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THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

EVALUATION OF THE GEORGES RIVER/GOSHEN E.L.A.

Author : P.A. Ruxton

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AMG REFERENCE POINTS ADDED

SUMMARY

The Goshen/Georges River ELA was pegged on 10/4/83. The majority of the ELA was previously held by CSR who pulled out on 28/3/83.

The area within the Georges River/Goshen ELA has been fully prospected by CSR and Geophoto (Texins Ltd.).

A stream sediment survey covers 95% of the ELA. All anomalous results have been followed up.

Several prospects were isolated by CSR with a shallow drilling programme completed at the Ferntree Hill anomaly.

None of the prospects are encouraging.

Traverse drilling by the Mines Department and bulk sampling by CSR downgrade the alluvial tin potential of the licence (essentially Thureau's Lead).

The source of alluvial tin has been defined as 1) spaced joint-fills/veins of greisen, quartz/tourmaline, quartz/muscovite and 2 mica granite within the Mt. Pierson Pluton; 2) the 2 mica granite and greisenization of the Constables Creek granite sheet and 3) veins associated with the Blue Tier/Lottah alkali granites.

Pending the results of the regional Blue Tier granite study by Bertus de Graaf BXR/AHO it is recommended that the application is dropped.

1.0 REGIONAL GEOLOGY (Fig. 1)

1.1 Mathinna Beds

The Mathinna Beds are the oldest rocks in the area (Ordovician to Devonian) consisting of interbedded sandstones, siltstones and shales. Deposition took place in deep water from turbidity current activity. The sequence has been subjected to low-grade regional metamorphism and folding (along NW - SE trending axes) during the Middle Devonian Tabberabberan Orogeny.

1.2 Devonian Granites

Granites of the Blue Tier Batholith passively intruded the folded Mathinna Bed sequence with a predominant NW - SE trending dilation axis. Contact metamorphic effects including spotting of sandstones and shales and fault/vein-related tin, copper, tungsten and silver mineralization. Three distinct phases of granites are recognized:

Early - Granodiorites - Hornblende/biotite-bearing (Scamander Tier Dyke, St. Helens Pluton)

- Biotite Granites - Equigranular coarse to medium grained or sparcely Porphyritic granites. (Poimena Pluton, Mt. Pierson Pluton)

Late - a) Two mica alkali granites of the Lottah/ Anchor area - intrusive plutons.

b) Two mica Constables Creek alkali granite - sheet-like body related to the Mt. Pierson granite pluton.

Two mica alkali granites contain associated tin mineralization essentially within structural highs.

