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4. LOILA TIER TIN PROSPECT, SCAMANDER AREA

by G. Urquhart

INTRODUCTION

The tin prospect located on the Loila Tier between Scamander and St Helens (fig. 4) is covered by two claims, each of 20 acres, numbered 4M/65 and 38M/66. An appraisal of the area was made on Tuesday, 21st June, 1966, when the writer was accompanied by the lessee, Mr H. H. Williams. Approximate grid co-ordinates of the prospect are 6006E, 9013N.

CONCLUSIONS

The concentration and deposition of tin in a shear zone 23 feet wide certainly justifies further exploration which should be directed firstly to ascertain the full width of the shear zone in the prospect pits, secondly to determine whether metallization persists at depth, and thirdly to trace any lateral continuation of metallization especially in a SW direction.

ACCESS AND LOCATION

The prospect can be approached from three different directions, two routes of access being via Upper Scamander, thence for 10 miles along tracks and Forestry Commission roads which have been bulldozed in the hilly terrain lying a few miles W of the coast. A third route to the prospect is provided by the Forestry Commission road leading off the main road at a point 4.7 miles N of the Upper Scamander turn-off, about 300 yards N of the Serpentine River. This road is then followed for a distance of 7.3 miles through country having high relief, but nevertheless easily negotiable by vehicle. The last half mile to the prospect, situated to the SW, must be traversed on foot. The Forestry Commission roads established within the last year greatly facilitate access. Previously ingress to the area was only possible on foot.

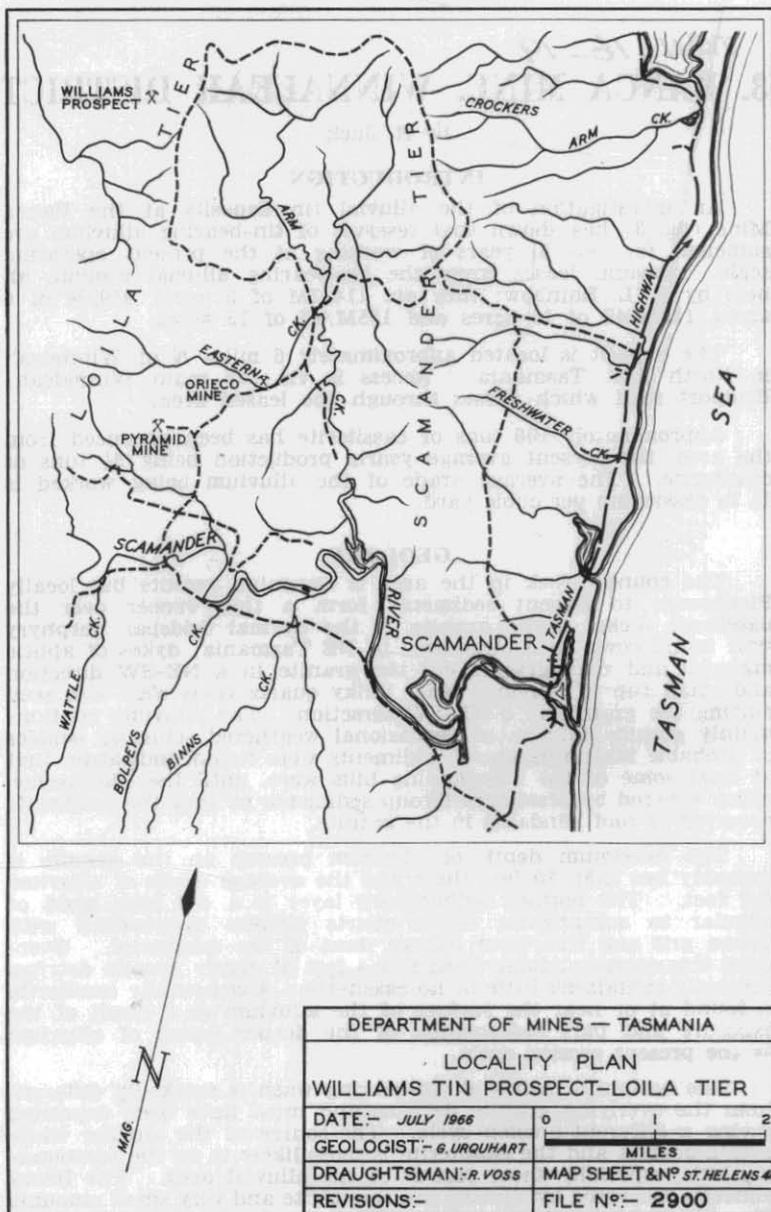


FIGURE 4

5 cm

GENERAL GEOLOGY

Loila Tier, where the prospect is situated, forms part of the highly dissected uplands which lie a few miles back from the coast in the sector between Scamander and St Helens. The access roads partly traverse the crests of the encircling ranges of hills, which rise fairly sharply to an altitude of 1500 feet above sea level within a distance of 2-3 miles of the coast.

