ/AGL		
Section	Township	Range		
Permanent Datum: G.L.	ELEVATION: G.L. 322			
Log Interval From: G.L.	ELEVATION: 0.F.			
Drilling Interval From: G.L.	ELEVATION: K.S.			

Remarks: Line Speed = 20 FT/MIN CCL READS MINUS 3.0' FROM DEPTH INDICATED.



11-614

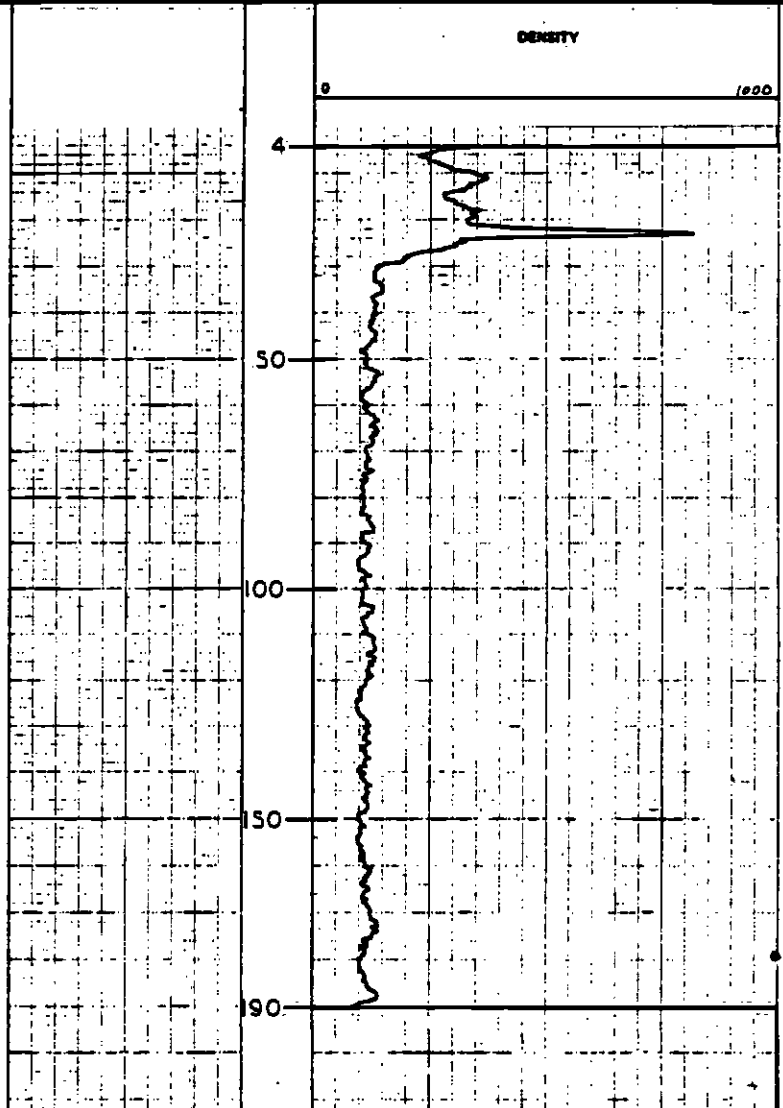


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DENSITY LOG

CLIENT: SCRTD	Date	3/24/81
PROJ. NO. 2191-25	Ram No.	TWO
WELL: 27	Depth-Outer	201
FIELD:	Depth-Logger	191
COUNTY: LOS ANGELES	Dist. Log Interval	190
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES, NATURAL GAMMA, C.C.L., CALPER, NEUTRON	Coring-Outer	2' ABS @ 200'
	Coring-Logger	2' ABS @ 200'
	Bit Size	4-7/8"
	Type Fluid in Hole	FRESH WATER
	Dist. Vis.	
	pt Fluid Loss	
	Source of Sample	NONE
LOCATION: SEWARD 100' N OF FOUNTAIN	Ram @ Min. Temp.	
	Ram @ Max. Temp.	
	Ram @ Min. Temp.	
	Source: Ref / Rate	
	Ram @ SHT	
Permeant Outside: G.L.	Completion Stopped	12/17/80
Log Measured From: G.L.	Logger on Bottom	3/24/81
Drilling Measured From: G.L.	Max. Res. Temp.	
	ELEVATION	322
	Recorded By:	MANDAGOL

Remarks: LINE-SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 29.8 FT.



10-5581-01-04 24-127 H100W TMO3 208 .8PRT:0V H100-TMTRAS30

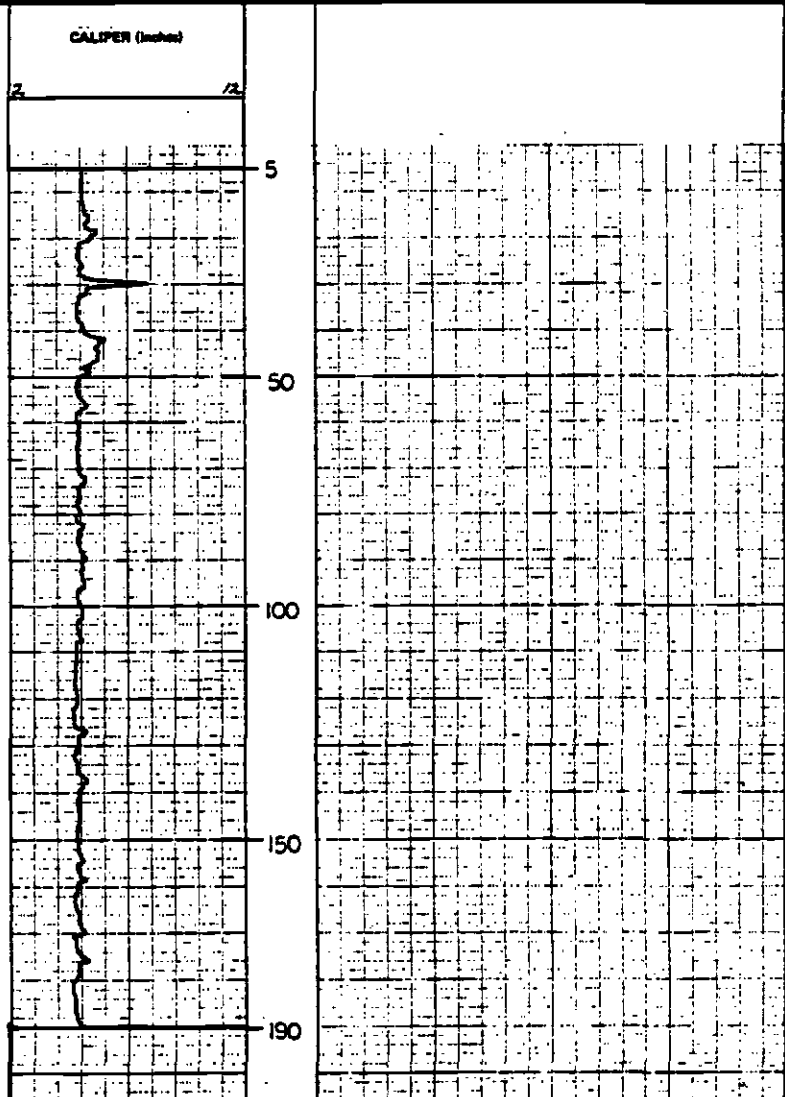


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CALIPER LOG

CLIENT: SCRTD	Date: 12/19/70				
PROJ. NO.: 2191-25	Run No.: 1				
WELL: 27	Depth-Order: 201				
FIELD:	Depth-Logger: 142				
COUNTY: Los Angeles	How Log Inteval: 1/20				
STATE: California	Top Log Inteval: 3				
Other Services: Michael Gomez, SP-Res.	Casing-Order: 5" @ 16'				
Density: Neutron	Casing-Logger: 5" @ 14'				
LOCALITY: SEWARD 100' N OF FOUNTAIN	Bit Size: 7 7/8"				
	Type Fluid in Hole: Seawater				
	Obs. Visc.:				
	pH - Field Log: 8				
	Source of Sample: Mud Tub				
	Run @ Min. Temp.: 100 @ 69°F				
	Ref @ Min. Temp.: 100 @ 69°F				
	Run @ Min. Temp.: 99 @ 69°F				
	Run @ Ref. Temp.:				
	Run @ 80°F:				
	Check-out Stop: 100				
Pressure Control: G.L.	Log on Bottom: 1050				
Log Interval from: G.L.	Min. Run Temp.:				
Drilling Interval from: G.L.	Recorded by: MRS. L. G. G.				

Remarks: Line Speed = 20 FT/MIN



CALIPER LOG - 11-616

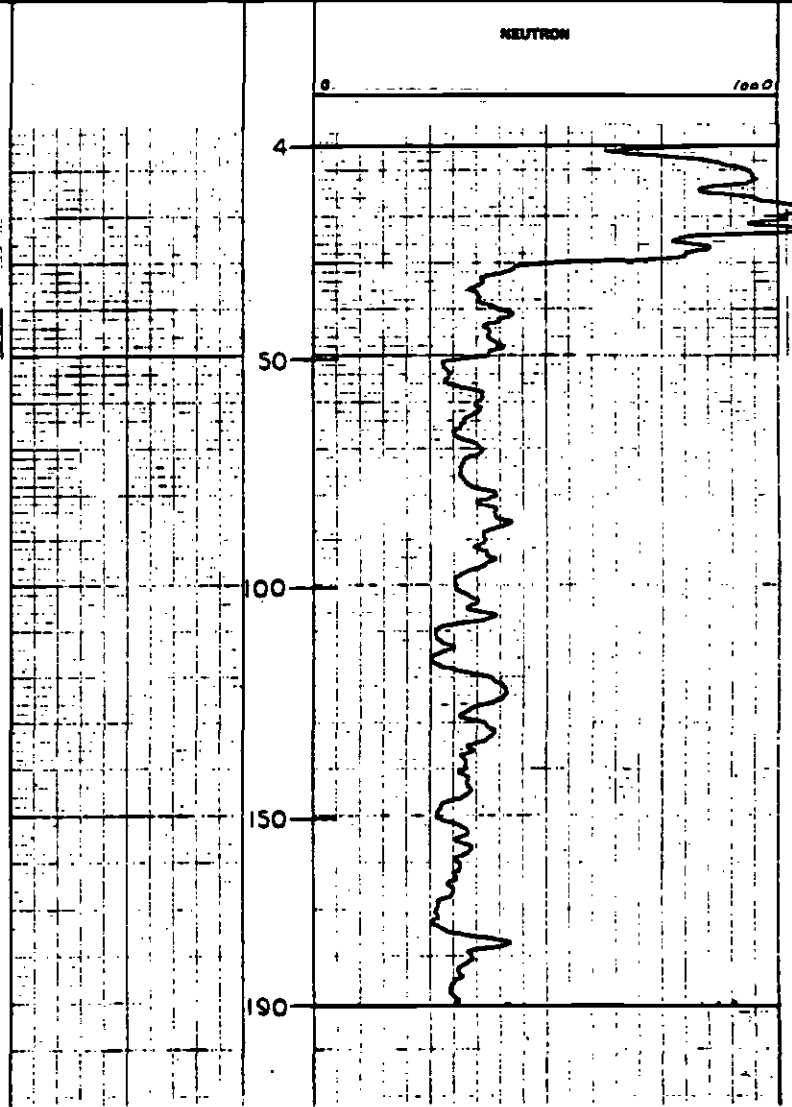


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NEUTRON LOG

CLIENT: SCRTD	Date	3/24/81
PROJ. NO. 2191-25	Well No.	TWO
WELL: 27	Depth-Offset	20'
FIELD:	Depth-Logger	19'
COUNTY: LOS ANGELES	Shm. Log Interval	170
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES. NATURAL GAMMA	Casing-Offset	2" ABS @ 200'
CAL. CALIBER, DENSITY	Casing-Logger	2" ABS @ 200'
SEWARD 100' N. OF FOUNTAIN	Bit Size	4 1/2"
	Type Fluid in Hole	FRESH WATER
	Dens. Visc.	
	pH Field Loss	oil oil oil
	Source of Sample	NOBLE
	Run @ Min. Temp.	• • • • •
	Run @ Max. Temp.	• • • • •
	Run @ Min. Temp.	• • • • •
	Run @ Max. Temp.	• • • • •
	Source: Prod / Disc	
	Run @ DWT	• • • • •
Permeant Datum: G.L.	ELEVATION	GL 372
Log Measured From: G.L.	D.F.	
Drilling Measured From: G.L.	K.S.	
	Completion Interval	12/18/80
	Logger on Section	3/24/81
	Run. Res. Temp.	• • • • •
	Recorded By	MANZ AGOL

Remarks: **LINE SPEED 15 FT/MIN, WATER LEVEL IN CASING AT 29.8 FT.**



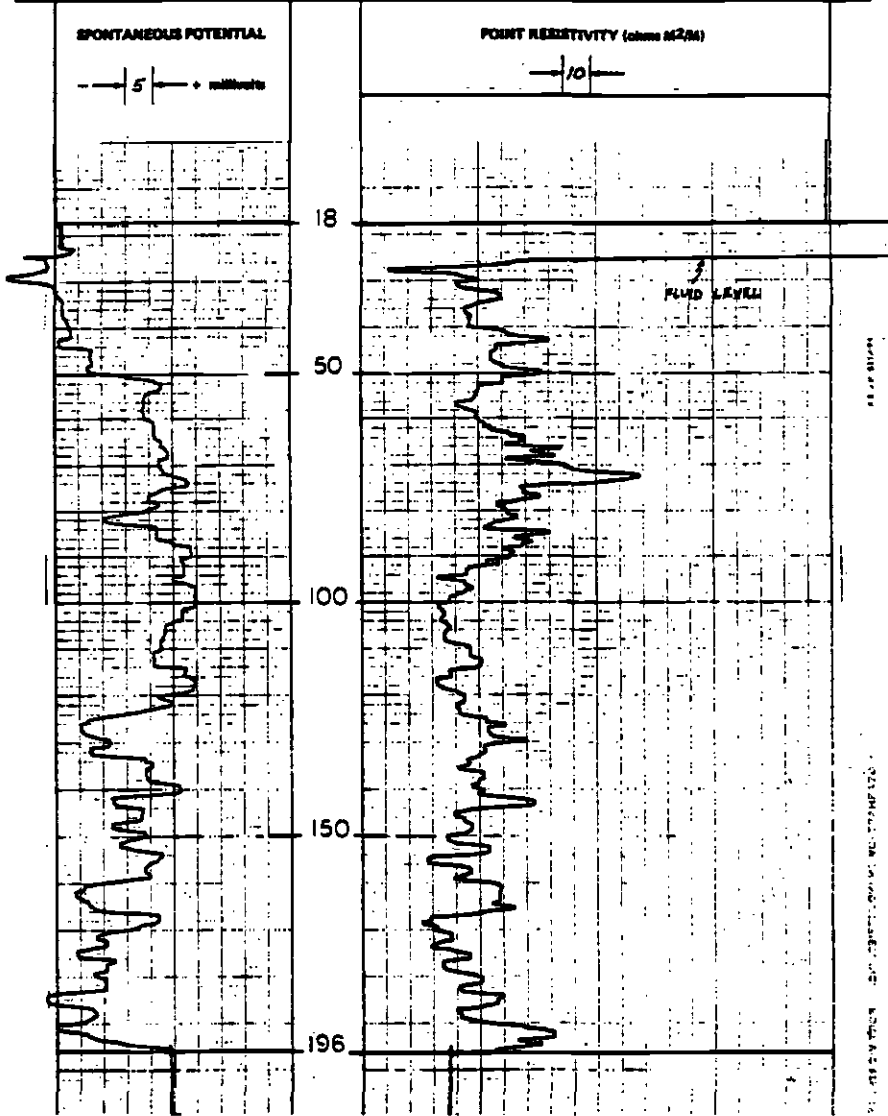


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 11/7/81				
PROJ. NO. 2191-25	Run No. ONE				
WELL: 28	Depth-Offset 207				
FIELD:	Depth-Logger 197				
COUNTY: LOS ANGELES	Run Log Interval 1%				
STATE: CALIFORNIA	Top Log Interval .18				
Other Services: GAMMA, CALIPER, NEUTRON, C.C.L.	Casing-Offset 8" @ 11'				
	Casing-Logov 5" @ 11'				
	Bit Size 4 1/2"				
	Type Fluid in Hole SEAWATER				
	Chem. Visc.				
	pH Fluid Loss				
	Summ of Sample AND TUB				
	Run @ Mass. Temp. 10° @ 25'				
	Run @ Mass. Temp. 10° @ 50'				
	Run @ Mass. Temp. 10° @ 88'				
	Source: Rod Run				
	Run @ BWT				
	Circulation Stoppage 12:00				
	Log on Bottom 21:40				
	Max. Run. Temp.				
	Recorded By MAUR. AGOL				

Remarks **LINE SPEED 35' / MIN.**



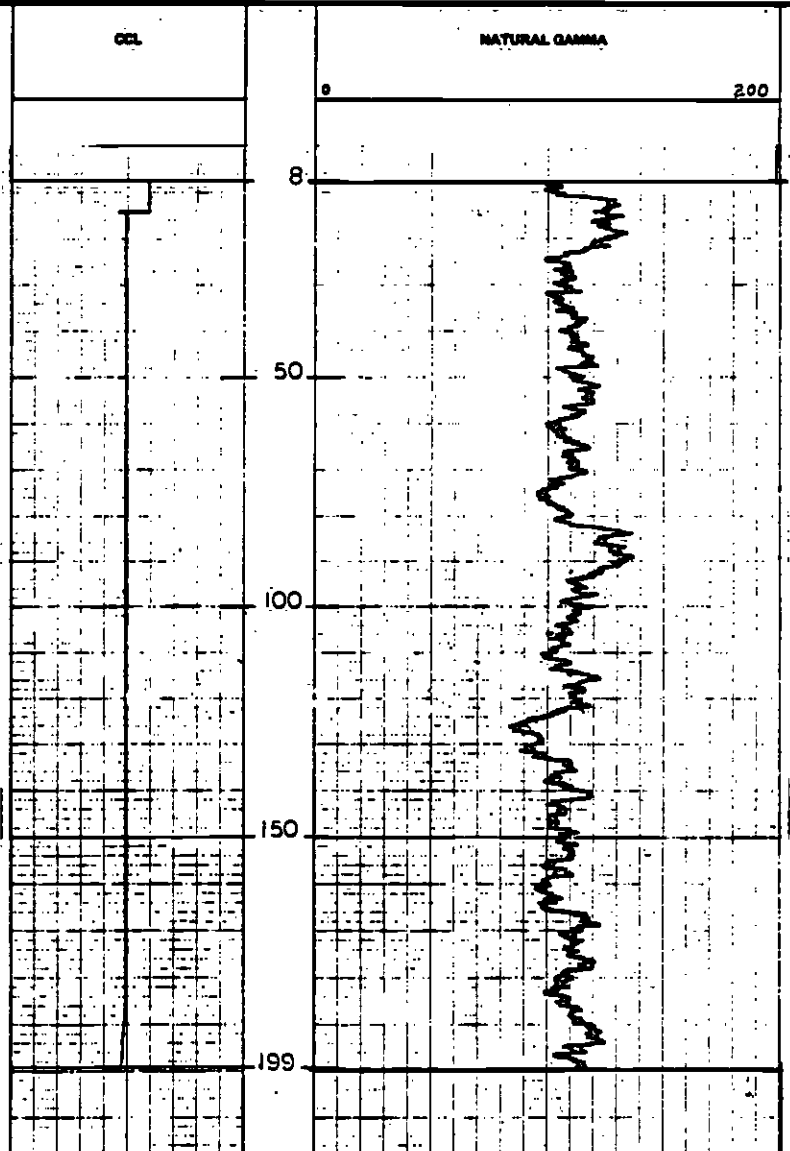


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/7/81	Run No.:	022
PROJ. NO. 2191-25	Depth-Driller:	202	
WELL: ZB	Depth-Logger:	200	
FIELD:	Min. Log Interval:	199	
COUNTY: LOS ANGELES	Top Log Interval:	3	
STATE: CALIFORNIA	Casing-Driller:	5" x 11"	
Other Services: S.P. RES. CALIPER, NEUTRON	Casing-Logger:	5" x 11"	
	Bit Size:	4 1/2"	
	Type Fluid in Hole:	SEMTAMITE	
	Class:		
	Visc.:		
	pH:	9	ml
	Field Log:		ml
	Gravity of Sample:	FLUD TUB	
	Run @ Min. Temp.:	100 - 0 88 °F	
	Run @ Max. Temp.:	100 - 0 88 °F	
	Run @ Min. Temp.:	100 - 0 88 °F	
	Run @ Max. Temp.:	100 - 0 88 °F	
	Screen - Size:		
	Run @ DWT:		
	Circulation Stopped:	1450	
	Logger on Bottom:	2110	
	Max. Run. Temp.:		
	Recorded By:	MANEAS-GOL	
Location:	Township:	Range:	
Permeability Datum:	G.L.	S.L. 385	
Log Measured From:	G.L.	D.P.	
Drilling Measured From:	G.L.	L.S.	

