

W. G. 1228002,
NCH
VP  Reprote

COPESERPET S.A.

Compañía Peruana de Servicios Petroleros

24 hr. Pressure Build-up & Static Gradient Tests

Well LO6 - 22R Lobitos Offshore

May, 7th-8th 1997

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CPSP 071-97

Talara, May the 10th, 1997.

ENG° JOHN MEYERS
Production Engineering Chief
PETRO-TECH PERUANA S.A.

Dear Sr.

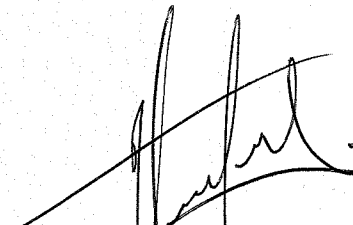
Attached you will find the report of the BUILD UP RECORD x 24 hr. and STATIC GRADIENT tests carried out in the well LO6 - 22R (Basal Salina sand) Lobitos Offshore.

Data used in this report was obtained using our Memory Gauge model EMS-700 EE PROM serie number 87166 with range of 5000 psi and 350 ° F, wich is aviable for you to have a good service.

If you have any question please contact us.

Thanks for your kind attention,

Yours sincerely,



José Manuel Castro Solórzano
COPESERPET S.A.

w.c.
Eng° Alberto Agurto
Eng° Ricardo Corman
File

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TEST: 24 hr. PRESSURE BUILD-UP & STATIC GRADIENT
WELL LO6 - 22R

FIELD: LOBITOS OFFSHORE
SAND: BASAL SALINA (9288' - 9273')
UPPER BASAL SALINA (8426' - 8145')