The dissected upland country is underlain by Mathinna Group sedimentary rocks, comprising siltstone, slate, hornfels and shale, which strike in a general direction 350° and dip at an angle of about 70° to the W. The boundary between the low lying coastal strip and the dissected uplands appears in places to be the approximate contact between granite of Devonian age intrusive into Mathinna Group rocks of Siluro-Ordovician age. Belts and tongues of granite in sediments can be seen where the access road begins to traverse the hilly terrain after leaving the coastal strip.

GEOLOGY OF THE PROSPECT

The prospect lies on the flank of a spur of ground 400-500 feet below the altitude of the encircling range of hills situated about half a mile away to the NE. The drainage in this particular area is inland, away from the coast. Local relief in the immediate vicinity of the prospect is approximately 100 feet formed by a sharp narrow valley to the N bounding another interfluve. The dry creek bed in the bottom of the valley is about 140 feet from the prospect and 70 feet lower in altitude.

The hillslopes are stony and covered with angular blocky fragments of Mathinna Group rocks. The intersection of closely spaced jointing (2-6 inches apart) with the bedding of these rocks promotes their rapid fragmentation on weathering. The ubiquitous rubble cover is 2-3 feet deep and effectively conceals much of the bedrock. The prospect pits (fig. 5a) were recently excavated where a half-embedded cassiterite-bearing boulder protruded above the surface indicating that tin might be present at depth. There are no other surface indications that the ground is mineralized apart from a lump of cassiterite-bearing rock found in the bed of the gully.

STRUCTURE

The two pits of the prospect (fig. 5a) intersect a shear zone which trends 50° in Mathinna Group sediments. The shear revealed in the pits is 23 feet wide and should intersect the gully at a tangent at a distance of about 400 feet to the NE (fig. 5b). A shallow pit sunk into the bed of the gully in this locality indicated fractured silicified rock according to Mr Williams, but was otherwise barren. The accuracy of this statement could not be verified because the pit has caved in and concealed the bedrock geology.

The two prospect pits, 3-5 feet deep, have been excavated over a length of 30 feet. Overburden is 2-3 feet thick; rock exposure on the walls is therefore generally poor. The unmineralized host rock in the lower part of the northern pit (the northern contact) is a fractured clayey siltstone, irregularly silicified near the shear contact. The material of the shear zone proper is highly silicified

and altered to a quartzitic looking rock, which is seamed and traversed by parallel coalescing and intersecting fractures (fig. 6) filled with a dark fine-grained greenish black mineral. This mineral (tourmaline and chlorite?) which fills all the fissures and microfissures to form a network of interconnecting veinlets, imparts in places a characteristic banded appearance to the rock, the width