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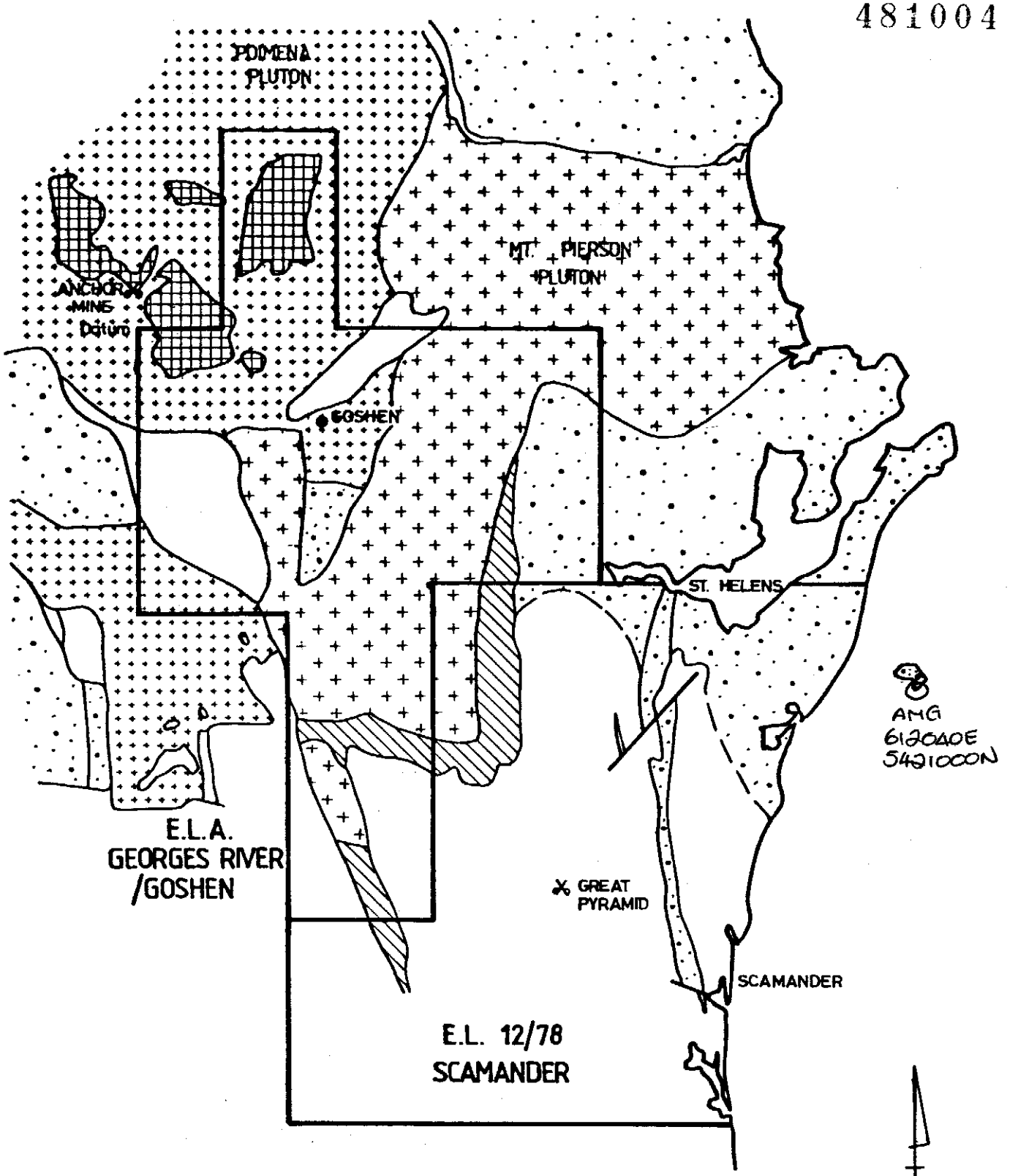

LEGEND

- LOTTA ALKALI GRANITE
- CONSTABLE CREEK GRANITE
- BIOTITE GRANITES
- HORNBLENDE GRANITOIDS
- MATHINNA BEDS

AMG REFERENCE POINTS ADDED

5 cm

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E.L.A. GEORGES RIVER/ GOSHEN
GEOLOGY

SCALE	DATE 25-8-83
AUTHOR P.A.R.	DRAWN J.L.L.
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1.3 Alluvium

Alluvium concentrations occur between St. Helens and Goshen predominantly, in an area known as Thureau's Lead (Fig. 2). Deposits range from Tertiary, Quaternary to Recent in age. Quaternary and Recent sands and gravels contain alluvial tin.

2.0 MINERALIZATION - EXPLORATION CONCEPTS

2.1 Anchor-style

Exploration in the Georges River/Goshen area has centred on the location of Anchor-style flat-lying greisen sheets related to the apices of alkali 2 mica granite intrusives. At the Anchor Mine cassiterite occurs in altered granite directly below a biotite granite cap-rock of the Poimena Pluton. The tin-bearing lodes have formed in the roof zone of an alkali granite intrusion. Efforts to locate exposed and buried Anchor-style mineralization have been futile to date between Goulds Country and St. Helens.

2.2 Pyramid-style

Mathinna hosted quartz-cassiterite vein/fracture stock-works represent a prime target. The percentage of Mathinna Bed cover in E.L. 11/78/ELA Goshen is low.