Remarks: **CCL READS 3' HIGHER THAN INDICATED, LINE SPEED 20"/MIN.**



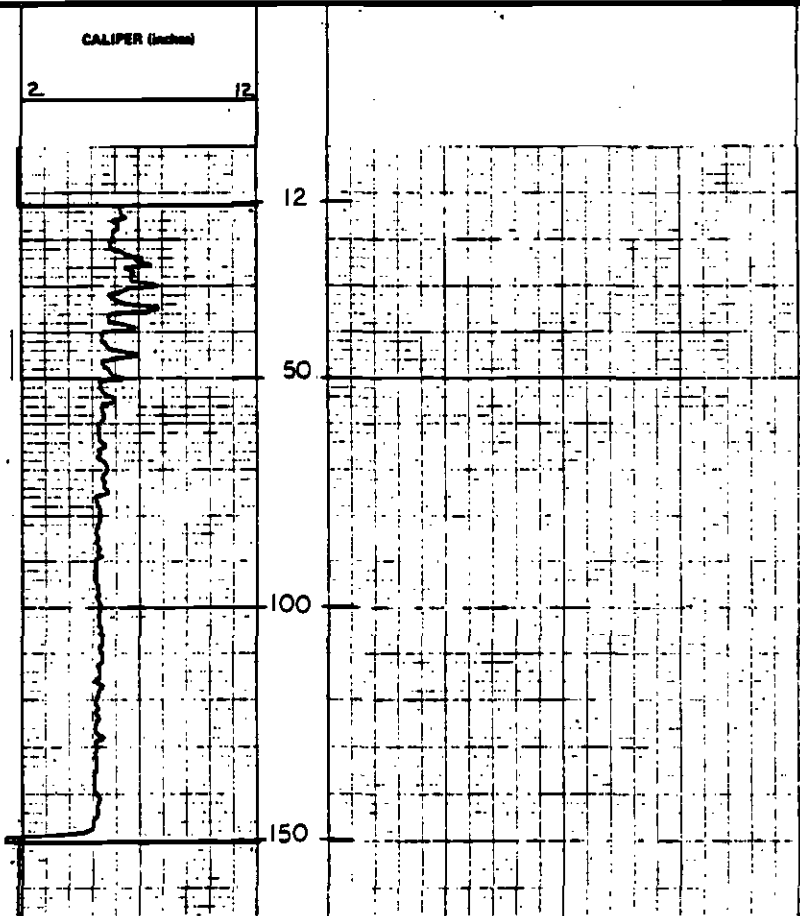


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CALIPER LOG

CLIENT: SCRTD	Date: 1/7/81			
PROJ. NO. 2191-25	Run No. 041E			
WELL: 28	Depth-Offbit 202			
FIELD:	Depth-Logger			
COUNTY: LOS ANGELES	Stat. Log Interval 150			
STATE: CALIFORNIA	Top Log Interval 12			
Other Services: GAMMA, J.P., RES.	Caliper-Offbit 5" @ 11"			
NEUTRON	Caliper-Logger 5" @ 11"			
NE CORNER HOLLYWOOD AND CARMEGA BLVD.	Bit Size 4 1/2"			
	Type Fluid in Hole DEMYONTE			
	Dens. Visc.			
	gr. Field Loss 9 ml			
	Spurs of Sample MUD TUG			
	Run @ Min. Temp. 10" @ 38 °F			
	Run @ Min. Temp. 10" @ 38 °F			
	Run @ Min. Temp. 10" @ 38 °F			
	Stems: Rod Rate			
	Run @ BHT			
	Completion Stopped 1400			
	Logger on Bottom 2030			
	Min. Res. Temp.			
	Recorded By: PLANE, MCL			
Permeant Datum G.L.	RELATIVE G.L. 385			
Log Measured From G.L.	D.P.			
Drilling Measured From G.L.	K.B.			

Remarks: UNABLE TO OPEN CALIPER ARMS BELOW 150' LARGE VOLUME COARSE SAND
SUSPENDED IN DRILLING MUD. LINE SPEED 20 FT/MIN.



CALIPER LOG - 11-620

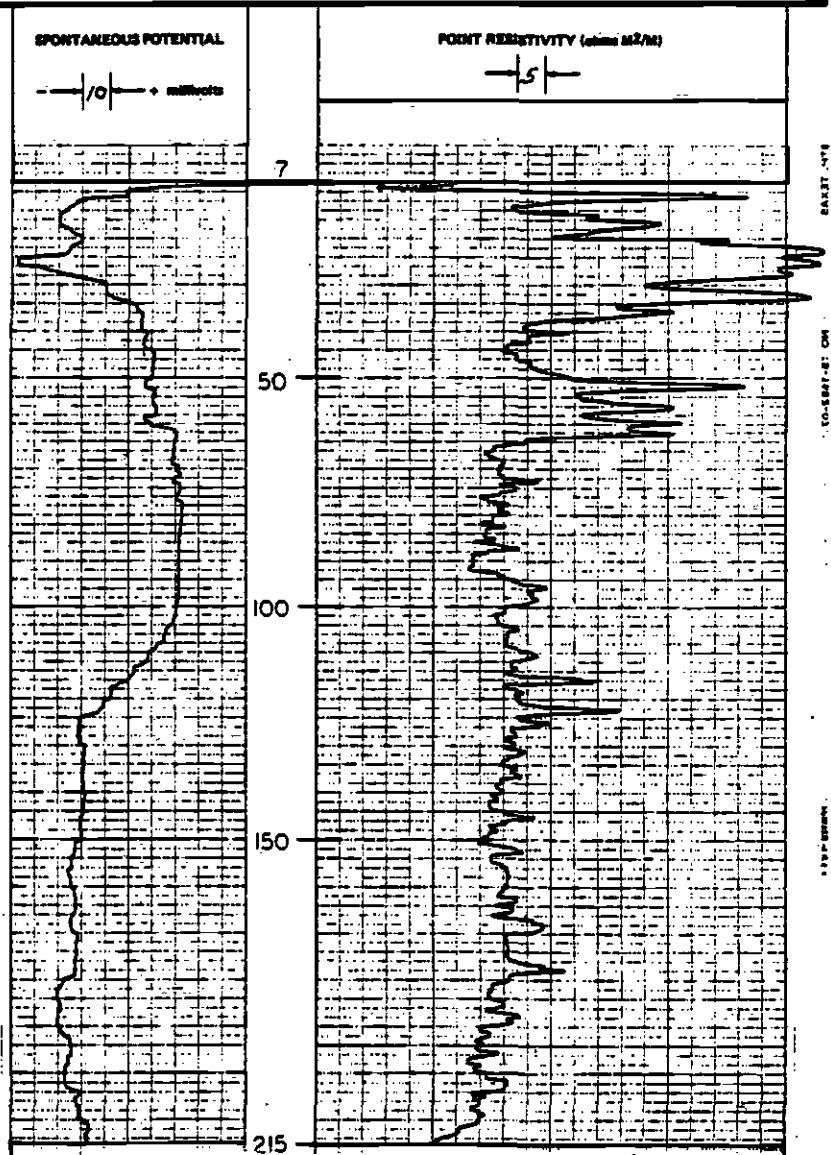


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/28/91
PROJ. NO. 2191-25	Run No. 1
WELL: 28A	Depth-Order 217.5
FIELD:	Depth-Logger 218
COUNTY: LOS ANGELES	Stem Log Interval 215
STATE: CALIFORNIA	Top Log Interval 7
Other Services: NATURAL GAS, CCL	Casing-Order 5' @ 7'
CALIPER	Casing-Logger 5' @ 7'
CANVENGA BLVD NORTH OF YUCCA STREET	Bit Size 4 7/8
Section Township Range	Type Fluid in Hole SEWAGE
Permanent Datum: G.L. ELEVATION G.L. 414	Core Visc. _____
Log Measured From: G.L. ELEVATION D.P.	pH _____
Drilling Measured From: G.L. ELEVATION K.B.	Field Loss _____
	Reasons of Sample _____
	Run @ Min. Temp. _____
	Run @ Max. Temp. _____
	Run @ Min. Temp. _____
	Run @ Max. Temp. _____
	Reasons Fluid / Run _____
	Run @ DWT _____
	Circulation Stopped 0900
	Logger on Bottom 1100
	Max. Run Temp. _____
	Recorded By GALLINOTTI

Remarks: LINE SPEED 35 FT/MIN



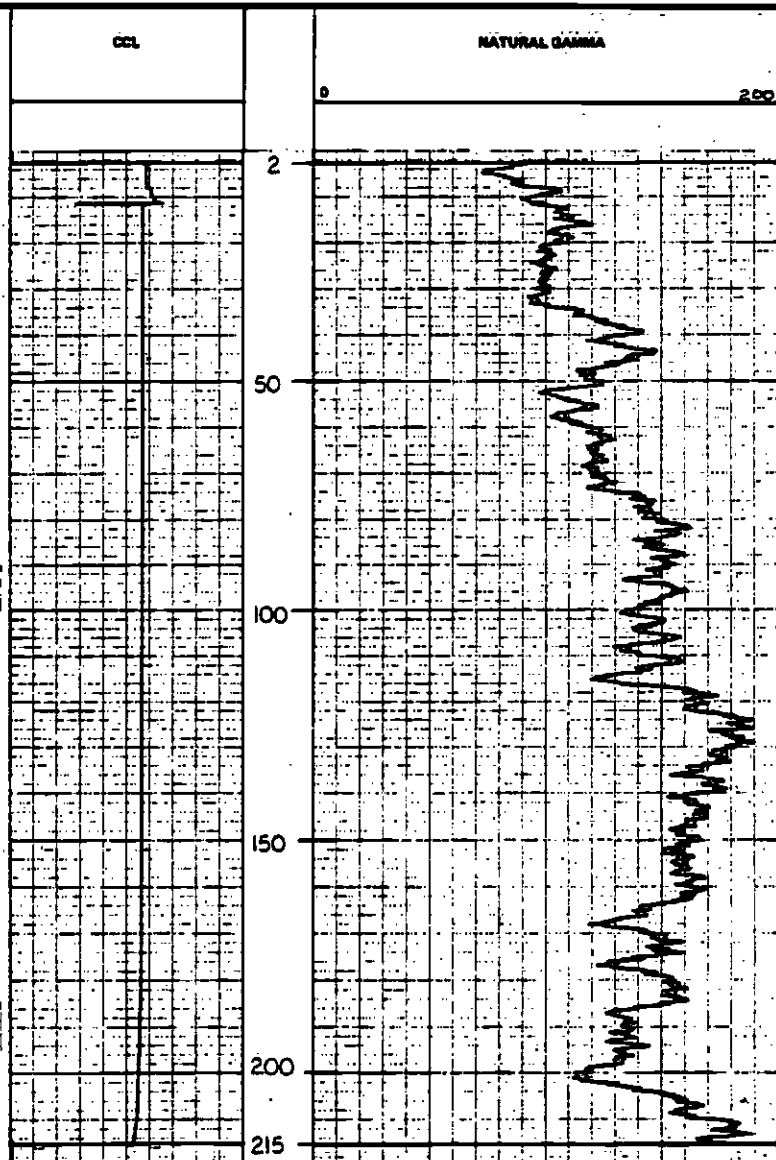


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/24/91
PROJ. NO.: 2191-25	Run No.: 217.5
WELL: 28A	Depth-Offset: 216
FIELD:	Depth-Logger: 215
COUNTY: LOS ANGELES	Min. Log Interval: 2
STATE: CALIFORNIA	Top Log Interval: 2
Other Services: SP-RES, CALIPER	Casing-Offset: 5' & 7'
	Casing-Logger: 5' & 7'
	Bit Size: 7 1/2"
	Type Fluid in Hole: KENTONITE
	Chem. Visc.
	pH Field Log
	Source of Sample
CANVENGA BLVD NORTH OF YUCCA STREET	Run @ Min. Temp.
	Run @ Max. Temp.
	Run @ Min. Temp.
	Run @ Max. Temp.
	Run @ Min. Temp.
	Run @ Max. Temp.
Section Township Range	Run @ 50FT
Formation Contact: G.L.	Chert/Other Stripped: 0.500
Log Measured From: G.L.	Logger on Bottom: 1000
Casing Measured From: G.L.	Max. Run Temp.
	Measured By: GALLINOTTI

Remarks: **LINE SPEED 20 FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED**



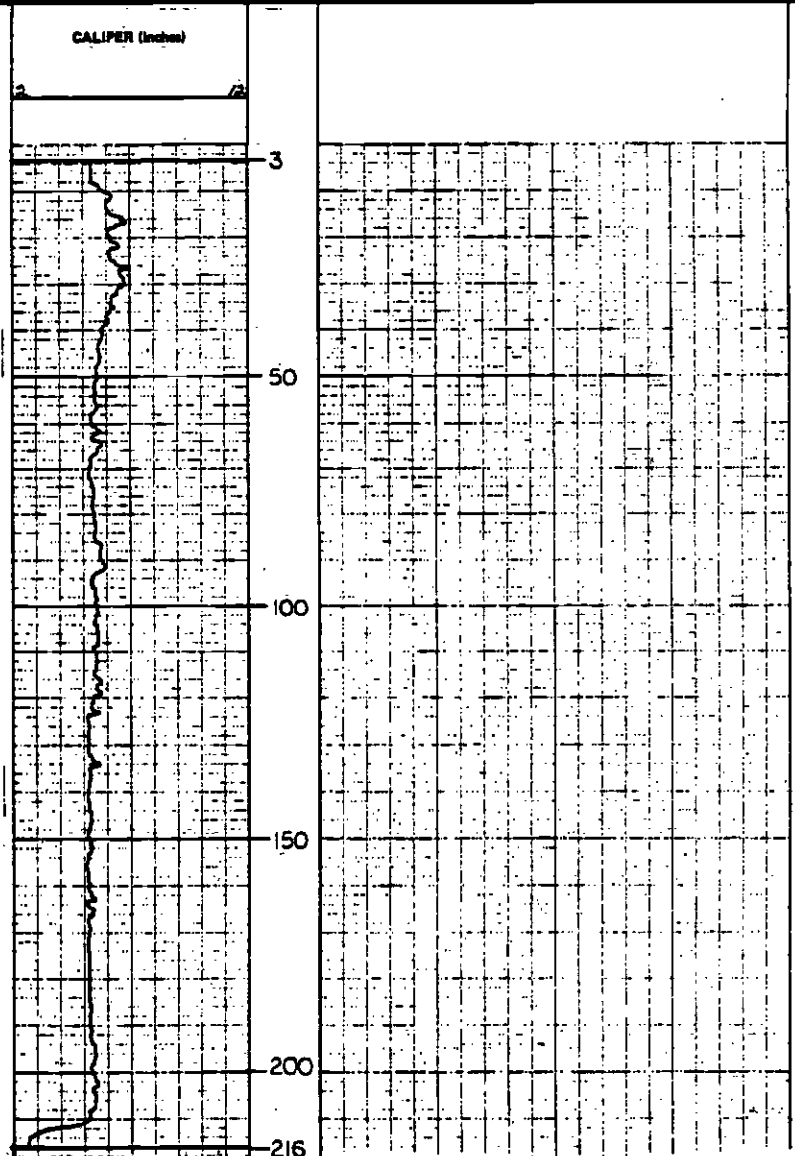


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CALIPER LOG

CLIENT: SCRTD	Date: 2/26/87			
PROJ. NO. 2191-25	Run In: 1			
WELL: 28A	Depth-Offset: 217.5			
FIELD:	Depth-Logger: 218			
COUNTY: LOS ANGELES	Min. Log Interval: 216			
STATE: CALIFORNIA	Top Log Interval: 3			
Other Services: NATURAL GAMMA, CCL	Coring-Offset: 5' 0 7/8"			
SP-R.S.:	Coring-Logger: 5' 0 7/8"			
CANVENS BLD NORTH OF YUCCA STREET	Sit Size: 4 1/2"			
	Type Fluid in Hole: BENTONITE			
	Chem. Visc.			
	pH Fluid Loss			
	Seepage of Sample			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Run @ Min. Temp.			
	Run @ Max. Temp.			
	Seepage: Roof Rise			
	Run @ BHT			
Permanent Datum: G.L.	Checkered Interval: 0500			
Log Measured From: G.L.	Logger on Bottom: 0915			
Drilling Measured From: G.L.	Max. Rec. Temp.			
	Recorded By: GALLINATI			

Remarks: **LINE SPEED 20. FT/MIN**



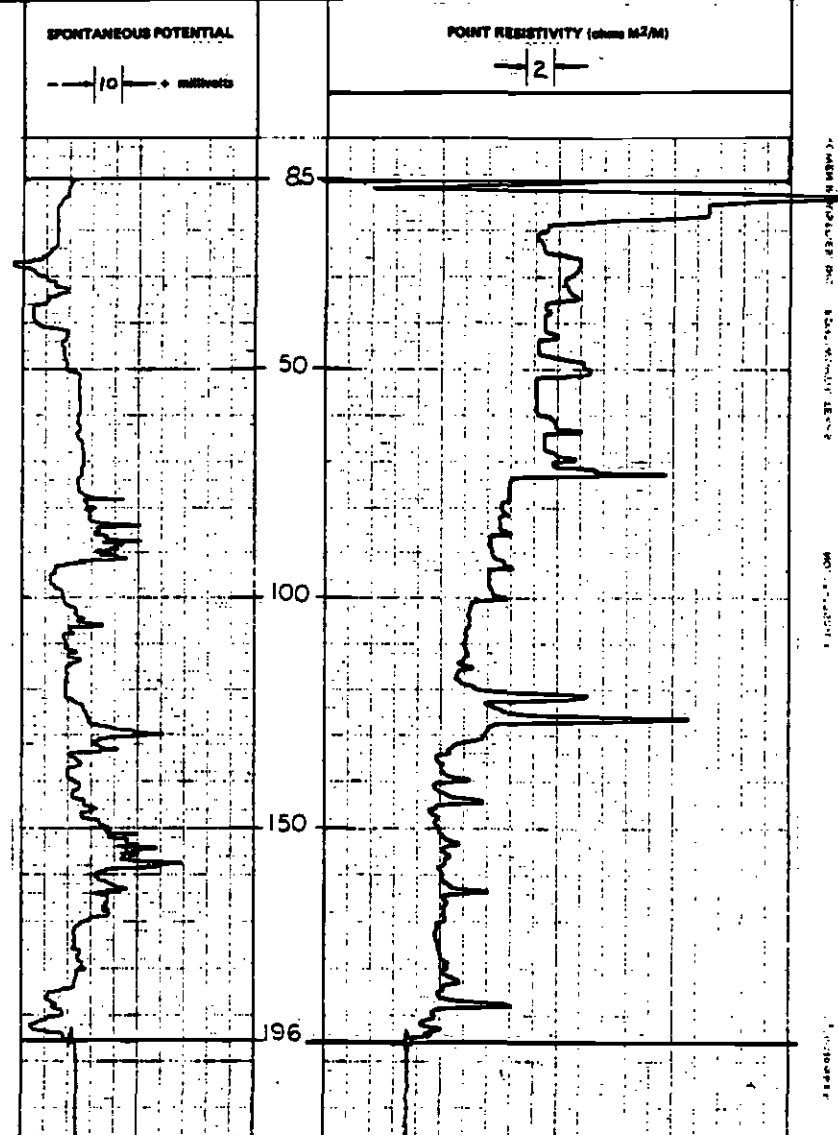


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 1/33/71			
PROJ. NO. 2191-22	Res. No. 84E			
WELL: 29	Depth-Driller 210			
FIELD:	Depth-Logger 197			
COUNTY: LOS ANGELES	Stm. Log Interval 196			
STATE: CALIFORNIA	Top Log Interval 8.5			
Other Services: CAMP, CCL, CALIPES, NEUTRON DENSITY	Coring-Driller NAHE			
	Coring-Logger NAHE			
	Stm. Size 5 7/8" - 7047' 3 3/4"			
	Type Fluid in Hole DRILL THIN			
	Temp. Vis.			
	pH Field Log			
	Source of Sample TOP TUR			
	Res @ Meas. Temp. 2.9 @ 76 °F			
	Res @ Meas. Temp. 8.0 @ 76 °F			
	Res @ Meas. Temp. 7.6 @ 76 °F			
	Source: Resist Res			
	Res @ BMT			
	Circulation Observed			
	Log on Bottom 1550			
	Max. Res. Temp.			
	Recorded By MANACOL			
Permeameter Depth G.L.	ELEVATION GL 417			
Log Measured From G.L.	S.F.			
Drilling Measured From G.L.	K.B.			

Remarks: **LINE SPEED 35 FT/MIN ; OBSTRUCTION IN HOLE AT 198', UNABLE TO LOG BOTTOM 10' OF HOLE**



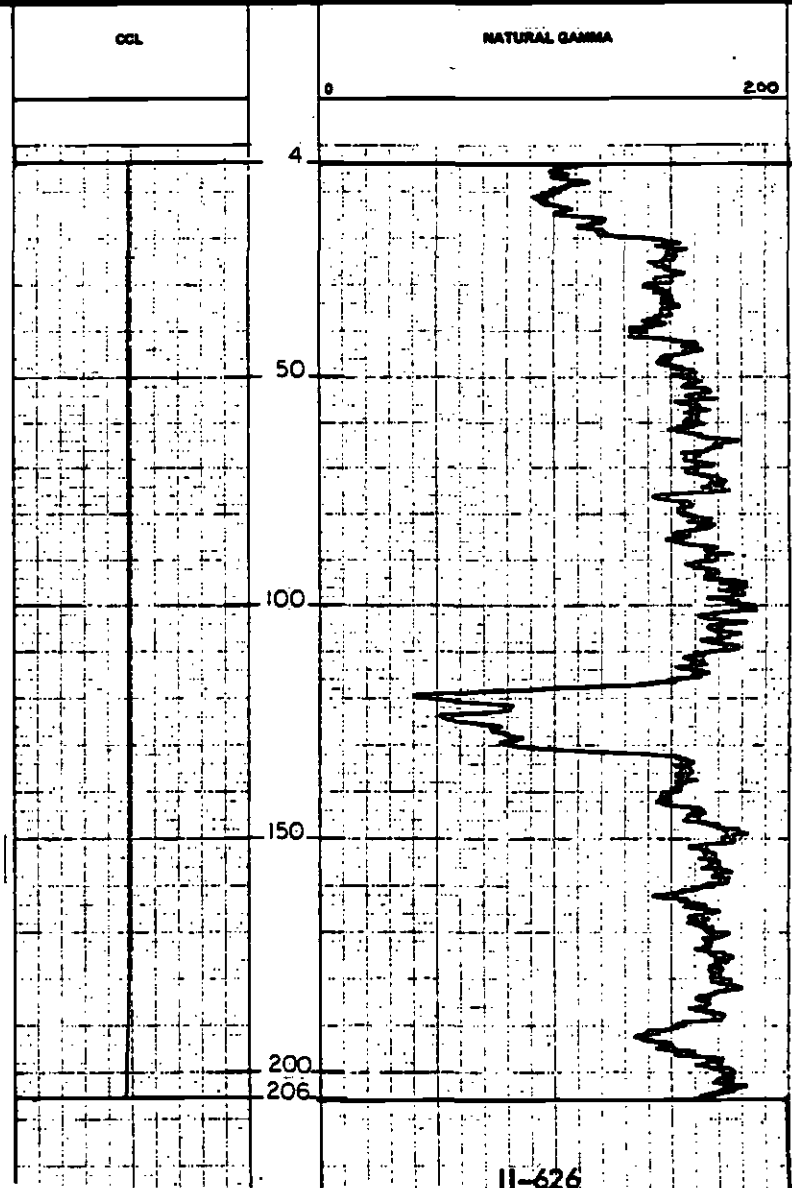


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/22/81		
PROJ. NO. 2191-22	Run No. ONE		
WELL: 29	Depth-Offset 2.0		
FIELD:	Depth-Logger 207		
COUNTY: LOS ANGELES	Dist. Log Interval 2.06		
STATE: CALIFORNIA	Top Log Interval 4		
Other Services: S.P. - RES., CALIPER, NEUTRON,	Coring-Offset ABOVE		
DENSITY	Coring-Logger ABOVE		
	Bit Size 4 7/8" TO 4 1/2" TO BOTTOM HOLE		
	Type Fluid in Hole QUICK TRK		
	Dist. Vol.		
	psi Field Loss 0	ml	ml
	Barrels of Barite NONE TRK		
	Run @ Min. Temp. 7.9 @ 76 °F		
	Run @ Min. Temp. 8.0 @ 76 °F		
	Run @ Min. Temp. 7.5 @ 76 °F		
	Source: Hand	Run	
	Run @ 80°F		
	Calculated Slugged 1500		
	Logger on Bottom 1500		
	Min. Res. Temp. °F		
	Recorded By MAURICE		
Section	Township	Range	
Permanent Datum: F.L.	ELEVATION: G.L. 477		
Log Measured From: F.L.	ELEVATION: D.F.		
Depth Measured From: F.L.	ELEVATION: K.B.		