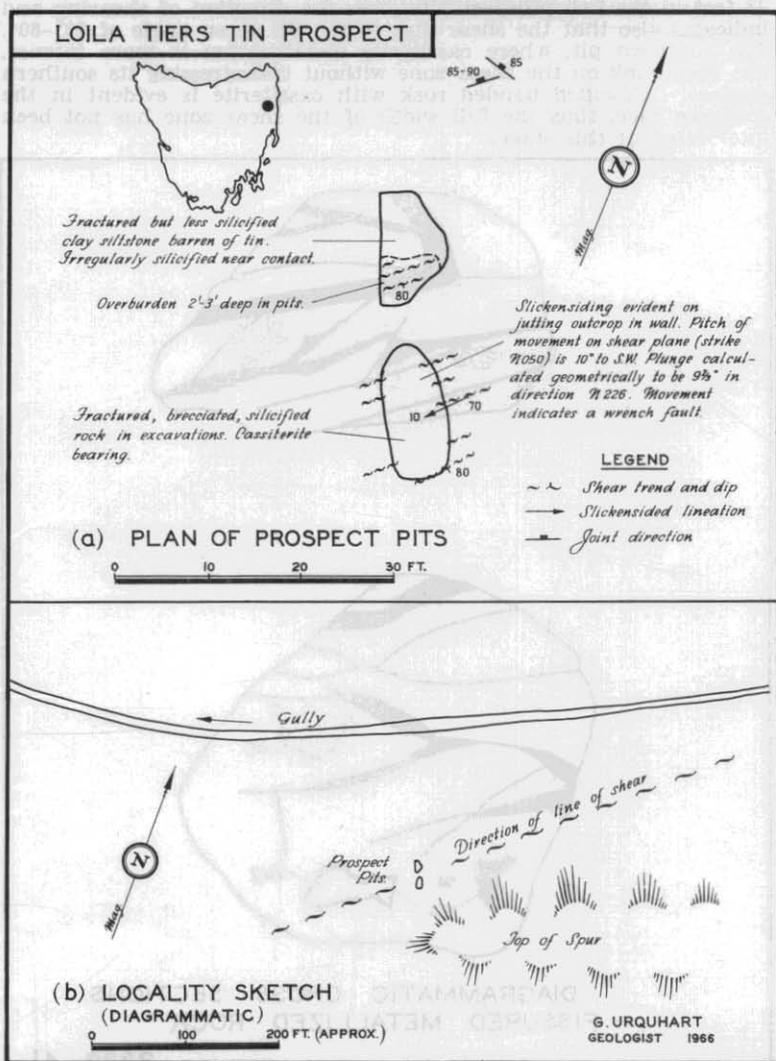
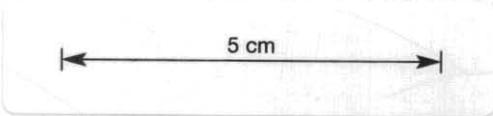


FIGURE 5

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of the infilling mineral ranging from hair-line stringers up to bands half an inch thick. The mineral is also present in irregular masses 1-2 inches in size apparently replacing material in the shear zone. Elsewhere the host rock is shattered, brecciated (a crush breccia) and cemented by the dark green mineral.

The linear banding of the shear zone revealed over a width of 23 feet in the two prospect pits gives the direction of shearing and indicates also that the shear dips to the SE at an angle of 70° - 80° . The southern pit, where cassiterite metallization is more intense, has been sunk on the shear zone without transgressing its southern contact. Silicified banded rock with cassiterite is evident in the southern face, thus the full width of the shear zone has not been intersected at this stage.

