

Denne rapport  
tilhører



**L&U DOK. SENTER**

L. NR. 30284220002

KODE Well 31/3-2 nr6

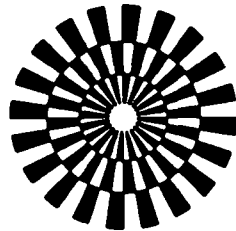
Returneres etter bruk

NORSK HYDRO A/S

FORMATION RESISTIVITY FACTOR MEASUREMENT

WELL: 31/3-2

DATE: MAY 1984



**GECO**  
GEOPHYSICAL COMPANY  
OF NORWAY A/S



NORSK HYDRO A/S

FORMATION RESISTIVITY FACTOR MEASUREMENT

WELL: 31/3-2

DATE: MAY 1984

FORMATION RESISTIVITY FACTOR

Formation resistivity factor has been measured on approximately every tenth one inch horizontal sample plug from well 31/3-2. All measurements were completed on samples installed in Hassler-type holders confined at 15 bar sleeve pressure while pore space remained at atmospheric pressure.

After air permeability and porosity measurements were completed, the samples were saturated as near as possible to 100% with the requested formation water; 50 000 ppm NaCl. Formation resistivity factor was then measured using a frequency of 1 kHz. The parameters "a" and "m" in Archies formula were calculated both by least squares method forced through (FF=1.0,  $\phi$ =1.0) and least squares method with free fit.

Archies formula: 
$$FF = \frac{r_o}{r_w} = a \cdot \phi^{-m}$$

where  $r_o$  = resistivity of sample (100% saturated)

$r_w$  = resistivity of saturating formation water

a = FF-value at fractional porosity of 1.0

$\phi$  = fractional porosity

m = cementation factor

The data sets and the calculated values are presented in tabular and graphical form.



FORMATION RESISTIVITY FACTOR

Plug no.	Depth (m)	Sample resistivity ohm-meters	Formation Factor	Porosity (%)
10	1569.75	1.99	14.1	26.6
20	1572.25	1.55	11.0	29.2
31	1575.25	2.02	14.3	25.2
40	1583.25	1.48	10.5	28.4
50	1585.75	1.06	7.49	35.0
60	1588.25	2.02	14.3	30.6
70	1593.25	1.90	13.4	26.8
80	1595.75	0.936	6.64	36.5
90	1598.50	1.06	7.51	34.8
100	1601.00	0.987	7.00	31.2
109	1603.25	1.13	8.00	32.3
121	1608.00	0.959	6.80	31.9
131	1610.75	0.981	6.96	31.6
139	1613.25	0.970	6.88	36.3
149	1615.75	1.81	12.8	26.0
162	1619.25	2.04	14.5	25.7
171	1622.50	1.18	8.36	31.8
180	1624.75	0.921	6.53	34.7
190	1627.50	0.666	4.73	37.7
200	1630.00	0.835	5.92	34.9
210	1632.50	0.794	5.63	34.6
220	1635.00	1.15	8.14	28.6
230	1637.50	0.933	6.62	33.6
239	1639.75	0.971	6.89	33.7

