



CORE LABORATORIES

April 18, 1991

GREENHILL PETROLEUM
12777 Jones Road
Suite 375
Houston, Texas 77070

File No.: 57181-16336
Subject: Core Analysis
Lovington Paddock No. 100
Lovington Paddock Field
Lea County, New Mexico

Gentlemen:

The subject well was cored using diamond coring equipment and brine to obtain 4 inch diameter cores from 6158 to 6338 feet from the Paddock formation.

Core analysis data is presented in tabular and graphical form for your convenience. A porosity vs. permeability plot and porosity and permeability histograms were prepared for statistical evaluation.

We trust these data will be useful in the evaluation of your property and thank you for the opportunity of serving you.

Very truly yours,

CORE LABORATORIES, a division of
WESTERN ATLAS INTERNATIONAL, INC.

Dean Olson
Laboratory Supervisor

DO/yn

GREENHILL PETROLEUM
Lovington Paddock No. 100
File No. 57181-16336
Procedural Page

The cores were preserved at the wellsite in CO₂ atmosphere and transported to Midland by Core Laboratories personnel.

Core analysis was made from selected intervals requested on one inch plug samples.

Fluid removal and saturations were determined using a Dean Stark/gas solvent extraction method.

Direct grain volume measurement was made using Boyle's law helium expansion. Bulk volume was measured by Archimedes Principle on samples after cleaning. Porosity was calculated using bulk volume and grain volume measurements.

$$\text{Porosity} = \frac{\text{Bulk Vol.} - \text{Grain Vol.}}{\text{Bulk Vol.}} \times 100$$

Steady State Air Permeability was measured in a horizontal direction while the core was confined in a Hassler rubber sleeve.

The core was slabbed and boxed after analysis.

The slabs were photographed under natural light.

The core was shipped via Merchants Motor Freight to Core Lab in Houston, Texas.

CORE ANALYSIS REPORT
FOR
GREENHILL PETROLEUM
LOVINGTON PADDOCK NO. 100
LOVINGTON PADDOCK FIELD
LEA COUNTY, NEW MEXICO

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom; and for whose exclusive and confidential use; this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories (all errors and omissions excepted); but Core Laboratories and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or formation in connection with which such report is used or relied upon.

CORE LABORATORIES

GREENHILL PETROLEUM
 LOVINGTON PADDOCK NO. 100
 165' FNL & 113' FEL, SEC. 12, T-17-S, R-36-E
 LEA COUNTY, NEW MEXICO

Field : LOVINGTON PADDOCK FIELD
 Formation : PADDOCK
 Coring Fluid : BRINE
 Elevation : 3823.5' KB
 File No.: 57181-16336
 Date : 4-4-91
 API No. : 30-025-31087
 Analysts: OLSON