2.3 Veins

Minor occurrences of WO_3 - Mo quartz veins, lead-zinc, copper, silver-lead and gold-bearing veins occur in the Mathinna sediments of the area.

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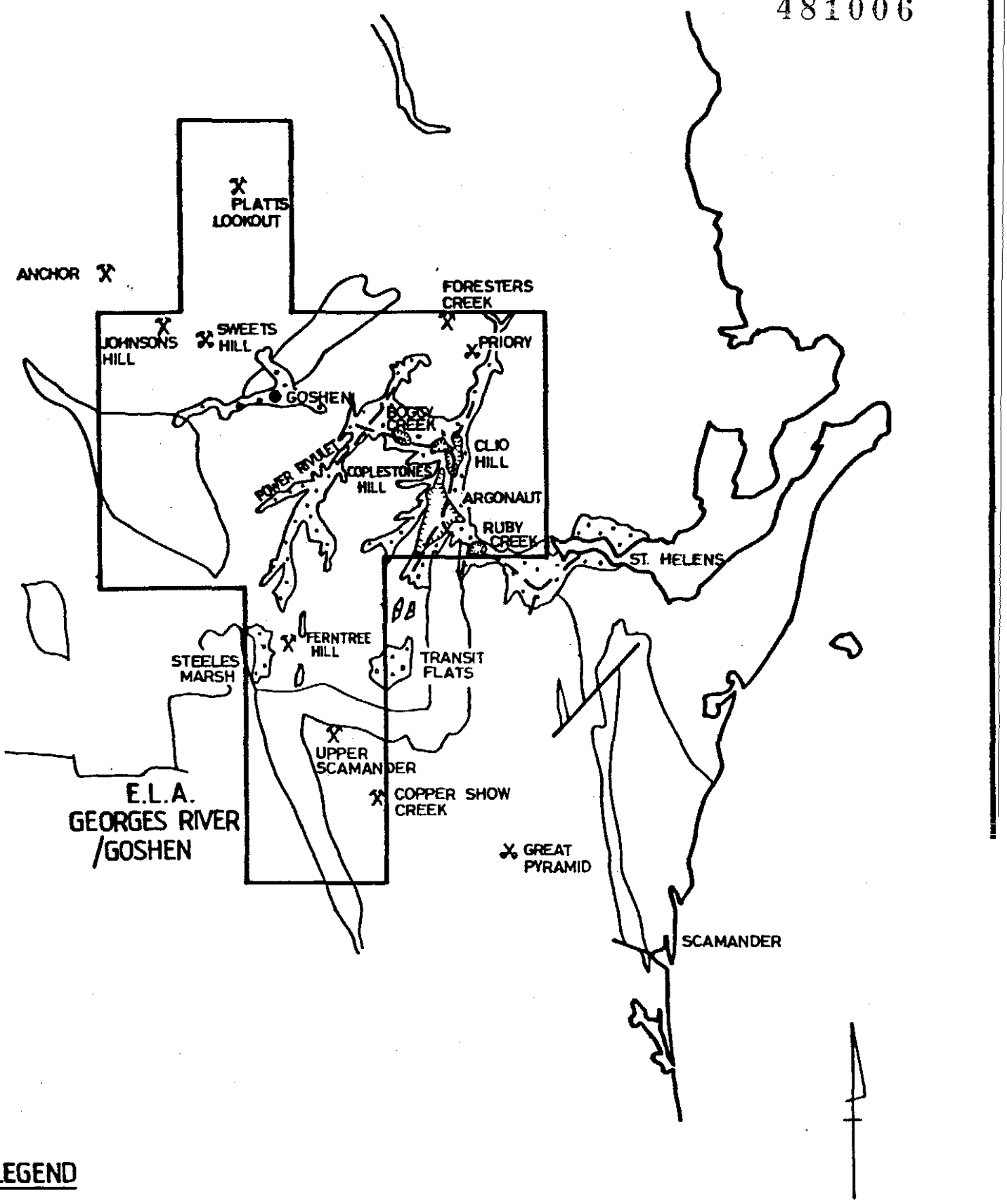

