

A2.7 Thermal History

Two washed and air dried samples were sent via ANALABS to Professor Alan Cook for vitrinite reflectance determination and coal maceral identification. The results of the study indicate that the sediments at 1341m and 1374m (the depths of the two samples) are thermally mature. However, organic matter in the samples appears to be contact altered, probably as a result of the intrusion of the igneous rocks seen deeper in the well. The following is a summary of the results of the study.

Depth	Ro(mean)	Range	No. of readings
1341	0.83	0.72 - 0.95	27
1374	0.86	0.72 - 1.29	29

Geothermal Gradient

The geothermal gradient for Seal No. 1 was calculated using only two temperature readings taken from the two runs of the second log suite. The data used to calculate the gradient is summarised below.

Depth (m)	Log	Time since last circ.	Temp (C)	T/(T + dt)
1669	DIL	5.67	68.3	0.870
1669	LDL	9.75	74.4	0.920

The results of the formula;

$$T/(T + dt)$$

where;

T = the time since the last circulation.

dt = the circulation time, taken as 51 minutes in both cases

were plotted and the resulting line between them was extrapolated. This gave a corrected bottom hole temperature of 79.5°C (see accompanying graph, Figure 4).

The geothermal gradient, corrected for water depth, was calculated using the formula;

$$G = \frac{ft - sbt}{md - KB - WD}$$

where;

G = geothermal gradient corrected for water depth,  
ft = formation temperature,