Forced Fit:  $FF = 1.0 \cdot \phi^{-1.85}$

Free Fit :  $FF = 0.48 \cdot \phi^{-2.48}$

# FORMATION RESISTIVITY FACTOR VERSUS POROSITY



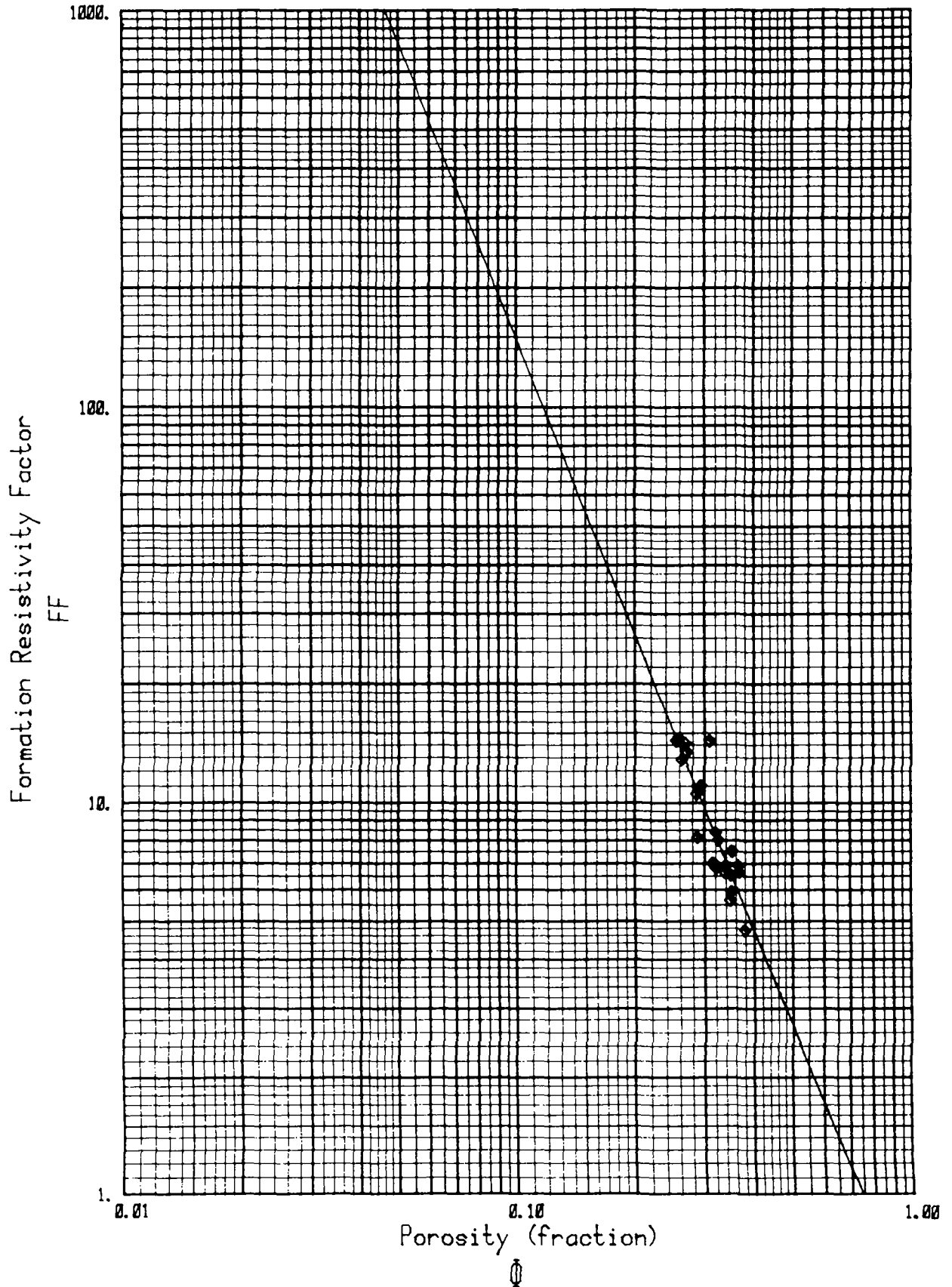
**GECO**  
GEOPHYSICAL COMPANY  
OF NORWAY A.S.  
Petroleum laboratory

Company : Norsk Hydro A/S

Well : 31/3-2

Confining pressure : 15 bar. Free fit.

$$FF = 0.48 * \phi^{-2.48}$$



# FORMATION RESISTIVITY FACTOR VERSUS POROSITY



Company : Norsk Hydro A/S

Well : 31/3-2

Confining pressure : 15 bar. Forced fit.

$$FF = 1.00 * \phi^{-1.85}$$