LEGEND

- SLUICED AREAS
- ALLUVIUM
- PALACOCHANNELS IN THUREAUS LEAD
- PROSPECT
- MINE

0 5km

5 cm

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E.L.A. GEORGES RIVER/ GOSHEN ALLUVIUM & PROSPECTS

SCALE	DATE 25-8-83
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2.4 Priory Mine

Cassiterite associated with quartz veins in the biotite granite - Mt. Pierson Pluton.

2.5 Alluvial/Eluvial Tin

Alluvial cassiterite workings are common NW of St. Helens. Exploration for an economic alluvial tin deposit has been conducted previously.

3.0 PAST EXPLORATION

3.1 Pre-CSR

Mt. Lyell Railway Co. (Pre 1950's)
Tasmania Mines Department (1910 on)
Rio Tinto Zinc Co. (1956 - 1958)
Austminex (1960's)
Utah Development Co. (1963 - 1966)
Broken Hill Proprietary Ltd. (1960's 1980's)
Aberfoyle Development Co. (mid 1960's)
Goldfields (late 1960's)
Texins Development Pty. Ltd. (Geophoto (1968 - 1970))

Geophoto extended the Austminex stream sediment survey assaying for Cu, Pb, Zn and Ag plus Mo and Bi. Stream data isolated the Upper Scamander and Copper Creek Show prospects. (Appendix 1).

Geophoto also flew an airborne radiometric survey with two anomalies in the Georges River area (O and U). Ground check yielded negative results. A digital fracture analysis was also completed. Structural anomaly follow-up did not lead to economic mineralization.

3.2 CSR Exploration

Regional stream sediment sampling was completed to cover the whole exploration licence E.L. 11/78. Streams bearing alluvial cassiterite were followed up to define the tin source (Appendix 1).

Aerial photographs were examined and structural anomalies followed up.

All old workings and prospects were evaluated. Radiometric anomalies (O and U) were not followed up due to low order geochemical results.

Regional investigations suggested that the only prospective areas were:

a) Known alluvial workings.
b) Known mines (Priory and Anchor).
c) The Ferntree Hill Prospect (located by alluvial tin follow up), Forester Creek (stream sediment anomaly) and Johnson's Hill/Sweets Hill (old pits/trenches etc.).

Detailed prospect evaluation is contained in Appendix 1.

4.0 SUMMARY OF PROSPECTS (Fig. 2)

4.1 Mathinna Beds : Fracture-related mineralization

The Copper Show Creek and Upper Scamander anomalies represent the fracture/fault-related Mathinna Bed mineralization. Both anomalies are located in quartzite units and consist of quartz/chlorite veinlets and breccia zones with associated pyrite

chalcopyrite and galena. A 230m hole (-60°) failed to locate significant mineralization at the Upper Scamander prospect. Both prospects are further downgraded by their association with a structurally low portion of 2 mica granite (Fig. 2).

4.2 Mt. Pierson & Constable Creek Granite Mineralization

Present day erosion is removing cassiterite from the Mt. Pierson and Constable Creek granite masses. The tin source is probably fine grained 2 mica granite, greisen, quartz/muscovite and quartz/tourmaline veins and joint-fills in the Mt. Pierson Pluton and the Constable Creek Granite sheet itself. Follow-up of alluvial tin and anomalous stream sediment samples has led to the recognition of several source areas: Ferntree Hill, Foresters Creek, Priory Mine, Copplestone Hill and Clio Hill.

The Ferntree Hill tin is related to thin greisen, quartz/tourmaline and tourmaline veins associated with a 30m maximum thickness of greisenized or "weathered" granite cap. Ten shallow (max. 40m) percussion holes yielded a maximum tin assay of 760 ppm over a 0.75m sample interval. There is considered to be no depth potential to the prospect which probably forms part of the Constable Creek (greisen) granite sheet.

