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6. Results of drilling at Lefroy.

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Following a trial geophysical programme (Leaman, 1972) a drilling programme was proposed to verify the character of the anomalies observed. Two holes were sited in the region of the principal anomaly (Line 3, Leaman, *op. cit.*) and a third on Line 1. The holes on Line 3 (no. 1, 3) were drilled on the same alignment but about 10 m apart vertically. All holes were drilled at 50° inclinations.

DRILLING RESULTS

Hole 1 (10 m south of cc´, section line 3)

Depth (m)	*Description*
0 - 3.86	Soil
3.86- 8.00	Deeply weathered rock, shattered quartz veins.
8.00- 21.38	Less weathered rock evidence of schistosity.
21.38- 30.00	Shattered slaty mudstone, with quartz veins.
30.00- 41.69	Relatively fresh greenish mudstone.
41.69- 51.64	Black, pyritic, quartz-bearing shattered mudstone.
51.64-101.85	Grey mudstone/slate. Generally massive. Pyrite-bearing to 84.73 m. Shears at 58.36, 65.12 m.
101.85-106.08	Black, pyritic, sheared, shattered slate. Many minor quartz veins.

Quartz veins, usually less than 1 cm thick, are restricted to three zones - the two black slates and the near-surface material; some quartz veins may be 2-5 cm thick. Pyrite is present in all fresh rock, but is only common to about 85 m although both black slates are extremely pyritic.

Hole 2 (100 m south of a, section line 1)

Depth (m)	*Description*
0 - 7.62	Soil, completely decomposed rock.
7.62- 18.13	Weathered sandstone, some quartz.
18.13- 26.84	Massive slaty mudstone.
26.84- 28.65	Sandstone.
28.65- 31.17	Mudstone.
31.17- 50.74	Massive but sheared sandstone, with pyrite from 46.22 m.
50.74- 52.93	Much quartz, shattered core.
52.93- 76.12	Predominantly sheared sandstone, some mudstone. Sandstone occasionally micaceous, mudstone often pyritic. Shears or faults at 59.93-60.23, 69.65 m.
76.12-100.76	Alternating mudstone-siltstone succession generally lacking in pyrite. Fault/large shears at 76.32, 80.73-80.93, 83.33, 97.57 m. Quartz distributed between 83.33 and 93.23 m and all main shear zones. Some quartz veins up to 8 cm thick were observed (∿88.11 m).

Hole 3 (5 m north of cc´, section line 3)

0 - 1.24	Soil
1.24- 14.35	Predominantly slaty mudstone, some sandstone; quartz veining at about 3.99, 6.18, 9.04 and 13.18 m.
14.35- 31.09	Predominantly sheared sandstone, some mudstone. Mudstone at 31.0 m pyritic. Quartz veining at about 25.86, 28.77 and 29.45 m (to 31.09 m sandstones contain most veining).
31.09- 73.04	Grey mudstone, sheared. Occasional very fine sandstone-

Depth (m)	*Description*
	siltstone. Traces of pyrite from 41.67 to 60.41 m. Quartz veins at 32.73-34.44, 39.42, 45.10-45.23, 52.91, 58.46 m and major shears at 37.90-38.00, 54.00-54.35 m.
73.04- 79.25	Black slate/mudstone. Quartz at 75.00, 79.25 m. Shattered.
79.25-109.22	Grey-green mudstone, massive but sheared, minor pyrite. Silt grade from about 95.00 m. Traces of pyrite from 95.20. Black pyritic banding at 102.60, 105.00 m.
109.22-115.97	Weathered black, sheared, shattered mudstone with much quartz and pyrite.
115.97-140.80	Predominantly grey mudstone. Black mudstone at 120.42-121.33 m, some pyrite from 122.19-131.06m. A major quartz rich zone (very little other core recovery) from 133.40-134.38 m.

RELATIONSHIP TO GEOPHYSICAL DATA

The principal anomalies recorded were electrical. However the core indicates little variation in resistivity.

Low resistivity: weathered rock, shattered black, pyritic mudstone.
Moderate resistivity: massive mudstone, sandstone.
High resistivity: occasional quartz veins.

Examination of the relationships between material types as displayed in holes 1 and 3 suggests that the massive mudstone/sandstone is the dominant electrical feature. Several features may be noted when these holes are related. Firstly the two principal zones containing shattered black pyritic conductive mudstone vary greatly in thickness and attitude. The more northerly zone dips south and thins in that direction whilst the southerly zone dips north. This has resulted in a substantial wedge of more resistive mudstone/sandstone opening upward which would be near the surface from 30 to 90 m south of hole 1. This is the region of the peak resistivity anomaly. The asymmetrical slope of the anomaly is confirmed by the steep northward dip of the southern side of the sandstone body. Whether this wedge is in fact a fault feature, since faults are present, or the core of a syncline is undetermined. Since the structural strike appears unrelated to the anomaly trend the possibility of conduction effects resulting from replacement processes cannot be neglected; alternatively some cross folding may be represented.

RESULTS OF ANALYSES

Samples were selected from the core from holes 1 and 3 in order to assess whether the mudstone, pyrite or quartz contained traces of gold.

Hole	*Depth (m)*		*Au (%)*
1	102.60	black, pyritic mudstone	trace
3	102.60	black, pyritic mudstone	trace
	114.44	mudstone, quartz with pyrite	trace
	133.17	quartz with pyrite.	trace

REFERENCE

LEAMAN, D.E. 1972. Preliminary geophysical work, Lefroy goldfield. *Unpub. Rep.Dep.Mines Tasm.* 1972.

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