DAILY REPORT

MAY, 7th 1997

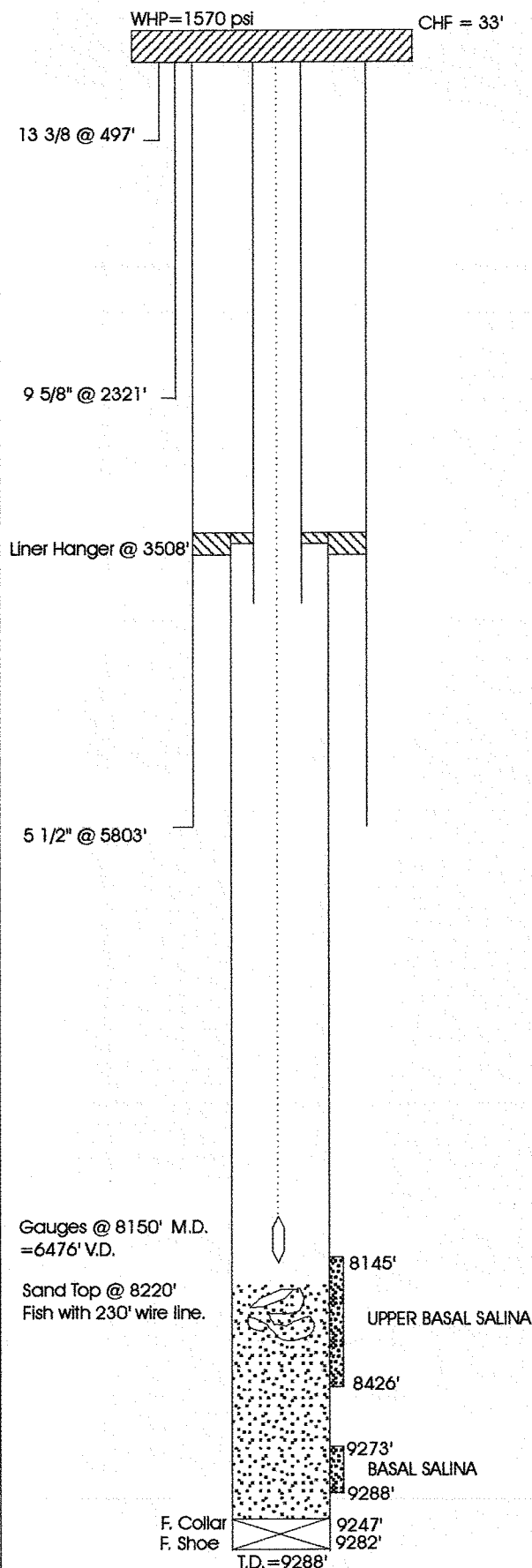
INITIAL CONDITIONS

Current Installation: None
Well Status: Flowing
BOP installed: yes
Sand top checked @ 8220'. = 9, 9/2
Production time: 413 days.
Cumulative production: 114533 STB.
Production rate: 197 STB/day.
Choke: 32/64.
9:40 Paraffin cutting. Free down to 3000'. Regular paraffin.
11:32 RIH dead weight down to 8150'.
12:07 Activate Memory gauge.
12:10 Activate 3118 psi. Amerada's 48 hr. clock.
12:24 Gauges into the lubricator.
12:25 RIH gauges.
12:40 Gauges at 8150'. Record 2 hr. flowing pressure.
WHP = 120 psi (manometer).
14:40 Close the well.
WHP = 120 psi (manometer).
18:00 WHP = 900 psi (manometer).

MAY, 8th 1997

8:00 WHP = 1500 psi (manometer).
11:30 WHP = 1600 psi (manometer).
14:40 WHP = 1600 psi (manometer).
15:16 POOH gauges with 3 min. stations as follows:
8150' 7500' 6750' 5500' 3000'
8000' 7250' 6500' 5000' 2000'
7750' 7000' 6000' 4000' 0'
16:20 Gauges at surface.
16:48 Deactivate memory gauge.
WHP = 1600 psi (manometer).

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Field Operator: Adán Quiroga

Results of the Pressure Build-up x 24 hr Test on well LO6 - 22R

Date of the test	May 7th to May 8th 1997
Formations	Basal Salina(9288'-9273') Upper Basal Salina(8426'-8145')
Depth of gauges	8150 ft. M.D. = 6476 ft. V.D.
Well head pressure	1600 psi (manometer)
Bottom hole static pressure	1892.81 psi
Bottom hole Temperature	117.00 F
Gas gradient	0.0498 psi/ft
Pressure at depth of gauges	1892.81 psi
Static Gradient at depth of gauges	1892.81 psi / 6476 ft = 0.2923 psi/ft
M.M.P.	8717 ft. M.D. = 6746 ft. V.D.
Pressure at M.M.P.	1902.24 psi (extrapolated)
Static gradient at M.M.P.	1902.24 psi / 6746 ft = 0.2820 psi/ft
Oiltramp	Water & Sand .

Build-up Data & Results

Oil viscosity	0.9 cp
Total compresibility	$8 \times 10^{-6} \text{ psi}^{-1}$
Porosity	9 %
Pay Zone	55 ft
Oil FVF	1.3 bbl/STB
Oil Production rate	197 STB/day (April 1997).
GOR	888 SCF/STB
Production time	413 days = 9912 hr.
Cummulative production	114533 STB (April 1997).

$$(P_D/\Delta P)_{MP} = 0.16/20$$

$$(t_D/\Delta t)_{MP} = 30/143$$

$$C_{De}^{2s} = 10^3$$

$$k = 4.7 \text{ md}$$

$$s = -3.4$$

$$Cs = 1.6 \text{ (using the 1 slope straight line)}$$

$$P^* = 2120 \text{ psia}$$

$$p_{wg} = 738 \text{ psig}$$

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2 hr. Flowing Pressure Record at 8150 ft. M.D.

