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QUALITY CONTROL OF ROUTINE CORE ANALYSIS

WELL 34/10-4
FILE 050-P5.12.03-01

STATOIL PRODUCTION LABORATORY

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Introduction

Routine porosity and permeability measurements have been checked on 26 samples previously measured by Geco. The samples were selected to cover a range of permeabilities. Porosity ranged from 10.6% to 39.6%, permeability spread from 2.3md to ≃ 2000md. See ϕ-log K plot, fig. 1.

Porosity Measurements

Porosity was measured using the conventional shared volume (2 matrix - cup) method. Helium gas was used by both labs to determine grain volume. Pore volume is determined by difference with bulk volume. In Prolab Bulk volume is determined by mercury displacement.

A plot of Geco Porosity against Prolab data shows good agreement especialy for lower porosity data. However, for larger porosities, Geco data appears higher, generaly abouth 0.5% porosity. Inspection of the grain density for these samples shows very good agreement. This would indicate that measurements of grain volume were in agreement. Any differences would thus be due to the measurement of Bulk Volume.

Permeability Measurements

Permeabilities were measured by a new nitrogen- permeameter constructed by Prolab. Three different back-pressures are used, and a plot is made to correct for Klinkenberg-effect. Our results are compared to Geco's values in the table. Many results are in good agreement. Only sample No. 121 shows a significant difference.

Geco are known to apply the Klinkenberg correction by using a mathematical correlation. This correlation is applicable so long as no effects of setting of the plug take place. For poorly consolidated samples therefore, some differences in the Klinkenberg corrected data can be expected between Prolab and Geco.

CHECK OF GECO - VALUES

Sample NO	Porosity (%)		Grain Density (g/cc		Permeability K_{eL} (md)	
	Geco	Statoil	Geco	Statoil	Geco	Statoil
2	34.4	33.6	2.94	2.94	1121	1243
5	35.2	34.4	2.84	2.82	1346	1340
11	37.4	36.5	2.71	2.72	1395	
12	37.9	37.5	2.70	2.70	1722	1580
18	38.9	38.1	2.70	2.70	1965	1945
22	39.2	38.4	2.68	2.68	2127	2335
23	38.5	37.8	2.72	2.72	1828	1945
24	35.7	35.7	2.77	2.78	1150	1190
26	37.9	37.7	2.73	2.73	1686	1770
[illegible]	13.3	13.5	2.72	2.72	0.63	1.0
59	38.2	37.8	2.70	2.72	1721	1400
60	39.2	39.1	2.68	2.72	2096	1990
62	36.2	36.4	2.71	2.72	1171	1150
64	10.6	11.1	2.71	2.72	0.1	<0.1
70	39.6	39.1	2.67	2.67	1520	1650
101	37.7	37.8	2.67	2.68	1000	948
103	34.0	34.1	2.75	2.75	392	406
117	37.5	37.5	2.65	2.71	726	862
121	37.5	37.8	2.65	2.68	920	400
142	35.6	35.0	2.67	2.69	212	278
160	35.8	36.2	2.64	2.67	309	360
163	30.3	30.1	2.66	2.69	46	49.6
171	28.4	28.0	2.66	2.67	32	33.0
173	30.6	30.6	2.68	2.70	84	89.7
176	29.0	29.0	2.68	2.70	4.9	4.3
187	26.8	26.8	2.66	2.67	2.3	2.7