The Forester's Creek Prospect is small with anomalous Sn in soils over 50m by 200m and a maximum soil value of 170 ppm Sn. Ellis (1983) relates the prospect to a buried alkali granite cupola with associated tin leakage to the surface through the biotite granite of the Mt. Pierson Pluton. The size of the anomaly

and the maximum Sn in soils value is sufficient to downgrade the potential of this prospect.

Isolated greisenized granite veins quartz/tourmaline and quartz/mica veins at Clio Hill and Copplestone Hill anomalies also shed tin. A 20m wide silicified granite diatreme is suggested as a further tin source at Copplestone Hill although re-assaying gave a Sn value of 30 ppm.

4.3 Lottah Granite Mineralization

Old workings on Johnson's/Sweet's Hills suggest tin mineralization in quartz/tourmaline and greisen veins related to topographic highs. A stream sediment value of 95 ppm Sn is recorded but rock chip assays give a maximum if 55 ppm Sn.

Alaskites, pegmatites and aplites crop out on Platt's Lookout however Sn values are low (max. 50 ppm).

4.4 Alluvial Potential (Appendix 2)

Cassiterite is concentrated in Quaternary and Recent deposits which attain a maximum thickness of 5m on Thureau's Lead where they overly 85m (maximum) of barren Tertiary sediments. Large areas of gravel on Thureau's Lead have been sluiced - the Boggy Creek, Clio Hill, Augonaut and Ruby Creek workings. The distribution of Quaternary and Recent alluvials is generally patchy and the grades essentially low. The prospect of a large economic alluvial tin concentration in this area is small.

5.0 CONCLUSIONS & RECOMMENDATIONS

The Georges River/Goshen area has been well prospected. CSR covered the whole area of E.L. 11/78 with stream geochemistry outlining several prospects. The area is geologically very interesting however not one prospect is exciting in terms of an economic tin deposit. The only work remaining is to bore a hole into Forester's Creek anomaly to test for alkali granite at depth and to assess the alluvial potential of the Powers Rivulet Quaternary/ Recent sediments. Both proposals are negative and long shots due to the confined nature and low grade of the Forester Creek soil anomaly and restricted dimensions of the Powers Rivulet alluvials and the low grades in the alluvials of Thureau's Lead.

The potential of the Georges River/Goshen ELA is not encouraging. On the grounds of examination of previous exploration data it is recommended to drop the application. However no move should be made prior to the compilation of regional geochemical and petrological data by Bertus de Graaf, BXR/AHO.

APPENDIX 1

PROSPECT EVALUATION ELA GEORGES RIVER/GOSHEN

Mathinna Beds : Fracture-related Mineralization
Mt. Pierson & Constable Creek Granite Mineralization
Lottah Granite Mineralization

MATHINNA BEDS : FRACTURE - RELATED MINERALIZATION

Two prospects related to fracturing in the Mathinna Bed cover rocks were located by Geophoto and lie in the southern part of E.L. 11/78 (Fig. 2).

Copper Show Creek (As, Cu, Pb, Zn, Ag)

Summary - Fracture/vein-related base metal mineralization with minor cassiterite. Gossanous Mathinna Bed quartzite host. Arsenopyrite common.

Location - Junction of Haley's Creek and the Scamander River, approximately 10 km NW of Upper Scamander.

Old Workings - 2 adits (800m apart), shaft, trenches.

Exploration - Geophoto
- Anomalous Cu geochemistry in streams.
- 3 lines of soil geochemistry (assaying for Cu, Pb, Zn, Ag).
- Rock chip assays on vein material 1.52% As and 460 ppm Pb and on Fe stained quartzite 6.8% Pb, 0.29% Zn, 105 ppm Ag and 35% As.
- Costeans.

C.S.R.
- Ground mapping - located the second adit 800m NNW of first.
- Minor rock chip sampling.
- Recognized that the copper anomalous zone is coincident with a Geophoto structural anomaly.
- Heavy concentrates in streams contain minor cassiterite, scheelite and gold.
- Potential for economic deposit slim (low tonnage, low grade only).