Elapsed time (hr)	Pressure (psia)	Temperature (F)
0.0000	756.02	114.29
0.0194	752.78	115.11
0.0417	748.13	115.62
0.0611	745.21	115.87
0.0806	742.54	116.01
0.1000	740.44	116.11
0.1194	740.77	116.17
0.1417	745.74	116.22
0.1611	748.76	116.26
0.1806	751.50	116.29
0.2000	754.58	116.32
0.2194	755.20	116.34
0.2417	756.64	116.35
0.2611	758.81	116.36
0.2806	761.50	116.37
0.3000	764.42	116.38
0.3194	761.23	116.38
0.3417	753.11	116.37
0.3611	746.07	116.35
0.3806	741.13	116.33
0.4000	738.13	116.32
0.4194	736.07	116.31
0.4417	737.09	116.31
0.4611	741.59	116.31
0.4806	744.73	116.32
0.4972	746.25	116.34
0.5167	747.71	116.35
0.5361	747.36	116.36
0.5583	748.11	116.36
0.5778	750.32	116.37
0.5972	753.50	116.38
0.6167	755.27	116.38
0.6361	750.71	116.38
0.6583	742.53	116.37
0.6778	736.20	116.35
0.6972	732.01	116.33
0.7167	727.69	116.32
0.7361	726.60	116.30
0.7583	725.99	116.30
0.7778	727.30	116.31
0.7972	729.22	116.31
0.8167	735.36	116.33
0.8361	738.62	116.35
0.8583	740.59	116.37
0.8778	740.10	116.38
0.8972	738.96	116.38
0.9167	738.39	116.38

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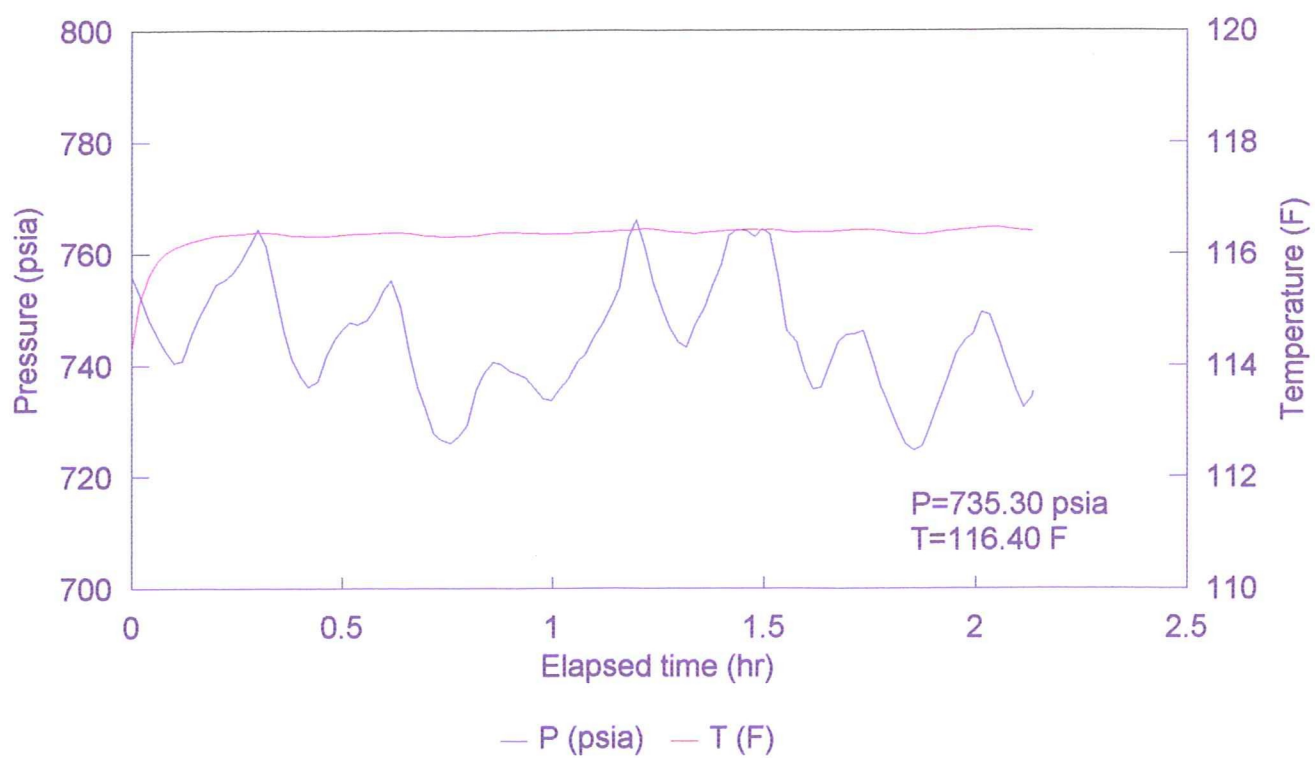
0.9361	737.74	116.37
0.9583	735.87	116.37
0.9778	734.00	116.36
0.9972	733.66	116.36
1.0167	735.72	116.36
1.0361	737.47	116.36
1.0583	740.69	116.37
1.0778	741.97	116.37
1.0972	744.97	116.38
1.1167	747.34	116.39
1.1361	750.14	116.39
1.1583	753.89	116.41
1.1778	762.92	116.42
1.1972	766.01	116.43
1.2167	761.26	116.45
1.2361	755.10	116.44
1.2583	750.04	116.42
1.2778	746.61	116.39
1.2972	744.08	116.38
1.3167	743.21	116.37
1.3361	747.21	116.36
1.3583	750.34	116.38
1.3778	754.46	116.39
1.3972	757.96	116.40
1.4167	763.24	116.41
1.4361	764.25	116.42
1.4583	764.04	116.43
1.4778	762.98	116.43
1.4944	764.38	116.42
1.5139	763.45	116.43
1.5333	754.96	116.41
1.5528	746.21	116.39
1.5750	744.18	116.38
1.5944	739.07	116.39
1.6139	735.70	116.39
1.6333	736.04	116.39
1.6528	739.54	116.39
1.6750	744.09	116.40
1.6944	745.52	116.42
1.7139	745.63	116.43
1.7333	746.18	116.43
1.7528	741.73	116.43
1.7750	736.19	116.42
1.7944	732.80	116.39
1.8139	729.10	116.37
1.8333	725.88	116.36
1.8528	724.77	116.35
1.8750	725.51	116.35
1.8944	729.52	116.36
1.9139	733.73	116.38
1.9333	737.69	116.40