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	PERMEABILITY (HORIZONTAL) Kair md	POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
				(PORE OIL %)	VOLUME WATER %		
CORE NO. 1 6158-6248 CUT 90' REC 90'							
1	6158.0- 88.0	0.04	7.8	14.6	22.2	2.88	NA Dol anhy
	6188.0- 89.0						Dol anhy sli/vug
	6189.0- 90.0						NA Dol vf
2	6190.0- 91.0	0.04	5.6	15.8	22.9	2.87	Dol sli/anhy p.p.
3	6191.0- 92.0	0.02	6.8	19.4	13.2	2.88	Dol anhy sli/vug
4	6192.0- 93.0	1.90	8.2	16.5	21.6	2.88	Dol anhy p.p.
5	6193.0- 94.0	3.80	10.3	18.5	15.0	2.88	Dol anhy f p.p.
6	6194.0- 95.0	0.53	8.1	16.7	19.9	2.88	Dol anhy sli/vug
7	6195.0- 96.0	0.09	7.6	19.7	21.1	2.87	Dol sli/anhy p.p.
8	6196.0- 97.0	0.01	3.7	11.2	35.1	2.87	Dol sli/anhy p.p.
9	6197.0- 98.0	0.04	6.5	16.8	14.5	2.88	Dol anhy p.p.
10	6198.0- 99.0	0.02	6.3	17.8	20.3	2.87	Dol sli/anhy vug
11	6199.0- 00.0	0.67	7.2	18.2	15.4	2.88	Dol anhy p.p.
	6200.0- 01.0						NA Dol anhy
12	6201.0- 02.0	0.15	5.0	18.4	20.1	2.87	Dol sli/anhy p.p. styl
13	6202.0- 03.0	0.20	7.9	24.4	18.8	2.85	Dol p.p.
	6203.0- 10.0						NA Dol anhy
14	6210.0- 11.0	0.03	7.8	20.7	17.4	2.87	Dol sli/anhy p.p.
15	6211.0- 12.0	0.03	6.3	10.9	26.4	2.88	Dol sli/anhy p.p.
	6212.0- 39.0						NA Dol anhy
16	6230.0- 40.0	0.07	9.5	15.3	34.1	2.78	Dol sdy sli/anhy f p.p.
17	6240.0- 41.0	0.04	8.7	19.2	31.5	2.82	Dol sli/sdy sli/anhy
	6241.0- 46.0						NA Dol anhy F
18	6246.0- 47.0	0.03	6.5	17.5	22.0	2.87	Dol sli/anhy p.p.
	6247.0- 48.0						NA Dol anhy

CORE LABORATORIES

GREENHILL PETROLEUM Field : LOVINGTON PADDOCK FIELD File No.: 57181-16336
 LOVINGTON PADDOCK NO. 100 Formation : PADDOCK Date : 4-4-91

C O R E A N A L Y S I S R E S U L T S

SAMPLE NUMBER	DEPTH ft	PERMEABILITY (HORIZONTAL) K _{air} md	POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
				(PORE OIL %)	(VOLUME WATER %)		
CORE NO. 2 6248-6338 CUT 90' REC 90'							
19	6248.0- 49.0	0.05	6.4	24.1	31.5	2.87	Dol sli/anhy sli/vug
20	6249.0- 50.0	1.00	7.8	18.7	18.6	2.86	Dol sli/anhy f vf p.p.
21	6250.0- 51.0	0.03	4.8	10.6	26.8	2.87	Dol sli/anhy p.p.
22	6251.0- 52.0	0.04	5.5	11.9	19.6	2.87	Dol sli/anhy p.p.
	6252.0- 54.0						NA Dol
23	6254.0- 55.0	0.02	5.7	12.4	26.2	2.87	Dol sli/anhy p.p.
24	6255.0- 56.0	0.76	8.3	18.6	20.4	2.86	Dol sli/anhy p.p.
25	6256.0- 57.0	0.81	8.7	15.4	25.5	2.86	Dol p.p.
26	6257.0- 58.0	0.02	4.7	22.4	21.6	2.87	Dol sli/anhy p.p.
27	6258.0- 59.0	0.68	7.4	17.4	15.8	2.89	Dol anhy p.p.
28	6259.0- 60.0	0.08	7.1	10.1	24.9	2.88	Dol anhy f p.p.
29	6260.0- 61.0	0.04	6.3	17.6	22.4	2.86	Dol sli/anhy p.p.
	6261.0- 67.0						NA Dol anhy
30	6267.0- 68.0	0.01	9.4	20.0	17.9	2.89	Dol anhy sli/vug foss
31	6268.0- 69.0	0.25	6.6	18.9	20.5	2.91	Dol v/anhy p.p. styl
32	6269.0- 70.0	0.09	6.5	17.4	10.1	2.88	Dol anhy p.p.
	6270.0- 82.0						NA Dol anhy
33	6282.0- 83.0	0.03	6.0	11.0	27.1	2.88	Dol sli/anhy p.p.
34	6283.0- 84.0	1.10	9.6	10.3	20.2	2.87	Dol sli/anhy p.p.
35	6284.0- 85.0	0.02	7.1	13.7	25.2	2.88	Dol anhy p.p.
	6285.0- 88.0						NA Dol anhy
36	6288.0- 89.0	1.70	6.9	13.5	27.0	2.88	Dol anhy p.p. styl
	6289.0- 90.0						NA Dol
37	6290.0- 91.0	0.50	9.6	11.5	40.4	2.87	Dol sli/anhy p.p.
	6291.0- 15.0						NA Dol anhy
38	6315.0- 16.0	1.70	7.3	15.9	29.6	2.88	Dol anhy p.p.
39	6316.0- 17.0	6.50	7.9	13.6	29.1	2.86	Dol p.p.