UPPER SCAMANDER PROSPECT

Summary - Fracture/fault/vein - related base metal and minor cassiterite mineralization. Quartzite Mathinna Bed host rocks.

Location - Headwaters of Haley's Creek approximately 12 km NW of Upper Scamander.

Geology - NW trending quartzite unit cross cut by NE trending fractures/faults/veins.

Exploration - Geophoto
- Anomalous Cu in stream sediments.
- Detailed stream geochemistry.
- Soil geochemistry.
- Scout geological mapping.
- 2 lines of IP.
- 1 drillhole - Drilled to test a soil Cu anomaly (weak) plus an IP feature. No significant mineralization. Total hole depth 230m (depressed -60° to 069°). Quartz/chlorite breccia zones and sulphides; pyrite, chalcopyrite and galena on joints in Mathinna Beds.

C.S.R. - Resampled streams - low Sn values.
- Minor rock chip geochemistry.
- Geology - located quartz/muscovite and quartz/tourmaline veins in Cu geochemical anomalous area.
- Heavy minerals draining prospect contain tourmaline/cassiterite/scheelite/wolframite and gold.
- Quartz veins common in area.
- Low potential.

A traverse between the Copper Show Creek and Upper Scamander Anomalies yielded limonitic gossans with upto 0.3% Sn associated with siltstones bearing quartz veins.

Comment - The Copper Show Creek and Upper Scamander anomalies are probably related forming a NW trending fault(?) zone of about 3 km strike length. The large amount of arsenopyrite at the Copper Show Creek prospect suggests similarities to the Dunn's/Paul Beahrs mineralization styles.

The two prospects lie close to the Constables Creek granite contact in a region where the granite surface is structurally low. No significant stream sediment Sn anomaly is evident.

There is little economic potential in this area.

MT. PIERSON & CONSTABLE CREEK GRANITE MINERALIZATION

Cassiterite is being shed from the Mt Pierson and Constable Creek granite masses in the present weathering cycle. The tin source is probably aplitic 2 mica granite, greisen, quartz/muscovite, quartz/tourmaline veins and the granites themselves. Several prospects have been located.

Ferntree Hill C.S.R. (Sn)

Summary - Cassiterite-bearing disseminated greisen quartz/tourmaline, tourmaline veins in greisenized granite.

Location - Headwaters of Derwent and Charters Creeks, close to Hogans Road, 11 km SW of St. Helens.

Discovery - During geological reconnaissance in the Derwent and Charter Creeks. Stream sediment anomaly 170 and 125 ppm Sn.

Exploration - Stream sediment sampling.
- Gridding]
- Soil sampled] - several times + extensions - generally hand augered and later samples assayed for Sn, WO_3 at -20 +80#, Cu, Pb, Zn, Bi + Mo at -80#.
- Rock chip sampled and roughly mapped.
- 10 shallow percussion holes drilled.

Anomaly - Sn in soils - results patchy with maximum Sn value 370 ppm. Soil zone 800m across E-W and 100m N-S - very patchy.
- Rock chip values elevated.

Geology - Limited outcrop of greisenized (weathered?) granite (Constable Creek sheet) overlying a coarse grained biotite adamellite of the Mt. pierson Pluton. Adamellite outcrops to the east.

Drilling - 10 vertical percussion holes to total depth of 40m each. Sampled every 0.75m. Maximum assay values from percussion samples 760 ppm Sn (FTH5). High values generally isolated (-vein-related).
- Greisen vein from chips FTH5 assayed at 2.3% Sn. Greisen, tourmaline/quartz, tourmaline veins coincident with soil geochemistry.

(Weathered?) greisen cap on hard competent biotite granite, about 30m thick maximum (skin of the Constable Creek Granite?).

C.S.R. model - veins related to an alkali granite intrusion.

- My interpretation - greisen sheet of the Constable Creek granite - flat-lying and restricted to topographic high areas. No depth potential to the prospect.