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1.9528	742.10	116.42
1.9750	744.55	116.44
1.9944	745.58	116.45
2.0139	749.49	116.46
2.0333	749.03	116.47
2.0528	744.93	116.47
2.0750	739.93	116.45
2.0944	735.55	116.43
2.1139	732.39	116.41
2.1333	734.23	116.40
2.1361	735.30	116.40

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2 hr. Flowing Pressure Record at 8150 ft. M.D.



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24 hr. Pressure Build-up Record

Elapsed time (hr)	Pressure (psia)	Temperature (F)
0.0000	737.75	116.40
0.1722	837.27	116.79
0.3444	912.16	116.93
0.5194	964.02	116.77
0.6917	1016.17	116.74
0.8667	1066.63	116.72
1.0389	1107.34	116.69
1.2389	1155.15	116.67
1.4222	1196.57	116.65
1.5889	1234.98	116.75
1.7556	1272.10	116.83
1.9222	1305.23	116.87
2.0889	1336.86	116.89
2.2556	1364.86	116.89
2.4222	1390.15	116.90
2.5889	1413.18	116.90
2.7556	1434.23	116.89
2.9222	1453.75	116.89
3.0889	1471.54	116.88
3.2556	1488.06	116.87
3.4222	1503.54	116.87
3.5889	1517.75	116.86
3.7556	1531.05	116.86
3.9222	1543.61	116.85
4.0889	1555.52	116.84
4.2556	1566.89	116.83
4.4222	1577.56	116.83
4.5889	1587.55	116.82
4.7556	1596.97	116.82
4.9222	1605.68	116.81
5.0889	1613.57	116.81
5.2556	1621.66	116.80
5.4222	1629.21	116.80
5.5889	1636.12	116.79
5.7556	1642.69	116.79
5.9222	1649.00	116.79
6.0889	1655.04	116.78
6.2556	1660.81	116.78
6.4222	1666.35	116.78
6.5889	1671.41	116.78
6.7556	1676.61	116.77
6.9222	1681.82	116.77
7.0889	1686.94	116.77
7.2556	1692.29	116.77
7.4222	1697.52	116.76
7.5889	1702.78	116.76
7.7556	1708.17	116.76