Remarks: LINE SPEED 20 FPM



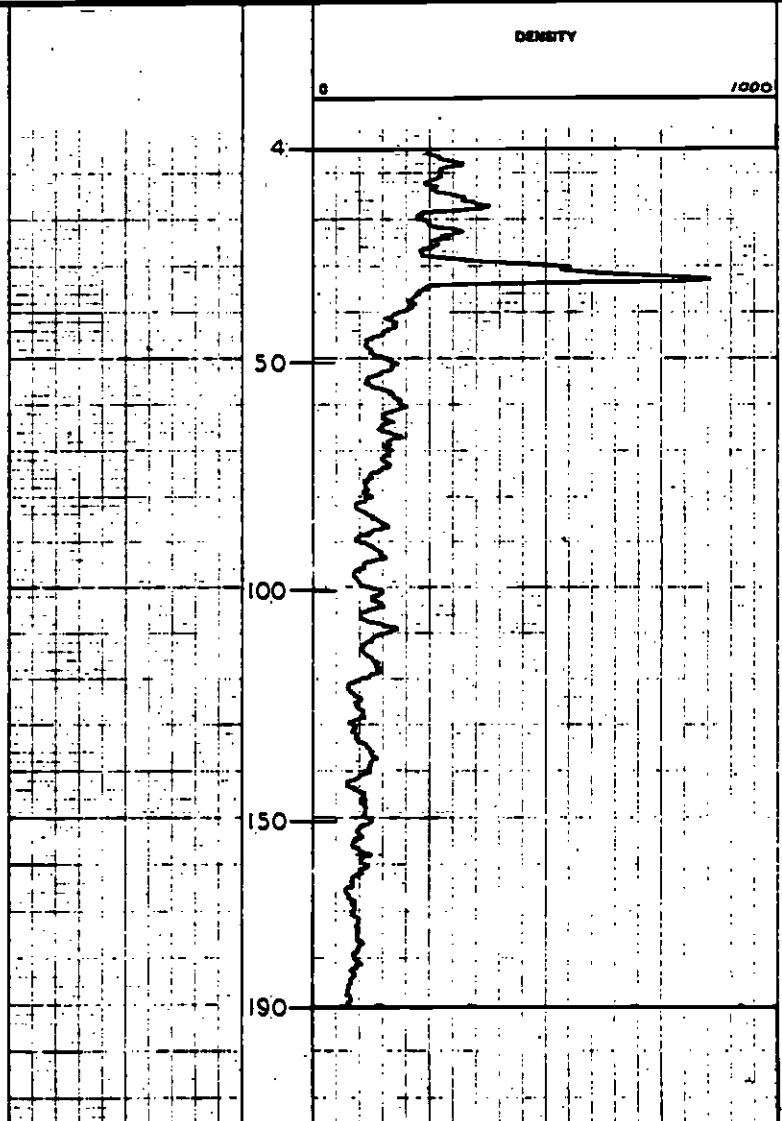


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DENSITY LOG

CLIENT: SCATD	Date: 3/23/81
PROJ. NO. 2191-25	Run No. 1
WELL: 29	Depth-Offset 210
FIELD:	Depth-Logger 191
COUNTY: LOS ANGELES	Min. Log Interval 150
STATE: CALIFORNIA	Top Log Interval 4
Other Services: S.P., RES., NATURAL GAMMA	Caliper-Offset 0
C.C.L. CALIPER, NEUTRON	Caliper-Logger 2 ARSQ 2015
NORTH END OF SMALL ISLAND	Bit Size 4 1/4 TO 4 7/8 TO BOTTOM
CENTERED BETWEEN FRANKLIN,	Type Fluid in Hole FRESH WATER
WILCOX, AND CAHUENSA STREETS	Temp. Vis.
	pH Field Log
	Source of Sample NONE
	Run @ Min. Temp. 0
	Run @ Max. Temp. 0
	Run @ Min. Temp. 0
	Run @ Max. Temp. 0
	Success. Conf. Rate
	Run @ 50FT
Perforated Interval G.L.	Completion Date 1/22/81
Log Interval From G.L.	Logger on Screen 3/23/81
Drilling Interval From G.L.	Max. Run. Temp.
	Recorded By MANZAGOL

Remarks: LINE SPEED 13 FT/MIN. 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 30.5 FT. BENTONITE PLUG BETWEEN PIEZOMETERS AT 38.5 TO 39.5 FT. WATER LEVEL AT 73.2 FT IN CASING.



TO: 2881-B, CA. PAUL J. HIRSH TRON TRON SVI, RPTFLDUM 18/80.

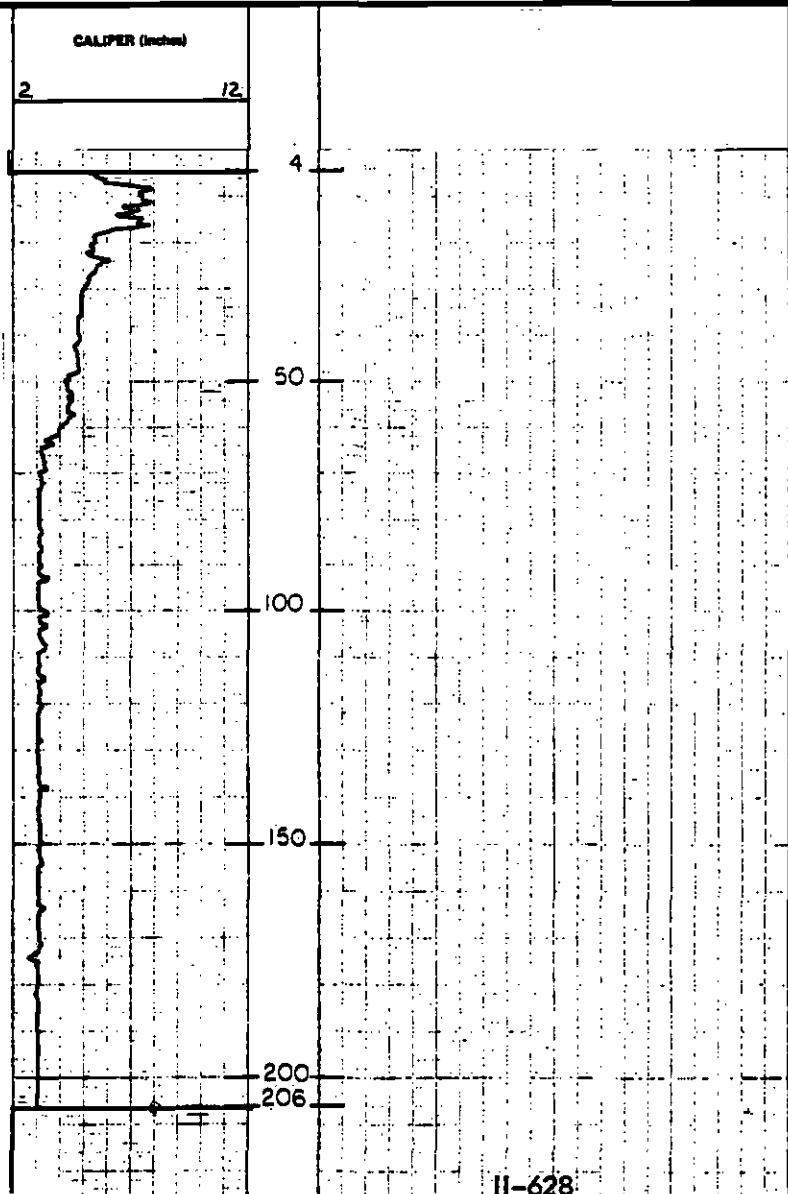


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CALIPER LOG

CLIENT: SCRTD	Date	1/22/81		
PROJ. NO. 2191-22	Run No.	61E		
WELL: 29	Depth-Offset	210		
FIELD:	Depth-Logger	20V		
COUNTY: LOS ANGELES	Stem Log Interval	2.0'		
STATE: CALIFORNIA	Top Log Interval	4'		
Other Services: CARMA, CCL, S.P., RES., NEUTRON, DENSITY	Coring-Offset	110E @	@	@
	Coring-Logger	110E		
	Site Size	4 7/8" x 9 1/2" x 3 1/2"	TO BOTTOM	SOLE
	Type Fluid in Hole	QUIK TANK		
	Core	Field Log	9'	nd
	Source of Sample	PLUG TUBE		
	Run @ Min. Temp.	7.9 @ 76 °F	@	@
	Run @ Max. Temp.	8.0 @ 76 °F	@	@
	Run @ Min. Temp.	7.5 @ 76 °F	@	@
	Run @ Max. Temp.			
	Run @ BHT			
	Completion Depth	1500'		
	Log on Bottom	1700'		
	Max. Res. Temp.		@	@
	Recorded By	AAWALON		

Remarks: LINE SPEED 2.0 F/MIN



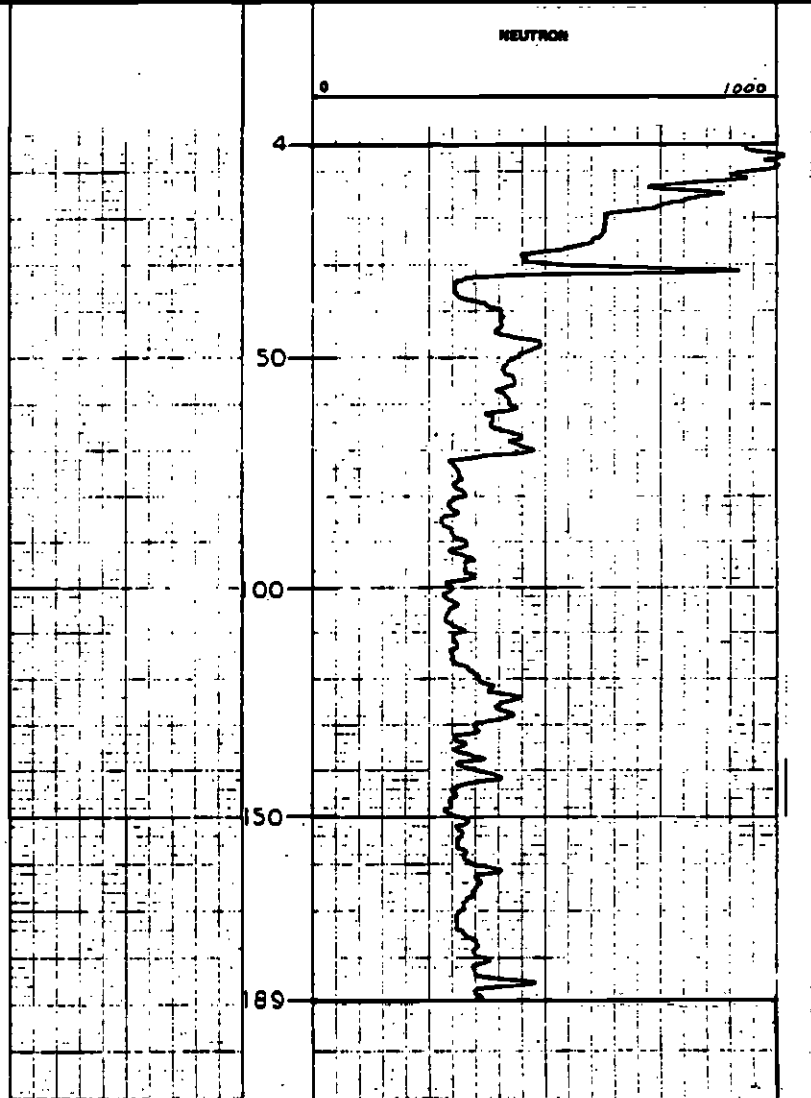


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NEUTRON LOG

CLIENT: <i>SCATD</i>		Date	3/23/81	
PROJ. NO. <i>2191-25</i>		Run No.	<i>TWO</i>	
WELL: <i>29</i>		Depth-Offset	<i>210</i>	
FIELD:		Depth-Logger	<i>190</i>	
COUNTY: <i>LOS ANGELES</i>		Bot. Log Interval	<i>189</i>	
STATE: <i>CALIFORNIA</i>		Top Log Interval	<i>4</i>	
Other Services: <i>S.P., RES., NATURAL GAMMA,</i>		Caliper-Offset	<i>2' ABS @ 283.5</i>	
<i>CEL. CALIPER, DENSITY</i>		Caliper-Logger	<i>2' ABS @ 283.5</i>	
<i>NORTH END OF SMALL ISLAND CENTER</i>		Bit Size	<i>4 1/4" TO 4 3/4" TO BITUM. AND</i>	
<i>BETWEEN FRANKLIN, WILCOX, AND</i>		Type Fluid in Hole	<i>FRESH WATER</i>	
<i>CAMBERNA STREETS</i>		Dist. Vis.		
Location	Township	Range		
Permit/Order	<i>G.L.</i>	<i>G.L. 417</i>	Chromium Checked	<i>1/22/81</i>
Log Interval From	<i>G.L.</i>	<i>D.P.</i>	Logger on Bottom	<i>3/23/81</i>
Drilling Material From	<i>G.L.</i>	<i>R.A.</i>	Max. Res. Temp.	
			Recorded By	<i>MANZAGOL</i>

Remarks: *LINE SPEED 15 FT/MIN, 1" PVC ALSO PLACED IN HOLE FROM G.L. TO 38.5 FT, BENTONITE PLUG BETWEEN PIEZOMETERS AT 38.5 TO 39.5 FT, WATER LEVEL AT 73.2 FT IN CASING.*



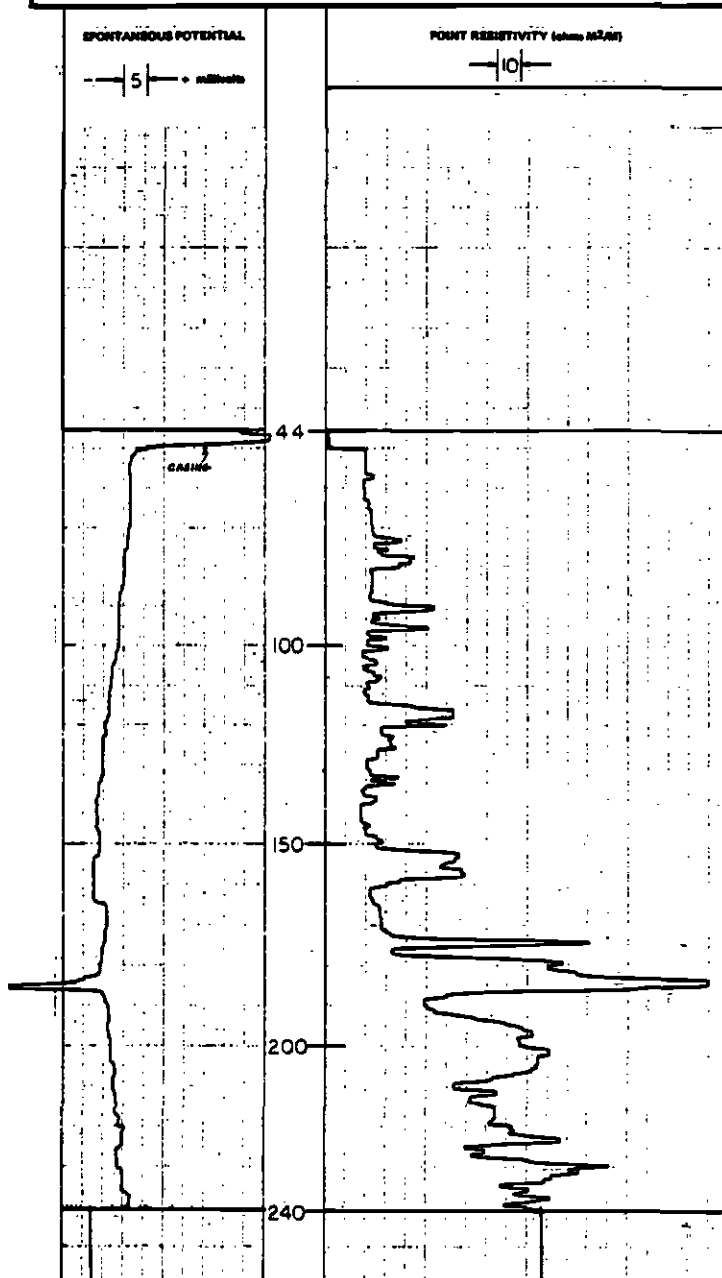


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SP-RESISTIVITY LOG

CLIENT: SCATO	Date: 3/4/81		
PROJ. NO. 2191-25	Well No. 20		
WELL: 30	Depth-Offset 25'		
FIELD:	Depth-Logger 24'		
COUNTY: Los Angeles	Min. Log Interval 240'		
STATE: California	Top Log Interval 44'		
	Casing-Offset 3" @ 48'		
	Casing-Logger 3" @ 48'		
	SS Size 3/6"		
	Type Fluid in Hole Glycerite		
Other Services: C.C., Natural Gamma	Corr. Corr.	Field Log	
Caliper Neutron Density	Source of Current Myd-Tub		
Highland at 44', E. side of street	Min. @ Min. Temp.		
	Foot @ Min. Temp.		
	Res @ Min. Temp.		
	Resistivity Foot		
	Res @ 200'		
	Chlorination Standard	1100	
	Log on Bottom	1162	
	Max. Res. Temp.		
	Recorded By: MGR-BAB		

Remarks: LINE SPEED 35 FT/MIN. -- 10' OF BORE H. BOTTOM OF HOLE.



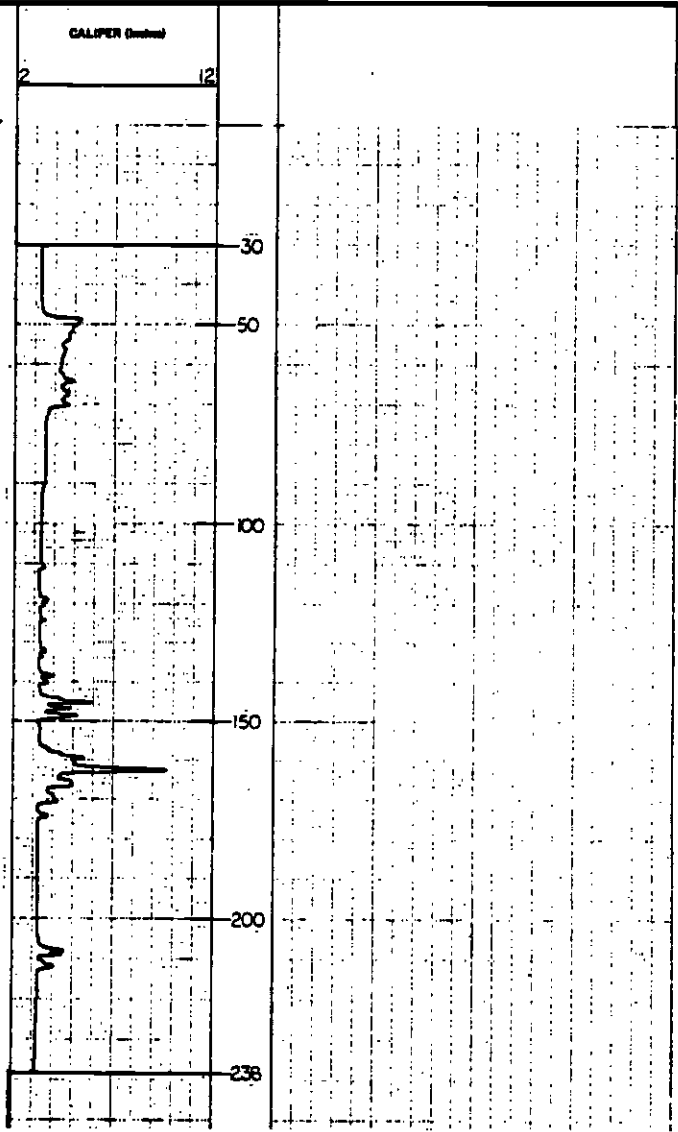


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CALIPER LOG

CLIENT: SCRTO	Date: 3/2/81		
PROJ. NO. 3191-25	Well No. 1		
WELL: 30	Depth-Depth 251		
FIELD:	Depth-Logtop 240		
COUNTY: Los Angeles	Depth-Log Interval 238		
STATE: California	Top Log Interval 30		
Other Services: CEI, Natural Gamma	Caliper-Depth 3" @ 48"		
	Caliper-Logtop 3" @ 48"		
	Caliper-Log Interval 3 1/4"		
	Type Fluid in Hole Brackish		
	Depth - Min.		
	Depth - Max.		
	psi		
	Flow Loss		
	Number of Struts		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Screen Size		
	Run @ 200'		
	Run @ 300'		
	Run @ 400'		
	Run @ 500'		
	Run @ 600'		
	Run @ 700'		
	Run @ 800'		
	Run @ 900'		
	Run @ 1000'		
	Run @ 1100'		
	Run @ 1200'		
	Run @ 1300'		
	Run @ 1400'		
	Run @ 1500'		
	Run @ 1600'		
	Run @ 1700'		
	Run @ 1800'		
	Run @ 1900'		
	Run @ 2000'		
	Run @ 2100'		
	Run @ 2200'		
	Run @ 2300'		
	Run @ 2400'		
	Run @ 2500'		
	Run @ 2600'		
	Run @ 2700'		
	Run @ 2800'		
	Run @ 2900'		
	Run @ 3000'		
	Run @ 3100'		
	Run @ 3200'		
	Run @ 3300'		
	Run @ 3400'		
	Run @ 3500'		
	Run @ 3600'		
	Run @ 3700'		
	Run @ 3800'		
	Run @ 3900'		
	Run @ 4000'		
	Run @ 4100'		
	Run @ 4200'		
	Run @ 4300'		
	Run @ 4400'		
	Run @ 4500'		
	Run @ 4600'		
	Run @ 4700'		
	Run @ 4800'		
	Run @ 4900'		
	Run @ 5000'		
	Run @ 5100'		
	Run @ 5200'		
	Run @ 5300'		
	Run @ 5400'		
	Run @ 5500'		
	Run @ 5600'		
	Run @ 5700'		
	Run @ 5800'		
	Run @ 5900'		
	Run @ 6000'		
	Run @ 6100'		
	Run @ 6200'		
	Run @ 6300'		
	Run @ 6400'		
	Run @ 6500'		
	Run @ 6600'		
	Run @ 6700'		
	Run @ 6800'		
	Run @ 6900'		
	Run @ 7000'		
	Run @ 7100'		
	Run @ 7200'		
	Run @ 7300'		
	Run @ 7400'		
	Run @ 7500'		
	Run @ 7600'		
	Run @ 7700'		
	Run @ 7800'		
	Run @ 7900'		
	Run @ 8000'		
	Run @ 8100'		
	Run @ 8200'		
	Run @ 8300'		
	Run @ 8400'		
	Run @ 8500'		
	Run @ 8600'		
	Run @ 8700'		
	Run @ 8800'		
	Run @ 8900'		
	Run @ 9000'		
	Run @ 9100'		
	Run @ 9200'		
	Run @ 9300'		
	Run @ 9400'		
	Run @ 9500'		
	Run @ 9600'		
	Run @ 9700'		
	Run @ 9800'		
	Run @ 9900'		
	Run @ 10000'		