CORE LABORATORIES

GREENHILL PETROLEUM
 LOVINGTON PADDOCK NO. 100
 Field : LOVINGTON PADDOCK FIELD
 Formation : PADDOCK
 File No.: 57181-16336
 Date : 4-4-91

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	PERMEABILITY (HORIZONTAL) K _{air} md	POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
				(PORE OIL %)	VOLUME WATER %		
40	6317.0- 18.0	0.17	9.8	13.2	48.2	2.86	DoI p.p.
41	6318.0- 19.0	0.07	6.4	9.5	26.5	2.86	DoI p.p.
42	6319.0- 20.0	0.13	9.0	8.7	55.3	2.86	DoI sli/any p.p.
43	6320.0- 21.0	0.17	10.6	16.0	51.3	2.86	DoI p.p.
44	6321.0- 22.0	1.10	10.1	9.0	42.8	2.87	DoI sli/any p.p.
45	6322.0- 23.0	0.02	9.1	11.3	52.7	2.85	DoI p.p.
46	6323.0- 24.0	8.70	13.1	18.1	41.8	2.86	DoI sli/any p.p.
47	6324.0- 25.0	1.70	9.8	7.0	46.0	2.87	DoI sli/any p.p.
48	6325.0- 26.0	2.20	9.0	18.7	31.0	2.87	DoI sli/any p.p.
49	6326.0- 27.0	0.01	6.3	7.6	46.4	2.84	DoI p.p.
50	6327.0- 28.0	0.04	5.6	11.2	37.1	2.88	DoI sli/any p.p.
51	6328.0- 29.0	0.20	6.8	8.5	41.8	2.87	DoI sli/any p.p.
52	6329.0- 30.0	0.01	6.2	17.8	35.2	2.87	DoI p.p.
	6330.0- 38.0						NA DoI any