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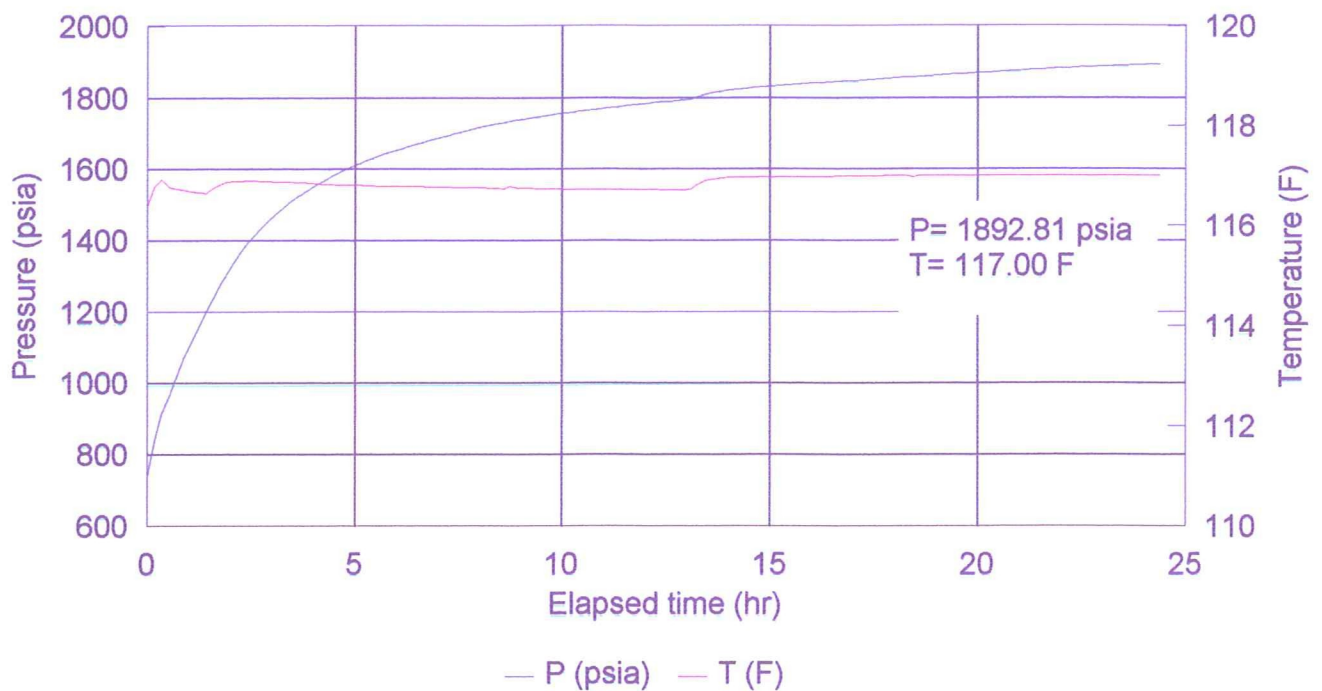
7.9222	1713.10	116.76
8.0889	1717.55	116.76
8.2556	1721.67	116.75
8.4222	1725.47	116.75
8.5889	1729.07	116.74
8.7556	1732.42	116.78
8.9222	1735.57	116.75
9.0889	1738.68	116.75
9.2556	1741.75	116.75
9.4222	1744.72	116.74
9.5889	1747.62	116.74
9.7556	1750.39	116.74
9.9222	1753.08	116.74
10.0889	1755.70	116.73
10.2556	1758.21	116.73
10.4222	1760.68	116.73
10.5889	1763.10	116.73
10.7556	1765.42	116.73
10.9222	1767.64	116.73
11.0889	1769.86	116.73
11.2556	1772.17	116.72
11.4222	1774.52	116.72
11.5889	1776.86	116.72
11.7556	1779.17	116.72
11.9222	1781.34	116.72
12.0889	1783.39	116.72
12.2556	1785.35	116.72
12.4222	1787.32	116.71
12.5889	1789.15	116.71
12.7556	1790.92	116.71
12.9222	1792.50	116.71
13.0889	1793.94	116.72
13.2556	1801.32	116.83
13.4389	1807.93	116.90
13.6389	1812.62	116.93
13.8389	1816.42	116.95
14.0389	1819.61	116.96
14.2389	1822.34	116.96
14.4389	1824.85	116.97
14.6389	1827.22	116.97
14.8389	1829.39	116.98
15.0389	1831.48	116.97
15.2389	1833.44	116.98
15.4389	1835.29	116.98
15.6389	1837.07	116.98
15.8389	1838.60	116.98
16.0389	1839.62	116.98
16.2389	1840.71	116.98
16.4389	1842.03	116.98
16.6389	1843.44	116.99
16.8389	1844.90	116.99

