FINAL REPORT FOR E.L. 1384.

SCARBOROUGH

May, 1978

P.W. Green

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SUMMARY

The licence area was considered to be prospective for base metals, tin, tungsten and uranium, mainly in carbonate and skarn environments. These targets were investigated by stream sediment and rock chip geochemistry with generally disappointing results.

The most prospective area was a radiometrically anomalous stock of granite detected by a Bureau of Mineral Resources airborne radiometric survey. Reconnaissance investigations suggest the source of radiation to be small pegmatite bodies and fracture zones within the granite.
1. INTRODUCTION

Exploration Licence 1384, designated as Scarborough, was granted to Central Pacific Minerals N.L. on December 15th, 1976. The area was considered to be prospective for the following associations.

1. Base metals, particularly copper and zinc, along Precambrian carbonate-amphibolite contacts.
2. Zinc, lead and copper in high grade metamorphic carbonate environments.
3. Uranium in Precambrian veins and skarns.
4. Scheelite and copper within calc-silicate units.
5. Scheelite and tin in skarn environments.

Field work consisted of stream sediment and rock chip sampling, including the use of heavy mineral concentrates. The elements copper, lead, zinc, manganese, tin, tantalum and tungsten were determined. Minor ground radiometrics were also carried out.

2. SITUATION & ACCESS

The licence area, centred on latitude 22° 32' 30" south longitude 133° 7' 30" east, was situated approximately 150 kilometres north-northwest of Alice Springs, and covered 711.0 sq. kms. (274.5 sq. miles). (Figure 1). It straddled the Reynolds Range and was accessible by two unsealed roads leaving the sealed Stuart Highway 125 and 141 kilometres north of Alice Springs.

3. GEOLOGY OF THE LICENCE AREA.

The area is largely underlain by Precambrian granites and metamorphics of the Arunta Complex, flanked to the north-east and south-west by Quaternary sand cover. The area was recognized as the site of the intersection of major structural trends, striking west-north-west and north-east. In the central part of the licence area, the mapped faults form a sympathetic rhomb fracture system. The combination of these fractures was considered to produce an attractive structural situation, favourable for the localization of numerous ore types.

The area was mapped by the B.M.R. during the mapping of the Aileron and Tea Tree 1:100,000 scale sheets. This mapping programme defined and delineated a number of carbonate units in the sequence, notably the Woodforde River Beds, a limestone, marble and calc-silicate unit, and the Wickstead Creek Beds, composed of calc-silicates. These units lie in a gneissic, schistose and granulitic sequence of metapelite and metapsammite, and have been intruded by 4 phases of granite.

Despite the frequent occurrence of granite - calc-silicate contact zones, no skarns were identified during the programme. This may be due to the apparent overall scarcity of pure carbonate. Early work by the B.M.R. in fact, mapped the calc-silicate in part as quartzite.
4. EXPLORATION CONDUCTED BY CENTRAL PACIFIC MINERALS N.L.

Exploration was conducted over the licence area in search of three mineral groups, zinc-copper-lead, tin-tungsten, and uranium.

4.1. Zinc-Copper-Lead

During reconnaissance work, the Woodforde River Beds were seen to contain ironstone bodies of unknown origin. A programme was initiated to trace, map and sample these ironstones and the host carbonate unit. It was considered that the geological environment might be conducive to the localization of zinc deposits.

Accordingly, 56 stream sediment and 19 rock chip samples were collected and analysed for zinc, copper, lead and manganese. Sample locations and results are shown on Plates 1 and 2. The element manganese was included since experience elsewhere had suggested that scavenging of base metals by manganese might be a problem in this area.

The stream sediment results, with maxima of 25 ppm, 18 ppm and 45 ppm for copper, lead and zinc respectively, were all less than the anticipated threshold levels. Rock chip analyses were also generally low, with respective maxima of 95 ppm, 75 ppm and 600 ppm. From hand specimen examination the ironstones appear to be generally massive, limonitic and commonly earthy. No gossans were identified, although minor patches may have been boxworks after pyrite or carbonate. A suggested origin, therefore, is through laterization, possibly over pre-existing ferruginous shear zones.