Forester Creek Tributary (C.S.R. (Sn)

Summary - Cassiterite-bearing veins in biotite adamellite related to an alkali granite intrusion at depth(?).

Location - Tributary of Forester Creek, 5 km NW of the Priory Prospect, 12 km NW of St. Helens.

Discovery - One anomalous stream sediment sample with 190 ppm Sn - confined to one tributary only. Repeat stream sample 250 ppm.

Exploration - Stream sediment sampling.
- Gridded roughly + soil geochemistry.
- Regridded with 4 N-S lines 1 km long each.
- Rock chip geochemistry + geology.
- Ground scintillometer survey (4 lines).
- Ground magnetics (4 lines).
- Gravity (4 lines).

Anomaly - Sn in soils maximum soil value of 170 ppm Sn (40 ppm Pb) in a 50m wide zone elongated to the E and W (-20# fraction).
- Coincident radiometrics anomaly of Geophoto - slightly elevated K40 values.
- Ground geophysics showed marginal gravity and magnetic anomalies coincident with the soil geochemistry anomaly - slightly offset ground radiometric anomaly. (Gravity used to distinguish between biotite adamellites and alkali granites - the latter slightly less dense).

Geology - Outcrops of medium to coarse grained adamellite with minor granodionite and aplitic material - float of alkali granite. More alkali granite to the east.

Results - Sub surface geological change between lines 3 and 4.

Model - Medium to coarse grained adamellite intruded by alkali granite. The former represents a cap rock for the latter in the prospect area. Tin values slightly elevated in the top of the cupola zone - leakage through the adamellite cap.

Comment - Possibility of tin at depth trapped beneath the biotite adamellite cap-rock in an alkali granite cupola. Potential is considered low due to the confined nature of the anomaly.

Other prospects

COPPLESTONE HILL/MOONLIGHT MARSH

Located - 9 km west of St. Helens, close to the Terryvale Road.

Geology - Extensively fractured granite - joints + fractures invaded by silicified granite breccia, fine grained granite and quartz/tourmaline veins. All 3 contain cassiterite - fine grained granite contains pyrite and tourmaline.

Location 138 pipe-like diatreme, vertical of siliceous material 20m across associated with filled flat-lying joints.

Exploration- small grid.
soil sampled - no significant anomalies
rock chip samples - aplites and quartz/tourmaline veins upto 1% Sn.
(No stream geochemical expression (why?)).

Comment - Copplestone Hill is a significant topographic high (again the association of topography and tin mineralization)!

Aplites, silicified breccias and quartz/tourmaline veins are the source for the alluvial cassiterite in Moonlight Marshes.

CLIO HILL

Located - 6 km NW of St. Helens by the side of the Tasman Highway.

Geology - Essentially an alluvial working. Granite exposure weakly greisenized.

Exploration- rough grid
geology
rock geochemistry - maximum value of 125 ppm Sn.

BELL MARSH CREEK

Located - 10 km NW of St. Helens.

Geology - Alluvial Sn in NE trending fault - controlled valley.
No mineralization in the fault.
May be an extension of Forester Creek Tributary zone.
No conclusive Sn source found.

LOTTAH GRANITE MINERALIZATION

Minor mineralization has been reported from the NW part of E.L. 11/78 associated with the Lottah Granite. Three prospects are associated with topographic high regions.

JOHNSONS HILL

Located - 1.5 km west of Goulds Country.

Geology - Biotite adamellite - muscovite-rich, may be fine grained and porphyritic.

Exploration - Stream sediment 95 ppm Sn.
Gridded.
Soil geocheistry - no Sn in soils.
Rock chip sampling values of 3.0% Sn - not repeatable - also 300 ppm Sn and 0.17% WO_3 suspect analyses.
Old workings.

Some quartz/tourmaline and greisen veins found in altered rocks.

Agricultural contamination too (ploughing, racking etc.).