LITHOLOGICAL ABBREVIATIONS

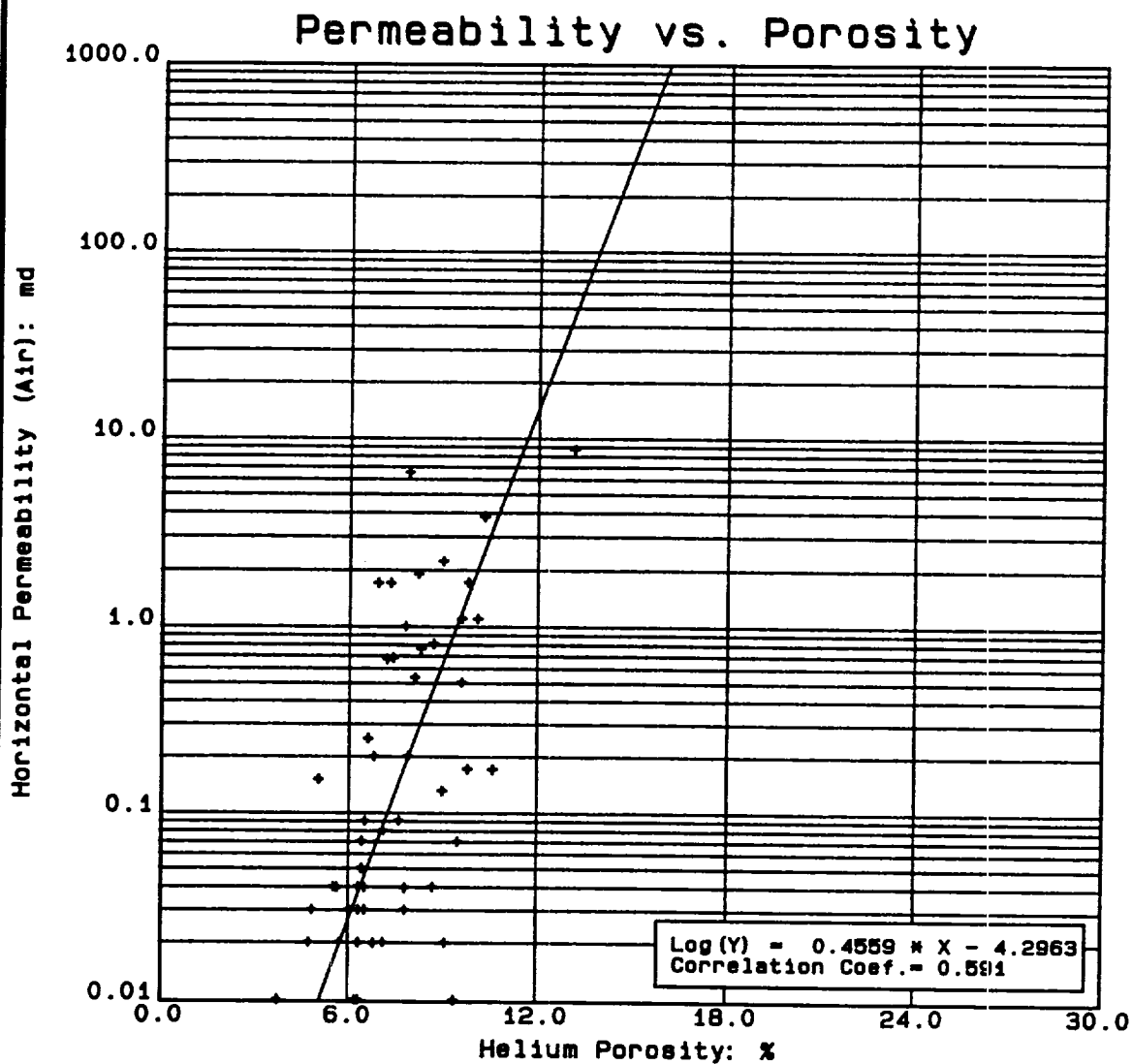
Anhy, anhy	anhydrite (-ic)	Lim, lim	limestone
Ark, ark	arkose (-ic)	med gr	medium grain
bnd	band (-ed)	Mtrx	matrix
Brec, brec	breccia	NA	interval not analyzed
Calc, calcic	calcite (-ic)	Nod, nod	nodules (-ar)
carb	carbonaceous	Ool, ool	oolite (-itic)
crs gr	course grained	Pisol, pisol	pisolite, pisolitic
Chk, chky	chalk (-y)	p.p.	pin-point (porosity)
cht, cht	chert (-y)	Ptg	parting
Ogl, ogl	conglomerate (-ic)	Pyr, pyr	pyrite (-itized, -itic)
crs xln	coarsely crystalline	Sd, sd	sand (-y)
dns	dense	Sh, shy	shale (-ly)
Dol, dol	dolomite (-ic)	SHR	solid hydrocarbon residue
F	randomly oriented fractures	sli	slightly
f	slightly fractured	Slt, slty	silt (-y)
f gr	fine grained	styl	stylolite (-itic)
foss	fossil (-iferous)	suc	sucrosic
f xln	finely crystalline	Su, su	sulphur, sulphurous
Gil	gilsonite	TEFA	TOO BROKEN FOR ANALYSIS
Glauc, glauc	glauconite (-itic)	Trip, trip	tripoli (-itic)
Grt	granite	v	very
Gyp, gyp	gypsum (-iferous)	vf	predominantly vertically fractured
hor frac	perdominantly horizontally fractured	vug (-gy)	vug (-gy)
incl	inclusion (-ded)	xbd	crossbedded
intbd	interbedded	xln	medium crystalline
lam	lamina (-tions, -ated)	xtl	crystal