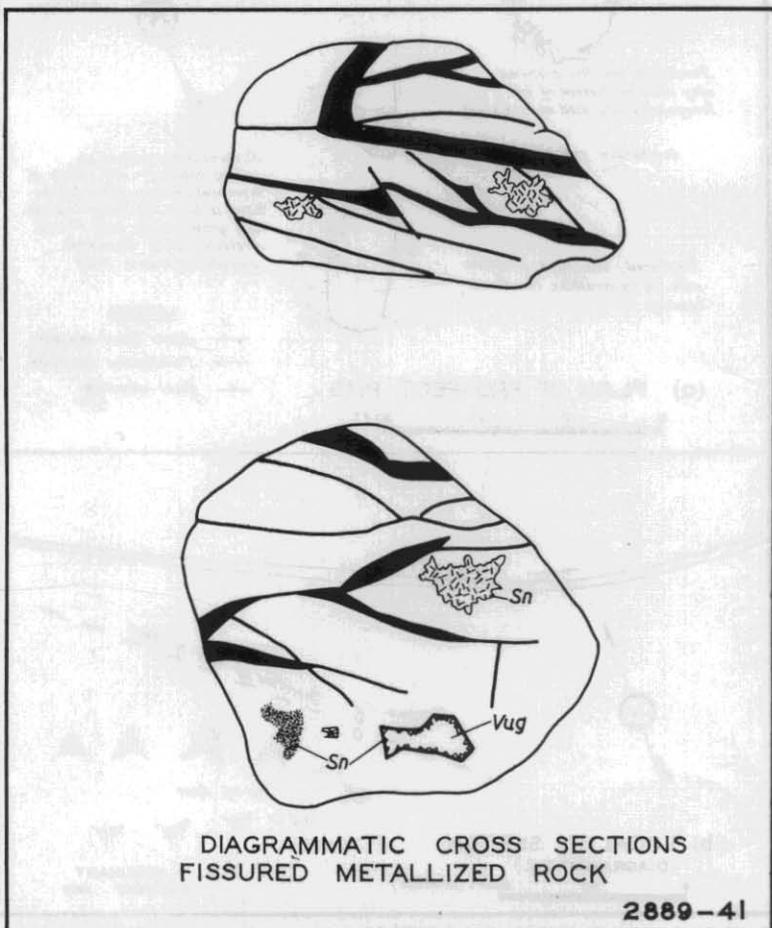


FIGURE 6

A slickensided lineation is evident on some faces of the tourmaline bands indicating a pitch of 10° to the SW on the shear plane in the southern pit. The geometrical solution of this structure shows that the slickensides plunge at an angle of $9\frac{1}{2}^\circ$ in a direction 226° and suggests that the rocks may have ruptured by a lateral wrenching movement rather than by vertical displacement.

Outcrops in the general vicinity of the prospect are scarce, but where they are present two sets of jointing were measured, one (related to the shear direction) trending 50° and dipping 85° - 90° to the N. Both joint sets near the prospect are filled with quartz stringers 3 mm thick. The jointing observed farther afield on the encircling ranges is regular, closely spaced (2-6 inches apart) and ranges in direction from 50° to 70° . The lithology in different outcrops is variable from rather massively bedded siltstone to thinly bedded maroon weathering slates composed of layers 0.5-1 inch thick. The sediments strike consistently in a direction 350° and dip 70° to the W.

MINERALIZATION IN THE PROSPECT PITS

Cassiterite metallization is best observed in the material on the dumps rather than in the pits themselves where the walls and floor are not well exposed. As previously mentioned the shear zone is evident in both pits, but the more richly concentrated cassiterite is present in rock extracted over a length of about 8 feet from the southern pit.

Cassiterite ranges from a variety which is almost colourless and translucent or pale yellowish brown to a variety which is brownish black. The finely granular mineral is associated with host rock in a number of different ways, some of which are shown by fig. 6. Cassiterite in most places fills vugs or forms crystalline encrustations, associated with hydrothermal quartz of a second(?) generation, on the surfaces of the vug-like openings found in the shear zone. The fissures and openings are irregular in outline, few exceeding 1 inch in length, consequently the cassiterite filling or partly filling these cavities forms concentrations of irregular shape. The tin mineral in other places is not confined to the cavities in the host rock but may be embedded as crystal aggregates of irregular shape within the siliceous quartzitic rock, or associated with areas of replacement quartz. Cassiterite was also observed to be sporadically embedded in the dark tourmalinized mineral bands. Sulphide minerals if present are in minor amount.

Generally speaking, cassiterite is emplaced as massive or disseminated granular crystalline aggregates and encrustations forming irregularly shaped concentrations up to 1 inch or more in size. Grade of the tin bearing rock is difficult to assess, but may be between 2 and 4 per cent Sn.

OTHER MINERAL OCCURRENCES IN THE AREA

A 5 feet wide silicified shear zone is exposed on the ridge about one quarter of a mile to the NE of the prospect. Arsenopyrite is present in quartz but tin content is low. The shear trends approximately 50° .

A number of excavations within a mile of the prospect to the NE shows the metallization to persist in this direction. The largest working, situated about 250 feet down the hillside on the W side of the road consists of a 15 feet deep shaft sunk by Mr Williams on a 1-3 feet wide vertical lode of brecciated rock and vuggy vein quartz which strikes in a direction 60° . Arsenopyrite is the most abundant sulphide mineral disseminated in plates and irregular masses through vein quartz. Bismuth and tin (up to 0.75 per cent near surface) was also reported in an assay, according to Mr Williams. The shear zone persists and is manifest about 100 feet down the hillside on the E side of the road, where surface workings indicate a 2 feet wide quartz lode bearing arsenopyrite.

The mineral occurrences described above are notable for their similarity of rock type, mineral content and structure and probably represent sporadic metallization along a single continuous line of shear trending 60° . The strike of the shear (50°) in the Lolla Tier prospect is similar; the position of the prospect relative to the other mineral occurrences suggests that it may be located along the same shear which has widened in a SW direction or that it is present in an ancillary shear.