Remarks: **LINE SERRA 20 FT/IN. - 10' OF HOLE IN BOTTOM OF HOLE**



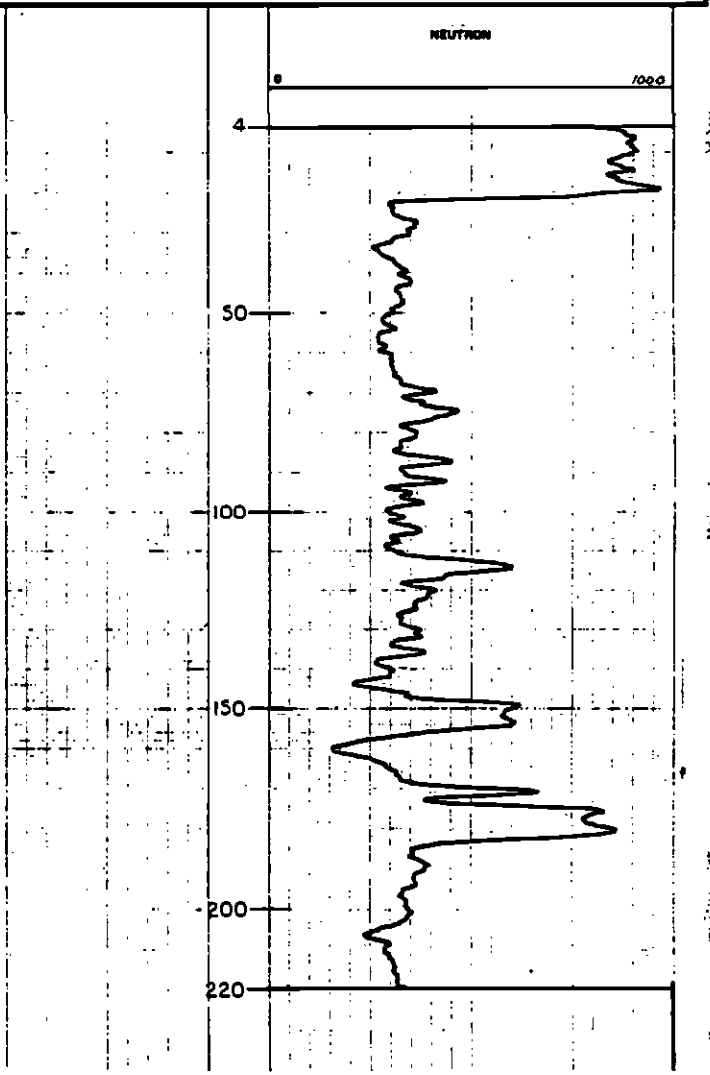


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NEUTRON LOG

CLIENT: SCR70	Date	3/20/81	
PROJ. NO. 241-25	Run No.	746	
WELL: 30	Depth-Counter	221	
FIELD:	Depth-Logger	221	
COUNTY: LOS ANGELES	Start Log Interval	220	
STATE: CALIFORNIA	Top Log Interval	4	
Other Services: S.P., R.E'S, NATURAL GAMMA, C.C.L., CALIBER, DENSITY	Counting-Counter	2	2
HIGHLAND AT GDM, EAST SIDE OF STREET	Counting-Logger	2	2
	Bit Size	3 1/2	
	Type Fluid in Hole	FRESH WATER	
	Dist. Vis.		
	pH Fluid Loss	all	all
	Source of Sample	NONE	
	Run @ Min. Temp.	0	0
	Run @ Max. Temp.	0	0
	Run @ Min. Temp.	0	0
	Run @ Max. Temp.	0	0
	Current: Run Rate		
	Run @ 500'	0	0
Provisional Datum: G.L.	SL: 476	Completion Date	3/4/81
Log Measured From: G.L.	DP.	Logger on System	3/20/81
Drilling Measured From: G.L.	R.B.	Max. Min. Temp.	0
		Measured By	MANZABGA

Remarks: **LINE SPEED 15 FT/MIN; WATER LEVEL IN CASING AT 22 FT; HOLE OBSTRUCTED AT 221 FT.**



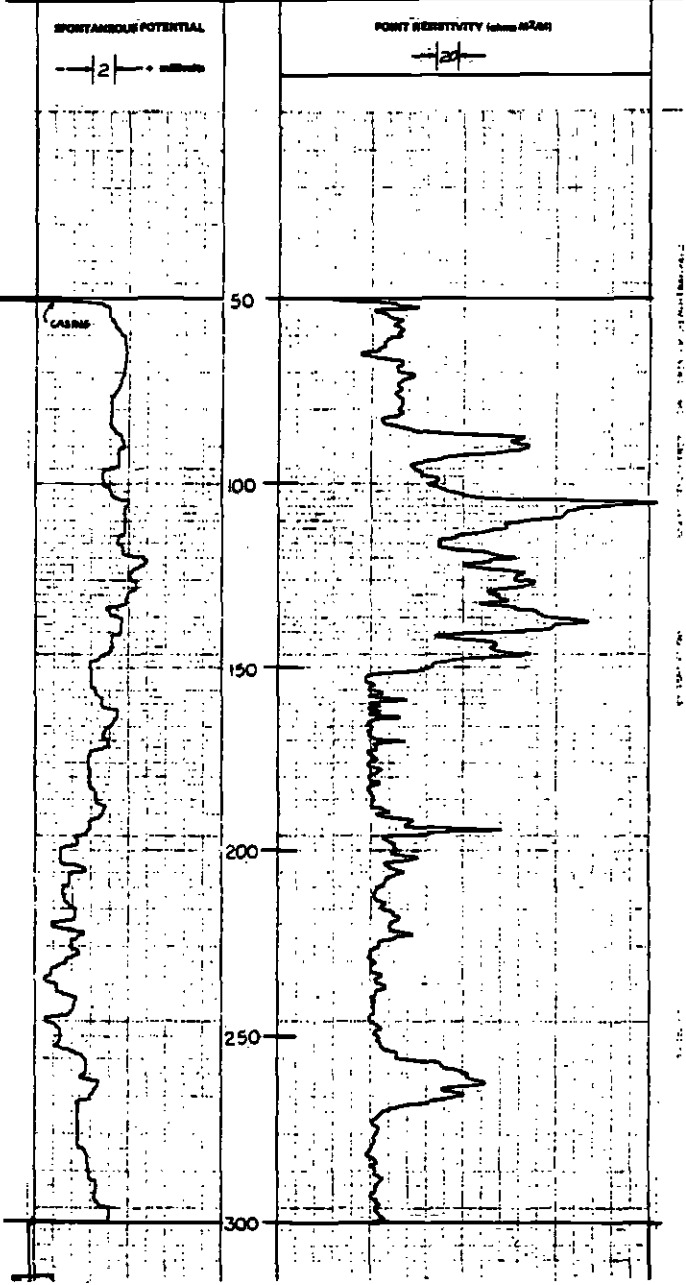


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 2/23/91
PROJ. NO. 2191-25	Well No. 31
WELL: 31	Depth-Station: 300
FIELD:	Depth-Log: 301
COUNTY: LOS ANGELES	Dist. Log Interval: 300
STATE: CALIFORNIA	Top Log Interval: 50
Other Services: NATURAL GAMMA, CCL	Completion: 1' @ 50'
CALIPER, DENSITY NEUTRON	Gravel Layer: 1' @ 50'
CONVERGENCE ALVD IN FRONT OF THE HOLLYWOOD BOWL	Oil Size: 3/4"
	Type Fluid in Hole: QUIN THTA
	Dist. Min. Max.
	Wt. Fluid Loss
	Sp. of Sample
	Jan @ Min. Temp.
	Jan @ Max. Temp.
	Mar @ Min. Temp.
	Mar @ Max. Temp.
	Summer Heat Rate
	Jan @ 50'
	Conduction Apparent
	Log on Bottom
	Dist. Res. Temp.
	Completed By: CALIHATTI

Number: LINE SPEED 35 FT/MIN



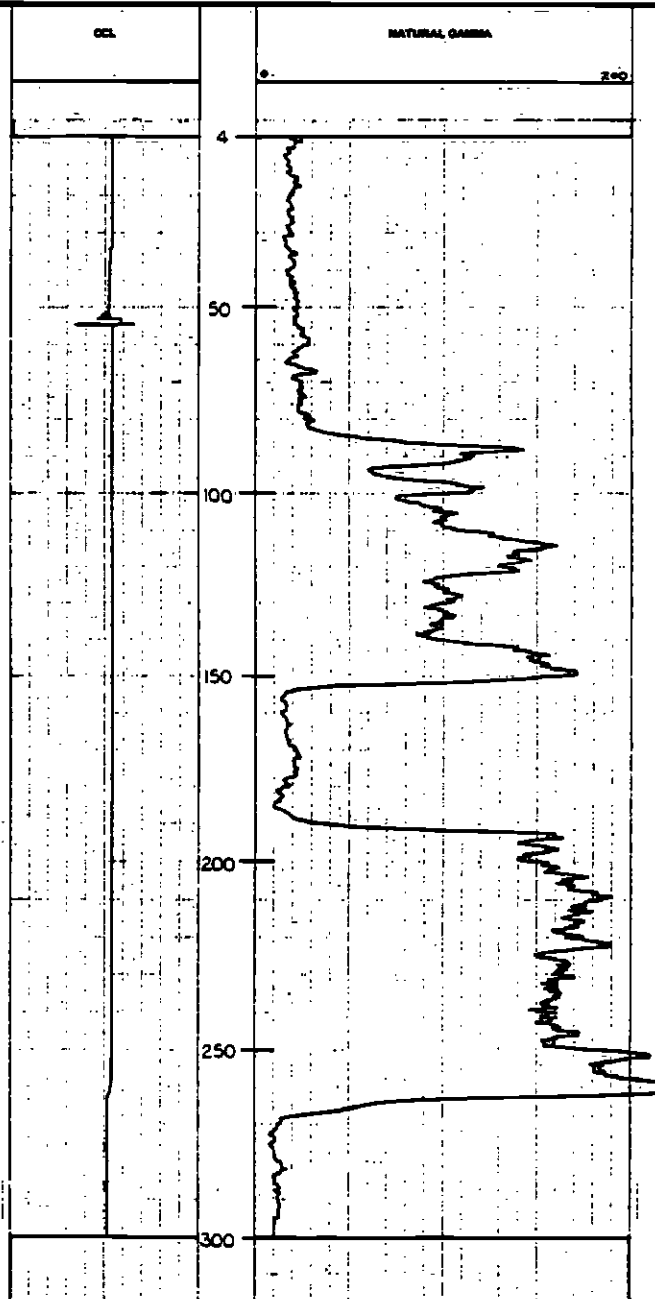


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 2/25/81				
PROJ. NO. 2191-25	Shot No. 1				
WELL: 31	Depth-Drifts 300				
FIELD:	Depth-Loggs 381				
COUNTY: LOS ANGELES	Top Log Interval 3' 0" 50'				
STATE: CALIFORNIA	Depth-Loggs 2' 0" 50'				
Other Services: SP-RS, CALIPA, DENSITY, NEUTRON	Bit Size 3 1/2"				
	Type Fluid in Well: QUIN. TRIP				
	Grain. Vols. 0% 0% 0% 0%				
	SP. Fluid Loss 0% 0% 0% 0%				
	Grains of Sample				
	Top of Min. Temp. 0% 0% 0% 0%				
	Foot of Min. Temp. 0% 0% 0% 0%				
	Base of Min. Temp. 0% 0% 0% 0%				
	Bottom Hole 0% 0% 0% 0%				
	Shot 0 0 0 0				
Formation Design: G.L. 482	Chronology Interval: 2/14/80				
Log Interval From: -G.L.	Loggs at Depth: 2/25/81				
Grainy Interval From: G.L.	Min. Temp. 0%				
	Recorded by: GALLINATI				

Remarks: LINE SPEED 20 FT/MIN ; CCL READS 3' HIGHER THAN DEPTH INDICATED



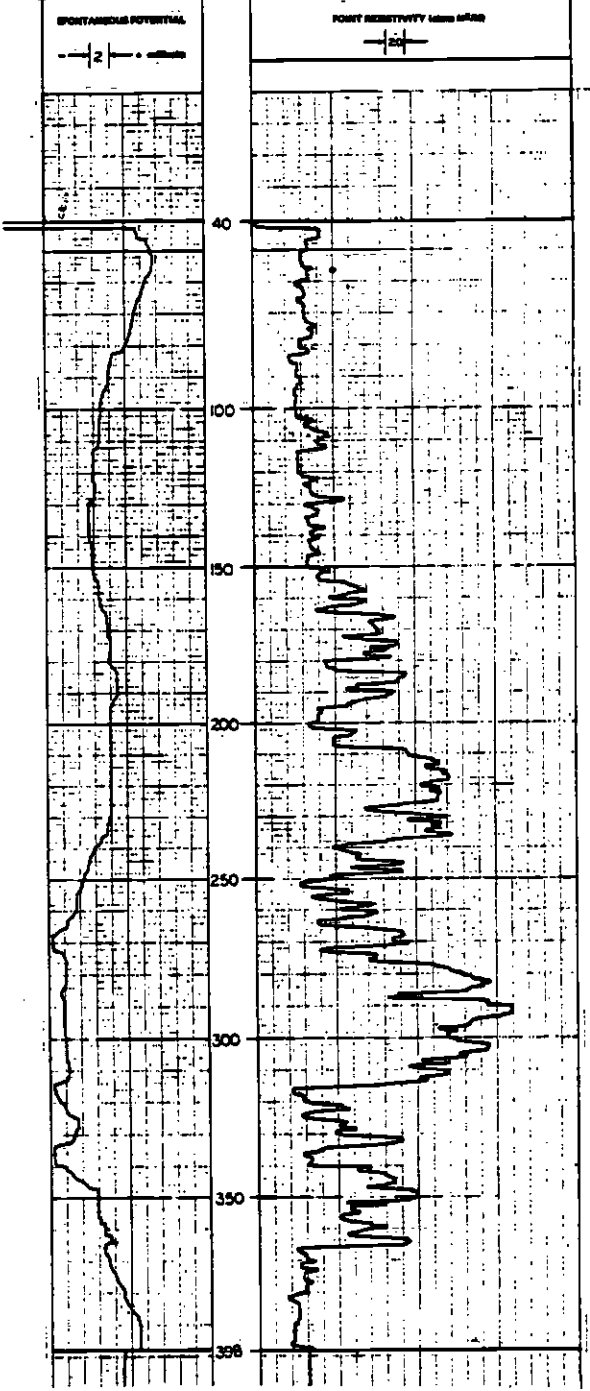


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SP-RESISTIVITY LOG

CLIENT: SC RTD	Date: 2/2/71
PROJ. NO. 241-25	Depth: 371.4
WELL: 32	Well No.: 07
COUNTY: LOS ANGELES	Well Name: 2 1/2" - 3 1/2" - 3 1/2" to 4 1/2" - 4 1/2"
STATE: CALIFORNIA	Well Type: 2 1/2" - 3 1/2" - 3 1/2" to 4 1/2" - 4 1/2"
Other Drilling: NATRON - BOSTON, CAL.	Well Type: 2 1/2" - 3 1/2" - 3 1/2" to 4 1/2" - 4 1/2"
CALIFORNIA RESISTIVITY SECTION	Well Type: 2 1/2" - 3 1/2" - 3 1/2" to 4 1/2" - 4 1/2"
WELL TYPE: DRILLER - CONCRETE - WEAP	Well Type: 2 1/2" - 3 1/2" - 3 1/2" to 4 1/2" - 4 1/2"
OF CONCRETE TUB	Well Type: 2 1/2" - 3 1/2" - 3 1/2" to 4 1/2" - 4 1/2"
Drill Bit: 6.6	Drill Bit: 7.0
Drill Bit: 6.6	Drill Bit: 6.6
Drill Bit: 6.6	Drill Bit: 6.6

Parameter: LINE SPEED 35 ft/min



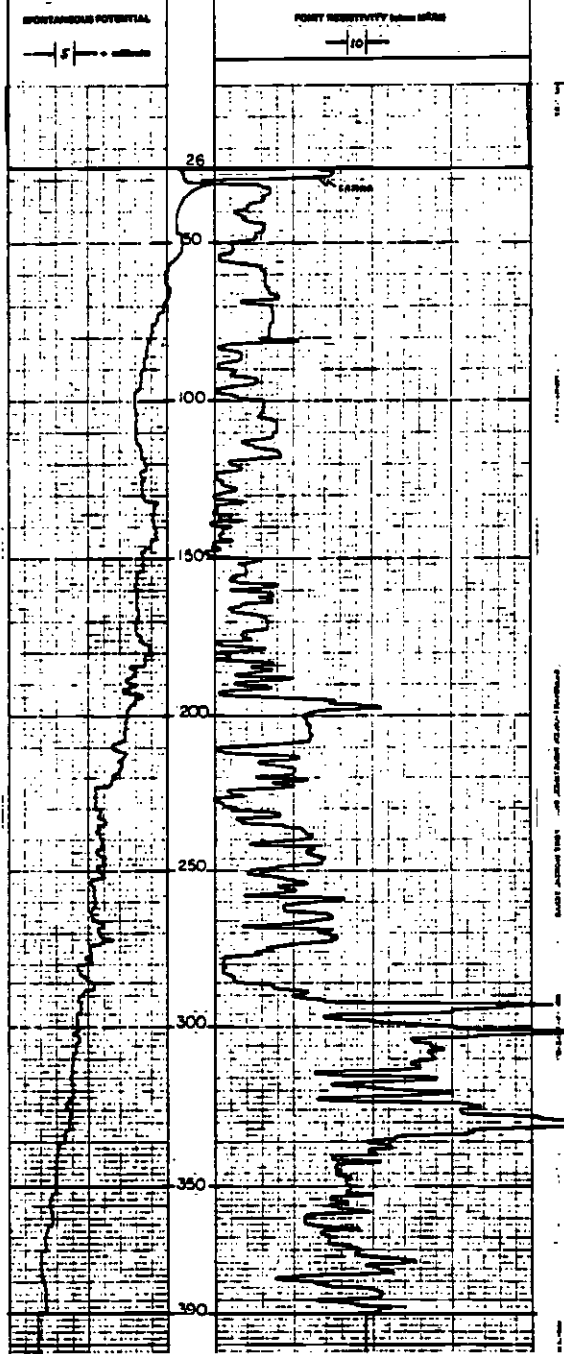


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SP-RESISTIVITY LOG

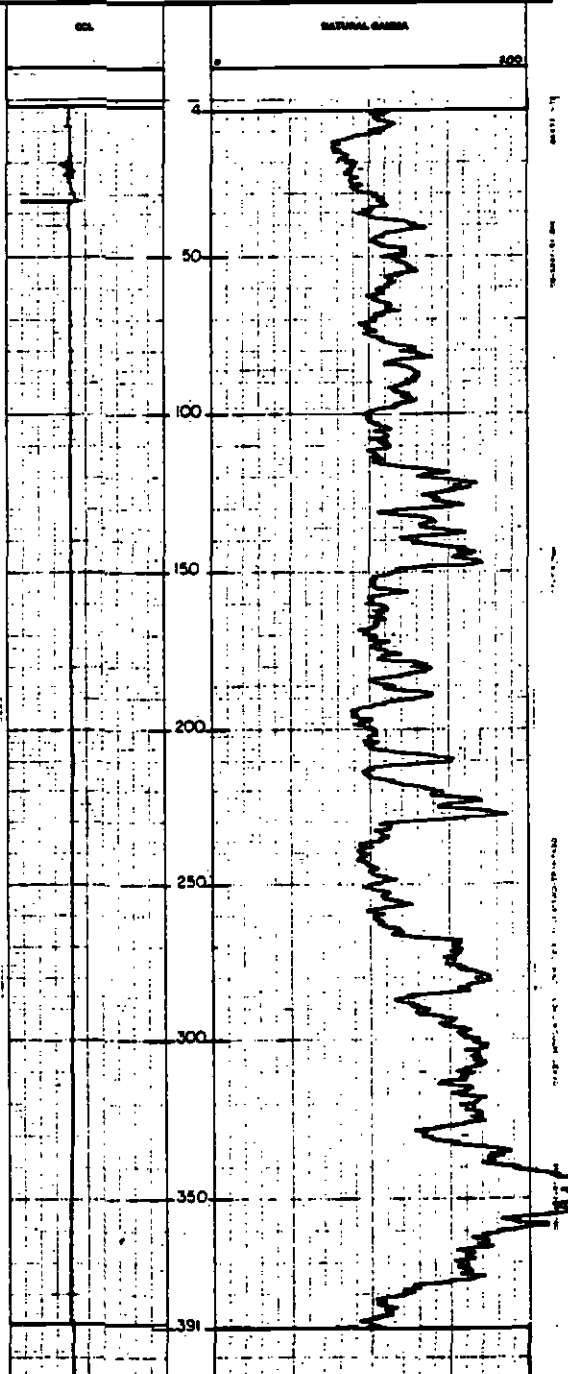
CLIENT: SCATD	Date: 2/17/81		
FIELD NO: 2191-ES	Depth: 231.7		
WELL: 32A	Depth: 231		
FIELD:	Area: 24.8		
COUNTY: LOS ANGELES	Area: 3.18 E 27		
STATE: CALIFORNIA	Area: 3.74		
Order Number: CCL 20000 CALIF.	Area: 3.74		
PROPERTY: HOFFMAN	Area: 3.74		
OWNER: HOFFMAN, RUTH HAYWOOD	Area: 3.74		
Location:	Area: 3.74		
Scale:	Area: 3.74		
Project Name:	Area: 3.74		
Log Number:	Area: 3.74		
Log Date:	Area: 3.74		
Log By:	Area: 3.74		
Checked By:	Area: 3.74		
Approved By:	Area: 3.74		
Scale:	Area: 3.74		
Project Name:	Area: 3.74		
Log Number:	Area: 3.74		
Log Date:	Area: 3.74		
Log By:	Area: 3.74		
Checked By:	Area: 3.74		
Approved By:	Area: 3.74		