THE FIRST WORD IN THE DESCRIPTION COLUMN OF THE CORE ANALYSIS REPORT DESCRIBES THE ROCK TYPE. FOLLOWING ARE ROCK MODIFIERS IN DECREASING ABUNDANCE AND MISCELLANEOUS DESCRIPTIVE TERMS.

DISTRIBUTION OF FINAL REPORTS

10cc

GREENHILL PETROLEUM
ATTN: KEN PFAU
12777 JONES ROAD
SUITE 375
HOUSTON, TX 77070



GREENHILL PETROLEUM
LOVINGTON PADDOCK NO. 100
LOVINGTON PADDOCK FIELD

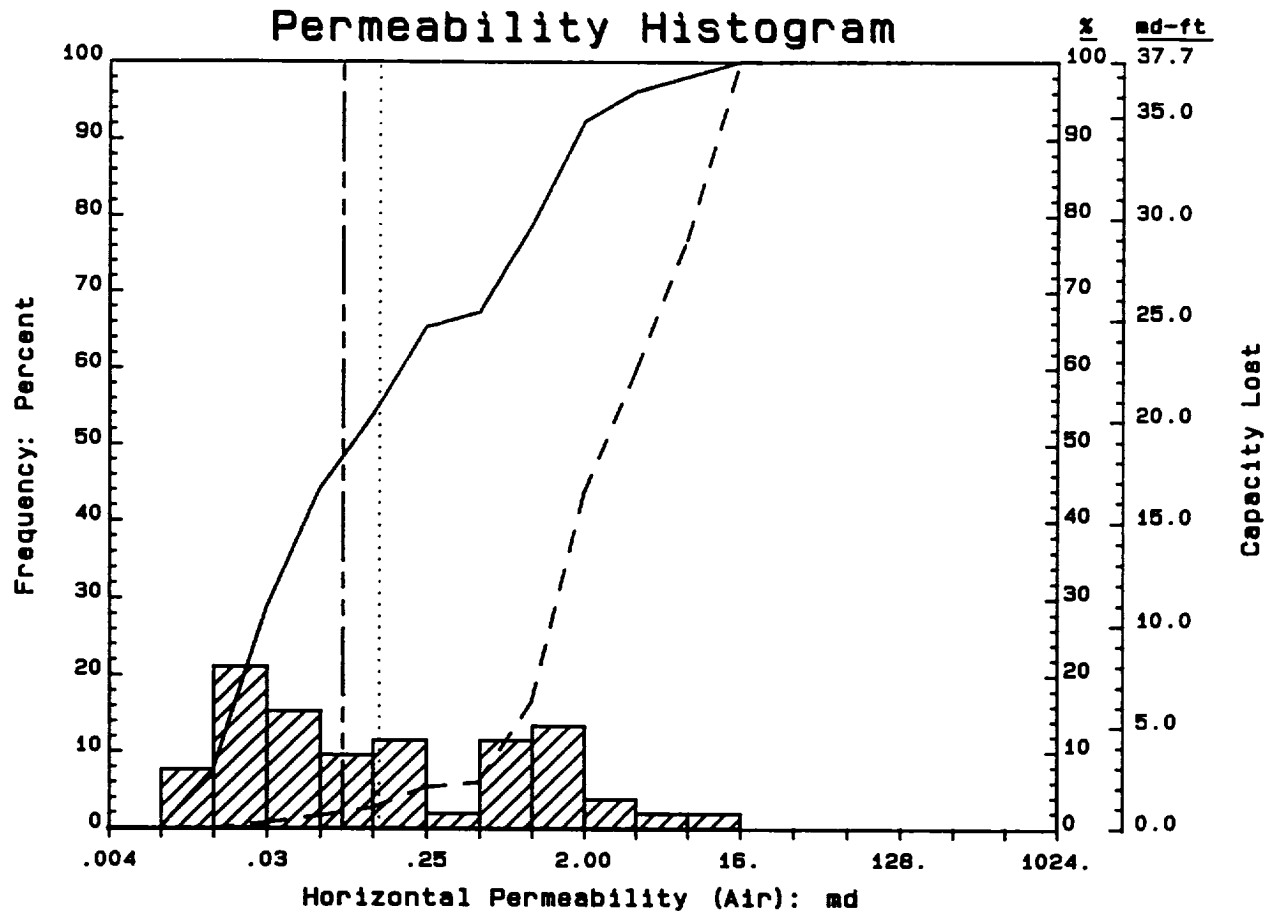
PADDOCK (6158-6338 feet)