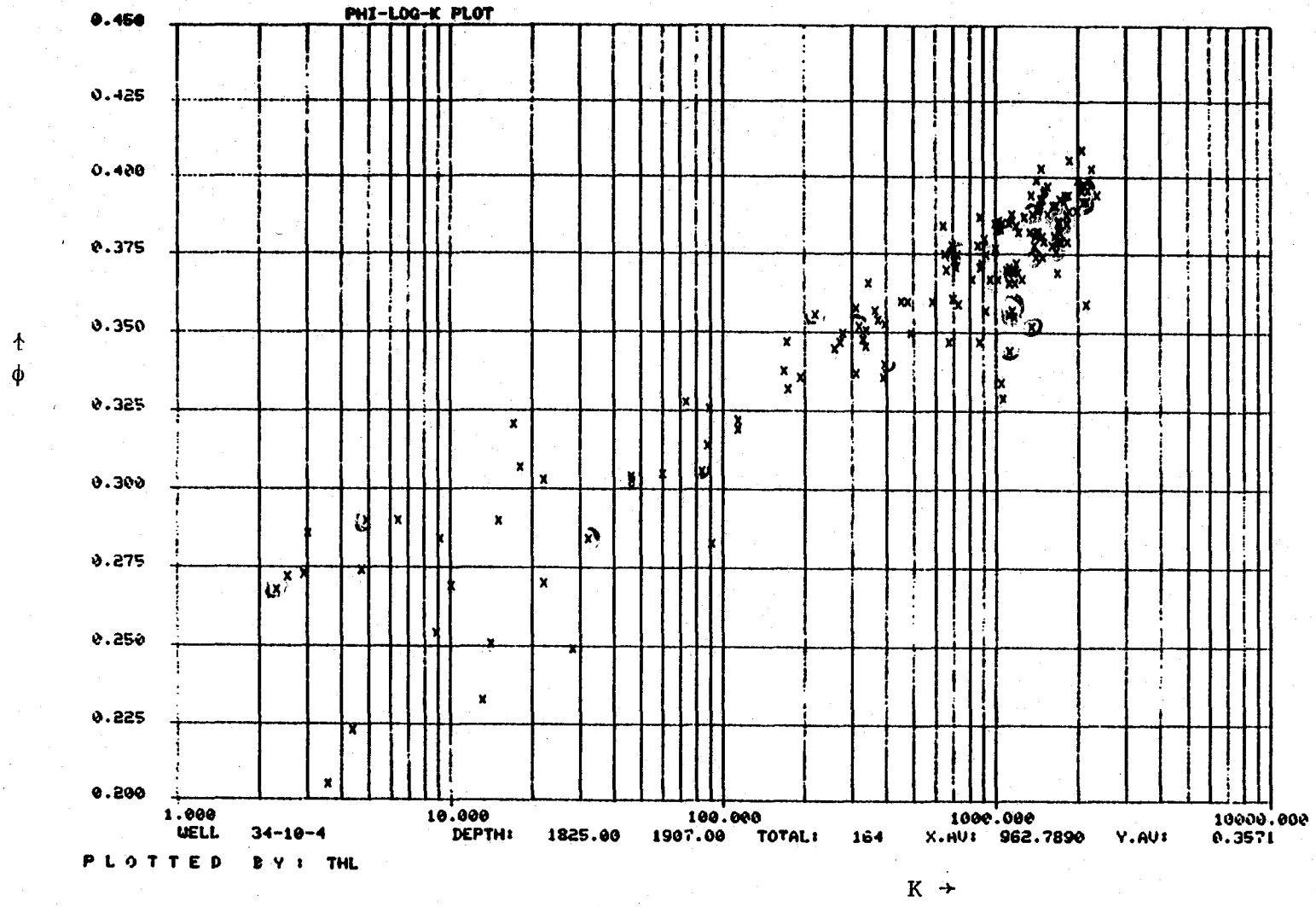

Fig. 1. Geco porosity vs Permeability.