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17.0389	1846.38	116.99
17.2389	1847.94	116.99
17.4389	1849.50	116.99
17.6389	1850.99	116.99
17.8389	1852.46	117.00
18.0389	1853.97	117.00
18.2389	1855.46	117.00
18.4389	1856.05	116.98
18.6389	1857.92	117.00
18.8389	1859.62	117.00
19.0389	1861.18	117.00
19.2389	1862.65	117.00
19.4389	1864.06	117.00
19.6389	1865.45	117.00
19.8389	1866.83	117.00
20.0389	1868.20	117.00
20.2389	1869.58	117.00
20.4389	1870.98	117.00
20.6389	1872.31	117.00
20.8389	1873.55	117.00
20.9389	1874.14	117.00
21.1389	1875.40	117.01
21.3389	1876.71	117.00
21.5389	1878.05	117.00
21.7389	1879.36	117.00
21.9389	1880.58	117.00
22.1389	1881.76	117.00
22.3389	1882.91	117.01
22.5389	1884.03	117.00
22.7389	1884.92	117.00
22.9389	1885.77	117.00
23.1389	1886.66	117.00
23.3389	1887.64	117.00
23.5389	1888.63	117.00
23.7389	1889.61	117.00
23.8389	1890.08	117.00
23.9389	1890.58	117.00
24.1389	1891.57	117.00
24.3389	1892.53	117.00
24.3944	1892.81	117.00