Notes: LOW RESISTIVITY TO 7' DEEP



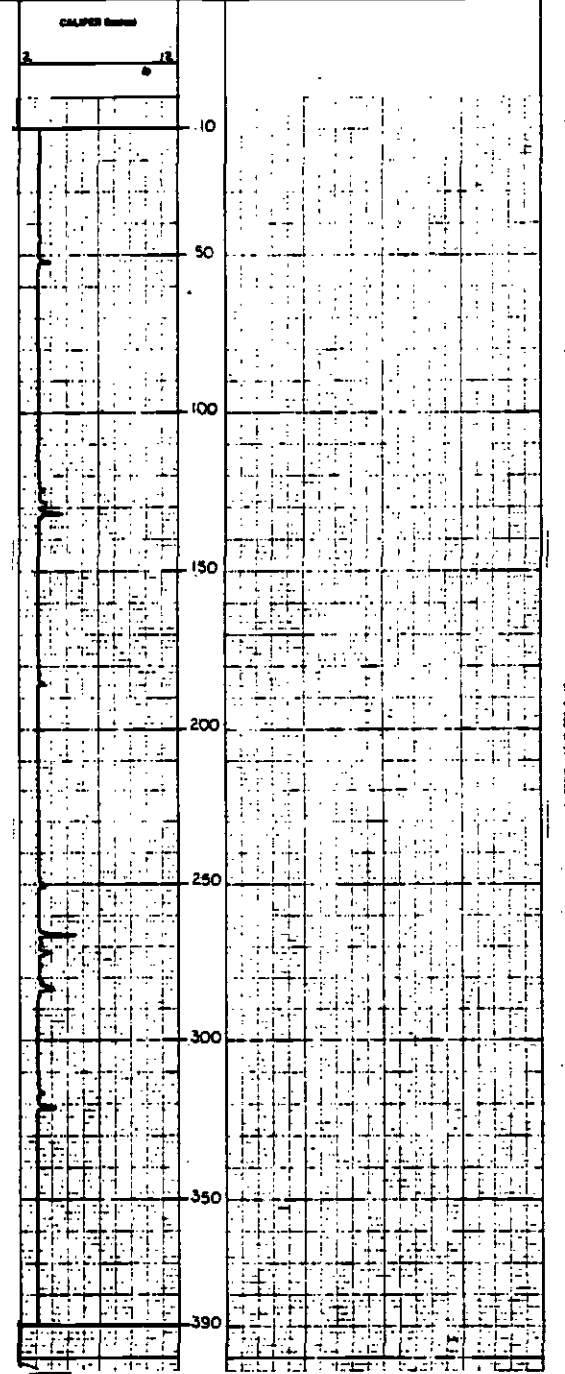
		CCL-GAMMA RAY LOG	
CLIENT: SCRTP	Date: 3/17/78		
WELL NO. 2191-25	Well No. 2191-25		
WELL: 32A	Well Log Interval 32A		
FIELD:	County: LOS ANGELES		
	State: CALIFORNIA		
Other Section: S.P. 484 CALIF. GEOL. SURV.	Other Section: S.P. 484 CALIF. GEOL. SURV.		
DEPTH:	Depth: 32A		
Operator:	Operator: SCRTP		
Log Made by:	Log Made by: SCRTP		
Checked by:	Checked by: SCRTP		
Supervisor:	Supervisor: SCRTP		
Company:	Company: SCRTP		
Address:	Address: SCRTP		
City:	City: SCRTP		
State:	State: SCRTP		
Zip:	Zip: SCRTP		
Phone:	Phone: SCRTP		
Facsimile:	Facsimile: SCRTP		
Telex:	Telex: SCRTP		
Radio:	Radio: SCRTP		
Other:	Other: SCRTP		
Notes:	Notes: SCRTP		

Notes: **LINE 1000 60" 7/8" G.L. FIRST 3.0' ABOVE TRIP INDICATED**



		CALIPER LOG	
CLIENT: SCRTP	Date: 3/17/78		
WELL NO. 2191-25	Well No. 2191-25		
WELL: 32A	Well Log Interval 32A		
FIELD:	County: LOS ANGELES		
	State: CALIFORNIA		
Other Section: S.P. 484 CALIF. GEOL. SURV.	Other Section: S.P. 484 CALIF. GEOL. SURV.		
DEPTH:	Depth: 32A		
Operator:	Operator: SCRTP		
Log Made by:	Log Made by: SCRTP		
Checked by:	Checked by: SCRTP		
Supervisor:	Supervisor: SCRTP		
Company:	Company: SCRTP		
Address:	Address: SCRTP		
City:	City: SCRTP		
State:	State: SCRTP		
Zip:	Zip: SCRTP		
Phone:	Phone: SCRTP		
Facsimile:	Facsimile: SCRTP		
Telex:	Telex: SCRTP		
Radio:	Radio: SCRTP		
Other:	Other: SCRTP		
Notes:	Notes: SCRTP		

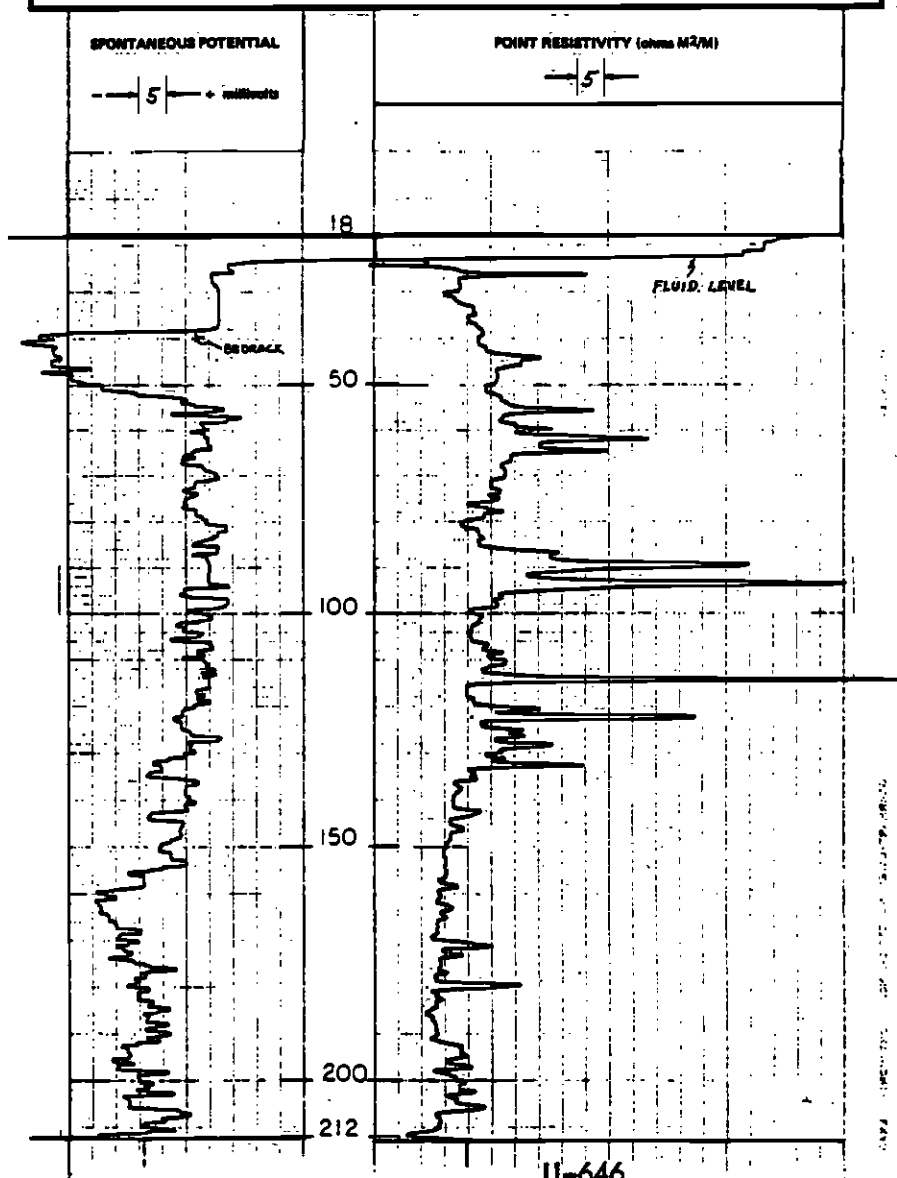
Notes: **LINE 1000 60" 7/8" G.L. FIRST 3.0' ABOVE TRIP INDICATED**





CLIENT: SCRTD	Date: 1/18/81				
PROJ. NO. 2191-25	Run No. ONE				
WELL: 33	Depth-Griller 2.20				
FIELD:	Depth-Logger 2.13				
COUNTY: LOS ANGELES	Box Log Interval 2.12				
STATE: CALIFORNIA	Top Log Interval 18				
Other Services: CALPER, GAMMA, NEUTRON	Casing-Orbiter 5' off @ 16'				
DENSITY	Casing-Logger 5' of 5' @ 16'				
SIDEWALK - N. SIDE OF CARDELLA BLVD.	Bit Size 4 7/8 TO 5 1/2	3 1/2"	TO 220'		
BY REUBEN'S MARKING LOT	Type Fluid in Hole SEWANTE				
Section	Dens. Visc.				
Yards	psi Fluid Loss	.9	ml	ml	ml
Range	Scams of Scams	AND TOP			
Permeability	Run @ Min. Temp.	40 @ 58 °F			
Log Measured From G.L.	Run @ Min. Temp.	40 @ 58 °F			
Drilling Measured From G.L.	Run @ Min. Temp.	6.0 @ 58 °F			
	Success Rate				
	Run @ ENT				
	Chronometer Stopped	1706			
	Logger on Bottom	1335			
	Max. Run. Temp.				
	Successed By	RANBAGOL			

Remarks: **LINE SPEED 35' / MIN.**



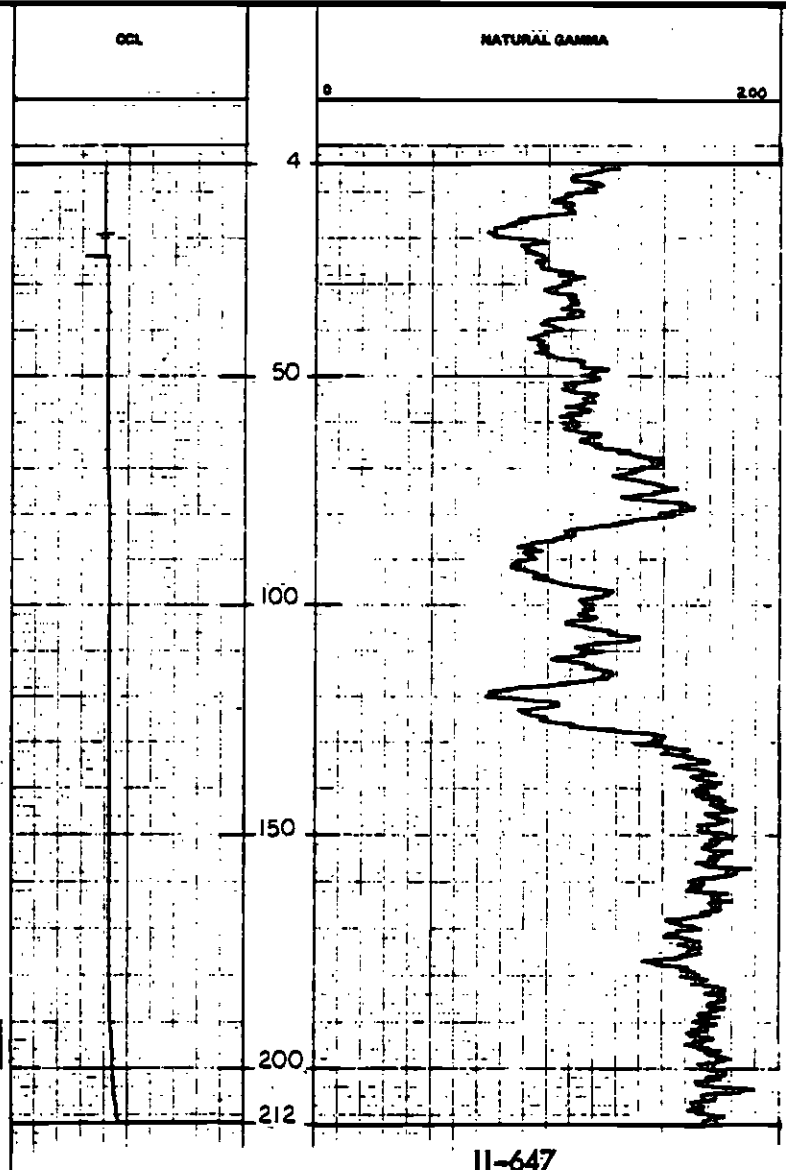


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/10/81			
PROJ. NO. 2191-25	Run No. 241E			
WELL: 33	Depth-Oriller 220			
FIELD:	Depth-Logger 213			
COUNTY: LOS ANGELES	Bot. Log Interval 212			
STATE: CALIFORNIA	Top Log Interval 4			
Other Services: S.P. RES., NEUTRON,	Casing-Oriller 5' 16" @ 16'			
DENSITY CALIPER	Casing-Logger 5' 16" @ 16'			
SIDEWALK, N. SIDE CANNING BLVD.	Bit Size 4 7/8" To 5 1/2"	3 1/4" To 2 3/4"		
BY REUDENS PARKING LOT	Type Fluid in Well REFRIGERANT			
	Core Visc.			
	PH Fluid Loss 9	ml		ml
	Source of Sample MUD TUB			
	Run @ Min. Temp. 10 @ 58 °F			
	Run @ Min. Temp. 10 @ 58 °F			
	Run @ Min. Temp. 60 @ 58 °F			
	Source Rod Rate			
	Run @ BHT			
	Circulation Stoppage 1700			
Parameter Obtained G.L.	D.F. 620			
Log Measured From G.L.	Logger on Screen 1850			
Drilling Measured From G.L.	Max. Run Temp.			
	Recorded By MAUBALGL			

Remarks: CCL READS 3' HIGHER THAN INDICATED, LINE SPEED 20"/MIN.



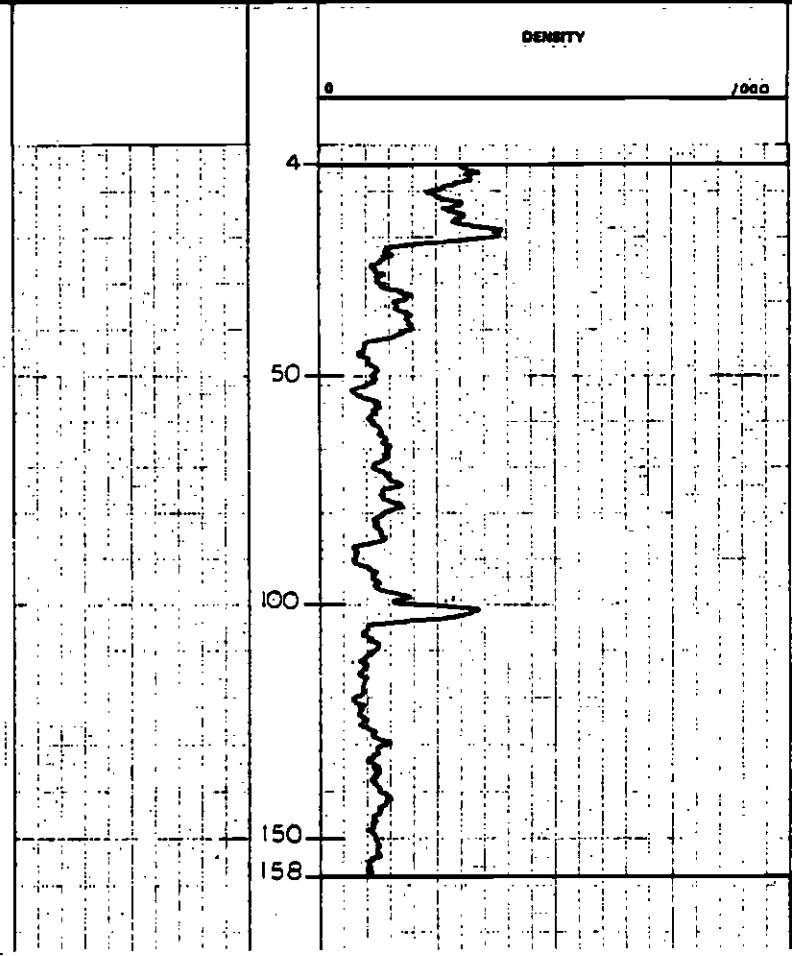


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DENSITY LOG

CLIENT: SCRTD	Date: 3/17/81		
PROJ. NO. 2191-25	Run No. TMAQ		
WELL: 33	Depth-Offset 220		
FIELD:	Depth-Logger 157		
COUNTY: LOS ANGELES	Bot. Log Interval 158		
STATE: CALIFORNIA	Top Log Interval 4		
Other Services: S.P., RES., C.C.L., GAMMA	Casing-Offset 2" ABS @ 160'		
CALIPER, NEUTRON	Casing-Logger 2" ABS @ 160'		
SIDEWALK N. SIDE CANNES BLVD.	Bit Size 4 1/2" to 5 1/2" 3 3/4" TO 220'		
BY RUBENS PARKING LOT	Type Fluid in Hole FRESH H₂O		
Section	County	Range	
Pervasive Datum G.L.	Q.L. 620		
Log Measured From G.L.	D.P.		
Drilling Measured From G.L.	K.B.		
	Core. Visc.		
	pH Field Log		
	Source of Sample		DONE
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Run @ Min. Temp.		
	Run @ Max. Temp.		
	Circulation Stoppage		11/10/81
	Logger on Screen		3/17/81
	Max. Run. Temp.		
	Reamed by		RAMBAGOL

Remarks: **LINE SPEED 15 FT/MIN. TOTAL DEPTH OF HOLE NOT LOGGED BECAUSE ONLY 160' OF 2" ABS WAS INSTALLED. DRILLER UNABLE TO PUSH CASING BEYOND 160'. WATER LEVEL IN CASING AT 22.8 FT.**



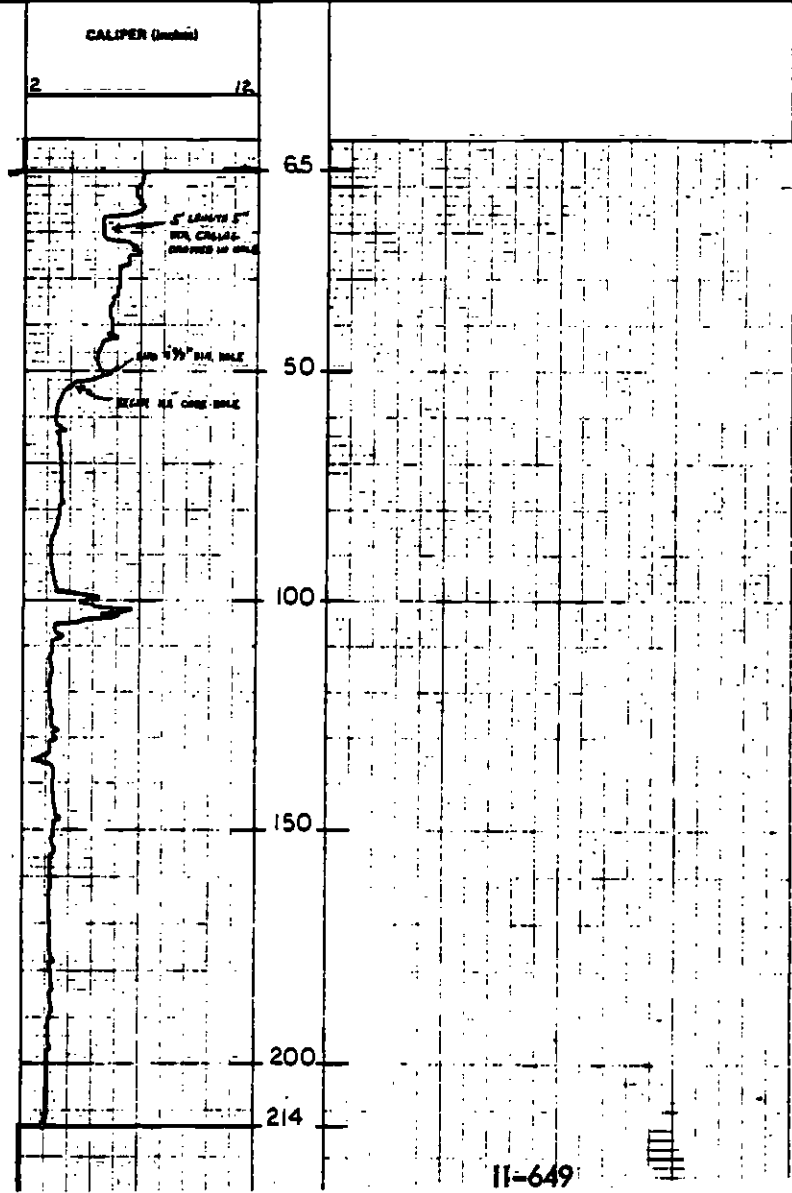


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CALIPER LOG

CLIENT: SCRTD	Date: 1/10/81
PROJ. NO. 2191-25	Run No. 219
WELL: 33	Depth-Offset 220
FIELD:	Depth-Logger 214
COUNTY: LOS ANGELES	Strat. Log Interval 214
STATE: CALIFORNIA	Top Log Interval 65
Other Services: GAMMA, S.P., RES., NEUTRON, DENSITY.	Casing-Offset 5' OFF @ 16'
	Casing-Logger 5' OFF @ 6'
	Bit Size 4 7/8" TO 5 1/2", 3/4" TO 2 3/4"
	Type Fluid in Hole: BEATRANTE
	Conn. Visc.
	Sp. Gr. Fluid Loss 9.0 ml
	Sp. Gr. of Sample 10.00 TVG
LOCATION: SIDEWALK - N SIDE OF CANNING BLVD. BY REUBEN'S PARKING LOT	Run @ Meas. Temp. 10.0 58 °F
	Run @ Meas. Temp. 10.0 58 °F
	Run @ Meas. Temp. 6.0 58 °F
	Recess. Run Rate
Section Township Range	Run @ BHT 0 °F
Permeation Datum: G.L.	Corrosion Observed 1700
Log Measured From: G.L.	Logger on Bottom 1830
Drilling Measured From: G.L.	Max. Pen. Temp. °F
	Recorded By: HAN, RAO

Remarks: SLIGHT (1/2") UPHOLE DRIFT FROM CALIPER TOOL, LINE SPEED 20 FT/MIN.