Core Laboratories

4-4-91

- LEGEND -
PADDOCK

Permeability Histogram



GREENHILL PETROLEUM
LOVINGTON PADDOCK NO. 100
LOVINGTON PADDOCK FIELD

PADDOCK (6158-6338 feet)

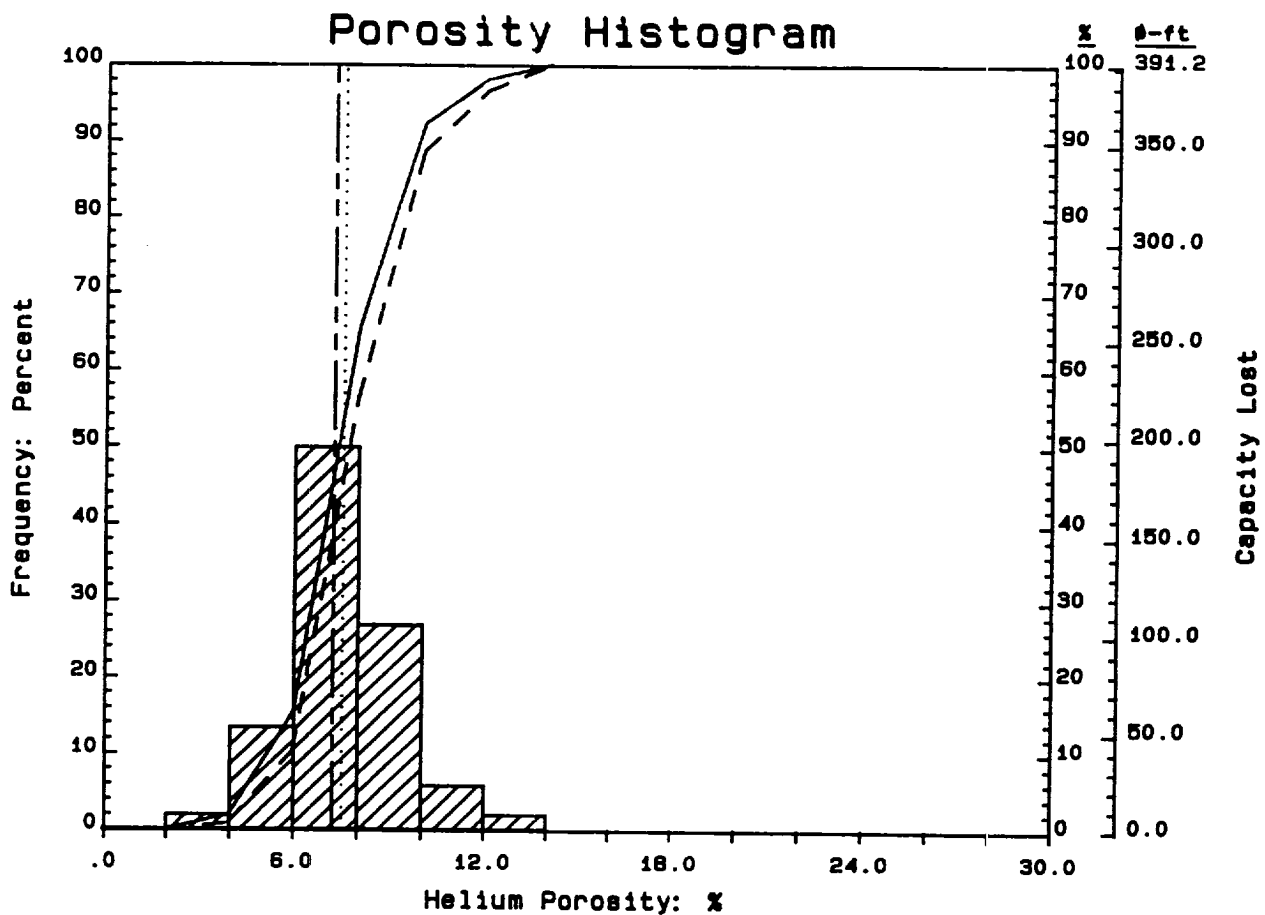
Core Laboratories

4-4-91

- LEGEND -

- - Median Value (0.085)
- Geom. Average (0.136)
- Cumulative Frequency
- - - Cumulative Capacity Lost

52 Samples



GREENHILL PETROLEUM
 LOVINGTON PADDOCK NO. 100
 LOVINGTON PADDOCK FIELD

PADDOCK (6158-6338 feet)

Core Laboratories

4-4-91

- LEGEND -

- Median Value (7.2)
- Arith. Average (7.5)
- Cumulative Frequency
- - - Cumulative Capacity Lost

52 Samples

CORE LABORATORIES

GREENHILL PETROLEUM
LOVINGTON PADDOCK NO. 100

Field : LOVINGTON PADDOCK FIELD
Formation : PADDOCK

File No.: 57181-16336
Date : 4-4-91

TABLE I
SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA		CHARACTERISTICS REMAINING AFTER CUTOFFS	
ZONE:		ZONE:	
Identification -----	PADDOCK	Number of Samples -----	52
Top Depth -----	6158.0 ft	Thickness Represented -	52.0 ft
Bottom Depth -----	6338.0 ft		
Number of Samples -----	66	POROSITY:	
DATA TYPE:		Storage Capacity -----	391.2 ϕ -ft
