DEPTH OF PERMAFROST

1. STUDY SCOPE

Depth of permafrost is important for mine construction and operation because it defines the depth of the active layer (freeze-thaw layer) and the potential for movement of shallow groundwater during the summer season. Thermistor strings to measure temperature were targeted for both the George and Goose lake areas; however only the Goose Lake site was examined in 1997.

2. METHODS

Thermistor strings were installed at 4 foot (1.2 m) intervals to a depth of 25 feet down an open (unfrozen) drill hole at Goose Lake in late summer 1997. The drill hole is designated 97GO-014. The approximate location is shown on Figure 4.1-1. Actual depths below the surface will be adjusted for the slope of the diamond drill hole prior to data evaluation. Thermistors were connected to a junction box grouted in place on a stand above the drill hole. The thermistor resistances were measured on two occasions with a digital ohmmeter and converted by means of a calibration chart supplied by the manufacturer, R Technical, to temperatures.

3. RESULTS

Table 1 lists results of the two measurements made in early and mid September 1997. The table indicates permafrost was at 1.5 m.

TABLE 1
GOOSE LAKE THERMISTOR DATA

Location: Drill Hole: 97GO-014

Date	Depth (m)	Resistance (ohms)	Temp (°C)
05-Sep-97	1.2	5.16	7.1
	2.4	6.14	3.8
	3.6	7.09	0.8
	4.8	7.63	-0.8
	12	8.52	-2.0
	14.2	8.90	-3.0
21-Sep-97	1.2	6.28	3.1
	2.4	6.88	1.7
	3.6	7.15	0.8
	4.8	7.56	-0.8
	12	8.03	-1.7
	14.2	8.39	-2.6