SAFETY: WEAR YOUR SAFETY BELT AND HELMETS AT ALL TIMES

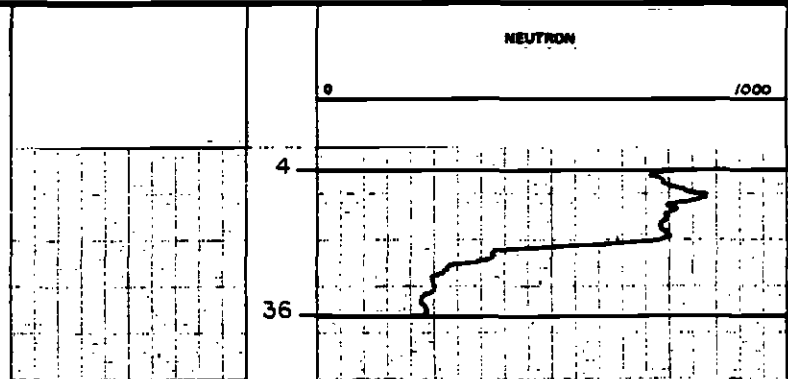


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NEUTRON LOG

CLIENT: SCRTD	Date	3/17/81
PROJ. NO. 2191-25	Run No.	TWO
WELL: 33	Depth-Driller	220
FIELD:	Depth-Logger	37
COUNTY: LOS ANGELES	Run Log Interval	4
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES., CALIPER CCL.	Casing-Driller	2" ABS @ 160'
GAMMA DENSITY:	Casing-Logger	2" ABS 160'
SIDEWALK N. SIDE OF CANUEGA BLVD. BY REUBENS PARKING LOT	Bit Size	4 1/4" TO 5 1/2" 3 1/4" TO 2 1/2"
Section	Type Fluid in Hole	FRESH H ₂ O
Township	Down - Vis.	
Range	PH - Fluid Loss	ml
Permeant Density: G.L.	Run @ 1 Min. Temp.	ABASE
Log Measured From: G.L.	Run @ 1 Min. Temp.	
Drilling Measured From: G.L.	Run @ 1 Min. Temp.	
	Source Size	
	Run @ 5MT	
	Circulation Stopped	1/10/81
	Logger on Bottom	3/17/81
	Min. Res. Temp.	
	Recorded By	PLANZAGOL

Remarks: LINE SPEED 157' MIN. UNABLE TO GET PORE PAST 36'. 2" ABS SCHEMATIC BENT WATER LEVEL AT 22.8 FT IN CASING.



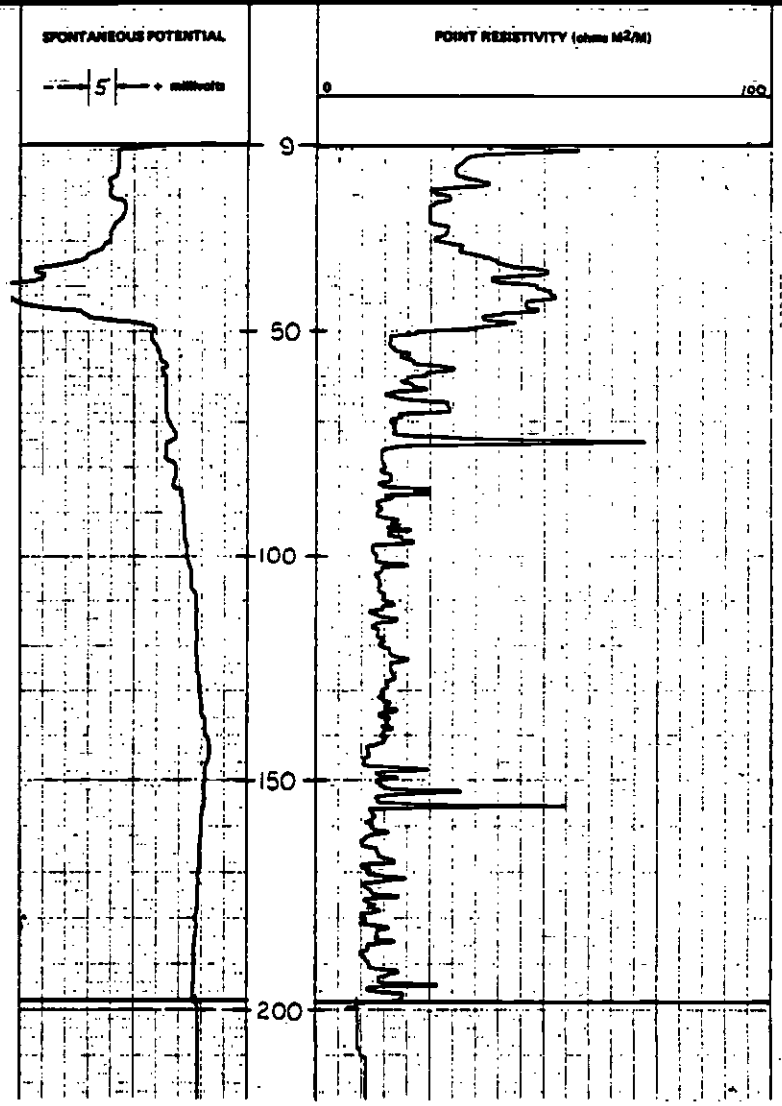


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 12/5/80		
PROJ. NO. 2191-25	Run No. 1		
WELL: 34	Depth-Offset 200		
FIELD:	Depth-Logger 177		
COUNTY: Los Angeles	Run Log Interval 177		
STATE: CALIFORNIA	Top Log Interval 0		
Other Services: NATURAL GAMMA, CALIPER	Chino-Offset 0' 8'		
NEUTRON	Chino-Logger 0' 8'		
BLUFFSIDE DRIVE, NEAR VINELAND	Site Size 4 1/2' x 8'		
	Type Field in Hole: RESISTIVITY		
	Date: Vln.		
	pH Field Log 9	ml	ml
	Source of Sample Mud Tub		
	Run @ Mean Temp. 10 @ 68°F		
	Run @ Mean Temp. 10+ @ 68°F		
	Run @ Mean Temp. 9 @ 68°F		
	Run @ Mean Temp. 9 @ 68°F		
Section Towards TIN Ramp R14W	Station: East / West		
Permanent Offset: G.L.	Run @ BHT		
Log Measured From: G.L.	Chisel Bit Stopped 900		
Drilling Measured From: G.L.	Logger on Bottom 930		
	Max. Res. Temp.		
	Recorded By: MWR/AGL		

Remarks: Line Speed: 30 f/min



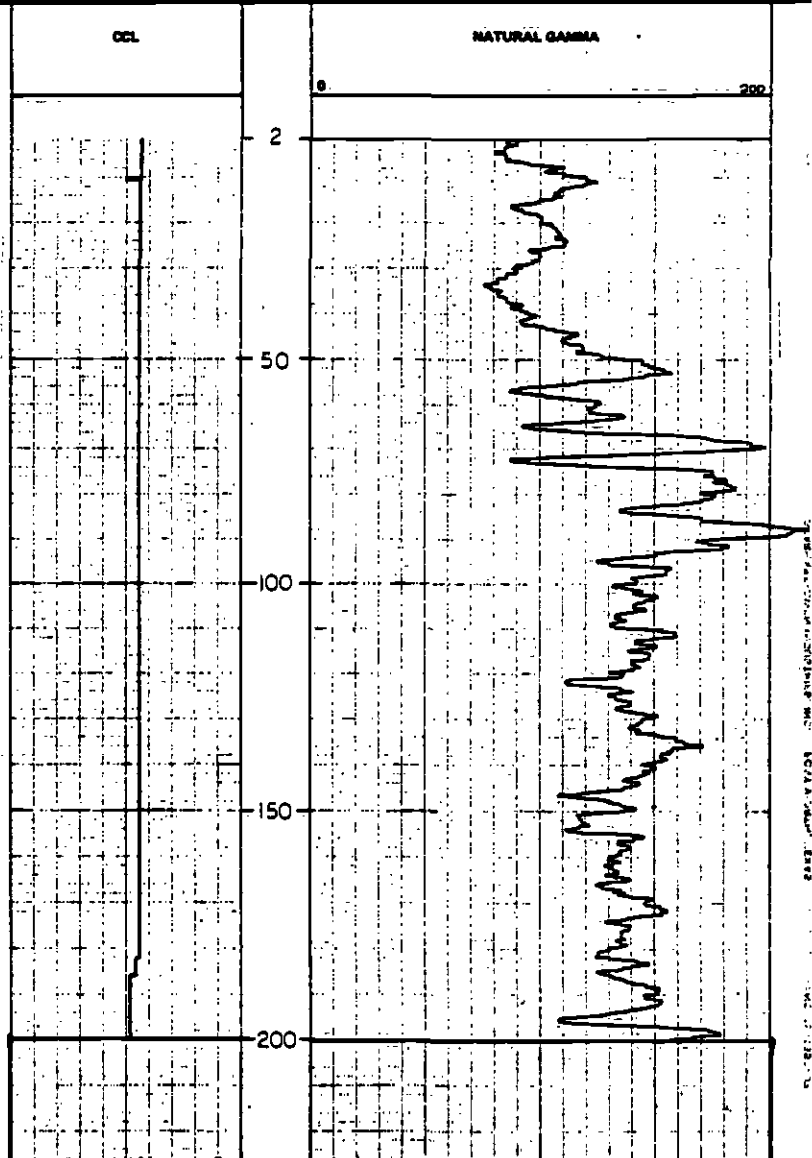


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 12/8/60		
PROJ. NO. 2191-25	Run No. 1		
WELL: 34	Depth-Order 200		
FIELD:	Depth-Logger 201		
COUNTY: Los Angeles	Stem Log Interval 200		
STATE: California	Top Log Interval 2		
Other Services: SP-Res, Caliper, Neutron	Comp-Order 9		
	Stem 9'		
	Type Fluid to Hole Non-Aqueous		
	Down. Visc.		
	pH - Fluid Loss 9		
	Source of Sample Mud Tub		
	Run @ Min. Temp. 10 @ 68°F		
	Run @ Min. Temp. 10 @ 68°F		
	Run @ Min. Temp. 9 @ 68°F		
	Source of Fluid		
	Run @ 68°F		
	Completion Stopped 200		
	Logger on Bottom - 200		
	Min. Run Temp.		
	Recorded By FINZWEGL		

Remarks: Line Speed: 20 FT/MIN



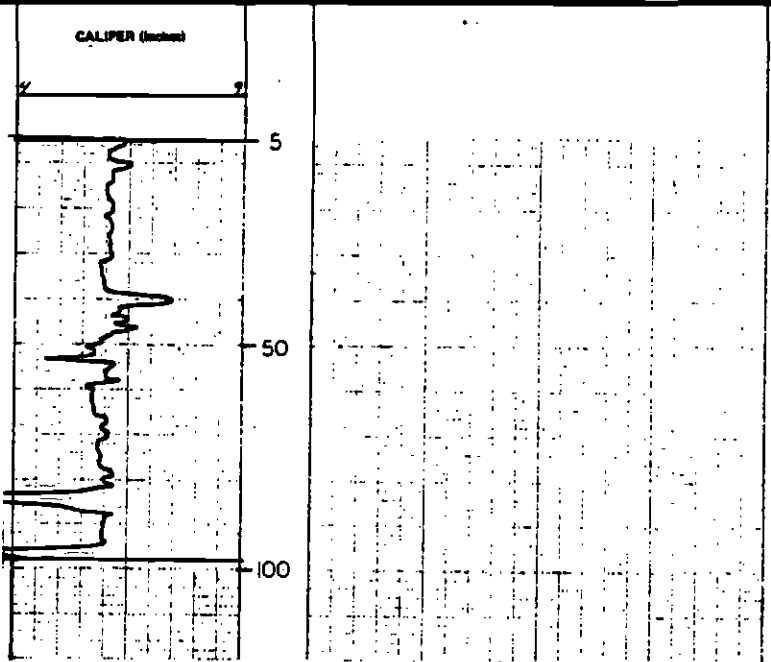


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CALIPER LOG

CLIENT: SCRTD	Date: 12/10/80	Run No.	
PROJ. NO. 2191-25	Depth-Driller: 100	Depth-Logger: 100	
WELL: 34 (PHONE HOLE A)	Run Log Interval: 98	Run Log Interval: 5	
FIELD:	Coring-Driller: 8'	Coring-Logger: 8'	
COUNTY: Los Angeles	Bit Size: 5 7/8"	Type Fluid in Hole: Bentonite	
STATE: California	Core: Vln.	psi	Field Log
Other Services: Natural Gas, SP-Res.	Source of Strata: Mud Tub	Run @ Min. Temp: 10 @ 68°F	
Neutron	Run @ Min. Temp: 10 @ 68°F	Run @ Min. Temp: 9 @ 68°F	
Section	Section	Run @ Min. Temp: 9 @ 68°F	
Terminology: TIN	Flow: B14W	Run @ BHT: 0	
Permeability: G.L.	GL 574	Completion Stopped: 1400	
Log Measured From: G.L.	B.P.	Logger on Screen: 1600	
Drilling Measured From: G.L.	R.B.	Max. Run Temp: 0	
		Recorded By: P.M.N.C.-G.L.	

Remarks: Line Speed: 20 fpm, PHONE HOLE A WAS LOGGED



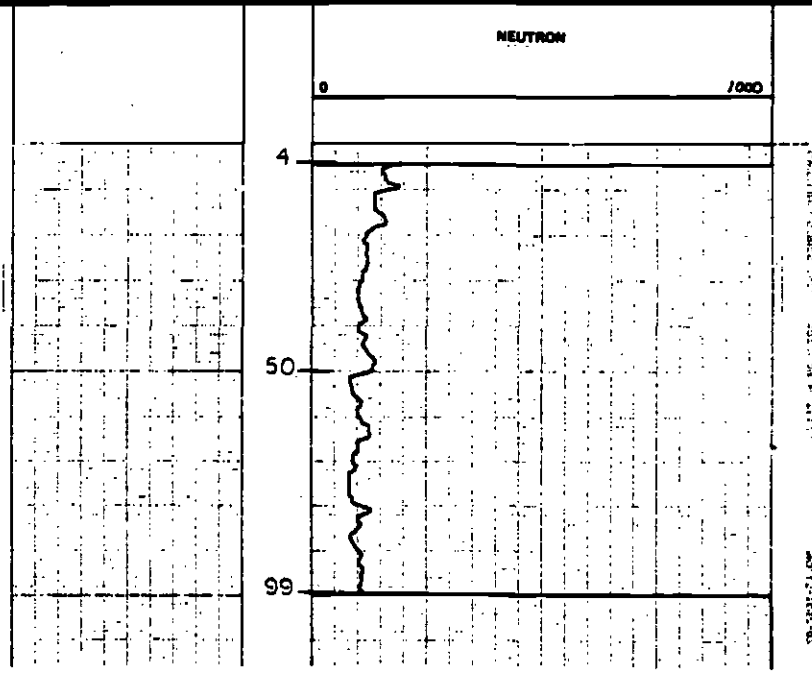


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NEUTRON LOG

CLIENT: SCRTD	Date: 3/16/81
PROJ. NO. 2191-25	Run No. 740
WELL: 34 (PHONE HOLE A)	Depth-Offset: 100
FIELD:	Depth-Logger: 100
COUNTY: LOS ANGELES	Min. Log Interval: 99
STATE: CALIFORNIA	Top Log Interval: 4
Other Services: S.P., RES., GAMMA, C.L.	Casing-Offset: 3" PVC @ 100'
CALIPER:	Casing-Logger: 3" PVC @ 100'
BLUFFSIDE DR. EAST OF VINELAND	Bit Size: 3/8"
	Type Fluid in Well: FRESH W.D.
	Temp. Visc.:
	Sp. Grav. Fluid Loss:
	Scale of Sample: NONE
	Run @ Min. Temp.:
	Run @ Min. Temp.:
	Run @ Min. Temp.:
	Source: Surf / Run:
	Run @ SURF:
	Chronometer Stopped: 12/10/80
	Logger on Bottom: 3/16/81
	Max. Run. Temp.:
	Accepted By: MAJERSON
Section: Township T12N Range R14W	
Permitted Owner: G.L.	G.L. 574
Log Measured From: G.L.	D.P.
Dialing Measured From: G.L.	ELEVATION: K.B.

Remarks: LINE SPEED 15" MIN. HOLE PLASTIC CASING AND CASING, 3" PVC FILLED W/ FRESH WATER, PHONE HOLE A WAS LOGGED.



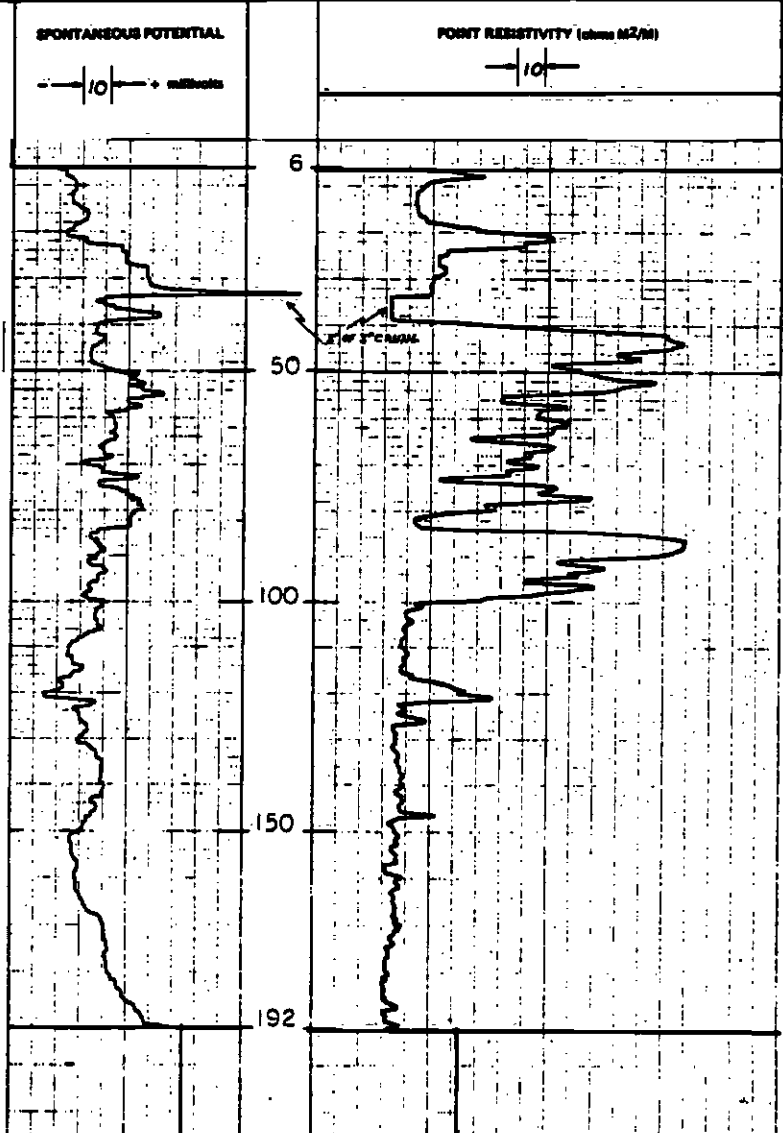


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 11/17/81			
PROJ. NO. 2191-22	Site No. 08C			
WELL: 35	Depth-Order 193.5			
FIELD:	Depth-Logger 193			
COUNTY: Los Angeles	Stem Log Interval 172			
STATE: California	Top Log Interval 6			
Other Services: Gamma, CCL, Caliper	Caliper-Order 5' @ 1'			
	Caliper-Logger 3' @ 30"			
	SR Stem 7 7/8"			
	Type Fluid in Hole: Seawater			
	Temp. Visc.			
	pH Field Log 9	ml	ml	ml
	Stem of Sample 7' @ 1'			
	Run @ Min. Temp. 10' @ 63°F			
	Run @ Max. Temp. 10' @ 63°F			
	Run @ Min. Temp. 8.9' @ 63°F			
	Stem. Rod / Stem			
	Run @ 2RT			
	Completion Diagram 1600			
	Logger on Bottom 1750			
	Min. Res. Temp.			
	Recorded By: Personnel			