Repeat sampling of rock and soils gave maximum of 55 ppm Sn (Ellis, 1983).

SWEETS HILL Similar to Johnsons Hill. No potential.

PLATTS LOOKOUT

Located - 6 km NNE of Goulds Country.

Geology - Alaskites aplites pegmatites associated with fine grained porphyritic adamellite and biotite adamellite contact. Minor Sn upto 50 ppm.

APPENDIX 2

THE ALLUVIAL TIN POTENTIAL OF ELA GEORGES RIVER/GOSHEN

ALLUVIAL TIN POTENTIAL

Summary

Cassiterite occurs in Quaternary sands and gravels which reach a maximum of 5m thick (Thureau's Lead), overlying barren Tertiary deposits. Tin values are uniformly low in the Quaternary sands attaining a maximum of 0.16 lbs per cubic yard. Reworking of Quaternary sediments and present day tin erosion has led to minor surficial tin concentrations.

Introduction

The buildup of alluvium in the St. Helens/Georges River area has taken place since the early Tertiary. The distribution of alluvium is patchy with the main concentration in an area between Goshen and St. Helens known as Thureau's Lead. Thureau's Lead incorporates the old tin workings of Boggy Creek, Clio Hill, Argonaut and Ruby Creek. Drill traverses centred on the main Tertiary palaeochannel of Thureau's Lead indicate between 60 to 90 metres of sediment accumulation. A basalt of Lower Tertiary age was intersected at the base of the channel - overlain by clays, mudstones, siltstones, sandstones and conglomerates. Tertiary sediments are overlain by conglomerates. Tertiary sediments are overlain by a thin capping of Quaternary and recent deposits.

In Thureau's Lead Tertiary and Quaternary sediments collected in a palaeochannel which is cross-cut by present day drainage. The palaeochannel is coincident with the major old workings of the area.

Mineralization

Cassiterite is concentrated within Quaternary and Recent deposits in this area. No significant tin occurs in the Tertiary suggesting unroofing of the granite took place in Quaternary times. The occurrence of pyrite in Tertiary sediments suggests erosion of sulphide-bearing Mathinna Beds.

Old workings in Thureau's Lead are centred on 5 metres of Quaternary and recent sand and gravels above the "marine bottom" or clayey siltstone at the top of the Tertiary sequence. Sampling of the Quaternary unconsolidated sediments by C.S.R. and the Mines Department indicate low tin values upto a maximum of 0.16 lbs/yd^3 (TMD Jacks, 1963) and 26.44 ppm (Argonaut Workings - CSR, Williams, 1980). These results are the highlights of 8 drill traverses (THD) and numerous 12 kg bulk samples (CSR) on Thureaus Lead.

The major alluvial workings occur at the junction of NE trending tributary creeks and the main palaeochannel.

Two types of cassiterite are recognized - predominately fine grained rounded black cassiterite and a coarse angular red cassiterite. The former is considered to have been reworked or possibly travelled some distance, perhaps from the Lottah/Anchor area(?). Ruby tin can be panned in recent sediments and is

probably being shed from differentiated 2 mica granite sources exposed in the area. Gold, sapphires, zircon and wolframite occur with the cassiterite in Thureau's Lead. Reputably enough gold was present to pay the wages of the workers in the oldworkings.

Patches of Quaternary and Recent alluvium south of Thureau's Lead contain alluvial cassiterite namely Powers Rivulet, Steele's Marshes, Transit Flat, Charters Marsh etc. The Groom River close to Goshen and Bell Marsh Creek, Albion Creek, Saxelby Creek, Hunt Mine Creek etc. also contain cassiterite.

Conclusions

Alluvial tin deposits in the Goshen/St. Helens area are contained within 5m of sediment which has generally low grade Sn. The alluvium has a patchy distribution and the areas of highest potential have been removed in previous workings. Further concentration of cassiterite is currently taking place with the reworking of Quaternary gravels and sands and the additional influx of coarse ruby tin.

The potential for an economic alluvial tin deposit is considered low.