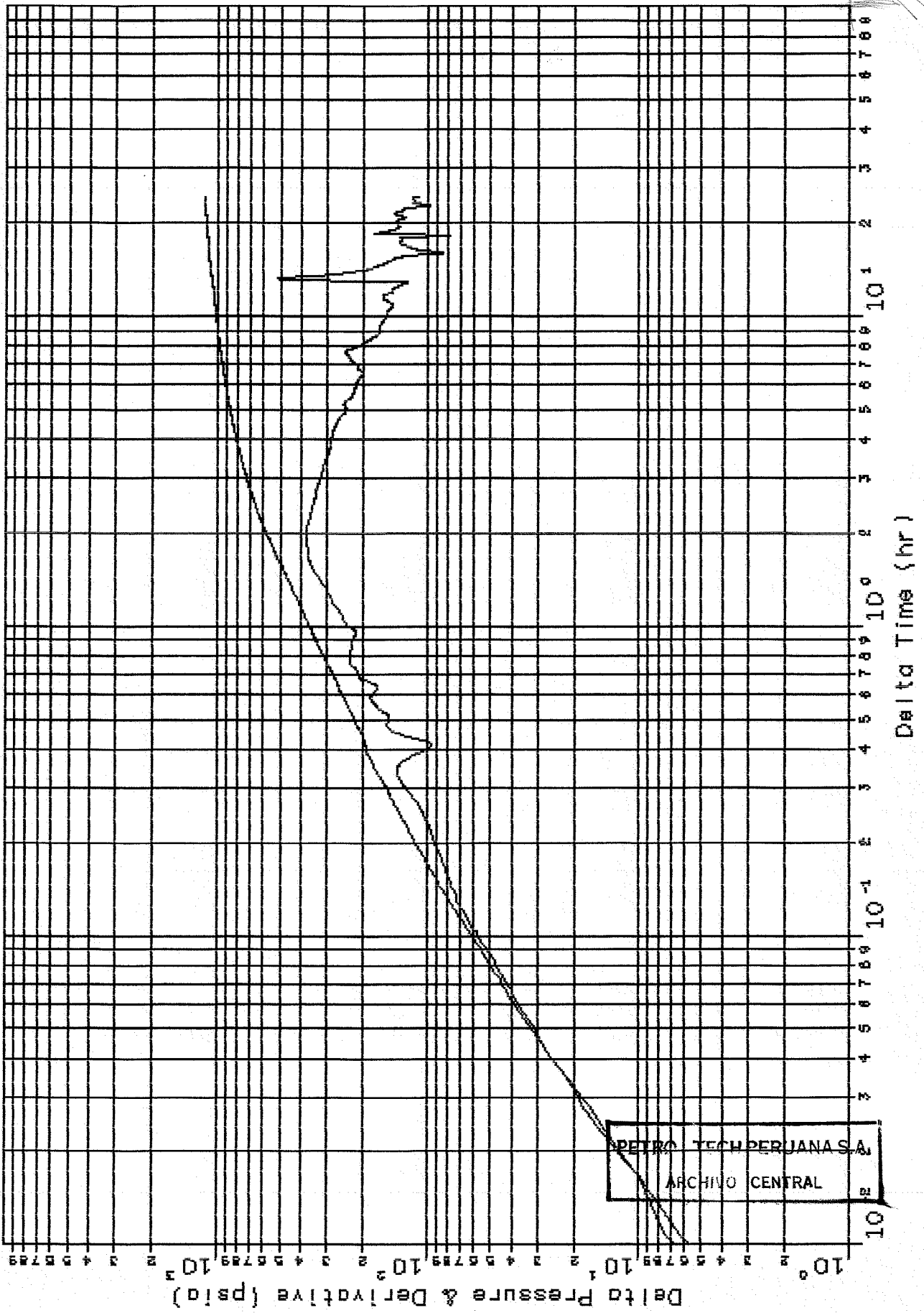
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24 hr. Pressure Build-up Record



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24 Hr. Pressure Build-up L06 - 22R



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Fluid Level at Static Condition

Measured depth (ft)	Vertical depth (ft)	Pressure (psia)	Gradient (psi/ft)
0	0.00	1570.00	-
2000	1897.13	1629.67	0.0315
3000	2635.97	1681.74	0.0705
4000	3401.65	1738.27	0.0738
5000	4267.98	1789.25	0.0588
5500	4698.55	1812.57	0.0542
6000	5136.44	1834.99	0.0512
6500	5527.93	1852.54	0.0448
6750	5670.42	1858.92	0.0448
7000	5808.52	1864.73	0.0421
7250	5951.00	1871.11	0.0448
7500	6099.09	1877.37	0.0423
7750	6246.30	1883.95	0.0447
8000	6386.10	1889.68	0.0410
8150	6475.69	1892.81	0.0349