Porosity -----	(HELIUM)	Arithmetic Average -----	7.5 %
Permeability -----	(HORIZONTAL) Kair	Minimum -----	3.7 %
		Maximum -----	13.1 %
		Median -----	7.2 %
CUTOFFS:		Standard Deviation -----	± 1.8 %
Porosity (Minimum) -----	0.0 %		
Porosity (Maximum) -----	100.0 %	GRAIN DENSITY:	
Permeability (Minimum) ---	0.0100 md	Arithmetic Average -----	2.87 gm/cc
Permeability (Maximum) ---	1000. md	Minimum -----	2.78 gm/cc
Water Saturation (Maximum)	100.0 %	Maximum -----	2.91 gm/cc
Oil Saturation (Minimum) -	0.0 %	Median -----	2.87 gm/cc
Grain Density (Minimum) --	2.00 gm/cc	Standard Deviation -----	± 0.02 gm/cc
Grain Density (Maximum) --	3.00 gm/cc		
Lithology Excluded -----	NONE		
		PERMEABILITY:	
		Flow Capacity -----	37.7 md-ft
		Arithmetic Average -----	0.72 md
		Geometric Average -----	0.14 md
		Harmonic Average -----	0.04 md
		Minimum -----	0.01 md
		Maximum -----	8.70 md
		Median -----	0.09 md
		Standard Dev. (Geom) --	$K \cdot 10^{\pm 0.814}$ md
		HETEROGENEITY (Permeability):	
		Dykstra-Parsons Var. --	0.817
		Lorenz Coefficient -----	0.733
		AVERAGE SATURATIONS (Pore Volume):	
		Oil -----	15.3 %
		Water -----	28.8 %