In contrast, the manganese stream results showed a range of values (to 5200 ppm) and were thus amenable to statistical treatment. The detailed results of this analysis are presented in the first annual report (Green, 1977).

The rock chip samples were also analysed for tungsten and molybdenum. The results are presented in Table 1.

4.2. Tungsten-Tin

In contrast to the Woodforde River Beds, the calc-silicates of the Wickstead Creek Beds are in extensive contact with the intruding Napperby Granite. It was considered that skarns and associated tungsten mineralization may have developed on these contacts and a programme of stream sediment sampling was therefore initiated to test this potential.

In the Mount Allan - Mount Denison area, approximately 95 kilometres to the north-west, pegmatites of the Arunta Complex contain tin and tantalum mineralization. Since the streams to be sampled were also draining granite in which pegmatites were known to be common, the elements tin and tantalum were included in the analysis. Moreover, tin occurs in metasomatic carbonate replacement deposits elsewhere in Australia, albeit of Palaeozoic age.

Initially, 41 samples, sieved to minus 12 mesh, were taken over an area of approximately 32 sq. km. A heavy mineral concentrate of each was produced by panning, and analysed by XRF. The sample locations and results are present on Plate 3.
Since there was no standard on which to base the assessment of results, the interpretation of anomalous values was qualitative. On this basis the most interesting area was immediately to the west of Mount Dunkin, where three high tungsten values were grouped with a maximum of 1950 ppm, 30 to 40 times background. Of lesser interest was an area of 2 to 3 times background tin and tungsten, 3 kilometres south-east of Mount Freeling.

Tantalum values were uniformly low and the element was thereafter disregarded. A follow-up programme of 27 samples was undertaken to increase the sample density around the two areas of interest. Results were discouraging and in some cases cast doubt on the validity of the initial anomalies. The sample locations and results are presented on Plates 4 and 5.

4.3. Uranium

Ground radiometrics were largely confined to ground investigations of the B.M.R. airborne radiometric anomalies. Reconnaissance investigations attributed the radioactivity to shears and small bodies of pegmatite in stocks of granite intruding the Lander Rock Beds. Maximum levels of 800 cps were recorded with a Scintrex BGS-1S scintillometer, against a background of 60 - 80 cps.

Minor ground radiometrics were also carried out during the geochemical sampling programmes. No anomalous radioactivity was detected.
CONCLUSIONS

The results of the programme suggested that there is little likelihood of economic mineralization existing on surface in the tenement area. The licence has therefore been relinquished.
BIBLIOGRAPHY

Unpublished Report,
Central Pacific Minerals N.L.
**TABLE 1**

**GEOCHEMICAL ANALYSES FOR TUNGSTEN AND MOLYBDENUM**  
**ROCK CHIP SAMPLES.**

For Location, see Plate 1.

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○ Stream sediment sample location

Sample No. | Tin  
Tungsten | Tantalum

NOTE - Results in p.p.m.

CENTRAL PACIFIC MINERALS N.L.

SCARBOROUGH  ELI 1384
Stage 2 Stream sediment sample
Locations & Geochemistry
MT. DUNKIN AREA

Scale: 1:10,000 Approx  Plan No.: NT 101

Date: Dec '77  Drawn by: PWG
LEGEND

O Stream sediment sample location

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NOTE - Results in p.p.m.

CENTRAL PACIFIC MINERALS N.L.

SCARBOROUGH NT 101

EL 1384

Stage 2 Stream sediment sample

Locations & Geochemistry

MT. FREILING AREA

Scale: 1:10,000 Approx

Date: Dec '77

Drawn by: P.W.G.

PLATE 5.