Levels

~~8286'~~ 6558 } 61.51
 8717 }
 9281 }
 7,019

	Measured (ft)	Vertical (ft)
Oil Level =	-	-
Water Level =	-	-

	Measured (ft)	Vertical (ft)
MPP =	8717	6746

$$\text{Pressure (MPP)} = 1892.81 + (6746 - 6475.69) \times 0.0349$$

$$\text{Pressure (MPP)} = 1902.24 \quad \text{psia}$$

Gradients

Gradient (MPP) =	0.2820	psi/ft
Gradient (Gauge) =	0.2923	psi/ft

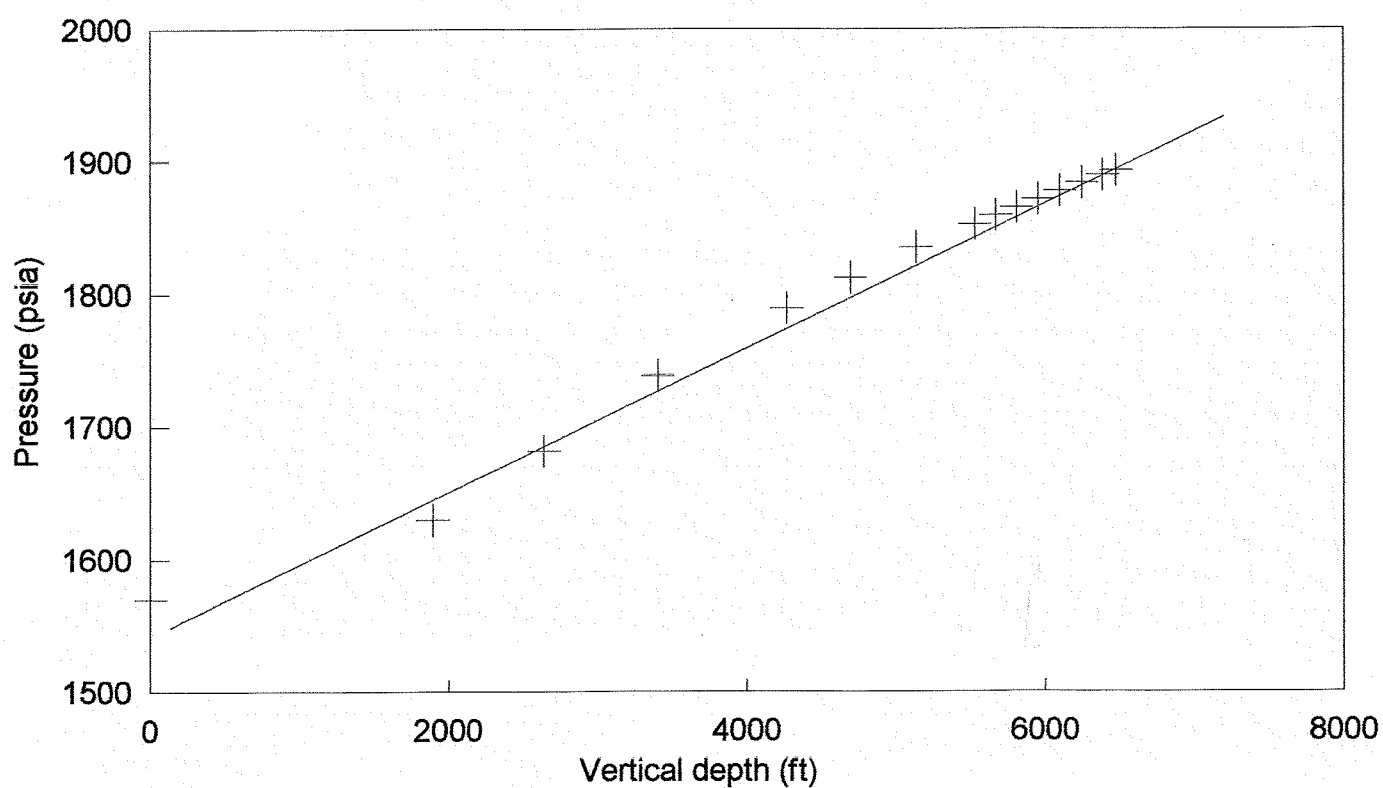
Oil Gradient =	-	psi/ft
Gas Gradient =	0.0498	psi/ft
Water Gradient =	-	psi/ft

$$P^* = 2547 \text{ Psia}$$

$$PG = 0.378 \text{ psi/ft}$$

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Fluid Level at Static Condition



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