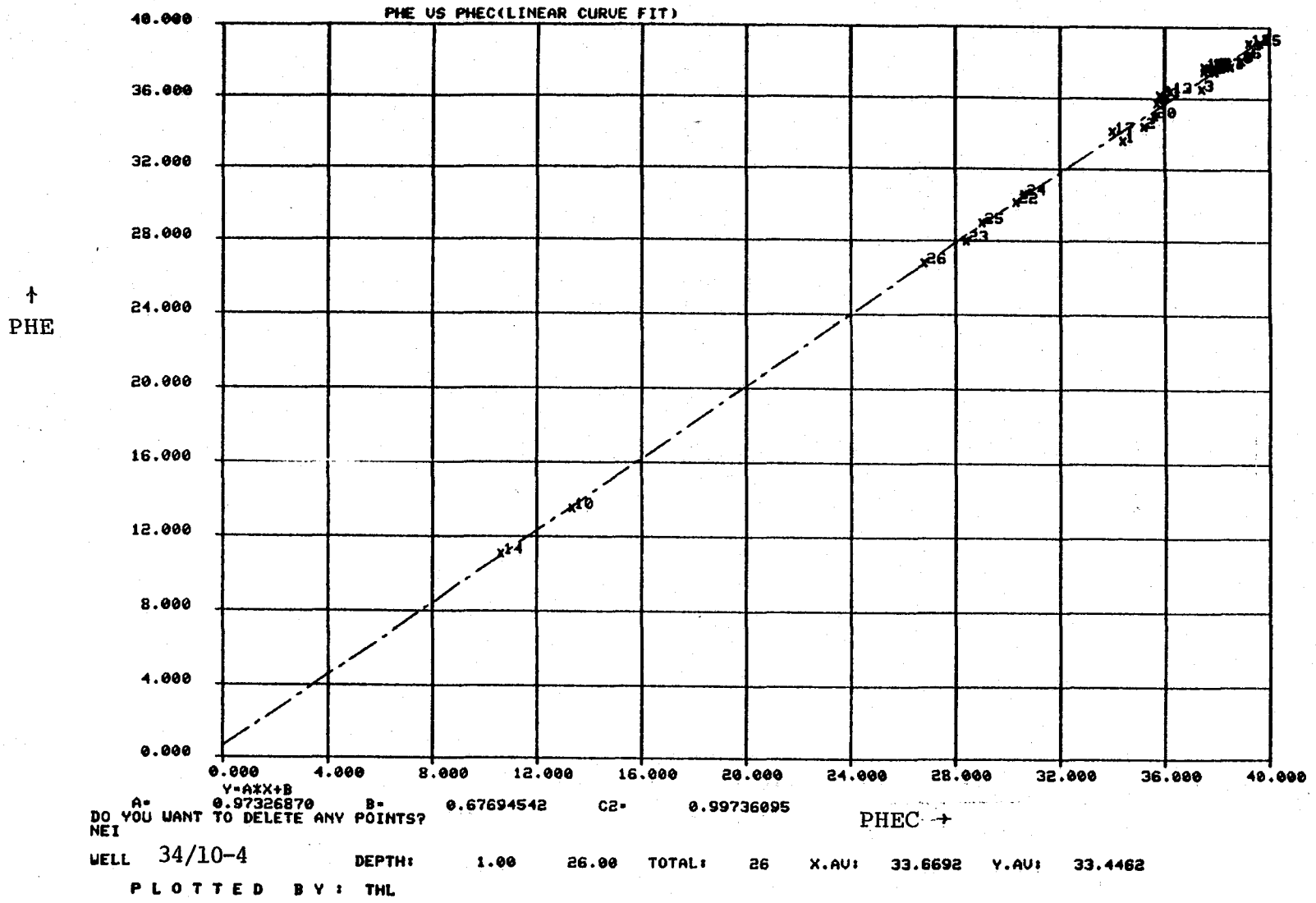

Fig. 2. Prolab Porosity (PHE) vs Geco Porosity (PHEC)

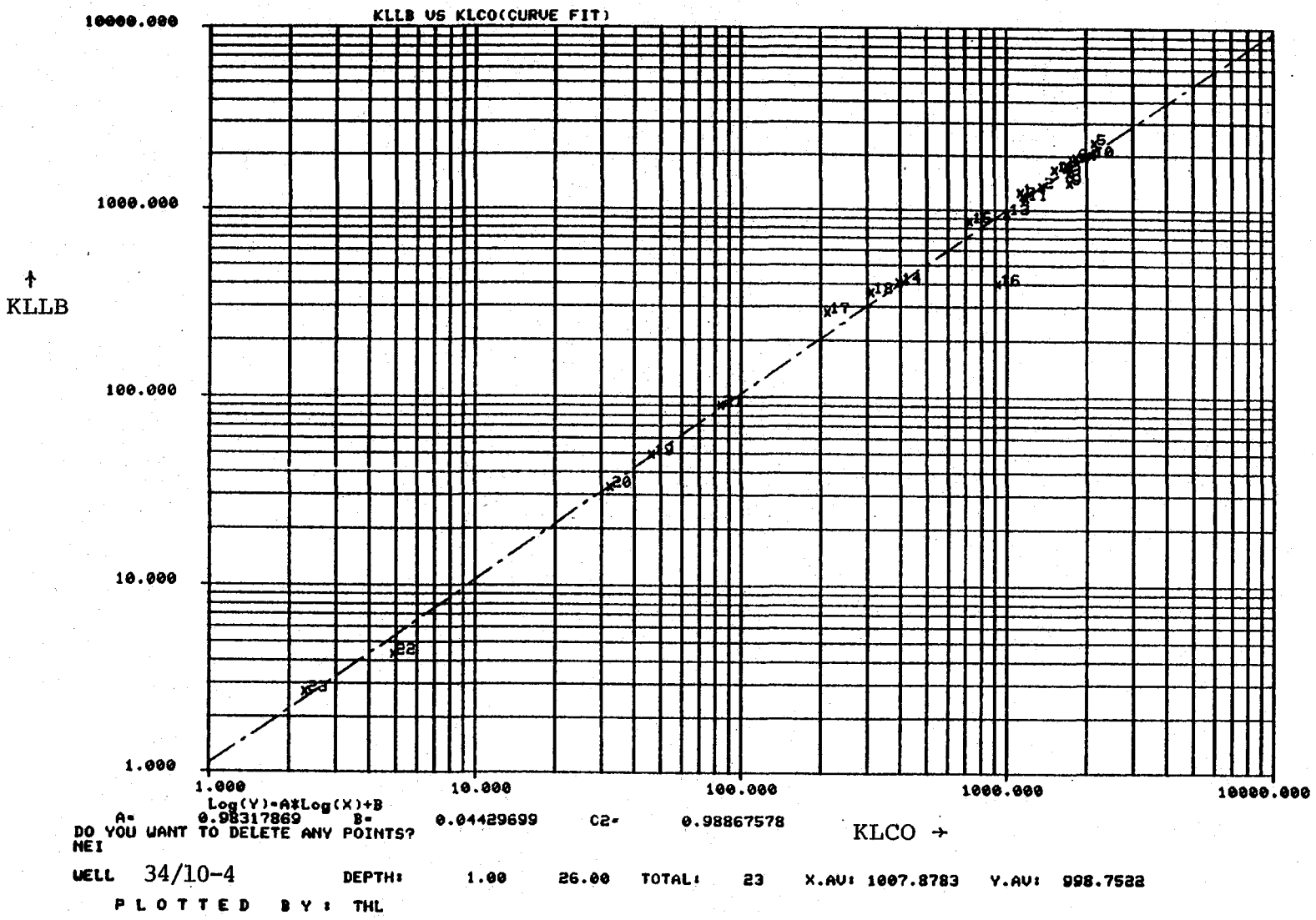

Fig. 3. Prolab Equivalent Liquid Permeability (KLLB) vs Geco Equivalent Liquid Permeability (KLCO)