Remarks: Line Sealed 3.0 FT/Min



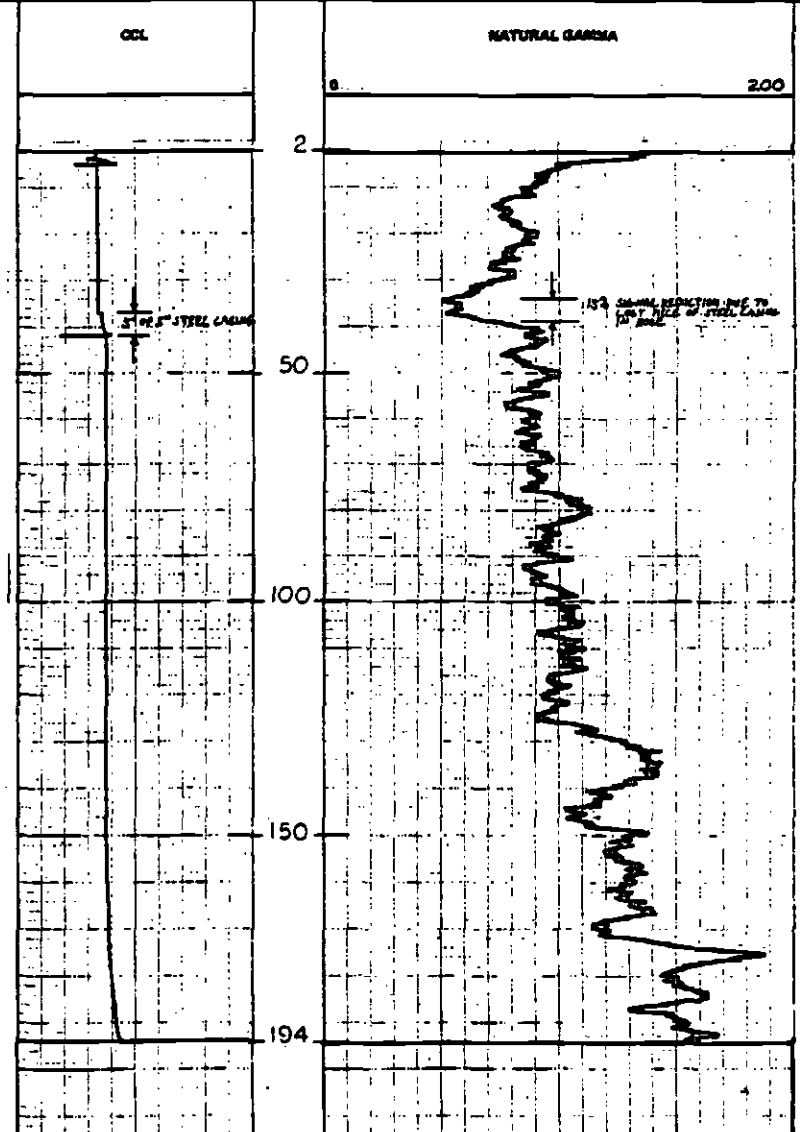


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 1/17/81			
PROJ. NO. 2191-EZ	Run No. 018			
WELL: 35	Depth-Orifer 193.5			
FIELD:	Depth-Logger 195			
COUNTY: Los Angeles	Run Log Interval 194			
STATE: California	Top Log Interval 2			
Other Services: SP. Res., Caliper	Casing-Orifer 5" - 8 1/2"			
	Casing-Logger 5" - 8 1/2"			
	Well Size 4 1/2"			
	Type Fluid in Hole Bentonite			
	Dens. Min.			
	pH Field Log	9	10	10
	Spores of Sample mud Tub			
	Run @ Mean Temp. 20 - 63 °F			
	Surf @ Mean Temp. 20 - 63 °F			
	Run @ Mean Temp. 29 - 63 °F			
	Source: Surf / Run			
	Run @ SURF			
	Chronometer Stopped	1600		
	Logger on Bottom	1720		
	Max. Run Temp.			
	Recorded By: GONZALES			

Remarks: Line Speed 20 ft/min



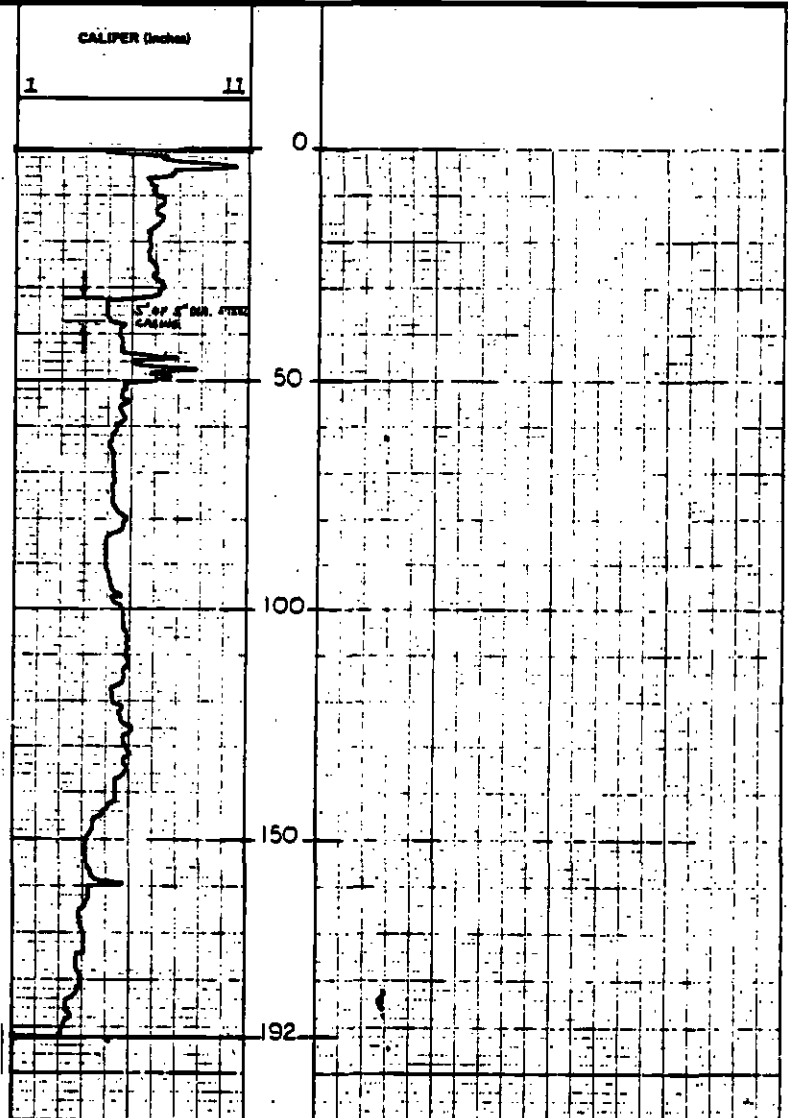


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CALIPER LOG

CLIENT: SCRTD	Date: 1/17/81		
PROJ. NO. 2191-22	Run No. 2191		
WELL: 35	Depth-Offset 193.5		
FIELD:	Depth-Logger 194		
COUNTY: LOS ANGELES	Run Log Interval 192		
STATE: CALIFORNIA	Top Log Interval 0		
Other Services: S.P.-RES., CCL, GAMMA	Casing-Offset 5' 0"		
	Casing-Logger 5' 0"		
	Bit Size 4 7/8"		
	Type Fluid in Hole Bentonite		
	Down. Visc.		
	pH Field Log 9	all	all
	Number of Samples Mud Log		
LOCATION: 117' N. of Agua Vista St. and Vineyard Ave. intersection, E. side of Vineyard	Run @ Max. Temp. 100 @ 63 °F		
	Run @ Min. Temp. 100 @ 63 °F		
	Run @ Max. Temp. 8.9 @ 65 °F		
	Run @ Min. Temp. 8.9 @ 65 °F		
	Run @ 500' Rate		
	Run @ 500'		
	Circulation Stopped 1400		
	Logger on Bottom 1500		
	Max. Run Temp. °F		
	Recorded By: Mansoori		
Permeameter Data: G.L. 681			
Log Measured From: G.L.			
Drilling Measured From: G.L.			

Remarks: LINE SPEED 20 FT/MIN.



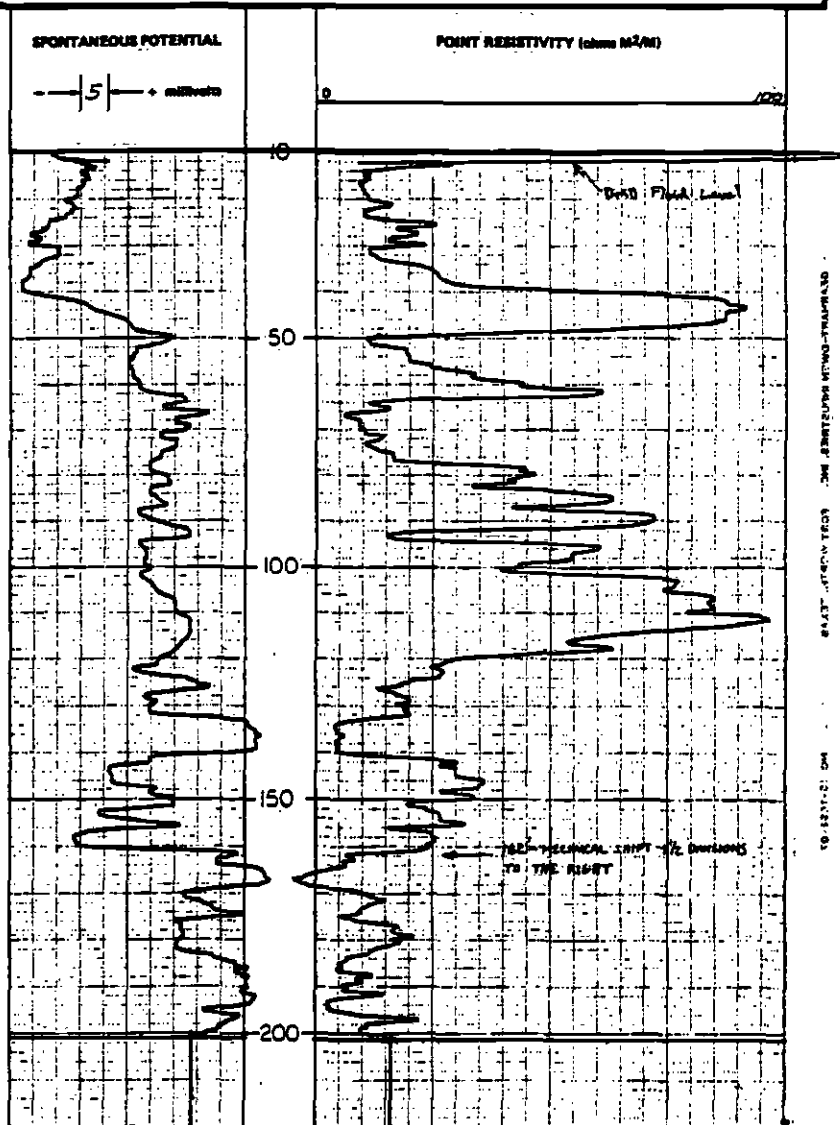


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date	12/7/80		
PROJ. NO. 2191-25	Run No.	3		
WELL: 36	Depth-Offset	206.7		
FIELD:	Depth-Logger	202		
COUNTY: Los Angeles	Stem Log Interval	201		
STATE: California	Top Log Interval	10		
Other Services: <i>Natural Gamma, Density</i>	Coring-Offset	0.0 8'	•	•
	Coring-Logger			
	Stem Size	1 1/8"		
	Type Fluid in Hole	Seawater		
	Date	Vis.		
	pH	Fluid Loss	9	ml
	Source of Seawater	Fluid Tank		
	Stem @ Stem Temp.	100° @ 63.5°	•	•
	Fluid @ Stem Temp.	100° @ 63.5°	•	•
	Stem @ Stem Temp.	100° @ 63.5°	•	•
	Seawater / Surf / Stem			
	Run @ BWT	•	•	•
	Circulation Pressure	1130		
	Logger on Screen	1200		
	Max. Stem Temp.	•	•	•
	Recorded By	MANZAGAL		

Remarks: Line Speed: 30 ft/min



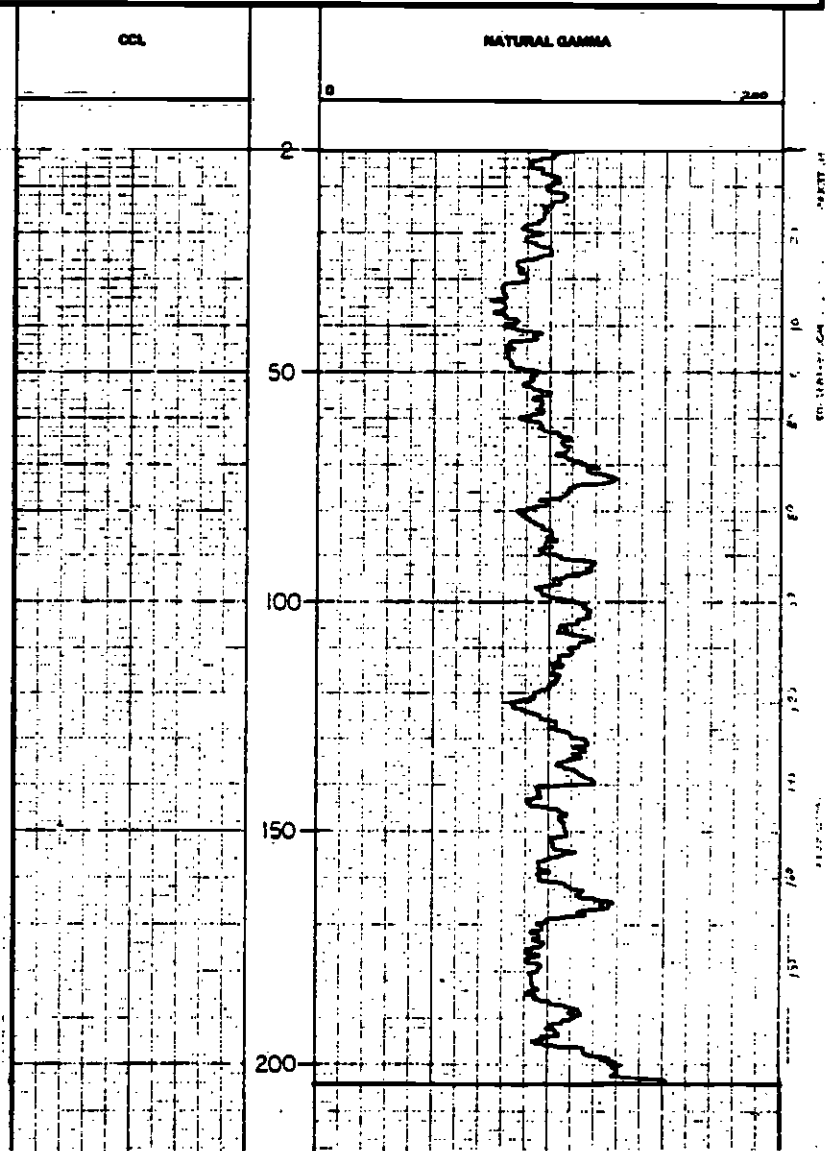


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CCL-GAMMA RAY
LOG

CLIENT: SCRTD	Date: 12/7/82		
PROJ. NO. 2191-25	Run No. 1		
WELL: 36	Depth-Order 206.7		
FIELD:	Depth-Logger 202		
COUNTY: Los Angeles	Min. Log Interval 202		
STATE: California	Top Log Interval 2		
Other Services: SP-Res. Density, Neutron	Calog-Order 0.9		
	Calog-Logger		
	Bit Size 4 7/8		
	Type Fluid in Hole Bentonite		
	Dens. Min.		
	SP - Field Log		
	Source of Sample Mud-Tub		
	Run @ Min. Temp. 10-0.63		
	Run @ Min. Temp. 10-0.63		
	Run @ Min. Temp. 10-0.63		
	Source: Mud / Rate		
	Run @ BHT		
Location: Township: TIN Range: R14W	Chatterbox Stoppage 1130		
Permeability: G.L.	Logger on Screen 1200		
Log Measured From: G.L.	Min. Res. Temp.		
Drilling Measured From: G.L.	Recorded By: AANZADOL		

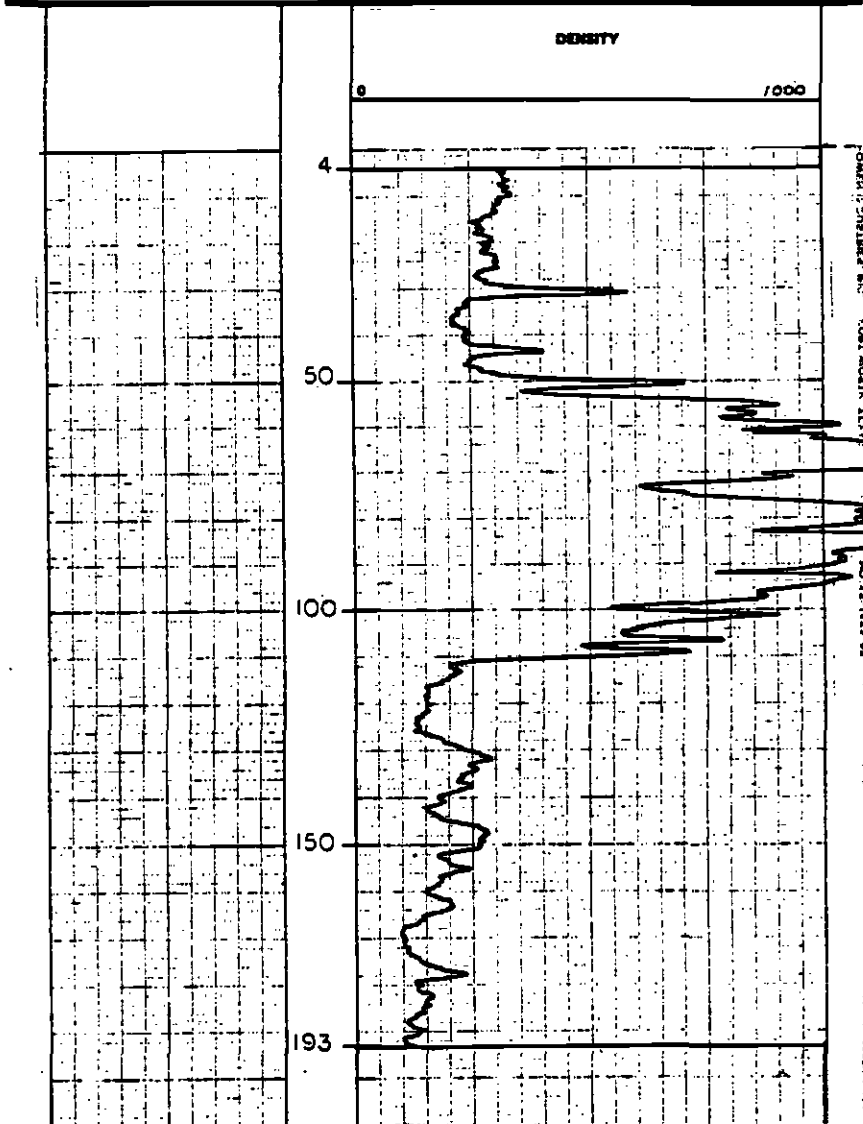
Remarks: Line Speed: 20.77/min





CLIENT: SCRTD	Date	3/15/81
PROJ. NO.: 2191-25	Run No.	Two
WELL: 36	Casing-Driller	206.7
FIELD:	Depth-Logger	194
COUNTY: LOS ANGELES	Max. Log Interval	193
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES., GAMMA, C.G.L.	Casing-Driller	2" ADS @ 230'
NEUTRON	Casing-Logger	2" ADS @ 200'
N.E. CORNER OF BROADFIELD AND WINELAND	Bit Size	4 1/2"
Location	Type Fluid in Hole	FRESH H ₂ O
Section	Dens.	Vis.
Turbidity TIN	g/l	Field Log
Road R14W	mi	mi
Portland Cement: G.L.	Reason of Sample	None
G.L. 570	Run @ Max. Temp.	
Log Measured From: G.L.	Run @ Min. Temp.	
Drilling Measured From: G.L.	Run @ Min. Temp.	
	Scanner: Rad / Rate	
	Run @ CNT	
	Completion Stripped	12/7/80
	Logger on Bottom	3/15/81
	Max. Res. Temp.	
	Recorded By	RANDY COL

Remarks: LINE SPEED 15" / MIN., HOLE GRANEL PACKED, WATER LEVEL AT 110.5 FT IN CASING



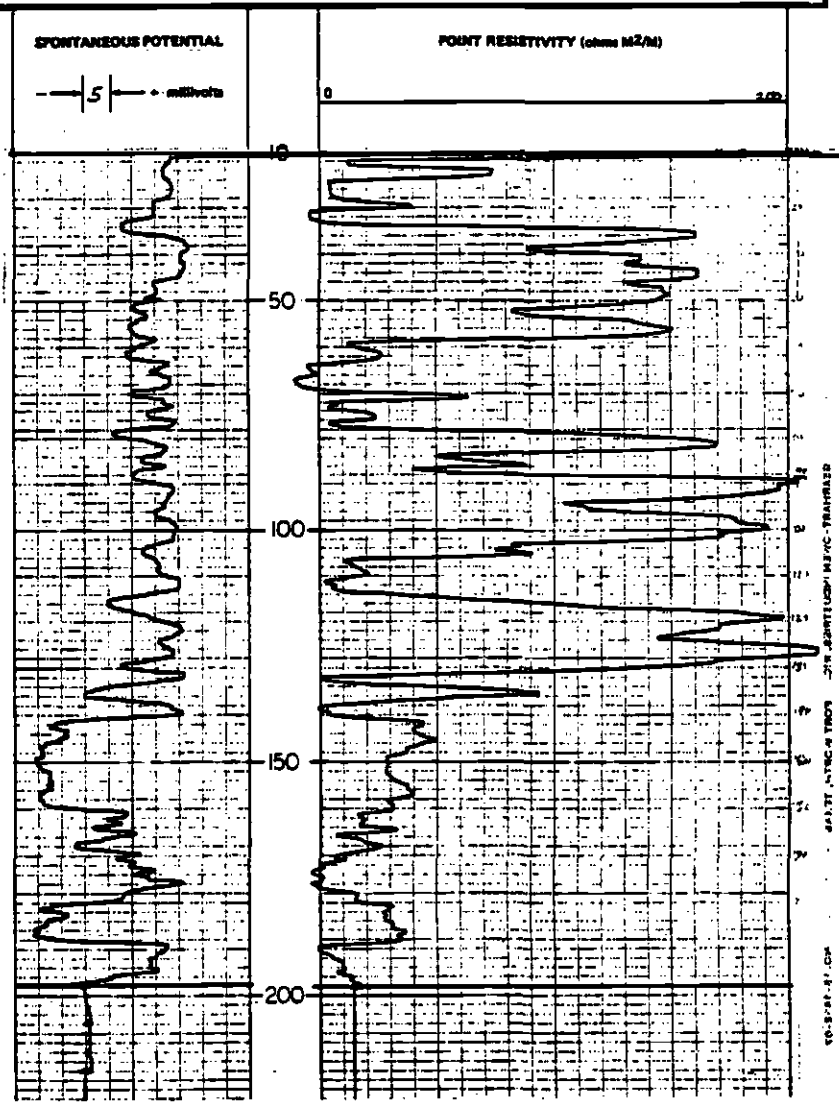


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 12/12/90			
PROJ. NO. 2191-25	Run No. 1			
WELL: 37	Depth-Offset 200			
FIELD:	Depth-Logger 199			
COUNTY: Los Angeles	Bot. Log Interval 175			
STATE: California	Top Log Interval 17			
Other Services: Michael Gamma, Caliper, Density, Neutron	Casing-Offset 5" @ 7'	0	0	
Auction St. near Lubbock	Casing-Logger 5" @ 7'			
	Bit Size 7 1/2"			
	Type Fluid in Hole Freshwater			
	Core Visc.			
	pH Field Log 9	ml	ml	ml
	Source of Sample Mud Tub			
	Run @ Min. Temp. 100 @ 64°F	0	0	0
	Run @ Min. Temp. 100 @ 64°F	0	0	0
	Run @ Min. Temp. 100 @ 64°F	0	0	0
	Section: Surf / Core			
	Run @ SURF	0	0	0
	Classification Standard / 200			
	Logger on Bottom / 1230			
	Min. Res. Temp.	0	0	0
	Recorded by: MRS. GAGLE			

Remarks: Line Speed: 30"/MIN



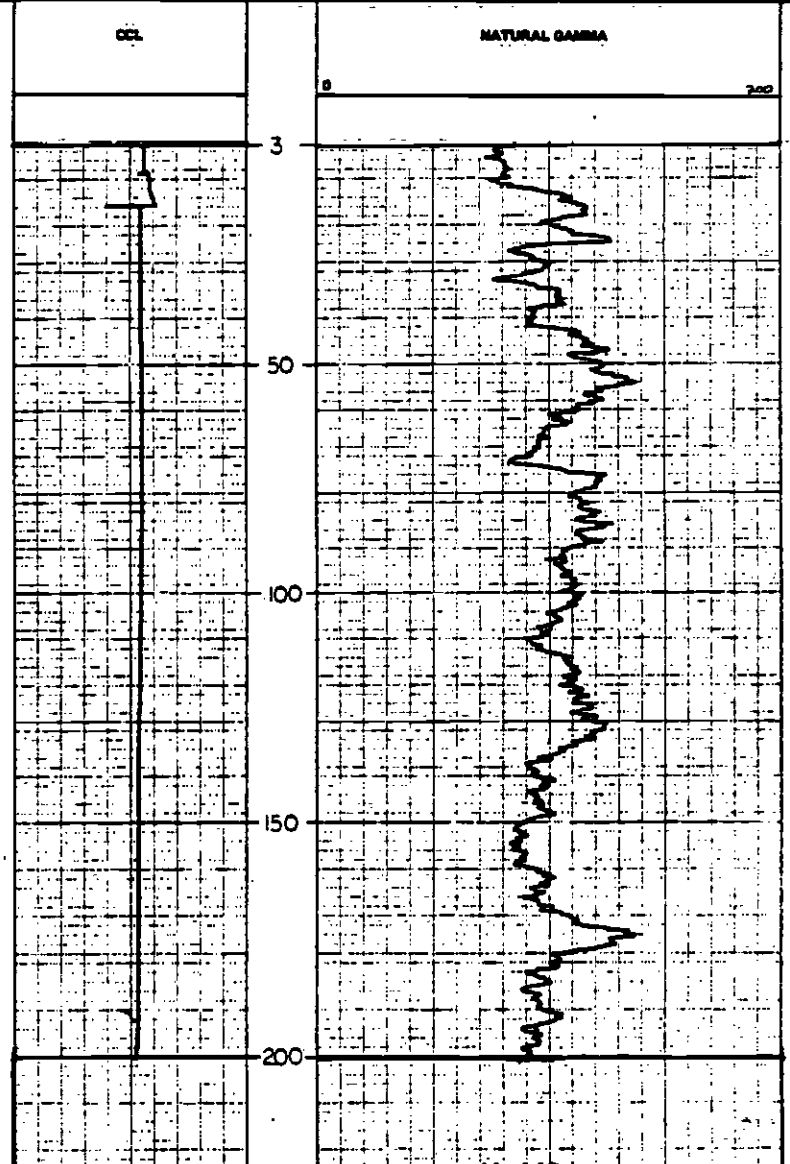


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CCL-GAMMA RAY
LOG

CLIENT: SCARD	Date: 12/10/80	Run No.:	1
PROJ. NO. 2191-25	Depth-Offset:	207	
WELL: 37	Depth-Logger:	201	
FIELD:	Base Log Interval:	200	
COUNTY: Los Angeles	Top Log Interval:	3	
STATE: California	Casing-Offset:	5'-0"	
Other Services: SP-RES, Caliper, Density, Neutron	Casing-Logger:	5'-0"	
	Bit Size:	4 7/8"	
	Type Fluid in Hole:	Brackish	
	Temp.:		
	pH:		
	Field Log:		
	Source of Sample:	Prod Tub	
	Run @ Min. Temp.:	10 - 64°	
	Start @ Min. Temp.:	70 - 64°	
	Stop @ Min. Temp.:	10 - 64°	
	Run @ BMT:		
	Circulation Stopped:	1300	
	Logger on Bottom:	1330	
	Min. Run Temp.:		
	Recorded By:	MANZAGEL	
Strat: Tertiary TIN	Range: R14W		
Porosity Offset: G.L.	CL: 604		
Log Measured From: G.L.	G.F.:		
Drilling Measured From: G.L.	K.B.:		

Remarks: Line Speed: 20 f/min



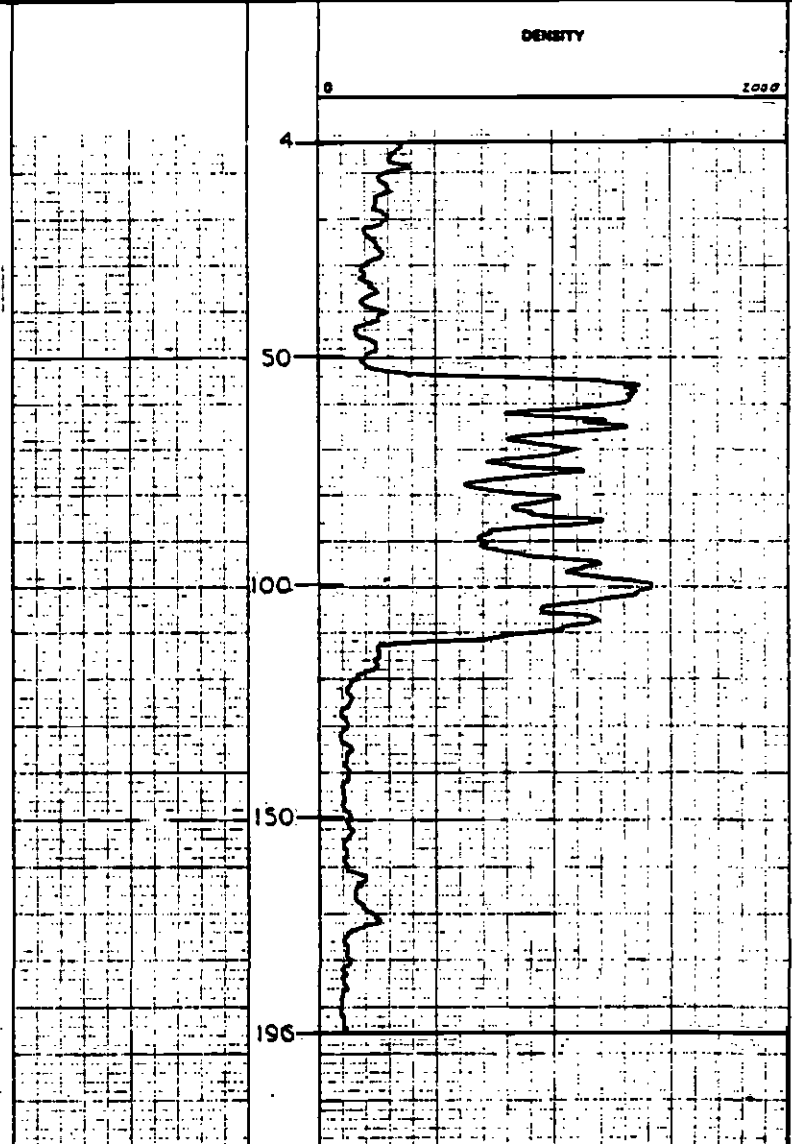


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DENSITY LOG

CLIENT: SCATD		Date	3/9/81
PROJ. NO. 2191-25		Run No.	TWO
WELL: 37		Depth-Offset	202
FIELD:		Depth-Logger	197
COUNTY: LOS ANGELES		Min. Log Interval	136
STATE: CALIFORNIA		Top Log Interval	4
Other Services: SP, RES, NATURAL GAMMA, CCL, CALIPER, NEUTRON		Casing-Offset	2" ABS @ 200'
MUSTON ST. NEAR LANKERSHIM		Casing-Logger	2" ABS @ 200'
Borehole		Bit Size	4 7/8"
Township T1N Range R14W		Type Fluid in Hole	FRESH WATER
Permeant Details: G.L.		Down	Vis.
Log Observed From: G.L.		off	Field Log
Drilling Observed From: G.L.		Source of Sample	NONE
		Run @ Min. Temp.	• • • • •
		Card @ Min. Temp.	• • • • •
		Ring @ Min. Temp.	• • • • •
		Spacer, Rod, Pipe	• • • • •
		Run @ BWT	• • • • •
		Correlation Observed	12/10/80
		Logger on Bottom	3/9/81
		Max. Run Temp.	• • • • •
		Recorded By	MANZAGOL

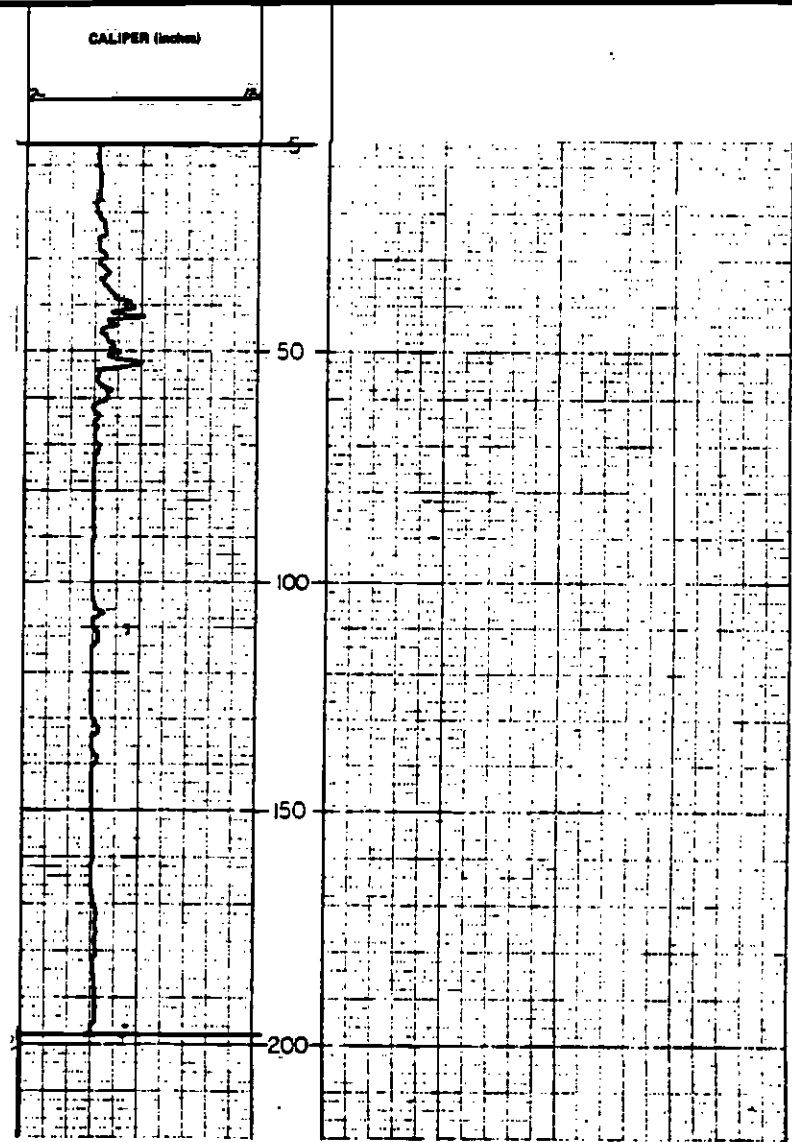
Remarks: LINE SPEED: 15 FT./MIN. WATER LEVEL IN CASING AT 121.5 FT.





CLIENT: SCRTD	Date: 12/16/80			
PROJ. NO. 2191-25	Rin. Dia. 1			
WELL: 37	Depth-Offset 202			
FIELD:	Depth-Logger 200			
COUNTY: Los Angeles	Bot. Log Interval 190			
STATE: California	Top Log Interval 4			
Other Services: SP-AES, Natural Gamma	Caliper-Offset 5' @ 7'	•	•	
Density, Newton	Caliper-Logger 5' @ 7'			
LOCATION: Huston St near Lankershim	Bot. Dia. 4.78"			
Section	Type Field in Hole	Benfonte		
Township TIN	Dist. Visc.			
Range R14W	pH Fluid Loss	9 ml	ml	ml
Permanent Offset G.L.	Source of Sample	Hand Tub		
Log Measured From G.L.	Rin @ Max. Temp.	10 @ 68°F	•	•
Drilling Observed From G.L.	Rin @ Min. Temp.	10 @ 68°F	•	•
	Rin @ Max. Temp.	10 @ 68°F	•	•
	Source Prod Rin		•	•
	Rin @ BWT		•	•
	Caliper Observed	1200		
	Logger on Bottom	1230		
	Max. Rin. Temp.		•	•
	Recorded By	MANZAGOL		

Remarks: Line Speed: 20 FT/min



10-5881-01-C-8 EAST-HYDRO-TAC - 0MP-201282111-010-10-19-80

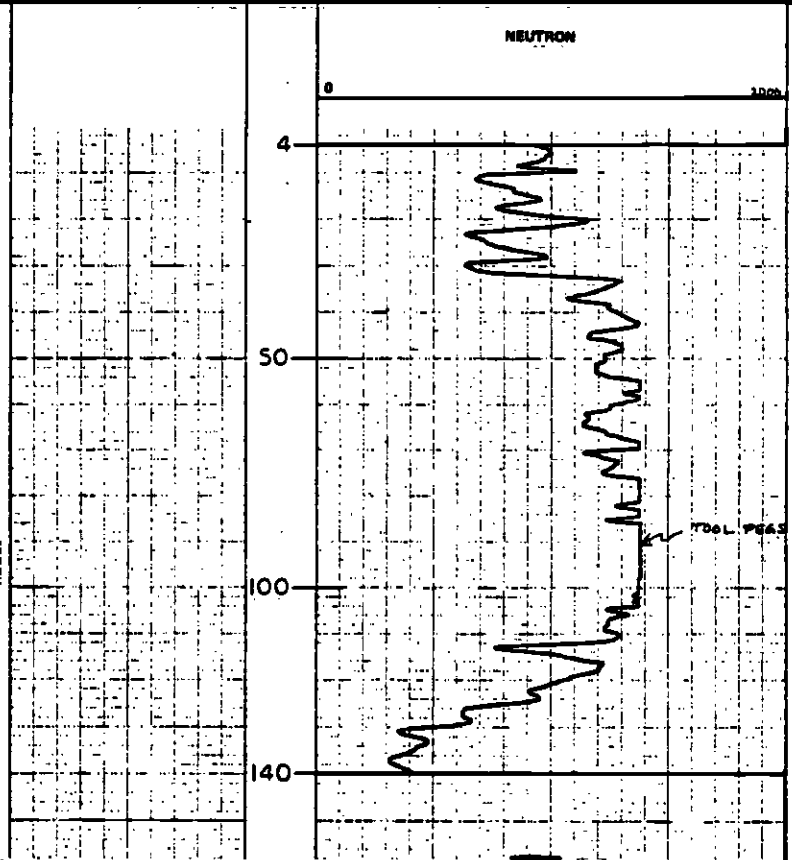


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NEUTRON LOG

CLIENT: SCATD	Date	3/9/91
PROJ. NO. 2191-25	Run No.	TWO
WELL: 97	Depth-Offset	202
FIELD:	Depth-Logger	141
COUNTY: LOS ANGELES	Bot. Log Interval	140
STATE: CALIFORNIA	Top Log Interval	4
Other Services: S.P., RES., NATURAL GAMMA, CCL, CALIPER, DENSITY	Casing-Driller	2" ABS @ 200'
LOCATION: HUSTON NEAR LANKERSHIM	Casing-Logger	2" ABS @ 200'
	Bit Size	4 7/8"
	Type Fluid in Hole	FRESH WATER
	Conn. Visc.	
	gill Fluid Loss	ml ml ml
	Spacers of Sample	NONE
	Run @ Min. Temp.	• • • • •
	Run @ Max. Temp.	• • • • •
	Run @ Min. Temp.	• • • • •
	Run @ Max. Temp.	• • • • •
Section	Turntable TIN	Range R.14W
Permeant Datum	G.L.	GL 604
Log Measured From	G.L.	D.F.
Drilling Measured From	G.L.	K.B.
	Chronometer Stopped	12:10 PM
	Logger on Bottom	3/9/91
	Min. Rod Temp.	• • • • •
	Recorded By	MANZAGOL

Remarks LINE SPEED: 15 FT/MIN, WATER LEVEL IN CASING AT 121.5 FT,
HOLE OBSTRUCTED AT 141 FT.



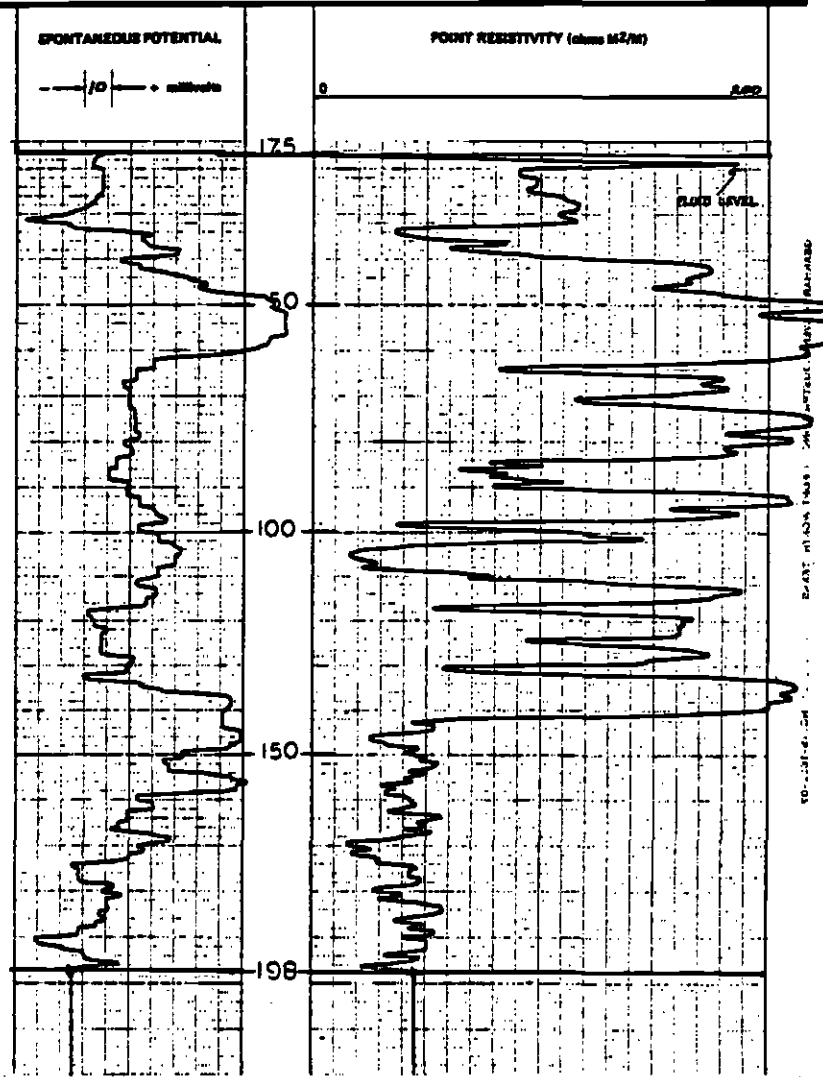


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SP-RESISTIVITY LOG

CLIENT: SCRTD	Date: 12/17/90			
PROJ. NO. 2191-25	Run No. 1			
WELL: 38	Depth-Offset 20'			
FIELD:	Depth-Logger 199			
COUNTY: Los Angeles	Stem Log Interval 17.5			
STATE: California	Top Log Interval 17.5			
Other Services: Alfred Geomex, Califex, Density Neutron	Casing-Offset 0.0			
Fair Ave. off Chandler Blvd. between railroad tracks and alley	Casing-Logger 0.0			
	Stk Elev 9 7/8"			
	Type Fluid in Hole Isoparatic			
	Down. Val.			
	PH Fluid Loss 9	ml	ml	ml
	Series of Sample 7 Mud Tub			
	Run @ Min. Temp. 10 @ 74 °F			
	Run @ Min. Temp. 10 @ 74 °F			
	Run @ Min. Temp. 9.7 @ 74 °F			
	Recorder Read / Rate			
	Run @ 5MT			
	Chronometer Stoppage 1130			
	Logger on Bottom 1400			
	Max. Res. Temp.			
	Recorded By GALLAGHER			
Section	Yards TN1	Range RMW		
Permanent Datum G.L.	AL 630			
Log Measured From G.L.	O.P.			
Casing Measured From G.L.	S.L.			

Remarks: **Line Speed = 30 feet/min**





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CALIPER LOG

CLIENT: SCRTD	Date: 12/17/90			
PROJ. NO.: 2191 - 25	Run No.: 1			
WELL: 38	Depth-Driller: 201			
FIELD:	Depth-Logger: 198			
COUNTY: Los Angeles	Max. Log Interval: 176			
STATE: California	Top Log Interval: 5			
Other Services: Artificial Gas, SP-Res	Calip-Driller: 0.0			
	Calip-Logger: 0.0			
	Bit Size: 4 1/2"			
	Type Field to Hole: Direct Run			
	Dist. Vis.			
	psi Field Log			
	Source of Sample: Mud Tub			
	Run @ Min. Temp. 100 @ 74 °F			
	Run @ Max. Temp. 10 @ 74 °F			
	Run @ Min. Temp. 9.7 @ 74 °F			
	Source: Run / Run			
	Run @ BHT			
Section: Towable TN1 Run R14W	Condition Stopped: 1130			
Permanent Datum: G.L.	Logger on Bottom: 1430			
Log Measured From: G.L.	Max. Res. Temp. °F			
Drilling Measured From: G.L.	Recorded By: GALLINATI			

Remarks: **Line Speed = 20 feet/min.**

